

BiPAC 7402NX(L)

**802.11n 3G/ADSL2+
(VPN) Firewall Router**

User's Manual

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Chapter 1: Introduction

Introduction to your Router

Welcome to the BiPAC 7402NX(L) 802.11n 3G/ADSL2+ (VPN) Firewall Router. The router is an “all-in-one” ADSL router, combining an ADSL modem, ADSL router and Ethernet network switch functionalities, providing everything you need to get the machines on your network connected to the Internet over your ADSL broadband connection. With features such as an ADSL 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

- Express Internet Access**
This router complies with worldwide ADSL standards. It supports downstream rates of up to 12/24 Mbps with ADSL2/2+, 8 Mbps with ADSL, and upstream rates of up to 1 Mbps. With this technology, users enjoy not only high-speed ADSL service but also broadband multimedia applications such as interactive gaming, video streaming and real-time audio much more quickly and easily than ever. In particular, by doubling the upstream data rate, the Annex M standard included in the BiPAC 7402NX model supports the latest ADSL2/2+ for higher upload speeds.
- Virtual Private Network (VPN) (BiPAC 7402NX only)**
It allows user to make a tunnel with a remote site directly to secure the data transmission among the connection. User can use embedded PPTP and L2TP client/server, IKE and IPSec which are supported by this router to make a VPN connection or users can run the PPTP client in PC and the router already provides IPSec and PPTP pass through function to establish a VPN connection if the user likes to run the PPTP client in his local computer.
- 802.11n Wireless AP with WPA Support**
With an integrated 802.11n Wireless Access Point in the router, the device delivers up to 6 times faster speeds and 3 times farther range than an 802.11b/g wireless network. It offers a quick yet easily accessible and mobile to the users among wired network, wireless network, broadband connection (ADSL). In addition to having a 300Mbps. data rate, it is also backward compatible with existing 802.11b/11g equipments. The supported features of Wireless Protected Access (WPA-PSK/ WPA2-PSK) and Wireless Encryption Protocol (WEP) enhance the security level of data protection and access control via Wireless LAN.
- Fast Ethernet Switch**
A 4-port 10/100/1000Mbps fast Ethernet switch is built in with automatic switching between MDI and MDI-X for 10Base-T, 100Base-TX and 1000Base-TX ports. An Ethernet straight or crossover cable can be used directly for auto detection.
- Multi-Protocol to Establish a Connection**
It supports PPPoA (RFC 2364 - PPP over ATM Adaptation Layer 5), RFC 1483 encapsulation over ATM (bridged or routed), PPP over Ethernet (RFC 2516), and IPoA (RFC1577) to establish a connection with the ISP. The product also supports VC-based and LLC-based multiplexing.
- 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.
- **Quality of Service (QoS)**
QoS gives you full control over which types of outgoing data traffic should be given priority by the router, ensuring important data like gaming packets, customer information, or management information move through the router at lightning speed, even under heavy load. The QoS features are configurable by source IP address, destination IP address, protocol, and port. You can throttle the speed at which different types of outgoing data pass through the router, to ensure P2P users don't saturate upload bandwidth, or office browsing doesn't bring client web serving to a halt. In addition, or alternatively, you can simply change the priority of different types of upload data and let the router sort out the actual speeds.
- **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 under high humidity or high temperatures.
- ✓ Do not use the same power source for this router as other equipment.
- ✓ Do not open or repair the case by yourself. If this router is too hot, turn off the power immediately and have it repaired at a qualified service center.
- ✓ Avoid using this product and all accessories outdoors.



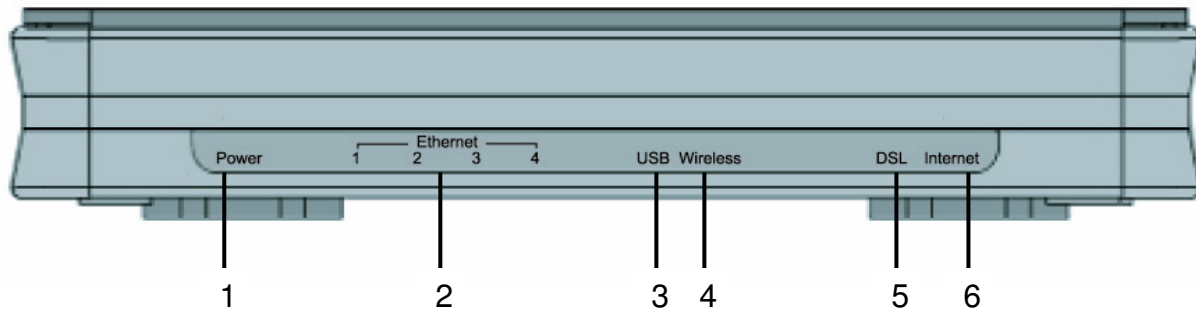
Attention

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

Package Contents

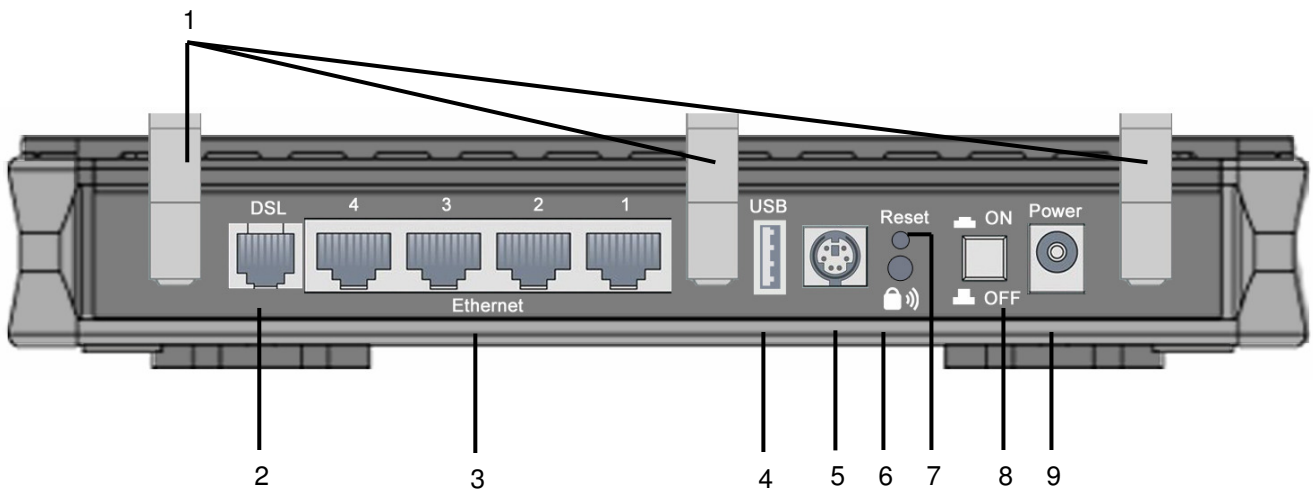
- BiPAC 7402NX(L) 802.11n 3G/ ADSL2+ (VPN) Firewall Router
- CD containing the on-line manual
- RJ-11 ADSL/ telephone cable
- Ethernet (CAT-5 LAN) cable
- Three 2dbi detachable antennas
- AC-DC power adapter (15V DC, 1.6A)
- PS2-RS 232 console cable
- Quick Start Guide
- Splitter/ Micro-filter (Optional)

The Front LEDs



LED		Meaning
1	Power	Lit when power turns ON. Lit in red means the system is failed. To restart the device or connect Billion for searching support.
2	LAN Port 1X — 4X (RJ-45 connector)	Lit when one of LAN ports connected to an Ethernet device. If the speed of transmission hits 1000Mbps light will appear Green; If the speed of transmission hits 100Mbps light will appear Orange. If the speed of transmission hits 10Mbps, light will not shine. Blinking when data is Transmitted / Received.
3	USB	Lit when the device connected to a USB device. Flash when the device is sending/receiving data.
4	Wireless	Lit green when the wireless connection is established. Flashes when the device is sending/receiving data.
5	DSL	Lit Green when the device is successfully connected to an ADSL DSLAM. ("line synch").
6	Internet	Lit red when WAN port fails to get IP address. Lit green when WAN port gets IP address successfully.

The Rear Ports



Port	Meaning
1	Antenna Connect the detachable antenna to this port.
2	DSL Connect the supplied RJ-11 ("telephone") cable on this port when connecting to the ADSL/telephone network.
3	LAN 1X — 4X (RJ-45 connector) 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, 100Mbps or 1000Mbps.
4	USB Connect the USB cable on this port.
5	Console Console port.
6	WPS Push WPS button to trigger Wi-Fi Protected Setup function.
7	RESET To be sure the device is being turned on → press RESET button for: 1-3 seconds: quick reset the device. 6 seconds above, and 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.
8	Power Power ON/OFF switch
9	Power Switch Connect the supplied power adapter to this jack.

Cabling

One of the most common causes of problems is the bad cabling or ADSL line(s). Make sure that all connected devices are turned on. On the front of the product is a bank of LEDs. Verify that the LAN Link and ADSL line LEDs are lit. If they are not, verify that you are using the proper cables.

Ensure that all other devices connected to the same telephone line as your router (e.g. telephones, fax machines, analogue modems) have a line filter connected between them and the wall socket (unless you are using a Central Splitter or Central Filter installed by a qualified and licensed electrician), and ensure that all line filters are correctly installed and the right way around. Missing line filters or line filters installed the wrong way around can cause problems with your ADSL connection, including causing frequent disconnections.

Chapter 3: Basic Installation

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

Please check your PC's 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 with the router, either through an external repeater hub to the router or directly connecting with PCs. However, to be sure PCs have an Ethernet interface installed properly prior to connecting to 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's web interface it may also be advisable to **uninstall** any kind of software firewall on your PCs, as they can cause problems accessing the 192.168.1.254 IP address of the router. Users should make their own decisions on how to best protect their network.

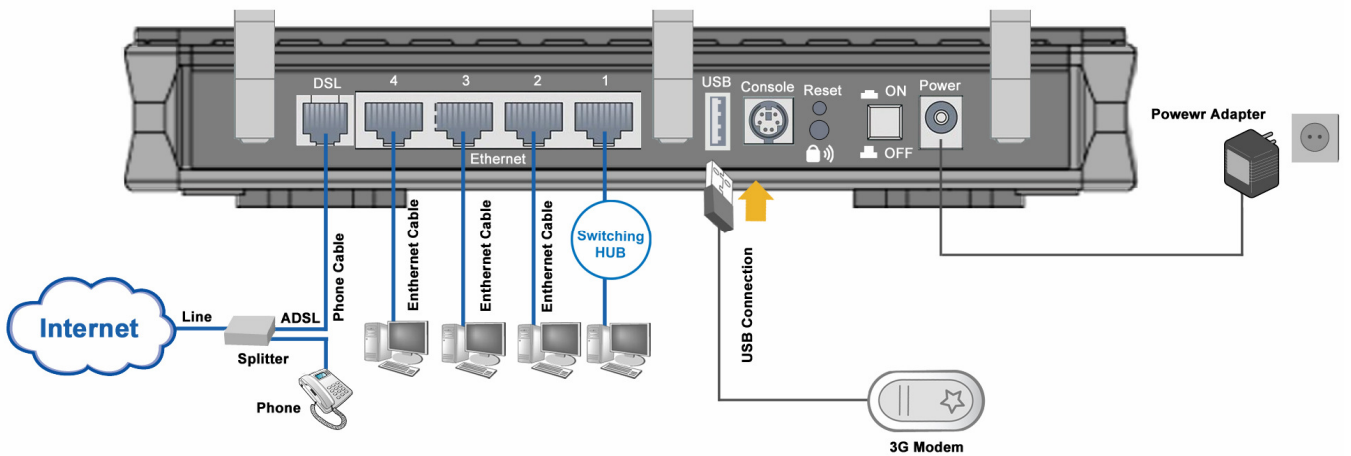
Please follow the steps below for your PC's network environment installation.



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

Connecting Your Router

1. Connect this router to a **LAN** (Local Area Network) and the ADSL/telephone (**ADSL**) network.
2. Power on the device.
3. Make sure the **Power** is lit steadily and that the **LAN** LED is lit.
4. Connect RJ-11 cable to LINE Port when connecting to the telephone wall jack.
5. Connect USB 2.0 cable.



Configuring PCs in Windows in Window XP

1. Go to **Start / Control Panel** (in Classic View). In the Control Panel, double-click **Network Connections**.
2. Double-click **Local Area Connection**. (See Figure 3.1)

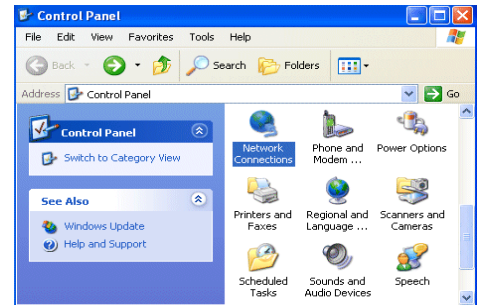


Figure 3.1: LAN Area Connection

3. In the **LAN Area Connection Status** window, click **Properties**. (See Figure 3.2)

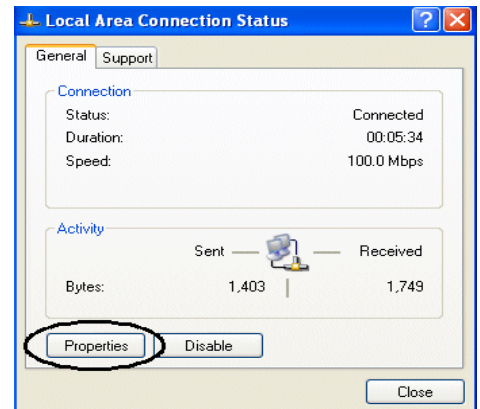


Figure 3.2: LAN Connection Status

4. Select **Internet Protocol (TCP/IP)** and click **Properties**. (See Figure 3.3)

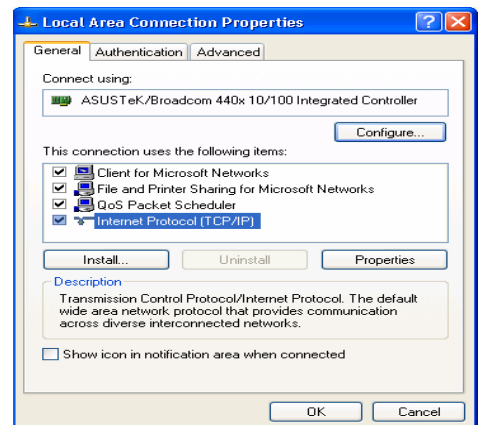


Figure 3.3: TCP / IP

5. Select the **Obtain an IP address automatically** and **Obtain DNS server address automatically** radio buttons. (See Figure 3.4)
6. Click **OK** to finish the configuration.

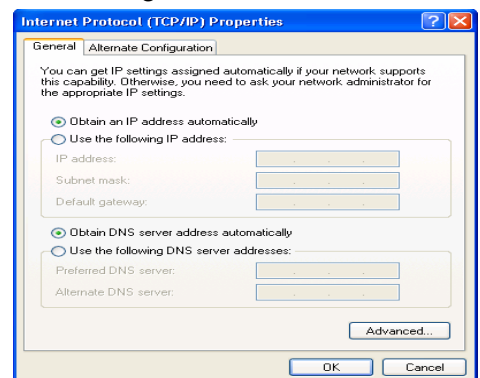


Figure 3.4: IP Address & DNS Configuration

Configuring PCs in Windows 2000

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click **Network and Dial-up Connections**.
2. Double-click **Local Area ("LAN") Connection**. (See Figure 3.5)



Figure 3.5: LAN Area Connection

3. In the **LAN Area Connection Status** window, click **Properties**. (See Figure 3.6)

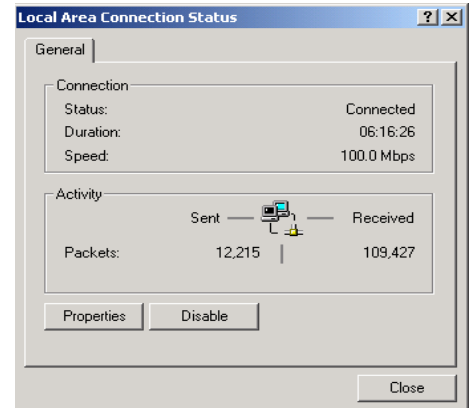


Figure 3.6: LAN Connection Status

4. Select **Internet Protocol (TCP/IP)** and click **Properties**. (See Figure 3.7)

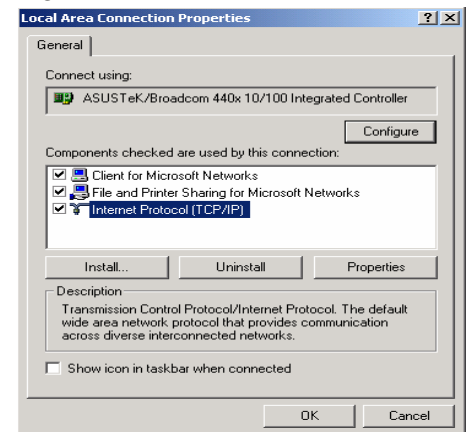


Figure 3.7: TCP / IP

5. Select the **Obtain an IP address automatically** and **Obtain DNS server address automatically** radio buttons. (See Figure 3.8)
6. Click **OK** to finish the configuration.

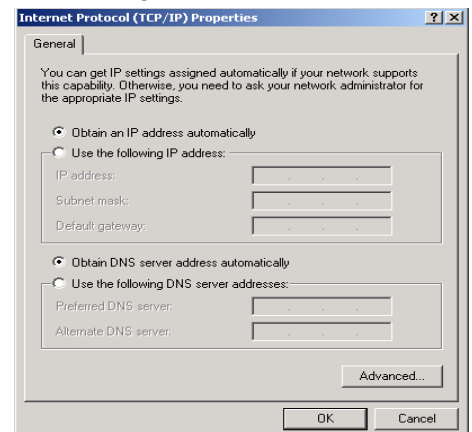


Figure 3.8: IP Address & DNS Configuration

Configuring PC in Windows 95/98/ME

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click **Network** and choose the **Configuration** tab.
2. Select **TCP / IP -> NE2000 Compatible**, or the name of any Network Interface Card (NIC) in your PC. (See Figure 3.9)
3. Click **Properties**.

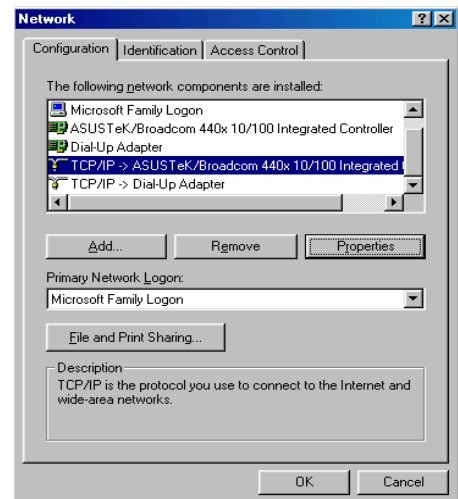


Figure 3.9: TCP / IP

4. Select the **IP Address** tab. In this page, click the Obtain an IP address automatically radio button. (See Figure 3.10)

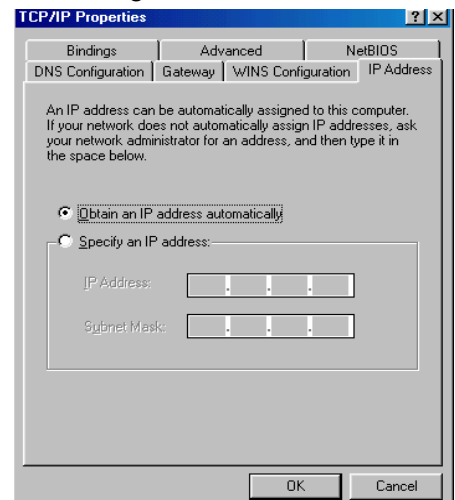


Figure 3.10: IP Address

5. Then select the **DNS Configuration** tab. (See Figure 3.11)
6. Select the **Disable DNS** radio button and click **OK** to finish the configuration.

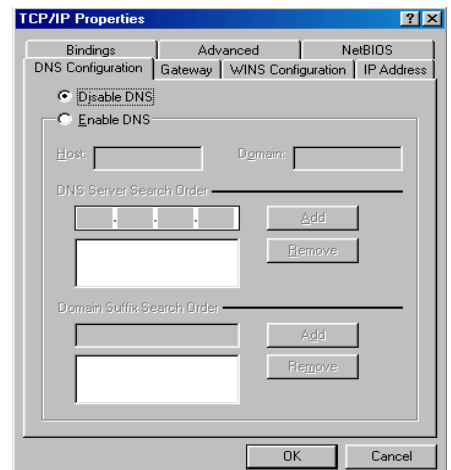


Figure 3.11: DNS Configuration

Configuring PC in Windows NT4.0

1. Go to **Start / Settings / Control Panel**. In the Control Panel, double-click **Network** and choose the **Protocols** tab.
2. Select **TCP/IP Protocol** and click **Properties**. (See Figure 3.12)

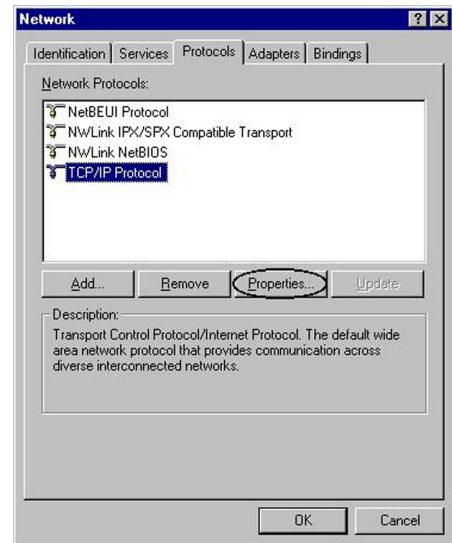


Figure 3.12: TCP / IP

3. Select the **Obtain an IP address from a DHCP server** radio button and click **OK**. (See Figure 3.13)

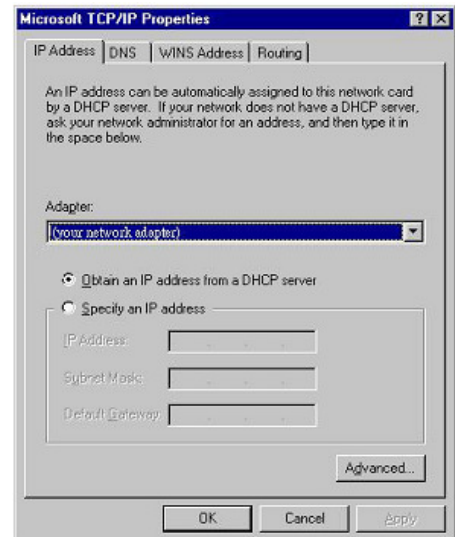


Figure 3.13: IP Address

Factory Default Settings

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

Web Interface (Username and Password)

- ▶ Username: admin
- ▶ Password: admin

The default username and password are “**admin**” and “**admin**” respectively.



Attention

If you ever forget the username/password to login to the router, you may press the RESET button up to 6 seconds to restore the factory default settings.

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

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 below.

LAN Port		WAN Port
IP address	192.168.1.254	The PPPoE function is <i>enabled</i> to automatically get the WAN port configuration from the ISP.
Subnet Mask	255.255.255.0	
DHCP server function	Enabled	
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) and PPPoE.

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

PPPoE(RFC2516)	VPI/VCI, VC / LLC-based multiplexing, Username, Password, Service Name, and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
PPPoA(RFC2684)	VPI/VCI, VC / LLC-based multiplexing, Username, Password and Domain Name System (DNS) IP address (it can be automatically assigned by your ISP when you connect or be set manually).
MPoA(RFC1483/RFC2684)	VPI/VCI, VC / LLC-based multiplexing, IP address, Subnet mask, Gateway address, and Domain Name System (DNS) IP address (it is a fixed IP address).
IPoA(RFC1577)	VPI/VCI, VC / LLC-based multiplexing, IP address, Subnet mask, Gateway address, and Domain Name System (DNS) IP address (it is a fixed IP address).
Pure Bridge	VPI/VCI, VC / LLC-based multiplexing to use Bridged Mode.

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)**

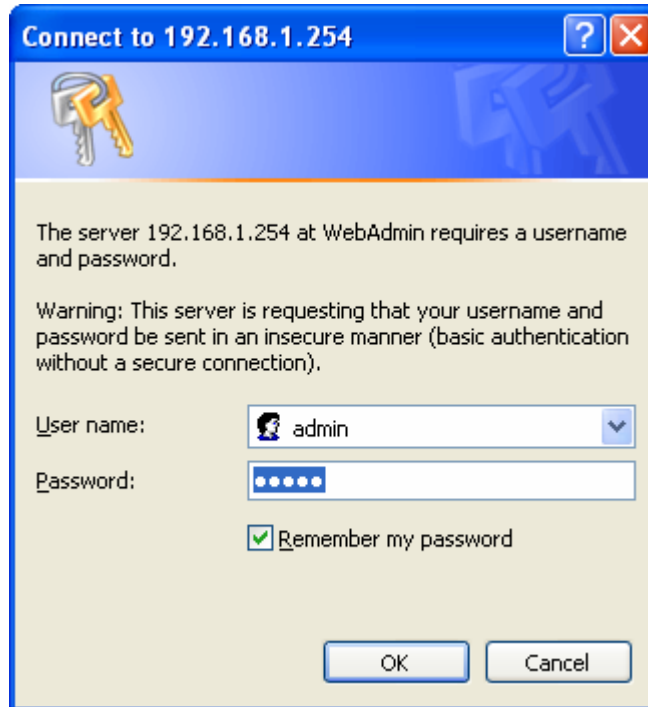


Figure 3.14: User name & Password Prompt Window

Congratulations! You are now successfully logon to the Router!

