BILLION™

BiPAC 6404VGP *R3*

VoIP/802.11g Broadband Firewall Router

User Manual

Version release: 6.22b

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Table of Contents

Chapter 1: Introduction

Introduction to your Router

Welcome to the VoIP/802.11g Broadband Firewall Router. The router is an “all-in-one” VoIP Broadband router, combining a Broadband router, Ethernet network switch and 2 ports for Voice over IP functionalities, providing everything you need to get the machines on your network connected to the Internet over your DSL/Cable broadband connection. With features such as a Quick-Start wizard and DHCP Server, you can be online in no time at all and with a minimum of fuss and configuration, catering for first-time users to the guru requiring advanced features and control over their Internet connection and network.

Features

- **Voice over IP compliance with SIP standard**

The router supports cost-effective, toll-quality voice calls over the Internet. It complies with the most popular industrial standard, SIP protocol, to ensure the interoperability with SIP devices and major VoIP Gateways. The VoIP router supports call waiting, silence suppression, voice activity detection (VAD), comfort noise generation (CNG), line echo cancellation, caller ID (Bell 202, V3) and so on.

- **802.11g Wireless AP with WPA Support (Wireless Router only)**

With integrated 802.11g Wireless Access Point in the router, the device offers a quick and easy access among wired network, wireless network and broadband connection with single device simplicity, and as a result, mobility to the users. In addition to 54 Mbps 802.11g data rate, it also interoperates backward with existing 802.11b equipment. The Wi-Fi Protected Access (WPA-PSK and WPA2-PSK) and Wired Equivalent Privacy (WEP) supported features enhance the security level of data protection and access control via Wireless LAN.

- **Fast Ethernet Switch**

A 4-port 10/100Mbps fast Ethernet switch is built in with automatic switching between MDI and MDI-X for 10Base-T and 100Base-TX ports. An Ethernet straight or crossover cable can be used directly for auto detection.

- **EWAN**

The router offers a WAN port to be used to connect to Cable Modems, VDSL and fibre optic lines. This alternative, yet faster method to connect to the internet will provide users more flexibility to get online.

- **Quick Installation Wizard**

It supports a WEB GUI page to install this device quickly. With this wizard, end users can enter the information easily which they get from their ISP, then surf the Internet immediately.

- **Universal Plug and Play (UPnP) and UPnP NAT Traversal**

This protocol is used to enable simple and robust connectivity among stand-alone devices and PCs from many different vendors. It makes network simple and affordable for users. UPnP architecture leverages TCP/IP and the Web to enable seamless proximity networking in addition to control and data transfer among networked devices. With this feature enabled, users can now connect to Net meeting or MSN Messenger seamlessly.

Network Address Translation (NAT)

Allows multi-users to access outside resources such as the Internet simultaneously with one IP address/one Internet access account. Many application layer gateway (ALG) are supported such as web browser, ICQ, FTP, Telnet, E-mail, News, Net2phone, Ping, NetMeeting, IP phone and others.

SOHO Firewall Security with DoS and SPI

Along with the built-in NAT natural firewall feature, the router also provides advanced hacker pattern-filtering protection. It can automatically detect and block Denial of Service (DoS) attacks. The router is built with Stateful Packet Inspection (SPI) to determine if a data packet is allowed through the firewall to the private LAN.

Domain Name System (DNS) Relay

It provides an easy way to map the domain name (a friendly name for users such as www.yahoo.com) and IP address. When a local machine sets its DNS server with this router's IP address, every DNS conversion request packet from the PC to this router will be forwarded to the real DNS in the outside network.

Dynamic Domain Name System (DDNS)

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname. This dynamic IP address is the WAN IP address. For example, to use the service, you must first apply for an account from a DDNS service like http://www.dyndns.org/. More than 5 DDNS servers are supported.

Virtual Server ("port forwarding")

Users can specify some services to be visible from outside users. The router can detect incoming service requests and forward either a single port or a range of ports to the specific local computer to handle it. For example, a user can assign a PC in the LAN acting as a WEB server inside and expose it to the outside network. Outside users can browse inside web servers directly while it is protected by NAT. A DMZ host setting is also provided to a local computer exposed to the outside network, Internet.

Rich Packet Filtering

Not only filters the packet based on IP address, but also based on Port numbers. It will filter packets from and to the Internet, and also provides a higher level of security control.

Dynamic Host Configuration Protocol (DHCP) Client and Server

In the WAN site, the DHCP client can get an IP address from the Internet Service Provider (ISP) automatically. In the LAN site, the DHCP server can allocate a range of client IP addresses and distribute them including IP address, subnet mask as well as DNS IP address to local computers. It provides an easy way to manage the local IP network.

Static and RIP1/2 Routing

It has routing capability and supports easy static routing table or RIP1/2 routing protocol.

Simple Network Management Protocol (SNMP)

It is an easy way to remotely manage the router via SNMP.

Web based GUI

It supports web based GUI for configuration and management. It is user-friendly and comes with on-line help. It also supports remote management capability for remote users to configure and manage this product.

Firmware Upgradeable

Device can be upgraded to the latest firmware through the WEB based GUI.

Rich Management Interfaces

It supports flexible management interfaces with local console port, LAN port, and WAN port. Users can use terminal applications through the console port to configure and manage the device, or Telnet, WEB GUI, and SNMP through LAN or WAN ports to configure and manage the device.

Chapter 2: Installing the Router

Important note for using this router

Warning

- Do not use this router in a high humidity or high temperature environment.
- Do not apply the same power source for this router to other types of equipments.
- Do not open or repair the case yourself. If the device becomes too hot, turn it off immediately and have it repaired at a qualified service center.
- Avoid using this product and all its accessories outdoor.

Attention

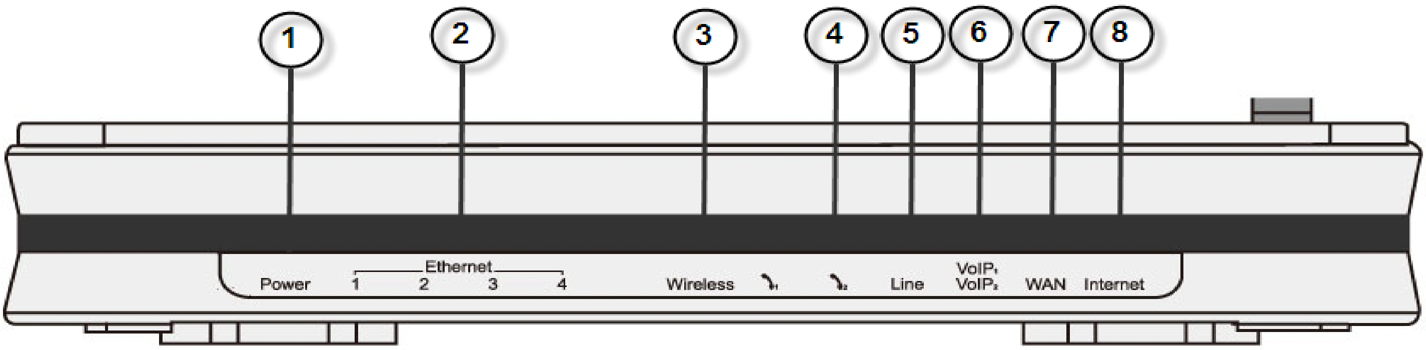
- Place the router on a stable surface.
- Only use the power adapter that comes with the package. Using a different voltage rating power adapter may damage the router.

Package Contents

- **VoIP/802.11g Broadband Firewall Router**
- **CD-ROM containing the online manual**
- **Ethernet (CAT-5) Cable**
- **RJ-45 to RS-232 Console kit**
- **Power adapter**
- **A detachable antenna**
- **Quick Start Guide**

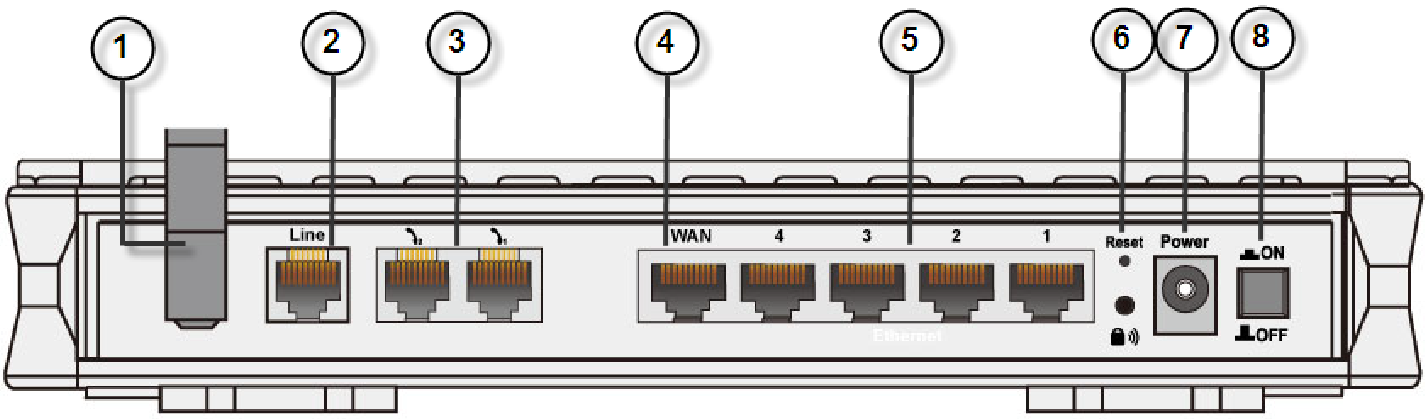
Device Description

The Front LEDs



LED		Meaning
1	**Power**	Both red and green LEDs lit together when power is ON. Lit red means system failure. Restart the device or contact support. Lit green when the device is ready.
2	**Ethernet Port**	Lit when one of LAN ports is connected to an Ethernet device. Lit green when the speed of transmission hits 100Mbps; Lit orange when the speed of transmission hits 10Mbps. Blink when data is being Transmitted / Received.
3	**Wireless**	Lit green when the wireless connection is established. Flash when sending/receiving data. Flash once per second while Wi-Fi protected setup is in progress.
4	**Phone 1x - 2x (RJ-11 connector)**	Lit green when phone is off hook.
5	**Line(Router with LINE port only)**	Lit green when the inbound and outbound calls are transmitted through PSTN.
6	**VoIP 1x - 2x (RJ-11 connector)**	Lit green when phone 1 has registered successfully. Lit orange when phone 2 has registered successfully. If both phone 1 & 2 have succeeded in registration, both green and orange LEDs will lit together.
7	**WAN**	Lit green/orange when connected to an modem or Cable modem's Ethernet port well.
8	**Internet**	Lit red when WAN port fails to get IP address. Lit green when WAN port gets IP address successfully. Lit off when the device is in bridge mode or when WAN connection is absent.

The Rear Ports



Port		Meaning
1	**Antenna**	Connect the detachable antenna to this port.
2	**Line**	Connect this port to the telephone jack on the wall with RJ-11cable.
3	**Phone 1X-2X**	Connect this port to an analog phone set with RJ-11 cable.
4	**WAN**	WAN 10/100M Ethernet port (with auto crossover support); connect xDSL / Cable modem here.
5	**Ethernet**	Connect a UTP Ethernet cable (Cat-5 or Cat-5e) to one of the LAN ports when connecting to a PC or an office/home network of 10Mbps or 100Mbps. ***Caution: Port 4 can be either a LAN or Console port at a time but not both.***
6	**RESET**	To be sure the device is being turned on press RESET button for: 1-3 seconds: quick reset the device. 6 seconds and above, power off, power on the device: restore to factory default settings. (Cannot login to the router or forgot your Username/Password. Press the button for more than 6 seconds). ***Caution: After pressing the RESET button for more than 6 seconds, to be sure you power cycle the device again.***
7	**Power**	Connect it with the supplied power adapter.
8	**Power Switch**	Power ON/OFF switch.

Cabling

The most common problem associated with Ethernet is bad cabling. Make sure that all connected devices are turned on. On the top of the product is a bank of LEDs, as a first check, verifies that the relevant LAN Link and WAN Link LEDs are lit. If they are not, verify that you are using the proper cables.

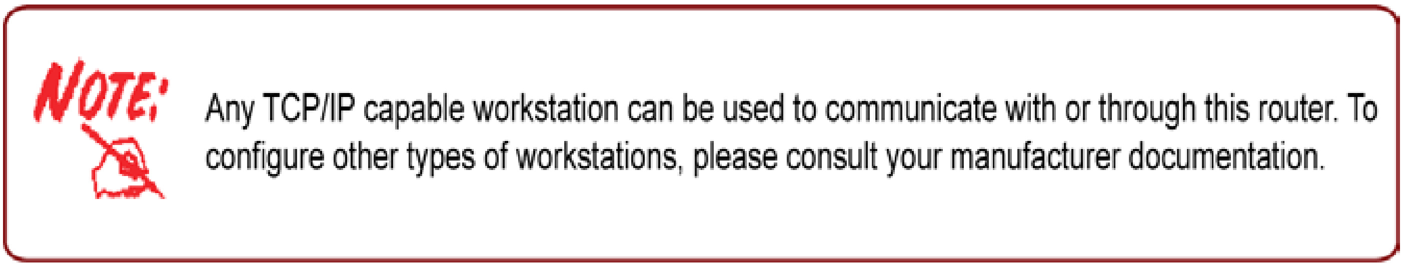
Chapter 3: Basic Installation

The router can be configured through your web browser. A web browser is included as a standard application in the following operating systems: Linux, Mac OS, Windows 7/98/NT/2000/XP/Me/Vista, etc. The product provides an easy and user-friendly interface for configuration.

Please check your PC network components. The TCP/IP protocol stack and Ethernet network adapter must be installed. If not, please refer to your Windows-related or other operating system manuals.

There are ways to connect the router, either through an external repeater hub or connect directly to your PCs. However, make sure that your PCs have an Ethernet interface installed properly prior to connecting the router device. You ought to configure your PCs to obtain an IP address through a DHCP server or a fixed IP address that must be in the same subnet as the router. The default IP address of the router is 192.168.1.254 and the subnet mask is 255.255.255.0 (i.e. any attached PC must be in the same subnet, and have an IP address in the range of 192.168.1.1 to 192.168.1.253). The best and easiest way is to configure the PC to get an IP address automatically from the router using DHCP. If you encounter any problem accessing the router web interface it is advisable to uninstall your firewall program on your PCs, as they can cause problems accessing the IP address of the router. Users should make their own decisions on what is best to protect their network.

Please follow the following steps to configure your PC network environment.

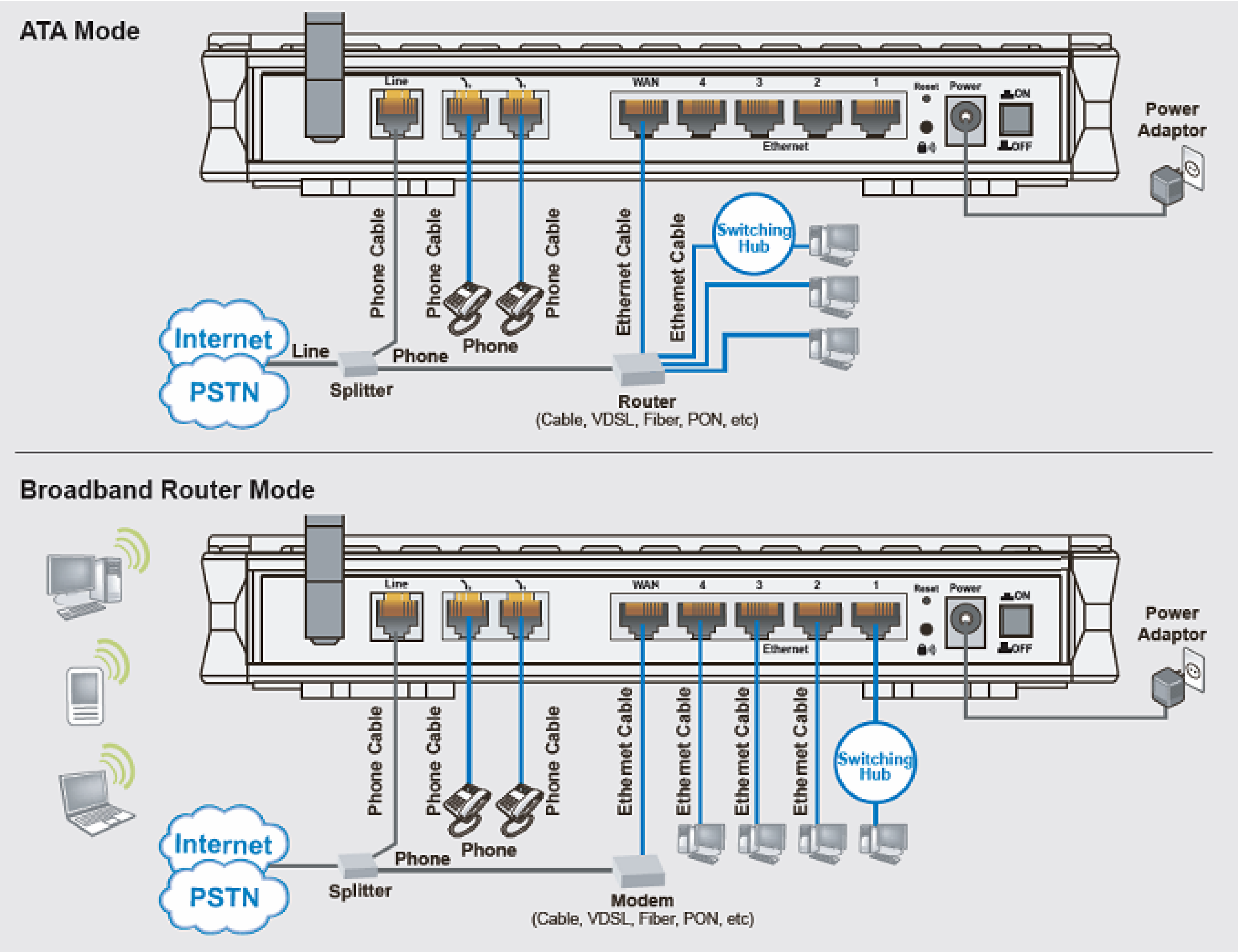


NOTE:

Any TCP/IP capable workstation can be used to communicate with or through this router. To configure other types of workstations, please consult your manufacturer documentation.

Connecting Your Router

1. (a) **ATA Mode:** Connect the ATA to a **WAN** (Connect to modem/router).
   (b) **Broadband Router Mode:** Connect the Router to a **LAN** (Local Area Network) and **WAN** (Connect to Cable or modem).
2. Power on the device.
3. Make sure the **Power LED** lit steadily and that the **LAN** LED is lit.
4. Connect your router to the telephone jack on the wall with RJ-11 cable.



ATA Mode

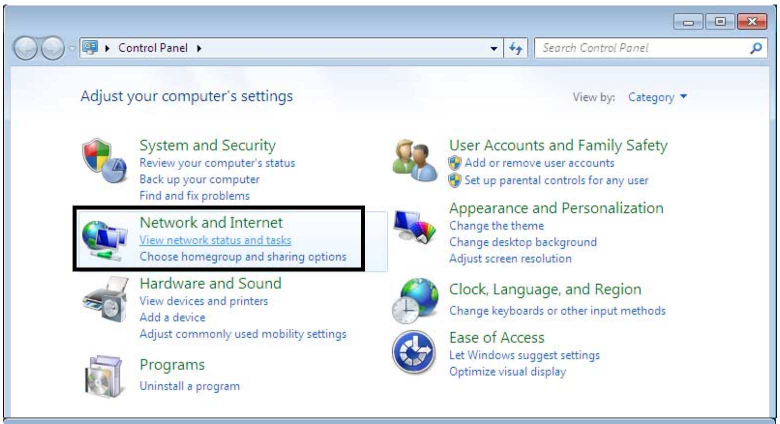
Broadband Router Mode

Network Configuration

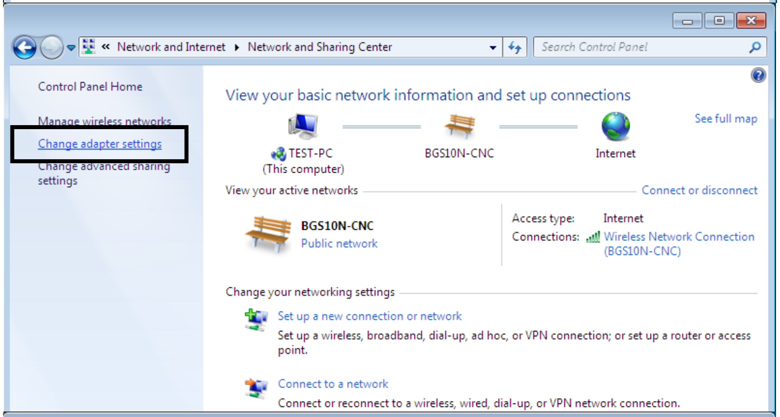
Configuring PC in Windows 7

1. Go to **Start**. Click on **Control Panel**.

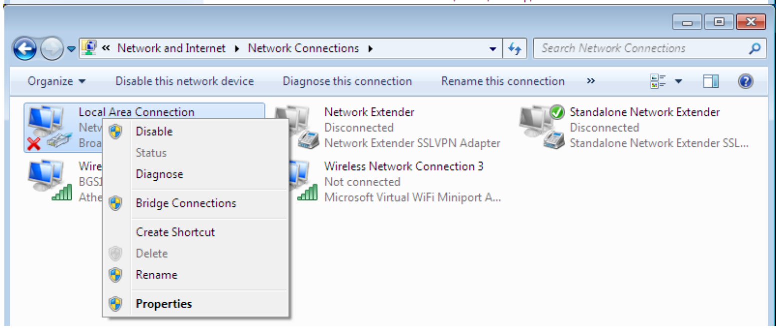
2. Then click on **Network and Internet**.


Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
Back up your computer
Find and fix problems
Network and Internet
View network status and tasks
Choose homegroup and sharing options
Hardware and Sound
View devices and printers
Add a device
Adjust commonly used mobility settings
Programs
Uninstall a program
User Accounts and Family Safety
Add or remove user accounts
Set up parental controls for any user
Appearance and Personalization
Change the theme
Change desktop background
Adjust screen resolution
Clock, Language, and Region
Change keyboards or other input methods
Ease of Access
Let Windows suggest settings
Optimize visual display

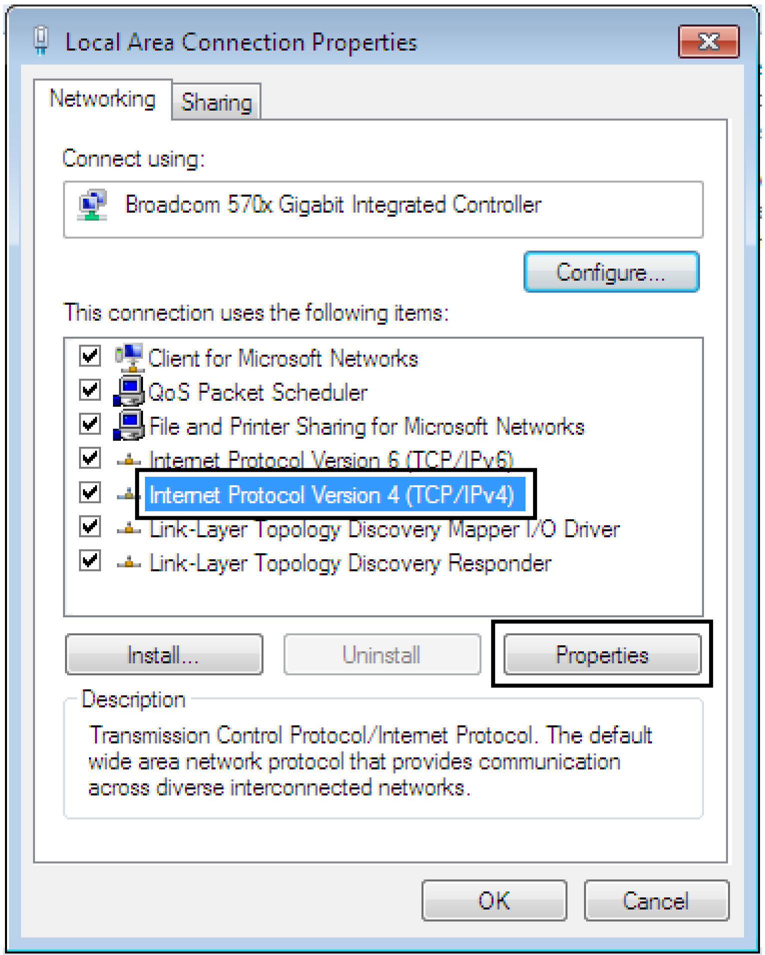
3. When the **Network and Sharing Center** window pops up, select and click on **Change adapter settings** on the left window panel.


Network and Internet ▸ Network and Sharing Center
Search Control Panel
Control Panel Home
Manage wireless networks
Change adapter settings
Change advanced sharing settings
View your basic network information and set up connections
See full map
TEST-PC
(This computer)
BGS10N-CNC
Internet
View your active networks
Connect or disconnect
BGS10N-CNC
Public network
Access type: Internet
Connections: Wireless Network Connection (BGS10N-CNC)
Change your networking settings
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.
Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

4. Select the **Local Area Connection**, and right click the icon to select **Properties**.


Network and Internet ▸ Network Connections ▸
Search Network Connections
Organize
Disable this network device
Diagnose this connection
Rename this connection
»
Local Area Connection
Netw
Broa
Wire
BGS1
Athe
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties
Network Extender
Disconnected
Network Extender SSLVPN Adapter
Wireless Network Connection 3
Not connected
Microsoft Virtual WiFi Miniport A...
Standalone Network Extender
Disconnected
Standalone Network Extender SSL...

5. Select **Internet Protocol Version 4 (TCP/IPv4)** then click **Properties**.



Local Area Connection Properties

Connect using:

Broadcom 570x Gigabit Integrated Controller

This connection uses the following items:

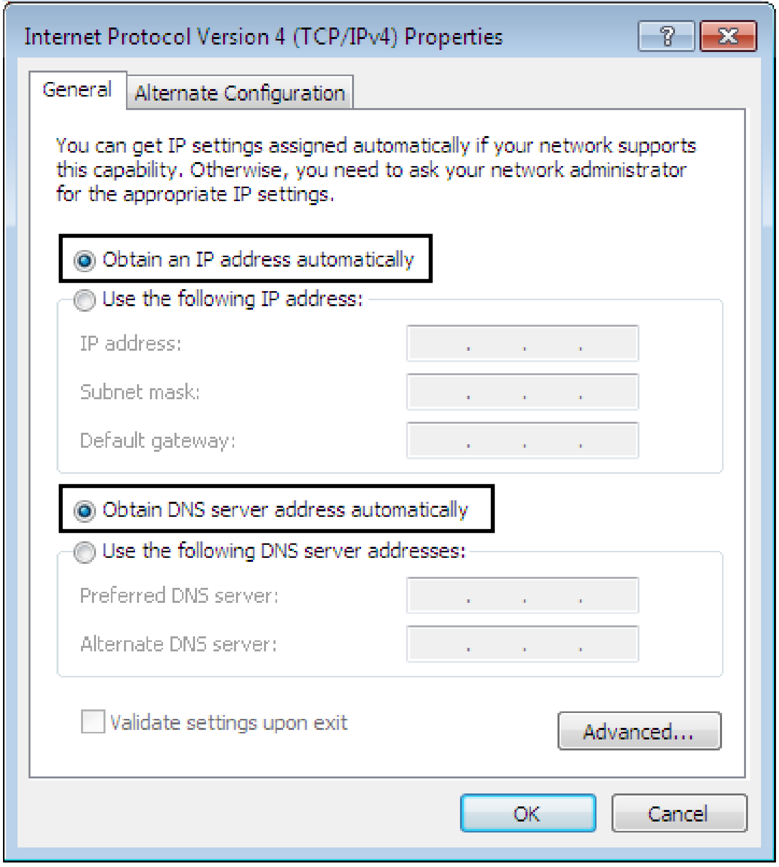
☑ Client for Microsoft Networks
☑ QoS Packet Scheduler
☑ File and Printer Sharing for Microsoft Networks
☑ Internet Protocol Version 6 (TCP/IPv6)
☑ Internet Protocol Version 4 (TCP/IPv4)
☑ Link-Layer Topology Discovery Mapper I/O Driver
☑ Link-Layer Topology Discovery Responder

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

6. In the **TCP/IPv4 properties** window, select the **Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click **OK** to exit the setting.

7. Click **OK** again in the **Local Area Connection Properties** window to apply the new configuration.



Internet Protocol Version 4 (TCP/IPv4) Properties

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically
○ Use the following IP address:

IP address: . . .
Subnet mask: . . .
Default gateway: . . .

● Obtain DNS server address automatically
○ Use the following DNS server addresses:

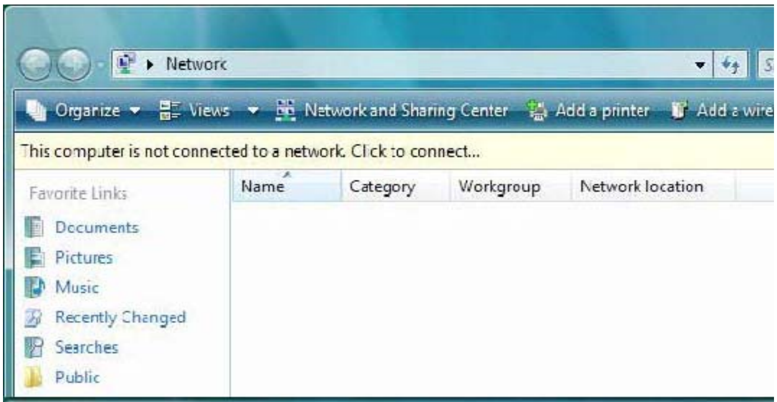
Preferred DNS server: . . .
Alternate DNS server: . . .

□ Validate settings upon exit

Configuring PC in Windows Vista

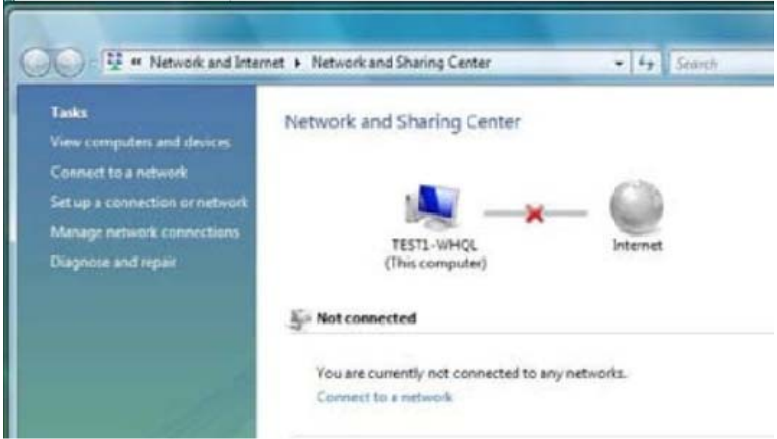
1. Go to **Start**. Click on **Network.**

2. Then click on **Network and Sharing** Center at the top bar.



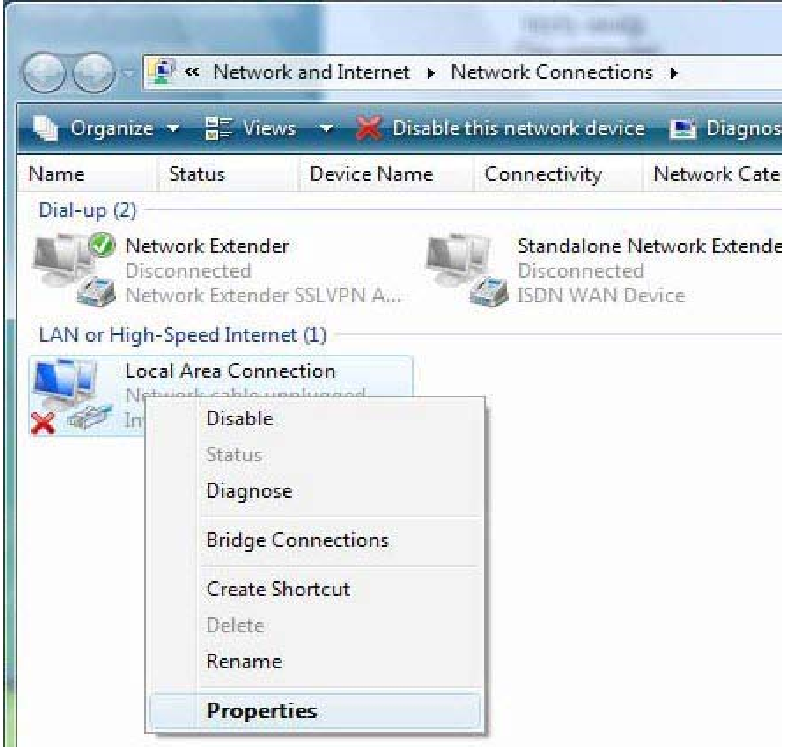
This computer is not connected to a network. Click to connect...

3. When the Network and Sharing Center window pops up, select and click on **Manage network connections** on the left window column.

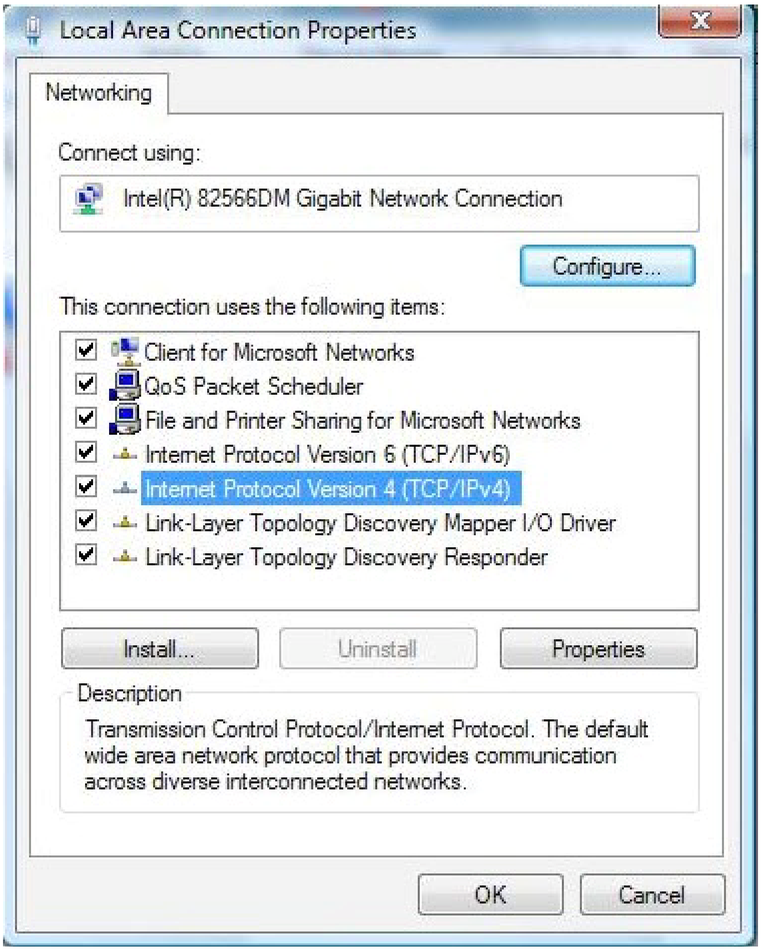


You are currently not connected to any networks.

4. Select the **Local Area Connection**, and right click the icon to select **Properties**.



5. Select **Internet Protocol Version4 (TCP/IPv4)** then click **Properties**.



Local Area Connection Properties

Networking

Connect using:

Intel(R) 82566DM Gigabit Network Connection

This connection uses the following items:

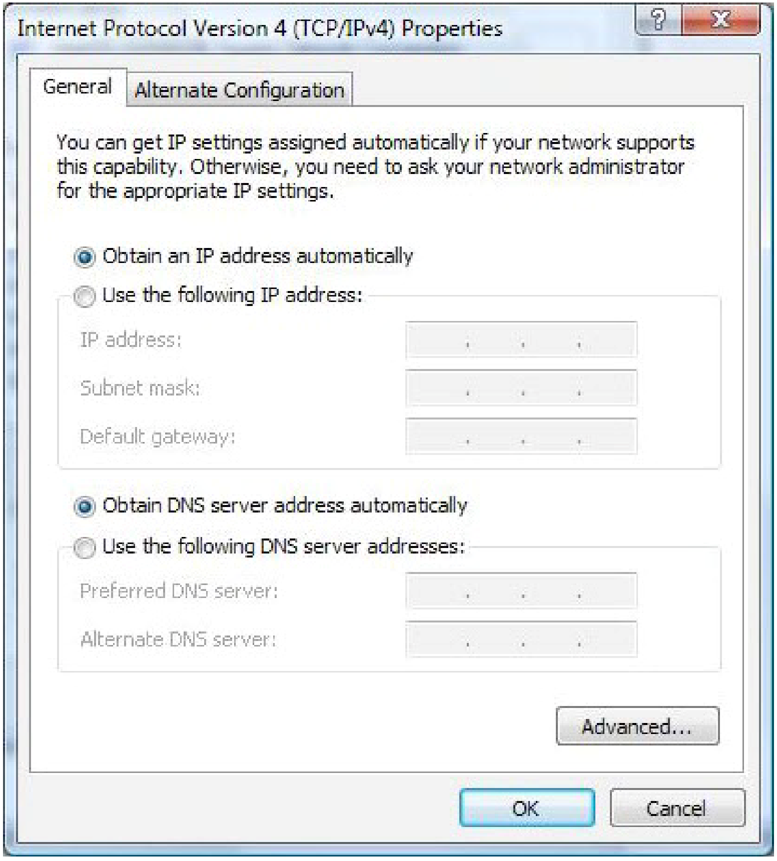
- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

6. In the TCP/IPv4 properties window, select **the Obtain an IP address automatically** and **Obtain DNS Server address automatically** radio buttons. Then click OK to exit the setting.

7. Click **OK** again in the Local Area Connection Properties window to apply the new configuration.



Internet Protocol Version 4 (TCP/IPv4) Properties

General | Alternate Configuration

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

● Obtain DNS server address automatically

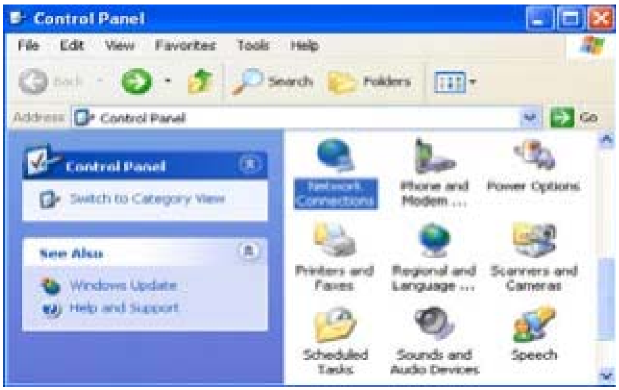
○ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

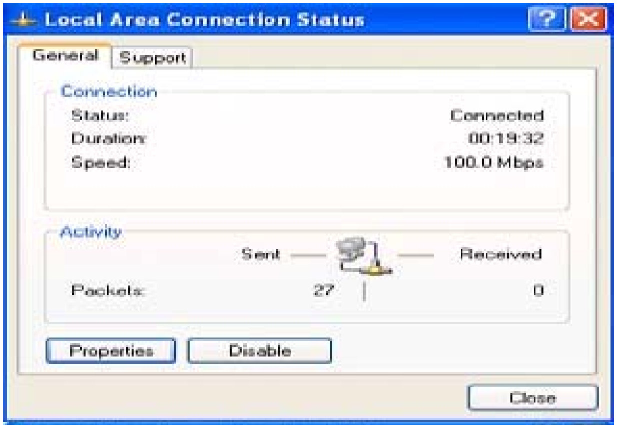
Configuring PC in Windows XP

1. Go to **Start** > **Control Panel** (in Classic View). In the Control Panel, double-click on **Network Connections**



2. Double-click **Local Area Connection**.

3. In the Local Area Connection Status window, click **Properties**.



Connection

Status: Connected

Duration: 00:19:32

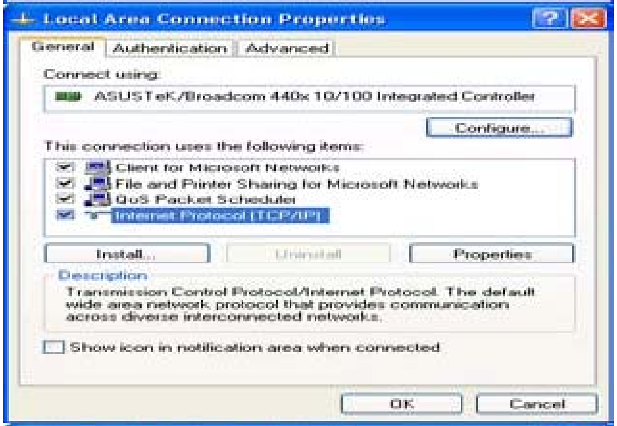
Speed: 100.0 Mbps

Activity

Sent — Received

Packets: 27 | 0

4. Select **Internet Protocol (TCP/IP)** and click **Properties**.



Connect using:

ASUSTeK/Broadcom 440x 10/100 Integrated Controller

This connection uses the following items:

☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ QoS Packet Scheduler
☑ Internet Protocol (TCP/IP)

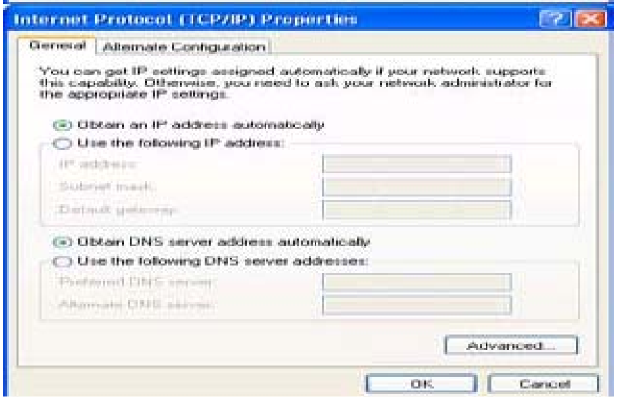
Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

□ Show icon in notification area when connected

5. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.

6. Click **OK** to finish the configuration.



You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address:

Subnet mask:

Default gateway:

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

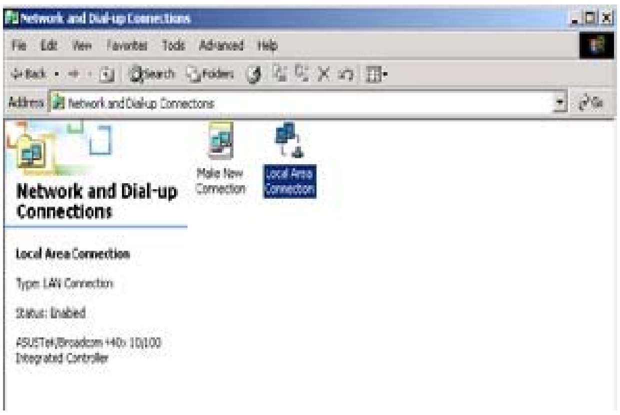
Preferred DNS server:

Alternate DNS server:

Configuring PC in Windows 2000

1. Go to **Start** > **Settings** > **Control Panel**. In the Control Panel, double-click on **Network and Dial-up Connections.**

2. Double-click **Local Area Connection**.


Network and Dial-up Connections
File Edit View Favorites Tools Advanced Help
Back Search Folders
Address Network and Dial-up Connections
Go
Make New Connection
Local Area Connection

Network and Dial-up Connections

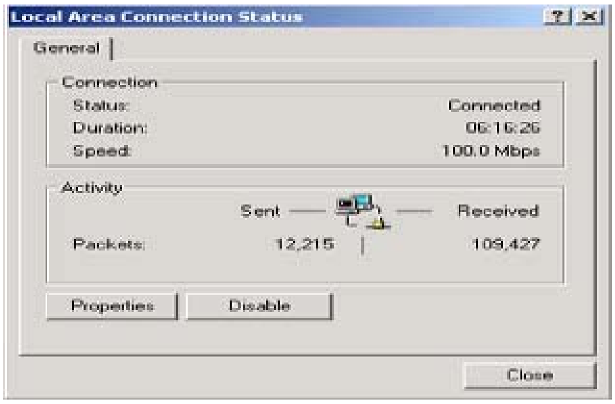
Local Area Connection

Type: LAN Connection

Status: Enabled

ASUSTeK/Broadcom 440x 10/100 Integrated Controller

3. In the Local Area Connection Status window click **Properties**.



Connection

Status: Connected

Duration: 06:16:26

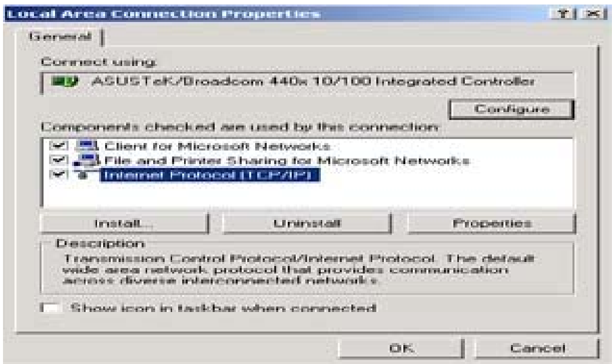
Speed: 100.0 Mbps

Activity

Sent — Received

Packets: 12,215 | 109,427

4. Select **Internet Protocol (TCP/IP)** and click **Properties**.



Connect using:

ASUSTeK/Broadcom 440x 10/100 Integrated Controller

Components checked are used by this connection:

☑ Client for Microsoft Networks

☑ File and Printer Sharing for Microsoft Networks

☑ Internet Protocol (TCP/IP)

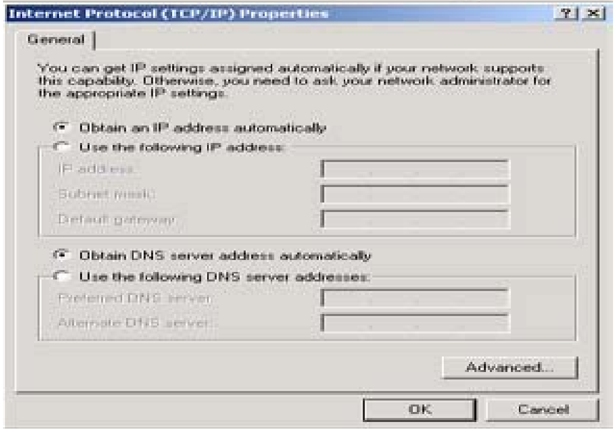
Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

☐ Show icon in taskbar when connected

5. Select the **Obtain an IP address automatically** and the **Obtain DNS server address automatically** radio buttons.

6. Click **OK** to finish the configuration.



You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

○ Use the following IP address:

IP address:

Subnet mask:

Default gateway:

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

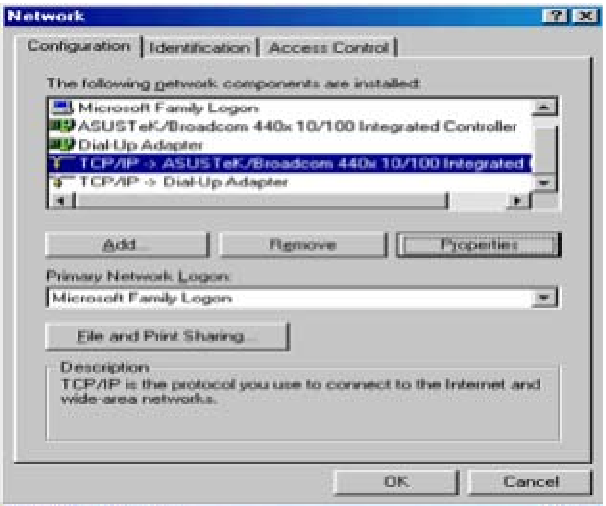
Preferred DNS server:

Alternate DNS server:

Configuring PC in Windows 95/98/Me

1. Go to **Start** > **Settings** > **Control Panel**. In the Control Panel, double-click on **Network** and choose the **Configuration** tab.

2. Select **TCP/IP** > **NE2000 Compatible**, or the name of your Network Interface Card (NIC) in your PC.



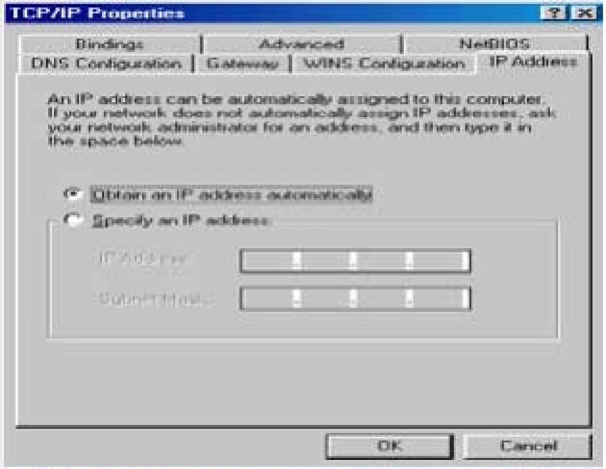
The following network components are installed:

- Microsoft Family Logon
- ASUSTeK/Broadcom 440x 10/100 Integrated Controller
- Dial-Up Adapter
- TCP/IP -> ASUSTeK/Broadcom 440x 10/100 Integrated
- TCP/IP -> Dial-Up Adapter

Primary Network Logon: Microsoft Family Logon

Description
TCP/IP is the protocol you use to connect to the Internet and wide-area networks.

3. Select the **Obtain an IP address automatically** radio button.

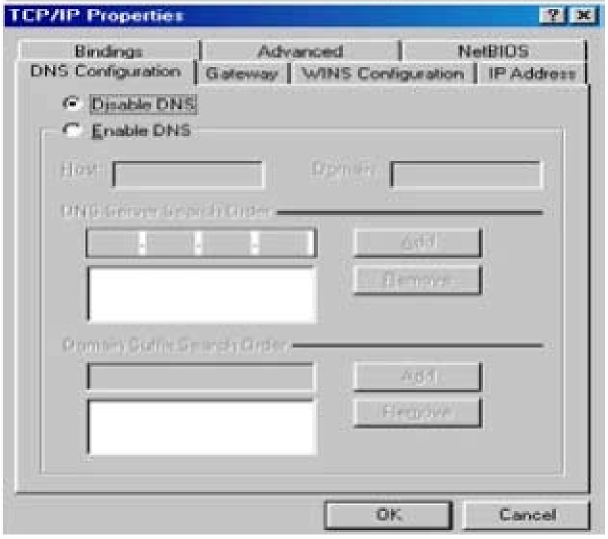


An IP address can be automatically assigned to this computer. If your network does not automatically assign IP addresses, ask your network administrator for an address, and then type it in the space below.

● Obtain an IP address automatically
○ Specify an IP address:

4. Then select the **DNS Configuration**.

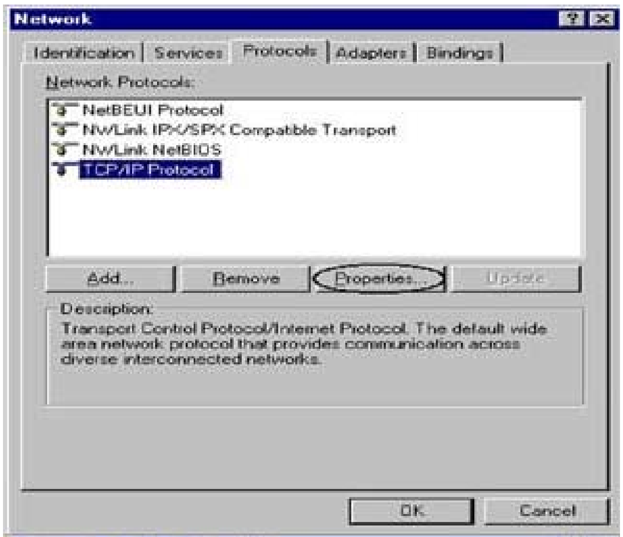
5. Select the **Disable DNS** radio button and click **OK** to finish the configuration.



● Disable DNS
○ Enable DNS

Configuring PC in Windows NT4.0

1. Go to **Start** > **Settings** > **Control Panel**. In the Control Panel, double-click on **Network** and choose the **Protocol**s tab.
2. Select **TCP/IP Protocol** and click **Properties**.



Network Protocols:

NetBEUI Protocol

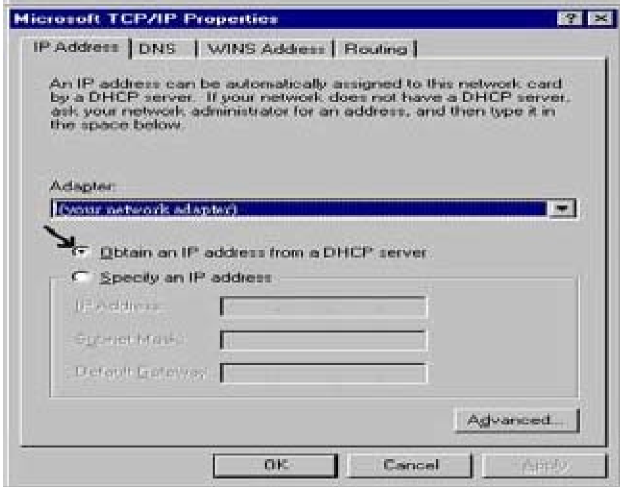
NWLink IPX/SPX Compatible Transport

NWLink NetBIOS

TCP/IP Protocol

Description:
Transport Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

3. Select the **Obtain an IP address from a DHCP server** radio button and click OK.



An IP address can be automatically assigned to this network card by a DHCP server. If your network does not have a DHCP server, ask your network administrator for an address, and then type it in the space below.

Adapter:
(your network adapter)

● Obtain an IP address from a DHCP server

○ Specify an IP address

IP Address:

Subnet Mask:

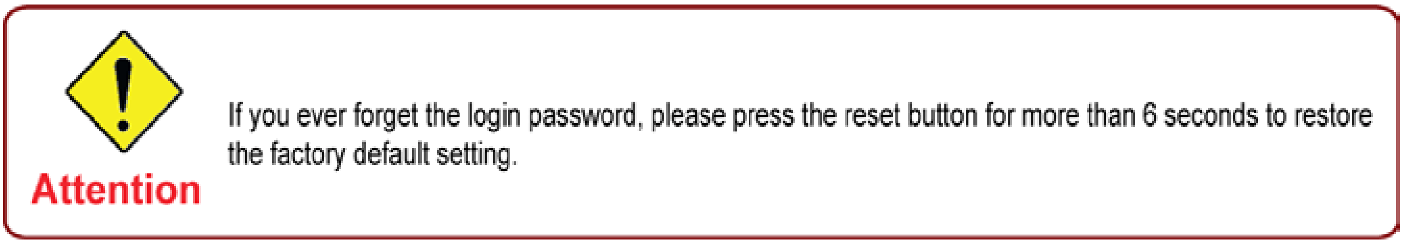
Default Gateway:

Factory Default Settings

Before configuring your router, you need to know the following default settings.

