LINKSYS®

A Division of Cisco Systems, Inc.

Voice Gateway with Router

VoIP
Voice

User Guide

CISCO SYSTEMS

Model No. **SPA3102**

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How to Use this Guide

Your guide to the Voice Gateway with Router has been designed to make understanding networking with the Voice Gateway easier than ever. Look for the following items when reading this guide:

This exclamation point means there is a caution or warning and is something that could damage your property or the Voice Gateway.

This question mark provides you with a reminder about something you might need to do while using the Voice Gateway.

This checkmark means there is a note of interest and is something you should pay special attention to while using the Voice Gateway.

In addition to these symbols, there are definitions for technical terms that are presented like this:

word: definition.

Also, each figure (diagram, screenshot, or other image) is provided with a figure number and description, like this:

Figure 0-1: Sample Figure Description

Figure numbers and descriptions can also be found in the "List of Figures" section.

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Voice Gateway with Router

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Chapter 1: Introduction

Welcome

Thank you for choosing the Voice Gateway with Router. This Voice Gateway will allow your computers to share a high-speed Internet connection as well as resources, including files and printers. Plus, the Voice Gateway can bridge traditional phone service, also known as Public Switched Telephone Network (PSTN) service, with Internet phone service, also known as Voice over Internet Protocol (VoIP). And after you have set up your Internet phone service, you will be able to make phone or fax calls using the Internet.

How does the Voice Gateway do all of this? By connecting your computers and peripherals, including phones or fax machines, to the Voice Gateway and connecting the Voice Gateway to your cable or DSL modem, then the Voice Gateway can direct and control communications for your network.

But what does all of this mean?

Networks are useful tools for sharing Internet access and computer resources. Multiple computers can share Internet access, so you don't need more than one high-speed Internet connection. With Internet phone service, your Internet access can now be shared by your phones or fax machines as well. You will be able to make phone calls using the account you set up with your Internet Telephony Service Provider (ITSP), even while you're surfing the Internet. Plus, you can access one printer from different computers and access data located on another computer's hard drive. Networks are even used for playing multiplayer video games. So, networks not only are useful in homes and offices, but also can be fun.

PCs on a wired network create a LAN, or Local Area Network. They are connected with Ethernet cables, which is why the network is called "wired".

network: a series of computers or devices connected for the purpose of data sharing, storage, and/or transmission between users.

lan (local area network): the computers and networking products that make up the network in your home or office.

ethernet: an IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium.

To create your network, install and set up the Voice Gateway. To guide you through the process, use the instructions in the Quick Installation or this User Guide to help you. These instructions should be all you need to get the most out of the Voice Gateway.

What's in this Guide?

This guide covers the basic steps for setting up a network with the Voice Gateway. After going through "Chapter 3: Getting to Know the Voice Gateway," most users will only need to use the following chapters:

- Chapter 4: Getting Started
  This chapter instructs you on how to connect and set up the Voice Gateway.

- Chapter 6: Using the Web-based Utility
  This chapter explains how to configure the Voice Gateway using your web browser and the Voice Gateway's Web-based Utility. You will configure the Voice Gateway using the settings provided by your ISP.

When you're finished with the basic steps, then you are ready to connect to the Internet.

You also have other chapters available for reference:

- Chapter 1: Introduction
  This chapter describes the Voice Gateway's applications and this User Guide.

- Chapter 2: Networking Basics
  This chapter briefly explains how a network functions.

- Chapter 5: Using the Interactive Voice Response Menu
  This chapter explains how to configure the Voice Gateway's network settings when you use its Interactive Voice Response Menu.

- Appendix A: Troubleshooting
  This appendix describes some possible problems and solutions, as well as frequently asked questions, regarding installation and use of the Voice Gateway.

- Appendix B: Finding the MAC Address and IP Address for Your Ethernet Adapter
  This appendix instructs you on how to find the MAC address or Ethernet address of your PC's Ethernet network adapter.

- Appendix C: Windows Help
  This appendix describes how you can use Windows Help for instructions about networking, such as installing the TCP/IP protocol.

- Appendix D: Glossary
  This appendix gives a brief glossary of terms frequently used in networking.

- Appendix E: Specifications
  This appendix provides the technical specifications for the Voice Gateway.

- Appendix F: Warranty Information
  This appendix supplies the warranty information for the Voice Gateway.

- Appendix G: Regulatory Information
  This appendix supplies the regulatory information regarding the Voice Gateway.

- Appendix H: Contact Information
  This appendix provides contact information for a variety of Linksys resources, including Technical Support.

Voice Gateway with Router

Chapter 2: Networking Basics

An Introduction to Local Area Networks

Simply put, a router is a network device that connects two networks together.

The Voice Gateway connects your local area network (LAN), or the group of PCs in your home or office, to the Internet. The Voice Gateway processes and regulates the data that travels between these two networks.

The Voice Gateway's Network Address Translation (NAT) technology protects your network of PCs so users on the Internet cannot "see" your PCs. This is how your LAN remains private. The Voice Gateway protects your network by inspecting the first packet coming in through the Internet port before delivery to the final destination on one of the Ethernet ports. The Voice Gateway inspects Internet port services like the web server, ftp server, or other Internet applications, and, if allowed, it will forward the packet to the appropriate PC on the LAN side.

nat (network address translation): NAT technology translates IP addresses of a local area network to a different IP address for the Internet.

The Use of IP Addresses

IP stands for Internet Protocol. Every device in an IP-based network, including PCs, print servers, and routers, requires an IP address to identify its location, or address, on the network. This applies to both the Internet and LAN connections.

ip (internet protocol): a protocol used to send data over a network.

There are two ways of assigning IP addresses to your network devices.

ip address: the address used to identify a computer or device on a network.

A static IP address is a fixed IP address that you assign manually to a PC or other device on the network. Since a static IP address remains valid until you disable it, static IP addressing ensures that the device assigned it will always have that same IP address until you change it. Static IP addresses are commonly used with network devices such as server PCs or print servers.

static ip address: a fixed address assigned to a computer or device that is connected to a network.

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If you use the Voice Gateway to share your cable or DSL Internet connection, contact your ISP to find out if they have assigned a static IP address to your account. If so, you will need that static IP address when configuring the Voice Gateway. You can get the information from your ISP.

A dynamic IP address is automatically assigned to a device on the network. These IP addresses are called dynamic because they are only temporarily assigned to the PC or other device. After a certain time period, they expire and may change. If a PC logs onto the network (or the Internet) and its dynamic IP address has expired, the DHCP server will assign it a new dynamic IP address.

A DHCP server can either be a designated PC on the network or another network device, such as the Voice Gateway. By default, the Voice Gateway's Internet Connection Type is **DHCP** (obtain an IP address automatically).

The PC or network device obtaining an IP address is called the DHCP client. DHCP frees you from having to assign IP addresses manually every time a new user is added to your network.

For DSL users, many ISPs may require you to log on with a user name and password to gain access to the Internet. This is a dedicated, high-speed connection type called Point to Point Protocol over Ethernet (PPPoE). PPPoE is similar to a dial-up connection, but PPPoE does not dial a phone number when establishing a connection. It also will provide the Voice Gateway with a dynamic IP address to establish a connection to the Internet.

By default, a DHCP server (on the LAN side) is enabled on the Voice Gateway. If you already have a DHCP server running on your network, you MUST disable one of the two DHCP servers. If you run more than one DHCP server on your network, you will experience network errors, such as conflicting IP addresses. To disable DHCP on the Voice Gateway, see the Router - LAN Setup section in "Chapter 5: Using the Web-based Utility."

dynamic ip address: a temporary IP address assigned by a DHCP server.

dhcp (dynamic host configuration protocol): a protocol that lets one device on a local network, known as a DHCP server, assign temporary IP addresses to the other network devices, typically computers.

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Chapter 3: Getting to Know the Voice Gateway

The Back Panel

The Voice Gateway's ports are located on the back panel.

Figure 3-1: Back Panel

LINE   Use this port to connect the Voice Gateway to your standard telephone wall jack.

PHONE   Use this port to connect an analog phone (or fax machine) with an RJ-11 telephone cable.

ETHERNET   The **ETHERNET** port connects to a network device, such as a PC or a switch, with an Ethernet network cable.

INTERNET   The **INTERNET** port connects to your cable or DSL modem.

Power   The **Power** port is where you will connect the power adapter.

NOTE: The LINE port will be active only if you have traditional phone service.

The Front Panel

The Voice Gateway's LEDs, which inform you about network activities, are located on the front panel.
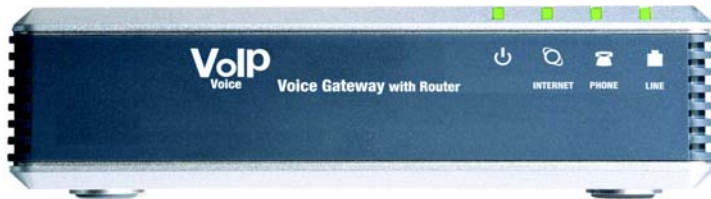
Figure 3-2: Front Panel

Power   Green. The **Power** LED lights up when the Voice Gateway is powered on and connected to the Internet. It flashes when the Voice Gateway is not connected to the Internet. The LED also flashes when the Voice Gateway is booting up or upgrading its firmware.

INTERNET   Green. The **INTERNET** LED lights up when there is an active connection through the ETHERNET port. If the LED is flashing, then there is traffic moving through that port.

PHONE   Green. The **PHONE** LED is solidly lit when a telephone or fax machine has an active or registered connection to your Internet Telephony Service Provider (ITSP) through the PHONE port. It flashes when the phone is being used or is off the hook.

LINE   Green. The **LINE** LED lights up when the a telephone or fax machine has an active connection to traditional phone service through the LINE port.

Proceed to "Chapter 4: Getting Started."

NOTE: The LINE port will be active only if you have traditional phone service.

Chapter 4: Getting Started

Before You Begin

Make sure you have the following:
- An active Internet connection
- An active Internet phone service account and its settings
- cable/DSL modem
- One computer for configuration of the Voice Gateway
- Analog telephone or fax machine with an RJ-11 phone cable

Connecting the Voice Gateway

1. Power off your network devices, including your modem and PC.

2. If you have traditional phone service, connect the RJ-11 phone cable (included) to the Voice Gateway's LINE port and your telephone wall jack.

Figure 4-1: Connect to the Telephone Wall Jack

3. Connect one end of a different RJ-11 phone cable to the Voice Gateway's PHONE port. Connect the other end to your analog telephone or fax machine.

> **IMPORTANT:** Do not connect the PHONE port to a telephone wall jack. Make sure you only connect a telephone or fax machine to the PHONE port. Otherwise, the Voice Gateway or the telephone wiring in your home or office may be damaged.

Figure 4-2: Connect a Telephone

Chapter 4: Getting Started
Before You Begin

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4. Connect one end of an Ethernet network cable (included) to the ETHERNET port of the Voice Gateway. Connect the other end to the Ethernet port of your PC.

5. Connect one end of a different Ethernet network cable to the INTERNET port of the Voice Gateway. Connect the other end to your cable/DSL modem.

6. Power on the broadband modem.

7. Connect the included power adapter to the Voice Gateway's power port, and then plug the power adapter into an electrical outlet. The power LED on the front panel will light up as soon as the Voice Gateway powers on.

8. Power on your PC.

NOTE: Make sure your PC's Ethernet adapter is set to obtain an IP address automatically. For more information, refer to Windows Help.

Proceed to the next section.

Figure 4-3: Connect a PC

Figure 4-4: Connect to the Modem

Figure 4-5: Connect Power

Configuring the Voice Gateway

1. Launch the web browser on the PC.

2. Enter **192.168.0.1/advanced** in the *Address* field (**192.168.0.1** is the default local IP address of the Voice Gateway). Then press the **Enter** key.

3. If your Internet Telephony Service Provider (ITSP) did not supply a password, you will not see a login screen. Proceed to step 4.

    If your ITSP supplied a password, you will see a login screen. In the *User Name* field, enter **user**, the default user name for user access (this cannot be changed). Then enter the user password supplied by your ITSP.

4. The *Router - Status* screen will appear. Click the **WAN Setup** tab.

5. Proceed to the appropriate instructions for your Internet Connection Type.

    DHCP

    a. Select **DHCP** from the *Connection Type* drop-down menu.

    b. If you use a cable modem, you may need to configure the MAC Clone Settings. (Contact your ISP for more information.)

        Enable MAC Clone Service. If your service uses a specific PC MAC address, then select **yes** from the *Enable MAC Clone Service* setting. Then enter the PC's MAC address in the *Cloned MAC Address* field.

    c. Click the **Submit All Changes** button.

Figure 4-6: Login Screen

Figure 4-7: Router - WAN Setup Screen
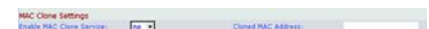
Figure 4-8: MAC Clone Settings

Static IP

a. Select **Static IP** from the *Connection Type* drop-down menu.

b. In the Static IP Settings section, enter the IP address in the *Static IP* field, the subnet mask in the *NetMask* field, and the default gateway IP address in the *Gateway* field.

c. In the Optional Settings section, enter the DNS server address(es) in the *Primary DNS* and optional *Secondary DNS* fields.

d. Click the **Submit All Changes** button.

