



Avaya Definity CM 2.0 to a Cisco IAD243X using E1-Q.SIG with SIP

January 5, 2007 Initial Version

Table of Contents

Introduction	1
Network Topology.....	2
Limitations.....	2
Hardware Requirements	3
Software Requirements	3
Features	3
Features Supported.....	3
Features Not Supported	3
Configuration.....	3
Configuration Sequence and Tasks for the Avaya System.....	3
Avaya PBX Configuration	4
Cisco IAD2432 24FXS Configuration	10
Acronyms	13

Introduction

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

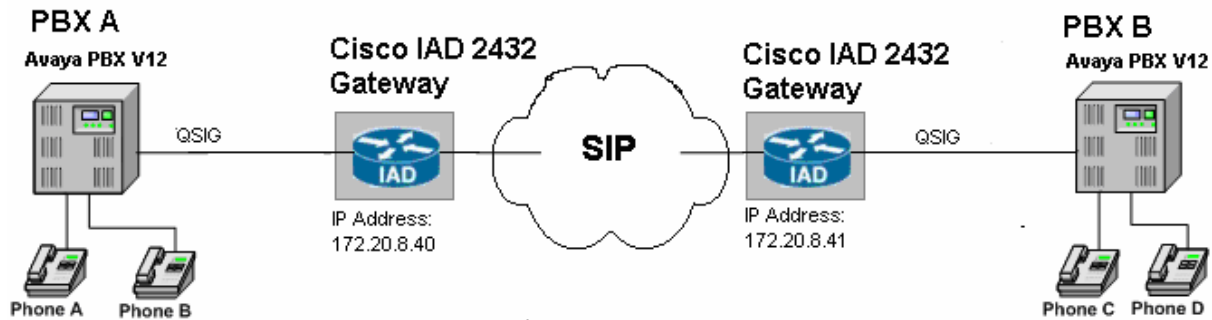
The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco IAD243X Gateway connected to the PBX via QSIG (T1 PRI). IP trunk connectivity between the IAD243X's is achieved by using SIP protocol.



Network Topology

Figure 1. Network Topology

Basic Call Setup End-to-End Configuration



Limitations

Calling Name (CNIP) feature does not interoperate. The limitation is due to the IAD2432 encoding the Calling Name using QSIG profile 'Rose' and gives an operation value of LocalValue=0, these parameters are unrecognized by the Avaya PBX and Calling Name presentation fails.

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

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.

Alerting name presentation feature does not interoperate. The limitation is due to the IAD2432 not supporting this feature

When Call Transfer or Call forward features are invoked the name and number updates have limited functionality. The limitation is due to the IAD2432 not supporting the Q931 FACILITY message.

IAD2432 PRI does not perform Overlap-Sending

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)
- Overlap Receiving – IAD2432 can perform Overlap-Receiving, but outgoing call will be ENBLOC
- 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
- DTMF end-to-end

Features Not Supported

- Calling Name and Connected Name presentation
- Alerting Name presentation
- Call Transfer Name/Number Facility updates
- Call Forward Name/Number Facility updates
- Overlap-Sending (Dialing out-from IAD)
- QSIG-MWI

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

```
                                DS1 CIRCUIT PACK

Location: 01A12                      Name: Tony IAD test
Bit Rate: 2.048                      Line Coding: hdb3

Signaling Mode: isdn-pri
Connect: pbx                          Interface: peer-master
TN-C7 Long Timers? n                 Peer Protocol: Q-SIG
Interworking Message: PROGRESS       Side: a
Interface Companding: alaw           CRC? y
Idle Code: 11111111                 Channel Numbering: timeslot
                                DCP/Analog Bearer Capability: 3.1kHz

Slip Detection? n                    Near-end CSU Type: other
```



```
 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: b Digit Handling (in/out): enbloc/enbloc

    Trunk Hunt: descend                QSIG Value-Added? y
                                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
```

```
 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                Hop Dgt? n
    Suppress # Outpulsing? n        Numbering Format: public
Outgoing Channel ID Encoding: preferred    UII IE Treatment: service-provider

                                Replace Restricted Numbers? y
                                Replace Unavailable Numbers? y
                                Send Called/Busy/Connected Number: y

    Send UII IE? n
    Send UCID? n
Send Codeset 6/7 LAI IE? n                Ds1 Echo Cancellation? n

Path Replacement with Retention? n
Path Replacement Method: better-route
    SBS? n    Network (Japan) Needs Connect Before Disconnect? n
```




