



Avaya S8500 Communications Manager 3.0 with Cisco Unified Border Element for H323-to-H323 Calls

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Introduction

- This is an application note for connectivity of Avaya S8500 Communications Manager 3.0 with Cisco Unified Border Element via H323 (10/100baseT).
- The network topology diagram (Figure 1) shows the test setup for end-to-end interoperability with the Cisco Unified Border Element (CUBE) connected to the IP PBX via H323 (10/100baseT). Connectivity is achieved by using the H.323 protocol.
- This Application Note uses the c3845 IOS-voice-gateway, however other Cisco voice gateways are also an option to use since CUBE implementation does not depend on the platform. Here is a list of Cisco Products capable of CUBE functionality:

[Cisco 2800 Series Integrated Services Routers](#)

[Cisco 3800 Series Integrated Services Routers](#)

[Cisco AS5350XM Universal Gateway](#)

[Cisco AS5400XM Universal Gateway](#)



Network Topology

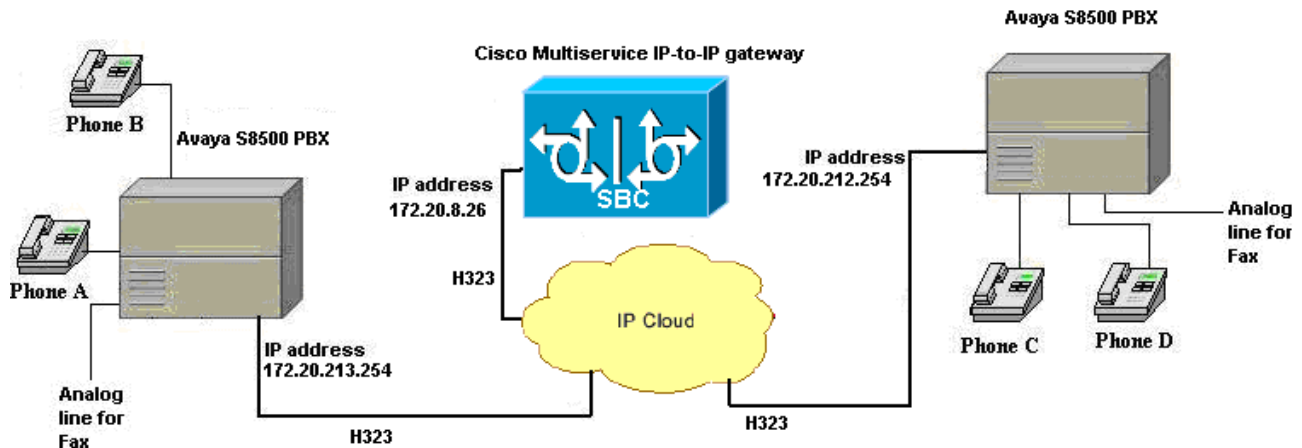


Figure 1. Network Topology or Test Setup

Limitations

- Connected Name is not presented to the originating (calling) Phone display. CUBE relays the "Connected Number" info in a method not understood by Avaya S8500 PBX
- Basic Call using G.726 codec fail. Avaya PBX rejects G.726 codec, even when the Avaya is set for G.726. (This limitation as of version G3V13 of the Avaya PBX)
- Call Transfer Name and Number updates do not occur. Feature interoperability are not compatible between systems
- End-to-end DTMF tones are not played if out-of-band signaling (H.245) is configured. Must use in-band signaling for DTMF tones to play across. This is an issue due to a lack of an optional feature on the Avaya PBX. This optional feature, Special Application SA8507 – H245 Support With Other Vendors, will address this issue.



System Components

Hardware Requirements

Cisco equipment

- Cisco 3845 (Cisco 3800 family routers)
- Cisco Catalyst 6500

Avaya equipment

- Avaya S8500
- TN2312BP IPSI
- TN799DP C-LAN
- TN2302AP IP Media Processor
- TN746B Analog
- TN2224B 2-wire Digital
- 2 - Digital stations 8410D
- 2 - Digital stations 6408D+

Software Requirements

- PBX Software: G3 version: V13
- Cisco IOS Release: c3845-ipvoice_ivs-mz.124-9.T

Features

Features Supported

- G711u and A law, G729 and G723 codecs
- Call Transfer blind and Call Transfer supervised
- Call Conference
- Call on-hold
- Call Forward
- FAX integrity
- DTMF (in-band signaling only). See limitation section

Features Not Supported

- Connected Name
- Out-of-Band DTMF signaling (H.245). See limitation section
- Name and Number updates on a Call Transfer.



