



# Avaya Definity CM 2.0 to a Cisco IAD243X using PRI T1-NI ISDN with SIP

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## Introduction

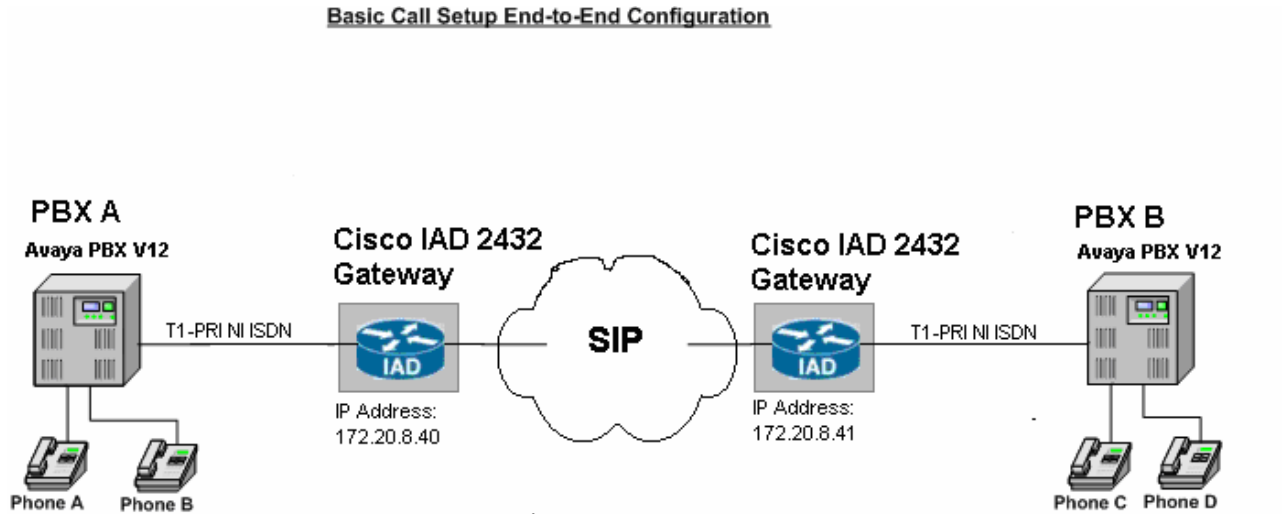
This is an application note for connectivity to Avaya Definity G3 Communications Manager 2.0 with Cisco IAD243X Gateway via PRI NI-to-SIP communication (10/100baseT).

The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco IAD243X Gateway connected to the PBX via PRI NI ISDN (T1). IP trunk connectivity between the IAD243X's is achieved by using SIP protocol.



## Network Topology

Figure 1. Basic Call Setup



## Limitations

Connected Name feature does not interoperate. The limitation is due to the IAD2432 not supporting this feature.

Overlap sending/receiving is not supported in IOS when configured for ISDN “switch-type primary-ni”

Connected Number does not follow the CallForward feature (e.g. If Phone A calls Phone C, and Phone C is forwarded to Phone D, the connected number displayed on Phone A will be Phone C’s number, not Phone D’s). The limitation is due to the IAD2432.

Connected number restriction is not honored. The limitation is due to the IAD2432

When a call conference is initiated by the external calling phone to conference a local phone (i.e. Phone A calls Phone C, Phone A conferences Phone D), in order for the call not to drop between the local phones at the instance that the conferencing phone leaves (i.e. Phone A hangs-up), the Avaya trunk configuration must be set for “Disconnect Supervision – In? yes Out? yes. This is detailed in the Configuration section.



## Hardware Requirements

- 2 Cisco IAD2432 24FXS
- 2 Avaya Definity G3 w/ TN464F circuit pack
- 4 Avaya Digital stations 8410D
- 1 Cisco Catalyst switch (CAT6500)

## Software Requirements

- Avaya PBX: G3 Version 12 Communications Manager 2.0
- Cisco IOS Release: c2430-ik9o3s-mz-124-9.T1

## Features

### Features Supported

- Basic end-to-end calls with CLIP (Calling Number) and COLP (Connected Number)
- Calling Number Restricted (CLIR calling number only)
- Call Transfer – Local and Network/External
- Call Waiting
- Call on-hold
- Call Forward (Unconditional, Busy and No answer) – local and Network/External
- 3-way Conference

