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VOIP (FreePBX)

If you're interested in having your own mesh phone extension on our local PBX, please reach out to our [Groups.io](#).



- Here is our [local phone directory and voicemail](#).
- We have a bi-weekly AREDN net every other Sunday at 7pm on our conference line, and zoom meetings on the other Sundays.
- More information from [arednmesh.org](#)
- More information from this [Groups.io thread](#).
- N2MH has a lot of information on his AREDN page, and maintains global white pages.



The following instructions are to connect to our local PBX. However, it's also possible to make direct phone-to-phone connections without a PBX. [Instructions are here](#).

Cisco SPA525G2 Setup

Most of our users have Cisco SPA303 or SPA5xx series devices, however any IP Phone with SIP firmware will function.

IP Address

After connecting the phone into the hAP:

- Navigate to the Port Forwarding, DHCP, and Services page and note the IP address of your phone.
- The Hostname will be different and will be setup later in the phone settings.

- At the end of the setup, we'll come back to this page to add the DHCP reservation (but not yet).

Node Status **Basic Setup** **Port Forwarding, DHCP, and Services**

[Help](#) [Save Changes](#)

DHCP Address Reservations

Hostname	IP Address	MAC Address	Do Not Propagate	
VA7FI-PHONE	10.153.73.107	30 — 2e	☐	Del
	- IP Address -		☐	Add

Current DHCP Leases

VA7FI-PHONE	10.153.73.107	30 — 2e	Add
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- Now use your IP address and navigate to <http://10.xxx.xxx.xxx/admin/advanced>

System

Click on System tab.

- Enter an (optional) Admin Password ' ' and/or ' 'User Web Password. But note that:
 - the Admin password will be required to navigate to <http://10.xxx.xxx.xxx/admin> with the username admin.
 - And the User Web password will be required to navigate to the other pages with the username user.
- Enter your HostName
- Enter the following Primary NTP Server: ca.pool.ntp.org
- Don't click [Submit All Changes](#) yet.



IP Phone SPA525G2

Cisco Systems, Inc.

Voice

Wi-Fi

Bluetooth

Personal Address Book

Call History

Speed Dials

Firmware Upgrade

Info

System

SIP

Provisioning

Regional

Phone

Ext 1

Ext 2

Ext 3

Ext 4

Ext 5

User

Att Console

TR-069

[Attendant Console Status](#) [User Login](#) [basic](#) | [advanced](#)

System Configuration

Restricted Access Domains:

Enable Web Server:	yes ▾	Web Server Port:	80
Enable Web Admin Access:	yes ▾	Admin Password:	*****
User Password:	<input type="text"/>	User Web Password:	*****
SPA525-protocol:	SIP ▾	SPA525-auto-detect-sccp:	yes ▾
SPA525-readonly:	no ▾	Phone-UI-user-mode:	no ▾
WiFi User Access Mode:	yes ▾		

Power Settings

PoE Power Required: Normal ▾

Internet Connection Type

Connection Type: DHCP ▾

Static IP Settings

Static IP:	<input type="text"/>	NetMask:	<input type="text"/>
Gateway:	<input type="text"/>	Lan MTU:	1500
Duplex Mode:	Auto ▾		

PPPoE Settings

PPPoE Login Name:	<input type="text"/>	PPPoE Login Password:	<input type="text"/>
PPPoE Service Name:	<input type="text"/>		

Optional Network Configuration

HostName:	VA7FI-PHONE	Domain:	<input type="text"/>
Primary DNS:	<input type="text"/>	Secondary DNS:	<input type="text"/>
DNS Server Order:	Manual,DHCP ▾	Syslog Server:	<input type="text"/>
Debug Server:	<input type="text"/>	Debug Level:	3 ▾
Layer 2 Logging:	no ▾	NTP Enable:	yes ▾
Primary NTP Server:	ca.pool.ntp.org	Secondary NTP Server:	<input type="text"/>
Enable Bonjour:	no ▾	SSL Key Negotiation:	RSA ▾
Enable SSLv3:	no ▾		

10.153.73.107

10.153.73.107

This site is asking you to sign in.

