

Avaya Solution & Interoperability Test Lab

Application Notes for the ClearOne Communications MAX IP with Avaya Communication Manager and Avaya SIP Enablement Services – Issue 1.0

Abstract

These Application Notes describe a compliance-tested solution comprised of Avaya Communication Manager, Avaya SIP Enablement Services (SES), and ClearOne Communications MAX IP Tabletop Conferencing Phones. MAX IP phones are SIP-based VoIP tabletop conferencing phones intended for use in conference rooms and similar environments. During compliance testing, the MAX IP phones successfully registered with Avaya SES, placed/received calls to/from SIP and non-SIP telephones, and established conference calls. Information in these Application Notes has been obtained through compliance testing and additional technical discussions. Testing was conducted via the Developer*Connection* Program at the Avaya Solution and Interoperability Test Lab.

1. Introduction

These Application Notes describe a compliance-tested solution comprised of Avaya Communication Manager 3.1.2, Avaya SIP Enablement Services 3.1, and ClearOne Communications MAX IP Tabletop Conferencing Phones. MAX IP phones are SIP-based VoIP tabletop conferencing phones intended for use in conference rooms and similar environments. Up to four MAX IP phones may be daisy-chained together to increase physical coverage, particularly in large or unusually shaped conference rooms. Each MAX IP phone supports two lines, and can bridge calls on the two lines to establish a 3-party conference.

Figure 1 illustrates a sample configuration consisting of an Avaya S8710 Media Server, an Avaya G650 Media Gateway, an Avaya SIP Enablement Services (SES) server, and ClearOne Communications MAX IP Tabletop Conferencing Phones. Avaya Communication Manager runs on the S8710 Media Server. The solution described herein is also extensible to other Avaya Media Servers and Media Gateways. For completeness, Avaya 4600 Series SIP IP Telephones, Avaya 4600 Series H.323 IP Telephones, and Avaya 6400 and 8400 Series Digital Telephones, are included in **Figure 1** to demonstrate calls between the SIP-based MAX IP phones and Avaya SIP, H.323, and digital phones. The analog PSTN phone is also included to demonstrate calls routed by Avaya Communication Manager between the MAX IP phones and the PSTN.

The MAX IP phone originates a call by sending a call request (SIP Invite message) to the Avaya SES server. The Avaya SES server routes the call over a SIP trunk to Avaya Communication Manager for origination services. If the call is destined for another local SIP phone, such as another MAX IP phone or an Avaya SIP phone, then Avaya Communication Manager routes the call back over the SIP trunk to the Avaya SES server, which in turn delivers the call to the destination SIP phone. Otherwise, Avaya Communication Manager routes the call to the PSTN, a local Avaya H.323, digital, or analog phone, an adjunct, a vector, a hunt group, etc., depending on the destination number. For a call arriving to Avaya Communication Manager that is destined for the MAX IP phone, Avaya Communication Manager routes the call over the SIP trunk to the Avaya SES server, which in turn delivers the call to the MAX IP phone. These Application Notes assume that the SIP trunk between Avaya Communication Manager and the Avaya SES server has already been configured. For details on configuring SIP trunks on Avaya Communication Manager and Avaya SES, consult [1] and [4].



Figure 1: Sample configuration.

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2. Equipment and Software Validated

The following equipment and software/firmware were used for the sample configuration provided:

Equipment	Software/Firmware
Avaya S8710 Media Server	Avaya Communication Manager 3.1.2
	(R013x.01.2.632.1)
Avaya G650 Media Gateway	-
TN2312BP IP Server Interface	HW12 FW 31
TN799DP C-LAN Interface	HW1 FW 17
TN2302AP IP Media Processor	HW20 FW 111
Avaya SIP Enablement Services Server	3.1
Avaya 4600 Series IP Telephones	2.3 (4602SW H.323)
	2.4 (4610SW H.323)
	2.4 (4620SW H.323)
	2.5 (4625SW H.323)
	2.2.2 (4610SW SIP)
	2.2.2 (4620SW SIP)
Avaya 6400 and 8400 Series Digital Telephones	-
ClearOne Communications MAX IP Tabletop	06-09-06
Conferencing Phones	
ClearOne Communications MAXAttach IP	11-03-05
Pods (for daisy-chaining up to 4 MAX IP	
phones)	
Analog Telephone	-