Chapter 4: Configuration

At the configuration homepage, the left navigation pane where bookmarks are provided links you directly to the desired setup page, including:

● **Status**

- [ADSL Status](#)
- [3G Status](#)
- [ARP Table](#)
- [DHCP Table](#)
- [Routing Table](#)
- [NAT Sessions](#)
- [UPnP Portmap](#)
- [PPTP Status](#)
- [IPSec Status](#)
- [L2TP Status](#)
- [Email Status](#)
- [Event Log](#)
- [Error Log](#)
- [Diagnostic](#)

● **Quick Start**

● **Configuration**

- [LAN](#)
- [WAN](#)
- [System](#)
- [Firewall](#)
- [VPN](#)
- [QoS](#)
- [Virtual Server](#)
- [Time Schedule](#)
- [Advanced](#)

● **Language** (provides user interface in English and French languages)

Status

ADSL Status

This section displays the ADSL overall status, which shows a number of helpful information such as DSP firmware version.

ADSL Status	
Parameters	
DSP Firmware Version	E.25.41.32 A
Connected	false
Operational Mode	Inactive
Annex Type	AnnexA
Upstream	0
Downstream	0
SNR Margin(Upstream)	
SNR Margin(Downstream)	
Line Attenuation(Upstream)	
Line Attenuation(Downstream)	
CRC Errors(Upstream)	0
CRC Errors(Downstream)	0
Latency(Upstream)	
Latency(Downstream)	

3G Status

This section displays the 3G Card's overall status, which shows you a number of helpful information such as the current signal strength and statistics on current and total bytes transferred and received (**Note: 3G card/modem does not come with the router**).

Status	
3G Status	
Parameters	
Status ▶	3G Card not found
Signal Strength	N/A
Network Name	N/A
Card Name	N/A
Card Firmware	N/A
Current TX Bytes / Packets	0 / 0
Current RX Bytes / Packets	0 / 0
Total TX Bytes / Packets	0 / 0
Total RX Bytes / Packets	0 / 0
<input type="button" value="Clear"/>	

Status: The current status of the 3G card.

Signal Strength: The signal strength bar indicates current 3G signal strength.

Network Name: The network name that the device is connected to.

Card Name: The name of the 3G card.

Card Firmware: The current firmware for the 3G card.

Current TX Bytes / Packets: The statistics of transmission, count for this call.

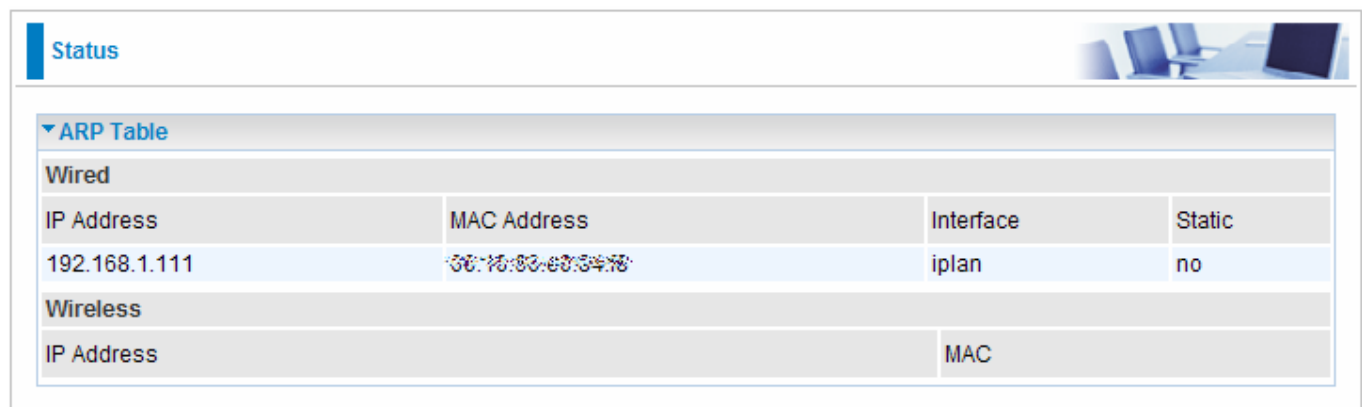
Current RX Bytes / Packets: The statistics of receive, count for this call.

Total TX Bytes / Packets: The statistics of transmission, count from system ready

Total RX Bytes / Packets: The statistics of receive, count from system ready

ARP Table

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



Wired			
IP Address	MAC Address	Interface	Static
192.168.1.111	08-15-83-63-34-78	iplan	no

Wireless	
IP Address	MAC

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

MAC Address: The MAC (Media Access Control) addresses for each device on your LAN.

Interface: 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



Type		
Leased ▶	Expired ▶	Permanent ▶

Leased: The DHCP assigned IP addresses information.

Expired: The expired IP addresses information.

Permanent: The fixed host mapping information

Leased Table

Leased Table			
IP Address	MAC Address	Client Host Name	Expiry


IP Address: The IP address that assigned to client.

MAC Address: The MAC address of client.

Client Host Name: The Host Name (Computer Name) of client.

Expiry: The current lease time of client.

Routing Table

Status 				
▼ Routing Table				
Routing Table				
Valid	Destination	Netmask	Gateway/Interface	Cost
RIP Routing Table				
Destination	Netmask	Gateway	Cost	

Routing Table

Valid: It indicates a successful routing status.

Destination: The IP address of the destination network.

Netmask: The destination Netmask address.

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

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

RIP Routing Table

Destination: The IP address of the destination network.

Netmask: The destination Netmask address.

Gateway: 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 current NAT sessions between interface of types external (WAN) and internal (LAN).

Status

NAT Sessions

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

UPnP Portmap

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

Status

UPnP Portmap

UPnP Portmap Table

Name	Protocol	External Port	Redirect Port	IP Address

PPTP Status

This shows details of your configured PPTP VPN Connections.

Status

PPTP Status

VPN/PPTP for Remote Access Application

Name	Type	Enable	Active	Tunnel Connected	Call Connected	Encryption

VPN/PPTP for LAN-to-LAN Application

Name	Type	Enable	Active	Tunnel Connected	Call Connected	Encryption

Name: The name you assigned to the particular PPTP connection in your VPN configuration.

Type: The type of connection (dial-in/dial-out).

Enable: Whether the connection is currently enabled.

Active: Whether the connection is currently active.

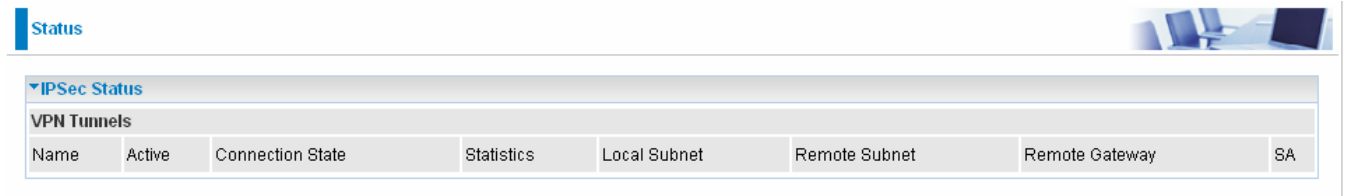
Tunnel Connected: Whether the VPN Tunnel is currently connected.

Call Connected: If the Call for this VPN entry is currently connected.

Encryption: The encryption type used for this VPN connection.

IPSec Status

This shows details of your configured IPSec VPN Connections.



IPSec Status							
VPN Tunnels							
Name	Active	Connection State	Statistics	Local Subnet	Remote Subnet	Remote Gateway	SA

Name: The name you assigned to the particular VPN entry.

Active: Whether the VPN Connection is currently Active.

Connection State: Whether the VPN is Connected or Disconnected.

Statistics: Statistics for this VPN Connection.

Local Subnet: The local IP Address or Subnet used.

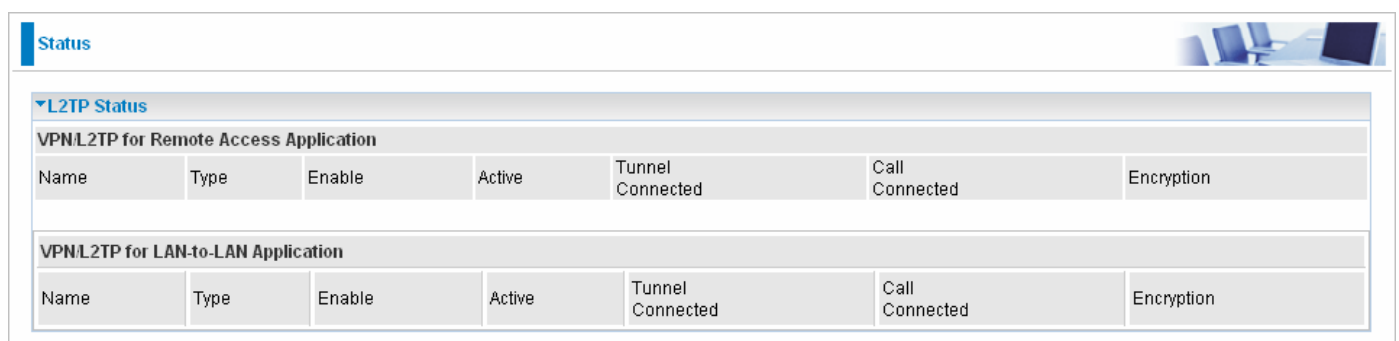
Remote Subnet: The Subnet of the remote site.

Remote Gateway: The Remote Gateway IP address.

SA: The Security Association for this VPN entry.

L2TP Status

This shows details of your configured L2TP VPN Connections.



L2TP Status						
VPN L2TP for Remote Access Application						
Name	Type	Enable	Active	Tunnel Connected	Call Connected	Encryption

VPN L2TP for LAN-to-LAN Application						
Name	Type	Enable	Active	Tunnel Connected	Call Connected	Encryption

Name: The name you assigned to the particular L2TP connection in your VPN configuration.

Type: The type of connection (dial-in/dial-out).

Enable: Whether the connection is currently enabled.

Active: Whether the connection is currently active.

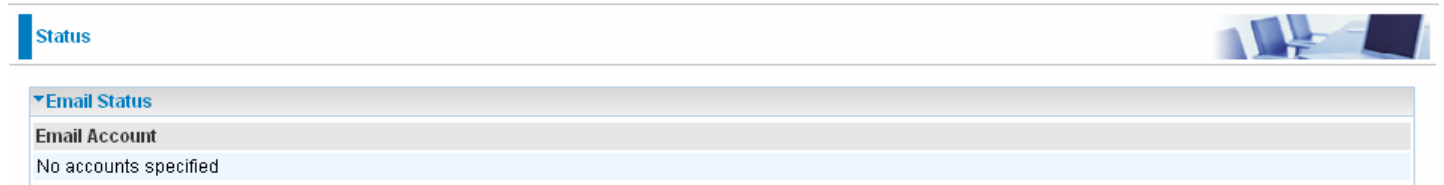
Tunnel Connected: Whether the VPN Tunnel is currently connected.

Call Connected: If the Call for this VPN entry is currently connected.

Encryption: The encryption type used for this VPN connection.

Email Status

Details and status for the Email Account you have configured the router to check. Please see the **Advanced** section of this manual for details on this function.



Status

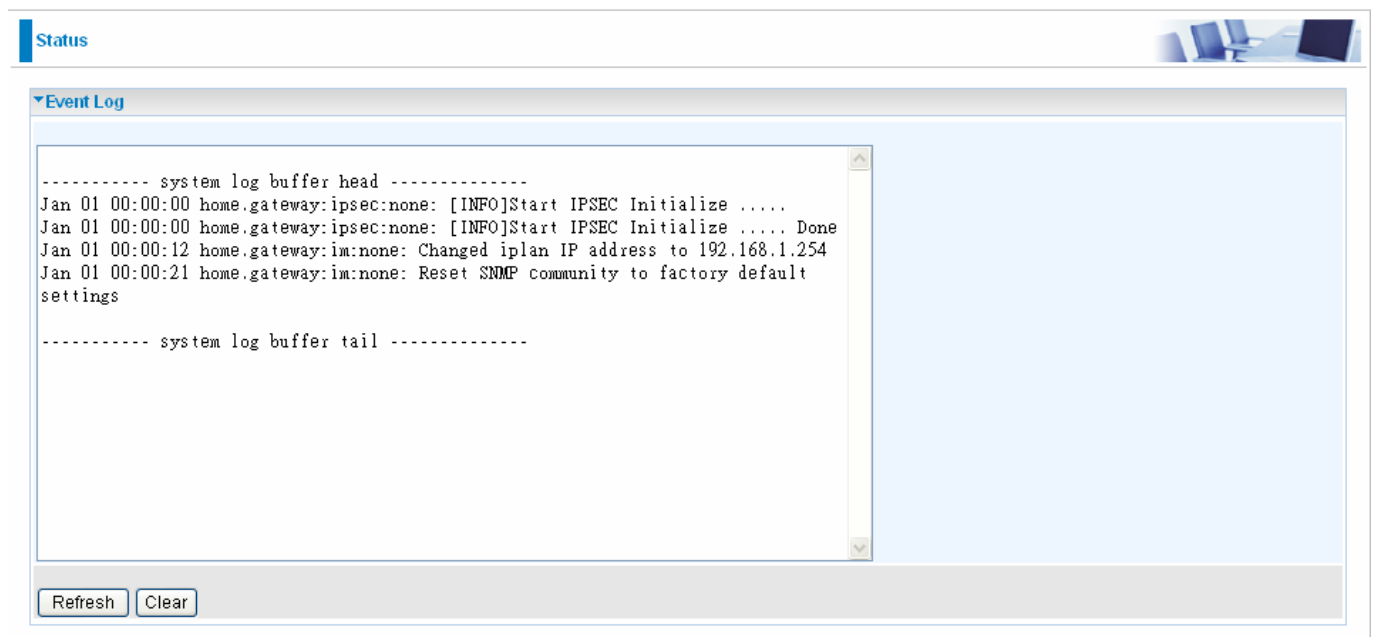
▼ **Email Status**

Email Account

No accounts specified

Event Log

This page displays the router's Event Log entries. Major events are logged to this window, such as when the router's ADSL connection is disconnected, as well as Firewall events when you have enabled Intrusion or Blocking Logging in the **Configuration – Firewall** section of the interface. Please see the **Firewall** section of this manual for more details on how to enable Firewall logging.



Status

▼ **Event Log**


```

----- system log buffer head -----
Jan 01 00:00:00 home.gateway:ipsec:none: [INFO]Start IPSEC Initialize .....
Jan 01 00:00:00 home.gateway:ipsec:none: [INFO]Start IPSEC Initialize ..... Done
Jan 01 00:00:12 home.gateway:im:none: Changed iplan IP address to 192.168.1.254
Jan 01 00:00:21 home.gateway:im:none: Reset SNMP community to factory default
settings
----- system log buffer tail -----
    
```

Refresh Clear

Error Log

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



Status

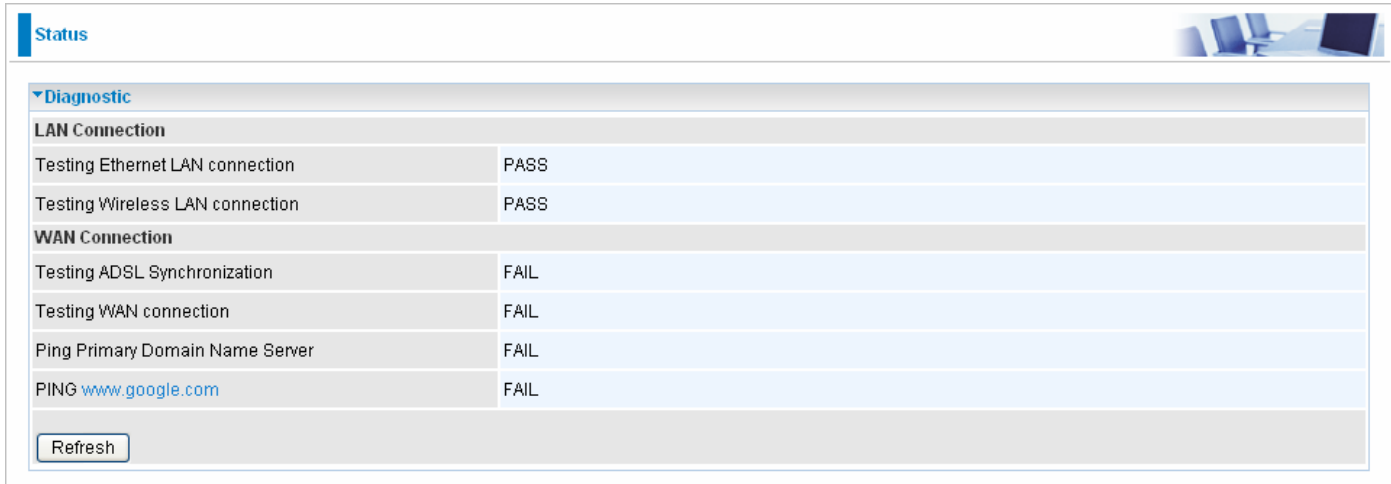
▼ **Error Log**

Error Log (times are in seconds since last reboot)

When	Process	Error Log
------	---------	-----------

Diagnostic

It tests the connection to computer(s) which is connected to 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 settings is set correctly.



Status

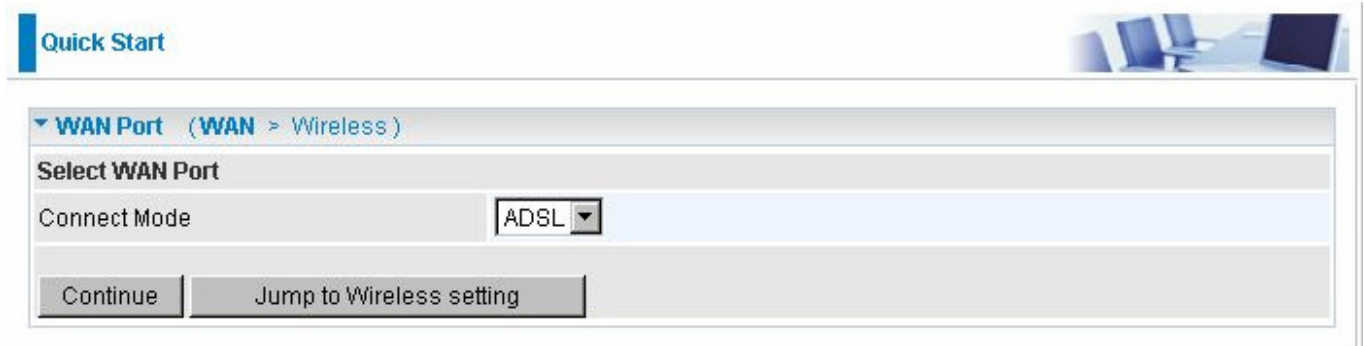
Diagnostic

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

Refresh

Quick Start

1. Click Quick Start. Select the connect mode you want. There are two options you can choose, **ADSL** and **3G**. Select **ADSL** from Connect Mode drop-down menu, and click **Continue**.



Quick Start

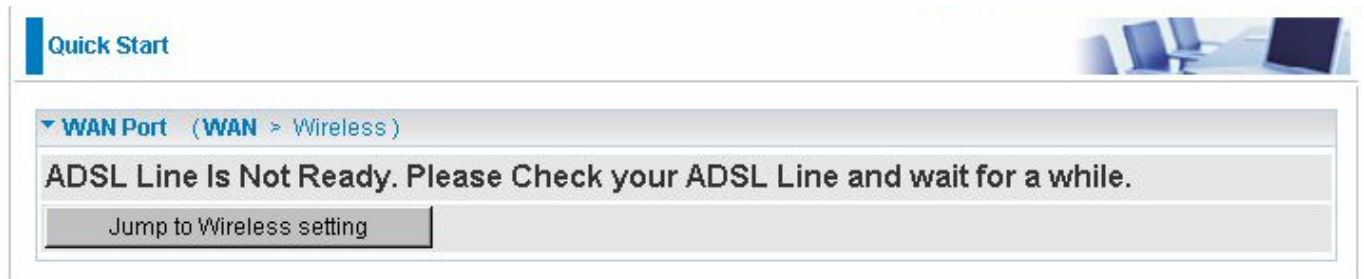
WAN Port (WAN > Wireless)

Select WAN Port

Connect Mode: ADSL

Continue Jump to Wireless setting

2. If your ADSL line is not ready, you need to check your ADSL line has been set or not.



Quick Start

WAN Port (WAN > Wireless)

ADSL Line Is Not Ready. Please Check your ADSL Line and wait for a while.

Jump to Wireless setting

3. If your ADSL line is ready, the screen appears ADSL Line is Ready. Choose **Auto** radio button and click **Apply**. It will automatically scan the recommended mode for you. Manually mode makes you to set the ADSL line by manual. (If you choose **Manually**, you will directly go to step 5.)

Quick Start

▼ **WAN Port** (WAN > Wireless)

ADSL Line Is Ready.

Auto scan Auto Manually

Quick Start

▼ **WAN Port** (WAN > Wireless)

ADSL Line Is Ready.

Scanning

Please wait for seconds

4. The list below has different mode applied for your choice. Choose **0/33/PPPoE(Recommended)** and click **Apply**.

Quick Start

▼ **Auto Scan**

- 1. 0/33/PPPoE
- 2. 0/33/RFC1483 SNAP/LLC Bridged

5. Please enter “**Username**” and “**Password**” as supplied by your ISP(Internet Service Provider) and click **Apply** to continue.

Quick Start

▼ **WAN Port** (WAN > Wireless)

Connection

Profile Port: ADSL

Encapsulation: PPPoE (RFC2516, PPP over Ethernet)

VPI/VCI: 0 / 33

Username: pppoe

Password: ●●●●

Service Name:

Authentication Protocol: Chap(Auto)

IP Address: 0.0.0.0
(‘0.0.0.0’ means ‘Obtain an IP address automatically’)

Profile Port: Select the connection mode. There are ADSL and 3G.

Encapsulation: Select the encapsulation mode. The default mode is PPPoE.

VPI/VCI: Enter the VPI and VCI information provided by your ISP.

Username: Enter the username provided by your ISP.

Password: Enter the password provided by your ISP.

Service Name: This item is for identification purposes. If it is required, your ISP provides you the information.

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

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

6. Configure the Wireless LAN setting.

WLAN Service: Default setting is set to **Enable**. If you want to use wireless, 802.11n, 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 exceed 32 characters. Make sure your wireless clients have exactly the ESSID as the device, in order to get connected to your network.

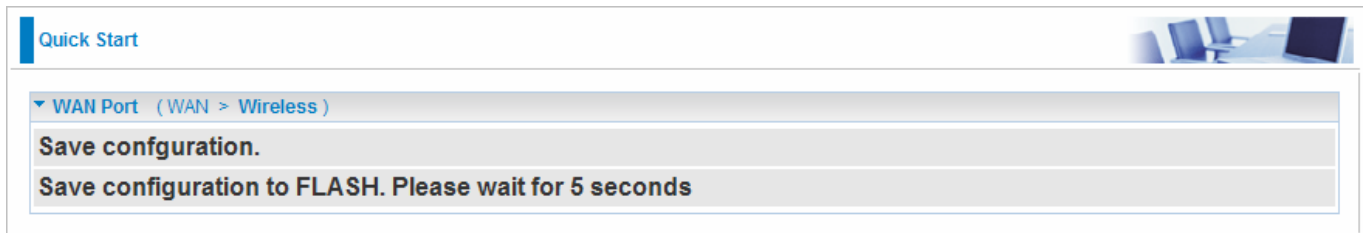
ESSID Broadcast: It is function in which transmits its ESSID to the air so that when wireless client searches for a network, router can then be discovered and recognized. Default setting is **Enable**.

- 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.

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**.

7. Wait for the configuration.



8. If connection is successful the following image will be shown.



Configuration

When you click this item, you get following sub-items to configure the ADSL router.

- **LAN, WAN, System, Firewall, VPN, QoS, Virtual Server, Time Schedule and Advanced**

These functions are described below in the following sections.

LAN - Local Area Network

Here are the items within the LAN section: [Bridge Interface](#), [Ethernet](#), [IP Alias](#), [Ethernet Client Filter](#), [Wireless](#), [Wireless Security](#), [Wireless Client Filter](#), [WPS](#), [Port Setting](#) and [DHCP Server](#).

Bridge Interface

Configuration

▼ Bridge Interface

Parameters

Bridge Interface	VLAN Port
ethernet ▶	<input checked="" type="checkbox"/> P1 <input checked="" type="checkbox"/> P2 <input type="checkbox"/> P3 <input type="checkbox"/> P4 <input type="checkbox"/> Wireless
ethernet1 ▶	<input type="checkbox"/> P1 <input type="checkbox"/> P2 <input checked="" type="checkbox"/> P3 <input checked="" type="checkbox"/> P4 <input checked="" type="checkbox"/> Wireless
ethernet2	<input type="checkbox"/> P1 <input type="checkbox"/> P2 <input type="checkbox"/> P3 <input type="checkbox"/> P4 <input type="checkbox"/> Wireless
ethernet3	<input type="checkbox"/> P1 <input type="checkbox"/> P2 <input type="checkbox"/> P3 <input type="checkbox"/> P4 <input type="checkbox"/> Wireless
ethernet4	<input type="checkbox"/> P1 <input type="checkbox"/> P2 <input type="checkbox"/> P3 <input type="checkbox"/> P4 <input type="checkbox"/> Wireless

Device Management

Management Interface: ethernet

You can setup member ports for each VLAN group under Bridge Interface section. From the example, two VLAN groups need to be created.

Ethernet: P1 and P2 (Port 1, 2).

Ethernet1: P3, P4 and Wireless (Port 3, 4, Wireless). Uncheck P3, P4 and Wireless from Ethernet VLAN port first.

Note: You should setup each VLAN group with caution. Each Bridge Interface is arranged in this order.

Bridge Interface	VLAN Port (Always starts with)
ethernet	P1 / P2 / P3 / P4 / Wireless
ethernet1	P2 / P3 / P4 / Wireless
ethernet2	P3 / P4 / Wireless
ethernet3	P4 / Wireless
ethernet4	Wireless

Management Interface: To specify which VLAN group has possibility to do device management, like doing web management.

