

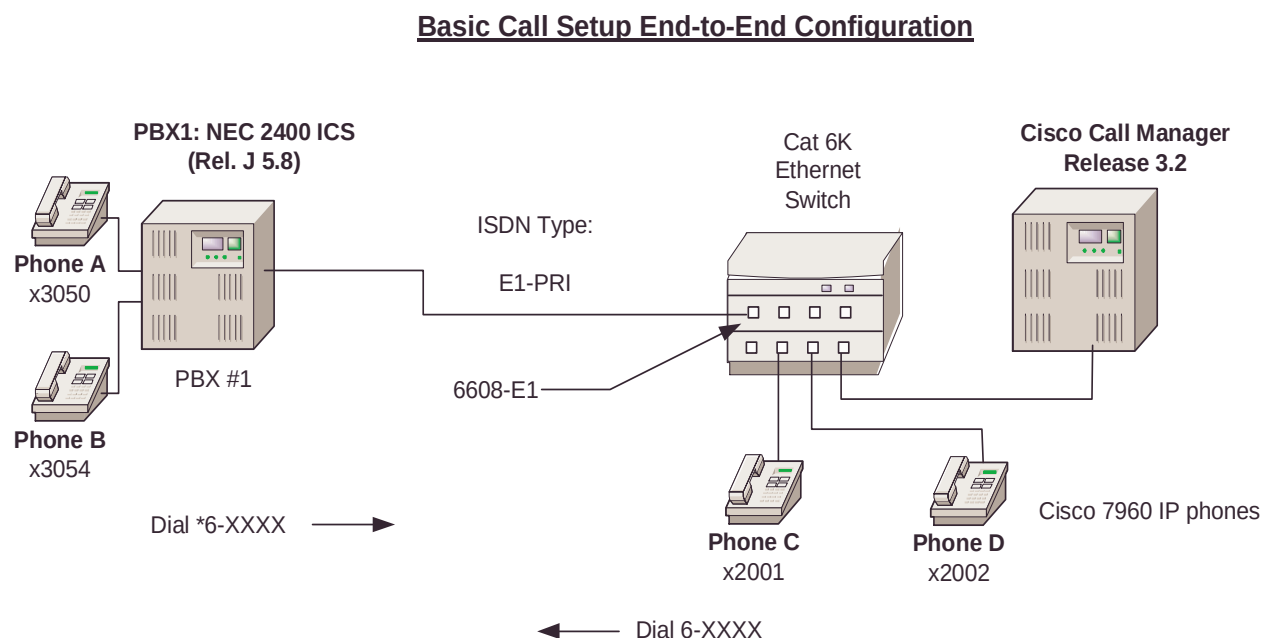
Cisco 6608 Gateway - PBX Interoperability: NEC 2400 ICS Rel. J 5.8 PBX with CallManager using E1 PRI EURO to an MGCP Gateway

Introduction

- This note describes the interoperability of the NEC 2400 ICS Release J 5.8 PBX, Cisco CallManager, and Cisco 6608 Catalyst switch in an MGCP gateway. The signaling protocol is E1 PRI.
- The network topology diagram shows the end-to-end interoperability.
- Connectivity is achieved by using the PRI EURO protocol on the gateway and NEC/ETSI switch type on the NEC 2400 PBX.

Network Topology

Figure 1. Network Topology



Limitations

- Though the NEC 2400 PBX can be configured as either “network side” (master) or “user side” (slave), this is not recommended and the NEC TAC center will not resolve a case presented with the NEC PBX configured as “network side.”
- Calling name delivery and presentation features are not supported by the NEC 2400 PBX.
- Cisco CallManager does not send “Connected Number” information in the CONNECT message back to PBX.



- When calling from a Cisco 7960 IP phone to a NEC digital phone, both phones display the calling number after the call is answered as expected. When calling from a NEC digital phone to a Cisco 7960 IP phone, the Cisco IP phone displays the connected number after the call is answered. The NEC phone, however, does not get updated when the call is answered. It displays the numbers being dialed instead (that is, access code + extension number). It was verified using an ISDN protocol analyzer that the Cisco CallManager was not sending “Connected Number” information in the CONNECT message back to PBX.

System Components

Hardware Requirements

- Cisco Catalyst 6000 switch with Cisco 6608-E1 gateway
- NEC 2400 ICS PBX, PA-30PRTB

Software Requirements

- PBX Software Release J 5.8.
- Cisco CallManager Release 3.2

Configuration

Configuring the NEC 2400 ICS Rel. J5.8 PBX

The NEC requires a substantial amount of programming and circuit card switch settings to properly install E1 PR. It is beyond the scope of this document to provide the entire configuration; therefore the NEC information below is mostly helpful for NEC techs. 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 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



Switch	Position	Description	Setting
SW13	1	On = PAD ROM Special Version Off = PAD ROM Standard Version	Off
	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



Switch	Position	Description	Setting
	5	On = Dch NegativeLogic 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 12 is the B channel and route 13 is the D channel.