3. Configure Avaya Communication Manager

This section describes the steps for configuring IP codec sets and associating SIP phone numbers with off-PBX telephone stations in Avaya Communication Manager. The steps are performed from the Avaya Communication Manager System Access Terminal (SAT) interface. IP codec sets identify the codecs that may be used in calls involving VoIP endpoints. An off-PBX telephone is a phone that Avaya Communication Manager does not control, such as a cellular phone, a home phone, or a SIP phone. Avaya Communication Manager features and calling privileges, however, can be applied to an off-PBX telephone by associating a local, i.e. on-PBX, extension with the off-PBX telephone. This approach is taken for SIP phones that register with the Avaya SES server and intend to use Avaya Communication Manager for call origination and termination services. Specifically, an Administration WithOut Hardware (AWOH) on-PBX station is administered in Avaya Communication Manager and then associated with the phone number of the SIP phone. Similarly, on the Avaya SES server, the number of the SIP phone is administratively associated with the extension of the on-PBX station. Throughout the rest of this document, on-PBX stations associated with SIP phones in such a manner will be referred to as Outboard Proxy SIP (OPS) stations.

3.1. IP Codec Set

Enter the **change ip-codec-set c** command, where "c" is a number between 1 and 7, inclusive. Enter at least one of the codecs supported in the ClearOne MAX IP phone (see Section 5 Step 7). IP codec sets are specified in the IP Network Region forms to define which codecs may be used within and between network regions.

```
change ip-codec-set 2
                                                                      1 of
                                                               Page
                          IP Codec Set
    Codec Set: 2
   Audio
                 Silence
                              Frames
                                       Packet
   Codec
                 Suppression Per Pkt Size(ms)
1: G.711MU
                                2
                                          20
                     n
2: G.729
                      n
                                 2
                                          20
3:
4:
5:
6:
7:
    Media Encryption
1: aes
2: none
 3:
```

2

3.2. SIP Stations

This section describes the steps for administering OPS stations in Avaya Communication Manager and associating the OPS station extensions with the numbers of ClearOne MAX IP phones.

Step	Des	cription					
1.	Enter the display system-parameters customer-options command. Verify that there are sufficient Maximum Off-PBX Telephones – OPS licenses. If not, contact an authorized Avaya account representative to obtain additional licenses.						
	display system-parameters customer-options Page 1 of 10 OPTIONAL FEATURES						
	G3 Version: V13 Location: 1 Platform: 8	RFA System ID (SID): 1 RFA Module ID (MID): 1	1				
	Platfo Maximum Maximum Off-PBX Te Maximum Off-PBX Te Maximum Off-PBX Te	USED rm Maximum Ports: 44000 818 Maximum Stations: 36000 397 XMOBILE Stations: 0 0 lephones - EC500: 5 0 lephones - OPS: 200 50 lephones - SCCAN: 0 0					
2.	Enter the add station s command, where " administer an OPS station. On Page 1 of th Port to " X ", and enter a descriptive Name .	s" is an available extension in the ne station form, set Type to "640".	e dial plan, to 8D +" and				
	add station 54005 S	Page	1 of 4				
	Extension: 54005 Type: 6408D+ Port: X Name: SIP-54005	Lock Messages? n Security Code: Coverage Path 1: Coverage Path 2: Hunt-to Station:	BCC: 0 TN: 1 COR: 2 COS: 1				
	STATION OPTIONS Loss Group: 2 Data Module? n Speakerphone: 2-way Display Language: english	Personalized Ringing Patter Message Lamp Ex Mute Button Enable	rn: 1 kt: 54005 ed? y				
		Media Complex Ex IP SoftPhor	kt: ne? n				