Note: NAT/NAPT can be applied to management interface only

Ethernet

Configuration

► Ethernet

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 creates multiple virtual IP interfaces on 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.

The screenshot shows the 'IP Alias' configuration page. At the top, there is a 'Configuration' header. Below it, the 'IP Alias' section is expanded. Under 'Parameters', there are three input fields: 'IP Address', 'Netmask', and 'Security Interface'. The 'Security Interface' dropdown menu is set to 'Internal'. Below the input fields are two buttons: 'Add' and 'Edit/Delete'. At the bottom, there is a table with the following columns: 'Edit', 'IP Address', 'Subnet Mask', 'Security Interface', and 'Delete'.

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

SubNetmask: Specify a subnet mask on this virtual interface.

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

Internal: The network is behind NAT. All traffic will do network address translation when sending out to Internet if NAT is enabled.

External: There is no NAT on this IP interface and connected to the Internet directly. Mostly it will be used when providing multiple public IP addresses by ISP. In this case, you can use public IP address in local network which gateway IP address point to the IP address on this interface.

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

Ethernet Client Filter

The Ethernet Client Filter supports up to 16 Ethernet network machines that helps you to manage your network control to accept traffic from specific authorized machines or can restrict unwanted machine(s) to access your LAN.

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

The screenshot shows the configuration interface for the Ethernet Client Filter. At the top, there is a 'Configuration' tab. Below it, the 'Ethernet Client Filter' section is expanded. Under 'Filtering Rules', the 'Ethernet Client Filter' is currently set to 'Disable' (indicated by a selected radio button). There are three radio buttons for 'Disable', 'Allowed', and 'Blocked'. Below the radio buttons is a table with 16 empty rows for entering MAC addresses. To the left of the table, there is a 'MAC Address List' section with a 'Candidates' button and a note: '(MAC Address Format is 'xx:xx:xx:xx:xx:xx')'. At the bottom left of the configuration area, there is an 'Apply' button.

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

⊙ **Allowed:** check to authorize specific device accessing your LAN by insert the MAC Address in the space provided or click [Candidates](#) . Make sure your PC's MAC is listed.

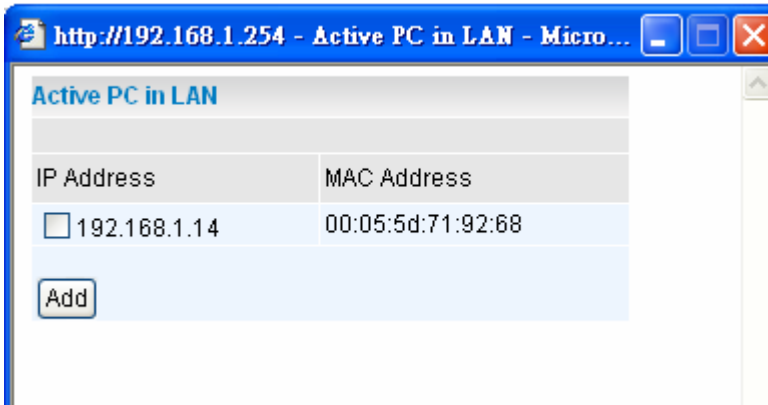
⊙ **Blocked:** check to prevent unwanted device accessing your LAN by insert the MAC Address in the space provided or click [Candidates](#) . Make sure your PC's MAC is not listed.

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: automatically detects devices connected to the router through the Ethernet. .

[Candidates](#) → **Active PC in LAN**



Active PC in LAN displays a list of individual Ethernet device's IP Address & MAC Address which connecting to the router.

You can easily by checking the box next to the IP address to be blocked or allowed. Then, **Add** to insert to the Ethernet Client Filter table. The maximum Ethernet client is 16.

Wireless

Configuration

Wireless

Parameters

WLAN Service	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Mode	802.11b + g + n
ESSID	wlan-ap
ESSID Broadcast	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Regulation Domain	N.America
Channel Width	40/20 MHz
Channel ID	Channel 1 (2.412 GHz)
Tx PowerLevel	100 (Range: 1 ~ 100, unit in percentage)
Connected	true
AP MAC address	00:0c:43:28:60:00
AP Firmware Version	1.1.6.0

Wireless Distribution System (WDS)

WDS Service	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Peer WDS MAC address	1. <input type="text"/> 2. <input type="text"/> 3. <input type="text"/> 4. <input type="text"/>

* : WDS depends on the settings of main security encryption type.

Apply Cancel

Parameters

WLAN Service: Default setting is set to **Enable**. If you do not have any wireless, 802.11n, 802.11g and 802.11b, device in your network, select **Disable**.

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

ESSID: The ESSID is the unique name of a wireless access point (AP) to be distinguished from another. For security purpose, change the default **wlan-ap** 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 exceed 32 characters. Make sure your wireless clients have exactly the ESSID as the device, in order to get connected to your network.

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

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 **Enabled**.

Disable: If you do not want broadcast your ESSID. Any client uses "any" wireless setting cannot discover the Access Point (AP) of your router.

Enable: Any client that using the "any" setting can discover the Access Point (AP) in

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 Width: Select either **20 MHz** or **20/40 MHz** for the channel bandwidth. The higher the bandwidth the better the performance will be.

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

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

TX PowerLevel: It is a function that enhances the wireless transmitting signal strength. User may adjust this power level from minimum 1 up to maximum 100.

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

Connected: Representing in **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.

Wireless Distribution System (WDS)

It is a wireless access point mode that enables wireless link and communication with other access point. It is easy to be installed simply to define peer's MAC address of the connected AP. WDS takes advantages of cost saving and flexibility which 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 enhances its link connection security in WEP mode, WEP key encryption 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's MAC Address. It is important that 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's MAC Address.

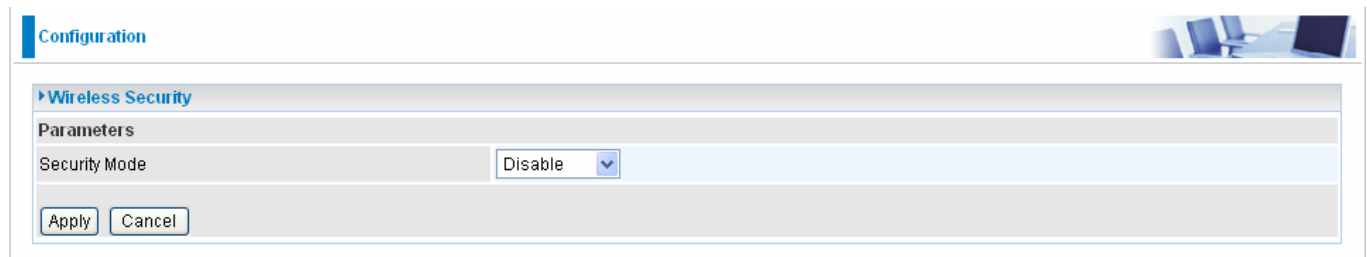
3. Peer WDS MAC Address: It is the third associated AP's MAC Address.

4. Peer WDS MAC Address: It is the fourth associated AP's MAC Address.

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

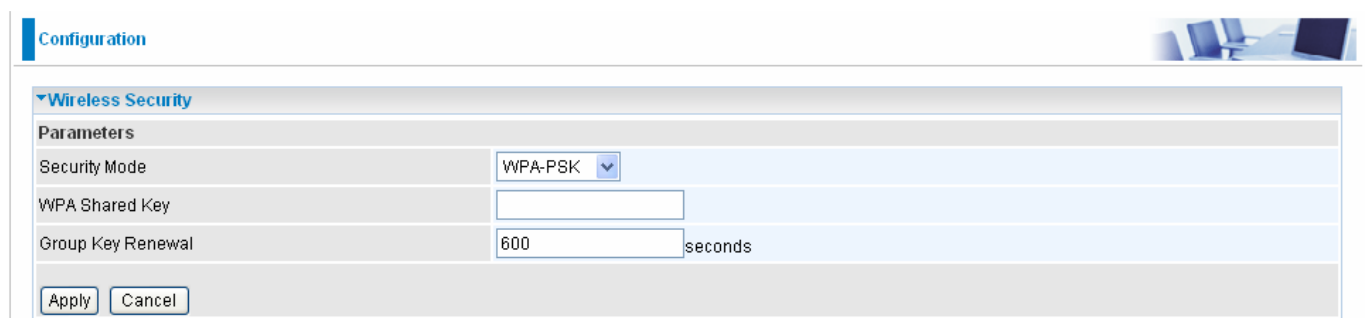
Wireless Security (Wireless Router only)

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



The screenshot shows the 'Configuration' page with the 'Wireless Security' section expanded. Under 'Parameters', the 'Security Mode' is set to 'Disable' in a dropdown menu. There are 'Apply' and 'Cancel' buttons at the bottom of the configuration area.

WPA-PSK / WPA2-PSK



The screenshot shows the 'Configuration' page with the 'Wireless Security' section expanded. Under 'Parameters', the 'Security Mode' is set to 'WPA-PSK' in a dropdown menu. The 'WPA Shared Key' field is empty, and the 'Group Key Renewal' is set to '600' seconds. There are 'Apply' and 'Cancel' buttons at the bottom of the configuration area.

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

WPA Algorithms: There are two types of the WPA-PSK, and WPA2-PSK. The WPA-PSK adapts the TKIP (Temporal Key Integrity Protocol) encrypted algorithms, which incorporates Message Integrity Code (MIC) to provide protection against hackers. The WPA2-PSK adapts CCMP (Cipher Block Chaining Message Authentication Code Protocol) of the AES (Advanced Encryption Security) algorithms.

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	<input checked="" type="radio"/> WEP64 <input type="radio"/> WEP128 Hex
Passphrase	<input type="text"/> <input type="button" value="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. The encryption can either be HEX or ASCII.

Passphrase: This is used to generate WEP keys automatically based upon the input string and a pre-defined algorithm in WEP64 or WEP128. You can input the same string in both the AP and Client card settings to generate the same WEP keys. Please note that you do not have to enter **Key (1-4)** as below when the **Passphrase** is enabled. Passphrase will convert an inputted string into the HEX format which will automatically fill the input space for Key 1 to Key 4.

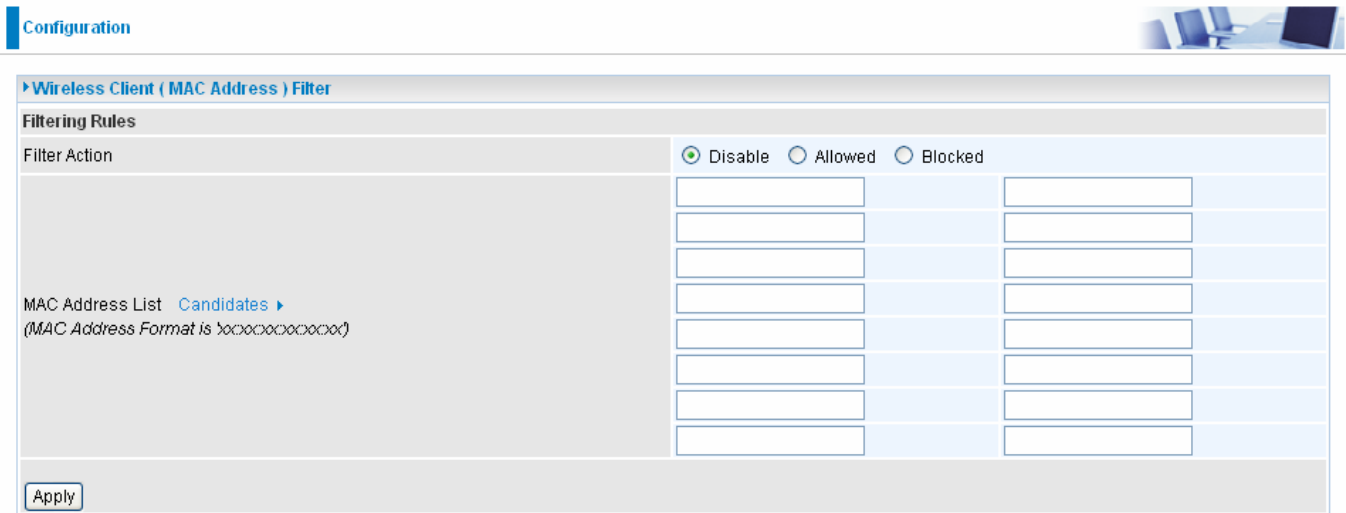
Default Used WEP Key: Select the encryption key ID. There are 4 keys to choose from so that you will not have to re-create a key every time you decide to have it as something different. You can just have 4 sets of keys to rotate instead of just having 1 key. Please refer to **Key (1~4)** below.

Key (1-4): Enter the key to encrypt wireless data this can be in ASCII or HEX depending on the WEP Encryption that you have selected above. 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 (10 and 26 HEX codes) or ASCII style (5 and 13 ASCII codes) are required for WEP64 and WEP128 respectively-no any separator is included.

Wireless Client / MAC Address Filter

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

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



Wireless Client Filter: Default setting is set to **Disable**.

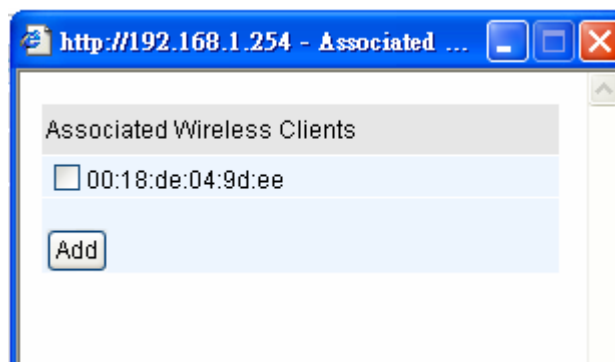
- ⊙ **Allowed:** To authorize specific device accessing your LAN by insert the MAC Address in the space provided or click [Candidates](#) . Make sure your PC's MAC is listed.
- ⊙ **Blocked:** To prevent unwanted device accessing the LAN by insert the MAC Address in the space provided or click [Candidates](#) . 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 devices connected to the router through the Wireless. .

[Candidates](#) → **Associated Wireless Clients**



Associate Wireless Client displays a list of individual wireless device's MAC Address that currently connects to the router.

You can easily by checking the box next to the MAC address to be blocked or allowed. Then, **Add** to insert to the Wireless Client (MAC Address) Filter table. The maximum Wireless client is 16.

WPS

WPS feature is follow Wi-Fi Alliance WPS standard and it easily set up security-enabled Wi-Fi networks in the home and small office environment. It reduces half the user steps to configure a network and supports two methods that are familiar to most consumers to configure a network and enable security.

Configuration

▼ WPS

Parameters

Role Registrar

WPS PIN 0

Enrollee's PIN

Port Setting

This section allows you to configure the settings for the router's Ethernet ports to solve some of the compatibility problems that may be encountered while connecting to the Internet, as well allowing users to tweak the performance of their network.

Configuration

▼ Port Setting

Parameters

Port1 Connection Type Auto

Port2 Connection Type Auto

Port3 Connection Type Auto

Port4 Connection Type Auto

IPv4 TOS Priority Control Enable Disable

Set High Priority TOS

63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48

47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32

31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

Port # Connection Type: There are Six options to choose from: Auto, 10M half-duplex, 10M full-duplex, 100M half-duplex, 100M full-duplex, 1000M full-duplex and Disable. Sometimes, there are Ethernet compatibility problems with legacy Ethernet devices, and you can configure different types to solve compatibility issues. The default is **Auto**, which users should keep unless there are specific problems with PCs not being able to access your LAN.

IPv4 TOS priority Control (Advanced users): TOS, Type of Services, is the 2nd octet of an IP packet. Bits 6-7 of this octet are reserved and bit 0-5 are used to specify the priority of the packet.

This feature uses bits 0-5 to classify the packet's priority. If the packet is high priority, it will flow first and will not be constrained by the Rate Limit. Therefore, when this feature is enabled, the router's Ethernet switch will check the 2nd octet of each IP packet. If the value in the TOS field matches the checked values in the table (0 to 63), this packet will be treated as high priority.

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 PCs on your network if they are configured to obtain IP addresses automatically.

Configuration

► DHCP Server

Configuration

DHCP Server Mode	<input type="radio"/> Disabled <input checked="" type="radio"/> DHCP Server <input type="radio"/> 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's 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 PCs on your network, and set the default gateway for each PCs to the IP address of the router (by default this is 192.168.1.254).

To configure the router's 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 ADSL 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 are the items within the **WAN** section: [WAN Interface](#), [WAN Profile](#) and [ADSL Mode](#).

WAN Interface

The factory default has the Connection Mode as ADSL and the Protocol as PPPoE.

WAN Connection-ADSL Mode

The screenshot shows the 'WAN Interface' configuration page. The 'Main Port' is set to 'ADSL'. Under 'Failover Parameters', 'Failover / Failback' is disabled. The 'Backup Port' is set to '3G'. 'Connectivity Decision' is set to 'Not in service when probing failed after 5 consecutive times'. 'Failover Probe Cycle' is set to 'Every 12 seconds' and 'Fallback Probe Cycle' is set to 'Every 3 seconds'. Under 'Detect Rule (either one)', 'Ping Gateway' is selected.

Main Port: User can select either “ADSL” or “3G” mode.

Failover / Failback: Set **Enable** to trigger ADSL / 3G failover / failback function ready.

Note: If 3G is set for main port, then there can be no option for failover/failback.

Backup Port: It links to backup port configuration page. It is necessary to configure it when Failover/Failback be set.

Connectivity Decision: Set how many times of probing failed to switch backup port.

Failover Probe Cycle: Set the time duration for the **Failover Probe Cycle** to determine when the router will switch to the backup connection (backup port) once the main connection (main port) fails.

Note: The time set is for each probe cycle, but the decision to change to the backup port is determined by **Probe Cycle duration** multiplied by **connection Decision amount** (e.g. From the image above it will be 12 seconds multiplied by 5 consecutive fails).

Failback Probe Cycle: Set the time duration for the **Failback Probe Cycle** to determine when the router will switch back to the main connection (main port) from the backup connection (backup port) once the main connection is communicating again.

Note: The time set is for each probe cycle, but the decision to change to the backup port is determined by **Probe Cycle duration** multiplied by **Connection Decision amount** (e.g. From the image above it will be 3 seconds multiplied by 5 consecutive fails).

Detect Rule:

Rule 1. ADSL Down

Rule 2. Ping Fail

Ⓒ **No Ping:** It will not send any ping packet to determine the connection. It means to disable the ping fail detection.

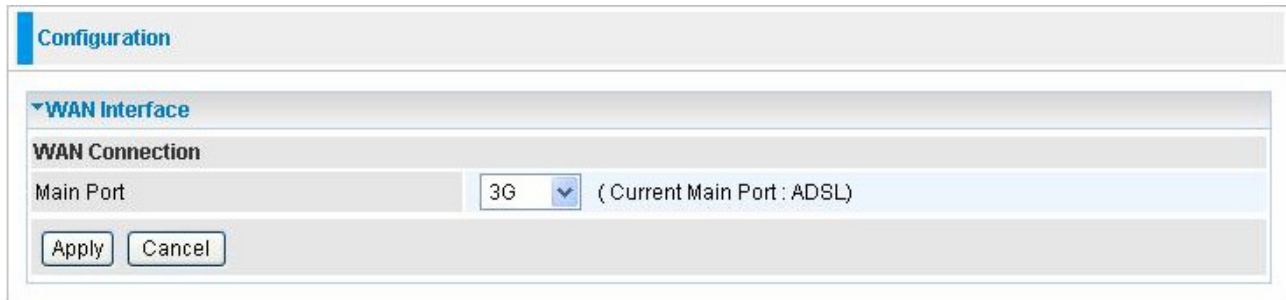
Ⓒ **Ping Gateway:** It will send ping packet to gateway and wait response from gateway in every “Probe Cycle”.

Ⓒ **Ping Host:** It will send ping packet to specific host and wait response in every “Probe

Cycle". The host must be an IP address.

WAN Connection-3G Mode

In the ADSL mode, as the ADSL is not available(failover/failback), it will turn to 3G mode for supporting WAN Connection. However, in the 3G Mode, the ADSL can not support WAN Connection when 3G Mode is unavailable (**Note: 3G card/modem does not come with the router**).



The screenshot shows a web-based configuration interface for a router. At the top, there is a 'Configuration' tab. Below it, the 'WAN Interface' section is expanded. Under 'WAN Connection', the 'Main Port' is set to '3G' via a dropdown menu. To the right of the dropdown, it says '(Current Main Port : ADSL)'. At the bottom of this section, there are two buttons: 'Apply' and 'Cancel'.

WAN Profile

PPPoE Connection

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

The screenshot shows the 'WAN Connection' configuration page. The 'PPPoE Routed' section is active. The 'Profile Port' is set to 'ADSL'. The 'Protocol' is 'PPPoE (RFC2516, PPP over Ethernet)'. The 'Description' is 'PPPoE WAN Link'. The 'VPI/VCI' is set to '8 / 35' and the 'ATM Class' is 'UBR'. The 'Username' and 'Password' fields are empty. The 'Service Name' is also empty. The 'NAT' checkbox is checked and 'Enable'. The 'IP (0.0.0.0: Auto)' is '0.0.0.0' and the 'Auth. Protocol' is 'Chap(Auto)'. The 'Connection' is set to 'Always On' and the 'Idle Timeout' is '0 min(s)'. The 'MTU' is '1492'. The 'RIP' section has 'RIP v1', 'RIP v2', and 'RIP v2 Multicast' all unchecked. The 'TCP MSS Clamp' checkbox is checked and 'Enable'. The 'MAC Spoofing' checkbox is unchecked. The 'Obtain DNS' checkbox is checked and 'Automatic'. The 'Primary' DNS is '0.0.0.0' and the 'Secondary' DNS is '0.0.0.0'. There is an 'Edit' button below the form. At the bottom, there is a table with columns: Edit, Name, Description, Creator, VPI, VCI, Delete.

Edit	Name	Description	Creator	VPI	VCI	Delete
<input checked="" type="radio"/>	wanlink	PPPoE WAN Link	Factory Defaults	8	35	

Profile Port: Select the profile port either ADSL or 3G.

Protocol: The ATM protocol will be used in the device.

Description: A given name for the connection.

VPI/VCI: Enter the information provided by your ISP.

ATM Class: The Quality of Service for ATM layer.

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: This item is for identification purposes. If it is required, your ISP provides you the information. Maximum input is **15** alphanumeric characters.

NAT: The NAT (Network Address Translation) feature allows multiple users to access the Internet through a single IP account, sharing the single IP address. If users on your LAN have public IP addresses and can access the Internet directly, the NAT function can be disabled.

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

Auth. Protocol: Default is **Auto**. Your ISP should advise you on whether to use **Chap** or **Pap**.

Connection:

⊙ **Always on:** If you want the router to establish a PPP session when starting up and to automatically re-establish the PPP session when disconnected by the ISP.

⊙ **Connect on Demand:** If you want to establish a PPP 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 broadband firewall gateway when there is no activity on the line for a predetermined period of time.

Detail: You can define the destination port and packet type (TCP/UDP) without checking by timer. It allows you to set which outgoing traffic will not trigger and reset the idle timer.

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.

TCP MSS Clamp: This option helps to discover the optimal MTU size automatically. Default is enabled.

MAC Spoofing: This option is required by some service providers. You must fill in the MAC address that specify by service provider when it is required. Default is disabled.

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

Primary DNS: Enter the primary DNS.

Secondary DNS: Enter the secondary DNS

PPPoA Connection

The screenshot shows the 'WAN Connection' configuration page. Under the 'PPPoA Routed' section, the following settings are visible:

- Profile Port: ADSL
- Protocol: PPPoA (RFC2864, PPP over AAL5)
- Description: PPPoA Routed
- VPI/VCI: 8 / 35
- ATM Class: UBR
- Username: [Empty]
- Password: [Empty]
- NAT: Enable
- IP (0.0.0.0: Auto): 0.0.0.0
- Auth. Protocol: Chap(Auto)
- Connection: Always On
- Idle Timeout: 0 min(s)
- MTU: 1500
- RIP: RIP v1 RIP v2 RIP v2 Multicast
- TCP MSS Clamp: Enable
- Obtain DNS: Automatic
- Primary: 0.0.0.0
- Secondary: 0.0.0.0

Below the configuration fields is an 'Edit' button and a table listing existing connections:

Edit	Name	Description	Creator	VPI	VCI	Delete
<input checked="" type="radio"/>	wanlink	PPPoE WAN Link	Factory Defaults	8	35	

Profile Port: Select the profile port either ADSL or 3G.

Protocol: The ATM protocol will be used in the device..

Description: A given name for the connection.

VPI/VCI: Enter the information provided by your ISP.

ATM Class: The Quality of Service for ATM layer.

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: This item is for identification purposes. If it is required, your ISP provides you the information. Maximum input is **15** alphanumeric characters.

NAT: The NAT (Network Address Translation) feature allows multiple users to access the Internet through a single IP account, sharing the single IP address. If users on your LAN have public IP addresses and can access the Internet directly, the NAT function can be disabled.

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

Auth. Protocol: Default is **Auto**. Your ISP should advise you on whether to use **Chap** or **Pap**.

Connection:

☉ **Always on:** If you want the router to establish a PPP session when starting up and to automatically re-establish the PPP session when disconnected by the ISP.

☉ **Connect on Demand:** If you want to establish a PPP 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 broadband firewall gateway when there is no activity on the line for a predetermined period of time.

☉ **Detail:** You can define the destination port and packet type (TCP/UDP) without checking by timer. It allows you to set which outgoing traffic will not trigger and reset the idle timer.

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.


TCP MSS Clamp: This option helps to discover the optimal MTU size automatically. Default is enabled.

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

Primary DNS: Enter the primary DNS.

Secondary DNS: Enter the secondary DNS.