Username

user

Password

Cancel Sign in

10.153.73.107/admin

10.153.73.107

This site is asking you to sign in.

Username

admin

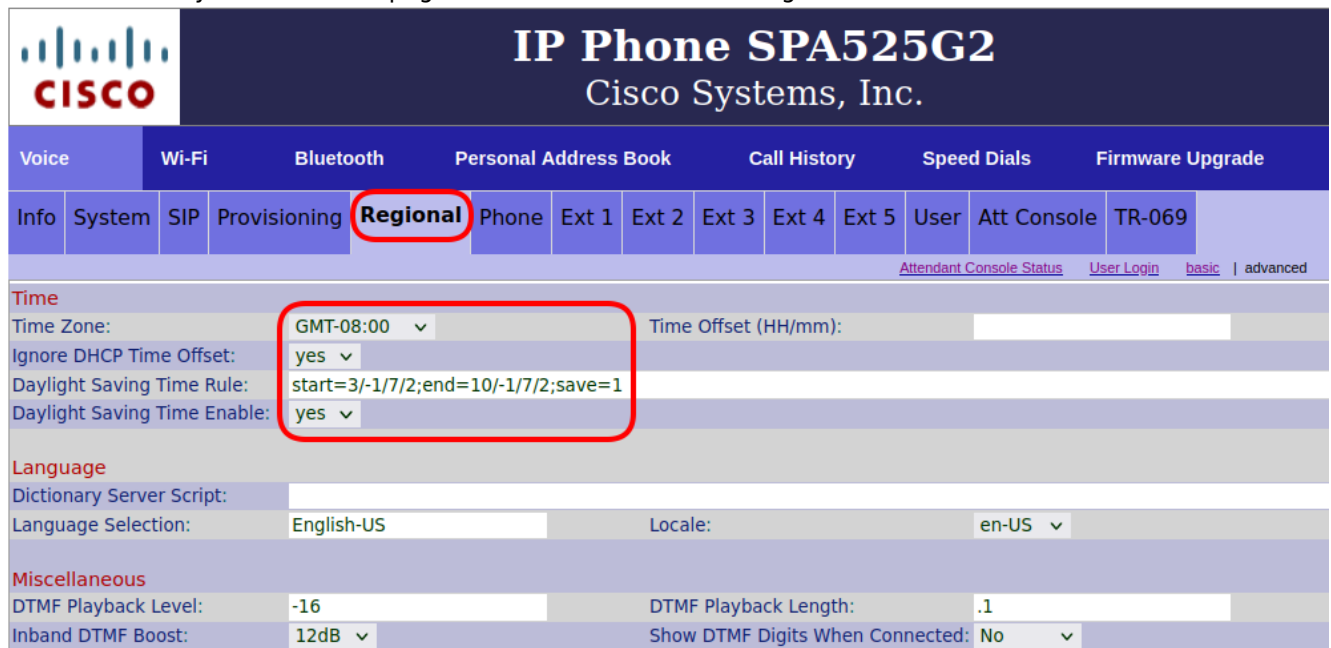
Password

Cancel Sign in

Regional

Click on the Regional tab.

1. Scroll to the very bottom of the page and ensure the Time settings are correct:



IP Phone SPA525G2
Cisco Systems, Inc.

Voice Wi-Fi Bluetooth Personal Address Book Call History Speed Dials Firmware Upgrade

Info System SIP Provisioning **Regional** Phone Ext 1 Ext 2 Ext 3 Ext 4 Ext 5 User Att Console TR-069

[Attendant Console Status](#) [User Login](#) [basic](#) | [advanced](#)

Time

Time Zone: GMT-08:00 ▾ Time Offset (HH/mm):

Ignore DHCP Time Offset: yes ▾

Daylight Saving Time Rule: start=3/-1/7/2;end=10/-1/7/2;save=1

Daylight Saving Time Enable: yes ▾

Language

Dictionary Server Script:

Language Selection: English-US Locale: en-US ▾

Miscellaneous

DTMF Playback Level: -16 DTMF Playback Length: .1

Inband DTMF Boost: 12dB ▾ Show DTMF Digits When Connected: No ▾

Phone

Click on the Phone tab.