PPPoE (most DSL users)

a. Select **PPPoE** from the *Connection Type* drop-down menu.

b. Enter the user name in the *PPPoE Login Name* field, and enter the password in the *PPPoE Login Password* field.

c. Click the **Submit All Changes** button.

6. If the Voice Gateway is pre-configured by your ITSP, then you do not need to change any of the default voice settings. Refer to the documentation supplied by your service provider for more information. If you need to configure additional settings, refer to "Chapter 6: Using the Web-based Utility" for instructions.

Figure 4-9: Static IP Settings

static ip address: a fixed address assigned to a computer or device connected to a network.

subnet mask: an address code that determines the size of the network.

default gateway: a device that forwards Internet traffic from your local area network.

Figure 4-10: PPPoE Settings

pppoe: a type of broadband connection that provides authentication (username and password) in addition to data transport.

Chapter 5: Using the Interactive Voice Response Menu

Overview

> **NOTE:** If your ITSP sent you the Voice Gateway, then it may be pre-configured for you, and you do not need to change any settings. Refer to the instructions supplied by your service provider for more information.

You may need to manually configure the Voice Gateway by entering the settings provided by your Internet Telephony Service Provider (ITSP). This chapter explains how to use the Interactive Voice Response Menu to configure the Voice Gateway's network settings. You will use the telephone's keypad to enter your commands and select choices, and the Voice Gateway will use voice responses.

For more advanced configuration, refer to "Chapter 6: Using the Web-based Utility."

Accessing the Interactive Voice Response Menu

1. Use a telephone connected to the PHONE port of the Voice Gateway. (You can only access the Interactive Voice Response Menu through an analog telephone, not any of the Internet phones.)

2. Press **** (in other words, press the star key four times).

3. Wait until you hear "Linksys configuration menu. Please enter the option followed by the # (pound) key or hang up to exit."

4. Refer to the following table that lists actions, commands, menu choices, and descriptions. After you select an option, press the # (pound) key. To exit the menu, hang up the telephone.

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Using the Interactive Voice Response Menu

While entering a value, such as an IP address, you may exit without entering any changes. Press the ***** (star) key twice within half a second. Otherwise, the * will be treated as a decimal point or dot.

After entering a value, such as an IP address, press the **#** (pound) key to indicate you have finished your selection. To save the new setting, press **1**. To review the new setting, press **2**. To re-enter the new setting, press **3**. To cancel your entry and return to the main menu, press ***** (star).

For example, to enter the IP address *191.168.1.105* by keypad, press these keys: **191*168*1*105**. Press the **#** (pound) key to indicate that you have finished entering the IP address. Then press **1** to save the IP address or press the ***** (star) key to cancel your entry and return to the main menu.

If the menu is inactive for more than one minute, the Voice Gateway will time out. You will need to re-enter the menu by pressing ****.

The settings you have saved will take effect after you have hung up the telephone. The Voice Gateway may reboot at this time.

Interactive Voice Response Menu

Action	Command (press these keys on the telephone)	Choices	Description
Enter Interactive Voice Response Menu	****		Use this command to enter the Interactive Voice Response Menu. Do not press any other keys until you hear, "Linksys configuration menu. Please enter the option followed by the # (pound) key or hang up to exit."
Check Internet Connection Type	100		Hear the Internet connection type of the Voice Gateway.
Check Internet IP Address	110		Hear the IP address assigned to the Voice Gateway's Internet (external) interface.
Check Network Mask (or Subnet Mask)	120		Hear the network or subnet mask assigned to the Voice Gateway.
Check Gateway IP Address	130		Hear the IP address of the Voice Gateway (usually the network router).
Check MAC Address	140		Hear the MAC address of the Voice Gateway in hexadecimal string format.

ip (internet protocol): a protocol used to send data over a network.

ip address: the address used to identify a computer or device on a network.

subnet mask: an address code that determines the size of the network.

gateway: a device that forwards Internet traffic from your local area network.

mac address: the unique address that a manufacturer assigns to each networking device.

Interactive Voice Response Menu

Action	Command (press these keys on the telephone)	Choices	Description
Check Firmware Version	150		Hear the version number of the firmware currently running on the Voice Gateway.
Check Primary DNS Server IP Address	160		Hear the IP address of the primary DNS (Domain Name Service) server.
Check Internet Web Server Port	170		Hear the port number of the Internet Web server used for the Web-based Utility.
Check Local IP Address	210		Hear the local IP address of the Voice Gateway.
Set Internet Connection Type	101	Press **0** to use DHCP. Press **1** to use a static IP address. Press **2** to use PPPoE.	Select the type of Internet connection you are using. Refer to the documentation supplied by your Internet Service Provider (ISP).
Set Static IP Address	111	Enter the IP address using numbers on the telephone keypad. Use the * (star) key when entering a decimal point.	First, set the Internet Connection Type to static IP address; otherwise, you will hear, "Invalid Option," if you try to set the static IP address.

firmware: *the programming code that runs a networking device.*

dhcp *(dynamic host configuration protocol): a protocol that lets one device on a local network, known as a DHCP server, assign temporary IP addresses to the other network devices, typically computers.*

static ip address: *a fixed address assigned to a computer or device that is connected to a network.*

pppoe: *a type of broadband connection that provides authentication (username and password) in addition to data transport.*

Interactive Voice Response Menu

Action	Command (press these keys on the telephone)	Choices	Description
Set Network (or Subnet) Mask	**121**	Enter the network or subnet mask using numbers on the telephone keypad. Use the * (star) key when entering a decimal point.	First, set the Internet Connection Type to static IP address; otherwise, you will hear, "Invalid Option," if you try to set the network or subnet mask.
Set Gateway IP Address	**131**	Enter the IP address using numbers on the telephone keypad. Use the * (star) key when entering a decimal point.	First, set the Internet Connection Type to static IP address; otherwise, you will hear, "Invalid Option," if you try to set the gateway IP address.
Set Primary DNS Server IP Address	**161**	Enter the IP address using numbers on the telephone keypad. Use the * (star) key when entering a decimal point.	First, set the Internet Connection Type to static IP address; otherwise, you will hear, "Invalid Option," if you try to set the IP address of the primary DNS server.

Interactive Voice Response Menu

Action	Command (press these keys on the telephone)	Choices	Description
Set the Mode	201	Press **0** to select the router/NAT mode. Press **1** to select the bridge/switch mode.	If the Voice Gateway acts as the router for your network, use the router/NAT mode. If your network already has a router, use the bridge/switch mode.
Enable/Disable WAN Access to the Web-based Utility	7932	Press **1** to enable. Press **0** to disable.	Use this setting to enable or disable WAN access to the Web-based Utility. (This Utility lets you configure the Voice Gateway.)
Manual Reboot	732668		After you hear, "Option successful," hang up the phone. The Voice Gateway will automatically reboot.
Factory Reset	73738	Press **1** to confirm. Press ***** (star) to cancel.	If necessary, enter the password. The Voice Gateway will request confirmation; enter **1** to confirm. You will hear, "Option successful." Hang up the phone. The Voice Gateway will reboot, and all settings will be reset to their factory default settings.

NOTE: This feature may be protected by a password available only from your ITSP.

If you need to enter a password, refer to the following section, "Entering a Password."

Interactive Voice Response Menu

Action	Command (press these keys on the telephone)	Choices	Description
User Factory Reset	**877778**	Press **1** to confirm. Press ***** (star) to cancel.	The Voice Gateway will request confirmation; enter **1** to confirm. You will hear, "Option successful." Hang up the phone. The Voice Gateway will reboot and all user-configurable settings will be reset to their factory default settings.

Entering a Password

You may be prompted to enter a password when you want to reset the Voice Gateway to its factory default settings. To enter the password, use the phone's keypad, and follow the appropriate instructions.

• To enter A, B, C, a, b, or c — press **2**.

• To enter D, E, F, d, e, or f — press **3**.

• To enter G, H, I, g, h, or i — press **4**.

• To enter J, K, L, j, k, or l — press **5**.

• To enter M, N, O, m, n, or o — press **6**.

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- To enter P, Q, R, S, o, q, r, or s — press **7**.

- To enter T, U, V, t, u, or v — press **8**.

- To enter W, X, Y, Z, w, x, y, or z — press **9**.

- To enter all other characters, press **0**.

> **NOTE:** These bulleted instructions only apply when you are entering a password. At all other times, pressing a number only selects a number, not a letter or punctuation mark.

For example, to enter the password *phone@321* by keypad, press these keys: **746630321**. Then press the **#** (pound) key to indicate that you have finished entering the password. To cancel your entry and return to the main menu, press ***** (star).

Configuring the Settings for Your Internet Phone Service

If you want to change the settings for your Internet phone service, refer to the instructions provided by your ITSP and "Chapter 6: Using the Web-based Utility."

Chapter 6: Using the Web-based Utility

Overview

> **NOTE:** If your ITSP sent you the Voice Gateway, then it may be pre-configured for you, and you do not need to change any settings. Refer to the instructions supplied by your service provider for more information. If you do wish to make changes, follow the instructions in this chapter.

The Web-based Utility can be accessed via your web browser through use of a computer on your network. It offers two levels of access: user and admin (administrator). Your level of access depends on your service provider's policies. In most cases you will only have user-level access, so this chapter will cover the user-level web pages of the Web-based Utility. Also, access to some settings may be protected or blocked, so they cannot be accidentally changed. For more information, contact your ITSP.

There are two main tabs: Router and Voice. Additional tabs will be available after you click one of the main tabs. This chapter will describe each web page of the Web-based Utility and each page's key functions.

Router

- Status. This screen displays product and system status information about the Voice Gateway.

- WAN Setup. Use this screen to configure the Internet connection, MAC clone, remote management, QoS, VLAN, and optional settings.

- LAN Setup. Use this screen to configure the local IP address, DHCP server, and DHCP lease settings.

- Application. On this screen, configure port forwarding, DMZ, multicast, and reserved ports range settings.

Voice

- Info. This screen displays voice-related status information about the Voice Gateway.

- System. Use this screen to configure the user password.

- User 1. Use this screen to configure call forward, speed dial, supplementary service, and ring settings for the Internet phone line.

- PSTN User. PSTN stands for Public Switched Telephone Network, which is the network that traditional phone service uses. Use this screen to configure call forward, speed dial, and ring settings for the PSTN line.

How to Access the Web-based Utility

To access the Web-based Utility of the Voice Gateway, launch the web browser on the PC connected to the Voice Gateway's Ethernet port. If the Voice Gateway uses its default address, then enter **192.168.0.1** in the *Address* field. If you have assigned a static IP address to the Voice Gateway, then enter *<IP address of the Voice Gateway>* in the *Address* field. Press the **Enter** key.

If your Internet Telephony Service Provider (ITSP) did not supply a password, you will not see a login screen. If your ITSP supplied a password, then you will see a login screen. In the *User Name* field, enter **user**, the default user name for user access. (This cannot be changed.) Then enter the password supplied by your ITSP.

Two views of the Web-based Utility are available. Click **basic** to view basic settings, or click **advanced** to view advanced settings.

When you have finished making changes on a screen, click the **Submit All Changes** button to save the changes, or click the **Undo All Changes** button to undo your changes. When changes are saved, the Voice Gateway may reboot.

Figure 6-1: Login Screen

The Router Tab

The Router - Status Screen

This screen displays product and system information.

Product Information

Product Name. Shown here is the model number of the Voice Gateway.

Serial Number. Shown here is the serial number of the Voice Gateway.

Software Version. Shown here is the version number of the Voice Gateway software.

Hardware Version. Shown here is the version number of the Voice Gateway hardware.

MAC Address. Shown here is the MAC address of the Voice Gateway.

Client Certificate. Shown here is the status of the client certificate. It authenticates the Voice Gateway for use in the ITSP's network.

System Status

Current Time. Displayed here is the current date and time of the Voice Gateway.

Elapsed Time. Displayed here is the amount of time elapsed since the last reboot of the Voice Gateway.

WAN Connection Type. Displayed here is the Internet connection type of the Voice Gateway.

Figure 6-2: Router - Status Screen

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Current IP. Displayed here is the Internet IP address of the Voice Gateway.

Host Name. Displayed here is the host name of the Voice Gateway.

Domain. Displayed here is the domain name of the Voice Gateway.

Current Netmask. Displayed here is the netmask or subnet mask of the Voice Gateway.

Current Gateway. Displayed here is the IP address of the Voice Gateway.

Primary DNS. Displayed here is the IP address of the primary DNS server.

Secondary DNS. Displayed here is the IP address of the secondary DNS server.

LAN IP Address. Displayed here is the local IP address of the Voice Gateway.

Broadcast Pkts Sent. Displayed here is the number of broadcast packets sent.

Broadcast Bytes Sent. Displayed here is the number of broadcast bytes sent.

Broadcast Pkts Recv. Displayed here is the number of broadcast packets received and processed.

Broadcast Bytes Recv. Displayed here is the number of broadcast bytes received and processed.

Broadcast Pkts Dropped. Displayed here is the number of broadcast packets received but not processed.