Web Interface (Username and Password)

- Username: admin
- Password: admin



Attention

If you ever forget the login password, please press the reset button for more than 6 seconds to restore the factory default setting.

The default username and password are "**admin**" and "**admin**" respectively.

Device LAN IP settings

- IP Address: 192.168.1.254
- Subnet Mask: 255.255.255.0

ISP setting in WAN site

- PPPoE

DHCP server

- DHCP server is enabled.
- Start IP Address: 192.168.1.100
- IP pool counts: 100

LAN and WAN Port Addresses

The parameters of LAN and WAN ports are pre-set in the factory. The default values are shown in the table.

LAN Port		**WAN Port**
IP address	192.168.1.254	The PPPoE function is *enabled* to automatically get the WAN port configuration from the ISP.
Subnet Mask	255.255.255.0	
DHCP server function	Enabled in ports 1, 2, 3 and 4	
IP addresses for distribution to PCs	100 IP addresses continuing from 192.168.1.100 through 192.168.1.199	

Information from your ISP

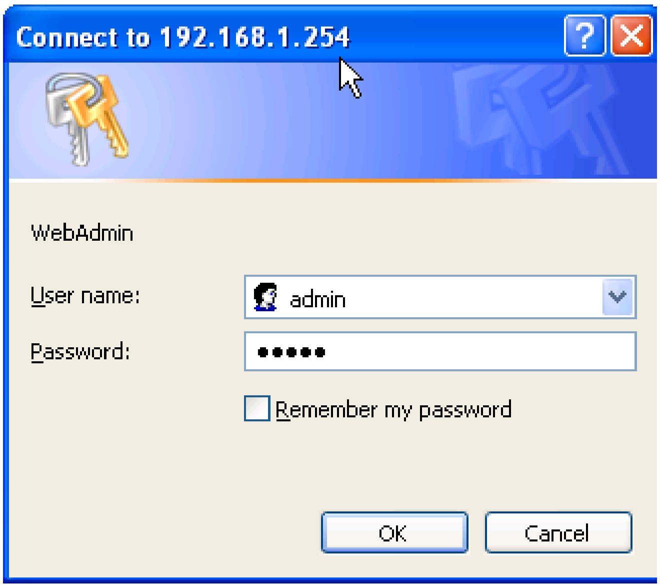
Before configuring this device, you have to check with your ISP (Internet Service Provider) to find out what kind of service is provided such as DHCP (Obtain an IP Address Automatically, Static IP (Fixed IP Address) or PPPoE.

Gather the information as illustrated in the following table and keep it for reference.

DHCP (Obtain an IP Address Automatically)	Configure this WAN Interface to use DHCP client protocol to get an IP address from your ISP automatically. Your ISP provides an IP address to the router dynamically when logging in.
Static IP(Fixed IP Address)	Configure this WAN interface with a specific IP address. This IP address should be provided by your ISP.
PPPoE	PPPoE (PPP over Ethernet) is known as a dial-up DSL or cable service. It is designed to integrate the broadband services into the current widely deployed, easy-to-use, and low-cost dial-up-access networking infrastructure.

Configuring with your Web Browser

Open your web browser, enter the IP address of your router, which by default is 192.168.1.254, and click “Go”, a user name and password window prompt will appear. The default username and password are “admin” and “admin” respectively. (See Figure 3.14)



Connect to 192.168.1.254

WebAdmin

User name: admin

Password: •••••

□ Remember my password

Figure 3.14: User name & Password Prompt Window

Congratulations! You are now successfully logging onto the VoIP / 802.11g Broadband Router!

Chapter 4: Configuration

At the configuration homepage, the left navigation column provides you the link to each configuration page. The category of each configuration page is listed as below.

Status

EWAN Status

ARP Table

DHCP Table

Routing Table

NAT Sessions

UPnP Portmap

VoIP Status

VoIP Call Log

Event Log

Error Log

IDS Log

Diagnostic

Quick Start

Configuration

LAN

WAN

System

Firewall

VoIP

Virtual Server

Wake on LAN

Time Schedule

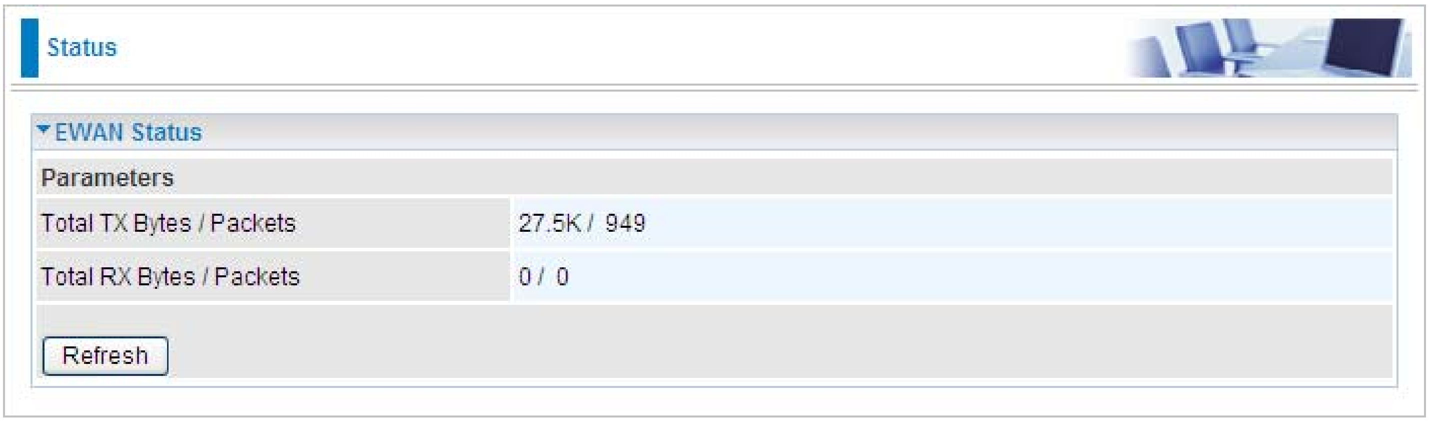
Advanced

Language (provides user interface in English and French languages)

Status

EWAN Status

The router offers a WAN port to be used to connect to Cable Modems and fiber optic lines. This alternative, yet faster method to connect to the internet will provide users more flexibility to get online.



EWAN Status

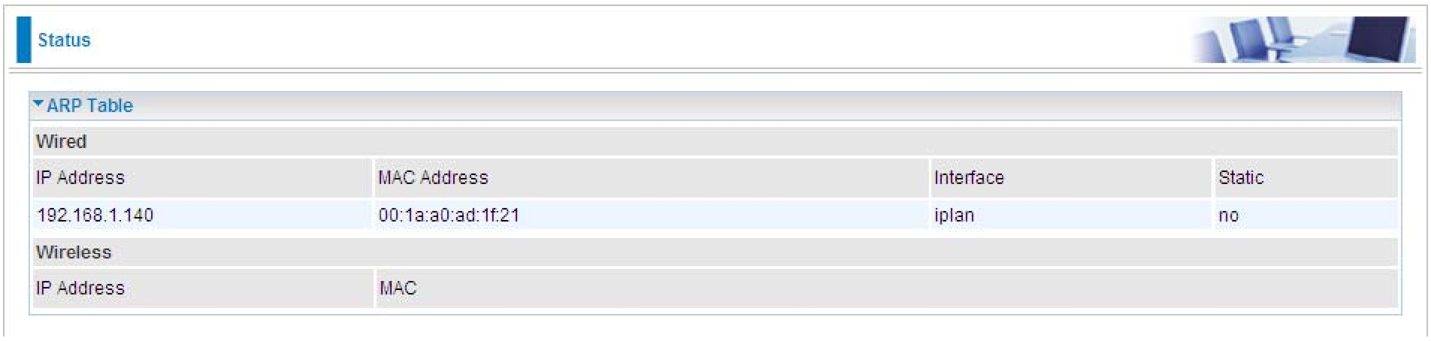
Parameters	
Total TX Bytes / Packets	27.5K / 949
Total RX Bytes / Packets	0 / 0

Total TX Bytes / Packets: The statistics of total data transmission in bytes / packets since system ready.

Total RX Bytes / Packets: The statistics of total data received in bytes / packets since system ready.

ARP Table

This section displays the router ARP (Address Resolution Protocol) Table which shows the mapping of Internet (IP) addresses to Ethernet (MAC) addresses. This is a quick way of determining the MAC address of the network interface of your PCs that use the Firewall – MAC Address Filter function. See the Firewall section of this manual for more information on this feature.



▾ARP Table

Wired			
IP Address	MAC Address	Interface	Static
192.168.1.140	00:1a:a0:ad:1f:21	iplan	no

Wireless	
IP Address	MAC

IP Address: Shows a list of IP addresses of devices on your LAN (Local Area Network).

MAC Address: Shows the MAC (Media Access Control) addresses of each device on your LAN.

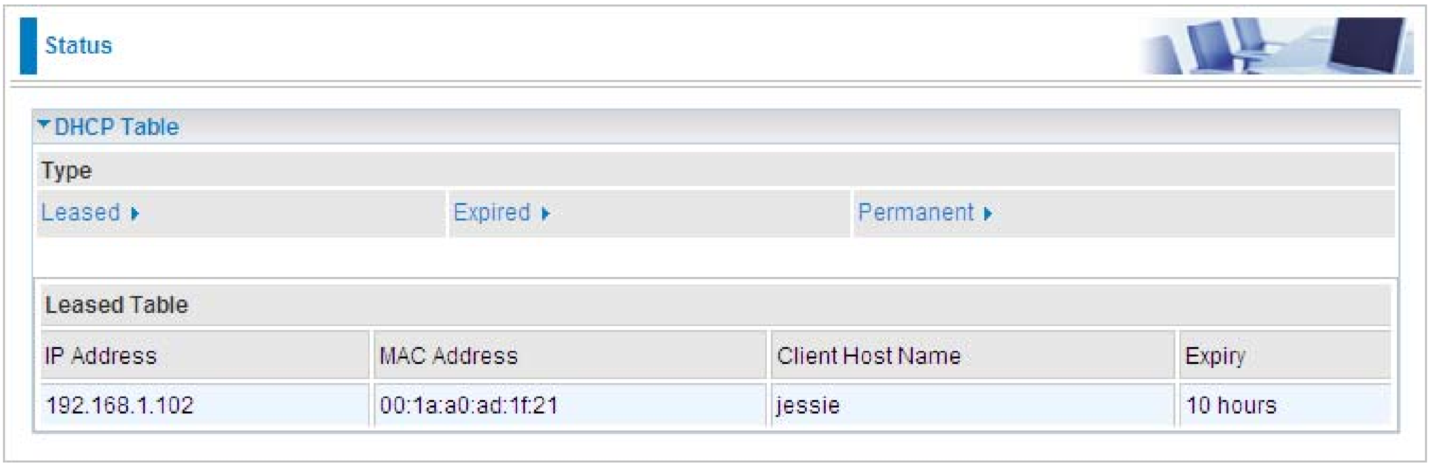
Interface: Shows the interface name (on the router) that this IP Address connects to.

Static: Static status of the ARP table entry:

“**no**” for dynamically-generated ARP table entries.

“**yes**” for static ARP table entries added by the user.

DHCP Table



Status

▾DHCP Table

Type		
Leased ▸	Expired ▸	Permanent ▸

Leased Table

IP Address	MAC Address	Client Host Name	Expiry
192.168.1.102	00:1a:a0:ad:1f:21	jessie	10 hours

Leased: Shows the information of the DHCP assigned IP addresses.

Expired: Shows the information of all expired IP addresses.

Permanent: Shows the fixed host mapping information.

Leased Table

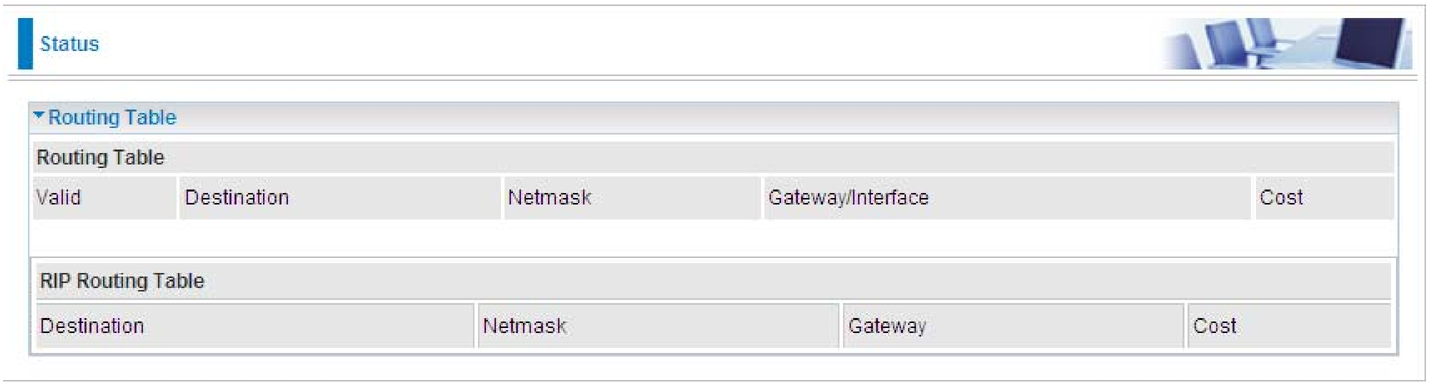
IP Address: Shows the IP address that is assigned to each client.

MAC Address: Shows the MAC address of each client.

Client Host Name: Shows the Host Name (Computer Name) of the client.

Expiry: Shows the current lease time of each client.

Routing Table



Status

▾ Routing Table

Routing Table

Valid	Destination	Netmask	Gateway/Interface	Cost

RIP Routing Table

Destination	Netmask	Gateway	Cost

Routing Table

Valid: A check mark indicates a successful routing status.

Destination: Shows the IP address of the destination network.

Netmask: Shows the destination Netmask address.

Gateway/Interface: Shows the IP address of the gateway or the existing interface that this route will use.

Cost: The number of hops counted as the cost of the route.

RIP Routing Table

Destination: Shows the IP address of the destination network.

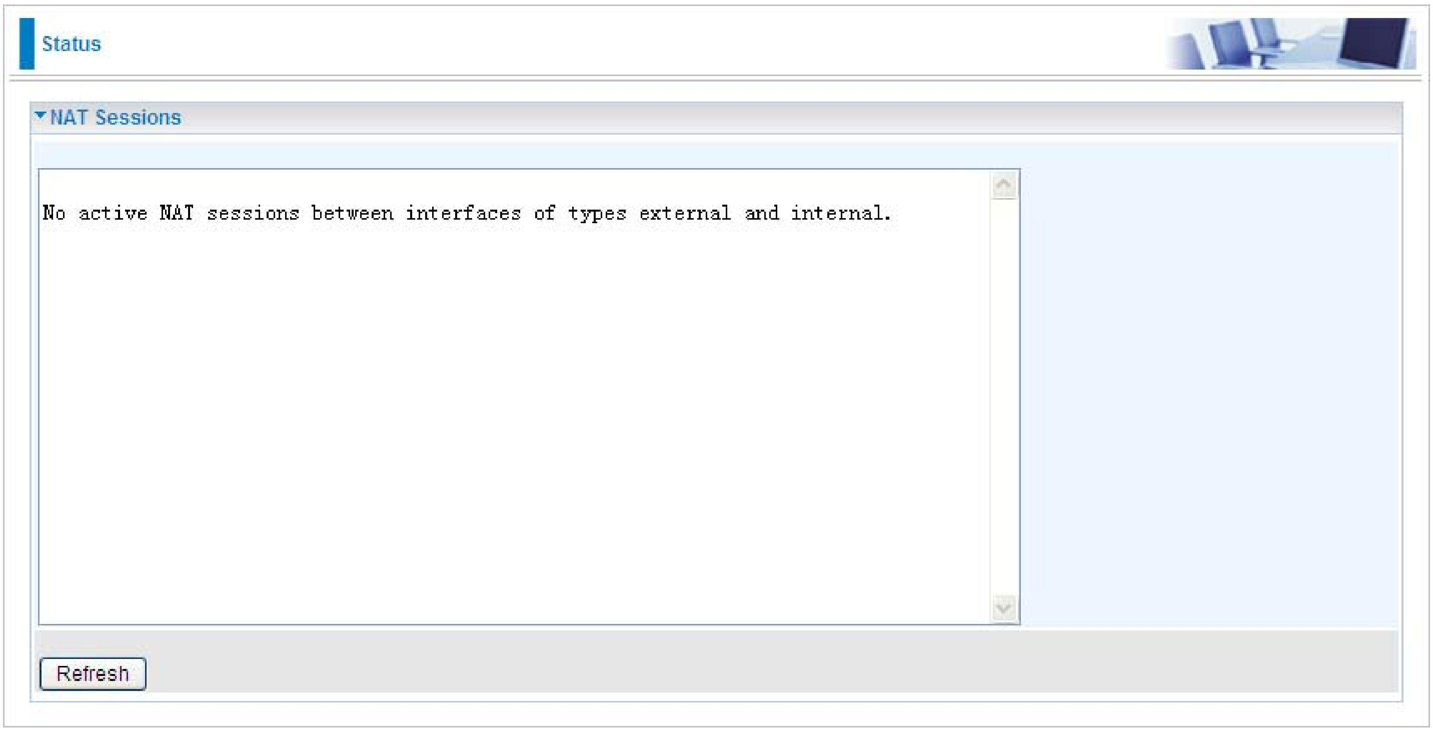
Netmask: Shows the destination Netmask address.

Gateway: Shows the IP address of the gateway that this route will use.

Cost: The number of hops counted as the cost of the route.

NAT Sessions

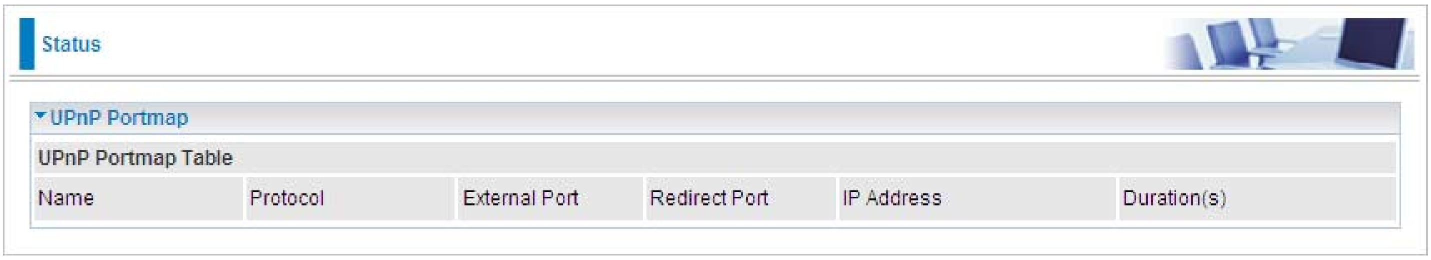
This section lists all the current NAT sessions between external (WAN) and internal (LAN) interface.



```
No active NAT sessions between interfaces of types external and internal.
```

UPnP Portmap

This section lists all the established port-mapping using UPnP (Universal Plug and Play). See the Advanced section of this manual for more details on UPnP and the router UPnP configuration options.

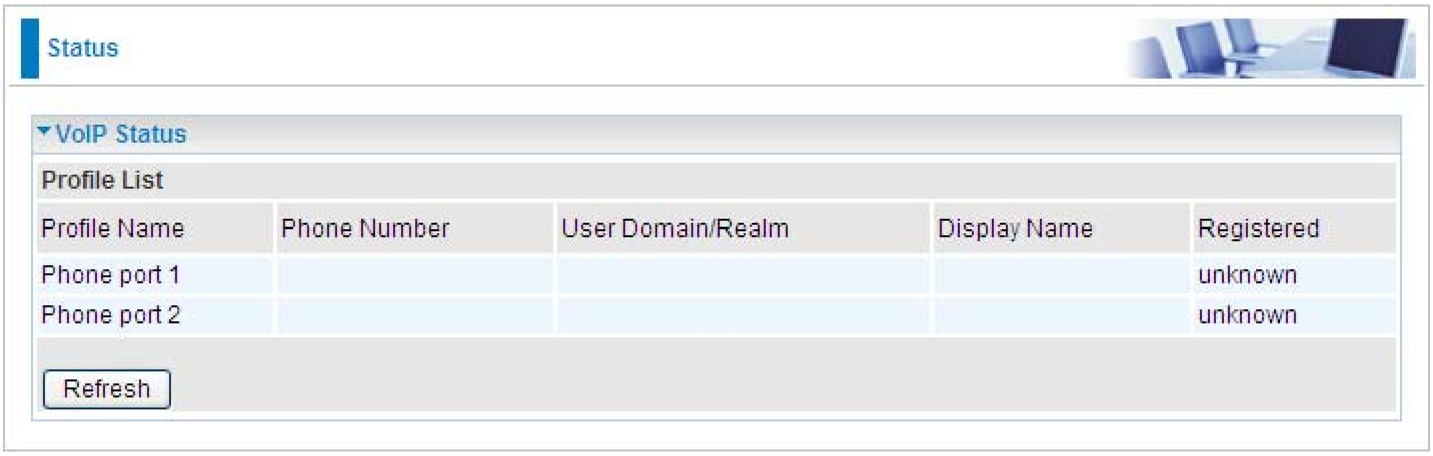


UPnP Portmap Table

Name	Protocol	External Port	Redirect Port	IP Address	Duration(s)

VoIP Status

This table shows the status of the phone ports when VoIP feature has been activated. It displays information such as domain name, display name & phone number of the VoIP device.



Status

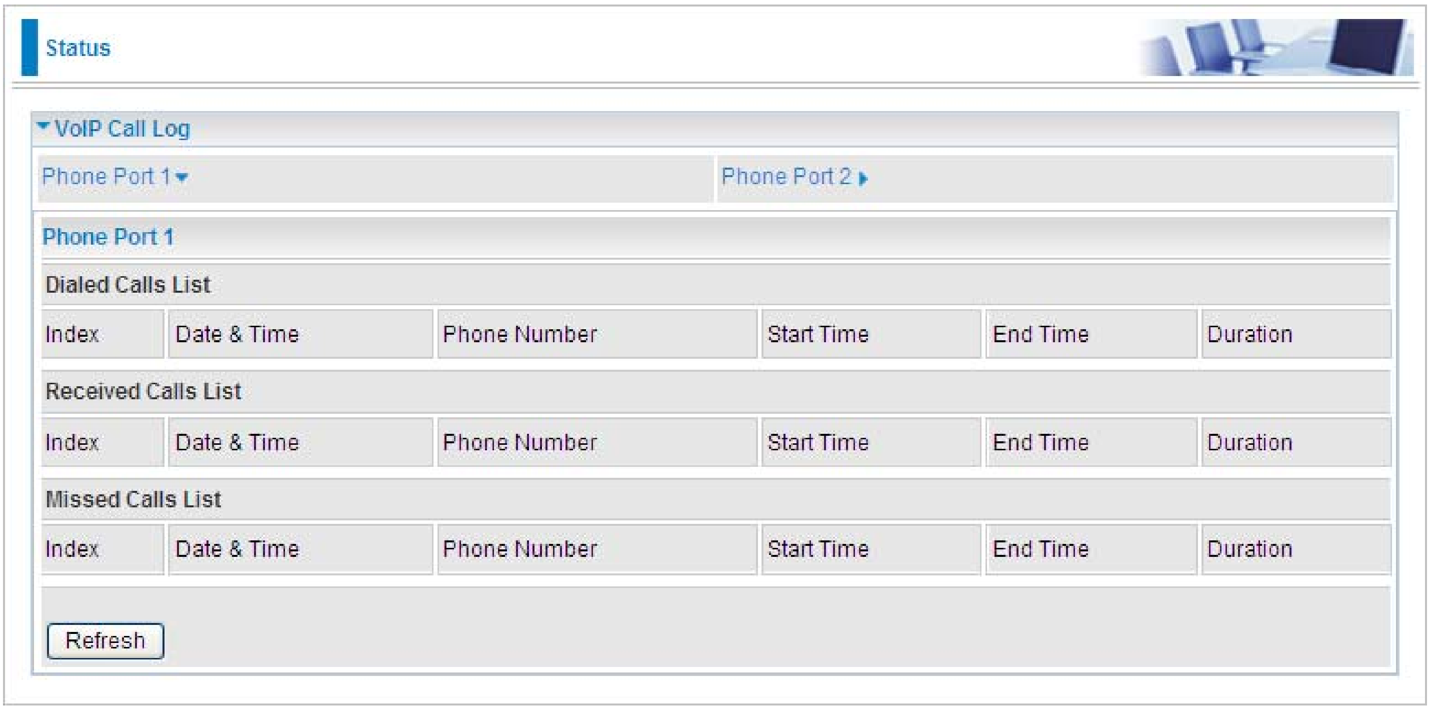
▾VoIP Status

Profile List

Profile Name	Phone Number	User Domain/Realm	Display Name	Registered
Phone port 1				unknown
Phone port 2				unknown

VoIP Call Log

The call log records the data from your VoIP devices such as the date / time of dial out calls, the duration of the calls, information about the missed calls and also incoming calls.



Status

▾VoIP Call Log

Phone Port 1

Dialed Calls List

Index	Date & Time	Phone Number	Start Time	End Time	Duration

Received Calls List

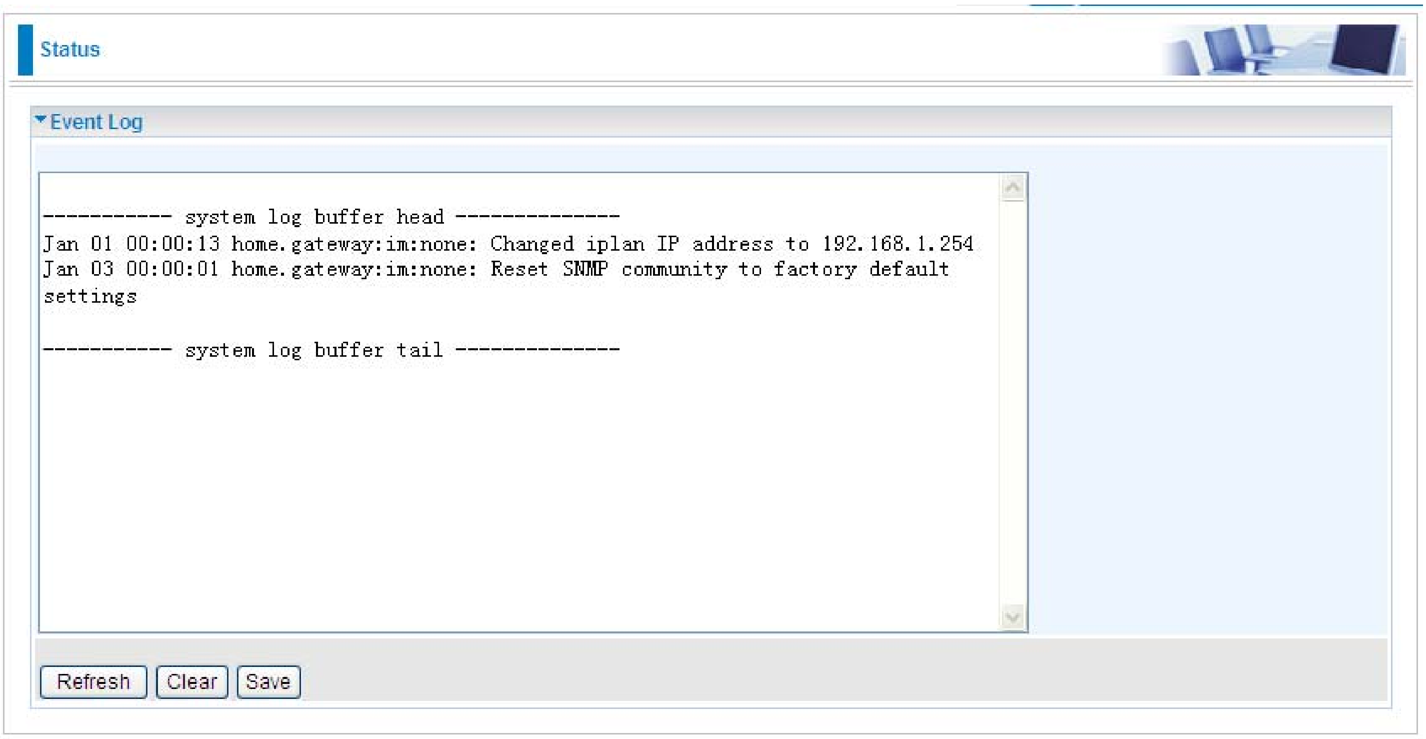
Index	Date & Time	Phone Number	Start Time	End Time	Duration

Missed Calls List

Index	Date & Time	Phone Number	Start Time	End Time	Duration

Event Log

This page displays all the event Log entries of the router such as when gets disconnected and during Firewall triggered events like Intrusion or Blocking Logging. Please see the Firewall section of this manual for more details on how to enable Firewall logging.



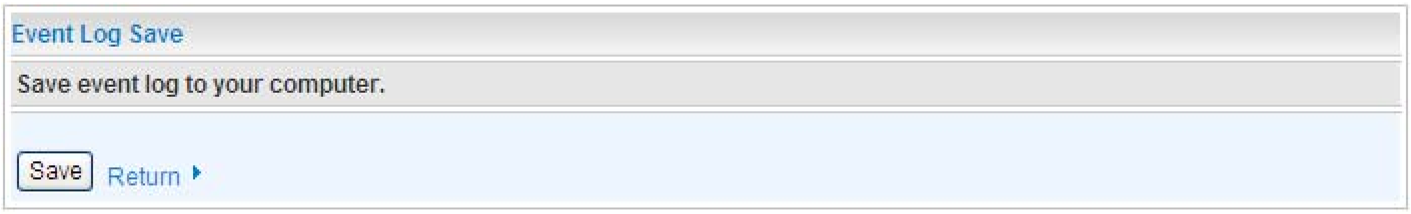
```
----------- system log buffer head --------------
Jan 01 00:00:13 home.gateway:im:none: Changed iplan IP address to 192.168.1.254
Jan 03 00:00:01 home.gateway:im:none: Reset SNMP community to factory default
settings

----------- system log buffer tail --------------
```

Click **Refresh** button to get the latest event log information.

Click **Clear** button to clear the log information.

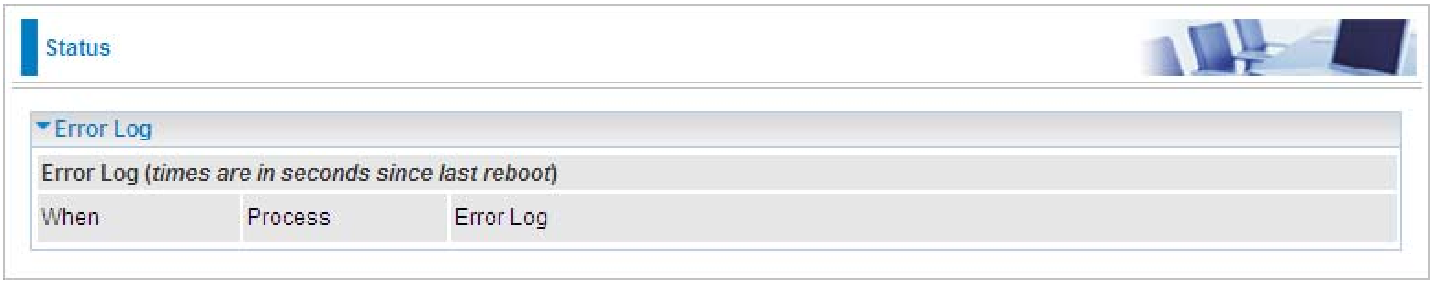
Click **Save** button to backup the event log information to your computer. Click Save button, you will enter page as follows to save the backup to your computer.



Save event log to your computer.

Error Log

Any errors encountered by the router (e.g. invalid names given to entries) are logged to this window.

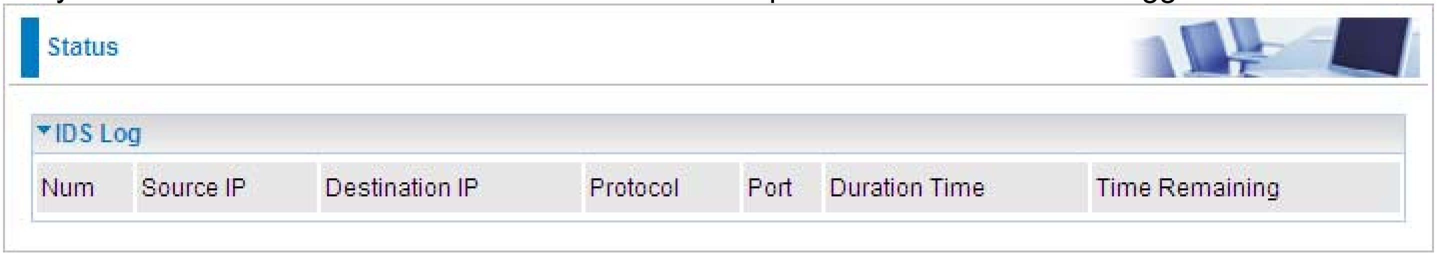


Error Log (*times are in seconds since last reboot*)

When	Process	Error Log

IDS Log

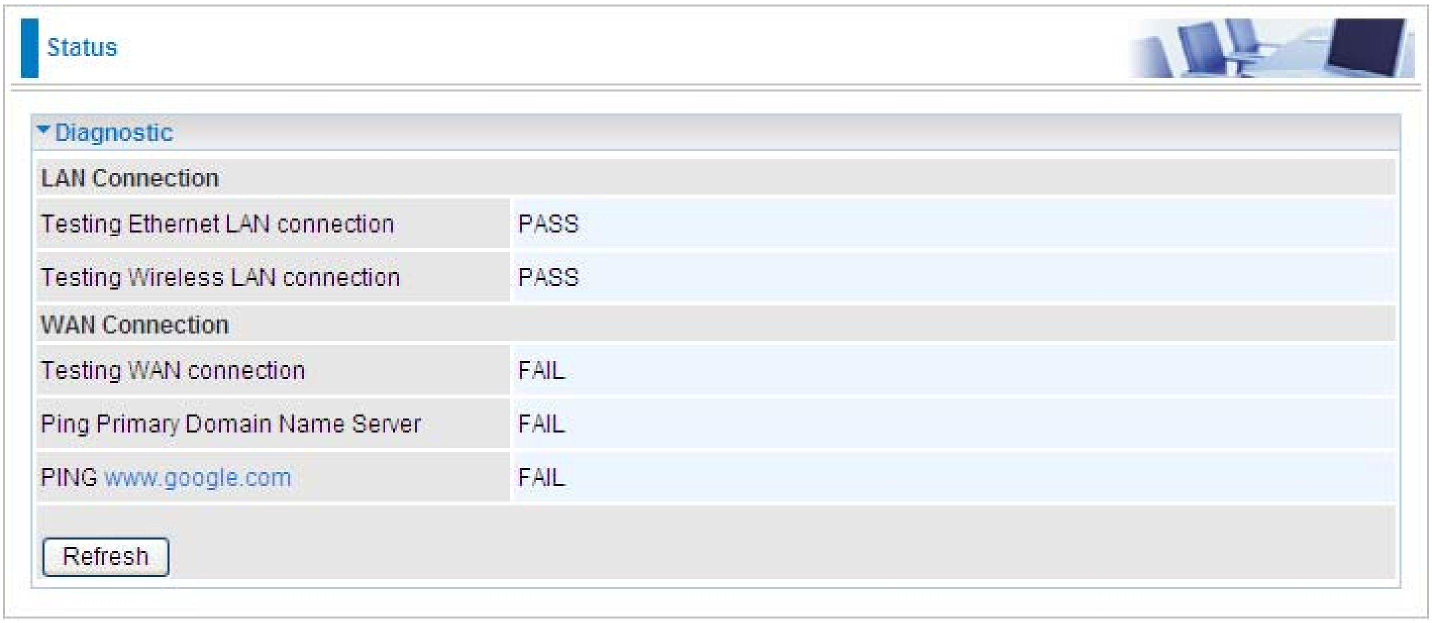
Any records about hacker attacks and intrusion attempts from the Internet are logged to this window.



Num	Source IP	Destination IP	Protocol	Port	Duration Time	Time Remaining

Diagnostic

It tests the connection to computer(s) which is connected to the LAN ports and also the WAN Internet connection. If PING **www.google.com** is shown FAIL and the rest is PASS, you ought to check your PC's DNS setting is correct.



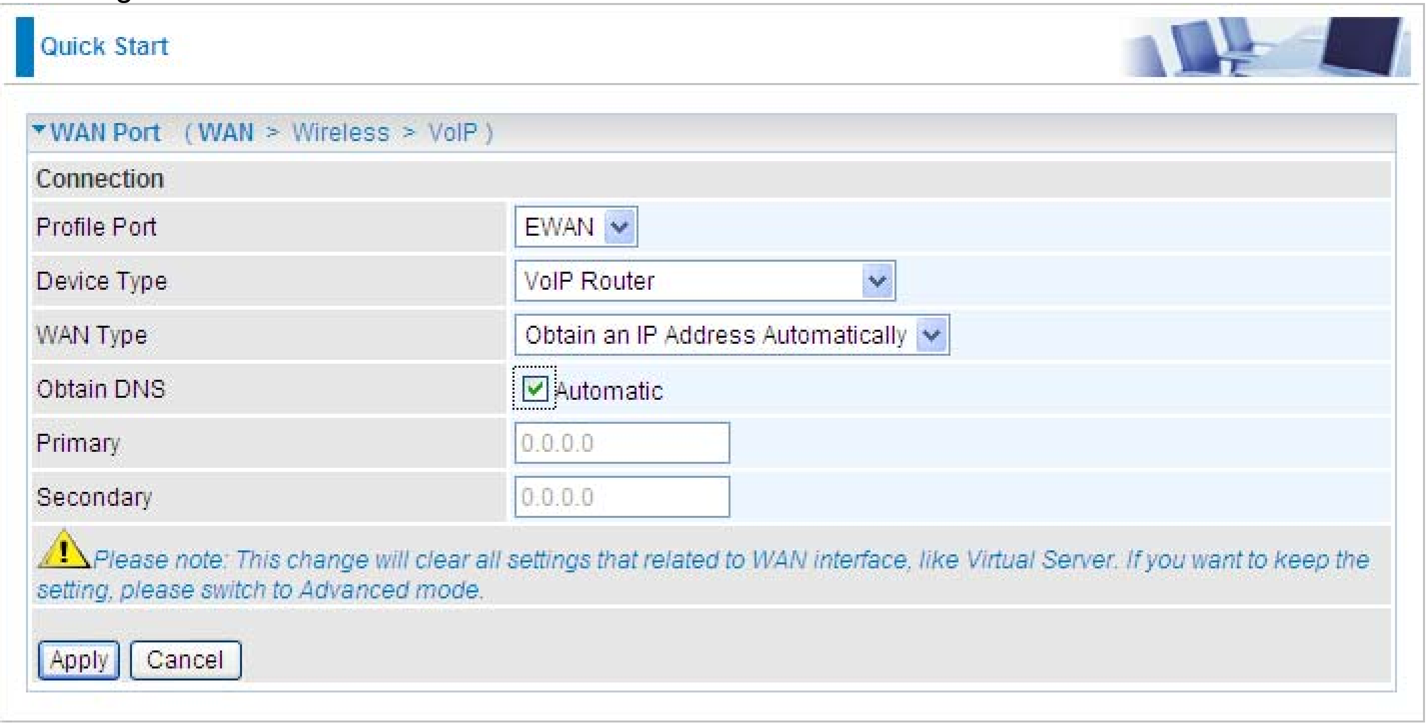
LAN Connection	
Testing Ethernet LAN connection	PASS
Testing Wireless LAN connection	PASS
WAN Connection	
Testing WAN connection	FAIL
Ping Primary Domain Name Server	FAIL
PING www.google.com	FAIL

Quick Start

1. Click Quick Start. Select the connect mode you want. There is only one option: EWAN.

Obtain an IP Address Automatically

When connecting to the ISP, the router also functions as a DHCP client. This router can automatically obtain an IP address, subnet mask, gateway address, and DNS server addresses if the ISP assigns this information via DHCP.



Quick Start

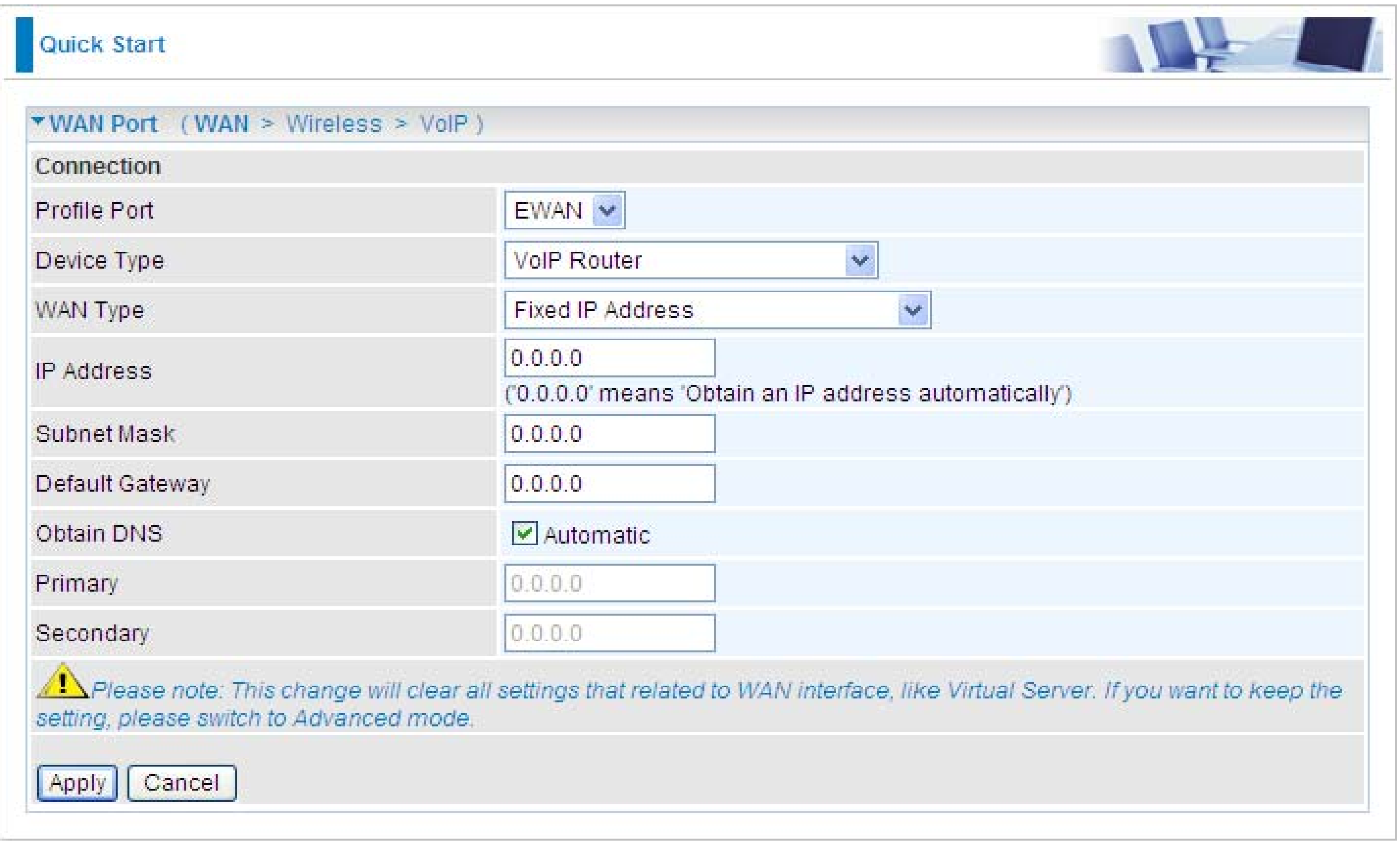
▾WAN Port (WAN > Wireless > VoIP)

Connection	
Profile Port	EWAN
Device Type	VoIP Router
WAN Type	Obtain an IP Address Automatically
Obtain DNS	☑ Automatic
Primary	0.0.0.0
Secondary	0.0.0.0

⚠ *Please note: This change will clear all settings that related to WAN interface, like Virtual Server. If you want to keep the setting, please switch to Advanced mode.*

Fixed IP Address

Select this option to set static IP information. You will need to enter in the Connection type, IP address, Netmask, and gateway address, provided to you by your ISP. Each IP address entered in the fields must be in the appropriate IP form, which are four IP octets separated by a dot (x.x.x.x). The Router will not accept the IP address if it is not in this format.



Quick Start

▾WAN Port (WAN > Wireless > VoIP)

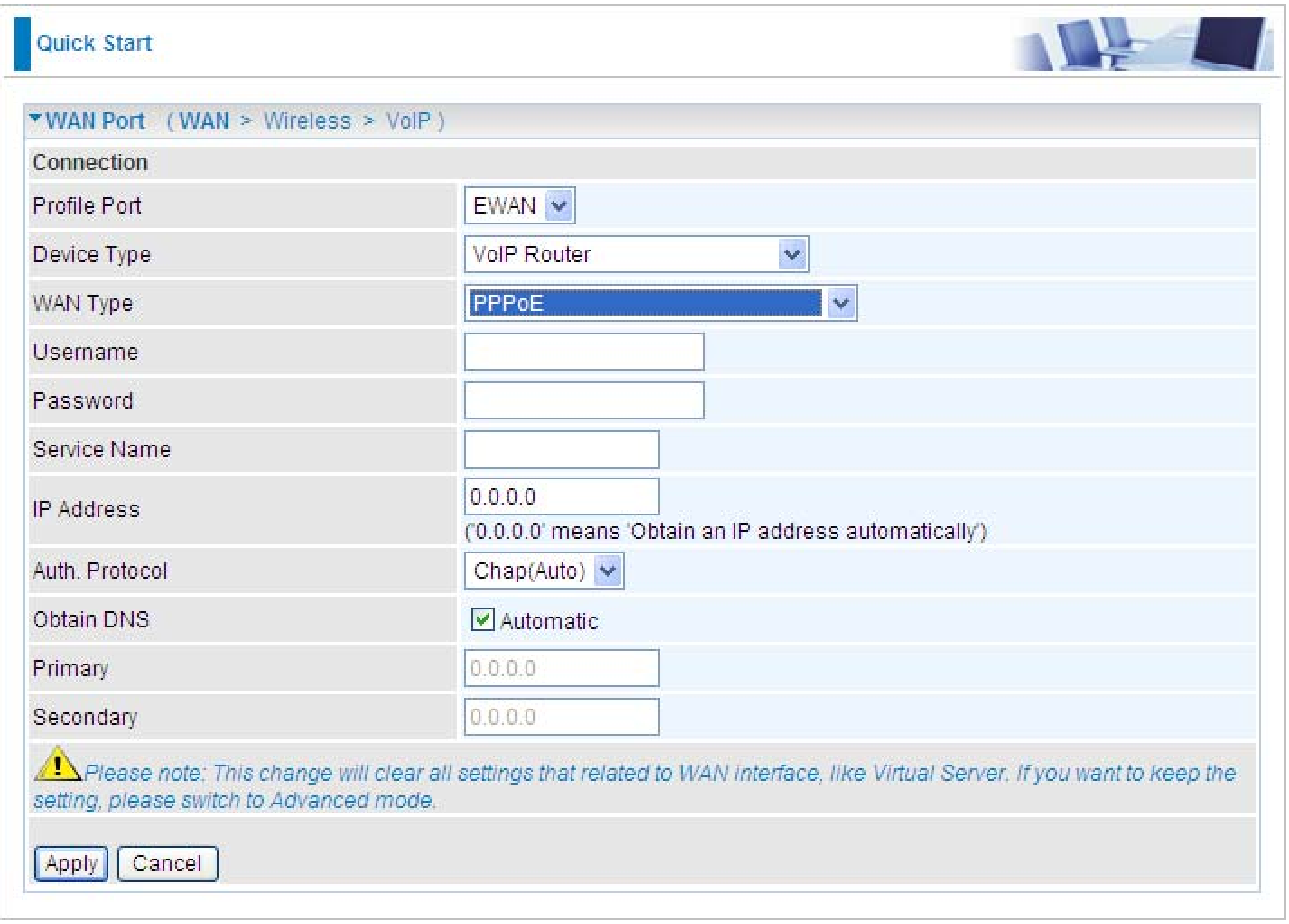
Connection	
Profile Port	EWAN
Device Type	VoIP Router
WAN Type	Fixed IP Address
IP Address	0.0.0.0 ('0.0.0.0' means 'Obtain an IP address automatically')
Subnet Mask	0.0.0.0
Default Gateway	0.0.0.0
Obtain DNS	☑ Automatic
Primary	0.0.0.0
Secondary	0.0.0.0

⚠ *Please note: This change will clear all settings that related to WAN interface, like Virtual Server. If you want to keep the setting, please switch to Advanced mode.*

IP Address: Your WAN IP address. Leave this at 0.0.0.0 to automatically obtain an IP address from your ISP.
Subnet Netmask: The default is 0.0.0.0. User can change it to other such as 255.255.255.0.Type the subnet mask assigned to you by your ISP (if given).
Gateway: You must specify a gateway IP address (supplied by your ISP).
Obtain DNS automatically: Click to activate DNS and to enable the system to automatically detect DNS.
Primary DNS / Secondary DNS: Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the netmask.

PPPoE

PPPoE (PPP over Ethernet) provides access control in a manner similar to dial-up services using PPP.



Connection

Profile Port	EWAN
Device Type	VoIP Router
WAN Type	PPPoE
Username	
Password	
Service Name	
IP Address	0.0.0.0 ('0.0.0.0' means 'Obtain an IP address automatically')
Auth. Protocol	Chap(Auto)
Obtain DNS	☑ Automatic
Primary	0.0.0.0
Secondary	0.0.0.0

Please note: This change will clear all settings that related to WAN interface, like Virtual Server. If you want to keep the setting, please switch to Advanced mode.

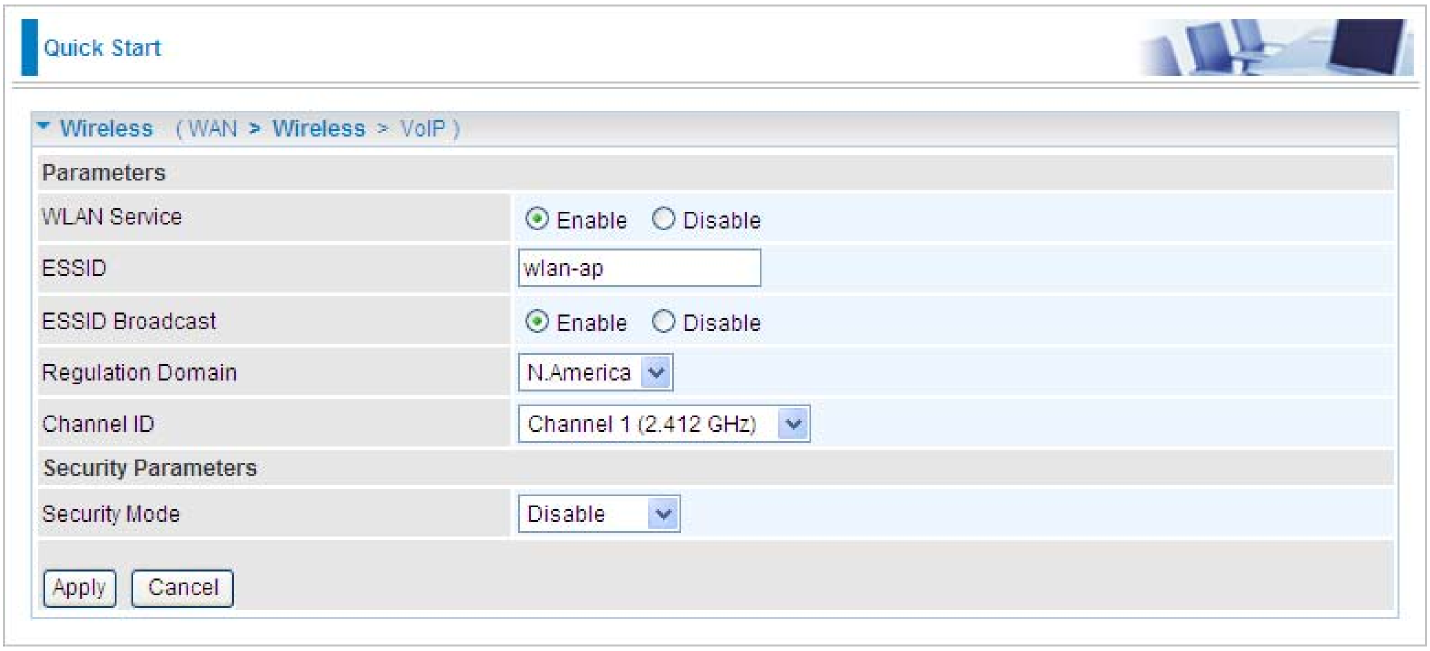
Username: Enter the username provided by your ISP. You can input up to 128 alphanumeric characters (case sensitive). This is in the format of “username@ispname” instead of simply “username”.

Password: Enter the password provided by your ISP. You can input up to 128 alphanumeric characters (case sensitive).

Service Name: Enter a name for this connection.

IP Address: Your WAN IP address. Leave this at 0.0.0.0 to automatically obtain an IP address from your ISP.
Obtain DNS automatically: Click to activate DNS and to enable the system to automatically detect DNS.
Primary DNS / Secondary DNS: Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the netmask.

2. Configure the Wireless LAN setting.



Quick Start

▼ Wireless (WAN > Wireless > VoIP)

Parameters	
WLAN Service	● Enable ○ Disable
ESSID	wlan-ap
ESSID Broadcast	● Enable ○ Disable
Regulation Domain	N.America
Channel ID	Channel 1 (2.412 GHz)
Security Parameters	
Security Mode	Disable

WLAN Service: Default setting is set to Enable. If you want to use wireless, both 802.11g and 802.11b device in your network, you can select Enable.

ESSID: The ESSID is the unique name of a wireless access point (AP) to be distinguished from another. For security propose, change to a unique ID name to the AP which is already built-in to the router's wireless interface. It is case sensitive and must not excess 32 characters. Make sure your wireless clients have exactly the ESSID as the device, in order to get connected to your network.

ESSID Broadcast: It is function in which transmits its ESSID to the air so that when wireless client searches for a network, router can then be discovered and recognized. Default setting is **Enable.**

Enable: When Enable is selected, you can allow anybody with a wireless client to be able to locate the Access Point (AP) of your router.

