

## **FCC Interference Statement**

This device complies with Part 15 of FCC rule. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This Advanced Wireless 11g Router has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment or device.
- Connect the equipment to an outlet other than the receiver's.
- Consult a dealer or an experienced radio/TV technician for assistance.

## **FCC Radiation Exposure Statement**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

## **CE Declaration of Conformity:**

This equipment complies with the specifications relating to electromagnetic compatibility, EN 55022/A1 Class B, and EN 50082-1. This meets the reasonable protection requirements set out in the European Council Directive on the approximation of the laws of the member states relating to Electromagnetic Compatibility Directive (89/336/EEC).

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## Introduction

Congratulations on your purchase of this Advanced Wireless 11g Router. This router is the perfect design product combining wireless and Ethernet network technology together. Fully compatible with IEEE 802.11g wireless standard, this device not only allows you to take advantage of mobility, but also to have fast Ethernet connection with built-in four 10/100 auto-sensing switch Ethernet ports. Users on wireless LAN and Ethernet LAN can share files, printers, and other networking resource each other at a blazing speed. Best of all, with NAT technology, all users can share single account of Internet access by having this device connect to a DSL/Cable modem.

Integrated 802.11g wireless AP and 4-port 10/100 Mbps switch, it is quick and easy to deploy wireless and wire LAN without spending extra cost of a wireless access point, hub or switch. All LAN users are able to share internal network data, like files, printers, and other networking resources in a blazing speed. The wireless Router's efficient antenna offers a covered range up to 30 meters indoor (150 meters outdoor) and seamless roaming throughout wireless LAN infrastructure. More over, the wireless operation provides 64 bit key and 128 bit WEP data encryption for high-level security.

With built-in NAT, this device not only provides natural firewall, protecting your network from access by outside users but also extends your LAN connection. Users on the LAN can share a single account of Internet access by having this device connect to a DSL/Cable modem. This Firewall Router allows up to 253 users on the Ethernet LAN simultaneously but makes IP configuration simple and easy. Configured as a DHCP server, the Advanced Wireless 11g Router assigns an IP Address to every connected PC on Ethernet LAN automatically. Also, DHCP client helps WAN port obtain IP address dynamically assigned by ISP.

With a web-based UI (User Interface), this Advanced Wireless 11g Router is easy to setup and maintain. With this exclusive user friendly interface, all functions can be configured easily via a web browser such as Netscape Communicator and Internet Explorer.

## **About this Guide**

This guide contains information about installing and configuring your Advanced Wireless 11g Router. It is designed to guide users through the correct setup procedures for appropriate hardware installation and basic configuration. Later, it shows how to complete advanced configurations to get the best operating performance from this Advanced Wireless 11g Router.

## **Chapter 1: Get to know your Advanced Wireless 11g Router**

This chapter describes the package contents and provides a list of features and applications illustrations of the Advanced Wireless 11g Router.

## **Chapter 2: Hardware Installation & Setup**

This chapter describes the steps for the hardware installation of the Advanced Wireless 11g Router.

## **Chapter 3: Internet Access**

This chapter describes the steps for the basic configuration and start up of the Advanced Wireless 11g Router.

## **Chapter 4: Advanced Applications**

This chapter describes how to configure advanced functions in order to get the most from your Advanced Wireless 11g Router.

## **Chapter 5: Management**

This Chapter describes how to configure management functions in order to manage and get the setting information of your Advanced Wireless 11g Router.

## **Chapter 6: Macintosh Setup**

This Chapter provides instructions on how to set up your Macintosh computers in your network.

## **Chapter 7: Trouble Shooting**

This chapter describes any potential problems you may encounter and the suggested remedies.

## Conventions

The following explains the conventions used throughout this document.

- |                                |   |
|--------------------------------|---|
| <i>Italics</i>                 | New words, terms, or special emphasis. E.g. <i>Getting to know your Advanced Wireless 11g Router.</i>                     |
| <b>“Boldface”</b>              | Buttons, checkboxes, or items that you can select from screens, menus, or dialog boxes. E.g. Click <b>“OK”</b> to restart |
| <b><i>Boldface Italics</i></b> | Items in <b><i>Bold Italics</i></b> are samples only and you should enter other names, numbers, or words to substitute.   |

## **Chapter 1: Getting to know your Advanced Wireless 11g Router**

This chapter describes the package contents and provides a list of features and application illustrations of the Advanced Wireless 11g Router.

