TECOM GW6000

Administrator's Manual

(ver.1.2.x)

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1. Introduction

Congratulate on becoming the owner of the GW6000.Your LAN (local area network) and WAN (wide area network) will now be able to access the Internet using your high-speed Ethernet connection. This Administrator Manual will show you how to install and set up your GW6000.

The IG (Intelligent Gateway) provides a variety of functions for users and can support a wide range of application in a complicated environment. Therefore, it needs Administrator to plan, install and set the whole environment of VoIP communication. And the knowledge of modern network and Internet technologies are essential for administrator.

Figure 1-1. Router Connection Diagram

Interfaces

- WAN Interface: 10/100Base-T Ethernet port
- CO Interface: 3 FXO (Loop Start, for PSTN)
- Analog Device Interface: 1 FXS (for analog Telephone or FAX)
- LAN Interface: 4 Ethernet (10/100Base-T)
- Built-in 802.11g Wi-Fi access point

Terminals

- 1 Analog Terminal
- 24 IP Stations (Wired/Wi-Fi IP Phone)

In principle, the Administration is required to do the following things:

(1) To understand the architecture, resources, and devices of whole environment which will be involved with the VoIP communications.

(2) To build a common setting file for most users.

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(3) To configure each phone and install them into the network.

(4) To configure each interfaces and install them into IG.

(5) And to solve the problems what users encounter during operation.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Notice : The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IMPORTANT NOTE: To comply with the FCC RF exposure compliance requirements, no change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user's authority to operate the device.The antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC INFORMATION
The Federal Communication Commission Radio Frequency Interference Statement includes the following paragraph:
The equipment has been tested and found to comply with the limits 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 in accordance with the instruction, may cause harmful interference to radio communication. However, there is no grantee that interference will not occur in a particular installation. If this equipment dose cause harmful interference to radio or television reception, which can be determined 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 and receiver.
--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
--Consult the dealer or an experienced radio/TV technician for help.

The user should not modify or change this equipment without written approval form TECOM CO., LTD. Modification could void authority to use this equipment.

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2. Getting to Know the Router

2.1 Specifications

Feature	Additional Info	
Main Processor	240MHZ MIPS32 CPU	
Processor SDRAM	External 32MB	
Processor Flash ROM	External 4MB	
Supplementary Processor	1x DSP Voice Pump VP101-4 (4 channel/each)	
System Flash (Voice Mail)	128MB	
Switch controller	Broadcom BCM5325E	
System Power:	15V/1A	
Standards	IEEE802.11g,IEEE802.11b,IEEE802.3	
Ports	1×WAN，4×LAN，1×FXS，3×FXO	
Button	Reset, Power on/off	
Cabling	RJ-45,RJ-11	
LEDs	POWER, WIRELESS, 3×LINE, TEL, 4×ETHERNET, WAN	
EMI/EMC:	FCC Part15 Class B	
Environmental	Operating Temp	.0ºC to40ºC (32ºF to 104ºF)
	Storage Temp.	-20ºC to 70ºC (-4ºF to 158ºF)
	Operating Humidity	10% to 80% relative humidity, Non-Condensing
	Storage Humidity	10% to 90% Non-Condensing

2.2 Front Panel

The front panel contains several LEDs that indicate the status of the unit.

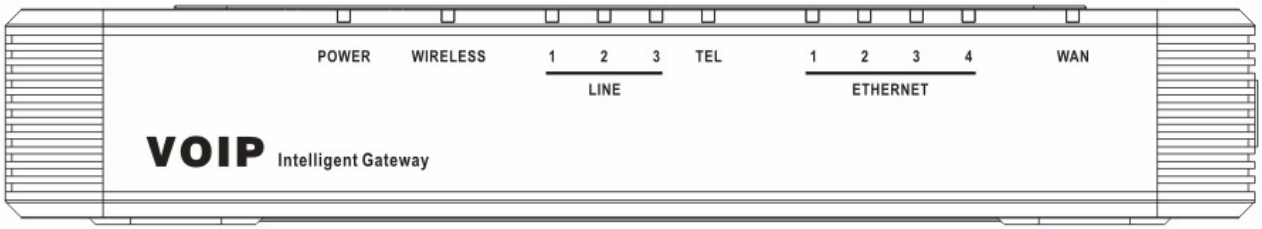

Figure 2-1. Front Panel of GW6000

LED Name	Color	Status	Description
POWER	Blue	On	Power on.
		Off	Power off.
WIRELESS	Blue	On	Wireless LAN initialization success.
		Off	Wireless LAN is not present.
LINE (1-3)	Blue	Off	PSTN Line is idle.
		On	PSTN Line is busy.
TEL	Blue	Off	Phone is idle.
		On	Phone is busy.
ETHERNET(1-4)	Blue	On	LAN connected.
		Off	LAN network connection not present.
		Flashing	LAN activity present (traffic in either direction).
INTERNET	Blue	On	WAN connected.
		Off	WAN network connection not present.
		Flashing	WAN activity present (traffic in either direction).

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2.3 Rear Panel

The rear panel contains the ports for the unit's data and power connections.

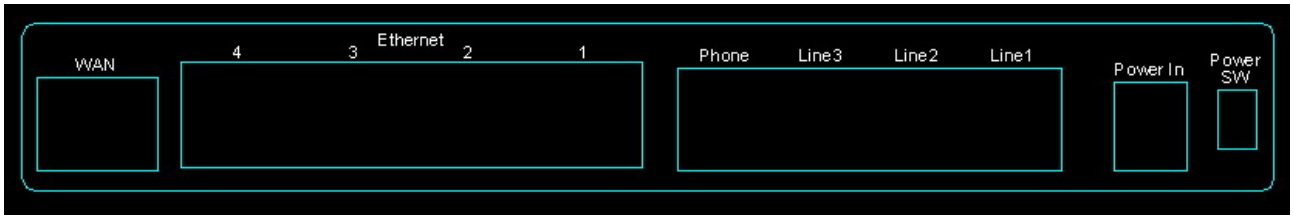

Figure 2-2. Rear Panel of GW6000

Label	Function
WAN	RJ-45 connector: Connects the device to your cable modem, or to your ADSL Modem, It's to connect to the remote network
LAN1-4	RJ-45 connector: Connects the device to your PC's Ethernet port, or to the uplink port on your LAN's hub,
TEL1	RJ-11 connector: Connects the device to your analog phone,
Line 1-3	RJ-11 connector: Connects the device to your PSTN lines
Power	Connects to the supplied power converter cable
On/Off	Switches the device on and off

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3. System Features

3.1 Answering Position

For incoming calls from PSTN (FXO ports), system provides the flexibility to ring to different destinations. System also provides the ability to have the calls to ring to 1-6 different extensions according to the system service mode (day or night modes).

It is also for those incoming VoIP calls from the registered ISP (Uplink Server) to be routed with the same method.

3.2 Auto Attendant & Voice Mail

The IG Auto Attendant can greatly enhance business office productivity by providing either a full-duty automated attendant to handle all incoming system calls or part-duty automated attendant to handle overflow traffic.

The Automated Attendant & Voice Mail Module provides 128MB of programmable voice announcements. It provides four ports to handle four (4) simultaneous callers. It provides the following functions:

- Auto Attendant Functions

  It provides an incoming caller with a customized welcome greeting that describes the actions available to an incoming caller:
  - Provide four kinds of main greeting messages: Day, Night, Noon, and Holiday greeting messages.
  - Dial an extension number or operator code to reach the appreciate destination.
  - Press a digit to leave a message in a particular mailbox.
  - Press a digit to make an outside call via the specified check.
  - Provide the phone to forward the call to its voicemail box.
  - Provide the phone to set Direct Call Forward, Busy Call Forward or No Answer Call Forward. It will forward the incoming trunk call to another extension.
  - Provide the phone to set Do Not Disturb to stop the incoming line call from ringing.
- Voice Mail Functions

  All mailbox users have access to these mailbox features
  - Delete, save, or skip messages.
  - Send messages to other mailbox.
  - Receive message information indicating the date, time, and sender information, if available.
  - Change personal greeting, and password.
  - Playback controls when reviewing messages.
  - Record a temporary greeting.
  - Send a notification via email when getting a leaving message.
  - The maximum recording length for each call is 60 seconds.
  - The maximum total length for each user is about 18 minutes.
  - For each leaving message, it's saved 1 - 7 days
- Voice Messages
  - Provide two languages service for the all voice files.
  - Administrators can record the all voice messages by themselves.

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- Administrators can update, backup or delete the all voice messages on the PC.

3.3 Call Abandon

For every PSTN call, system provides the facility to monitor the call status. If the remote party hangs up, the ongoing call must be terminated.

3.4 Call Operator (Call Attendant)

One primary operator may be assigned in the system. The standard IP phone will serve as the operator telephone. When assigned as operator, this extension supports general system functions.

While the internal extension dials Operator Directory Number ("0" at default), or the outside party dials "0" when Auto Attendant plays the Welcome message, these calls will be stored into Operator Queue. The Operator is First-In-First-Out to service these calls. At the waiting time, the calling party will be on Music-On-Hold state.

3.5 Call Routing

The Call Routing feature automatically routes outgoing calls using the most appropriate route. The appropriate route is determined based on the number dialed. If necessary, GW6000 can automatically modify the dialed number by deleting and inserting digits.

The call routing destination is a PSTN line, an IP line, a line group or another GW6000.

3.6 Caller ID

GW6000 provides the ability to detect the calling party identification provided by CO via PSTN lines or by Uplink Server via IP trunks. This data when received by the telephone carrier will be displayed on all ringing IP phones or Caller ID equipped Single Line Telephone.

3.7 Caller ID to Extension

When Caller ID data is received on PSTN Lines or IP Lines of the IG system, this caller ID data is re-broadcast to analog devices or IP phones. This means that Caller ID will be supported even when connected “behind” the IG system as a system extension.

3.8 Class Of Service (COS)

GW6000 provides eight (8) Classes of Service (COS) for assignment of outside line dialing-privileges. Each extension may be assigned one Day-COS and one Night-COS. The Extension COS is primarily used for restriction and control of long distance dialing.

COS 0 is the highest priority. COS 7 is the lowest one.

3.9 Daylight Saving Time

Daylight Saving Time (DST) feature supports auto adjustment for daylight saving time.

3.10 Default Set

When the feature is active, the extension will return to default settings. It will affect the following options:

Cancel any Call Forward via AA
Cancel DND via AA
Paging Accept

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Default Feature Key Setting

3.11 Direct Inward System Access (DISA) via Auto Attendant

The current PSTN/IP lines are all DISA lines. While ringing to AA, the outside callers have direct access to extensions, PSTN/IP lines, Call Routing and Trunk Groups.

3.12 Dynamic DNS

GW6000 support Dynamic DNS to see the DDNS host name as GW6000's WAN IP address in SIP application. Let the GW6000 have a static domain name for dynamic IP address.

Before using the feature, you must register domains on DynDNS.org or TZO.

3.13 Extension Password

All extensions of the IG system have an associated User Password. Password length is system programmable from 0 to 24 characters.

3.14 Fax/Modem

GW6000 supports FAX/modem tone detection and auto-fallback to G.711.

3.15 Feature Key Programming

Feature Keys can be programmed by phone users. A feature key can be programmed for line appearance.

3.16 Flash - Analog Port (SLT) Flash Recognition

Flash is the momentary operation of the hook-switch at the analog device, which can be deciphered by the IG system in such a way that the previous call in progress is held, or placed in a status of transfer awaiting further instructions from the user.

3.17 IG to IG

While dialing a number, it may route to another GW6000 through Call Routing Table. It allows the user to make a direct call to an extension in another GW6000. It also allows the user to share the PSTN or IP Trunks in another GW6000 to make an outside call.

3.18 IP Trunk

GW6000 can register up to 8 SIP Uplink Servers. The extensions may make a call to the users of the Uplink Servers, or any user in the world through the Uplink Servers.

- SIP message, including INVITE, re-INVITE, ACK, CANCEL, OPTIONS, BYE, REGISTER, INFO, REFER, SUSCRIBE/NOTIFY and REPLACE messages.
- SIP Outbound Proxy, SIP Proxy and Registrar
- Auto-Registration when power-on or period
- Session Timer support
- Support IP address, domain name, user name, display name for SIP URL

3.19 Line Group Assignment

System assigns each PSTN/IP line to a specific Line Group. Each line can be assigned to only one Line Group. The Line group assignment is used for Line pool access.

If setting some PSTN lines and some IP lines into the same Line Group, the line access depends on the access priority.

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3.20 Make an Outside Call

System provides three methods to make an outside call.

- The extension user dials the phone number directly. System automatically routes the outgoing call using the least expensive line via Call Routing Table.
- The extension user dials a Line number or a Line Group number first. After hearing the dial tone, the user dials the phone number.
- The extension presses a Line key first. After hearing the dial tone, the user dials the phone number.

3.21 Message Waiting Indication

It's a Voice Mail feature. When somebody leave messages, the router will inform the phones, and phones' LCD will display new voice mails information, and its led will flash accordingly.

3.22 Multi-Line Appearance

GW6000 provides PSTN line and IP line status to the phones.
Trunk LED:

Dark – the line is Null or Idle
Lit – the line is in Talk

3.23 Music On Hold

Any PSTN/IP line calls which placed on hold will give music to the other external party.

3.24 Night Switching

GW6000 provide Day and night settings in service mode page. And during different time, Trunk incoming call will be forwarded to different extensions according to the settings.

3.25 Numbering Plan

The Numbering Plan refers to the structure of dialed access to the various resources that are part of the system. GW6000 also allows for a very flexible configuration numbering for the various system resources.

3.26 Paging

A Page can be initiated from any extension in the system. Dialing a Paging Group Directory number allows an extension to broadcast a page to all assigned members of the selected paging group.

3.27 Plug and Play

While connecting IP2007/2008 phones to GW6000 LAN port, it will register to GW6000 automatically.

3.28 Polarity Reversal (PR) Detection

When making an outgoing PSTN call, the system must know if the remote party answers the call or not (for SMDR recording purpose). If the CO provides the PR signal, the system can monitor the signal to determine whether the remote party answers the call or not.

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3.29 PSTN Backup

In case of power failure, GW6000 automatically switches the first PSTN line to the Single-line analog phone. The other PSTN lines are not supported.

3.30 Registration

The IG combines Proxy and Registrar servers in its application. For a Registrar server, it acts as the front end to the location service for a domain, reading and writing mappings based on the contents of REGISTER requests. The location service is then typically consulted by a Proxy server.

3.31 Remote Management via PC

Programming the IG system database is possible via PC. IG build-in a web server for remote administration.

3.32 System Time & Date

The IG system provides a built-in time clock to track System Time for reference in certain features such as System Night Service Mode Change. This clock has the ability to automatically adjust with network NTP server through Internet.

3.33 Toll Restriction

GW6000 provides sophisticated monitoring of digits dialed on PSTN/IP Trunks. If a digit or range of digits dialed on a Trunk line is inconsistent with the dialing extension's COS, the call is denied. This calling COS criteria can be applied to local calls, long distance calls, and specific numbers that are considered allowed in areas where other numbers may be restricted.

3.34 Transfer

Transfer is used to deliver calls at your extension to another extension. It means that calls can be routed to IG system destinations: an extension or an outside phone number.

3.35 Trunk Group

System assigns each PSTN Trunk and IP Trunk to a specific Trunk Group. Each Trunk can be assigned to only one Trunk Group. The Trunk group assignment is used for Trunk pool access.

If setting some PSTN trunks and some IP trunks into the same Trunk Group, the trunk access depends on the access priority.

System provides up to 4 Trunk Groups. All PSTN Trunks and IP Trunks are assigned to default Trunk Group 1 and PSTN Trunks has higher access priority.

3.36 Wizard Setup

Wizard Setup allows system administrator to select the appropriate mode and configure the corresponding settings step by step to create a basic GW6000 operation.

The following eight operation setting items are supported

WAN Setting

LAN Setting

Wireless Basic

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Wireless Security

Internet Time

Numbering Plan

IP Trunk

Call Routing Table

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4. Phone Features

The following features depend on whether the phone provides.

Feature	Tecom IP 2007/8	FXS	Other SIP Phones
Alphanumeric Display	Yes	Depends	Depends
Basic Call	Yes	Yes	Yes
Call Forward via Auto Attendant	Yes	Yes	No
Call Hold	Yes	Yes	Yes
Call Transfer	Yes	Yes	Depends
Call Waiting	Yes	No	Depends
Conference	Yes	No	Depends
COS Following	Yes	No	No
Distinctive Ringing	Yes	No	No
Do Not Disturb via Auto Attendant	Yes	Yes	No
External Call Forward (ECF) via Auto Attendant	Yes	Yes	Yes
Feature Key Programming	Yes	No	No
Last Number Redial	Yes	Yes	Depends
LCD & Interactive Buttons	Yes	No	Depends
Mute	Yes	No	Depends
On Hook Dialing	Yes	No	Depends
Page Allow / Deny	Yes	No	No
Phone Book	Yes	No	Depends
Phone Lock/Unlock	Yes	No	No
Speed Dial	Yes	No	Depends
Volume Control	Yes	Depends	Depends

Tips: the word “Depends” means that the features depend on whether the phone provides.

4.1 Alphanumeric Display

The IP Phone extension provides a graphic LCD that supports 64 alphanumeric characters. The LCD enhances many system features.

4.2 Basic Call

To make an intercom call, dial a Station number (IP Terminal, POTS) or a Voice Mail number.

