# SCOPTEL IP PBX Software - Automatic Provisioning System

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### Background

• The APS (Automatic Provisioning System) is used to create the required configuration files needed for many SIP end devices. The APS assigns SIP usernames and passwords, network options, time settings, QoS settings, dial plans, firmware upgrade policies, soft key programming, DSS/BLF programming, security settings, DTMF modes, LDAP settings,

- Templates can be configured to simplify tedious configuration settings for as many supported SIP end points as required
- Extensions you wish to assign to a MAC address must already exist so they must be created first before trying to assign then them to hardware using the APS.
- Here is a list of supported vendors :
  - Yealink
  - Aastra
  - Polycom
  - Cisco
  - Sipura/Linksys/Cisco
  - Panasonic SIP and SIP DECT
  - VtechHospitality Phones
  - Snom
  - CyberdataIntercoms
  - Grandstream
  - SpectraLink
  - Alcatel
  - AudioCodes
  - LG-Ericsson

#### Security

- Hackers are routinely scanning IP addresses for open ports and if they find an IP address vulnerable to brute force scanning they will execute a remote Provisioning scan using the first 6 digits of popular vendor ID's like Polycom, Yealink and then brute force the last 6 digits of a 12 digit MAC address.
- By example a SCOPTEL server using the default HTTP listen port of 5555 can be attacked using this method. Other vendors are also vulnerable on whatever HTTP listen port they use to remotely provision IP phones.
- TFTP is especially vulnerable on UDP port 69 because no specific path is required to the MAC.cfgfile. Only the <MAC>.cfgvariable is required to harvest the MAC.cfgfile. TFTP should be denied on the Firewall whenever possible.
- If you have enabled Telephony>Configuration>Security>Flood Protection and the SCOPTEL Firewall and Telephony Flood Protection (Fail2ban) Service then the remote attacker's IP address will be blacklisted by the Firewall when a brute force attack is detected.
- But if the remote attacker knows of a valid MAC address on the network then this MAC.cfgfile can easily be harvested unless HTTP Authentication is configured. The exact methodology won't be published here as this should not be public knowledge.
- Refer to: https://blog.scopserv.com/2018/10/securing-configuration-files-with-http-authentication/

### **IP/DNS Mapping explained**

The purpose of the IP/DNS Mapping it to replace a 'dummy' IP address or static IP address with a FQDN (Fully Qualified Domain Name)

- FQDN's are highly advantageous for the following reasons :
  - A public DNS A record can help a remote VoIP phone contact the SCOPTEL server's public IP address in order to register its SIP account and update its provisioning settings.
  - A local DNS A record can help a local VoIP phone contact the SCOPTEL server's public IP address in order to register its SIP account and update its provisioning settings.

- If either the server's LAN or WAN addresses changes the APS configurations will not require changing
- Only the DNS A records will require any changes and since the phone will always use DNS lookups to re register or reconfigure itself, downtime is kept to a minimum
- In any of these scenarios the phone only is always configured with the same FQDN and if the DNS A record requires changing on the IP/DNS Mapping needs to be edited.

### Add a new Provisioning System

• From Configuration > Telephony > Provisioning click on "Add a new Provisioning System "

Auto Provisioning Sys	Auto Provisioning System (APS): Phone Provisioning 🔋 😵 Network Auto-Discovery (Scan) 📑 Import MAC										
Phone Provisioning Firm	nware										
IP/DNS Mapping [1 to 1	of 1]							Add a new	Provisioning S	ystem	
Search:	Search										
	Desti	ination							Tenant		
	maste	er88.commzilla.ne	t						debcomainbtn		
Action: - select an action -	۲							Column	<b>is to display:</b> Select	•	
Polycom: [1 to 4 of 4]											
Search:	Search										
□ 1	Firmware	Description	Туре	Extension(s)		Time Serve	r DHCP	Template Name	Tenant		
00:04:F2:D6:88:A2			Polycom VVX 500	211 (1)			~	vvx500	debcomainbtn		
□ 📝 🔎 00:04:F2:40:96:79			Polycom IP600/650	212 (1)			~	ip650	debcomainbtn		
Vvx500	4.0		Polycom VVX 500	N/A		~			debcomainbtn		
🗆 🗹 🔎 ip650	4.0		Polycom IP600/650	N/A		$\checkmark$			debcomainbtn	<b>X</b> N	
Action: - select an action -	T							Columns to	display: Select	•	
Yealink: [1 to 21 of 21]											
Search:	Search										
🗌 📝 🔎 Mac Address	Description	Туре	Extensi	ion(s)		Time Server	DHCP	Template Name	Tenant	🗹 🗙	
🔲 🗹 🔎 00:15:65:BF:66:21		Yealink T41	214 (1)				$\checkmark$	t41	debcomainbtn	🔽 🗙	
🗆 🗹 🔎 t48s		Yealink T48	N/A						debcomainbtn	🗹 🗙	
🔲 🗹 🔎 00:15:65:C1:4B:BC		Yealink T48	225 (1)				$\checkmark$	t48s	debcomainbtn	🔽 🗙	
🗆 🗹 🔎 t41		Yealink T41	N/A						debcomainbtn	🔽 🗙	
🗆 🗹 🔎 t28p		Yealink T28	N/A						debcomainbtn	🗹 🗙	
🗆 🗹 🔎 t38p		Yealink T38	N/A						debcomainbtn	🗹 🗙	
🔲 📝 🔎 00:00:00:00:11		Yealink T48	110 (1)				$\checkmark$	t48g	debcomainbtn	🗹 🗙	
🗆 🗹 🔎 00:15:65:65:9E:6C		Yealink T48	216 (1)				$\checkmark$	t48g	debcomainbtn	🗹 🗙	
🔲 🗹 🔎 t42gtest		Yealink T42	N/A		A.				debcomainbtn	🗹 🗙 ,	
4					*0					► E	