### **1-1 About The Advanced Wireless 11g Router**

*The Advanced Wireless 11g Router* is a hybrid design product which combines Ethernet technology and wireless access into a single stand-alone unit. The device allows you take advantages of both mobility and fast connection. All PCs whenever on wireless LAN or Ethernet LAN can share files, printers and other network resource. Moreover, all users can share single account of Internet access by having this device connect to a DSL/Cable modem.

#### **Ethernet / Fast Ethernet**

*Ethernet* is the most widely-used network access method, especially in a Local Area Network (LAN) and is defined by the IEEE as the 802.3 standard. Normally, Ethernet is a shared media LAN. All stations on the segment share the total bandwidth, which could be 10Mbps (Ethernet), 100Mbps (Fast Ethernet), or 1000Mbps (Gigabit Ethernet). With a switched Ethernet, each sender and receiver has the full bandwidth.

*Fast Ethernet* is defined as IEEE 802.3u standard, a high-speed version of Ethernet with 100Mbps transmission rate.

#### **Wireless LAN**

Wireless Local Area Network systems (WLANs) transmit and receive data through the air by using radio frequency (RF). This offers some advantages like mobility, ease of installation, and scalability over traditional wired systems.

- **Mobility:** WLANs combine data connectivity with user mobility. This provides users with access to network anywhere in their organization. For example, users can roam from a conference room to their office without being disconnected from the LAN. This is impossible with wired networks.
- **Ease of Installation:** Eliminating the need to deploy network cable in walls and ceilings, Installing WLANs is easy for novice and expert users alike.



- Scalability: WLAN topologies are easy to change in various ways from peer-to-peer networks for a small group of users to full infrastructure networks for hundreds of users roaming over a broad area.

Wireless LAN is suitable for difficult-to-wire and frequently changing environments. It's also an ideal solution for mobile workers to access network resource and for setting a temporary LAN when necessary

Wireless LANs can be set as "Ad-hoc" network and "Infrastructure" network. Unlike the "Ad-hoc network", where users on the LAN send data directly to each other, the "Infrastructure" network includes an access point and users on the "Infrastructure" network send data to that dedicated access point. Advanced Wireless 11g Router uses "Infrastructure" network as Wireless LANs. Each wireless LAN PC within the range of the access point can communicate with other wireless LAN PCs within the range.

## **1-2 Contents of the Advanced Wireless 11g Router Package**

After carefully unpacking the shipping carton, check the contents listed below.



Router

Power Adapter

Manual

1. Advanced Wireless 11g Router.
2. Power Adapter.
3. User's Manual

### **1-3 Features of the Advanced Wireless 11g Router**

Your Advanced Wireless 11g Router contains the following features that make it excellent for network connections.

- Allows multiple users to access the Internet at the same time by providing maximum Internet utilization to multiple users sharing a single public IP Address.
- Allows users on Ethernet LAN and Wireless LAN to transfer data to each other through wireless-to-wire bridge.
- Provides wireless access roaming, best access point selection, loading balance, network traffic filtering included in wireless roaming function.
- Provides 64bits/128bits key WEP (Wired Equivalent Privacy) wireless data encryption to secure wireless communication.
- Fully supports 802.11 open and shared key authentications.
- Integrates four 10/100BASE-T/TX auto-sensing switch ports.
- Uses NAT to allow your entire network's PCs to connect to the Internet using only one (purchased) IP address.
- Supports PPPoE that enable user to seamlessly connect to ISPs with the familiar "dial-up" connection interface.
- Built-in web-based user interface for easy configuration and management through common web browsers such as Netscape Communication 6.0 or later and Internet Explorer 5.0 or later.
- Built-in firewall to protect your PCs from outside intruders (NAT).
- Supports DHCP client to receive both a dynamic IP Address and a fixed IP Address from ISP.