To make an outgoing call, dial a phone number. System chooses a line (PSTN line or IP trunk) via Call Routing Table to dial out. If it includes “*” in the phone number, and the call is dialed through PSTN Trunk, it will be as a one second Pause time.

To make an outgoing call, dial a PSTN, an IP Trunk or a Trunk Group number first. After hearing dial tone, dial the phone number.

4.3 Call Forward via Auto Attendant

Auto Attendant Call Forwarding reroutes incoming trunks calls from one extension to another destination. The destination of a call forward can be another extension or an outside phone number (External Call Forward; ECF).

GW6000 support the following Call Forwards:

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Direct Call Forward:

Forward all of the calls without regard to the extension status.
To enable, dial *21 + Ext No.
*21 + * + (PSWD) + * + Destination
To disable, dial **21.

Busy Call Forward

Forwards the calls if the extension is busy.
To enable, dial *22 + Ext No
*22 + * + (PSWD) + * + Destination
To disable, dial **22.

No Answer Call Forward

Forward the calls if the extension doesn't answer the call within No Answer Time.
To enable, dial *23 + Ext No + * + Time.
*23 + * + (PSWD) + * + Destination + * + Time.
To disable, dial **23.

Direct Call Forward to VM

Forward all of the calls to its own Voice Mail box.
To enable, dial *24.
To disable, dial **24.

4.4 Call Hold

Trunk and Intercom calls can be placed on hold at any extension. Callers on hold hear the Music On Hold.

For the Single Line phone, it's to put a call on hold, press flash then hang up (optional). It's to return to the original call, press flash or pick up the phone.

For Tecom IP2007/2008, please refer to "IP Phone User Guide".

4.5 Call Transfer

It allows a user to perform a screened or unscreened transfer to an extension or an outside phone number.

For the Single Line phone, it's to transfer a call, press flash then dial the new number. To transfer immediately, hang up (Unscreened). To transfer with consultation, wait for the party to answer, consult, and then hang up (Screened). To abort the transfer (if the third party does not answer), press flash to return to the original call.

For Tecom IP2007/2008, please refer to "IP Phone User Guide".

4.6 Call Waiting

If call waiting is disabled on a line, it returns busy response while getting second call at non-idle state.

To enable the call waiting feature, dial *99.

To disable the call waiting feature, dial **99.

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4.7 Conference

The Conference feature allows the user to connect to two or more parties into a single conversation.

For Tecom IP2007/2008, please refer to “IP Phone User Guide”.

4.8 COS Following

You can change the individual Class of Service of each extension temporarily. You may want to do this when the user goes to the office of low-priority COS extension and try to make an outgoing call, the user can use the function to use his/her own COS.

When setting COS following, the effective time of following is 1 minute.

To make a COS Following, dial *55+(phone number)+(password)

4.9 Distinctive Ringing

Distinctive ring cadences can be selected allowing adjacent users to discern which extension is ringing. It also provides the different ring tones for intercom and trunk calls.

4.10 Do Not Disturb (DND) via Auto Attendant

Extension users can enable DND to stop incoming PSTN or IP Trunk calls from ringing at their phone. The DND on an extension can be allowed or denied through the feature access code.

If an extension has DND and Call Forward enabled at the same time, Calls follow the DND.

To enable the do not disturb feature, dial *4.

To disable the do not disturb feature, dial **4.

4.11 External Call Forward (ECF) via Auto Attendant

Auto Attendant Call Forwarding reroutes incoming trunks calls from one extension to another destination. The destination of a call forward can be an outside phone number.

4.12 Feature Key Programming

Feature Keys can be programmed by phone users. A feature key can be programmed for line appearance, or a function such as Call Forward, Do Not Disturb.

It’s also allowed to program the Feature Keys by dialing feature Access Code:

*70 + (Feature Key number; 1 - 4) + (PSTN, IP Trunk or Trunk Group number)

4.13 Last Number Redial (LNR)

The features depend on whether the phone provides.

The Last Number Redial feature automatically dials the last number dialed from the phone. For the Single Line phone, it’s to dial *8. For Tecom IP2007/2008, please refer to “IP Phone User Guide”.

4.14 LCD & Interactive Buttons

The IP phone is equipped with Liquid Crystal Display to enhance features operation. And incorporates four-screen-prompt and interactive buttons that simplify feature operation.

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4.15 Mute

The Mute feature allows the user to disable the handset transmitter or the speakerphone microphone.

For Tecom IP2007/2008, please refer to “IP Phone User Guide”.

4.16 On Hook Dialing

IP phone extensions may make outgoing calls without lifting the handset and monitor the dialing status through the built-in speaker. The button lamp is lit when monitoring a call.

4.17 Page Allow/Deny

You can block one-way pages (internal, group, and all page) over the IP phone speaker by dialing the Page Deny code.

To enable Page Deny feature, dial *99.

To disable Page Deny feature, dial **99.

4.18 Phone Book

In Phone book, each entry is containing of Phone Number and User Name. The phone number could be extension number, phone number or IP address.

For Tecom IP2007/2008, please refer to “IP Phone User Guide”.

4.19 Phone Lock/Unlock

You can use the Lock feature to prevent unauthorized trunk calls from being made from extension. A locked extension continues to receive incoming trunk calls, and a user can continue to place and receive intercom calls. Outgoing Trunk calls are blocked.

To lock the phone, dial *97 + (password)

To unlock the phone, dial **97 + (password)

4.20 Speed Dial

Speed Dialing allows you to store frequently dialed numbers.

For Tecom IP2007/2008, please refer to “IP Phone User Guide”.

4.21 Volume Control

The IP phone is equipped with a volume control that is used to adjust the various volume settings of the telephone. The following functions can be adjusted:

- Ringing
- Handset
- Speaker
- Headset

For Tecom IP2007/2008, please refer to “IP Phone User Guide”.

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5. Quick Installation

This Quick Installation help to you install the product quickly and easily. For detailed instructions on installation, and further setup option, please refer to the configuration chapter.

5.1 Connecting the GW6000

(1) Place GW6000 in an optimum location.
(2) Connect the included Category 5 Ethernet network cable to the GW6000's LAN port or WAN port. Then connect the other end of the network cable to a switch or hub or directly your PC's Ethernet port. The GW6000 will then be connected to your 10/100 network.
(3) Connect the AC power adapter to the GW6000's Power port. Only use the power adapter supplied with the GW6000. Use of a different adapter may result in product damage.
(4) Press the reset button on the rear panel to set the GW6000 to factory default settings.
(5) Now that you have connected the GW6000 to your network, you are ready to begin setting it up. The Setup Wizard will take you through all necessary steps to help you to configure the GW6000 easily.

5.2 Wizard Setup

This system administrator can configure the GW6000 remotely or locally via a Web Browser. When GW6000 return to default factory settings, its LAN address is "192.168.1.1" , and username is "admin", password is "admin".

Wizard Setup allows system administrator to select the appropriate operation mode and configure the corresponding setting step by step. The following eight items are supported.

- WAN Settings
- LAN Settings
- Wireless Basic
- Wireless Security
- Internet Time
- Numbering Plan
- IP Trunk
- Call Routing Table

In the configuration, the administrator presses "Next" or "Back" button to choose the setting item. If pressing "Exit & Reboot", it will asks whether store settings. If choose Yes, the settings will be saved and the GW6000 will be reboot automatically. From now on, if entering the GW6000 Web configuration, it goes to home page "*Intelligent Gateway*" directly.

5.2.1 WAN Setting

There are three modes that you can configure WAN IP address: Static IP mode, DHCP mode and PPPoE mode. You can also select to enable or disable Firewall and IGMP.

Note that Network Address Translation function (NAT) is default enabled and is not showing on the page to prevent it from being disabled.

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This page shows that the current existing WAN interfaces in the system is Static IP mode. (Figure 5-1-1).

Figure 5-1-1. Wan Settings (Static IP mode)

The Dynamic Host Configuration Protocol (DHCP) is an Internet protocol for automating the configuration of computers that use TCP/IP. DHCP can be used to automatically assign IP addresses, to deliver TCP/IP stack configuration parameters such as the subnet mask and default router, and to provide other configuration information.

This page shows the current existing WAN interfaces in the system by DHCP mode (Figure 5-1-2).

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Figure 5-1-2. Wan Settings (DHCP mode)

The Point-to-Point Protocol over Ethernet (PPPoE) requires a user name and password that your ISP has provided to you to establish your connection. This page shows that the current existing WAN interfaces in the system is PPPoE mode (Figure 5-1-3).

Figure 5-1-3. Wan Settings (PPPoE mode)

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5.2.2 LAN Setting

It allows you giving LAN IP and Subnet Mask for LAN interface (Figure 5-2-1). You can also select to enable or disable DHCP Server and configure related settings for that mode.

Figure 5-2-1. Lan Settings

If necessary, check the “Secondary IP” to configure the secondary IP address and Subnet Mask for LAN (Figure 5-2-2). This IP address is used for management only.

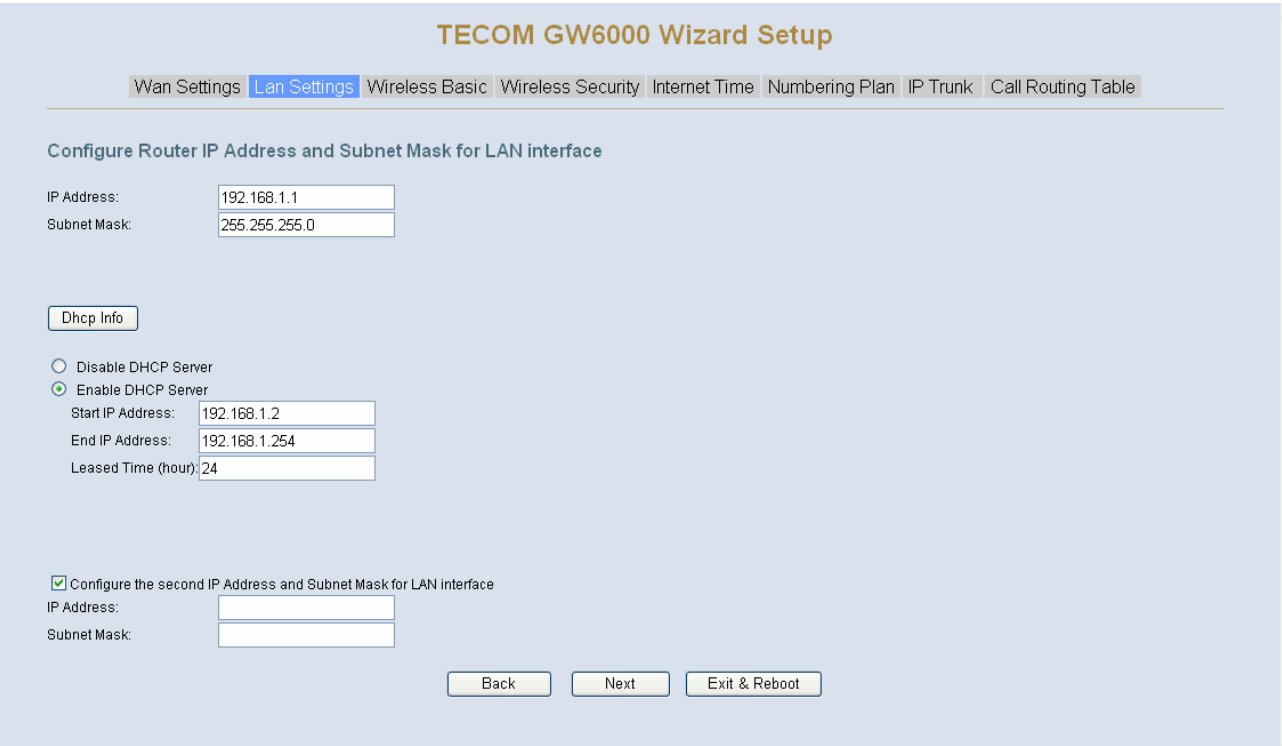

Figure 5-2-2. Lan Settings (Secondary LAN IP checked)

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5.2.3 Wireless Basic

The page (Figure 5-3) allows you to configure basic feature of the wireless LAN interface. You can enable or disable the wireless LAN interface, hide the network from active scans, set the wireless network name (also known as SSID) and restrict the channel set based on country requirement.

Figure 5-3. Wireless Basic

5.2.4 Wireless Security

The page (Figure 5-4) allows you to configure security features of the wireless LAN interface. You can set the network authorization method, select data encryption, specify whether a network key is required to authenticate to this wireless network and specify the encryption strength.

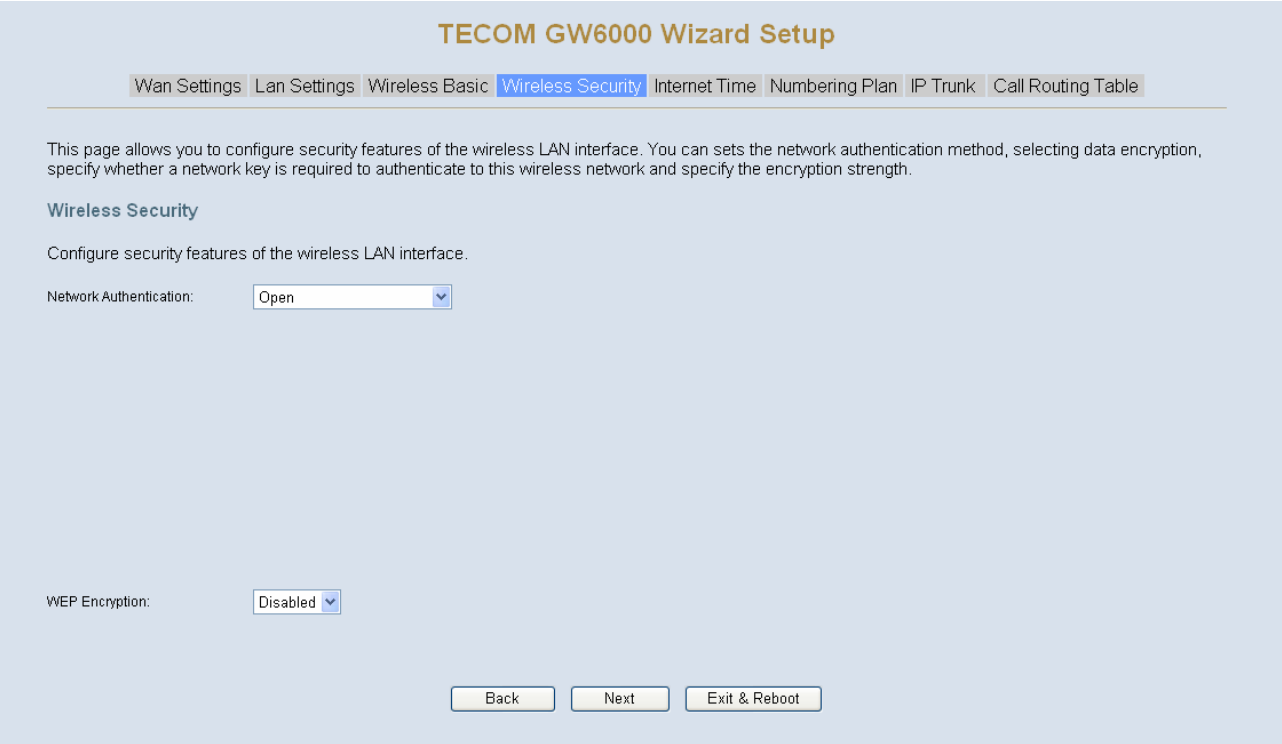

Figure 5-4. Wireless Security

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The item will be clearly described in 6.5.2.

5.2.5 Internet Time

The page allows you to configure the NTP time server so the GW6000 can have correct system time. It is useful such as reviewing the System Log.

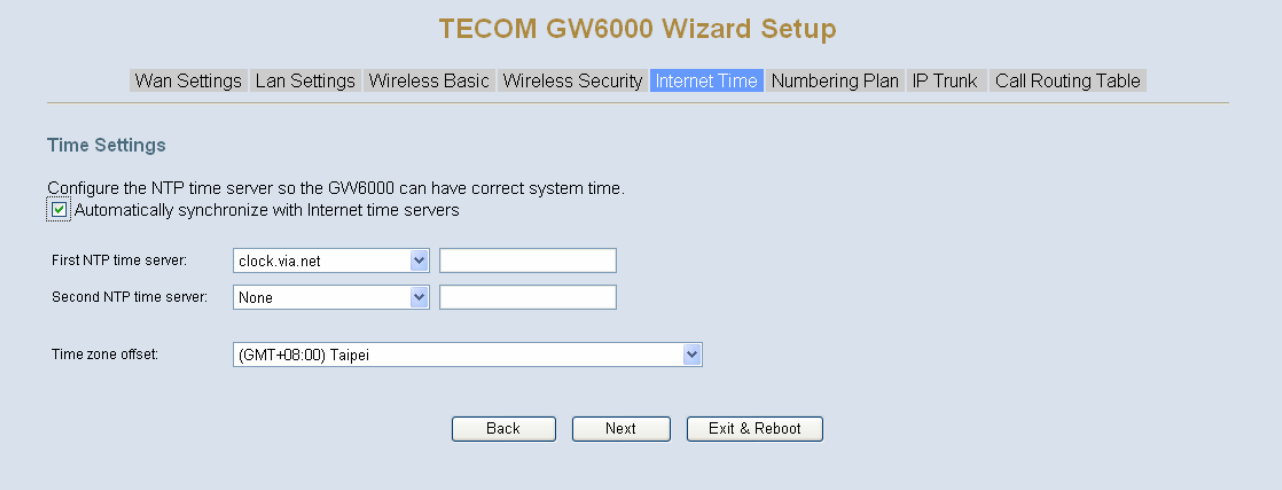

Figure 5-5. Internet Time

5.2.6 Numbering Plan

GW6000 has a flexible numbering plan so that phone or trunk numbers can be customized to meet a wild range of applications. It will check the numbers what you enter to prevent from conflicting among the all system resources.