Step			Description					
3.	Enter the ch ates extension of	Enter the change off-pbx-telephone station-mapping s command, where " s " is the extension of the OPS station configured in Step 2. On Page 1 of the off-pbx-telephone						
	station-map	ping form, conf	figure the following:					
	• Stati	on Extension –	Enter the extension of the	e OPS station.				
	• Appl	ication – Set to	" OPS ".					
	Phon	e Number – Er	nter the number that the C	learOne MAX IP phone will use	for			
	regis	tration and call (origination and terminatio	on. In the example below, the Ph	one			
	Num	ber is the same	as the OPS Station Exter	nsion , but is not required to be the	e			
	same			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	-			
	• Trur	k Selection – F	Enter the number of the SF	P trunk group connected to the				
	Avay	a SES server.		a dami group connected to the				
	• Conf	"iguration Set –	Set to "1" which during	compliance testing used the defai	ult			
	value	s of the off-phy	-telephone configuration-	-set form	un			
	varue	s of the off pox	telephone configuration					
	change off-	pbx-telephone :	station-mapping 54005	Page 1 of 2				
		STATIONS	S MILH OFF-DBX LEFEDHON	IE INTEGRATION				
	Station	Application	Dial Phone Number	Trunk Configuration				
	Extension	0.5.4	Prefix	Selection Set				
	54005	OPS	- 54005	10 1				
4.	Repeat Steps	32-3 as necess	ary to administer OPS sta	ations and associations for additio	nal			
	ClearOne M	AX IP phones.	•					
		Ŧ						

4. Configure Avaya SIP Enablement Services

This section describes the steps for creating SIP user accounts in Avaya SIP Enablement Services (SES) and associating the SIP users with an Avaya Communication Manager OPS station extension. The ClearOne MAX IP phones will register with Avaya SES using the SIP user accounts.

This section assumes that the necessary Avaya SES configuration steps for establishing a SIP trunk with Avaya Communication Manager have been completed. For further details, consult [4].

tep	Description								
1.	Open a web brows and log in with the Interface " link up	er, enter <u>http:/</u> appropriate c on successful	// <ip address="" avaya<br="" of="">redentials. Click on th login.</ip>	<u>SES server>/admin</u> for the URL, e " Launch Administration Web					
2.	In the left pane of " "Add". Top - Microsoft Internet Explored File Edit View Favorites Icols	n the left pane of the SES Administration Web Interface, expand "Users" and click on Add".							
	← Back → → → ② ③ ④ ④ ③	Search 💽 Favorites 《Med	ia 🧐 P₂- 🦛 🖬 🗄	* 260					
				Integrated Management SIP Server Management Server: 192.45.52.160					
	Top Users List Add Search Edit Delete Password Default Profile Registered Users Conferences Media Server Extensions Emergency Contacts Hosts Media Servers Adjunct Systems Services Services Services Server Configuration Web Certificate Management IM Logs Trace Logger Export/Import to ProVision	Manage Users Manage Users Manage Conferencing Manage Media Server Extensions Manage Hosts Manage Hosts Manage Media Servers Manage Media Servers Manage Media Servers Manage Services Server Configuration Certificate Management IM Logs Trace Logger Export Import to ProVision	Add and delete Users. Add and delete Conference Extensions. Add and delete Conference Extensions. Add and delete Media Server Contacts. Add and delete Hosts. Add and delete Hosts. Add and delete Media Servers. Add and delete Adjunct Systems. Add and delete Adjunct Systems. Start and stop server processes on this host. Edit Properties of the system. Manage Web Certificate. Download IM Logs. Manage SIP Trace Logs. Export and import data using ProVision on this host.						

