

Configuring the Cisco SPA500S Attendant Console in an Asterisk® Environment:



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Introduction

This document assumes that you have read the Asterisk: Configuring Cisco SPA5xx phones with the Web-UI document available on the [Cisco IP Phone Community](#) site. You should read the Asterisk: Zero-Touch Configuring Cisco SPA5xx phones if you plan to deploy SPA500S devices with zero-touch configuration.

The Cisco® SPA500S Attendant Console provides 32 additional buttons to any of the SPA50xG or SPA525G IP phones. The SPA500S is perfectly suited to interoperate with Asterisk systems. Like the SPA5xx family of IP phones, the SPA500S fully supports secure, automated provisioning and configuration via its host phone. Up to two SPA500S consoles can be added to a phone providing 64 additional buttons.

The console buttons can be used for speed dial (SD), call pickup (CP), and busy lamp field (BLF). Speed dial allows you to press a single button to dial a number. Call pickup allows you to press a flashing button in order to answer a call. Busy lamp field allows you to view the console to determine the status of monitored phones.

The following table provides a summary of the SPA5xx phone family's features:

IP Phone	Line Keys	Color	Attendant Console	WiFi	BlueTooth	PoE	PC Switch Port	Wideband Audio G.722
SPA525G	5	Y	Y	Y	Y	Y	Y	Y
SPA509G	12	Y	Y	N	N	Y	Y	Y
SPA508G	8	N	Y	N	N	Y	Y	Y
SPA504G	4	N	Y	N	N	Y	Y	Y
SPA502G	1	N	Y	N	N	Y	Y	Y
SPA501G	8	n/a	Y	N	N	Y	Y	Y

Audience

This application note is targeted to Asterisk administrators, users, enthusiasts, and those wanting to add a SPA500S Attendant Console (Sidecar) to a Cisco SPA5xx IP phone. Readers of this document are expected to be familiar with IP networking and the administration tasks involved with configuring VoIP in an Asterisk environment.

Scope

This scope of this document is limited to configuring the SPA500S to work with a SPA5xx IP phone in an Asterisk environment and does not address the following topics:

- Installing an Asterisk server
- Advanced Asterisk configuration
- Installing or configuring the DHCP, TFTP, and HTTPS servers and services
- Security

Refer to the Related Documents for additional configuration and background information.

Related Documents

- Asterisk: <http://www.asterisk.org>
- Asterisk Book from O'Reilly: <http://www.asteriskdocs.org/>
- [Cisco SPA500 User Guide](#)
- [Cisco SPA500 Series and WIP310 IP Phone Administration Guide](#)
- [Cisco IP Telephony Devices Provisioning Guide](#)
- Cisco Community Central: [Small Business Community IP Phone Support](#)

Overview

For the purposes of this document, the SPA509G 12-line IP phone with wideband audio support is used in most examples.

By the end of this document, you will be able to connect and configure a SPA500S to a previously configured SPA5xx IP phone and appropriately configure the Asterisk server.

Summary of Tasks in this Document

You must complete the following tasks in order to deploy a SPA500S on a SPA5xx IP phone in an Asterisk environment:

1. Configure the Asterisk Server
 - a. Edit the `sip.conf` file
 - b. Edit the `extensions.conf` file
 - c. Reload Asterisk modules
2. Configure the IP phone using either the manual or zero-touch method:
 - Manual: Use the phone's web-user interface (web-ui)

OR

 - Zero-touch: Prepare the phone's `/spa$MA.xml` configuration file
3. Test the phone and SPA500S for appropriate behavior

Requirements

You need the following equipment, services, and information:

- A functional Asterisk server
- The Asterisk server's IP address
- The SPA500S' hosting phone's IP address for web-ui configuration
- The SPA500S' hosting phone's IP and MAC address for zero-touch configuration
- A list of extensions to be monitored

Using the SPA500S

In this document's example, a 12-line SPA509G IP phone hosts the SPA500S Attendant Console which monitors extension 5251 on a SPA525G IP Phone. Here's a summary of the SPA500S' light emitting diode's (LED) behavior:

- When 5251 is not in use, SPA500S Unit 1 Key 1's LED is off.
- When 5251 goes off-hook, SPA500S Unit 1 Key 1's LED is off.
- When 5251 dials a number, SPA500S Unit 1 Key 1's LED is off.
- When the called phone starts ringing, SPA500S Unit 1 Key 1's LED is solid red.
- If the called phone is being monitored, it's LED flashes red.
- When the called phone is answered and if it is being monitored, it's LED is solid red.
- When someone calls 5251, it's LED flashes red while it rings.
- The LED representing 5251 is solid red when it answers the call.
- While 5251's LED is flashing red with an inbound call, press the flashing red button to answer the call on the monitoring phone.
- Speed dial 5251 by pressing the button/key on the SPA500S

Configuring Asterisk for a SPA500S

Before you configure your Asterisk server for the SPA5xx IP phone, you need to decide which extensions the SPA500S will monitor.

In this example, existing extension 5251 will be monitored by the SPA500S.

Configuring the Asterisk Server

In order to configure the Asterisk server to support the SPA500S you must edit the `sip.conf` and the `extensions.conf` files.

The `sip.conf` File

Following is a sample of the minimum `sip.conf` content to support a SPA500S monitoring extension 5251:

```
[general]
...
;
;SPA500S specific edits #1 start here
allowsubscribe=yes ;allow SPA500S to subscribe to extension status
notifyringing=yes ;notify SPA500S when phones ring
limitonpeer=yes ; notify SPA500S of device status via SIP subscriptions
notifyhold=yes ; notify SPA500S of call hold state
;SPA500S specific edits #1 end here
;
...
;
[5251]
type=friend
nat=no
secret=5251secret
context=PhoneUsers
host=dynamic
regext=5251
;SPA500S specific edits #2 start here
subscribecontext=PhoneUsers ; look for hint in PhoneUsers context
call-limit=10 ; required to allow Asterisk to properly track ext status
callgroup=1 ; assign to call group so SPA500S can pickup calls
pickupgroup=1 ; allow SPA500S to pick up calls
;SPA500S specific edits #2 end here
;
...
; eof
```

The extensions.conf File

Following is a sample of the minimum extensions.conf content to support a SPA500S monitoring extension 5251:

```
...
...
[PhoneUsers]
...
...
exten => 5251,1,Dial(SIP/5251,10,rT) ;inbound calls ring for 10 secs
;SPA500S specific edits #3 start here
exten => 5251,hint,SIP/5251 ; monitor ext and report to SPA500S
;SPA500S specific edits #3 end here
exten => 5251,2,VoiceMail(5251@default,u) ; voicemail if unanswered
exten => 5251,3,hangup
exten => 95251,1,VoiceMailMain(5251) ;mailbox access for extension
;
;
...
...
; eof
```

Loading the Modified Asterisk Configuration Files

1. Connect to the Asterisk console:

```
$ sudo asterisk -r
*CLI>
```

2. Use the reload command to load the changed configuration:

```
*CLI> module reload
```

This completes the Asterisk server configuration. You must now configure the SPA 5xx IP phone.

Web-UI SPA500S Configuration

This section describes how to use the web-ui to configure a SPA500S to monitor extension 5251. Refer to the Zero-Touch SPA500S Configuration section if you prefer to use automatic provisioning and configuration.

In this section, you will need the following information:

- IP address of phone hosting the SPA500S: **192.168.2.155** in this example
- Call pickup code for Attendant Console to use, ***8** is Asterisk default
- Extension to be monitored: **5251** in this example
- Features to be assigned to SPA500S key: **BLF**, **SD**, and **CP** in this example
- Key/Button on SPA500S to use: **Unit 1 Key 1** in this example

Configure SPA500S Unit 1 Key 1 hosted on SPA509G, IP address 192.168.2.155 to provide blf, sd, and cp functionality for extension 5251 as follows:

1. Configure **http://192.168.2.155/admin/advanced** > Attendant Console tab > General >
 - a. Server Type: **Asterisk**
 - b. Attendant Console Call Pickup Code: ***8** Asterisk default