MPoA Connection

Configuration 

WAN Connection

RFC 1483 Routed

Profile Port: ADSL

Protocol: MPoA (RFC1483/RFC2684, Multiprotocol Encapsulation over AAL5)

Description: RFC 1483 routed n VPI/VCI: 8 / 35 ATM Class: UBR


NAT: Enable Encap. Method: LLC Bridged MTU: 1500

IP (0.0.0.0: Auto): 0.0.0.0 Netmask: 0.0.0.0 Gateway:

RIP: RIP v1 RIP v2 RIP v2 Multicast TCP MSS Clamp: Enable

MAC Spoofing: Enable 00 : 00 : 00 : 00 : 00 : 00

Obtain DNS: Automatic Primary: 0.0.0.0 Secondary: 0.0.0.0

Edit	Name	Description	Creator	VPI	VCI	Delete
	wanlink	PPPoE WAN Link	Factory Defaults	8	35	

Profile Port: Select the profile port either ADSL or 3G.

Protocol: The ATM protocol will be used in the device.

Description: A given name for the connection.

VPI/VCI: Enter the information provided by your ISP.

ATM Class: The Quality of Service for ATM layer.

NAT: The NAT (Network Address Translation) feature allows multiple users to access the Internet through a single IP account, sharing a single IP address. If users on your LAN have public IP addresses and can access the Internet directly, the NAT function can be disabled.

Encap. mode: Choose whether you want the packets in WAN interface as bridged packet or routed packet.

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

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

Netmask: The default is 0.0.0.0. User can change it to other such as 255.255.255.128. Type the subnet mask assigned to you by your ISP (if given).

Gateway: Enter the IP address of the default gateway (if given).

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

TCP MSS Clamp: This option helps to discover the optimal MTU size automatically. Default is enabled.

MAC Spoofing: This option is required by some service providers. You must fill in the MAC address that specify by service provider when it is required. Default is disabled.

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

Primary DNS: Enter the primary DNS.

Secondary DNS: Enter the secondary DNS.

IPoA Routed Connection

Configuration

WAN Connection

IPoA Routed

Profile Port	ADSL				
Protocol	IPoA (RFC1577, Classic IP and ARP over ATM)				
Description	IPoA routed	VPI/VCI	8 / 35	ATM Class	UBR
NAT	<input checked="" type="checkbox"/> Enable	MTU	1500		
IP (0.0.0.0: Auto)	0.0.0.0	Netmask	0.0.0.0	Gateway	
RIP	<input type="checkbox"/> RIP v1 <input type="checkbox"/> RIP v2 <input type="checkbox"/> RIP v2 Multicast			TCP MSS Clamp	<input checked="" type="checkbox"/> Enable
Obtain DNS	<input checked="" type="checkbox"/> Automatic	Primary	0.0.0.0	Secondary	0.0.0.0

Edit	Name	Description	Creator	VPI	VCI	Delete
+	wanlink	PPPoE WAN Link	Factory Defaults	8	35	-

Profile Port: Select the profile port either ADSL or 3G.

Protocol: The ATM protocol will be used in the device.

Description: A given name for the connection.

VPI/VCI: Enter the information provided by your ISP.

ATM Class: The Quality of Service for ATM layer.

NAT: The NAT (Network Address Translation) feature allows multiple users to access the Internet through a single IP account, sharing a single IP address. If users on your LAN have public IP addresses and can access the Internet directly, the NAT function can be disabled.

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

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

Netmask: The default is 0.0.0.0. User can change it to other such as 255.255.128. Type the subnet mask assigned to you by your ISP (if given).

Gateway: Enter the IP address of the default gateway (if given).

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

TCP MSS Clamp: This option helps to discover the optimal MTU size automatically. Default is enabled.

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

Primary DNS: Enter the primary DNS.

Secondary DNS: Enter the secondary DNS.

Pure Bridge

Configuration

WAN Connection

RFC 1483 Bridged

Profile Port: ADSL

Protocol: Pure Bridge

Description: RFC 1483 bridged VPI/VCI: 8 / 35 ATM Class: UBR

Encap. Method: LLC Bridged Acceptable Frame Type: acceptall Filter Type: All

Obtain DNS: Automatic Primary: 0.0.0.0 Secondary: 0.0.0.0

Edit	Name	Description	Creator	VPI	VCI	Delete
<input checked="" type="radio"/>	wanlink	PPPoE WAN Link	Factory Defaults	8	35	

Profile Port: Select the profile port either ADSL or 3G.

Protocol: The ATM protocol will be used in the device.

Description: A given name for this connection.

VPI/VCI: Enter the information provided by your ISP.

ATM Class: The Quality of Service for ATM layer.

Encap. mode: Choose whether you want the packets in WAN interface as LLC bridged packet or VcMux bridged packet..

Acceptable Frame Type: Specify which kind of traffic goes through this connection, all traffic or only VLAN tagged.

Filter Type: Specify the type of ethernet filtering performed by the named bridge interface.


All	Allows all types of ethernet packets through the port.
Ip	Allows only IP/ARP types of ethernet packets through the port.
Pppoe	Allows only PPPoE types of ethernet packets through the port.

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

Primary DNS: Enter the primary DNS.

Secondary DNS: Enter the secondary DNS.

ADSL Mode

Configuration 

▼ ADSL Mode

Parameters

Connect Mode	All
Modulation	G.Dmt.BisPlusAuto
Profile Type	MAIN
Activate Line	true
Coding Gain	auto

Apply Cancel

Connect Mode: This mode will automatically detect your ADSL line code, **ADSL2+, ADSL2, AnnexM2 and AnnexM2+, ADSL, All**. Please keep the factory setting unless ADSL is detected as the symptom of synchronization problem.

Modulation: It will automatically detect capability of your ADSL line mode. Please keep the factory setting unless ADSL is detected as the symptom of synchronization problem.

Profile Type: Please keep the factory settings unless ADSL is detected as the symptom of low link rate or unstable problems. You may need to change the profile setting to reach the best ADSL line rate, it depends on the different DSLAM and location.

Activate Line: Aborting (false) your ADSL line and making it active (true) again for taking effect with setting of **Connect Mode**.

Coding Gain: It reduces router's transmit power which will effect to router's downstream performance. Higher the gain will increase the downstream rate but it sometimes causes unstable ADSL line. The configurable ADSL coding gain is from 0 dB to 7dB, or automatic.

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 v

SNTP Server IP Address

1. <input style="width: 90%;" type="text" value="carl.css.gov"/>	2. <input style="width: 90%;" type="text" value="india.colorado.edu"/>
3. <input style="width: 90%;" type="text" value="time.nist.gov"/>	4. <input style="width: 90%;" type="text" value="time-b.nist.gov"/>

Daylight Saving Automatic

Resync Period 1440 minutes

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 **Automatic** box to auto 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 minutes. (0 means allowed allways)

To temporarily permit remote administration of the router (i.e. from outside your LAN), select a time period the router will permit remote access for and click **Enable**. You may change other configuration options for the web administration interface using **Device Management** options in the **Advanced** section of the GUI.

If you wish to permanently enable remote access, choose a time period of **0** minute.

Firmware Upgrade



Configuration

▶ **Firmware Upgrade**

You may upgrade the system software on your network device

New Firmware Image

Your router's "firmware" is the software that allows 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.



DO NOT power down the router or interrupt the firmware upgrading while it is still in process. Improper operation could damage the router.

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.

These functions allow you to save and backup your router's current settings to a file on your PC, or to restore a previously saved backup. This is useful if you wish to experiment with different settings, knowing that you have a backup handy in the case of any mistakes. It is advisable to backup your router's settings before making any significant changes to your router's configuration.

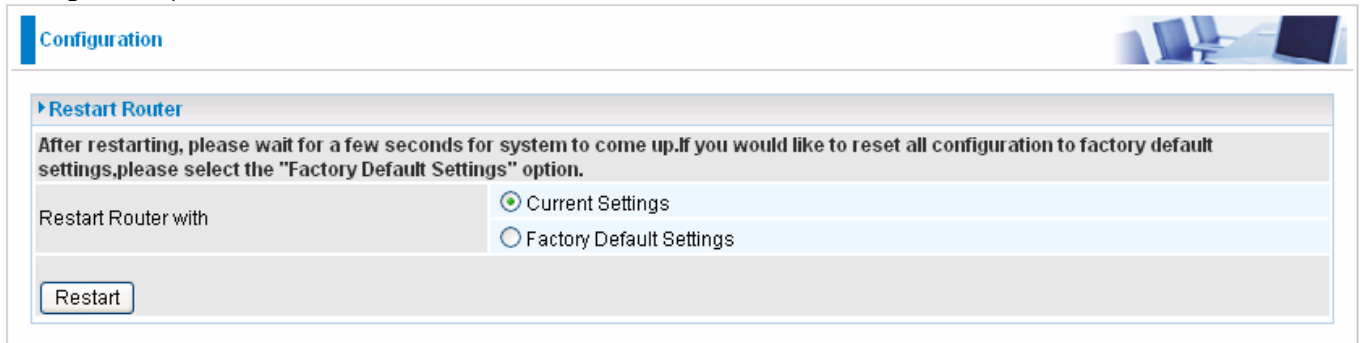
Press **Backup** to select where on your local PC to save the settings file. You may also change the name of the file when saving if you wish to keep multiple backups.

Press **Browse** to select a file from your PC to restore. You should only restore settings files that have been generated by the Backup function, and that were created when using the **current version** of the router's firmware. **Settings files saved to your PC should not be manually edited in any way.**

After selecting the settings file you wish to use, pressing **Restore** will load those settings into the router.

Restart Router

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




The screenshot shows the 'Configuration' page of the router. At the top right, there is a small image of a router. Below the 'Configuration' header, there is a section titled 'Restart Router'. This section contains a warning message: '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.' Below this message, there is a label 'Restart Router with' followed by two radio button options: 'Current Settings' (which is selected) and 'Factory Default Settings'. At the bottom of this section, there is a 'Restart' button.

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

Configuration 


► User Management

Current Defined Users

Valid	User	Comment	Password	Confirm Password
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="button" value="Add"/>		<input type="button" value="Edit / Delete"/>		
Edit	Valid	User	Comment	Delete
<input type="radio"/>	true	admin	Default admin user	

In order to prevent unauthorized access to your router's configuration interface, it requires all users to login with a password. You can set up multiple user accounts, each with their own password.

You are able to **Edit** existing users and **Add** new users who are able to access the device's configuration interface. Once you have clicked on **Edit**, you are shown the following options:


Configuration 

► User Management

Current Defined Users

Valid	User	Comment	Password	Confirm Password
<input checked="" type="checkbox"/>	admin	Default admin user	•••••	•••••
<input type="button" value="Add"/>		<input type="button" value="Edit / Delete"/>		
Edit	Valid	User	Comment	Delete
<input checked="" type="radio"/>	true	admin	Default admin user	

You can change the user's **password**, whether their account is active and **valid**, as well as add a comment to each user account. Click Edit/Delete button to save your revise. You cannot delete the default admin account, if you do you will be log out. However, you can delete any other created accounts by clicking **Delete** when editing the user. You are strongly advised to change the password on the default "**admin**" account when you receive your router, and any time you reset your configuration to Factory Defaults.

Configuration 

► User Management

Current Defined Users

Valid	User	Comment	Password	Confirm Password
<input type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="button" value="Add"/>		<input type="button" value="Edit / Delete"/>		
Edit	Valid	User	Comment	Delete
<input type="radio"/>	true	admin	Default admin user	

When you create a user account, you check Valid to fill in the blank with User, Comment, Password and Confirm Password. Later, click **Add** button to add your new user account.

Configuration

► User Management

Current Defined Users

Valid	User	Comment	Password	Confirm Password
<input checked="" type="checkbox"/>	2 Test	Test

3

Add Edit / Delete

Edit	Valid	User	Comment	Delete
<input type="radio"/>	true	admin	Default admin user	

Configuration

► User Management

Current Defined Users

Valid	User	Comment	Password	Confirm Password
<input type="checkbox"/>				

4

Add Edit / Delete

Edit	Valid	User	Comment	Delete
<input type="radio"/>	true	admin	Default admin user	
<input type="radio"/>	true	Test	Test	<input type="radio"/>

For deleting the user account, you choose Delete option. In the end, you click **Edit/Delete** button to delete the chosen user account.

Configuration

► User Management

Current Defined Users

Valid	User	Comment	Password	Confirm Password
<input type="checkbox"/>	2			

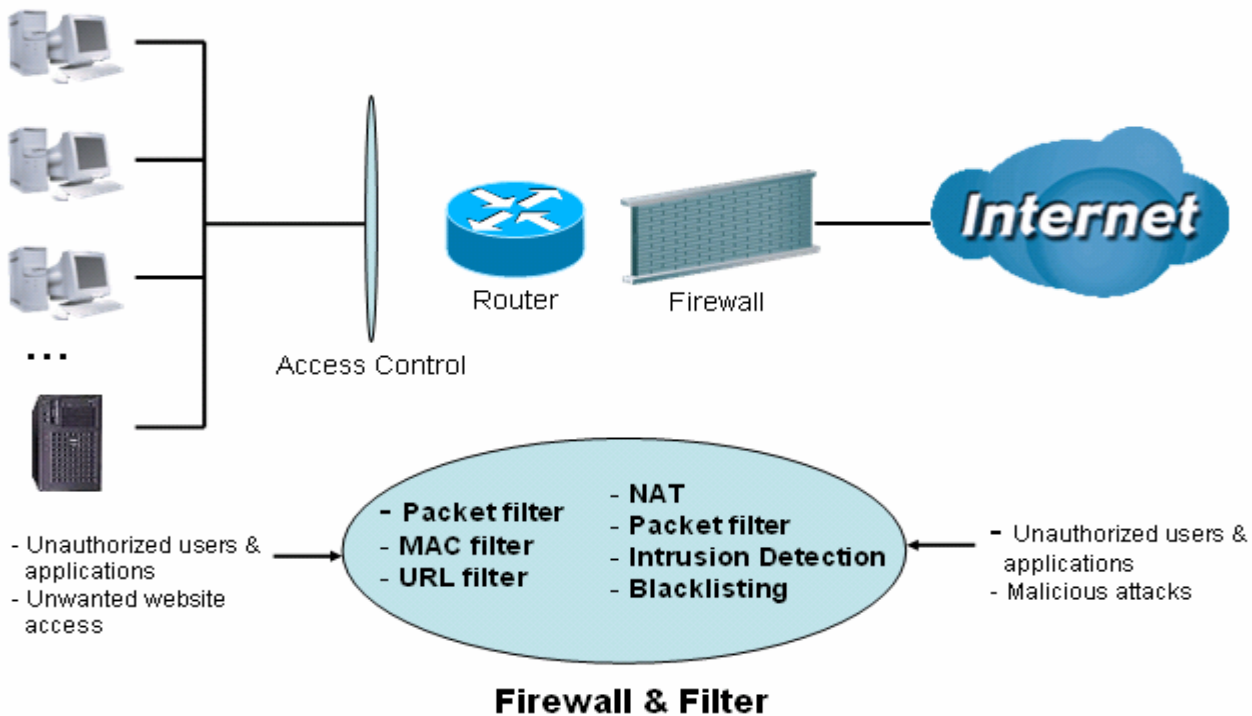
Add Edit / Delete

Edit	Valid	User	Comment	Delete
<input type="radio"/>	true	admin	Default admin user	
<input type="radio"/>	true	Test	Test	<input checked="" type="radio"/>

1

Firewall and Access Control

Your router includes a full SPI (Stateful Packet Inspection) firewall for controlling Internet access from your LAN, as well as helping to prevent attacks from hackers. Besides, when using NAT, the router acts as a “natural” Internet firewall, as all PCs on your LAN will use private IP addresses that cannot be directly accessed from the Internet.



Firewall: Prevents access from outside your network. The router provides three levels of security support:

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

NOTE:

When using Virtual Servers your PCs will be exposed to the degree specified in your Virtual Server settings provided the ports specified are opened in your firewall packet filter settings.

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

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

Access Control: Prevents 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 accessing the Internet.

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

Here are the items within the **Firewall** section: [General Settings](#), [Packet Filter](#), [Intrusion Detection](#), [URL Filter](#), [IM/P2P Blocking](#) and [Firewall Log](#).

General Settings

You can choose not to enable Firewall and still able to access to URL Filter and IM/P2P Blocking or enable the Firewall using 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.

There are four options when you enable the Firewall, they are:

- ⊙ **All blocked/User-defined:** no pre-defined 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 for further access to the Internet.

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

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

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

The **“Block WAN Request”** is a stand-alone function and not relate to whether security enable or disable. Mostly it is for preventing any scan tools from WAN site by hacker.

Configuration

▶ General Settings


Firewall Security

Security	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Policy	<input type="radio"/> All blocked/User-defined <input type="radio"/> High security level <input checked="" type="radio"/> Medium security level <input type="radio"/> Low security level
<small>(! 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.)</small>	
Block WAN Request	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
<small>(! Enable for preventing any ping test from Internet, such as hacker attack.)</small>	
<input type="button" value="Apply"/>	

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

Packet Filter

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

Configuration 

Packet Filter

Parameters

Rule Name Helper << --Select--

Time Schedule

Source IP Address(es) Netmask

Destination IP Address(es) Netmask

Type Protocol Number

Source Port -

Destination Port -

Inbound

Outbound

Edit	Rule Name	Time Schedule	Source IP / Netmask	Protocol	Source port(s)	Inbound	Delete
			Destination IP / Netmask		Destination port(s)	Outbound	
<input type="radio"/>	mei_http	Always On	0.0.0.0 / 0.0.0.0	TCP	0 ~ 65535	Block	<input type="radio"/>
			0.0.0.0 / 0.0.0.0		80 ~ 80	Allow	<input type="radio"/>
<input type="radio"/>	mei_dns	Always On	0.0.0.0 / 0.0.0.0	UDP	0 ~ 65535	Block	<input type="radio"/>
			0.0.0.0 / 0.0.0.0		53 ~ 53	Allow	<input type="radio"/>

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	
		Start	End	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
HTTP(80)	TCP(6)	80	80	NO	YES	NO	YES	NO	YES
DNS (53)	UDP(17)	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
SMTP(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) (Network News Transfer Protocol)	TCP(6)	119	119	NO	YES	NO	YES	NO	NO
RealAudio/ RealVideo (7070)	UDP(17)	7070	7070	YES	YES	YES	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 (9000)	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

Rule Name: Users-define description to identify this entry or click “**Select**” drop-down menu to select existing predefined rules. The maximum name length is 32 characters.

Time Schedule: It is 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). Selecting the **Subnet Mask** of the IP address range you wish to allow/block the traffic to or from; set IP address and Subnet Mask to **0.0.0.0** to inactive the Address-Filter rule.

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”.

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.


Type: It is the packet protocol type used by the application, select **TCP**, **UDP** or both **TCP/UDP**. **Protocol Number:** Insert the port number.

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

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	Helper	<input type="text"/>	<<	--Select--	▼
Time Schedule	Always On ▼				
Source IP Address(es)	<input type="text" value="0.0.0.0"/>	Netmask	<input type="text" value="0.0.0.0"/>		
Destination IP Address(es)	<input type="text" value="0.0.0.0"/>	Netmask	<input type="text" value="0.0.0.0"/>		
Type	Use Protocol Number ▼		Protocol Number	<input type="text"/>	
Source Port	<input type="text" value="0"/> - <input type="text" value="65535"/>				
Destination Port	<input type="text" value="0"/> - <input type="text" value="65535"/>				
Inbound	Allow ▼				
Outbound	Allow ▼				

Rule Name Helper: Users-define description to identify this entry or choosing “Select” drop-down menu to select existing predefined rules.

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

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

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

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 no matter 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), inbound HTTP access is not allowed which means remote access through HTTP to your router is not allowed.

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

Packet Filter

Parameters

Rule Name Helper << --Select--

Time Schedule

Source IP Address(es) Netmask

Destination IP Address(es) Netmask

Type Protocol Number

Source Port -

Destination Port -

Inbound

Outbound

	Rule Name	Time Schedule	Source IP / Netmask	Protocol	Source port(s)	Inbound	
			Destination IP / Netmask		Destination port(s)	Outbound	
<input type="radio"/>	mei_http	Always On	0.0.0.0 / 0.0.0.0	TCP	0 ~ 65535	Block	<input type="radio"/>
			0.0.0.0 / 0.0.0.0		80 ~ 80	Allow	<input type="radio"/>
<input type="radio"/>	mei_dns	Always On	0.0.0.0 / 0.0.0.0	UDP	0 ~ 65535	Block	<input type="radio"/>
			0.0.0.0 / 0.0.0.0		53 ~ 53	Allow	<input type="radio"/>
<input type="radio"/>	mei_tdns	Always On	0.0.0.0 / 0.0.0.0	TCP	0 ~ 65535	Block	<input type="radio"/>
			0.0.0.0 / 0.0.0.0		53 ~ 53	Allow	<input type="radio"/>
<input type="radio"/>	mei_ftp	Always On	0.0.0.0 / 0.0.0.0	TCP	0 ~ 65535	Block	<input type="radio"/>
			0.0.0.0 / 0.0.0.0		21 ~ 21	Allow	<input type="radio"/>

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.

The screenshot shows the 'Configuration' page for 'Packet Filter'. The form includes the following fields:

- Rule Name: Helper (with a dropdown menu set to '--Select--')
- Time Schedule: Always On
- Source IP Address(es): 0.0.0.0 (with Netmask: 0.0.0.0)
- Destination IP Address(es): 0.0.0.0 (with Netmask: 0.0.0.0)
- Type: TCP (with a dropdown menu open showing options: TCP, UDP, TCP/UDP, Use Protocol Number)
- Source Port: (empty)
- Destination Port: (empty)
- Inbound: Allow
- Outbound: Allow

Buttons at the bottom: Add, Edit / Delete

2. Choose the radio button you want to delete the existing HTTP rule. Click **Edit/Delete** button to delete the existing HTTP rule.

The screenshot shows the 'Configuration' page for 'Packet Filter' with a list of rules and a table below. The 'Edit/Delete' button is circled in red.

Form fields (from previous screenshot):

- Rule Name: lei_http
- Time Schedule: Always On
- Source IP Address(es): 0.0.0.0 (with Netmask: 0.0.0.0)
- Destination IP Address(es): 0.0.0.0 (with Netmask: 0.0.0.0)
- Type: TCP
- Source Port: 0 - 65535
- Destination Port: 80 - 80
- Inbound: Block
- Outbound: Allow

Edit	Rule Name	Time Schedule	Source IP / Netmask Destination IP / Netmask	Protocol	Source port(s) Destination port(s)	Inbound Outbound	Delete
<input type="radio"/>	lei_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	<input checked="" type="radio"/>
<input type="radio"/>	lei_dns	Always On	0.0.0.0 / 0.0.0.0 0.0.0.0 / 0.0.0.0	UDP	0 ~ 65535 53 ~ 53	Block Allow	<input type="radio"/>

3. Input the Rule Name, Time Schedule, Source/Destination IP, Type, Source/Destination Port,

Inbound and Outbound.

Example:

Application: *Cindy_HTTP*

Time Schedule: *Always On*

Source / Destination IP Address(es): *0.0.0.0 (I do not wish to activate the address-filter, instead I use the port-filter)*

Type: *TCP (Please refer to Table1: Predefined Port Filter)*

Source Port: *0-65535 (I allow all ports to connect with the application))*

Redirect Port: *80-80 (This is Port defined for HTTP)*

Inbound / Outbound: *Allow*

The screenshot shows the 'Configuration' page with the 'Packet Filter' section expanded. The configuration for the 'Cindy_HTTP' rule is as follows:

Parameters	
Rule Name Helper	Cindy_HTTP << --Select--
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	Allow
Outbound	Allow

Buttons: Add, Edit / Delete

Rule Name	Time Schedule	Source IP / Netmask	Destination IP / Netmask	Protocol	Source port(s)	Destination port(s)	Inbound	Outbound
Cindy_HTTP	Always On	0.0.0.0 / 0.0.0.0	0.0.0.0 / 0.0.0.0	TCP	0 ~ 65535	80 ~ 80	Allow	Allow

4. The new port filter rule for HTTP is shown below:

○	Cindy_HTTP	Always On	0.0.0.0 / 0.0.0.0	0.0.0.0 / 0.0.0.0	TCP	0 ~ 65535	80 ~ 80	Allow	Allow	○
---	------------	-----------	-------------------	-------------------	-----	-----------	---------	-------	-------	---

5. Configure your Virtual Server (“port forwarding”) settings so that incoming HTTP requests on port 80 will be forwarded to the PC running your web server:

Note: For how to configure the HTTP in Virtual Server, go to Add Virtual Server in Virtual Server section for more details.

Configuration

Port Forwarding

Add Virtual Server in " IP interface

Virtual Server Entry

Application [Helper ▶](#) << --Select-- ▼

Protocol Time Schedule ▼

External Port from to Redirect Port from to

Internal IP Address [Candidates ▶](#)

[Return ▶](#)

Edit	Application	Time Schedule	Protocol	External Port	Redirect Port	IP Address	Interface	Delete
<input type="radio"/>	HTTP_Server	Always On	tcp	80 - 80	80 - 80	192.168.1.101	ipwan	<input type="radio"/>

Intrusion Detection

Configuration

Intrusion Detection

Parameters

Intrusion Detection Enable Disable

Victim Protection Block Duration seconds

Scan Attack Block Duration seconds

DOS Attack Block Duration seconds

Maximum TCP Open Handshaking Count per second

Maximum Ping Count per second

Maximum ICMP Count per second

The router's *Intrusion Detection System (IDS)* is used to detect hacker attacks 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 be added to the Blacklist. Any further attempts using this IP address will be blocked for the time period specified as the **Block Duration**. The default setting for this function is false (disabled). Some attack types 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).

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

Dst Port: Destination Port

Src Port: Source 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 rules allow you to prevent users on your network from accessing particular websites by their URL. There are no pre-defined URL filter rules; you can add filter rules to meet your requirements.

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

Block Mode: A list of the modes that you can choose to check the URL filter rules. The default is set to **Always On**.