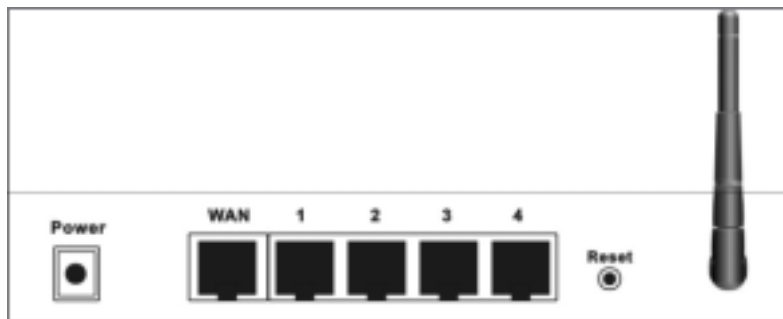
- Built-in DHCP server to automatically assign and manage LAN IP addresses.
- Allow administrators to block specific internal users from accessing specified applications or services.
- Allows external Internet users to access information from the internal target host by setting the Virtual Server.
- Provides unrestricted two-way communication between one PC on your LAN and certain Internet services such as conferencing, video and gaming applications.
- Enhances routing performance by using Dynamic and Static routing settings.
- Allow administrators to change the WAN MAC address of the router.
- Compatible with all popular Internet applications.

## Chapter 2: Hardware Installation & Setup

This chapter provides information about your Advanced Wireless 11g Router's physical features and gives step-by-step installation instructions.

### 2-1 Rear Panel & Connections

The following figure shows the rear view of the Advanced Wireless 11g Router and illustrates how the cables connect to the interfaces on the rear panel.



- Plug one end of the UTP cable into the WAN port, the other into the RJ45 Ethernet jack on your ADSL or Cable modem.
- Connect a PC, which must have an Ethernet NIC (Network Interface Card) installed, to one of the LAN Ports.
- Connect the external power supply to the Advanced Wireless 11g Router.
- The Reset button is used to reboot and re-initialize the device (press once quickly), or for clearing configuration settings back to factory default values (press for longer than 3 seconds).

### 2-2 Front Panel LEDs

The following figure shows the front view of the Advanced Wireless 11g Router.



The LEDs on the front panel indicate the status of the unit. You can easily view the operation of your Advanced Wireless 11g Router from this panel.

- Power: Green The Power LED illuminates when the Wireless 11g Router is powered on.
- Diag Red The Diag LED illuminates when Router goes through its self-diagnosis mode during boot-up. It will turn off upon successful completion of the diagnostic.

For WLAN

- Enable Green The Links LED illuminates when the wireless option is enabled. When the wireless option is disabled (through the web-based utility), the LED is off.
- /Activity: Blinking when there is wireless connection activity.

For WAN port & LAN ports (x4)

- Link/Act Green Steady on when a successful 100Mbps connection is made through the corresponding port.
- & 10/100: Blinking when data is flowing through this port.
- Yellow Steady on when a successful 10Mbps connection is made through the corresponding port.
- Blinking when data is flowing through this port.

## 2-3 System Requirements and Setup

To connect to the Internet, an external ADSL or Cable modem and an Internet access account from an ISP is required. In order to operate with the Advanced Wireless 11g Router, each PC that is to be connected to the Advanced Wireless 11g Router should have the following things installed:

1. Ethernet NIC (Network Interface Card: a 10Base-T or 10/100Base-T/TX Ethernet card), or wireless client card for wireless connection.

2. Standard twisted-pair Ethernet cable (UTP network cable) with RJ-45 connectors.
3. System OS: Windows 95/98, Windows NT4.0, or Windows 2000/XP
4. TCP/IP network protocol.
5. Web browser, such as Microsoft Internet Explorer 5.0 or later, or Netscape Navigator 6.0 or later.

### Installing the TCP/IP Protocol

If you are not sure whether the TCP/IP Protocol has been installed, follow these steps to check, and if necessary, install TCP/IP onto your PCs.

1. Click the **“Start”** button. Choose **“Settings”**, then **“Control Panel”**.

Double-click the **“Network”** icon. Your Network window should appear.



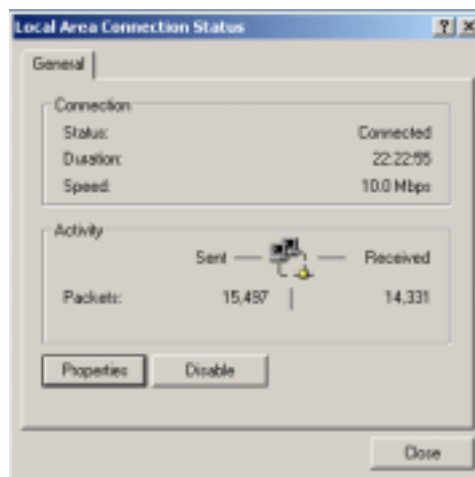
Select the **“Configuration”** tab.

**Note: For Windows 2000 & Windows XP Setting**

Click the **“Local Area Connection”** icon on the lower right hand side of your desktop screen.