Step			Description					
3.	In the Add User page, configure the following:							
	Primary Han	• Primary Handle – Enter the phone number of the ClearOne MAX IP phone. The						
	number must r	number must match the phone number entered in Section 3.2 Step 3						
	 Password and 	Confirm Pag	ssword – Specify a password that the ClearOne MAX IP					
	• I assword and	a to successful	a password in a clear one with A vove SES					
	phone must us	e to successiu	iny register with Avaya SES.					
	• Host – Select	the IP address	s or FQDN of the Avaya SES server.					
	• First Name ar	nd Last Name	e – Enter descriptive names.					
	• Check the Ad	d Media Serv	ver Extension checkbox.					
	Click on "Add".							
	🏄 Add User - Microsoft Internet Ex	plorer						
	<u>File Edit View Favorites Tools</u>	Help						
	(⇔ Back ▼ ⇒ ▼ (2) (2) (2) (2) (2)	Search 🗽 Favorites 🏈 1	Media 🎯 🖏 🍜 🖬 🗐					
	Address 😂 https://192.45.52.160/imp	ress/do/listusers/add_user	¥					
	AVAYA		Integrated Managem SIP Server Managem					
	Help Exit		Server: 192.45.5					
	Тор	Add User						
	= Users							
	Add	Primary Handle*	54005					
	Search	User ID	54005					
	Edit	Password*	****					
	Delete	Confirm Password*	****					
	Password	Host*	192.45.52.160 💌					
	Default Profile Registered Lisers	First Name*	SIP					
	Conferences	Last Name*	54005					
	Media Server Extensions	Address 1						
	Emergency Contacts	Address 2						
	• Hosts	Office						
	Media Servers	City						
	 Adjunct Systems Services 	State						
	Server Configuration	Country						
	Web Certificate	Zip						
	Management IM Logs	Add Media Server Extension						
	 Trace Logger 	Fields marked * are	required.					
	Export/Import to ProVision	Add						
	Update	A A A A A A A A A A A A A A A A A A A						

Step		Description
4.	Click on "Continu	ie".
	A Cashing Minered Talanak Fu	
	File Edit View Favorites Tools	Help Reference R
	(→ Back • → • 🔕 🗿 🚮 🔕	Search 🗟 Favorites 🛞 Media 🧭 🔂 - 🎒 🗹 🗐
	Address 🙆 https://192.45.52.160/imp	ress/do/listusers/do_adduser 🕑 🔗 Go
	avaya	▲ SIP Server Management
	Help Exit	Server: 192.45.52.160
	Top ■ Users	Continue
	List Add Search	User ID 54005 added.
	Edit Delete	Continue
	Password Default Profile Peristered Users	
	configured in Sect configured. Calls Communication M	ion 3.2 Step 3 and select the Media Server on which the OPS station is from this user will always be routed to the selected Avaya Ianager media server for origination services. Click on " Add ".
	🗿 Add Media Server Extension - M	rrosoft Internet Explorer
	<u>File Edit View Favorites Tools</u>	Help E
	수 Back 🔹 🤿 🖉 🙆 🔕	Search 🗟 Favorites 🛞 Media 🧭 🛃 🗐
	Address 🙆 https://192.45.52.160/imp	ress/do/edituserextension/add_extension?auth_user_id=540058sid=sid91&cmd=Continue
	AVAYA	Integrated Management SIP Server Management
	Help Exit	Server: 192.45.52.160
	Top ■ Users List	Add Media Server Extension
	Add	Add Media Server extension for user 54005.
	Search	Media Server S8710
	Edit Delete	Fields marked * are required.
	Password Default Profile	Add
	Registered Users	

Step		Description					
6.	Click on "Continu	e".					
	🚰 Continue - Microsoft Internet Ex	🖉 Continue - Microsoft Internet Explorer					
	<u>File Edit View Favorites Tools</u>	Help Search Califevorites @Media 24 R+	<u>*</u>				
	Address Address https://192.45.52.160/impr	ess/do/edituserextension/do_add_extension	▼ ∂G0				
	Αναγα		Integrated Management				
	Help Exit		Server: 192.45.52.160				
	Top Ilsers	Continue					
	List	Extension 54005 added for user 54005					
	Add Search						
	Edit Delete	Continue					
	Password						
	Registered Users						
7.	Click on "Update"	at the bottom of the left pane.					
	List Media Server Extensions - M File Edit View Esvorites Tools	crosoft Internet Explorer					
	$\begin{array}{c c} & \underline{c} \\ \hline \\ $	isearch @iFavorites @iMedia 🗭 🛃 🖨 🚍					
	Address 🙆 https://192.45.52.160/impi	ess/do/edituserextension/listextension?auth_user_id=54005&sid=sid92&cmd=Continue	▼ @Go				
	AVAYA		Integrated Management SIP Server Management				
	Help Exit		Server: 192.45.52.160				
	Top	List Media Server Extensions					
	List	Media Server extensions for user 54005.					
	Add Search	Commands Extension User Media Server Host					
	Edit	Free Edit User Delete 54005 54005 58710 192.45.52.160					
	Password						
	Default Profile						
	Conferences						
	Media Server Extensions						
	 Emergency contacts Hosts 						
	Media Servers						
	 Adjunct Systems Services 						
	Server Configuration						
	 Web Certificate Management 						
	IM Logs Trace Logger						
	Export/Import to ProVision						
	<u>Update</u>						
8.	Repeat Steps 2 – 7	as necessary to configure SIP users for addition	onal MAX IP phones.				
	1	, , , , , , , , , , , , , , , , , , , ,	r				

5. Configure the ClearOne MAX IP Phone

This section describes the steps for configuring the ClearOne MAX IP phone. This section assumes that the MAX IP phone has already been configured with an IP address.

