

# Release Notes for Linksys SPA Firmware Release 5.2

## SPA2102, SPA3102, SPA8000, SPA9000, SPA9X2

These Release Notes describe the new features, enhancements, and resolved issues that apply to Linksys SPA Firmware Release Version 5.2.

### What's in this Release Note?

- [“New Features” on page 1](#)
- [“User Interface Features and Enhancements” on page 2](#)
- [“Usability Features and Enhancements” on page 3](#)
- [“Provisioning Features and Enhancements” on page 4](#)
- [“SIP Enhancements” on page 4](#)
- [“Management, QoS, and Configuration Enhancements” on page 5](#)
- [“Bug Fixes” on page 5](#)
- [“Hardware Supported” on page 6](#)
- [“Determining the Firmware Version ” on page 6](#)
- [“Downloading the Firmware ” on page 6](#)
- [“Upgrading the Firmware ” on page 7](#)
- [“Where Can I Find More Information? ” on page 7](#)
- [“Service and Support ” on page 8](#)

### New Features

The major features included in this release are listed in the first column of the table. You can use the table to see which products have each feature.

Feature	SPA2102	SPA3102	SPA8000	SPA9000	SPA922/942	SPA962
<i>User Interface</i>						
Broadsoft CMS Extension Mobility					✓	✓
Star Codes					✓	✓
Service Announcement Codes	✓	✓	✓	✓	✓	✓
Phone Display - Caller ID Display Options					✓	✓
Reception of Text Messages via SIP					✓	✓
Phone Display - Additional Character Sets					✓	✓
Phone Display - Screen Saver					✓	✓
Phone Display - Customizable Logo Picture					✓	✓
Phone Display - Customizable Background Picture					✓*	✓

Feature	SPA2102	SPA3102	SPA8000	SPA9000	SPA922/942	SPA962
Phone Display - Photo Album					✓	✓
<i>Usability</i>						
Emergency Number Support	✓	✓	✓	✓	✓	✓
<i>Provisioning</i>						
Provisioning from Phone Keypad					✓	✓
DID-to-Extension Mapping				✓		

\* Customized background picture is available on SPA942 and SPA962 only.

## User Interface Features and Enhancements

- **Broadsoft CMS Extension Mobility**

Products: SPA9x2 IP Phones

This feature works in conjunction with Broadsoft CMS, allowing users to perform dynamic User Login to the VoIP network using any SPA9X2 connected to the Office Phone system. After logging on, the user has access to personal directory number(s), services, speed dials, and other properties on the phone in use. This feature is useful for people who share a phone on different shifts or who work at different desks during the work week. For example, when User A logs in to the phone, all of her personal phone settings are available. Later in the day, when User B logs in to the same phone, his settings are available. The Extension Mobility feature dynamically configures a phone according to the current user. When the user logs out, the phone receives a basic profile with limited features enabled. This feature is managed with the new SIP parameters <EM\_Enable>, <EM\_Phone\_User\_ID>, and <EM\_Phone\_Password>.

- **Configurable Local/Remote Supplementary Services via Softkeys (Star Codes )**

Products: SPA9x2 IP Phones

The phones support Supplementary Services, also known as star (\*) codes. With this feature, a user can activate the feature by entering a predefined short code (such as \*21 for call forward) followed by the target number. These codes can be handled locally by the phone or to be sent to the network as an INVITE to the service provider.

- **Service Announcement Codes**

Products: SPA9x2 IP Phones

Service announcements are supported on the phones. When an end user enters the service activation code, the feature is activated locally, and a SIP INVITE is sent with the appropriate code to the proxy in order to execute the service activation/status/deactivation announcement. This feature supports all services that can be activated on the phone. In previous releases, this feature was available only on SPA2102/3102/8000/9000.

- **Caller ID Display Options**

Products: SPA9x2 IP Phones

A new parameter, <Caller ID Header>, provides the option to take the caller ID from PAID-RPID-FROM, P-ASSERTED-IDENTITY, REMOTE-PARTY-ID, or FROM header.

- **Phone Display - Additional Character Sets**

Products: SPA9x2 IP Phones

The following character sets were added to support additional languages on the user interface: Latin2 (Czech, Hungarian, Polish, Romanian, Croatian, Slovak, Slovenian, Sorbian), Cyrillic (Russian, Bulgarian, Ukrainian and others), and Latin5 (Turkish). The phones officially support the ISO-8859-1 to 8859-16 character sets, which encompass all Eastern and Western European languages. The following exceptions apply:

- ISO-8859-8 (Latin/Hebrew) is supported except Left-to-Right Mark and Right-to-Left Mark.