1. Enter the Station Name, Voice Mail Number: *97, and Station Display Name
2. Enter Line Key 1 information with your callsign and extension number
3. Line Key 2 to Line Key 5 are quick dial buttons. The Extended Function text is of the form fnc=blf+sd+cp;sub=2400@\$PROXY where the number (here 2400) is the extension number.



IP Phone SPA525G2

Cisco Systems, Inc.

Voice	Wi-Fi	Bluetooth	Personal Address Book	Call History	Speed Dials	Firmware Upgrade							
Info	System	SIP	Provisioning	Regional	Phone	Ext 1	Ext 2	Ext 3	Ext 4	Ext 5	User	Att Console	TR-069

[Attendant Console Status](#) [User Login](#) [basic](#) | [advanced](#)

General

Station Name: Station Display Name:

Voice Mail Number:

BluePhone

Bluetooth Mode: Line:

Short Name: User Friendly ID:

PIN Code:

Line Key 1

Extension: Short Name:

Share Call Appearance:

Extended Function:

Line Key 2

Extension: Short Name:

Share Call Appearance:

Extended Function:

Ext 1

Click on the Ext 1 tab.

- Under the Proxy and Registration section, enter the following IP address: 10.160.14.252
- Under the Subscriber Information section, enter
 - Your Display Name
 - The Password that was assigned to you by Kyle, VE7ODG
 - Your extension as the User ID



The IP address of the new PBX was changed from 10.246.225.227 to 10.160.14.252 on April 2025. The screenshot below shows the old address.

Cisco		IP Phone SPA525G2 Cisco Systems, Inc.												
Voice		Wi-Fi		Bluetooth		Personal Address Book			Call History		Speed Dials		Firmware Upgrade	
Info	System	SIP	Provisioning	Regional	Phone	Ext 1	Ext 2	Ext 3	Ext 4	Ext 5	User	Att Console	TR-069	
Attendant Console Status User Login basic advanced														
Proxy and Registration														
Proxy:		10.246.225.227												
Outbound Proxy:														
Alternate Proxy:														
Alternate Outbound Proxy:														
Use Outbound Proxy:		no				Use OB Proxy In Dialog:				yes				
Register:		yes				Make Call Without Reg:				no				
Register Expires:		3600				Ans Call Without Reg:				no				
Use DNS SRV:		no				DNS SRV Auto Prefix:				no				
Proxy Fallback Intvl:		3600				Proxy Redundancy Method:				Normal				
Dual Registration:		no				Auto Register When Failover:				no				
Subscriber Information														
Display Name:		VA7FI				User ID:				2225				
Password:		*****				Use Auth ID:				no				
Auth ID:						Reversed Auth Realm:								
Mini Certificate:														
SRTP Private Key:														
Resident Online Number:						SIP URI:								

Att Console

Click on the Att Console tab

- Change the Server Type to Asterisk

Cisco		IP Phone SPA525G2 Cisco Systems, Inc.												
Voice		Wi-Fi		Bluetooth		Personal Address Book			Call History		Speed Dials		Firmware Upgrade	
Info	System	SIP	Provisioning	Regional	Phone	Ext 1	Ext 2	Ext 3	Ext 4	Ext 5	User	Att Console	TR-069	
Attendant Console Status User Login basic advanced														
General														
Subscribe Expires:		1800				Subscribe Retry Interval:				30				
Unit 1 Enable:		yes				Subscribe Delay:				1				
Unit 2 Enable:		yes				Server Type:				Asterisk				
Test Mode Enable:		no				Attendant Console Call Pickup Code:				*98				
Attendant Console Call Park Code:		*68				Attendant Console Call unPark Code:				*88				
BLF List URI:														
Use Line Keys For BLF List:		no				Call Pickup Audio Notification:				no				
Attendant Console Font Size:		10				Attendant Console LCD Contrast:				12				
BXfer To Starcode Enable:		no				BXfer On Speed Dial Enable:				yes				
BLF Label Display Mode:		Name												