Step			Description		
1.	Open a web brows	ser, enter <u>http://a</u>	b.c.d for the URL, when	e a.b.c.d is the IP ad	dress of
	the MAX IP phone	e, and log in with	n the appropriate credent	ials.	
2.	Click on "CONFI	GURATION".			
	🚰 MAX IP WebPortal - Microsoft Int	ernet Explorer			
	File Edit View Favorites Tools	Help			100 A
	↔ Back • → • 🕥 🖉 🚮 🔍 Address 🍘 http://192.45.53.71/	Search 💽 Favorites 🥹 Media 🤮) B· # 0 · 9		▼ 🖓 Go Links »
	ClearOne	CONFIGURATION PHONE	BOOK VIEW LOG TOOLS	ABOUT DEVICE REGISTRATION	
	oicai one.				
	MAX IP WebPortal	Device Inform	nation		
		System Name:	MAXIP-BE15		
		Local phone number:	3000		
		Manufacturer:	ClearOne Communications		
		Copyright Notice:	Manufactured by ClearOne Communications (C) 2005 ClearOne Communications All rights reserved	×	
		Protocol Information:	SIP		
		Base Firmware Version:	06-09-06		
		Pod Firmware Version:	11-03-05		
		MAC Address:	00:06:24:0D:BE:15		

Step		Description						
3.	For Local phone	For Local phone number , enter the SIP user (Primary Handle) created in Section 4 Step						
	3 and click on "Ap	and click on "Apply". Click on "SIP Parameters" in the left menu.						
	A MAX IP WebPortal - Microsoft Int	ernet Evnlorer	- FIX					
	<u>File Edit View Favorites Tools</u>	Help						
	수 Back 🗸 🤿 🗸 🙆 🙆 🚳	earch 🗟 Favorites 🛞 Media 🛞 🖏 - 🚔 🖸 - 🗎						
	Address 🕘 http://192.45.53.71/		▼ (PGo Links »					
	ClearOne.	CONFIGURATION PHONE BOOK VIEW LOG TOOLS ABOUT DEVICE REGISTRATION						
	MAX IP WebPortal	General Settings						
	General Settings	User name: admin						
	User Preferences	Password:						
	Dial Plan	Apply						
	Network Settings	Provisioning © Lise local settings						
	SIP Parameters	© Use DHCP/TFTP						
	Audio Parameters	TFTP Address from DHCP						
	Trace and Logging	Use TFTP Server: 0 .0 .0 .0 .0 .0 .0 .0 .0						
		Phone Numbers						
		Local phone number: 54005						
		Help line number:						
		Reboot						
		C Allow reboot during a call						
		Wait until current call ends Apply						

Step		De	escription
4.	Check the "Enable	le Authentication", "Er	nable SIP Proxy registration", and "Enable
	Outbound proxy	" checkboxes and config	sure the following parameters:
	• Authorizati	on user and Authorizat	ion password _ Enter the SIP user and
	• Authorizati	ministered in Section 4	Stop 2
	passworu au	Infinite red in Section 4.	
	Proxy serve	r IP address/URL and	Outbound proxy server IP address/UKL –
	Enter the IP	address of the Avaya SE	2S server.
	The remaining fie	lds may be left at the de	faults. Click on "Apply" and then "Dial Plan"
	in the left menu.	-	
	MAX IP WebPortal - Microsoft In	iternet Explorer	
	$\begin{array}{c c} \underline{r} & $	·)Search ि≽iFavorites आ?Media (36 ⊡∿ +	
	Address i http://192.45.53.71/		▼ ∂Go Links »
	ClearOne.	CONFIGURATION PHONE BOOK	VIEW LOG TOOLS ABOUT DEVICE REGISTRATION
		SIP Configuration	
	General Settings	Authorization user:	54005
	User Preferences	Authorization bassword	37003 ##04000
	Dial Plan	Finable SIP Provy registration	
	Network Settings	Proxy server IP address/URL:	192.45.52.160
	SIP Parameters	Proxy port:	5060
	Audio Parameters	Enable Outbound proxy	
	Trace and Longing	Outbound proxy server IP address/URL:	192.45.52.160
		Outbound proxy port:	5060
		SIP Transport:	
		• UDP	Listen port 5060
		ОТСР	Listen port 5060
		Enable In Band DTMF Relay	
		Payload:	97 (96 - 127)
		Registration timeout:	3600
			Apply
	1		