Configuration

Configuration Sequence and Tasks

Configuration Menus and Commands

Avaya Configuration

Voice System name: S8500SIP1 - TRUNK GROUP

Group Number: 7 Group Type: isdn CDR Reports: y
Group Name: IPIPGateway test COR: 1 TN: 1 TAC: 808
Direction: two-way Outgoing Display? n Carrier Medium: IP
Dial Access? y Busy Threshold: 255 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: a Digit Handling (in/out): enbloc/enbloc

Trunk Hunt: ascend QSIG Value-Added? n
Digital Loss Group: 18
Incoming Calling Number - Delete: Insert: Format: unk-unk
Bit Rate: 1200 Synchronization: async Duplex: full
Disconnect Supervision - In? y Out? n
Answer Supervision Timeout: 0

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 Format: unknown
Outgoing Channel ID Encoding: preferred UUI IE Treatment: service-provider

Replace Restricted Numbers? n
Replace Unavailable Numbers? n
Send Connected Number: y
Hold/Unhold Notifications? y
Send UUI IE? n Modify Tandem Calling Number? n
Send UCID? n
Send Codeset 6/7 LAI IE? y

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



TRUNK GROUP Administered Members (min/max): 1/3
GROUP MEMBER ASSIGNMENTS Total Administered Members: 3

Port	Code Sfx	Name	Night	Sig Grp
1:	T00056			7
2:	T00057			7
3:	T00058			7
4:				
5:				
6:				
7:				

Voice System name: S8500SIP1 - SIGNALING GROUP

Group Number: 7 Group Type: h.323
Remote Office? n Max number of NCA TSC: 7
SBS? n Max number of CA TSC: 7
IP Video? n Trunk Group for NCA TSC: 7
Trunk Group for Channel Selection: 7
Supplementary Service Protocol: a
T303 Timer(sec): 10

Near-end Node Name: **clan1** Far-end Node Name: **ipipgw**
Near-end Listen Port: 1720 Far-end Listen Port: 1720
Far-end Network Region: 1
LRQ Required? n Calls Share IP Signaling Connection? n
RRQ Required? n
Media Encryption? n Bypass If IP Threshold Exceeded? n

DTMF over IP: in-band Direct IP-IP Audio Connections? n
IP Audio Hairpinning? n
Interworking Message: PROGress
DCP/Analog Bearer Capability: 3.1kHz



Voice System name: S8500SIP1 - IP NODE NAMES

Name	IP Address
CCM4.1	172.20 .231.254
CCM4.1.2	172.20 .236.2
CM-POLARIS	172.20 .236.50
avayasip1	172.20 .212.254
clan1	172.20 .212.253 → Local IP address used in dial-peer 4150 (incoming-call)
clan1serverb	172.20 .213.253
default	0 .0 .0 .0
pipgw	172.20 .8 .26 → Points to Cisco IPIP gateway (outgoing-call)
medpro1	172.20 .212.252
procr	. . .

(10 of 10 administered node-names were displayed)

Use 'list node-names' command to see all the administered node-names

Use 'change node-names ip xxx' to change a node-name 'xxx' or add a node-name

Voice System name: S8500SIP1 - IP Codec Set

Codec Set: 3

Audio Codec	Silence Suppression	Frames Per Pkt	Packet Size(ms)
1: G.711MU	n	1	30

→ Codec type is changed under 'Audio Codec' field (i.e G.723, G.711A, G.729AB)

Media Encryption

1: none

2:

3:



IP Codec Set

Allow Direct-IP Multimedia? n

	Mode	Redundancy	
FAX	t.38-standard	0	➔ Fax mode is changed to Pass-through option when testing pass-through fax mode
Modem	off	0	
TDD/TTY	US	3	
Clear-channel	n	0	