- ⊙ **Disabled:** No action will be performed by the Block Mode.
- ⊙ **Always On:** Action is enabled. URL filter rules will be monitoring and checking at 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.

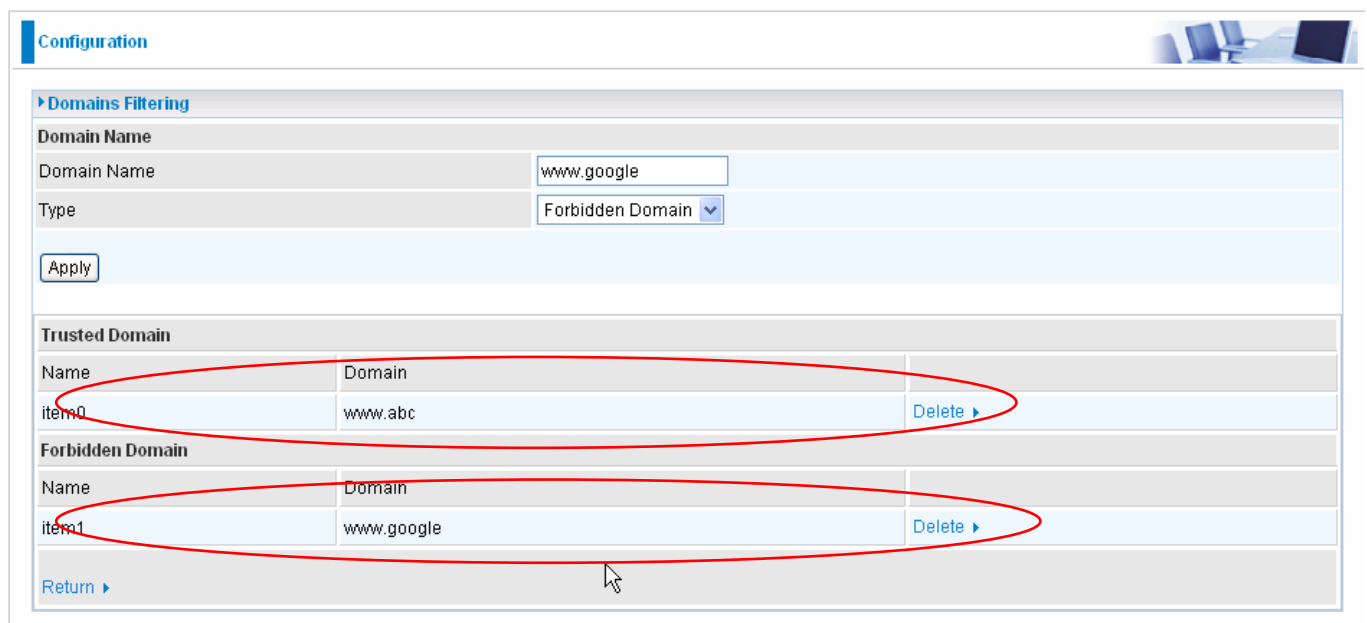
Keywords Filtering: Allows blocking by specific keywords within a particular URL rather than having to specify a complete URL (e.g. to block any image called “advertisement.gif”). When enabled, your specified keywords list will be checked to see if any keywords are present in URLs accessed to determine 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>, it will be dropped as the keyword “abcde” occurs in the URL.

Domains Filtering: This function checks the whole URL not the IP address, in URLs accessed against your list of domains to block or allow. If it is matched, the URL request will be sent (Trusted) or dropped (Forbidden). For this function to be activated, both check-boxes 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 items, it is sent to the remote web server.
4. Please be note that the completed URL, "www" + domain name shall be specified. For example 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.



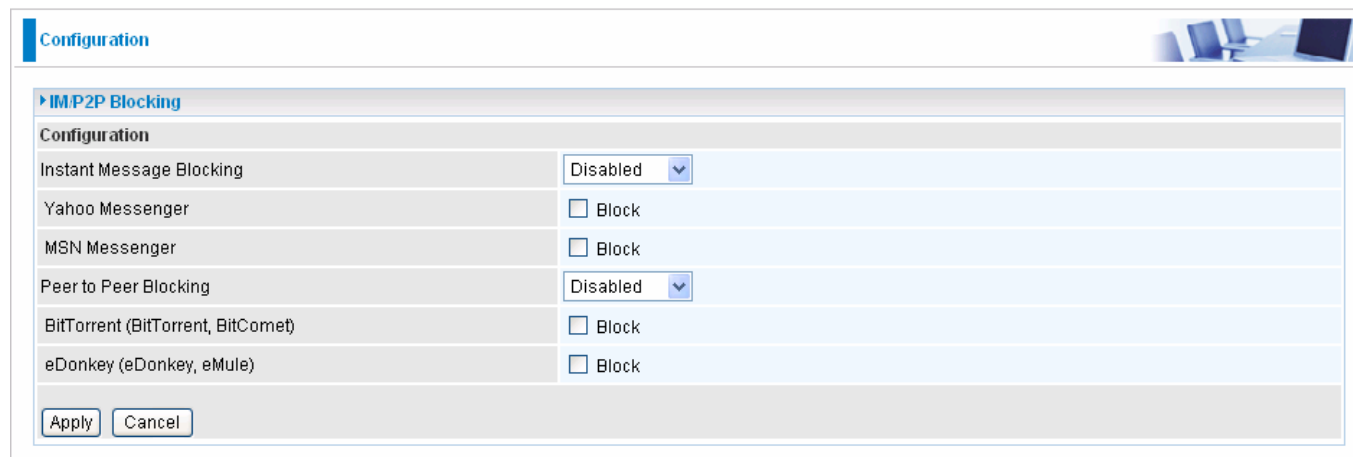
Example: Andy wishes to disable all WEB traffic except for ones listed in the trusted domain, which would prevent Bobby from accessing other web sites. Andy selects both functions in the *Domain Filtering* and thinks that it will stop Bobby. But Bobby knows this function, *Domain Filtering*, ONLY disables all WEB traffic except for **Trusted Domain**, BUT not its **IP address**. If this is the situation, **Block surfing by IP address** function can be handy and helpful to Andy. Now, Andy can prevent Bobby from accessing other sites.

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

- ⊙ **Block Java Applet:** This function can block Web content that includes the Java Applet. It is to prevent someone who wants to damage your system via standard HTTP protocol.
- ⊙ **Block surfing by IP address:** Preventing someone who uses the IP address as URL for skipping Domains Filtering function. Activates only and if Domain Filtering enabled.

IM / P2P Blocking

IM, short for Instant Message, is required to use client program software that allows users to communicate, in exchanging text message, with other IM users in real time over the Internet. A P2P application, known as Peer-to-peer, is group of computer users who share file to specific groups of people across the Internet. 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 to 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	<input type="checkbox"/> Block
MSN Messenger	<input type="checkbox"/> Block
Peer to Peer Blocking	Disabled
BitTorrent (BitTorrent, BitComet)	<input type="checkbox"/> Block
eDonkey (eDonkey, eMule)	<input type="checkbox"/> Block

Apply Cancel

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 box 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 box to block either or both Bit Torrent or/and eDonkey. To be sure you enabled the *Peer to Peer Blocking* first.

Firewall Log

Configuration 

► Firewall Log

Event will be shown in the Status - Event Log

Filtering Log	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Intrusion Log	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
URL Blocking Log	<input type="radio"/> Enable <input checked="" type="radio"/> Disable

Firewall Log display log information of any unexpected action with your firewall settings.

Check the **Enable** box to activate the logs.

Log information can be seen in the **Status – Event Log** after enabling.

VPN - Virtual Private Networks (BiPAC 7402NX only)

Virtual Private Networks is ways to establish secured communication tunnels to an organization's network via the Internet. Your router supports three main types of VPN (Virtual Private Network), **PPTP**, **IPSec** and **L2TP**.

PPTP (Point-to-Point Tunneling Protocol)

There are two types of PPTP VPN supported; **Remote Access** and **LAN-to-LAN** (please refer below for more information.). Click Configuration/VPN/PPTP.

Edit	Active	Name	Connection Type	Type	Delete
<input type="radio"/>	<input checked="" type="checkbox"/>	Test	remoteaccess	dialout	<input type="radio"/>

Name: A given name for the connection.

Active: This function activates or deactivates the PPTP connection. Check Active checkbox if you want the protocol of tunnel to be activated and vice versa.

Note: When the Active checkbox is checked, the function of Edit and Delete will not be available.

Connection Type: It informs your PPTP tunnel connection condition.

Type: This refers to your router operates as a client or a server, **Dialout** or **Dialin** respectively.

PPTP Connection - Remote Access

Configuration

▼ PPTP

Parameters

Name	<input type="text"/>	Connection Type	Remote Access ▼		
Type	Dial out (Connect to below Server IP address or FQDN) ▼	IP Address	<input type="text"/>		
Username	<input type="text"/>	Password	<input type="text"/>	Auth. Type	Chap(Auto) ▼
Data Encryption	Auto ▼	Key Length	Auto ▼	Mode	stateful ▼
Active as default route	<input type="checkbox"/> Enable				

Edit	Active	Name	Connection Type	Type	Delete
<input type="radio"/>	<input checked="" type="checkbox"/>	Test	remoteaccess	dialout	<input type="radio"/>

Name: A given name for the connection (e.g. "connection to office").

Connection Type: **Remote Access** or **LAN to LAN**

Type: Check **Dial Out** if you want your router to operate as a client (connecting to a remote VPN server, e.g. your office server), check **Dial In** operates as a VPN server.

- ⊙ When configuring your router as a Client, enter the remote **Server IP Address (or Domain Name)** you wish to connect to.
- ⊙ When configuring your router as a server, enter the **Private IP Address Assigned to Dial in User** address.

Username: If you are a Dial-Out user (client), enter the username provided by your Host. If you are a Dial-In user (server), enter your own username.

Password: If you are a Dial-Out user (client), enter the password provided by your Host. If you are a Dial-In user (server), enter your own password.

Authentication Type: Default is **Auto** if you want the router to determine the authentication type to use, or else manually specify CHAP (Challenge Handshake Authentication Protocol) or PAP (Password

Authentication Protocol) if you know which type the server is using (when acting as a client), or else the authentication type you want clients connecting to you to use (when acting as a server). When using PAP, the password is sent unencrypted, whilst CHAP encrypts the password before sending, and also allows for challenges at different periods to ensure that an intruder has not replaced the client.

Data Encryption: Data sent over the VPN connection can be encrypted by an MPPE algorithm. Default is **Auto**, so that this setting is negotiated when establishing a connection, or else you can manually **Enable** or **Disable** encryption.

Key Length: The data can be encrypted by MPPE algorithm with 40 bits or 128 bits. Default is **Auto**, it is negotiated when establishing a connection. 128 bit keys provide stronger encryption than 40 bit keys.

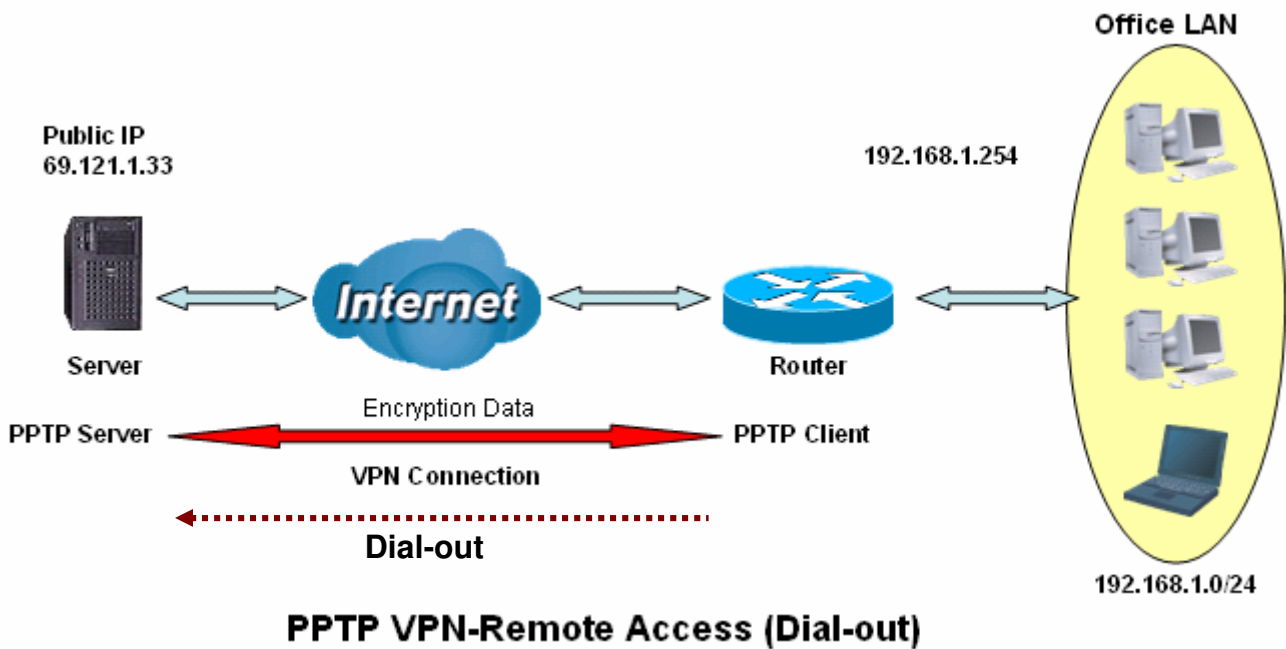
Mode: You may select **Stateful** or **Stateless** mode. The key will be changed every 256 packets when you select Stateful mode. If you select Stateless mode, the key will be changed in each packet.

Active as default route: Commonly used by the *Dial-out* connection which all packets will route through the VPN tunnel to the Internet; therefore, active the function may degrade the Internet performance.

Click **Edit/Delete** button to save your changes.

Example: Configuring a Remote Access PPTP VPN Dial-out Connection

A company's office establishes a PPTP VPN connection with a file server located at a separate location. The router is installed in the office, connected to a couple of PCs and Servers.



Configuring the PPTP VPN in the Office

Click **Configuration/VPN/PPTP**. Choose **Remote Access** from **Connect Type** drop-down menu. You can either input the IP address (69.121.1.33 in this case) or hostname to reach the server.

The screenshot shows the PPTP configuration page. The 'Parameters' section includes the following fields:

- Name:** VPN_PPTP
- Connection Type:** Remote Access
- Type:** Dial out (Connect to below Server IP address or FQDN)
- IP Address:** 69.121.1.33
- Username:** username
- Password:** [masked]
- Auth. Type:** Chap(Auto)
- Data Encryption:** Auto
- Key Length:** Auto
- Mode:** stateful
- Active as default route:** Enable

Below the form is a table of existing PPTP connections:

Edit	Active	Name	Connection Type	Type	Delete
<input type="radio"/>	<input checked="" type="checkbox"/>	Test	remoteaccess	dialout	<input type="radio"/>

Item	Function		Description
1	Name	VPN_PPTP	Given name of PPTP connection
2	Connection Type	Remote Access	Select Remote Access from Connection Type drop-down menu
3	Type	Dial out	Select Dial out from Type drop-down menu
	IP Address (or Domain name)	69.121.1.33	An Dialed server IP
4	Username	username	A given username & password
	Password	123456	
5	Auth.Type	Chap(Auto)	Keep as default value in most of the cases, PPTP server & client will determine the value automatically. Refer to manual for details if you want to change the setting.
	Data Encryption	Auto	
	Key Length	Auto	
	Mode	stateful	

PPTP Connection - LAN to LAN

Configuration

▼ PPTP

Parameters

Name	VPN_PPTP	Connection Type	LAN to LAN
Type	Dial out (Connect to below Server IP address or FQDN)	IP Address	69.121.1.33
Peer Network IP		Netmask	
Username	username	Password	*****
Data Encryption	Auto	Auth. Type	Chap(Auto)
Active as default route	<input type="checkbox"/> Enable	Key Length	Auto
		Mode	stateful

Add Edit/ Delete

Edit	Active	Name	Connection Type	Type	Delete
<input type="radio"/>	<input checked="" type="checkbox"/>	Test	remoteaccess	dialout	<input type="radio"/>

Name: A given name of the connection.

Connection Type: Remote Access or LAN to LAN.

Type: Check **Dial Out** if you want your router to operate as a client (connecting to a remote VPN server, e.g. your office server), check **Dial In** operates as a VPN server.

- ⊙ When configuring your router as a Client, enter the remote **Server IP Address (or Domain name)** you wish to connect to.
- ⊙ When configuring your router as a server, enter the **Private IP Address Assigned to Dial in User** address.

Peer Network IP: Enter Peer network IP address.

Netmask: Enter the subnet mask of peer network based on the Peer Network IP setting.

Username: If you are a Dial-Out user (client), enter the username provided by your Host. If you are a Dial-In user (server), enter your own username.

Password: If you are a Dial-Out user (client), enter the password provided by your Host. If you are a Dial-In user (server), enter your own password.

Authentication Type: Default is **Auto** if you want the router to determine the authentication type to use, or else manually specify CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol) if you know which type the server is using (when acting as a client), or else the authentication type you want clients connecting to you to use (when acting as a server). When using PAP, the password is sent unencrypted, whilst CHAP encrypts the password before sending, and also allows for challenges at different periods to ensure that the client has not been replaced by an intruder.

Data Encryption: Data sent over the VPN connection can be encrypted by an MPPE algorithm. Default is **Auto**, so that this setting is negotiated when establishing a connection, or else you can manually **Enable** or **Disable** encryption.

Key Length: The data can be encrypted by MPPE algorithm with 40 bits or 128 bits. Default is **Auto**, it is negotiated when establishing a connection. 128 bit keys provide stronger encryption than 40 bit keys.

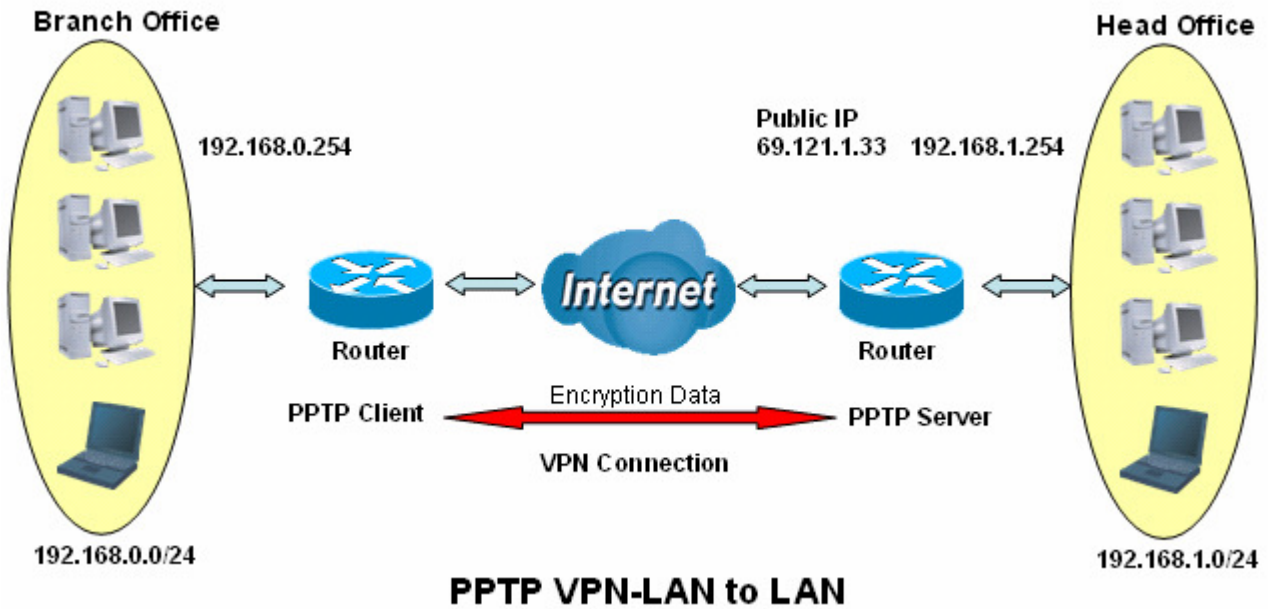
Mode: You may select **Stateful** or **Stateless** mode. The key will be changed every 256 packets when you select Stateful mode. If you select Stateless mode, the key will be changed in each packet.

Active as default route: As the connection type is LAN to LAN, this function will become to disable.

Click **Edit/Delete** button to save your changes.

Example: Configuring a PPTP LAN-to-LAN VPN Connection

The branch office establishes a PPTP VPN tunnel with head office to connect two private networks over the Internet. The routers are installed in the head office and branch offices accordingly.



Attention

Both office LAN networks **MUST** in different subnet with LAN to LAN application.

Configuring PPTP VPN in the Head Office

The IP address 192.168.1.201 will be assigned to the router located in the branch office. Please make sure this IP is not used in the head office LAN.

Configuration

▼ PPTP

Parameters

Name	1	HeadOffice	2	Connection Type	LAN to LAN
Type	3	Dial in (Assign below IP address to dial-in user)		IP Address	192.168.1.200
Peer Network IP	4	192.168.0.0	Netmask	255.255.255.0	
Username	5	username	Password	••••••	6 Auth. Type: Chap(Auto)
Data Encryption		Auto	Key Length	Auto	Mode: stateful
Active as default route		<input type="checkbox"/> Enable			

Edit	Active	Name	Connection Type	Type	Delete
<input type="radio"/>	<input checked="" type="checkbox"/>	Test	remoteaccess	dialout	<input type="radio"/>

Item	Function		Description
1	Name	HeadOffice	Given a name of PPTP connection
2	Connection Type	LAN to LAN	Select LAN to LAN from Connection Type drop-down menu
3	Type	Dial in	Select Dial in from Type drop-down menu
	IP Address	192.168.1.200	IP address assigned to branch office network
4	Peer Network IP	192.168.0.0	Branch office network
	Netmask	255.255.255.0	
5	Username	username	Input username & password to authenticate branch office network
	Password	123456	
6	Auth.Type	Chap(Auto)	Keep as default value in most of the cases, PPTP server & client will determine the value automatically. Refer to manual for details if you want to change the setting.
	Data Encryption	Auto	
	Key Length	Auto	
	Mode	stateful	

Configuring PPTP VPN in the Branch Office

The IP address 69.121.1.33 is the **Public IP** address of the router located in head office. If you registered the DDNS (please refer to the **DDNS** section of this manual), you can also use the domain name instead of the IP address to reach the router.

Parameters	
1	Name: BranchOffice
2	Connection Type: LAN to LAN
3	Type: Dial out (Connect to below Server IP address or FQDN)
	IP Address: 69.121.1.33
4	Peer Network IP: 192.168.1.0
	Netmask: 255.255.255.0
5	Username: username
	Password: 123456
6	Auth. Type: Chap(Auto)
	Data Encryption: Auto
	Key Length: Auto
	Mode: stateful
	Active as default route: <input type="checkbox"/> Enable

Edit	Active	Name	Connection Type	Type	Delete
<input type="radio"/>	<input checked="" type="checkbox"/>	Test	remoteaccess	dialout	<input type="radio"/>

Item	Function		Description
1	Name	BranchOffice	Given a name of PPTP connection
2	Connection Type	LAN to LAN	Select LAN to LAN from Connection Type drop-down menu
3	Type	Dial out	Select Dial out from Type drop-down menu
	IP Address (or Domain name)	69.121.1.33	IP address of the head office router (in WAN side)
4	Peer Network IP	192.168.1.0	Head office network
	Netmask	255.255.255.0	
5	Username	username	Input username & password to authenticate head office network
	Password	123456	
6	Auth.Type	Chap(Auto)	Keep as default value in most of the cases, PPTP server & client will determine the value automatically. Refer to manual for details if you want to change the setting.
	Data Encryption	Auto	
	Key Length	Auto	
	Mode	stateful	

IPSec (IP Security Protocol)

Configuration

IPSec

Parameters

Name	<input type="text"/>		
Local Network	Single Address <input type="button" value="v"/>	IP Address	<input type="text"/>
Remote Secure Gateway IP	<input type="text"/>		
Remote Network	Single Address <input type="button" value="v"/>	IP Address	<input type="text"/>
IKE Mode	Main <input type="button" value="v"/>	Pre-shared Key	<input type="text"/>
Local ID Type	Default <input type="button" value="v"/>	IDContent	<input type="text"/>
Remote ID Type	Default <input type="button" value="v"/>	IDContent	<input type="text"/>
Hash Function	MD5 <input type="button" value="v"/>	Encryption	3DES <input type="button" value="v"/> DH Group MODP1024 (DH2) <input type="button" value="v"/>
IPSec Proposal	<input checked="" type="checkbox"/> ESP	Authentication	MD5 <input type="button" value="v"/> Encryption 3DES <input type="button" value="v"/>
	<input type="checkbox"/> AH	Authentication	MD5 <input type="button" value="v"/>
Perfect Forward Secrecy	MODP1024 (DH2) <input type="button" value="v"/>		
Phase 1 (IKE)SA Lifetime	480 <input type="text"/> minutes	Phase 2 (IPSec)	60 <input type="text"/> minutes
PING for keepalive	None <input type="button" value="v"/>	PING to the IP (0.0.0.0:NEVER)	0.0.0.0 <input type="text"/> Interval 10 <input type="text"/> seconds *
Disconnection Time after no traffic	180 <input type="text"/> seconds (180 at least)		
Reconnection Time	3 <input type="text"/> minutes (3 at least)		

Note *: (0-3600, 0 means NEVER)

VPN Tunnels

Edit	Active	Name	Local Subnet	Remote Subnet	Remote Gateway	IPSec Proposal	Delete

Active: This function activates or deactivates the IPSec connection. Check Active checkbox if you want the protocol of tunnel to be activated and vice versa.

Note: When the Active checkbox is checked, the function of Edit and Delete will not be available.

Name: This is a given name of the connection.

Local Subnet: Displays IP address and subnet of the local network.

Remote Subnet: Displays IP address and subnet of the remote network.

Remote Gateway: This is the IP address or Domain Name of the remote VPN device that is connected and established a VPN tunnel.