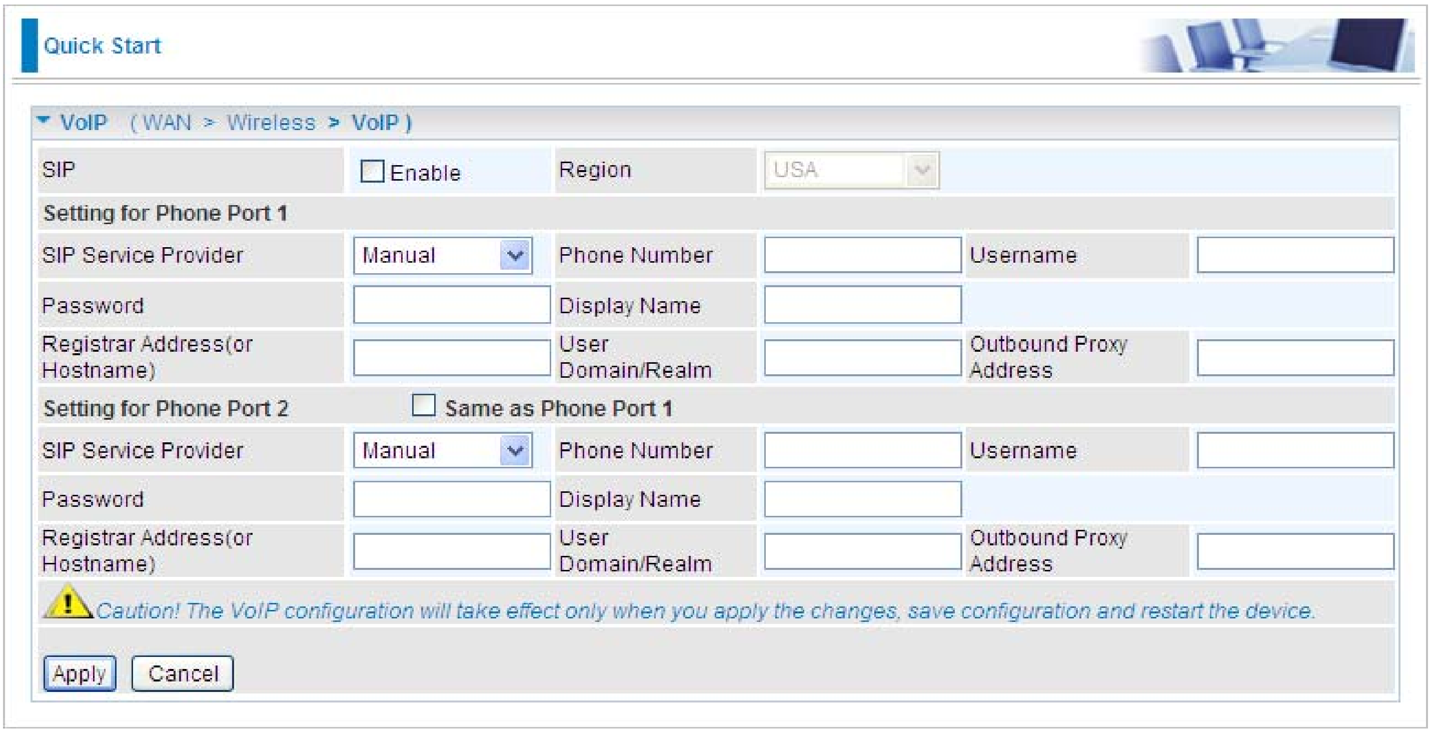
Disable: Select Disable if you do not want broadcast your ESSID. When select Disable, no one will be able to locate the Access Point (AP) of your router.

Regulation Domain: There are seven Regulation Domains for you to choose from, including North America (N.America), Europe, France, etc. The Channel ID will be different based on this setting.

Channel ID: Select the ID channel that you would like to use.

Security Mode: You can disable or enable with WPA or WEP for protecting wireless network. The default mode of wireless security is **Disable**.

3. Set up VoIP.



Quick Start

▾ VoIP (WAN > Wireless > VoIP)

SIP	□ Enable	Region	USA		
Setting for Phone Port 1					
SIP Service Provider	Manual	Phone Number		Username	
Password		Display Name			
Registrar Address(or Hostname)		User Domain/Realm		Outbound Proxy Address	
Setting for Phone Port 2	□ Same as Phone Port 1				
SIP Service Provider	Manual	Phone Number		Username	
Password		Display Name			
Registrar Address(or Hostname)		User Domain/Realm		Outbound Proxy Address	

⚠ *Caution! The VoIP configuration will take effect only when you apply the changes, save configuration and restart the device.*

SIP: To use VoIP SIP as VoIP call signaling protocol. Default is set to ***Disable.***

Region: This selection is a drop-down box, which allows user to select the country for which the VoIP device must work. When a country is selected, the country parameters are automatically loaded.

SIP Service Provider: This section allows you to select the service provider. When the selection is done, respective parameters below are automatically displayed.

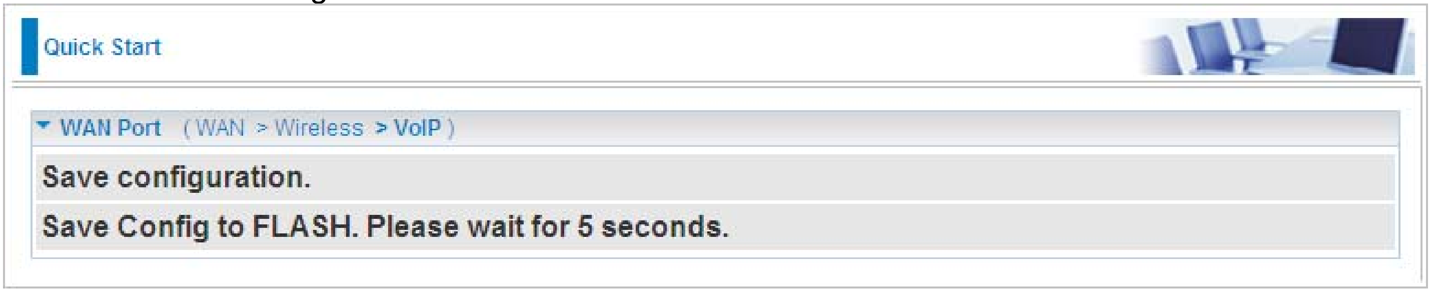
Phone Number: This parameter holds the registration ID of the user within the VoIP SIP registrar.

Username: If the username is same as the Phone Number, leave it blank. Otherwise, fill in the space with your username given by your VoIP provider.

Password: This parameter holds the password used for authentication within VoIP SIP registrar.

Display Name: This parameter will be appeared on the Caller ID.

4. Wait for the configuration.

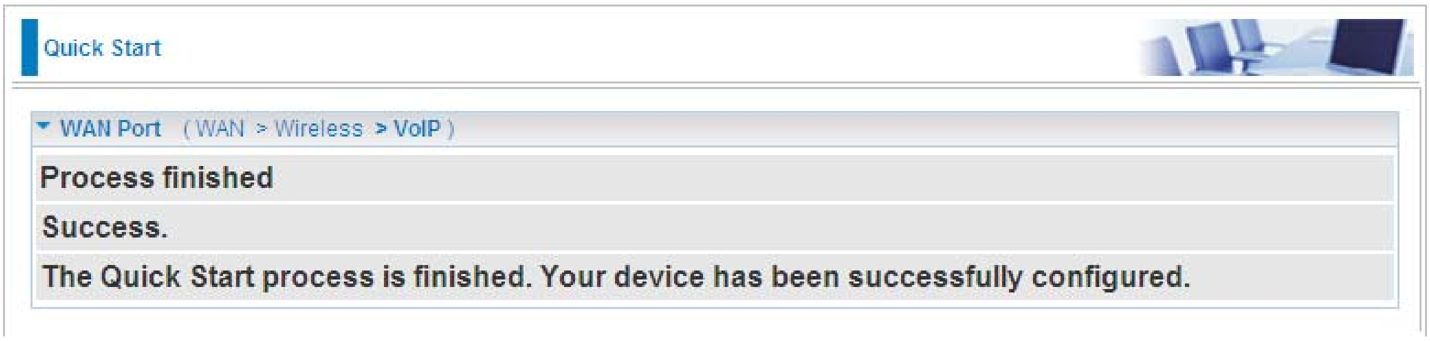


Quick Start

▾ WAN Port (WAN > Wireless > VoIP)

Save configuration.

Save Config to FLASH. Please wait for 5 seconds.



Quick Start

▾ WAN Port (WAN > Wireless > VoIP)

Process finished

Success.

The Quick Start process is finished. Your device has been successfully configured.

Configuration

When you click this item, the column will expand to display the sub-items that will allow you to further configure your router.

LAN, WAN, System, Firewall, VoIP, Virtual Server, Wake on LAN, Time Schedule and Advanced

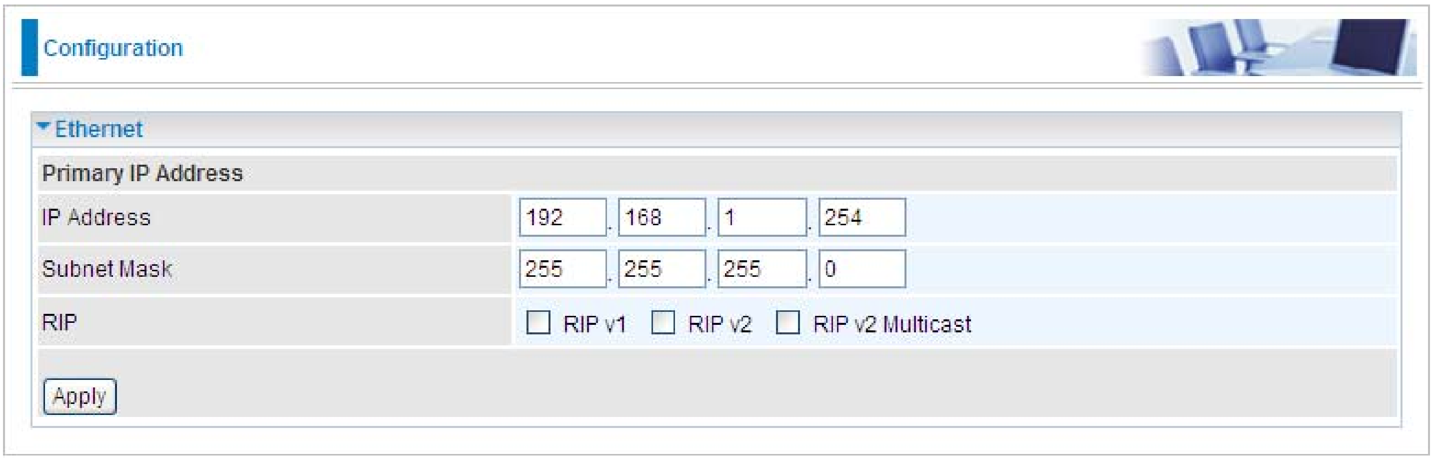
The function of each configuration sub-item is described in the following sections.

LAN - Local Area Network

Here are the items within the LAN section: **Ethernet, IP Alias, IPv6 Autoconfig, Ethernet Client Filter, Wireless, Wireless Security, Wireless Client Filter, WPS** and **DHCP Server.**

Ethernet

The router supports more than one Ethernet IP addresses in the LAN that supports multiple internet access at the same time. Users usually only have one subnet in their LAN. The default IP address for the router is 192.168.1.254.



Primary IP Address	
IP Address	192 . 168 . 1 . 254
Subnet Mask	255 . 255 . 255 . 0
RIP	□ RIP v1 □ RIP v2 □ RIP v2 Multicast

Primary IP Address

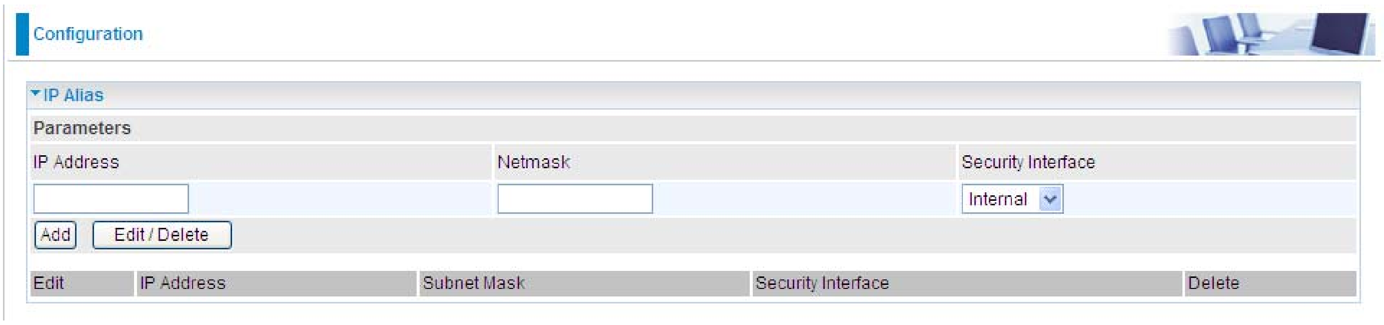
IP Address: The default IP on this router.

Subnet Mask: The default subnet mask on this router.

RIP: RIP v1, RIP v2, and RIP v2 Multicast. Check to enable RIP function.

IP Alias

This function enables the creation of multiple virtual IP interfaces for this router. It helps to connect two or more local networks to the ISP or remote node. In this case, an internal router is not required.



Configuration

IP Alias

Parameters

IP Address	Netmask	Security Interface
		Internal

Edit	IP Address	Subnet Mask	Security Interface	Delete

IP Address: Specify an IP address for this virtual interface.

Netmask: Specify a subnet mask for this virtual interface.

Security Interface: Specify the firewall setting for this virtual interface.

> **Internal:** This mean the network is behind NAT. All traffic will do network address translation when sending out data to the Internet if NAT is enabled.
>
> **External:** This means there is no NAT on this IP interface and it is connected directly to the Internet. This function is mostly used when you are provided with multiple public IP addresses by the ISP. In this case, you can use the public IP address in the local network whose gateway IP address points to the IP address on this interface.

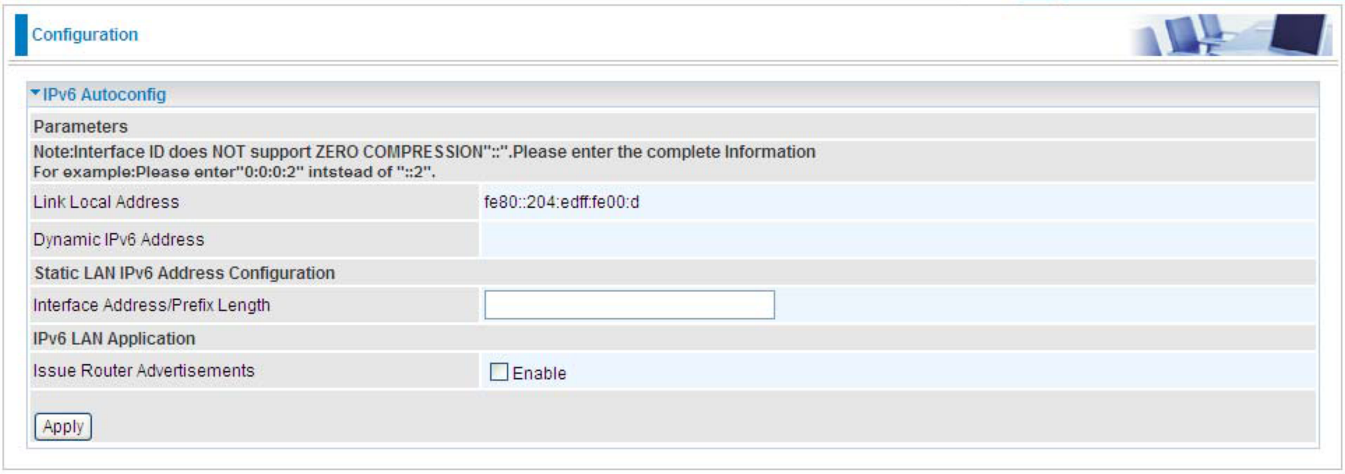
DMZ: Specify this network to a DMZ area. There is no NAT on this interface.

IPv6 Autoconfig

The IPv6 address composes of two parts, thus, the prefix and the interface ID.

BiPAC 6404VGP R3 dynamically configure IPv6 address on host with Stateless auto-configuration mode.

Stateless auto-configuration requires no manual configuration of hosts, minimal (if any) configuration of routers, and no additional servers. The stateless mechanism allows a host to generate its own addresses using a combination of locally available information (MAC address) and information(prefix) advertised by routers. Routers advertise prefixes that identify the subnet(s) associated with a link, while hosts generate an "interface identifier" that uniquely identifies an interface on a subnet. An address is formed by combining the two. When using stateless configuration, you needn't configure anything on the client.



Configuration

▾IPv6 Autoconfig

Parameters	
Note:Interface ID does NOT support ZERO COMPRESSION"::".Please enter the complete Information For example:Please enter"0:0:0:2" intstead of "::2".	
Link Local Address	fe80::204:edff:fe00:d
Dynamic IPv6 Address	
Static LAN IPv6 Address Configuration	
Interface Address/Prefix Length	
IPv6 LAN Application	
Issue Router Advertisements	□ Enable

Link Local Address: the Link local address for this device.

Dynamic IPv6 Address: this field displays the dynamic obtained IPv6 address if you haven't set static IPv6 address.

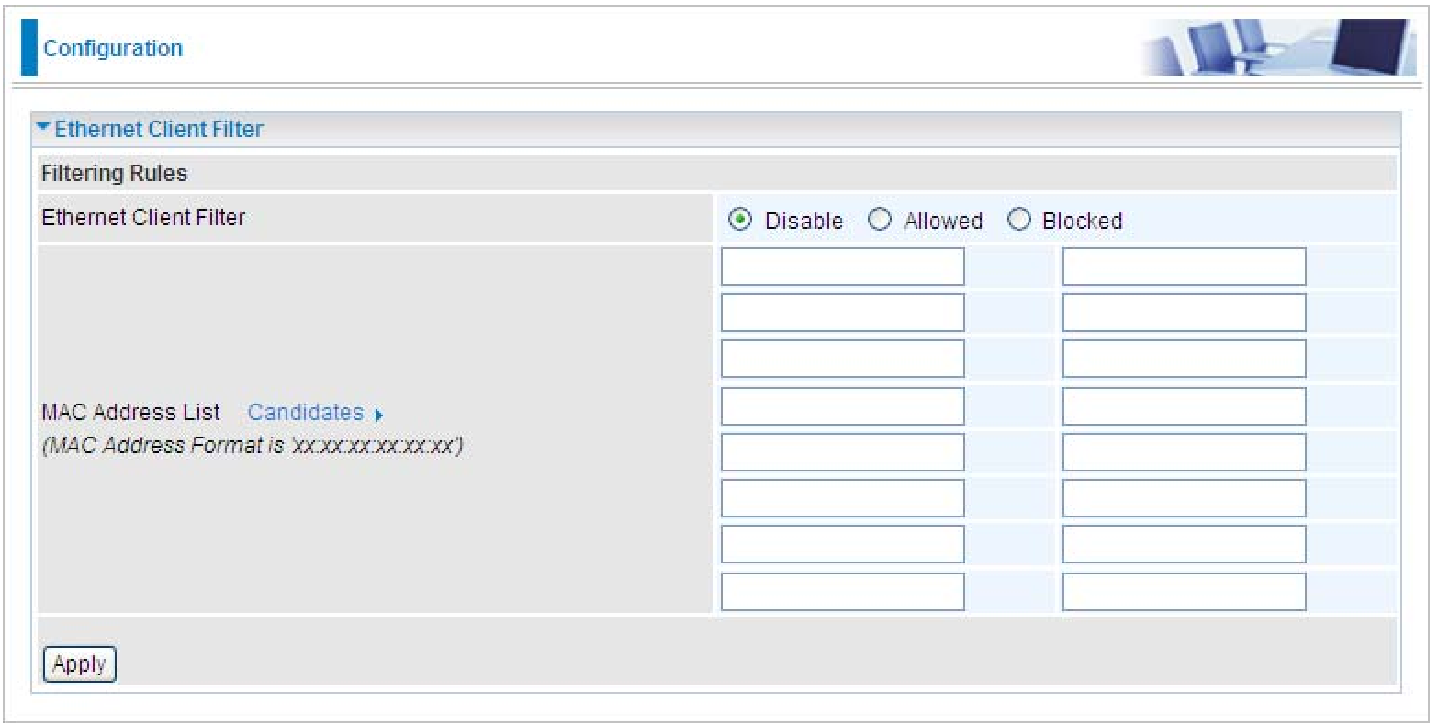
Interface Address/Prefix length: enter the static LAN IPv6 address.

Issue Router Advertisements: check whether to enable issue Router Advertisement feature. It is to send Router Advertisement messages periodically.

Ethernet Client Filter

The Ethernet Client Filter can support up to 16 Ethernet network computers. It enables you to accept traffic from specific authorized computers or can restrict unwanted computer(s) to access your LAN.

There are no pre-defined Ethernet MAC address filter rules, you can add the filter rules to meet your requirements.



Ethernet Client Filter

Filtering Rules

Ethernet Client Filter: ● Disable ○ Allowed ○ Blocked

MAC Address List Candidates ▸
(MAC Address Format is 'xx:xx:xx:xx:xx:xx')

Ethernet Client Filter: Default setting is set **Disable**.

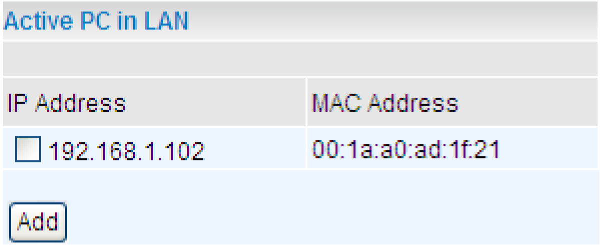
> **Allowed:** check to enable a specific PC to access your LAN by inserting the MAC Address in the space provided or click the Candidate button. Make sure your PC's MAC is listed.
>
> **Blocked:** check to prevent an unwanted PC from accessing your LAN by inserting the MAC Address in the space provided or click the Candidate button. Make sure your PC's MAC is not listed.

The maximum number of client is 16. The MAC addresses should be 6 bytes long and are presented only in hexadecimal characters. Only numbers (0 - 9) and letters (a - f) are acceptable.

Note: Follow the MAC Address Format xx:xx:xx:xx:xx:xx. Semicolon (:) must be included.

Candidates: automatically detects devices that are connected to the router through the Ethernet.

Click the Candidate button to access the **Active PC in LAN** window.

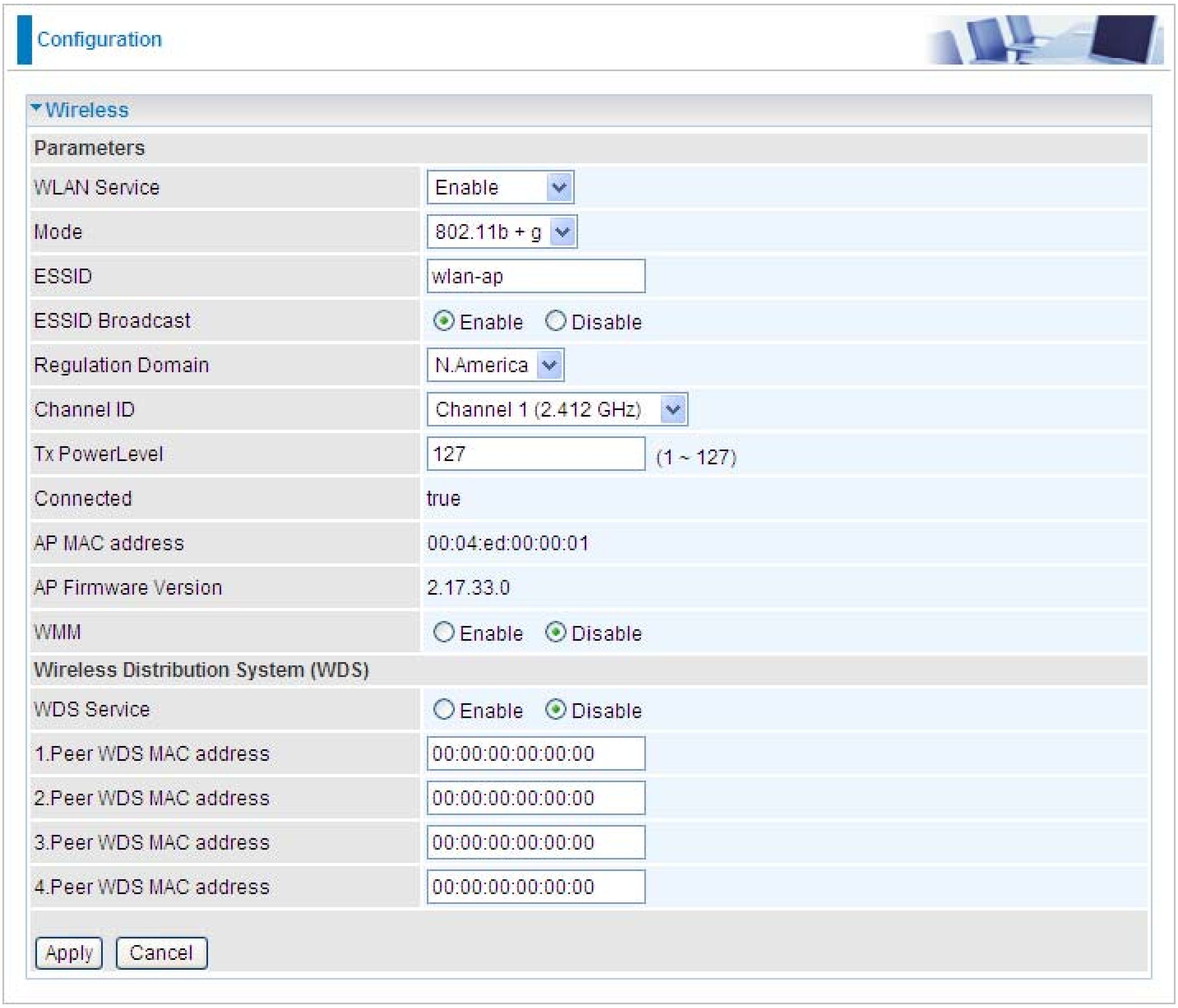


Active PC in LAN

IP Address	MAC Address
□ 192.168.1.102	00:1a:a0:ad:1f:21

Active PC in LAN: Active PC in LAN window displays a list of IP Address & MAC Address of each Ethernet device which connects to the router.
You can check the checkbox next to the IP address to block or to allow the PC from accessing the LAN. Then, click Add to insert the IP to the Ethernet Client Filter table. The maximum number of supported Ethernet client is 16.

Wireless



Parameters	
WLAN Service	Enable
Mode	802.11b + g
ESSID	wlan-ap
ESSID Broadcast	● Enable ○ Disable
Regulation Domain	N.America
Channel ID	Channel 1 (2.412 GHz)
Tx PowerLevel	127 (1 ~ 127)
Connected	true
AP MAC address	00:04:ed:00:00:01
AP Firmware Version	2.17.33.0
WMM	○ Enable ● Disable
Wireless Distribution System (WDS)	
WDS Service	○ Enable ● Disable
1.Peer WDS MAC address	00:00:00:00:00:00
2.Peer WDS MAC address	00:00:00:00:00:00
3.Peer WDS MAC address	00:00:00:00:00:00
4.Peer WDS MAC address	00:00:00:00:00:00

Parameters

WLAN Service: Choose Disabled/Enable/TimeSlot from the drop-down list.

Mode: The default setting is 802.11b+g (Mixed mode). If you do not know or do not have both 11g and 11b devices on your network, then keep the setting in mixed mode. From the drop-down menu, you can select 802.11g if you have only 11g card. If you have only 11b card, then select 802.11b.

ESSID: The ESSID is a unique name of a wireless access point (AP) used to distinguish one from another. For security purpose, change the default wlan-ap to a unique ID name that is already built into the router wireless interface. It is case sensitive and must not exceed 32 characters. Make sure your wireless clients have exactly the ESSID as the device in order to connect to your network.

Note: It is case sensitive and must not exceed 32 characters.

ESSID Broadcast: It is used to broadcast its ESSID on the network so that when a wireless client searches for a network, the router can be discovered and recognized. Default setting is **Enable.**

> **Enable:** When enabled, you allow anybody with a wireless client to be able to locate the Access Point (AP) of your router.

Disable: When disabled, you do not broadcast your ESSID. Therefore, no one will be able to locate the Access Point (AP) of your router.

Regulation Domain: There are seven Regulation Domains for you to choose from, including North America (N.America), Europe, France, etc. The Channel ID will be different based on this setting.

Channel ID: Select the wireless connection ID channel that you would like to use.

Note: Wireless performance may degrade if the selected ID channel is already being occupied by other AP(s).

TX PowerLevel: It is a function that enhances the wireless transmission signal strength. User may adjust this power level from minimum 1 up to maximum 100 or 127 depending on the models used. Please refer to the note table for the appropriate power level range of your model.

Note: The Power Level maybe different in each access network user premises environment so choose the most suitable level for your network.

Connected: Display either as true or false. That it is the connection status between the system and the build-in wireless card.

AP MAC Address: It is a unique hardware address of the Access Point.

AP Firmware Version: The Access Point firmware version.

WMM: This feature works concurrently with QoS that enables the system to prioritize the flow of data packets according to 4 categories: Voice, Video, Best Efforts and Background.

Wireless Distribution System (WDS)

It is a wireless access point mode that enables wireless link and communication with other access points. It is easy to install simply by defining the peer's MAC address of the connected AP. WDS takes advantage of the cost saving and flexibility with no extra wireless client device is required to bridge between two access points and extending an existing wired or wireless infrastructure network to create a larger network. It can connect up to 4 wireless APs for extending cover range at the same time.

In addition, WDS also enhances its link connection security mode. Key encryption and channel must be the same for both access points.

WDS Service: The default setting is **Disabled.** Check **Enable** radio button to activate this function.

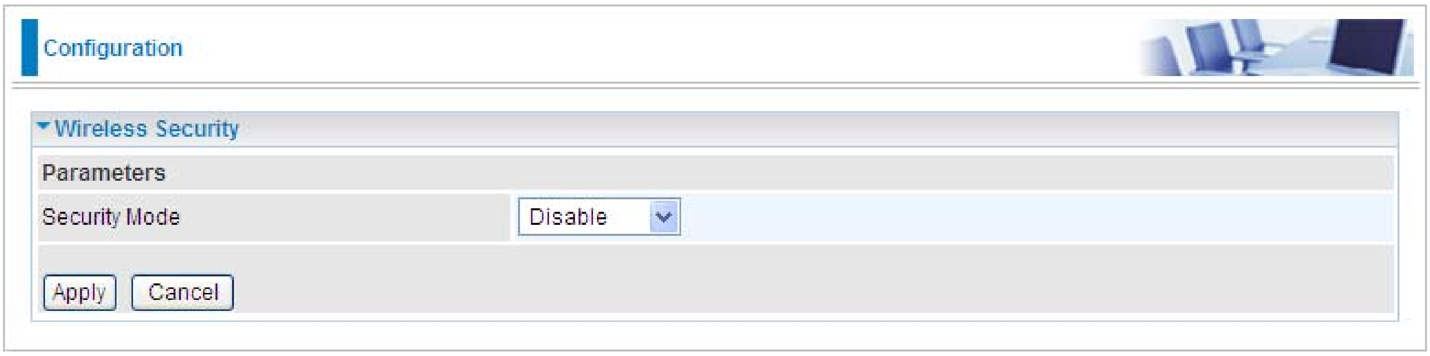
1. **Peer WDS MAC Address:** It is the associated AP MAC Address. It is important you're your peer's AP must include your MAC address in order to acknowledge and communicate with each other.
2. **Peer WDS MAC Address:** It is the second associated AP MAC Address.
3. **Peer WDS MAC Address:** It is the third associated AP MAC Address.
4. **Peer WDS MAC Address:** It is the fourth associated AP MAC Address.

Note: For MAC Address, Semicolon (:) must be included.

Wireless Security

You can disable or enable the wireless security function using WPA or WEP for wireless network protection.

The default mode of wireless security is set to disabled.



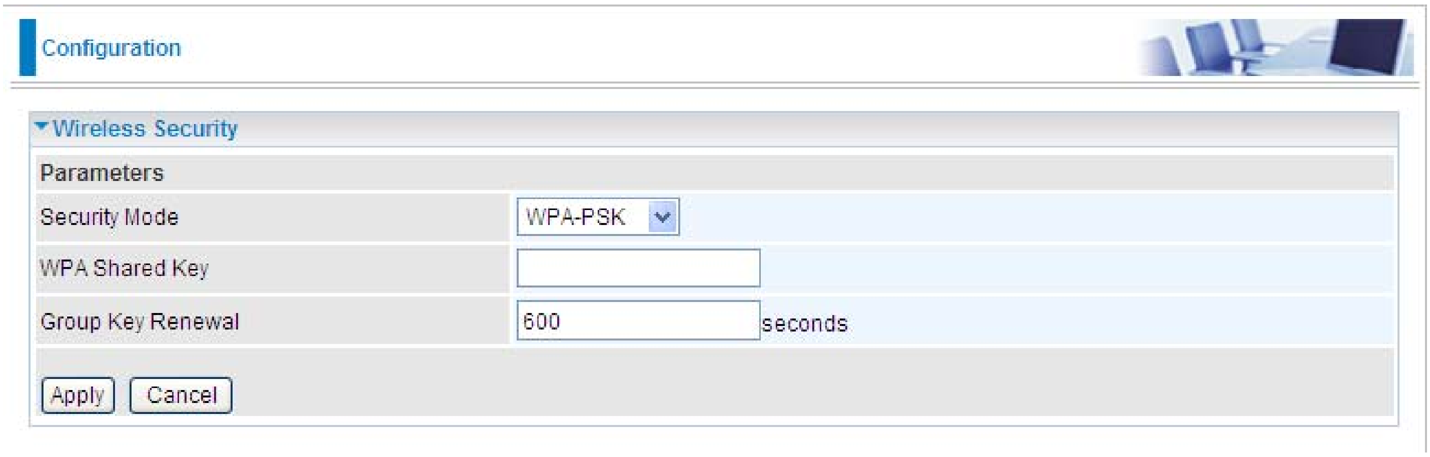
Configuration

Wireless Security

Parameters

Security Mode: Disable

WPA-PSK / WPA2-PSK



Configuration

Wireless Security

Parameters

Security Mode: WPA-PSK

WPA Shared Key:

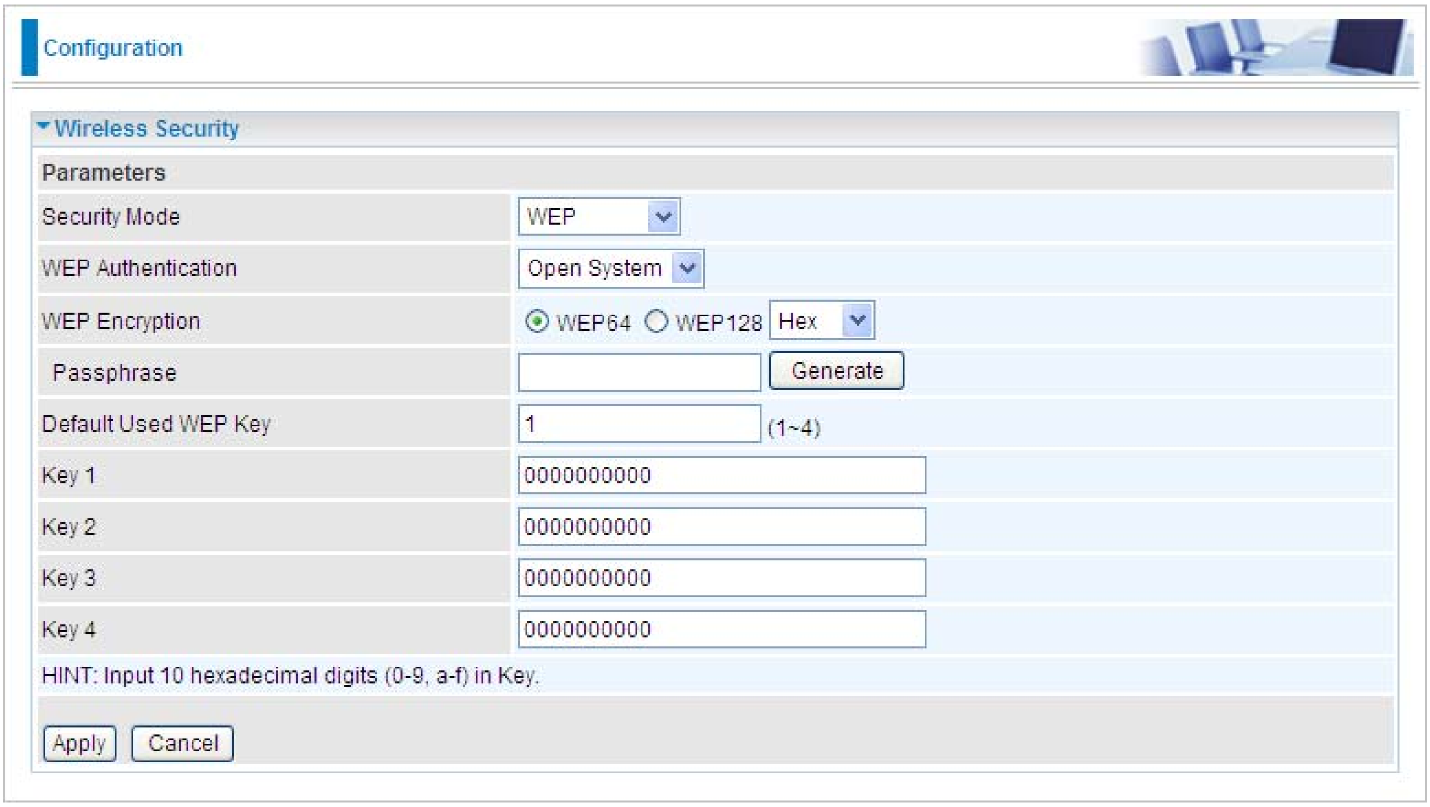
Group Key Renewal: 600 seconds

Security Mode: You can disable or enable with WPA or WEP for protecting wireless network. The default mode of wireless security is **Disable**.

WPA Shared Key: The key for network authentication. The input format is in character style and key size should be in the range between 8 and 63 characters.

Group Key Renewal: The period of renewal time for changing the security key automatically between wireless client and Access Point (AP). Default value is **600** seconds.

WEP



Configuration

Wireless Security

Parameters	
Security Mode	WEP
WEP Authentication	Open System
WEP Encryption	● WEP64 ○ WEP128 Hex
Passphrase	Generate
Default Used WEP Key	1 (1~4)
Key 1	0000000000
Key 2	0000000000
Key 3	0000000000
Key 4	0000000000

HINT: Input 10 hexadecimal digits (0-9, a-f) in Key.

WEP Authentication: To prevent unauthorized wireless stations from accessing data transmitted over the network, the router offers secure data encryption, known as WEP. If you require high security for transmissions, there are two options to select from: **Open System, Share key**.

WEP Encryption: To prevent unauthorized wireless stations from accessing data transmitted over the network, the router offers highly secure data encryption, known as WEP. If you require high security for transmissions, there are two alternatives to select from: **WEP 64 and WEP 128**. WEP 128 will offer increased security over WEP 64.

Passphrase: This is used to generate WEP keys automatically based upon the input string and a pre-defined algorithm in WEP64 or WEP128.

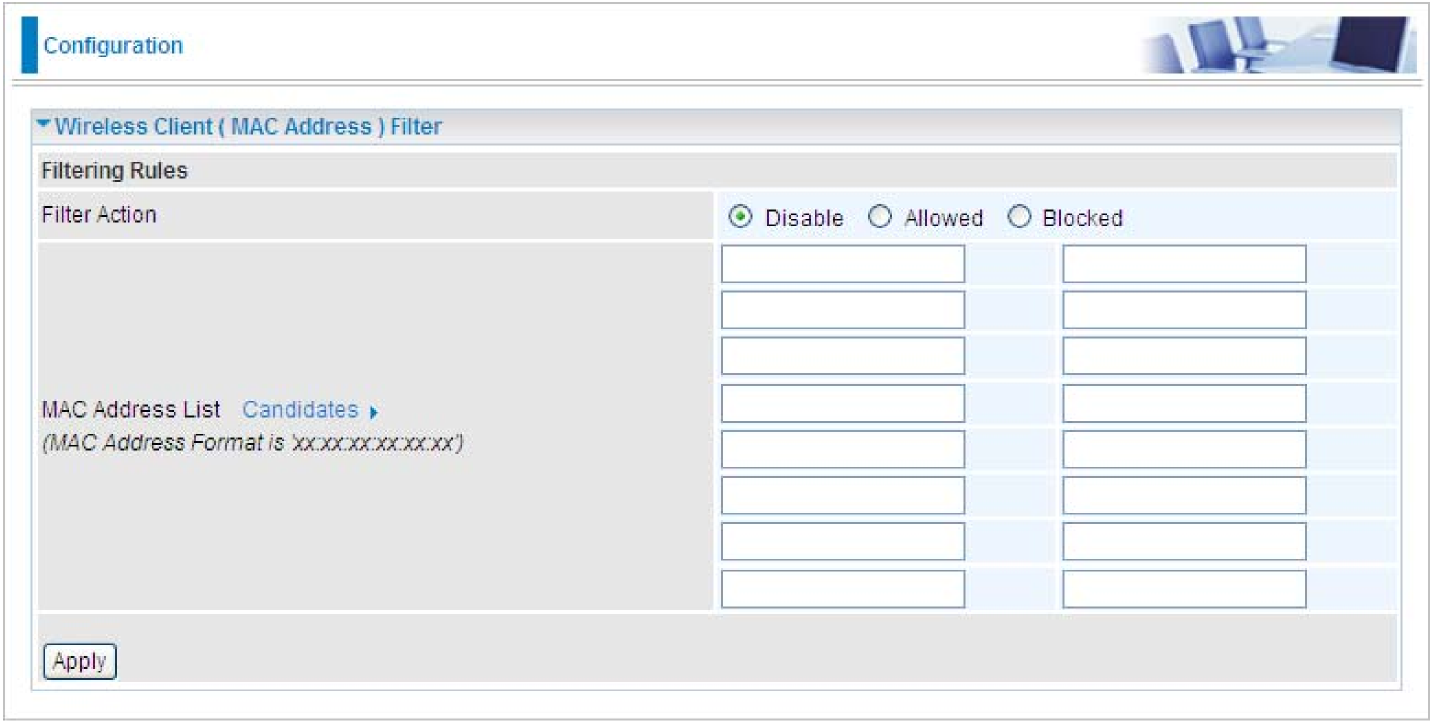
Default Used WEP Key: Select the encryption key ID; please refer to **Key (1~4)** below.

Key (1-4): Enter the key to encrypt wireless data. To allow encrypted data transmission, the WEP Encryption Key values on all wireless stations must be the same as the router. There are four keys for your selection. The input format is in HEX style, 10 and 26 HEX codes are required for WEP64 and WEP128 respectively.

Wireless Client / MAC Address Filter

The MAC Address supports up to 16 wireless network PCs and helps you manage your network control to accept traffic from specific authorized PCs or to restrict unwanted PC(s) to access your LAN.

There are no pre-defined MAC Address filter rules; you can add the filter rules to meet your requirements.



Configuration

Wireless Client (MAC Address) Filter

Filtering Rules

Filter Action: ● Disable ○ Allowed ○ Blocked

MAC Address List Candidates ▸

(MAC Address Format is 'xx:xx:xx:xx:xx:xx')

Apply

Filter Action: Default setting is set to **Disable**.

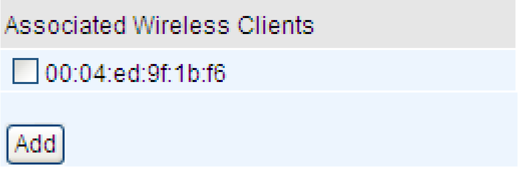
> **Allowed:** To authorize specific device to access your LAN by insert the MAC Address in the space provided or click the Candidate button. Make sure your PC's MAC is listed.
>
> **Blocked:** To prevent unwanted device from accessing the LAN by insert the MAC Address in the space provided or click the Candidate button. Make sure your PC's MAC is not listed.

The maximum client is 16. The MAC addresses are 6 bytes long; they are presented only in hexadecimal characters. The number **0** - **9** and letters **a** - **f** are acceptable.

Note: Follow the MAC Address Format xx:xx:xx:xx:xx:xx. Semicolon (:) must be included.

Candidates: It automatically detects for devices that are connected to the router through the Wireless feature.

Click the Candidate button to access the **Associated Wireless Client** window.



Associated Wireless Clients

□ 00:04:ed:9f:1b:f6

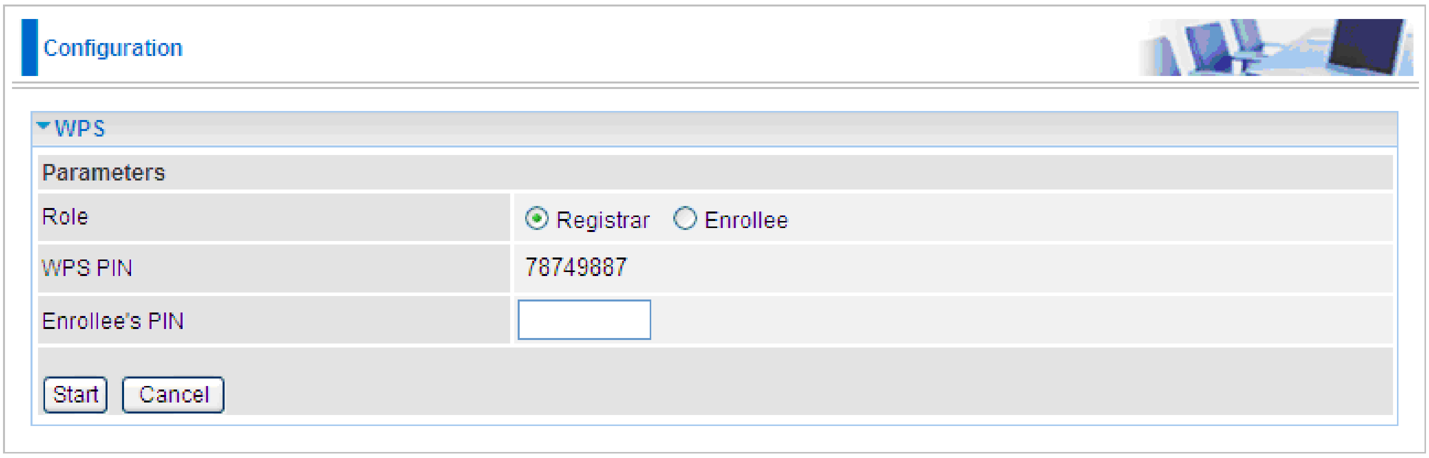
Add

Associate Wireless Client: Displays a list MAC addresses of all wireless devices that are currently connected to the router.

You can check the checkbox next to the MAC address to block or allow the wireless client to access the network. Then, Add to insert to the Wireless Client (MAC Address) Filter table. The maximum Wireless client is 16.

WPS

WPS (WiFi Protected Setup) feature is a standard protocol created by Wi-Fi Alliance. This protocol is used to build a Wi-Fi network within a home / small office environment in an easy and secured manner. This feature thus provides a much simplified method to configure Wi-Fi Protected Access to those who know very little about wireless security.

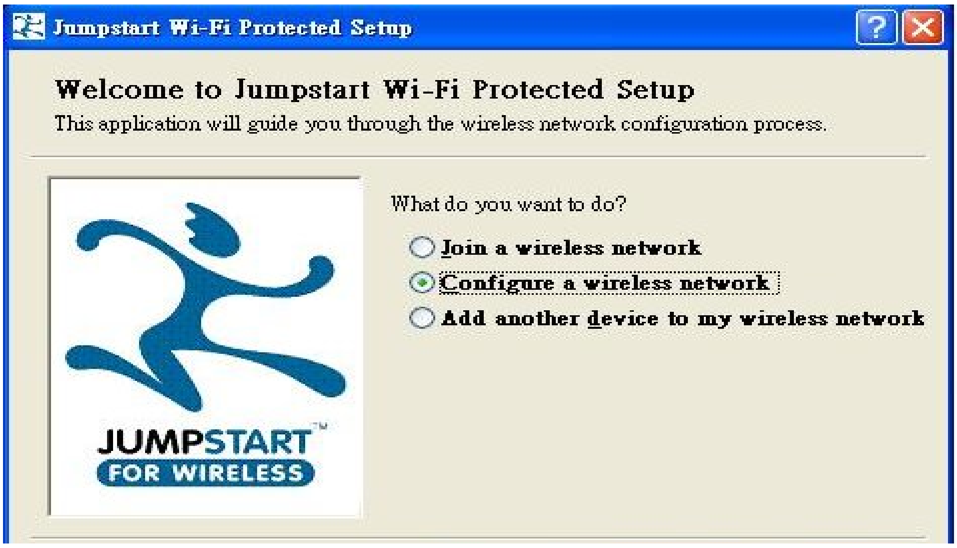


Role	● Registrar ○ Enrollee
WPS PIN	78749887
Enrollee's PIN	

Set up of security-enabled Wi-Fi network

Step 1: Note down the AP's PIN from Web (Ex: 78749887).

Step 2: Open wireless client's WPS utility (Ex: Atheros Jumpstart WPS utility), select "Configure a wireless network" and apply "next" button.



Welcome to Jumpstart Wi-Fi Protected Setup

This application will guide you through the wireless network configuration process.

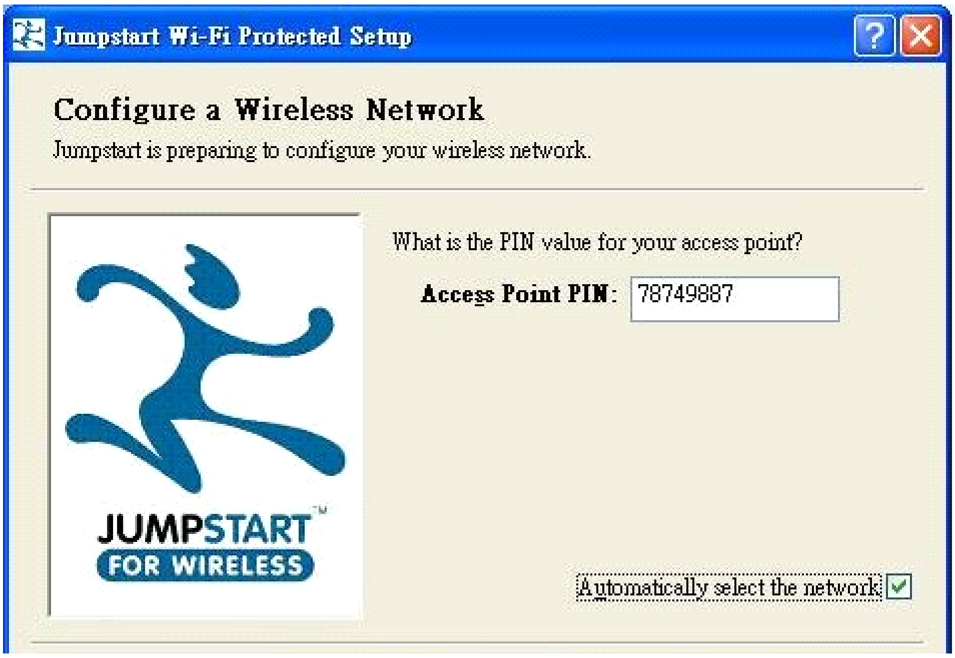
What do you want to do?

○ Join a wireless network

● Configure a wireless network

○ Add another device to my wireless network

Step 3: Enter AP's PIN into the utility and click on the "**next**" button.



Jumpstart Wi-Fi Protected Setup

Configure a Wireless Network

Jumpstart is preparing to configure your wireless network.

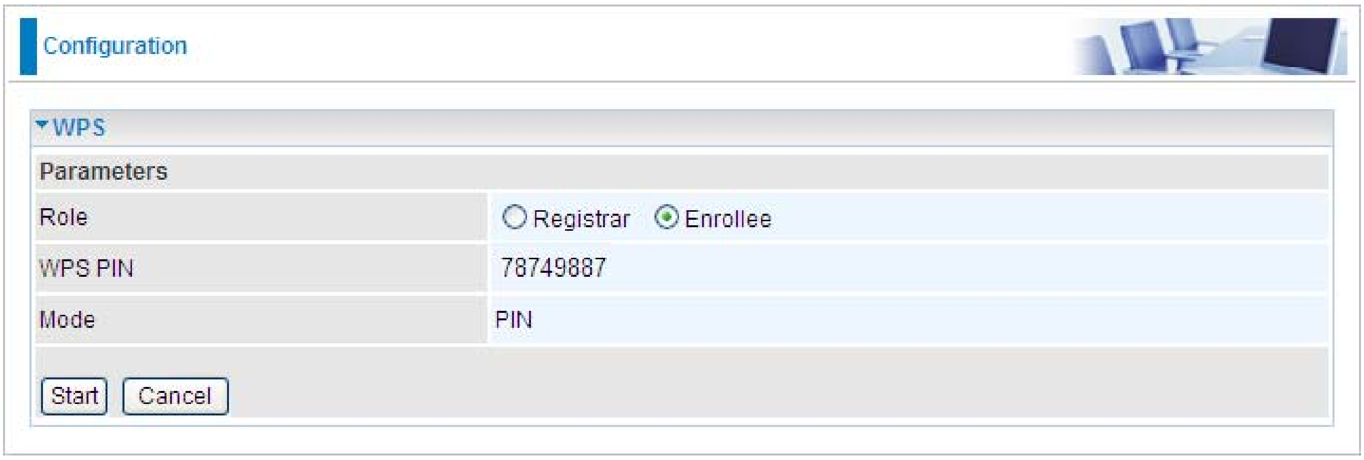
What is the PIN value for your access point?

Access Point PIN: 78749887

Automatically select the network ☑

Step 4: These are two ways to trigger AP as Enrolee role, you can choose one to do it.

- Push AP's WPS button 1 second and release it.
- In the AP's WPS configuration page, change Role to "Enrollee" and apply "Start" button.