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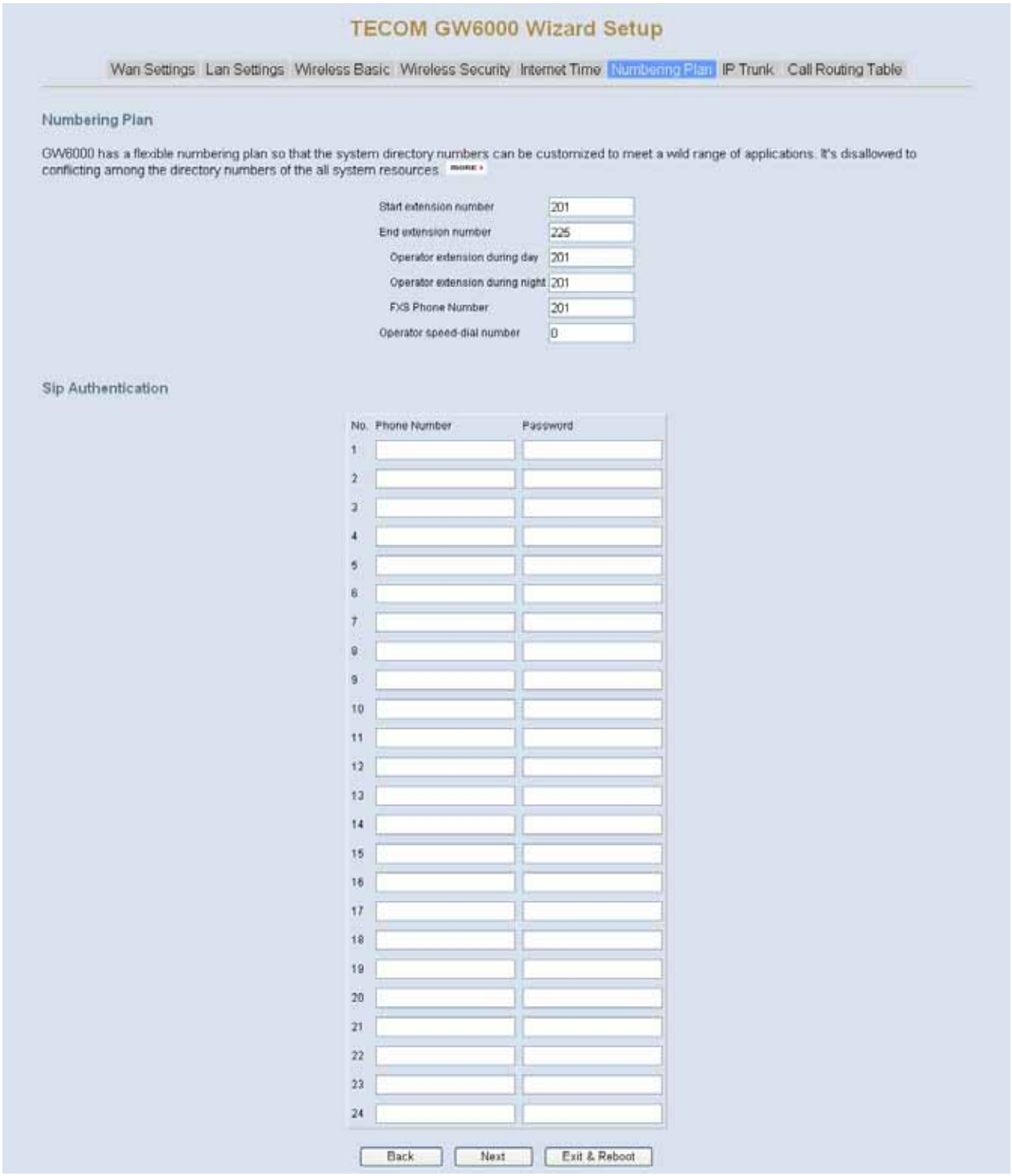

Figure 5-6. Numbering Plan

5.2.7 IP Trunk

GW6000 can register up to 8 SIP Uplink Servers. The extensions may make a call to the users of the Uplink Servers, or any user in the world through the Uplink Servers.

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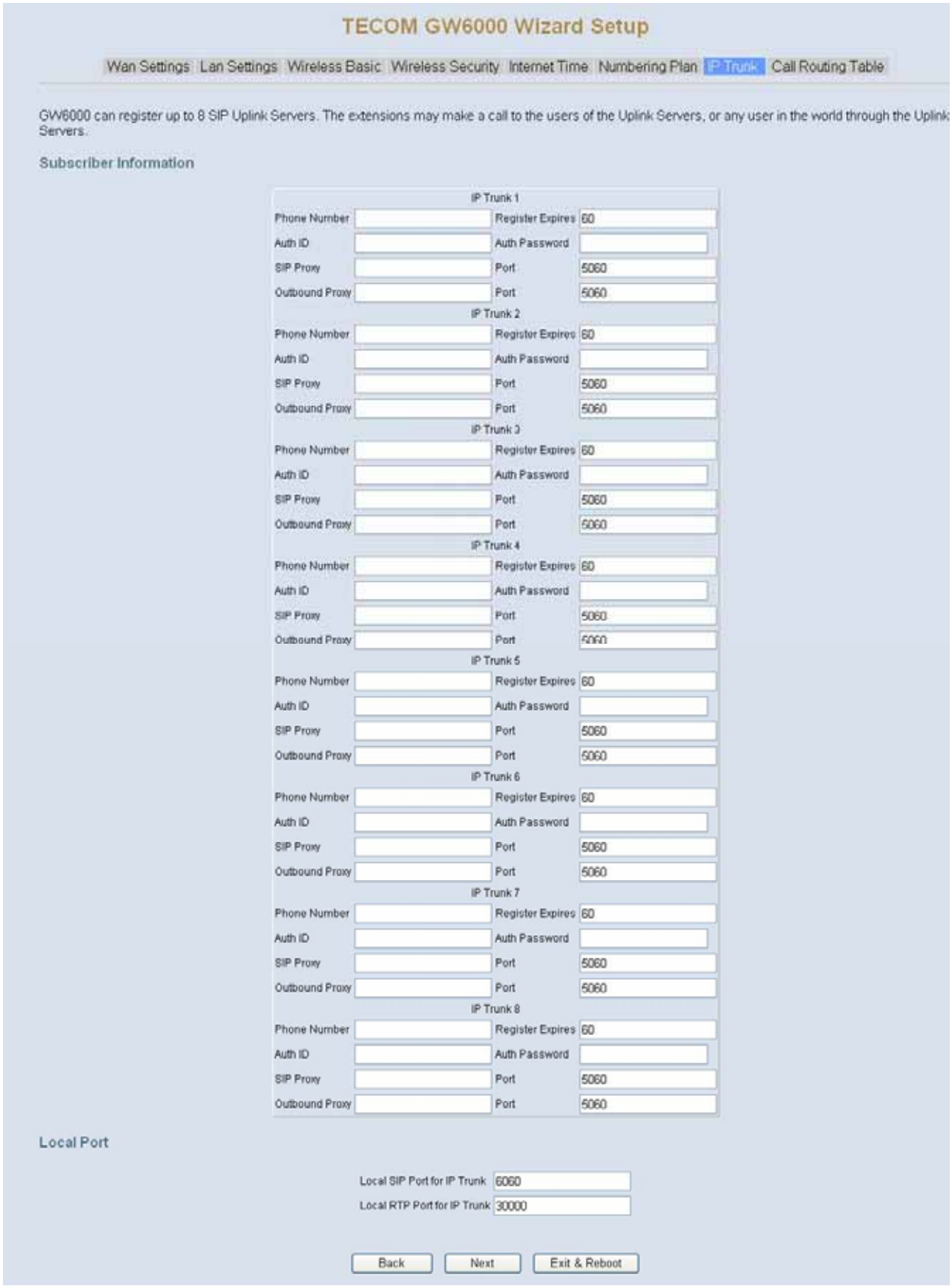

Figure 5-7. IP Trunk

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5.2.8 Call Routing Table

The Call Routing Table automatically routes outgoing calls using the most appropriate route. The appropriate route is determined based on the number dialed. If necessary, GW6000 can automatically modify the dialed number by deleting and/or inserting digits.

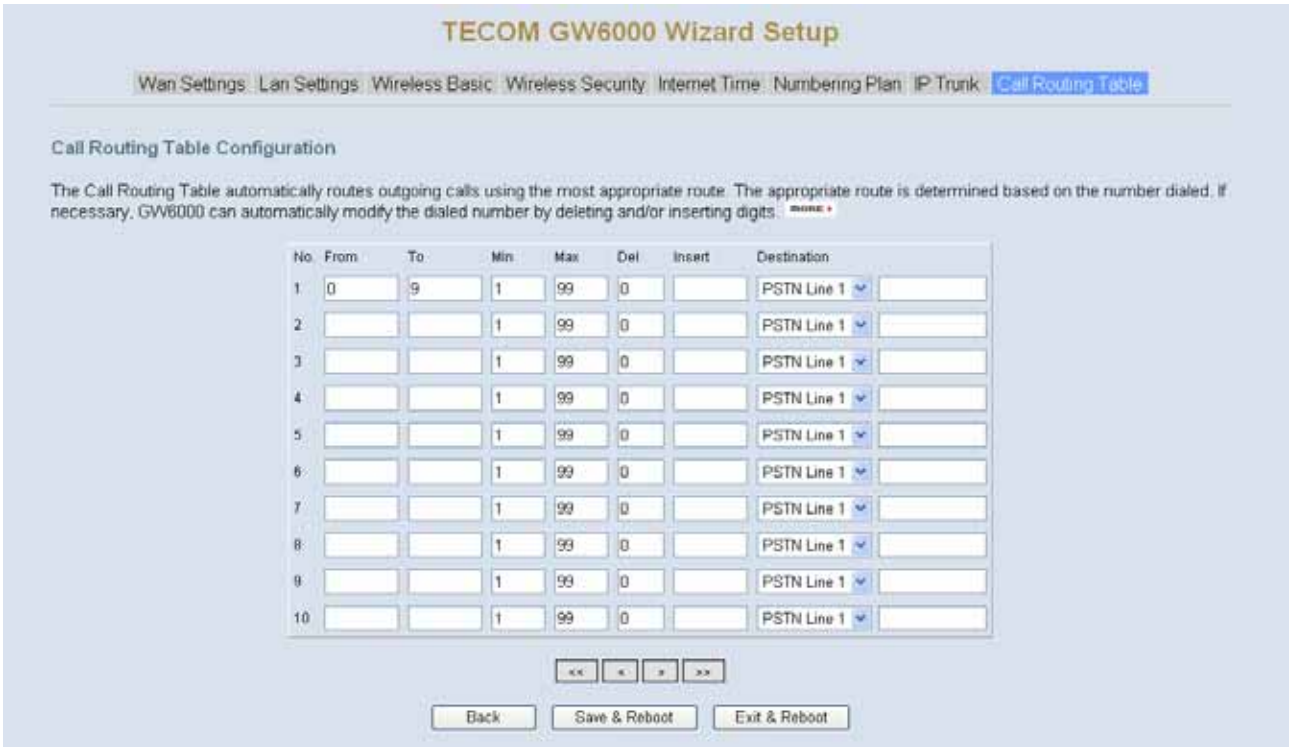

Figure 5-8. Call Routing Table

5.2.9 Wizard Setup Finished

When you click “Save & Reboot” Button at above page, the wizard setup will save your setting and the wizard setup will finished. Then the system will reboot as shown below.

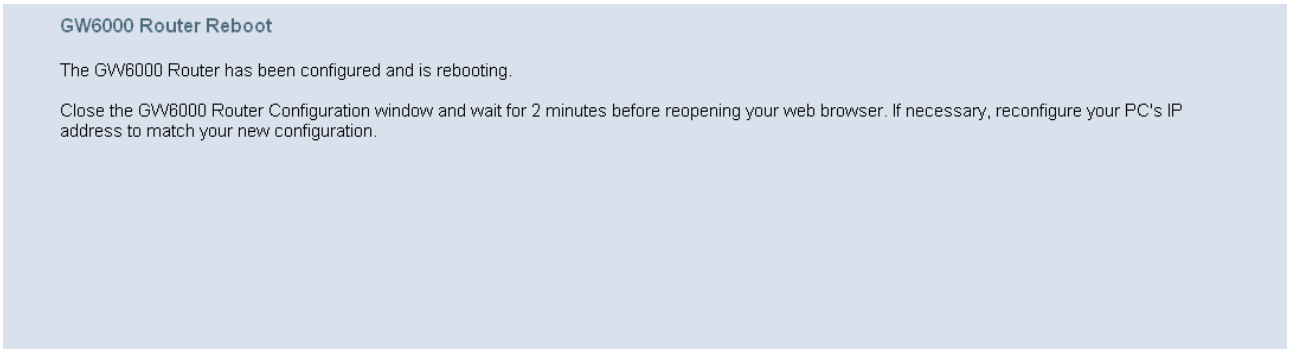

Figure 5-9. Wizard Setup finished

Congratulations! The installation of the GW6000 is complete.
For additional details, advanced configuration, or any other questions, refers to the next chapter.

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6. Configuration

6.1 Setup

- Connect the GW6000 and PC.
- The default LAN IP of the GW6000 is 192.168.1.1.
- The default WAN IP of the GW6000 is 192.168.10.210.
- For web login, the default user name is “admin”, the default password is “admin”.
- For telnet login, the default user name is “admin”, the default password is “admin” in LAN port. But in WAN port, the default user name is “support”, the default password is “support”.

6.2 Establish The Connection

Enter the IP address of GW6000 from the Web Browser.

A Dialogue Box will pop up to request the user to enter username and password. (Figure 6-1)

Figure 6-1. Authentication

Please enter the management username/password into the fields then click the OK button (default username/password is admin/admin).

When the authentication is OK, the home page “*Intelligent Gateway*” will be displayed on the browser (Figure 6-2).

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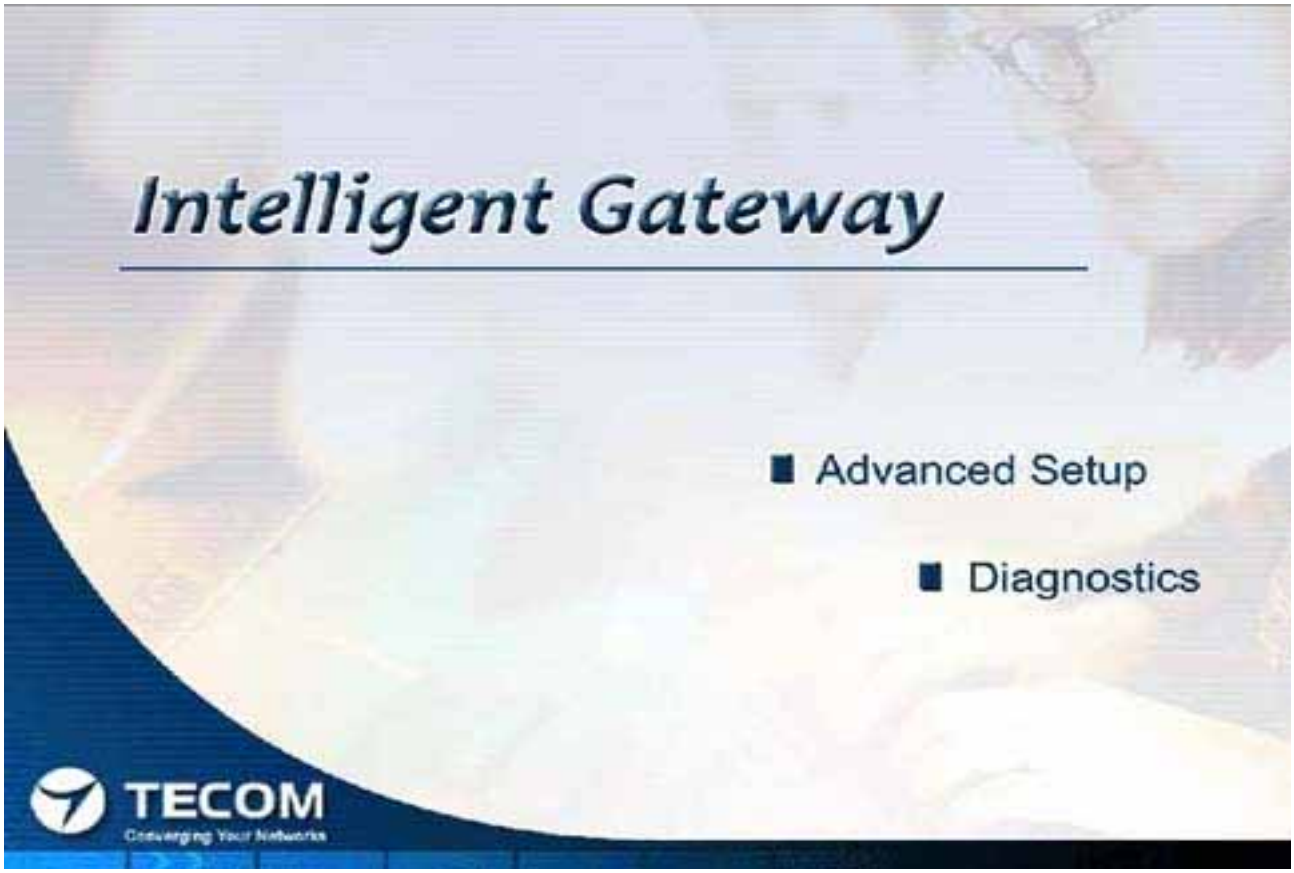