Step				Description					
5.	The MAX IP phon	MAX IP phone dial plan can be either loaded from a file or manually configured.							
	Consult [6] for gui	nsult [6] for guidelines on creating the dial plan file or manually configuring the dial							
	plan. The following	plan. The following briefly explains the settings in the screen below:							
	Manual se	nd kev is se	t to "No	ne " so that a	"Send"	kev does r	not have to	o be	
	entered after	er entering th	he destin	ation numbe	r.	2			
	• Extension	dialing is se	et to "5 d	ligits" becaus	se 5-dig	it extension	ns were u	sed	
	Local diali	ing (Prefix)	and Lor	ng distance d	lialing (Prefix) are	e set to "9	" and	
	"91" respe	ectively bec:	ause "9"	was configu	red as th	ne ARS Fe	ature Acc	ess Cor	le
	in Avava C	'ommunicati	on Man	ager	iou us ti				
l	in rivuyu c	,onnuneut	on mun	4901.					
l	Taken together th	e settings me	an that.						
	• If "0" follo	wed by "1"	is ontoro	d than the M		talanhona	will dial a	out ofter	r 10
	• II 9 10110	wed by 1	is entere		ΙΑΛ Π	telephone	will ulai (10
		are entered.	digit oth	or then "1"	antora	d than tha		talanha	no
	• II 9 IUIIU	wed by ally	ngit oti na digita	era antarad	Note th	u, illell ille	WIAA IF	ablam	me
	where 10 d	ligit dialing	ie uigits	ale entered.	hone of	lla In that		Justom (1:01
	plan file m	light thanning i	d and lo	adad		IIIS. III uia	i case, a c	ustom	11a1
		ust be cleate	$(0)^{*}$	aueu.	MAVI	Dealamhan		1 and of	
	• If any digit	other than	9 18 018	aled, then the	MAAI	P telephon	ie will dia	I out al	ter
	4 more dig	its are entere	ea.						
		and these "N	. 4		41 1				
	Click on Apply		etwork	Settings III	the left	menu.			
	MAX IP WebPortal - Microsoft Int	ernet Explorer						_	
	File Edit View Favorites Tools	Help Search 🐨 Favorites 🕬	Media 🦛 🖳 🕶						
	Address Address http://192.45.53.71		<u> </u>					▼ \$\varchim{\varchim{c}}{\varchim{c}}\$	Links »
	ClearOne.	CONFIGURATION	PHONE BOOK	VIEW LOG	TOOLS	ABOUT DEVICE	REGISTRATION		
I									
I		Dial Plan							
	MAX IP WebPortal								
	General Settings	Current dial plan:		View					
	User Preferences	Select new dial plan	location:	O File	configuration				
	Dial Plan	Load From File		Browse					
	Network Settings	The location. j		Diomoc		Upload			
	SIP Parameters								
	Audio Parameters	Manual Configuration	lone 🔽 Totol (dial timor 2 minutes 💌	Interdigit time	or 15 seconds 💌			
	Trace and Logging	Enable	Extens	sion dialing:	5 digits 🔽				
		✓ Enable	Local	dialing (Prefix):	9 -				
		🗹 Enable	Long	distance dialing (Prefix)	91 💌				
		□ Enable	Emerg	ency dialing:	911 💌				
		🗖 Enable	Opera	tor dialing:	0 💌				
						Apply			
									I