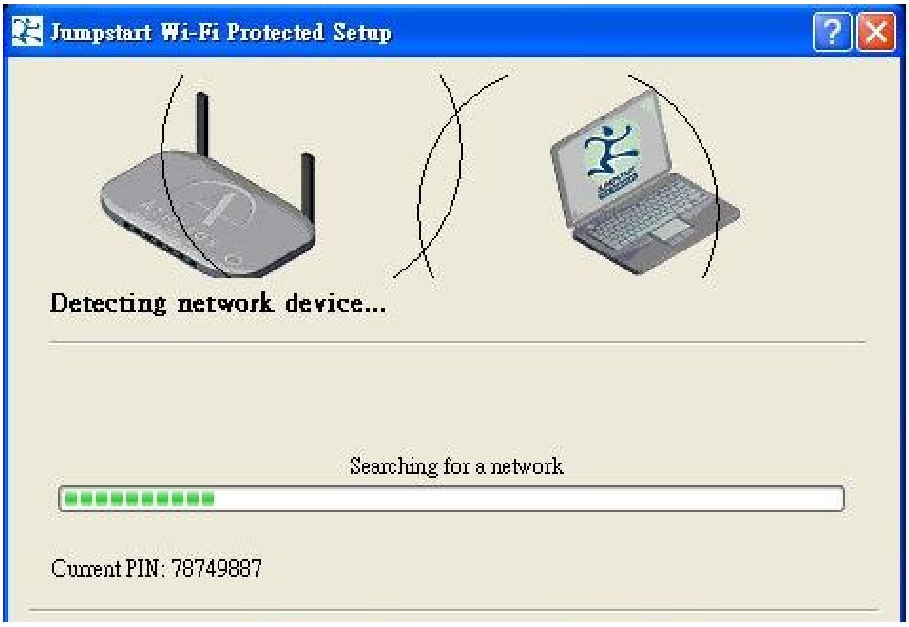


Configuration

WPS

Parameters	
Role	○ Registrar ● Enrollee
WPS PIN	78749887
Mode	PIN

Step 5: Jumpstart WPS utility search WPS AP.

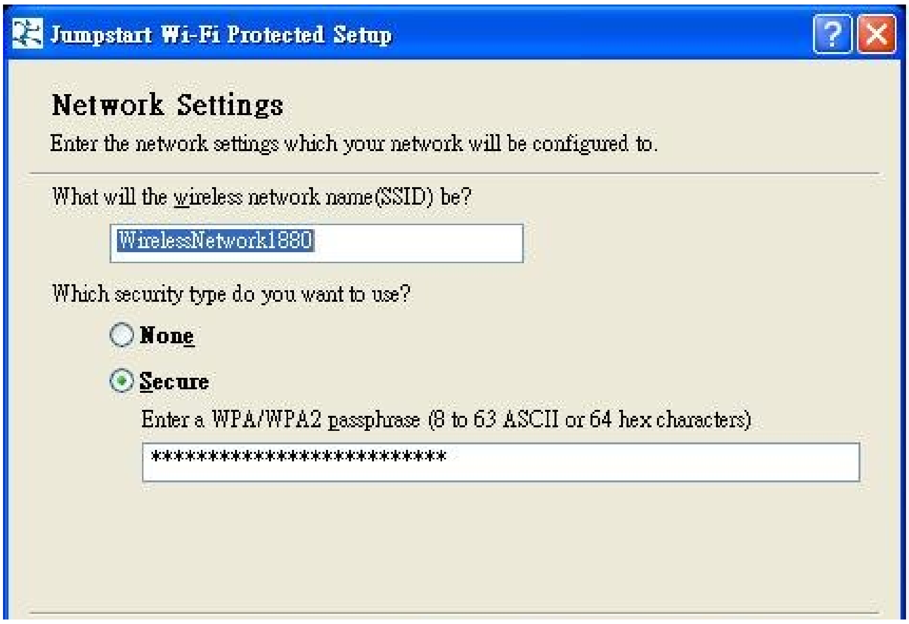


Detecting network device...

Searching for a network

Current PIN: 78749887

Step 6: SSID and security will be generated automatically (You can change it) and apply "next" button.



Network Settings

Enter the network settings which your network will be configured to.

What will the wireless network name(SSID) be?

WirelessNetwork1880

Which security type do you want to use?

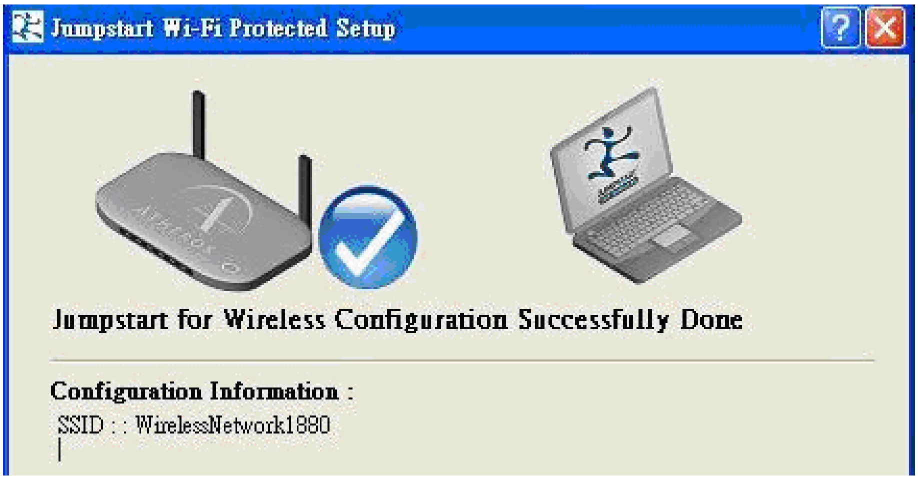
○ None

● Secure

Enter a WPA/WPA2 passphrase (8 to 63 ASCII or 64 hex characters)

****

Step 7: WPS set up complete. And you have set up security-enabled Wi-Fi networks.



Jumpstart for Wireless Configuration Successfully Done

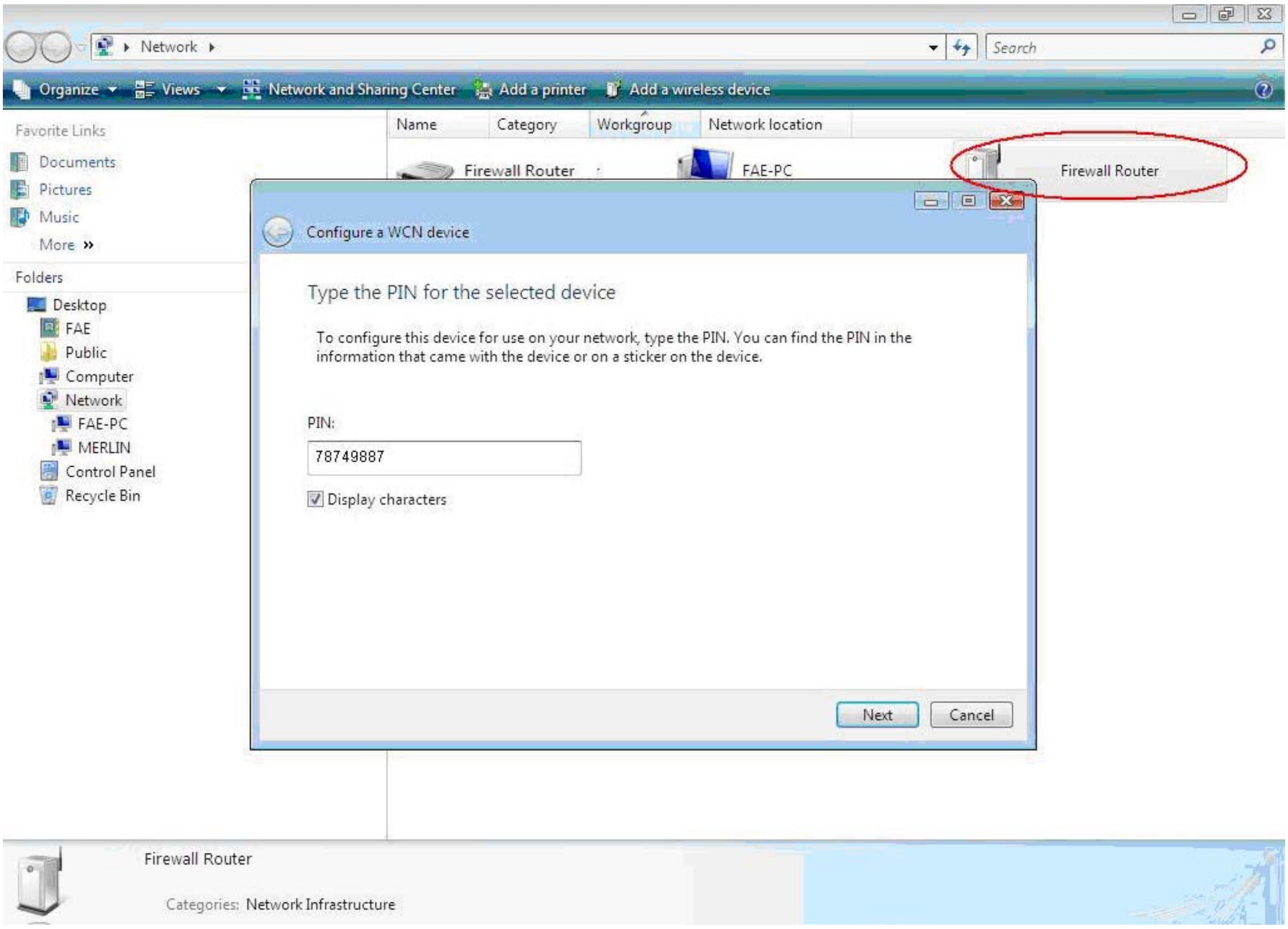
Configuration Information :

SSID : : WirelessNetwork1880

Set up of security-enabled Wi-Fi network using WCN in Vista

Step 1: Note down the AP's PIN from Web (Ex: 78749887).

Step 2: In Vista's Control Panel, select **Network and Internet and** choose **View network computers and devices**. Double click the "Firewall Router" icon and enter the AP's PIN code then click "Next".



Configure a WCN device

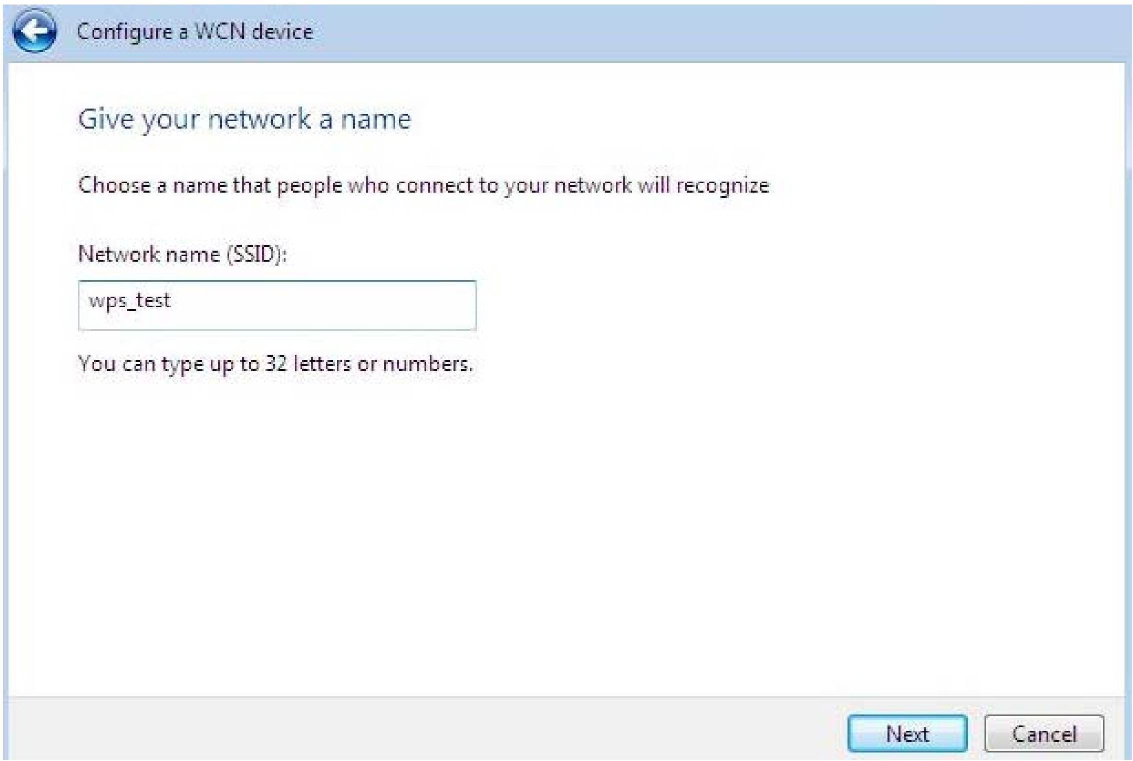
Type the PIN for the selected device

To configure this device for use on your network, type the PIN. You can find the PIN in the information that came with the device or on a sticker on the device.

PIN: 78749887

☑ Display characters

Step 3: Enter the AP SSID and apply “Next” button.



Configure a WCN device

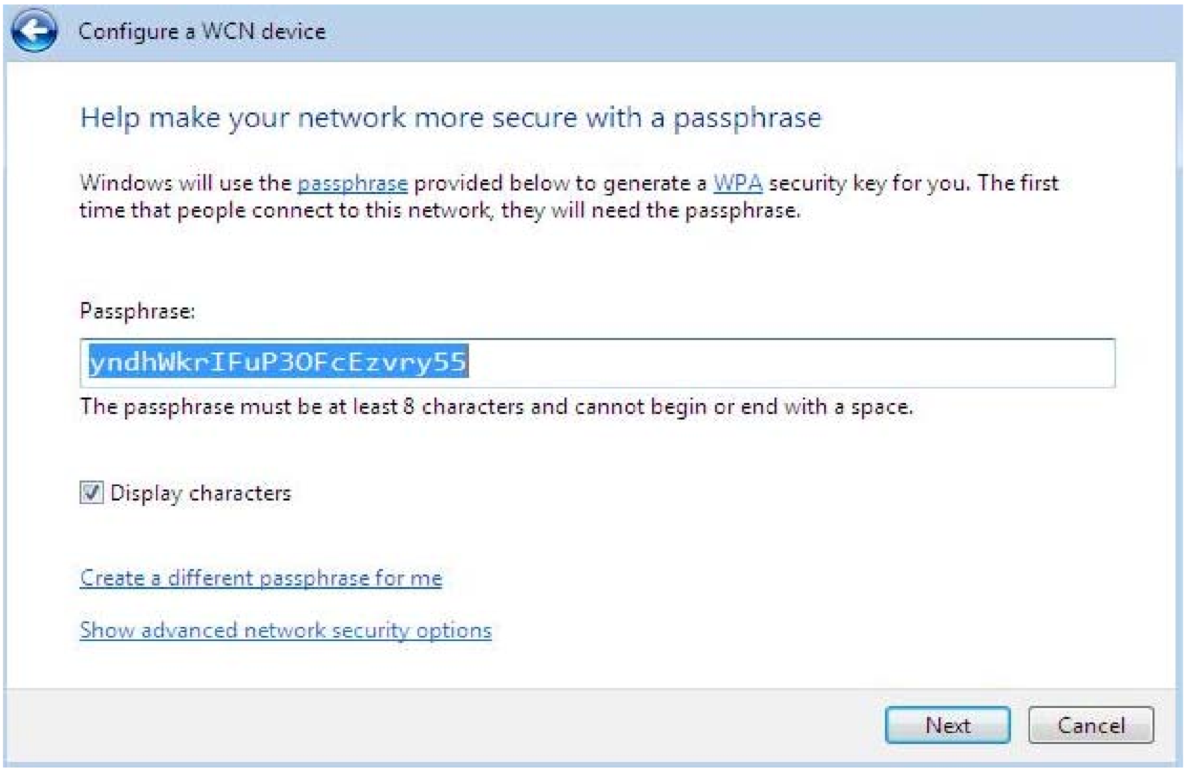
Give your network a name

Choose a name that people who connect to your network will recognize

Network name (SSID): wps_test

You can type up to 32 letters or numbers.

Step 4: Enter the Passphrase and apply “Next” button.



Configure a WCN device

Help make your network more secure with a passphrase

Windows will use the passphrase provided below to generate a WPA security key for you. The first time that people connect to this network, they will need the passphrase.

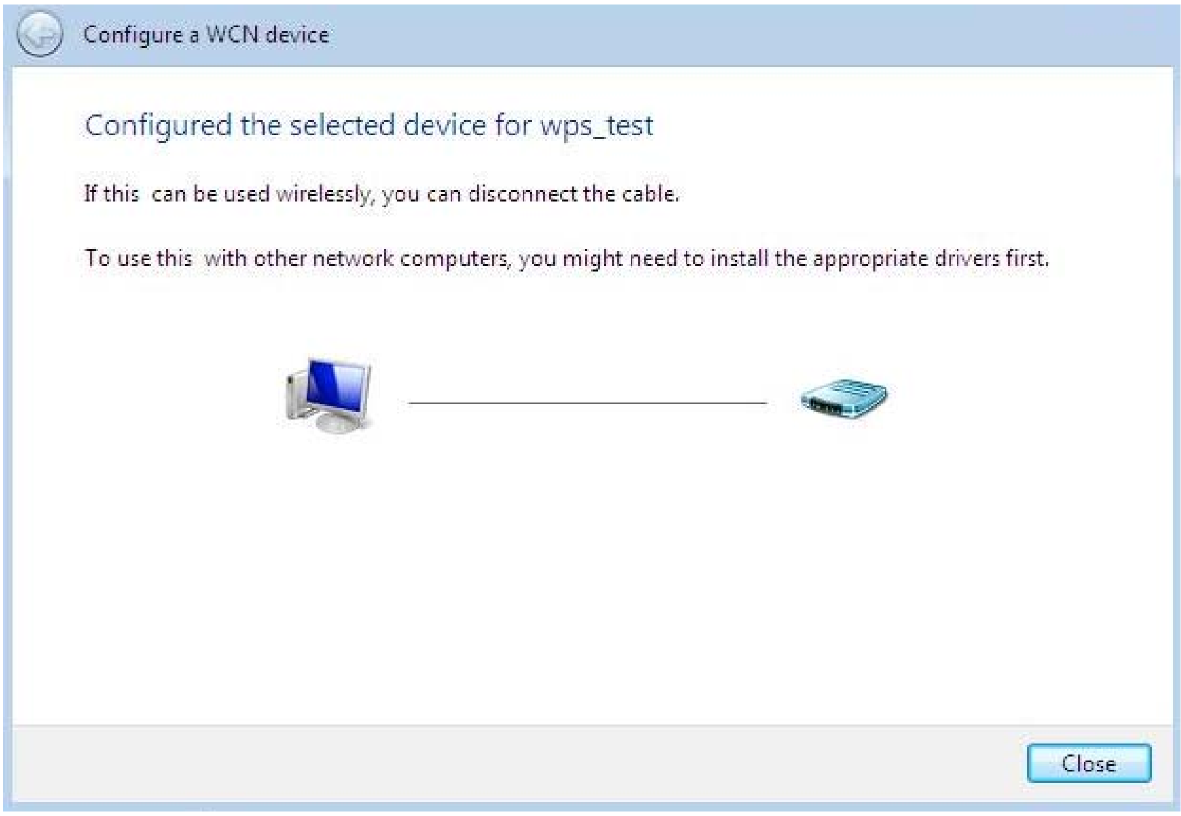
Passphrase: yndhWkrIFuP3OFcEzvry55

The passphrase must be at least 8 characters and cannot begin or end with a space.

☑ Display characters

Create a different passphrase for me
Show advanced network security options
Next
Cancel

Step 5: WCN set up complete. And you have set up security-enabled Wi-Fi networks.



Configured the selected device for wps_test

If this can be used wirelessly, you can disconnect the cable.

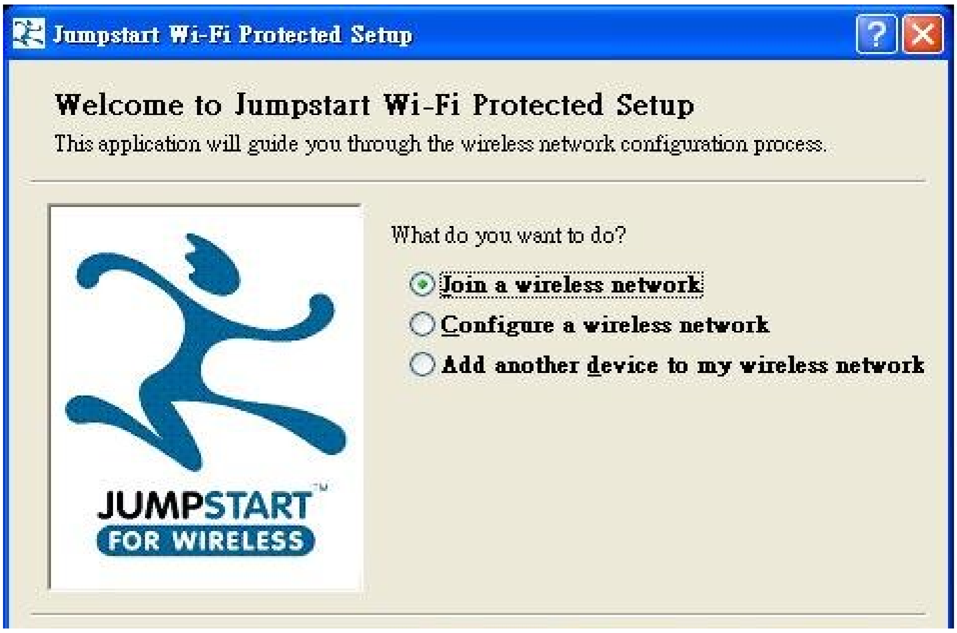
To use this with other network computers, you might need to install the appropriate drivers first.

Adding a new WPS device (wireless client) to a network - Use PBC Method

Step 1: Push AP's WPS button more than one second and you will see AP's WLAN led will flashing per second.

Step 2: Open wireless client's WPS utility, select "Join a wireless network" and apply "next" button.

Note: After you push AP's WPS button, below steps should be completed between 2 minutes.



Jumpstart Wi-Fi Protected Setup

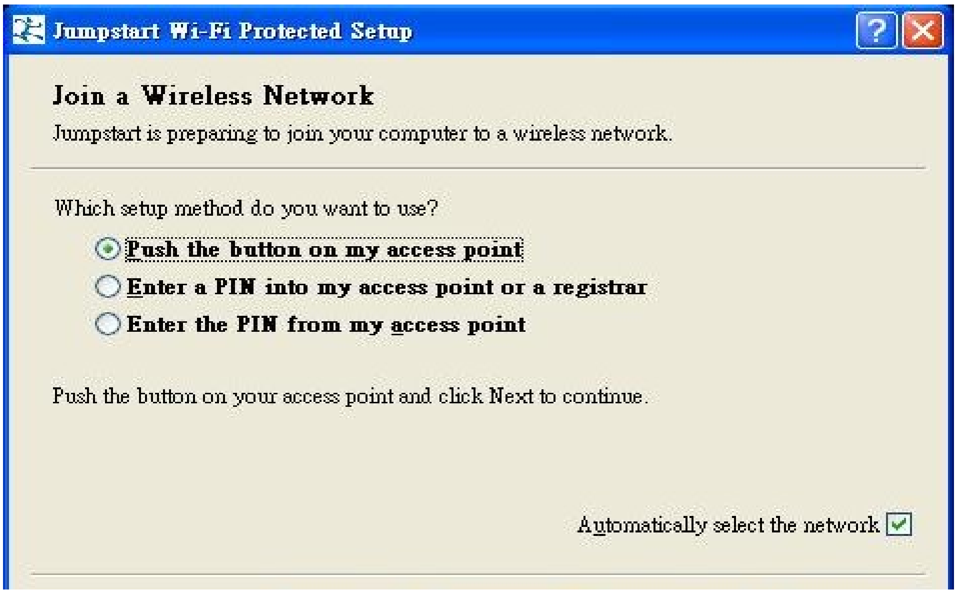
Welcome to Jumpstart Wi-Fi Protected Setup

This application will guide you through the wireless network configuration process.

What do you want to do?

- ● Join a wireless network
- ○ Configure a wireless network
- ○ Add another device to my wireless network

Step 3: Select "Push the button on my access point" and apply "next" button.



Jumpstart Wi-Fi Protected Setup

Join a Wireless Network

Jumpstart is preparing to join your computer to a wireless network.

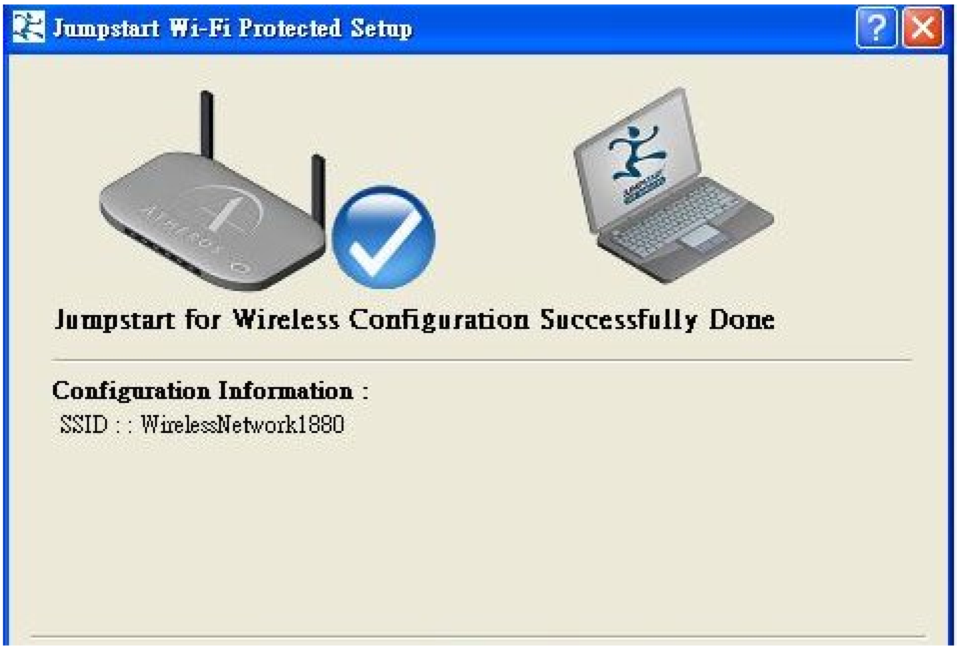
Which setup method do you want to use?

- ● Push the button on my access point
- ○ Enter a PIN into my access point or a registrar
- ○ Enter the PIN from my access point

Push the button on your access point and click Next to continue.

Automatically select the network ☑

Step 4: New WPS device have join into the wireless network.



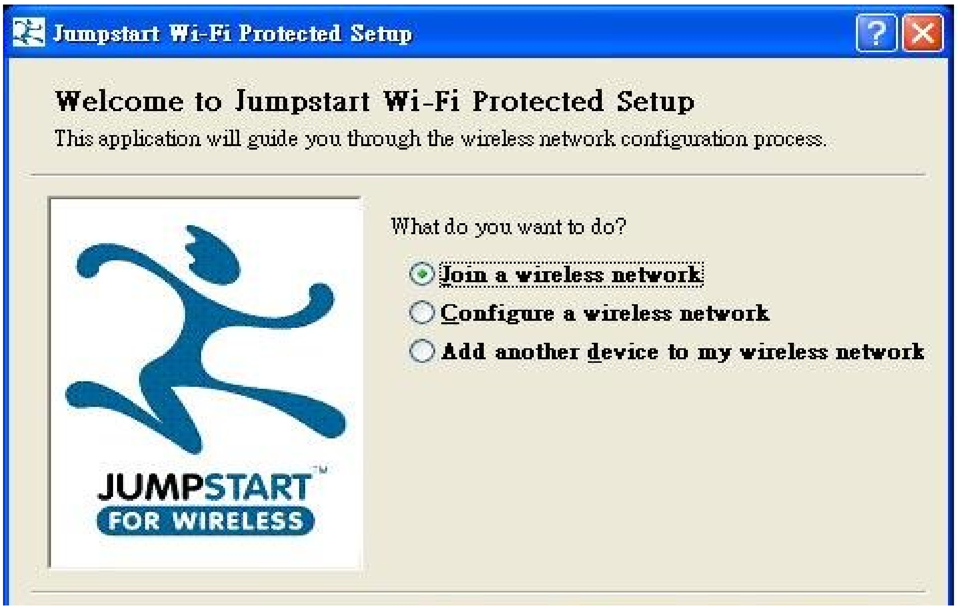
Jumpstart for Wireless Configuration Successfully Done

Configuration Information :

SSID : : WirelessNetwork1880

Adding a new WPS device (wireless client) to a network - Use PIN Method

Step 1: Open wireless client's WPS utility, select "Join a wireless network" and apply "next" button.



Jumpstart Wi-Fi Protected Setup

Welcome to Jumpstart Wi-Fi Protected Setup

This application will guide you through the wireless network configuration process.

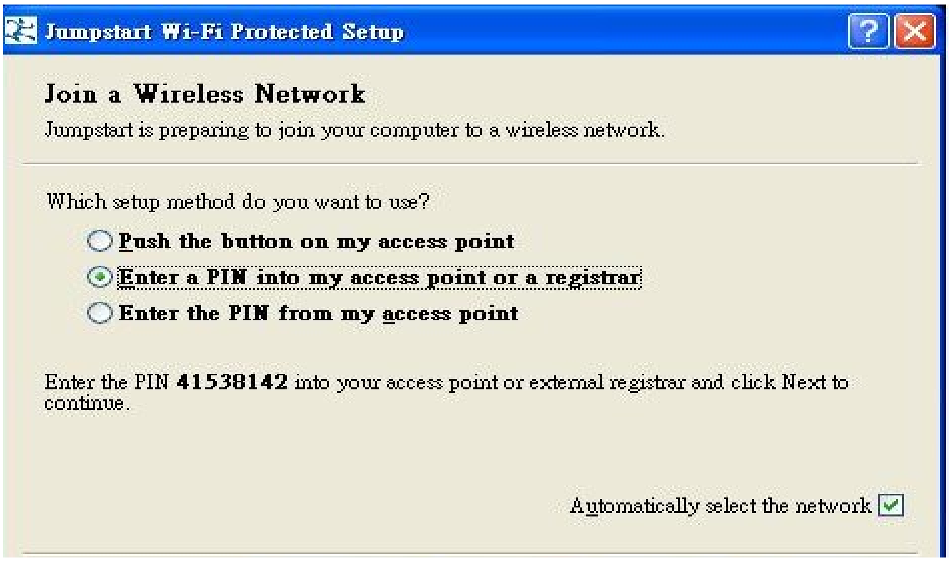
What do you want to do?

● Join a wireless network

○ Configure a wireless network

○ Add another device to my wireless network

Step 2: Note down the wireless client's PIN (Ex: 41538142) and apply "Start" button for active wireless client WPS PIN method.



Jumpstart Wi-Fi Protected Setup

Join a Wireless Network

Jumpstart is preparing to join your computer to a wireless network.

Which setup method do you want to use?

○ Push the button on my access point

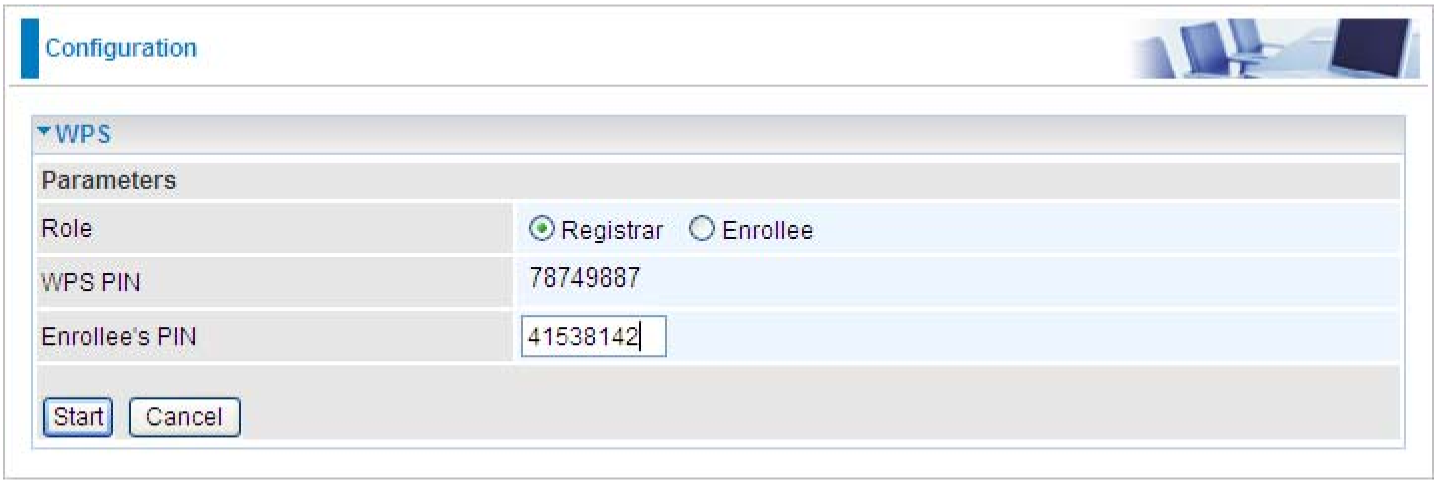
● Enter a PIN into my access point or a registrar

○ Enter the PIN from my access point

Enter the PIN **41538142** into your access point or external registrar and click Next to continue.

Automatically select the network ☑

Step 3: Enter wireless client's PIN into "Enrollee's PIN" of Web and apply "Start" button.

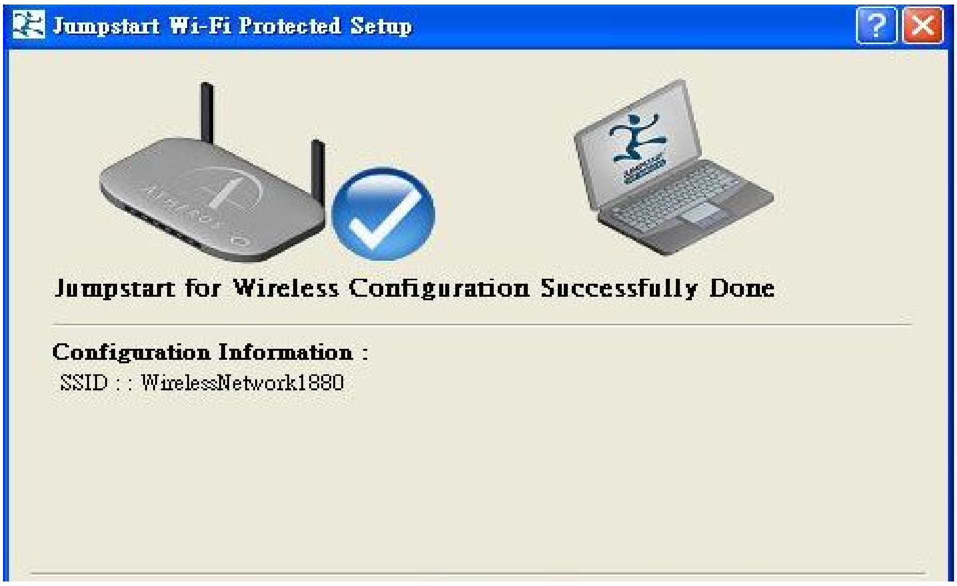


Configuration

▾WPS

Parameters	
Role	● Registrar ○ Enrollee
WPS PIN	78749887
Enrollee's PIN	41538142

Step 4: New WPS device have join into the wireless network.

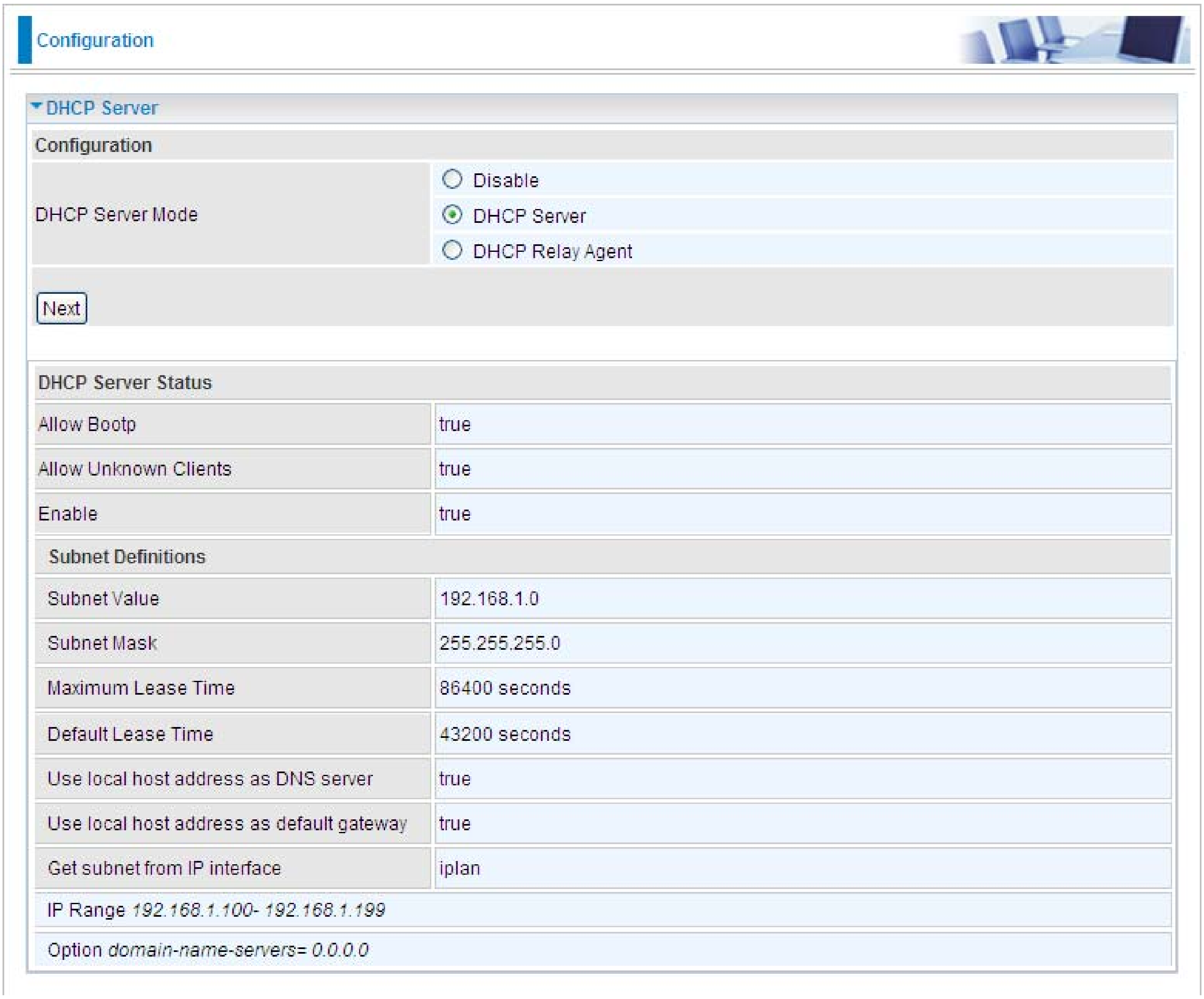


Jumpstart for Wireless Configuration Successfully Done

Configuration Information :
SSID : : WirelessNetwork1880

DHCP Server

You can disable or enable the DHCP (Dynamic Host Configuration Protocol) server or enable the router's DHCP relay functions. The DHCP protocol allows your router to dynamically assign IP addresses to the PCs on your network if they are configured to obtain IP addresses automatically.



Configuration

▾DHCP Server

Configuration

DHCP Server Mode	○ Disable ● DHCP Server ○ DHCP Relay Agent

DHCP Server Status	
Allow Bootp	true
Allow Unknown Clients	true
Enable	true
Subnet Definitions	
Subnet Value	192.168.1.0
Subnet Mask	255.255.255.0
Maximum Lease Time	86400 seconds
Default Lease Time	43200 seconds
Use local host address as DNS server	true
Use local host address as default gateway	true
Get subnet from IP interface	iplan
IP Range *192.168.1.100- 192.168.1.199*	
Option *domain-name-servers= 0.0.0.0*	

To disable the router DHCP Server, check Disabled and click Next, then click Apply. When the DHCP Server is disabled you will need to manually assign a fixed IP address to each PC on your network, and set the default gateway for each PC to the IP address of the router (by default this is 192.168.1.254).

To configure the router DHCP Server, check DHCP Server and click Next. You can then configure parameters of the DHCP Server including the IP pool (starting IP address and ending IP address to be allocated to PCs on your network), lease time for each assigned IP address (the period of time the IP address assigned will be valid), DNS IP address and the gateway IP address. These details are sent to the DHCP client (i.e. your PC) when it requests an IP address from the DHCP server. Click Apply to enable this function. If you check Use Router as a DNS Server", the Router will perform the domain name lookup, find the IP address from the outside network automatically and forward it back to the requesting PC in the LAN (your Local Area Network).

If you check DHCP Relay Agent and click Next, then you will have to enter the IP address of the DHCP server which will assign an IP address back to the DHCP client in the LAN. Use this function only if advised to do so by your network administrator or ISP.
Click Apply to enable this function.

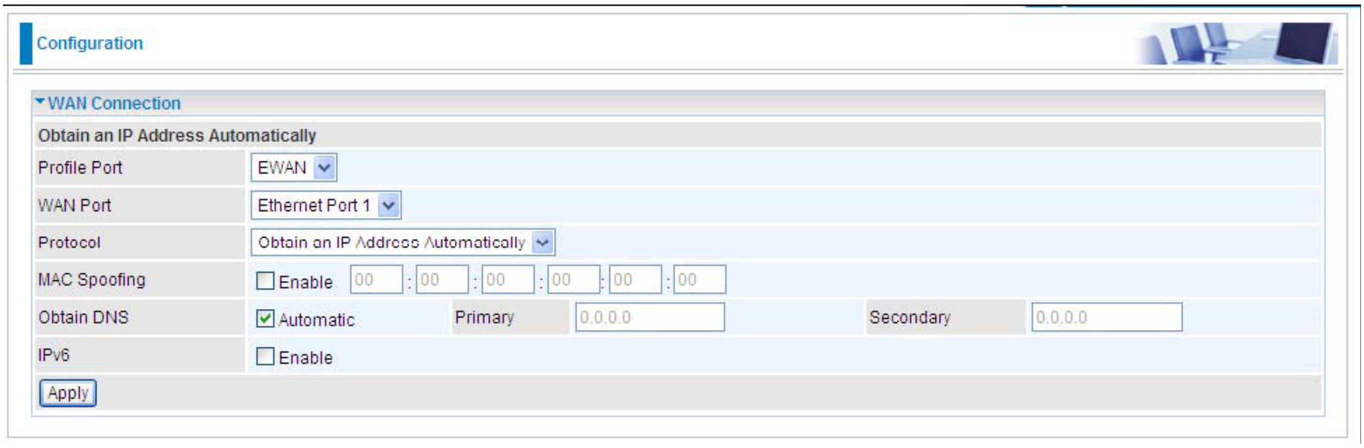
WAN - Wide Area Network

WAN refers to your Wide Area Network connection, i.e. your router's connection to your ISP and the Internet. Here is the item within the WAN section: **WAN Profile.**

WAN Profile

Obtain an IP Address Automatically (EWAN)

When connecting to the ISP, This router also functions as a DHCP client. It can automatically obtain an IP address, netmask, gateway address, and DNS server addresses if the ISP assigns this information via DHCP.



Configuration

▾WAN Connection

Obtain an IP Address Automatically					
Profile Port	EWAN				
WAN Port	Ethernet Port 1				
Protocol	Obtain an IP Address Automatically				
MAC Spoofing	□ Enable 00 : 00 : 00 : 00 : 00 : 00				
Obtain DNS	☑ Automatic	Primary	0.0.0.0	Secondary	0.0.0.0
IPv6	□ Enable				

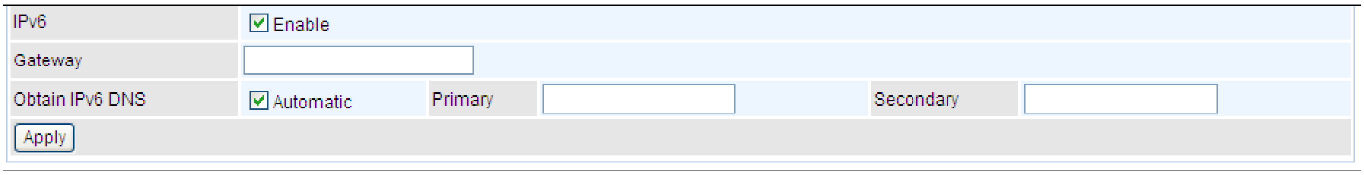
Profile Port: Select the profile port as EWAN.

Protocol: Select **Obtain an IP Address Automatically**.

Obtain DNS: A Domain Name System (DNS) contains a mapping table for domain name and IP addresses. DNS helps to find the IP address of a specific domain name. Check the checkbox to obtain DNS automatically.

Primary DNS/ Secondary DNS: Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the Netmask.

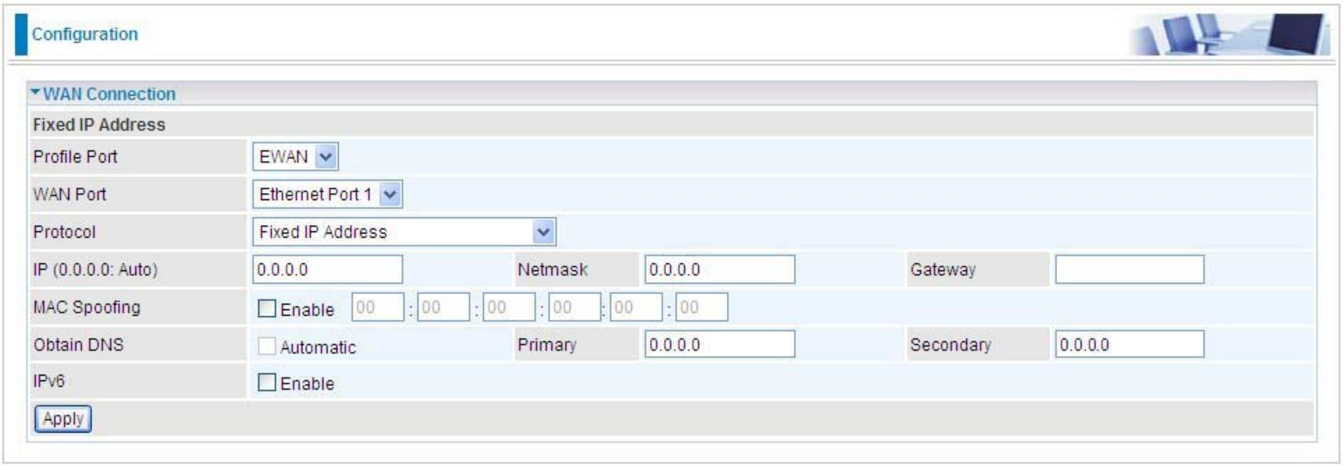
IPv6: check to enable IPv6 service. Enter IPv6 Gateway address and set IPv6 DNS as same in IPv4 mode.



IPv6	☑ Enable				
Gateway					
Obtain IPv6 DNS	☑ Automatic	Primary		Secondary	

Fixed IP Address (EWAN)

Select this option to set static IP information. You will need to enter in the Connection type, IP address, netmask, and gateway address, provided to you by your ISP. Each IP address entered in the fields must be in the appropriate IP form, which is four IP octets separated by a dot (x.x.x.x). The Router will not accept the IP address if it is not in this format.



Configuration

▾WAN Connection

Fixed IP Address

Profile Port	EWAN				
WAN Port	Ethernet Port 1				
Protocol	Fixed IP Address				
IP (0.0.0.0: Auto)	0.0.0.0	Netmask	0.0.0.0	Gateway	
MAC Spoofing	□ Enable 00 : 00 : 00 : 00 : 00 : 00				
Obtain DNS	□ Automatic	Primary	0.0.0.0	Secondary	0.0.0.0
IPv6	□ Enable				

Apply

IP: Your WAN IP address. Leave this at 0.0.0.0 to automatically obtain an IP address from your ISP.

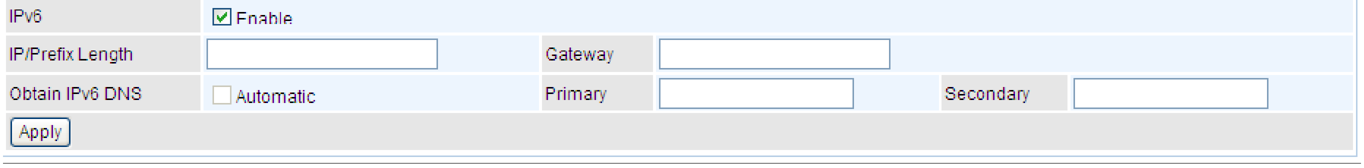
Netmask: The default is 0.0.0.0. User can change it to other such as 255.255.255.0.Type the netmask assigned to you by your ISP (if given).

Gateway: You must specify a gateway IP address (supplied by your ISP).

Obtain DNS: A Domain Name System (DNS) contains a mapping table for domain name and IP addresses. DNS helps to find the IP address of a specific domain name. Check the checkbox to obtain DNS automatically.

Primary DNS/ Secondary DNS: Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the netmask.

IPv6: check to enable IPv6 service. Enter IPv6 Gateway address and set IPv6 DNS as same in IPv4 mode.

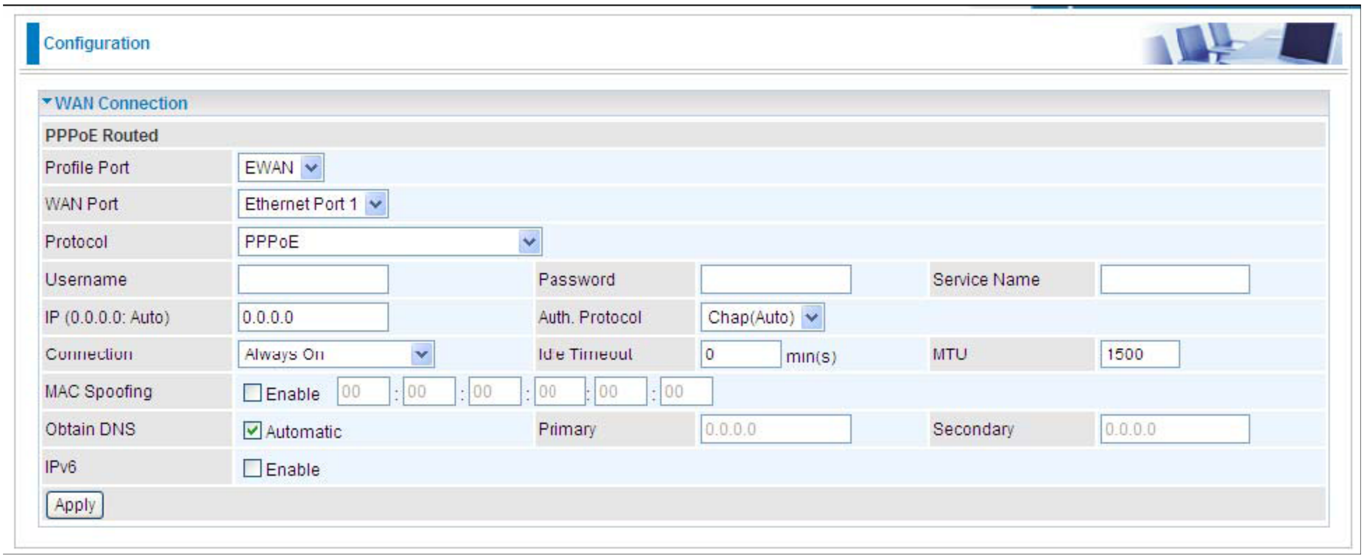


IPv6	☑ Enable				
IP/Prefix Length		Gateway			
Obtain IPv6 DNS	□ Automatic	Primary		Secondary	

Apply

PPPoE (EWAN)

PPPoE (PPP over Ethernet) provides access control in a manner similar to dial-up services using PPP.



Configuration

▾WAN Connection

PPPoE Routed

Profile Port	EWAN				
WAN Port	Ethernet Port 1				
Protocol	PPPoE				
Username		Password		Service Name	
IP (0.0.0.0: Auto)	0.0.0.0	Auth. Protocol	Chap(Auto)		
Connection	Always On	Idle Timeout	0 min(s)	MTU	1500
MAC Spoofing	□ Enable 00 : 00 : 00 : 00 : 00 : 00				
Obtain DNS	☑ Automatic	Primary	0.0.0.0	Secondary	0.0.0.0
IPv6	□ Enable				

Profile Port: Select the profile port as EWAN.

Username: Enter the username provided by your ISP. You can input up to **128** alphanumeric characters (case sensitive). This is in the format of “username@ispname” instead of simply “username”.

Password: Enter the password provided by your ISP. You can input up to **128** alphanumeric characters (case sensitive).

Service Name: Enter a name for this connection.

IP: Your WAN IP address. Leave this at 0.0.0.0 to automatically obtain an IP address from your ISP.

Connection:

Always on: If you want the router to establish a PPPoE session when starting up and to automatically re-establish the PPPoE session when disconnected by the ISP.
Connect on Demand: If you want to establish a PPPoE session only when there is a packet requesting access to the Internet (i.e. when a program on your computer attempts to access the Internet)**.**

Idle Timeout: Auto-disconnect the router when there is no activity on the line for a predetermined period of time.

MTU: Maximum Transmission Unit. The size of the largest datagram (excluding media-specific headers) that IP will attempt to send through the interface.

RIP: RIP v1, RIP v2, and RIP v2 Multicast. Check to enable RIP function.

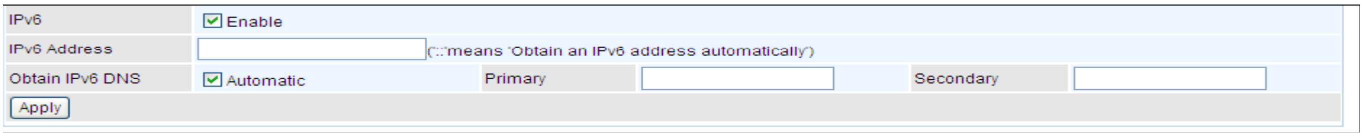
Auth. Protocol: Default is **Auto.** Your ISP advises on using **Chap** or **Pap.**

MAC Spoofing: Select **Enable** and enter a MAC address that will temporarily change your router’s MAC address to the one you have specified in this field. Leave it as Disabled if you do not wish to change the MAC address of your router.

Obtain DNS: Select **Automatic** to use DNS.

Primary DNS/ Secondary DNS: Enter the IP addresses of the DNS servers. The DNS servers are passed to the DHCP clients along with the IP address and the subnet mask.

IPv6: check to enable IPv6 service. Enter IPv6 Gateway address and set IPv6 DNS as same in IPv4 mode.