Figure 6-2. Intelligent Gateway

If choosing “Advanced Setup” in the Web Configuration of “*Intelligent Gateway*”, the home page “*Device Info – Summary*” will be displayed. In the Web Configuration, if a wireless card is in the GW6000, it is divided into six categories (Figure 6-3):

- Device Info
- Advanced
- Wireless
- Voice
- Management
- Diagnostics

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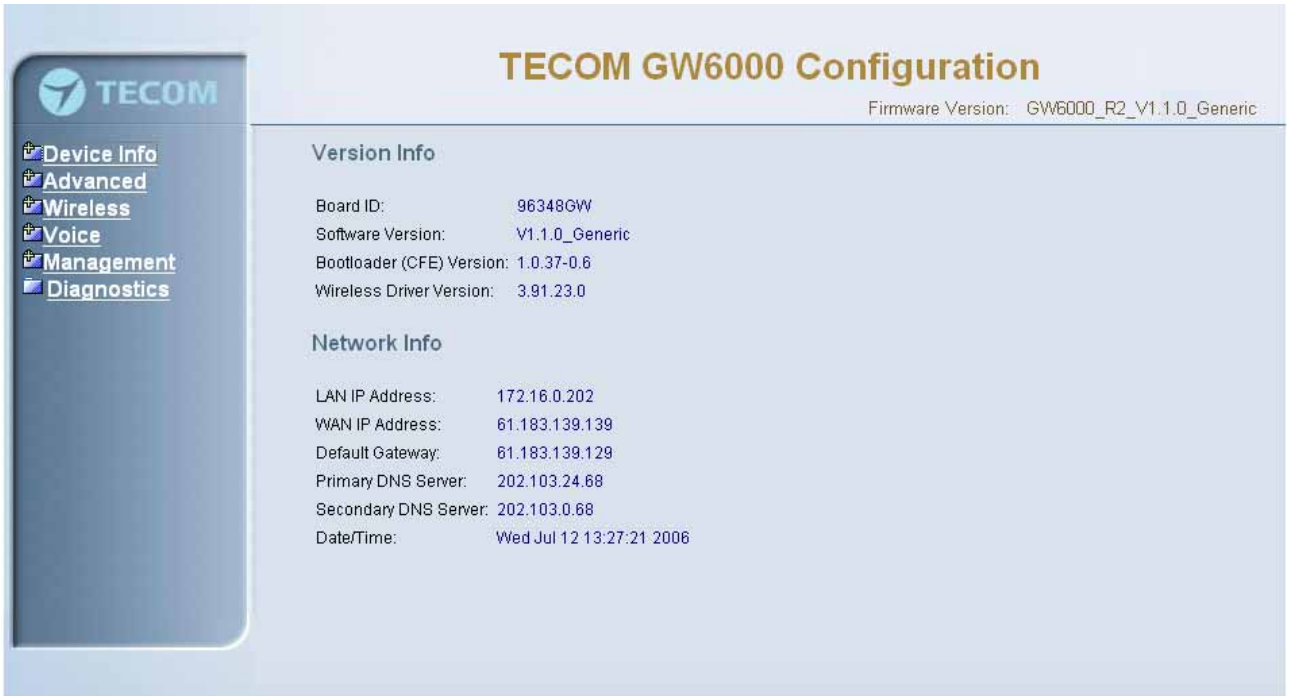

Figure 6-3. Device Info - Summery

If there is no wireless card plugged in the GW6000, it is divided into five categories (Figure 6-4)

- Device Info
- Advanced
- Voice
- Management
- Diagnostics

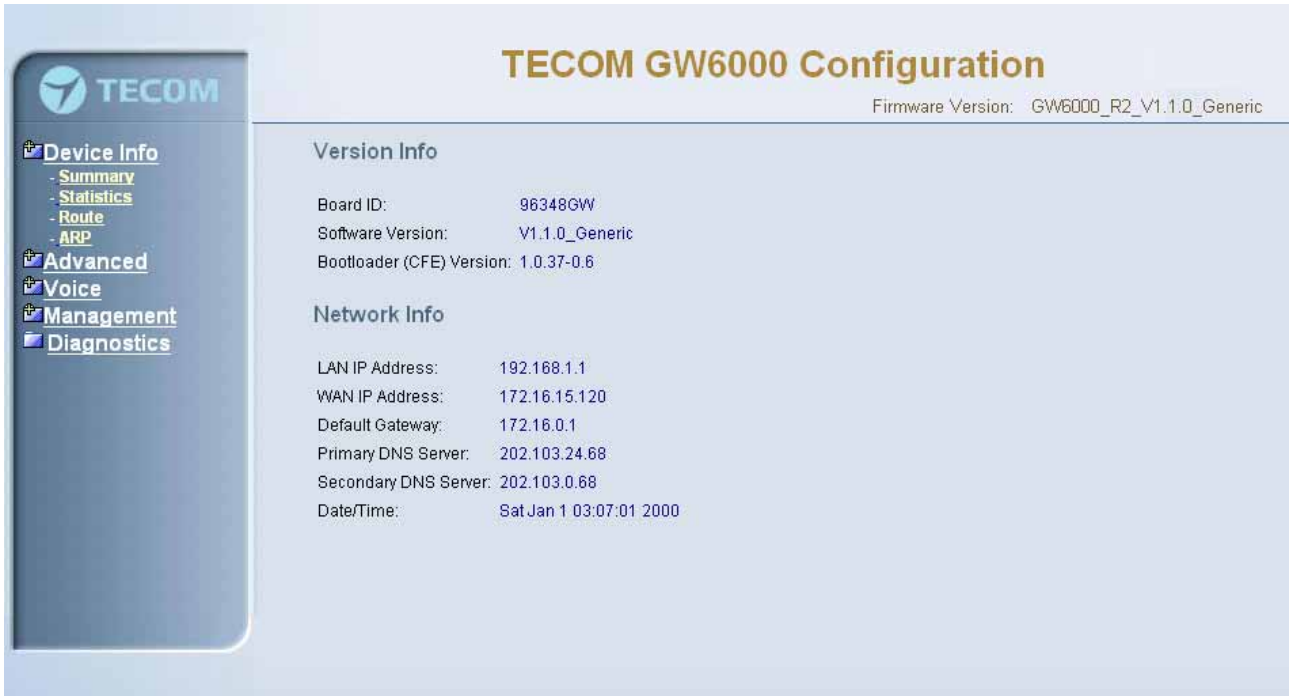

Figure 6-4. Device Info – Summary (no Wireless card)

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6.3 Device Info

This information reflects the current Status of GW6000 connection. It includes the following topics:

- Summary
- Statistics
- Route
- ARP

6.3.1 Summary

In the page (Figure 6-4) you can get the information reflects the current software version and connection status. It includes Version Info and Network Info.

6.3.2 Statistics

In this page (Figure 6-5) you can get the network statistics of the specific interface.

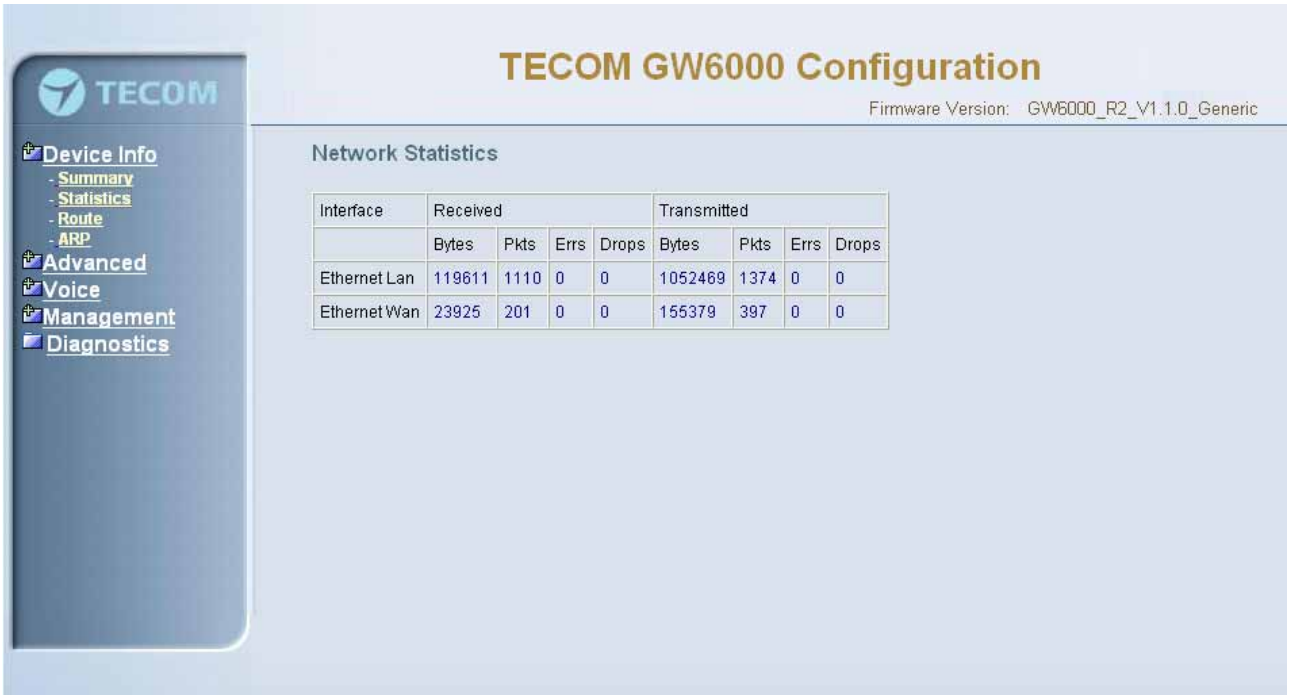

Figure 6-5. Device Info – Statistics

6.3.3 Route

In this page (Figure 6-6) you can get the IP route information of the device.

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Figure 6-6. Device Info – Route

6.3.4 ARP

This page (Figure 6-7) shows an ARP table which map IP network addresses to hardware addresses used by data link level protocol.

Figure 6-7. Device Info – ARP

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6.4 Advanced Setup

Advanced Setup allows system administrator to configure the following topics:

- LAN
- WAN
- Route
  - Static Route
  - RIP
- NAT
  - Virtual Servers
  - Port Trigger
  - DMZ
- Security
  - Incoming Filtering
  - Outgoing Filtering
  - Parental Service
- Quality of Service
  - Traffic Class
  - Bandwidth Control
- Dynamic DNS

6.4.1 LAN

It allows you to set LAN IP and Subnet Mask for LAN interface (Figure 6-8-1). You can also enable or disable DHCP Server and configure related settings for that mode.

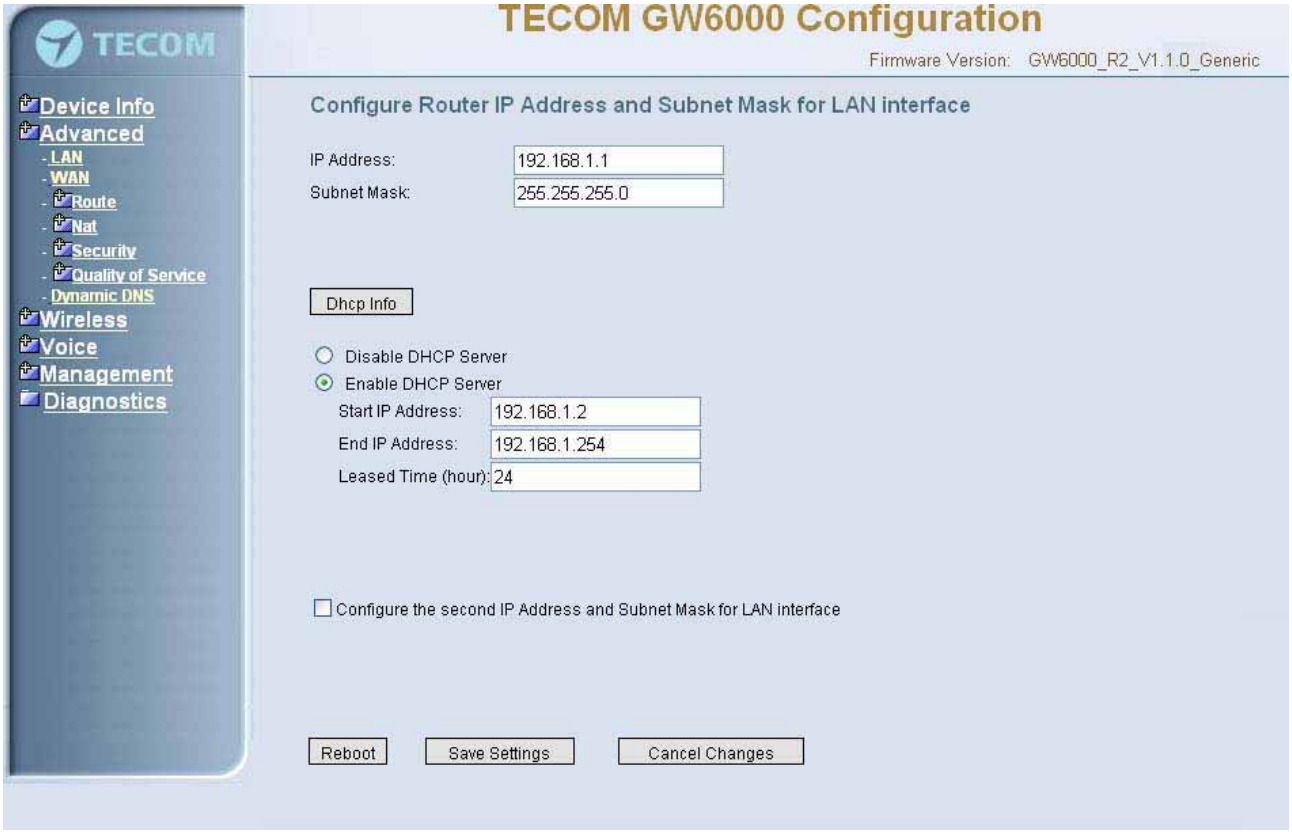

Figure 6-8-1. Advanced Setup – LAN

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If necessary, check the “Secondary IP” to configure the secondary IP address and Subnet Mask for LAN interface (Figure 6-8-2). This IP address is used for management only.

Figure 6-8-2. Advanced Setup – LAN (Secondary LAN IP checked)

6.4.2 WAN

There are three modes that you can give to WAN IP address: Static IP mode, DHCP mode and PPPoE mode. You can also enable or disable Firewall and IGMP.

When the Firewall option is selected, you can configure firewall settings in the followed Security directory. Or, the Security directory will hide and firewall settings is disabled.

Network Address Translation (NAT) allows you to share one Wide Area Network (WAN) IP address for multiple computers on your Local Area Network (LAN). In GW6000, NAT is default enabled and is not showing on the page to prevent it from being disabled.

This page shows the current existing WAN interfaces in the system is Static IP mode (Figure 6-9-1).

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Figure 6-9-1 Advanced Setup – WAN (Static IP Mode)

The Dynamic Host Configuration Protocol (DHCP) is an Internet protocol for automating the configuration of computers that use TCP/IP. DHCP can be used to automatically assign IP addresses, to deliver TCP/IP stack configuration parameters such as the subnet mask and default router, and to provide other configuration information.

This page shows the current existing WAN interfaces in the system is DHCP mode (Figure 6-9-2).

Figure 6-9-2 Advanced Setup – WAN (DHCP Mode)

This page shows the current existing WAN interfaces in the system is PPPoE mode (Figure 6-9-3).

