CISCO

INSTALLATION AND CONFIGURATION GUIDE

Cisco Small Business Pro
SPA9000 Voice System

System Configuration Using the SPA9000 Setup Wizard, Version 2.1

CISCO™

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Preface

This guide helps you to prepare your site and to complete the basic installation and configuration of the SPA9000 Voice System by using the Configuration Wizard. This guide describes the SPA9000 Voice System and its components. It also presents step-by-step instructions to help you to install and configure the system, to select the features that the business needs, to verify the installation, and to resolve any problems that occur.

Purpose and Audience

This document is written for SPA9000 Voice System administrators who want to install, configure, and manage the SPA9000 Voice System by using the Setup Wizard. This guide will help you to complete the following tasks:

- Configure new installations of the SPA9000 Voice System

- Configure existing installations of the SPA9000 Voice System

- Backup and restore SPA9000 Voice System configurations

Included Firmware

Version 2.1 of the Wizard ships with the following versions of firmware for the devices that can be used in the SPA9000 Voice System. If the Wizard discovers that an installed device is not up to date, it prompts you to upgrade the firmware.

Product	Firmware Version
SPA9000	6.1.5
SPA400	1.1.2.2
SPA901	5.1.5
SPA921/SPA941	5.1.8
SPA922/942	6.1.3
SPA962	6.1.3
WIP310	5.0.8

Document Conventions

The following typographic conventions are used in this document.

Typographic Element	Meaning
Boldface	May indicate either of the following features: ■ A user interface element that you need to click, select, or otherwise act on ■ A literal value to be entered in a field.
Italic	May indicate either of the following features: ■ A variable that should be replaced with a literal value. ■ A system message
`Monospaced Font`	Indicates code samples or system output.

Finding Information in PDF Files

The SPA9000 Voice System documents are published as PDF files. The PDF Find/Search tool within Adobe® Reader® lets you find information quickly and easily online. You can perform the following tasks:

- Search an individual PDF file.

- Search multiple PDF files at once (for example, all PDFs in a specific folder or disk drive).

- Perform advanced searches.

Finding Text in a PDF

Follow this procedure to find text in a PDF file.

STEP 1   Enter your search terms in the Find text box on the toolbar.

NOTE   By default, the Find tool is available at the right end of the Acrobat toolbar. If the Find tool does not appear, choose **Edit > Find**.

STEP 2   Optionally, click the arrow next to the Find text box to refine your search by choosing special options such as Whole Words Only.

STEP 3   Press **Enter.**

STEP 4   Acrobat displays the first instance of the search term.

STEP 5   Press **Enter** again to continue to more instances of the term.

Finding Text in Multiple PDF Files

The *Search* window lets you search for terms in multiple PDF files that are stored on your PC or local network. The PDF files do not need to be open.

STEP 1 Start Acrobat Professional or Adobe Reader.

STEP 2 Choose **Edit** > **Search**, or click the arrow next to the *Find* box and then choose **Open Full Acrobat Search.**
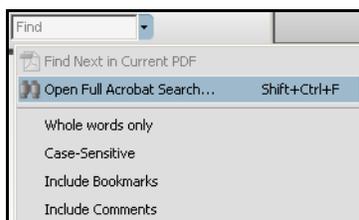
STEP 3 In the *Search* window, complete the following steps:

a. Enter the text that you want to find.

b. Choose **All PDF Documents in.**

From the drop-down box, choose **Browse for Location**. Then choose the location on your computer or local network, and click **OK.**

c. If you want to specify additional search criteria, click **Use Advanced Search Options**, and choose the options you want.

d. Click **Search.**
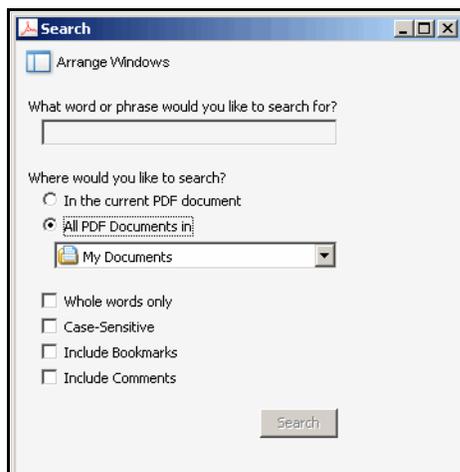
STEP 4   When the Results appear, click + to open a folder, and then click any link to open
the file where the search terms appear.
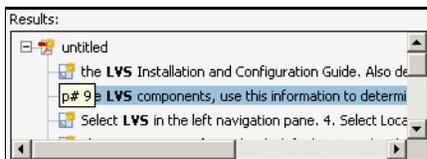
For more information about the Find and Search functions, see the Adobe Acrobat
online help.

1

Getting Started

This chapter introduces you to the SPA9000 Voice System by describing the components and presenting several deployment scenarios.

NOTE This chapter is essential reading before you begin installing the equipment or configuring the system.

- "Introduction to the SPA9000 Voice System," on page 10
- "Deployment Scenarios," on page 12
- "Introducing Components of the SPA9000 Voice System," on page 17

Introduction to the SPA9000 Voice System

The SPA9000 Voice System is an affordable and feature-rich IP telephone system that is designed especially for the Small and Home Office. The SPA9000 Voice System uses standard TCP/IP protocols and can provide global connectivity through any Internet Telephony Service Provider (ITSP) that supports the Session Initiation Protocol (SIP).

At minimum, the SPA9000 Voice System includes a SPA9000 IP PBX and one or more SPA900 series IP phones. These devices are connected through a switch to a local area network. With an Internet connection, the SPA9000 Voice System can subscribe to ITSP services to take advantage of low calling rates. With the SPA400, the SPA9000 Voice System can connect to the Public Switched Telephone Network (PSTN) to support analog phone lines. See Figure 1 "SPA9000 Voice System with the SPA9000 and SPA400" on page 11 to learn more about a typical deployment.

Figure 1 SPA9000 Voice System with the SPA9000 and SPA400
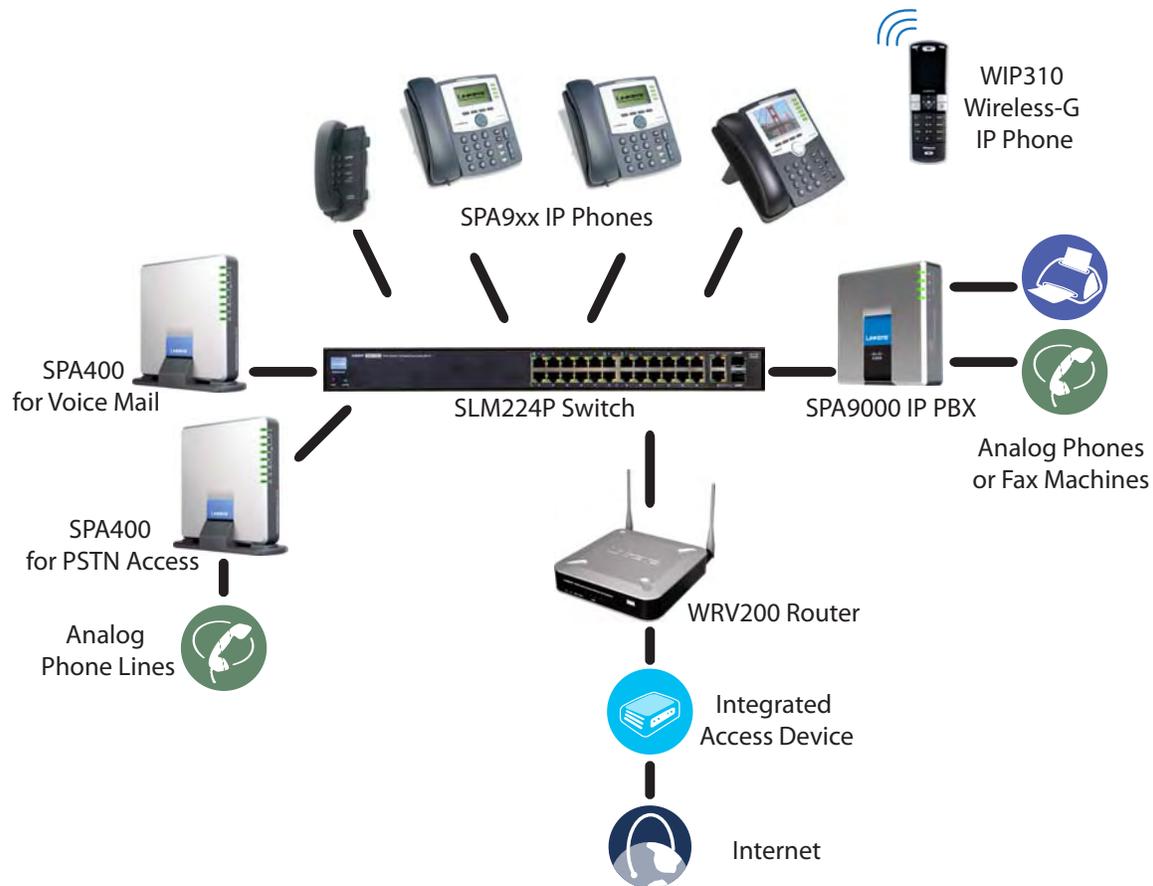
SPA9000 IP PBX

The SPA9000 is an IP PBX that supports up to 16 phones. It also has a built-in Analog Telephone Adapter (ATA) with two FXS ports for analog telephones, fax devices, or an external music source for the music on-hold service. Devices connected to the FXS ports are not included in the device count.

The SPA9000 has four line interfaces, which can be configured in any combination for ITSP service, ISDN access, SPA400 PSTN access, or SPA400 voice mail service. A different ITSP account can be configured on each line interface. If a service provider supplies a group of sequential direct inward dial (DID) phone numbers (such as 408-555-0100 through 555-0145) the SPA9000 can support all of the assigned numbers on a single line interface.

The SPA9000 includes an Auto Attendant service that plays pre-recorded voice messages to offer the caller a menu of choices and to direct the call. When the Auto-Attendant is enabled, it parses and operates on user key presses according to the rules that are specified in the Auto Attendant script.

SPA400 SIP-PSTN Gateway and Voicemail Server

The SPA400 provides a SIP-PSTN gateway for voice connectivity between the PSTN and the local client stations that are connected to the SPA9000. It also includes an integrated voice mail application that supports up to 32 voice mail accounts with customized greetings, providing the ability to receive and playback voice mail messages.

Each SPA400 occupies one of the four line interfaces on the SPA9000. The SPA400 has four ports for that can be connected to PSTN or ISDN lines.

IP Phones and Accessories

The SPA9000 Voice System supports any of the Cisco SPA900 Series SIP IP Phones, as well as the Cisco WIP310 Wireless IP Phone.

NOTE This guide explains how to configure the SPA9000 and the SPA400 to support the calling features on the phones. For more information about the phones, see the *SPA9x2 Phone Administration Guide*, the *SPA9x2 Phone User Guide*, and the *Cisco Wireless-G IP Phone User Guide*.

Deployment Scenarios

The SPA9000 Voice System can meet the calling needs of many small businesses. Various deployment scenarios are possible. This section includes the following examples:

- "PSTN Access and Local Voice Mail," on page 13

- "ITSP Service Only," on page 14

- "ITSP Service, PSTN Access and Local Voice Mail," on page 15

- "ITSP Service, PSTN and ISDN Access and Local Voice Mail," on page 16

PSTN Access and Local Voice Mail

In this scenario, the customer requires a robust phone system but is not using VoIP services. The SPA9000 Voice System is deployed with a SPA9000 IP PBX, one SPA400 for PSTN access with four FXO ports, and another SPA400 for local voice mail service. Up to 16 IP phones can be installaed. Optionally, analog phones or fax machines (not illustrated) can be connected to the two phone ports on the SPA9000.
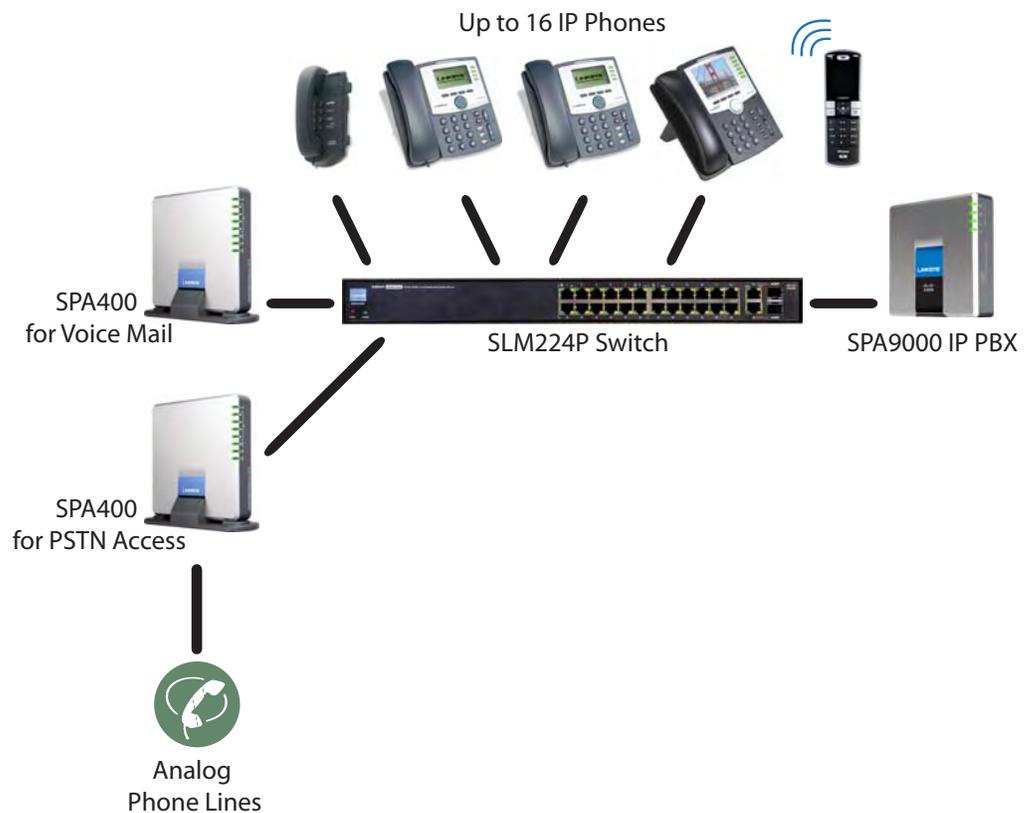
ITSP Service Only

In this scenario, a customer has no legacy telephone numbers and either needs no voice mail at all or has voice mail hosted by the ITSP. The SPA9000 Voice System is deployed with the SPA9000 IP PB and VoIP service. Up to 16 IP phones can be installaed. Optionally, analog phones or fax machines (not illustrated) can be connected to the two phone ports on the SPA9000.

Up to 16 IP Phones

SLM224P Switch

SPA9000 IP PBX

WRV200 Router

Integrated
Access Device

Internet
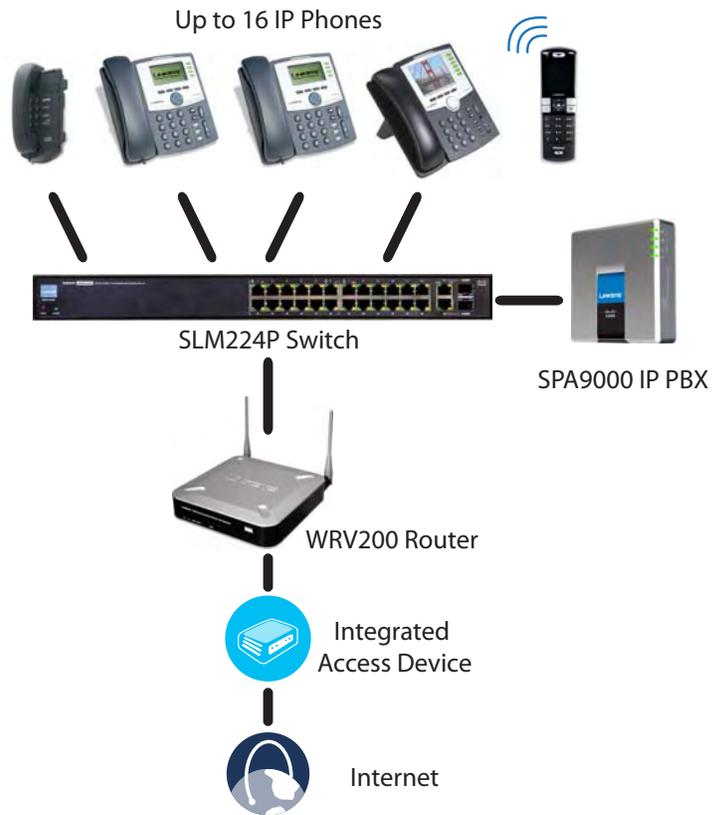
ITSP Service, PSTN Access and Local Voice Mail

In this scenario, the customer wants to use ITSP service for reduced long distance fees but needs to support legacy local telephone numbers (for example, to receive calls to a legacy telephone number or to place outbound calls in the local area). This customer also prefers local voice mail service. The SPA9000 Voice System is deployed with the SPA9000 IP PBX, VoIP service, one SPA400 unit for voice mail service, and another SPA400 unit for PSTN access with four FXO ports. Up to 16 IP phones can be installaed. Optionally, analog phones or fax machines (not illustrated) can be connected to the two phone ports on the SPA9000.
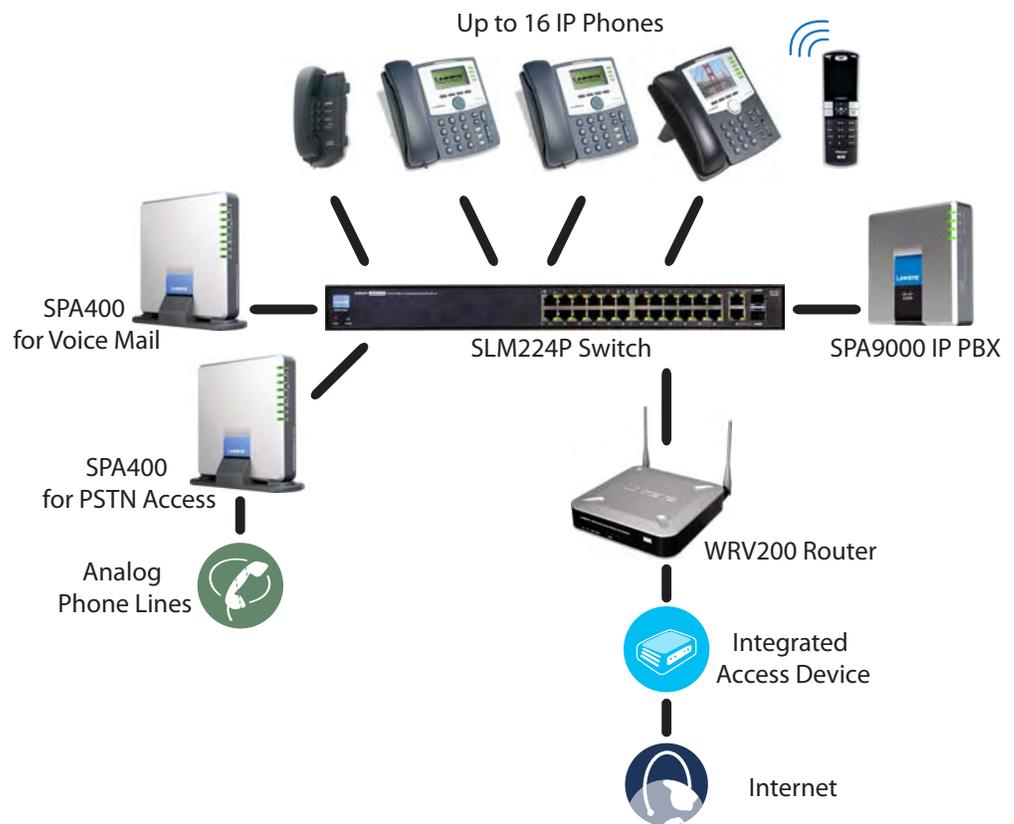
ITSP Service, PSTN and ISDN Access and Local Voice Mail

In this scenario, the customer takes full advantage of the SPA9000 Voice System solution. This customer has the SPA9000 IP PBX, VoIP service, one SPA400 unit for voice mail service, and another SPA400 for PSTN access with four FXO ports. In addition, this installation includes an ISDN Gateway for ISDN BRI access with four BRI ports. Up to 16 IP phones can be installaed. Optionally, analog phones or fax machines (not illustrated) can be connected to the two phone ports on the SPA9000.

Up to 16 IP Phones

SPA400
for Voice Mail

SLM224P Switch

SPA9000 IP PBX

SPA400
for PSTN Access

Analog
Phone Lines

Mediatrix® 4402
BRI Gateway

WRV200 Router

Integrated
Access Device

ISDN
Phone Lines

Internet
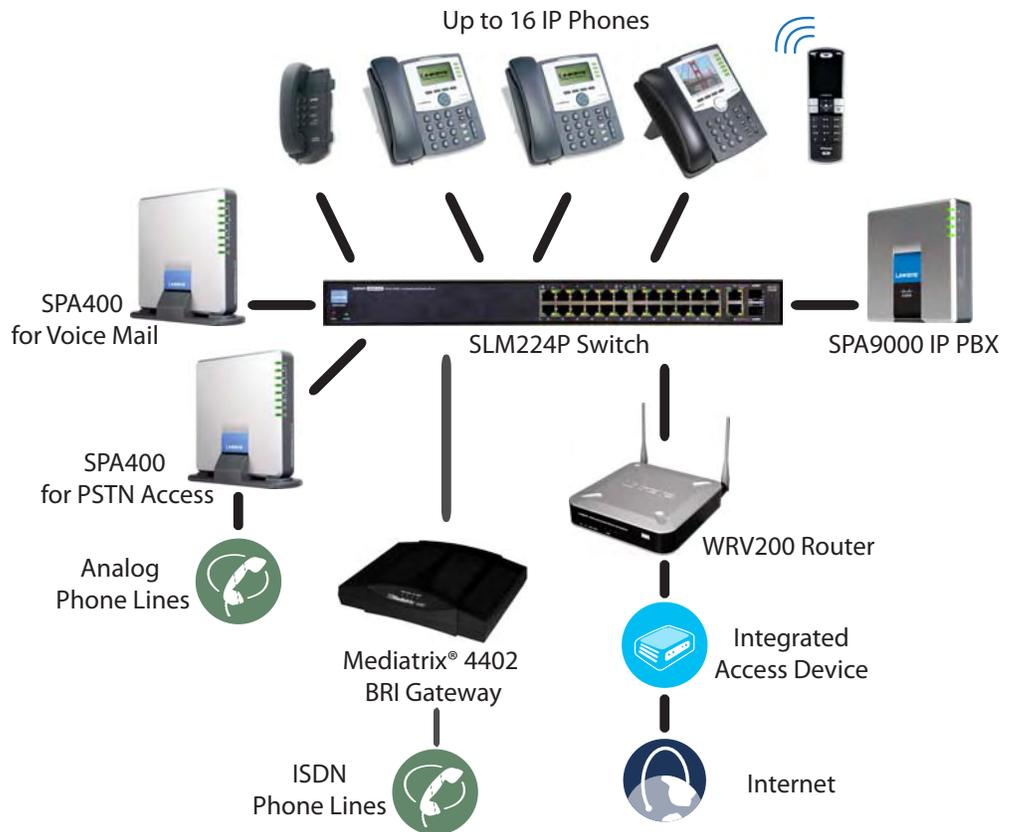
Introducing Components of the SPA9000 Voice System

This section describes the features of the components of the SPA9000 Voice System, including the SPA9000, the SPA400, and the various models of SPA9xx phones.

- "Getting to Know Your SPA9000," on page 17

- "Getting to Know Your SPA400," on page 19

- "Getting to Know Your IP Phones and Accessories," on page 21

- "Getting to Know Your WRV200 Router," on page 23

- "Getting to Know the SLM224P Switch," on page 25

Getting to Know Your SPA9000

The SPA9000 is an IP PBX system with high-end features comparable to traditional large business voice services. This section describes the LEDs on the front panel and the ports on the back panel of the device.

SPA9000 Front Panel

LED	Description/Notes
Power	- Green: The device is receiving power and is connected to the Internet. - Flashing Green: The device is receiving power but is not connected to the Internet. - Unlit: The device is not receiving power.

LED	Description/Notes
Internet	▪ Green: The device is connected to the Internet. ▪ Flashing Green: The device is experiencing network activity. ▪ Unlit: The device is not connected to the Internet.
Phone 1, Phone 2	▪ Green: The phone is on hook and is registered with an active Internet phone service account. ▪ Unlit: The phone is on hook but is not registered with an active Internet phone service account. ▪ Flashing Green: The phone is off hook.

SPA9000 Back Panel

Port	Description/Notes
Phone 1, Phone 2	Use these ports to connect analog phones or fax machines to your IP phone account.
Ethernet	Use this port to connect a computer for administration of the SPA9000.
Internet	Use this port to connect the SPA9000 to the Local Area Network (LAN). The cable may be connected to a switch, router or Integrated Access Device.
Power	Use this port to connect to the external Power adapter (PA100).

Getting to Know Your SPA400

The SPA400 provides the SPA9000 access to the PSTN by connecting the FXO ports to analog lines. The SPA400 also has a built-in voice mail server.

This section describes the LEDs on the front panel and the ports on the back panel of the device.

SPA400 Front Panel

LED	Description/Notes
Power	▪ Steady green: The SPA400 is receiving power and is connected to the Internet. ▪ Flashing: The SPA400 is not connected to the Internet, booting, or upgrading firmware.
Status	▪ Steady green: The SPA9000 is registered to the SPA400. ▪ Flashing: The SPA9000 is not registered to the SPA400.
Ethernet	▪ Steady green: The SPA400 has an active connection through the Ethernet port. ▪ Flashing: Network activity is occurring over the Ethernet port.
Line 1, 2, 3, 4	▪ Steady green: The line is active. ▪ Flashing: The line is ringing. ▪ Off: The line is idle.
USB	▪ Steady green: The USB voice mail module is registered. ▪ Off: No module is detected.

SPA400 Back Panel
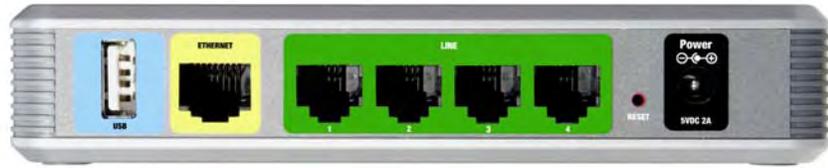
Port	Description/Notes
USB	Use this port for the USB voice mail module, which contains the voice mail prompts and provides the storage location for saving voice mailbox messages.
Ethernet	Use this port to connect to the Local Area Network (LAN) for communications with SPA9000.
Line 1, 2, 3, 4	These FXO ports are used to connect to an analog phone lines.
Reset	This button is used to reset the device.
Power	Use this port to connect to the external Power adapter (PA100).