Step			Description			
6.	To set 802.1p/Q Qos	S values in SIP and	RTP frames origin	ated by the MAX IP phone,		
	configure the follow	ring:				
	• Check the E	nable VLAN check	box.			
	VLAN Prior	rity - Select an app	ropriate priority va	lue in the range $0 - 7$, where 7		
	is the highest	t priority.	1 1 2			
	• VLAN ID -	Enter the ID of the	VLAN on which t	he MAX IP phone resides.		
	, ,					
	To set specific DiffS	Serv ¹ OoS values in	RTP packets origin	nated by the MAX IP phone.		
	configure the follow	ving:	1111 partice on 84			
	Description/	/Precedence - Sele	ct "Custom"			
	• Custom/Cu	rrant DSCP Value	- Enter the hevede	cimal equivalent of the desired		
	• Custom/Cu	S value for VoID tra	offic The DiffServ	αOoS value should be set in		
	Diffserv Qu	yith the customer's	Oos policies In the	a example below 0x2E is		
	accordance v	the decimal value	Qos policies. Il u 16	le example below, 0x2E is		
	equivalent to	o the decimal value -	+0.			
	Click on " Apply " ar	nd then " Audio P ar	amotors" in the le	ft menu		
	Click on Apply a	iu ileli Auulo I al	anieters in the le	it menu.		
	🚰 MAX IP WebPortal - Microsoft Inte	rnet Explorer				
	File Edit View Favorites Tools	<u>H</u> elp				
		earch 🗽 Favorites 🥹 Media 🎯 🗄		र लेख		
	ClearOne.	CONFIGURATION PHONE BOO		OLS ABOUT DEVICE REGISTRATION		
	MAX IP WebPortal		douconnact.com			
		Domain Name.				
	General Settings	Static IP Address:	192			
	User Preferences	Subriel Mask.	102 //E E2 1			
	Dial Plan	Primary DNS IP Address				
	Network Settings	Secondary DNS IP Address:				
	SIP Parameters	SNTD Server 1 ID Address:				
	Audio Parameters SNTP Server 2 IP Address: 0 0 0 0					
	Trace and Logging					
		RTP/RTCP QoS Setting				
		Description/Precedence	Custom			
		Custom/Current DSCP Value	0x2E (0x0 - 0x3F)			
		Enable VLAN				
		VLAN Priority:	6 🔽			
		VLAN ID:	53 (1 - 4094)			
			Annly	1		
			[Apply]	1		

¹ The ClearOne MAX IP phone does not set DiffServ QoS values in SIP signaling packets.

Step		Description	
7.	Order the Preferred Audio Codecs list if necessary and click "Apply". Codecs listed		
	higher in the list hav	ve higher preference.	
	File Edit View Favorites Tools	Help	
	4= Back • ⇒ • (2) (2) (2) (2)		
	Address 🙆 http://192.45.53.71		• @G
	ClearOne	CONFIGURATION PHONE BOOK VIEW LOG TOOLS ABOUT DEVICE REGISTRATION	
	orcar one.		
			-
	MAX IP WebPortal	Audio Settings	
		Finable VAD	
	General Settings	VAD Noise Matching:	
	User Preferences	- O None	
	Dial Plan	© Level	
	Network Settings	O G-711A2	
	SIP Parameters	VAD Noise LP Order: 5 (1 - 10)	
	Audio Parameters	Preferred Audio Codecs:	
	Trace and Logging	G.711 uLaw 🗾 Up	
		G.711 ALaw G.729AB	
		G.723.1 6.3 kbps Vown	
		[Apply]	

6. Interoperability Compliance Testing

The focus of the interoperability compliance testing was primarily on verifying call establishment on the ClearOne MAX IP phones, MAX IP phone operations such as dialing methods (manual, re-dial, and phone book), hold, mute, and conference, and MAX IP phone interactions with Avaya SIP Enablement Services (SES), Avaya Communication Manager, and Avaya SIP, H.323, and digital phones.