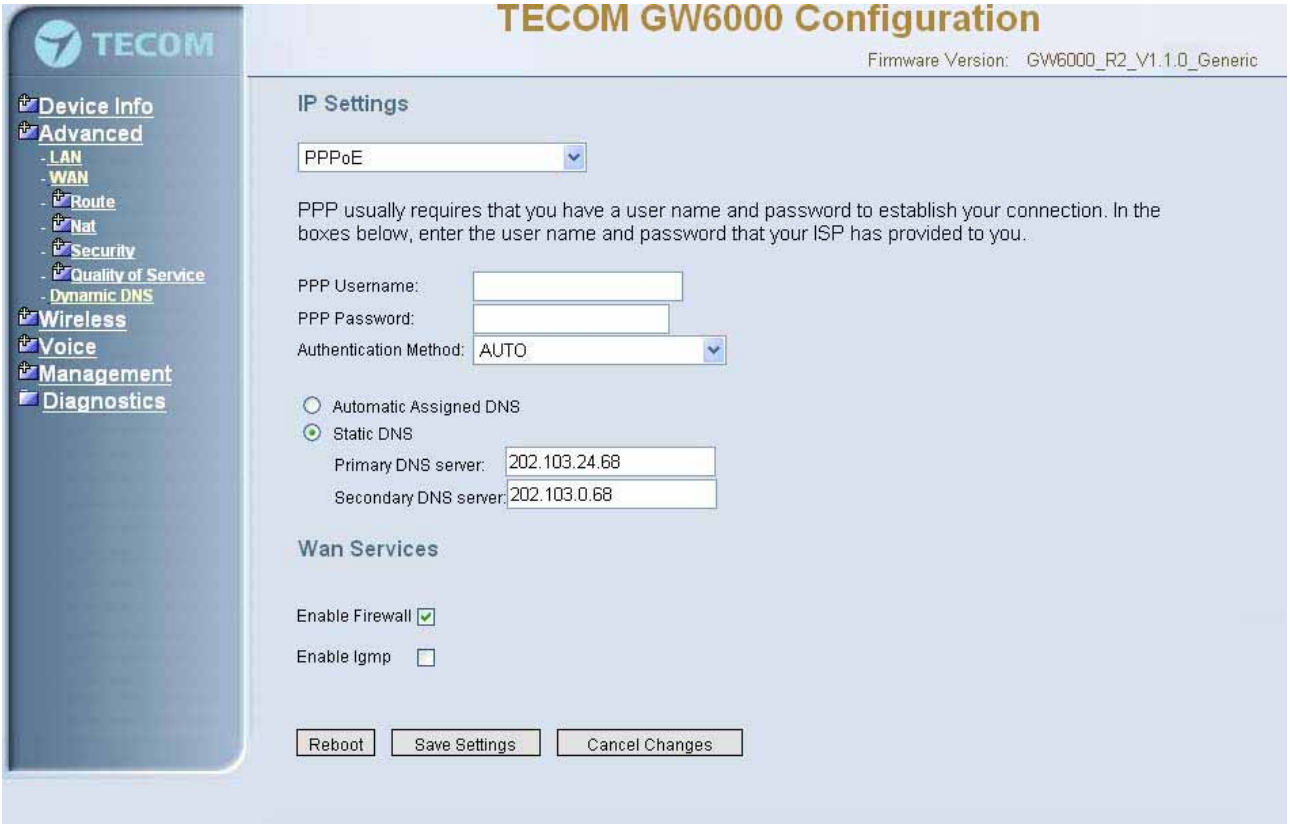

Figure 6-9-3 Advanced Setup – WAN (PPPoE Mode)

6.4.3 Route

It's separated into two parts: Static Route and RIP.

6.4.3.1 Static Route

Figure 6-10-1. Advanced Setup – Route – Static Route

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Click on Add to create a new Static Route. Enter the destination network address, subnet mask, gateway AND/OR available WAN interface then click "Save Settings" to add the entry to the routing table. (Figure 6-10-1, 6-10-2)

Figure 6-10-2. Advanced Setup – Route – Static Route – Add

6.4.3.2 RIP

To activate RIP for the device, select the 'Enabled' radio button for Global RIP Mode. To configure an individual interface, select the desired RIP version and operation, followed by placing a check in the 'Enabled' checkbox for the interface. Click the 'Apply' button to save the configuration, and to start or stop RIP based on the Global RIP mode selected. (Figure 6-11)

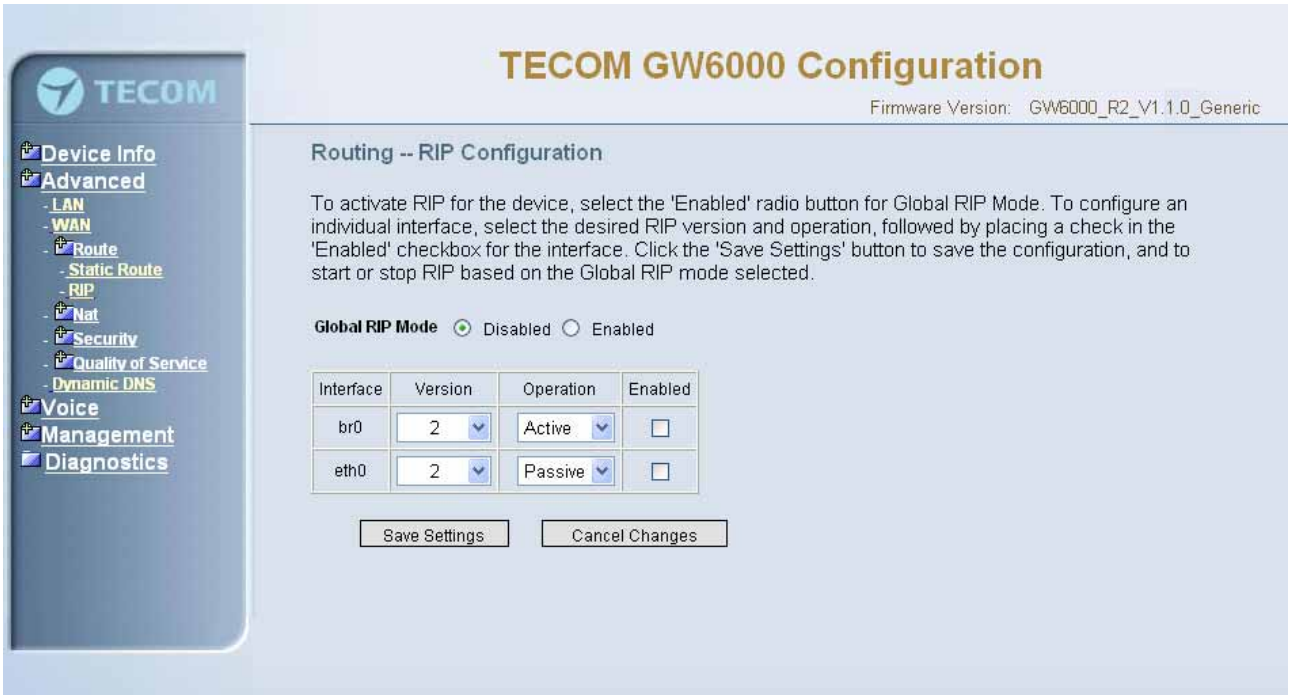

Figure 6-11. Advanced Setup – Route – RIP

6.4.4 NAT

It's separated into three parts: Virtual Servers, Port Trigger, and DMZ.

6.4.4.1 Virtual Servers

Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol, IP address and service port) to the internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. (Figure 6-12-1, Figure 6-12-2)

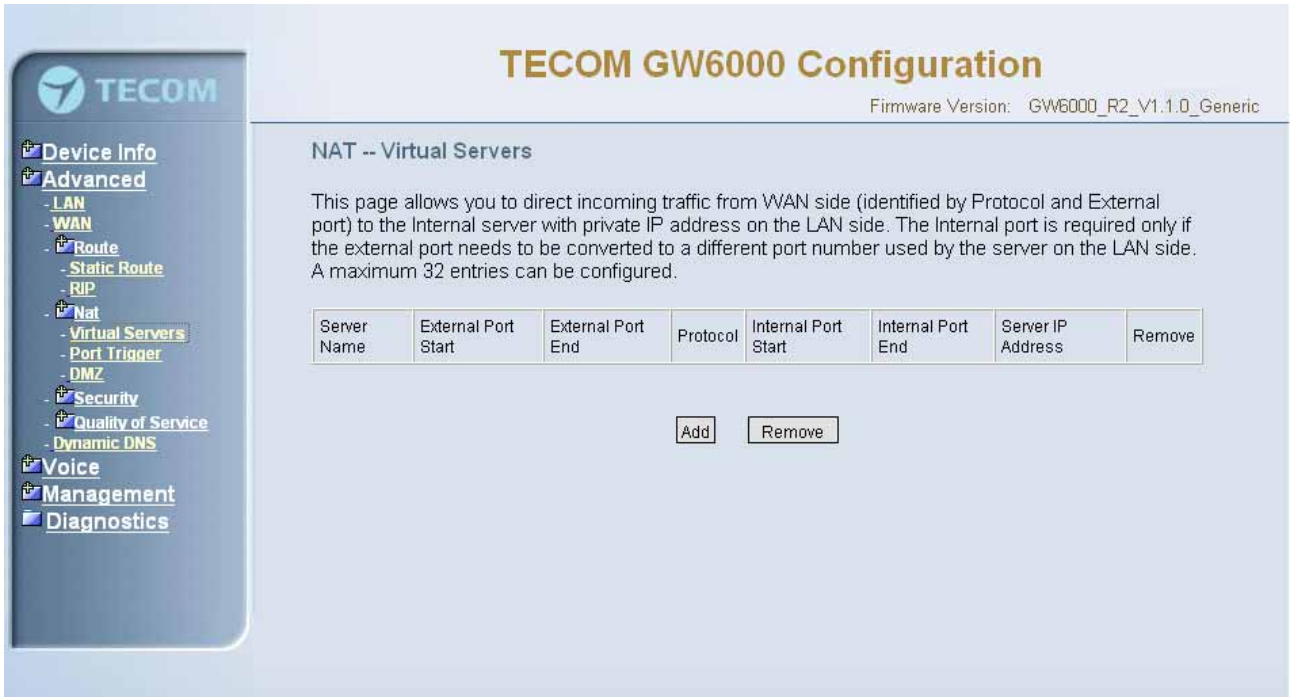

Figure 6-12-1. Advanced Setup – NAT – Virtual Servers

Figure 6-12-2. Advanced Setup – NAT – Virtual Servers – Add

6.4.4.2 Port Triggering

Some applications require that specific port(s) in the Router's firewall be opened for access by the remote parties. Port Trigger dynamically opens up the 'Open Ports' in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the 'Triggering Ports'. The Router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the 'Open Ports'. (Figure 6-13-1, 6-13-2)

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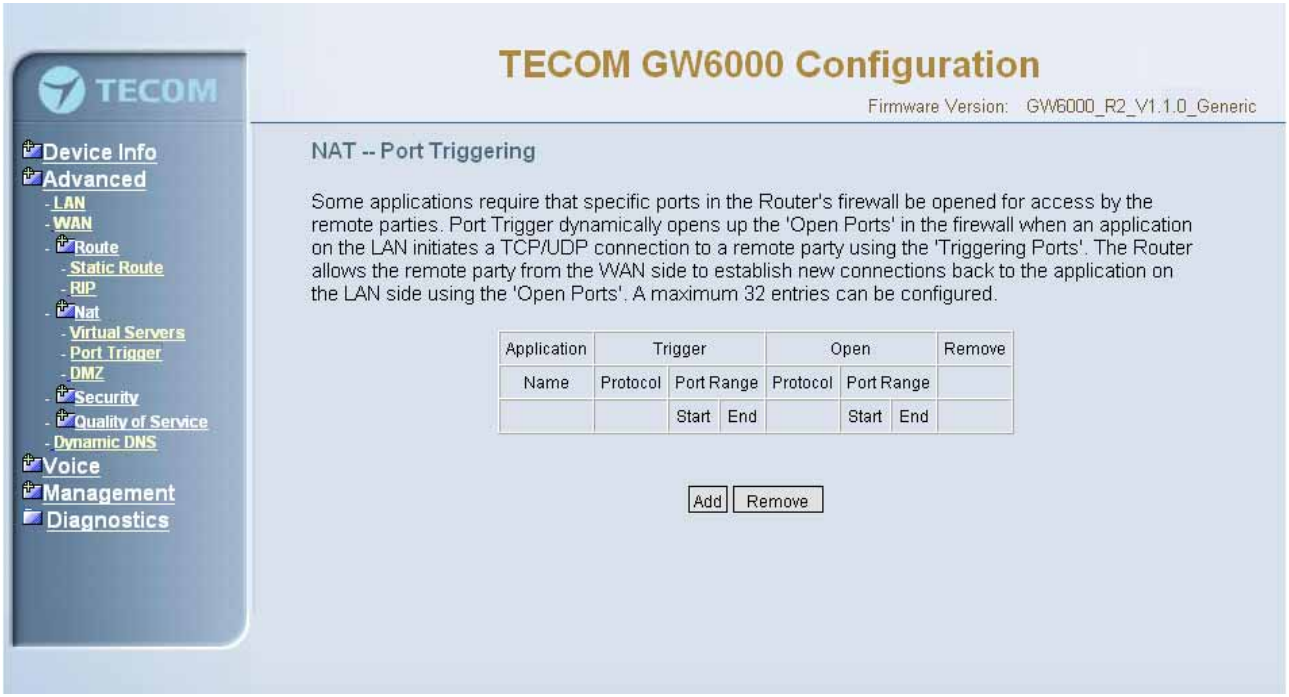

Figure 6-13-1. Advanced Setup – NAT – Port Triggering

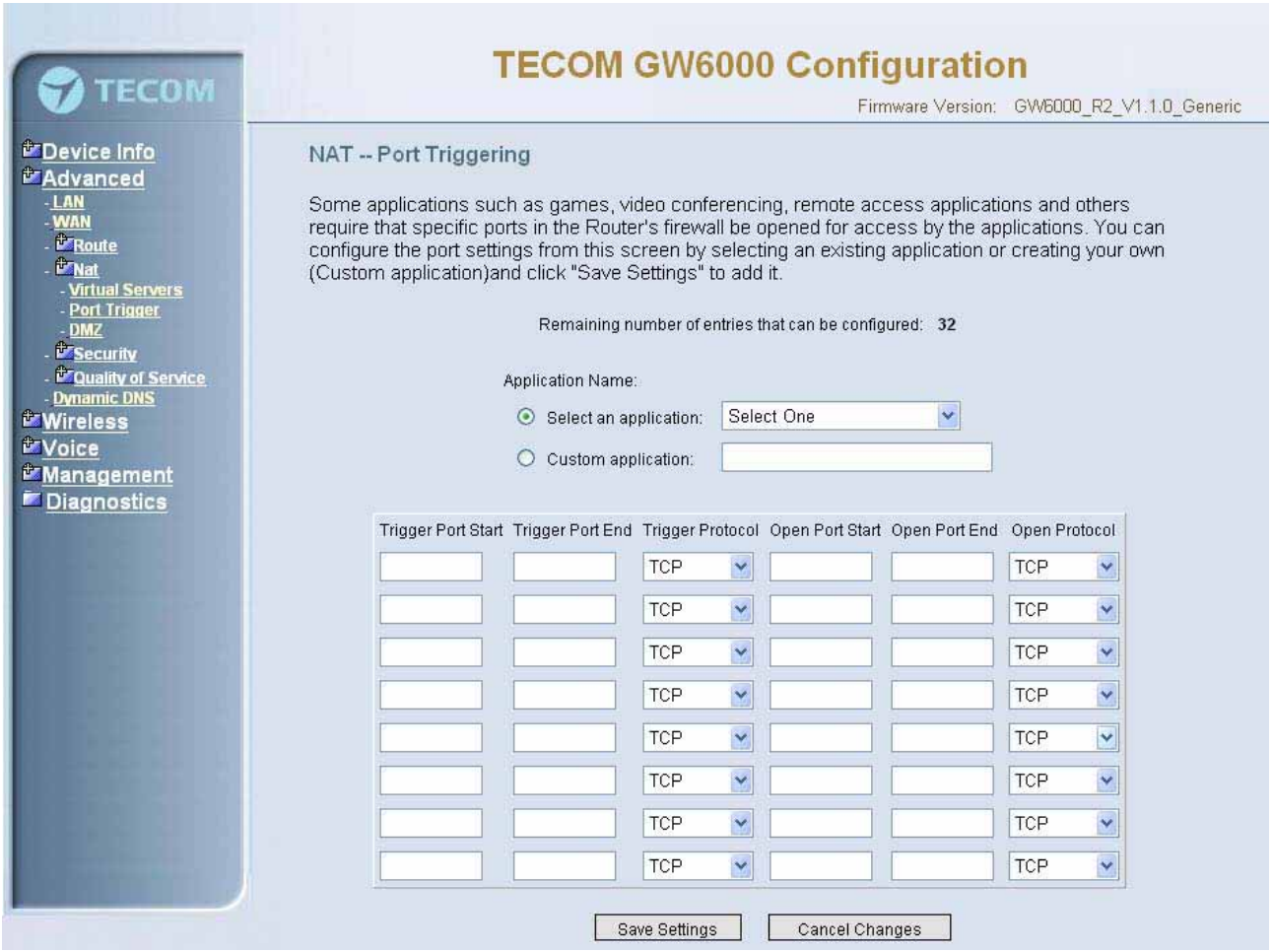

Figure 6-13-2. Advanced Setup – NAT – Port Triggering – Add

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6.4.4.3 DMZ

The GW6000 will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer. (Figure 6-14)

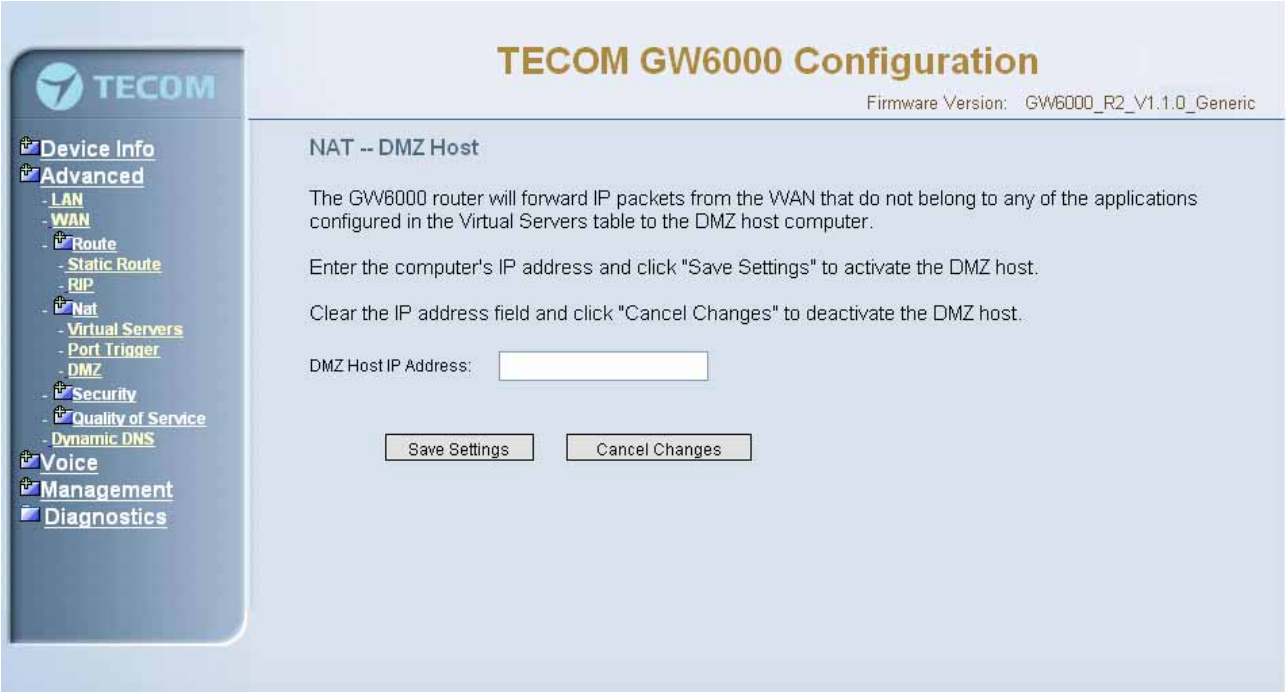

Figure 6-14. Advanced Setup – NAT – DMZ

6.4.5 Security

The configuration display only when WAN page's security option is selected. It's separated into three parts: Incoming Filter, Output Filter, and Parental Control.