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* ROUTE CLASS DATA LIST *

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	1	1	1	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]

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* ROUTE CLASS DATA LIST *

CDN	FUNCTION	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 Cisco CallManager

Step 1. Configure the Cisco 6608-E1 gateway. Use the following screens as a reference.

Cisco CallManager 3.2 Administration - Gateway Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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System Route Plan Service Feature Device User Application Help

Cisco CallManager Administration
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Gateway Configuration [Back to Find/List Gateways](#)

Product : Cisco Catalyst 6000 E1 VoIP Gateway
Gateway : S0/DS1-0@SDA0001C9D8633E
Device Protocol: Digital Access PRI
Registration: Registered with Cisco CallManager 10.1.1.2
IP Address: [10.1.1.104](#)

Status: Ready

MAC Address*	0001C9D8633E
Description	
Device Pool*	Default
Media Resource Group List	< None >
Network Hold Audio Source	< None >
User Hold Audio Source	< None >
Calling Search Space	< None >
Location	< None >
Load Information	
Channel Selection Order*	Top Down
PCM Type*	A-law
Protocol Side*	Network
Caller ID DN	
Calling Party Selection*	Originator

Local intranet



Cisco CallManager 3.2 Administration - Gateway Configuration - Microsoft Internet Explorer

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Channel IE Type*	Use Number when 1B
MCDN Channel Number Extension Bit Set to Zero**	☐
Interface Identifier Present**	☐
Interface Identifier Value**	0
Display IE Delivery	☒
Redirecting Number IE Delivery - Outbound	☒
Redirecting Number IE Delivery - Inbound	☐
Delay for first restart (1/8 sec ticks)	32
Delay between restarts (1/8 sec ticks)	4
Num Digits*	23
Sig Digits	☒
Prefix DN	
Presentation Bit*	Allowed
Called party IE number type unknown*	Cisco CallManager
Calling party IE number type unknown*	Cisco CallManager
Called Numbering Plan*	Cisco CallManager
Calling Numbering Plan*	Cisco CallManager
PRI Protocol Type*	PRI EURO
Inhibit restarts at PRI initialization	☒
Enable status poll	☐
Number of digits to strip*	0
Network Locale	United States
Setup non-ISDN Progress Indicator IE Enable****	☐

Local intranet



Cisco CallManager 3.2 Administration - Gateway Configuration - Microsoft Internet Explorer

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Product Specific Configuration

Clock Reference*	Network
Framing*	CRC4
Audio Signal Adjustment into IP Network*	NoDbPadding
Audio Signal Adjustment from IP Network*	NoDbPadding
Zero Suppression*	HDB3
Digit On Duration(50-500ms)*	100
Interdigit Duration(50-500msec)*	100
Adaptive Gain Control Enable*	☐
SNMP Community String	public

Fax Parameters

Fax Relay Enable*	☒
Fax Error Correction Mode Override*	☒

* indicates required item
** applicable to DMS-100 protocol only
*** applicable to DMS-100 protocol and DMS-250 protocol only
**** may be required to force ringback from some PBXs

[Back to Find/List Gateways](#)

Local intranet



Step 2. Configure the route pattern. Use the following screen as a reference.

Cisco CallManager 3.2 Administration - Route Pattern Configuration - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Address 6-482E-82A5-26FFF0723031 Go Links

System Route Plan Service Feature Device User Application Help

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Route Pattern Configuration

[Add a New Route Pattern](#)
[Back to Find/List Route Patterns](#)

Route Pattern: 6.XXXX

Status: Ready
Note: Any update to this route pattern automatically resets the associated gateway/route list

Copy Update Delete Cancel Changes

Pattern Definition

Route Pattern* 6.XXXX

Partition <None>

Numbering Plan* North American Numbering Plan

Route Filter <None>

Gateway/Route List* S0/DS1-0@SDA0001C9D8633E (Edit)

Route Option
☒ Route this pattern ☐ Block this pattern

☒ Provide Outside Dial Tone ☐ Urgent Priority

Calling Party Transformations

☐ Use Calling Party's External Phone Number Mask

Calling Party Transform Mask

Prefix Digits (Outgoing Calls)

Called Party Transformations

Discard Digits PreDot

Called Party Transform Mask

Prefix Digits (Outgoing Calls)

* indicates required item.