In the **“Local Area Connection Status”** window, click the **“Properties”** button then your Network window will appear.

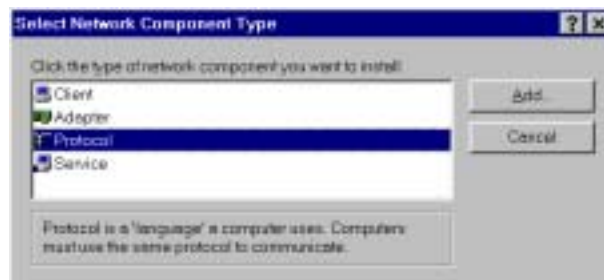


There is only one tab, **“General”**, in the Network window.

2. Check whether the TCP/IP Protocol has already been installed onto your computer's Ethernet card. Note that TCP/IP Protocol can be installed for a computer's Dial-Up Adapter as well as for the Ethernet card.
  - If yes, go to step 7.
  - If no, click the **"Add"** button.

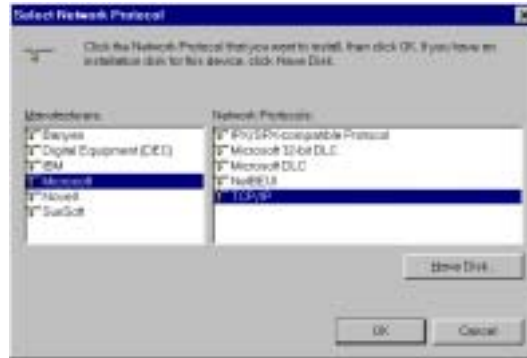


3. Double-click **"Protocol"** in the Select Network Component Type or highlight **"Protocol"** then click **"Add"**.



4. Highlight **"Microsoft"** under the list of manufacturers.  
Double-click **"TCP/IP"** from the list on the right or highlight **"TCP/IP"** then click **"OK"** to install TCP/IP.





5. After a few seconds, you will be returned to the Network window. The TCP/IP Protocol should now be on the list of installed network components (see 2 above).
6. Click the **“Properties”** button.  
The TCP/IP Properties window consists of several tabs. Choose the **“IP Address”** tab.
7. Select **“Obtain an IP address automatically”**. Click **“OK”**. Restart your PC to complete the TCP/IP installation.



## Fixed IP Addresses Configuration

Fixed IP addresses may be assigned to network devices for many reasons, such as the server PCs or printers which are consistently accessed by multiple users. To set up computers with fixed IP Addresses, go to the **“IP Address”** tab of the **“TCP/IP Properties”** window as shown above.

Select **“Specify an IP address”** and enter **“192.168.1.\*\*\*”** in the **“IP Address”** location (where \*\*\* is a number between 2 and 254 used by the Advanced Wireless 11g Router to identify each computer), and the default **“Subnet Mask” 255.255.255.0**. Note that no two computer on the same LAN can have the same IP address.



Click on the **“DNS Configuration”** tab and select **“Enable DNS”**. Enter the **“DNS IP Address”** obtained from your ISP in the **“Server Search Order”** location. Then click the **“Add”** button.



Click on the **“Gateway”** tab and enter the Advanced Wireless 11g Router’s default gateway value **192.168.1.1** in the **“New gateway”** field, then click **“Add”** Button.



Click **“OK”**. Restart your PC to complete the TCP/IP installation.

## Chapter 3: Internet Access

This chapter describes the procedures necessary to configure the basic functions and begin using your Advanced Wireless 11g Router. If you follow these procedures correctly, there should be no problem in accessing the Internet via your Advanced Wireless 11g Router.

### 3-1 Prepare your network information

In order to allow quick referencing when setting up your Advanced Wireless 11g Router, it is suggested you complete the table below with the necessary information. This should be supplied by your ISP.

Provided by some ISPs	Host Name: Domain Name:
IP address given by ISP:	<input type="radio"/> Obtain IP Address automatically <input type="radio"/> Static IP IP Address: . . . Subnet Mask: . . . Default Gateway: . . . DNS Server Primary: . . . DNS Server Secondary: . . . DNS Server Third: . . .
PPP authentication:	<input type="radio"/> PPPoE <input type="radio"/> PPTP Login Name: Password: _____

### 3-2 Web-based User Interface

Your Advanced Wireless 11g Router is designed to use a Web-based User Interface for configuration. Open your web browser and type <http://192.168.1.1> in the browser's *address box*. This address is the factory set IP Address of your Advanced Wireless 11g Router. Press **“Enter”**.