#### **IP/DNS Mapping**

- From the Tenant drop list selector choose Tenant>All (Global) so that all tenants can use the same IP/DNS Mapping. Or select the specific tenant you would like to restrict the IP/DNS Mapping to.
- In this example the source IP address 1.1.1.1 is a dummy address which will be replaced with master88.commzilla.net in the /tftpboot/<mac>.cfg files.
- When done editing Add the object and carry on adding hardware based templates and then add MAC address based objects using the templates.
- This replacement is automatically done for all instances of 1.1.1.1 in any template or MAC based APS object as shown in these examples :

#### Auto Provisioning System (APS): Phone Provisioning

Phone Provis	ioning	Firmware					
Phone Prov	visioning						
General							
		<b>*</b> Te	nant 🖸	: All (Global)	T		
		* Phone M	odel 🖯	: IP/DNS Ma	pping		•
		ć	Source	: 1	. 1 . 1	. 1	
		* De	stinatior	i : master88.co	ommzilla.net		
Add Cance	ł						
Phone Provis	ioning						
		Comment New York		D-tIT'	Di 0	DCC K	<b>D</b>
General Pr		Server Net	work	Date and Time			Programm
Power Saving	Security	Internal Ringe	r M	ulticast Paging	PBX Services	LDAP Cus	tom Settings
		* Registra	r : 1	. 1	. 1 . 1	Port 5060	
	Out	bound Proxy Serve	r :			Port	
		Backup Registra	r :			Port	
	Backup Out	bound Proxy Serve	r :			Port	

### Adding a new Hardware based template

- From Configuration > Telephony > Provisioning click on "Add a new Provisioning System "
- From the Tenant drop list selector choose Tenant>All (Global) so that all tenants can use the same IP/DNS Mapping. Or select the specific tenant you would like to restrict the vendor template to.
- From the Phone Model drop list select the matching hardware for the phones you will be deploying.
- Make sure you click on the 'Create Template' checkbox.
- · Give this template a meaningful name
- Click on the Provisioning tab

Phone Provisionin	g									
General Provision	ng Server	Network PRX Services	Date and Time	Phone Options	DSS Keys	Programmable Keys	Audio/Volume	Power LED	LCD Display	Security
	* To					-				
	* Phone M	odel 🖸 : Yea	link T48		•					
	Des	cription :	lousers							
								₩.		
							<i></i>	-0		
	Create Templa	ite ? 🗗 : 🗹 Forci	ing Template mode w	vhen Tenant is set to All	l (Global)					
Add Cancel										

#### General

- Use the drop list selector to choose the installed firmware version of the device so this template will write compatible files.
- Use the drop list to choose the preferred sync method.
- Provisioning URL : enter the full path to the provisioning server in format : < http\_protocol >://<WAN\_IP/LAN\_IP>:< Listen\_on\_Port >/< TFTP\_Alias >/
- Example : http://master 88.commzilla.net:5555/tftpboot/
- Firmware URL : Enter the full path to the provisioning server in format : < http\_protocol >://<WAN\_IP/LAN\_IP>:Listen\_on\_Port >/< TFTP\_Alias >/< firmware \_filename >
- Example : http://master88.commzilla.net:5555/tftpboot/T48-35.83.0.50.rom
- · Click on the Server tab

Filone Frovisioning								
General <b>Provisioning</b>	Server Netwo	rk Date and Time	Phone Option	s DSS Keys	Programmable Keys	Audio/Volume	Power LED	LCD Display
Power Saving Security	Internal Ringer	Multicast Paging	PBX Services	LDAP Cust	om Settings			
Firr	nware Version 🖯 :	Version 83 🔻 Default: Version 83						
Provi	isioning Mode 🖯 🗄	Power on + Repeatedly Default: Power on	T					
Sync Ir	nterval (in Minutes) :	60 Value: 1 to 43200 minutes						
	Provisioning URL :	http://master88.commzill Example: http://192.168.0.	a.net:5555/tftpboot, 1:5555/tftpboot/	/				
Protect per	sonalized settings? :	If enabled, personalized se	ettings configured vid	a web or phone user	interface will be protected	and remained after aut	o provisioning.	
Periodically upload per	sonalized settings? :	If enabled, the IP phone w local CFG file from the pro	ill periodically uploa wisioning server.	d the MAC-local CF	G file to the provisioning se	rver. During auto provis	ioning, the IP pho	ne will download the MAC-
HT	TP Upload method :	PUT   Default: PUT						
	Firmware URL :	http://master88.commzill Example: http://192.168.0.	a.net:5555/tftpboot, 1:5555/tftpboot/yea	/T48- link/2.70.0.50.rom				

#### Server

- In the Registar boxes enter the dummy IP address created for the IP/DNS Mapping
- Click on the Network tab

Phone Prov	visioning											
General	Provisioning	Server	Networ	k Date and T	ime	Phone Option	s DSS	S Keys	Programm	able Keys	Audio/Volume	Power LED
Power Saving	g Security	Interna	l Ringer	Multicast Pagin	g PB	X Services	LDAP	Custo	om Settings			
		* F	Registrar :	1.1	. 1	. 1	Port	t 5060				
	Ou	tbound Prox	y Server :	1.1	. 1	. 1	Port	t 5060				
		Backup F	Registrar :				Port	t				
	Backup Ou	tbound Prox	y Server :				Port	t				
	★ Registra	ition Expirati	on Time :	3600 Default: 3600								
	* Regis	tration Retry	Counts :	3 Default: 3								
		Failbac	k Mode :	New Requests 🔻								
		* Failback	Timeout :	3600 Default: 3600								
		Register on	Enable? :	Enables or disables	the IP pho	ne to register t	o the secon	dary serve	er before sendi	ng requests to	the secondary server	in the failover mode

#### Network

- Use NAT option is recommended so that rport may be enabled.
- STUN Server : not recommended
- Enable Link Layer Discovery Protocol (LLDP) is an optional open standard Layer 2 protocol that allows automatic VLAN membership.
- Enable Cisco Discovery Protocol (CDP ) is an optional Cisco Layer 2 protocol that allows automatic VLAN membership.
- Click on Date and Time tab when done