Done Local intranet



Configuring the Catalyst 6000 Switch

- Verify the software version using the **show version** command. The following is sample output.

```
Console> (enable) sh version
```

```
WS-C6006 Software, Version NmpSW: 5.5(6a)  
Copyright (c) 1995-2001 by Cisco Systems  
NMP S/W compiled on Feb 23 2001, 10:23:18
```

```
System Bootstrap Version: 5.3(1)
```

```
Hardware Version: 2.0 Model: WS-C6006 Serial #: TBA04511172
```

Mod	Port	Model	Serial #	Versions
1	2	WS-X6K-SUP1A-2GE	SAD05010NBK	Hw : 7.0 Fw : 5.3(1) Fw1: 5.4(2) Sw : 5.5(6a) Sw1: 5.5(6a)
3	48	WS-F6K-PFC WS-X6348-RJ-45	SAD05020221 SAD04420N7B	Hw : 1.1 Hw : 1.4 Fw : 5.4(2) Sw : 5.5(6a) Hw : 1.0
4	24	WS-F6K-VPWR WS-X6624-FXS	SAD050203M8	Hw : 3.0 Fw : 5.4(2) Sw : 5.5(6a) HP : A00203010038; DSP : A003Q031 (3.6.
15)				
6	8	WS-X6608-E1	SAD04380DW1	Hw : 1.1 Fw : 5.4(2) Sw : 5.5(6a) HP1: D00403010044; DSP1: D005Q031 (3.6.
15)				HP2: D00403010044; DSP2: D005Q031 (3.6.
15)				HP3: D00403010044; DSP3: D005Q031 (3.6.
15)				HP4: D00403010044; DSP4: D005Q031 (3.6.
15)				HP5: D00403010044; DSP5: D005Q031 (3.6.
15)				HP6: D00403010044; DSP6: D005Q031 (3.6.
15)				HP7: D00403010044; DSP7: D005Q031 (3.6.
15)				HP8: D00403010044; DSP8: D005Q031 (3.6.

Module	DRAM Total	Used	Free	FLASH Total	Used	Free	NVRAM Total	Used	Free
1	65408K	37340K	28068K	16384K	11546K	4838K	512K	198K	314K

```
Uptime is 127 days, 7 hours, 31
```

- Verify modules using the **show module** command. The following is sample output.

```
Console> (enable) sh module
```

Mod	Slot	Ports	Module-Type	Model	Sub	Status
1	1	2	1000BaseX Supervisor	WS-X6K-SUP1A-2GE	yes	ok
3	3	48	10/100BaseTX Ethernet	WS-X6348-RJ-45	yes	ok
4	4	24	FXS	WS-X6624-FXS	no	ok
6	6	8	E1	WS-X6608-E1	no	ok



Mod	Module-Name	Serial-Num			
1		SAD05010NBK			
3		SAD04420N7B			
4		SAD050203M8			
6		SAD04380DW1			

Mod	MAC-Address(es)	Hw	Fw	Sw
1	00-04-c0-f8-42-02 to 00-04-c0-f8-42-03	7.0	5.3(1)	5.5(6a)
	00-04-c0-f8-42-00 to 00-04-c0-f8-42-01			
	00-04-9b-f0-78-00 to 00-04-9b-f0-7b-ff			
3	00-02-fc-20-5e-50 to 00-02-fc-20-5e-7f	1.4	5.4(2)	5.5(6a)
4	00-03-32-ba-2e-35	3.0	5.4(2)	5.5(6a)
6	00-01-c9-d8-63-3e to 00-01-c9-d8-63-45	1.1	5.4(2)	5.5(6a)

Mod	Sub-Type	Sub-Model	Sub-Serial	Sub-Hw
1	L3 Switching Engine	WS-F6K-PFC	SAD05020221	1.1
3	Inline Power Module	WS-F6K-VPWR		1.0

- Verify the ports using the **show port** command. The following is sample output.

Console> (enable) **sh port 6/1**

Port	Name	Status	Vlan	Duplex	Speed	Type
6/1		connected	1	full	2.048	E1

Port	DHCP	MAC-Address	IP-Address	Subnet-Mask
6/1	enable	00-01-c9-d8-63-3e	10.1.1.104	255.255.255.0

Port	Call-Manager(s)	DHCP-Server	TFTP-Server	Gateway
6/1	10.1.1.2	10.1.1.2	10.1.1.2	10.1.1.7

Port	DNS-Server(s)	Domain
6/1	-	-

Port	CallManagerState	DSP-Type
6/1	registered	C549

Port	NoiseRegen	NonLinearProcessing
6/1	enabled	enabled

Console> (enable)

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Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters

Cisco Systems International
BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters

Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 317 7777
Fax: +65 317 7799

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