The **“Username and Password Required”** prompt box will appear. Leave the Username field empty and type **“admin”** (default password) in the Password field. Click **“OK”**. The setup screen will then appear.



### 3-3 Initial Configuration – Setup

The **“OnePage Setup”** screen is the first screen you will see when you access the *Utility*. If the router has already been successfully installed and set up, this screen's values will already be properly configured.

**Main Menu**

- OnePage Setup
- Advanced
  - Firewall
  - VPN
  - DHCP Settings
  - Web Control
  - Telnet Control
  - Access Control
  - Virtual Server
  - Special Application
  - DMZ Host
  - Dynamic Routing
  - Static Routing
  - Wireless
  - IGMP
- Management
  - Device Admin
  - Status Monitor
  - Log
  - Backup & Restore
  - Upgrade Firmware
  - Diagnostic Ping/Tracer

**OnePage Setup**

Host Name:  (Required by some ISPs)

Domain Name:  (Required by some ISPs)

Time Zone:  (GMT+8:00)

Private IP Address

Device IP Address:  (192.168.1.1)

Subnet Mask:  (255.255.255.0)

**Wireless** (IP Address: 192.168.0.0-47.255.40)

☐ Enable ☒ Disable

SSID:  WGC418D-1

SSID Broadcast: ☐ Allow ☒ Disallow

Channel:  6 (Default: 11A)

WEP: ☐ Mandatory ☒ Disable

**WAN Connection Type**  (Dynamic IP)

Select the Internet connection type you wish to use.

- **Host Name** This entry is required by certain ISPs.
- **Domain Name** This entry is required by certain ISPs.
- **Private IP Address** The “Device IP Address” and “Subnet Mask” of the router are used by the internal LAN. The default values are 192.168.1.1 for the IP Address and 255.255.255.0 for the Subnet Mask.

### Wireless

Check “Disable”, “Mixed” or “G-only” to make the wireless LAN function active or select to support 11b/11g mixed mode or 11g only.

- **SSID** As the acronym for **Service Set Identifier**, SSID is the unique name shared among all clients and Wireless Broadband Router in a same wireless network. The SSID must be identical for all points and must not exceed 32 characters.
- **SSID Broadcast** Router will broadcast the SSID to let

WLANs clients easily search and connect to this wireless router by leaving this item as default setting “**Allow**”. Click “**Disallow**” to disable the broadcast.

- **Channel** Select the appropriate channel number from the drop-down. The permissible channels are different from Regulatory Domains. Make sure that all nodes in the same wireless LAN network use the same channel, or the channel usage is automatic when a connection between client and access point are made.
- **WEP** As the acronym for **Wired Equivalent Privacy**, WEP is an encryption mechanism used to protect your wireless data communications. WEP uses a combination of 64-bit/128-bit keys to encrypt data that is transmitted between all points in a wireless network to insure data security. To code/decode the data transmission, all points must use the identical key. To make the WEP encryption active or inactive, select “**Mandatory**” or “**Disable**”.
- **WEP Key Setting** As the WEP is active, click the button of “**WEP Key Setting**” to go to the setting page. Select “**64Bit**” or “**128Bit**” encryption algorithm from the drop-down list. There are two ways to generate WEP key:
  1. **Passphrase** Enter a alphanumeric text string in this column then click “**Generate**” button, and four 64-bit or 128-bit encryption key will be created automatically.
  2. You can enter the WEP key manually.

You may need to enter the WEP key manually in case to join the existing wireless network. However, if not, the Pass phrase method is recommended. If you are not sure which way to use, check with your network administrator.

- **Default TX Key** Select one of the four keys to be the

encryption key you are going to use in the wireless network. To be sure that all the points in a same wireless network have to have the same encryption key.

The screenshot shows a configuration window for WEP keys. At the top, a blue box contains the text: "To create a new WEP key, either enter a passphrase and press the generate button, or enter the key elements into the table below." Below this, there is a dropdown menu set to "64Bit". Under the heading "Passphrase:", there is a text input field and a "Generate" button. Below that, there are four rows, each with a label "Key 1:" through "Key 4:" and a corresponding text input field. Each input field is currently filled with "00000000". To the right of the input fields are "Clear" and "Generate" buttons. At the bottom, under the heading "Default TX Key:", there is a dropdown menu set to "1". At the very bottom are "Apply" and "Undo" buttons.