Phone Provisioning	
General Provisioning Server Network Date and Time Phone Options	DSS Keys Programmable Keys Audio/Volume Power LED LCD Display
Power Saving Security Internal Ringer Multicast Paging PBX Services LD/	AP Custom Settings
Use NAT ? 🖸 🗄 🗹	
STUN Server :	
STUN Port : 3478 Default: 3478	
Enable 'rport' support ? : Note: rport is used for symmetric NAT traversal.	[₃
Enable Link Layer Discovery Protocol (LLDP) ? 🖯 :	
Enable Cisco Discovery Protocol (CDP) ? 🕒 :	
QoS RTP ToS :	
QoS Signal ToS :	
Enable VLAN Change? : □ It enables or disables the IP phone to obtain IP addre IP address with the current VLAN assignment metho	iss with lower preference of VLAN assignment method or disable VLAN feature when the IP phone can not obtain d.
Use VLAN on WAN Port? 🖯 : 🗌	
Use VLAN on PC Port? 😏 : 🗆	

### **Date and Time**

- Modify the Date and Time configuration if needed
- Click on Phone Options

Phone Provisioning						
General Provisioning Server Netwo	Date and Time	Phone Options	DSS	Keys Programmable	e Keys Audio/Volume	Power LED
rower saving security internal kinger	Multicast Paging	PBA Services	LDAP	Custom Settings		
Enable Time Server? 🖯 :	✓ Default: True					
* Primary NTP Server :	pool.ntp.org Default: pool.ntp.org					
Secondary NTP Server :						
NTP Refresh Time (in seconds) :	3600 Default: 3600					
Enable Daylight Saving Time? 🖯 💠	✓ Default: True					
Daylight Saving Mode :	Automatic 🔻 Default: Automatic					
DST Time Type :	By Date 🔻					
DST Start Date :	The value formats are 'MM,	/DD/HH' (for By Date	) or 'Mont	h/Day of Week/Day of We	ek Last in Month/Hour of Day	r' (for By Week)
DST End Date :	The value formats are 'MM/	/DD/HH' (for Bv Date	) or 'Mont	h/Dav of Week/Dav of We	ek Last in Month/Hour of Day	r' (for By Week)
DST Offset time (in minutes) :	Range: -300 to +300	,				M , , ,
Display Date format :	WWW MMM DD 🔻					
Display Time in 24 hour format? :	Default: True					
Time Zone :	-5 United States-Eastern T Default: -5 United States-E	Time 🔹 🔻	]			

## **Phone Options**

Modify settings like :

- The Phone Language for the end user interface
- Country Tone
- Set Custom Tones
- Any other preferred options
- Click on DSS Keys

Phone Pro	visioning								
General	Provisioning	Server	Network	C Date and Tim	e Phone Optic	ons DS	S Keys	Programm	able Ke
Power Savir	ng Security	Internal	Ringer	Multicast Paging	PBX Services	LDAP	Custor	n Settings	
		Phone Lar	nguage : D	English 🔹 Default: English					
		Ringer	device : C	Speaker & Headset ■ Pefault: Speaker & He	adset				
		Count	ry Tone : D	United States 🔻 Default: United States					
	Set	Custom Ton	ies? 🖯 : 🖪						
Custom Tones									
			Dial :						
		Rin	ng Back :						
			Busy :						
		Con	gestion :						
		Call \	Waiting : 0	)/100,500/100,0/100,5	500/100,0/100,500/1	00,0/500			
		Dia	I Recall :						
			Record :						
			Info :						
			Stutter : 0	)					

### **DSS Keys Vs Programmable Keys**



### **DSS Keys**

- DSS Keys are the
- Enable Enhanced DSS Keys (EDK) support to enable SCOPTEL PBX Features in the drop lists
- Deal Type recommendation is Attended Transfer for proper PBX Features functionality
- Expansion Module type and Number of Expansion Modules assigned is dependent on additional hardware and optional.

- Key 1 is used for the Extension assignment. Leave the Label blank and the Line drop list set to Line 1. NOTE : each line key can process 8 concurrent calls. There is no need to have more than one Key assignment per Extension. Remaining Key buttons can be allocated for BLF, Key Event, Speed Dials, Features, DTMF events, Directory lookups, etc...
- Click on Programmable Keys when you are done editing.

Phone Provi	sioning										
General	Provisioning	Server 1	Network	Date and Time	Phone Options	DSS	Keys Progra	mmable Keys	Audio/Volume	Power LED	LCD Display
Power Saving	Security	Internal Rin	ger	Multicast Paging	PBX Services	LDAP	Custom Setting	ls .			
								_			
Enable Enha	nced DSS Kevs (	EDK) support ?	<del>[]</del> : 🗹								
-	Enable extend	ed DSS Keys labe	el ? : 🗹								
		Deal Ty	/pe : A De	ttended Transfer 🔻	]						
	Exp	ansion Module	<del>0</del> : D	CD Expansion Module	(EXP40) 🔻						
	Number of Exp	ansion Module	<del>0</del> : 0	•							
Line Keys							-				
		Key 1	<del>0</del> : L	ine 🔻							
		La	bel :								
		L	ine : L	ine 1 🔻							
		Key 2	<b>€</b> : ₽	BX Feature 🔻							
		La	bel : Pa	ark							
		L	ine : Li	ine 1 🔻							
		* Feat	ure : Ti	ransfer To Voicemail (El	OK) ▼						
			E	ransfer to voicemail (El xpress Messaging (EDK	)						
		Key 3		irect Intercom							
		La	. C	one Touch Park (EDK)							
		ule Foster aller: 0.64		Ine Touch Recording 🕏	DK)						
		<ul> <li>extension/Va</li> </ul>	C	all Forward (Immediate	e)						
		Kan A		all Forward (On Busy) all Forward (Not Availa	ble)						
		Key 4									

### **Programmable Keys**

- Programmable Keys can be reassigned from their Factory Defaults
- Click On Security tab when done