1	2	AAR DIGIT ANALYSIS TABLE						Percent Full: 9
612	Dialed String	Total Min	Total Max	Route Pattern	Call Type	Node Num	ANI Req'd	
		7	7	12	aar		n	

Pattern Number: 12 Pattern Name:

Grp No	FRL	NPA	Pfx Mrk	Hop Lmt	Toll List	No. Del	Inserted Digits	DCS/ QSIG	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 Request	ITC	BCIE	Service/Feature	BAND	No. Dgts	Numbering Format	LAR
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                Auto Select Any Idle Appearance? n
  LWC Activation? y                 Coverage Msg Retrieval? y
  LWC Log External Calls? n         Auto Answer: none
  CDR Privacy? n                   Data Restriction? n
  Redirect Notification? y          Idle Appearance Preference? n
  Per Button Ring Control? n        Restrict Last Appearance? n
  Bridged Call Alerting? n
  Active Station Ringing: single
                                     H.320 Conversion? n      Per Station CPN - Send Calling Number?
  Service Link Mode: as-needed
  Multimedia Mode: basic
  MWI Served User Type:
                                     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
  Emergency Location Ext: 2004      IP Audio Hairpinning? y
```




1 | 2 | 3 | 4

STATION

SITE DATA

Room:	Headset?	n
Jack:	Speaker?	n
Cable:	Mounting:	d
Floor:	Cord Length:	0
Building:	Set Color:	

ABBREVIATED DIALING

List1:	List2:	List3:
--------	--------	--------

BUTTON ASSIGNMENTS

1: call-appr	6:
2: call-appr	7:
3: cfwd-bsyda Ext:	8:
4:	9:
5:	10: last-numb

1 | 2 | 3 | 4

STATION

SOFTKEY BUTTON ASSIGNMENTS

1: lwc-store
2: lwc-cancel
3: auto-cback
4: timer
5: call-fwd Ext:
6: call-park
7: date-time
8: priority
9: abr-prog
10: abr-spchar Char: ~p
11: abr-spchar Char: ~m
12: abr-spchar Char: ~w



```
!  
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 1/0:15  
!  
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  
!  
voice-port 2/10  
!  
voice-port 2/11  
!  
voice-port 2/12  
!  
voice-port 2/13  
!  
voice-port 2/14  
!  
voice-port 2/15  
!  
voice-port 2/16  
!  
voice-port 2/17  
!  
voice-port 2/18  
!  
voice-port 2/19  
!  
voice-port 2/20  
!  
voice-port 2/21  
!  
voice-port 2/22  
!  
voice-port 2/23  
!  
!
```



```
!  
!  
dial-peer voice 2000 voip  
destination-pattern 2...  
supplementary-service pass-through  
session protocol sipv2  
session target ipv4:172.20.8.40  
!  
dial-peer voice 4000 pots  
destination-pattern 4...  
supplementary-service pass-through  
direct-inward-dial  
port 1/0:15  
forward-digits all  
!  
!  
!  
!  
line con 0  
password cisco  
login  
line aux 0  
line vty 0 4  
password cisco  
login  
!  
end  
  
IAD_V6#
```



Acronyms

Acronym	Definitions
IAD	Integrated Access Device
SIP	Session Initiation Protocol



Important Information

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.



**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

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the Cisco Web site at www.cisco.com/go/offices.

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

© 2007 Cisco Systems, Inc. All rights reserved.

CCVP, the Cisco Logo, and the Cisco Square Bridge logo are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn is a service mark of Cisco Systems, Inc.; and Access Registrar, Aironet, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, Follow Me Browsing, FormShare, GigaDrive, GigaStack, HomeLink, Internet Quotient, IOS, iPhone, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, iQuick Study, LightStream, Linksys, MeetingPlace, MGX, Networking Academy, Network Registrar, Packet, PIX, ProConnect, RateMUX, ScriptShare, SlideCast, SMARTnet, StackWise, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0612R)

Printed in the USA