Click “**Apply**” after making any changes.

### **WAN Connection Type**

There are four options for WAN connection types, Obtain IP automatically, Static IP, PPPoE, and PPTP. The connection type you need to choose is dependent upon the settings assigned by your ISP. Which connection type you need to choose may differ from ISPs as well as the service you applied for. It depends on your ISP’s assignment. If you are unsure which connection type you currently use, contact your ISP to obtain the correct information.

#### **Obtain IP automatically**

It is the default option for the router. If your ISP automatically assign a IP address and other values to the Advanced Wireless 11g Router, leave them there without making any changes.



## Static IP

The Public IP Address and Subnet Mask of the router are used by external users of the Internet (including your ISP). If your ISP assigned a fixed IP address, select this item and enter the IP Address and Subnet Mask provided by your ISP.

The screenshot shows a configuration window titled "WAN Connection Type". At the top, there is a dropdown menu with "Static IP" selected. Below the dropdown, a red text prompt says "Select the Internet connection type you wish to use". The main area of the window contains several fields for configuration: "Specify WAN IP Address:" with four input boxes (0, 0, 0, 0), "Subnet Mask:" with four input boxes (255, 255, 255, 0), "Default Gateway Address:" with four input boxes (0, 0, 0, 0), "DNS(Required) 1:" with four input boxes (0, 0, 0, 0), "DNS 2:" with four input boxes (0, 0, 0, 0), and "DNS 3:" with four input boxes (0, 0, 0, 0). At the bottom right, there are "Apply" and "Cancel" buttons.

- **Specify WAN IP Address** Enter the IP address provided by your ISP.
- **Subnet Mask** Enter the subnet mask values provided by your ISP.
- **Default Gateway IP Address** Your ISP will provide you with the Default Gateway IP Address.
- **Domain Name Server (DNS)** Your ISP will provide you with at least one DNS IP Address. Multiple DNS IP settings are common. The first available DNS entry is used in most cases.

## PPPoE

PPPoE is a dial-up connection type provided by some ISPs. It is a cost-effective way for a user to access this connection type. If your ISP provides PPPoE connectivity, you should choose this item from the drop-down list. Note that if you select PPPoE, please remove any existing PPPoE application on any PCs on your LAN.

- **User Name** Enter the user name your ISP provides you.
- **Password** Enter the password your ISP provides you.
- **Connect-on-demand** is a utility used to trigger the PPPoE session when there is packet being sent through the WAN port while it is on disconnected situation. Check the radio button to make this function active, and then you must enter the number of minutes you wish the network to remain idle before disconnection occurs in the “**Max Idle Time**” location. Note that this function is for PPPoE only.
- **Keep Alive** This function keeps your PPPoE connection enable even if it remains idle. However, in some situation, PPPoE session cannot be established immediately after disconnection. This is because the system on the ISP’s site may need a little time to restore itself. You may need to check with your ISP to obtain detail of how long you need to wait before re-establish the PPPoE session. Enter this information in the “**Redial Period**” field.

## PPTP

PPTP is the acronym of Point to Point Tunneling Protocol. Usually, it is used to encapsulate other protocols’ packets for transmission over IP network. Some ISPs use this protocol as way to establish the initial connection between the CPE (end-user side) and DSLAM (ISP side). If your ISP uses PPTP to establish the connection, you should select this item and follow the steps below.

- **Specify WAN IP Address** Enter the IP address provided by your ISP. If your ISP provides you an Alcatel Speed Touch™ modem, it is suggested that you enter 10.0.0.150 in this column.
- **Subnet Mask** Enter the subnet mask values provided by your ISP.
- **Default Gateway IP Address** Your ISP will provide you with the Default Gateway IP Address. If your ISP provides you an Alcatel Speed Touch™ modem, it is suggested that you enter the 10.0.0.138 in this column.
- **User Name** Enter the user name provided by your ISP.
- **Password** Enter the password provided by your ISP.
- **Connect-on-demand** is a utility used to trigger the PPTP session when there is packet being sent through the WAN port while it is on disconnected situation. Check the radio button to make this function active, and then you must enter the number of minutes you wish the network to remain idle before disconnection occurs in the “**Max Idle Time**” location. Note that this function is for PPTP only.
- **Keep Alive** This function keeps your PPTP connection enable even if it remains idle. However, in some situation, PPTP session cannot be established immediately after disconnection. This is because the

system on the ISP's site may need a little time to restore itself. You may need to check with your ISP to obtain detail of how long you need to wait before re-establish the PPTP session. Enter this information in the “**Redial Period**” field.