Phone Provisi	ioning									
		C	Network			DEC	V	D	<b>K</b>	And's Atalana
Bower Saving	Security	Joternal	Ringer	Multicast Paging	PRV Services		Custom	Settings	кеуз	Audio/volume
rower saving	Security	Internal	Minger	mutucast raging	P DA Services		Custom	secungs		
	Key	1 (Soft Key	nft:	History <b>T</b>						
	Ney	T (SOIT REY	Label :	instory i						
	Kev	2 (Soft Key	ן  : סרכי	XML Phone Book 🔻						
		2 (5011 112)	Label :	lab88						
	XM	L Phone Bo	ok URL : [							
	Key	3 (Soft Key	3) 🖯 : 🗍	PBX Feature 🔹						
	,		Label :	Park						
		<b>*</b> F	eature :	One Touch Park (EDK)	•					
	Кеу	4 (Soft Key	4) 🖯 : [	Menu 🔻						
			Label :							
	1	Key 5 (UP k	ey) 🔂 : [	History 🔻						
			Label : [							
	Key (	5 (DOWN k	ey) 🖯 : [	XML Phone Book 🔻						
			Label : [							
	XM	L Phone Bo	ok URL : [							
	Ke	y 7 (LEFT k	ey) 🖯 : [	Switch Account						
			Label : [							
	Кеу	8 (RIGHT k	ey) 🖯 : [	Switch Account						
			Label : [							
	H	(ey 9 (OK k	ey) 🖯 : [	Status 🔻						
			Label :							

### Security

- It is recommended to change the Admin Password
- It is quite common for a user to experience ghost calls on their phones. This happens when a firewall binds the default SIP signaling port udp / 5060 of the phone with the public interface of the firewall as a badly implemented SIP ALG.
- Public tools like http://blog.sipvicious.org/ are often used to port scan public IP addresses on port 5060 looking for devices with weak security to exploit. When this happens we often see and hear the ghost calls.

To prevent this it is recommended to : \* Disable Allow Direct IP Call \* Enable Accept SIP Trust Server Only \* On the Line Key assignment use a non standard UDP port between the values of udp / 10000 - 20000 \* NOTE that the Local SIP Port cannot be configured in any template and must be assigned to the APS MAC configuration. \* Click on the Multicast Paging tab when done

Phone Provisi	ioning						
General Pro	ovisioning	Server	Netwo	ork	Date and Time	Phone Option	ns DS
Power Saving	Security	Interna	l Ringer	M	ulticast Paging	PBX Services	LDAP
	*	Admin Us	ername :	admii Defau	n It: admin		
		🖈 Admin Pa	assword :	26634 Defau	14 It: admin		
	Enabl	e Web Serv	ver? 🖯 :	✓ Defau	lt: True		
		Web Sen	ver Port :	80 Defau	lt: 80		
	W	/eb Server S	SSL Port :	443 Defau	lt: 443		
	Al Accept SIP	llow Direct I Trust Serve	IP Call ? : r Only ? :	Defau	lt: True		6
			_	_			
Phone Provis	sioning						
General	ines Netv	vork	PBX Servic	es [	Custom Setting	5	
Line 1							
		L	ine 1 🖸 🗄	501	: David Brillert (Ma	in Account) (SIP) 🔻	]
	La	abel (Phone	Display) :	501			
		Displ	ay Name :				
		R	ling Type :	Cor Defa	nmon ▼ ult: Common		
		Caller II	D Source :	PAI	FROM 🔻		
			fransport :	UD	p 🔻		
		Loca	SIP Port :	105	01		
		DTN	/IF Mode :	RFC Defa	2833 •		

# **Multicast Paging**

- Multicast Paging is beyond the scope of this document.
- Refer to : https://blog.scopserv.com/2018/02/how-to-setup-paging-in-SCOPTEL/
- When you are finished setting up Multicast Paging click on the PBX Services tab

P	Phone Provisioning													
1	General	Pro	visioning	Server	Netwo	rk	Date and T	ime	Phone Opti	ons D	SS Keys	Programm	able Keys	
	Power Sav	ving	Security	Internal	Ringer	Mult	ticast Pagin	g	PBX Services		Cust	om Settings		
M	Multicast Page Group #1													
					Label :	MG10								
				Listen IPA	ddress :	224	. 0	. (	. 1	Po	rt 11000			
		-												
M	lulticast Pag	ge Gro	up #2											
					Label :							_		
				Listen IPA	ddress :			•	·	Po	rt			

### **PBX Services**

- PBX Services allow you to configure the URL for the phones to do internal Directory Lookups
- Click on the LDAP tab when done

**Phone Provisioning** 

General	Pro	ovisioning	Server	Netwo	rk Date and	d Time	Phone Option	is DS	S Keys				
Power Sav	ing	Security	Internal	Ringer	Multicast Pag	ging	PBX Services	LDAP	Cust				
			GUI P	rotocol :	HTTP 🔻								
		* GUI Serve	er (Hostnam	e or IP) :	master88.commzilla.net								
			<b>*</b> G	UI Port :	5555 Default: 5555								
Remote Phon													
				Name :	lab88								
		Use inter	nal director	r <b>y ? </b> :	<b>√</b>								
			Directory	Order :	Name	T							
			* Directory	Name :	lab88	Ŧ							
Remote Phon	e Boo	ok #2											
				Name :									
				URL :									
		Use inter	nal director	ry ? 🔂 💠									
LDAP													

- LDAP configuration is beyond the scope of this document
- Refer to : https://blog.scopserv.com/2012/08/setting-up-an-Idap-directory-server-on-SCOPTEL-pbx/
- Once you have completed your template Click on the Add button