Getting to Know Your IP Phones and Accessories

Cisco provides a variety of phone models to suit the needs of small businesses. The following table provides a comparison of Cisco IP phones and accessories that can be used with the SPA9000 Voice System.

Product		RJ-45	Voice Lines	Additional Features/Notes
SPA922*		2	1	One-line IP phone with Power over Ethernet (PoE) support
SPA942*		2	4	Four-line IP phone with Power over Ethernet (PoE) support
SPA962*		2	6	Six-line IP Phone with high-resolution color display and Power over Ethernet (PoE) support
WIP310		N/A	1	Wireless-G IP phone

Product		RJ-45	Voice Lines	Additional Features/Notes
SPA932		—	—	Attendant console (sidecar) for SPA962 with 32 buttons and LEDs for monitoring and call transfer
POES5		1	N/A	Provides an 802.3af PoE port for connection back to a PoE switch for SPA9000 and SPA400
WBP54G		1	N/A	Converts your IP phone into a wireless device, so it can connect to your wireless network without an Ethernet cable
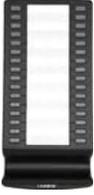
NOTE * SPA922/942/962 do not include an external power adapter. If you are using a non-PoE switch, a PA100 power adapter is required.

Getting to Know Your WRV200 Router

WRV200 is a VPN router with a Wireless-G access point for small offices and home offices. It is strongly recommended for use with the SPA9000 Voice System.

NOTE A Wireless-G router is required if you are using wireless components such as the WIP310 telephone.

WRV200 Front Panel

LED/Port	Description
Power	▪ Green: The router is receiving power. ▪ Flashing Green: The router is running a diagnostic test.
DMZ	▪ Green: The router has an available DMZ port. ▪ Flashing Green: The router is sending or receiving data over the DMZ port.
Internet	▪ Green: The router is connected to a Broadband Access device at the indicated speed (10, 100, 1000). ▪ Flashing Green: The router is transmitting or receiving data over the Internet port.

LED/Port	Description
Wireless	▪ Green: The router has a successful wireless connection. ▪ Flashing Green: The Router is actively sending or receiving data over the wireless network.
1-4 (Ethernet)	These four LEDs correspond to the router's four Ethernet ports. ▪ Green: The Router is connected to a device through the corresponding port (1, 2, 3, or 4). ▪ Flashing Green: The Router is actively sending or receiving data over the corresponding port.

WRV200 Back Panel

LED/Port	Description
Power	The port is used to connect the router to AC power, using the provided power cable.
Reset	▪ The Reset button has two functions: ▪ If the Router is having problems connecting to the Internet, press the Reset button for just a second with a paper clip or a pencil tip. This is similar to pressing the Reset button on your PC to reboot it. ▪ If you are experiencing extreme problems with the router and have tried all other troubleshooting measures, press and hold in the Reset button for 10 seconds. This action restores the factory defaults and clears all of the Router's settings, such as port forwarding or a new password.
Internet	Use this port to connect the router to a Broadband Access device.
1-4 (Ethernet)	Use these ports to connect the router to network devices, such as PCs, print servers, or additional switches.

Getting to Know the SLM224P Switch

The SLM224P switch has 24 10/100 Copper ports with two shared Gigabit copper or optical SFP ports (combo ports) for connecting the switch to the core network.

NOTE In this guide, the SLM224P switch is used in all examples and illustrations. However, various Cisco switches can be used with the SPA9000 Voice System. Cisco recommends use of SLMxxxP, SRWxxxP and SRWxxxMP switch product families with the SPA9000 Voice System.

SLM224P Front Panel

LED/Port	Description
System	■ Green: Power is being supplied to the switch. ■ Solid Amber: The switch is performing the Power-On Self Test (POST).
Link/Act (1-24)	■ Green: The switch has a functional 10/100 Mbps network link through the corresponding port with an attached device. ■ Flashing: The switch is actively sending or receiving data over the corresponding port.
PoE (1-6, 13-18)	■ Flashing Amber: Power is being supplied to an attached powered device (PD) on the corresponding port (1 through 6, 13 through 18).
100M (7-12, 19-24)	■ Amber: The switch has a functional 100 Mbps connection on the corresponding port (7 through 12, 19 through 24) with an attached device.
Link/Act (G1-G2)	■ Green: Lights up to indicate a functional 10/100/1000 Mbps network link through the corresponding port (G1 through G2) with an attached device. ■ Flashing Green: The switch is actively sending or receiving data over the corresponding port.
Gigabit (G1-G2)	■ Amber: The switch has a functional 1000 Mbps connection on the corresponding port with an attached device.
Reset	■ To reboot the switch, press and hold the Reset button for approximately five seconds. ■ To reset the Switch settings to the factory defaults, press and hold the Reset Button for approximately ten seconds.

LED/Port	Description
Ethernet (1-24)	The Switch is equipped with 24 auto-sensing, Ethernet network ports, which use RJ-45 connectors. The Fast Ethernet ports support network speeds of 10 Mbps, 100 Mbps, or 1000 Mbps. They can operate in half- and full-duplex modes. Auto-sensing technology enables each port to automatically detect the speed of the device connected to it (10 Mbps, 100 Mbps, or 1000 Mbps), and adjust its speed and duplex accordingly.
G1-G2	The switch is equipped with 2 auto-sensing 10 Mbps, 100 Mbps, or 1000 Mbps Gigabit Ethernet network ports, which use RJ-45 connectors. They can operate in half- and full-duplex modes.
mini-GBIC (1-2)	The mini-GBIC (gigabit interface converter) port is a connection point for a mini-GBIC expansion module, so the switch can be uplinked via fiber to another switch.

SLM224P Back Panel

The back panel has one port, the Power port, which is used to connect the power cord.

2

Installation and Configuration Process Overview

This chapter provides an overview of the installation and configuration process.

A. Preparation

In Chapter 3, "Preparation," you learn about the equipment and service requirements, bandwidth requirements, call capacity, and related topics, to ensure that the system is well designed to meet the needs of the customer. This chapter also describes basic procedures such as downloading firmware, which should be completed before you begin installing the equipment.

B. Connecting and Configuring the SPA9000 Voice System

In this phase, you will physically connect the equipment to the LAN, configure the voice features, call routing, localization and business features using the Setup Wizard. Chapter 4, "Connecting the Equipment," explains step-by-step use of the Wizard for the purpose of Installing and Configuring your system.

C. Testing the Installation and Configuration

After the system is installed and configured using the Setup Wizard, it is recommended that you perform some basic tests to ensure that the SPA9000 Voice System is properly installed and configured. Chapter 5, "Testing Your SPA9000 Voice System," provides basic steps for verifying your SPA9000 Voice System is properly installed and is operational.

D. Maintaining the SPA9000 Voice System Using the Wizard

After the system is installed, configured and operational, it is possible that you require to update the system (e.g. to add a new extension because there is a new employee on the business, or to add a new SPA400 because of additional PSTN traffic). Chapter 6, "Maintaining Your SPA9000 Voice System," explains all individual menu options for performing basic and advanced configuration tasks.

Preparation

This chapter is essential reading before you begin installing the equipment or configuring the system. To ensure that the installation process goes smoothly, verify that you have the required services, equipment, and information.

Refer to the following topics:

- "Site Survey," on page 30

- "System Design Considerations," on page 31

- "Network Setup Review," on page 33

- "Quality of Service," on page 35

- "Local Area Network Design," on page 35

- "Services and Equipment," on page 36

Site Survey

The site surveys consists of gathering relevant information about the customer, the existing infrastructure, the network, the telephone equipment, and the available services. This survey helps you to prepare for the installation of the SPA9000 Voice System (for example, ordering the Cisco SPA devices from the distribution channel) and to anticipate the design considerations. The site survey can be conducted on the customer premises or remotely over the phone and email.

Various site survey templates can be used. Appendix A, "Installation Workbook," contains a site survey template example that you can use to record the customer information.

System Design Considerations

When installing and configuring the SPA9000 Voice System, it is necessary to analyze and meet some design considerations to ensure the best quality and user experience. The design considerations cover available bandwidth and quality of service.

Bandwidth Requirements and Call Capacity

The available connection bandwidth determines the maximum number of simultaneous calls that the system can support with the appropriate audio quality. Before installing and configuring the Cisco SPA devices, use this information to determine the maximum number of simultaneous VoIP connections that the system can support. For asymmetric connections, such as ADSL, the maximum number of calls is determined by the upstream bandwidth. In general it is a good practice to use no more than 75% of the total available bandwidth for calls. This provides space for data traffic and helps ensure good voice quality.

NOTE Some ITSP SIP trunk services limit the maximum number of simultaneous calls. Please check with your Service Provider to understand the maximum number of simultaneous calls each SIP trunk supports.

The following table provides the approximate bandwidth budget for different codecs.

Codec	Approximate bandwidth budget for each side of conversation	2 calls	4 calls	6 calls	8 calls
G.711	110 kbps	220 kbps	440 kbps	660 kbps	880 kbps
G.726-40	87 kbps	174 kbps	348 kbps	522 kbps	696 kbps
G.726-32	79 kbps	158 kbps	316 kbps	474 kbps	632 kbps
G.726-24	71 kbps	142 kbps	284 kbps	426 kbps	568 kbps

Codec	Approximate bandwidth budget for each side of conversation	2 calls	4 calls	6 calls	8 calls
G.726-16	63 kbps	126 kbps	252 kbps	378 kbps	504 kbps
G.729	55 kbps	110 kbps	220 kbps	330 kbps	440 kbps

For more information about bandwidth calculation, refer to the following web sites:

www.erlang.com/calculator/lipb/

www.bandcalc.com/

Wide Area Network (WAN) Quality of Service

You can choose from several types of broadband access technologies to provide symmetric or asymmetric connectivity to a small business. These technologies vary on the available bandwidth and on the quality of service. It is generally recommended that you use broadband access with a Service Level Agreement that provides quality of service. If there is not a Service Level Agreement with regard to the broadband connection quality of service, the downstream audio quality may be affected negatively under heavy load conditions (bandwidth utilization beyond 80%).

To eliminate or minimize this effect, Cisco recommends one of the following actions:

- For broadband connections with a bandwidth lower than 2 Mbps, perform the call capacity calculations by assuming a bandwidth value of 50% of the existing broadband bandwidth. For example, in the case of a 2 Mbps uplink broadband connection, assume 1 Mbps. Limit the uplink bandwidth in the Integrated Access Device to this value. This setting helps to maintain the utilization levels below 60%, thus reducing jitter and packet loss.

- Use an additional broadband connection for voice services only. A separate connection is required when the broadband connection services do not offer quality of service and when it is not possible to apply the above mentioned utilization mechanism.

Network Setup Review

The Local Area Network (LAN) is the communication platform used by the SPA9000 Voice System for allowing communications among the telephone users and between the telephone users and the external VoIP, PSTN or/and ISDN network services. This LAN is composed of the data wiring (UTP cabling), networking equipment (switches and routers/access device) and the telecommunication (PSTN or ISDN) lines.

The Local Area Network (LAN) may be already installed or it can be installed and configured at the time of installing the SPA9000 Voice System. Below are the general recommendations to ensure proper operation of the SPA9000 Voice System.

Infrastructure, Cabling and PSTN/ISDN Lines

- AC outlets: Ensure there is an AC outlet available for every LAN and Cisco SPA component that requires AC power. If you are using a Power over Ethernet switch, SPA9x2 phones do not require an AC outlet as they are powered by the switch.

- Ethernet cabling: Ensure there is a Ethernet cabling system and that there is an outlet for each Cisco SPA device. It is recommended that Ethernet cables are UTP CAT 5e or better.

- PSTN and ISDN lines: Ensure that the lines are operative and that any features, such as caller identification, operate properly before starting the installation. Ensure that the cables are available in the location where you are installing the Cisco SPA devices.

- UPS: If you are using an Uninterrupted Power Supply (UPS) mechanism, ensure that the SPA9000 Voice System design is covered by securing the router and switch AC connections and the Cisco SPA devices and by using the Power over Ethernet adapter (POES5) for the non-POE products (SPA9000, SPA400, SPA9x1 phones). Also ensure that devices such as the WAN modem, CSU/DSU, or DDS modem are connected to the UPS.

NAT Mapping

Network Address Translation (NAT) is a function that allows multiple devices to share the same public, routable, IP address to establish connections over the Internet. NAT is present in many broadband access devices to translate public and private IP addresses. To enable VoIP to co-exist with NAT, some form of NAT traversal is required.

Some ITSPs provide NAT traversal, but some do not. If your ITSP does not provide NAT traversal, you have several options.

- NAT mapping with SIP-ALG router: Use a router such as the WRV200, which has a SIP ALG (Application Layer Gateway). With a SIP ALG in the router, you have more choices in selecting an ITSP.

- ITSP that supports NAT mapping through a Session Border Controller: With NAT mapping provided by the ITSP, you have more choices in selecting a router.

- NAT mapping with the SPA9000 EXT IP setting: Configuring NAT mapping in the SPA9000 is recommended only if the ITSP network does not provide a Session Border Controller functionality. If this is the case, and if the external (public) IP address is static, then Cisco recommends mapping a static (permanent) IP address on the SPA9000. Instructions are available in the *SPA9000 Voice System Administration Guide*.

- Configuring NAT Mapping with Simple Traversal of UDP through NAT (STUN): Configuring NAT mapping in the SPA9000 is recommended only if the ITSP network does not provide a Session Border Controller functionality. If this is the case, and if the external (Public) IP address is assigned dynamically by the network (and the router uses asymmetric NAT mechanism), it is possible to use STUN as a mechanism to discover the NAT mapping in SPA9000. This method is considered a practice of last resort and should be used only if the other methods are unavailable. For more information, see the *SPA9000 Voice System Administration Guide*.

Quality of Service

Cisco recommends using the SPA9000 Voice System with QoS-capable networking equipment that can prioritize the VoIP application traffic. QoS features are available on many Cisco data networking switches (such as the SLM224P) and routers (such as WRV200). A QoS-enabled router prioritizes the packets going upstream to the Internet Service Provider. QoS can be enforced using either DSCP (Diffserv Codepoint) ToS (Type of Service) or 802.1 Q/p VLAN ID and priority setting. DSCP ToS is recommended for its simplified setup.

Instructions for the SLM224P are provided in this guide.

Local Area Network Design

Use the following guidelines to manage the LAN setup for the SPA9000 Voice System.

- Ensure that all Cisco SPA devices are located in the same local area network subnet.

- Although all Cisco SPA devices support static IP addressing, we recommend using a DHCP server to add IP telephones to the system. Ensure that the DHCP server can assign enough IP addresses to serve the Cisco IP phones and the existing networked components such as PCs, servers, and so on.

- If you are using DHCP, use a long lease time. Cisco IP phones may reboot on the event of an IP address change because of lease time expiration.

- Use stable DNS server addresses for URL name resolution. Your Internet Service Provider can provide the primary and secondary DNS server IP addresses.

Services and Equipment

To install and configure SPA9000 Voice System, you need the following services and equipment.

Basic Services and Equipment

The following basic services and equipment are required:

- An Integrated access device or modem for broadband access to the Internet; business grade account recommended

- Internet Telephony Service Provider (ITSP) for Voice Over IP telephone service, supporting a "bring your own device" model

  You must have at least the following information about your account:

  - SIP Proxy (IP address or name)

  - Account Information and Password

- Computer with Microsoft Windows XP or Windows Vista (for system configuration)

- Analog phone for administrative use with the SPA9000 Interactive Voice Response (IVR) system

- Uninterruptible Power Source (UPS), recommended for devices such as the Integrated Access Device, network switch, router, and PoE switch to ensure continuous operation during a power failure

Cisco Equipment and Services

The following Cisco equipment is recommended:

- SPA9000 IP PBX

  One SPA9000 unit is required for IP PBX features. Only one SPA9000 is supported.

- SPA400 PSTN Gateway and Voice Mail Server

  It is recommended that you install one SPA400 unit exclusively for voice mail service and one or more additional SPA400 units for PSTN access. Each unit has four FXO ports and occupies one line interface on the SPA9000. With ITSP

service taking one line interface on the SPA9000, up to three SPA400 units can be installed. With no ITSP service, up to four SPA400 units can be installed.

- SPA9xx series IP phones

  The SPA9x1 series phones require access to power outlets. The SPA9x2 series phones can receive power from a Power over Ethernet (PoE) switch and are not supplied with power supplies. If you are not using the recommended PoE switch, you need to purchase a suitable power supply or power injector for the SPA9x2 phones.

- Switch (example: SLM224P)

- Router (example: WRV200)

- Optional POES5 Power over Ethernet adapters, for providing POE-derived power to non-POE devices such as SPA9000, SPA400 and SPA9x1, in case UPS is available.

- Optional WBP54G Wireless-G adapter, for providing Wireless client functionality to IP Phones, if required to connect a phone to the LAN using Wireless technology.

Downloading Firmware

The Setup Wizard includes the latest version of firmware for the various devices that the Wizard can configure. You can find all available updates at www.cisco.com/go/smallbiz.

4

Connecting the Equipment

This chapter explains how to connect your equipment and upgrade the firmware. At the end of each section, you verify that the installation is progressing correctly.

- "Connecting and Configuring the Switch," on page 38
- "Installing the SPA9000," on page 46
- "Installing the IP Phones," on page 53
- "Installing the SPA400," on page 58

Connecting and Configuring the Switch

Before installing any equipment, you need to connect the SLM224P Ethernet switch to a network broadband router or Integrated Access Device (IAD). If the site is not already equipped with another broadband router/IAD, Cisco recommends the use of the WRV200 broadband router to connect to the access device.

- "Connecting the Switch to the Router," on page 39
- "Configuring the Switch," on page 40

NOTE In this guide, the SLM224P switch is used in all examples. However, various Cisco switches can be used with SPA9000 Voice System. Cisco recommends use of the SLMxxxP, SRWxxxP and SRWxxxMP switch product families with SPA9000 Voice System. For more information, visit www.cisco.com/go/smallbiz.

Connecting the Switch to the Router

In this procedure, you connect the switch to the router and a power source.
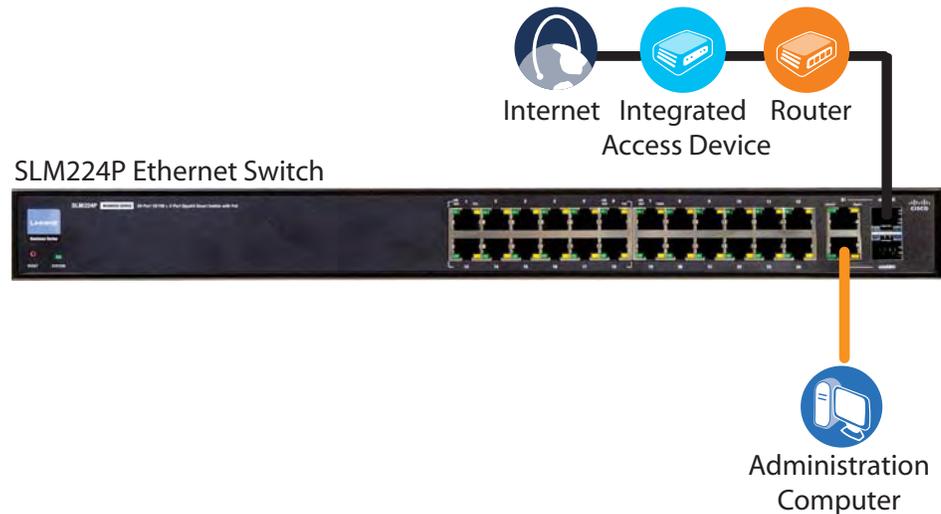
STEP 1 Connect an Ethernet network cable to one of the Ethernet ports on your router. Then connect the other end of the cable to an Ethernet port on the switch.

STEP 2 Connect an administrative computer to an Ethernet port on the switch. The PC needs to have an IP address on the same network as the switch, which has a default IP address of 192.168.1.254.

STEP 3 Connect the power cord to the back of the switch, and then connect the power adapter to an electrical outlet.

The Power LED is solid amber during the Power-On Self Test (POST). Then the LED is solid green. You are ready to configure the switch.

Configuring the Switch

You need to enable port fast to facilitate the broadcast communications between the SPA9000 and the phones. You also need to configure the Quality of Service settings to help to prevent network delays affecting voice communications.

- Enable spanning tree and port fast.

> **NOTE** If the switch does not provide a way to enable port fast, then you must disable spanning tree. The preferred method is to enable spanning tree and port fast.

- Enable QoS with DSCP.

Enabling Spanning Tree and Port Fast on the SLM224P Switch

To avoid timing issues related to Spanning Tree Protocol (STP) and to allow multicasting to work correctly for SPA9000 Voice System, enable port fast on the switch ports that will be connected to the SPA9000 and the SPA9xx IP phones.

When Port Fast is enabled, Fast Link mode is active. In Fast Link mode, the Port State is automatically placed in the forwarding state when the port link is up. Fast Link optimizes the STP protocol convergence. STP convergence can take 30-60 seconds in large networks.

STEP 1 Choose the ports that you will use to connect the SPA9000 and the IP phones.

STEP 2 Connect the administration computer to the switch.

STEP 3 Start Internet Explorer, and enter the IP address of the switch. The default IP address of the switch is 192.168.1.254. The default User ID is **admin**, with no password. After you log on, the Home page appears.

STEP 4 Click **Spanning Tree tab > STP Port Settings**.

STEP 5 From the **Port** drop-down list, choose the port number for the SPA9000.

STEP 6 Make sure that the **Enable STP** check box is checked, to enable STP on the port.

STEP 7 From the **Port Fast** drop-down list, choose **Enable**.

SLM224P Spanning Tree tab > STP Port Settings page
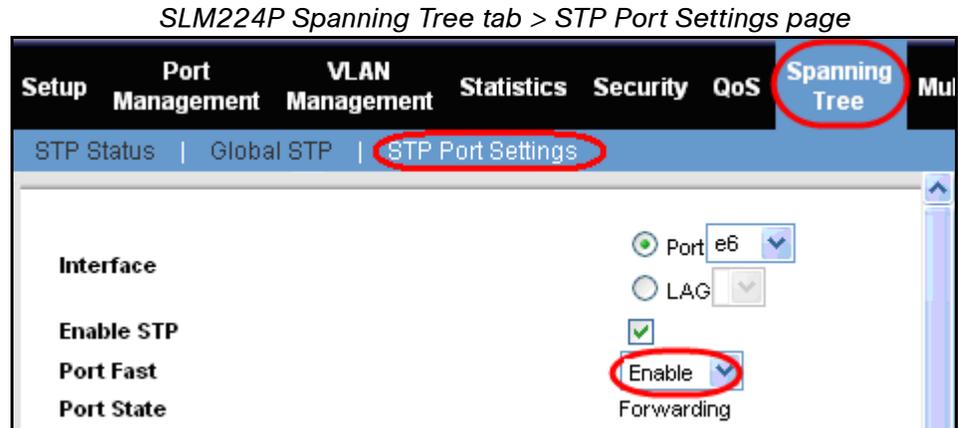
STEP 8 Click **Update**.

STEP 9 Repeat the previous steps to enable STP and Port Fast on each port where an IP phone or a SPA400 will be connected.

STEP 10 Click **Save Settings**.
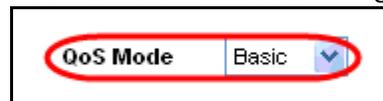
Setting QoS on the SLM224P Switch

To avoid possible network related delays, configure QoS on the switch.

STEP 1 Click **QoS tab > CoS Settings**.

STEP 2 From the **QoS Mode** list, select **Basic**.

SLM224P QoS tab > CoS Settings page

STEP 3 Click **Save Settings**.

STEP 4   Click **QoS tab > Basic Mode.**

STEP 5   From the **Trust Mode** list, select **DSCP.**

SLM224P QoS tab > Basic Mode page

STEP 6   Click **Save Settings.**

Introducing the Setup Wizard

The Cisco SPA9000 Voice System Setup Wizard guides you through the entire installation process, from connecting cables, to powering on, to configuring the Auto Attendant and other services.

Wizard Capabilities

The Wizard assists with the following advanced tasks:

- Backing up and restoration of device configuration

- Changing device's network settings

- Upgrading device's firmware

- Configuring NAT settings

- Configuring SIP trunks in only a few clicks

Downloading the Wizard

You can download the Wizard from www.cisco.com/go/smallbiz.

Extracting the Wizard

The file must be extracted and used on one computer that is on the same network as the SPA9000. You must unzip all of the files from the zip archive before starting the Wizard. The Wizard will not properly function if you double-click the Wizard file within the compressed archive file.

Choosing an Administration Computer for the Wizard

You must choose one PC on which to run the Wizard. The Wizard creates files that are stored in a local directory, C:\linksys. If you run another copy of the Wizard from another PC, you will have two sets of files, and your system settings will be affected. Before using the Wizard on another PC, first copy the *C:\linksys\PBX<MAC-address>.act* file to the second PC in order to populate the Wizard's phone extension table.

Wizard User Guide

Click **User Guide** to display this User Guide. The User Guide must exist in the Wizard's messages directory. In the event that the file is not found, download this guide from www.cisco.com/go/smallbiz. Then open the Wizard folder, move the file to the messages sub-directory, and change its name to ug_english.pdf.

Required Information

Before you start using the Wizard, use the following pages to gather the information that you will need to provide in response to the Wizard prompts.

IP Addresses

NOTE   When choosing static IP addresses for your SPA equipment, it is recommended to set an IP address that is outside the address range assigned by the DHCP server. For example, if the DHCP server assigns IP addresses in the range from 192.168.1.50 to 192.168.1.254, you should select a static IP address between 192.168.1.2 and 192.168.1.49.

- SPA9000 static IP address: __ __ __ . __ __ __ . __ __ __ . __ __ __
- SPA400 static IP address: __ __ __ . __ __ __ . __ __ __ . __ __ __
- Subnet mask: __ __ __ . __ __ __ . __ __ __ . __ __ __
- Gateway IP address: __ __ __ . __ __ __ . __ __ __ . __ __ __
- Primary DNS server IP address: __ __ __ . __ __ __ . __ __ __ . __ __ __
- Secondary DNS server IP address: __ __ __ . __ __ __ . __ __ __ . __ __ __
- NTP server name or IP address: __ __ __ . __ __ __ . __ __ __ . __ __ __

ITSP Information

- SIP Proxy: sip._____.com
- User ID:_____
- Password: _____

- Does the ITSP deploy Session Border Controller for NAT traversal?   Yes   No

Steering Digits

- Steering digit for the ITSP Line 1 SIP trunk: 0   1   2   3   4   5   6   7   8   9

- Steering digits for each SPA400:

  Line 1 (if no ITSP):   0   1   2   3   4   5   6   7   8   9

  Line 2:   0   1   2   3   4   5   6   7   8   9

  Line 3:   0   1   2   3   4   5   6   7   8   9

  Line 4:   0   1   2   3   4   5   6   7   8   9

Voice Mail Configuration (Complete the appropriate section below.)