When you have properly configured the Setup page, click “**Apply**”. You can now test to see if the settings are all correct by attempting to connect to the Internet.

## Chapter 4: Advanced Applications

This chapter provides information on how to set up and use the advanced functions of your Advanced Wireless 11g Router.

### 4-1 Firewall

The settings page allows you to configure advanced Firewall functions, providing superior security for your network environment.

**Firewall Settings**

**Firewall Option**

**Advanced Firewall Protection:** ☒ Enable ☐ Disable

**Web Filter**

**Proxy:** ☒ Allow ☐ Deny

**Java:** ☒ Allow ☐ Deny

**ActiveX:** ☒ Allow ☐ Deny

**Cookie:** ☒ Allow ☐ Deny

- **Firewall Option** Enabling this function will prevent DoS (Denial of Service) attacks and activates the SPI (Stateful Packet Inspection). The SPI function will check any incoming data packets, particularly whenever there is a TCP connection initiated by your LAN PCs.
- **Web Filter** This feature provides options allowing you to filter any potential risk contained in some web technologies by individually checking “Allow” or “Deny”.

**Web proxy** is a server your device will connect to when you access any web site. Setting web proxy can speed up access time but also can create other potential security issue. For example, if you configure the Broadband Security Router to block access to 216.115.102.76, which is the IP address of [www.yahoo.com](http://www.yahoo.com), it will fail. This is because your PC will connect to web proxy server instead of connecting to Yahoo's IP address.

**Java & Active X** are programming languages for web page. However, some potentially harmful Trojan programs and viruses are also written in these languages. If you deny access to either of these, you may run the risk of not having access to certain web pages.

A **cookie** is a small piece of data (usually in the form of a text file), which is stored on your PC when you visit certain web sites. This allows the server to identify your machine at a future date. The cookie normally contains an ID number but can also contain other information.

Click the “**Apply**” button after making any changes, or click the “**Cancel**” button to exit the screen without saving any changes.

## 4-2 VPN Settings

VPN Settings

Select Tunnel entry: Tunnel 1 (-)

This Tunnel: ☒ Enable ☐ Disable

Tunnel Name:

Local Secure Group: Select IP: 192 168 1 0 Mask: 255.255.255.0

Remote Secure Group: Select IP: 0 0 0 0 Mask: 255.255.255.0

Remote Security Gateway: P Addr. IP: 0 0 0 0

Encryption: ☒ DES ☐ 3DES ☐ Disable

Authentication: ☒ MD5 ☐ SHA ☐ Disable

Key Management: Auto (IKE)

- **Select Tunnel Entry** When you wish to establish a “Tunnel” to transfer security data or information between specific points, you must first select a **“Tunnel”** number from the drop-down box. This will allow you to identify the setting of each individual tunnel.

Check **“Enable”** on the next column to activate the tunnel.

Once the tunnel is enabled, you should enter the name of the tunnel in the **“Tunnel Name”** field. This allows you to differentiate a new tunnel from any others you have created.

Note: The tunnel name set here does not always have to match the name used at the other end of the tunnel. However, certain VPN applications require a tunnel to have the same name at both ends of the tunnel. If the other end point with which you want to establish the tunnel does not use this Broadband VPN Router, it is important that you give the other side precise set up instructions and ensure that these are followed.

- **Local Secure Group** and **Remote Secure Group** You can choose one of five options:

1. **Subnet** Select this item to allow all the PCs on the LAN side access to the tunnel.

The screenshot shows a configuration window for a tunnel. At the top, 'This Tunnel:' has 'Enable' selected. 'Tunnel Name:' is 'Tunnel\_1'. 'Local Secure Group:' is set to 'Subnet' with IP '192.168.1.0' and Mask '255.255.255.0'. 'Remote Secure Group:' is also set to 'Subnet' with IP '192.168.2.0' and Mask '255.255.255.0'. 'Remote Security Gateway:' is 'P Addr.' with IP '0.0.0.0'. 'Encryption:' has 'DES' selected. 'Authentication:' has 'MD5' selected.

Refer to the above figure as an example. All **Local Secure Group** computers with IP Addresses 192.168.1.xxx will be able to access the tunnel. All **Remote Secure Group** computers with IP Addresses 192.168.2.xxx will be able to access the tunnel. When the Subnet setting is selected, the default values of 0 should remain in the **IP** and **Mask** fields.