<b>Phone Provisi</b>	oning												
General Pro Power Saving	visioning Security	Server Internal	Network Ringer	Date and Time Multicast Paging	Phone Option PBX Services	IS DSS	i Keys Custe	Programm om Settings	nable Keys	Audio/Volume	Power LED	LCD Display	
	Enable L	DAP suppor	t? 🖯 : 🗹										
		LDAP Source	e 🖯 🕴 No	one (Custom) 🔻									
LDAP Server													
		* Server Ad	dress : Thi	s setting refers to the Di	NS name or IP addre	ess of the LD	AP serve	r.					
		*	Port : 38 Thi	9 s setting specifies the LL	DAP server port. The	default LDA	P port is	389.					
		Protocol Ve	ersion : Ve Def	rsion 3 🔻 ault: Version 3									
		* Bas	e DN : Thi sea	s setting specifies the LL rch is requested to begi	DAP search base (the n.	distinguish	ed name	of the search l	base object) w	hich corresponds to	the location in the o	directory from which the LD	DAP
Authentication													
		User	name : Thi seri	s setting specifies the bi ver does not allow anon	nd 'Username' for LE ymous binds, you wi	DAP servers. ill need to pi	Most LD. rovide th	AP servers allo e Username an	w anonymou nd Password c	s binds in which cas allowed to query the	e the setting can be LDAP server.	left blank. However if the L	.DAP
		Pass	word : Thi the	s setting specifies the bi Password along with th	nd 'Password' for LD. ne Username in order	AP servers. r to access t	This setti he LDAP	ng can be left l server.	blank in case	the server allows an	onymous binds, oth	erwise you will need to prov	vide
LDAP Options													
Enable LI	DAP Lookup fo	or Outgoing	Call ? : 🔲										

## Adding a MAC address and assigning an Extension

#### • From Configuration > Telephony > Provisioning click on "Add a new Provisioning System "

Auto Provisioning Sys	to-Discovery (S	Scan) 📴 Impo	rt MA	С						
Phone Provisioning Firm	ware									
		Drovicioning 6								
	• Aut a new	Provisioning 5	yster	<u> </u>						
Search:	Search									
🗆 🗹 🔎 📥 Source	Desti	nation						Tenant		×
🔲 🗹 🔎 1.1.1.1	maste	er88.commzilla.net	t					debcomainbtn	<b>~</b>	×
Action: - select an action -	T						🗌 Column	s to display: Select		•
Polycom: [1 to 4 of 4]										
Search:	Search									
🗆 📝 🔎 Mac Address	Firmware	Description	Туре	Extension(s)	Time Serve	r DHCF	Template Name	Tenant		×
🔲 🗹 🔎 00:04:F2:D6:88:A2			Polycom VVX 500	211 (1)		~	vvx500	debcomainbtn		×
🗆 🗹 🔎 00:04:F2:40:96:79			Polycom IP600/650	212 (1)		$\checkmark$	ip650	debcomainbtn		X
🔲 🗹 🔎 vvx500	4.0		Polycom VVX 500	N/A	$\checkmark$			debcomainbtn	<ul> <li>Image: A second s</li></ul>	X
🗆 🗹 🔎 ip650	4.0		Polycom IP600/650	N/A	$\checkmark$			debcomainbtn		×
Action: - select an action -	۲						Columns to	display: Select		•
Yealink: [1 to 21 of 21]										
✓ Search:	Search									
🗌 📝 🔎 Mac Address	Description	Туре	Extensio	on(s)	Time Server	DHCP	Template Name	Tenant		×
🔲 🗹 🔎 00:15:65:BF:66:21		Yealink T41	214 (1)			$\checkmark$	t41	debcomainbtn	<ul> <li>Image: A second s</li></ul>	X
🗆 🗹 🔎 t48s		Yealink T48	N/A					debcomainbtn		×
🔲 🗹 🔎 00:15:65:C1:4B:BC		Yealink T48	225 (1)			$\checkmark$	t48s	debcomainbtn	<ul> <li>Image: A set of the set of the</li></ul>	X
🗆 🗹 🔎 t41		Yealink T41	N/A					debcomainbtn		×
🗆 🗹 🔎 t28p		Yealink T28	N/A					debcomainbtn		X
🗆 🗹 🔎 t38p		Yealink T38	N/A					debcomainbtn		×
🔲 🗹 🔎 00:00:00:00:11		Yealink T48	110 (1)			$\checkmark$	t48g	debcomainbtn		×
🗆 🗹 🔎 00:15:65:65:9E:6C		Yealink T48	216 (1)			$\checkmark$	t48g	debcomainbtn		×
🗆 🗹 🔎 t42gtest		Yealink T42	N/A					debcomainbtn		×
4										

#### Assigning a MAC address

- You must use the Tenant selector to choose a dedicated Tenant. You cannot use Tenant 'All (Global)
- Use the Phone Model drop list selector to find matching hardware for your phone deployment
- · Choose from an already configured template
- Enter the unique MAC address of your hardware in the MAC Address field
- Click on Lines when done

Phone Provision	ing				
General Lines	Network	PBX Services	Custom Settings		
		🗙 Tenant 🖯 🕴 d	lebcomainbtn 🔻		
	* Pho	ne Model 🖯 : 🍸	ealink T48	T	
	Phone	Template 🖯 : 🕇	48acdusers 🔻		
Over	ride template D	SS Keys? 🖯 : 🗆	)		
	*	MAC Address : 0(	0:15:65:65:15:16		
		Description :			
	Create Te	emplate ? 🖯 : 🗆	)		

#### Lines

- In the template example only one DSS Key was given a Line 1 assignment, so we will only configure Line 1
- Use the drop list selector to assign an unassigned Extension
- Enter the Label (Phone Display) text you wish to display on the phone's LCD screen
- In order to support P Asserted CallerID connected line updates you must change the default Caller ID Source selection to PAI - FROM
- You may change the Local SIP Port to any custom value from 10000 20000 to reduce the likelihood of ghost calls
- You may optionally enable SRTP Voice Encryption but this has pre requisite configurations that must be done in advance. Refer to : https://blog.scopserv.com/2016/09/how-to-use-the-SCOPTEL-certificate-manager-to-enable-tls-encryption/
- Click on the PBX Services tab when done