- ITSP voice mail:

  Mailbox subscribe URL:_____

  Mailbox Deposit URL:_____

  Mailbox Manage URL:_____

- Separate voice mail server

  Voice mail Proxy: _____

  Mailbox subscribe URL: _____

  Mailbox deposit URL: _____

  Mailbox manage URL: _____

  User ID: _____

  Password: _____

- No voice mail

- SPA400 voice mail server

Phones

Name	Extension	Voicemail ?	MAC Address Ending
SPA9000 FXS 1			
SPA9000 FXS 2			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			

Name	Extension	Voicemail?	MAC Address Ending
14.			
15.			
16.			

Call Routing Rule (choose one method):

- Auto Attendant to answer all calls in _____ seconds

- Ring extension _____ for _____ seconds

- Ring the Auto Attendant immediately

Hunt Groups (Optional)

Group Name	Group Extension Number	Member Extension Numbers

NOTES:

Connecting and Configuring the Equipment (New Installation)

Refer to this section if you have a new installation and configuration to perform.

This section assumes that:

- You have some basic networking knowledge.

- The equipment is not connected or powered on.

- You are configuring an Internet telephony service provider (ITSP) account and a public switched telephone network (PSTN) account.

- You have completed the Site Survey. See Appendix A, "Installation Workbook."

Starting the Wizard

Double-click the **SetupWizard.exe** file to start the Setup Wizard. When the Welcome page appears, click **Next** to continue.

End User License Agreement

You must click EULA, read the license agreement, and click **Accept** in order to use the Wizard for the first time. The Wizard displays the SPA9000 Installation page once you have accepted the EULA.
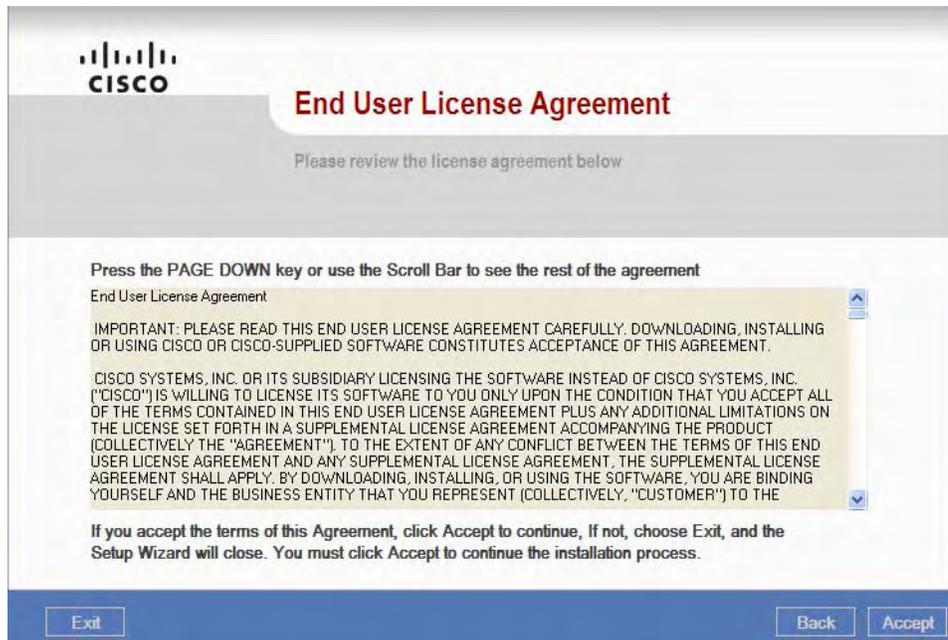
Installing the SPA9000
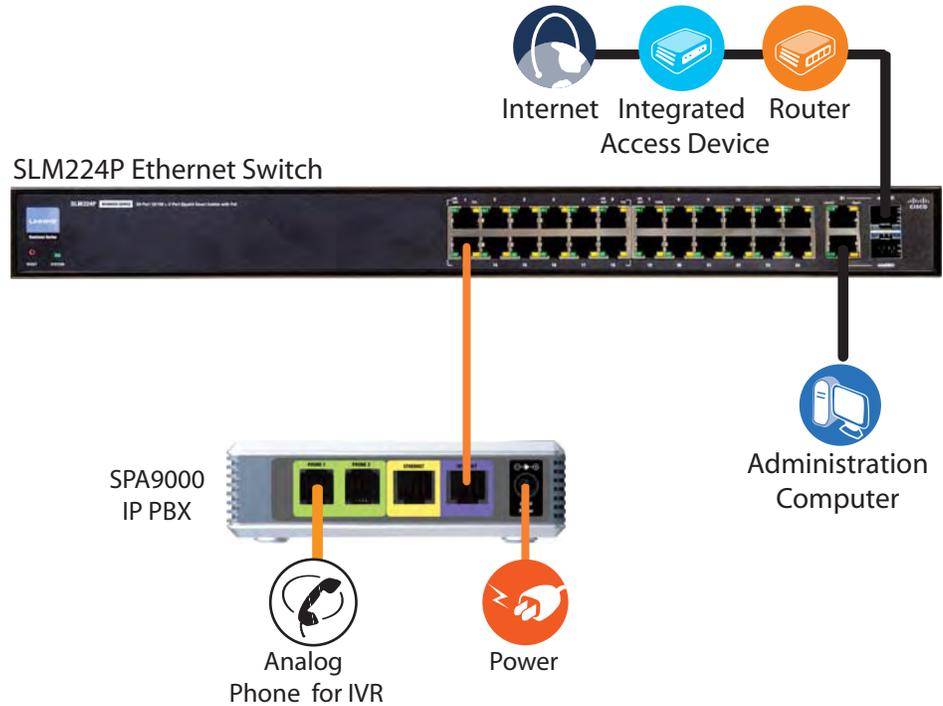
NOTE Before you begin this procedure, the switch must be configured as described in "Connecting and Configuring the Switch," on page 38.

STEP 1 Start the Wizard on the administration computer.

STEP 2 To install and configure a new system, click the first option, **This is the first time...**

- Use the second option if you have previously configured this SPA9000, and the C:\linksys\PBX*<mac address>*.act file exists.

- The Advanced Feature Menu is for experienced users only. See Chapter 6, "Maintaining Your SPA9000 Voice System."

- A message appears if you select the first-time option but have previously configured the SPA9000. Select **Yes** to cause the Wizard to extract and use the configuration from the C:\linksys\PBX*<mac address>*.act file. Select **No** to cause the Wizard to delete the C:\linksys\PBX*<mac address>*.act file.

STEP 3 Click **Next** to continue to the Network Installation page.
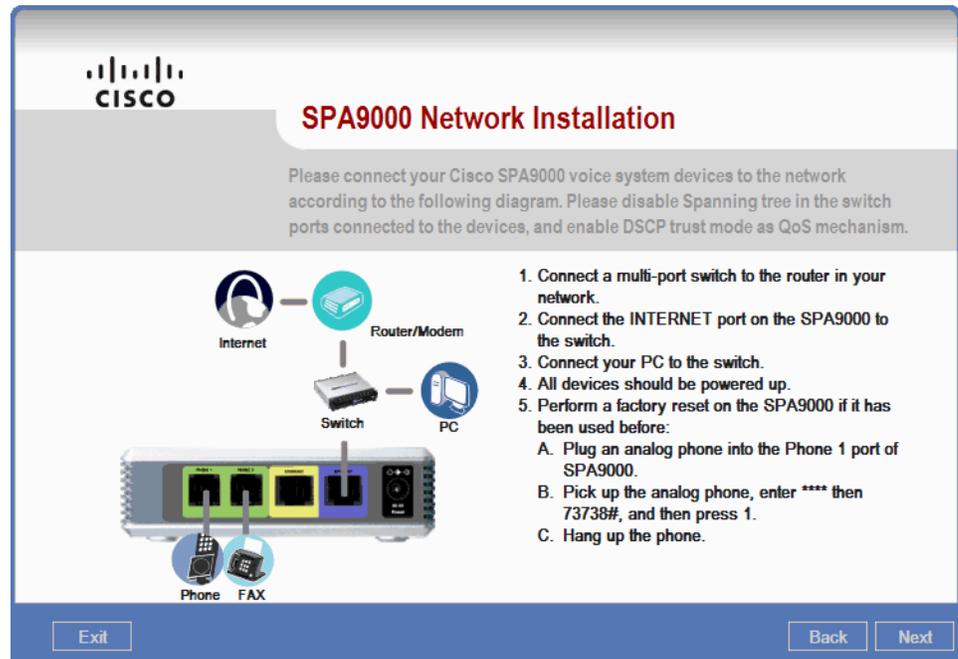
STEP 4 Follow the instructions on the SPA9000 Network Installation page to connect the SPA9000.

- Do not connect anything to the SPA9000's ETHERNET port. Use only the SPA9000's INTERNET port. Refer to the *SPA9000 Voice System Administration Guide* for more information about the ETHERNET port.

- You will not hear a dial tone from the analog phone when you take it off-hook. To use the integrated voice response (IVR) system, press the asterisk key four times: ****

STEP 5 Click **Next** to continue to the next page. Continue with the next procedure, .

Installing the SPA400 (Optional)

SPA9000
IP PBX

SPA400

Power

Analog
Phone Lines
for PSTN Access

Power
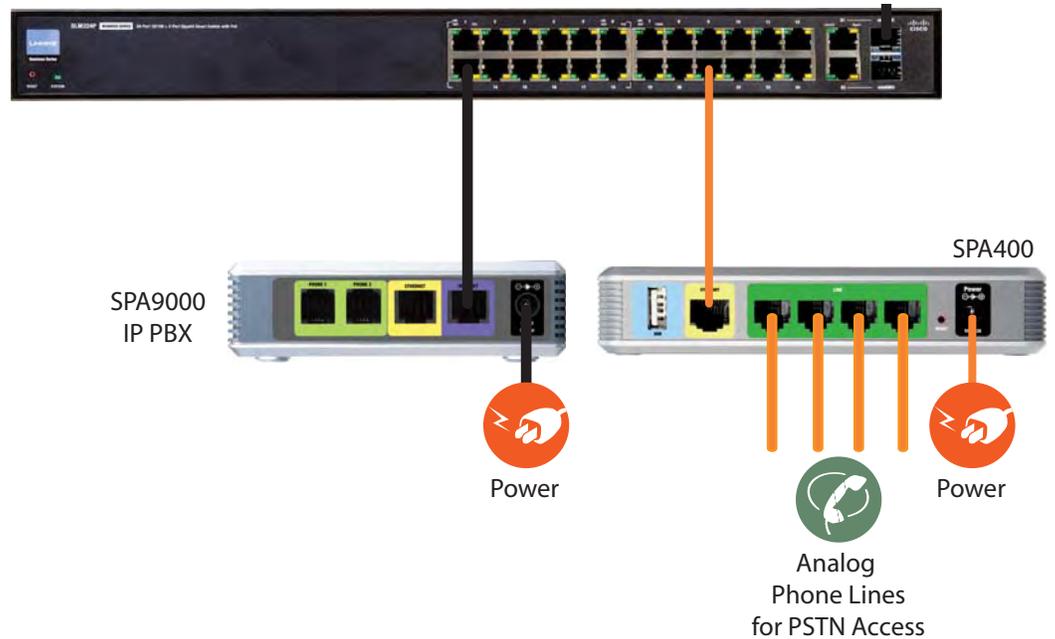
When you click the Next button on the first SPA9000 Network Installation page, the Wizard guides you through the process of installing the SPA400.

SPA9000 Network Installation

If you plan on connecting to a PSTN voice service provider, the following steps will help you configure the SPA400. Up to 4 SPA400s may be used in a SPA9000 voice system network. If you do not need to connect to the PSTN and you do not use SPA400 to provide voice mail, click the Skip button below.

1. Connect your SPA400s to the switch.
2. Connect each FXO port of SPA400 you plan to use to the wall telephone socket using a telephone cable.
3. Power on your SPA400s.
4. If you have not already done so, perform a factory reset by pressing and holding the reset button at the back of the SPA400 using a sharp point for six seconds. You will have to wait for a minute or so for the device to reboot before proceeding to the next step.

PSTN — SPA400 — Switch

Exit   Skip   Back   Next

STEP 1 Follow the instructions on the page to connect one to four SPA400 devices to the switch.

- If you are not connecting a SPA400 at this time, click **Skip** to bypass the SPA400 installation steps. The *Main Menu* appears. Continue to the procedure "Configuring the SPA9000," on page 57.

- Connect an Ethernet cable from the SPA400 ETHERNET port to an available port on your switch. The port must be configured with the Qos and CoS settings described in "Configuring the Switch," on page 40.

- If you are using a SPA400 for voice mail, insert the provided 128MB USB 2.0 flash drive into the SPA400 USB port before powering on the SPA400.

- Where multiple SPA400 units are installed, use only one unit for voice mail. The other units do not require the USB flash drive, which you can reuse for other purposes.

- The SPA400 device takes significantly longer to power up than does the SPA9000. Wait at least 2 minutes after powering the SPA400 before you click the Next button.

STEP 2 Click **Next** to cause the Wizard to discover all SPA400 devices that are connected to the network.

STEP 3 Wait as the progress messages appear on the PC screen.

The following alerts may appear:

- *You have no SPA400s connected in your network.*

  This message may appear if the SPA400 was not fully booted up when the Wizard began the auto-detection process or if the Wizard is running on a computer that is not on the same local network as the SPA9000. Click **OK** to close the message. After you resolve the issues, click **Next** to cause the Wizard to auto-dectect the SPA400 devices. Then continue with this procedure.

- *SPA400 password needed.*

  This message appears if the SPA400 previously was configured with a password. Enter the password, and then click **OK**. (By default, the SPA400 has no password, so this message should not appear if you are installing a new device.)

  The Wizard expects the SPA400 administrative user name to be the default **Admin** with a capital A.

STEP 4   Proceed according to the prompt or menu that appears:

- If a *Click OK to Upgrade* message appears, click **OK** to upgrade the firmware.

- If the *Device is configured to use DHCP* message appears, configure a static IP address. See "Configuring a Static IP Address on the SPA400 (If Prompted)," on page 55.

- If the Main Menu appears, continue with the configuration. See "Configuring the SPA9000," on page 57.

Configuring a Static IP Address on the SPA400 (If Prompted)

The Wizard tests each SPA400 device to verify that it is configured with a static IP address in order to ensure professional-grade uptime. The SPA400 devices would not be available for PSTN calls or voice mail services if its IP address was changed by a DHCP server.

Complete this procedure if the Wizard displays the following message: *Device is configured to use DHCP.*

STEP 1   Click **OK** to display the Network Settings page.

STEP 2 From the **Connection** drop-down list, choose **Static IP**.

STEP 3 Enter the following information to configure a static IP address for the SPA400:

- IP Address: Enter an IP address that is out of the scope of the LAN's DHCP server, such as 192.168.2.192. Type a period (.) to move from one octet to the next.

- Subnet Mask: Enter the appropriate mask for your network.

- Gateway: Enter the IP address of the network gateway.

- Primary DNS: Enter the IP address of the DNS server for your network, which may be the same as the gateway address, as in this example.

- Secondary DNS server's IP addresses as appropriate for your network.

STEP 4 Click **Next** to display the Main Menu.

Configuring the SPA9000

When the Main Menu appears, you are ready to configure the SPA9000. You will set a static IP address and upgrade firmware if needed.

STEP 1 On the Main Menu, select **Configure SPA9000**.
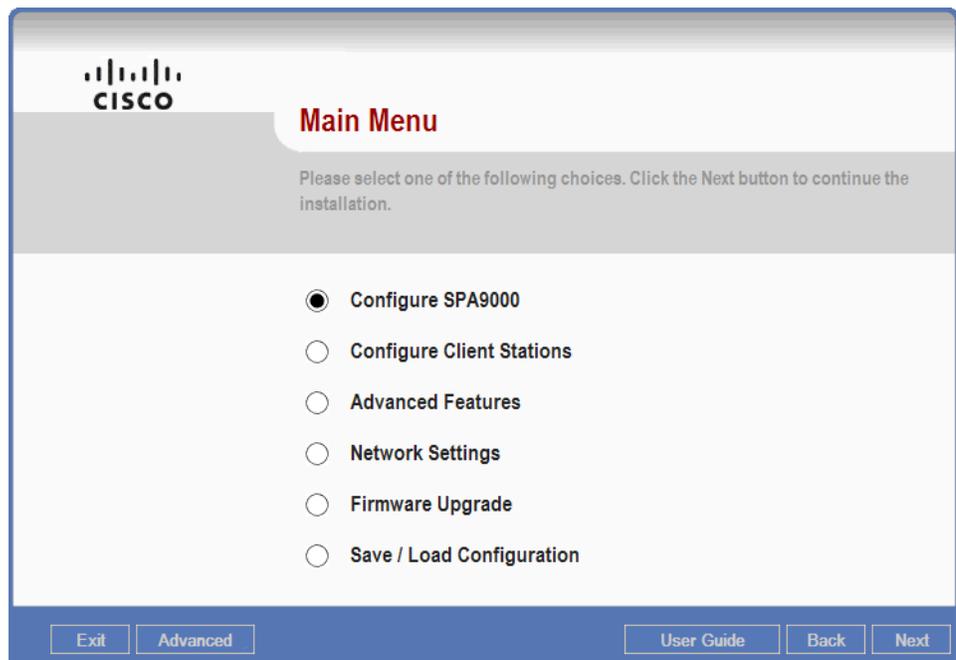
STEP 2 Click **Next** to cause the Wizard to discover all connected SPA9000 devices connected to the network.

NOTE Only one SPA9000 is supported. Any unused SPA9000 devices should be disconnected from the LAN.

STEP 3 Wait as the Wizard displays progress messages on the PC screen.

NOTE If the Wizard is unable to detect the SPA9000, either the SPA9000 INTERNET port is not connected to the LAN switch, or you have some other LAN networking problem that needs to be resolved before you can continue. See .

STEP 4 Proceed according to the prompts that appear:

- If the Manually Input SPA9000 IP Address page appears, troubleshoot the problem. See "Manually Inputting the SPA9000's IP Address (If Prompted)," on page 58.

- If the *Device is configured to use DHCP* message appears, set a static IP address. See "Configuring a Static IP Address on the SPA9000 (If Prompted)," on page 59.

- If the *Firmware upgrade required!* message appears, upgrade the SPA9000 firmware. See "Upgrading SPA9000 Firmware (If Prompted)," on page 62.

- If the Wizard displays the Configure SPA9000 Voice Services page, continue to the next step in the configuration process. See "Configuring SPA9000 Voice Service Lines," on page 63.

Manually Inputting the SPA9000's IP Address (If Prompted)

If the Wizard cannot detect a SPA9000, the following screen appears:
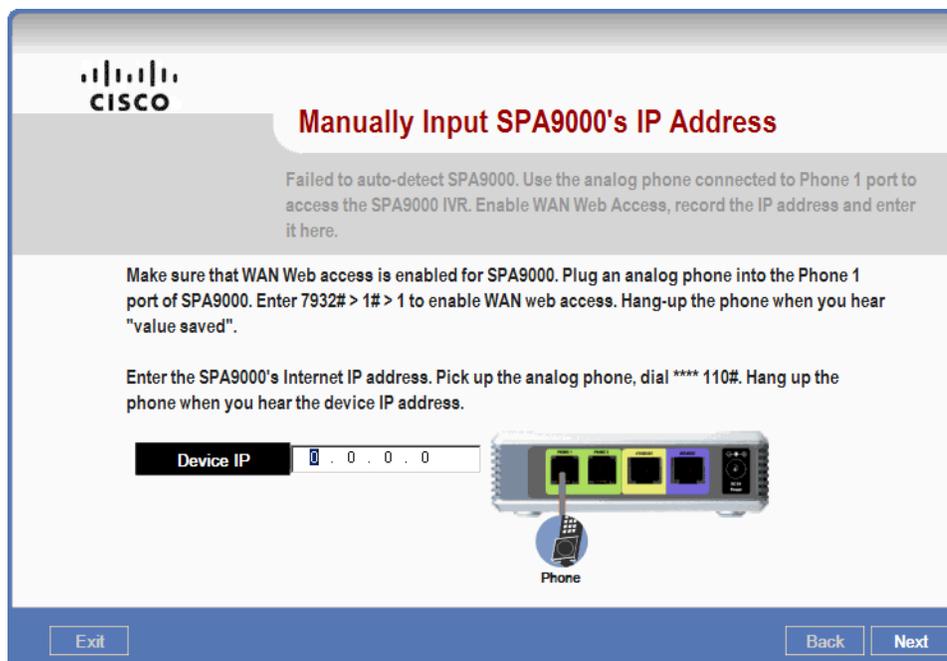
This message may occur for the following reasons:

- The network cable is disconnected from the SPA9000 INTERNET port or the switch port. Check the cables to ensure that the SPA9000 is properly connected to the switch.

- The Wizard is running on a computer that is not on the same local network as the SPA9000. Check the IP address of the administration computer.

- WAN access is not enabled on the SPA9000. This issue should not occur with a new device, where WAN access is enabled by default, but may occur on a device that was configured previously. Follow the instructions on the screen to ensure that WAN access is enabled and to learn the IP address of the SPA9000.

- After correcting any errors that you find, click **Back** to return to the previous screen. Then click **Next**, and the Wizard attempts to discover the SPA9000.

NOTE If the Manually Input SPA9000 IP Address screen appears after you complete these troubleshooting steps, enter the IP address, and then click **Next** to continue.

Configuring a Static IP Address on the SPA9000 (If Prompted)

The Wizard tests the SPA9000 device to verify that it is configured with a static IP address in order to ensure professional-grade uptime. The SPA9000 device would not be able to provide PBX functions to devices that cannot locate it if its IP address was changed by a DHCP server.

Complete this procedure if the Wizard displays the following message: *Device is configured to use DHCP*.

STEP 1   Click **OK** to display the SPA9000 Network Installation - Static IP page.

STEP 2   From the **Connection** drop-down list, choose **Static IP.**

STEP 3   Enter the following information to configure the static IP address:

WARNING Do not guess at values for the fields on this page because your SPA9000 device will not properly function without proper network settings. Refer to the information that you collected before beginning the installation.

- IP Address: Enter an IP address that is out of the scope of the LAN's DHCP server. Type a period (.) to move from one octet to another.

- Subnet Mask: Enter the appropriate subnet mask for your network.

- Gateway: Enter the IP address of your network gateway.

- Primary DNS: Enter the IP address of the DNS server for your network, which may be the same as the gateway address, as in this example.

- Secondary DNS server's IP addresses as appropriate for your network.

STEP 4 Click **Next** to preview the parameters that will be submitted to the network. The parameters appear in a dialog box.

STEP 5 Click **OK** to close the dialog box. Progress messages appear as the Wizard submits the configuration changes to the device.

STEP 6 Click **OK** when the *Submit Succeeded* message appears.

Upgrading SPA9000 Firmware (If Prompted)

The Wizard verifies that the SPA9000 passes the minimum firmware version requirement and will notify you in the event that out of date firmware is detected.

Complete this procedure if the following message appears: *Firmware upgrade is required!*

NOTE You must upgrade the SPA9000's firmware if the above message appears. If you press cancel instead of selecting a valid version of firmware for the device, an error message appears.

STEP 1 Click **OK** to navigate to the current version of SPA9000 firmware that you downloaded.

STEP 2 On the Firmware Upgrade page, click **Browse** to select the spa9000-xxx.bin or spa9000t-xxx.bin firmware file and click **Open**.

STEP 3 Click **OK** to begin the upgrade process. A series of messages appear as the firmware is loaded and the device is upgraded.

When the process is completed, the Wizard displays the Configure SPA9000 Voice Services page.

Configuring SPA9000 Voice Service Lines

The Wizard allows you to configure ITSP service only on Line 1 of the SPA9000. The remaining lines can be associated with SPA400 devices or with Mediatrix® 4400 ISDN Gateways (see "Configuring ISDN Connectivity," on page 103).

STEP 1   Use the drop-down lists to select the voice services for each line interface. In this example, we select ITSP for Line 1 and a SPA400 device for Line 2.

STEP 2   Click **Next** to display the Configure SPA9000 ITSP Voice Service page.

STEP 3 Enter the service provider data into the mandatory fields, which are indicated by an asterisk (*).

⚡

WARNING Do not guess at values for the fields on this page because your ITSP voice over IP (VoIP) service will not properly function with incorrect settings. Refer to the information provided by your ITSP.

- Proxy: Enter the SIP proxy name.

- Outbound Proxy: If your ITSP supports Session Border Controller (SBC), enter its name or IP address here.

- User ID: Enter the user ID for the ITSP account. The user ID is often the direct inward dial (DID) number.

- Password: Enter the password for the ITSP account.

STEP 4   Click **Next** to display the SPA9000 NAT Traversal page.

Configuring SPA9000 NAT Traversal

The SPA9000 NAT Traversal page appears after you click the Next button on the Configure SPA9000 ITSP Voice Service page.

Proceed according to the NAT traversal services provided by your ITSP:

- In most environments, the ITSP deploys an SBC to deal with traversing networks that deploy network address translation. If your ITSP uses an SBC, leave all fields blank. Then click **Next** to display the Configure Outbound Call Routes page.

- If you need to configure for NAT traversal, see "Modifying the NAT Settings," on page 112.

Configuring Steering Digits and Outbound Call Routes

The Configure Outbound Call Routes page appears after you click the Next button on the SPA9000 NAT Traversal page.

STEP 1 Check one of the **Select backup** boxes to designate a line to be automatically used by the system in the event that the primary line is not available.

STEP 2 In the **Prefix** field, enter a unique steering digit for each SIP line.

- A prefix, or steering digit, is the first number that a user dials before entering the phone number for an external call.

- You can use a prefix to determine which line is chosen for a particular type of call. This example uses 8 for Service Provider 1 and 9 for Service Provider 2. These Service Provider fields correspond to Line 1-4 on the Configure SPA9000 Voice Services page. In an earlier example, Line 1 was configured for relatively inexpensive ITSP service, and Line 4 was configured for PSTN access. When a user presses 9, the call is transmitted via the ITSP.

- To choose steering digits, you can use any digit that is not the first digit of an extension number. For example, if your extension numbers are 1xx for primary extensions and 2xx for hunt groups, the numbers 3-9 are available for steering digits.

STEP 3 Alternatively, to configure custom routing, complete the following tasks:

    a. Check the **Custom routing rule** check box.

    b. Make changes in the **Call Routing Rule** field and the **Line Dial Plan** fields, as needed.

NOTE This configuration requires knowledge of the syntax for call routing rules and line dial plans. For more information, see the *SPA9000 Voice System Administration Guide*.

STEP 4 Click **Next** to display the Configure SPA9000 Voicemail Server page.

Configuring the SPA400 Voice Mail Server (Optional)

The Configure SPA9000 Voicemail Server page appears after you click the Next button on the Configure Outbound Call Routes page.

STEP 1   To configure SPA400 voice mail service, select the fourth option, **I use the SPA400 as my voice mail server.**

This example assumes that you are using the SPA400 voice mail service. If you are not using SPA400 voice mail service, click the appropriate option:

- If you have voice mail service through your ITSP, select the first option.

- If you are using a separate voice mail server, select the second option, **I have a separate voice mail server...**

- If you do not have voice mail service and do not want to configure a SPA400 as a voice mail server, select the third option, **I don't have multiple voice mail accounts...**

STEP 2   Click **Next** to go to the SPA9000 Internal Phone Extensions page, and continue with the next procedure.