IPSec Proposal: This is selected IPSec security method.

IPSec VPN Connection

Configuration

IPSec

Parameters

Name	<input type="text"/>		
Local Network	Single Address <input type="button" value="v"/>	IP Address	<input type="text"/>
Remote Secure Gateway IP	<input type="text"/>		
Remote Network	Single Address <input type="button" value="v"/>	IP Address	<input type="text"/>
IKE Mode	Main <input type="button" value="v"/>	Pre-shared Key	<input type="text"/>
Local ID Type	Default <input type="button" value="v"/>	IDContent	<input type="text"/>
Remote ID Type	Default <input type="button" value="v"/>	IDContent	<input type="text"/>
Hash Function	MD5 <input type="button" value="v"/>	Encryption	3DES <input type="button" value="v"/> DH Group MODP1024 (DH2) <input type="button" value="v"/>
IPSec Proposal	<input checked="" type="checkbox"/> ESP	Authentication	MD5 <input type="button" value="v"/> Encryption 3DES <input type="button" value="v"/>
	<input type="checkbox"/> AH	Authentication	MD5 <input type="button" value="v"/>
Perfect Forward Secrecy	MODP1024 (DH2) <input type="button" value="v"/>		
Phase 1 (IKE)SA Lifetime	480 <input type="text"/>	Phase 2 (IPSec)	60 <input type="text"/> minutes
PING for keepalive	None <input type="button" value="v"/>	PING to the IP (0.0.0.0:NEVER)	0.0.0.0 <input type="text"/> Interval 10 <input type="text"/> seconds *
Disconnection Time after no traffic	180 <input type="text"/> seconds (180 at least)		
Reconnection Time	3 <input type="text"/> minutes (3 at least)		

Note * : (0-3600, 0 means NEVER)

VPN Tunnels

Edit	Active	Name	Local Subnet	Remote Subnet	Remote Gateway	IPSec Proposal	Delete

Name: A given name for the connection (e.g. "connection to office").

Local Network: Set the IP address, subnet or address range of the local network.

- ⊙ **Single Address:** The IP address of the local host.
- ⊙ **Subnet:** The subnet of the local network. For example, IP: 192.168.1.0 with netmask 255.255.255.0 specifies one class C subnet starting from 192.168.1.1 (i.e. 192.168.1.1 through to 192.168.1.254).
- ⊙ **IP Range:** The IP address range of the local network. For example, IP: 192.168.1.1, end IP: 192.168.1.10.

Remote Secure Gateway Address (or Domain Name): The IP address or hostname of the remote VPN device that is connected and establishes a VPN tunnel.

Remote Network: Set the IP address, subnet or address range of the remote network.

IKE (Internet key Exchange) Mode: Select IKE mode to Main mode or Aggressive mode. This IKE provides secured key generation and key management.

Local ID:

- ⊙ **Content:** Input ID's information, like domain name www.ipsectest.com.

Remote ID:

- ⊙ **Identifier:** Input remote ID's information, like domain name www.ipsectest.com.

Hash Function: It is a Message Digest algorithm which converts any length of a message into a unique set of bits. It is widely used MD5 (Message Digest) and SHA-1 (Secure Hash Algorithm) algorithms. SHA1 is more resistant to brute-force attacks than MD5, however it is slower.

- ⊙ **MD5:** A one-way hashing algorithm that produces a 128-bit hash.
- ⊙ **SHA1:** A one-way hashing algorithm that produces a 160-bit hash

Encryption: Select the encryption method from the pull-down menu. There are several options, **DES**, **3DES** and **AES (128, 192 and 256)**. 3DES and AES are more powerful but increase latency.

- ⊙ **DES:** Stands for Data Encryption Standard, it uses 56 bits as an encryption method.
- ⊙ **3DES:** Stands for Triple Data Encryption Standard, it uses 168 (56*3) bits as an encryption method.
- ⊙ **AES:** Stands for Advanced Encryption Standards, you can use 128, 192 or 256 bits as encryption method.

DH (Diffie-Hellman) Group: It is a public-key cryptography protocol that allows two parties to establish a shared secret over an unsecured communication channel (i.e. over the Internet). There are three modes, MODP 768-bit, MODP 1024-bit and MODP 1536-bit. MODP stands for Modular Exponentiation Groups.

IPSec Proposal: Select the IPSec security method. There are two methods of checking the authentication information, AH (authentication header) and ESP (Encapsulating Security Payload). Use ESP for greater security so that data will be encrypted and authenticated. Using AH data will be authenticated but not encrypted.

Authentication: Authentication establishes the integrity of the datagram and ensures it is not tampered with in transmit. There are three options, Message Digest 5 (**MD5**), Secure Hash Algorithm (**SHA1**) or **NONE**. SHA1 is more resistant to brute-force attacks than MD5, however it is slower.

- ⊙ **MD5:** A one-way hashing algorithm that produces a 128-bit hash.
- ⊙ **SHA1:** A one-way hashing algorithm that produces a 160-bit hash.

Encryption: Select the encryption method from the pull-down menu. There are several options, **DES**, **3DES**, **AES (128, 192 and 256)** and **NULL**. NULL means it is a tunnel only with no encryption. 3DES and AES are more powerful but increase latency.

- ⊙ **DES:** Stands for Data Encryption Standard, it uses 56 bits as an encryption method.
- ⊙ **3DES:** Stands for Triple Data Encryption Standard, it uses 168 (56*3) bits as an encryption method.
- ⊙ **AES:** Stands for Advanced Encryption Standards, you can use 128, 192 or 256 bits as encryption method.

Perfect Forward Secrecy: Choose whether to enable PFS using Diffie-Hellman public-key cryptography to change encryption keys during the second phase of VPN negotiation. This function will provide better security, but extends the VPN negotiation time. Diffie-Hellman is a public-key cryptography protocol that allows two parties to establish a shared secret over an unsecured communication channel (i.e. over the Internet). There are three modes, MODP 768-bit, MODP 1024-bit and MODP 1536-bit. MODP stands for Modular Exponentiation Groups.

Pre-shared Key: This is for the Internet Key Exchange (IKE) protocol, a string from 4 to 128 characters. Both sides should use the same key. IKE is used to establish a shared security policy and authenticated keys for services (such as IPSec) that require a key. Before any IPSec traffic can be passed, each router must be able to verify the identity of its peer. This can be done by manually entering the pre-shared key into both sides (router or hosts).

SA Lifetime: Specify the number of minutes that a Security Association (SA) will stay active before new encryption and authentication key will be exchanged. There are two kinds of SAs, IKE and IPSec. IKE

negotiates and establishes SA on behalf of IPSec, an IKE SA is used by IKE.

☉ **Phase 1 (IKE):** To issue an initial connection request for a new VPN tunnel. The range can be from 5 to 15,000 minutes, and the default is 480 minutes.

☉ **Phase 2 (IPSec):** To negotiate and establish secure authentication. The range can be from 5 to 15,000 minutes, and the default is 60 minutes.

A short SA time increases security by forcing the two parties to update the keys. However, every time the VPN tunnel re-negotiates, access through the tunnel will be temporarily disconnected.

PING for Keep Alive:

☉**None:** The default setting is **None**. To this mode, it will not detect the remote IPSec peer has been lost or not. It only follows the policy of **Disconnection time after no traffic**, which the remote IPSec will be disconnected after the time you set in this function.

☉**PING:** This mode will detect the remote IPSec peer has lost or not by pinging specify IP address.

☉**DPD:** Dead peer detection (DPD) is a keeping alive mechanism that enables the router to be detected lively when the connection between the router and a remote IPSec peer has lost. Please be noted, it must be enabled on the both sites.

PING to the IP: It is able to IP Ping the remote PC with the specified IP address and alert when the connection fails. Once alter message is received, Router will drop this tunnel connection. Re-establish of this connection is required. Default setting is 0.0.0.0 which disables the function.

Interval: This sets the time interval between **Pings to the IP** function to monitor the connection status. Default interval setting is 10 seconds. Time interval can be set from 0 to 3600 second, 0 second disables the function.

Ping to the IP	Interval (sec)	Ping to the IP Action
0.0.0.0	0	No
0.0.0.0	2000	No
xxx.xxx.xxx.xxx (A valid IP Address)	0	No
xxx.xxx.xxx.xxx(A valid IP Address)	2000	Yes, activate it in every 2000 second.

Disconnection Time after no traffic: It is the NO Response time clock. When no traffic stage time is beyond the Disconnection time set, Router will automatically halt the tunnel connection and re-establish it base on the **Reconnection Time** set. **180 seconds** is minimum time interval for this function.

Reconnection Time: It is the reconnecting time interval after NO TRAFFIC is initiated. **3 minutes** is minimum time interval for this function.

Click **Edit/Delete** to save your changes.

Example: Configuring a IPSec LAN-to-LAN VPN Connection

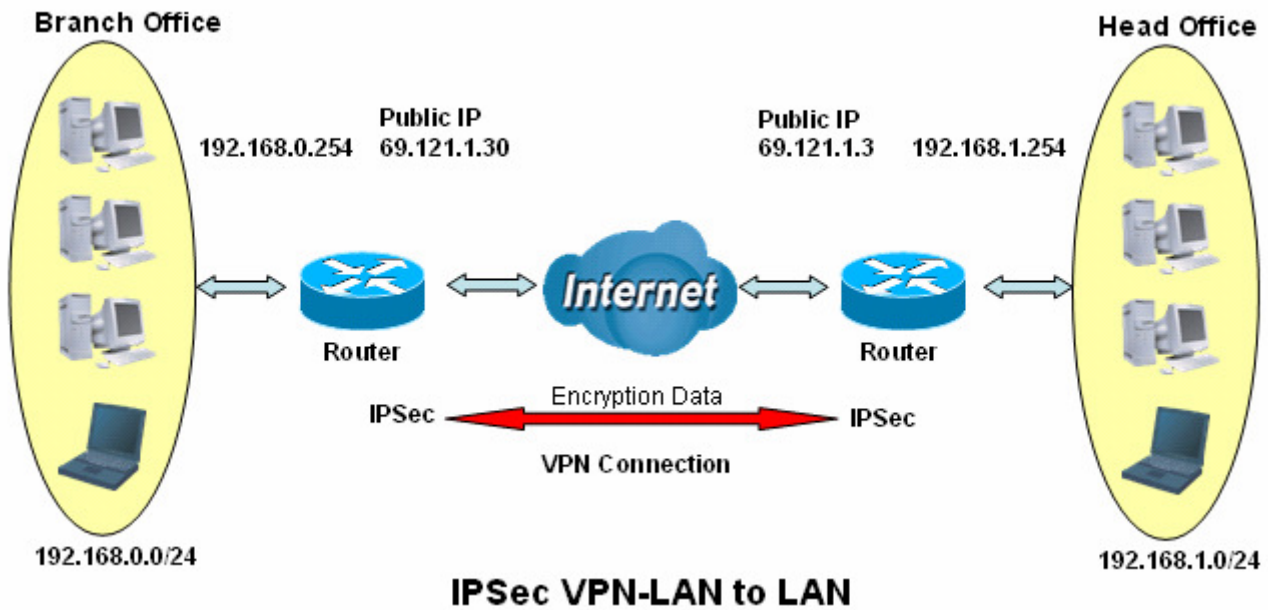


Table 3: Network Configuration and Security Plan

	Branch Office	Head Office
Local Network ID	192.168.0.0/24	192.168.1.0/24
Local Router IP	69.121.1.30	69.121.1.3
Remote Network ID	192.168.1.0/24	192.168.0.0/24
Remote Router IP	69.1.121.3	69.1.121.30
IKE Pre-shared Key	12345678	12345678
VPN Connection Type	Tunnel mode	Tunnel mode
Security Algorithm	ESP:MD5 with AES	ESP:MD5 with AES



Attention

Both office LAN networks **MUST in different subnet** with LAN to LAN application.
 Functions of **Pre-shared Key, VPN Connection Type and Security Algorithm** **MUST BE** identically set up on both sides.

Configuring IPSec VPN in the Head Office

Configuration

IPSec

Parameters

Name	1	IPSec_HeadOffice		
Local Network	2	Subnet	IP Address	192.168.1.0
			Netmask	55.255.255.0
Remote Secure Gateway IP	3	69.121.1.30		
Remote Network	4	Subnet	IP Address	192.168.0.0
			Netmask	55.255.255.0
IKE Mode		Main	Pre-shared Key	12345
Local ID Type		Default	IDContent	
Remote ID Type		Default	IDContent	
Hash Function		MD5	Encryption	DES
			DH Group	MODP1024 (DH2)
IPSec Proposal		<input checked="" type="checkbox"/> ESP	5	Authentication
		<input type="checkbox"/> AH		MD5
			Authentication	MD5
Perfect Forward Secrecy		None		
Phase 1 (IKE)SA Lifetime		480	Phase 2 (IPSec)	60
		minutes		minutes
PING for keepalive		None	PING to the IP (0.0.0.0:NEVER)	0.0.0.0
			Interval	10
				seconds *
Disconnection Time after no traffic		180	seconds (180 at least)	
Reconnection Time		3	minutes (3 at least)	

Note *: (0-3600, 0 means NEVER)

VPN Tunnels

Edit	Active	Name	Local Subnet	Remote Subnet	Remote Gateway	IPSec Proposal	Delete

Item	Function	Description
1	Name	IPSec_HeadOffice Given a name of IPSec connection
2	Local Network	Subnet Select Subnet from Local Network drop-down menu.
	IP Address	192.168.1.0 Head office network
	Netmask	255.255.255.0
3	Remote Secure Gateway IP (or Hostname)	69.121.1.30 IP address of the branch office router (in WAN side)
4	Remote Network	Subnet Select Subnet from Remote Network drop-down menu
	IP Address	192.168.0.0 Branch office network
	Netmask	255.255.255.0
5	Authentication	MD5 Security plan
	Encryption	3DES
	Prefer Forward Security	None
	Pre-shared Key	12345

Configuring IPsec VPN in the Branch Office

Configuration

IPSec

Parameters

Name	1	IPSec_BranchOffice		
Local Network	2	Subnet	IP Address	192.168.0.0
			Netmask	255.255.255.
Remote Secure Gateway IP	3	69.121.1.3		
Remote Network	4	Subnet	IP Address	192.168.1.0
			Netmask	255.255.255.
IKE Mode		Main	Pre-shared Key	12345
Local ID Type		Default	IDContent	
Remote ID Type		Default	IDContent	
Hash Function		MD5	5	Encryption
				DES
				DH Group
				MODP1024 (DH2)
IPSec Proposal		<input checked="" type="checkbox"/> ESP	Authentication	MD5
		<input type="checkbox"/> AH	Authentication	MD5
Encryption			Encryption	3DES
Perfect Forward Secrecy		None		
Phase 1 (IKE)SA Lifetime		480	Phase 2 (IPSec)	60
		minutes		minutes
PING for keepalive		None	PING to the IP (0.0.0.0:NEVER)	0.0.0.0
			Interval	10
				seconds *
Disconnection Time after no traffic		180 seconds (180 at least)		
Reconnection Time		3 minutes (3 at least)		

Note *: (0-3600, 0 means NEVER)

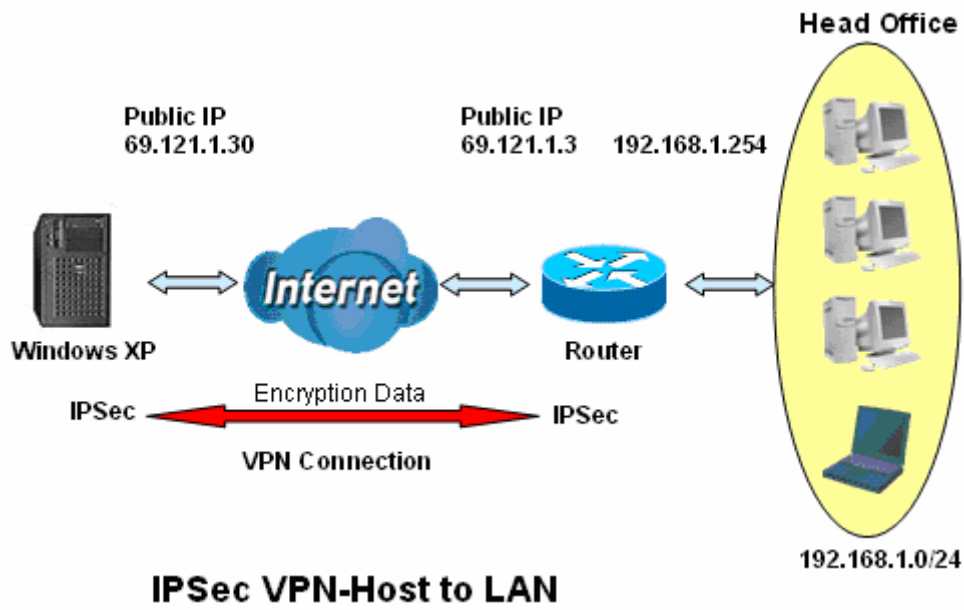
Add Edit / Delete

VPN Tunnels


Edit	Active	Name	Local Subnet	Remote Subnet	Remote Gateway	IPSec Proposal	Delete

Item	Function	Description
1	Name	IPSec_Branch Office Given a name of IPsec connection
2	Local Network	Subnet Select Subnet from Local Network drop-down menu.
	IP Address	192.168.0.0
	Netmask	255.255.255.0 Branch office network
3	Remote Secure Gateway IP (or Hostname)	69.121.1.3 IP address of the head office router (in WAN side)
4	Remote Network	Subnet Select Subnet from Remote Network drop-down menu
	IP Address	192.168.1.0
	Netmask	255.255.255.0 Head office network
5	Authentication	MD5
	Encryption	3DES
	Prefer Forward Security	None
	Pre-shared Key	12345 Security plan

Example: Configuring a IPSec Host-to-LAN VPN Connection



Configuring IPsec VPN in the Office

Configuration 

IPSec

Parameters

Name	1	IPSec		
Local Network	2	Subnet	IP Address	192.168.1.0
			Netmask	255.255.255.0
Remote Secure Gateway IP	3	69.121.1.30		
Remote Network	4	Single Address	IP Address	192.168.1.30
			Netmask	255.255.255.0
IKE Mode		Main	Pre-shared Key	12345
Local ID Type		Default	IDContent	
Remote ID Type		Default	IDContent	
Hash Function		MD5	Encryption	DES
			DH Group	MODP1024 (DH2)
IPSec Proposal		<input checked="" type="checkbox"/> ESP	5	Authentication
		<input type="checkbox"/> AH		MD5
			Authentication	MD5
Perfect Forward Security		None		
Phase 1 (IKE)SA Lifetime		480	Phase 2 (IPSec)	60
		minutes		minutes
PING for keepalive		None	PING to the IP (0.0.0.0:NEVER)	0.0.0.0
			Interval	10
				seconds *
Disconnection Time after no traffic		180 seconds (180 at least)		
Reconnection Time		3 minutes (3 at least)		

Note *: (0-3600, 0 means NEVER)

VPN Tunnels

Edit	Active	Name	Local Subnet	Remote Subnet	Remote Gateway	IPSec Proposal	Delete
------	--------	------	--------------	---------------	----------------	----------------	--------

Item	Function	Description
1	Name	IPSec
		Given a name of IPsec connection
2	Local Network	Subnet
	IP Address	192.168.1.0
	Netmask	255.255.255.0
		Head office network
3	Remote Secure Gateway IP (or Hostname)	69.121.1.30
		Remote worker's IP address
4	Remote Network	Single Address
	IP Address	69.121.1.30
		Remote worker's IP address
5	Authentication	MD5
	Encryption	3DES
	Prefer Forward Security	None
	Pre-shared Key	12345
		Security plan

L2TP (Layer Two Tunneling Protocol)

Configuration

L2TP

Parameters

Name	<input type="text"/>	Connection Type	Remote Access
Type	Dial out (Connect to below Server IP address or FQDN)	IP Address	<input type="text"/>
Username	<input type="text"/>	Password	<input type="text"/>
Tunnel Authentication	<input type="checkbox"/> Enable	Secret	<input type="text"/>
Remote Host Name(Optional)	<input type="text"/>	Local Host Name(Optional)	<input type="text"/>
IPSec	<input type="checkbox"/> Enable	Authentication	None
Perfect Forward Secrecy	None	Pre-shared Key	<input type="text"/>
		Active as default route	<input type="checkbox"/> Enable
		Encryption	NULL

Edit	Active	Name	Connection Type	Type	Delete
<input type="radio"/>	<input type="checkbox"/>	test	remoteaccess	dialout	<input type="radio"/>

Two types of L2TP VPN are supported **Remote Access** and **LAN-to-LAN** (please refer below for more information.). Fill in the blank with information you need and click **Add** to create a new VPN connection account.

Active: This function activates or deactivates the L2TP connection. Check Active checkbox if you want the protocol of tunnel to be activated and vice versa.

Note: When the Active checkbox is checked, the function of Edit and Delete will not be available.

Name: This is a given name of the connection.

Connection Type: It informs your L2TP tunnel connection condition.

Type: This refers to your router operates as a client or a server, **Dialout** or **Dialin** in respectively.

L2TP Connection - Remote Access

Configuration

L2TP

Parameters

Name	<input type="text"/>	Connection Type	Remote Access
Type	Dial out (Connect to below Server IP address or FQDN)	IP Address	<input type="text"/>
Username	<input type="text"/>	Password	<input type="text"/>
Tunnel Authentication	<input type="checkbox"/> Enable	Secret	<input type="text"/>
Remote Host Name(Optional)	<input type="text"/>	Local Host Name(Optional)	<input type="text"/>
IPSec	<input type="checkbox"/> Enable	Authentication	None
Perfect Forward Secrecy	None	Pre-shared Key	<input type="text"/>
		Active as default route	<input type="checkbox"/> Enable
		Encryption	NULL

Edit	Active	Name	Connection Type	Type	Delete
<input type="radio"/>	<input type="checkbox"/>	test	remoteaccess	dialout	<input type="radio"/>

Connection Type: Remote Access or LAN to LAN.

Name: A given name for the connection (e.g. "connection to office").

Active: This function activates or deactivates the L2TP connection. Check Active checkbox if you want the protocol of tunnel to be activated and vice versa.

Note: When the Active checkbox is checked, the function of Edit and Delete will not be available.

Type: Check **Dial Out** if you want your router to operate as a client (connecting to a remote VPN server, e.g. your office server), check **Dial In** operates as a VPN server.

- ⊙ When configuring your router as a Client, enter the remote **Server IP Address (or Hostname)** you wish to connection to.
- ⊙ When configuring your router as a server, enter the **Private IP Address Assigned to Dial in User** address.

Username: If you are a Dial-Out user (client), enter the username provided by your Host. If you are a Dial-In user (server), enter your own username.

Password: If you are a Dial-Out user (client), enter the password provided by your Host. If you are a Dial-In user (server), enter your own password.

Authentication Type: Default is **Auto** if you want the router to determine the authentication type to use, or else manually specify CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol) if you know which type the server is using (when acting as a client), or else the authentication type you want clients connecting to you to use (when acting as a server). When using PAP, the password is sent unencrypted, whilst CHAP encrypts the password before sending, and also allows for challenges at different periods to ensure that the client has not been replaced by an intruder.

Tunnel Authentication: This enables router to authenticate both the L2TP remote and L2TP host. This is only valid when L2TP remote supports this feature.

Secret: The secure password length should be 16 characters which may include numbers and characters.

Active as default route: Commonly used by the *Dial-out* connection which all packets will route through the VPN tunnel to the Internet; therefore, active the function may degrade the Internet performance.

Remote Host Name (Optional): Enter hostname of remote VPN device. It is a tunnel identifier from the Remote VPN device matches with the Remote hostname provided. If remote hostname matches, tunnel will be connected; otherwise, it will be dropped.

Caution: This is only when the router performs as a VPN server. This option should be used by advanced users only.

Local Host Name (Optional): Enter hostname of Local VPN device that is connected / establishes a VPN tunnel. As default, Router's default Hostname is **home.gateway**.

IPSec: Enable for enhancing your L2TP VPN security.

Authentication: Authentication establishes the integrity of the datagram and ensures it is not tampered with in transmit. There are three options, Message Digest 5 (**MD5**), Secure Hash Algorithm (**SHA1**) or **NONE**. SHA1 is more resistant to brute-force attacks than MD5, however it is slower.

- ⊙ **MD5:** A one-way hashing algorithm that produces a 128-bit hash.
- ⊙ **SHA1:** A one-way hashing algorithm that produces a 160-bit hash.

Encryption: Select the encryption method from the pull-down menu. There are four options, **DES**, **3DES**, **AES** and **NULL**. NULL means it is a tunnel only with no encryption. 3DES and AES are more powerful but increase latency.

- ⊙ **DES:** Stands for Data Encryption Standard, it uses 56 bits as an encryption method.
- ⊙ **3DES:** Stands for Triple Data Encryption Standard, it uses 168 (56*3) bits as an encryption method.
- ⊙ **AES:** Stands for Advanced Encryption Standards, it uses 128 bits as an encryption method.