Broadcast Bytes Dropped. Displayed here is the number of broadcast bytes received but not processed.

ip (internet protocol): a protocol used to send data over a network.

ip address: the address used to identify a computer or device on a network.

packet: a unit of data sent over a network.

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The Router - WAN Setup Screen

This screen lets you configure the Internet connection, MAC clone, remote management, QoS, VLAN, and optional settings. Information about your Internet connection type should be provided by your Internet Service Provider (ISP). If you do not have this information, contact your service provider.

Internet Connection Settings

Connection Type. Select the connection type you use: **DHCP**; **Static IP**; **PPPOE**; **PPPoE, DHCP**; or **DHCP, PPPoE**. If you select PPPoE, DHCP or DHCP, PPPoE, then the Voice Gateway will try the first Internet connection type. If that fails, then the Voice Gateway will try the second Internet connection type.

Static IP Settings

If you selected Static IP, complete the Static IP Settings section.

Static IP. Enter the static or fixed IP address of the Voice Gateway (this should be provided by your ISP).

NetMask. Enter the net or subnet mask of the Voice Gateway (this should be provided by your ISP).

Gateway. Enter the IP address of the gateway (this should be provided by your ISP).

PPPoE Settings

If you selected PPPOE, complete the PPPoE Settings section.

PPPoE Login Name. Enter the name provided by your ISP.

PPPoE Login Password. Enter the password provided by your ISP.

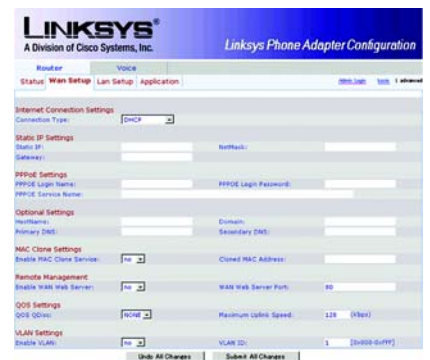**Figure 6-3: Router - WAN Setup Screen**

Figure 6-4: Static IP Settings

Figure 6-5: PPPoE Settings

NOTE: For DSL users, if you need to enable PPPoE support, remember to remove any PPPoE applications that are installed on your PCs.

PPPoE Service Name (optional). Enter the service name provided by your ISP.

Optional Settings

HostName. Enter the host name, if provided by your ISP.

Domain. Enter the domain name, if provided by your ISP.

Primary DNS. Enter the IP address of the primary DNS server.

Secondary DNS (optional). Enter the IP address of the secondary DNS server.

MAC Clone Settings

Enable MAC Clone Service. Select whether you want to clone a MAC address onto the Voice Gateway, **yes** or **no**. The default is **no**.

mac address: the unique address that a manufacturer assigns to each networking device.

Cloned MAC Address. Enter the MAC address you want to clone.

Remote Management

Enable WAN Web Server. This feature lets you enable or disable access to the Web-based Utility from the WAN side. Select **yes** or **no** from the drop-down menu. The default is **no**.

WAN Web Server Port. Enter the port number used to access the Utility from the WAN side. The default is **80**.

QOS Settings

QOS QDisc. QoS prioritizes voice communications when different types of traffic are competing for bandwidth. Select the method you want to use: **NONE**, **CBQ**, or **TBF**. The default is **NONE**.

Maximum Uplink Speed. Enter the maximum upload speed of your Internet connection. The default is **128Kbps**.

VLAN (Virtual Local Area Network) Settings

Enable VLAN. VLAN (802.1Q) settings let you use the Voice Gateway in a virtual LAN environment. Select **yes** or **no** from the drop-down menu. The default is **no**.

VLAN ID. Enter the ID number used by the Voice Gateway. The default is **1**.

When you have finished making changes, click the **Submit All Changes** button to save the changes, or click the **Undo All Changes** button to undo your changes.

NOTE: To test your settings, connect to the Internet now.

The Router - LAN Setup Screen

This screen lets you configure the local network, dynamic DHCP, and static DHCP lease settings.

Networking Service. Select the service you want to use, **NAT** or **Bridge**. The default is **NAT**.

LAN Network Settings

LAN IP Address. Enter the local IP address of the Voice Gateway. The default is **192.168.0.1**.

LAN Subnet Mask. Select the local subnet mask: **255.255.255.0**, **255.255.255.128**, **255.255.255.192**, **255.255.255.224**, **255.255.255.240**, **255.255.255.248**, or **255.255.255.252**. The default is **255.255.255.0**.

Enable DHCP Server. To use the Voice Gateway as a router assigning IP addresses, select **yes**. Otherwise, select **no**. The default is **yes**.

DHCP Lease Time. Enter the lease time used by the Voice Gateway to distribute IP addresses. The default is **24 Hours**.

DHCP Client Starting IP Address. When the Voice Gateway issues IP addresses, it starts with the first value of its DHCP client IP address range. Enter that value here. The default is **192.168.0.2**.

Number of Client IP Addresses. Enter the number of IP addresses that can be distributed. The default is **50**.

Static DHCP Lease Settings

Enable. You can have the Voice Gateway assign the same IP address to a specific device. To disable this feature, select **no**. To use this feature, select **yes**. The default is **no**.

Figure 6-6: Router - LAN Setup Screen

Host MAC Address. Enter the MAC address of the device whose IP address you want to specify.

Host IP Address. Enter the IP address you want to assign to the device, 192.168.0.x (x being a different number for each device you specify).

When you have finished making changes, click the **Submit All Changes** button to save the changes, or click the **Undo All Changes** button to undo your changes.

The Router - Application Screen

This screen lets you configure port forwarding, DMZ, and reserved ports range settings.

Port Forwarding Settings

Enable. Select **yes** or **no** for each port forwarding entry, which defines a port range to be forwarded to a server. The default is **no**.

Service Name. Enter the name of the service or application.

Starting Port. Enter the starting port number of the forwarded port range.

Ending Port. Enter the ending port number of the forwarded port range.

Protocol. Select the protocol used, **TCP**, **UDP**, or **Both**. The default is **TCP**.

Server IP Address. Enter the IP address of the server, 192.168.0.x (x being a different number for each server you specify).

DMZ Settings

Enable DMZ. DMZ hosting forwards all ports at the same time to one computer. This allows one local user to be exposed to the Internet for use of special-purpose services such as videoconferencing. Select **yes** or **no** from the drop-down menu. The default is **no**.

DMZ Host IP Address. Enter the IP address of the DMZ host, 192.168.0.x (x being the number for the computer you want to specify). Use the Static DHCP Lease Settings section on the *LAN Setup* screen, so the DMZ Host keeps this IP address; otherwise, its IP address may change.

Figure 6-7: Router - Application Screen

tcp: a network protocol for transmitting data that requires acknowledgement from the recipient of data sent.

udp: a network protocol for transmitting data that does not require acknowledgement from the recipient of the data that is sent.

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Miscellaneous Settings

Multicast Passthru. Multicasting allows for multiple transmissions to specific recipients at the same time. If multicasting is permitted, then the Voice Gateway will allow IP multicast packets to be forwarded to the appropriate computers. Select the types of multicast transmissions to allow: **Disabled** (none), **Inbound Only**, **Outbound Only**, or **Inbound and Outbound**. The default is **Disabled**.

System Reserved Ports Range

Starting Port. This port range defines the random TCP/UDP ports used by the application running on the Voice Gateway. They cannot be used by port forwarding or DMZ. Enter the starting port number of the reserved ports range. The default is **50000**.

Num of Ports Reserved. Select the number of ports you want to reserve: **256**, **512**, or **1024**. The default is **256**.

When you have finished making changes, click the **Submit All Changes** button to save the changes, or click the **Undo All Changes** button to undo your changes.

The Voice Tab

The Voice - Info Screen

This screen shows voice-related settings for the Voice Gateway.

Product Information

Product Name. Shown here is the model number of the Voice Gateway.

Serial Number. Shown here is the serial number of the Voice Gateway.

Software Version. Shown here is the version number of the Voice Gateway software.

Hardware Version. Shown here is the version number of the Voice Gateway hardware.

MAC Address. Shown here is the MAC address of the Voice Gateway.

Client Certificate. Shown here is the status of the client certificate, which indicates that the Voice Gateway has been authorized by your ITSP.

System Status

Current Time. Displayed here is the current date and time of the Voice Gateway.

Elapsed Time. Displayed here is the amount of time elapsed since the last reboot of the Voice Gateway.

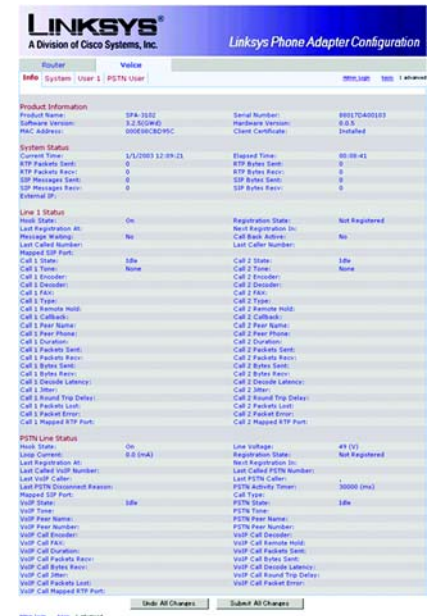**RTP Packets Sent**. Displayed here is the number of RTP packets sent by the Voice Gateway.

Figure 6-8: Voice - Info Screen

RTP Bytes Sent. Displayed here is the number of RTP bytes sent by the Voice Gateway.

RTP Packets Recv. Displayed here is the number of RTP packets received by the Voice Gateway.

RTP Bytes Recv. Displayed here is the number of RTP bytes received by the Voice Gateway.

SIP Messages Sent. Displayed here is the number of SIP messages sent by the Voice Gateway.

SIP Bytes Sent. Displayed here is the number of SIP bytes sent by the Voice Gateway.

SIP Messages Recv. Displayed here is the number of SIP messages received by the Voice Gateway.

SIP Bytes Recv. Displayed here is the number of SIP bytes received by the Voice Gateway.

External IP. Displayed here is the external IP address used for NAT mapping.

Line 1 Status

Hook State. Displayed here is the status of the Internet phone line's readiness. **On** indicates that it is ready for use, while **Off** indicates that it is in use.

Registration State. Shown here is the status of the line's registration with the ITSP.

Last Registration At. Shown here are the last date and time the line was registered.

Next Registration In. Shown here is the number of seconds until the next registration.

Message Waiting. This indicates whether you have new voicemail waiting.

Call Back Active. This indicates whether a call back request is in progress.

Figure 6-9: Line 1 Status

Last Called Number. Displayed here is the last number called.

Last Caller Number. Displayed here is the number of the last caller.

Mapped SIP Port. Shown here is the port number of the NAT mapped SIP port.

Calls 1 and 2 have the same status information available.

Call 1/2 State. Displayed here is the status of the call.

Call 1/2 Tone. Displayed here is the type of tone used by the call.

Call 1/2 Encoder. Displayed here is the codec used for encoding.

Call 1/2 Decoder. Displayed here is the codec used for decoding.

Call 1/2 FAX. Displayed here is the status of the fax pass-through mode.

Call 1/2 Type. Displayed here is the direction of the call.

Call 1/2 Remote Hold. This indicates whether the far end has placed the call on hold.

Call 1/2 Callback. This indicates whether the call was triggered by a call back request.

Call 1/2 Peer Name. Displayed here is the name of the internal phone.

Call 1/2 Peer Phone. Displayed here is the phone number of the internal phone.

Call 1/2 Duration. Displayed here is the duration of the call.

Call 1/2 Packets Sent. Displayed here is the number of packets sent.

Call 1/2 Packets Recv. Displayed here is the number of packets received.

Call 1/2 Bytes Sent. Displayed here is the number of bytes sent.

Call 1/2 Bytes Recv. Displayed here is the number of bytes received.

Call 1/2 Decode Latency. Displayed here is the number of milliseconds for decoder latency.

Call 1/2 Jitter. Displayed here is the number of milliseconds for receiver jitter.

Call 1/2 Round Trip Delay. Displayed here is the number of milliseconds for delay.

Call 1/2 Packets Lost. Displayed here is the number of packets lost.

Call 1/2 Packet Error. Displayed here is the number of invalid packets received.

Call 1/2 Mapped RTP Port. Displayed here is the number of the NAT mapped RTP port.

PSTN Line Status
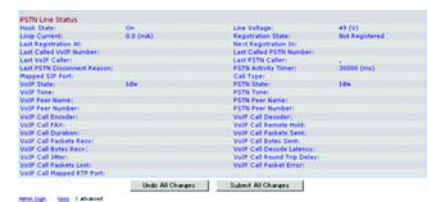
Hook State. Displayed here is the status of the LINE port. **On** indicates that it is ready for use, while **Off** indicates that it is in use.

Line Voltage. Displayed here is the tip-to-ring voltage of the LINE port.

Loop Current. Displayed is the loop current to the LINE port.

Registration State. Shown here is the status of the line's registration.

Last Registration At. Shown here are the last date and time the line was registered.

Figure 6-10: PSTN Line Status

Next Registration In. Shown here is the number of seconds until the next registration.

Last Called VoIP Number. VoIP stands for Voice over Internet Protocol, which is used by Internet phone calls. Displayed here is the last Internet phone number called from the landline.