### Features Not Supported

- Calling Name
- Connected Name presentation
- Overlap sending/receiving

## Configuration

### Configuration Sequence and Tasks for the Avaya System

1. DS1 Configuration
2. Trunk group
3. Signaling Group
4. Assign trunk members
5. Uniform-dialing
6. ARR
7. Route Pattern
8. Digital station config



## Avaya PBX Configuration

```
1 2 |
DS1 CIRCUIT PACK

Location: 01A12                      Name: Tony B.IAD test
Bit Rate: 1.544                      Line Coding: b8zs
Line Compensation: 1                 Framing Mode: esf
Signaling Mode: isdn-pri
Connect: pbx                         Interface: network
TN-C7 Long Timers? n                Country Protocol: 1
Interworking Message: PROGRESS       Protocol Version: b
Interface Companding: mulaw          CRC? n
Idle Code: 1111111
DCCP/Analog Bearer Capability: 3.1kHz

Slip Detection? n                    Near-end CSU Type: other

Block Progress Indicator? n
```



```

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
TRUNK GROUP

Group Number: 12                Group Type: isdn                CDR Reports: y
  Group Name: Tony B. IAD testing  COR: 1                TN: 1                TAC: 612
  Direction: two-way              Outgoing Display? n    Carrier Medium: PRI/BRI
  Dial Access? y                  Busy Threshold: 99     Night Service:
Queue Length: 0
Service Type: tie                Auth Code? n           TestCall ITC: rest
                               Far End Test Line No:

TestCall BCC: 4
TRUNK PARAMETERS
  Codeset to Send Display: 0      Codeset to Send National IEs: 6
  Max Message Size to Send: 260  Charge Advice: none
  Supplementary Service Protocol: g  Digit Handling (in/out): enbloc/enbloc

  Trunk Hunt: descend                QSIG Value-Added? n
                                     Digital Loss Group: 13
Calling Number - Delete:          Insert:                Numbering Format: unk-unk
  Bit Rate: 1200                  Synchronization: async Duplex: full
Disconnect Supervision - In? y  Out? y
Answer Supervision Timeout: 0

```

T1 ISDN Calling Name config matrix					
Country Protocol	IOS setting	Avaya DS1 country protocol and protocol version setting	Avaya Trunk-Group Supplementary Services setting	Calling Name delivery method (What IE used?)	Result
National ISDN (NI)	Primary-ni	1-b	a (national)	Facility IE "CallingName"	Fail
National ISDN (NI)	Primary-ni	1-b	g (ANSI)	Display IE	Pass

Note: To set PRI trunk to use "Display IE" for name delivery set the "Supplementary Service Protocol:" parameter to 'g'.



```
1 2 3 4 5 6 7 8 9 10
TRUNK FEATURES
  ACA Assignment? n           Measured: none           Wideband Support? n
                               Internal Alert? n         Maintenance Tests? y
                               Data Restriction? n       NCA-TSC Trunk Member: 1
                               Send Name: y                 Send Calling Number: y
  Used for DCS? n
  Suppress # Outpulsing? n    Numbering Format: public
  Outgoing Channel ID Encoding: preferred  UUI IE Treatment: service-provider
                               Replace Restricted Numbers? y
                               Replace Unavailable Numbers? y
                               Send Connected Number: y
  Send UUI IE? n
  Send UCID? n
  Send Codeset 6/7 LAI IE? n           Ds1 Echo Cancellation? n
  SBS? n  Network (Japan) Needs Connect Before Disconnect? n
```

```
1 2 3 4 5
SIGNALING GROUP
Group Number: 12           Group Type: isdn-pri
  Associated Signaling? y   Max number of NCA TSC: 12
  Primary D-Channel: 01A1224  Max number of CA TSC: 12
                               Trunk Group for NCA TSC: 12
  Trunk Group for Channel Selection: 12  X-Mobility/Wireless Type: NONE
  Supplementary Service Protocol: a
```



1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

```

TRUNK GROUP
Administered Members (min/max): 1/4
Total Administered Members: 4

GROUP MEMBER ASSIGNMENTS

  Port      Code Sfx Name      Night      Sig Grp
1: 01A1201  TN464 F           Night      12
2: 01A1202  TN464 F           Night      12
3: 01A1203  TN464 F           Night      12
4: 01A1204  TN464 F           Night      12
5:
6:
7:
8:
9:
10:
11:
12:
13:
14:
15:

```

Note: When adding members to the trunk group you will need to add all available ports to the trunk group. For T1 you will configure all 23 available timeslots (e.g. 01A1201 thru 01A1223). Do so in a sequential manner.