Phone Provisioning													
General	Lines	Network	PBX Services	Custom Settings									
Line 1													
			Line 1 🔂 : 21	6: Jen Taylor (SIP)									
		Label (Ph	one Display) : 21	6 Jen Taylor									
		D	isplay Name :										
		Call	ler ID Source : PA	AI-FROM T									
		_	Transport : U[	UDP V									
		L	ocal SIP Port : 50	5060									
			DTMF Mode : RF Def	: RFC2833 ▼ Default: RFC2833									
	Enable Voi	ce Encryption	(SRTP)? 🖯 : 🗆										
		Enable A	uto-Answer? : 🗌										
	Custom	ize Voicemail	Button ? 🖯 : 🗆										
Line 2													
			Line 2 🖯 🕴 No	one 🔻									
Line 3													
			Line 3 🔮 🕴 No	one 🔻									

#### **PBX Services**

- Using the drop list selector choose the Extension you assigned to Line 1
- Click on Add when done

Phone Provisioning													
General	Lines	Network	PBX Services	Custom Settings									
	Override template settings? 😏 : 🔲												
			Extension : 2	16: Jen Taylor (SIP)	•								

### Provisioning

- Security is a critical so before proceeding refer to : https://blog.scopserv.com/2018/10/securing-configuration-files-with-http-authentication/
- The SIP Server Address is used for the Auto Provisioning Feature Code at Telephony Settings : Configuration>Provisioning. It must be an address physically assigned to the server
- The TFTP server address must be an address physically assigned to the server and should be the address bound to the interface running DHCP.
- The Server Hostname must have a matching DNS A record on the DNS Server supporting this network.

- If 'Enable Auto Create support if configuration doesn't exist' is enabled when DHCP detection detects a supported device it's MAC address will be added to the APS MAC address list. If this option is enabled then configuring the Whitelist should be considered mandatory for security purposes.
- Supported devices are : Aastra Snom Polycom Yealink

Configuration	
General Provisioning Proxy Settings SMTP	Settings Performance Tuning Authentication (LDAP) Security (SSL)
* SIP Server Address :	172 . 31 . 240 . 1
TETD Description	
	Default: True
Enable Syslog Logging ? :	el Default: True
Enable 'Write' permission ? :	
TFTP Server Address :	172 . 31 . 240 . 1
HTTP Provisioning	
Enable HTTP support ? U	Default: True
* Protocol :	HTTP V
* Server (Hostname or IP) :	master88.commzilia.net
	Default: master88.commzilla.net
* Listen on Port 😏 :	Default: 5555
* TFTP Alias :	/tftpboot/
Fachla Anda Carada anna de Kara Farradian da an tha inte	Default: /tftpboot/
enable Auto-Create support if configuration doesn't exist : ? G	
Allow Auto-Create from the following IP address (Whitelist) :	172.16.240.0/20 192.168.192.0/24 If empty, we will accept request from any IP addresses. You can specify multiple addresses separated by space.
	Example: 192.168.0.1 172.16.240.0/24
Enable HTTP Authentication 2 🔒	
* Master Username :	admin
* Master Password :	

In addition to manually configuring MAC addresses for supported SIP devices SCOPTEL also supports several mass deployment methods

- Text import of MAC addresses from a file
- Network Scan of selected IP addresses on selected subnets
- DHCP detection of new devices when the SCOPTEL DHCP server is the only DHCP server on the LAN SCOPTEL Minimum Package Requirements
- scopserv\_yum install nmap (if nmap is not already installed)
- scopserv-network-2.6.4-1.nodist. scopserv.noarch.rpm
- scopserv-server-2.6.4-1.nodist. scopserv.noarch.rpm
- scopserv-telephony 25-2.6.52-1.el5.scopserv.noarch.rpm

#### Text import of MAC addresses from a file

- From the APS Main Page click on Import MAC
- Enter a list of MAC addresses or copy and paste from a ASCII file
- Click Next
- A New SIP device list appears showing that the MAC vendor ID matches supported hardware (in this case 3 new Polycom phones)
- Press Next

Import MAC Address											
MAC Address(es)	)	6									
	00:04:F2:01:1C:01 00:04:F2:01:1C:02 00:04:F2:01:1C:03		ш								
Next		Step 1 of 4	_								
•		4	Ŧ								

Telephony: Import MAC Address	×
Import MAC Address	
Checking MAC Address	G
Checking MAC 00:04:F2:01:1C:01	×
New SIP device (polycom) detected on 00:04:F2:01:1C:01	Δ
Checking MAC 00:04:F2:01:1C:02	<ul> <li>Image: A set of the set of the</li></ul>
New SIP device (polycom) detected on 00:04:F2:01:1C:02	Δ
Checking MAC 00:04:F2:01:1C:03	I
New SIP device (polycom) detected on 00:04:F2:01:1C:03	Δ
Import Results	G
Total MAC verified :3	×
New SIP devices +3	А
Previous Next	Step 2 of 4

• Since the system cannot know the model number of each device you must select a matching model number from the list for each MAC address using the drop down list selections