Last Called PSTN Number. Displayed here is the last landline number dialed by the Voice Gateway.

Last VoIP Caller. The VoIP caller is the one who calls the Voice Gateway via VoIP to obtain traditional phone service. Displayed here is the number of the last VoIP caller.

Last PSTN Caller. The PSTN caller is the one who calls the Voice Gateway from the traditional phone service to obtain VoIP service. Displayed here are the name and number of the last PSTN caller.

Last PSTN Disconnect Reason. Displayed here is why the Voice Gateway terminated the LINE port connection.

PSTN Activity Timer. Displayed here is the number of milliseconds before the Voice Gateway disconnects the current gateway unless the landline has some audio activity.

Mapped SIP Port. Shown here is the port number of the NAT mapped SIP port.

Call Type. Displayed here is the direction of the call.

VoIP State. Displayed here is the status of Line 1, Call 1.

PSTN State. Displayed here is the status of the PSTN call.

VoIP Tone. Displayed here is the tone playing to the VoIP call leg.

PSTN Tone. Displayed here is the tone playing to the PSTN call leg.

VoIP Peer Name. Displayed here is the name of the party at the VoIP call leg.

PSTN Peer Name. Displayed here is the name of the party at the PSTN call leg.

VoIP Peer Number. Displayed here is the phone number of the party at the VoIP call leg.

PSTN Peer Number. Displayed here is the phone number of the party at the PSTN call leg.

The following are the same as the status information for Line 1, Call 1 in the Line 1 Status section.

VoIP Call Encoder. Displayed here is the codec used for encoding the VoIP call leg.

VoIP Call Decoder. Displayed here is the codec used for decoding the VoIP call leg.

VoIP Call FAX. Displayed here is the status of the fax pass-through mode.

VoIP Call Remote Hold. This indicates whether the far end has placed the call on hold.

VoIP Call Duration. Displayed here is the duration of the call.

VoIP Call Packets Sent. Displayed here is the number of packets sent.

VoIP Call Packets Recv. Displayed here is the number of packets received.

VoIP Call Bytes Sent. Displayed here is the number of bytes sent.

VoIP Call Bytes Recv. Displayed here is the number of bytes received.

VoIP Call Decode Latency. Displayed here is the number of milliseconds for decoder latency.

VoIP Call Jitter. Displayed here is the number of milliseconds for receiver jitter.

Voice Gateway with Router

VoIP Call Round Trip Delay. Displayed here is the number of milliseconds for delay.

VoIP Call Packets Lost. Displayed here is the number of packets lost.

VoIP Call Packet Error. Displayed here is the number of invalid packets received.

VoIP Call Mapped RTP Port. Displayed here is the number of the NAT mapped RTP port.

When you have finished making changes, click the **Submit All Changes** button to save the changes, or click the **Undo All Changes** button to undo your changes.

The Voice - System Screen

This screen lets you change the password for user access to the Web-based Utility.

NOTE: If your ITSP supplied this password, you may not be able to change it.

Figure 6-11: Voice - System Screen

System Configuration

User Password. Enter the password for the user. (By default, there is no password.)

When you have finished making your change, click the **Submit All Changes** button to save the changes, or click the **Undo All Changes** button to undo your change.

The Voice - User 1 Screen

This screen lets you configure the settings for the Internet phone line.

Call Forward Settings

Enter the call forwarding numbers you want to use.

Cfwd All Dest. Enter the number for the Call Forward All Service feature (when you want to forward all calls).

Cfwd Busy Dest. Enter the number for the Call Forward Busy feature (when the line is busy).

Cfwd No Ans Dest. Enter the number for the Call Forward No Answer feature (when the line is not answered).

Cfwd No Ans Delay. Enter the number of seconds to wait before the Call Forward No Answer feature is triggered.

Selective Call Forward Settings

Enter the caller numbers that will be forwarded to specific phone numbers.

Cfwd Sel1 Caller. Enter the caller number pattern to trigger the Call Forward Selective 1 feature.

Cfwd Sel1 Dest. Enter the forward number for the Call Forward Selective 1 feature.

Cfwd Sel2 Caller. Enter the caller number pattern to trigger the Call Forward Selective 2 feature.

Cfwd Sel2 Dest. Enter the forward number for the Call Forward Selective 2 feature.

Cfwd Sel3 Caller. Enter the caller number pattern to trigger the Call Forward Selective 3 feature.

Figure 6-12: Voice - User 1 Screen

Cfwd Sel3 Dest. Enter the forward number for the Call Forward Selective 3 feature.

Cfwd Sel4 Caller. Enter the caller number pattern to trigger the Call Forward Selective 4 feature.

Cfwd Sel4 Dest. Enter the forward number for the Call Forward Selective 4 feature.

Cfwd Sel5 Caller. Enter the caller number pattern to trigger the Call Forward Selective 5 feature.

Cfwd Sel5 Dest. Enter the forward number for the Call Forward Selective 5 feature.

Cfwd Sel6 Caller. Enter the caller number pattern to trigger the Call Forward Selective 6 feature.

Cfwd Sel6 Dest. Enter the forward number for the Call Forward Selective 6 feature.

Cfwd Sel7 Caller. Enter the caller number pattern to trigger the Call Forward Selective 7 feature.

Cfwd Sel7 Dest. Enter the forward number for the Call Forward Selective 7 feature.

Cfwd Sel8 Caller. Enter the caller number pattern to trigger the Call Forward Selective 8 feature.

Cfwd Sel8 Dest. Enter the forward number for the Call Forward Selective 8 feature.

Cfwd Last Caller. Enter the caller number that is actively forwarded to the Cfwd Last Dest number when the Call Forward Last activation code is used.

Cfwd Last Dest. Enter the forward number for the Cfwd Last Caller feature.

Block Last Caller. Enter the ID of the caller blocked via the Block Last Caller service.

Accept Last Caller. Enter the ID of the caller accepted via the Accept Last Caller service.

Speed Dial Settings

Speed Dial 2. Enter the target phone number (or URL) to assign to speed dial 2.

Speed Dial 3. Enter the target phone number (or URL) to assign to speed dial 3.

Speed Dial 4. Enter the target phone number (or URL) to assign to speed dial 4.

Speed Dial 5. Enter the target phone number (or URL) to assign to speed dial 5.

Speed Dial 6. Enter the target phone number (or URL) to assign to speed dial 6.

Speed Dial 7. Enter the target phone number (or URL) to assign to speed dial 7.

Speed Dial 8. Enter the target phone number (or URL) to assign to speed dial 8.

Speed Dial 9. Enter the target phone number (or URL) to assign to speed dial 9.

Supplementary Service Settings

CW Setting. Select whether you want to use the call waiting feature for all calls, **yes** or **no**. The default is **yes**.

Block CID Setting. Select whether you want to block caller ID for all calls, **yes** or **no**. The default is **no**.

Block ANC Setting. Select whether you want to block anonymous calls, **yes** or **no**. The default is **no**.

DND Setting. Select whether you want to use the Do Not Disturb (DND) feature, **yes** or **no**. The default is **no**.

CID Setting. Select whether you want to enable caller ID generation, **yes** or **no**. The default is **yes**.
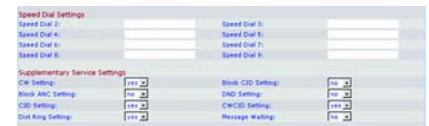
**Figure 6-13: Speed Dial and
Supplementary Service Settings**

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CWCID Setting. Select whether you want to enable caller ID for call waiting, **yes** or **no**. The default is **yes**.

Dist Ring Setting. Select whether you want to use the distinctive ring feature, **yes** or **no**. The default is **yes**.

Message Waiting. Select whether you want to use the message waiting feature, **yes** or **no**. The default is **no**.

Distinctive Ring Settings

Ring1 Caller. Enter the caller number pattern to play Distinctive Ring/Call Waiting Tone (CWT) 1.

Ring2 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 2.

Ring3 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 3.

Ring4 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 4.

Ring5 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 5.

Ring6 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 6.

Ring7 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 7.

Ring8 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 8.

Ring Settings

Default Ring. Select the default ringing pattern for all callers.

Default CWT. Select the default CWT pattern for all callers.

Figure 6-14: Distinctive Ring and Ring Settings

Hold Reminder Ring. Select the ring pattern that will remind you of a call on hold when the phone is on-hook.

Call Back Ring. Select the ring pattern for call back notification.

Cfwd Ring Splash Len. Enter the duration of the ring splash when a call is forwarded. The range is 0 to 10.0 seconds.

Cblk Ring Splash Len. Enter the duration of the ring splash when a call is blocked. The range is 0 to 10.0 seconds.

VMWI Ring Splash Len. Enter the duration of the ring splash when new messages arrive before the VoiceMail Waiting Indication (VMWI) signal is applied. The range is 0 to 10.0 seconds.

When you have finished making your change, click the **Submit All Changes** button to save the changes, or click the **Undo All Changes** button to undo your change.

The Voice - PSTN User Screen

This screen lets you configure the settings for the LINE port service, which can be a PSTN service or a second VoIP service.

PSTN-To-VoIP Selective Call Forward Settings

Enter the landline caller numbers that will be forwarded to specific Internet phone numbers.

Cfwd Sel1 Caller. Enter the caller number pattern that will be forwarded to the Cfwd Sel1 Dest number.

Cfwd Sel1 Dest. Enter the forward number for the Cfwd Sel1 Caller. If this is blank, then the landline caller is blocked for Internet phone service.

Cfwd Sel2 Caller. Enter the caller number pattern that will be forwarded to the Cfwd Sel2 Dest number.

Cfwd Sel2 Dest. Enter the forward number for the Cfwd Sel2 Caller. If this is blank, then the landline caller is blocked for Internet phone service.

Cfwd Sel3 Caller. Enter the caller number pattern that will be forwarded to the Cfwd Sel3 Dest number.

Cfwd Sel3 Dest. Enter the forward number for the Cfwd Sel3 Caller. If this is blank, then the landline caller is blocked for Internet phone service.

Cfwd Sel4 Caller. Enter the caller number pattern that will be forwarded to the Cfwd Sel4 Dest number.

Cfwd Sel4 Dest. Enter the forward number for the Cfwd Sel4 Caller. If this is blank, then the landline caller is blocked for Internet phone service.

Cfwd Sel5 Caller. Enter the caller number pattern that will be forwarded to the Cfwd Sel5 Dest number.

Figure 6-15: Voice - PSTN User Screen

Cfwd Sel5 Dest. Enter the forward number for the Cfwd Sel5 Caller. If this is blank, then the landline caller is blocked for Internet phone service.

Cfwd Sel6 Caller. Enter the caller number pattern that will be forwarded to the Cfwd Sel6 Dest number.

Cfwd Sel6 Dest. Enter the forward number for the Cfwd Sel6 Caller. If this is blank, then the landline caller is blocked for Internet phone service.

Cfwd Sel7 Caller. Enter the caller number pattern that will be forwarded to the Cfwd Sel7 Dest number.

Cfwd Sel7 Dest. Enter the forward number for the Cfwd Sel7 Caller. If this is blank, then the landline caller is blocked for Internet phone service.

Cfwd Sel8 Caller. Enter the caller number pattern that will be forwarded to the Cfwd Sel8 Dest number.

Cfwd Sel8 Dest. Enter the forward number for the Cfwd Sel8 Caller. If this is blank, then the landline caller is blocked for Internet phone service.

PSTN-To-VoIP Speed Dial Settings

Enter the Internet phone numbers to call when the landline caller dials a single digit (2-9).

Speed Dial 2. Enter the target phone number to assign to speed dial 2.

Speed Dial 3. Enter the target phone number to assign to speed dial 3.

Speed Dial 4. Enter the target phone number to assign to speed dial 4.

Speed Dial 5. Enter the target phone number to assign to speed dial 5.
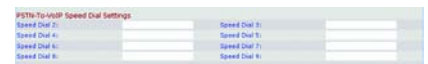
Figure 6-16: PSTN-To-VoIP Speed Dial Settings

Speed Dial 6. Enter the target phone number to assign to speed dial 6.

Speed Dial 7. Enter the target phone number to assign to speed dial 7.

Speed Dial 8. Enter the target phone number to assign to speed dial 8.

Speed Dial 9. Enter the target phone number to assign to speed dial 9.

PSTN Ring Thru Line 1 Distinctive Ring Settings

Enter the landline caller numbers that will trigger the corresponding ring tones for Line 1.

Ring1 Caller. Enter the caller number pattern to play Distinctive Ring/Call Waiting Tone (CWT) 1.

Ring2 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 2.

Ring3 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 3.

Ring4 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 4.

Ring5 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 5.

Ring6 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 6.

Ring7 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 7.

Ring8 Caller. Enter the caller number pattern to play Distinctive Ring/CWT 8.

Figure 6-17: PSTN Ring Thru Line 1 Distinctive Ring Settings

PSTN Ring Thru Line 1 Ring Settings

This ring tone will be used to ring through Line 1.

Default Ring. Select the default ringing pattern for all callers. If you select Follow Line 1, then the ring selection will be determined by Line 1's distinctive ring settings.

When you have finished making your change, click the **Submit All Changes** button to save the changes, or click the **Undo All Changes** button to undo your change.