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:	*8

2. Configure Unit 1 Key 1 as follows:

http://192.168.2.155/admin/advanced > Attendant Console tab > Unit 1 Key 1:

fnc=sd+cp+blf;sub=5251@192.168.2.245

Unit 1 Key 1:	fnc=sd+cp+blf;sub=5251@192.168.2.245
Unit 1 Key 2:	
Unit 1 Key 3:	
Unit 1 Key 4:	
Unit 1 Key 5:	
Unit 1 Key 6:	
Unit 1 Key 7:	

Where:

- fnc—Function to be configured
- sd—Speed dial
- cp—Call pickup
- blf—Busy lamp field
- sub—Subscribe
- 5251—Extension to subscribe to

- 192.168.2.245—Asterisk server's IP address

3. Click Submit All Changes

This completes the web-ui SPA500S configuration section. Test SD, CP, and BLF to verify that all is working as expected.

Zero-Touch SPA500S Configuration

This section describes how to use automatic provisioning and configuration to configure a SPA500S to monitor extension 5251.

Refer to the Web-UI SPA500S Configuration section if you prefer to use the web-ui.

In this section, you will need the following information:

- MAC address of phone hosting the SPA500S: **002584d8cf99** in this example
- Call pickup code for Attendant Console to use, ***8** is Asterisk default
- Extension to be monitored: **5251** in this example
- Features to be assigned to SPA500S key: **BLF**, **SD**, and **CP** in this example
- Key/Button on SPA500S to use: **Unit 1 Key 1** in this example

Configure SPA500S Unit 1 Key 1 hosted on SPA509G, IP address 192.168.2.155 to provide blf, sd, and cp functionality for extension 5251 as follows:

1. Edit the `spa002584d8cf99.xml` file as follows:

- a. `<Server_Type ua="na">Asterisk</Server_Type>`
- b. `<Attendant_Console_Call_Pickup_Code ua="na">*8</Attendant_Console_Call_Pickup_Code>`
- c. `<Unit_1_Key_1 ua="na">fnc=sd+cp+blf;sub=5251@192.168.2.245</Unit_1_Key_1>`

Where:

- fnc—Function to be configured
- sd—Speed dial
- cp—Call pickup
- blf—Busy lamp field
- sub—Subscribe
- 5251—Extension to subscribe to
- 192.168.2.245—Asterisk server's IP address

2. Reboot the phone:

`http://192.168.2.155/admin/reboot`

This completes the zero-touch SPA500S configuration section. Test SD, CP, and BLF to verify that all is working as expected.

Troubleshooting the SPA500S

No LEDs are lit:

The buttons / keys on a SPA500S only illuminate when they are properly configured.

A button / key is orange:

A key will light orange if:

- There is a syntax error in the key's function definition
- The Asterisk server does not have any available hints for the SPA500S. The Asterisk server's SIP module must be reloaded after modifying the `sip.conf` file:

```
*CLI> sip reload
```

The dial plan must be reloaded after editing the `extensions.conf` file:

```
*CLI> dialplan reload
```

It does not work:

If you are sure that the appropriate configuration is on the phone, it is possible that the phone and Asterisk are out of sync. Verify that Asterisk is aware of the SPA500S and is watching the extension.

```
*CLI> core show hints
```

```
== Registered Asterisk Dial Plan Hints ==
5251@PhoneUsers      : SIP/5251      State:Idle      Watchers 1
-----
- 1 hints registered
*CLI>
```

There should be only 1 watcher for the 5251 extension. If there are more or less watchers, the SPA500S is out of sync. Do the following, in the order listed:

1. Reload the SIP module:

```
*CLI> sip reload
```
2. Reload the dial plan:

```
*CLI> dialplan reload
```
3. Reboot the phone:

```
http://192.168.2.155/admin/reboot
```

Gathering Information for Support

In the event that you need to reach out for support, collect the following information first:

- A. SPA5xx's configuration

Web-UI > Admin Login > Advanced >

Browser > File > Save As > [save entire page as SPA5xxVoice.html]

- B. SPA5xx syslog log from debug output:

Web-UI > Admin Login > Advanced >

System tab > Syslog & Debug Server: and Debug Level: 3

Configuring this is described fully at: <https://www.myciscocommunity.com/docs/DOC-3033>

- C. Voice tab
D. Asterisk sip.conf
E. Asterisk extensions.conf
F. WireShark trace



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