Voice System name: S8500SIP1 - IP NETWORK REGION

Region: 1

Location: 1 Authoritative Domain: lab.com

Name: CiscoLAB

Intra-region IP-IP Direct Audio: no

MEDIA PARAMETERS

Inter-region IP-IP Direct Audio: no

Codec Set: 3

IP Audio Hairpinning? y

UDP Port Min: 2048

UDP Port Max: 3028

RTCP Reporting Enabled? y

DIFFSERV/TOS PARAMETERS

RTCP MONITOR SERVER PARAMETERS

Call Control PHB Value: 34

Use Default Server Parameters? y

Audio PHB Value: 46

Video PHB Value: 26

802.1P/Q PARAMETERS

Call Control 802.1p Priority: 7

Audio 802.1p Priority: 6

AUDIO RESOURCE RESERVATION PARAMETERS

H.323 IP ENDPOINTS

RSVP Enabled? n

H.323 Link Bounce Recovery? y

Idle Traffic Interval (sec): 20

Keep-Alive Interval (sec): 5

Keep-Alive Count: 5



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:		8:
4:		9:
5:		10:

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	



STATION		
SITE DATA		
Room:		Headset? n
Jack:		Speaker? n
Cable:		Mounting: d
Floor:		Cord Length: 0
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STATION	
SOFTKEY BUTTON ASSIGNMENTS	
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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	



STATION

SITE DATA

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

ABBREVIATED DIALING

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

HOT LINE DESTINATION

Abbreviated Dialing List Number (From above 1, 2 or 3):
Dial Code:

Line Appearance: call-appr



Cisco 3845 IOS Configuration

```
tony3845#sh run
Building configuration...

Current configuration: 2011 bytes
!
Version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname tony3845
!
boot-start-marker
boot system flash:c3845-ipvoice_ivs-mz.124-3.9.PI3d
boot-end-marker
!
enable password cisco
!
no aaa new-model
!
resource policy
!
ip subnet-zero
ip cef
!
!
!
no ip domain lookup
voice-card 0
no dspfarm
!
!
!
voice service voip
allow-connections h323 to h323
allow-connections h323 to sip
allow-connections sip to h323
allow-connections sip to sip
signaling forward unconditional
fax protocol t38 ls-redundancy 0 hs-redundancy 0 fallback pass-through g711ulaw
no fax-relay sg3-to-g3
h323
h225 connect-passthru
!
!
!
voice class codec 1
codec preference 1 g711ulaw
codec preference 2 g711alaw
codec preference 3 g723r63
codec preference 4 g723ar63
codec preference 5 g729br
codec preference 6 g729r8
!
```



```
!  
interface GigabitEthernet0/0  
ip address 172.20.8.26 255.255.255.0  
duplex auto  
speed auto  
media-type rj45  
negotiation auto  
!  
interface GigabitEthernet0/1  
no ip address  
shutdown  
duplex auto  
speed auto  
media-type rj45  
negotiation auto  
!  
ip default-gateway 172.20.8.1  
ip classless  
ip route 0.0.0.0 0.0.0.0 172.20.8.1  
!  
ip http server  
!  
!  
!  
control-plane  
!  
dial-peer voice 3000 voip  
destination-pattern 30..  
voice-class codec 1  
session target ipv4:172.20.213.253  
dtmf-relay h245-alphanumeric  
fax-relay ecm disable  
no fax-relay sg3-to-g3  
no vad  
!  
dial-peer voice 4150 voip  
destination-pattern 41..  
voice-class codec 1  
session target ipv4:172.20.212.253  
dtmf-relay h245-alphanumeric  
fax-relay ecm disable  
no fax-relay sg3-to-g3  
no vad  
!  
dial-peer voice 1660 voip  
destination-pattern 16..  
voice-class codec 1  
session target ipv4:172.20.7.252  
dtmf-relay h245-alphanumeric  
fax-relay ecm disable  
no fax-relay sg3-to-g3  
no vad  
!  
!  
gatekeeper  
zone local IP2IP pbx.com  
shutdown  
!
```



```
!  
line con 0  
password cisco  
stopbits 1  
line aux 0  
stopbits 1  
line vty 0 4  
password cisco  
login  
!  
scheduler allocate 20000 1000  
!  
end  
  
tony3845#
```

Acronyms

Acronym	Definitions
CUBE	Cisco Unified Border Element
Cisco IOS	Cisco Internetwork Operating System



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