Figure 6-18: PSTN Ring Thru Line 1 Ring Settings

Appendix A: Troubleshooting

This appendix provides solutions to problems that may occur during the installation and operation of the Voice Gateway. Read the description below to solve your problems. If you can't find an answer here, check the website of your Internet Telephony Service Provider (ITSP) or the Linksys website at *www.linksys.com*.

Common Problems and Solutions

1. **I don't hear a dial tone, and the PHONE LED is not lit.**
   Go through this checklist until your problem is solved:
   • Make sure the telephone is plugged into the PHONE port.
   • Disconnect and re-connect the RJ-11 telephone cable between the Voice Gateway and telephone.
   • Make sure your telephone is set to its tone setting (not pulse).
   • Make sure your network has an active Internet connection. Try to access the Internet. If you do not have a connection, power off your network devices, including the Voice Gateway and cable/DSL modem. Wait 30 seconds, and power on the cable/DSL modem first. Then power on the Voice Gateway and other network devices.
   • Verify your account information and confirm that the phone line is registered with your ITSP.

2. **I'm trying to access the Voice Gateway's Web-based Utility, but I do not see the login screen. Instead, I see a screen saying, "404 Forbidden."**
   If you are using Windows Explorer, perform the following steps until you see the Web-based Utility's login screen (Netscape Navigator will require similar steps):
   A. Click **File**. Make sure *Work Offline* is NOT checked.
   B. Press **CTRL + F5**. This is a hard refresh, which will force Windows Explorer to load new webpages, not cached ones.

C.   Click **Tools**. Click **Internet Options**. Click the **Security** tab. Click the **Default level** button. Make sure the security level is Medium or lower. Then click the **OK** button.

3.   *I need to set a static IP address on a PC.*
     The Voice Gateway, by default, assigns an IP address range of 192.168.0.100 to 192.168.0.150 using the DHCP server on the Voice Gateway. To set a static IP address, you can only use the ranges 192.168.0.2 to 192.168.0.99 and 192.168.0.151 to 192.168.0.254. Each PC or network device that uses TCP/IP must have a unique address to identify itself in a network. If the IP address is not unique to a network, Windows will generate an IP conflict error message. You can assign a static IP address to a PC by performing the following steps:

For Windows 98 and Millennium:

A.   Click **Start**, **Setting**, and **Control Panel**. Double-click **Network**.
B.   In *The following network components are installed* box, select the **TCP/IP**-> associated with your Ethernet adapter. If you only have one Ethernet adapter installed, you will only see one TCP/IP line with no association to an Ethernet adapter. Highlight it and click the **Properties** button.
C.   In the *TCP/IP properties* window, select the **IP address** tab, and select **Specify an IP address**. Enter a unique IP address that is not used by any other computer on the network connected to the Voice Gateway. You can only use an IP address in the ranges 192.168.0.2 to 192.168.0.99 and 192.168.0.151 to 192.168.0.254.   Make sure that each IP address is unique for each PC or network device.
D.   Click the **Voice Gateway** tab, and in the *New Voice Gateway* prompt, enter **192.168.0.1**, which is the default IP address of the Voice Gateway. Click the **Add** button to accept the entry.
E.   Click the **DNS** tab, and make sure the **DNS Enabled** option is selected. Enter the Host and Domain names (e.g., John for Host and home for Domain). Enter the DNS entry provided by your ISP. If your ISP has not provided the DNS IP address, contact your ISP to get that information or go to its website for the information.
F.   Click the **OK** button in the *TCP/IP properties* window, and click **Close** or **OK** for the *Network* window.
G.   Restart the computer when asked.

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For Windows 2000:

A. Click **Start**, **Settings**, and **Control Panel**. Double-click **Network and Dial-Up Connections**.
B. Right-click the **Local Area Connection** that is associated with the Ethernet adapter you are using, and select the **Properties** option.
C. In the *Components checked are used by this connection* box, highlight **Internet Protocol (TCP/IP)**, and click the **Properties** button. Select **Use the following IP address** option.
D. Enter a unique IP address that is not used by any other computer on the network connected to the Voice Gateway. You can only use an IP address in the ranges 192.168.0.2 to 192.168.0.99 and 192.168.0.151 to 192.168.0.254.
E. Enter the Subnet Mask, **255.255.255.0**.
F. Enter the Default Gateway, **192.168.0.1** (Voice Gateway's default IP address).
G. Toward the bottom of the window, select **Use the following DNS server addresses**, and enter the Preferred DNS server and Alternative DNS server (provided by your ISP). Contact your ISP or go on its website to find the information.
H. Click the **OK** button in the *Internet Protocol (TCP/IP) Properties* window, and click the **OK** button in the *Local Area Connection Properties* window.
I. Restart the computer if asked.

For Windows XP:

The following instructions assume you are running Windows XP with the default interface. If you are using the Classic interface (where the icons and menus look like previous Windows versions), please follow the instructions for Windows 2000.

A. Click **Start** and **Control Panel**.
B. Click the **Network and Internet Connections** icon and then the **Network Connections** icon.
C. Right-click the **Local Area Connection** that is associated with the Ethernet adapter you are using, and select the **Properties** option.

D. In the *This connection uses the following items* box, highlight **Internet Protocol (TCP/IP)**. Click the **Properties** button.

E. Enter a unique IP address that is not used by any other computer on the network connected to the Voice Gateway. You can only use an IP address in the ranges 192.168.0.2 to 192.168.0.99 and 192.168.0.151 to 192.168.0.254.

F. Enter the Subnet Mask, **255.255.255.0**.

G. Enter the Default Gateway, **192.168.0.1** (Voice Gateway's default IP address).

H. Toward the bottom of the window, select **Use the following DNS server addresses**, and enter the Preferred DNS server and Alternative DNS server (provided by your ISP). Contact your ISP or go on its website to find the information.

I. Click the **OK** button in the *Internet Protocol (TCP/IP) Properties* window. Click the **OK** button in the *Local Area Connection Properties* window.

4. *I want to test my Internet connection.*

A. Check your TCP/IP settings.

For Windows 98 and Millennium:

Refer to Windows Help for details. Make sure **Obtain IP address automatically** is selected in the settings.

For Windows 2000:

1. Click **Start**, **Settings**, and **Control Panel**. Double-click **Network and Dial-Up Connections**.

2. Right-click the **Local Area Connection** that is associated with the Ethernet adapter you are using, and select the **Properties** option.

3. In the *Components checked are used by this connection* box, highlight **Internet Protocol (TCP/IP)**, and click the **Properties** button. Make sure that **Obtain an IP address automatically** and **Obtain DNS server address automatically** are selected.

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4. Click the **OK** button in the *Internet Protocol (TCP/IP) Properties* window, and click the **OK** button in the *Local Area Connection Properties* window.
5. Restart the computer if asked.
6. Click the **OK** button in the *Internet Protocol (TCP/IP) Properties* window, and click the **OK** button in the *Local Area Connection Properties* window.
7. Restart the computer if asked.

For Windows XP:

The following instructions assume you are running Windows XP with the default interface. If you are using the Classic interface (where the icons and menus look like previous Windows versions), please follow the instructions for Windows 2000.

1. Click **Start** and **Control Panel**.
2. Click the **Network and Internet Connections** icon and then the **Network Connections** icon.
3. Right-click the **Local Area Connection** that is associated with the Ethernet adapter you are using, and select the **Properties** option.
4. In the *This connection uses the following items* box, highlight **Internet Protocol (TCP/IP)**, and click the **Properties** button. Make sure that **Obtain an IP address automatically** and **Obtain DNS server address automatically** are selected.

B. Open a command prompt.
    *   For Windows 98 and Millennium, click **Start** and **Run**. In the *Open* field, type **command**. Press the **Enter** key or click the **OK** button.
    *   For Windows 2000 and XP, click **Start** and **Run**. In the *Open* field, type **cmd**. Press the **Enter** key or click the **OK** button.

C. In the command prompt, type **ping 192.168.0.1** and press the **Enter** key.
    *   If you get a reply, the computer is communicating with the Voice Gateway.

Appendix A: Troubleshooting
Common Problems and Solutions

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- • If you do NOT get a reply, check the cable, and make sure **Obtain an IP address automatically** is selected in the TCP/IP settings for your Ethernet adapter.

D. In the command prompt, type **ping** followed by your Internet IP address and press the **Enter** key. The Internet IP Address can be found in the web interface of the Voice Gateway. For example, if your Internet IP address is 1.2.3.4, you would enter **ping 1.2.3.4** and press the **Enter** key.
- • If you get a reply, the computer is connected to the Voice Gateway.
- • If you do NOT get a reply, try the ping command from a different computer to verify that your original computer is not the cause of the problem.

E. In the command prompt, type **ping www.linksys.com** and press the **Enter** key.
- • If you get a reply, the computer is connected to the Internet. If you cannot open a webpage, try the ping command from a different computer to verify that your original computer is not the cause of the problem.
- • If you do NOT get a reply, there may be a problem with the connection. Try the ping command from a different computer to verify that your original computer is not the cause of the problem.

5. *I am not getting an IP address on the Internet with my Internet connection.*
   A. Refer to "Problem #4, I want to test my Internet connection" to verify that you have connectivity.
   B. If you need to register the MAC address of your Ethernet adapter with your ISP, please see "Appendix B: Finding the MAC Address and IP Address for Your Ethernet Adapter." If you need to clone the MAC address of your Ethernet adapter onto the Voice Gateway, see the Router - WAN Setup - MAC Clone Settings section of "Chapter 6: Using the Web-based Utility" for details.
   C. Make sure you are using the right Internet settings. Contact your ISP to see if your Internet connection type is DHCP, Static IP Address, or PPPoE (commonly used by DSL consumers). Please refer to the Router - WAN Setup - Internet Connection Settings section of "Chapter 6: Using the Web-based Utility" for details on Internet Connection Type settings.
   D. Make sure you use the right cable. Check to see if the Ethernet LED is solidly lit.

E. Make sure the cable connecting from your cable or DSL modem is connected to the Voice Gateway's Internet port. Verify that the Router - Status page of the Voice Gateway's Web-based Utility shows a valid IP address from your ISP.

F. Turn off the computer, Voice Gateway, and cable/DSL modem. Wait 30 seconds, and then turn on the Voice Gateway, cable/DSL modem, and computer. Check the Router - Status page of the Voice Gateway's Web-based Utility to see if you get an IP address.

6. *I am not able to access the Voice Gateway's Web-based Utility Setup page.*

A. Refer to "Problem #4, I want to test my Internet connection" to verify that your computer is properly connected to the Voice Gateway.

B. Refer to "Appendix B: Finding the MAC Address and IP Address for Your Ethernet Adapter" to verify that your computer has an IP Address, Subnet Mask, Gateway, and DNS.

C. Set a static IP address on your system; refer to "Problem #3: I need to set a static IP address on a PC."

D. Refer to "Problem #10: I am a PPPoE user, and I need to remove the proxy settings or the dial-up pop-up window."

7. *I need to set up a server behind my Voice Gateway.*

To use a server like a web, ftp, or mail server, you need to know the respective port numbers they are using. For example, port 80 (HTTP) is used for web; port 21 (FTP) is used for FTP, and port 25 (SMTP outgoing) and port 110 (POP3 incoming) are used for the mail server. You can get more information by viewing the documentation provided with the server you installed. Follow these steps to set up port forwarding through the Voice Gateway's Web-based Utility. We will be setting up web, ftp, and mail servers.

A. Access the Voice Gateway's Web-based Utility by going to **http://192.168.0.1** or the IP address of the Voice Gateway. Go to the **Router** => **Application** tab.

B. Select **yes** from the *Enable* drop-down menu.

C. Enter any name you want to use for the service.

D. Enter the port range of the service you are using. For example, if you have a web server, you would enter the range 80 (in the *Starting Port* field) to 80 (in the *Ending Port* field).

E. Select the protocol you will be using, **TCP** or **UDP**, or select **Both**.

F. Enter the IP address of the PC or network device that you want the port server to go to. For example, if the web server's Ethernet adapter IP address is 192.168.0.100, you would enter 100 in the field provided. Check "Appendix B: Finding the MAC Address and IP Address for Your Ethernet Adapter" for details on getting an IP address.

G. Follow the instructions in steps B-F for the port services you want to use. Consider the examples below:

Enable	Service Name	Starting and Ending Ports	Protocol	IP Address
yes	Web server	80 to 80	Both	192.168.0.100
yes	FTP server	21 to 21	TCP	192.168.0.101
yes	SMTP (outgoing)	25 to 25	Both	192.168.0.102
yes	POP3 (incoming)	110 to 110	Both	192.168.0.102

When you have completed the configuration, click the **Submit All Changes** button.