6.4.5.1 Incoming Filter

It allows the users to create a filter rule to identify incoming IP traffic by specifying a new filter name and at least one condition. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. (Figure 6-15-1, Figure 6-15-2)

By default, all incoming IP traffic from the WAN will be blocked if it is not consistent with the incoming filter rules. In fact, GW6000 has opened some necessary ports such as web port, sip ports and rtp ports, to make sure that voice application can communicate well.

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Figure 6-15-1. Advanced Setup – Security – Incoming IP Filtering

Figure 6-15-2. Advanced Setup – Security – Incoming IP Filtering – Add

6.4.5.2 Output Filter

It allows the users to create a filter rule to identify outgoing IP traffic by specifying a new filter name and at least one condition. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. (Figure 6-16-1, Figure 6-16-2)

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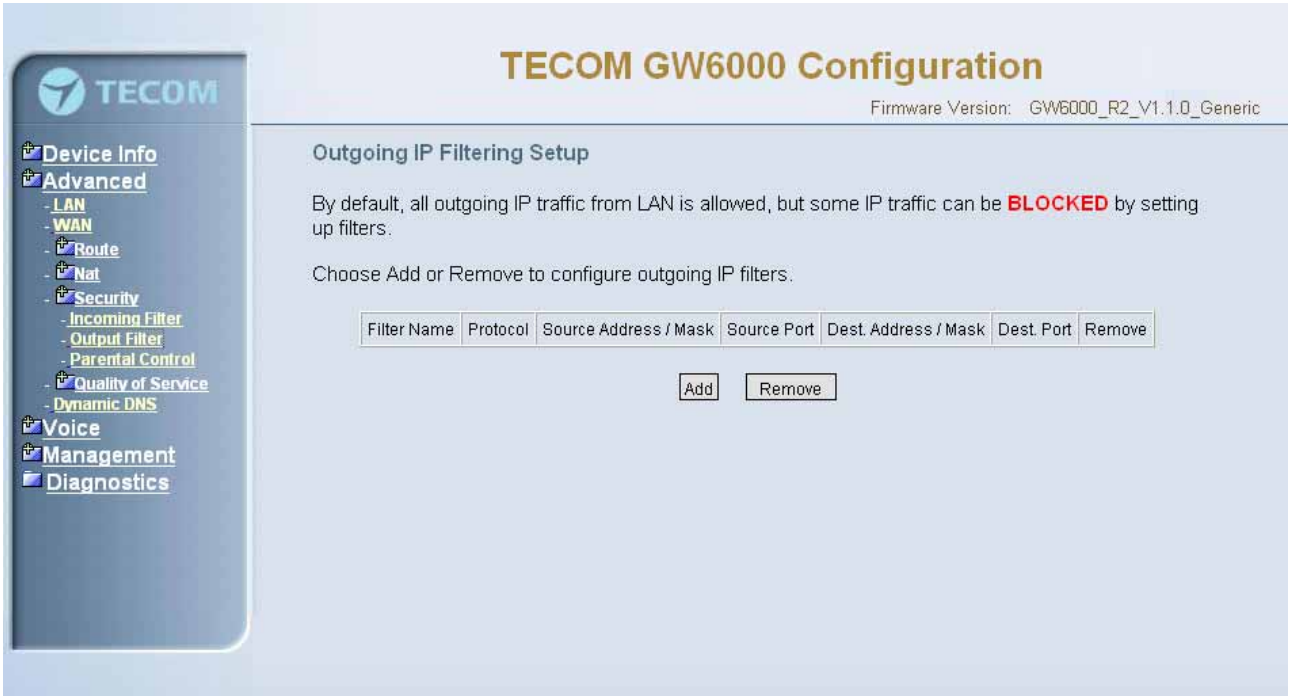

Figure 6-16-1. Advanced Setup – Security – Outgoing IP Filtering

Figure 6-16-2. Advanced Setup – Security – Outgoing IP Filtering – Add

6.4.5.3 Parental Control

It adds time restriction to a special LAN device connected to the Router. The 'Browser's MAC Address' automatically displays the MAC address of the LAN device where the browser is running. To restrict other LAN device, click the "Other MAC Address" button and enter the MAC address of the other LAN device. (Figure 6-17-1, Figure 6-17-2)

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Figure 6-17-1. Advanced Setup – Security –Parental Control

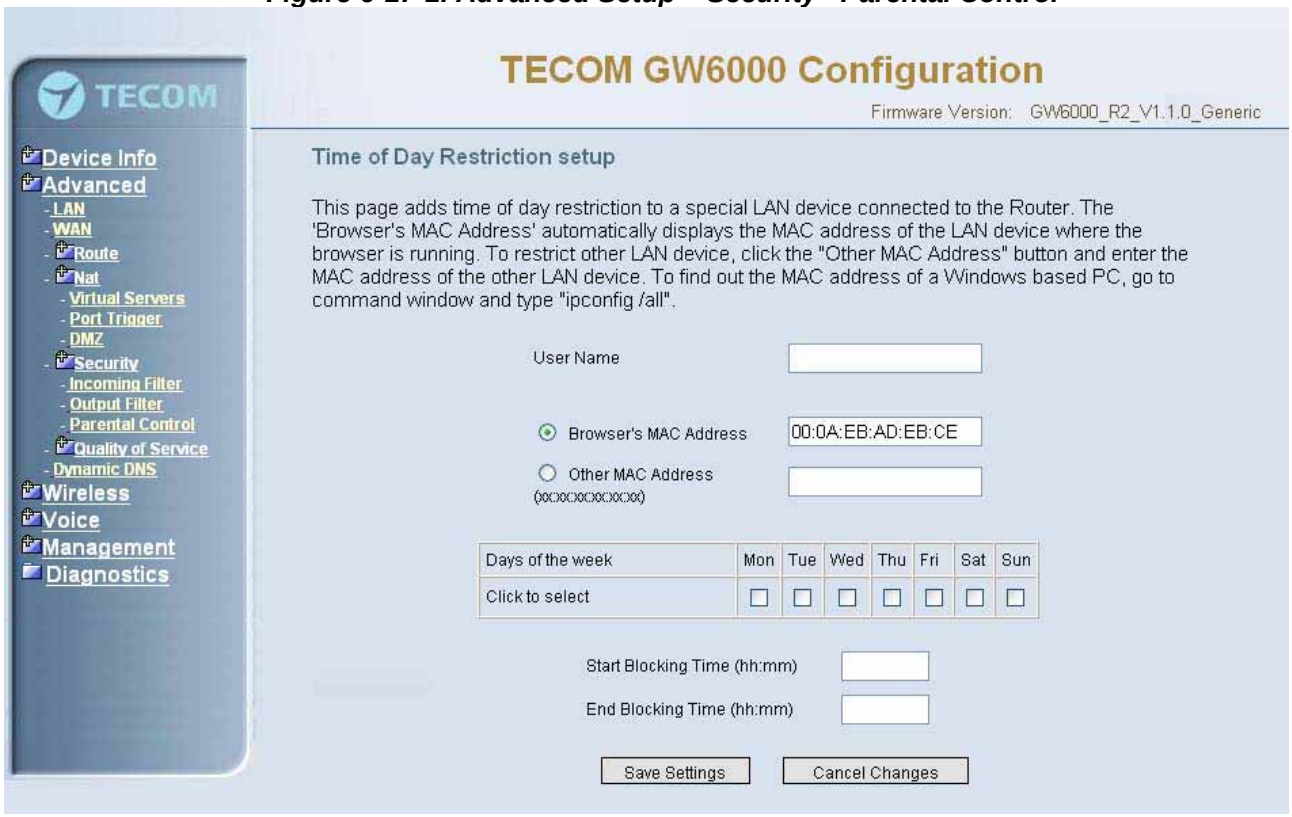

Figure 6-17-2. Advanced Setup – Security –Parental Control – Add

6.4.6 Quality of Service

It's separated into two parts: Traffic Class, and Bandwidth Control.

6.4.6.1 Traffic Class

Click on Add to create a class to identify the IP traffic by specifying at least one condition below. If multiple conditions are specified, all of them should be satisfied to make sure the rule will take effect. (Figure 6-18-1, Figure 6-18-2)

IP QoS is applied to the traffic from LAN to WAN; the traffic from WAN to LAN will not be applied.

Enter the QoS class name for this policy. Define the priority for this policy, and the priority will be used by the next bandwidth control setting. GW6000 will modify the IP header with new IP Precedence and/or IP Type Of Service fields.

It's a IP Layer QoS policy. At least (but not limited to) one condition must be configured.

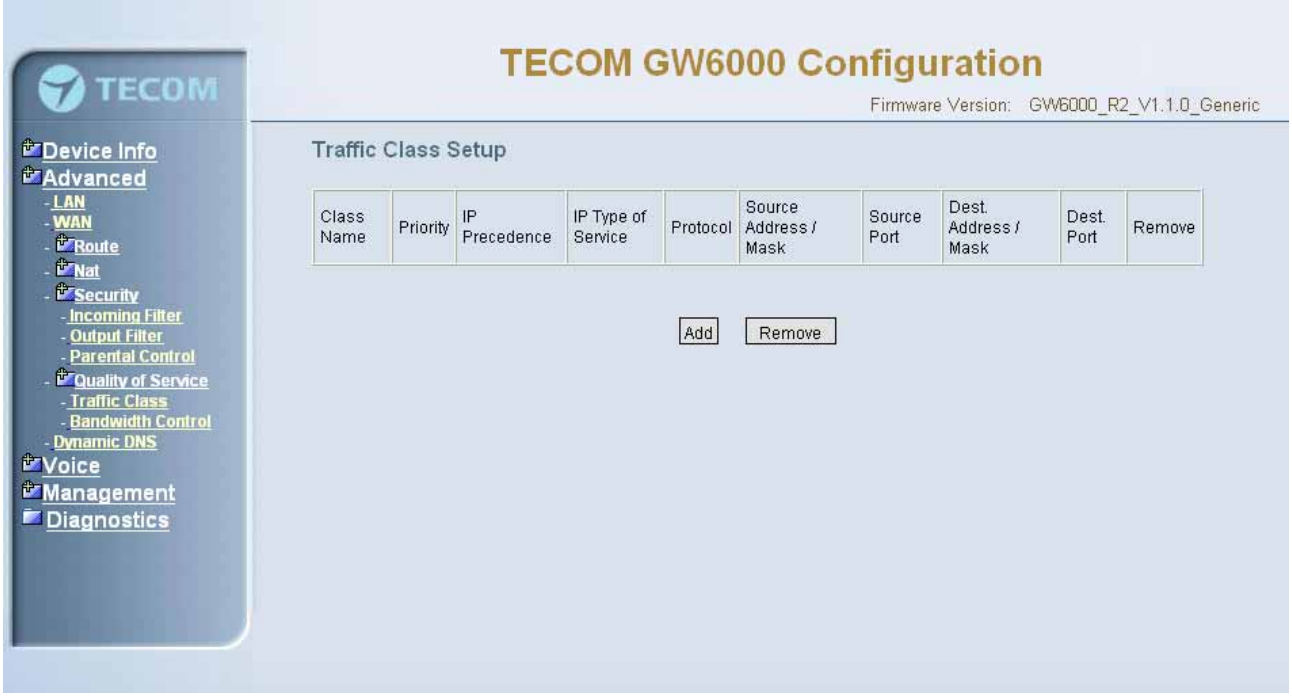

Figure 6-18-1. Advanced Setup – Quality of Service – Traffic Class

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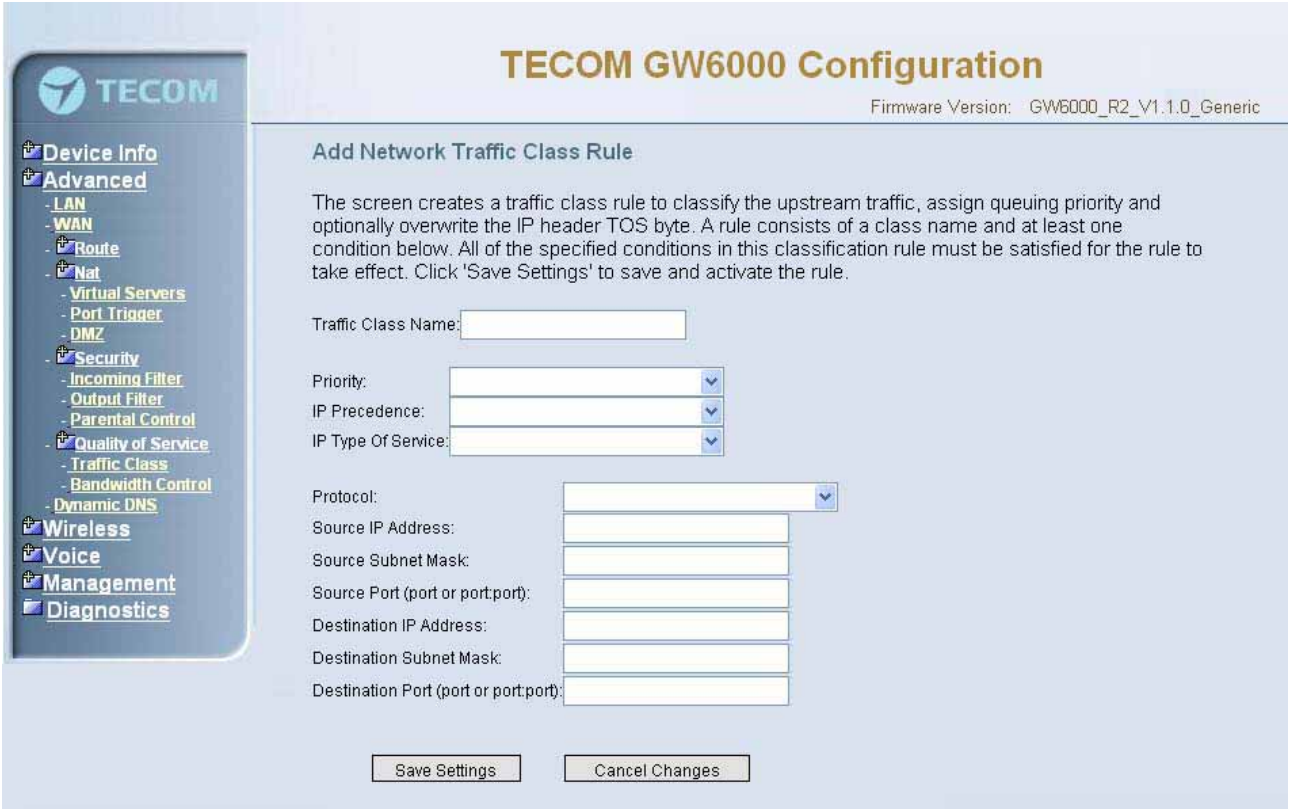

Figure 6-18-2. Advanced Setup – Quality of Service – Traffic Class – Add

6.4.6.2 Bandwidth Control

This page allows you to control WAN port's upstream bandwidth according to your settings (Figure 6-19). And it can ensure the highest priority IP packets' traffic firstly. By default, all voice packets has been queued in the highest IP packets, and the others has been queued in the normal IP packets if they have not been set in the priority field of the traffic class rule.

Figure 6-19. Advanced Setup – Quality of Service – Bandwidth Control

6.4.7 Dynamic DNS

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your DSL router to be more easily accessed from various locations on the Internet. (Figure 6-20-1, Figure 6-20-2)

Figure 6-20-1. Advanced Setup – Dynamic DNS

Figure 6-20-2. Advanced Setup – Dynamic DNS - Add

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6.5 Wireless

This directory display only when wireless card is installed in your GW6000 board. Use the Wireless screen to configure the GW6000 for wireless access. It is separated into 6 parts:

- Basic
- Security
- MAC Filter
- Wireless Bridge
- Advanced
- Station Info

The configurable items for each part would be described in the following.