Perfect Forward Secrecy: Choose whether to enable PFS using Diffie-Hellman public-key cryptography to change encryption keys during the second phase of VPN negotiation. This function will provide better security, but extends the VPN negotiation time. Diffie-Hellman is a public-key cryptography protocol that

Billion BiPAC 7402NX(L) 802.11n 3G/ADSL2+ (VPN) Firewall Router

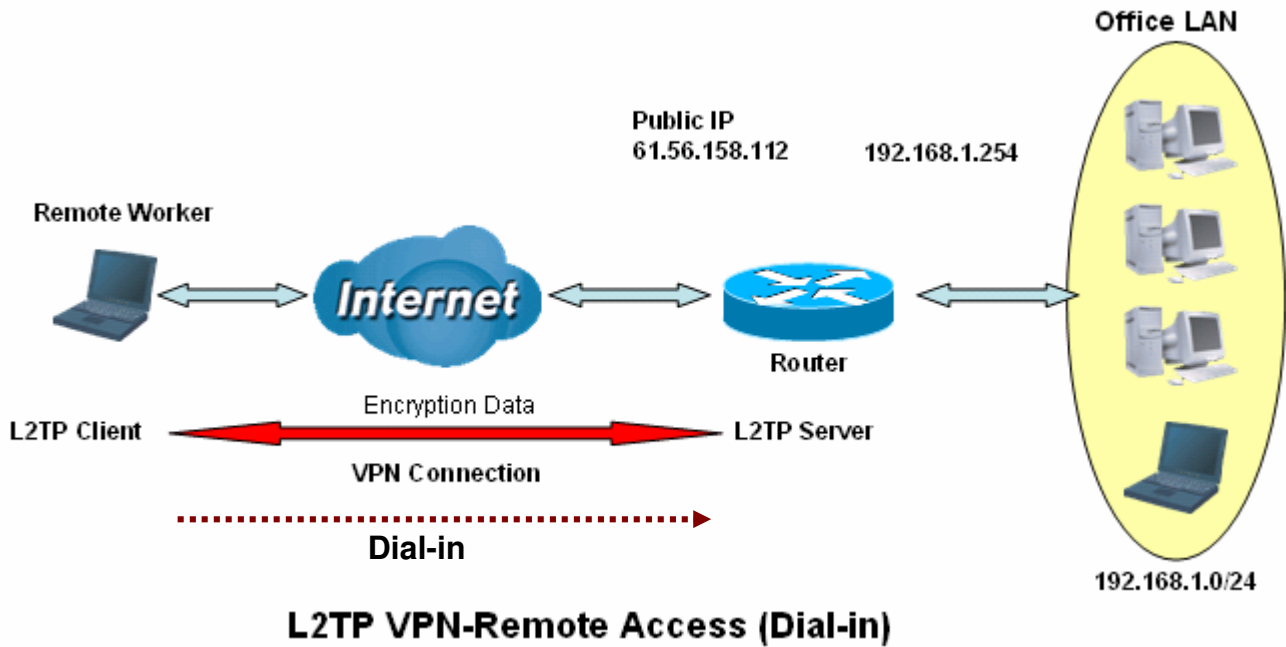
allows two parties to establish a shared secret over an unsecured communication channel (i.e. over the Internet). There are three modes, MODP 768-bit, MODP 1024-bit and MODP 1536-bit. MODP stands for Modular Exponentiation Groups.

Pre-shared Key: This is for the Internet Key Exchange (IKE) protocol, a string from 4 to 128 characters. Both sides should use the same key. IKE is used to establish a shared security policy and authenticated keys for services (such as IPSec) that require a key. Before any IPSec traffic can be passed, each router must be able to verify the identity of its peer. This can be done by manually entering the pre-shared key into both sides (router or hosts).

Click **Edit/Delete** to save your changes..

Example: Configuring a L2TP VPN - Remote Access Dial-in Connection

A remote worker establishes a L2TP VPN connection with the head office using Microsoft's VPN Adapter (included with Windows XP/2000/ME, etc.). The router is installed in the head office, connected to a couple of PCs and Servers.



Configuring L2TP VPN in the Office

The input IP address 192.168.1.200 will be assigned to the remote worker. Please make sure this IP is not used in the Office LAN.

Configuration

L2TP

Parameters

Name	VPN-L2TP	Connection Type	Remote Access
Type	Dial in (Assign below IP address to dial-in user)	IP Address	192.168.1.200
Username	username	Password	123456
Tunnel Authentication	<input type="checkbox"/> Enable	Secret	
Remote Host Name(Optional)		Local Host Name(Optional)	
IPSec	<input checked="" type="checkbox"/> Enable	Authentication	MD5
Perfect Forward Secrecy	None	Pre-shared Key	
		Active as default route	<input type="checkbox"/> Enable

Auth. Type: Chap(Auto)

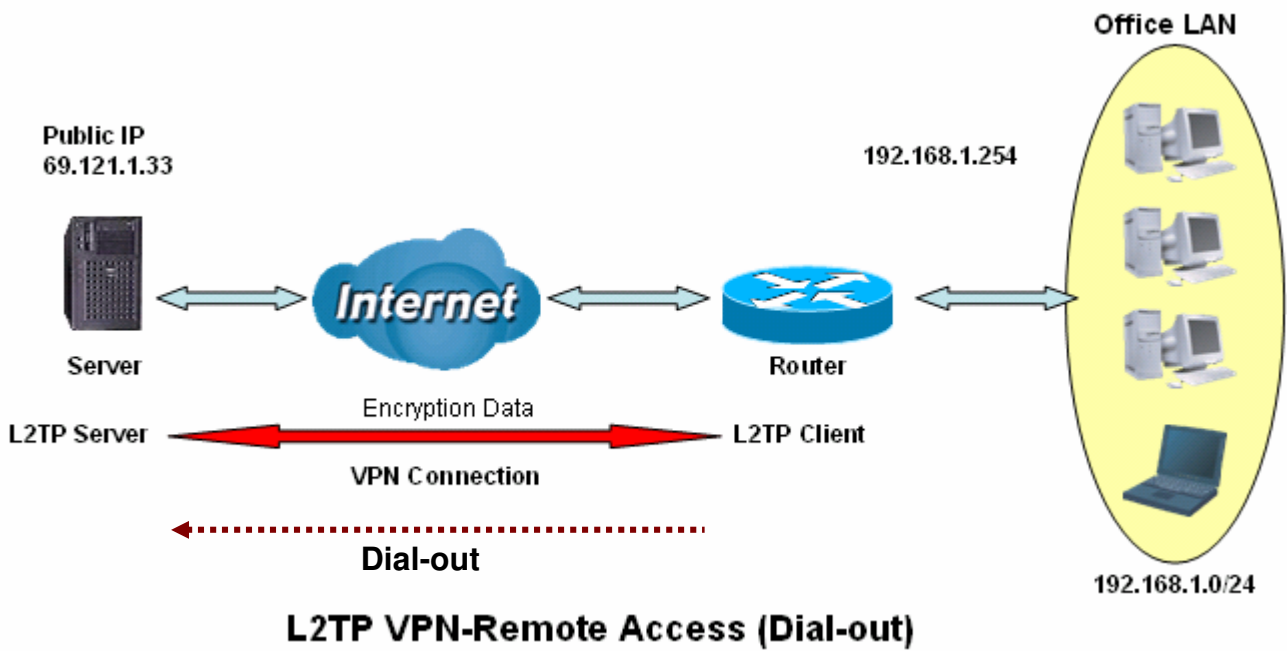
Buttons: Add, Edit / Delete

Edit	Active	Name	Connection Type	Type	Delete
------	--------	------	-----------------	------	--------

Item	Function	Description
1	Name	VPN_L2TP
2	Connection Type	Remote Access
3	Type	Dial in
	IP Address	192.168.1.200
4	Username	username
	Password	123456
5	Auth. Type	Chap(Auto)
6	IPSec	Enable
	Authentication	MD5
	Encryption	3DES
	Perfect Forward Secrecy	None
	Pre-shared Key	12345678
		Both sites should use the same value.

Example: Configuring a Remote Access L2TP VPN Dial-out Connection

A company's office establishes a L2TP VPN connection with a file server located at a separate location. The router is installed in the office, connected to a couple of PCs and Servers.



Configuring the L2TP VPN in the Office

Configuration

L2TP

Parameters	1	2
Name	VPN-L2TP	Connection Type: Remote Access
Type	Dial out (Connect to below Server IP address or FQDN)	IP Address: 69.121.1.33
Username	username	Password: Auth. Type: Chap(Auto)
Tunnel Authentication	<input type="checkbox"/> Enable	Secret: Active as default route: <input type="checkbox"/> Enable
Remote Host Name(Optional)		Local Host Name(Optional)
IPSec	<input checked="" type="checkbox"/> Enable	Authentication: MD5 Encryption: 3DES
Perfect Forward Secrecy	None	Pre-shared Key: 12345678

Edit	Active	Name	Connection Type	Type	Delete
------	--------	------	-----------------	------	--------

Item	Function		Description
1	Name	VPN_L2TP	Given name of L2TP connection
2	Connection Type	Remote Access	Select Remote Access from Connection Type drop-down menu
3	Type	Dial out	Select Dial out from Type drop-down menu
	IP Address (or Hostname)	69.121.1.33	An Dialed server IP
4	Username	username	A given username & password
	Password	123456	
5	Auth. Type	Chap(Auto)	Keep as default value in most of the cases.
6	IPSec	Enable	Both sites should use the same value.
	Authentication	MD5	
	Encryption	3DES	
	Perfect Forward Secrecy	None	
	Pre-shared Key	12345678	

Example: Configuring your Router to Dial-in to the Server

Currently, Microsoft Windows operation system does not support L2TP incoming service. Additional software may be required to set up your L2TP incoming service.

L2TP Connection - LAN to LAN

Parameters		
Name	Connection Type: LAN to LAN	
Type: Dial out (Connect to below Server IP address or FQDN)	IP Address	
Peer Network IP	Netmask	
Username	Password	Auth. Type: Chap(Auto)
Tunnel Authentication: <input type="checkbox"/> Enable	Secret	Active as default route: <input type="checkbox"/> Enable
Remote Host Name(Optional)	Local Host Name(Optional)	
IPsec: <input type="checkbox"/> Enable	Authentication: None	Encryption: NULL
Perfect Forward Secrecy: None	Pre-shared Key	

Edit	Active	Name	Connection Type	Type	Delete
------	--------	------	-----------------	------	--------

L2TP VPN Connection

Name: A given name of the connection.

Connection Type: Remote Access or LAN to LAN.

Active: This function activates or deactivates the L2TP connection. Check Active checkbox if you want the protocol of tunnel to be activated and vice versa.

Note: When the Active checkbox is checked, the function of Edit and Delete will not be available.

Type: Check **Dial Out** if you want your router to operate as a client (connecting to a remote VPN server, e.g. your office server), check **Dial In** operates as a VPN server.

- ⊙ When configuring your router establish the connection to a remote LAN, enter the remote **Server IP Address (or Hostname)** you wish to connection to.
- ⊙ When configuring your router as a server to accept incoming connections, enter the **Private IP Address Assigned to Dial in User** address.

Peer Network IP: Enter Peer network IP address.

Netmask: Enter the subnet mask of peer network based on the Peer Network IP setting.

Username: If you are a Dial-Out user (client), enter the username provided by your Host. If you are a Dial-In user (server), enter your own username.

Password: If you are a Dial-Out user (client), enter the password provided by your Host. If you are a Dial-In user (server), enter your own password.

Authentication Type: Default is **Auto** if you want the router to determine the authentication type to use, or else manually specify CHAP (Challenge Handshake Authentication Protocol) or PAP (Password Authentication Protocol) if you know which type the server is using (when acting as a client), or else the authentication type you want clients connecting to you to use (when acting as a server). When using PAP, the password is sent unencrypted, whilst CHAP encrypts the password before sending, and also allows for challenges at different periods to ensure that the client has not been replaced by an intruder.

Tunnel Authentication: This enables router to authenticate both the L2TP remote and L2TP host. This is only valid when L2TP remote supports this feature.

Secret: The secure password length should be 16 characters which may include numbers and characters.

Active as default route: As the connection type is LAN to LAN, this function will become to disable.

Remote Host Name (Optional): Enter hostname of remote VPN device. It is a tunnel identifier from the Remote VPN device matches with the Remote hostname provided. If remote hostname matches, tunnel will be connected; otherwise, it will be dropped.

Caution: This is only when the router performs as a VPN server. This option should be used by advanced users only.

Local Host Name (Optional): Enter hostname of Local VPN device that is connected / establishes a VPN tunnel. As default, Router's default Hostname is **home.gateway**.

IPSec: Enable for enhancing your L2TP VPN security.

Authentication: Authentication establishes the integrity of the datagram and ensures it is not tampered with in transmit. There are three options, Message Digest 5 (**MD5**), Secure Hash Algorithm (**SHA1**) or **NONE**. SHA-1 is more resistant to brute-force attacks than MD5, however it is slower.

- Ⓐ **MD5:** A one-way hashing algorithm that produces a 128-bit hash.
- Ⓐ **SHA1:** A one-way hashing algorithm that produces a 160-bit hash.

Encryption: Select the encryption method from the pull-down menu. There are four options, **DES**, **3DES**, **AES** and **NULL**. NULL means it is a tunnel only with no encryption. 3DES and AES are more powerful but increase latency.

- Ⓐ **DES:** Stands for Data Encryption Standard, it uses 56 bits as an encryption method.
- Ⓐ **3DES:** Stands for Triple Data Encryption Standard, it uses 168 (56*3) bits as an encryption method.
- Ⓐ **AES:** Stands for Advanced Encryption Standards, it uses 128 bits as an encryption method.

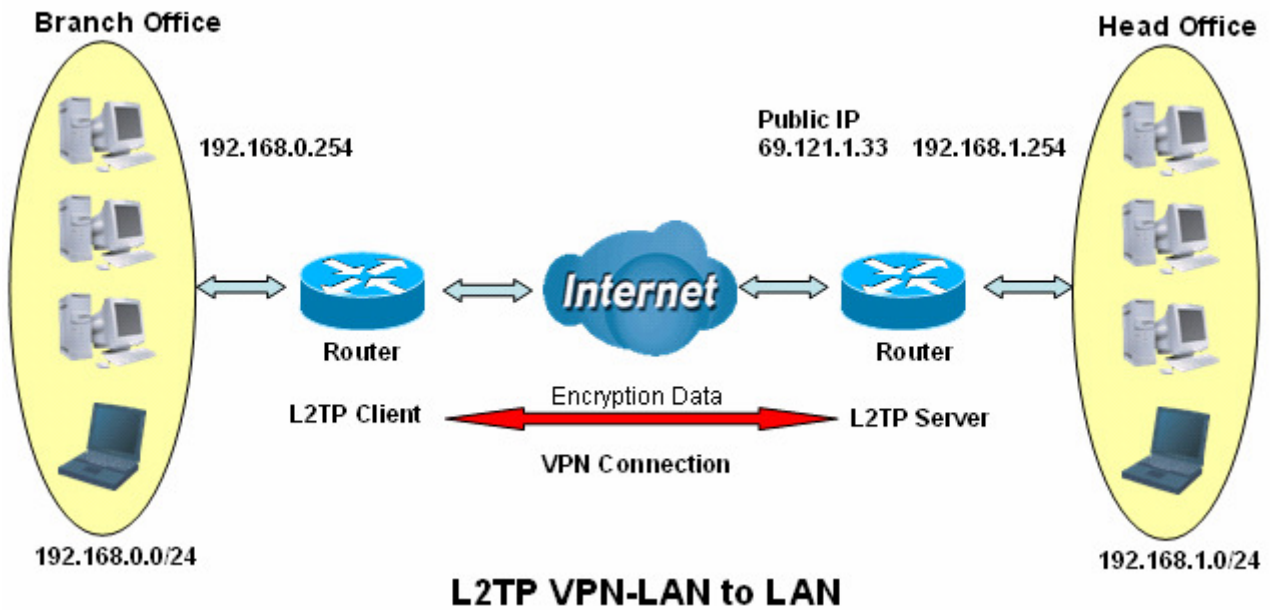
Perfect Forward Secrecy: Choose whether to enable PFS using Diffie-Hellman public-key cryptography to change encryption keys during the second phase of VPN negotiation. This function will provide better security, but extends the VPN negotiation time. Diffie-Hellman is a public-key cryptography protocol that allows two parties to establish a shared secret over an unsecured communication channel (i.e. over the Internet). There are three modes, MODP 768-bit, MODP 1024-bit and MODP 1536-bit. MODP stands for Modular Exponentiation Groups.

Pre-shared Key: This is for the Internet Key Exchange (IKE) protocol, a string from 4 to 128 characters. Both sides should use the same key. IKE is used to establish a shared security policy and authenticated keys for services (such as IPSec) that require a key. Before any IPSec traffic can be passed, each router must be able to verify the identity of its peer. This can be done by manually entering the pre-shared key into both sides (router or hosts).

Click **Edit/Delete** to save your changes.

Example: Configuring L2TP LAN-to-LAN VPN Connection

The branch office establishes a L2TP VPN tunnel with head office to connect two private networks over the Internet. The routers are installed in the head office and branch office accordingly.



Attention

Both office LAN networks **MUST in different subnet** with LAN to LAN application.

Functions of **Pre-shared Key, VPN Connection Type and Security Algorithm** **MUST BE** identically set up on both sides.

Configuring L2TP VPN in the Head Office

The IP address 192.168.1.200 will be assigned to the router located in the branch office. Please make sure this IP is not used in the head office LAN.

Configuration



Parameters		1	2		
Name		HeadOffice	Connection Type	LAN to LAN	
Type	3	Dial in (Assign below IP address to dial-in user)	IP Address	192.168.1.200	
Peer Network IP	4	192.168.0.0	Netmask	255.255.255.0	
Username		username	Password	6	Auth. Type
Tunnel Authentication	5	<input type="checkbox"/> Enable	Secret		Active as default route
Remote Host Name(Optional)			Local Host Name(Optional)		<input type="checkbox"/> Enable
IPSec	7	<input checked="" type="checkbox"/> Enable	Authentication	MD5	Encryption
Perfect Forward Secrecy		None	Pre-shared Key	12345678	

Edit	Active	Name	Connection Type	Type	Delete
------	--------	------	-----------------	------	--------

Item	Function		Description
1	Name	HeadOffice	Given a name of L2TP connection
2	Connection Type	LAN to LAN	Select LAN to LAN from Connection Type drop-down menu
3	Type	Dial in	Select Dial in from Type drop-down menu
	IP Address	192.168.1.200	IP address assigned to branch office network
4	Peer Network IP	192.168.0.0	Branch office network
	Netmask	255.255.255.0	
5	Username	username	Input username & password to authenticate branch office network
	Password	123456	
6	Auth. Type	Chap(Auto)	Keep as default value in most of the cases.
7	IPSec	Enable	Both sites should use the same value.
	Authentication	MD5	
	Encryption	3DES	
	Perfect Forward Secrecy	None	
	Pre-shared Key	12345678	

Configuring L2TP VPN in the Branch Office

The IP address 69.121.1.33 is the **Public IP** address of the router located in head office. If you registered the DDNS (please refer to the **DDNS** section of this manual), you can also use the domain name instead of the IP address to reach the router.

Item	Function		Description
1	Name	BranchOffice	Given a name of L2TP connection
2	Connection Type	LAN to LAN	Select LAN to LAN from drop-down menu
3	Type	Dial out	Select Dial out from drop-down menu
	IP Address (or Hostname)	69.121.1.33	IP address of the head office router (in WAN side)
4	Peer Network IP	192.168.1.0	Head office network
	Netmask	255.255.255.0	
5	Username	username	Input username & password to authenticate head office network
	Password	123456	
6	Auth.Type	Chap(Auto)	Keep as default value in most of the cases.
7	IPSec	Enable	Both sites should use the same value.
	Authentication	MD5	
	Encryption	3DES	
	Perfect Forward Secrecy	None	
	Pre-shared Key	12345678	

QoS - Quality of Service

QoS function helps you to control your network traffic for each application from LAN (Ethernet and/or Wireless) to WAN (Internet). It facilitates you to control the different quality and speed of through put for each application when the system is running with full loading of upstream.

Here are the items within the **QoS** section: **Prioritization** and **Outbound / Inbound IP Throttling** (bandwidth management).

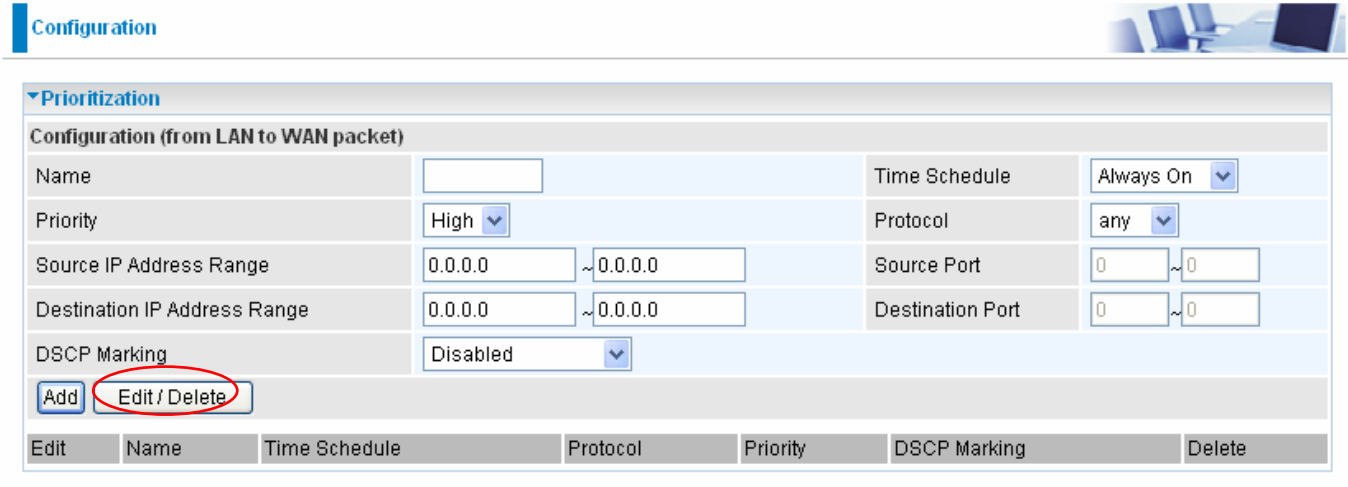
Prioritization

There are three priority settings to be provided in the Router:

- High**
- Normal** (The default is normal priority for all of traffic without setting)
- Low**

And the balances of utilization for each priority are High (60%), Normal (30%) and Low (10%).

To delete the application, you can choose Delete option and then click Edit/Delete.



Configuration

▼ Prioritization

Configuration (from LAN to WAN packet)

Name	<input type="text"/>	Time Schedule	Always On <input type="button" value="v"/>
Priority	High <input type="button" value="v"/>	Protocol	any <input type="button" value="v"/>
Source IP Address Range	<input type="text"/> 0.0.0.0 ~ <input type="text"/> 0.0.0.0	Source Port	<input type="text"/> 0 ~ <input type="text"/> 0
Destination IP Address Range	<input type="text"/> 0.0.0.0 ~ <input type="text"/> 0.0.0.0	Destination Port	<input type="text"/> 0 ~ <input type="text"/> 0
DSCP Marking	Disabled <input type="button" value="v"/>		

Edit	Name	Time Schedule	Protocol	Priority	DSCP Marking	Delete

Name: User-define description to identify this new policy/application.

Time Schedule: Scheduling your prioritization policy.

Priority: The priority given to each policy/application. Its default setting is set to High; you may adjust this setting to fit your policy/application.

Protocol: The name of supported protocol.

Source IP Address Range: The source IP address or range of packets to be monitored.

Source Port: The source port of packets to be monitored.

Destination IP address Range: The destination IP address or range of packets to be monitored.

Destination Port: The destination port of packets to be monitored.

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.

Table 4: DSCP Mapping Table

DSCP Mapping Table	
(Wireless) ADSL Router	Standard DSCP
Disabled	None
Best Effort	Best Effort (000000)
Premium	Express Forwarding (101110)
Gold service (L)	Class 1, Gold (001010)
Gold service (M)	Class 1, Silver (001100)
Gold service (H)	Class 1, Bronze (001110)
Silver service (L)	Class 2, Gold (010010)
Silver service (M)	Class 2, Silver (010100)
Silver service (H)	Class 2, Bronze (010110)
Bronze service (L)	Class 3, Gold (011010)
Bronze service (M)	Class 3, Silver (011100)
Bronze service (H)	Class 3, Bronze (011110)

Outbound IP Throttling (LAN to WAN)

IP Throttling allows you to limit the speed of IP traffic. The value entered will limit the speed of the application that you set to the specified value's multiple of 32kbps.

Configuration

Outbound IP Throttling

Configuration (from LAN to WAN packet)

Name	<input type="text"/>	Time Schedule	Always On ▼
Protocol	any ▼	Rate Limit	1 *32 (kbps)
Source IP Address Range	<input type="text" value="0.0.0.0"/> ~ <input type="text" value="0.0.0.0"/>	Source port(s)	<input type="text" value="0"/> ~ <input type="text" value="0"/>
Destination IP Address Range	<input type="text" value="0.0.0.0"/> ~ <input type="text" value="0.0.0.0"/>	Destination port(s)	<input type="text" value="0"/> ~ <input type="text" value="0"/>

Edit	Application	Time Schedule	Protocol	Rate Limit	Delete
[+]					[-]

Name: User-define description to identify this new policy/name.

Time Schedule: Scheduling your prioritization policy. Refer to **Time Schedule** for more information.

Protocol: The name of supported protocol.

Rate Limit: To limit the speed of outbound traffic

Source IP Address Range: The source IP address or range of packets to be monitored.

Source Port(s): The source port of packets to be monitored.

Destination IP Address Range: The destination IP address or range of packets to be monitored.

Destination Port(s): The destination port of packets to be monitored.

Inbound IP Throttling (WAN to LAN)

IP Throttling allows you to limit the speed of IP traffic. The value entered will limit the speed of the application that you set to the specified value's multiple of 32kbps.

Configuration

Inbound IP Throttling

Configuration (from WAN to LAN packet)

Name	<input type="text"/>	Time Schedule	Always On ▼
Protocol	any ▼	Rate Limit	1 *32 (kbps)
Source IP Address Range	0.0.0.0 ~ 0.0.0.0	Source port(s)	0 ~ 0
Destination IP Address Range	0.0.0.0 ~ 0.0.0.0	Destination port(s)	0 ~ 0

Edit	Application	Time Schedule	Protocol	Rate Limit	Delete

Name: User-define description to identify this new policy/application.

Time Schedule: Scheduling your prioritization policy. Refer to **Time Schedule** for more information.

Protocol: The name of supported protocol.

Rate Limit: To limit the speed of for inbound traffic.