8. *I need to set up online game hosting or use other Internet applications.*
If you want to play online games or use Internet applications, most will work without doing any port forwarding or DMZ hosting. There may be cases when you want to host an online game or Internet application. This would require you to set up the Voice Gateway to deliver incoming packets or data to a specific computer. This also applies to the Internet applications you are using. The best way to get the

information on what port services to use is to go to the website of the online game or application you want to use. Follow these steps to set up online game hosting or use a certain Internet application:

A. Access the Voice Gateway's Web-based Utility by going to **http://192.168.0.1** or the IP address of the Voice Gateway. Go to the **Router** => **Application** tab.
B. Select **yes** from the *Enable* drop-down menu.
C. Enter any name you want to use for the service.
D. Enter the port range of the service you are using. For example, if you have a web server, you would enter the range 80 (in the *Starting Port* field) to 80 (in the *Ending Port* field).
E. Select the protocol you will be using, **TCP** or **UDP**, or select **Both**.
F. Enter the IP address of the PC or network device that you want the port server to go to. For example, if the web server's Ethernet adapter IP address is 192.168.0.100, you would enter 100 in the field provided. Check "Appendix B: Finding the MAC Address and IP Address for Your Ethernet Adapter" for details on getting an IP address.
G. Follow the instructions in steps B-F for the port services you want to use. Consider the examples below:

Enable	Service Name	Starting and Ending Ports	Protocol	IP Address
yes	UT	7777 to 27900	Both	192.168.0.100
yes	Halflife	27015 to 27015	Both	192.168.0.105
yes	PC Anywhere	5631 to 5631	UDP	192.168.0.102
yes	VPN IPSec	500 to 500	UDP	192.168.0.100

When you have completed the configuration, click the **Submit All Changes** button.

9. ***I can't get the Internet game, server, or application to work.***
If you are having difficulties getting any Internet game, server, or application to function properly, consider exposing one PC to the Internet using DeMilitarized Zone (DMZ) hosting. This option is available when an application requires too many ports or when you are not sure which port services to use. Make sure you disable all the forwarding entries if you want to successfully use DMZ hosting, since forwarding has priority over DMZ hosting. (In other words, data that enters the Voice Gateway will be checked first by the forwarding settings. If the port number that the data enters from does not have port forwarding, then the Voice Gateway will send the data to whichever PC or network device you set for DMZ hosting.) Follow these steps to set DMZ hosting:

A. Access the Voice Gateway's Web-based Utility by going to **http://192.168.0.1** or the IP address of the Voice Gateway. Go to the **Router** => **Application** tab.
B. Disable or remove the entries you have entered for forwarding. Keep this information in case you want to use it at a later time.
C. Select **yes** from the **Enable DMZ** drop-down menu.
D. Enter the Ethernet adapter's IP address of the computer you want exposed to the Internet. This will bypass the NAT security for that computer. Please refer to "Appendix B: Finding the MAC Address and IP Address for Your Ethernet Adapter" for details on getting an IP address.

Once completed with the configuration, click the **Submit All Changes** button.

10. *I am a PPPoE user, and I need to remove the proxy settings or the dial-up pop-up window.*
If you have proxy settings, you need to disable these on your computer. Because the Voice Gateway is the gateway for the Internet connection, the computer does not need any proxy settings to gain access. Please follow these directions to verify that you do not have any proxy settings and that the browser you use is set to connect directly to the LAN.

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For Microsoft Internet Explorer 5.0 or higher:

A. Click **Start**, **Settings**, and **Control Panel**. Double-click **Internet Options**.
B. Click the **Connections** tab.
C. Click the **LAN settings** button and remove anything that is checked.
D. Click the **OK** button to go back to the previous screen.
E. Click the option **Never dial a connection**. This will remove any dial-up pop-ups for PPPoE users.

For Netscape 4.7 or higher:

A. Start **Netscape Navigator**, and click **Edit**, **Preferences**, **Advanced**, and **Proxies**.
B. Make sure you have **Direct connection to the Internet** selected on this screen.
C. Close all the windows to finish.

11. *When I enter a URL or IP address, I get a time-out error or am prompted to retry.*
   Go through this checklist until your problem is solved:
   • Check if other PCs work. If they do, ensure that your workstation's IP settings are correct (IP Address, Subnet Mask, Default Gateway, and DNS). Restart the computer that is having a problem.
   • If the PCs are configured correctly, but still not working, check the Voice Gateway. Ensure that it is connected and powered on. Connect to it and check its settings. (If you cannot connect to it, check the LAN and power connections.)
   • If the Voice Gateway is configured correctly, check your Internet connection (DSL/cable modem, etc.) to see if it is working correctly. You can remove the Voice Gateway to verify a direct connection.
   • Manually configure the TCP/IP with a DNS address provided by your ISP.
   • Make sure that your browser is set to connect directly and that any dial-up is disabled. For Internet Explorer, click **Tools**, **Internet Options**, and then the **Connection** tab. Make sure that Internet Explorer is set to **Never dial a connection**. For Netscape Navigator, click **Edit**, **Preferences**, **Advanced**, and **Proxy**. Make sure that Netscape Navigator is set to **Direct connection to the Internet**.

Frequently Asked Questions

Can I make calls if my Internet connection is down?

When you make Internet phone calls, your high-speed Internet connection must be active. However, you can make calls using your landline.

Can I make calls while I'm browsing the Internet?

Yes. You can make calls while browsing the Internet. However, your web browsing may affect the quality of your Internet calls, depending on the amount of upstream data traffic passing through your Internet connection.

What is the maximum number of IP addresses that the Voice Gateway will support?

The Voice Gateway will support up to 253 IP addresses.

Where is the Voice Gateway installed on the network?

In a typical environment, the Voice Gateway is installed between the cable/DSL modem and the local area network (LAN). Plug the Voice Gateway into the cable/DSL modem's Ethernet port.

Does the Voice Gateway support IPX or AppleTalk?

No. TCP/IP is the only protocol standard for the Internet and has become the global standard for communications. IPX, a NetWare communications protocol used only to route messages from one node to another, and AppleTalk, a communications protocol used on Apple and Macintosh networks, can be used for LAN to LAN connections, but those protocols cannot connect from the Internet to the LAN.

What is Network Address Translation and what is it used for?

Network Address Translation (NAT) translates multiple IP addresses on the private LAN to one public address that is sent out to the Internet. This adds a level of security since the address of a PC connected to the private LAN is never transmitted on the Internet. Furthermore, NAT allows the Voice Gateway to be used with low cost Internet

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accounts, such as DSL or cable modems, when only one TCP/IP address is provided by the ISP. The user may have many private addresses behind this single address provided by the ISP.

Does the Voice Gateway support any operating system other than Windows 98, Millennium, 2000, or XP?
Yes, but Linksys does not, at this time, provide technical support for setup, configuration or troubleshooting of any non-Windows operating systems.

Does the Voice Gateway support ICQ send file?
Yes, with the following fix: click **ICQ menu** => **preference** => **connections** tab=>, and check **I am behind a firewall or proxy**. Then set the firewall time-out to 80 seconds in the firewall setting. The Internet user can then send a file to a user behind the Voice Gateway.

I set up an Unreal Tournament Server, but others on the LAN cannot join. What do I need to do?
If you have a dedicated Unreal Tournament server running, you need to create a static IP for each of the LAN computers and forward ports 7777, 7778, 7779, 7780, 7781, and 27900 to the IP address of the server. You can also use a port forwarding range of 7777 to 27900. If you want to use the UT Server Admin, forward another port (8080 usually works well but is used for remote admin. You may have to disable this.), and then in the [UWeb.WebServer] section of the server.ini file, set the ListenPort to 8080 (to match the mapped port above) and ServerName to the IP assigned to the Voice Gateway from your ISP.

Can multiple gamers on the LAN get on one game server and play simultaneously with just one public IP address?
It depends on which network game or what kind of game server you are using. For example, Unreal Tournament supports multi-login with one public IP.

How do I get Half-Life: Team Fortress to work with the Voice Gateway?
The default client port for Half-Life is 27005. The computers on your LAN need to have "+clientport 2700x" added to the HL shortcut command line; the x would be 6, 7, 8, and on up. This lets multiple computers connect to the same server. One problem: Version 1.0.1.6 won't let multiple computers with the same CD key connect at the same time, even if on the same LAN (not a problem with 1.0.1.3). As far as hosting games, the HL server does not need to be in the DMZ. Just forward port 27015 to the local IP address of the server computer.

How can I block corrupted FTP downloads?
If you are experiencing corrupted files when you download a file with your FTP client, try using another FTP program.

The web page hangs; downloads are corrupt, or nothing but junk characters are being displayed on the screen. What do I need to do?
Force your Ethernet adapter to 10Mbps or half duplex mode, and turn off the "Auto-negotiate" feature of your Ethernet adapter as a temporary measure. (Please look at the Network Control Panel in your Ethernet adapter's Advanced Properties tab.) Make sure that your proxy setting is disabled in the browser. Check our website at *www.linksys.com* for more information.

Will the Voice Gateway function in a Macintosh environment?
Yes, but the Voice Gateway's setup pages are accessible only through Internet Explorer 5.0 or Netscape Navigator 5.0 or higher for Macintosh.

I am not able to get the web configuration screen for the Voice Gateway. What can I do?
You may have to remove the proxy settings on your Internet browser, e.g., Netscape Navigator or Internet Explorer. Or remove the dial-up settings on your browser. Check with your browser documentation, and make sure that your browser is set to connect directly and that any dial-up is disabled. Make sure that your browser is set to connect directly and that any dial-up is disabled. For Internet Explorer, click **Tools**, **Internet Options**, and then the **Connection** tab. Make sure that Internet Explorer is set to **Never dial a connection**. For Netscape

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Navigator, click **Edit**, **Preferences**, **Advanced**, and **Proxy**. Make sure that Netscape Navigator is set to **Direct connection to the Internet**.

What is DMZ Hosting?

Demilitarized Zone (DMZ) allows one IP address (computer) to be exposed to the Internet. Some applications require multiple TCP/IP ports to be open. It is recommended that you set your computer with a static IP if you want to use DMZ Hosting. To get the LAN IP address, see "Appendix B: Finding the MAC Address and IP Address for Your Ethernet Adapter."

If DMZ Hosting is used, does the exposed user share the public IP with the Voice Gateway?

No.

Is the Voice Gateway cross-platform compatible?

Any platform that supports Ethernet and TCP/IP is compatible with the Voice Gateway.

Does the Voice Gateway replace a modem? Is there a cable or DSL modem in the Voice Gateway?

No, this version of the Voice Gateway must work in conjunction with a cable or DSL modem.

Which modems are compatible with the Voice Gateway?

The Voice Gateway is compatible with virtually any cable or DSL modem that supports Ethernet.

How do I get mIRC to work with the Voice Gateway?

Use the *Router - Application* screen. Configure an entry and set the Starting and Ending Ports to **113** for the PC on which you are using mIRC.

How do I reset the Voice Gateway?

Refer to "Chapter 5: Using the Interactive Voice Response Menu" for instructions.

Voice Gateway with Router

Appendix B: Finding the MAC Address and IP Address for Your Ethernet Adapter

This section describes how to find the MAC address for your computer's Ethernet adapter so you can use the MAC address cloning feature of the Voice Gateway. You can also find the IP address of your computer's Ethernet adapter. This IP address is used for the Voice Gateway's forwarding and/or DMZ features. Follow the steps in this appendix to find the adapter's MAC or IP address in Windows 98, Me, 2000, or XP.

Windows 98 or Me Instructions

1. Click **Start** and **Run**. In the *Open* field, enter **winipcfg**. Then press the **Enter** key or the **OK** button.

2. When the *IP Configuration* screen appears, select the Ethernet adapter you have connected to the Voice Gateway via a CAT 5 Ethernet network cable.

3. Write down the Adapter Address as shown on your computer screen. This is the MAC address for your Ethernet adapter and is shown as a series of numbers and letters.

   The MAC address/Adapter Address is what you will use for MAC address cloning.

   The example shows the Ethernet adapter's IP address as 192.168.1.100. Your computer may show something different.
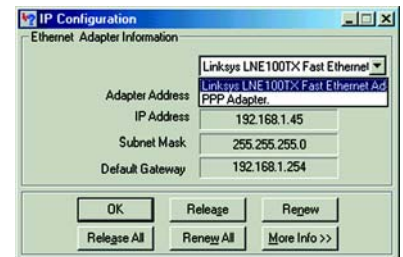
Figure B-1: IP Configuration Screen
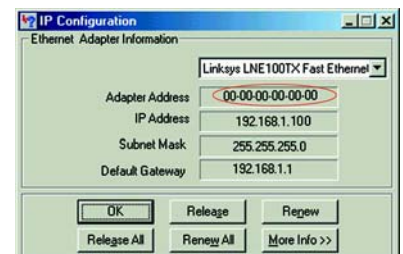
Figure B-2: MAC/Adapter Address

Windows 2000 or XP Instructions

1. Click **Start** and **Run**. In the *Open* field, enter **cmd**. Press the **Enter** key or click the **OK** button.

2. At the command prompt, enter **ipconfig /all**. Then press the **Enter** key.

3. Write down the Physical Address as shown on your computer screen; it is the MAC address for your Ethernet adapter. This appears as a series of numbers and letters.

   The MAC address/Physical Address is what you will use for MAC address cloning.

   The example shows the Ethernet adapter's IP address as 192.168.1.100. Your computer may show something different.
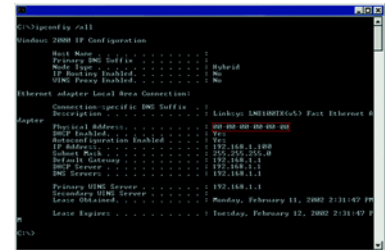

Figure B-3: MAC/Physical Address

For the Voice Gateway's Web-based Utility

For MAC address cloning, enter the 12-digit MAC address in the field provided.