6.1. General Test Approach

The general test approach was to place calls to and from the MAX IP phones and exercise basic phone operations on the MAX IP phones. The main objectives were to verify that:

- The MAX IP phone successfully registers with Avaya SES.
- The MAX IP phone successfully establishes calls with Avaya SIP, H.323, and digital phones attached to Avaya SES or Avaya Communication Manager.
- The MAX IP phone successfully establishes calls with PSTN phones through Avaya Communication Manager.
- The MAX IP phone is able to hold and retrieve calls.
- The MAX IP phone successfully handles concurrent calls on its two lines and is able to switch between and bridge the two lines.
- The MAX IP phone successfully transmits DTMF during a call.

For serviceability testing, failures such as cable pulls and hardware resets were applied. For performance testing, a conference call involving two MAX IP phones and two Avaya phones was formed as follows. A call was established between an Avaya phone and a MAX IP phone. The MAX IP phone then used its second line to establish a call with another MAX IP phone, and bridged the two lines together, forming a 3-party conference. The second MAX IP phone then used its second line to establish a call with another forming a two lines together, effectively forming a 4-party conference.

6.2. Test Results

The test objectives of Section 6.1 were verified. For serviceability testing, the MAX IP phone operated properly after recovering from failures such as cable disconnects, and resets of the MAX IP phone, the Avaya SES server, and Avaya Communication Manager. For performance testing, the conference call was successfully maintained for approximately two hours.

The following observations were made during testing:

- An unattended transfer where the transfer target is a MAX IP phone and the transferring phone is a SIP phone does not complete and causes the call to drop. The workaround is to perform attended transfers instead for such situations.
- When the MAX IP phone places a call on hold, the held party does not hear the holding party (MAX IP phone) as expected, but also does not hear Music On Hold.

- When the MAX IP phone attempts to unregister, it does not respond to the authentication challenge from Avaya SES. Thus, Avaya SES continues to consider the MAX IP phone registered until the registration timer expires or the MAX IP phone registers again.
- The MAX IP phone codec list includes G.729AB (see screenshot in Section 5 Step 7), but advertises G.729 in the SIP signaling. Therefore, if G.729 is desired, G.729 must be included in the Avaya Communication Manager IP codec set list.
- The MAX IP phone does not operate properly when the MAX IP phone is configured to use TCP as the SIP transport protocol. Therefore, the MAX IP phone must use UDP (the default configuration) as the SIP transport protocol.

ClearOne Communications expects to resolve the above observations in future releases. Contact ClearOne Communications (<u>www.clearone.com</u>) for further updates.

7. Verification Steps

The following steps may be used to verify the configuration:

• Verify that the MAX IP phones successfully register with the Avaya SES server by following the Users -> Registered Users links on the SES Administration Web Interface.



• Place calls to and from the MAX IP phones and verify that the calls are successfully established with two-way talk path.

8. Support

For technical support on ClearOne Communications MAX IP phones, consult the support pages at <u>http://www.clearone.com/support</u> or contact ClearOne Communications technical support at:

- Phone: 1.800.283.5936
- E-mail: <u>tech.support@clearone.com</u>

9. Conclusion

These Application Notes described a compliance-tested solution comprised of Avaya Communication Manager 3.1.2, Avaya SIP Enablement Services (SES) 3.1, and ClearOne Communications MAX IP Tabletop Conferencing Phones. MAX IP phones are SIP-based VoIP tabletop conferencing phones intended for use in conference rooms and similar environments. During compliance testing, the MAX IP phones successfully registered with Avaya SES, placed/received calls to/from SIP and non-SIP telephones, and established 3-party conference calls.

10. Additional References

Product documentation for Avaya products may be found at http://support.avaya.com.

[1] Administrator Guide for Avaya Communication Manager, Issue 2.1, May 2006, Document Number 03-300509

[2] Administration for Network Connectivity for Avaya Communication Manager, Issue 11, February 2006, Document Number 555-233-504

[3] *SIP Support in Release 3.1 of Avaya Communication Manager*, Issue 6, February 2006, Document Number 555-245-206

[4] *Installing and Administering SIP Enablement Services R3.1*, Issue 1.5, February 2006, Document Number 03-600768

Product documentation for ClearOne Communications products may be found at <u>http://www.clearone.com</u>.

[5] MAX IP User's Guide, January 2006 (Rev 1.0), Part No. 800-158-301

[6] MAX IP Administrator's Guide, January 2006 (Rev 1.0), Part No. 800-158-302

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