- ISO-8859-11 (Latin/Thai) is supported except the following Thai characters: 0xD1 0x0E31 # MAI HAN-AKAT, 0xD3 0x0E33 # SARA AM, 0xD4 0x0E34 # SARA I, 0xD5 0x0E35 SARA II, 0xD6 0x0E36 SARA UE, 0xD7 0x0E37 SARA UEE, 0xD8 0x0E38 SARA U, 0xD9 0x0E39 SARA UU, 0xDA 0x0E3A PHINTHU, 0xE7 0x0E47 MAITAIKHU, 0xE8 0x0E48 MAI EK, 0xE9 0x0E49 MAI THO, 0xEA 0x0E4A MAI TRI, 0xEB 0x0E4B MAI CHATTAWA, 0xEC 0x0E4C THANTHAKHAT, 0xED 0x0E4D NIKHAHIT, 0xEE 0x0E4E YAMAKKAN..
- ISO-8859-12 is not supported.

- **Reception of Text Messages via SIP**

Products: SPA9x2 IP Phones

Text messages that are sent to the phone via SIP can be displayed on the SPA9x2 phones, according to RFC3428. The <Text Message> and <Text Message From 3rd Party> parameters are used to enable or disable the display of messages up to 255 characters in length. When this feature is enabled and a message is received, the message appears on the phone display along with the date and time. This feature allows an ITSP to provide billing information, for example, by sending messages that notify the end user of the calling minutes consumed or available under the contract. As another possible application, it also allows the ITSP to include additional text with a call in order to facilitate call processing.

- **Phone Display - Customizable Logo Picture**

Products: SPA9x2 IP Phones

A customized Service Provider logo can be downloaded, to appear on the phone display during boot-up.

- **Phone Display - Customizable Background Picture**

Products: SPA942/962 IP Phones

A customized background picture can be downloaded, to appear on the phone display.

- **Phone Display - Photo Album**

Products: SPA962 IP Phones

The photo album feature provides a refreshable display of photos on the SPA962 phones. If the HTTP Refresh Timer is set in the server's response to <BMP Picture Download URL>, then the phone automatically re-gets the picture after the specified number of seconds. The phone downloads the picture from the link and displays it on the screen.

- **Phone Screen Savers**

Products: SPA9x2 IP Phones

A screen saver can be enabled on the SPA9x2 series phones. When the phone is in idle state for a specified time, it enters screen saver mode. Optionally, a user can enter the screen saver mode directly through the setup menu. Any key press or on/off hook event will trigger the phone to return to the normal phone mode. If a user password is set, the user will be required to enter the password to exit the screen save mode. A screen saver window will show "Press any key to unlock your phone" information. The user can select different screen saver icons from the web config/phone menu.

- **User Interface Enhancements:**

- The SPA9x2 phones can display the header of the 18X call progress message, instead of displaying "Called Party Ringing."
- The phone no longer reboots when the background image URL is changed from either the Web UI or the provisioning profile. When the user changes the <BMP picture URL> parameter, the phone compares the URL to previous successfully downloaded image's URL. If it is the same, the phone will not continue downloading to avoid excess network traffic. If it is different, phone will download the image and display the image if the <Select Background Picture> is set to "BMP Picture."

## Usability Features and Enhancements

- **Emergency Numbers**

Products: SPA2102/3102/8000/9000, SPA9x2

An administrator can enter a list of emergency numbers in the <Emergency Number> parameter. When one of these numbers is dialed on an IP phone, the unit disables processing of "CONF", "HOLD", and other similar softkeys or buttons to avoid accidentally putting the current call on hold. In addition, only the far end can terminate this emergency call. This feature previously was available only on the SPA2102.

- **Usability enhancements**

- Codec priority order is supported. Up to three preferred codecs can be selected for the SPA2102/3102/8000/9000, SPA9x2
- Speakerphone performance is improved with better full duplex audio quality. As a result, echo should not be heard and speakerphone users should experience a conversation that is clear, as if both parties are in the same room.

## Provisioning Features and Enhancements

- **Provisioning Configuration from Phone Keypad**

Products: SPA9x2 phones

Remote provisioning can be performed from a phone keypad. After the user enters the IP address of the provisioning server, the unit resyncs to a known path name. This feature enables Service Providers to have VARs install and provision Linksys phones.