Figure B-4: MAC Address Cloning

Appendix C: Windows Help

Almost all Linksys products require Microsoft Windows. Windows is the most used operating system in the world and comes with many features that help make networking easier. These features can be accessed through Windows Help and are described in this appendix.

TCP/IP

Before a computer can communicate with a network router, TCP/IP must be enabled. TCP/IP is a set of instructions, or protocol, all PCs follow to communicate over a network. This is true for wireless networks as well. Your PCs will not be able to utilize wireless networking without having TCP/IP enabled. Windows Help provides complete instructions on enabling TCP/IP.

Shared Resources

If you wish to share printers, folder, or files over your network, Windows Help provides complete instructions on utilizing shared resources.

Network Neighborhood/My Network Places

Other PCs on your network will appear under Network Neighborhood or My Network Places (depending upon the version of Windows you're running). Windows Help provides complete instructions on adding PCs to your network.

Voice Gateway with Router

Appendix D: Glossary

This glossary contains some basic networking terms you may come across when using this product. For more advanced terms, see the complete Linksys glossary at http://www.linksys.com/glossary.

Bandwidth - The transmission capacity of a given device or network.

Bit - A binary digit.

Boot - To start a device and cause it to start executing instructions.

Broadband - An always-on, fast Internet connection.

Browser - An application program that provides a way to look at and interact with all the information on the World Wide Web.

Byte - A unit of data that is usually eight bits long.

Cable Modem - A device that connects a computer to the cable television network, which in turn connects to the Internet.

Daisy Chain - A method used to connect devices in a series, one after the other.

DDNS (**D**ynamic **D**omain **N**ame **S**ystem) - Allows the hosting of a website, FTP server, or e-mail server with a fixed domain name (e.g., www.xyz.com) and a dynamic IP address.

Default Gateway - A device that forwards Internet traffic from your local area network.

DHCP (**D**ynamic **H**ost **C**onfiguration **P**rotocol) - A networking protocol that allows administrators to assign temporary IP addresses to network computers by "leasing" an IP address to a user for a limited amount of time, instead of assigning permanent IP addresses.

DMZ (**De**militarized **Z**one) - Removes the Router's firewall protection from one PC, allowing it to be "seen" from the Internet.

DNS (**D**omain **N**ame **S**erver) - The IP address of your ISP's server, which translates the names of websites into IP addresses.

Domain - A specific name for a network of computers.

Download - To receive a file transmitted over a network.

DSL (**D**igital **S**ubscriber **L**ine) - An always-on broadband connection over traditional phone lines.

Dynamic IP Address - A temporary IP address assigned by a DHCP server.

Encryption - Encoding data transmitted in a network.

Ethernet - IEEE standard network protocol that specifies how data is placed on and retrieved from a common transmission medium.

Firewall - A set of related programs located at a network gateway server that protects the resources of a network from users from other networks.

Firmware - The programming code that runs a networking device.

FTP (**F**ile **T**ransfer **P**rotocol) - A protocol used to transfer files over a TCP/IP network.

Full Duplex - The ability of a networking device to receive and transmit data simultaneously.

Gateway - A device that interconnects networks with different, incompatible communications protocols.

Half Duplex - Data transmission that can occur in two directions over a single line, but only one direction at a time.

HTTP (**H**yper**T**ext **T**ransport **P**rotocol) - The communications protocol used to connect to servers on the World Wide Web.

IP (**I**nternet **P**rotocol) - A protocol used to send data over a network.

IP Address - The address used to identify a computer or device on a network.

IPCONFIG - A Windows 2000 and XP utility that displays the IP address for a particular networking device.

ISP (**I**nternet **S**ervice **P**rovider) - A company that provides access to the Internet.

LAN - The computers and networking products that make up your local network.

MAC (**M**edia **A**ccess **C**ontrol) **Address** - The unique address that a manufacturer assigns to each networking device.

Mbps (**M**ega**B**its **P**er **S**econd) - One million bits per second; a unit of measurement for data transmission.

NAT (**N**etwork **A**ddress **T**ranslation) - NAT technology translates IP addresses of a local area network to a different IP address for the Internet.

Network - A series of computers or devices connected for the purpose of data sharing, storage, and/or transmission between users.

Packet - A unit of data sent over a network.

Ping (**P**acket **IN**ternet **G**roper) - An Internet utility used to determine whether a particular IP address is online.

POP3 (**P**ost **O**ffice **P**rotocol **3**) - A standard mail server commonly used on the Internet.

Port - The connection point on a computer or networking device used for plugging in cables or adapters.

PPPoE (**P**oint to **P**oint **P**rotocol **o**ver **E**thernet) - A type of broadband connection that provides authentication (username and password) in addition to data transport.

PPTP (**P**oint-to-**P**oint **T**unneling **P**rotocol) - A VPN protocol that allows the Point to Point Protocol (PPP) to be tunneled through an IP network. This protocol is also used as a type of broadband connection in Europe.

RJ-45 (**R**egistered **J**ack-**45**) - An Ethernet connector that holds up to eight wires.

Router - A networking device that connects multiple networks together.

Appendix D: Glossary

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Server - Any computer whose function in a network is to provide user access to files, printing, communications, and other services.

SMTP (**S**imple **M**ail **T**ransfer **P**rotocol) - The standard e-mail protocol on the Internet.

SNMP (**S**imple **N**etwork **M**anagement **P**rotocol) - A widely used network monitoring and control protocol.

Static IP Address - A fixed address assigned to a computer or device that is connected to a network.

Static Routing - Forwarding data in a network via a fixed path.

Subnet Mask - An address code that determines the size of the network.

Switch - 1. A data switch that connects computing devices to host computers, allowing a large number of devices to share a limited number of ports. 2. A device for making, breaking, or changing the connections in an electrical circuit.

TCP (**T**ransmission **C**ontrol **P**rotocol) - A network protocol for transmitting data that requires acknowledgement from the recipient of data sent.

TCP/IP (**T**ransmission **C**ontrol **P**rotocol/**I**nternet **P**rotocol) - A set of instructions PCs use to communicate over a network.

Telnet - A user command and TCP/IP protocol used for accessing remote PCs.

Throughput - The amount of data moved successfully from one node to another in a given time period.

TX Rate - Transmission Rate.

Upgrade - To replace existing software or firmware with a newer version.

Upload - To transmit a file over a network.

URL (**U**niform **R**esource **L**ocator) - The address of a file located on the Internet.

WAN (**W**ide **A**rea **N**etwork)- The Internet.

Appendix E: Specifications

Model   SPA3102

Data Networking   MAC Address (IEEE 802.3)
                          IPv4 - Internet Protocol v4 (RFC 791) upgradeable to v6 (RFC 1883)
                          ARP - Address Resolution Protocol
                          DNS - A Record (RFC 1706), SRV Record (RFC 2782)
                          DHCP Client - Dynamic Host Configuration Protocol (RFC 2131)
                          DHCP Server - Dynamic Host Configuration Protocol (RFC 2131)
                          PPPoE Client - Point to Point Protocol over Ethernet (RFC 2516)
                          ICMP - Internet Control Message Protocol (RFC792)
                          TCP - Transmission Control Protocol (RFC793)
                          UDP - User Datagram Protocol (RFC768)
                          RTP - Real Time Protocol (RFC 1889) (RFC 1890)
                          RTCP - Real Time Control Protocol (RFC 1889)
                          DiffServ (RFC 2475), Type of Service - TOS (RFC 791/1349)
                          VLAN Tagging - 802.1p
                          SNTP - Simple Network Time Protocol (RFC 2030)
                          Upload Data Rate Limiting - Static and Automatic
                          QoS - Voice Packet Prioritization over Other Packet Types
                          Router or Bridge Mode of Operation
                          MAC Address Cloning
                          Port Forwarding

Voice Gateway   SIPv2: Session Initiation Protocol v2 (RFC 3261, 3262, 3263, 3264)
                                 SIP Proxy Redundancy - Dynamic via DNS SRV, A Records
                                 Re-registration with Primary SIP Proxy Server
                     SIP Support in Network Address Translation Networks - NAT (incl. STUN)
                     Secure (Encrypted) Calling via Pre-Standard Implementation of Secure RTP
                     Codec Name Assignment

Voice Algorithms   G.711 (A-law and µ-law)
                     G.726 (16/24/32/40 kbps)
                     G.729 A
                     G.723.1 (6.3 kbps, 5.3 kbps)
                     Dynamic Payload
                     Adjustable Audio Frames per Packet

Fax Capability   T.38 Fax
                     Fax Tone Detection and Pass-Through (Using .711)
                     Fax Pass-Though - Using G.711
                     DTMF: In-band & Out-of-band (RFC 2833) (SIP Info)
                     Flexible Dial Plan Support with Interdigit Timers and IP Dialing
                     Call Progress Tone Generation
                     Jitter Buffer - Adaptive
                     Frame Loss Concealment
                     Full Duplex Audio
                     Echo Cancellation (G.165/G.168)
                     VAD - Voice Activity Detection with Silence Suppression
                     Attenuation / Gain Adjustments
                     Flash Hook Timer
                     MWI - Message Waiting Indicator Tones

	VMWI - via FSK
	Polarity Control
	Hook Flash Event Signaling
	Caller ID Generation (Name & Number) - Bellcore, DTMF, ETSI
	Music on Hold Client
	Streaming Audio Server - up to 10 sessions
Security	Password Protected System Reset to Factory Default
	Password Protected Admin and User Access Authority
	Provisioning/Configuration/Authentication:
	HTTPS with Factory Installed Client Certificate
	HTTP Digest - Encrypted Authentication via MD5 (RFC 1321)
	Up to 256-bit AES Encryption
Provisioning, Administration & Maintenance	Web Browser Administration & Configuration via Integrated Web Server
	Telephone Key Pad Configuration with Interactive Voice Prompts
	Automated Provisioning & Upgrade via HTTP, TFTP
	Asynchronous Notification of Upgrade Availability via SIP NOTIFY
	Non-intrusive, In-Service Upgrades
	Report Generation & Event Logging
	Stats in BYE Message
	Syslog & Debug Server Records - Per Line Configurable
	Per Line and Purpose Configurable Syslog and Debug Options

Physical Interfaces	2 100baseT RJ-45 Ethernet Port (IEEE 802.3) -- 1 WAN, 1 LAN
	1 RJ-11 FXS Phone Ports - For Analog Circuit Telephone Device (Tip/Ring)
	1 RJ-11 FXO Phone Ports - For a Telco or PBX Connection
FXS	Ring Voltage: 40-55 VRMS Configurable
Subscriber Line Interface Circuit (SLIC)	Ring Frequency: 10 Hz - 40 Hz
	Ring Waveform: Trapezoidal and Sinusoidal
	Maximum Ringer Load: 3 REN
	On-hook/off-hook Characteristics:
	On-hook voltage (tip/ring): -50 V NOMINAL
	Off-hook current: 25 mA min
	Terminating Impedance: 8 Configurable Settings including
	North America 600 ohms, European CTR21
Regulatory Compliance	FCC (Part 15 Class B), CE, ICES-003, A-Tick Certification
Power Supply	DC Input Voltage: +5 VDC at 2.0 A Max.
	Power Consumption: 5 Watts
	Switching Type (100-240v) Automatic
	Power Adapter: 100-240v - 50-60Hz (26-34VA) AC Input
Indicator Lights/LEDs	Power, Internet, Phone, Line

Appendix E: Specifications

Documentation	Quick Installation and Compliance Guide
	User Guide
	Administration Guide - Service Providers Only
	Provisioning Guide - Service Providers Only
Dimensions	3.98" x 3.98" x 1.10"
(W x H x D)	(101 x 101 x 28 mm)
Unit Weight	5.11 oz. (0.145 kg)
Operating Temp.	32 to 113º F (0 to 45º C)
Storage Temp.	-13 to 185º F (-25 to 85º C)
Operating Humidity	10 to 90% Non-condensing, operating and non-operating

Voice Gateway with Router

Appendix F: Warranty Information

This Warranty is valid and may be processed only in the country of purchase. Contact your service provider if the warranty support issues are to be handled by them as per your service agreements.

Linksys warrants to You that, for a period of two years (the "Warranty Period"), your Linksys Product will be substantially free of defects in materials and workmanship under normal use. Your exclusive remedy and Linksys' entire liability under this warranty will be for Linksys at its option to repair or replace the Product or refund Your purchase price less any rebates. This limited warranty extends only to the original purchaser.

If the Product proves defective during the Warranty Period call Linksys Technical Support in order to obtain a Return Authorization Number, if applicable. BE SURE TO HAVE YOUR PROOF OF PURCHASE ON HAND WHEN CALLING. If You are requested to return the Product, mark the Return Authorization Number clearly on the outside of the package and include a copy of your original proof of purchase. RETURN REQUESTS CANNOT BE PROCESSED WITHOUT PROOF OF PURCHASE. You are responsible for shipping defective Products to Linksys. Linksys pays for UPS Ground shipping from Linksys back to You only. Customers located outside of the United States of America and Canada are responsible for all shipping and handling charges.