1	2
---	---

```

UNIFORM DIAL PLAN TABLE

                                Percent Full

 Matching      Insert      Node      Matching      Insert
Pattern  Len Del  Digits  Net Conv  Num      Pattern  Len Del  Digits  Net Conv
4001      4  0   612   aar  n              4001      4  0   612   aar  n
4002      4  0   612   aar  n              4002      4  0   612   aar  n

```

1	2
---	---

```

AAR DIGIT ANALYSIS TABLE

                                Percent Full: 9

  Dialed      Total      Route      Call      Node      ANI
String      Min Max  Pattern  Type      Num      Req'd
612          7  7    12     aar      12      n

```



Pattern Number: 12 Pattern Name:

Grp No	FRL	NPA	Pfx Mrk	Hop Lmt	Toll List	No. Del	Inserted Digits	DCS/ QSIG Intw	IXC
1:	12	0					3	n	user
2:								n	user
3:								n	user
4:								n	user
5:								n	user
6:								n	user

Grp No	BCC	VALUE	TSC	CA-TSC	ITC	BCIE	Service/Feature	BAND	No. Dgts	Numbering Format	LAR Subaddress
	0	1	2	3	4	W					
1:	y	y	y	y	y	n	y	none	rest		none
2:	y	y	y	y	y	n	n		rest		none
3:	y	y	y	y	y	n	n		rest		none
4:	y	y	y	y	y	n	n		rest		none
5:	y	y	y	y	y	n	n		rest		none
6:	y	y	y	y	y	n	n		rest		none

1 | 2 | 3 | 4 |

STATION

Extension: 2004	Lock Messages? n	BCC: 0
Type: 8410D	Security Code:	TN: 1
Port: 01A0604	Coverage Path 1: 103	COR: 1
Name: PBX-Ken1	Coverage Path 2:	COS: 1
	Hunt-to Station:	

STATION OPTIONS

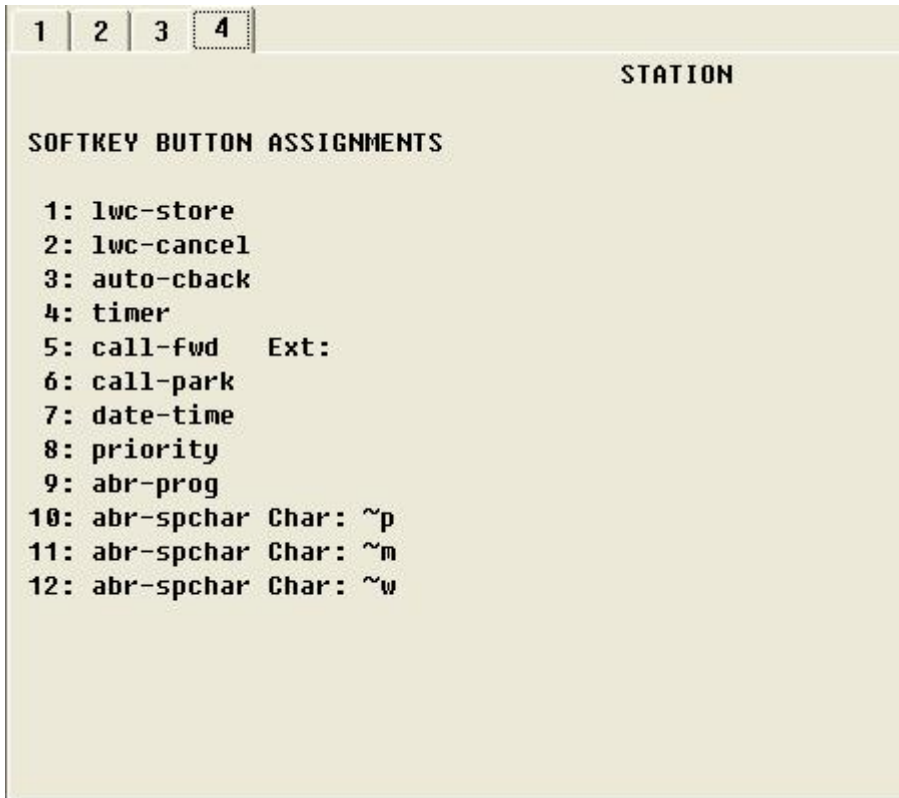
Loss Group: 2	Personalized Ringing Pattern: 1
Data Module? n	Message Lamp Ext: 2004
Speakerphone: 2-way	Mute Button Enabled? y
Display Language: english	
	Media Complex Ext:
	IP SoftPhone? n





```
1 2 3 4
STATION
FEATURE OPTIONS
  LWC Reception: spe
  LWC Activation? y
  LWC Log External Calls? n
  CDR Privacy? n
  Redirect Notification? y
  Per Button Ring Control? n
  Bridged Call Alerting? n
  Active Station Ringing: single
  H.320 Conversion? n
  Service Link Mode: as-needed
  Multimedia Mode: basic
  MWI Served User Type:
  Emergency Location Ext: 2004
  Auto Select Any Idle Appearance? n
  Coverage Msg Retrieval? y
  Auto Answer: none
  Data Restriction? n
  Idle Appearance Preference? n
  Restrict Last Appearance? n
  Per Station CPN - Send Calling Number?
  Audible Message Waiting? y
  Display Client Redirection? y
  Select Last Used Appearance? n
  Coverage After Forwarding? s
  Multimedia Early Answer? n
  Direct IP-IP Audio Connections? y
  IP Audio Hairpinning? y
```

```
1 2 3 4
STATION
SITE DATA
  Room:
  Jack:
  Cable:
  Floor:
  Building:
  Headset? n
  Speaker? n
  Mounting: d
  Cord Length: 0
  Set Color:
ABBREVIATED DIALING
  List1:
  List2:
  List3:
BUTTON ASSIGNMENTS
  1: call-appr
  2: call-appr
  3: cfwd-bsyda Ext:
  4:
  5:
  6:
  7:
  8:
  9:
  10: last-numb
```