- **DID-to-Extension Mapping with Wildcard Support**

Products: SPA9000

An extension number can be mapped to the final digits of a DID number, via wildcards in the <Contact List> parameter. This feature enhances DID support. Each wild card digit is represent by an “x.” There must be exactly the same number of “x” wildcards in the master number and in the extension number. For example, 408853117x:+100x maps 1001 to 4085311711. Multiple mapping rules may be present in the <Contact List>, and a given extension can match more than one rule.

- **Provisioning Enhancements**

The remote customization blink patterns have been modified for greater ease of use. This feature applies to the SPA9x2 phones, PAP2T, SPA2102/3102

- Power LED red/orange slow blink (1.0 seconds on, 1.0 seconds off): Contacting server, server not resolvable, not reachable, or down
- Power LED red/orange slow blink (0.2 seconds on, 0.2 seconds off, 0.2 seconds on, 1.4 seconds off): Server responded with file not found or corrupt file

Note: On SPA9x2, Mute button LED is used in place of Power LED

## SIP Enhancements

- The SPA9x2 phones can support and display up to 50 characters for the <Display Name>, <Password>, <Auth ID>, and <User ID> parameters.
- Inbound Caller ID Number Mapping: In previous releases, SPA9x2 IP phones showed the caller ID number as extracted from the header fields in the inbound SIP INVITE message. The same number was recorded in the call logs. Now inbound caller ID numbers can be mapped to a different string. For example, a number that begins with +44xxxxxx can be mapped to 0xxxxxx. This feature is facilitated through the new <Caller ID Map> parameter (per EXT) which has the same syntax as the <Dial Plan> parameter. With this parameter, you can specify how to map a caller ID number for display on screen and recorded into call logs.
- To support 3PCC per RFC 3725, if a SPA9x2 series phone receives a reINVITE without SDP, it will send a 200 reply message with an SDP offer that is the same version as the last SDP offer, if the last SDP is an offer. On the other hand, if the last SDP is an answer, the phone still generates a new offer to the peer with a new SDP version. Note that a new SDP version number is generated by incrementing the last SDP version number by 1.
- The SPA9x2 phones allow the current call to resume if a permission issue is encountered during an attempt to transfer a call. Upon receiving a “603 Decline” to a SIP REFER request, the unit does not terminate the call. Instead, the transfer is cancelled, a message on the phone screen indicates that the call transfer request has been rejected, and the call resumes with the transferee. This behavior applies to both attended and blind call transfer.
- The SPA9x2 phones allow the current call to continue if a permission issue is encountered during an attempt to place a call on hold. If the user tries to place a call on hold on a SPA9x2 series phone and the softswitch rejects the RE-INVITE request, the unit will abort the request and will continue the current call as if the request was never made.

- The SPA2102/3102/8000/9000 and SPA9x2 units can make use of a RETRY-AFTER value that is received when the SIP proxy server is too busy to process a request (503 Service Unavailable message). If the response message includes a RETRY-AFTER header, the unit will wait for the specified length of time before retrying to REGISTER again. If a RETRY-AFTER header is not present, the unit will wait for the value specified in the <Reg Retry Interval> or <Reg Retry Long Interval> parameter.
- The SPA2102/3102/8000/9000 and SPA9x2 units support outbound SIP requests with different host fields in the Request URI and FROM header. The unit allows the Initial INVITE to include different values for the host portion of the Request URI and the host portion of the From Field.
- The SPA2102/3102/8000/9000 and SPA9x2 have an improved ability to detect and recover from an upstream failure from a gateway product. This situation might occur in the case of a DSL modem retraining and obtaining a different IP address upon PPP session re-establishment, or in the case of a device restart or reboot. Now when a device registers with the softswitch, the SPA caches the IP address and port the ATA is traversing. If a change is detected in subsequent SIP Ping responses, the SPA immediately attempts to re-register with the proxy. If a failure is longer term and SIP ping responses are not received, then the SPA attempts to re-register immediately, and continues to do so on a regular basis until it is successful.

## Management, QoS, and Configuration Enhancements

- On the SPA2102, a new parameter <QoS Policy> allows QoS settings to be “always on” or “on when phone in use.” With the “always on” setting, QoS is enforced even when no phones are in use. With the “on when phone in use” setting, QoS is enforced only when phones are in use; otherwise, the maximum uplink speed is available for other traffic. “In use” is defined as phone is off hook, an incoming call is detected, an outgoing call is originated, a phone is in conversation, provisioning is originated/in progress, or an upgrade is originated/in progress.
- Daylight Savings Time can be turned on or off on the SPA2102/3102/8000/9000 and SPA9x2 series IP phones. This option affects the time stamp on CallerID. Daylight Savings Time is turned on by selecting y (yes) or turned off by selecting n (no) in the <Daylight Saving Time Enable> parameter. This setting affects all the lines (or extensions on the phones).
- For disaster recovery, devices can use DHCP option 60. Linksys is identified in Option 60 of a DHCP discovery broadcast message.
- CALEA Compliance : To ensure compliance with the Communications Assistance for Law Enforcement Act (CALEA) in the United States, privacy setting parameters have been modified for SPA2102/3102/8000/9000, and SPA9x2. If a user’s privacy settings are activated, the “From” value is not changed to Anonymous. Instead, the switch equipment masks the caller ID, and the calls can be tracked as required by US government regulations.