Configuring the Internal Phone Extensions

For each phone, you must configure a name and extension number. On this page, you can set up the list of extensions that will be available when you set up the phones. For each extension, you can optionally enable and assign a voice mail box.

The Configure the SPA9000 Internal Phone Extensions page appears when you click the Next button on the Configure SPA9000 Voicemail Server page.
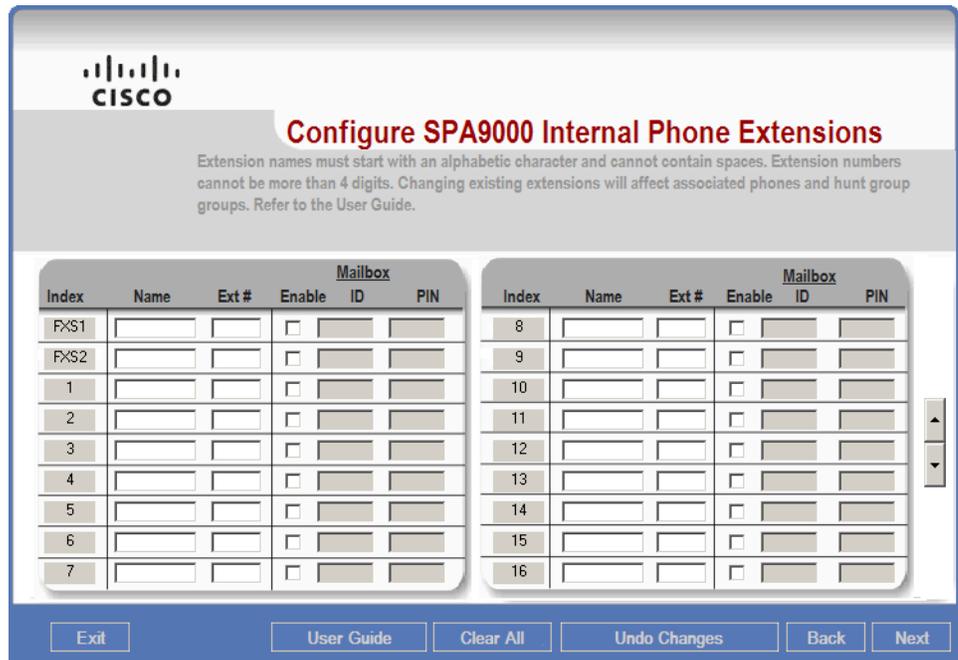
STEP 1   Plan which devices you will assign to each person. Refer to the following example.

User		Extension	Voice Mail?	MAC Address Ending
FXS1	WiringCloset	49	Not applicable	Not applicable
1	Patrick	21	y	575e
2	Penny	22	y	3a9b
3	Jarryd	23	y	29b8

NOTE No spaces are allowed in the names.

STEP 2   For each Index number, enter the following information:

- Name: Enter a name for the phone. The name must begin with a letter and must not contain spaces.

- Ext. #: Enter the extension number to associate with this voice mailbox.

- Enable: Check the box to enable this voice mail account.

- ID: Enter the mailbox ID number, which can be the same as the extension number.

- PIN: Enter the numerical password for this voice mail box.

NOTE Voice mail is not available for FXS ports.

STEP 3 Click **Next** to display the Configure the SPA9000 Call Routing Rule page, and then continue with the next procedure.

Configuring Inbound Call Routing

You can determine whether inbound calls are routed to the Auto Attendant or to a particular extension or hunt group. Optionally, you can route calls to the Auto Attendant only if they are not answered by an extension or hunt group within a specified number of seconds.

The Configure the SPA9000 Call Routing Rule page appears when you click the Next button on the Configure the SPA9000 Internal Phone Extensions page.

STEP 1 Choose the appropriate option:

- If you want to route all inbound calls to the Auto Attendant, select the first option, and then enter the desired number of seconds to ring before the Auto Attendant greets the caller. The default value is 12 seconds.

- If you want to route all inbound calls to a particular extension, select the second option. Then choose an extension from the drop-down list. If the phone does not have voice mail, an unanswered call is forwarded to the Auto Attendant after the specified number of seconds.

NOTE If the selected extension has voice mail, unanswered calls may be forwarded to voice mail instead of the Auto Attendant if the specified

number of seconds is longer than the time it takes for voice mail to be activated (default 20 seconds). To ensure that the call is forwarded to the Auto Attendant, set the specified number of seconds to a smaller number.

- If you need to add a new hunt group, click **Edit Hunt Group**. Continue with the procedure "Configuring Hunt Groups (Optional)," on page 73. After you add a hunt group, you return to this page to select your call routing option.

- If you want to route the call to the Auto Attendant immediately, choose the third option.

STEP 2   Click **Next** to display the Localization page. Continue with the procedure "Localizing the SPA400 Voice Mail Prompts (Optional)," on page 94.

Configuring Hunt Groups (Optional)

The Configure SPA9000 Hunt Groups page appears after you click **Edit Hunt Group** on the Configure the SPA9000 Call Routing Rule page.

The Wizard guides you through the process of creating hunt groups. A hunt group is a feature that causes an incoming call to ring a group of stations simultaneously or in a chosen sequence.

This example will define a hunt group called Sales so that inbound calls can be directed to Sales' extension.

STEP 1   Check the **Index** check box for group 1 and then click **Edit**. A dialog box appears.

STEP 2   Enter the hunt group information as follows:

- **Hunt Group Name:** A group name for the corporate directory entry

- **Hunt Group Extension #:** An extension number [can be more digits, example 500]

- **Hunt Rule:** A method for alerting the member stations of an incoming call, with the following choices:

    - Simultaneously: Rings all phones at the same time

    - Sequentially (restart): Rings each phone individually in order; the sequence always starts with the first listed phone

    - Sequentially (next): Rings each phone individually in order; if a phone previously answered a call, the sequence starts with the next phone in the list.

STEP 3   To add a station to the group, click an extension number in the **Available** list, and then click **Add** to move it to the **Chosen** list.
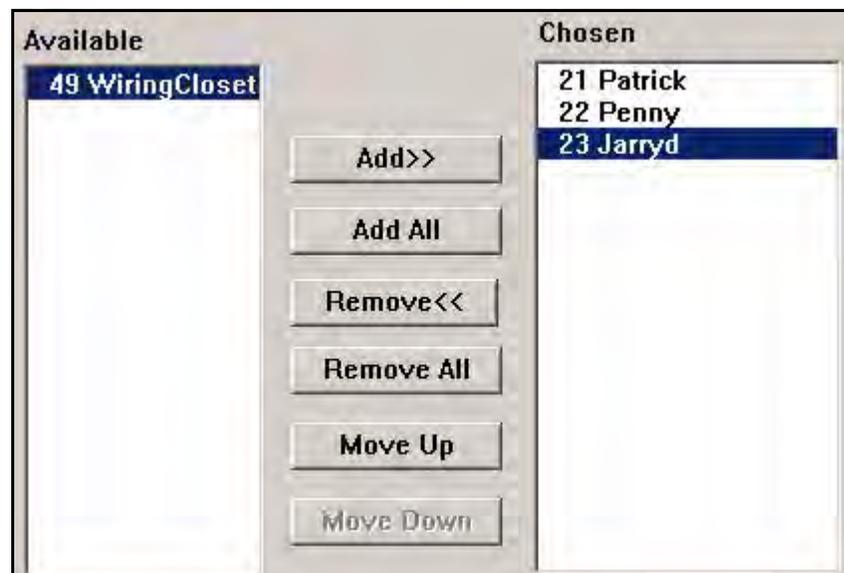
STEP 4 To modify the ring order of the Chosen stations for sequential hunt rules, click an extension number and then click **Move Up** or **Move Down** until it appears in the desired position.

STEP 5 Click **OK** to return to the Configure SPA9000 Hunt Groups page.
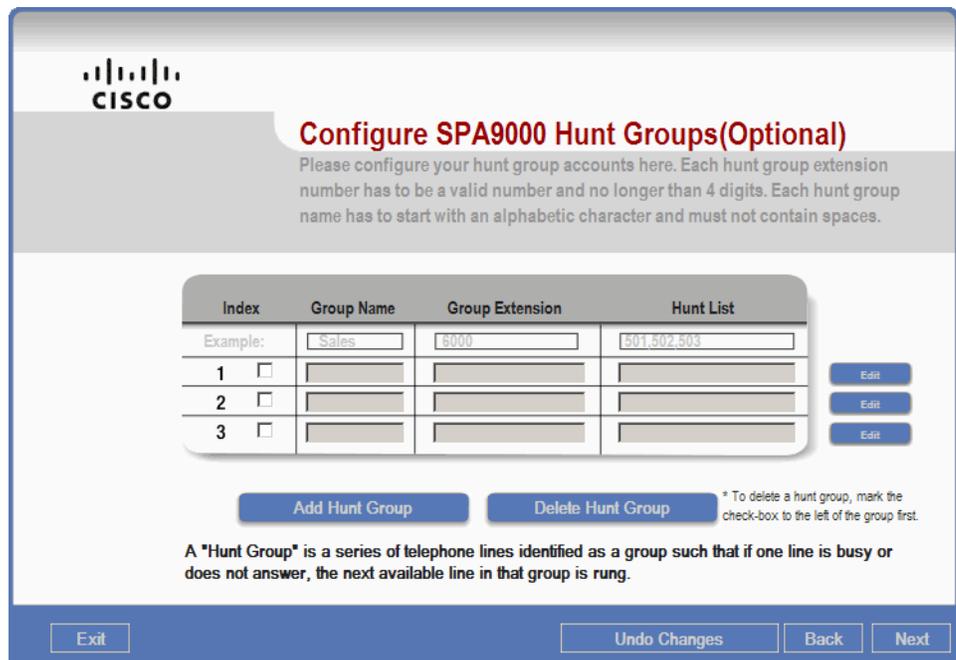
STEP 6 Create other hunt groups, as needed.

STEP 7 Click **Next** to display the client account changes. The Client Account Changes dialog box appears.

STEP 8 Click **OK** to close the dialog box and to return to the Configure the SPA9000 Call Routing Rule page.

STEP 9 Select the **Ring Extension** radio button.

STEP 10 From the **Ring Extension** drop-down list, choose the hunt group that you created, for example Sales. Leave the default ring time of 20 seconds.

STEP 11 Click **Next** to display the Localization page.

Localizing the SPA9000

The Localization page appears after you click the Next button to display the Configure SPA9000 Hunt Groups page.

You can localize the SPA9000 by selecting your country, time zone, preferred date and time formats, and NTP server. The SPA9000 will update the dial plan and the Auto Attendant prompts based on the selected country.

- Phones get the time settings from the SPA9000. The SPA9000 may get its time settings from multiple sources: its internal clock, the specified NTP server, or the service providers (including SPA400 devices).

- When the SPA9000 is offline (not subscribed to a service provider, with no specified NTP server or no connection to a specified NTP server), the internal clock is used.

- When there is an NTP server and one or more service providers, the source that provided the time most recently is used as the time source. Usually, this source is the service provider because the time is updated whenever the SPA9000 re-registers with the service provider (order of minutes). The NTP server time update occurs less frequently (order of hours).

- When there is a SPA400, the time source is the designated NTP server. The NTP server set on the localization page applies to both SPA9000 and SPA400.

STEP 1   As needed, select your Country, Time Zone, Date Format, Time Format, and NTP Server.

STEP 2   Check the **Update dial plan based on locale** check box to update the default dial plan (US-based) with the appropriate settings for your location.

- If you check the *Resync PC* check box, then the SPA9000's internal clock will be set to be in sync with the PC. This does not apply to the SPA400 since its internal clock cannot be set.

- If you check the **Update Dial Plan** check box, the dial plan is automatically updated based on the selected locale. This selected dial plan overwrites any existing customized dial plan on the SPA9000 and on the phones. For detailed information about configuring a dial plan, refer to the *SPA9000 Voice System Administration Guide*.

STEP 3   Click **Next** to display the Download Prompts for SPA9000 Auto Attendant page.

Customizing the Auto Attendant Prompts (Optional)

The Download Prompts for SPA9000 Auto Attendant page appears after you click the Next button on the Localization page.

The SPA9000 will choose the Auto Attendant prompts based on the selected country. If you wish, you can choose different language files from the Wizard's prompts folder, or you can download your own custom Auto Attendant prompts.

- To use the default prompts for the selected country, do not make any selections on this page. Click **Next** to go to the next page.

- Custom prompts must be WAV files in 8KHz, Mono, G.711u format. A prompt must not exceed 60 seconds in length.

- Alternatively, you can record custom prompts by using the IVR. See "Configuring the Auto Attendant," on page 117.

- The default prompts are as follows:

  - p1: "If you know your party's extension, you may enter it now."

  - p2: "Your call has been forwarded."

- p3: "Not a valid extension, please try again."

- p4: "Goodbye."

- Prompts 5 to 7 are available for custom greetings.

STEP 1 Choose the prompt number that you want to change, and then click **Browse**.

a. When the Open dialog box appears, double-click the folder for the language files that you want to install.
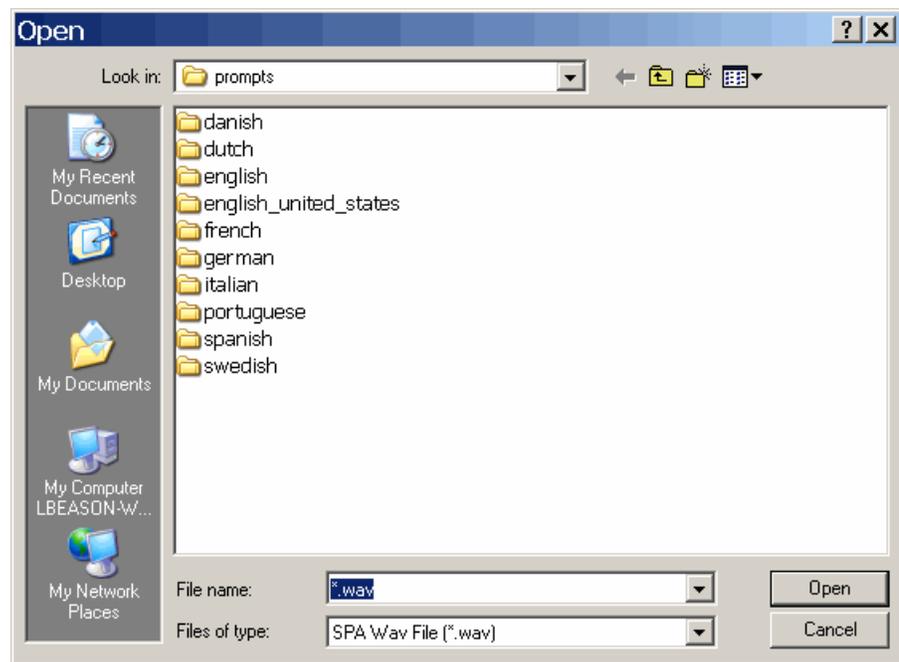
b. When the list of files appears, double-click the WAV file corresponding to the prompt number that you want to change. For example, to change Prompt 3 to French, you would open the *french* folder and then would select *fr_3.wav*. Refer to the following illustration.
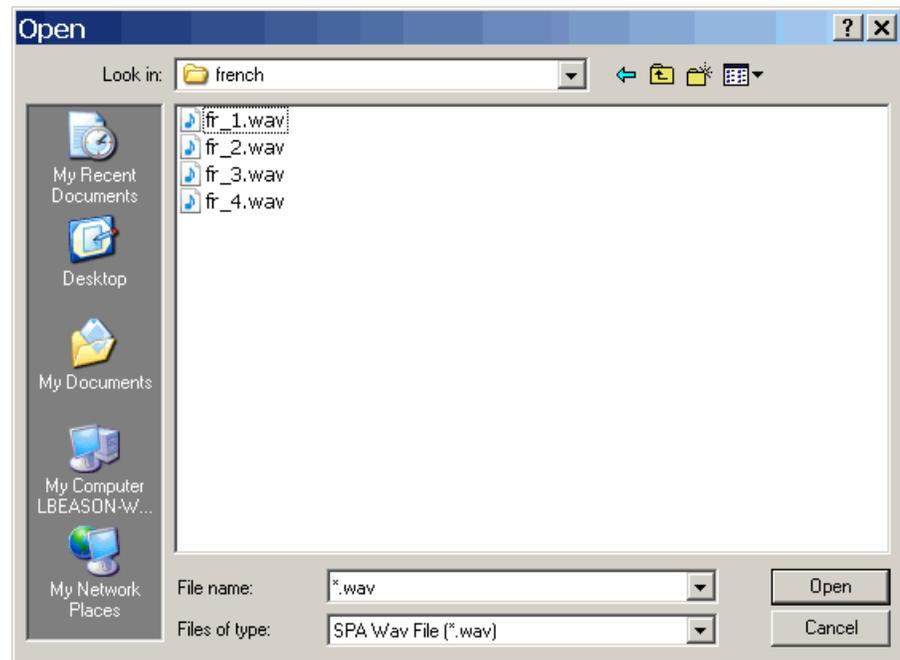
> **NOTE** If you want to use a custom recording, navigate to the folder where you have stored the recordings, and then select the WAV file. Custom prompts must be WAV files in G.711u format and must not exceed 60 seconds in length. Alternatively, you can record custom prompts by using the IVR. See "Configuring the Auto Attendant," on page 117.

    c. Repeat this step for each prompt that you want to change.

STEP 2 Click **Next** to display the Download Client Dictionary page.

> **NOTE** If you select a file in error, you can click **Clear All** to clear all custom prompts from the page. In this case, the default English prompts are used.

STEP 3 Click **Next** to display the Submit Confirmation page.
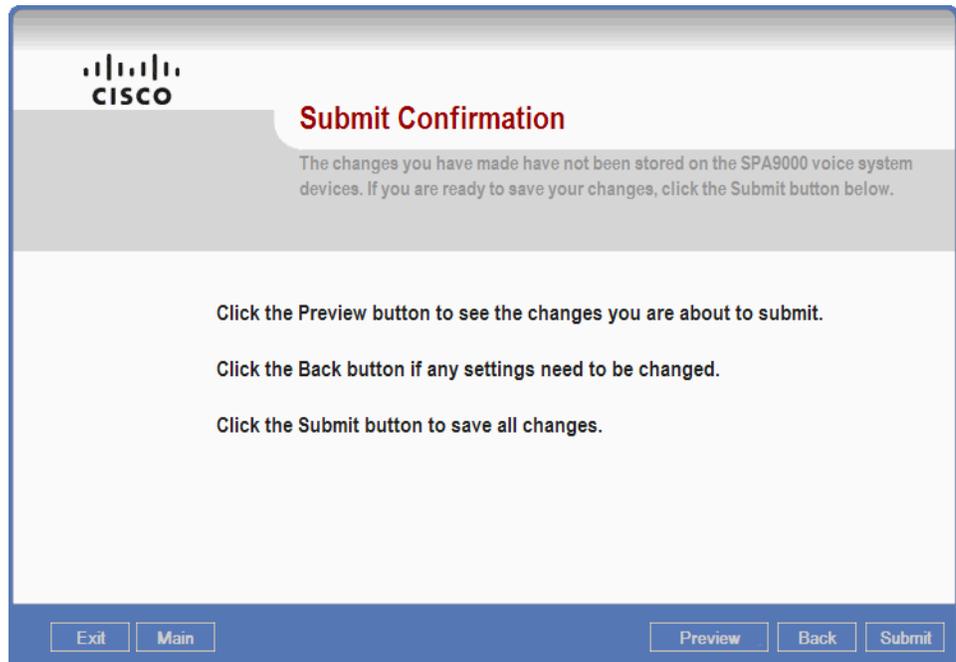
STEP 4 Click **Submit** to submit the configuration changes to the SPA9000 and to the SPA400.

A series of messages appear, as the Wizard connects to the device and submits the configuration changes. The Wizard restarts the SPA400 after it has successfully set the configuration.

STEP 5 Click **OK** when the *Submit Succeeded* message appears.

The Main Menu appears.

Configuring Client Stations

The Wizard guides you through the process of configuring the client stations.

STEP 1   From the Main Menu, click **Configure Client Stations**.
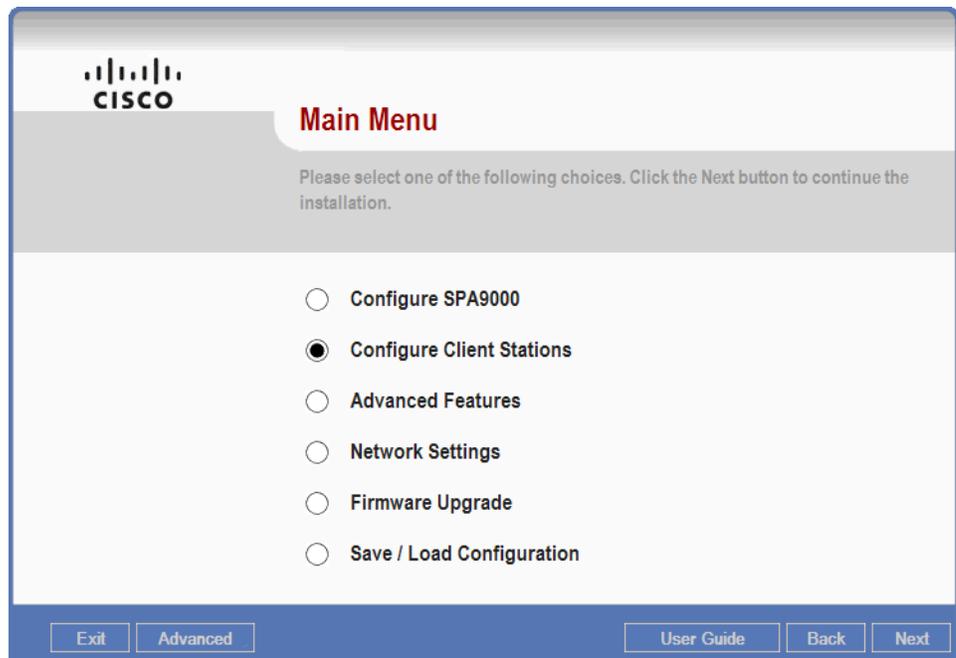
STEP 2   Click **Next** to display the Configure the SPA9xx IP Phone page.
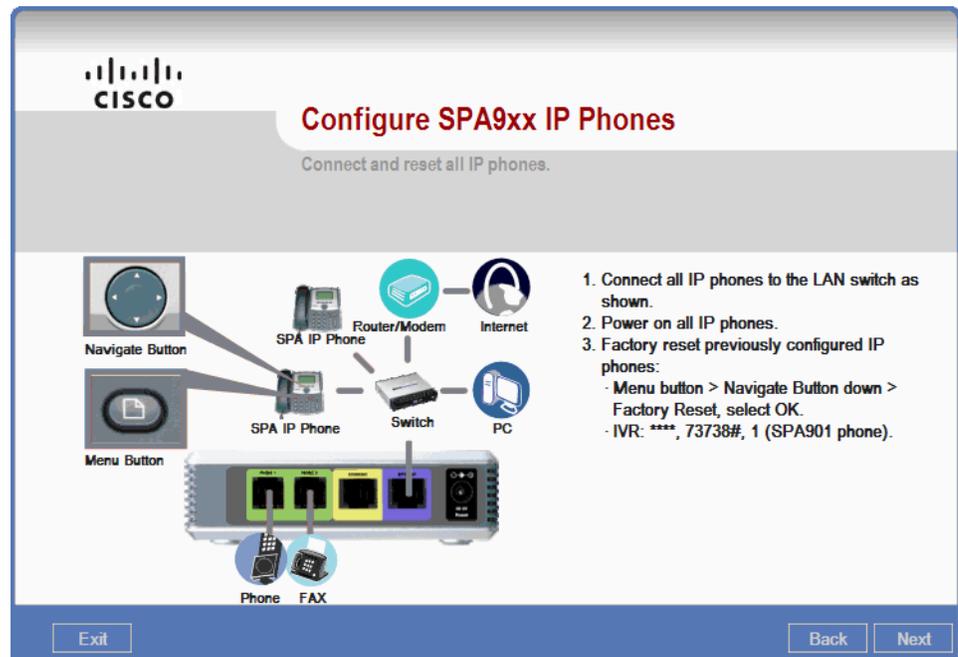
STEP 3 Connect the SPA9x2 phones to PoE ports on your network switch. Connect the WAN port on the phone to the network cable that connects to your switch. You can connect your computer to the PC port on the phone if you only have one network connection in your office.

NOTE If you are using a non-PoE switch, connect PA100 power adapters to the phones to provide power from a wall outlet.

The phones will display the following messages:

- Initializing network

- Checking DNS

The phone's buttons will change appearance as the installation progresses:

- Flashing orange

- Shining solid orange (indicating that the phone cannot properly communicate with the SPA9000 at this time)

NOTE   If any SPA9x2 phone was previously configured for use with a SPA9000, reset the phone to the factory default settings. Press the Setup button [icon] . Dial **14** for Factory Reset. When the confirmation message appears, press **ok** on the phone display to reset the phone.

STEP 4   If you are installing a WIP310 wireless phone, power on the WIP310 and configure it for your wireless IP network, as described in the *Cisco Wireless-G IP Phone User Guide*.

NOTE   If any WIP310 was previously configured for use with a SPA9000 device, reset the phone to the factory default settings. From the Home screen, press the **Select** button to choose the Settings icon. Press the **Select** button again to open the Settings menu. Use the **Up** or **Down** arrow key to scroll to Factory Reset. Press the **Select** button. Under Phone Reset, press the Right arrow key to choose Yes. Press the Select button (check mark icon). When the confirmation message appears, press the Select button (check mark icon).

STEP 5   Click **Next** to display the Configure Client Station page.

Configuring a Client Station

The Configure Client Station - Select an IP Phone page appears after you click the Next button on the Configure the SPA9xx IP Phone page. You can assign an extension to the telephone. On the SPA942 and SPA962, you also can configure the line keys for shared line appearances (SLA), Busy Lamp Field (BLF), Speed Dial (SD), and Call Pickup (CP).

STEP 1   Click **Refresh List** to cause the Wizard to search for recently added phones.

STEP 2   From the **Current Phone** list, choose the MAC address of the first phone that you want to configure, and then click **Next** to cause the Wizard to connect to the phone.

- As you go through these steps, refer to your list of phones, extensions, and MAC addresses in order to assign each phone to its associated owner.