6.5.1 Basic

The page (Figure 6-21) allows you to configure basic feature of the wireless LAN interface. You can enable or disable the wireless LAN interface, hide the network from active scans, set the wireless network name (also known as SSID) and restrict the channel set based on country requirement.

Figure 6-21. Wireless – Basic

6.5.2 Security

The page allows you to configure security features of the wireless LAN interface. You can set the network authorization method, select data encryption, specify whether a network key is required to authenticate to this wireless network and specify the encryption strength.

The following items will be configured in the page:

Network Authentication: Set the network Authentication method. 802.1X and WPA require setting valid RADIUS parameters. WPA-PSK requires a valid WPA Pre-Shared Key to be set. (Figure 6-22-1)

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802.1X: As the IEEE standard for access control for wireless and wired LANs, 802.1x provides a means of authentication and authorizing devices to attach to a LAN port. This standard defines the Extensible Authentication Protocol (EAP), which uses a central authentication server to authenticate each user on the network.

WPA/WPA2: The Wi-Fi Alliance put together WPA/WPA2 as a data encryption method for 802.11 wireless LANs. WPA is an industry-supported, pre-standard version of 802.11i utilizing the Tempoal Key Integrity Protocol (TKIP), which fixes the problems of WEP, including using dynamic keys.

WPA/WPA2 Pre-Shared Key: Set the WPA/WPA2 Pre-Shared Key (PSK).

WPA/WPA2 Group Rekey Interval: Set the WPA/WPA2 Group Rekey Interval in seconds. Leave blank or set to zero to disable periodic re-keying.

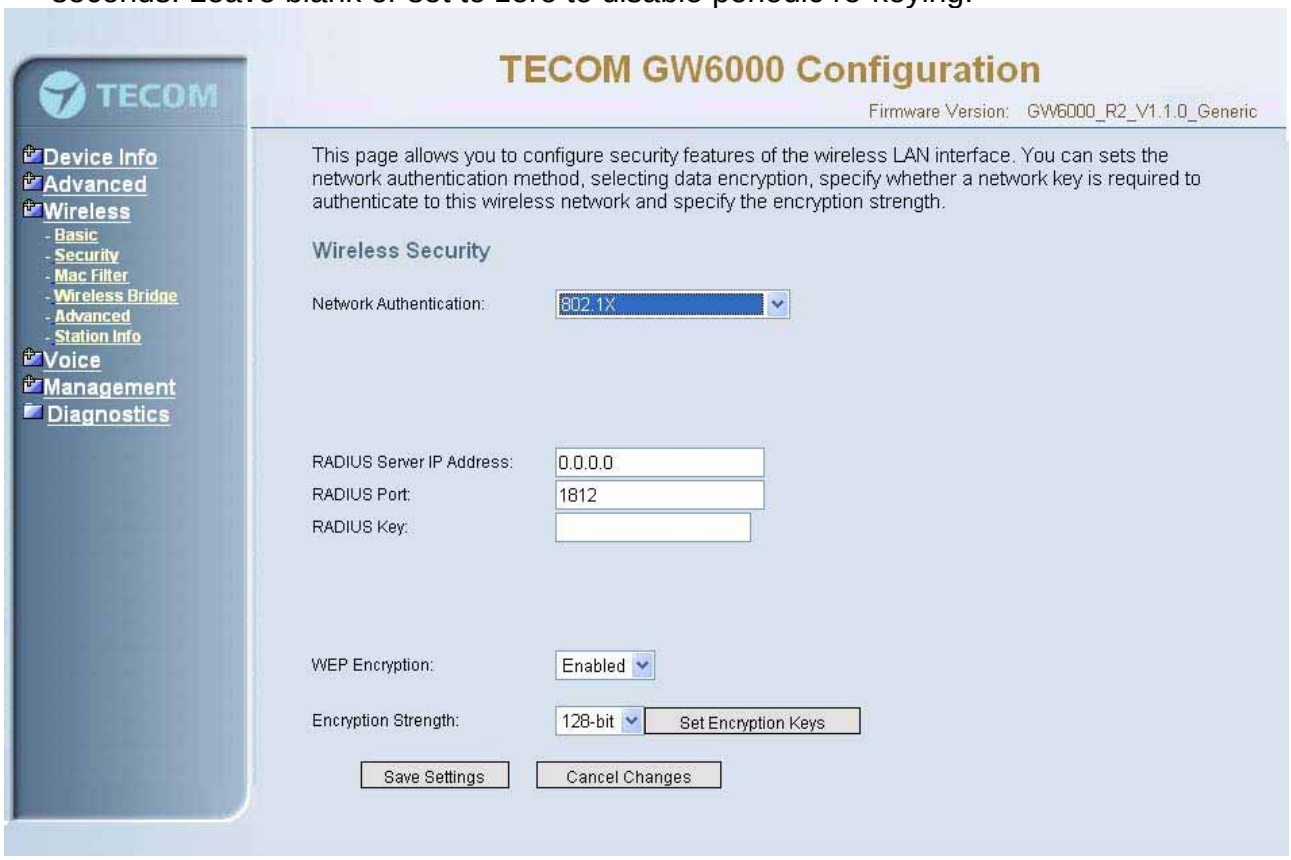

Figure 6-22-1. Wireless – Security

Radius Server: Set the IP address of the RADIUS server to use for authentication and dynamic key derivation.

RADIUS Server is responsible for receiving user connection requests, authenticating the user, and then returning all of the configuration information necessary for the client to deliver the server to the user.

Radius Port: Sets the UDP port number of the RADIUS server. The port number is usually 1812 or 1645 and depends on the server.

Radius Key: Set the shared secret for the RADIUS connection.

WEP Encryption: Selecting Disabled disables WEP data encryption. Selecting Enabled enables WEP data encryption and requires that a valid network key be set and selected unless 802.1X is enabled.

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WEP, short for Wired Equivalent Privacy, is a protocol for wireless LANs or local area networks. This WEP is defined in the 802.11 Standard. WEP is designed so security levels are maintained at the same level as the wired LAN. WEP's aim is to provide security by encrypting data over radio waves. WEP protects data as it's transmitted from one end point to another. WEP is used at two lowest layers, the data link and physical layer. WEP is designed to make up for the inherent security in wireless transmission as compared to wired transmission.

Shared Key Authentication: Set whether shared key authentication is required to associate. A valid network key must be set and selected if required. (Figure 6-22-2)

Figure 6-22-2. Wireless – Security – Encryption Keys

6.5.3 MAC Filter

Figure 6-23-1. Wireless – MAC Filter

This page allows users to Add/Remove hosts with the specified MAC addresses that are able or unable to access the wireless network. When users decide to use Allow, only the MAC addressed in the user-defined list can access the wireless network. When users use Deny, only the user specified MAC addresses are unable to access to wireless network. And if the Disable option is selected, all users will be able to access to wireless network.

Note: The MAC addresses in the list would immediately take effect when Allow or Deny is checked.

Figure 6-23-2. Wireless – MAC Filter – Allow/Deny

6.5.4 Wireless Bridge

It allows the users to configure wireless bridge features of the wireless LAN interface. You can select Wireless Bridge (also known as Wireless Distribution System) to disables access point functionality. Selecting Access Point enables access point functionality. Wireless bridge functionality will still be available and wireless stations will be able to associate to the AP. Select Disabled in Bridge restricts which disables wireless bridge restriction. Any wireless bridge will be granted access. Selecting Enabled or Enabled (Scan) enables wireless bridge restriction. Only those bridges selected in Remote Bridges will be granted access.(Figure 6-24).

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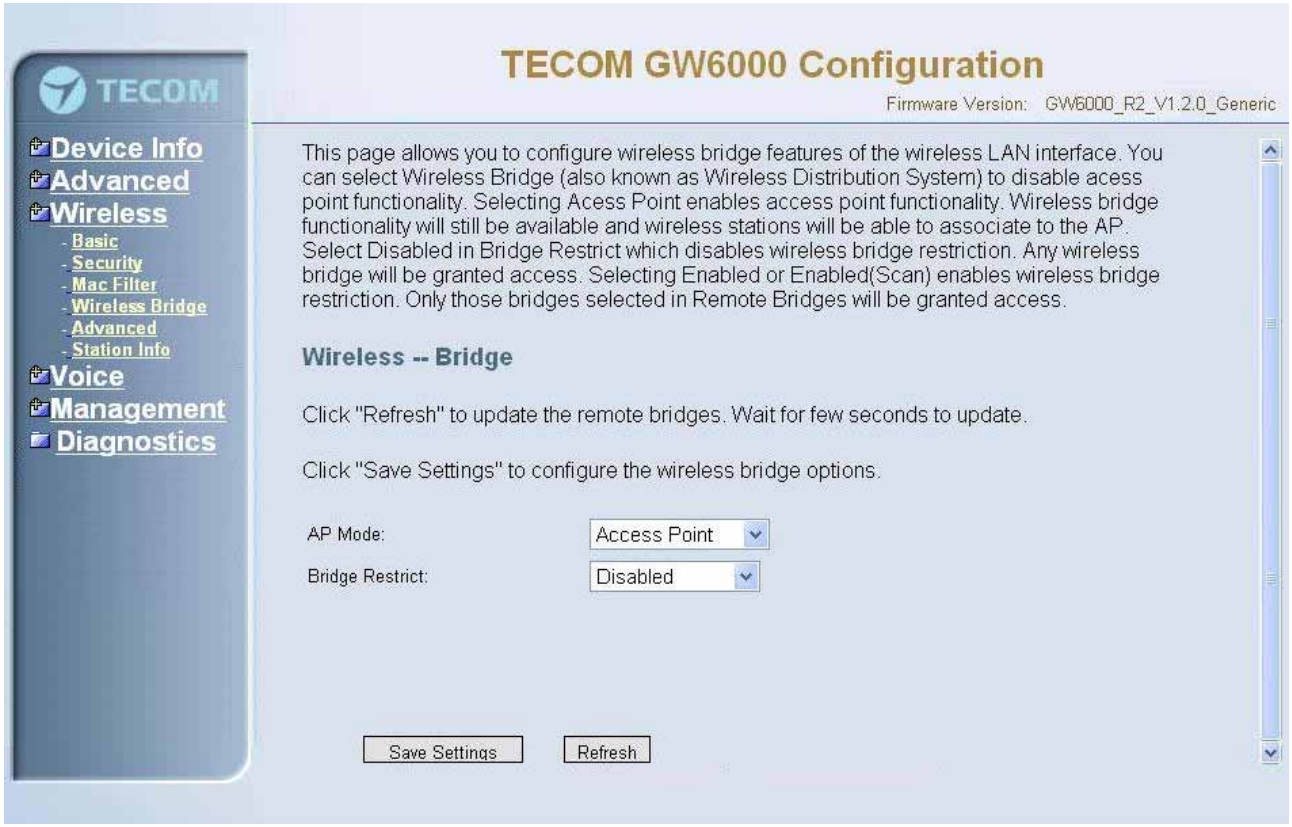

Figure 6-24. Wireless – Wireless Bridge

6.5.5 Advanced

It allows you to configure advanced features of the wireless LAN interface. You can select a particular channel on which to operate, force the transmission rate to a particular speed, set the fragmentation threshold, set the RTS threshold, set the wakeup interval for clients in power-save mode, set the beacon interval for the access point, set XPress mode and set whether short or long preambles are used

Channel: Select the appropriate channel from the list provided to correspond with your network settings. All devices in your wireless network must use the same channel in order to function correctly.

Rate: The default setting is Auto. The range is from 1 to 54Mbps. The rate of data transmission should be set depending on the speed of your wireless network. You can select from one transmission speed, or keep the default setting, Auto, to have the IAD automatically use the fastest possible data rate.

Multicast Rate: The default setting is 54Mbps. The range is from 1 to 54Mbps. The rate of data transmission should be set depending on the speed of your wireless network. You can select from one transmission speed, or keep the default setting, to have the IAD automatically use the fastest data rate for multicast packets.

Basic Rate: Select the basic rate that wireless clients must support.

Fragmentation Threshold: This value should remain at its default setting of 2346. The range is 256~2346 bytes. It specifies the maximum size for a packet before data is fragmented into multiple packets. If you experience a high packet error rate, you may slightly increase the Fragmentation Threshold. Setting this value too low may result in poor network performance. Only minor modifications of this value are recommended.

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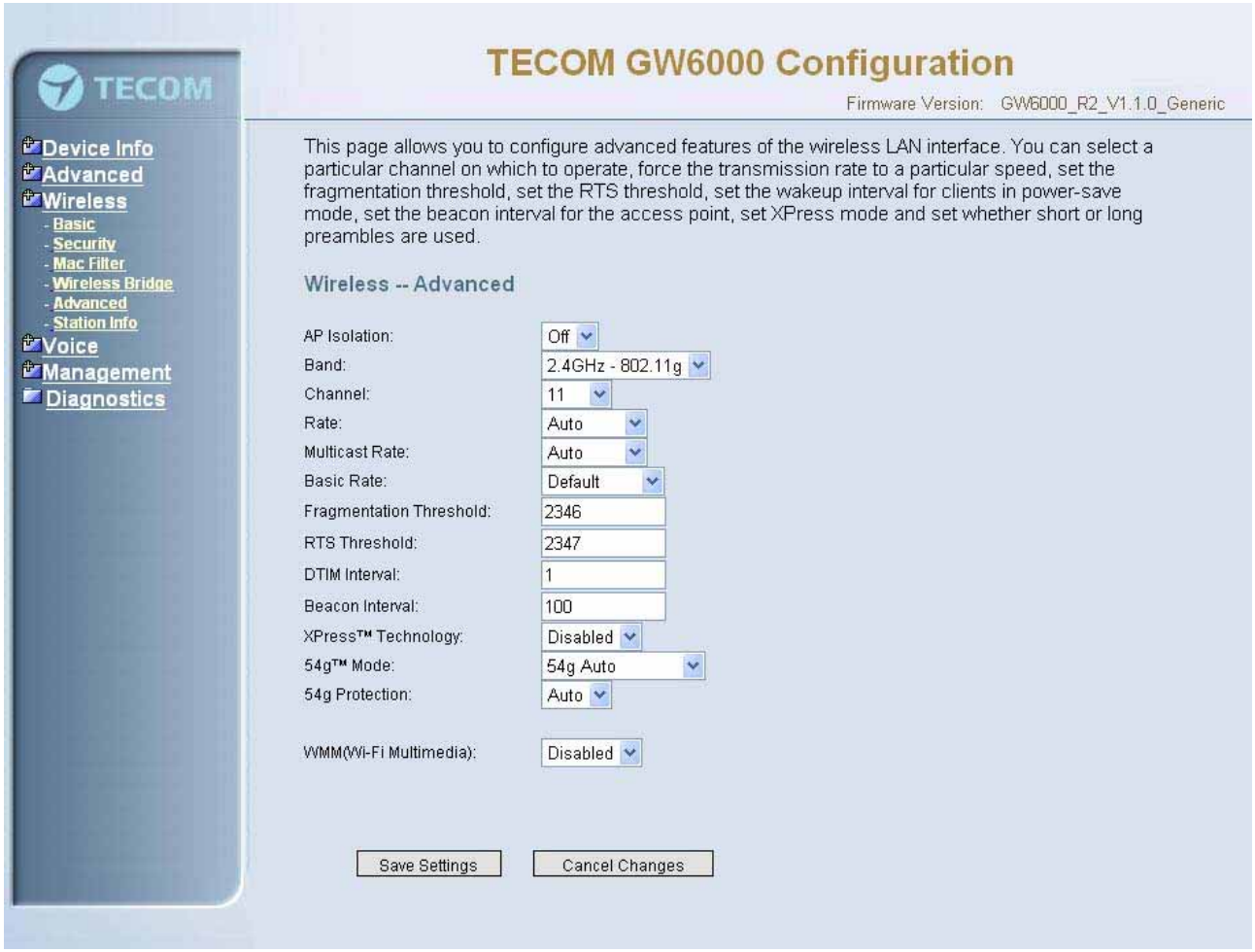

Figure 6-25. Wireless – Advanced

RTS Threshold: This value should remain at its default setting of 2347. The range is 0~2347 bytes. Should you encounter inconsistent data flow, only minor modifications are recommended. If a network packet is smaller than the packet RTS threshold size, the RTS/CTS mechanism will not be enabled. The IAD sends Request of Send (RTS) frames to a particular receiving station and negotiates the sending of a data frame. After receiving an RTS, the wireless station responds with a Clear to Send (CTS) frame to acknowledge the right to begin transmission.

DTIM Interval: The default value is 3. This value, between 1 and 255 milliseconds, indicates the interval of the Delivery Traffic Indication Message (DTIM). A DTIM field is a countdown field informing clients of the next window for listening to broadcast and multicast messages. When the router has buffered broadcast or multicast for associated clients, it sends the next DTIM with a DTIM Interval value. Its clients hear the beacons and awaken to receive the broadcast and multicast message.

Beacon Interval: The default value is 100. Enter a value between 1 and 65535 milliseconds. The Beacon Interval value indicates the frequency interval of the beacon. A beacon is a packet broadcast by the router to synchronize the wireless network.

XPress™ Technology: Select to enable/disable this proprietary mode.

54g™ Mode: Select the mode to 54g Auto for the widest compatibility. Select the mode to 54g Performance for the fastest performance among 54g certified equipment. Set the mode to 54g LRS if you are experiencing difficulty with legacy 802.11b equipment.

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54g protection: In Auto mode the IAD will use RTS/CTS to improve 802.11g performance in mixed 802.11g/802.11b networks. Turn protection off to maximize 802.11g throughput under most conditions.