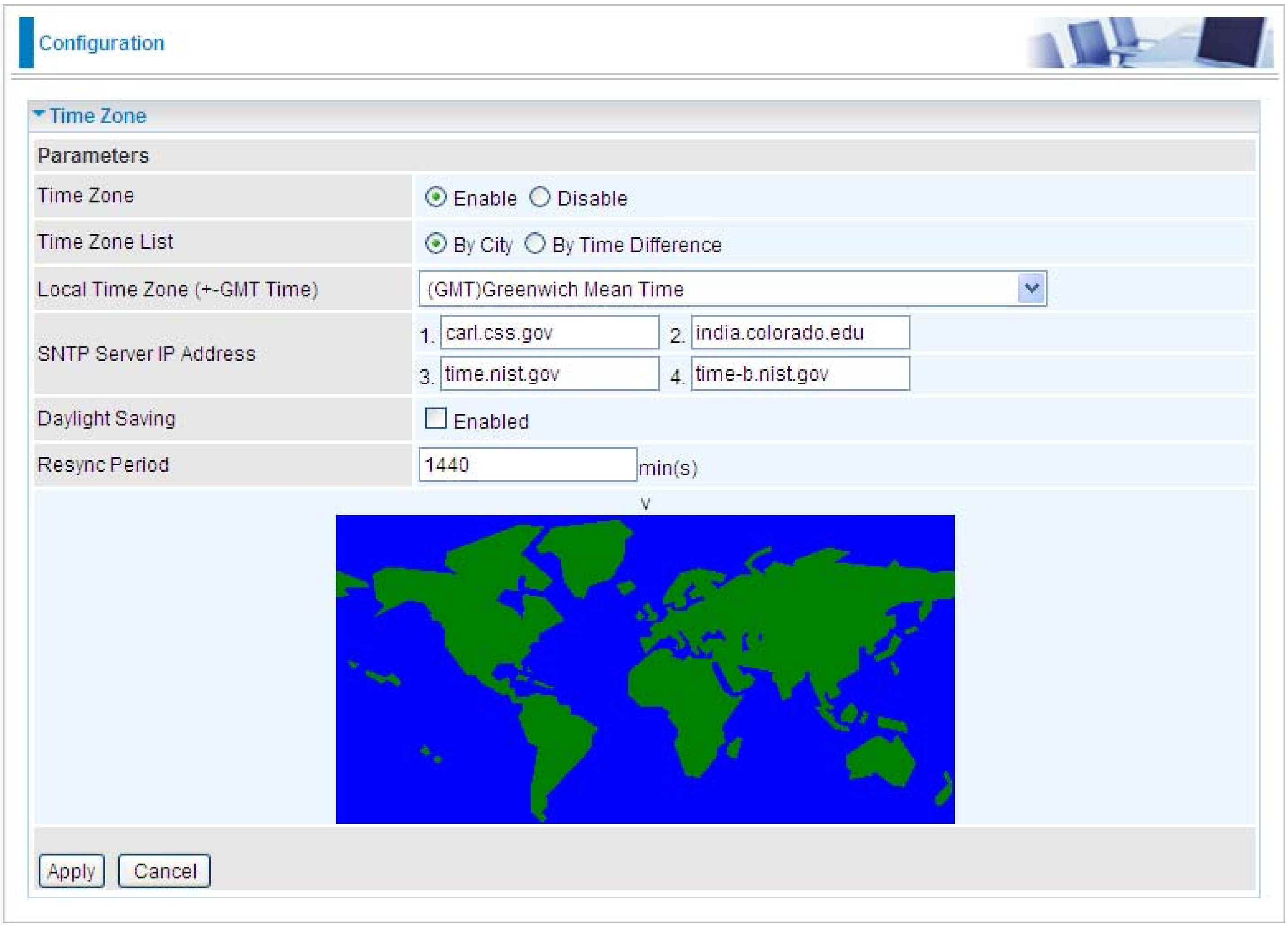


IPv6	☑ Enable				
IPv6 Address	(::'means 'Obtain an IPv6 address automatically')				
Obtain IPv6 DNS	☑ Automatic	Primary		Secondary	

System

Here are the items within the System section: **Time Zone, Remote Access, Firmware Upgrade, Backup/Restore, Restart** and **User Management.**

Time Zone



Configuration

▾ Time Zone

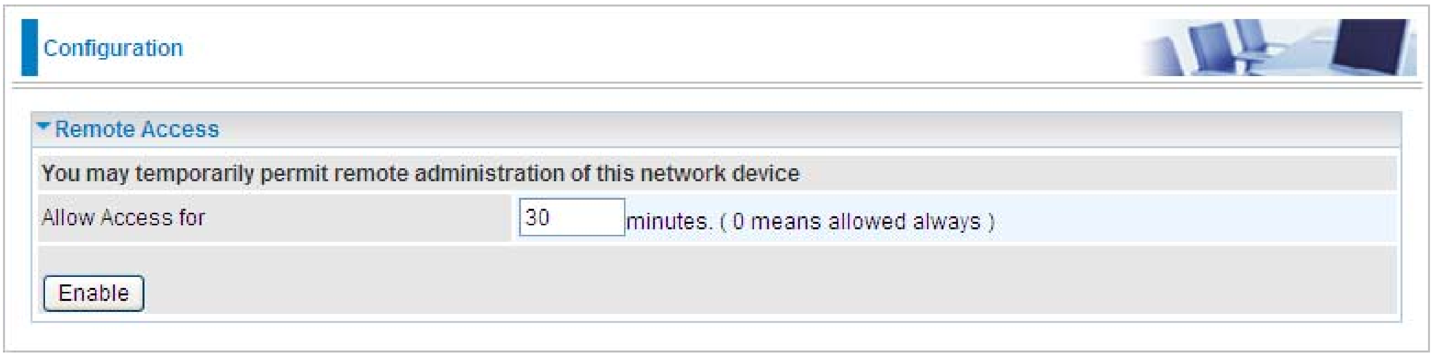
Parameters	
Time Zone	● Enable ○ Disable
Time Zone List	● By City ○ By Time Difference
Local Time Zone (+-GMT Time)	(GMT)Greenwich Mean Time
SNTP Server IP Address	1. carl.css.gov 2. india.colorado.edu 3. time.nist.gov 4. time-b.nist.gov
Daylight Saving	□ Enabled
Resync Period	1440 min(s)

The router does not have a real time clock on board; instead, it uses the Simple Network Time Protocol (SNTP) to get the current time from an SNTP server outside your network. Choose your local time zone, click Enable and click the Apply button. After a successful connection to the Internet, the router will retrieve the correct local time from the SNTP server you have specified. If you prefer to specify an SNTP server other than those in the list, simply enter its IP address as shown above. Your ISP may provide an SNTP server for you to use.

Daylight Saving is also known as Summer Time Period. Many places in the world adapt it during summer time to move one hour of daylight from morning to the evening in local standard time. Check Enable checkbox to set your local time.

Resync Period (in minutes) is the periodic interval the router will wait before it re-synchronizes the router's time with that of the specified SNTP server. In order to avoid unnecessarily increasing the load on your specified SNTP server you should keep the poll interval as high as possible – at the absolute minimum every few hours or even days.

Remote Access



Configuration

▾Remote Access

You may temporarily permit remote administration of this network device

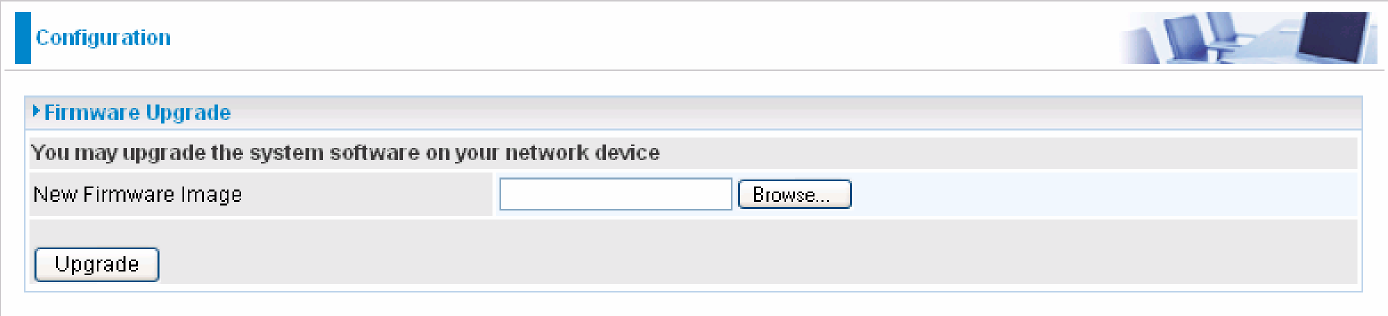
Allow Access for 30 minutes. (0 means allowed always)

Enable

This feature enables system administrator to set the time interval where the router can be accessed for administration purpose from a remote site (i.e. from outside your LAN).

If you wish to permanently enable remote access, set the time period to 0 minute.

Firmware Upgrade



Configuration

▸Firmware Upgrade

You may upgrade the system software on your network device

New Firmware Image

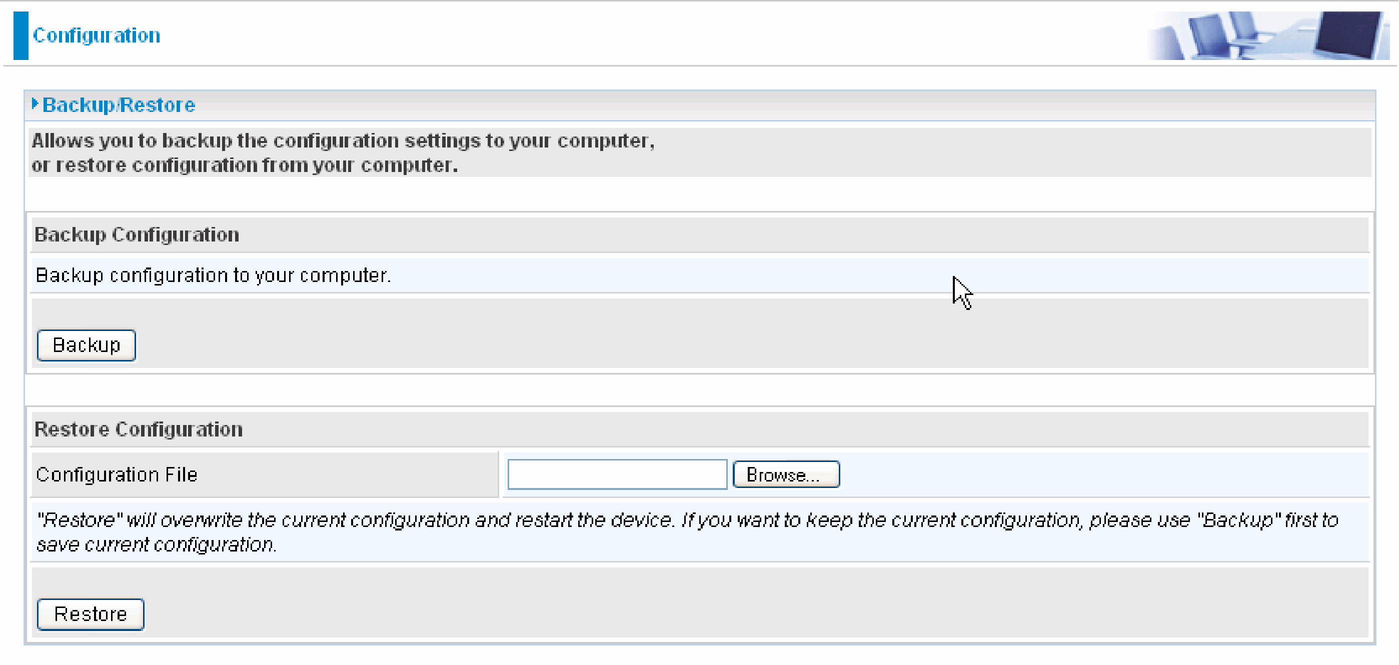
Your router firmware is the software that enables it to operate and provides all its functionality. Think of your router as a dedicated computer, and the firmware as the software it runs. Over time this software may be improved and revised, and your router allows you to upgrade the software it runs to take advantage of these changes.

Clicking on Browse will allow you to select the new firmware image file you have downloaded to your PC. Once the correct file is selected, click Upgrade to update the firmware in your router.

Don't power down the router or interrupt the firmware while it is still in process.Improper opteration could damage the router.

Warning

Backup / Restore



Configuration

▸Backup/Restore

Allows you to backup the configuration settings to your computer,
or restore configuration from your computer.

Backup Configuration

Backup configuration to your computer.

Restore Configuration

Configuration File

"Restore" will overwrite the current configuration and restart the device. If you want to keep the current configuration, please use "Backup" first to save current configuration.

This function allows you to save a backup of the current configuration of your router to a file on your PC, or to restore a previously saved configuration. This is very useful if you wish to customize the setting of the router, knowing in advance that you can always restore the setting if any mistakes do occur. Therefore, it is advisable that you create a backup of the configuration of your router before customizing its configuration.

Create a Router Configuration Backup

To create a backup of the setting, simply press the Backup button and specify the location on where to save your configuration file. You may also change the name of the file if you wish to keep multiple backups.

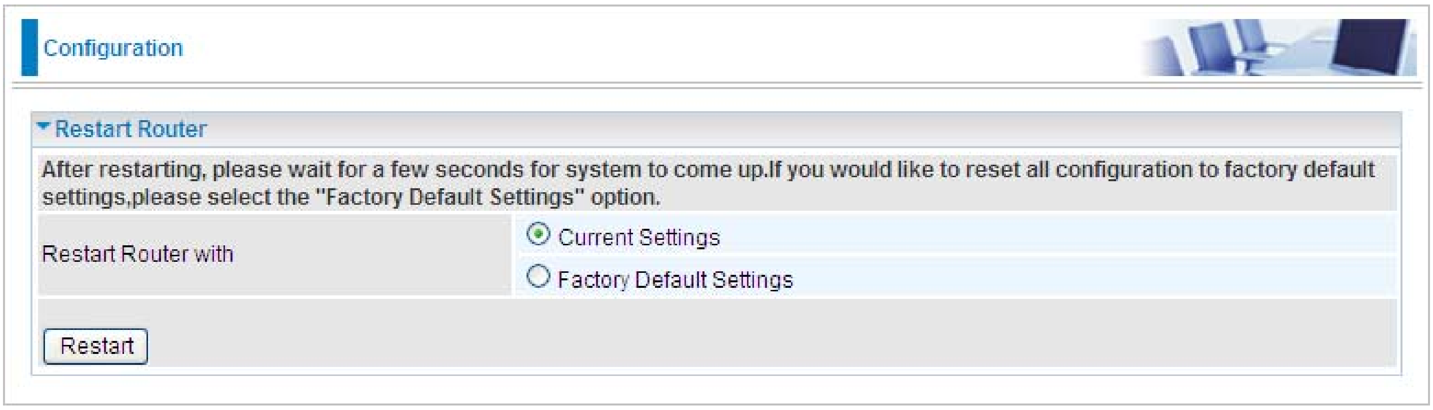
Restoring the Router Configuration

To restore the configuration of the router, press Browse to locate the configuration file from your PC. Once the file has been located, click on the file then click on the Restore button to load the setting.

Note: You should only restore the setting with the files that have been created using the Backup function with the most current firmware version. Settings files saved to your PC should not be manually edited in any way.

Restart Router

Click Restart with option Current Settings to reboot your router (and restore your last saved configuration).



▾Restart Router

After restarting, please wait for a few seconds for system to come up.If you would like to reset all configuration to factory default settings,please select the "Factory Default Settings" option.

Restart Router with ● Current Settings ○ Factory Default Settings

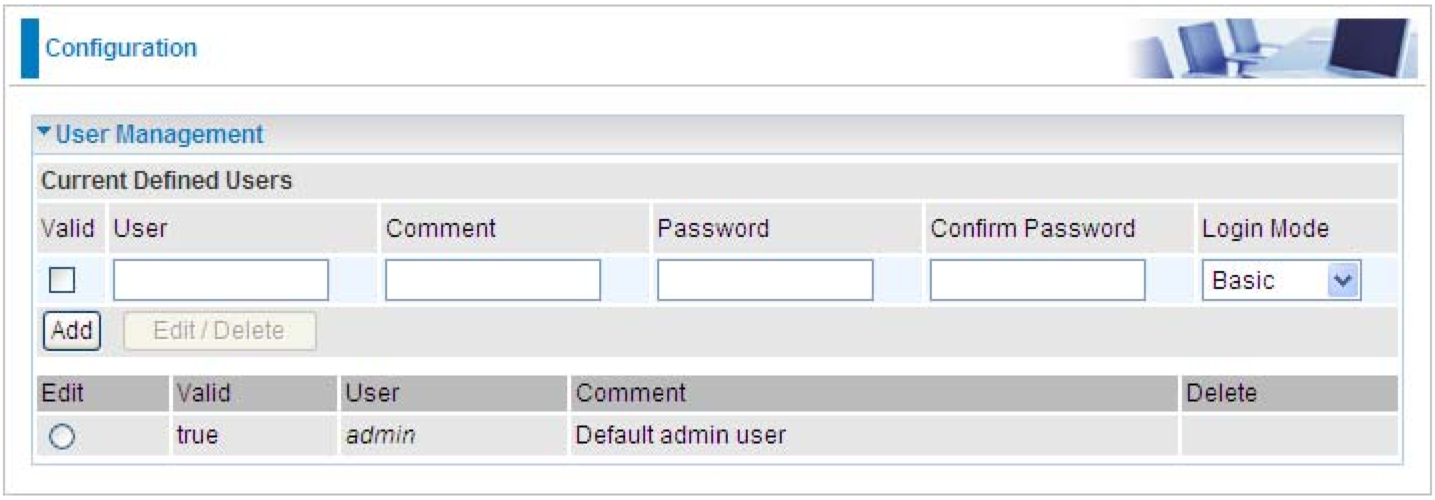
If you wish to restart the router using the factory default settings (for example, after a firmware upgrade or if you have saved an incorrect configuration), select Factory Default Settings to reset to factory default settings.

You may also reset your router to factory settings by holding the small Reset pinhole button more than 6 seconds on the back of your router.

Caution: After pressing the RESET button for more than 6 seconds, to be sure you power cycle the device again.

User Management

In order to prevent unauthorized access to your router's configuration interface, it requires that all users are to login the GUI with a password. You can set up multiple user accounts, each with their own password. You can Edit any existing user accounts and Add new user account to grant access to the device configuration interface.



Configuration

▾User Management

Current Defined Users

Valid	User	Comment	Password	Confirm Password	Login Mode
□					Basic

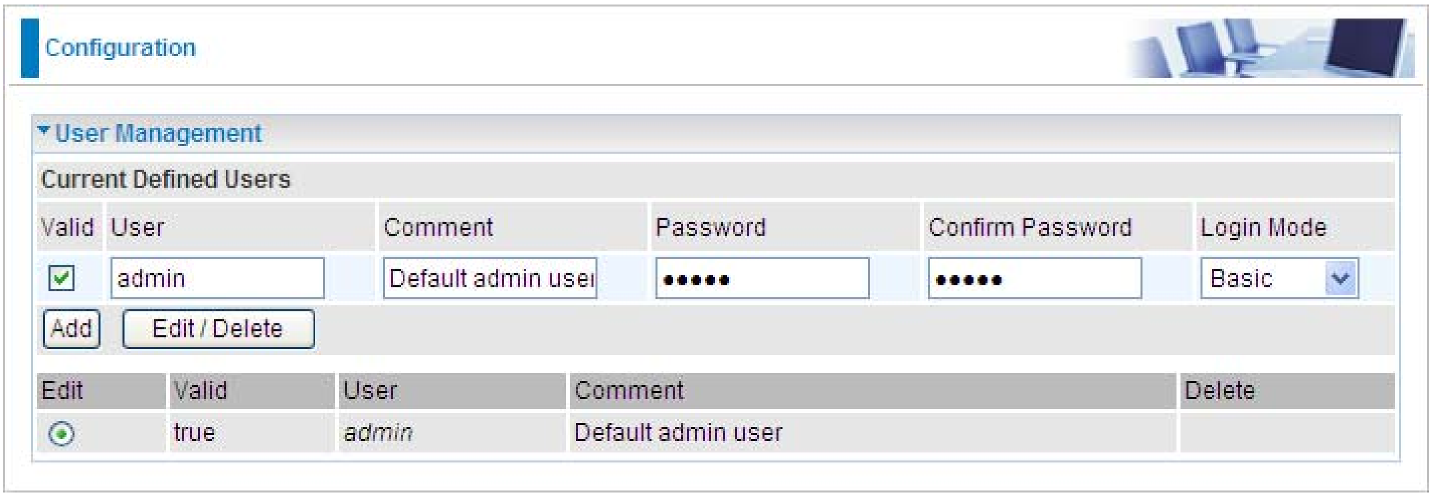
Edit	Valid	User	Comment	Delete
○	true	*admin*	Default admin user	

Edit Account Information

You can change the information of any account whether the account is active or valid.

1. To edit an account, select the Edit radio button of the account to be edited. Once selected, all information of that account will be displayed.
2. Delete the information to be edited and replace it with the new one.
3. When it is done, simply click on the Edit/ Delete button to save your changes.

Note: It is recommended that you change the password immediately to prevent security breach to your GUI.



Configuration

▾User Management

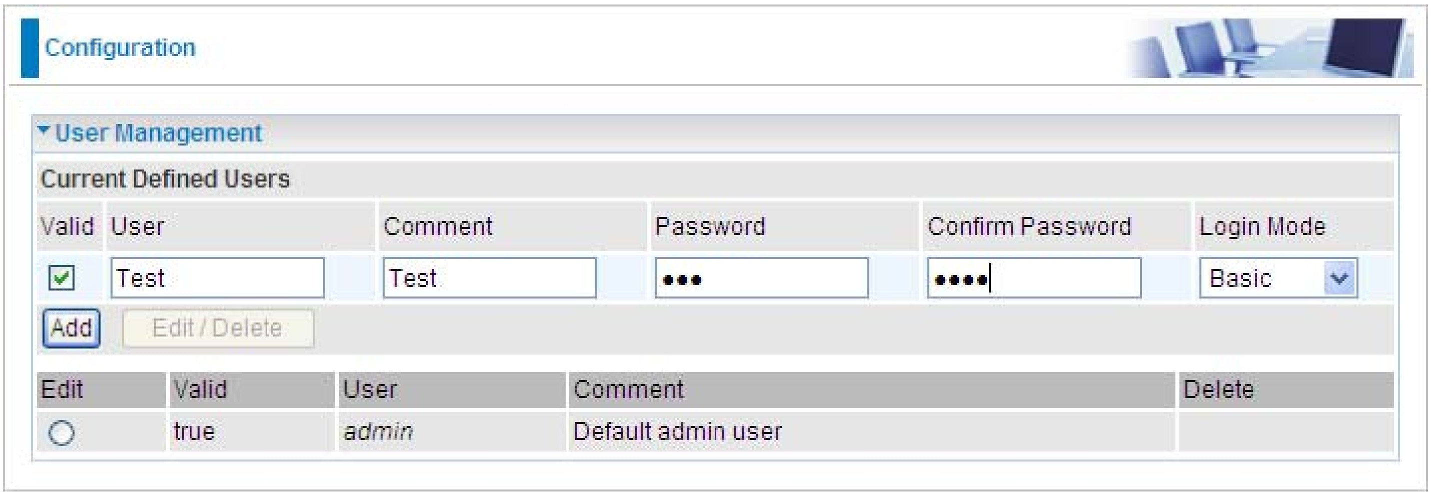
Current Defined Users

Valid	User	Comment	Password	Confirm Password	Login Mode
☑	admin	Default admin usei	●●●●●	●●●●●	Basic

Edit	Valid	User	Comment	Delete
◉	true	*admin*	Default admin user	

To Add an Account

1. Check the Valid checkbox, fill in all the information: User name, Comment (optional), Password, Confirm Password.
2. When it is done, click the Add button.



Configuration

User Management

Current Defined Users

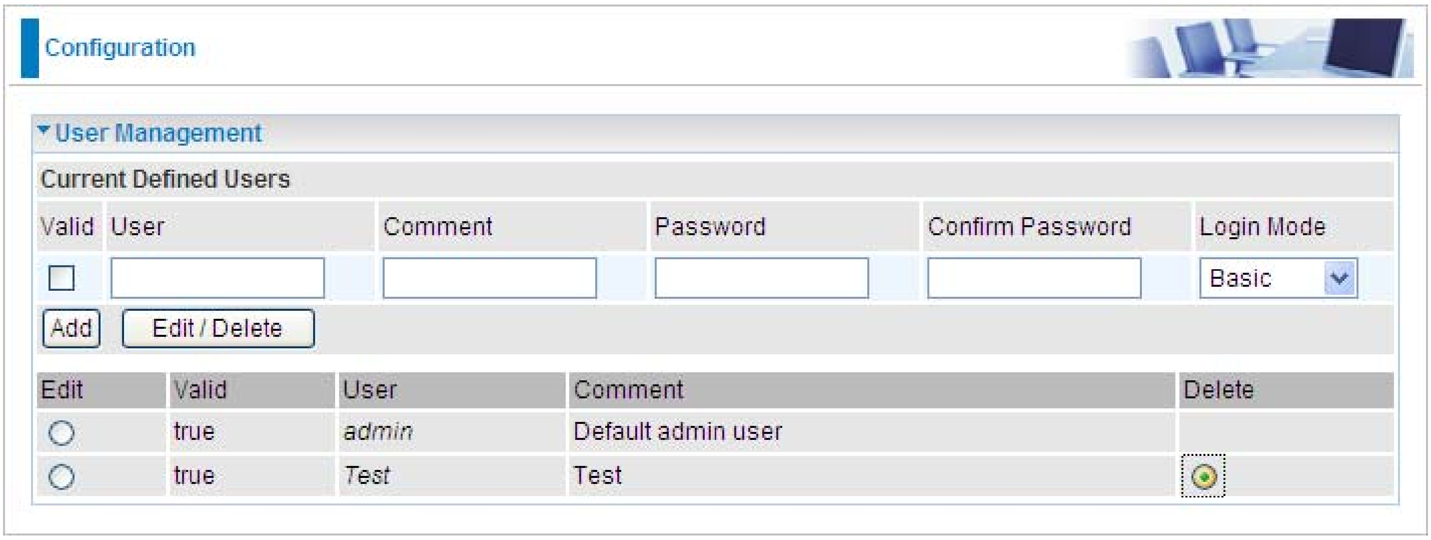
Valid	User	Comment	Password	Confirm Password	Login Mode
☑	Test	Test	•••	••••	Basic

Edit	Valid	User	Comment	Delete
○	true	admin	Default admin user	

To delete a user account

1. Click on the Delete radio button of the account you want to delete.
2. Then click the Edit/Delete to confirm the deletion.

Note: You can delete any user account except for the default admin account. Thus there is no delete radio button available for this account.



Configuration

User Management

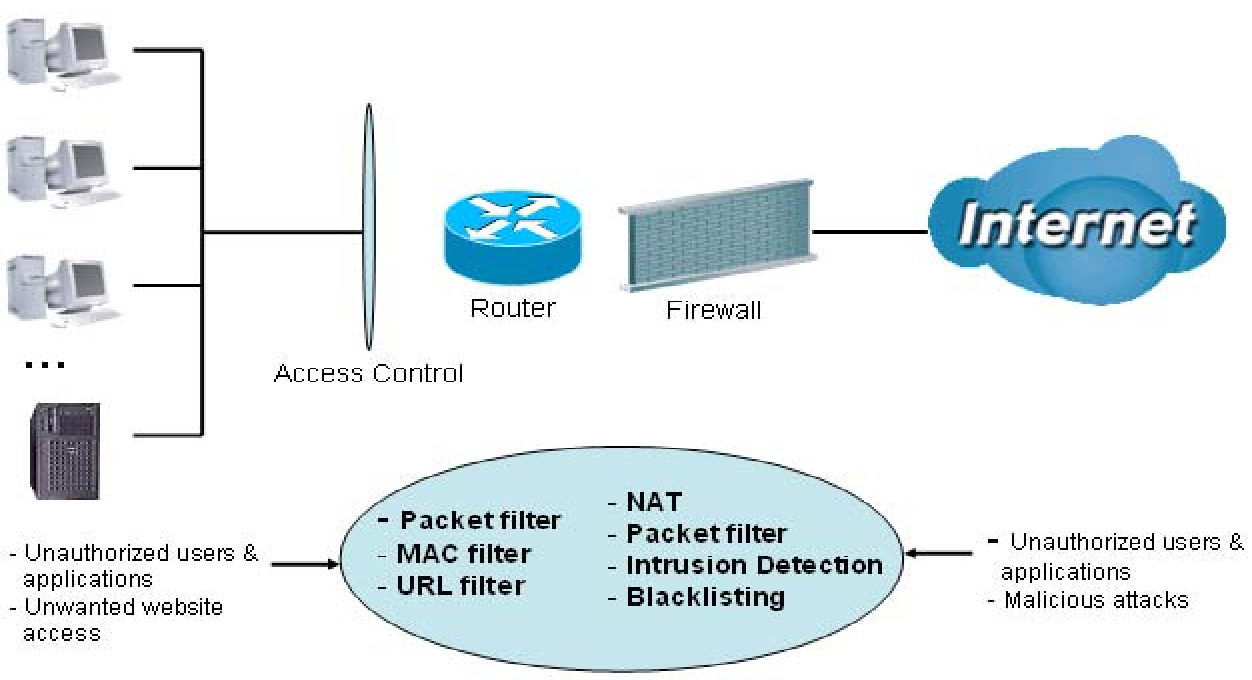
Current Defined Users

Valid	User	Comment	Password	Confirm Password	Login Mode
□					Basic

Edit	Valid	User	Comment	Delete
○	true	admin	Default admin user	
○	true	Test	Test	●

Firewall and Access Control

Your router includes a full SPI (Stateful Packet Inspection) firewall for Internet access controlling from your LAN. This feature also protects your system from being attacked by hackers. When using NAT, the router acts as a “natural” Internet firewall, as all PCs on your LAN will have their own private IP addresses which are not directly accessible from the Internet. The router provides three levels of security support.



Firewall & Filter

NAT natural firewall: This masks LAN users’ IP addresses which are invisible to users on the Internet, thus making it more difficult for a hacker to target a machine on your network. This natural firewall is turned on when NAT function is enabled.

Firewall Security and Policy (General Settings): Inbound direction of Packet Filter rules to prevent unauthorized computers or applications to access your local network from the Internet.

Intrusion Detection: Enable Intrusion Detection to detect, prevent and log malicious attacks.

Access Control: Prevent access from PCs on your local network:

Firewall Security and Policy (General Settings): Outbound direction of Packet Filter rules to prevent unauthorized computers or applications from accessing the Internet.

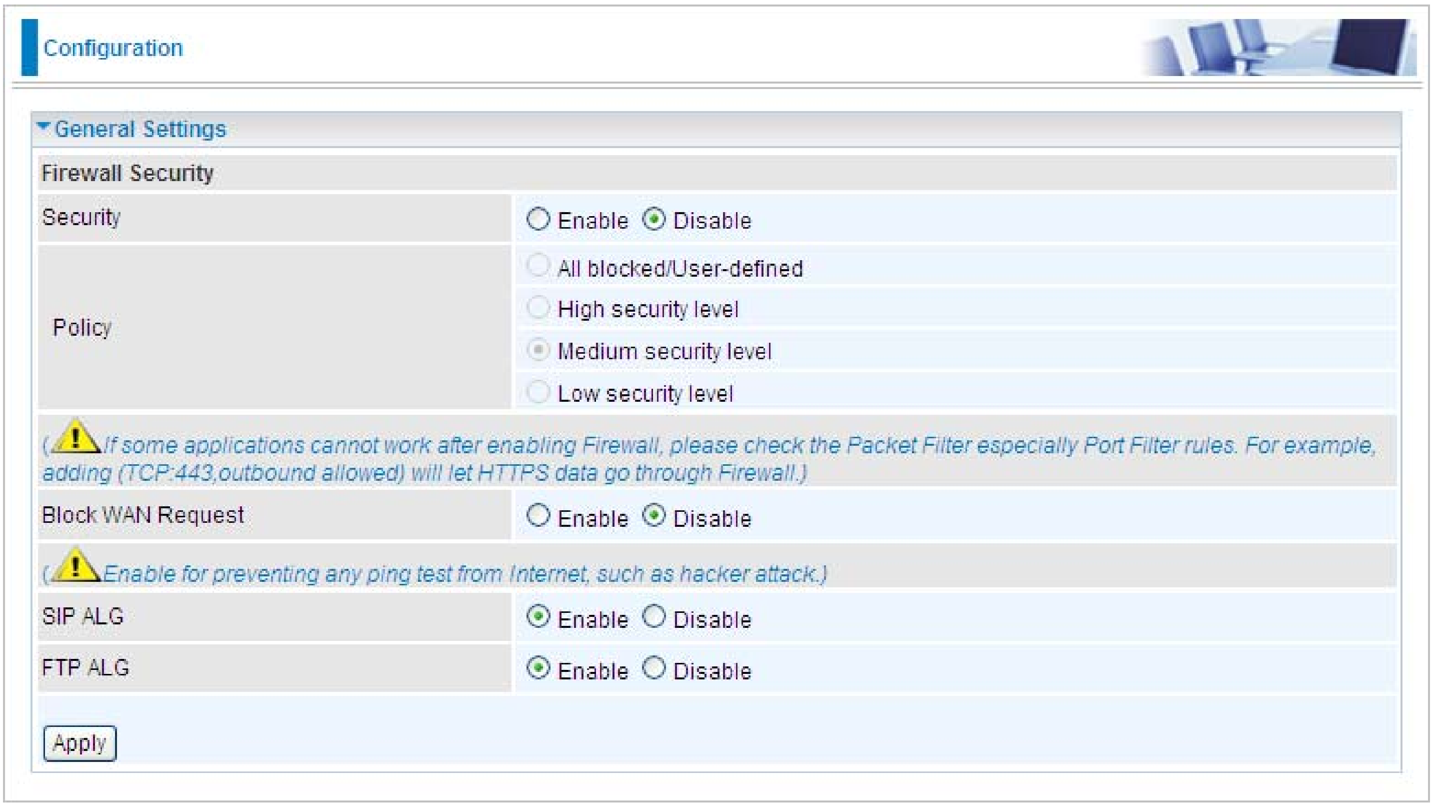
URL Filter: To block PCs on your local network from unwanted websites.

NOTE: When using Virtual Server, your PC will thus become exposed in a certain degree to unknown users if specific ports are set to open in the firewall packet filter setting. The degree of exposure depends on the parameter set in the Virtual Server Setting.

Listed are the items under the Firewall section: **General Settings, Packet Filter, Intrusion Detection, URL Filter, IM/P2P Blocking** and **Firewall Log.**

General Settings

You can choose to disable Firewall and still be able to access the URL Filter, Intrusion Detection and IM/P2P Blocking or enable the Firewall using the preset filter rules and modify the port filter rules as required. The Packet Filter is used to filter packets based on Applications (Port) or IP addresses.



Configuration

General Settings

Firewall Security

Security	○ Enable ● Disable
Policy	○ All blocked/User-defined ○ High security level ● Medium security level ○ Low security level

(⚠If some applications cannot work after enabling Firewall, please check the Packet Filter especially Port Filter rules. For example, adding (TCP:443,outbound allowed) will let HTTPS data go through Firewall.)

Block WAN Request	○ Enable ● Disable

(⚠Enable for preventing any ping test from Internet, such as hacker attack.)

SIP ALG	● Enable ○ Disable
FTP ALG	● Enable ○ Disable

There are four policy options to choose from:

All blocked/User-defined: no predefined port or address filter rules by default, meaning that all inbound (Internet to LAN) and outbound (LAN to Internet) packets will be blocked. Users have to add their own filter rules to access the Internet.

High/Medium/Low security level: the predefined port filter rules for High, Medium and Low security are displayed in the Port Filters of the Packet Filter.

Select either High, Medium or Low security level to enable Firewall protection. The only difference between these three is the preset port filter rules in the Packet Filter. Firewall function is the same for all levels; it is only the list of preset port filters that changes between each setting. For more detail on level of preset port filter information, please refer to **Table 1: Predefined Port Filter**.

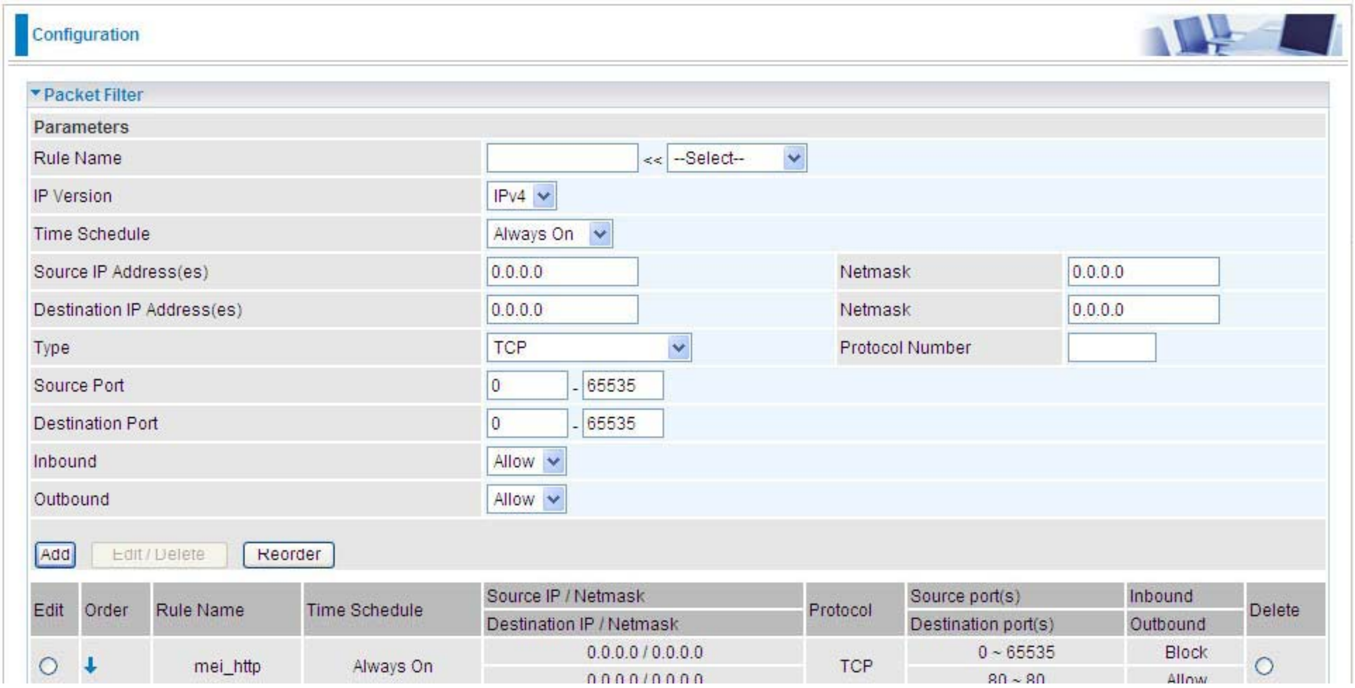
If you choose the preset security levels and add custom filters, the level of filter rules will be saved and you do not need to re-configure the rules again if you disable or switch to the other security level.

The "Block WAN Request" is a standalone function that is not affected by whether the security is enabled or disabled. This is used to prevent any scan tools that might be from hackers.

NOTE! Any remote user attempting to perform this action may result in blocking all accesses to configure and manage the device from the Internet.

Packet Filter

This function is only available when Firewall is enabled with one of the four security levels selected (All blocked, High, Medium and Low). The preset port filter rules in the Packet Filter must be modified accordingly to the level of security selected. See Table1: Predefined Port Filter for more detail information.



Parameters

Rule Name	<< --Select--		
IP Version	IPv4		
Time Schedule	Always On		
Source IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Destination IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Type	TCP	Protocol Number	
Source Port	0 - 65535		
Destination Port	0 - 65535		
Inbound	Allow		
Outbound	Allow		

Edit	Order	Rule Name	Time Schedule	Source IP / Netmask Destination IP / Netmask	Protocol	Source port(s) Destination port(s)	Inbound Outbound	Delete
○	↓	mei_http	Always On	0.0.0.0 / 0.0.0.0 0.0.0.0 / 0.0.0.0	TCP	0 ~ 65535 80 ~ 80	Block Allow	○

Example: Predefined Port Filters Rules

The predefined port filter rules for High, Medium and Low security levels are listed. See Table 1.

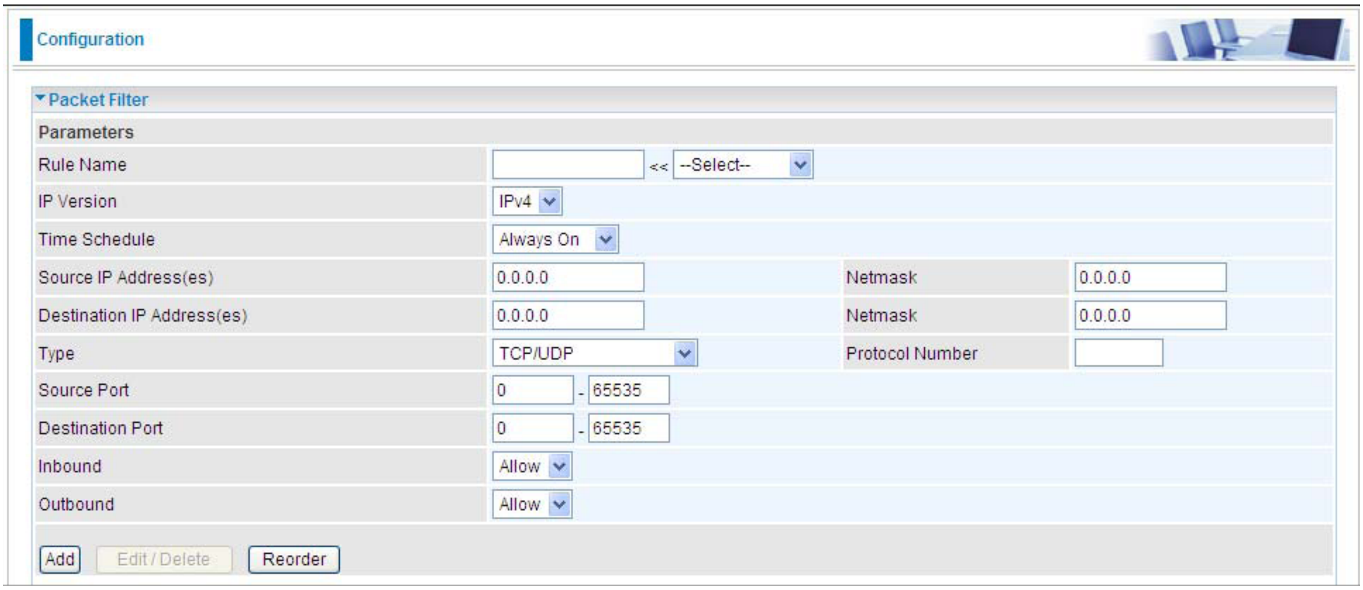
Note: Firewall – All Blocked/User-defined, you must define and create the port filter rules yourself. No predefined rule is being preconfigured.

Table 1: Predefined Port Filter

Application	Protocol	Port Number		Firewall - Low		Firewall - Medium		Firewall – High	
HTTP(80)	TCP(6)	80	80	NO	YES	NO	YES	NO	YES
DNS(53)	UDP	53	53	NO	YES	NO	YES	NO	YES
DNS(53)	TCP(6)	53	53	NO	YES	NO	YES	NO	YES
FTP(21)	TCP(6)	21	21	NO	YES	NO	YES	NO	NO
Telnet(23)	TCP(6)	23	23	NO	YES	NO	YES	NO	NO
SMPT(25)	TCP(6)	25	25	NO	YES	NO	YES	NO	YES
POP3(110)	TCP(6)	110	110	NO	YES	NO	YES	NO	YES
NEWS(NNTP)	TCP(6)	119	119	NO	YES	NO	YES	NO	NO
PING	ICMP(1)	N/A	N/A	NO	YES	NO	YES	NO	YES
H.323(1720)	TCP(6)	1720	1720	YES	YES	NO	YES	NO	NO
T.120(1503)	TCP(6)	1503	1503	YES	YES	NO	YES	NO	NO
SSH(22)	TCP(6)	22	22	NO	YES	NO	YES	NO	NO
NTP/SNTP	UDP(17)	123	123	NO	YES	NO	YES	NO	YES
HTTP/HTTP Proxy(8080)	TCP(6)	8080	8080	NO	YES	NO	NO	NO	NO
HTTPS(443)	TCP(6)	443	443	NO	YES	NO	YES	N/A	N/A
ICQ(5190)	TCP(6)	5190	5190	YES	YES	N/A	N/A	N/A	N/A
MSN(1863)	TCP(6)	1863	1863	YES	YES	N/A	N/A	N/A	N/A
MSN(7001)	UDP(17)	7001	7001	YES	YES	N/A	N/A	N/A	N/A
MSN VEDIO	TCP(6)	9000	9000	NO	YES	N/A	N/A	N/A	N/A

Inbound: Internet to LAN
Outbound: LAN to Internet
YES: Allowed
NO: Blocked
N/A: Not Applicable

Packet Filter – Add TCP/UDP Filter



Parameters

Rule Name	<< --Select--		
IP Version	IPv4		
Time Schedule	Always On		
Source IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Destination IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Type	TCP/UDP	Protocol Number	
Source Port	0 - 65535		
Destination Port	0 - 65535		
Inbound	Allow		
Outbound	Allow		

Rule Name Helper: User defined description for entry identification. You may also choose from the Select drop-down menu for an existing predefined rule. The maximum name length is 32 characters.

Time Schedule: A self defined time period. You may specify a time schedule for your prioritization policy. For setup and detail, refer to Time Schedule section.

Source IP Address (es) / Destination IP Address (es): This is the Address-Filter used to allow or block traffic to/from particular IP address (es). Select the Subnet Mask of the IP address range you wish to allow/block the traffic to or from. 0.0.0.0 means all IP Addresses.

Tip: To block access, to/from a single IP address, enter that IP address as the Host IP Address and use a Host Subnet Mask of "255.255.255.255".

Type: It is the packet protocol type used by the application, select TCP, UDP or both TCP/UDP.

Protocol Number: Insert the port number.

Source Port: This Port or Port Ranges defines the port allowed to be used by the Remote/WAN to connect to the application. Default is set from range 0 ~ 65535. It is recommended that this option be configured by an advanced user.

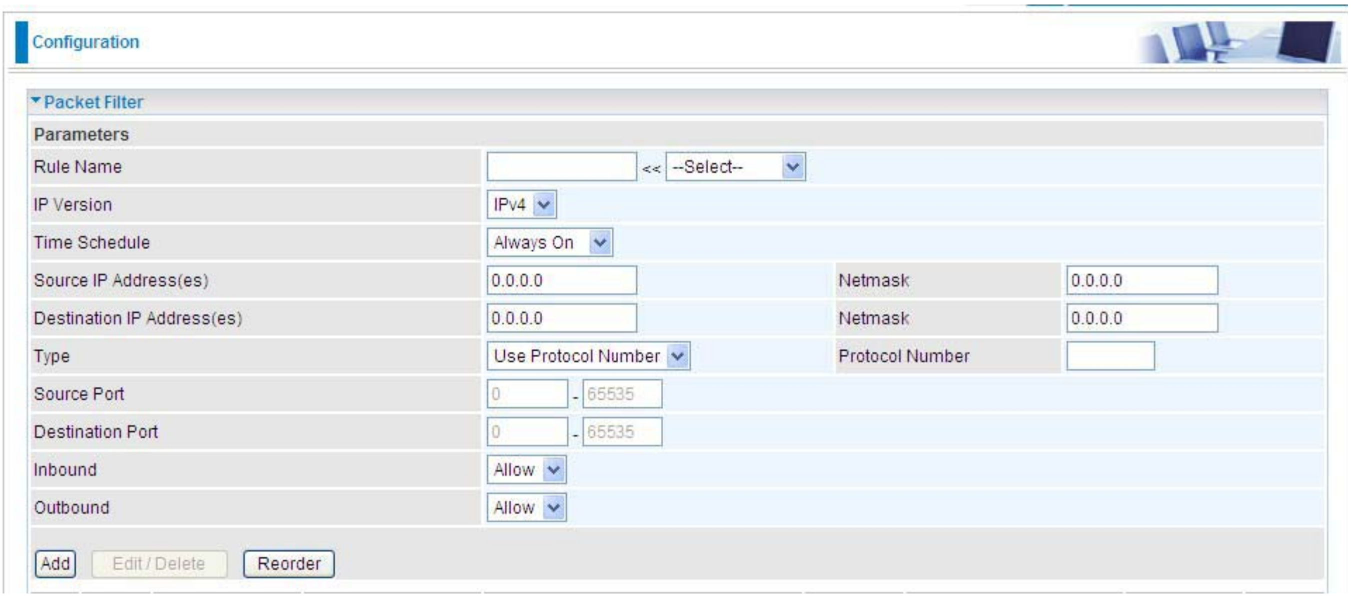
Destination Port: This is the Port or Port Ranges that defines the application.

Inbound / Outbound: Select Allow or Block the access to the Internet ("Outbound") or from the Internet ("Inbound").

When all changes are made, click Add button to apply your changes.

Packet Filter – Add Raw IP Filter

Go to “Type” drop-down menu, select “Use Protocol Number”.



Configuration

Packet Filter

Parameters

Rule Name	<< --Select--		
IP Version	IPv4		
Time Schedule	Always On		
Source IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Destination IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Type	Use Protocol Number	Protocol Number	
Source Port	0 - 65535		
Destination Port	0 - 65535		
Inbound	Allow		
Outbound	Allow		

Rule Name Helper: User defined description for entry identification. You may also choose from the Select drop-down menu for an existing predefined rule.

Time Schedule: A self defined time period. You may specify a time schedule for your prioritization policy. For setup and detail, refer to Time Schedule section.

Source IP Address (es) / Destination IP Address (es): This is the Address-Filter used to allow or block traffic to/from particular IP address (es). Select the Subnet Mask of the IP address range you wish to allow/block the traffic to or from; 0.0.0.0 means all IP Addresses.

Tip: To block access to/from a single IP address, enter that IP address as the Host IP Address and use a Host Subnet Mask of “255.255.255.255”.

Type: It is the packet protocol type used by the application, select TCP, UDP or both TCP/UDP.

Protocol Number: Insert the port number, i.e. GRE 47.

Source Port: This Port or Port Ranges defines the port allowed to be used by the Remote/WAN to connect to the application. Default is set from range 0 ~ 65535. It is recommended that this option be configured by an advanced user.

Destination Port: This is the Port or Port Ranges that defines the application.

Inbound / Outbound: Select Allow or Block the access to the Internet (“Outbound”) or from the Internet (“Inbound”).

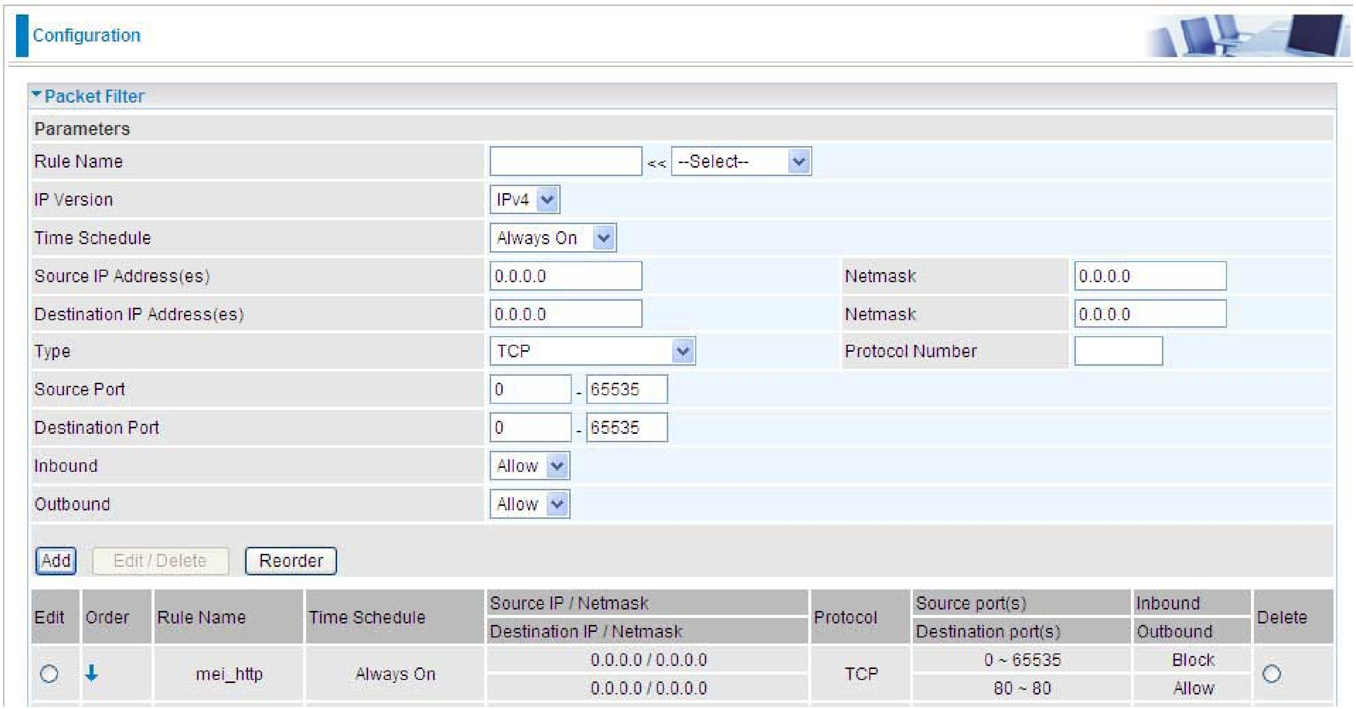
When all changes are made, click Add button to apply your changes.

Example: Configuring your firewall to allow a publicly accessible web server on your LAN

The predefined port filter rule for HTTP (TCP port 80) is the same whether the firewall is set to a high, medium or low security level. To setup a web server located on the local network when the firewall is enabled, you have to configure the Port Filters setting for HTTP.

As you can see from the diagram below, when the firewall is enabled with one of the three presets (Low/Medium/High) security level selected, an inbound HTTP access is not allowed which means remote access through HTTP to your router is not allowed.

Note: Inbound indicates accessing from the Internet to LAN and Outbound is from LAN to the Internet.