## Bug Fixes

The following issues were addressed:

- The phones now correctly display the time after it is reset for Daylight Saving Time.
- Fixed a problem with unintended muting of speakerphone input.
- The phones now correctly terminate pending outbound INVITE transactions after the far end hangs up.
- Provided backward compatibility when upgrading to firmware with the codec preference feature, so that there is no conflict with the existing configuration prior to the upgrade.
- Changed the behavior in incrementing the SDP version to facilitate updates from the proxy.
- Fixed a problem that caused the [DND] and [-DND] softkey to go into wrong state.
- Modified the layout of the web pages for Ext 2 and Ext 3.
- Corrected the Call Log display.
- Improved stability of system during phone GUI configuration changes of system setting for “static IP” or “DHCP.”
- Fixed truncation in display of star codes.
- Improved the performance of the mute and speakerphone features during three-way conference calls.
- Fixed a display issue in which the phone indicated “no network link” due to Internet port inactivity.
- New phone numbers in the personal directory now function correctly.
- Complete phone numbers now appear in the redial list.

- Added a work-around to compensate for some servers' changing the contact header address in their response to a SIP REGISTER request. The system uses the first entry in the contact header if an exactly matching address is not found.

## Hardware Supported

The Linksys hardware devices supported by Firmware Version 5.2 include the following:

Product Name	FXS (Analog Phone)	FXO PSTN Connection	Ethernet/PC	WAN/Internet	Lines	Comments
SPA9000	2	—	1 Ethernet	1 Internet	Up to 4 SIP lines/trunks	IP PBX, Auto-Attendant, Setup Wizard to Configure SPA400
SPA922	—	—	1 PC	1 WAN	1	Power over Ethernet (PoE) support
SPA942	—	—	1 PC	1 WAN	4	Power over Ethernet (PoE) support
SPA962	—	—	1 PC	1 WAN	6	Six lines, hi-res color display
SPA2102	2	—	1 Ethernet	1 Internet	2	Voice adapter with router
SPA3102	2	—	1 Ethernet	1 Internet	1	Voice adapter with router

## Determining the Firmware Version

You can determine the firmware version by using the phone keypad, the IVR (SPA9000), or by using the web interface.

### From an IP Phone with an LCD display:

1. Press the Menu button on the 900 Series IP phone.
2. Press 10, or scroll down until Product Info is highlighted and then press the select soft key.
3. Press 3 from the Product Info menu or scroll down to highlight the software version, and then press the select soft key.

### From an IVR (SPA9000):

1. Connect an analog telephone to a phone port on the VoIP device.  
You can access the IVR menu only through an analog telephone, not an IP phone.
2. Press \*\*\*\* (quickly press the star key four times).
3. Wait until you hear "Linksys configuration menu."  
You cannot access the IVR from a phone that is currently connected to a call.
4. Press 150# to determine the current firmware version.

### From the web interface:

1. Connect a computer to the same network as the SPA9000.
2. Direct a web browser to the IP address of the SPA9000.
3. Click Admin Login, near the top right corner of the page, and then click Advanced.
4. On the Voice > Info page, find the listing for Software Version.

## Downloading the Firmware

To download the firmware, you need a computer with an active Internet connection. To download new firmware for a Linksys VoIP device, perform the following steps:

1. To begin, direct your browser to the following URL: <http://www.linksys.com>
2. Find the download page for your product:
  - a. From the website home page menu, select Products>Business to open the Business page.
  - b. Click IP Communications.
  - c. Click Linksys Voice System.
  - d. Click the product that you want to upgrade.

- e. Under More Information, click the Firmware link to open the firmware download page.

Note: Depending on the product, you may need to select the product version.

- f. Click the link for the firmware that you want to download.

Note: If you are using Windows XP Service Pack 2 (SP2) and Internet Explorer, you may see the "Pop-up blocked" message in your browser information bar. If you see this message, click the information bar and select Temporarily Allow Pop-ups. Then click Download again.