- After you choose a phone from the list and click the Next button, the Wizard verifies that the selected device passes the minimum firmware version requirement. If outdated firmware is detected, a message appears. You must upgrade the firmware if this message appears. See "Upgrading the Phone Firmware (If Prompted)," on page 93.
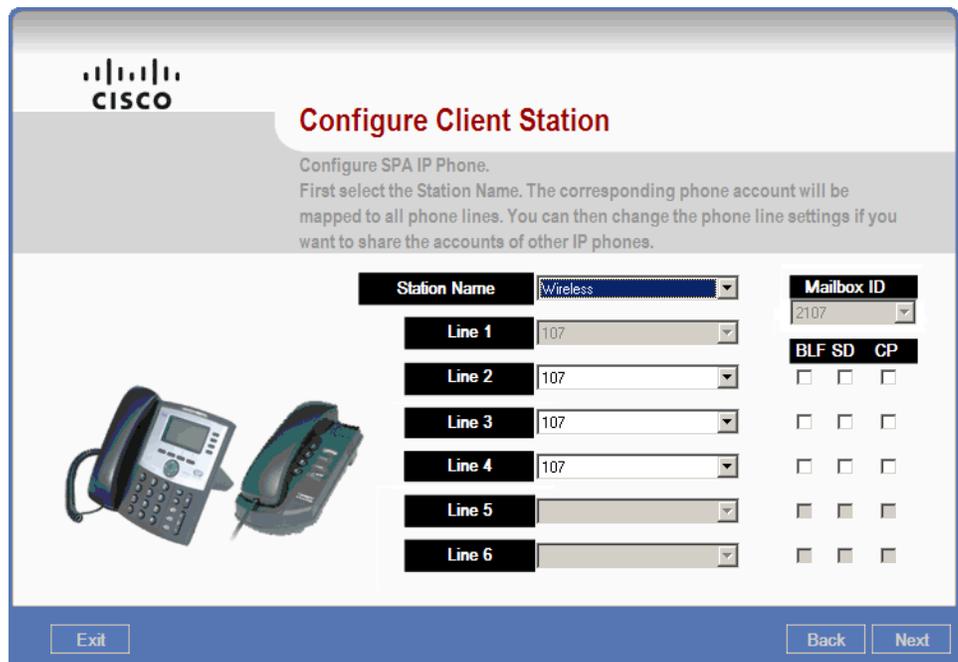
STEP 3   From the **Station Name** drop-down list, choose the correct name for the selected device.

NOTE   If you do not need to configure the line keys, or if you are configuring a phone other than SPA942/962, choose a Station Name and then click **Next**. Continue with the procedure "Installing a Localized Client Dictionary for a Client Station," on page 88.

STEP 4   As needed, configure each Line button (numbered Line 1, Line 2, Line 3, and so on, depending on the phone model).

- **SLA:** For a Shared Line Appearance, choose a station from the drop-down list. Do not check any of the check boxes on the right side of the page. Refer to the following illustration and description.

In this example, a station is configured with the name Sales2. Line 2 is configured with a Shared Line Appearance for a station named Sales1. After these settings are submitted, the button will display the name of the selected station, Sales1. When an incoming call is directed to Sales1, both phones will ring, and Line 2 on Sales2 will flash red. The user at Sales1 can answer the call normally, or the user at Sales2 can answer the call by pressing the Line 2 button. If the call is answered and put on hold, it can be resumed from either Sales1 or Sales2.

- **BLF**: For a a Busy Lamp Field button, choose a station from the drop-down list, and check the **BLF** box.

  - A Busy Lamp Field button is used to monitor calls on another station. The button displays the name of the station that is being monitored. The LED indicates the line status:

    - Red: Busy

    - Red Fast Blink: Ringing

    - Amber: Failed to subscribe (received 4xx response)

    - Amber Slow Blink: Undefined (may be no response to subscribe, or BLF not specified)

  - To enable Call Pickup for the line, check the **CP** box. The user can press the button to answer a call that is ringing on the other station.

    NOTE Call Pickup is available only if BLF also is enabled.

- **SD**: For a Speed Dial button, check the **SD** box.

    - This feature can be used alone or in combination with BLF.

    - The button will display the name of the other station. The user can press the button to place a call to the other station.

STEP 5   Click **Next** to display the Download Client Dictionary page.

Installing a Localized Client Dictionary for a Client Station

The Download Client Dictionary page appears after you click the Next button on the Configure Client Station - Select an IP Phone page. The Wizard automatically chooses a file based on your location, but you can choose other language files if needed.

NOTE   This feature does not apply to the WIP310 phone.

STEP 1   To change the selected language, click the **Browse** button next to the **Reference Dictionary File** field. The available dictionary files appear in the Open window.
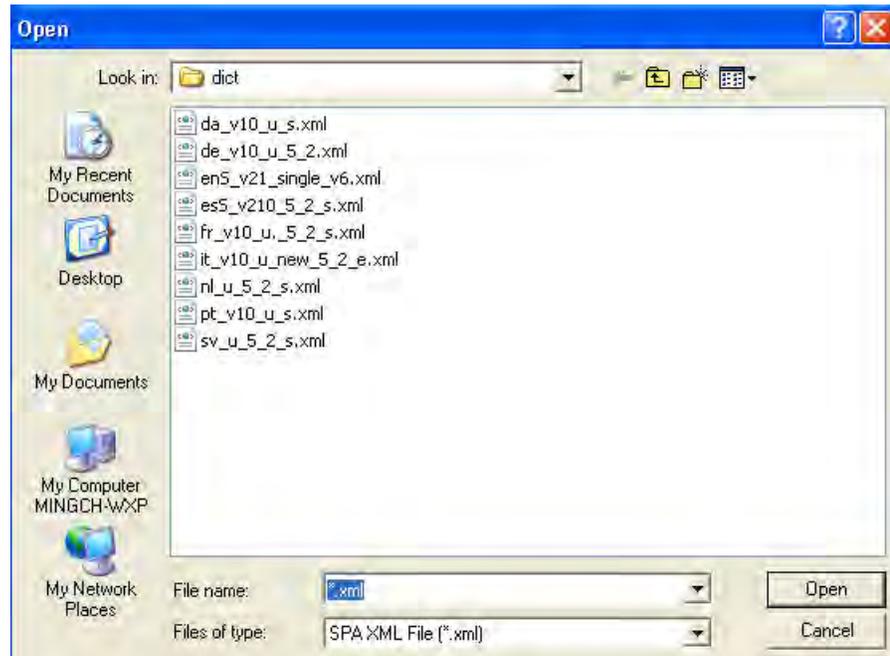
STEP 2   Click the file that you want, and then click **Open**.

To choose the appropriate file, look for the language code at the beginning of the file name (based on ISO-639-1):

de	German
da	Danish
en	English
es	Spanish
fr	French
it	Italian
nl	Dutch
pt	Portuguese
sv	Swedish

The selected file appears on the page.

STEP 3 Select the language from the **Language** drop-down list.

NOTE If you select a file in error, you can click **Reset** to revert to the default selection, English.

STEP 4 Click **Next** to display the Background Picture and Screen Saver page.

Choosing a Background Picture and Screen Saver

The Background Picture and Screen Saver page appears after you click the Next button on the Download Client Dictionary page. You can use this page to select a screen background image for the SPA942 and SPA962. You also can choose screen saver options.

STEP 1   Choose the background picture settings:

- Background Image Enable: Choose **None** to use no image, **Default** to use the default image, or **Custom** to use an image that you will upload.

  NOTE   The default image for SPA942 is a blank image.

- Custom Background Image: Click **Browse** to upload any BMP, JPEG, TIFF, GIF or PNG file. After you complete the steps in the Wizard, a BMP version of the file will be stored in the C:\linksys\img folder.

  - The SPA942 can display a 128x48 image without resizing. Simple black-and-white images are recommended. Color images can be used but will be rendered with black pixels.

  - The SPA962 can display a 320x240 pixel image without resizing; however, the top 30 pixels of the image are covered by the date/time header.

  - If you upload an image that is smaller than the display space, the image will be aligned in the top left corner of the phone display.

  - If you upload a larger image with an aspect ratio that differs significantly from that of the LCD screen, a message appears. You can choose to crop the image or to add Pillar Box or Letter Box borders to maintain the required aspect ratio.

STEP 2   Choose the screen saver settings:

- Screen Saver Enable: Click **Yes** to enable the screen saver or click **No** to disable the screen saver.

- Screen Saver Timer: Enter the number of seconds of inactivity that will trigger the screen saver to appear.

- Screen Saver Icon: From the drop-down list, choose the type of screen saver to display when the screen saver is triggered by the timer.

  - Background Picture: The selected background picture appears as the screen saver. To use this option, the Background Picture field must be set to either Default or Custom. In the case of Custom, you must first upload a custom background picture as described above.

  - Station Time: The current time appears in black type in the center of the phone display.

- Lock: A lock icon jumps across the background image.

- Phone: A blue phone icon jumps across the background image.

- Date Time: The current date and time appear in black type in the center of the phone display.

STEP 3 Click **Next** to display the Configure Client Station confirmation page.

Submitting the Client Station Settings

The Submit Confirmation screen appears after you finish configuring the features that are available for the selected phone.
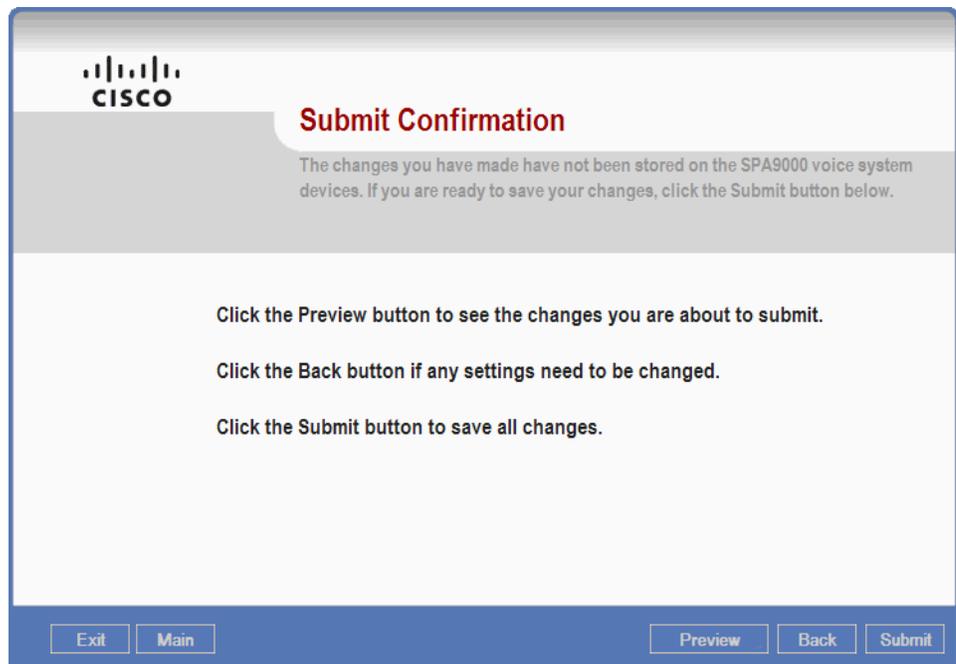
STEP 1 Click **Submit** to send the configuration to the selected phone. The selected phone reboots and reinitializes.

STEP 2 Wait a the progress messages appear on the PC screen.

STEP 3 Click **OK** when the *Submit Succeeded* message appears. The Configure Client Station - Configure Another IP Phone page appears.
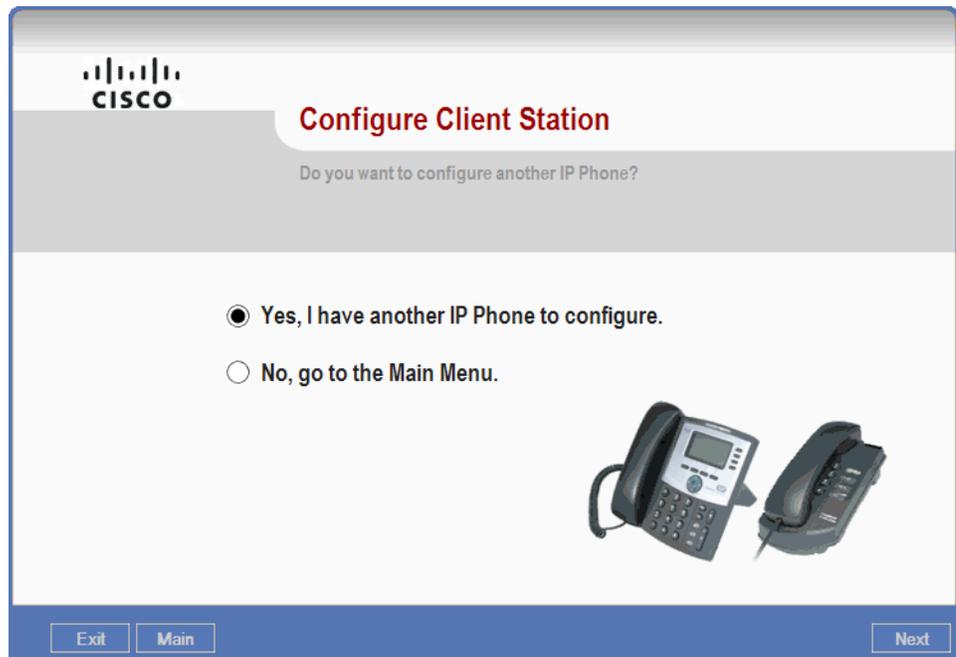
STEP 4   Click **Yes** to configure another phone, or click **No** if you want to go to the Main Menu. Then click **Next**.

Congratulations! You have now completed basic configuration of your IP PBX optional voice mail, and all phones. Click **Exit** to exit the Wizard.

Upgrading the Phone Firmware (If Prompted)

The Wizard verifies that each phone passes the minimum firmware version requirement and notifies you in the event that outdated firmware is detected.

Complete this procedure if the following message appears: *Firmware upgrade is required!*

You must upgrade the firmware if this message appears. If you press cancel instead of selecting a valid version of firmware for the device, an error message appears.

STEP 1   Click **OK** to navigate to the current version of SPA9xx firmware (SPA962 in this example) that you downloaded.

STEP 2   Select the *spa9xx-xxx.bin* firmware file, and then click **Open**.

After you click **OK** to upgrade, a confirmation message appears, confirming the old version number and the new version to be installed.

STEP 3   Click **OK** to begin the upgrade process. A series of progress messages appear as the Wizard upgrades the firmware.

STEP 4   Click **OK** when the *Upgrade Succeeded* message appears. The Configure Client Station - Configure SPA IP Phone page appears.

STEP 5   Continue with .

Localizing the SPA400 Voice Mail Prompts (Optional)

By default, English language sound files are provided on the SPA400 USB drive. You can localize the voice mail prompts to use languages other than English.

STEP 1   Download the necessary language files from Cisco Partner Central, Voice & Conferencing page, Technical Resources section, using the following URL: www.cisco.com/web/partners/sell/smb/products/ voice_and_conferencing.html#~vc_technical_resources.

STEP 2   Extract the files:

a.   Use WinZip to open the sounds.zip file.

b.   Click **Extract** on WinZip toolbar.

c.   Select the Desktop or other temporary destination, select the **Use folder names** check box, and then click **Extract**.

A progress bar appears as the files are extracted. The Sounds folder appears in the selected location.

STEP 3   Move the files to the SPA400 USB drive to replace the existing voice prompts:

a.   Power off the SPA400 by removing the power cord, and then remove the USB drive.

b.   Insert the SPA400 USB drive into a USB port on the PC where you extracted the files.

c. When the *USB Disk* window appears, click **Open folder to view files using Windows Explorer**, and then click **OK**. The USB drive contains the *spa400vm* folder.

> **NOTE** If the *USB Disk* window does not appear, use Windows Explorer to navigate to the USB disk drive (usually Drive E).

d. Open *spa400vm\var\lib*. The window displays the *lib* contents, including the *sounds* folder.

e. If desired, make a backup copy of the existing *sounds* folder.

> **NOTE** You are not overwriting any user message files in this procedure. However, it is a good practice to make a backup copy of your files before doing any upgrades.

f. Move the new *sounds* folder into *spa400vm\var\lib* on the USB drive. When the *Confirm Folder Replace* window appears, click **Yes to All**.

g. Safely remove the USB drive from the PC, and then insert it into the SPA400.

h. Power on the SPA400.

STEP 4 Place a test call to the voice mail system to confirm that the new language prompts are used.

Testing Your SPA9000 Voice System

5

Verify that you can successfully perform the following tasks in order to complete your installation.

NOTE Refer to the *SPA IP Phone User Guide* for more information about placing calls from your phone.

STEP 1 Make and answer extension-to-extension calls. For example, use station 21 to place a call to station 22.

STEP 2 Make outbound calls. Remember to start the dial sequence with an appropriate steering digit. Perform these tests for all configured steering digits.

STEP 3 Dial a local 7-digit number, such as 555-1212.

STEP 4 Dial a 10-digit number, such as 361-555-1212.

STEP 5 Dial a 10-digit number, prefaced with a 1, such as 1-361-555-1212.

STEP 6 Dial directory services, such as 411.

STEP 7 Answer inbound calls.

STEP 8 Access voice mail.

Congratulations! You have now completed basic testing of your SPA9000 Voice System.

6

Maintaining Your SPA9000 Voice System

This chapter explains how to use the Wizard to manage your system and to ensure that it meets the changing needs of your business.

You can edit any of the settings that you configured during the initial installation. You can change your Internet phone service, expand your PSTN or ISDN gateways, and add or remove phones. You can reconfigure your Auto Attendant with new menu options, and reorganize your hunt groups. You also can use the Wizard to upgrade firmware and to back up and restore all device configurations.

Refer to the following topics:

Using the Main Menu

You can display the Main Menu by clicking **Main** near the lower left corner of the Wizard. You also can display the Main Menu by selecting the second option on the SPA9000 Installation page: *I have configured the SPA9000 using the Wizard before.*
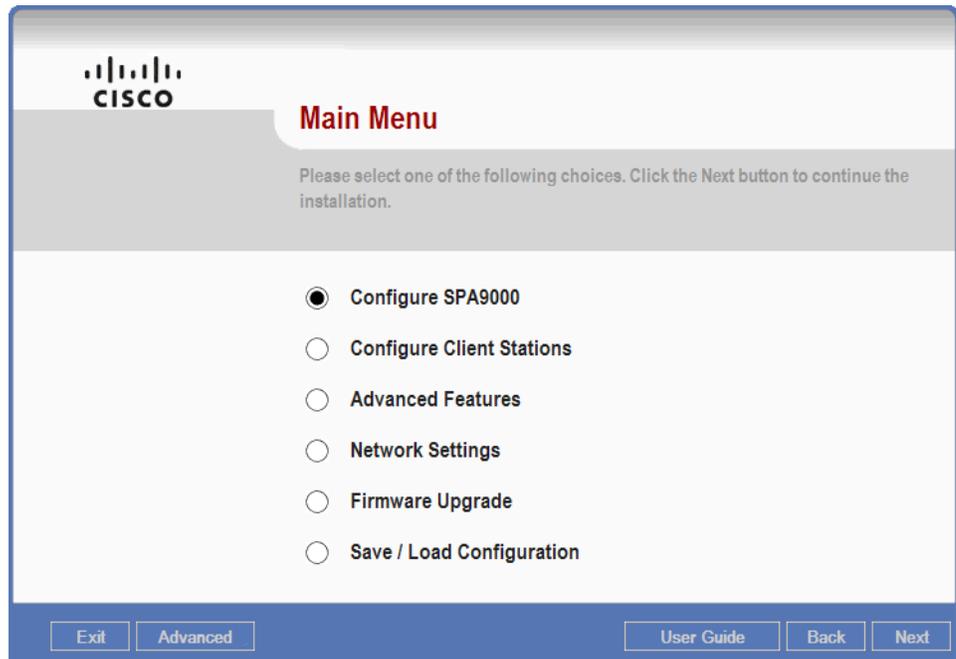
The Main Menu provides access to the following functions:

- **Configure SPA9000:** Choose this option to configure SPA9000 Voice Services. The Wizard expects you to use up to one ITSP, up to 4 SPA400s, or up to 4 Mediatrix® devices. An ITSP must be associated with Line 1 of the SPA9000. SPA400s and Mediatrix devices can be associated with any line. After selecting the voice service for a line, you can click Next to configure features such as steering digits and inbound call routing.

  NOTE Configuration of ITSP and SPA400 voice services are described in "Configuring SPA9000 Voice Service Lines," on page 63. Configuration of Mediatrix services is described in "Configuring ISDN Connectivity," on page 103

- **Configure Client Stations:** Choose this option to associate phones with extensions, to configure shared line appearances, or to load language dictionaries to phones. These procedures are described in "Configuring the Internal Phone Extensions," on page 69.

- **Advanced Features:** Choose this option to configure NAT settings, client extensions, hunt groups, Auto Attendant, localization, administrative passwords, and the SPA932 attendant console. These procedures are described in "Using the Advanced Features Menu," on page 111.

- **Network Settings:** Choose this option to configure dynamic or static IP addresses and to define DNS entries. These procedures are described in "Configuring a Static IP Address on the SPA9000 (If Prompted)," on page 59.

- **Firmware Upgrade:** Choose this option to upgrade the firmware on the SPA devices. These procedures are described in "Upgrading the Firmware," on page 100.

- **Save / Load Configuration:** Choose this option to backup and restore your SPA9000 Voice System configuration. These procedures are described in "Backing Up and Restoring Device Configurations," on page 106.

Upgrading the Firmware

Use the Firmware Upgrade feature to upgrade the firmware on all devices.

NOTE The Wizard uses the firmware files that are stored in its root directory. If you download new firmware from www.cisco.com/go/smallbiz, you should store it in this location for easy installation with the Wizard.

STEP 1   From the Main Menu, choose **Firmware Upgrade**, and then click **Next**.

STEP 2   If you have SPA400 devices in the network, click **Yes** when the *Do you have SPA400 devices* message appears. If not, click **No**.

STEP 3   Wait while the Wizard displays progress messages and discovers the SPA400 devices.

STEP 4   From the **Device** drop-down list, choose one device to upgrade or choose **All devices**.
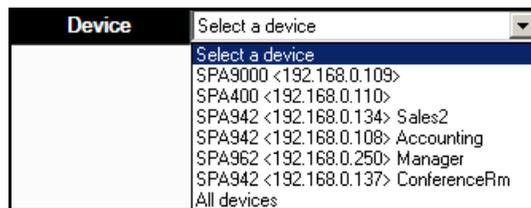
STEP 5   Click **Next**.

STEP 6   Wait while the Wizard displays progress messages and retrieves the latest configuration information.

The Firmware Upgrade for Devices page identifies the current firmware version and the version that is available in the Wizard files.

STEP 7 Check the box to select a device, or uncheck the box if you do not want to upgrade the device. Refer to the following example.

☑	Device	Current Version	New Version
☐	SPA9000	6.1.5	6.1.5
☐	SPA400	1.1.2.2	1.1.2.2
☑	SPA-942	6.1.2	6.1.3
☑	SPA-942	6.1.2	6.1.3
☑	SPA-962	5.2.9(0714h)	6.1.3
☑	SPA-942	5.2.9(0714h)	6.1.3
☐			
☐			
☐			

- The Wizard automatically selects a device if newer firmware is available in the Wizard files.

- When you are using the All devices option, you can manually check or uncheck individual devices, or use the check box in the heading row to check or uncheck all devices.

STEP 8 Click **Upgrade** to upgrade the selected devices.

STEP 9 Wait while the Wizard displays progress messages.

The Wizard sends upgrade requests, copies the firmware from the ~\Wizard\ directory to the C:\linksys\firmwaredb\ directory, and loads the new firmware to each device. Messages also appear on the phone screen as the phone firmware is upgraded. Do not disconnect or remove power from any device during this time.

STEP 10 Click **OK** when the *Upgrade Succeeded* message appears.

The Firmware Upgrade - Options page appears.
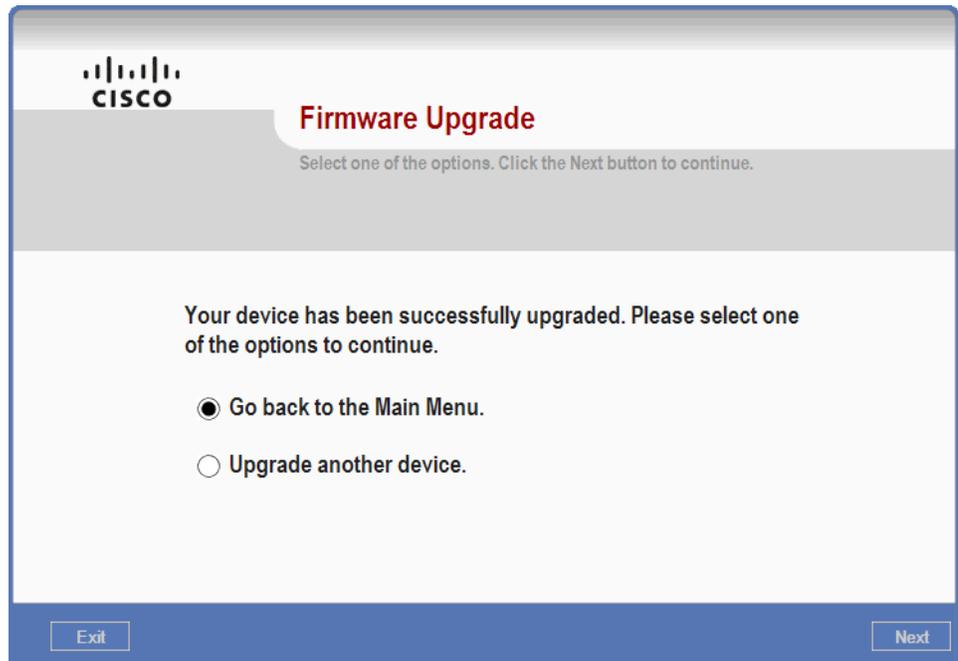
STEP 11 Choose the appropriate option, and then click **Next**.

Configuring ISDN Connectivity

This procedure explains how to configure your SPA9000 to interoperate with a Mediatrix® device.

STEP 1 From the Main Menu, choose **Configure SPA9000**, and then click **Next**.