Configuration

▾Packet Filter

Parameters

Rule Name	<< --Select--		
IP Version	IPv4		
Time Schedule	Always On		
Source IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Destination IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Type	TCP	Protocol Number	
Source Port	0 - 65535		
Destination Port	0 - 65535		
Inbound	Allow		
Outbound	Allow		

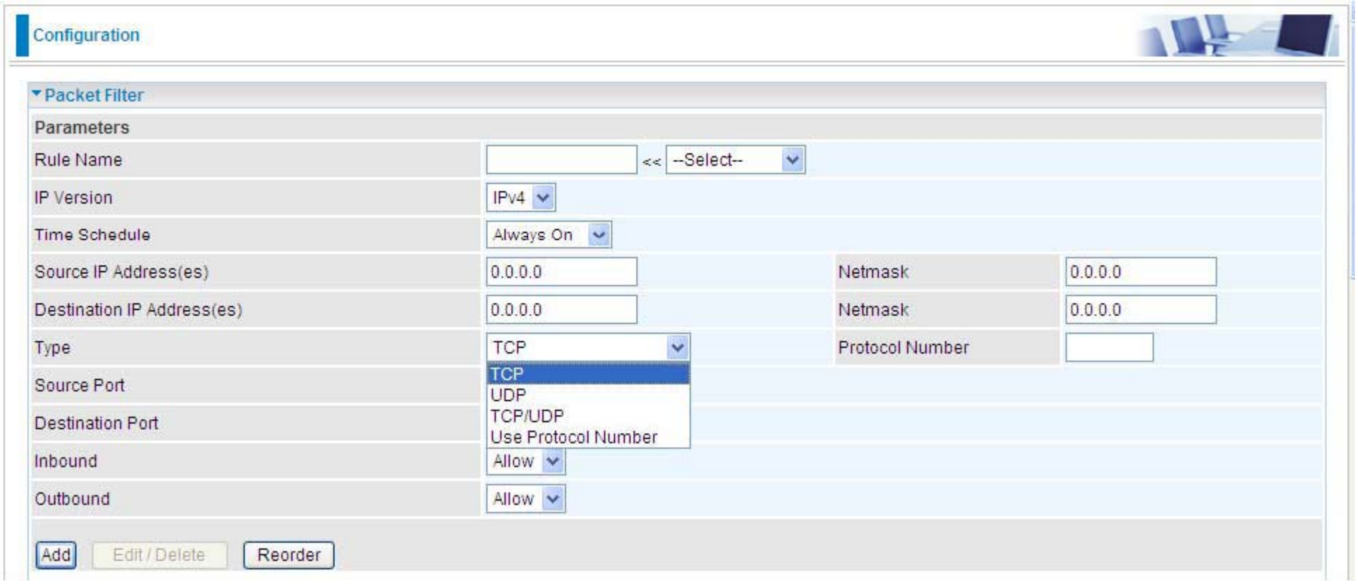
Add | Edit / Delete | Reorder

Edit	Order	Rule Name	Time Schedule	Source IP / Netmask	Protocol	Source port(s)	Inbound	Delete
				Destination IP / Netmask		Destination port(s)	Outbound	
○	↓	mei_http	Always On	0.0.0.0 / 0.0.0.0	TCP	0 ~ 65535	Block	○
				0.0.0.0 / 0.0.0.0		80 ~ 80	Allow	

Configuring Packet Filter:

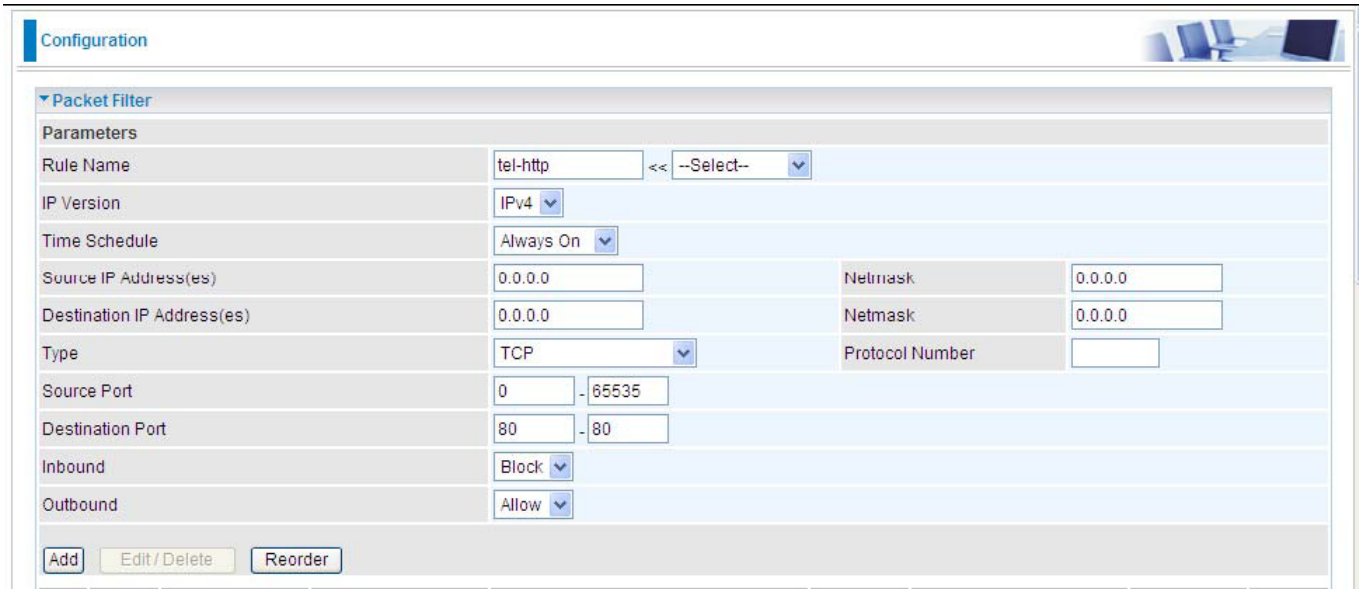
1. Click Packet Filters. You will then be presented with the predefined port filter rules screen (in this case for the low security level), shown below:

Note: You may click Edit the predefined rule instead of Delete it. This is an example to show to how you add a filter on your own.



Parameters			
Rule Name			
IP Version	IPv4		
Time Schedule	Always On		
Source IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Destination IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Type	TCP	Protocol Number	
Source Port			
Destination Port			
Inbound	Allow		
Outbound	Allow		

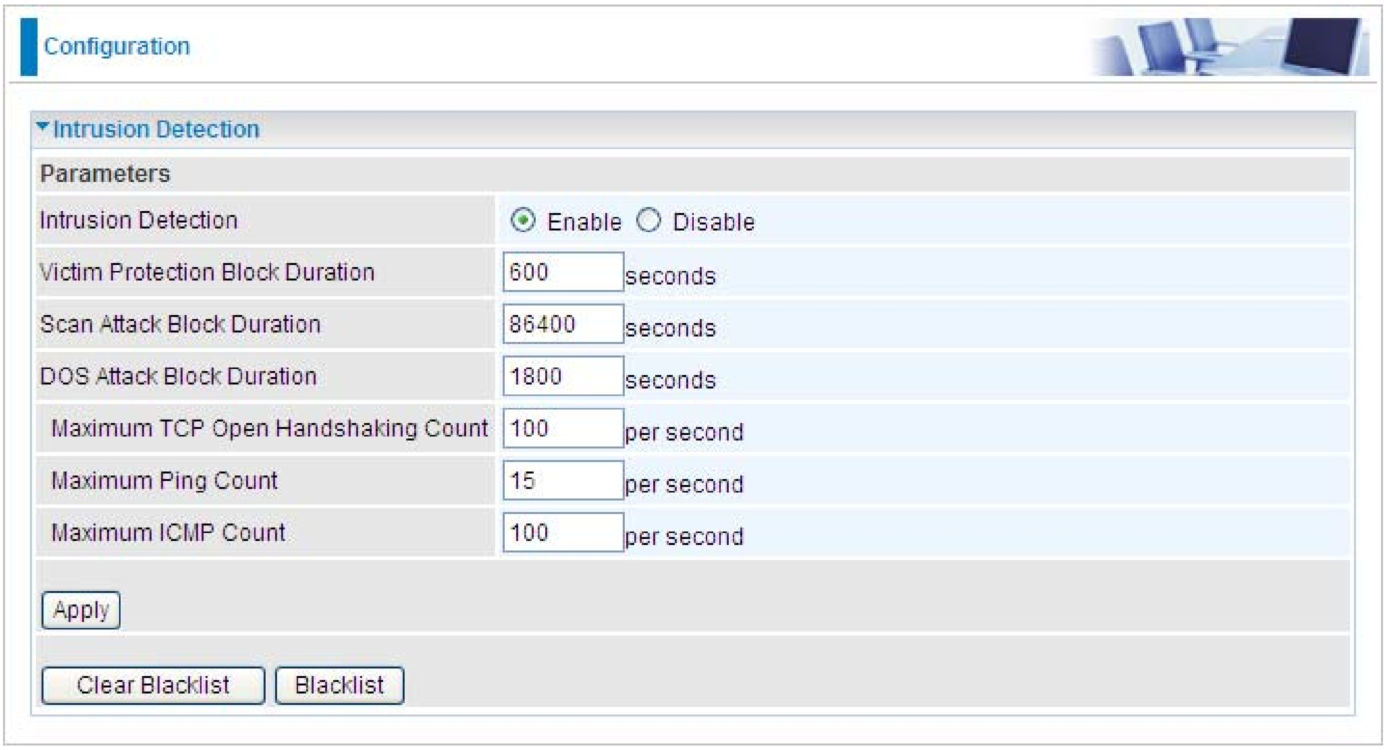
2. If you want to delete a filter rule, select the delete radio button of the HTTP rule you want to delete. Then click the Edit/Delete button to delete the rule.



Parameters			
Rule Name	tel-http		
IP Version	IPv4		
Time Schedule	Always On		
Source IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Destination IP Address(es)	0.0.0.0	Netmask	0.0.0.0
Type	TCP	Protocol Number	
Source Port	0 - 65535		
Destination Port	80 - 80		
Inbound	Block		
Outbound	Allow		

3. To add a new rule, Input the Rule Name, Time Schedule, Source/Destination IP, Type, Source / Destination Port, Inbound and Outbound. Then click the Add button.

Intrusion Detection



Configuration

▾Intrusion Detection

Parameters	
Intrusion Detection	● Enable ○ Disable
Victim Protection Block Duration	600 seconds
Scan Attack Block Duration	86400 seconds
DOS Attack Block Duration	1800 seconds
Maximum TCP Open Handshaking Count	100 per second
Maximum Ping Count	15 per second
Maximum ICMP Count	100 per second

The router Intrusion Detection System (IDS) is used to detect hacker's attack and intrusion attempts from the Internet. If the IDS function of the firewall is enabled, inbound packets are filtered and blocked depending on whether they are detected as possible hacker attacks, intrusion attempts or other connections that the router determines to be suspicious.

Blacklist: If the router detects a possible attack, the source IP or destination IP address will beaded to the Blacklist. Any further attempts using this IP address will be blocked for the time period specified in the Block Duration. The default setting for this function is false (disabled). Some types of attack are denied immediately without using the Blacklist function, such as Land attack and Echo / CharGen scan.

Intrusion Detection: If enabled, IDS will block Smurf attack attempts. Default is false.

Block Duration:

Victim Protection Block Duration: This is the duration for blocking *Smurf* attacks. Default value is 600 seconds.

Scan Attack Block Duration: This is the duration for blocking hosts that attempt a possible Scan attack. Scan attack types include *X'mas scan, IMAP SYN/FIN scan* and similar attempts. Default value is 86400 seconds.

DoS Attack Block Duration: This is the duration for blocking hosts that attempt a possible Denial of Service (DoS) attack. Possible DoS attacks this attempts to block include *Ascend Kill* and *WinNuke*. Default value is 1800 seconds.

Max TCP Open Handshaking Count: This is a threshold value to decide whether a *SYN Flood* attempt is occurring or not. Default value is 100 TCP SYN per seconds.

Max PING Count: This is a threshold value to decide whether an *ICMP Echo Storm* is occurring or not. Default value is 15 ICMP Echo Requests (PING) per second.

Max ICMP Count: This is a threshold to decide whether an *ICMP flood* is occurring or not. Default value is 100 ICMP packets per seconds except ICMP Echo Requests (PING).

Clear Blacklist: Clear the current blacklist.
Blacklist: Show the blacklist information.

For SYN Flood, ICMP Echo Storm and ICMP flood, IDS will just warn the user in the Event Log. It cannot protect against such attacks.

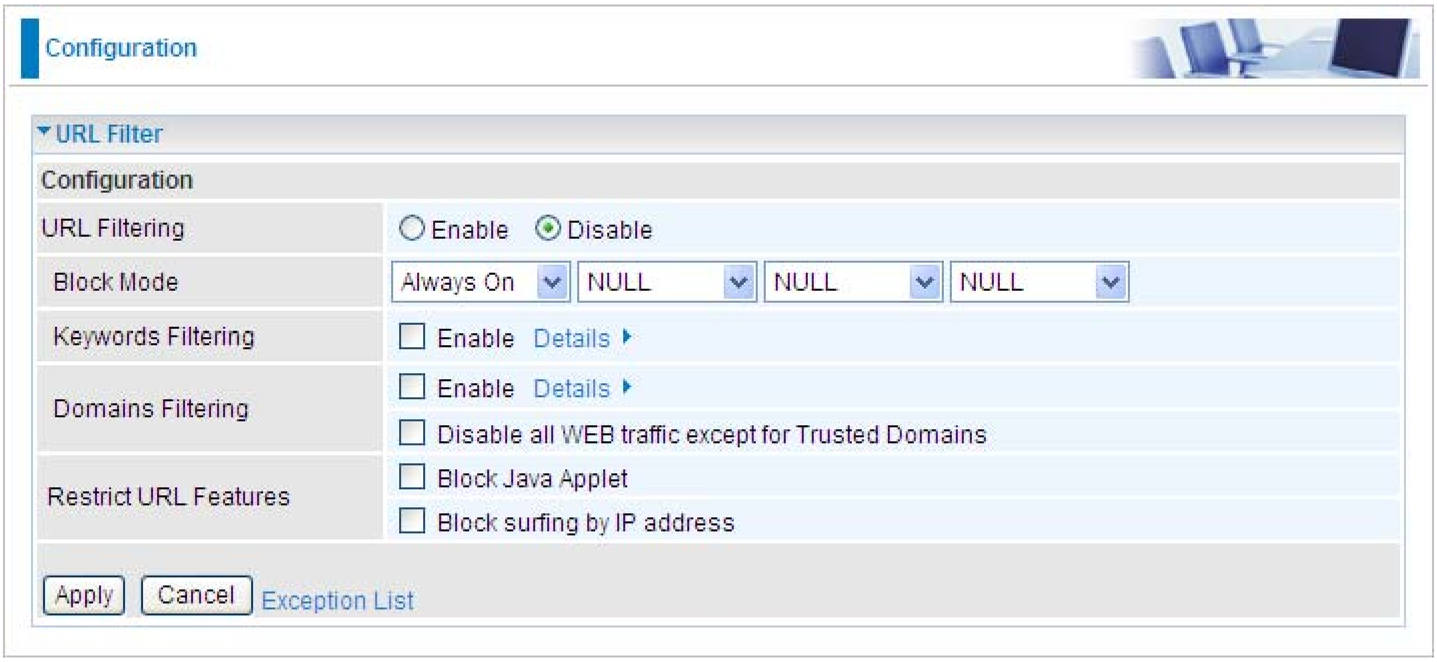
Table 2: Hacker attack types recognized by the IDS

Intrusion Name	Detect Parameter	Blacklist	Type of Block Duration	Drop Packet	Show Log
Ascend Kill	Ascend Kill data	Src IP	DoS	Yes	Yes
WinNuke	TCP Port 135, 137~139, Flag: URG	Src IP	DoS	Yes	Yes
Smurf	ICMP type 8 Des IP is broadcast	Dst IP	Victim Protection	Yes	Yes
Land attack	SrcIP = DstIP			Yes	Yes
Echo/CharGen Scan	UDP Echo Port and CharGen Port			Yes	Yes
Echo Scan	UDP Dst Port = Echo(7)	Src IP	Scan	Yes	Yes
CharGen Scan	UDP Dst Port = CharGen(19)	Src IP	Scan	Yes	Yes
X'mas Tree Scan	TCP Flag: X'mas	Src IP	Scan	Yes	Yes
IMAP SYN/FIN Scan	TCP Flag: SYN/FIN DstPort: IMAP(143) SrcPort: 0 or 65535	Src IP	Scan	Yes	Yes
SYN/FIN/RST/ACK Scan	TCP, No Existing session And Scan Hosts more than five.	Src IP	Scan	Yes	Yes
Net Bus Scan	TCP No Existing session DstPort = Net Bus 12345,12346, 3456	SrcIP	Scan	Yes	Yes
Back Orifice Scan	UDP, DstPort = Orifice Port (31337)	SrcIP	Scan	Yes	Yes
SYN Flood	Max TCP Open Handshaking Count (Default 100 c/sec)				Yes
ICMP Flood	Max ICMP Count (Default 100 c/sec)				Yes
ICMP Echo	Max PING Count (Default 15 c/sec)				Yes

Src IP: Source IP
Src Port: Source Port
Dst Port: Destination Port
Dst IP: Destination IP

URL Filter

URL (Uniform Resource Locator) (e.g. an address in the form of http://www.abcde.com or http://www.example.com) filter rule allows you to prevent users on your network from accessing specific websites defined by their URL. There are no predefined URL filter rules, therefore you can add filter rules to meet your requirements.



Configuration

▾URL Filter

Configuration	
URL Filtering	○ Enable ● Disable
Block Mode	Always On ▾ NULL ▾ NULL ▾ NULL ▾
Keywords Filtering	□ Enable Details ▸
Domains Filtering	□ Enable Details ▸ □ Disable all WEB traffic except for Trusted Domains
Restrict URL Features	□ Block Java Applet □ Block surfing by IP address

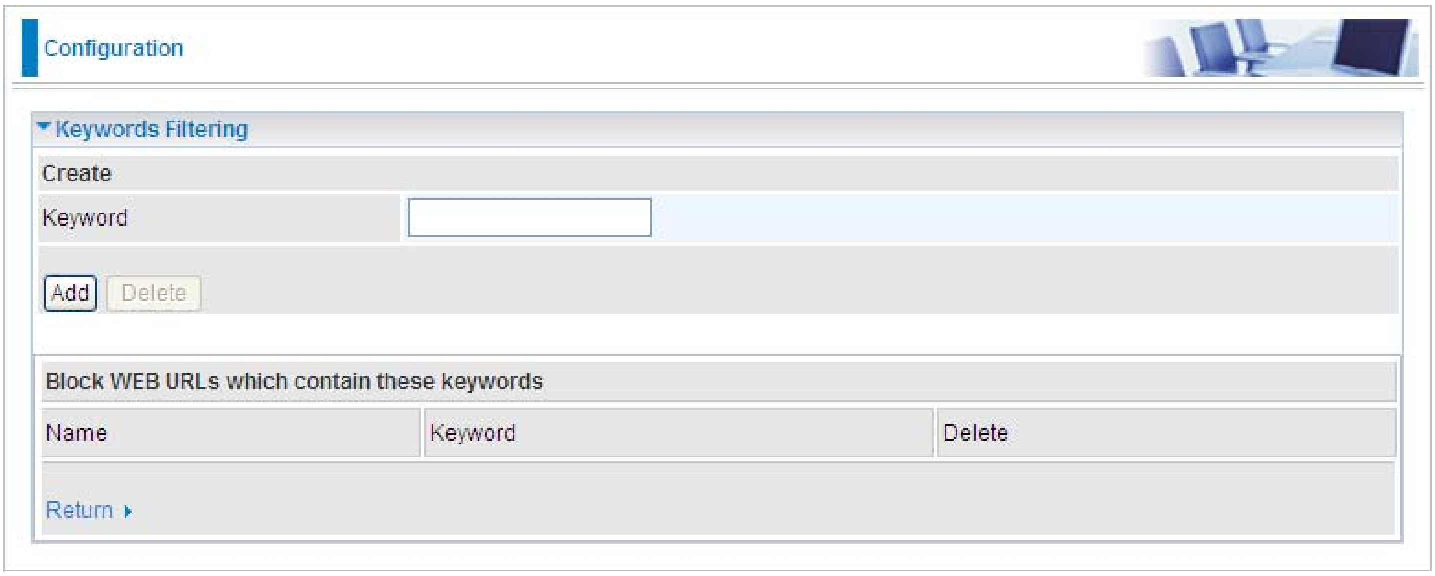
Enable/Disable: To enable or disable URL Filter feature.

Block Mode: It can support up to 4 timeslots.

- **Disabled:** No action will be performed by the Block Mode.
- **Always On:** Action is enabled. URL filter rules will be monitoring and checking all hours of the day.
- **TimeSlot1 ~ TimeSlot16:** It is self-defined time period. You may specify the time period to check the URL filter rules, i.e. during working hours. For setup and detail, refer to **Time Schedule** section.

Keywords Filtering: Allow blocking against specific keywords within a particular URL rather than having to specify a complete URL (e.g. to block any image called “advertisement.gif”). When enabled, your specified keywords list will be checked to see if any keywords are present in URLs accessed to determine if the connection attempt should be blocked. Please note that the URL filter blocks web browser (HTTP) connection attempts using port 80 only.

For example, if the URL is http://www.abc.com/abcde.html, the connection will be dropped if the keyword "abcde" occurs in the URL.



Configuration

▾Keywords Filtering

Create	
Keyword	

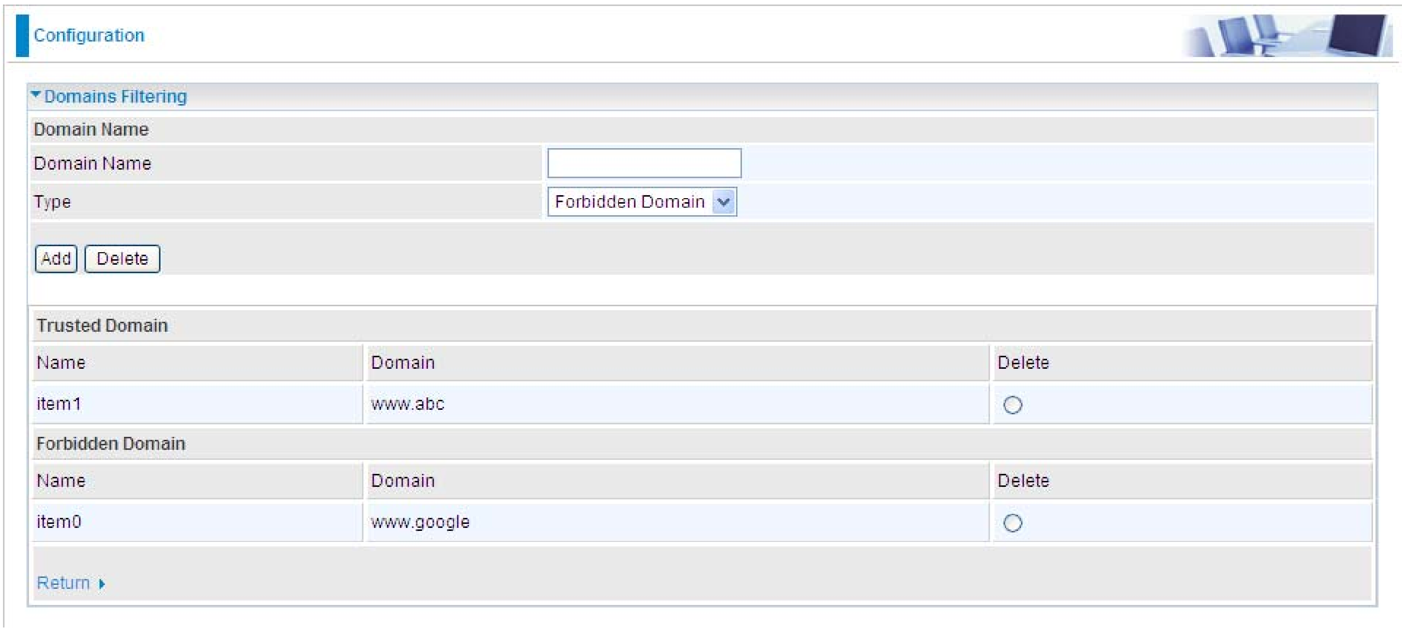
Block WEB URLs which contain these keywords

Name	Keyword	Delete

Domains Filtering: This function checks the whole URL address but not the IP address against your list of domains to block or allow. If it is matched, the URL request will either be sent (Trusted) or dropped (Forbidden). For this function to be activated, both enable and disable checkboxes of Domain Filtering must be checked. Here is the checking procedure:

1. Check the domain in the URL to determine if it is in the trusted list. If yes, the connection attempt is sent to the remote web server.
2. If not, check if it is listed in the forbidden list. If yes, then the connection attempt will be dropped.
3. If the packet does not match either of the above two conditions, it is sent to the remote web server.
4. Please be noted that the completed URL, "www" + domain name should be specific. e.g.: In order to block traffic to **www.google.com.au**, enter "**www.google**" or "**www.google.com**"

In the example below, the URL request for **www.abc.com** will be sent to the remote web server because it is listed in the trusted list, whilst the URL request for **www.google** or **www.google.com** will be dropped, because **www.google** is in the forbidden list.



Configuration

▾Domains Filtering

Domain Name	
Domain Name	
Type	Forbidden Domain

Trusted Domain

Name	Domain	Delete
item1	www.abc	○

Forbidden Domain

Name	Domain	Delete
item0	www.google	○

Example:

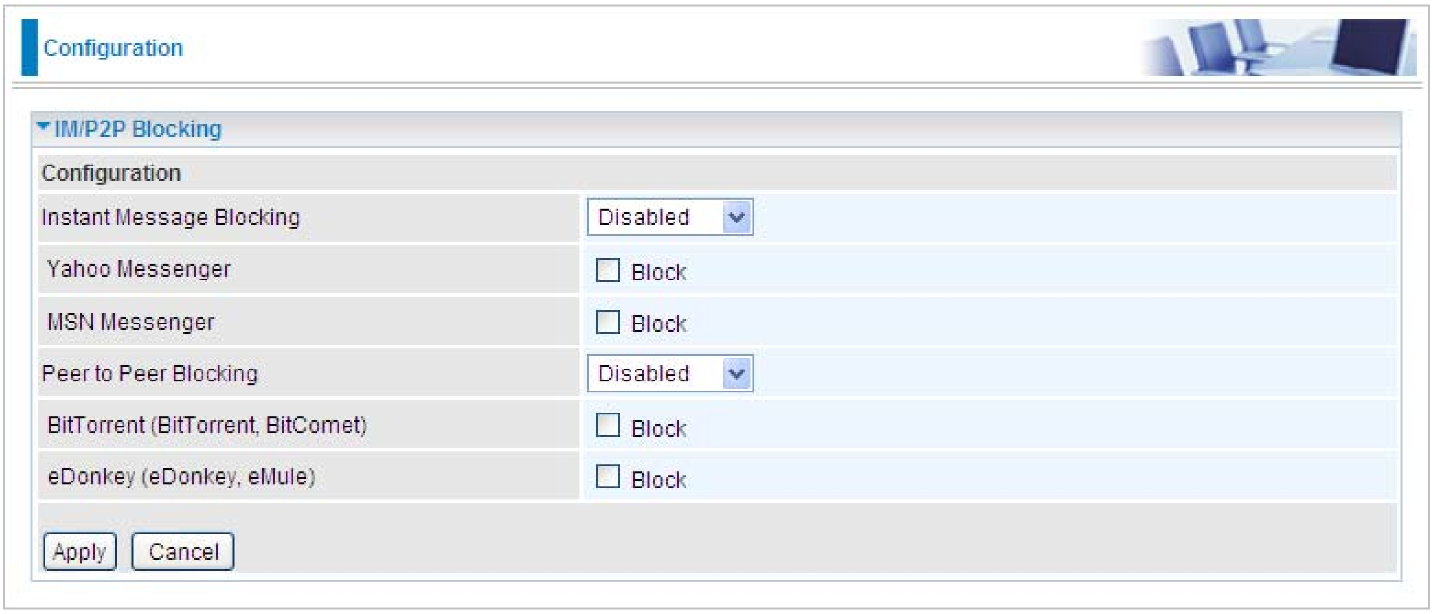
Andy wishes to disable all WEB traffic except for the ones listed in the trusted domain, which would prevent Bobby from accessing other websites. Andy selects both conditions in the Domain Filtering thinking that this will stop Bobby. But Bobby knows this function, Domain Filtering, ONLY disables all WEB traffic except for Trusted Domain, BUT not its IP address. If this is the situation, Block surfing by IP address function can become helpful. Now, Andy can successfully prevent Bobby from accessing other websites.

Restrict URL Features: This function enhances the restriction to your URL rules.

> **Block Java Applet:** This function can block Web content that includes Java Applets. It is to prevent someone who wants to damage your system via standard HTTP protocol.
>
> **Block surfing by IP address:** A further restriction against someone who uses IP address as URL to cheat around the Domains Filtering rule.

IM / P2P Blocking

IM, short for Instant Message, is a client software that allows users to communicate & exchange text messages with other IM users in real time over the Internet. A P2P application, known as Peer-to-peer, is group of users who share their files with each other within the network over the Internet across the globe. Both Instant Message and Peer-to-peer applications make communication faster and easier but your network can become increasingly insecure at the same time. Billion's IM and P2P blocking helps users to restrict LAN PCs to access the commonly used IM, Yahoo and MSN, and P2P, BitTorrent and eDonkey, applications over the Internet.



Configuration

▾IM/P2P Blocking

Configuration	
Instant Message Blocking	Disabled
Yahoo Messenger	□ Block
MSN Messenger	□ Block
Peer to Peer Blocking	Disabled
BitTorrent (BitTorrent, BitComet)	□ Block
eDonkey (eDonkey, eMule)	□ Block

Instant Message Blocking: The default is set to Disabled.

Disabled: Instant Message blocking is not triggered. No action will be performed.

Always On: Action is enabled.

TimeSlot1 ~ TimeSlot16: This is the self defined time period. You may specify the time period to trigger the blocking, i.e. during working hours. For setup and detail, refer to **Time Schedule** section.

Yahoo/MSN Messenger: Check the checkbox to block either or both Yahoo or/and MSN Messenger. To be sure you enabled the *Instant Message Blocking* first.

Peer to Peer Blocking: The default is set to Disabled.

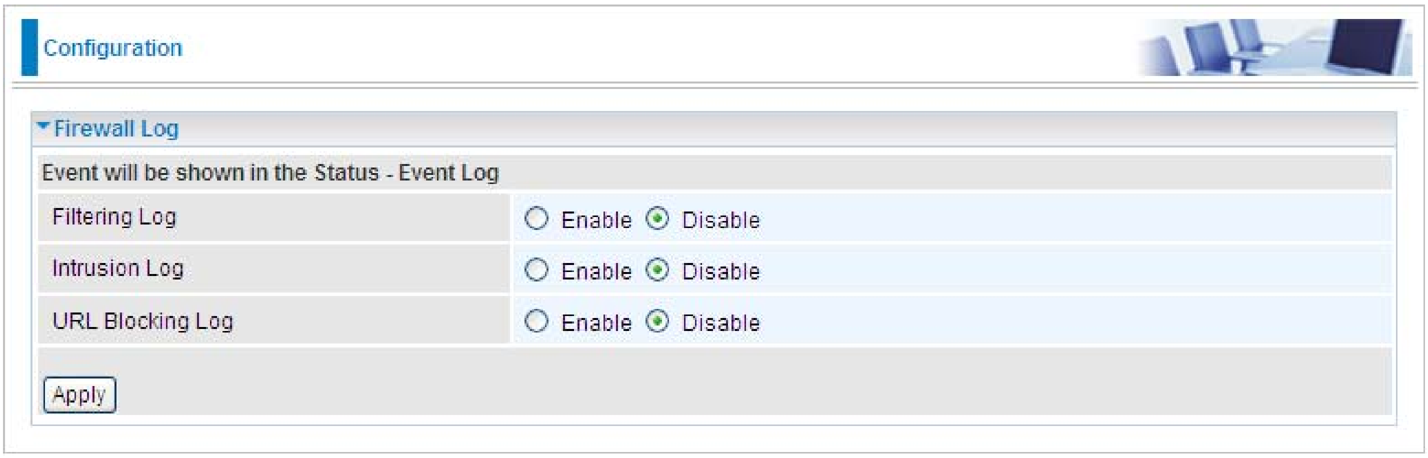
Disabled: Instant Message blocking is not triggered. No action will be performed.

Always On: Action is enabled.

TimeSlot1 ~ TimeSlot16: This is the self defined time period. You may specify the time period to trigger the blocking, i.e. during working hours. For setup and detail, refer to Time Schedule section.

BitTorrent / eDonkey: Check the checkbox to block either or both Bit Torrent or/and eDonkey. To be sure you enabled the Peer to Peer Blocking first.

Firewall Log



Event will be shown in the Status - Event Log

Filtering Log	○ Enable ● Disable
Intrusion Log	○ Enable ● Disable
URL Blocking Log	○ Enable ● Disable

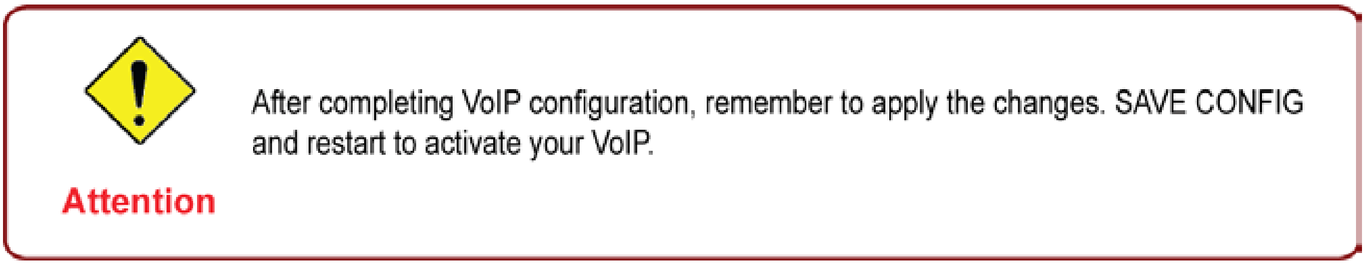
Firewall Log displays a log that contains information of any unexpected actions that occur to your firewall settings.

Check the Enable checkbox to activate event logging.

Log information can be seen in the Status – Event Log after the feature is enabled.

VoIP - Voice over Internet Protocol

VoIP enables telephone calls through existing Internet connection instead of going through the PSTN (Public Switched Telephone Network). It is not only cost-effective, especially for a long distance telephone charges, but also toll-quality voice calls over the Internet.



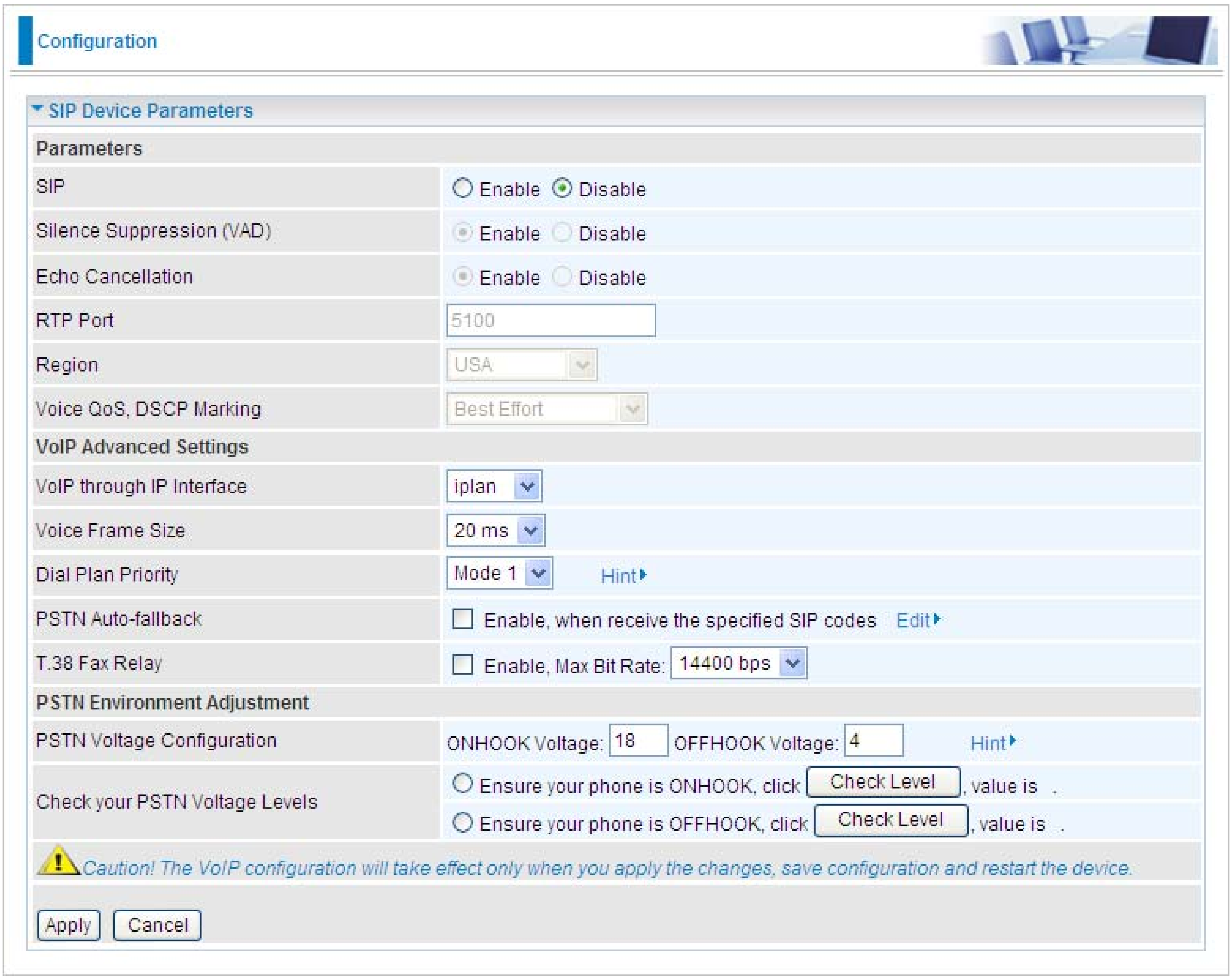
Attention

After completing VoIP configuration, remember to apply the changes. SAVE CONFIG and restart to activate your VoIP.

Here are the items within the VoIP section: **SIP Device Parameters, SIP Accounts, Phone Port, PSTN Dial Plan, VoIP Dial Plan, Call Features, Speed Dial** and **Ring &Tone.**

SIP Device Parameters

This section provides easy setup for your VoIP service. Phone port 1 and 2 can be registered to different SIP Service Provider.



Configuration

▾ SIP Device Parameters

Parameters	
SIP	○ Enable ● Disable
Silence Suppression (VAD)	● Enable ○ Disable
Echo Cancellation	● Enable ○ Disable
RTP Port	5100
Region	USA
Voice QoS, DSCP Marking	Best Effort
VoIP Advanced Settings	
VoIP through IP Interface	iplan
Voice Frame Size	20 ms
Dial Plan Priority	Mode 1 Hint▸
PSTN Auto-fallback	□ Enable, when receive the specified SIP codes Edit▸
T.38 Fax Relay	□ Enable, Max Bit Rate: 14400 bps
PSTN Environment Adjustment	
PSTN Voltage Configuration	ONHOOK Voltage: 18 OFFHOOK Voltage: 4 Hint▸
Check your PSTN Voltage Levels	○ Ensure your phone is ONHOOK, click Check Level , value is . ○ Ensure your phone is OFFHOOK, click Check Level , value is .

⚠ *Caution! The VoIP configuration will take effect only when you apply the changes, save configuration and restart the device.*

Apply Cancel

SIP Device Parameters

SIP: To use VoIP SIP as VoIP call signaling protocol. Default is set to Disable.

Silence Suppression (VAD): Voice Activation Detection (VAD) prevents transmitting the nature silence to consume the bandwidth. It is also known as Silence Suppression which is a software application that ensures the bandwidth is reserved only when voice activity is activated. Default is set to Enable.

Echo Cancellation: G.168 echo canceller is an ITU-T standard. It is used for isolating the echo while you are on the phone. This helps you not to hear much of your own voice reflecting on the phone while you talk. Default is set to Enable.

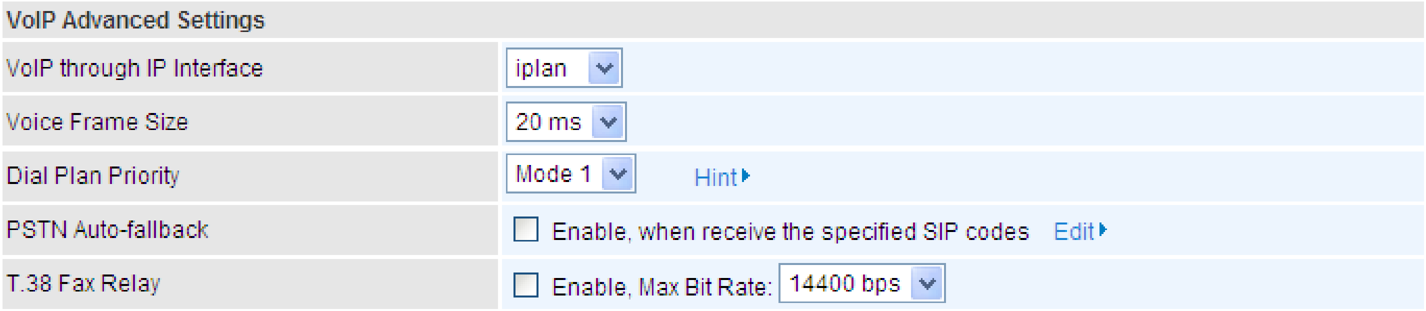
RTP Port: Provide the based value from the media (RTP) ports that are assigned for various endpoints and the different call sessions that may exist within an end-point. (Range from 5100 to 65535, default value is 5100)

Region: This selection is a drop-down box, which allows user to select the country for which the VoIP device must work. When a country is selected, the country parameters are automatically loaded.

Voice QoS, DSCP Marking: Differentiated Services Code Point (DSCP), it is the first 6 bits in the ToS byte. DSCP Marking allows users to assign specific application traffic to be executed in priority by the next Router based on the DSCP value. See Table 4. The DSCP Mapping Table:

Note: To be sure the router(s) in the backbones network have the capability in executing and checking the DSCP through-out the QoS network.

Advanced – Parameters



VoIP Advanced Settings

VoIP through IP Interface	iplan
Voice Frame Size	20 ms
Dial Plan Priority	Mode 1 Hint ▸
PSTN Auto-fallback	□ Enable, when receive the specified SIP codes Edit ▸
T.38 Fax Relay	□ Enable, Max Bit Rate: 14400 bps

VoIP through IP Interface: IP Interface decides where to send/receive the voip traffic; it includes: ipwan and iplan. Easy way to select the interface is to check the location of the SIP server. If it locates some where in the Internet then select **ipwan.** If the VoIP SIP server is on the local Network then select **iplan.**

Voice Frame Size: Frame size is available from 10ms to 60ms. Frame size meaning how many milliseconds the Voice packets will be queued and sent out. It is ideal to have the same frame size in both of Caller and Receiver.

Dial Plan Priority: Define the priority between VoIP and PSTN dial plan.

PSTN Auto-fallback: Whenever VoIP SIP responses error and error code matching with the codes in the **Edit** section, the VoiP calls will automatically fallback to PSTN. In the other word, the call will be called via the PSTN when VoIP SIP returns an error code.

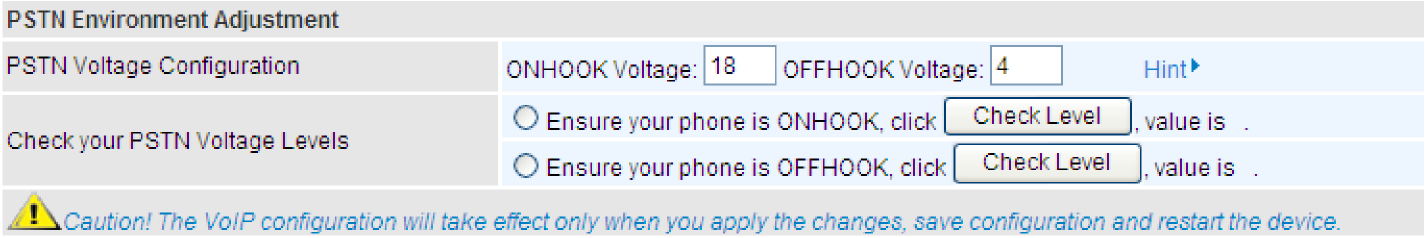
Click the **Edit** to add or remove the responses code. To be sure the code is separated by a comma (,).

For more information about SIP responses codes, please check Here ▸ to link to **http://voip-info.org/wiki/view/sip+response+codes** where you can get to know the meaning of each error code.

T.38 Fax Relay: It allows the transfer of facsimile documents in real-time between two standard Group 3 facsimile terminals over the Internet or other networks using IP protocols. It will only function when both sites are support this feature and enabled.

Advanced – PSTN Environment Adjustment

PSTN Environment Adjustment options will help you to adjust the onhook and offhook voltage detection values for your environment. You should use these if the default values are incorrect and result in PSTN calls not being detected properly, e.g. calls being terminated within 5 seconds of being answered. The actual levels are determined by your environment including the number and type of telephones used.



PSTN Environment Adjustment	
PSTN Voltage Configuration	ONHOOK Voltage: 18 OFFHOOK Voltage: 4 Hint▸
Check your PSTN Voltage Levels	○ Ensure your phone is ONHOOK, click Check Level, value is . ○ Ensure your phone is OFFHOOK, click Check Level, value is .

⚠ *Caution! The VoIP configuration will take effect only when you apply the changes, save configuration and restart the device.*

Note: ONHOOK means hung up.

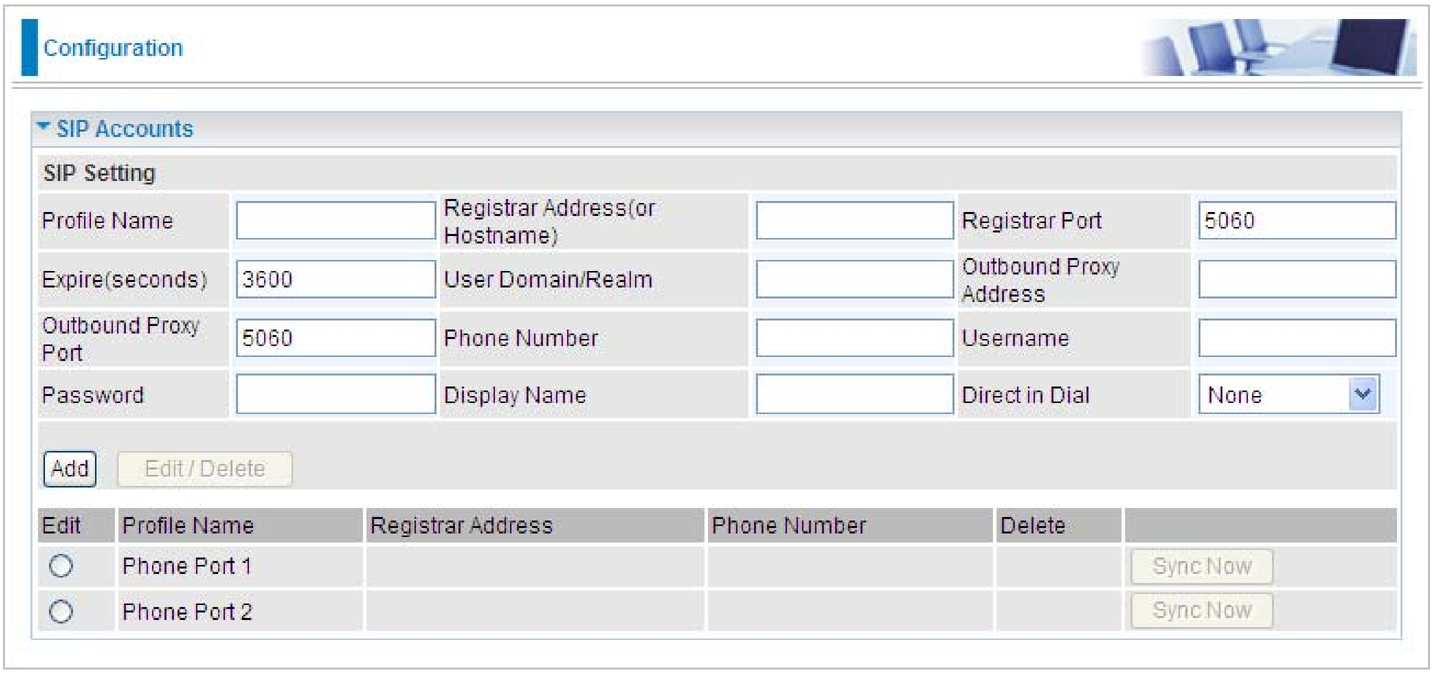
To take your phone OFFHOOK, lift the receiver then press Hook/Flash until you hear your normal PSTN dialtone, not your VoIP dialtone. Wait several seconds and then press Check Level.

You should check the OFFHOOK value for each telephone you have connected to this device. Set the OFFHOOK voltage to the lowest setting registered for all your telephones, e.g. if your telephones return values of 4, 5 and 7 then you should set your OFFHOOK voltage to 4.

Note: The detected values will not automatically be set by the Check Level function; you must enter the lowest level detected after testing all your telephones.

SIP Accounts

This section reflects and contains the basic settings of the VoIP module from the selected provider in the Wizard section. Fail to provide the correct information will stop making calls out to the Internet.



SIP Setting

Profile Name		Registrar Address(or Hostname)		Registrar Port	5060
Expire(seconds)	3600	User Domain/Realm		Outbound Proxy Address	
Outbound Proxy Port	5060	Phone Number		Username	
Password		Display Name		Direct in Dial	None

Edit	Profile Name	Registrar Address	Phone Number	Delete	
○	Phone Port 1				Sync Now
○	Phone Port 2				Sync Now

Profile Name: Assign a name for profile identification.

Registrar Address (or Hostname): Indicate the VoIP SIP registrar IP address.

Registrar Port: Specify the port of the VoIP SIP registrar on which it will listen for register requests from VoIP device.

Expire: This is the duration for the registration message being sent.

User Domain/Realm: Set a different domain name for the VoIP SIP proxy server.

Outbound Proxy Address: Indicate the VoIP SIP outbound proxy server IP address. This parameter is very useful when VoIP device is behind a NAT.

Outbound Proxy Port: Specify the port of the VoIP SIP outbound proxy on which it will listen for messages.

Phone Number: This parameter holds the registration ID of the user within the VoIP SIP registrar.

Username: Same as Phone Number.

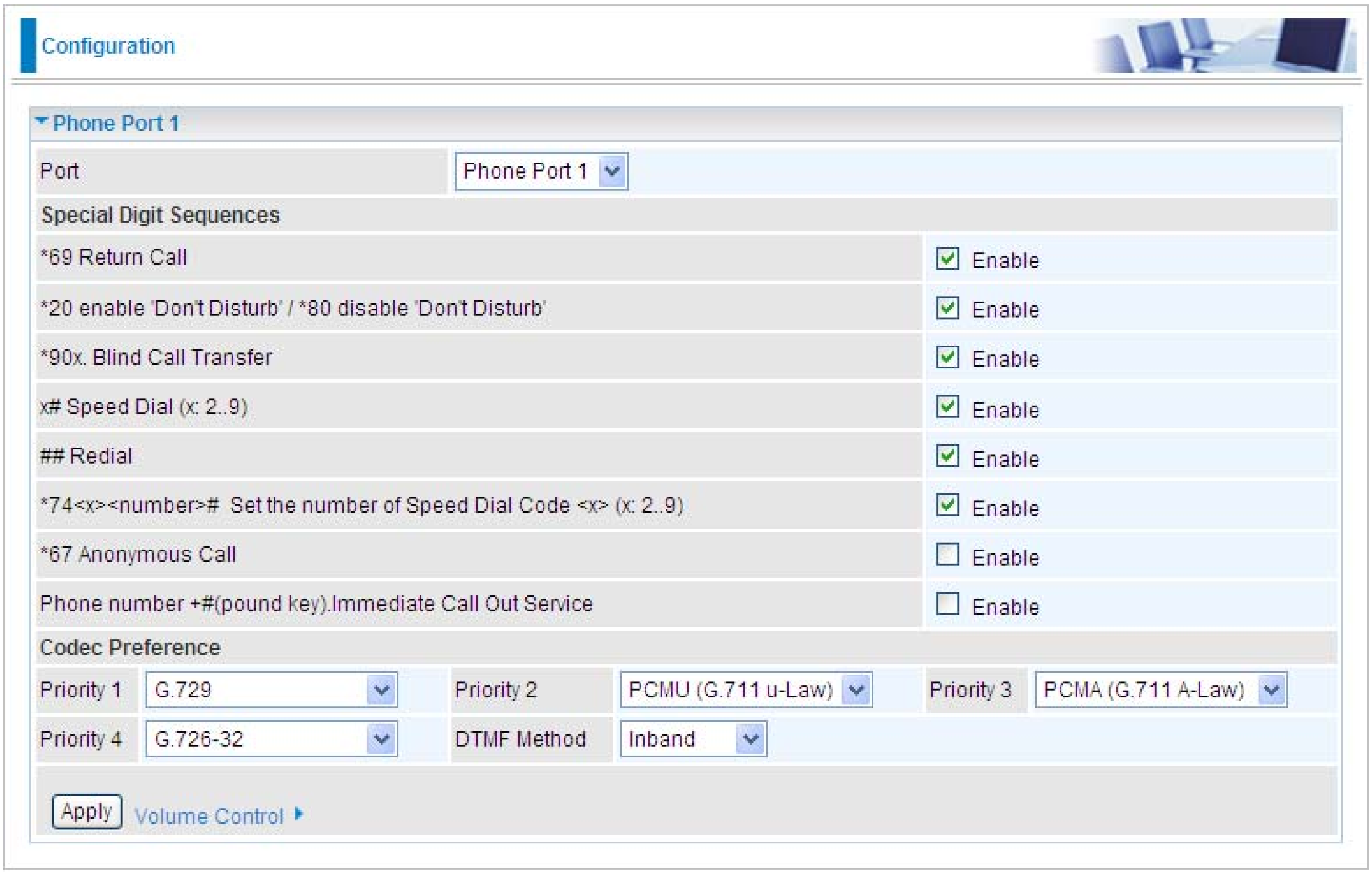
Password: This parameter holds the password used for authentication within the VoIP SIP registrar.

Display Name: This parameter will appear on the Caller ID.

Direct in Dial: Select the ringing port when getting an incoming VoIP call.

Phone Port

This section displays the status and allows for further editing on the account information of the Phones. Click Edit to update your phone information.



Configuration

▾ Phone Port 1

Port	Phone Port 1
Special Digit Sequences	
*69 Return Call	☑ Enable
*20 enable 'Don't Disturb' / *80 disable 'Don't Disturb'	☑ Enable
*90x. Blind Call Transfer	☑ Enable
x# Speed Dial (x: 2..9)	☑ Enable
## Redial	☑ Enable
*74<x><number># Set the number of Speed Dial Code <x> (x: 2..9)	☑ Enable
*67 Anonymous Call	□ Enable
Phone number +#(pound key).Immediate Call Out Service	□ Enable

Codec Preference

Priority 1	G.729	Priority 2	PCMU (G.711 u-Law)	Priority 3	PCMA (G.711 A-Law)
Priority 4	G.726-32	DTMF Method	Inband		

Port: It allows you to change the phone port setting for specific FXS port.