ALL IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE WARRANTY PERIOD. ALL OTHER EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF NON-INFRINGEMENT, ARE DISCLAIMED. Some jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to You. This warranty gives You specific legal rights, and You may also have other rights which vary by jurisdiction.

This warranty does not apply if the Product (a) has been altered, except by Linksys, (b) has not been installed, operated, repaired, or maintained in accordance with instructions supplied by Linksys, or (c) has been subjected to abnormal physical or electrical stress, misuse, negligence, or accident. In addition, due to the continual development of new techniques for intruding upon and attacking networks, Linksys does not warrant that the Product will be free of vulnerability to intrusion or attack.

TO THE EXTENT NOT PROHIBITED BY LAW, IN NO EVENT WILL LINKSYS BE LIABLE FOR ANY LOST DATA, REVENUE OR PROFIT, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, REGARDLESS OF THE THEORY OF LIABILITY (INCLUDING NEGLIGENCE), ARISING OUT OF OR RELATED TO THE USE OF OR INABILITY TO USE THE PRODUCT (INCLUDING ANY SOFTWARE), EVEN IF LINKSYS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT WILL LINKSYS' LIABILITY EXCEED THE AMOUNT PAID BY YOU FOR THE PRODUCT. The foregoing limitations will apply even if any warranty or remedy

provided under this Agreement fails of its essential purpose. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to You.

Please direct all inquiries to: Linksys, P.O. Box 18558, Irvine, CA 92623.

Appendix G: Regulatory Information

FCC Statement

This product has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna

• Increase the separation between the equipment or devices

• Connect the equipment to an outlet other than the receiver's

• Consult a dealer or an experienced radio/TV technician for assistance

FCC Part 68 Statement

This equipment complies with Part 68 of the FCC Rules. A label is attached to the equipment that contains, among other information, its FCC registration number and ringer equivalence number. If requested, this information must be provided to the telephone company.

This equipment uses the following USOC Jack: RJ-11.

An FCC compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack, which is FCC Part 68 compliant. Connection to the telephone network should be made by using the standard modular telephone jack.

The REN is useful to determine the quantity of devices that may be connected to the telephone line and still have all of those devices ring when your telephone number is called. In most, but not all areas, the sum of RENs should not exceed 5. To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to determine the maximum REN for the calling area.

If this equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.

In the event this equipment should fail to operate properly, disconnect the unit from the telephone line. Try using another FCC approved device in the same telephone jack. If the trouble persists, call the telephone company repair service bureau. If the trouble does not persist and appears to be with this unit, disconnect the unit from the telephone line and discontinue use of the unit until it is repaired. Please note that the telephone company may ask that you disconnect the equipment from the telephone network until the problem has been corrected or until you are sure that the equipment is not malfunctioning. The user must use the accessories and cables supplied by the manufacturer to get optimum performance from the product.

No repairs may be done by the customer. If trouble is experienced with this equipment, please contact your authorized support provider for repair and warranty information. If the trouble is causing harm to the telephone network, the telephone company may request you remove the equipment from the network until the problem is resolved. This equipment cannot be used on telephone company provided coin service. Connection to Party Line Service is subject to state tariffs.

Safety Notices

Caution: To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

Do not use this product near water, for example, in a wet basement or near a swimming pool.

Avoid using this product during an electrical storm. There may be a remote risk of electric shock from lightning.

Industry Canada (Canada)

This device complies with Industry Canada ICES-003 rule.

Cet appareil est conforme à la norme NMB003 d'Industrie Canada.

**EC Declaration of Conformity (Europe)**

In compliance with the EMC Directive 89/336/EEC, Low Voltage Directive 73/23/EEC, and Amendment Directive 93/68/EEC, this product meets the requirements of the following standards:

- **EN55022 Emission**

- **EN55024 Immunity**

- **EN60950 Safety**

User Information for Consumer Products Covered by EU Directive 2002/96/EC on Waste Electric and Electronic Equipment (WEEE)
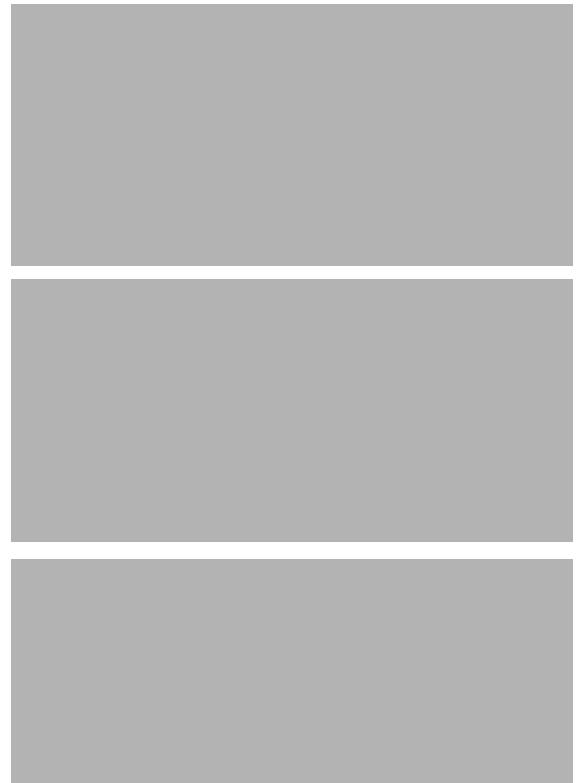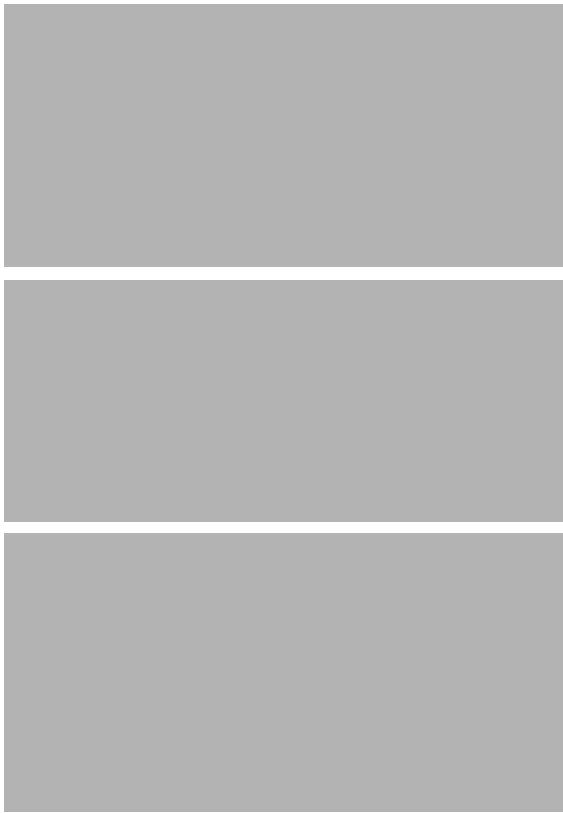
This document contains important information for users with regards to the proper disposal and recycling of Linksys products. Consumers are required to comply with this notice for all electronic products bearing the following symbol:
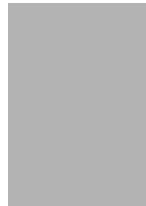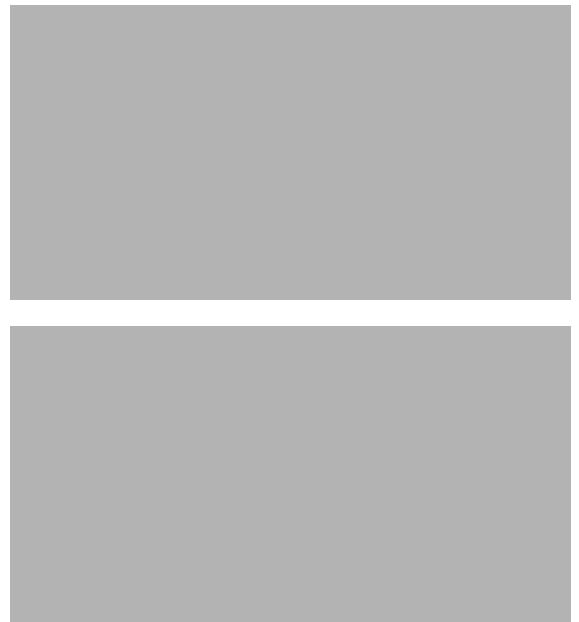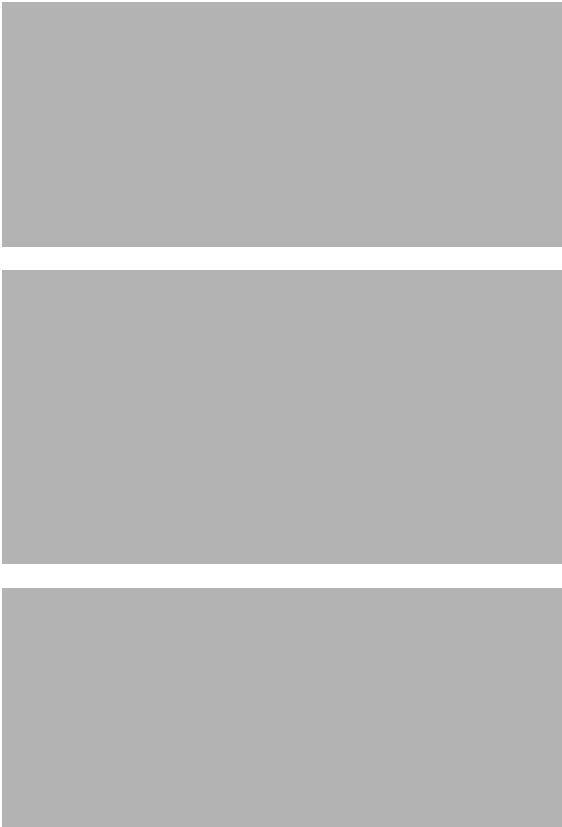
Voice Gateway with Router
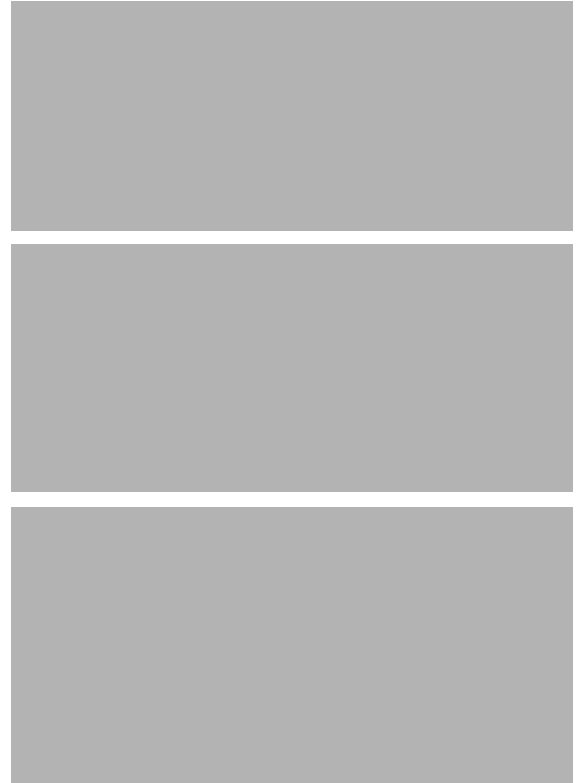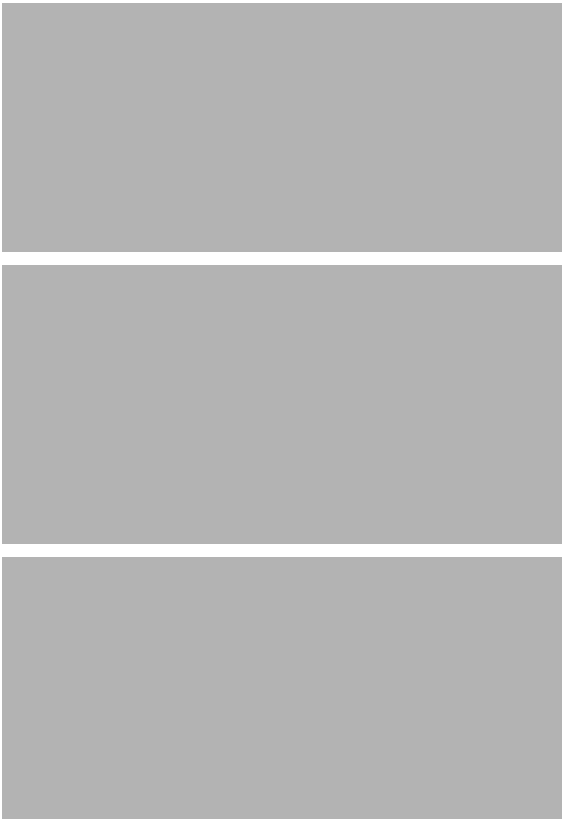
Voice Gateway with Router

Appendix H: Contact Information

Internet Telephony Service Provider (ITSP)

For support, contact your ITSP.

Linksys

Visit Linksys online for information on the latest products and updates
to your existing products at: http://www.linksys.com

Voice Gateway with Router

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