- Click Next
- Click Finish to add the new MAC's to the APS list

Telephony: Impo	rt MAC Address	×
	Import MAC Result	
Please select phone mod	lel for each detected devices.	Ś
You can ignore device by	uncheck it.	
MAC Address	Phone Model(s)	
☑ 0004F2011C01	Polycom IP450	
☑ 0004F2011C02	Polycom IP600	
☑ 0004F2011C03	Polycom SpectraLink 8440/8450/8452 💌	
Previous Next		Step 3 of 4
Telephony: Impo	rt MAC Address	
Telephony: Impo	rt MAC Address	X
Telephony: Impo	ort MAC Address Summary	×
Telephony: Impo	ort MAC Address Summary	X
Telephony: Impo Configuration co	mpleted	× ()
Telephony: Impo Configuration con Adding information for C Adding information for C	mpleted 00:04:F2:01:1C:01 (Polycom IP450) 00:04:F2:01:1C:02 (Polycom IP600)	×
Telephony: Impo Configuration con Adding information for C Adding information for C Adding information for C	Summary           mpleted           00:04:F2:01:1C:01 (Polycom IP450)           00:04:F2:01:1C:02 (Polycom IP600)           00:04:F2:01:1C:03 (Polycom SpectraLink 8440/8450/8452)	
Telephony: Impo Configuration con Adding information for 0 Adding information for 0 Adding information for 0	mpleted D0:04:F2:01:1C:01 (Polycom IP450) D0:04:F2:01:1C:02 (Polycom IP600) D0:04:F2:01:1C:03 (Polycom SpectraLink 8440/8450/8452)	
Telephony: Impo Configuration con Adding information for 0 Adding information for 0 Adding information for 0	mpleted D0:04:F2:01:1C:01 (Polycom IP450) D0:04:F2:01:1C:02 (Polycom IP600) D0:04:F2:01:1C:03 (Polycom Spectralink 8440/8450/8452)	X
Telephony: Impo Configuration con Adding information for C Adding information for C Adding information for C	mpleted D0:04:F2:01:1C:01 (Polycom IP450) D0:04:F2:01:1C:02 (Polycom IP600) D0:04:F2:01:1C:03 (Polycom Spectralink 8440/8450/8452)	X
Telephony: Impo Configuration con Adding information for 0 Adding information for 0 Adding information for 0	mpleted 00:04:F2:01:1C:01 (Polycom IP450) 00:04:F2:01:1C:02 (Polycom IP600) 00:04:F2:01:1C:03 (Polycom SpectraLink 8440/8450/8452)	
Telephony: Impo Configuration con Adding information for 0 Adding information for 0 Adding information for 0	mpleted 00:04:F2:01:1C:01 (Polycom IP450) 00:04:F2:01:1C:02 (Polycom IP600) 00:04:F2:01:1C:03 (Polycom SpectraLink 8440/8450/8452)	▼
Telephony: Impo Configuration con Adding information for 0 Adding information for 0 Adding information for 0	mpleted 00:04:F2:01:1C:01 (Polycom IP450) 00:04:F2:01:1C:02 (Polycom IP600) 00:04:F2:01:1C:03 (Polycom SpectraLink 8440/8450/8452)	
Telephony: Impo Configuration con Adding information for O Adding information for O Adding information for O	ort MAC Address Summary mpleted 00:04:F2:01:1C:01 (Polycom IP450) 00:04:F2:01:1C:02 (Polycom IP600) 00:04:F2:01:1C:03 (Polycom SpectraLink 8440/8450/8452)	∑ten 4 of 4

## Network Scan of selected IP addresses on selected subnets

- This method will only add un-configured MAC addresses to the APS list
- Click on Network Auto Discovery (Scan)

<b>E</b> General	Configuration	Tanager	Extensions	a Lines	₩ Interfaces	iii Virtual Fax	ACD	<b>R</b> Applications	Provisioning	<b>Audio</b>	88 Miscellaneous	<b>%</b> Options					-
Auto P	rovisioning	System	(APS):	Phon	e Provis	ioning				l		twork Auto	-Discovery (Sca	ny (Scan)	) 🐞 Impor	t MAC	
Phon IP/DN	e Provisioning S Mapping	Gatewa [1 to 1 of 1]	y Provisionin	9	Firmware								🛛 🖉 Add a	new Prov	visioning S	ystem	
🔎 Searci	h:		Search														
	Source		Destina	tion										Te	nant	M 🗑	
🗆 📝 🛅 1	.1.1.1		6000.sco	pserv.lo	cal									de	fault	🗹 🔐	1
R Actio	n: - select an ac									4 Co	olumns to dis	play: Select	•				
Aastra	[1 to 3 of 3]																
Search	1:		Search														1

Search:

- Enter the first available IP address on a valid subnet (normally the first IP address in a DHCP pool)
- Enter the last available IP address on a valid subnet (normally the last IP address in a DHCP pool)
- Choose the Network Interface that services the valid subnet
- Choose the desired tenant
- Enter the IP address of the SIP Server (usually the IP address of the Network Interface servicing the local subnet)
- Click Next

Telephony: SIP Phones Auto-Discovery	<u>^</u>
Network Scan	
Warning! This step may take a few minutes to run depending on the number of active IPs to scan.	0
Network Range	(i)
From : 172 . 16 . 74 . 100 To : 172 . 16 . 74 . 200 Verify if HTTP port is enabled ? : 📝	E
Local Network Interface: eth1	
Default Tenant : default 💌	
Register Server : 172 . 16 . 74 . 1	
Next	Step 1 of 4
•	+

• The new window will show a list of detected MAC addresses

Summary	
Configuration completed	i
Adding information for 00:04:F2:01:1C:01 (Polycom IP450)	
Adding information for 00:04:F2:01:1C:02 (Polycom IP600)	<ul> <li>✓</li> </ul>
Adding information for 00:04:F2:01:1C:03 (Polycom SpectraLink 8440/8450/8452)	<ul> <li>Image: A set of the set of the</li></ul>
Previous Finish	Step 4 of 4

### Automatic Addition of Supported Devices via DHCP Classes

#### **Pre-requisites :**

#### Network Module Pre-requisites :

• Network>DHCP Server must be enabled and properly configured

By creating DHCP Classes a default list of supported devices will be added by known Vendor ID.