***69 (Return Call):** Dial *69 to return the last missed call. It is only available for VoIP call(s).

***20 (Do not Disturb ON):** Dial *20 to enable the No Disturb feature. Your phone will not ring if someone calls.

***90x (Blind Call Transfer):** Dial *90 + phone-number to transfer a call to a third party. This feature is enabled by default.

x# Speed Dial (x:2..9): Refer to the Phone Port section in the Web GUI. Set up your Speed Dial phone book first before accessing the Speed Dial feature. This feature is enabled by default.

## Redial: Press ## to redial the latest phone number. This feature is enabled by default.

***74<x><number>#:** Use your phone key pad to insert a phone number to the Speed Dial phone book. Or you can update your Speed Dial phone number manually. Refer to the Phone Port section in the Web GUI for details.

***67 Anonymous Call:** Hide your phone number from being displayed at the remote terminal. It is only applied to the next call when you enter this control character. The detailed operation procedure is “Off Hook -> *67 -> On Hook -> Off Hook -> Dial”. This feature is disabled by default.

Phone Number + #: This is the fast dial which you can dial out a phone number immediately without waiting.

Note: Refer to the Special Dial Code section in this Manual for more details.

Codec Preference

Codec is known as Coder-Decoder, it is used for data signal conversion. Set the priority of voice compression with Priority 1 represents the top priority.

G.729: It is used to encode and decode voice information into a single packet to reduce bandwidth consumption.

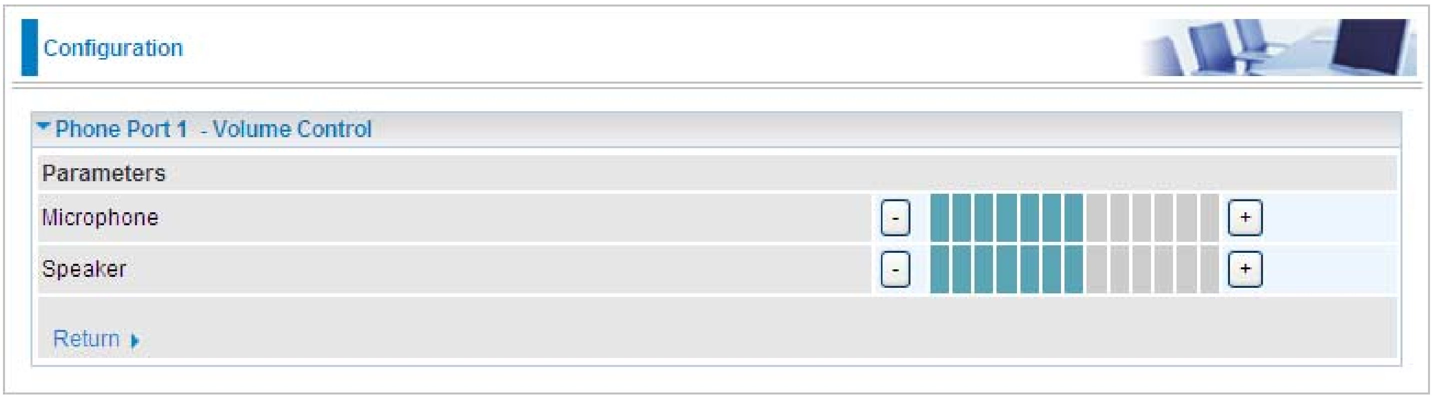
G.711µ-LAW: It is a basic non-compressed encoder and decoder technique. µ-LAW uses pulse code modulation (PCM) encoder and decoder to convert a 14-bit linear sample.

G.711A-LAW: It is a basic non-compressed encoder and decoder technique. A-LAW uses pulse code modulation (PCM) encoder and decoder to convert a 13-bit linear sample.

G.726-32: It is used to encode and decode voice information into a single packet to reduce bandwidth consumption. Currently only supports bit rate with 32Kbps.

DTMF Method: The Inband, RFC 2833 and SIP INFO (RFC 2976) are supported.

Volume Control



Volume control enables you to adjust the voice quality of telephone to the best & comfortable level.

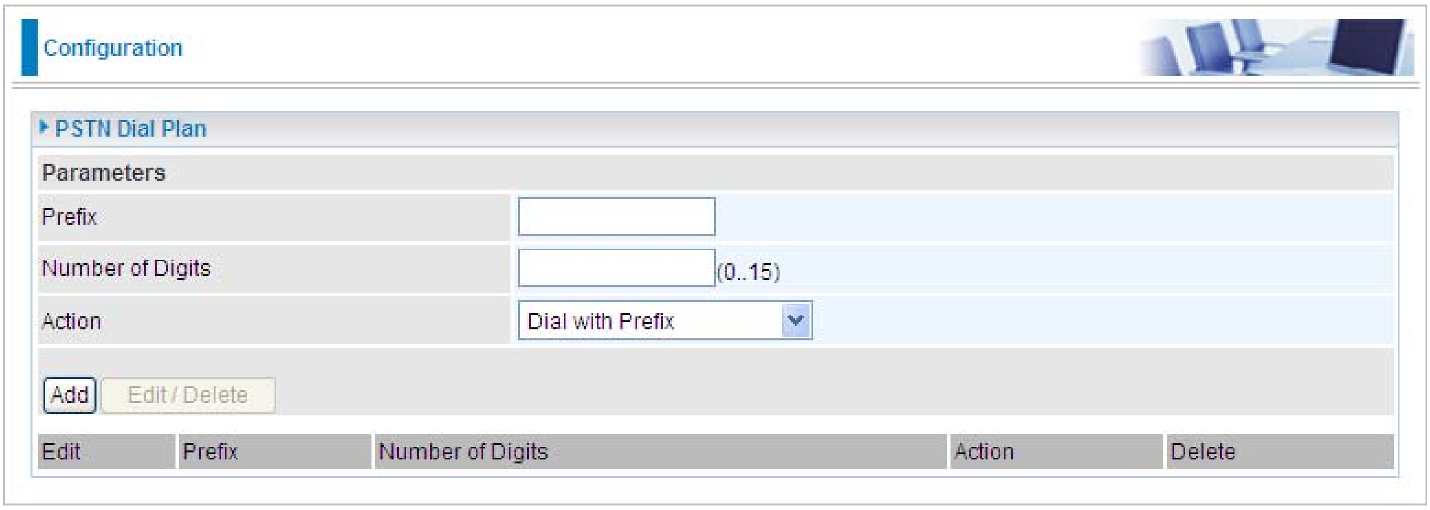
Press "**-**" the minus sign to reduce either the microphone, speaker's level of your telephone or both.

Press "**+**", the plus sign to increase either the microphone, speaker's level of your telephone or both.

PSTN Dial Plan (Router with LINE port only)

This section enables you to configure the “VoIP with PSTN switching” on your system. You can define a range of dial plans that will make regular call to switch from VoIP to PSTN line. Prefix number is an essential key to make a difference between VoIP and Regular phone call. If the actual numbers dialed match with the prefix number defined in this dial plan, the dialed number will be rerouted to the PSTN to make a regular call. Otherwise, the number will be rerouted to the VoIP networks.

Note: In order to utilize this feature, you must have registered and connected to your SIP Server first.



Configuration

▸ PSTN Dial Plan

Parameters	
Prefix	
Number of Digits	(0..15)
Action	Dial with Prefix

Edit	Prefix	Number of Digits	Action	Delete

Prefix: Specify the number(s) that will be used to switch from VoIP to PSTN when making a call.

Number of Digits: Specify the total number of digits you wish to dial out. The maximum number of digit is 15.

Action: Specify a dialing method that you wish to use when making PSTN call(s).

> **Dial with Prefix:** With this selected, the prefix which is dialed together with the phone number will be dialed out as well via FXO when making a regular call.

Note: The prefix number dialed has to match the number of digit specified.

> **Dial without Prefix:** With this selected, the prefix which is dialed together with the phone number will not be dialed out with the phone number via FXO when making a regular call.

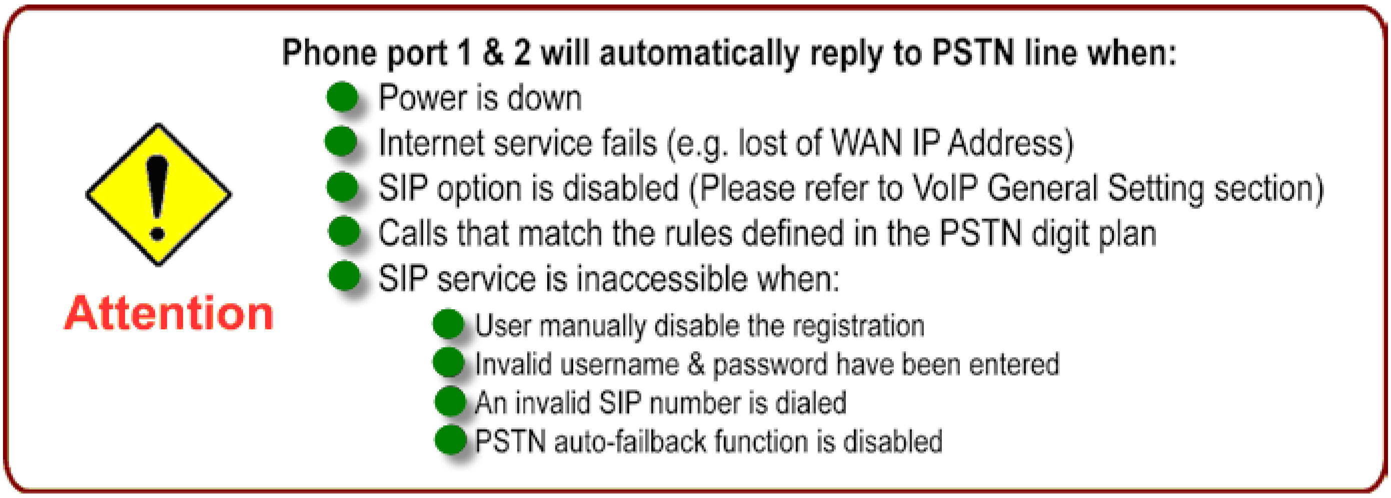
Note: The length of the number of digit dialed should match the number of digit specified.

> **Dial at Timeout:** The number & the prefix entered will be dialed out via the FXO port after a defined timeout interval although the number of digits of the phone number entered does not match the number of digits specified.

Note: The length of the number of digit dialed must not exceed the number of digit defined otherwise dialing will be invalid.

> **Dial at Timeout no Prefix:** The phone number will be dialed out via the FXO port excluding the prefix after a defined timeout interval although the number of digit of the phone number entered does not match the number of digit specified.

Note: The length of the number of digit dialed must not exceed the number of digit defined otherwise dialing will be invalid.



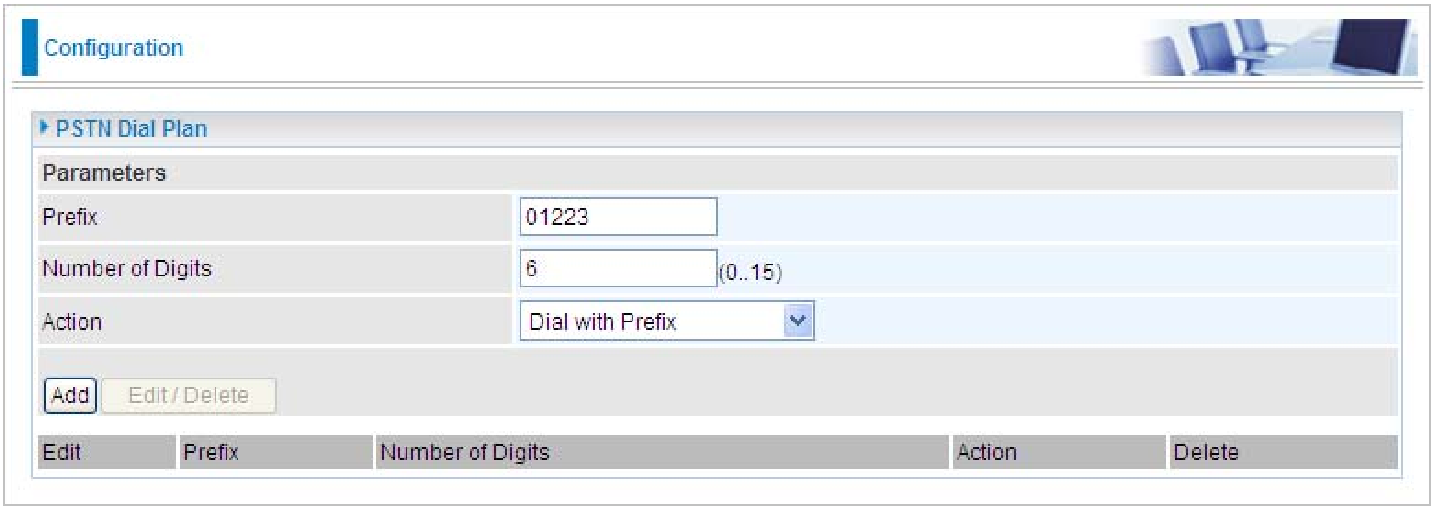
Attention

Phone port 1 & 2 will automatically reply to PSTN line when:

- Power is down
- Internet service fails (e.g. lost of WAN IP Address)
- SIP option is disabled (Please refer to VoIP General Setting section)
- Calls that match the rules defined in the PSTN digit plan
- SIP service is inaccessible when:
    - User manually disable the registration
    - Invalid username & password have been entered
    - An invalid SIP number is dialed
    - PSTN auto-failback function is disabled

PSTN Dial Plan Examples:

1. Dial with Prefix



Configuration

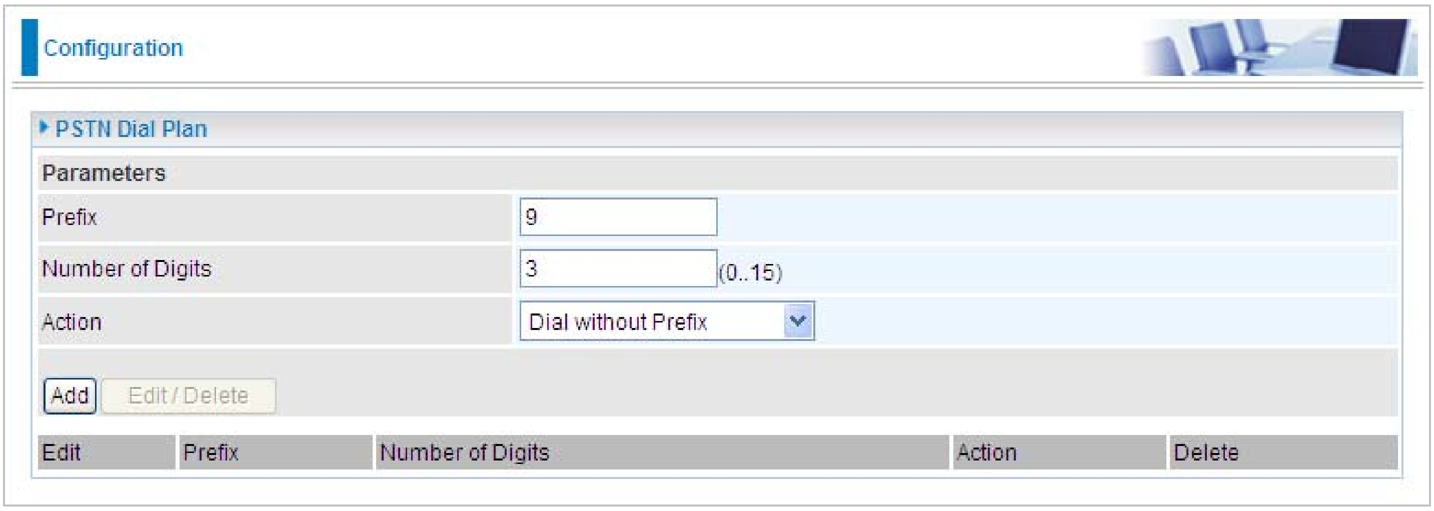
▸ PSTN Dial Plan

Parameters	
Prefix	01223
Number of Digits	6 (0..15)
Action	Dial with Prefix

Edit	Prefix	Number of Digits	Action	Delete

If you dial 01223 707070, the number 01223707070 will be dialed out via FXO for making a regular phone call.

2. Dial without Prefix



Configuration

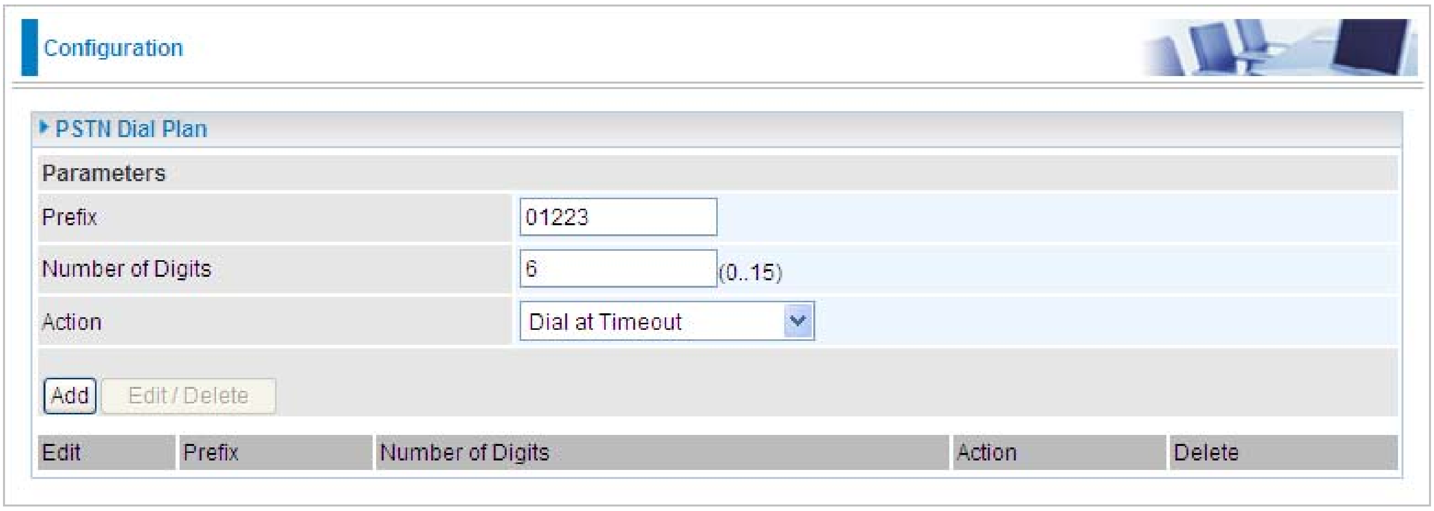
▸ PSTN Dial Plan

Parameters	
Prefix	9
Number of Digits	3 (0..15)
Action	Dial without Prefix

Edit	Prefix	Number of Digits	Action	Delete

If you dial 9102, only 102 will be dialed out via FXO port for making a regular phone call.

3. Dial at Timeout



Configuration

▸ PSTN Dial Plan

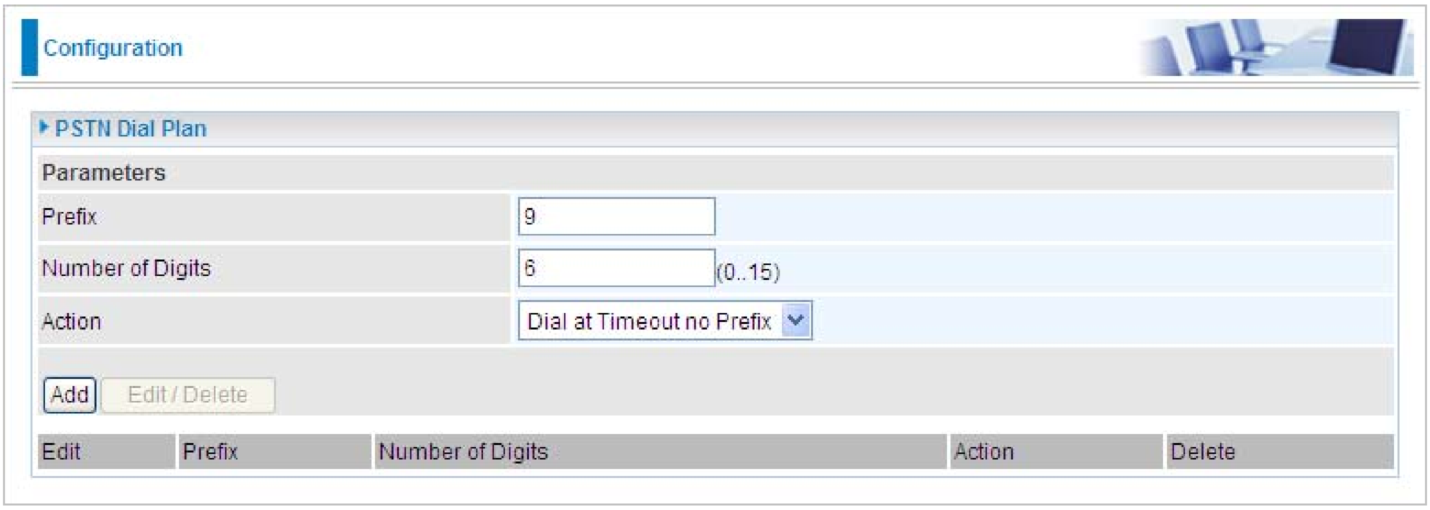
Parameters	
Prefix	01223
Number of Digits	6 (0..15)
Action	Dial at Timeout

Add | Edit / Delete

Edit	Prefix	Number of Digits	Action	Delete

If you only dial 01223 7070, the number 012237070 will be dialed to make a regular call via FXO port after a defined timeout interval even though the number of digit entered does not match the number of digit defined. Number 7070 will still be a valid number for the device to complete the dialing because it does not exceed the number of digit defined.

4. Dial at Timeout no Prefix



Configuration

▸ PSTN Dial Plan

Parameters	
Prefix	9
Number of Digits	6 (0..15)
Action	Dial at Timeout no Prefix

Add | Edit / Delete

Edit	Prefix	Number of Digits	Action	Delete

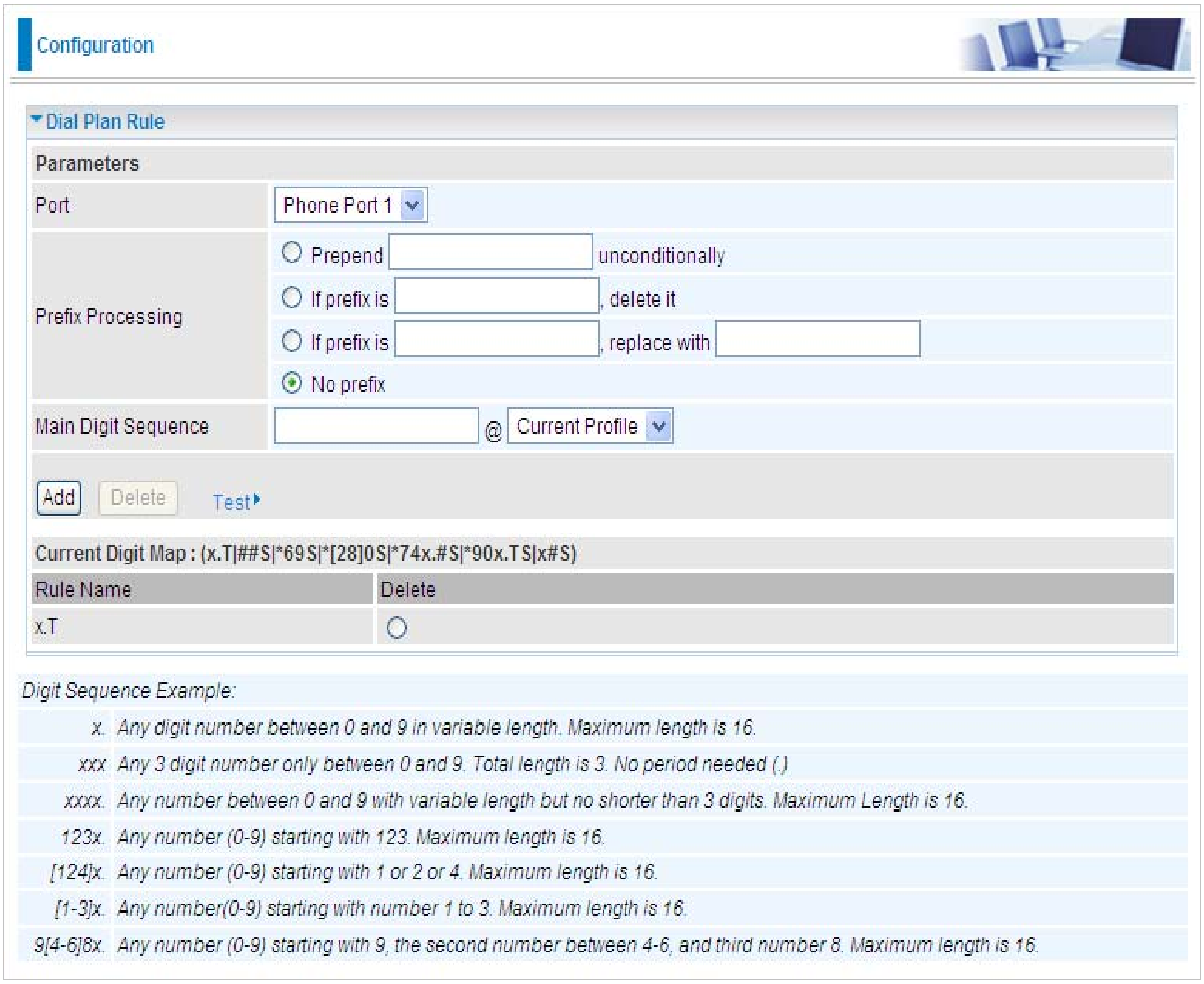
If you only dial 97070, the number that is dialed out via FXO port for making a regular call will not have its prefix. Even though 7070 (only 4 digits) does not match the number of digit defined in the field, 7070 is still a valid phone number since it has not exceeded the number of digit defined.

VoIP Dial Plan

This feature makes dialing phone number a lot more convenient and easy. Instead of having to memorize long digits of every single contact, VoIP Dial Plan provides you the ease to create dial plans that will enable you to make your phone calls without the need to memorize the phone number. To access this feature, go to Configuration > VoIP > VoIP Dial Plan.

Dial Plan Rules

Click the Add button to create and define a VoIP dial plan rule.



Parameters

Port	Phone Port 1
Prefix Processing	○ Prepend ______ unconditionally ○ If prefix is ______, delete it ○ If prefix is ______, replace with ______ ● No prefix
Main Digit Sequence	______ @ Current Profile

Current Digit Map : (x.T|##S|*69S|*[28]0S|*74x.#S|*90x.TS|x#S)

Rule Name	Delete
x.T	○

Digit Sequence Example:

x.	*Any digit number between 0 and 9 in variable length. Maximum length is 16.*
xxx	*Any 3 digit number only between 0 and 9. Total length is 3. No period needed (.)*
xxxx.	*Any number between 0 and 9 with variable length but no shorter than 3 digits. Maximum Length is 16.*
123x.	*Any number (0-9) starting with 123. Maximum length is 16.*
[124]x.	*Any number (0-9) starting with 1 or 2 or 4. Maximum length is 16.*
[1-3]x.	*Any number(0-9) starting with number 1 to 3. Maximum length is 16.*
9[4-6]8x.	*Any number (0-9) starting with 9, the second number between 4-6, and third number 8. Maximum length is 16.*

Prefix Processing:

Prepend xxx unconditionally: xxx number is appended unconditionally to the front of the dialing number when making a call. Prefix can also be included with any number and/or character such as +, *, #.

Note: For special service with +, *, #, you may need to check with your VoIP or Local Telephone

Service Provider for information.

If Prefix is xxx, delete it: Prefix xxx is removed from the dialing numbers before making a call.

If Prefix is xxx, replace with: Prefix xxx is replaced when making a call.

No prefix: No prefix is appended to the front of the numbers dialed. This is the default setting for Prefix Processing section.

Main Digit Sequence: The call(s) can be called out via SIP, PSTN or ENUM. x: Any numeric number between 0 and 9.

. (period): Repeat numeric number(s) between 0 and 9.

*** (asterisk sign):** It is a normal character '*' on the phone key pad. Please check if any special service is provided by your VoIP Service Provider or your Local Telephone Service Provider.

# (pound sign): It is a normal character '#' on the phone key pad. Please check if any special service is provided by your VoIP Service Provider or the Local Telephone Service Provider.

<@ Current Profile>: Refer to the VoIP account registered on the *VoIP Wizard* for Port 1 or 2.

<@ PSTN>: Making a telephone call via the PSTN line.

<@ENUM>: Making a VoIP SIP direct call via an Electronic number (ENUM) 164 to an ENUM callee.
Electronic Number (ENUM) uses DNS (Domain Network System) based technology to map between a traditional phone number (PSTN) to an Internet addresses/ SIP URL. The ENUM number must be registered via a public ENUM site or your VoIP Service Provider.

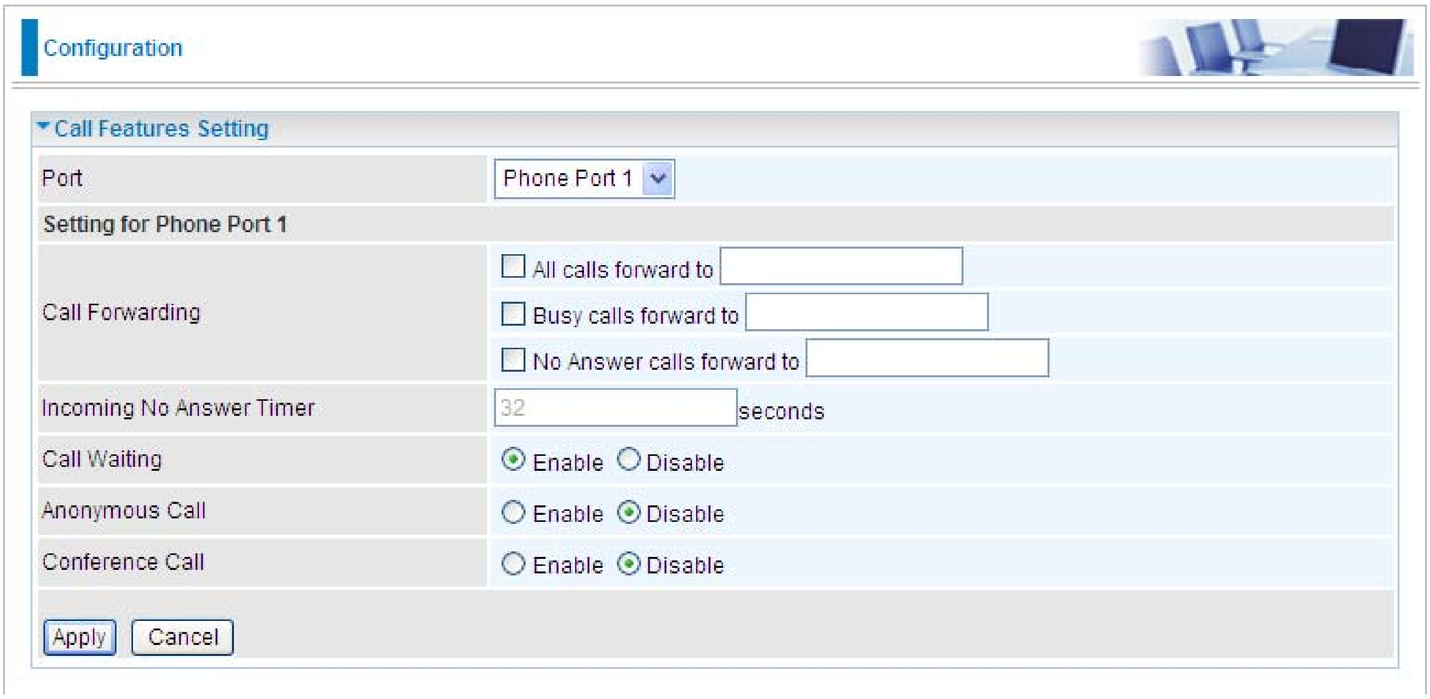
<@ SIPgateway>: It is used for the Intelligent Call Routing feature where you need to set up your SIP account on the VoIP User defined Profiles link on the VoIP Wizard page. Go to the VoIP Wizard in this manual for more information.

Dial-Plan Examples:	**Description**
x.	Any digit number between 0 and 9 in variable length. Maximum length is 16.
xxx	Any 3 digit number only between 0 and 9. Total length is 3. ***Note: No period is needed (.)***
xxxx.	Any number between 0 and 9 with variable length but no shorter than 3 digits. Maximum length is 16.
123x.	Any number (0-9) starting with 123. Maximum length is 16.
[x…x]x. For example: [124]x.	Any number (0-9) starting with 1 or 2 or 4. Maximum length is16.
[x-x]x. For example: [1-3]x.	Any number (0-9) starting with number 1 to 3. Maximum length is 16.
x[x-x]x. For example: 9[4-6]8x.	Any number (0-9) starting with 9, the second number between 4-6, and third number 8. Maximum length is 16.

Special Dial Plan Examples:	**Description**
*xx*x.	Starting with ‘* sign’ + any two digit numbers + any number (0-9) in variable length. Maximum length is 16.
*xx	Starting with ‘* sign’ + any 2 digit numbers between 0 and 9. Total length including the * is 3. ***Note: No period is needed (.)***
**xx*x.	Starting with ‘** sign’ + any two digit numbers between 0 + any number (0-9) in variable length. Maximum length is 16.
#xx.	Starting with ‘# sign’ + any digit number (0-9) in variable length but no shorter than 1 digits. Maximum length is 16.
##xx*x.	Starting with ‘## sign’ + any two digit numbers + ‘* sign’ + any number (0-9) in variable length. Maximum length is 16.

Call Feature

VoIP has all the basic features of a traditional phone. Besides the provided basic features, VoIP also comes with several enhanced features that allows you to further customize their settings to suit your personal needs such as call forwarding setting, call waiting time length, conference call feature, anonymous call feature and incoming no answer timer.



Configuration

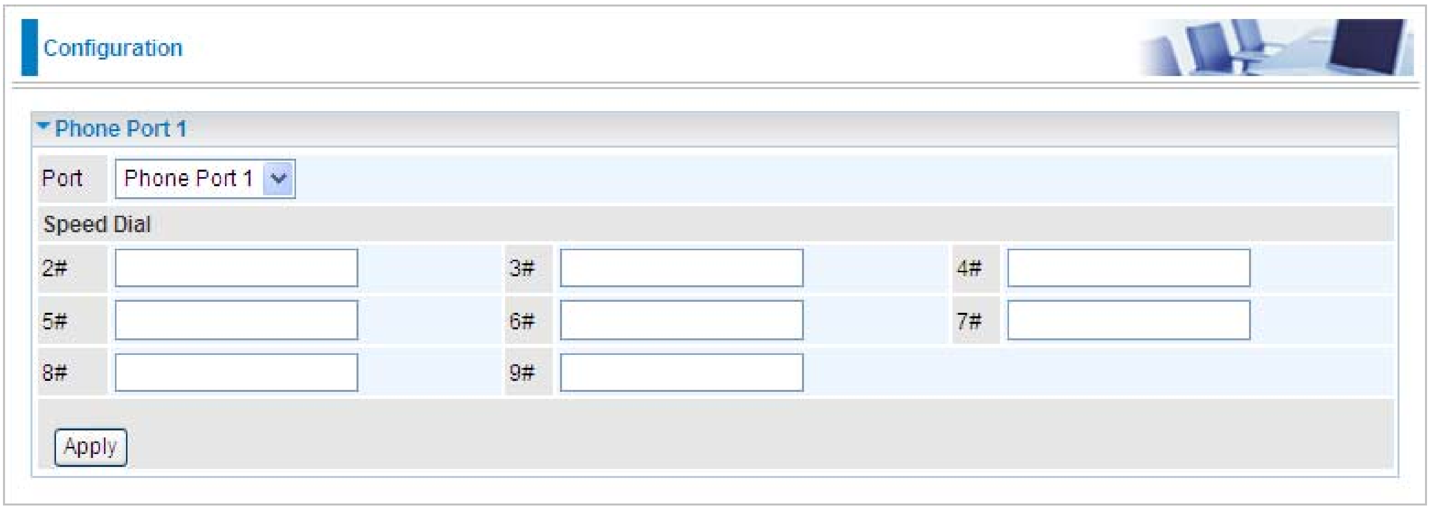
Call Features Setting

Port	Phone Port 1
Setting for Phone Port 1	
Call Forwarding	□ All calls forward to □ Busy calls forward to □ No Answer calls forward to
Incoming No Answer Timer	32 seconds
Call Waiting	● Enable ○ Disable
Anonymous Call	○ Enable ● Disable
Conference Call	○ Enable ● Disable

Apply Cancel

Speed Dial

Speed Dial comes in handy to store frequently used telephone numbers which you can press number from 0 to 9 and the pound sign (#) on the phone keypad to activate the function. For example, speed dial to phone number lists on 9, just press keypad 9 then #. Your router will automatically call out to number listed on entry 9.



Configuration

Phone Port 1

Port: Phone Port 1

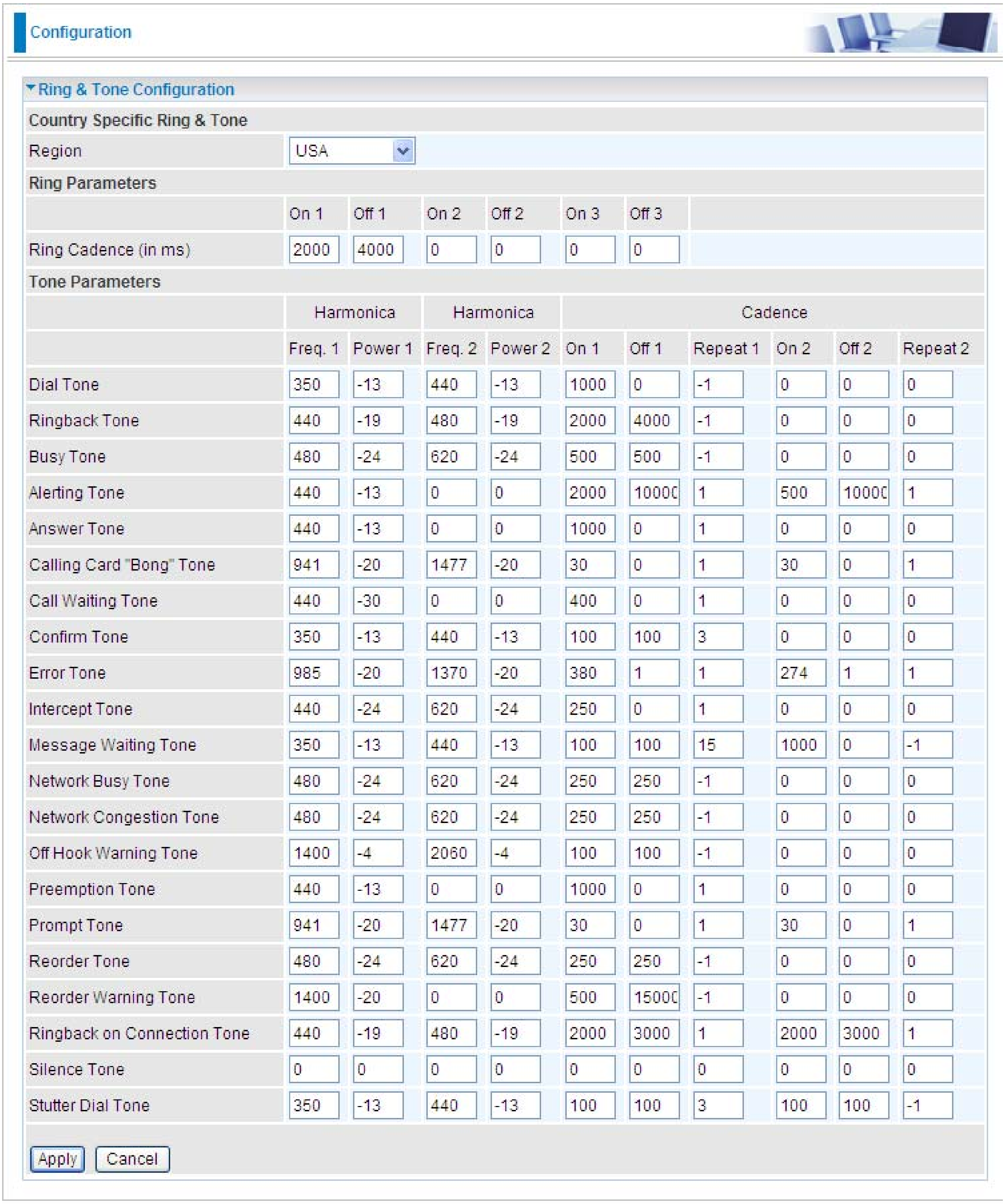
Speed Dial

2#		3#		4#	
5#		6#		7#	
8#		9#			

Apply

Ring & Tone

This section allows advanced user to change the existing or newly defined parameters for various ring tones (dial tone, busy tone, answer tone and etc.)



Configuration

▾Ring & Tone Configuration

Country Specific Ring & Tone

Region: USA

Ring Parameters

	On 1	Off 1	On 2	Off 2	On 3	Off 3
Ring Cadence (in ms)	2000	4000	0	0	0	0

Tone Parameters

	Harmonica		Harmonica		Cadence					
	Freq. 1	Power 1	Freq. 2	Power 2	On 1	Off 1	Repeat 1	On 2	Off 2	Repeat 2
Dial Tone	350	-13	440	-13	1000	0	-1	0	0	0
Ringback Tone	440	-19	480	-19	2000	4000	-1	0	0	0
Busy Tone	480	-24	620	-24	500	500	-1	0	0	0
Alerting Tone	440	-13	0	0	2000	10000	1	500	10000	1
Answer Tone	440	-13	0	0	1000	0	1	0	0	0
Calling Card "Bong" Tone	941	-20	1477	-20	30	0	1	30	0	1
Call Waiting Tone	440	-30	0	0	400	0	1	0	0	0
Confirm Tone	350	-13	440	-13	100	100	3	0	0	0
Error Tone	985	-20	1370	-20	380	1	1	274	1	1
Intercept Tone	440	-24	620	-24	250	0	1	0	0	0
Message Waiting Tone	350	-13	440	-13	100	100	15	1000	0	-1
Network Busy Tone	480	-24	620	-24	250	250	-1	0	0	0
Network Congestion Tone	480	-24	620	-24	250	250	-1	0	0	0
Off Hook Warning Tone	1400	-4	2060	-4	100	100	-1	0	0	0
Preemption Tone	440	-13	0	0	1000	0	1	0	0	0
Prompt Tone	941	-20	1477	-20	30	0	1	30	0	1
Reorder Tone	480	-24	620	-24	250	250	-1	0	0	0
Reorder Warning Tone	1400	-20	0	0	500	15000	-1	0	0	0
Ringback on Connection Tone	440	-19	480	-19	2000	3000	1	2000	3000	1
Silence Tone	0	0	0	0	0	0	0	0	0	0
Stutter Dial Tone	350	-13	440	-13	100	100	3	100	100	-1

Country Specific Ring & Tone

Region: Select a country ring tone from the drop-down list that pertains to your residence. This VoIP router will display the default parameters of each ring tone according to the country selected. If your country is not found in the list, you may manually enter the parameters of the ring tone that pertains to the country.

Ring Parameters

Ring Cadence (in ms): Ring cadence is defined by three fields, Frequency: On Time1, Off Time1, On Time2, Off Time2 and On Time3, Off Time3. Frequency is specified in Hertz. Time is given in milliseconds.

Tone Parameters

You may need to check with your local telephone service provider for such information. Also, it is recommended that this option be configured by an advanced user unless you are instructed to do so.

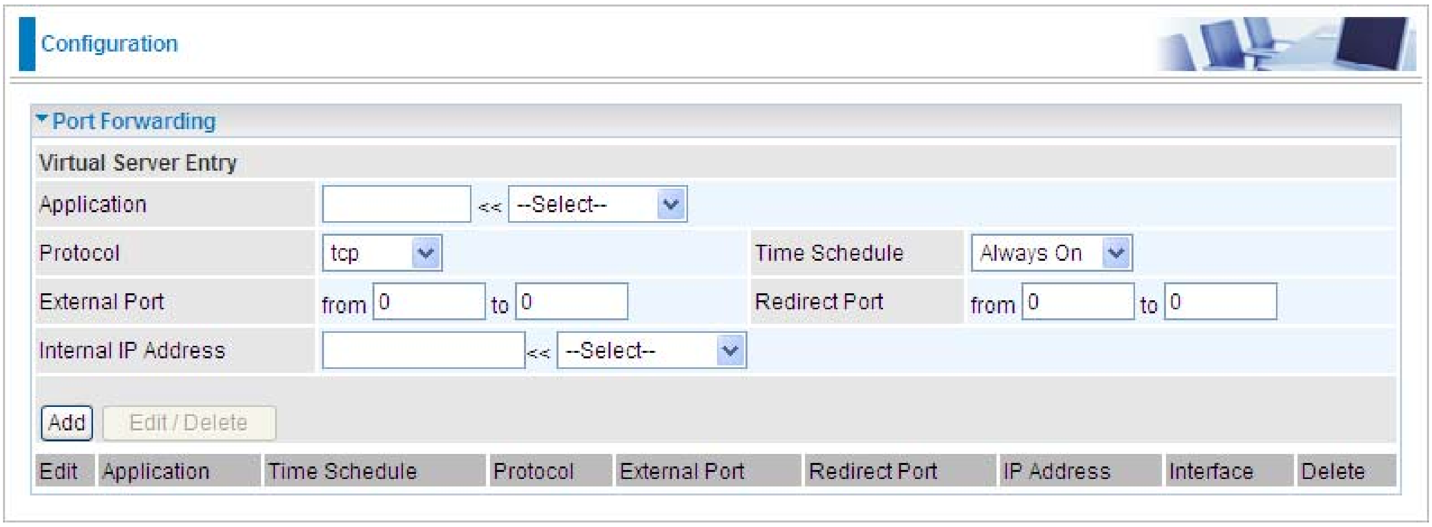
Virtual Server (known as Port Forwarding)

In TCP/IP and UDP networks, a port is a 16-bit number used to identify which application program (usually a server) incoming connections should be delivered to. Some ports have numbers that are pre-assigned to them by the IANA (the Internet Assigned Numbers Authority), and these are referred to as “well-known ports”. Servers follow the well-known port assignments so clients can locate them.

If you wish to run a server on your network that can be accessed from the WAN (i.e. from other machines on the Internet that are outside your local network), or any application that can accept incoming connections (e.g. Peer-to-peer/P2P software such as instant messaging applications and P2P file-sharing applications) and are using NAT (Network Address Translation), then you will usually need to configure your router to forward these incoming connection attempts using specific ports to the PC on your network running the application. You will also need to use port forwarding if you want to host an online game server.

The reason for this is that when using NAT, your publicly accessible IP address will be used by and point to your router, which then needs to deliver all traffic to the private IP addresses used by your PCs. Please see the WAN configuration section of this manual for more information on NAT.

The device can be configured as a virtual server so that remote users accessing services such as Web or FTP services via the public (WAN) IP address can be automatically redirected to local servers in the LAN network. Depending on the requested service (TCP/UDP port number), the device redirects the external service request to the appropriate server within the LAN network.



Configuration

▾Port Forwarding

Virtual Server Entry

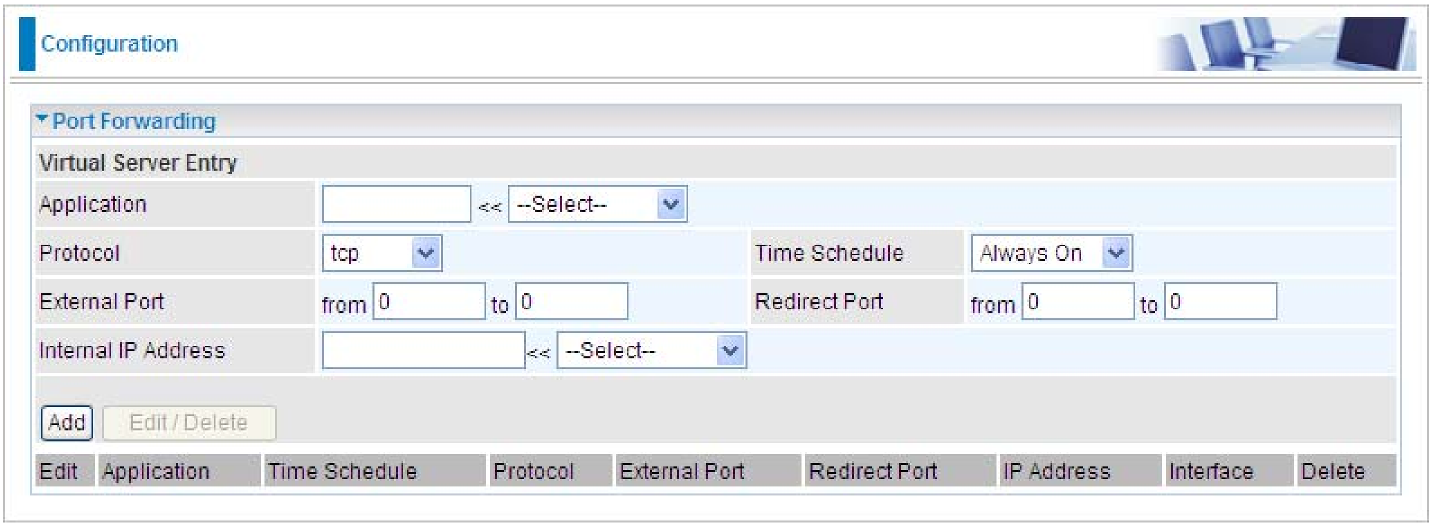
Application	<< --Select--		
Protocol	tcp	Time Schedule	Always On
External Port	from 0 to 0	Redirect Port	from 0 to 0
Internal IP Address	<< --Select--		

Edit	Application	Time Schedule	Protocol	External Port	Redirect Port	IP Address	Interface	Delete

Add Virtual Server

Because NAT can act as a “natural” Internet firewall, your router protects your network from being accessed by outside users when using NAT, as all incoming connection attempts will point to your router unless you specifically create Virtual Server entries to forward those ports to a PC on your network.

When your router needs to allow an outside user to access the internal server, e.g. a web server, FTP server, Email server or game server, the router can act as a virtual server. You can set up a local server with a specific port number for this service, e.g. web/HTTP (port 80), FTP (port 21), Telnet (port 23), SMTP (port 25), or POP3 (port 110). When an incoming access request to the router for a specified port is received, it will be forwarded to the corresponding internal server.



Configuration

Port Forwarding

Virtual Server Entry

Application	<< --Select--		
Protocol	tcp	Time Schedule	Always On
External Port	from 0 to 0	Redirect Port	from 0 to 0
Internal IP Address	<< --Select--		

Edit	Application	Time Schedule	Protocol	External Port	Redirect Port	IP Address	Interface	Delete

Application: User defined description to identify this entry or click the Application drop-down menu to select an existing predefined rule.

--Select--: 20 predefined rules are available. Application, Protocol and External/Redirect Ports will be filled after the selection.

Protocol: It is the supported protocol for the virtual server. In addition to specifying the port number to be used, you will also need to specify the protocol used. The protocol used is determined by a particular application. Most applications will use TCP or UDP.

Time Schedule: User defined time period to enable your virtual server. You may specify a time schedule or select “Always on” for this Virtual Server Entry. For setup and detail, refer to **Time Schedule** section.

External Port: The Port number on the Remote/WAN side used when accessing the virtual server.

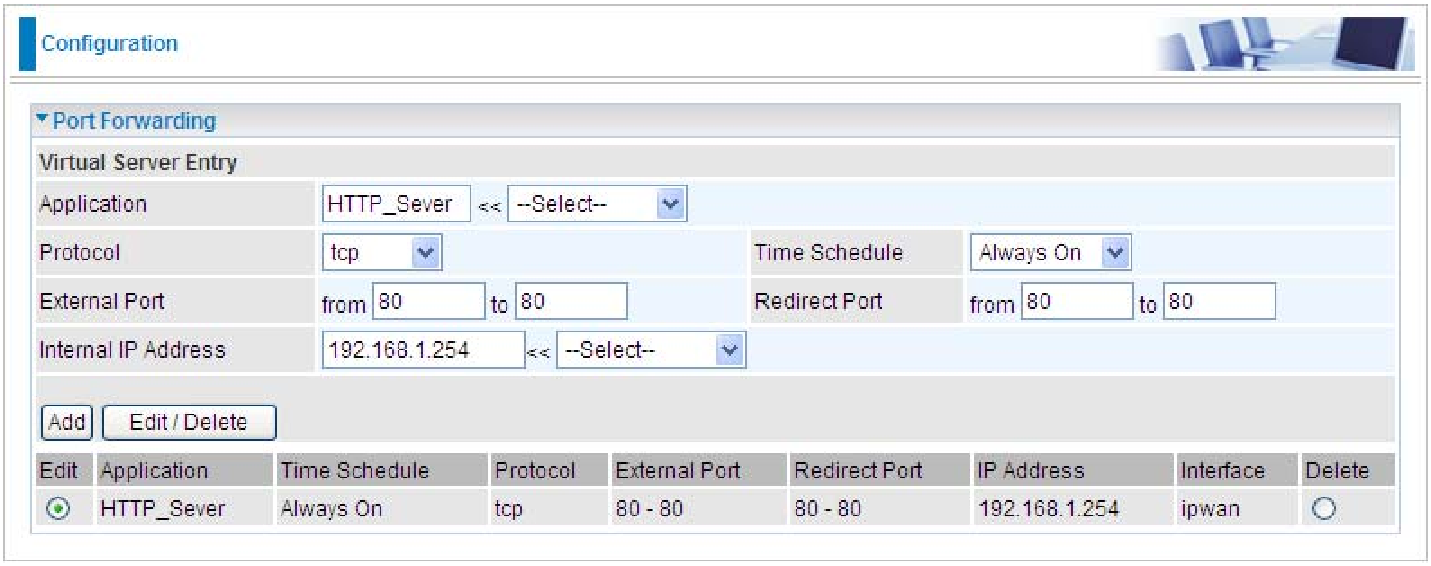
Redirect Port: The Port number used by the Local server in the LAN network.

Internal IP Address: The private IP in the LAN network, which will be providing the virtual server application. --Select-- List all existing PCs connecting to the network. You may assign a PC with IP address and MAC from this list.