3. Click Save in the File Download dialog box that appears.
4. In the Save As dialog box, choose a location for the file and then click Save.
5. When the download is complete, if prompted, click Close.

Note: The name of the file depends on the firmware file of your device. If the firmware file you download is in zip format, double-click the file and extract its contents to a single folder or to the desktop. To extract the firmware file from the archive, use a utility such as WinZip, or use the built-in decompression features of Windows XP.

6. After downloading and uncompressing the firmware, upgrade the device firmware by following the steps in the following section.

## Upgrading the Firmware

If you are using the SPA900 Series phones with a SPA9000, see the SPA9000 Administration Guide for instructions to upgrade your phones using the SPA9000 Installation Wizard.

To install firmware on a Linksys VoIP device other than SPA2102/3102/9000, perform the following steps:

1. After extracting the file, run the executable file to upgrade the firmware.
2. When the Firmware Upgrade warning window appears, click Continue.
3. Enter the IP address of the SPA9000 in the field provided.
  - To check the IP address of the system, use the analog phone that is connected to the SPA9000. Press \*\*\*\*110# on the analog phone. The IVR announces the IP address.
  - For SPA2102/3102/9000, you must do the firmware upgrade from a computer that is connected the LAN port, or enable WAN access. To enable WAN access, use the analog phone that is connected to the SPA9000. Press \*\*\*\*7932, and then choose 1.
  - If the device has an FXO port, make sure it is disconnected from the PSTN because the IVR does not work if a PSTN line is connected.

The Connecting Status screen appears while a connection is in progress. Another window appears when the upgrade is completed.

## Where Can I Find More Information?

The following documentation describes how to use, configure, or provision Linksys Voice System products:

- SPA9000 Administrator Guide
- SPA900 Series IP Phones Administrator Guide
- Linksys ATA Admin Guide
- Linksys SPA Provisioning Guide (available only to service providers)

The Linksys Voice System product set includes a full suite of documentation for ITSPs, VARs and end users. All Linksys Voice Solution documentation is available to Linksys Registered Service Providers and VARs through the Linksys Partner Connection Program (requires login).

End-user documentation and the Linksys Voice System Administration Guides are available on the web at [www.Linksys.com](http://www.Linksys.com) (Home »Products » Business »IP Communications » Linksys Voice System).

For more information about supported Linksys products, deployment models, and solution features, refer to the LVS Product Guide, available on [www.linksys.com](http://www.linksys.com) (Home »Connected Office »Resource Center » Guides/Catalogues).

## Service and Support

If you are an end user of Linksys VoIP products and need technical support, contact the reseller or Internet telephony service provider (ITSP) that supplied the equipment. Technical support contact information for authorized Linksys Voice System partners is as follows:

Country	Telephone Number	E-mail Address	Office Hours (Monday - Friday)
<i>North America</i>			
USA and Canada	888 333-0244	voipsupport@linksys.com	4am-6pm PST, 7 days a week
<i>EMEA</i>			
Austria	0800 301 045	business.support.at@linksys.com	9-18 (CET)
Belgium	0800 58 047	business.support.be@linksys.com	9-18 (CET)
Czech	800 800 156	support.cz@linksys.com	9-17 (CET)
Denmark	82 33 27 29	support.dk@linksys.com	9-19 (CET)
Finland	0800 52 3062	support.fi@linksys.com	9-19 (CET)
France	0800 294 607	business.support.fr@linksys.com	9-18 (CET)
Germany	0800 000 1139	business.support.de@linksys.com	9-18 (CET)
Ireland	Soon available at <a href="http://www.linksys.com/ie">www.linksys.com/ie</a>	business.support.ie@linksys.com	9-18 (CET)
Netherlands	0800 0203595	business.support.nl@linksys.com	9-18 (CET)
Norway	235-00060	support.no@linksys.com	9-19 (CET)
Poland	00800 331 1345	support.pl@linksys.com	9-17 (CET)
Russia	(800) 200-09-02	support.ru@linksys.com	11-19 MSK
Spain	900 90 0089	business.support.es@linksys.com	9-18 (CET)
Sweden	0851 992 251	support.se@linksys.com	9-19 (CET)
Switzerland	0800 712 208	business.support.ch@linksys.com	9-18 (CET)
UK	0800 026 1415	business.support.uk@linksys.com	9-18 (CET)
UAE	Soon available at <a href="http://www.linksys.com/ae">www.linksys.com/ae</a>	business.support.ae@linksys.com	9-18 (CET)
All other countries	+44 207 660 0121	business.support.emea@linksys.com	9-18 (CET)