WMM (WiFi Multimedia): Select to enable/disable the support.(Figure 6-25)

6.5.6 Station Info

Authenticated wireless stations and their status will be shown here.(Figure 6-26)

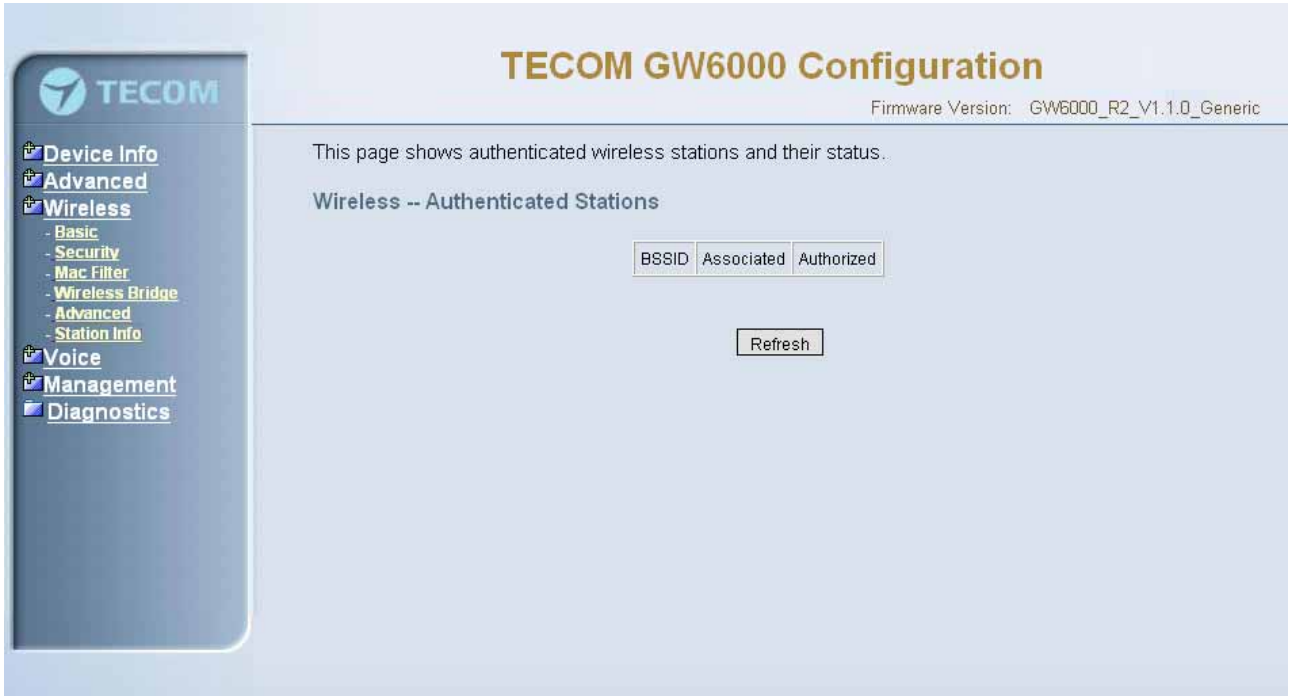

Figure 6-26. Wireless – Station Info

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6.6 Voice

Use the Voice screen to configure the GW6000 function related parameters. It allows system administrator to configure the following topics:

- Phone
  - Phone Extension
  - Extension Linekey
- Trunk
  - IP Trunk
  - Trunk Group
  - Answering Positions
  - Call Restriction Table
  - Call Routing Table
- System
  - Numbering Plan
  - Service Mode
  - Transmission
  - IG Dynamic Discovery
  - IG Expansion Table
- Voice Mail
  - General
  - Extension
  - Holiday
  - Advanced

The configurable items for each part would be described in the following.

6.6.1 Phone

Use the phone extension screen to configure GW6000's phone extension authentication and IP2007's extension line key default setting.

6.6.1.1 Phone Extension

The GW6000 combines Proxy and Registrar servers in its application. The all phones registered to the internal Registrar are set here. (Figure 6-27)

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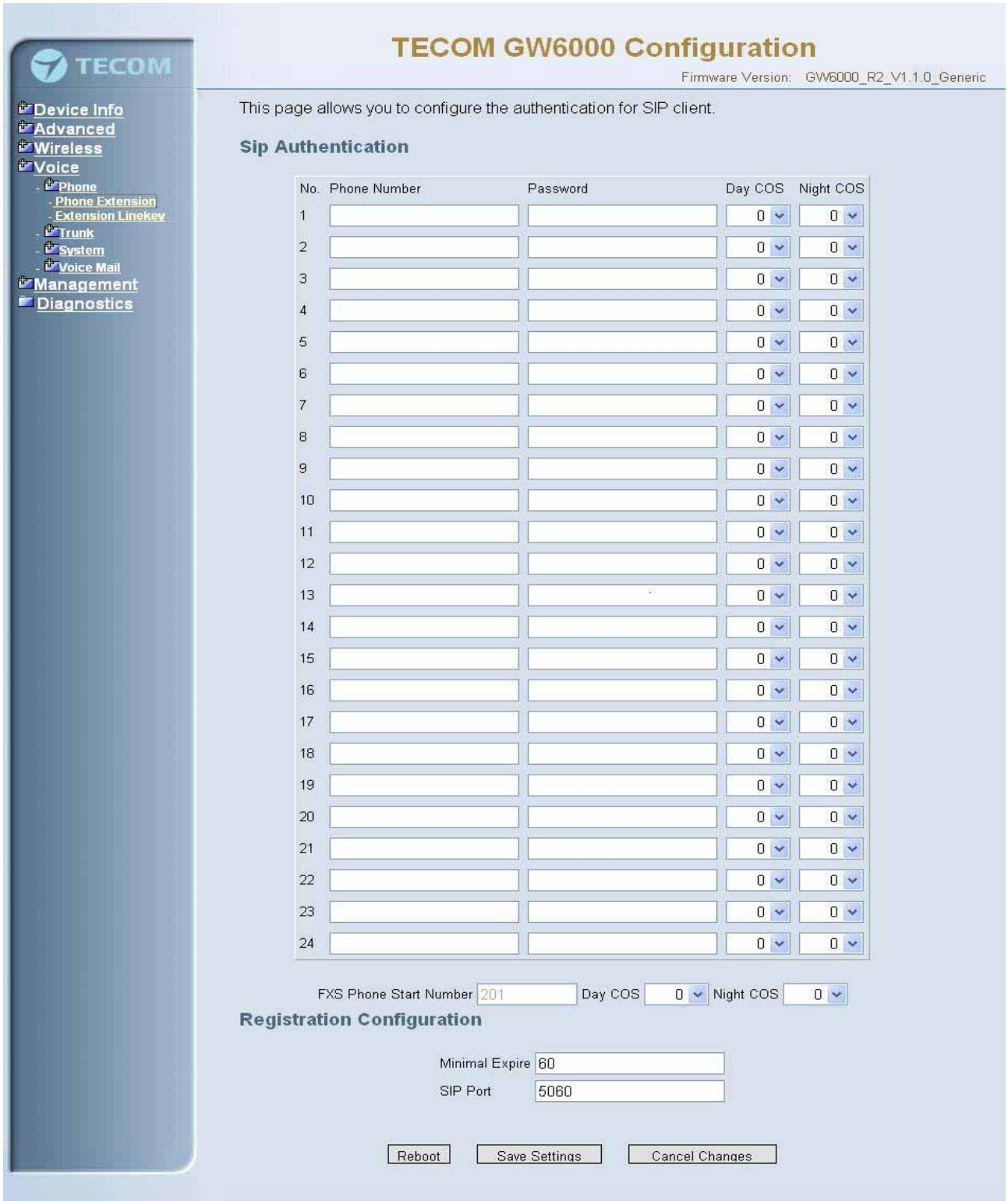

Figure 6-27. Voice – Phone – Phone Extension

SIP Authentication: It provides 24 IP phones registered.

Phone Number: The phone number is a station number. If it conflicts with the setting in Numbering Plan, it fails to add or make the change. Its value range is limited by Start Extension Number and End Extension Number settings in Numbering Plan page.

Password: The user password of this phone. The length is up to 24 digits or characters. It's used for Digest Authentication.

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Day COS: The field assigns Class of Service for day mode operation. Acceptable values are 0-7. At default, all extensions are unrestricted.

Night COS: The field assigns Class of Service for night mode operation. Acceptable values are 0-7. At default, all extensions are unrestricted.

FXS Phone Start Number: It shows the FXS phone number. It's programmed in System – Numbering Plan.

Registration Configuration

Minimal Expire: the minimum refresh interval registrar time supported for these IP phones managed by the Gateway Server.

SIP Port: The Gateway Server listens for requests on the SIP port. This port is used for UDP application and 5060 is its recommended value.

6.6.1.2 Extension Linekey

This page allows you to configure the default settings for IP2007's linekeys. While a new-allocated IP2007 is registering to IG, IG will send these settings to the phone.(Figure 6-28)

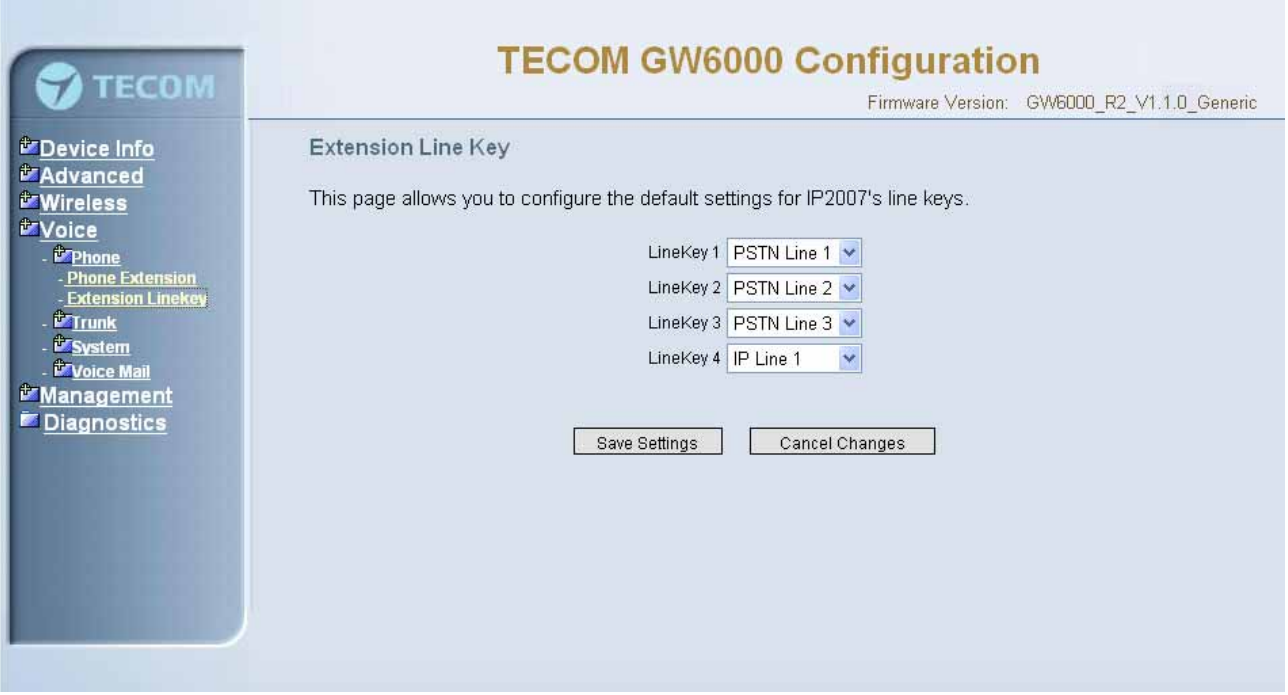

Figure 6-28. Voice – Phone – Extension Linekey

6.6.2 Trunk

Use the Trunk screen to configure the PSTN/IP Trunk function related parameters. It is separated into 5 parts:

- IP Trunk
- Trunk Group
- Answering Positions
- Call Restriction Table
- Call Routing Table

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6.6.2.1 IP Trunk

This page allows you to configure the proxy and registration server of IP Trunk, up to 8 lines of IP Trunk are supported. (Figure 6-29)

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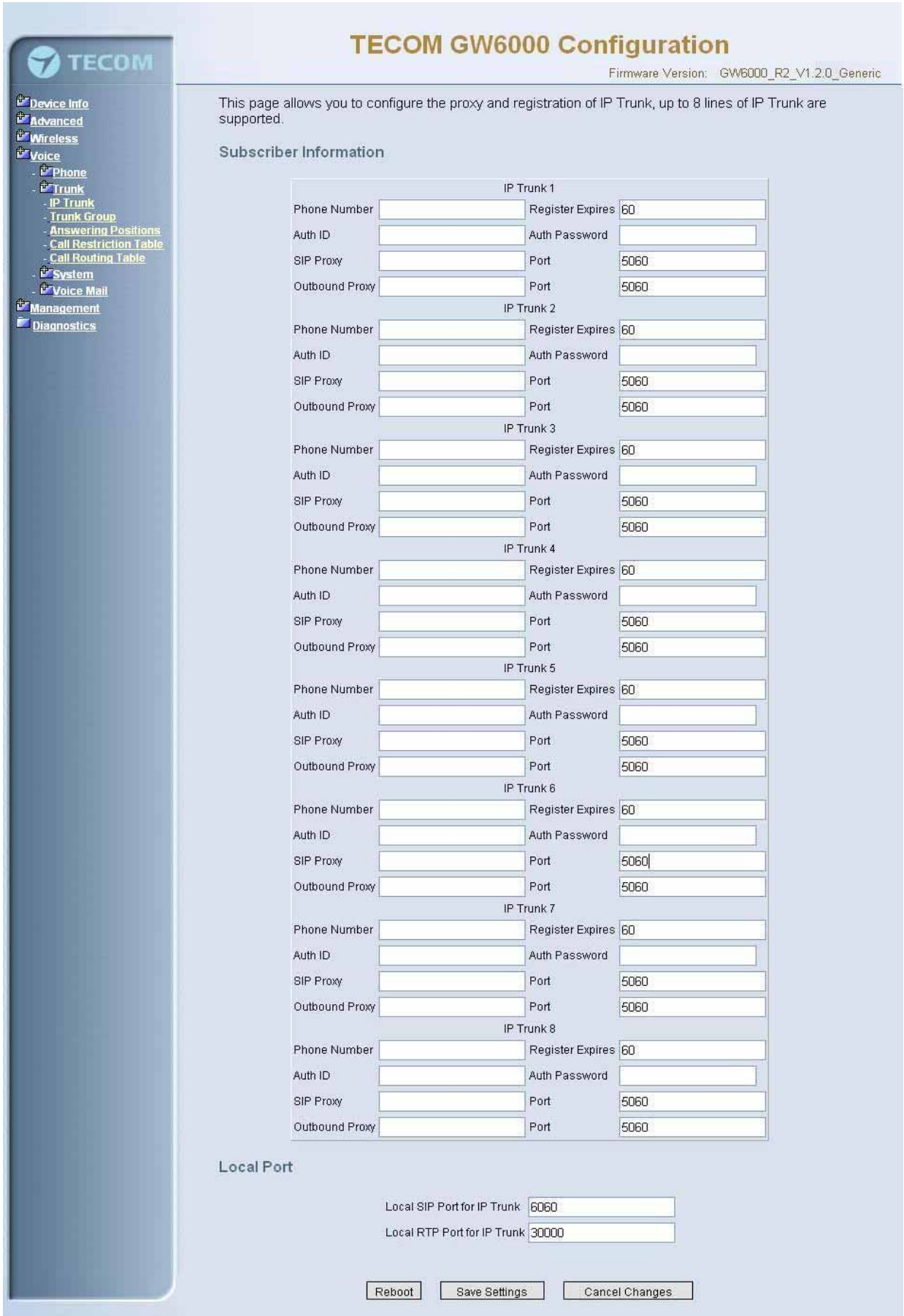

Figure 6-29. Voice – Trunk – IP Trunk

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Subscriber Information

Trunk Number: The assigned phone number from Uplink Server.

Register Expires: how long the Gateway sends REGISTER to uplink registrar server. It counts based on second.

Auth ID: The Account ID of registration to uplink server. It's used for Digest Authentication.

Auth Password: The Password of registration to uplink server. It's used for Digest Authentication.

SIP Proxy: the position of uplink registrar server. Digital IP address and domain name are all supported.

SIP Proxy Port: SIP signal port of uplink registrar server.

Outbound Proxy: the address of uplink outbound proxy server. All sip request packet will be sent to this server that will determine their next hops.

Outbound Proxy Port: SIP signal port of uplink outbound proxy server.

Local Port

Local SIP Port for IP Trunk: SIP control signal packet Port of IP Trunk Client.

Local RTP Port for IP Trunk: Real-Time Protocol packet Port of IP Trunk Client. It's the start RTP port address for these IP Trunks.

6.6.2.2 Trunk Group

This page allows you to configure the virtual Trunk Group, up to 4 Trunk Groups are supported.(Figure 6-30)

Trunk Group & Label

This item allows you to assign physical Trunk to virtual Trunk Group. And you can configure your personal string as incoming Caller ID number. For three PSTN lines and eight IP lines you can choose from Group1 to Group 4.

Trunk Group Priority

This Item allows you to define 4 Trunk Group's interior priority. For four groups you can choose IP first or PSTN first. This will take effect if call routing entry's destination has been set as Group choice.

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