Example:

If you like to remotely access your Router through the Web/HTTP all the time, you will need to enable port number 80 (Web/HTTP) and map to the Router's IP Address. Then all incoming HTTP requests from you (Remote side) will be forwarded to the Router with an IP address of 192.168.1.254. Since port number 80 has already been predefined, next to the Application click Helper. A window with a list of predefined rules will pop, you can then select HTTP Sever.

Application: *HTTP_Sever* Time Schedule: *Always On* Protocol: *tcp*
External Port: *80-80*
Redirect Port: *80-80*
IP Address: *192.168.1.254*



Configuration

▾ Port Forwarding

Virtual Server Entry

Application	HTTP_Sever << --Select--		
Protocol	tcp	Time Schedule	Always On
External Port	from 80 to 80	Redirect Port	from 80 to 80
Internal IP Address	192.168.1.254 << --Select--		

Edit	Application	Time Schedule	Protocol	External Port	Redirect Port	IP Address	Interface	Delete
●	HTTP_Sever	Always On	tcp	80 - 80	80 - 80	192.168.1.254	ipwan	○

Add: Click it to apply your settings.

Edit/Delete: Click it to edit or delete this virtual server application.

NOTE:

Using Port Forwarding does have implications, as outside users will be able to connect to the PCs on your network. For this reason, you are adviced to use specific Virtual Server entries just for the port your application requires instead of using DMZ. Doing so will result in all connections from WAN to attempt to access the public IP your DMZ specifies.

Attention

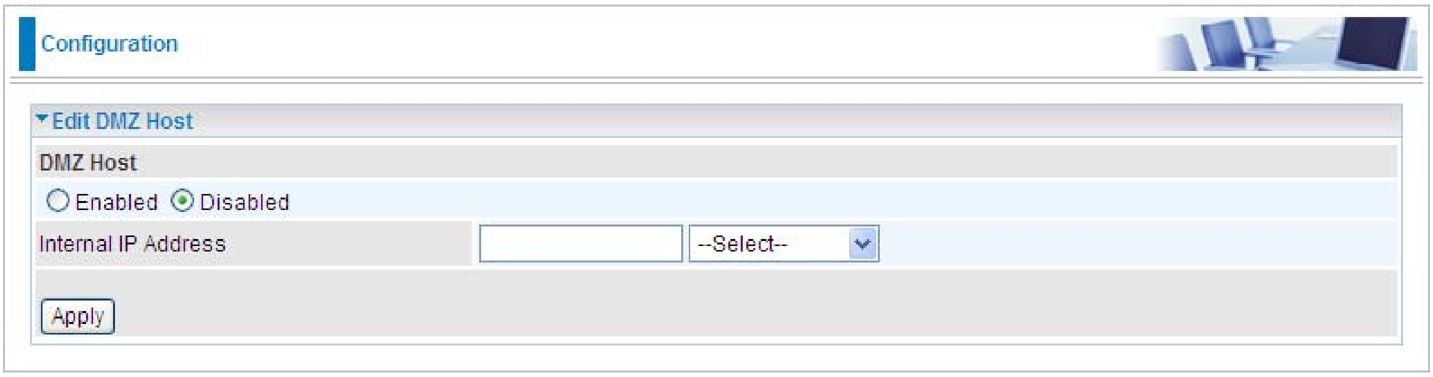
If you have disabled the NAT option in the WAN-ISP section, the Virtual Server will hence become invalid. If the DHCP option is enabled, you have to be very careful in assigning the IP addresses of the virtual servers in order to avoid conflicts. The easiest way of configuring Virtual Servers is to manually assign static IP address to each virtual server PC, with an address that does not fall into the range of IP addresses that are to be issued by the DHCP server. You can configure the virtual server IP address manually, but it must still be in the same subnet as the router.

Edit DMZ Host

DMZ Host is a local computer that is exposed to the Internet. When setting a particular internal IP address as the DMZ Host, all incoming packets especially those that do not use the port number that is being used by any other Virtual Server entries will be checked by the Firewall and NAT algorithms before being passed to the DMZ host.

Cautious: The local computer that is exposed to the Internet may face various security risks.

Go to Configuration > Virtual Server > Edit DMZ Host



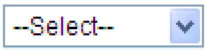
○ Enabled ● Disabled

Internal IP Address: [ ] --Select--

Enabled: It activates your DMZ function.

Disabled: As set in default setting, it disables the DMZ function.

Internal IP Address: Give a static IP address to the DMZ Host when **Enabled** radio button is checked. Be aware that this IP will be exposed to the WAN/Internet.



List all the existing PCs connected to the network. You may assign a PC with an IP address from this list.

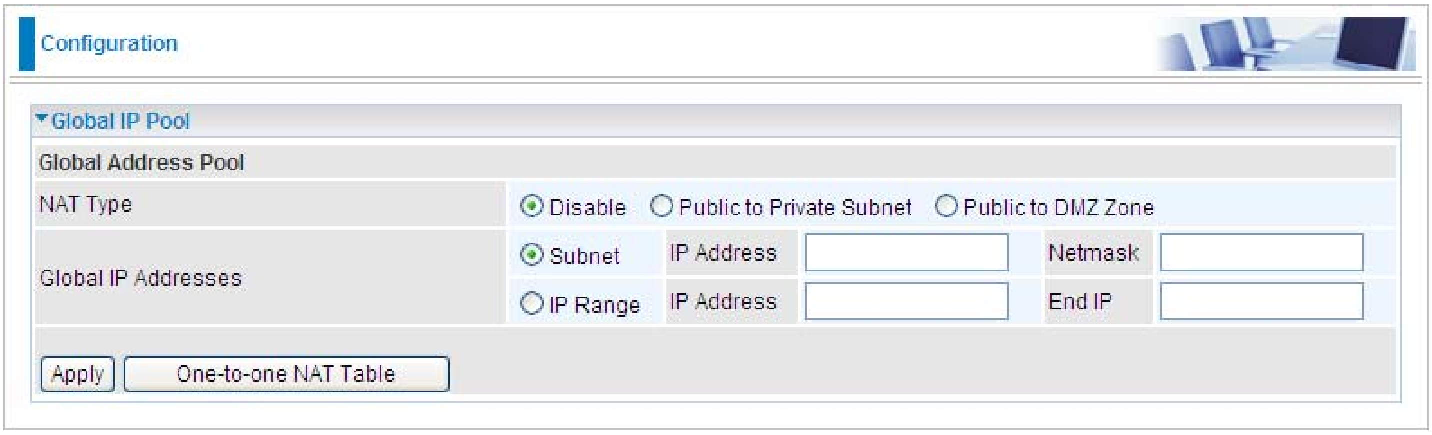
Select the Apply button to apply your changes.

Edit One-to-One NAT (Network Address Translation)

One-to-One NAT maps a specific private / local IP address to a global / public IP address.

If you have multiple public / WAN IP addresses from your ISP, you are eligible to use these IP addresses in One-to-One NAT

Go to Configuration > Virtual Server > Edit One-to-one NAT



Configuration

▾Global IP Pool

Global Address Pool				
NAT Type	● Disable ○ Public to Private Subnet ○ Public to DMZ Zone			
Global IP Addresses	● Subnet	IP Address		Netmask
	○ IP Range	IP Address		End IP

NAT Type: Select the desired NAT type. One-to-One NAT function is set to Disabled by default.

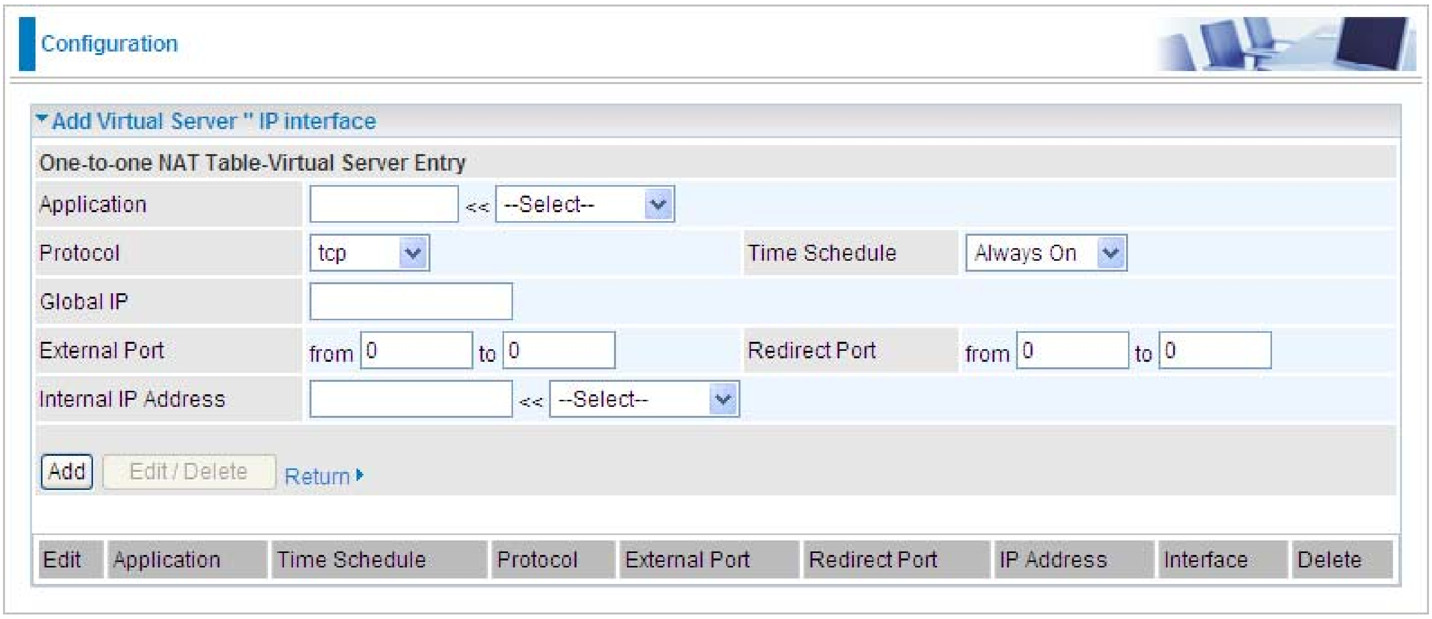
Global IP Address:

Subnet: The subnet of the public/WAN IP address given by your ISP. If your ISP has provided this information, you may insert it here. Otherwise, use IP Range method.

IP Range: The IP address range of your public/WAN IP addresses. For example, IP: 192.168.1.1, end IP: 192.168.1.10.

Select the **Apply** button to apply your changes.

Check One-to-one NAT Table to create a new One-to-One NAT rule:



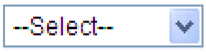
Configuration

▾Add Virtual Server " IP interface

One-to-one NAT Table-Virtual Server Entry			
Application	<< --Select--		
Protocol	tcp	Time Schedule	Always On
Global IP			
External Port	from 0 to 0	Redirect Port	from 0 to 0
Internal IP Address	<< --Select--		

Edit	Application	Time Schedule	Protocol	External Port	Redirect Port	IP Address	Interface	Delete

Application: User defined description to identify this entry or click the --Select-- drop-down menu to select an existing predefined rule.

 --Select--**:** 20 predefined rules are available. Application, Protocol and External/Redirect Ports will be filled after the selection.

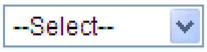
Protocol: It is the supported protocol for the virtual server. In addition to specifying the port number to be used, you will also need to specify the protocol used. The protocol used is determined by the particular application. Most applications will use TCP or UDP.

Time Schedule: User defined time period to enable your virtual server. You may specify a time schedule or select “Always on” for this Virtual Server Entry. For setup and detail, refer to **Time Schedule** section.

Global IP: Define a public / WAN IP address for this Application. This Global IP address must be defined in the Global IP Address blank.

External Port: The Port number on the Remote / WAN side used when accessing the virtual server.

Redirect Port: The Port number used by the Local server in the LAN network.

Internal IP Address: The private IP in the LAN network which provides the virtual server application.  --Select-- List all the existing PCs connecting to the network. You may assign a PC with an IP address from this list.

Select the **Add** button to apply your changes.

Example: List of some well-known and registered port numbers.

The Internet Assigned Numbers Authority (IANA) is the central coordinator for the assignment of unique parameter values for Internet protocols. Port numbers range from 0 to 65535, but only ports numbers 0 to 1023 are reserved for privileged services and are designated as “well-known ports” (Please refer to Table 5). The registered ports are numbered from 1024 through 49151. The remaining ports, referred to as dynamic or private ports, are numbered from 49152 through 65535.

For further information, please see IANA’s website at **http://www.iana.org/assignments/port-numbers**

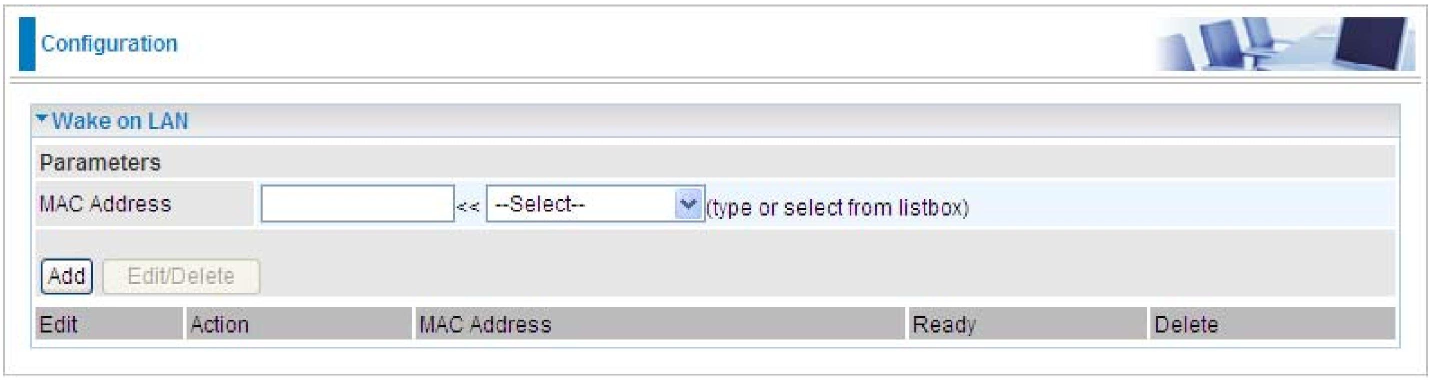
For help on determining which private port numbers are used by common applications on this list, please see the FAQs (Frequently Asked Questions) at **http://www.billion.com**

Table 5: Well-known and registered Ports

Port Number	Protocol	Description
20	TCP	FTP Data
21	TCP	FTP Contro
22	TCP & UDP	SSH Remote Login Protocol
23	TCP	Telnet
25	TCP	SMTP (Simple Mail Transfer Protocol)
53	TCP & UDP	DNS (Domain Name Server)
69	UDP	TFTP (Trivial File Transfer Protocol)
80	TCP	World Wide Web HTTP
110	TCP	POP3 (Post Office Protocol Version 3)
119	TCP	NEWS (Network News Transfer Protocol)
123	UDP	NTP (Network Time Protocol) / SNTP (Simple Network Time Protocol)
161	TCP	SNMP
443	TCP & UDP	HTTPS
1503	TCP	T.120
1720	TCP	H.323
4000	TCP	ICQ
7070	UDP	RealAudio

Wake on LAN

This feature provides greater flexibility for users to turn on / boot the computer of the network from a remotely site.



Configuration

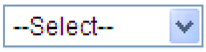
▾Wake on LAN

Parameters				
MAC Address	<< --Select-- (type or select from listbox)			

Add | Edit/Delete

Edit	Action	MAC Address	Ready	Delete

MAC Address: Enter the MAC address of the target computer or you can select the MAC address directly from the Select drop down menu on the right.

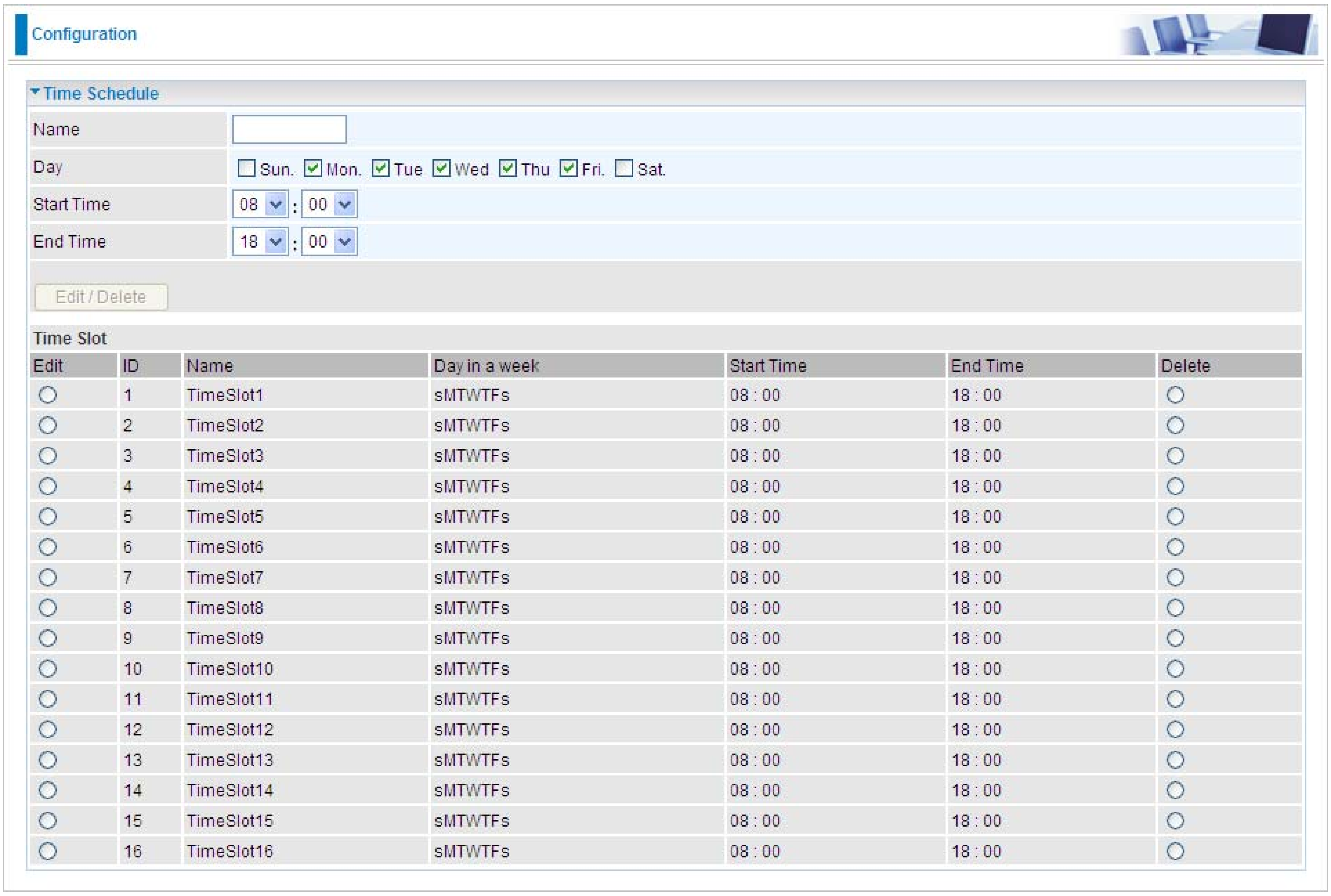


: You can select the MAC from this list.

Time Schedule

The Time Schedule supports up to 16 time slots which helps you to manage your Internet connection. In each time profile, you may schedule specific day(s) i.e. Monday through Sunday to restrict or allow the use of the Internet by users or applications.

Time Schedule correlates closely with router time. Since router does not have a real time clock on board, it uses the Simple Network Time Protocol (SNTP) to get the current time from an SNTP server. Refer to Time Zone for details. Your router time should correspond with your local time. If the time is not set correctly, your Time Schedule will not function properly.



Name	
Day	□ Sun. ☑ Mon. ☑ Tue ☑ Wed ☑ Thu ☑ Fri. □ Sat.
Start Time	08 : 00
End Time	18 : 00

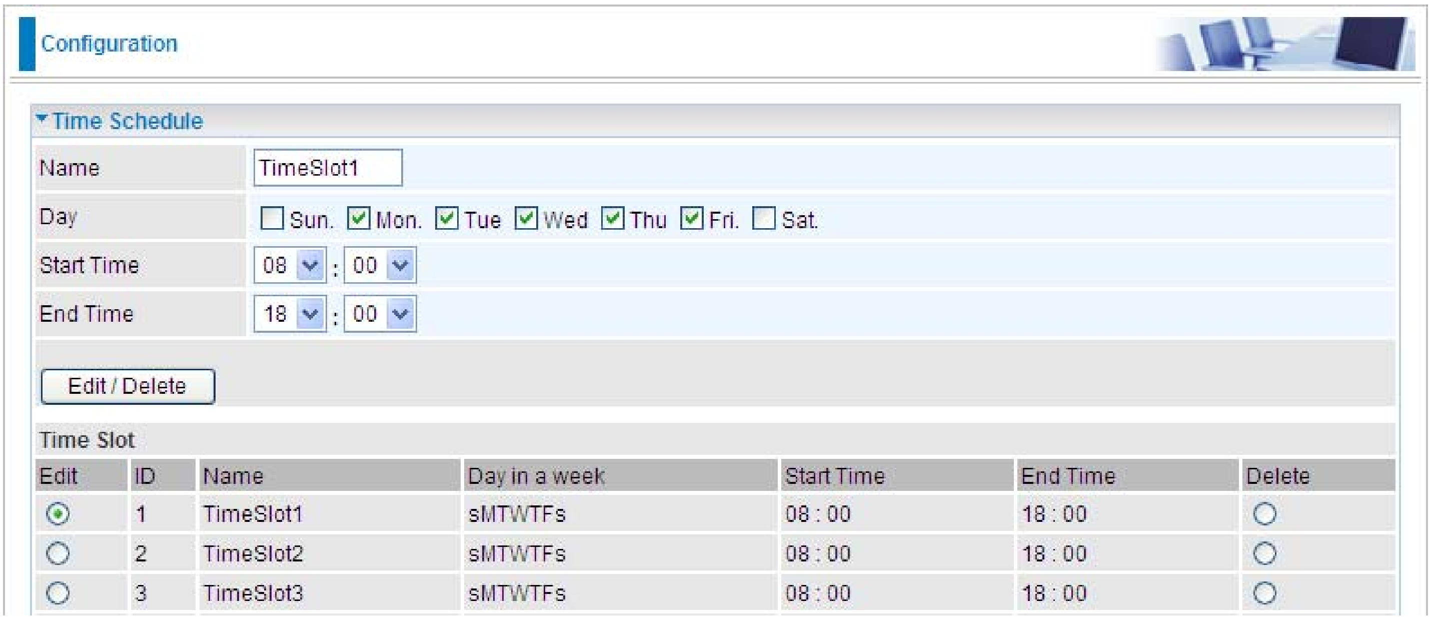
Time Slot

Edit	ID	Name	Day in a week	Start Time	End Time	Delete
○	1	TimeSlot1	sMTWTFs	08 : 00	18 : 00	○
○	2	TimeSlot2	sMTWTFs	08 : 00	18 : 00	○
○	3	TimeSlot3	sMTWTFs	08 : 00	18 : 00	○
○	4	TimeSlot4	sMTWTFs	08 : 00	18 : 00	○
○	5	TimeSlot5	sMTWTFs	08 : 00	18 : 00	○
○	6	TimeSlot6	sMTWTFs	08 : 00	18 : 00	○
○	7	TimeSlot7	sMTWTFs	08 : 00	18 : 00	○
○	8	TimeSlot8	sMTWTFs	08 : 00	18 : 00	○
○	9	TimeSlot9	sMTWTFs	08 : 00	18 : 00	○
○	10	TimeSlot10	sMTWTFs	08 : 00	18 : 00	○
○	11	TimeSlot11	sMTWTFs	08 : 00	18 : 00	○
○	12	TimeSlot12	sMTWTFs	08 : 00	18 : 00	○
○	13	TimeSlot13	sMTWTFs	08 : 00	18 : 00	○
○	14	TimeSlot14	sMTWTFs	08 : 00	18 : 00	○
○	15	TimeSlot15	sMTWTFs	08 : 00	18 : 00	○
○	16	TimeSlot16	sMTWTFs	08 : 00	18 : 00	○

Configuration of Time Schedule

Edit a Time Slot

1. Choose any Time Slot (ID 1 to ID 16) to edit, click Edit radio button.



Configuration

Time Schedule

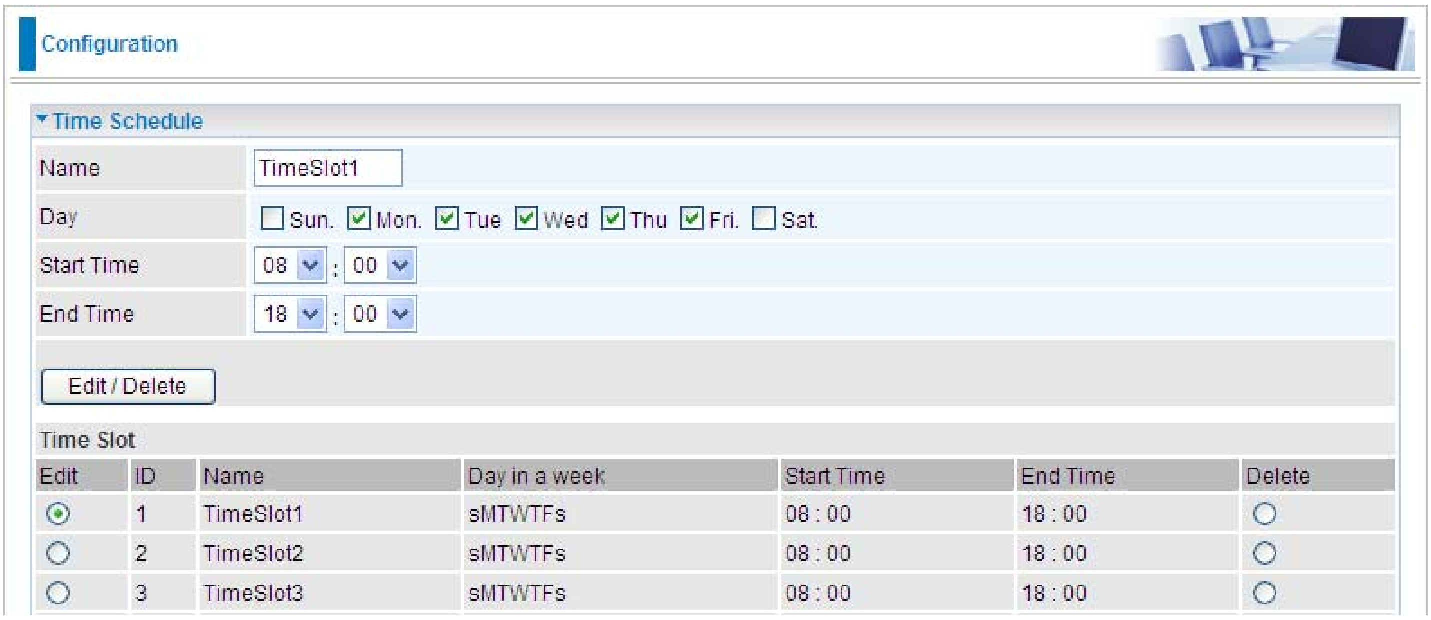
Name	TimeSlot1
Day	☐ Sun. ☑ Mon. ☑ Tue ☑ Wed ☑ Thu ☑ Fri. ☐ Sat.
Start Time	08 : 00
End Time	18 : 00

Time Slot

Edit	ID	Name	Day in a week	Start Time	End Time	Delete
●	1	TimeSlot1	sMTWTFs	08 : 00	18 : 00	○
○	2	TimeSlot2	sMTWTFs	08 : 00	18 : 00	○
○	3	TimeSlot3	sMTWTFs	08 : 00	18 : 00	○

Note: Watch it carefully, the days you have selected will present in capital letter. Lower case letter shows the day(s) is not selected, and no rule will apply on this day(s).

2. A detailed setting of this Time Slot will be shown.



Configuration

Time Schedule

Name	TimeSlot1
Day	☐ Sun. ☑ Mon. ☑ Tue ☑ Wed ☑ Thu ☑ Fri. ☐ Sat.
Start Time	08 : 00
End Time	18 : 00

Edit / Delete

Time Slot

Edit	ID	Name	Day in a week	Start Time	End Time	Delete
●	1	TimeSlot1	sMTWTFs	08 : 00	18 : 00	○
○	2	TimeSlot2	sMTWTFs	08 : 00	18 : 00	○
○	3	TimeSlot3	sMTWTFs	08 : 00	18 : 00	○

ID: This is the index of the time slot.

Name: A user defined description to identify this time portfolio.

Day in a week: The default is set from Monday through Friday. You may also specify the days for schedule to be applied to.

Start Time: The default is set at 8:00 AM. You may specify the start time of the schedule.

End Time: The default is set at 18:00 (6:00PM). You may specify the end time of the schedule.

Choose Edit radio button and click Edit/Delete button to apply your changes.

Delete a Time Slot

Click on the Delete radio button of the Time Slot you wish to delete under the Time Slot section, and then click the Edit/Delete button to confirm the deletion of the selected Time profile, i.e. erase the Day and back to default setting of Start Time / End Time.

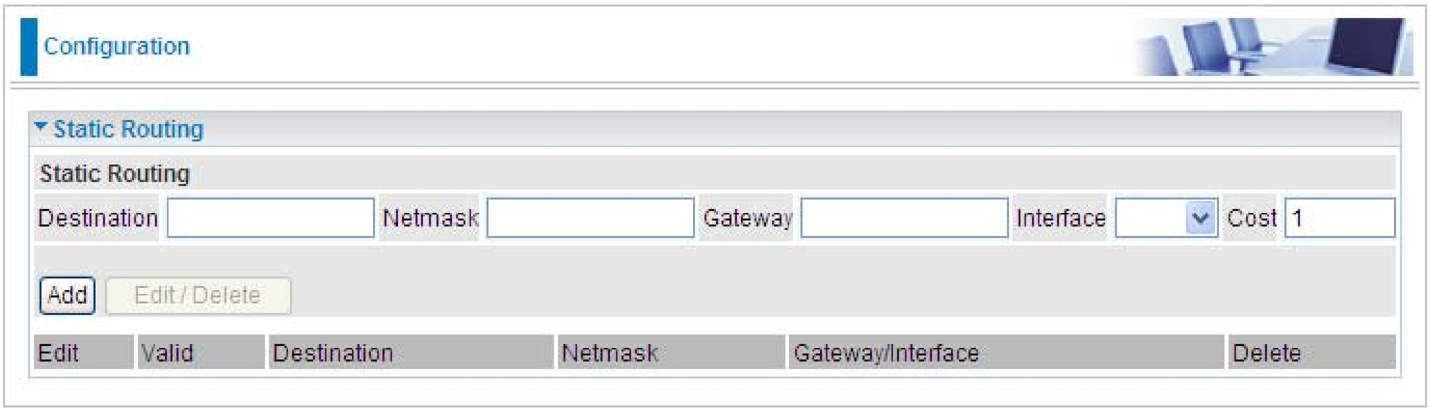
Advanced

Configuration options within the Advanced section are for users who wish to take advantage of the more advanced features of the router. Users who do not understand the features should not attempt to reconfigure their router, unless advised to do so by support staff.

These are the items within the Advanced section: **Static Route, Static ARP, Dynamic DNS, Device Management** and **IGMP.**

Static Route

Go to Configuration > Advanced > Static Route.



Cost 1

Edit	Valid	Destination	Netmask	Gateway/Interface	Delete

Destination: This is the destination subnet IP address.

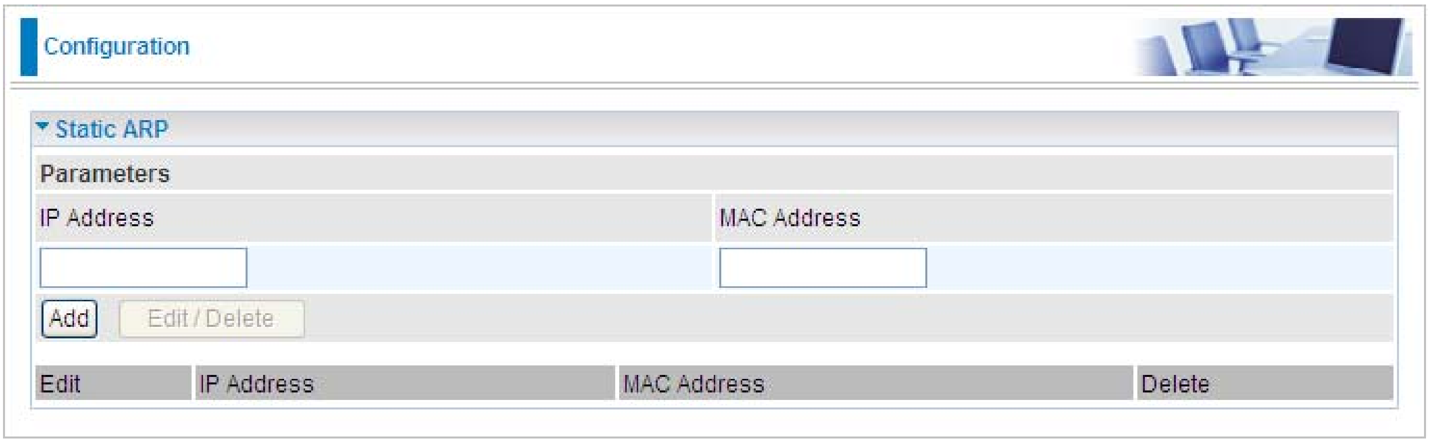
Netmask: Subnet mask of the destination IP addresses based on the above destination subnet IP.

Gateway: This is the gateway IP address to which packets are to be forwarded.

Interface: Select the interface through which packets are to be forwarded.

Cost: This is the same meaning as Hop. This should usually be left at 1.

Static ARP



Edit	IP Address	MAC Address	Delete

IP Address: Fill in the IP address of the host computer that is sending the data packet.

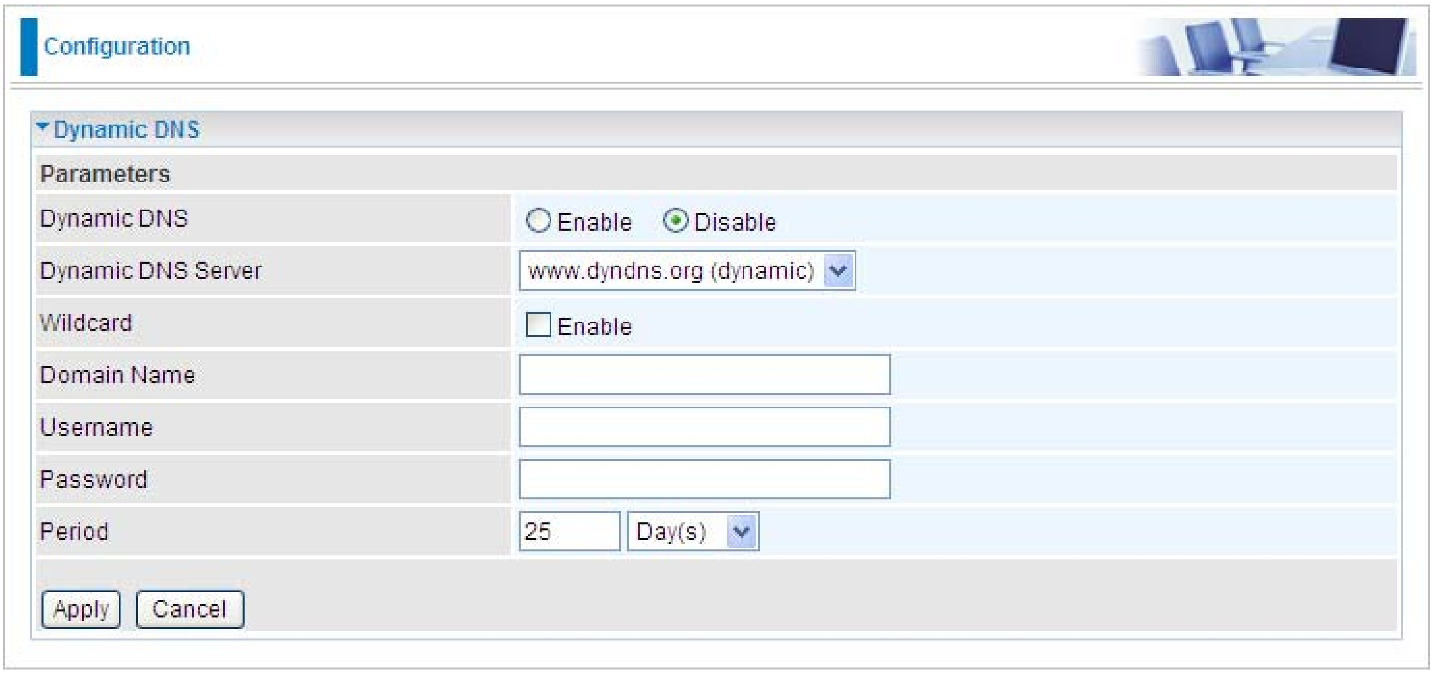
MAC Address: Fill in the MAC address of the computer that the incoming data packets are to be forwarded.

Dynamic DNS

The Dynamic DNS function allows you to alias a dynamic IP address to a static hostname, allowing users whose ISP does not assign them a static IP address to use a domain name. This is especially useful for hosting servers via your connection, so that anyone wishing to connect to you may use your domain name, rather than having to use your dynamic IP address, which changes from time to time. This dynamic IP address is the WAN IP address of the router, which is assigned to you by your ISP.

You will first need to register and establish an account with the Dynamic DNS provider using their website, for example **http://www.dyndns.org/**

There are more than 5 DDNS services supported.



Configuration

▾Dynamic DNS

Parameters	
Dynamic DNS	○ Enable ● Disable
Dynamic DNS Server	www.dyndns.org (dynamic)
Wildcard	□ Enable
Domain Name	
Username	
Password	
Period	25 Day(s)

Dynamic DNS:

Disable: Check to disable the Dynamic DNS function.

Enable: Check to enable the Dynamic DNS function. The following fields will be activated and required.

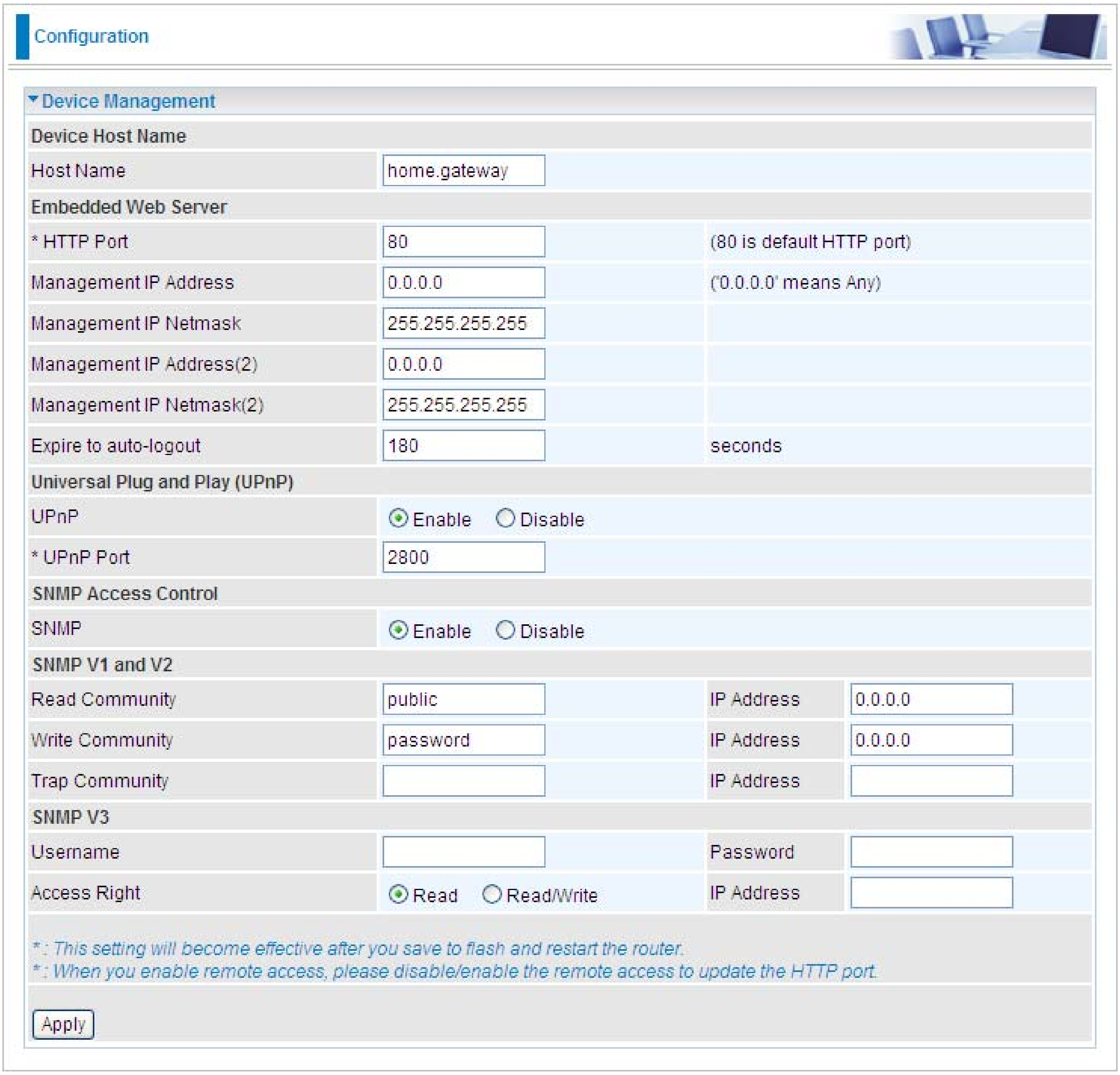
Dynamic DNS Server: Select the DDNS service you have established an account with.

Domain Name, Username and Password: Enter your registered domain name and your username and password for this service.

Period: Set the time period between updates, for the Router to exchange information with the DDNS server. In addition to updating periodically as per your settings, the router will perform an update when your dynamic IP address changes.

Device Management

The Device Management advanced configuration setting allows you to control your router security option and device monitoring features.



Device Management

Device Host Name			
Host Name	home.gateway		
Embedded Web Server			
* HTTP Port	80	(80 is default HTTP port)	
Management IP Address	0.0.0.0	('0.0.0.0' means Any)	
Management IP Netmask	255.255.255.255		
Management IP Address(2)	0.0.0.0		
Management IP Netmask(2)	255.255.255.255		
Expire to auto-logout	180	seconds	
Universal Plug and Play (UPnP)			
UPnP	● Enable ○ Disable		
* UPnP Port	2800		
SNMP Access Control			
SNMP	● Enable ○ Disable		
SNMP V1 and V2			
Read Community	public	IP Address	0.0.0.0
Write Community	password	IP Address	0.0.0.0
Trap Community		IP Address	
SNMP V3			
Username		Password	
Access Right	● Read ○ Read/Write	IP Address	

*: This setting will become effective after you save to flash and restart the router.
*: When you enable remote access, please disable/enable the remote access to update the HTTP port.

Device Host Name

Host Name: Assign it a name.

Note: The Host Name must have more than a word. These two words should be connected with a '.' period inbetween.

Example:
Host Name: homegateway ==> Incorrect
Host Name: home.gateway or my.home.gateway ==> Correct)

Embedded Web Server (2 Management IP Accounts)

HTTP Port: This is the port number that the router embedded web server (for web-based configuration) will use. The default value is the standard HTTP port 80. Users may specify an alternative if, for example, they are running a web server on a PC within their LAN.

Management IP Address: You may specify an IP address for logon and access the router web server. Setting the IP address to 0.0.0.0 will disable IP address restrictions, allowing users to login from any IP address.

Expire to auto-logout: Specify a duration for the system to log the user out of the configuration session automatically.

For Example:

User A changes the HTTP port number to 100, specifies their own IP address as 192.168.1.55 and sets the logout time as 100 seconds. The router will only allow User A to access the Web GUI from the IP address 192.168.1.55 by typing **http://192.168.1.254:100** in their web browser. Nevertheless, after 100 seconds the device will automatically log User A out of the system.

Universal Plug and Play (UPnP)

UPnP offers peer-to-peer network connectivity for PCs and other network devices, along with control and data transfer features between devices. UPnP offers many advantages for users that run NAT routers through UPnP NAT Traversal and on supported systems. This makes tasks such as port forwarding become easier by letting the application control the required settings & remove the need for the user to control the advanced configuration of their device.

Both operating system and the relevant application must support UPnP in addition to the router. Windows XP and Windows ME natively support UPnP (when the component is installed) while Windows 98 users may install the Internet Connection Sharing client from Windows XP in order to gain support for UPnP. Nevertheless Windows 2000 does not support UPnP.

Disable: Check to disable the router’s UPnP functionality.

Enable: Check to enable the router’s UPnP functionality.

UPnP Port: Its default setting is 2800. It is highly recommended for users to use this port value. If this value conflicts with other ports already being used, you may wish to change the port.

SNMP Access Control (Software on a PC within the LAN is required in order to utilize this function) – Simple Network Management Protocol.

- ⊙ **Disable:** Check to disable the router’s SNMP functionality.
- ⊙ **Enable:** Check to enable the router’s SNMP functionality.

SNMP V1 and V2:

Read Community: Specify a name to be identified as the Read Community and an IP address. This community string will be checked against the string entered in the configuration file. Once the string name is matched, user with this IP address will be able to view the data.

Write Community: Specify a name to be identified as the Write Community and an IP address. This community string will be checked against the string entered in the configuration file. Once the string name is matched, users with this IP address will be able to view and modify the data.

Trap Community: Specify a name to be identified as the Trap Community and an IP address. This community string will be checked against the string entered in the configuration file. Once the string name is matched, users with this IP address will be sent SNMP Traps.

SNMP V3:

Specify a name and password for authentication and define the access right from an identified IP address. Once the authentication has succeeded, users with this IP address will be able to view and modify the data.

SNMP Version: SNMPv2c and SNMPv3

SNMPv2c is the combination of the enhanced protocol features of SNMPv2 without the SNMPv2 security. The "c" comes from the fact that SNMPv2c uses the SNMPv1 community string paradigm for "security", but is widely accepted as the SNMPv2 standard.

SNMPv3 is a strong authentication mechanism, authorization with fine granularity for remote monitoring.

Traps supported: Cold Start, Authentication Failure.

The following MIBs are supported:

From RFC 1213 (MIB-II)

- System group
- Interface group
- Address Translation group
- IP group

ICMP Group

- TCP group
- UDP group
- EGP (not applicable) Transmission
- SNMP group

From RFC 1650 (EtherLike-MIB)

- dot3stats

From RFC 1493 (Bridge MIB)

- dot1 dBase group
- dot1 dTp group
- dot1 dStp group (if configured as spanning tree)

From RFC 1472 (PPP/Security MIB)

- PPP security group

From RFC 1473 (PPP/IP MIB)

- PPP IP group

From RFC 1474 (PPP/Bridge MIB)

- PPP Bridge group

From RFC 1573 (IfMIB)

- ifMIBObjects group

From RFC 1695 (atmMIB)

- atmMIBObjects

From RFC 1907 (SNMPv2)

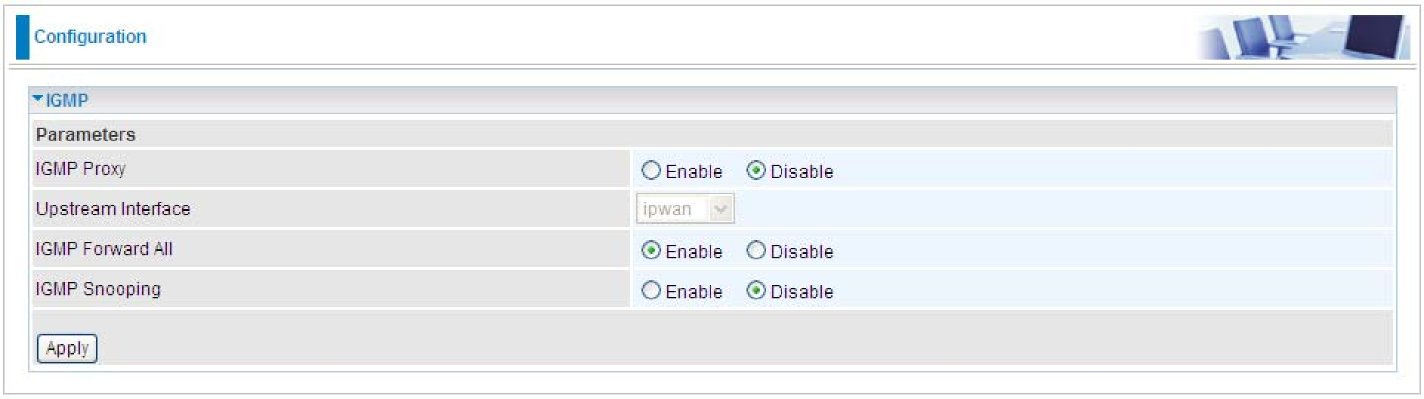
- only snmpSetSerialNo OID

From RFC 1471 (PPP/LCP MIB)

- pppLink group
- pppLgr group (not applicable)

IGMP

IGMP, known as Internet Group Management Protocol, is used to manage hosts from multicast group.



Configuration

▾IGMP

Parameters	
IGMP Proxy	○ Enable ● Disable
Upstream Interface	ipwan
IGMP Forward All	● Enable ○ Disable
IGMP Snooping	○ Enable ● Disable

IGMP Proxy: Enables or disables the router’s IGMP Proxy.

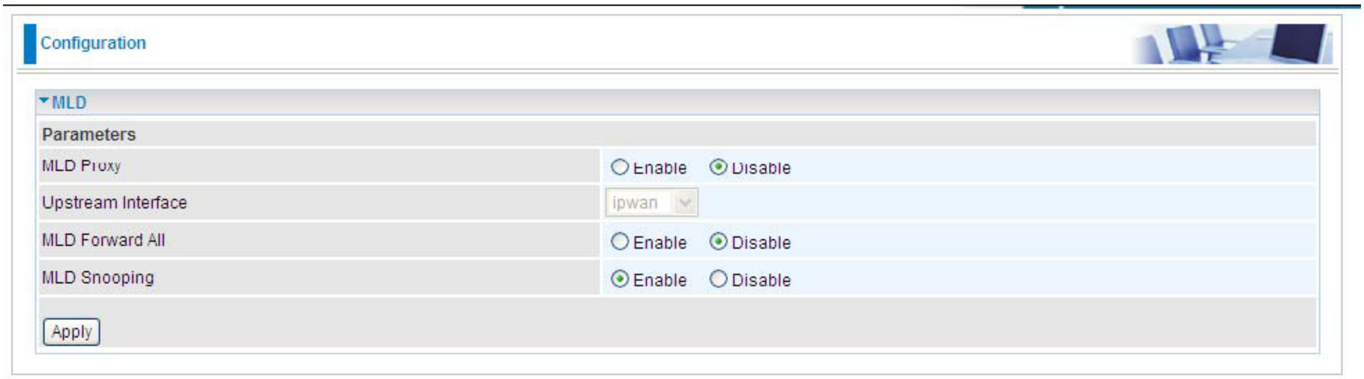
Upstream Interface: When IGMP Proxy enabled, sets one of the router’s existing IP interfaces as the upstream interface; all other router interfaces are designated downstream interfaces.

IGMP Forward All: Enables/Disables your router’s ability to forward multicast traffic to ALL interfaces.

IGMP Snooping: Enables/Disables the IGMP Snoop functionality in the bridge. When the IGMP snoop functionality is enabled, all the attached bridge interfaces are designated as downstream interfaces.

MLD

MLD, short for **Multicast Listener Discovery** protocol, is a component if the Internet Protocol version 6(IPv6) suite. MLD is used by IPv6 to discover multicast listeners on a directly attached link, much as IGMP used in IPv4. The protocol is embedded in ICMPv6 instead of using a separate protocol. MLDv1 is similar to IGMPv2 and MLDv2 is similar to IGMPv3.



Configuration

▾MLD

Parameters	
MLD Proxy	○ Enable ● Disable
Upstream Interface	ipwan
MLD Forward All	○ Enable ● Disable
MLD Snooping	● Enable ○ Disable

MLD Proxy: check whether to enable this function. MLD (**Multicast Listener Discovery** Protocol) Proxy intercepts the MLD request from Clients and forwards it to the router after some dealings. Support MLDv1 and MLDv2.

Upstream Interface: When MLD Proxy enabled, sets one of the router’s existing IP interfaces as the upstream interface; all other router interfaces are designated downstream interfaces.

MLD Forward All: select enable to forward the multicast packets to all ports. If select disable, the multicast packets will be forwarded to ports set according to the MLD Snooping below.
MLD Snooping: similar to IGMP snooping, listens in on the MLD conversation between hosts and routers by processing MLD packets sent in a multicast network, and it analyzes all MLD packets between hosts and the connected multicast routers in the network. Without MLD snooping, multicast traffic is treated in the same manner as broadcast traffic - that is, it is forwarded to all ports. With MLD snooping, multicast traffic of a group is only forwarded to ports that have members of that group.

Logout

To exit the router web interface, choose Logout. Please save your configuration setting before logging out of the system.

Be aware that the router configuration interface can only be accessed by one PC at a time. Therefore when a PC has logged into the system interface, the other users cannot access the system interface until the current user has logged out of the system. If the previous user forgets to logout, the second PC can only access the router web interface after a user-defined auto logout period which is by default 3 minutes. You can however modify the value of the auto logout period using the Advanced > Device Management section of the router web interface. Please see the Advanced section of this manual for more information.

Chapter 5: Troubleshooting

If your router is not functioning properly, please refer to the suggested solutions provided in this chapter. If your problems persist or the suggested solutions do not meet your needs, please kindly contact your service provider or Billion for support.

Problems with the router

Problem	Suggested Action
None of the LEDs lit when the router is turned on.	Check the connection between the router and the adapter. If the problem persists, most likely it is due to the malfunction of your hardware. Please contact your service provider for technical support.
You have forgotten your login username and/or password	Try the default username "admin" and password "admin". If this fails, you can restore your router to its factory settings by holding the Reset button on the back of your router more than 6 seconds.

Problems with LAN interface

Problem	Suggested Action
Cannot PING any PC on LAN	Check the Ethernet LEDs on the front panel. The LED should be on for the port that has a PC connected. If it does not lit, check to see if the cable between your router and the PC is properly connected. Make sure you have first uninstalled your firewall program before troubleshooting.
	Verify that the IP address and the subnet mask are consistent for both the router and the workstations.

Appendix: Product Support & Contact

Following the suggestions listed in the Troubleshooting section of the user manual can help you solve most of your problems. However if your problems persist or you come across other technical issues that are not listed in the Troubleshooting section, please contact the dealer from where you purchased your product.

Contact Billion

Worldwide:

http://www.billion.com