STEP 2 Choose **Mediatrix** from the drop-down list associated with a SPA9000 line that you want to configure. The example shows Mediatrix on the Line 2 interface.
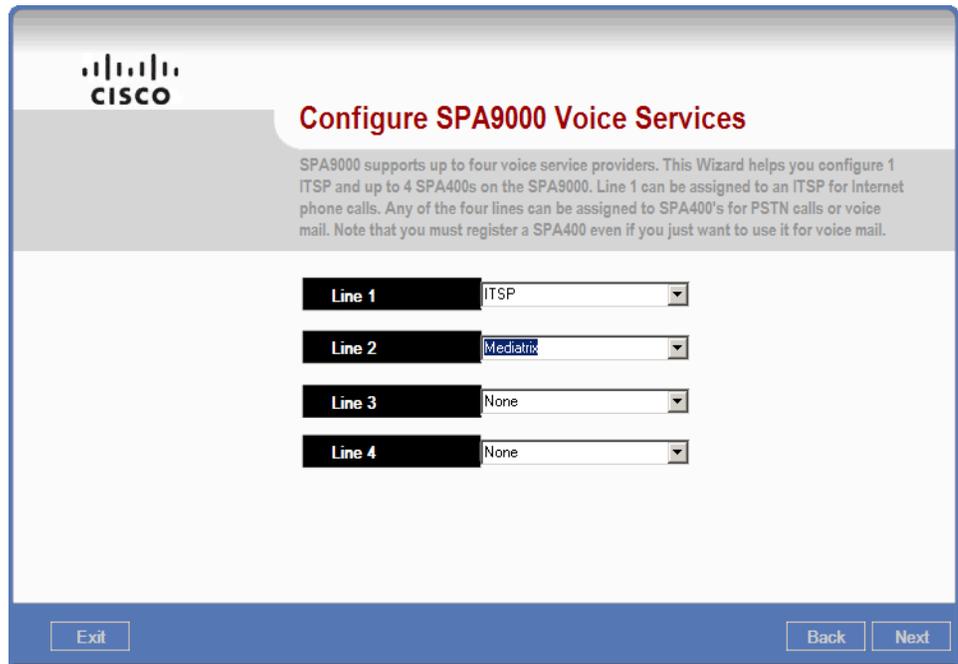
STEP 3   Click **Next** to display the Configure SPA9000 ITSP Voice Service page.
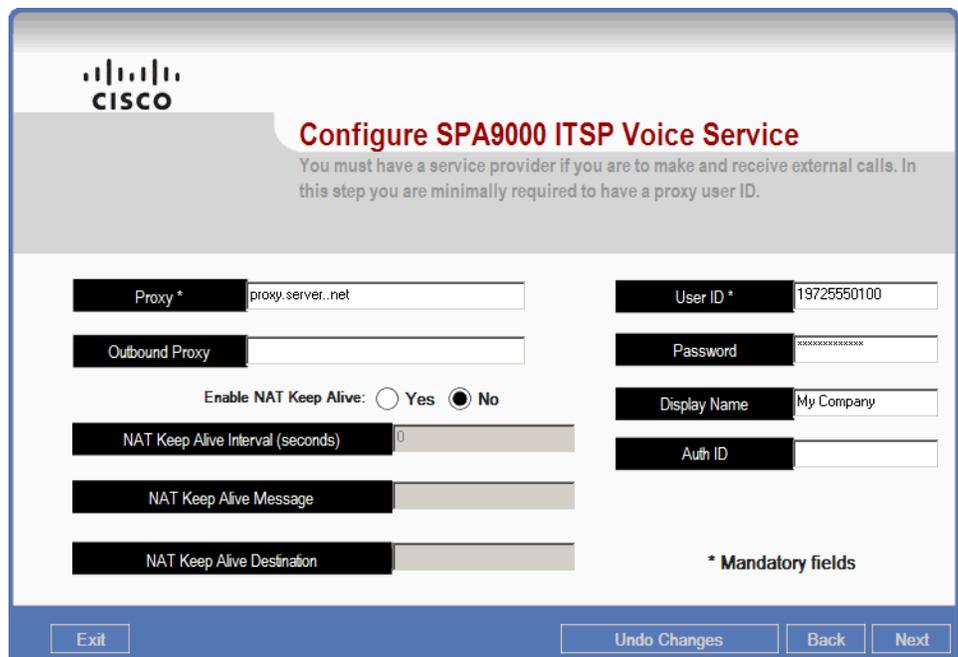
This page displays the ITSP information that you entered previously. No changes are required on this page.

STEP 4   Click **Next** to display the Configure Mediatrix page.
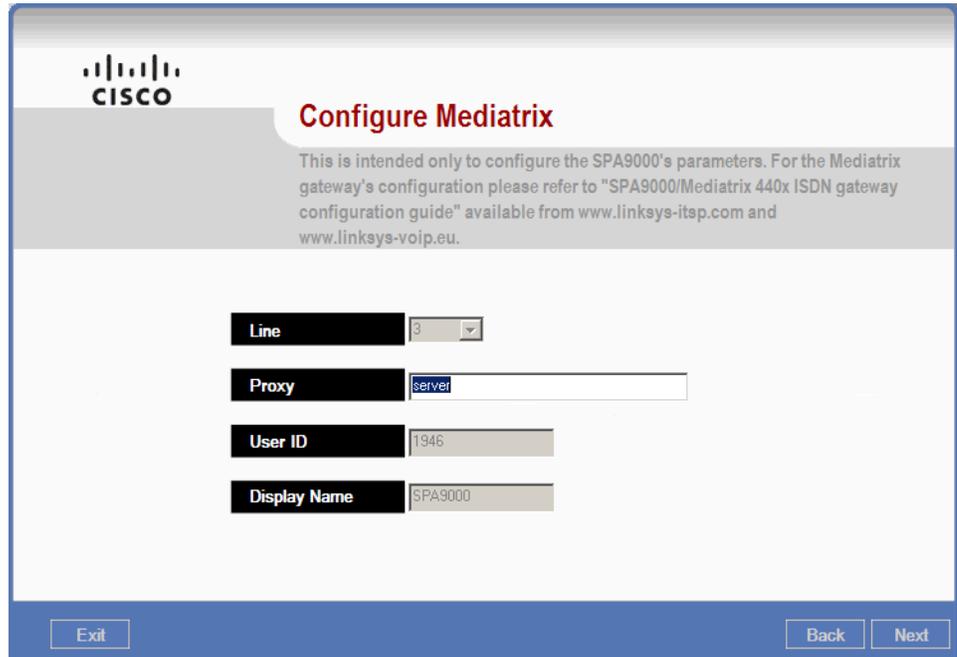
STEP 5 Enter the IP address of the Mediatrix device in the **Proxy** field.

STEP 6 Click **Next** to continue through each of the remaining SPA9000 configuration pages. No other changes should be needed at this point.

STEP 7 When the Submit Confirmation page appears, click **Submit** to save your changes.
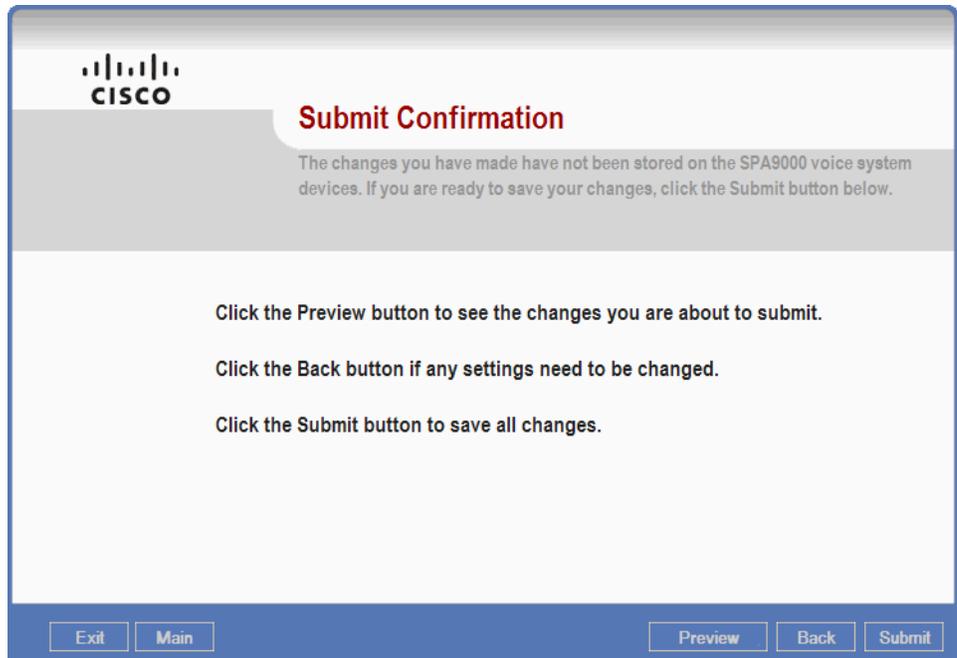
STEP 8 Wait while the wizard displays progress messages and reboots the phones.

STEP 9 Click **OK** when the *Submit Succeeded* message appears.

> **NOTE** To complete the Mediatrix configuration please see the *Mediatrix Configuration Guide*, which can be downloaded from Cisco Partner Central at www.cisco.com/web/partners/sell/smb/.

Backing Up and Restoring Device Configurations

The Wizard makes it easy to back up and restore device configurations. You can perform the following tasks:

- "Backing Up the Device Configurations," on page 106
- "Restoring a Previous Configuration to a Device," on page 108

Backing Up the Device Configurations

It is a good practice to save all device configurations before you make any configuration change. Later, if problems occur or if the changes are not accepted by the users, you can load the saved configurations to restore the previous device settings.

STEP 1 From the Main Menu, click **Save / Load Configuration**, and then click **Next**.

STEP 2 Wait while the Wizard displays progress messages and discovers the connected devices.

The Save/Load Configuration page appears.
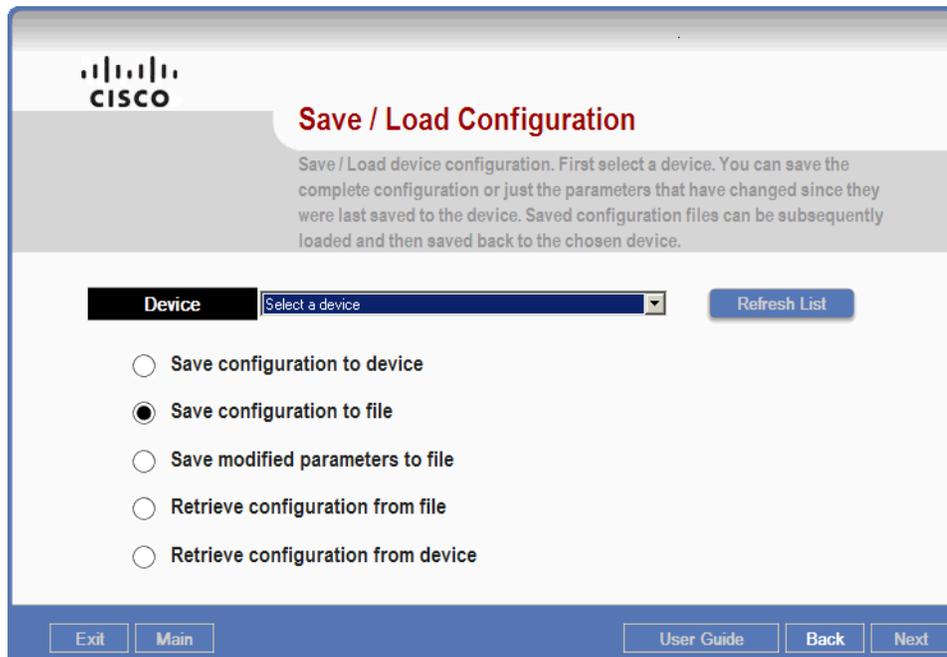
STEP 3   From the **Device** drop-down list, choose a particular device or choose **All devices** (recommended).

STEP 4   Select **Save Configuration to file.**

STEP 5   Click **Next** to continue.

The Wizard displays a message. The file will be saved in a new sub-directory of the Wizard directory. The directory is named in the following format:
PBX*<mac address>-<month>-<day>-<year>-<hour>-<minute>*
EXAMPLE: PBX000E08E1BA69-07-25-2008-14-28
In this example, the MAC address is 000E08E1BA69, the date is July 25, 2008, and the time is 2:28 p.m.

STEP 6   Click **OK** to close the message.

STEP 7 Wait as the Wizard displays progress messages and saves the files.

The Wizard displays a message listing all of the files that were added to the new sub-directory.

STEP 8 Click **OK** to close the message.

TIP You can create a directory called backups and copy all backup files to this directory. Sort the displayed files by name to view all backup files per device.

Restoring a Previous Configuration to a Device

Follow this procedure to retrieve a configuration from a backup file and to save it to the device.

STEP 1 From the Main Menu, choose **Save / Load Configuration**, and then click **Next**.

STEP 2 From the **Device** drop-down list, choose the device.

STEP 3 Select **Retrieve configuration from file**.

STEP 4 Click **Next** to select the backup file.

The Wizard displays the contents of the Wizard directory.
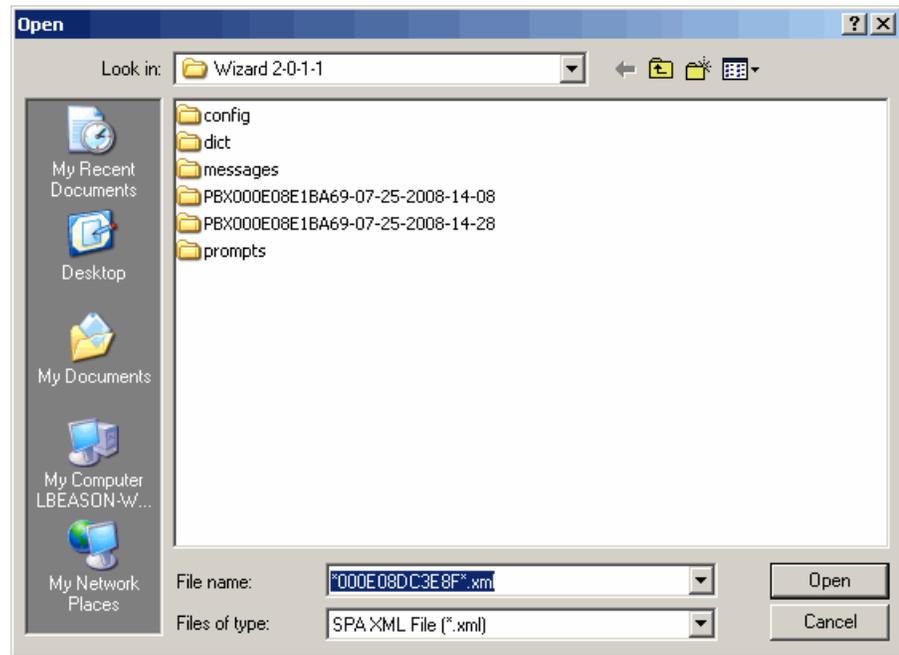
STEP 5 Open the folder that identifies the date of the configuration that you want to restore.

The folders are named in the following format: PBX*<mac address>-<month>-<day>-<year>-<hour>-<minute>*. Disregard the MAC address at this point. Look for the date, near the middle of the folder name.
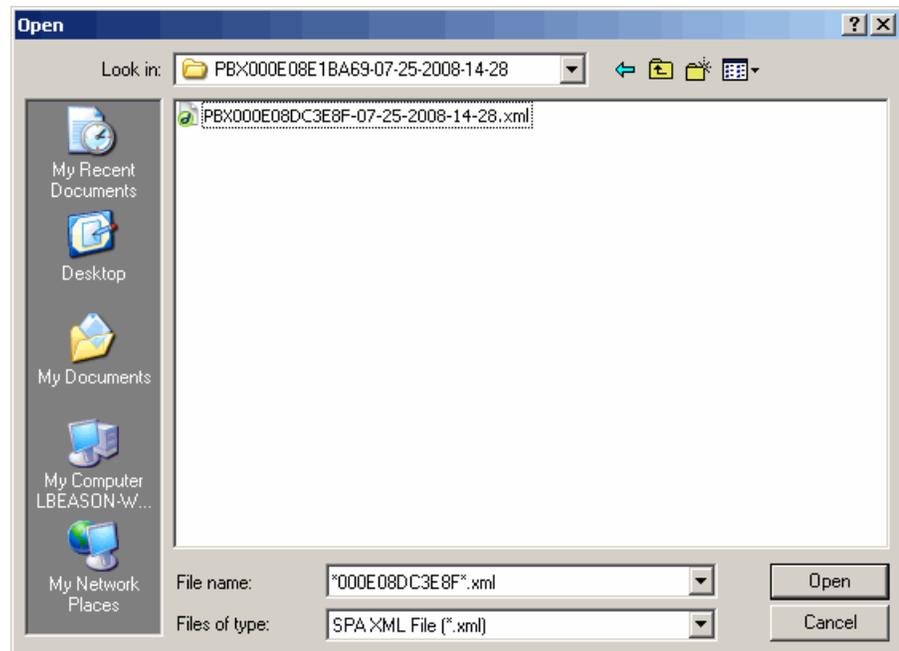
STEP 6   Select the file, and then click **Open.**

STEP 7   Click **OK** when the *Load Succeeded* message appears.

STEP 8   Click **Save configuration to device.**
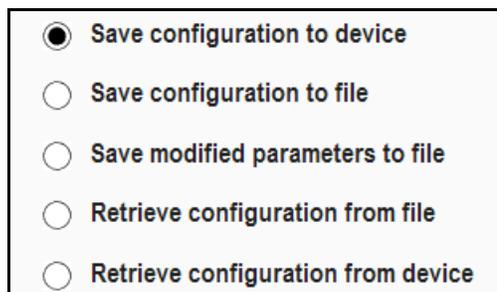
- ● Save configuration to device
- ○ Save configuration to file
- ○ Save modified parameters to file
- ○ Retrieve configuration from file
- ○ Retrieve configuration from device

STEP 9   Click **Next** to preview the parameters that will be set on the device.

TIP   This is a good time to verify that you selected the appropriate backup file by scrolling through the preview.

STEP 10 Click **OK** to close the dialog box and to submit the configuration to the device.

STEP 11 Wait while the Wizard displays progress messages and reboots the device.

STEP 12 Click **OK** when the *Save Succeeded* message appears. The device configuration is now restored.

Using the Advanced Features Menu

The Advanced Feature Menu helps you to update the device configurations. You can display this menu by selecting **Advanced Features** on the Main Menu.
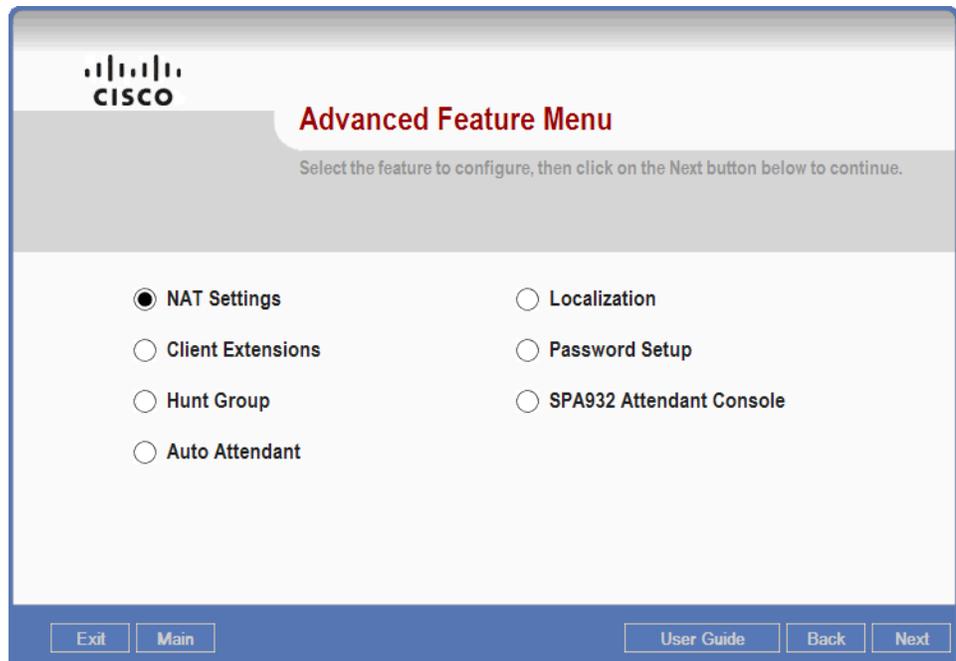
Refer to the following topics:

- "Modifying the NAT Settings," on page 112

- "Assigning Client Extensions," on page 115

- "Managing Hunt Groups," on page 116

- "Configuring the Auto Attendant," on page 117

- "Localizing Your SPA9000 Voice System," on page 127

- "Managing Administrative Passwords," on page 133

- "Configuring the SPA932 Attendant Console," on page 135

Modifying the NAT Settings

The SPA9000 NAT Traversal page helps you to modify the SPA9000 NAT traversal mechanisms. You can find this page under Main Menu > Advanced Features > NAT Settings.

NOTE Modify your NAT settings ONLY with guidance from your ITSP.

Setting an External IP Address (EXT IP)

Configuring NAT mapping in the SPA9000 is recommended only if the ITSP network does not provide a Session Border Controller functionality. In this case, you can set an external (public) IP address to perform a static (permanent) mapping on SPA9000. This solution requires that the following conditions are met:

- The external (public) IP address is static.

- The router uses a symmetric NAT mechanism.

- The LAN switch is configured to enable Spanning Tree Protocol and Port Fast on the ports to which the SPA9000 and the SPA9xx phones are connected. See "Connecting and Configuring the Switch," on page 38.

STEP 1   Enter the public IP address of your router in the **EXT IP** field.

STEP 2   Select **VIA Enable** to cause the SPA9000 to process the received IP address in the VIA header. This value is inserted by the server in response to any requests.

STEP 3   Click **Next** to display the parameters that the Wizard will submit to the SPA9000.
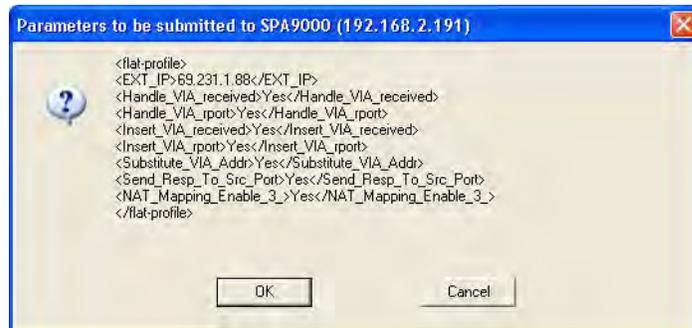
STEP 4   Click **OK** to close the parameter preview window and cause the Wizard to submit the changes to the SPA9000 and reboot it.

Setting the EXT SIP Port

This setting allows you to change the SIP port that the SPA9000 inserts into all outbound SIP messages.

STEP 1   Enter the EXT SIP port number that you need to use, 1096 in this example.

STEP 2   Click **Next** to preview the parameters that the Wizard will send to the SPA9000.

STEP 3   Click **OK** to close the parameter preview dialog box and to cause the Wizard to submit the changes to the SPA9000 and reboot it.

Using a STUN Server

Configuring NAT mapping in the SPA9000 is recommended only if the ITSP network does not provide a Session Border Controller functionality. You can use STUN as a mechanism to discover the NAT mapping in the SPA9000. This solution requires that the following conditions are met:

- The external (Public) IP address is assigned dynamically by the network.

- The router uses an asymmetric NAT mechanism.

CAUTION STUN is considered a method of last resort and should be used only if the other methods are unavailable. STUN is a viable option only if your router uses asymmetric NAT.

STEP 1 Enter the STUN Server's IP address in the **STUN Server** field. Example 69.231.1.88

STEP 2 Click **Next** to preview the parameters the Wizard will send to the SPA9000.

STEP 3 Click **OK** to close the parameter preview dialog box and cause the Wizard to submit the changes to the SPA9000 and reboot it.

Assigning Client Extensions

You can find this page under Main Menu > Advanced Features > Client Extensions. On this page, you can perform the following tasks:

- Assign names and extensions for FXS ports

- Assign names, extension, enable mail, assign mail PIN for each IP phone

NOTE The Client Extensions page is described in "Configuring the Internal Phone Extensions," on page 69.

Managing Hunt Groups

You can find this page under Main Menu > Advanced Features > Hunt Group. You can assign a group name and extension number, specify the hunt type, and choose members.

> **NOTE** The Configure SPA9000 Hunt Groups page is described in "Configuring Hunt Groups (Optional)," on page 73.

To maintain hunt groups:

- Add hunt groups as described in "Configuring Hunt Groups (Optional)," on page 73.

- To edit a hunt group, click the **Edit** button associated with the hunt group.

- To delete a hunt group, click the **Index** check box associated with the hunt group and then click **Delete Hunt Group.**

Configuring the Auto Attendant

You can find this page under Main Menu > Advanced Features > Auto Attendant. You can use the default Auto Attendant script, or you can use the Wizard to implement scripts with customized greetings and call routing.
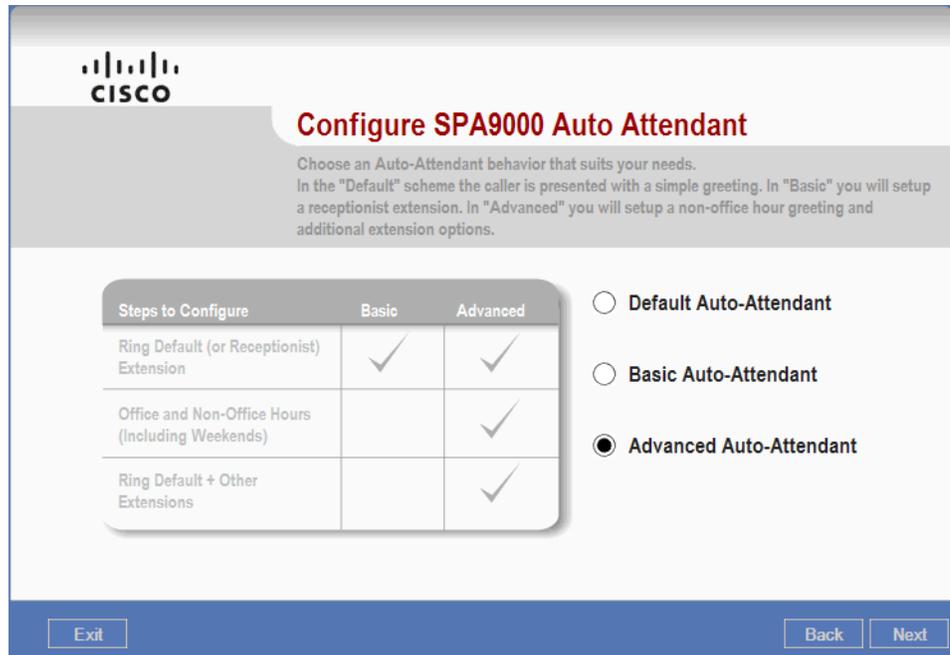
Refer to the following topics:

- "About the AA Script Options," on page 118

- "Preparing to Configure Your AA Script," on page 119

- "Configuring Your AA Script," on page 121

About the AA Script Options

The Wizard provides three AA script options: Default, Basic, and Advanced. The following table will help you to choose which script is best for your business.

Table 1   Comparison of Auto Attendant Scripts

Greetings and Menu Options	Default AA	Basic AA	Advanced AA
You can record your own welcome greeting.	X	X	X
Callers can dial any extension.	X	X	X
Callers also can press 0 for an operator or 1 for a location and hours message.		X	X
Callers also can choose from a menu that includes up to three hunt groups, such as Sales, Service, or Billing.			X
Callers hear a different greeting when the business is closed.			X

Preparing to Configure Your AA Script

Before you configure your AA script, complete the following tasks:

STEP 1 Configure the SPA9000 Call Routing Rule to direct inbound calls to the Auto Attendant. See .

STEP 2 Become familiar with the default greetings that are provided on the SPA9000.

- The default welcome greeting is, "If you know your party's extension, you may enter it now." (Prompt 1)

- The default message for a valid extension number is, "Your call has been forwarded." (Prompt 2)

- The default message for an invalid extension number is, "Not a valid extension, please try again." (Prompt 3)

- The default message when the user presses the pound (#) key is, "Goodbye." (Prompt 4)

- You can add additional messages by using prompts 5 to 7. When you use the Wizard to configure your AA script, you will use prompt 5 for the welcome greeting, prompt 6 for the non-office hours message (Advanced AA only), and prompt 7 for the location and hours message (Basic AA and Advanced AA).