### Cisco IAD2432 24FXS Configuration

```
IAD_V7#sh run
Building configuration...

Current configuration : 2033 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname IAD_V7
!
boot-start-marker
boot system flash:c2430-ik9o3s-mz-124-9.T1.bin
boot-end-marker
!
card type t1 1
enable secret 5 $1$WJPz$ZoIKHvDdxxTEDUc2AwOoM0
!
no aaa new-model
!
resource policy
!
network-clock-participate T1 1/0
network-clock-participate T1 1/1
network-clock-select 1 T1 1/0
!
!
no ip domain lookup
```



```
!  
!  
!  
isdn switch-type primary-ni  
isdn gateway-max-interworking  
!  
voice-card 0  
!  
!  
!  
!  
!  
controller T1 1/0  
framing esf  
linecode b8zs  
pri-group timeslots 1-2,24  
!  
controller T1 1/1  
framing esf  
linecode b8zs  
!  
!  
!  
!  
!  
interface FastEthernet0/0  
ip address 172.20.8.40 255.255.255.0  
ip broadcast-address 0.0.0.0  
duplex auto  
speed auto  
!  
interface FastEthernet0/1  
no ip address  
ip broadcast-address 0.0.0.0  
shutdown  
duplex auto  
speed auto  
!  
interface Serial1/0:23  
no ip address  
encapsulation hdlc  
isdn switch-type primary-ni  
isdn incoming-voice voice  
isdn supp-service name calling =====> If you are using Display IE for Calling Name set to "isdn supp-service name calling ie 40 cs 0"  
no cdp enable  
!  
ip default-gateway 172.20.8.1  
ip http server  
no ip http secure-server  
!  
ip route 0.0.0.0 0.0.0.0 172.20.8.1  
!  
!  
!  
!  
!  
control-plane  
!  
!  
!  
voice-port 1/0:23  
!  
voice-port 2/0  
!  
voice-port 2/1
```



```
!  
voice-port 2/2  
!  
voice-port 2/3  
!  
voice-port 2/4  
!  
voice-port 2/5  
!  
voice-port 2/6  
!  
voice-port 2/7  
!  
voice-port 2/8  
!  
voice-port 2/9  
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voice-port 2/10  
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voice-port 2/11  
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voice-port 2/19  
!  
voice-port 2/20  
!  
voice-port 2/21  
!  
voice-port 2/22  
!  
voice-port 2/23  
!  
!  
!  
!  
!  
dial-peer voice 4000 voip  
destination-pattern 4...  
supplementary-service pass-through  
session protocol sipv2  
session target ipv4:172.20.8.41  
!  
dial-peer voice 2000 pots  
destination-pattern 2...  
supplementary-service pass-through  
direct-inward-dial  
port 1/0:23  
forward-digits all  
!  
!  
!  
!  
line con 0  
password cisco
```



```
login
line aux 0
line vty 0 4
password cisco
login
!
end

IAD_V7#
```

### Acronyms

Acronym	Definitions
IAD	Integrated Access Device
SIP	Session Initiation Protocol



## Important Information

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