- If you have an Attendance Console (sidecar) and would like to program the speed dial buttons, follow the example here. Make sure you change the extension number and the name for the contact you want to add. Here's a [printout for the SPA500S Sidecar](#).

Unit 1	
Unit 1 Key 1:	fnc=sd+cp+blf;sub=2222@\$PROXY;nme=VE7GEC-GAB-ECC-2222
Unit 1 Key 2:	fnc=sd+cp+blf;sub=2228@\$PROXY;nme=VE7UY-2228
Unit 1 Key 3:	fnc=sd+cp+blf;sub=2204@\$PROXY;nme=VE7TOP-2204
Unit 1 Key 4:	fnc=sd+cp+blf;sub=2205@\$PROXY;nme=VE7FAA-2205
Unit 1 Key 5:	fnc=sd+cp+blf;sub=2215@\$PROXY;nme=VE7GDE-2215
Unit 1 Key 6:	fnc=sd+cp+blf;sub=2207@\$PROXY;nme=VA7WPM-2207
Unit 1 Key 7:	fnc=sd+cp+blf;sub=2220@\$PROXY;nme=VE7KGV-2220
Unit 1 Key 8:	fnc=sd+cp+blf;sub=2218@\$PROXY;nme=VE7PMD-2218
Unit 1 Key 9:	fnc=sd+cp+blf;sub=2225@\$PROXY;nme=VA7FI-2225
Unit 1 Key 10:	fnc=sd+cp+blf;sub=2236@\$PROXY;nme=VE7KOD-2236
Unit 1 Key 11:	fnc=sd+cp+blf;sub=2235@\$PROXY;nme=VA7ILO-2235
Unit 1 Key 12:	fnc=sd+cp+blf;sub=2219@\$PROXY;nme=VA7MLZ-2219
Unit 1 Key 13:	fnc=sd+cp+blf;sub=2206@\$PROXY;nme=VA7MPG-2206
Unit 1 Key 14:	fnc=sd+cp+blf;sub=2211@\$PROXY;nme=VE7BEF-2211

- Here is a copy and paste example of the code: fnc=sd+cp+blf;sub=2202@\$PROXY;nme=VE7LSE-2202

Saving Changes

- It's a lost time to save the changes, but first, make sure you remember your admin and user passwords on the [System](#) tab. You'll need them to come back to the settings after your phone reboots.
- Click on [Submit All Changes](#) when ready and what for your phone to reboot.

DHCP Reservation

Now that the phone is all setup, go back to your hAP settings and

- Add its address to the DHCP reservation.

The screenshot shows the 'DHCP Address Reservations' page. At the top, there are tabs for 'Node Status', 'Basic Setup', and 'Port Forwarding, DHCP, and Services'. The 'Basic Setup' tab is active. Below the tabs, there are links for 'Help' and 'Save Changes'. The main section is titled 'DHCP Address Reservations' and contains a table with the following columns: 'Hostname', 'IP Address', 'MAC Address', and 'Do Not Propagate'. The first row shows a reservation for 'VA7FI-PHONE' with IP '10.153.73.107' and MAC '30 - 2e'. Below the table, there is a section for 'Current DHCP Leases' which shows the same reservation. The 'Add' button in the 'Current DHCP Leases' section is circled in red.

This step ensures that if the hAP reboots and starts giving out IP addresses to your connected devices, it'll keep the same one for your phone. This is important because if your phone gets a different IP address from the hAP, the phone settings won't match anymore.