- Each Class will use default provisioning options for each supported hardware vendor
- This simplifies the editing of options like TFTP option 66 or 150 depending on vendor

DHCP Server:	s Cre	ate Provisioning C	Classes
Configuration Subnet Dynamic DHCP Static DHCP Classes			
DHCP Classes: [1 to 27 of 27]		Add a new DHC	P Class
Search: Search			
🗆 👔 🛃 🛦 Name	Match	Value	
AASTRA_00085D	MAC Address	00:08:5D	
CODES_00908F	MAC Address	00:90:8F	🗹 🔐
CISCO_00036B	MAC Address	00:03:6B	🗹 🔐
🔲 📝 🛅 CISCO_00036C	MAC Address	00:03:6C	M 😁
CARANDSTREAM_000B82	MAC Address	00:0B:82	M 🗑
CINKSYS_000C41	MAC Address	00:0C:41	M 🔐
C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2	MAC Address	00:0E:08	M 🔐
C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2	MAC Address	00:0F:66	M 🔐
🗆 🎽 🛅 LINKSYS_001A70	MAC Address	00:1A:70	
C 2 C 10 C 10	MAC Address	00:1C:10	M 🔐
C INKSYS_001D7E	MAC Address	00:1D:7E	M 😁
EINKSYS_001EE5	MAC Address	00:1E:E5	ピ 😭
C 2 C 1217	MAC Address	00:12:17	ピ 😭
C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2	MAC Address	00:13:10	ピ 😭
ELINKSYS_0014BF	MAC Address	00:14:BF	ピ 😭
C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2	MAC Address	00:16:B6	😭 🗹
C P LINKSYS_0018F8	MAC Address	00:18:F8	ピ 😭
🔲 📝 🛅 LINKSYS_001839	MAC Address	00:18:39	🗑 🗹
C 2 C 1002129	MAC Address	00:21:29	M 🔐
EINKSYS_00226B	MAC Address	00:22:6B	ピ 😭
C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2	MAC Address	00:23:69	🗑 🗹
C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2 C 2	MAC Address	00:25:9C	M 🗑
POLYCOM_0004F2	MAC Address	00:04:F2	M 🔐
E SIPURA_1CDF0F	MAC Address	1C:DF:0F	۲ 😭
C 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	MAC Address	00:04:13	۲ 😭
C 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	MAC Address	00:05:90	🗹 🎬
C YEALINK_001565	MAC Address	00:15:65	🗹 🗑

After creating the Default Classes the Classes must be added to the DHCP Subnet

DHCP Server:
Configuration Subnet Dynamic DHCP Static DHCP Classes
Subnet
General DNS Configuration Classes DHCP Options
GRANDSTREAM 000B82
LINKSYS 000C41
LINKSYS_000E08
LINKSYS_000F66
LINKSYS_001A70
LINKSYS_001C10
LINKSYS_001D7E
LINKSYS_001EE5
✓ LINKSYS_001217
✓ LINKSYS 001839
✓ LINKSYS 002129
LINKSYS_00226B
LINKSYS_002369
LINKSYS_00259C
POLYCOM_0004F2
SIPURA_1CDF0F
SNOM_000413
SWISSVOICE_000590
VEALINK_001565
Select all, Select none, Invert selection

- Commit Network changes
- Restart the DHCP Server Service to enable the changes

1	e la calculation de la calculatio de la calculation de la calculation de la calculat	a		đ	a 🗇	ã	<u> </u>	2			
General	Network	Firewall T	raffic Shaper	DHCP Sen	ver DNS Server	VPN Client/Server	Radius Server	<u>O</u> ptions			Commit
											$\sim$
🚯 You n	nust click on	Commit butto	on in order to ap	ply Change.							
Service	es Statu	IS:									
			Net	work: R	unning				Restart Network		
			Fir	ewall: R	unning				Restart Service	🕐 Stop Service	
			Traffic S	haper: S	ervice Disabled						
		I	DHCP Server (	IPv4): R	unning				Restart Service	Stop Service	
			Dynamic	DNS: S	ervice Disabled						
			DNS S	erver: R	unning				2 Restart Service	🕐 Stop Service	
			VPN Server (	PPTP): S	ervice Disabled						
		Oper	NVPN Client/S	erver: S	ervice Disabled						
		R	adius Server	(AAA): S	ervice Disabled						
Edit Ser	vices 🛛 F	Refresh									

Telephony Module Pre-requisites :

- Telephony>Configuration>Channels>SIP Channel>Auto-Create Peers=yes
- WARNING Auto-Create Peers can be vulnerable to malicious SIP attacks so the server should not have SIP ports exposed to the public (firewall your SIP ports to external subnets and follow SCOPSERV security best practices)

Telephony Settings: Channels					
Configuration Channels Language	Time Zones Asterisk Manager	Monitoring S	Scheduled Tasks	Hangup Causes	Synchronization
General RTP Options Codecs SIP C	Channel IAX Channel UDPTL	(T.38) Jitter Buffe	er Guest Accour	nt	
Port (UDP):	5060				
Bind Address (UDP):					
Enable support for SIP TCP ?: Enable support for SIP TLS (secure) ?: Enable Outbound Proxy support ?:	No No No				
SIP Options					
Realm for Digest Authentication :	scopserv				
User Agent :	Asterisk PBX (ScopServ)				
Record SIP History	No				
Auto-create Peers:	Yes				
Enable RTP Auto Framing ?:	No				
Enable DNS SRV lookups on outbound calls:	No				
Max length of incoming registration :	3600				
Default length of incoming/outgoing registration:	120				

- Telephony>Configuration>Provisioning
- Change the Unprovisioned Feature PIN to a complex number for security
- Enter the SIP Server address required for registration
- Save and Commit changes

Configuration	n Channels Language Time Zones Asterisk Manager
Configuratio	on
General	Telephony Modules Advanced Modules Commit Menu E
Recording/M	Ionitoring Sound Manager Provisioning Security
-	
	Unprovisioned Feature PIN 7788
	Default SIP Server: 17216741

#### **USAGE**

- Plug a supported SIP device into the voice subnet
- Wait for it to boot (it may reboot after it downloads its configuration from the server for the first time)
- Once the phone boots up you should see its MAC address in the APS list as an unprovisioned device
- Once the phone displays UNPROV on its display you can begin the registration process
- Dial any phone number to hear the password prompt
- Enter the Provisioning PIN number defined in Telephony>Configuration>Provisioning using the keypad
- Enter a defined but unused extension number using the keypad when prompted

- Edit the MAC address in the APS list and change any required settings like the template used, name, soft key assignments etc.
- Commit
- Reboot the phone to download the final configurations