STEP 3 If you plan to create your own greetings, consider your options:

- You can use the SPA9000 Interactive Voice Response (IVR) feature to record your greetings. The Wizard will guide you through this process. You will need to connect an analog phone to the Phone 1 port of the SPA9000.

- You can upload WAV files to use as greetings. Record these files in 8KHz, Mono, G.711u format.

- Each greeting must be less than 60 seconds. The total size of all greetings must be less than 94.5 seconds.

STEP 4 Depending on the type of AA that you plan to use, write your welcome greeting.

- Default AA example: "Thank you for calling <name of company>. You may enter your party's extension or press <extension number> for the receptionist."

NOTE Alternatively, the Default AA script can use the default welcome greeting: "If you know your party's extension, you may enter it now."

- Basic AA example: "Thank you for calling <name of company>. You may enter your party's extension, press 1 for our location and hours, or press 0 for an operator."

> **NOTE** The Basic AA script always supports using 0 for the receptionist and 1 for the location and hours message. If you do not want to make these options available to your callers, do not announce them in your greeting.

- Advanced AA example: "Thank you for calling <name of company>. You may enter your party's extension at any time. Press 1 for our location and office hours. Dial 2 for <hunt group>. Dial 3 for <hunt group>. Dial 4 for <hunt group>. Dial 0 for the receptionist."

> **NOTE** The Advanced AA script always supports using 0 for the receptionist and 1 for the location and hours message. Optionally, you can configure up to three menu options that direct calls to hunt groups, using the digits 2, 3, and 4.

STEP 5 For the Basic AA script or the Advanced AA script, write your location and hours message, such as "Our location is *<street address>*. Our office is open *<days and hours>*."

STEP 6 For the Basic AA and the Advanced AA, choose the extension number that will ring when a caller presses 0.

STEP 7 For the Advanced AA only, choose the hunt groups that will ring when a caller presses 2, 3, or 4. If you have not yet configured your hunt groups, see "Managing Hunt Groups," on page 116.

Configuring Your AA Script

After you choose your AA option and complete the preparations (see "Preparing to Configure Your AA Script," on page 119), you can use the Wizard to configure the AA script.

STEP 1 From the Main Menu of the Wizard, choose **Advanced Features**, and then click **Next**.

STEP 2 From the Advanced Features page, choose **Auto Attendant**, and then click **Next**.

STEP 3 Choose the AA script that you want to configure: **Default**, **Basic**, or **Advanced** (see Table 1, "Comparison of Auto Attendant Scripts," on page 118).

STEP 4 Click **Next** to continue to the next page for the chosen AA script type.

- **Default AA:** The Wizard displays a message asking whether or not you want to customize the welcome greeting.

    - If you want to use the default greeting or a WAV file, click **No**, and then continue to Step 13 on page 125.

    - If you want to record a greeting with the IVR, click **Yes**. On the Configure Default Auto Attendant (AA) Operation page, study the flow chart to understand the operation of the AA script. Then click **Next**. Continue to Step 5 on page 123.

- **Basic AA:** The Configure Basic Auto Attendant (AA) Operation page appears. Study the flow chart to understand the operation of this AA script. From the **Ring Receptionist** drop-down list, choose the extension that will ring when a caller presses 0. Click **Next**, and then continue to Step 5 on page 123.
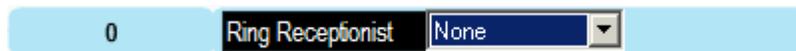
- **Advanced AA:** The Configure Advanced Auto Attendant (AA) Operation page appears. You need to enter the hours of operation.

    a. In the Office Hours section, use the drop-down lists to enter your normal business hours.

    The Wizard uses a 24-hour clock, where 0100 is 1 a.m. and 2400 is 12 midnight. In the following example, the business is open from 1030 (10:30 a.m.) to 2300 (11:00 p.m.).
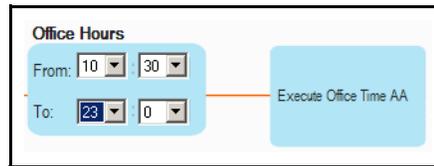
b. In the Weekends and Non-Office Hours section, click the days when the business is closed. In the following example, the business is closed on Sunday and Monday.
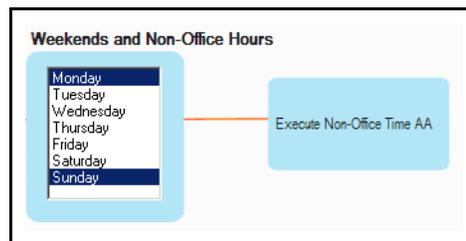
c. Click **Next**.

d. On the Configure Office Hour Auto Attendant (AA) Operation page, choose the menu options that are active when the business is open.
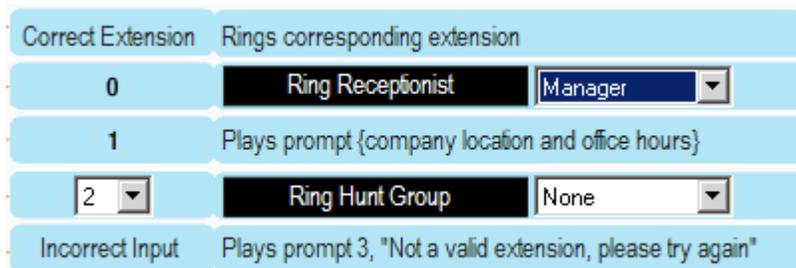
- Ring Receptionist: Choose the extension that rings when a caller presses 0.

- Ring Hunt Group: Choose a number from the first drop-down list, and then choose the hunt group that rings when a caller presses that number. Repeat as needed, to create up to three menu options.

e. Click **Next**.

f. When the Configure Non Office Hours Auto Attendant (AA) Operation page appears, study the flow chart to understand how the AA script works when the business is closed.

g. Click **Next** to display the SPA9000 Auto Attendant Greetings page. Continue to .

STEP 5 (For all script types) On the SPA9000 Auto Attendant Greetings page, read the instructions about using the IVR to record your greetings.

NOTE If you are uploading WAV files instead of recording your greetings with the IVR, click **Next** and continue to .
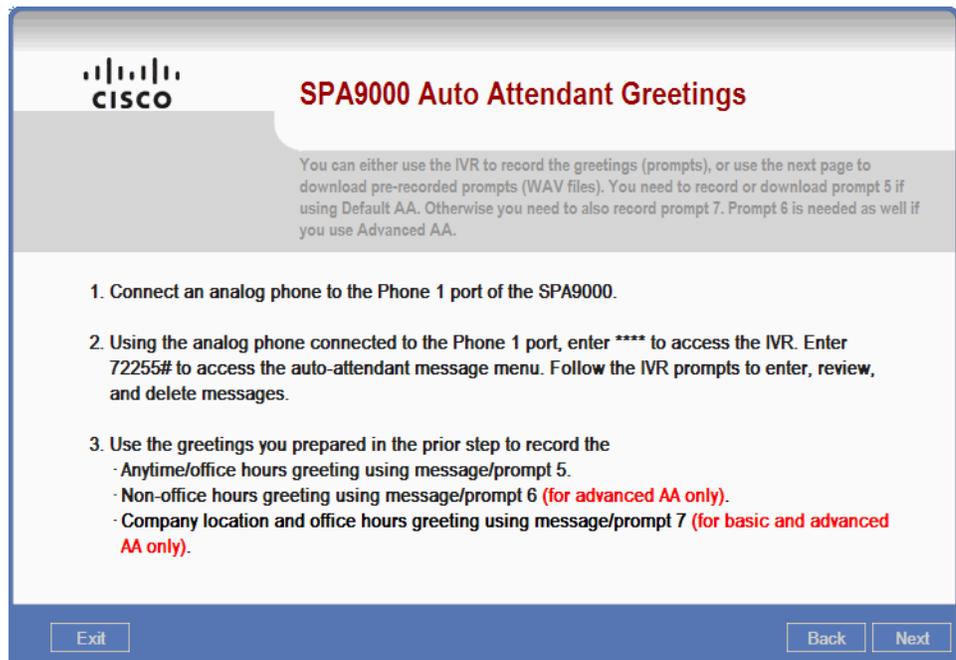
STEP 6 Connect an analog phone to the Phone 1 port of the SPA9000. Lift the receiver and press the asterisk key four times: * * * *

NOTE The IVR does not play a dial tone.

STEP 7 Press **72255#** to manage Auto Attendant messages.

STEP 8 For all AA scripts, record your welcome greeting.

    a. Press **5#** to select Message 5 for your welcome greeting.

    b. Press **1** to record.

    c. Listen to the instructions, and begin speaking after you hear the tone.

    d. Press **#** at the end of your greeting.

    e. Press **1** to save, **2** to review, or **3** to re-enter.

STEP 9 For the Basic AA script and the Advanced AA script, record your location and hours message. If you are not using a location and hours message, continue to .

    a. Press **7#** to select Message 7 for your location and hours message.

    b. Press **1** to record your message.

    c. Listen to the instructions, and begin speaking after you hear the tone.

    d. Press **#** at the end of your message.

    e. Press **1** to save, **2** to review, or **3** to re-enter.

STEP 10 For the Advanced AA script only, record your non-office-hours message.

    a. Press **6#** to select Message 6 for your non-office-hours message.

    b. Press **1** to record your message.

    c. Listen to the instructions, and begin speaking after you hear the tone.

    d. Press **#** at the end of your message.

    e. Press **1** to save, **2** to review, or **3** to re-enter.

STEP 11 Press * to exit. Hang up the receiver. The IVR saves the changes, and the phones reboot.

STEP 12 Click **Next** to display the Download Prompts for SPA9000 Auto Attendant page.
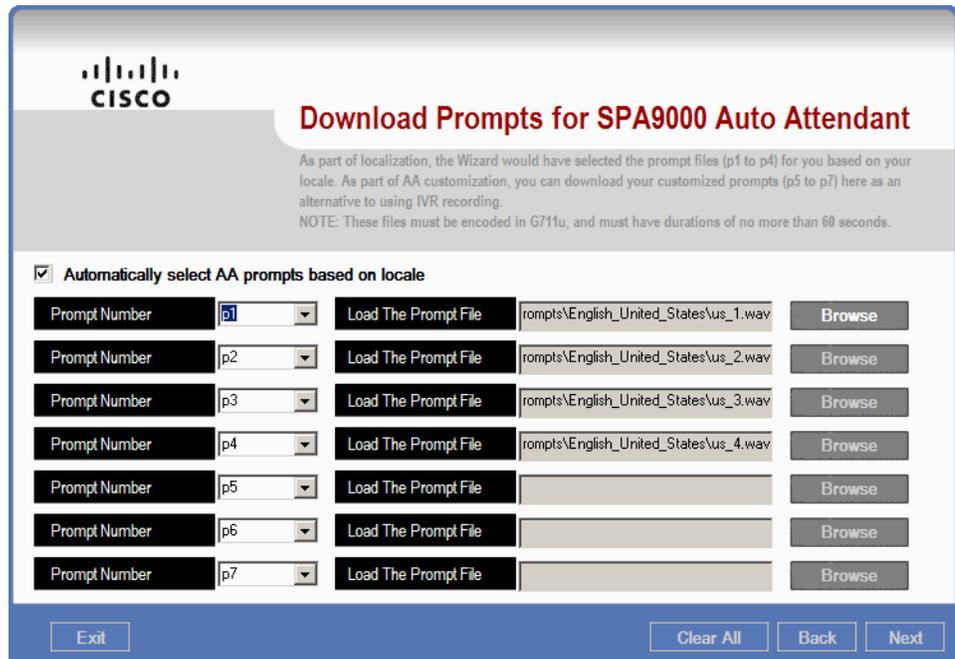
STEP 13 Use this page if you need to upload WAV files to use as greetings.

> **NOTE** If you used the IVR to record greetings, or if you want to use the default greetings, click **Next** and then continue to .

a. For all script types, upload your welcome greeting as Prompt Number p5.

   1. In the row for **Prompt Number p5**, click **Browse**.

   2. In the Open file window, navigate to the WAV file for your welcome greeting.

   3. Click **Open**. The file name appears in the Load The Prompt File field.

b. For the Basic AA script and the Advanced AA script, upload your location and hours message as Prompt Number p7.

   1. In the row for **Prompt Number p7**, click **Browse**.

   2. In the Open file window, navigate to the WAV file for your location and hours message.

   3. Click **Open**. The file name appears in the Load The Prompt File field.

c. For the Advanced AA script only, upload your non-office-hours message as Prompt Number p6.

1. In the row for **Prompt Number p6**, click **Browse**.

2. In the Open file window, navigate to the WAV file for your non-office-hours message.

3. Click **Open**. The file name appears in the Load The Prompt File field.

> **NOTE** If you select a file in error, you can click **Clear All** to clear all custom prompts from the page. In this case, the default English language prompts are used.

d. Upload any additional custom messages that you want to use.

e. Click **Next** to continue.

STEP 14 Wait while the Wizard displays progress messages and saves the changes. The Submit Confirmation page appears.
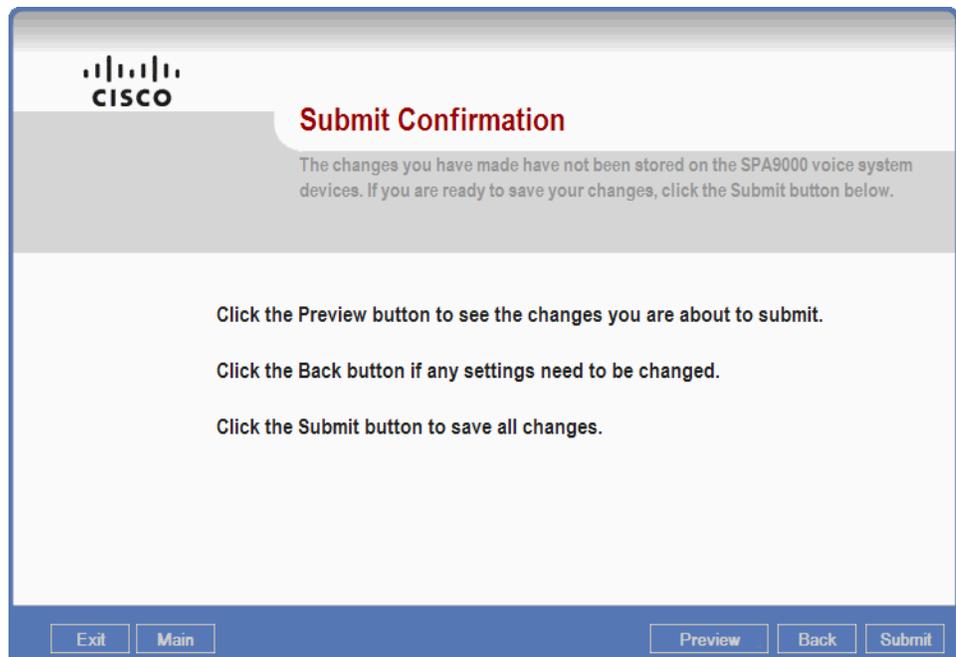
STEP 15 You can click **Preview** to preview the changes that will be submitted to the SPA9000. Click **OK** to close the preview.

STEP 16 Click **Submit** to save the changes to the SPA9000.

STEP 17 Wait while the Wizard displays progress messages and saves the changes.

STEP 18 Click **OK** when the *Submit Succeeded* message appears.

STEP 19 Test the system by making an inbound call and navigating through the AA menu options. Be sure to test all of the options that you announced in your welcome greeting.

Localizing Your SPA9000 Voice System

You can localize the date and time, dial plan, phone display language, and the Auto Attendant language.

- The phone display dictionary files are included in the Wizard release package. If you download new dictionary files from www.cisco.com/go/smallbiz, save them in the Wizard's *dict* sub-directory.

- The default AA prompts are available in nine different languages. English is used unless you select another language.

- For information about localizing the SPA400 voice mail prompts, see "Localizing the SPA400 Voice Mail Prompts (Optional)," on page 94.
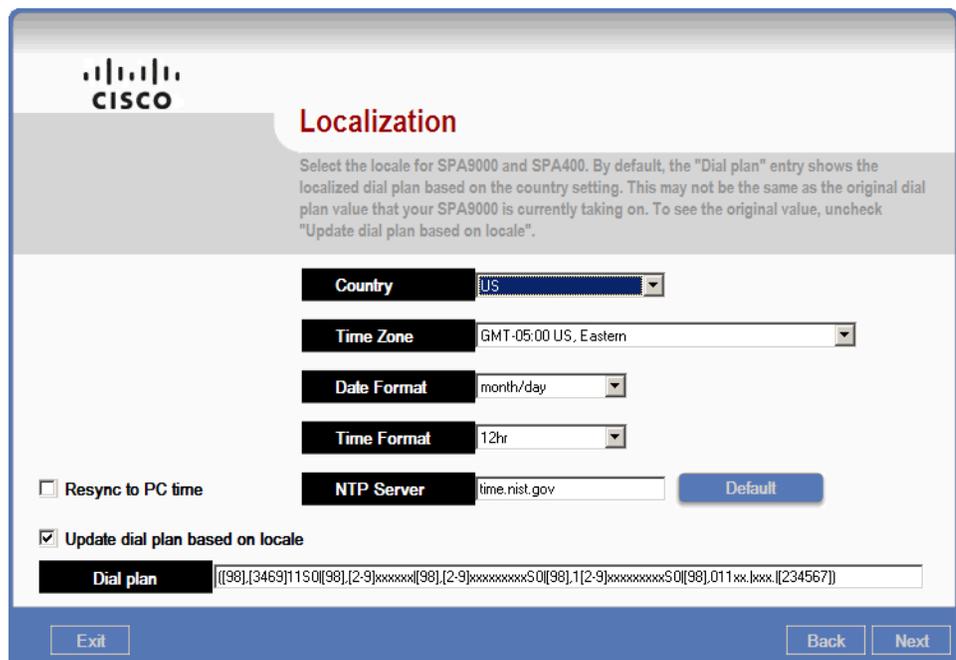
STEP 1   From the Main Menu, choose **Advanced Features**, and then click **Next.**

STEP 2   From the Advanced Features page, choose **Localization,** and then click **Next.**

STEP 3   Choose your country, time zone, date format, time format, and NTP server.

STEP 4   Select the **Update Dial Plan Based On Locale** check box if you want to automatically update the dial plan based on your country selection.

STEP 5   Click **Next** to cause the Wizard to connect to all SPA devices and display the Download Prompts for SPA9000 Auto Attendant page.
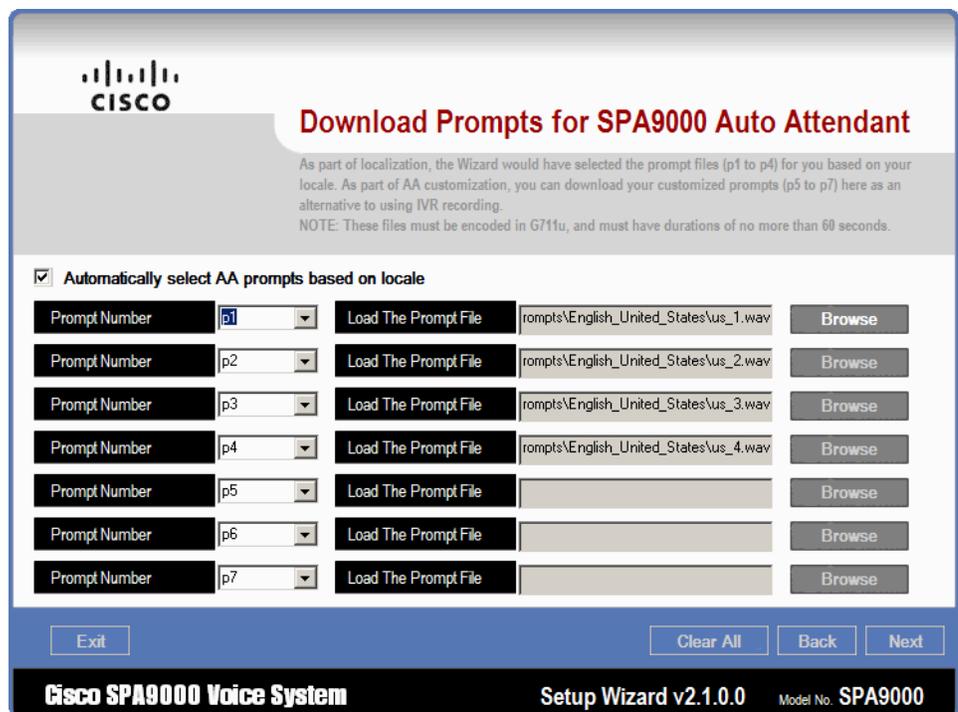
The default prompts are as follows:

- p1: "If you know your party's extension, you may enter it now."

- p2: "Your call has been forwarded."

- p3: "Not a valid extension, please try again."

- p4: "Goodbye."

Prompts 5 to 7 are available for custom greetings.

Choose the prompt number that you want to change, and then click **Browse** .

NOTE   If you do not need to change any prompts, skip this step.

a. When the Open dialog box appears, double-click the folder for the language files that you want to install.
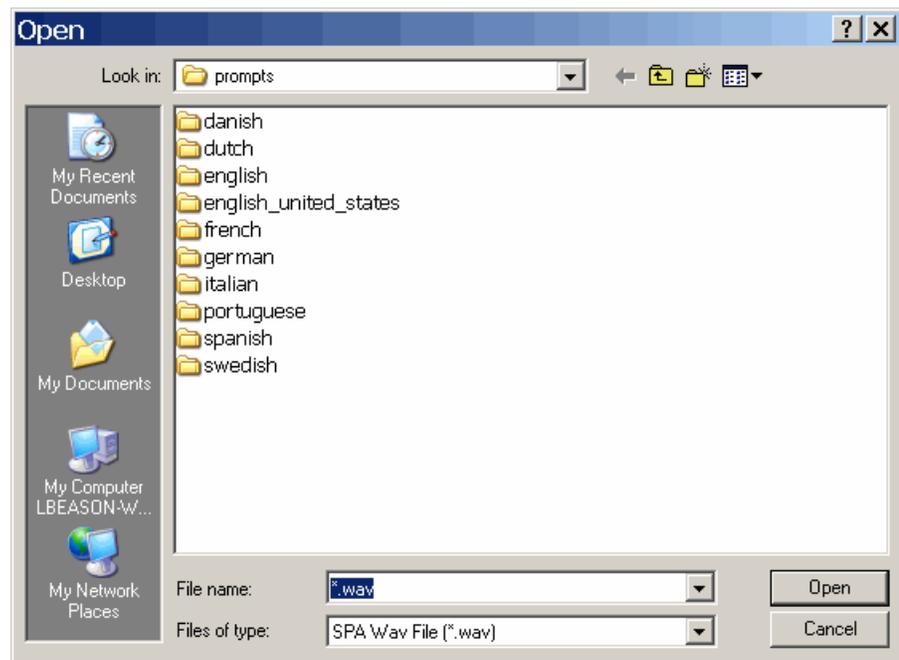
b. When the list of files appears, double-click the WAV file corresponding to the prompt number that you want to change. For example, to change Prompt 3 to French, you would open the french folder and then would select fr_3.wav. Refer to the following illustration.
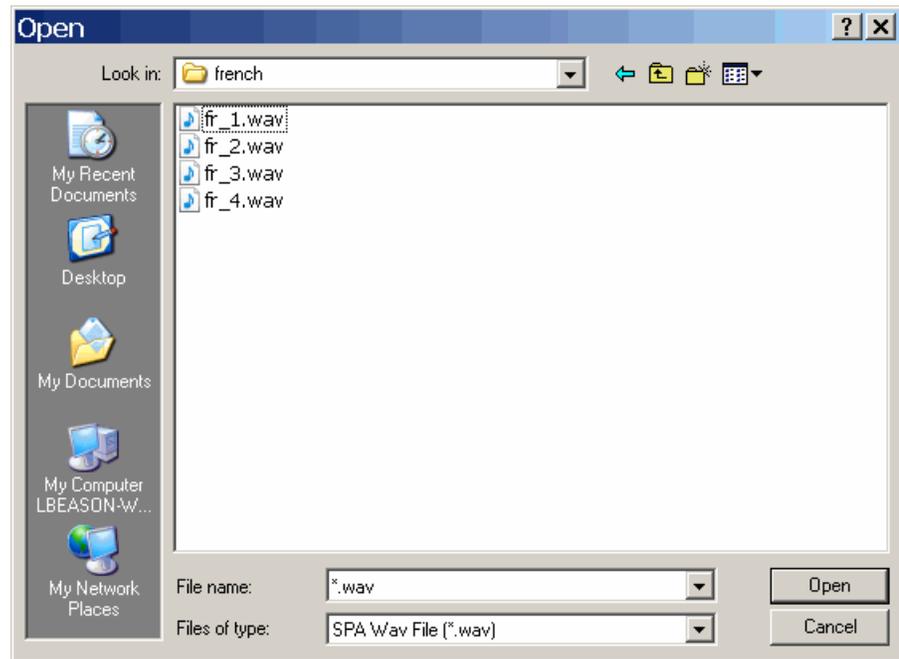
> **NOTE** If you want to use your own WAV recording, navigate to the folder where the recordings are stored, and then select the WAV file.

    c. Repeat this step for each prompt that you want to change.

STEP 7   Click **Next** to display the Download Client Dictionary page.
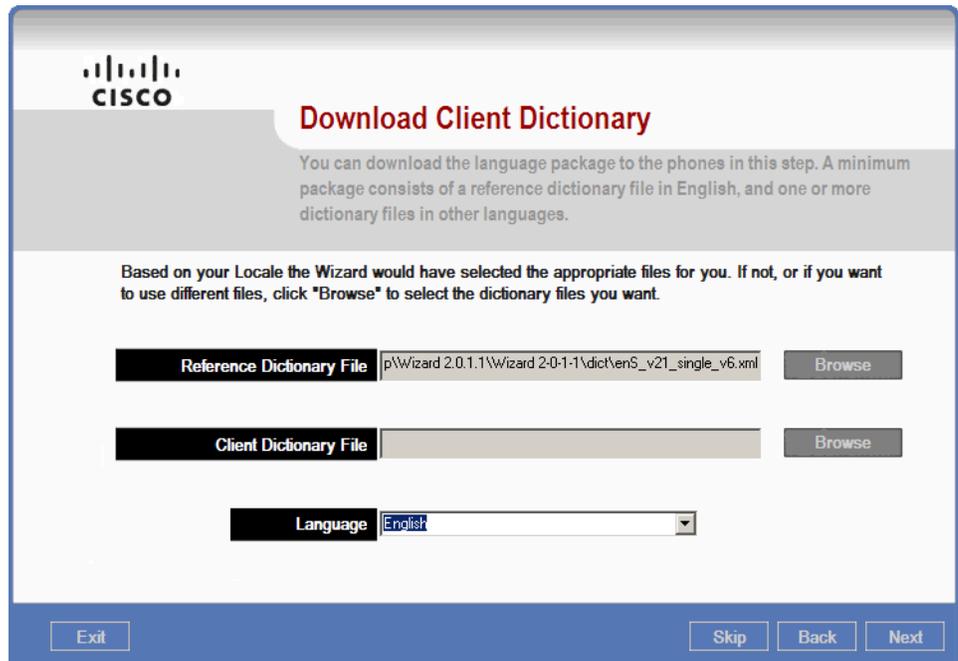
The Wizard automatically chooses a Reference Dictionary file based on the selected country, but you can choose a different language file, if needed.