Source IP Address Range: The source IP address or range of packets to be monitored.

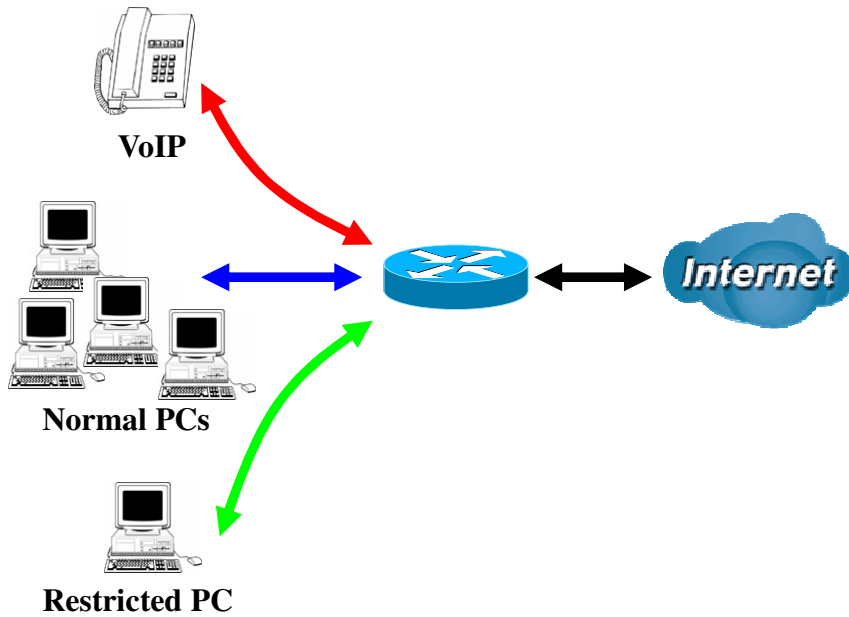
Source Port(s): The source port of packets to be monitored.

Destination IP Address Range: The destination IP address or range of packets to be monitored.

Destination Port(s): The destination port of packets to be monitored.

Example: QoS for your Network

Connection Diagram



Information and Settings

Upstream: 928 kbps
Downstream: 8 Mbps

VoIP User : 192.168.1.1
Normal Users : 192.168.1.2~192.168.1.5
Restricted User: 192.168.1.100

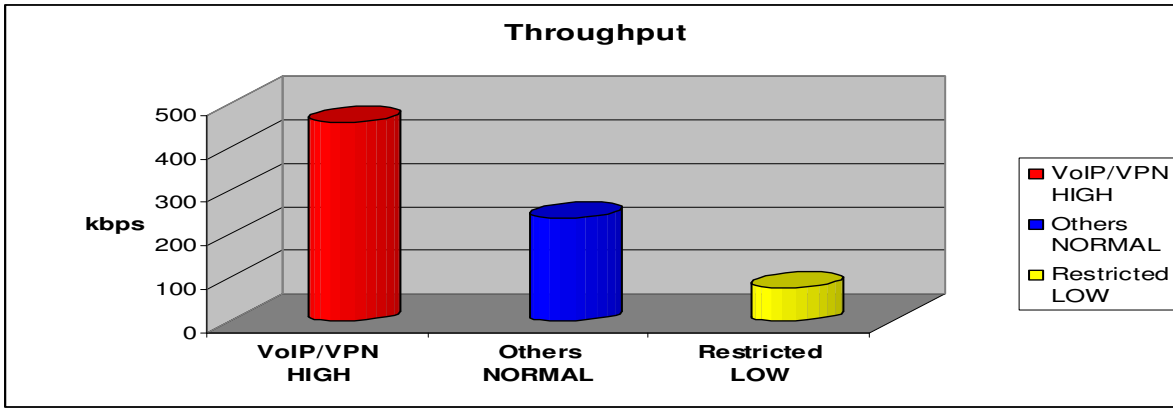
Configuration

▼ Prioritization

Configuration (from LAN to WAN packet)

Name	<input type="text"/>	Time Schedule	Always On <input type="button" value="v"/>
Priority	High <input type="button" value="v"/>	Protocol	any <input type="button" value="v"/>
Source IP Address Range	0.0.0.0 ~ 0.0.0.0	Source Port	0 ~ 0
Destination IP Address Range	0.0.0.0 ~ 0.0.0.0	Destination Port	0 ~ 0
DSCP Marking	Disabled <input type="button" value="v"/>		

Edit	Name	Time Schedule	Protocol	Priority	DSCP Marking	Delete
<input type="radio"/>	PPTP	Always On	GRE	High	Gold service (L)	<input type="radio"/>
<input type="radio"/>	VoIP	Always On	Any	High	Gold service (L)	<input type="radio"/>
<input type="radio"/>	Restricted	TimeSlot1	Any	High	Gold service (L)	<input type="radio"/>



Mission-critical application

Mostly the VPN connection is mission-critical application for doing data exchange between head and branch office.

Configuration

▼ Prioritization

Configuration (from LAN to WAN packet)

Name	PPTP	Time Schedule	Always On
Priority	High	Protocol	gre
Source IP Address Range	0.0.0.0 ~ 0.0.0.0	Source Port	0 ~ 0
Destination IP Address Range	0.0.0.0 ~ 0.0.0.0	Destination Port	0 ~ 0
DSCP Marking	Gold service (L)		

Edit	Name	Time Schedule	Protocol	Priority	DSCP Marking	Delete
<input checked="" type="radio"/>	PPTP	Always On	GRE	High	Gold service (L)	<input type="radio"/>

The mission-critical application must be sent out smoothly without any dropping. Set priority as high level for preventing any other applications to saturate the bandwidth.

Voice application

Voice is latency-sensitive application. Most VoIP devices are use SIP protocol and the port number will be assigned by SIP module automatically. Better to use fixed IP address for catching VoIP packets as high priority.

Configuration

▼ Prioritization

Configuration (from LAN to WAN packet)

Name	VoIP	Time Schedule	Always On
Priority	High	Protocol	any
Source IP Address Range	192.168.1.1 ~ 192.168.1.1	Source Port	0 ~ 0
Destination IP Address Range	0.0.0.0 ~ 0.0.0.0	Destination Port	0 ~ 0
DSCP Marking	Gold service (L)		

Edit	Name	Time Schedule	Protocol	Priority	DSCP Marking	Delete
<input type="radio"/>	PPTP	Always On	GRE	High	Gold service (L)	<input type="radio"/>
<input checked="" type="radio"/>	VoIP	Always On	Any	High	Gold service (L)	<input type="radio"/>

Above settings will help to improve quality of your VoIP service when traffic is full loading.

Restricted Application

Some of companies will setup FTP server for customer downloading or home user sharing their files by using FTP.

Configuration

▼ Prioritization

Configuration (from LAN to WAN packet)

Name	Restricted	Time Schedule	TimeSlot1
Priority	High	Protocol	any
Source IP Address Range	192.168.1.100 ~ 192.168.1.100	Source Port	0 ~ 0
Destination IP Address Range	0.0.0.0 ~ 0.0.0.0	Destination Port	0 ~ 0
DSCP Marking	Gold service (L)		

Edit	Name	Time Schedule	Protocol	Priority	DSCP Marking	Delete
<input type="radio"/>	PPTP	Always On	GRE	High	Gold service (L)	<input type="radio"/>
<input type="radio"/>	VoIP	Always On	Any	High	Gold service (L)	<input type="radio"/>
<input checked="" type="radio"/>	Restricted	TimeSlot1	Any	High	Gold service (L)	<input type="radio"/>

With above settings that help to limit utilization of upstream of FTP. Time schedule also help you to only limit utilization at daytime.

Advanced setting by using IP throttling

With IP throttling you can specify more detail for allocating bandwidth; even the applications are located in the same level.

- Upstream: 928kbps (29*32kbps)
- Mission-critical Application: 192kbps (6*32kbps)
- Voice Application: 128kbps (4*32kbps)
- Restricted Application: 160kbps (5*32kbps)
- Other Applications: 448kbps (14*32kbps)

$6+4+14+5=29, 29*32kbps=928kbps$

Configuration

▼ Outbound IP Throttling

Configuration (from LAN to WAN packet)

Name		Time Schedule	Always On
Protocol	any	Rate Limit	1 *32 (kbps)
Source IP Address Range	0.0.0.0 ~ 0.0.0.0	Source port(s)	0 ~ 0
Destination IP Address Range	0.0.0.0 ~ 0.0.0.0	Destination port(s)	0 ~ 0

Edit	Name	Time Schedule	Protocol	Rate Limit	Delete
<input type="radio"/>	PPTP	Always On	GRE	6	<input type="radio"/>
<input type="radio"/>	VoIP	Always On	Any	4	<input type="radio"/>
<input type="radio"/>	Restricted	TimeSlot1	Any	5	<input type="radio"/>
<input type="radio"/>	Others	TimeSlot1	Any	14	<input type="radio"/>

Sometime your customers or friends may upload their files to your FTP server and that will saturate your

downstream bandwidth. The settings below help you to limit bandwidth for the restricted application.

Configuration

Outbound IP Throttling

Configuration (from LAN to WAN packet)

Name	Restricted	Time Schedule	TimeSlot1
Protocol	any	Rate Limit	64 *32 (kbps)
Source IP Address Range	0.0.0.0 ~ 0.0.0.0	Source port(s)	0 ~ 0
Destination IP Address Range	192.168.1.100 ~ 192.168.1.100	Destination port(s)	0 ~ 0

Edit	Name	Time Schedule	Protocol	Rate Limit	Delete
<input checked="" type="radio"/>	Restricted	TimeSlot1	Any	64	<input type="radio"/>

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

Add Virtual Server in 'ipwan' IP interface

Virtual Server Entry

Application	<input type="text"/>	<<	--Select--	v			
Protocol	tcp				Time Schedule	Always On	v
External Port	from <input type="text" value="0"/> to <input type="text" value="0"/>				Redirect Port	from <input type="text" value="0"/> to <input type="text" value="0"/>	
Internal IP Address	<input type="text"/>	<<	--Select--	v			

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 outside users to access internal servers, 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 the service to use, 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.

The screenshot shows the 'Port Forwarding' configuration page. The 'Add Virtual Server in 'ipwan' IP interface' section is active. The 'Virtual Server Entry' form includes the following fields:

- Application:** A dropdown menu currently showing '--Select--'.
- Protocol:** A dropdown menu set to 'tcp'.
- Time Schedule:** A dropdown menu set to 'Always On'.
- External Port:** Two input boxes for 'from' and 'to', both containing '0'.
- Redirect Port:** Two input boxes for 'from' and 'to', both containing '0'.
- Internal IP Address:** An input box followed by a dropdown menu showing '--Select--'.

Below the form are two buttons: 'Add' (circled in red) and 'Edit / Delete'. At the bottom, a table header lists the columns for the virtual server entries: Edit, Application, Time Schedule, Protocol, External Port, Redirect Port, IP Address, Interface, and Delete.

Application: Users-define description to identify this entry or click drop-down menu to select existing predefined rules.

: 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 Always on for the usage of 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. 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 remote accessing your Router through the Web/HTTP at all time, you would need to enable port number 80 (Web/HTTP) and map to Router's IP Address. Then all incoming HTTP requests from you (Remote side) will be forwarded to the Router with IP address of 192.168.1.254. Since port number 80 has already been predefined, next to the **Application** click **Helper**. A list of predefined rules window will pop and select **HTTP_Server**.

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

Configuration

Port Forwarding

Add Virtual Server in 'ipwan' IP interface

Virtual Server Entry

Application	HTTP_Server << --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- >>				

Buttons: Add, Edit / Delete

Edit	Application	Time Schedule	Protocol	External Port	Redirect Port	IP Address	Interface	Delete
<input checked="" type="radio"/>	HTTP_Server	Always On	tcp	80 - 80	80 - 80	192.168.1.254	ipwan	<input type="radio"/>

Add: Click it to apply your settings.

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



Using port forwarding does have security implications, as outside users will be able to connect to PCs on your network. For this reason you are advised to use specific Virtual Server entries just for the ports your application requires, instead of using DMZ. As doing so will result in all connections from the WAN attempt to access to your public IP of the DMZ PC specified.



Attention

If you have disabled the NAT option in the WAN-ISP section, the Virtual Server function will hence be invalid.

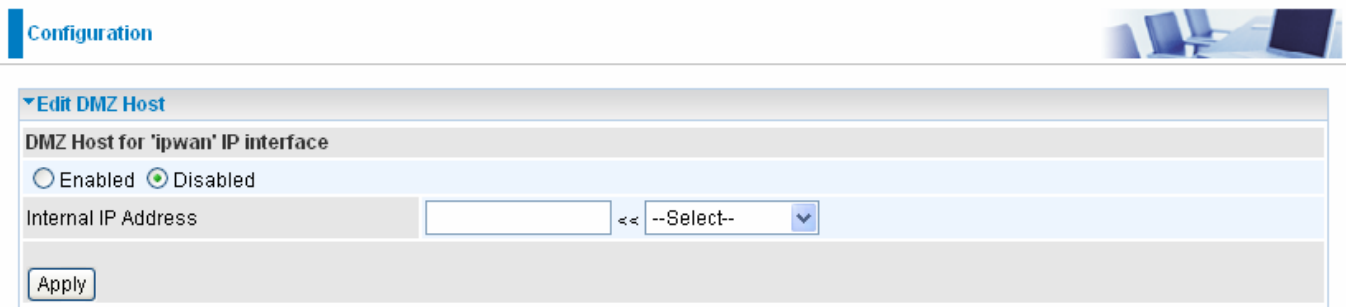
If the DHCP server option is enabled, you have to be very careful in assigning the IP addresses of the virtual servers in order to avoid conflicts. The easiest way of configuring Virtual Servers is to manually assign static IP address to each virtual server PC, with an address that does not fall into 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

The DMZ Host is a local computer exposed to the Internet. When setting a particular internal IP address as the DMZ Host, all incoming packets will be checked by the Firewall and NAT algorithms then passed to the DMZ host, when a packet received does not use a port number used by any other Virtual Server entries.

Caution: This Local computer exposing to the Internet may face varies of security risks.

Go to **Configuration**→**Virtual Server**→**Edit DMZ Host**



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 existing PCs connecting to the network. You may assign a PC with IP address and MAC 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 you ISP, you are eligible for One-to-One NAT to utilize these IP addresses.

Go to **Configuration**→**Virtual Server**→**Edit One-to-one NAT**

NAT Type: Select desired NAT type. As set in default setting, it disables the One-to-One NAT function.

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 to create a new One-to-One NAT rule:

Application: Users-defined description to identify this entry or click drop-down menu to select existing predefined rules.

: 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 Always on for the usage of this Virtual Server Entry. For setup and detail, refer to **Time Schedule** section

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

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. List all existing PCs connecting to the network. You may assign a PC with IP address and MAC 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 Control
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

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 allowing the usage of the Internet by users or applications.

This Time Schedule correlates closely with router's 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 from the Internet. 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.

Configuration

▶ Time Schedule

Name

Day Sun. Mon. Tue Wed Thu Fri. Sat.

Start Time :


End Time :

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

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
<input checked="" type="radio"/>	1	TimeSlot1	sMTWTFs	08 : 00	18 : 00	<input type="radio"/>
<input type="radio"/>	2	TimeSlot2	sMTWTFs	08 : 00	18 : 00	<input type="radio"/>
<input type="radio"/>	3	TimeSlot3	sMTWTFs	08 : 00	18 : 00	<input type="radio"/>

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

Time Slot

Edit;	ID	Name	Day in a week	Start Time	End Time	Delete
<input checked="" type="radio"/>	1	TimeSlot1	sMTWTFs	08 : 00	18 : 00	<input type="radio"/>
<input type="radio"/>	2	TimeSlot2	sMTWTFs	08 : 00	18 : 00	<input type="radio"/>
<input type="radio"/>	3	TimeSlot3	sMTWTFs	08 : 00	18 : 00	<input type="radio"/>

ID: This is the index of the time slot.

Name: A user-define description to identify this time portfolio.

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

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

Choose Delete radio button, and click **Delete** button to delete the existing Time profile, i.e. erase the Day and back to default setting of Start Time / End Time.

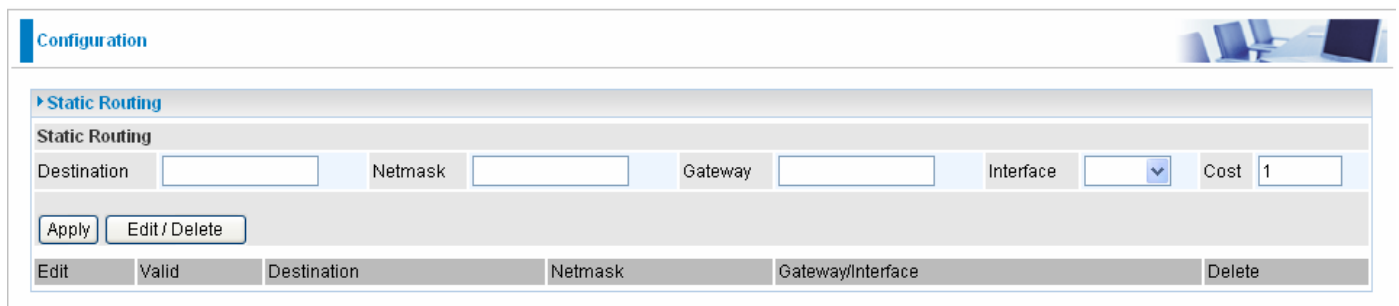
Advanced

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.

Here are the items within the **Advanced** section: [Static Route](#), [Dynamic DNS](#), [Check Email](#), [Device Management](#), [IGMP](#) and [VLAN Bridge](#).

Static Route

Go to Configuration/Advanced/Static Route.



The screenshot shows the 'Configuration' page with a sub-section for 'Static Routing'. It features a form with the following fields: 'Destination', 'Netmask', 'Gateway', 'Interface' (a dropdown menu), and 'Cost' (set to 1). Below the form are 'Apply' and 'Edit / Delete' buttons. At the bottom, there is a table with columns: 'Edit', 'Valid', 'Destination', 'Netmask', 'Gateway/Interface', and 'Delete'.

Destination: This is the destination subnet IP address.

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

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 ADSL 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.

Configuration

Dynamic DNS

Parameters

Dynamic DNS	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Dynamic DNS Server	<input type="text" value="www.dyndns.org (dynamic)"/>
Wildcard	<input type="checkbox"/> Enable
Domain Name	<input type="text"/>
Username	<input type="text"/>
Password	<input type="text"/>
Period	<input type="text" value="25"/> <input type="text" value="Day(s)"/>

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.

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.

Check Email

This function allows you to have the router check your POP3 mailbox for new Email messages. The Mail LED on your router will light when it detects new messages waiting for download. You may also view the status of this function using the Status – Email Checking section of the web interface, which also provides details on the number of new messages waiting. See the Status section of this manual for more information.

Configuration

Check Email

Parameters

Check Email	<input type="radio"/> Enable <input checked="" type="radio"/> Disable
Account Name	<input type="text"/>
Password	<input type="text"/>
POP3 Mail Server	<input type="text"/>
Period	<input type="text" value="60"/> minutes
Dial-out for Checking Emails	<input type="checkbox"/> Automatic

Check Email:

- Disable:** Check to disable the router's Email checking function.
- Enable:** Check to enable the routers Email checking function. The following fields will be activated and required:

Account Name: Enter the name (login) of the POP3 account you wish to check. Normally, it is the text in your email address before the "@" symbol. If you have trouble with it, please contact your ISP.

Password: Enter the account's password.

POP3 Mail Server: Enter your (POP) mail server name. Your Internet Service Provider (ISP) or network administrator will be able to supply you with this.

Period: Enter the value in minutes between periodic mail checks.

Dial-out for checking emails: When the function is enabled, your ADSL router will connect to your ISP automatically to check emails if your Internet connection dropped. Please be careful when using this feature if your ADSL service is charged by time online.

Device Management

The Device Management advanced configuration settings allow you to control your router's security options and device monitoring features.

Configuration			
Device Management			
Device Host Name			
Host Name	<input type="text" value="home.gateway"/>		
Embedded Web Server			
* HTTP Port	<input type="text" value="80"/>	(80 is default HTTP port)	
Management IP Address	<input type="text" value="0.0.0.0"/>	('0.0.0.0' means Any)	
Management IP Netmask	<input type="text" value="255.255.255.255"/>		
Management IP Address(2)	<input type="text" value="0.0.0.0"/>		
Management IP Netmask(2)	<input type="text" value="255.255.255.255"/>		
Expire to auto-logout	<input type="text" value="180"/>	seconds	
Universal Plug and Play (UPnP)			
UPnP	<input checked="" type="radio"/> Enable <input type="radio"/> Disable		
* UPnP Port	<input type="text" value="2800"/>		
SNMP Access Control			
SNMP V1 and V2			
Read Community	<input type="text" value="public"/>	IP Address	<input type="text" value="0.0.0.0"/>
Write Community	<input type="text" value="password"/>	IP Address	<input type="text" value="0.0.0.0"/>
Trap Community	<input type="text"/>	IP Address	<input type="text"/>
SNMP V3			
Username	<input type="text"/>	Password	<input type="text"/>
Access Right	<input checked="" type="radio"/> Read <input type="radio"/> Read/Write		IP Address <input type="text"/>
<small>* : 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.</small>			
<input type="button" value="Apply"/>			

Device Host Name

Host Name: Give a name for it.

(The Host Name cannot be used with one word only. There are two words should be connected with a '.' at least.

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 the router's 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 allowed to logon and access the router's 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 time frame for the system to auto-logout the user's configuration session.

For Example: User A changes HTTP port number to **100**, specifies their own IP address of **192.168.1.55**, and sets the logout time to be **100** seconds. The router will only allow User A access from the IP address **192.168.1.55** to logon to the Web GUI by typing: <http://192.168.1.254:100> in their web browser. After 100 seconds, the device will automatically logout User A.

Universal Plug and Play (UPnP)

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

Both the user's 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), and Windows 98 users may install the Internet Connection Sharing client from Windows XP in order to support UPnP. 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.

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 obtains 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 from 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 from this IP address will be sent SNMP Traps.

SNMP V3:

Specify a name and password for authentication. And define the access right from identified IP address. Once the authentication has succeeded, users from 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
- Interfaces group
- Address Translation group
- IP group
- ICMP group

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

From RFC1650 (EtherLike-MIB):

- dot3Stats

From RFC 1493 (Bridge MIB):

- dot1dBase group
- dot1dTp group
- dot1dStp group (if configured as spanning tree)

From RFC 1471 (PPP/LCP MIB):

- pppLink group
- pppLqr group (not applicable)

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 RFC1573 (IfMIB):

- ifMIBObjects Group

From RFC1695 (atmMIB):

- atmMIBObjects

From RFC 1907 (SNMPv2):

- only snmpSetSerialNo OID

IGMP

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

Configuration

IGMP

Parameters

IGMP Forwarding Enable Disable

IGMP Snooping Enable Disable

Apply

IGMP Forwarding: Accepting multicast packet. Default is set to **Enable**.

IGMP Snooping: Allowing switched Ethernet to check and make correct forwarding decisions. Default is set to **Disable**.

VLAN Bridge

This section allows you to create VLAN group and specify the member.

Configuration

VLAN Bridge

Parameters

Name	VLAN ID	Tagged Ports	UnTagged Ports	Edit	Delete
DefaultVlan	1	None	ethernet,	Edit	

Create VLAN

Edit: Edit your member ports in selected VLAN group.

Create VLAN: To create another VLAN group.

Logout

To exit the router's web interface, choose **Logout**. Please ensure that you have saved the configuration settings before you logout.

Be aware that the router is restricted to only one PC accessing the configuration web pages at a time. Once a PC has logged into the web interface, other PCs cannot get access until the current PC has logged out of the web interface. If the previous PC forgets to logout, the second PC can access the page after a user-defined period, by default 3 minutes. You can modify this value using the **Advanced – Device Management** section of the web interface. Please see the **Advanced** section of this manual for more information.

Chapter 5: Troubleshooting

If the router is not functioning properly, first check this chapter for simple troubleshooting before contacting your service provider or Billion support.

Problems starting up the router

<i>Problem</i>	<i>Corrective Action</i>
None of the LEDs are on when you turn on the router.	Check the connection between the adapter and the router. If the error persists, you may have a hardware problem. In this case you should contact technical support.
You have forgotten your router login and/or password.	Try the default login and password, refer to Chapter 3. 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. Caution: After pressing the RESET button for more than 6 seconds, to be sure you power cycle the device again.

Problems with the WAN Interface

<i>Problem</i>	<i>Corrective Action</i>
Initialization of the PVC connection (“linesync”) failed.	Ensure that the telephone cable is connected properly from the ADSL port to the wall jack. The ADSL LED on the front panel of the router should be on. Check that your VPI, VCI, encapsulation type and type of multiplexing settings are the same as those provided by your ISP. Reboot the router GE. If you still have problems, you may need to verify these settings with your ISP.
Frequent loss of ADSL linesync (disconnections).	Ensure that all other devices connected to the same telephone line as your router (e.g. telephones, fax machines, analogue modems) have a line filter connected between them and the wall socket (unless you are using a Central Splitter or Central Filter installed by a qualified and licensed electrician), and ensure that all line filters are correctly installed and the right way around. Missing line filters or line filters installed the wrong way around can cause problems with your ADSL connection, including causing frequent disconnections.

Problems with the LAN Interface

<i>Problem</i>	<i>Corrective Action</i>
Can't ping any PCs on the LAN.	Check the Ethernet LEDs on the front panel. The LED should be on for a port that has a PC connected. If it is off, check the cables between your router and the PC. Make sure you have uninstalled any software firewall for troubleshooting.
	Verify that the IP address and the subnet mask are consistent between the router and the workstations.

APPENDIX A: Product Support and Contact Information

Most problems can be solved by referring to the **Troubleshooting** section in the User's Manual. If you cannot resolve the problem with the **Troubleshooting** chapter, please contact the dealer where you purchased this product.

Contact Billion

WORLDWIDE

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