STEP 8   Next to the **Reference Dictionary File** field, click **Browse**. The available dictionary files appear in the Open window.
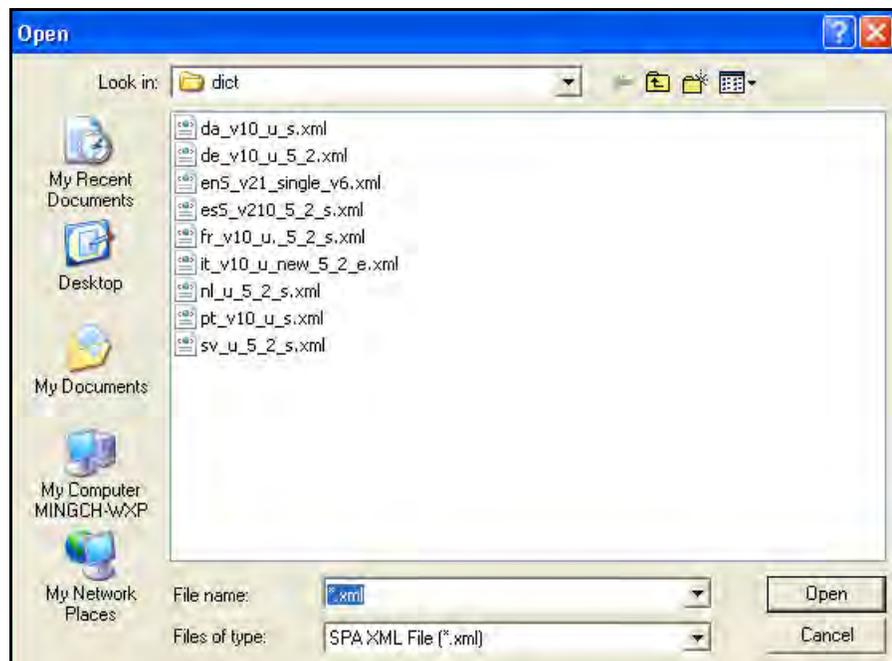
STEP 9   Click the file that you want, and then click **Open.**

To choose the appropriate file, look for the language code at the beginning of the file name (based on ISO-639-1):

de	German
da	Danish
en	English
es	Spanish
fr	French
it	Italian
nl	Dutch
pt	Portuguese
sv	Swedish

STEP 10   Click the file that you want, and then click **Open.** The selected file appears on the page.

STEP 11   Select the language from the **Language** drop-down list.

STEP 12   Click **Next** to display the Submit Confirmation page.
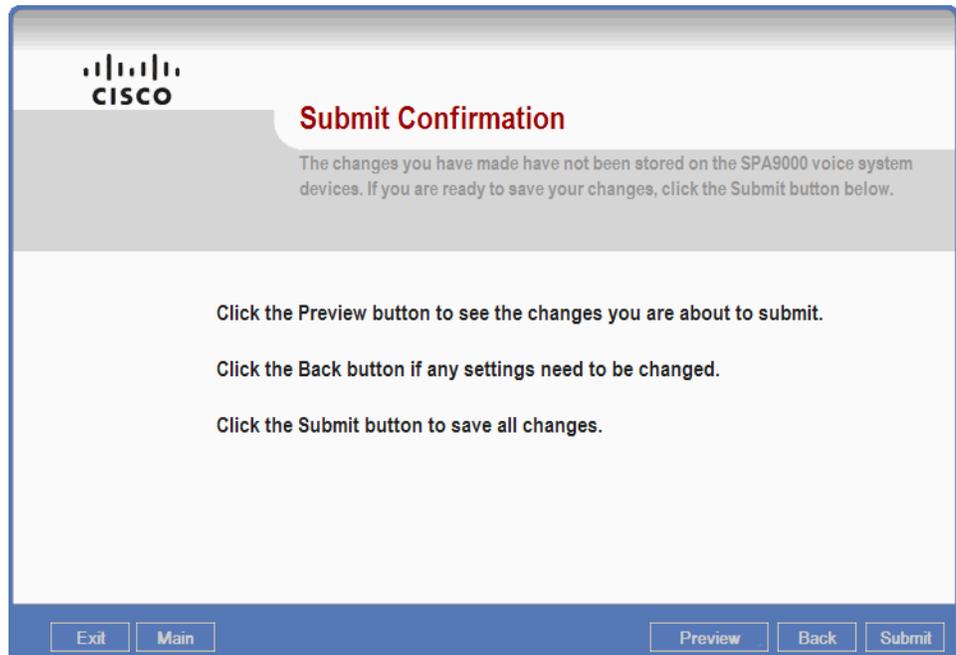
STEP 13 Wait while the Wizard displays progress messages and reboots the phones.

STEP 14 Click **OK** when the *Submit Succeeded* message appears.

The Advanced Features Menu appears.

Managing Administrative Passwords

On the Set Administrative Passwords page, you can perform the following tasks:

- Change the admin password for the SPA9000

- Change the admin password for each SPA400

- Change the admin password for a selected phone

- Change the admin password for all phones

By default, the Administrator account name is admin, and the User account name is user. These account names cannot be changed.

STEP 1   From the Main Menu, click **Advanced Features**, and then click **Next**.

STEP 2   From the Advanced Features page, choose **Admin Password**, and then click **Next**.

STEP 3   From the **Device** drop-down list, choose a particular device, or choose **Password for All Phones**.

STEP 4   Type the password in the **New Password** field, and then retype it in the **Confirm Password** field.

STEP 5   Click **Submit** to cause the Wizard to change the password on the selected device.

STEP 6   Click **OK** when the *Submit Succeeded* message appears.

The Advanced Features Menu appears.

Configuring the SPA932 Attendant Console

A SPA932 attendant console can be connected to a SPA962 phone for the purpose of monitoring and supporting the SPA9x2 IP phones in the SPA9000 Voice System.

NOTE Only SPA9x2 IP phones support computer telephony interface (CTI) which is required for SPA932 interaction.

The following types of monitoring are available:

- Busy Line Field (BLF): The selected LED indicates the state of the monitored line.

  - Green: Idle

  - Red: Busy

  - Red Fast Blink: Ringing

  - Amber: Failed Subscribe (received 4xx response)

  - Amber Slow Blink: Undefined (may be no response to subscribe, or BLF not specified)

- Speed Dial (SD): Allows the user to dial the selected extension quickly, either to place an internal call or to perform a blind transfer of an active call

- Call Pickup (CP): Used in combination with BLF, allows the user to pick up an unanswered call on the selected extension
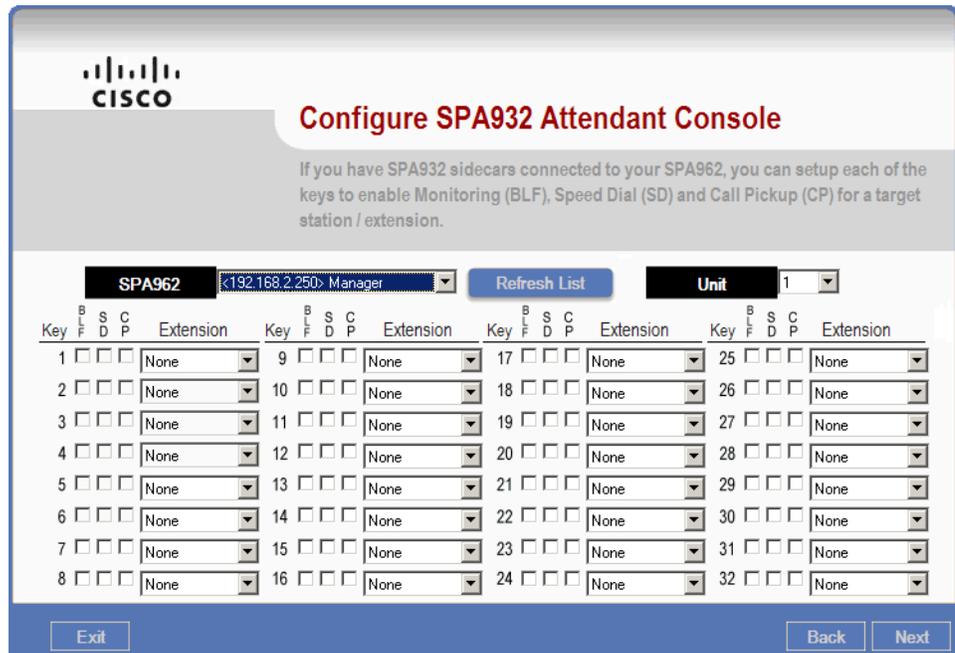
TIP In the event that you need to monitor a SPA9x1 phone, you can configure a shared line appearance on a SPA9x2 phone and then configure the SPA932 to monitor the SPA9x1 phone with the Wizard. The Wizard will use the SPA9x2 phone to monitor the SPA9x1's SLA, allowing you to effectively monitor a SPA9x1 phone. In the following example, the SPA932 key 2 is assigned to monitor a SPA901 IP phone.

STEP 1 From the Main Menu, click **Advanced Features**, and then click **Next**.

STEP 2 From the *Advanced Features* page, choose **SPA932 Attendant Console**, and then click **Next**.

STEP 3 In the SPA962, choose the SPA962 that you want to configure.

STEP 4 In the **Unit** field, choose the SPA932, if more than one is connected to the SPA962.

NOTE You may have up to two units connected to a SPA962. Unit 1 is the unit that is connected directly to the AUX port of the SPA962. Unit 2 is connected to the AUX OUT port on the first SPA932.

STEP 5   Assign a phone to each LED key, and select the options.

- Key: The numbers correspond to the 32 LED keys on the SPA932 unit.

- BLF, SP, CP: Check the box to enable the feature.

  - BLF: Busy Lamp Field

  - SP: Speed Dial

  - CP: Call Pickup (requires that BLF also is selected)

Refer to the following example:

In this example, the receptionist uses the first key as a speed dial for Sales. She uses the second key to monitor the Accounting phone and can see that it is busy before transferring callers. She uses the third key both to monitor the Customer Support line and to pick up calls if they are unanswered.

STEP 6   Click **Submit** or **Next** to display the parameters to be submitted to the SPA9000.

STEP 7   Click **OK** to display the parameters to be submitted to the SPA962.

STEP 8   Click **OK** to close the parameter preview window. The Wizard enables CTI on each of the monitored phones and then reboots them.

STEP 9   Click **OK** when the *Submit Succeeded* message appears.

The Advanced Features Menu appears.

Adding a Phone to an Existing Configuration

This example explains how to add a phone, called TYG, extension 31, to an existing configuration.

STEP 1   Click the Menu button to open the Main Menu.

STEP 2   On the Main Menu, select **Configure Client Stations**.

STEP 3   Follow the instructions on the Configure SPA9xx IP Phones page to connect the new phone to the switch.

The phone reboots and initializes, and an extension number appears on the phone display. You can change the extension number later, if needed.

STEP 4   Click **Next** to display the Configure Client Station page.

STEP 5   From the **Current Phone** drop-down list, choose the MAC address of the new phone.

STEP 6   Click **Next** to display the next Configure Client Station page.

STEP 7   From the **Station Name** drop-down list, choose an available name, or click **Add New** to enter a new name and extension number.

If you click **Add New**, a dialog box appears. Enter a name and extension number. If you want this station to have voice mail, select the **Voice Mail** check box, and then enter the Mailbox ID and Mailbox PIN. After entering the information, click **OK**.

```
Add a new client extension

Name            [                    ]

Extension       [                    ]

Mailbox         [ ]

Mailbox ID      [                    ]

Mailbox PIN     [                    ]

      [   OK   ]      [  Cancel  ]
```

STEP 8   Wait while the Wizard displays progress messages and reboots the phone. The assigned name and extension number appear on the phone display.

STEP 9   Click **OK** when the *Submit Succeeded* message appears.

Replacing a Phone (Experts Only)

Replace a phone with an identical replacement model as follows:

STEP 1   Disconnect the phone to be replaced and note its MAC address.

STEP 2   Install the new phone and note its MAC address.

STEP 3   Locate the most recent backup for the replaced phone.

STEP 4   Copy the backup file and save it using the MAC address of the new phone.

STEP 5   Perform a factory default reset on the new phone.

STEP 6   Navigate to the Wizard's Main Menu, select **Save / Load Configuration**.

STEP 7   Click **Next** to display the Save / Load Configuration Page.

STEP 8   Click **Refresh List** to cause the Wizard to locate the newly added phone.

STEP 9   Select the new phone from the Device drop-down menu.

STEP 10   Select **Retrieve configuration from file**.

STEP 11   Click **Next** to display the Open file dialog.

STEP 12   Navigate to the renamed backup file.
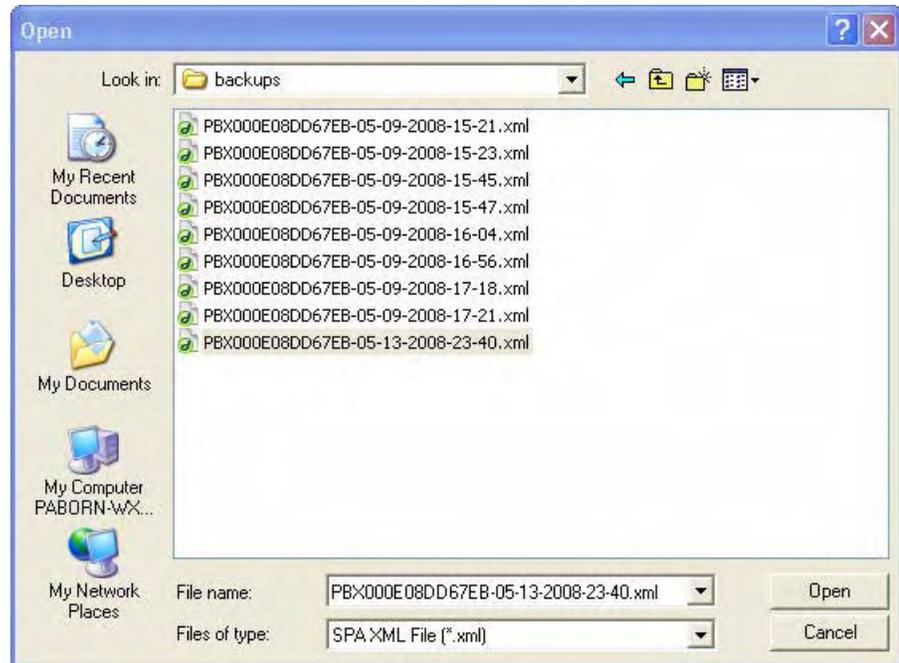
STEP 13   Click **Open** to start the load from file.

STEP 14   Click **OK** to when the *Load Succeeded* message appears.

STEP 15   Select **Save** configuration to device.

STEP 16   Click **Next** to preview the changes that will be sent to the phone.

STEP 17   Click **OK** to close the preview window.

STEP 18   Wait while the Wizard displays progress messages and reboots the phone.

STEP 19   Click **OK** when the *Save Succeeded* message appears.

The new phone now has the same configuration as the replaced phone and is ready for use.

Removing a Forgotten Password (Expert Only)

In the event that a password has been forgotten and needs to be changed, you can reset the password.

STEP 1   Locate the device's most recent backup file.

STEP 2   Make a copy of the backup file.

STEP 3   Edit the copied backup file.

STEP 4   Locate the <Admin_Passwd> parameter.
Example: `<Admin_Passwd>*************</Admin_Passwd>`

STEP 5   Delete all of the asterisks.

STEP 6   Save the file.

STEP 7   Factory reset the device.

STEP 8   Retrieve the configuration from file.

STEP 9   Save the configuration to device.

Information for Expert Users

This section of the guide contains information that expert users may find useful when working with the Wizard. In addition, this section describes the Advanced Feature Menu.

Wizard Directories

Two directories are used by the Wizard:

- ~"\Wizard <version>" [where ~ represents any directory]

  The ~"\Wizard <version>" directory is created when the Wizard's zip archive file is uncompressed and unarchived.

  NOTE The entire contents of the Wizard's zip file must be extracted from the zip file. Attempting to run the Wizard directly from the zip archive file will result in failure.

- C:\linksys\

  The C:\linksys directory is automatically created and populated by the Wizard when it is first run.

The ~\Wizard <version> Directory

The ~\Wizard <version> directory contains the following directories:

- ~\config

  Contains locale-specific information

- ~\dict

  Contains language/local phrases that are preloaded with the Wizard. Any additional language files should be saved here in order for Wizard to use.

- ~\messages

  Contains the language-specific phrases used in the Wizard

- ~\prompts

  Contains the language-specific Auto Attendant prompts that are preloaded with the Wizard

The C:\linksys\ Directory

The C:\linksys\ directory contains the PBX<MAC address>.act file. This file contains the SPA9000 account information and includes the following information:

- Passwords

- SPA400 definition

- Extension to station name associations

- Hunt group definitions.

The C:\linksys\ directory contains the following directories of interest:

- ~\dict

  Copies of the language dictionaries files are copied here when they are downloaded to the phones.

- ~\firmwaredb

  When the firmware on a device is upgraded, a copy of the firmware is automatically copied to this directory.

- ~\img

  BMP versions of user-selected image files are stored here when the user selects files for the SPA942 or SPA962 phone background image.

- ~\prompts

  User-selected WAV-format AA prompts are copied here when they are sent to SPA9000.

A

Installation Workbook

This workbook is intended to help you to record information about the customer's network environment as well as the order and service information, before installing the SPA9000 Voice System. By using this workbook, you can minimize the installation time and ensure that all setup requirements are met.

This workbook is designed to help SPA9000 Voice System installation technicians and can be used as a training guide and checklist for VARs and Service Providers.

Customer Information

Company Name	
Contact Name – Commercial	
Contact Phone Number – Commercial	
Contact Email Address - Commercial	
Alternate Contact Phone Number	
Contact Name – IT Responsible	
Contact Phone Number – IT Responsible	
Contact email address – IT Responsible	
Installation Location	

City and Postal Code	
Site Survey Date and Method (circle one)	Date: _____ ON SITE / BY PHONE
Installation Schedule Date	

Site Survey

Survey date	
Survey by	

Service Provider Information

If you have multiple service providers, copy this page as needed. You can configure the four SPA9000 interfaces with different service providers.

Service Provider Name	
Service Provider Contact Information	
Service Order Number	
Service Activation Date	
Service Order Type	

Provisioning Information

SIP Proxy	
User Name	
Password	
Provisioning Method (Circle one.)	SPA9000 VOICE SYSTEM WIZARD VERSION _____ WEB UI REMOTE PROVISIONING
Service provider additional parameters (e.g. DID numbers)	
Audio preferred codec (Circle one.)	G.711A G.711u G.729a G.726 G.723.1

Telephony System Survey

Number of IP Phones to install	
Is it there an existing KTS or PBX to replace (Circle one.)	YES / NO
If yes, please list the existing features provided by the system	
Is the customer setup requiring any of the following features? (Circle all that apply.)	Receptionist telephone Automatic attendant Direct Inward Dialing Voice mail Other (please specify):

Infrastructure Survey

New Cable wiring required (Circle one.)	YES / NO
If yes, how many and where?	
AC Outlet available for each Cisco SPA device location (Circle one.)	YES / NO
If no, where are the missing locations?	
PSTN Line (Circle one.)	YES / NO
If yes, how many?	
ISDN BRI Line (Circle one.)	YES / NO
If yes, how many?	
Battery backup (Circle one.)	YES / NO
If yes, what devices are covered?	
Fax Machine (Circle one.)	YES / NO
If yes, is there a telephone cable available from SPA9000 to the fax machine?	YES / NO

Broadband Type

Broadband connection type (Circle one.)	T1 / ADSL / xDSL / FTTH / Other If other please specify:
IP addressing type (Circle one.)	DYNAMIC / STATIC
If static, IP address	
If static, network mask	
Primary DNS	
Secondary DNS	
Bandwidth	Uplink (kbps): _____ Downlink (kbps): _____

Bandwidth

Codec Bandwidth per conversation	G.711 – 110 kbps, G.723 – 12.6 kbps, G.726 – 87 to 63 kpbs, G.729 – 55 kbps
Minimum bandwidth requirement (including Internet access and VoIP) calculation	

LAN

Gateway LAN IP Address	
Network Mask	
DNS	
DHCP Server	YES / NO
NAT	YES / NO
QoS Router (Circle one.)	YES / NO
If yes, Type of QoS enforcement (Circle one.)	IP TOS / VLAN ID / 802.1p
QoS Switch	YES / NO
If yes, Type of QoS enforcement (Circle one.)	IP TOS / VLAN ID / 802.1p
VLAN tagging (Circle one.)	YES / NO
If yes, Voice VLAN ID	
If yes, Data VLAN ID	
Power over Ethernet	YES / NO
If yes, how many ports available	
Total number of ports on switch	
WiFi Network (Circle one.)	YES / NO
If yes, SSID	
If yes, encryption type (Circle one.)	WEP / WPA / WPA2

New LAN Device(s) needed	YES / NO
If yes, define the type	
Sufficient Ethernet ports for each IP phone location	YES / NO
If no, what type of new device added	
Firewall	YES / NO
If yes, Hardware or Software based	Hardware / Software
Is a specific port need to be opened	YES / NO Port Number:
If yes, does the customer have the administrative access	YES / NO
AC Outlet availability for each installing component	
SPA9000	YES / NO
SPA400 – 1	YES / NO
SPA400 – 2	YES / NO
SPA400 – 3	YES / NO
SPA400 – 4	YES / NO
IP Phone 1	YES / NO
IP Phone 2	YES / NO
IP Phone 3	YES / NO
IP Phone 4	YES / NO

IP Phone 5	YES / NO
IP Phone 6	YES / NO
IP Phone 7	YES / NO
IP Phone 8	YES / NO
IP Phone 9	YES / NO
IP Phone 10	YES / NO
IP Phone 11	YES / NO
IP Phone 12	YES / NO
IP Phone 13	YES / NO
IP Phone 14	YES / NO
IP Phone 15	YES / NO
IP Phone 16	YES / NO
Component	YES / NO
Component	YES / NO
Component	YES / NO
Component	YES / NO
Component	YES / NO
Component	YES / NO
Component	YES / NO

Are office junction boxes accurately labeled between the telco closet and the installation locations?	YES / NO
Is there room in the existing equipment rack for additional equipment	YES / NO

Cisco SPA devices

SPA9000	
Firmware version	
SPA901	
Number of phones	
Firmware version	
SPA921	
Number of phones	
Firmware version	
SPA941	
Number of phones	
Firmware version	
SPA922	
Number of phones	
Firmware version	

SPA942	
Number of phones	
Firmware version	
SPA962	
Number of phones	
Firmware version	
SPA932	
Number of consoles	
SPA400	
Number of gateways	
Firmware version	
POES5 Number of units	
WBP54G Number of units	
MB100 Number of units	

SPA9000 Voice System Configuration

SPA9000

MAC ID	Key Upgrade (opt)	VM
NOTES:		

SPA400 #1

MAC ID	PSTN Phone Numbers	VM
NOTES:		

SPA400 #2

MAC ID	PSTN Phone Numbers	VM
NOTES:		

SPA400 #3

MAC ID	PSTN Phone Numbers	VM
NOTES:		

SPA400 #4

MAC ID	PSTN Phone Numbers	VM
NOTES:		

Phone : _____ **(enter station number)**

Copy and print this page as needed for each phone.

Link	
Phone Model	
MAC ID	
DID Numbers	
WiFi / POE	

L1	EXT	Share / Private	Hunt Group	Voice Mail
L2	EXT	Share / Private	Hunt Group	Voice Mail
L3	EXT	Share / Private	Hunt Group	Voice Mail
L4	EXT	Share / Private	Hunt Group	Voice Mail
L5	EXT	Share / Private	Hunt Group	Voice Mail
L6	EXT	Share / Private	Hunt Group	Voice Mail

Additional Equipment

Equipment Type	
Model	
MAC Address	
Notes	

Equipment Type	
Model	
MAC Address	
Notes	

Equipment Type	
Model	
MAC Address	
Notes	

Equipment Type	
Model	
MAC Address	
Notes	

Additional Installation and Configuration Notes

B

Where to Go From Here

This appendix describes additional resources that are available to help you and your customer obtain the full benefits of the SPA9000 Voice System.

- "Product Resources," on page 159
- "Related Documentation," on page 160

Product Resources

Website addresses in this document are listed without **http://** in front of the address because most current web browsers do not require it. If you use an older web browser, you may have to add **http://** in front of the web address.

Resource	Link
Cisco Partner Central (requires partner registration and login)	www.cisco.com/web/partners/sell/smb/
Cisco Small Medium Business Product Information	www.cisco.com/go/smallbiz

Related Documentation

The following table describes the various documents that Cisco provides to help you to install, configure, and manage the SPA9000 Voice System and its components.

These documents and more are available at www.cisco.com/go/smallbiz.

Document Title	Description	Intended Audience
SPA9000 Voice System Installation and Configuration Guide Using the Setup Wizard	Installation, configuration and maintenance of the SPA9000 Voice System by using the Setup Wizard.	End Users, VARs, and Service Providers
SPA9000 Voice System Installation and Configuration Guide - Web-UI (Legacy) Based Product Configuration	Manual installation of the SPA9000 Voice System, by using the Web User Interface, instead of the Cisco SPA900 Voice System Setup Wizard.	End Users, VARs, and Service Providers
SPA9000 Voice System Administration Guide	- Administration and configuration of system features using the SPA9000 and SPA400 - Deployment options for ITSP, PSTN, and ISDN services - SPA9000, SPA400, SPA900 series phones	VARs and Service Providers
SPA9x2 Phone Administration Guide	- Configuration and management of SPA9x2 series IP phones - Deployment options with or without the SPA9000 IP PBX - SPA9x2 series IP phones	VARs and Service Providers

Document Title	Description	Intended Audience
SPA9x2 Phone User Guide	▪ Phone setup ▪ Phone features ▪ SPA9x2 series IP phones	VARs and phone end-users
Analog Telephone Adapter Administration Guide	▪ Administration and use of Cisco Small Business ATAs ▪ PAP2T, SPA2102, SPA3102, SPA8000, WRP400, and WRTP54G	VARs, system administrators, and Service Providers
User Guide for switch		
User Guide for router		

C

Additional Information

This appendix provides links to resources that provide additional information about Cisco Small Business and Cisco Small Business Pro products and services.

Resource	Location
End User License Agreement	www.cisco.com/go/smallbiz
Regulatory Compliance and Safety Information	www.cisco.com/go/smallbiz
Warranty Information	www.cisco.com/go/smallbiz
Cisco Partner Central site for Small Business	www.cisco.com/web/partners/sell/smb/

D

Support Contacts

To obtain current support contact information for Cisco Small Business and Small Business Pro products, visit the following URL:

www.cisco.com/go/smallbiz