2. **IP Address** Selecting this item allows only the specific PC with the IP address you enter in the IP field to the tunnel.

The screenshot shows the same configuration window. 'Local Secure Group:' is now 'IP Addr.' with IP '192.168.1.101'. 'Remote Secure Group:' is 'IP Addr.' with IP '192.168.2.51'. 'Remote Security Gateway:' is 'IP Addr.' with IP '140.111.1.2'. All other settings remain the same as in the previous screenshot.

Refer to the above figure as an example. Only the PC with IP Address 192.168.1.101 will have the access from the local side of tunnel. Similarly, only the PC with IP Address 192.168.2.51 can access the tunnel from the other end.



3. **IP Range** Selecting this item allows a specific group of PCs access to the tunnel.

The screenshot shows a configuration window for a VPN tunnel. At the top, 'This Tunnel' has 'Enable' selected. Below, 'Tunnel Name' is 'Tunnel1'. 'Local Secure Group' is 'IP Range' with IP '192.168.1.2' and '200'. 'Remote Secure Group' is 'IP Range' with IP '192.168.2.2' and '100'. 'Remote Security Gateway' is 'IP Addr' with IP '192.168.1.1'. 'Encryption' has 'DES' selected, and 'Authentication' has 'MD5' selected.

Refer to the above figure as an example. Only the PCs with the IP addresses between 192.168.1.2 and 192.168.1.200 can access the local side of the tunnel. Similarly, PCs with IP Address between 192.168.2.2 and 192.168.2.100 can access the tunnel from the other end.

4. **Host** If you select “Host”, the value set here should be the same as the Remote Security Gateway setting.
  5. **Any** When this option is selected, the Router accepts remote requests from any IP address, such as mobile users or telecommunications device using dynamic IP address. Note that the router can not initial VPN connection when “Any” is selected as Remote Security Group,
- **Remote Security Gateway** Define the end point of VPN tunnel in the other side. The remote VPN tunnel end point can be another VPN Router, a VPN Server, or a host with VPN software. For example, if the VPN device at the other end of the tunnel is a VPN router, enter the WAN IP Address of that VPN router in this section. For more detail, refer to the description of “**Example - establish the VPN connection**” on next few pages.

**IP Address** Use IP Address to identify the remote VPN tunnel end point.

**FQDN** Use domain name to identify the remote VPN

tunnel end point.

**Any** Accepts remote requests from any IP address. Note that the router can not initial VPN connection when “Any” is selected.

- **Encryption** This item helps give your VPN connection added security. There are two different type of encryption: “**DES**” or “**3DES**”. You may choose either of them, but be aware that both end of a VPN tunnel should use the same encryption type. You may also choose not to enable encryption by selecting “**Disable**”.
- **Authentication** This item adds another level of security. There are two types of authentication: “**MD5**” and “**SHA**”. You may choose either of these but, as with encryption, both ends of the VPN tunnel should use the **same authentication type**. You may also choose not to use the authentication function by selecting “**Disable**”.
- **Key Management** In addition to use the same encryption type, both side of VPN tunnel should also share the same encryption “**Key**”. This is necessary for proper encryption security and allows the encryption to function correctly. By using the **Key Management** drop down list, you can choose two of two methods to set the Encryption Key: “**key**”: **Auto (IKE)** or **Manual**.



With **Auto (IKE)**, you must enter a series of characters in the “**Pre-shared Key**” field. In the example shown in the figure above, the word *Test* has been used. The program will automatically generate the correct codes to be used in the encryption and authentication basing on the word you entered. You may use any combination of up to 23 alphanumeric characters in this field. No special characters or spaces are allowed.

By entering the number of seconds in the **Key Lifetime** field, you may optionally select to have the key expire at the end of the time you specify. Leave this field blank for the key to last indefinitely.



Key Management:	
Encryption KEY:	q12x2200 (0x)
Authentication KEY:	ccccc000 (0x)
Inbound SPI:	1234567890 (0)
Outbound SPI:	0987654321 (0)

**Manual Keying** This allows you to manually enter the keys to be used for encryption and authentication. Enter the Keys (code) you wish to use for encryption and authentication separately in the “**Encryption KEY**” and “**Authentication KEY**” fields. Up to 23 alphanumeric characters are allowed in each field. Be aware that both ends of the VPN tunnel should use the **same key management** method in addition to same encryption and authentication keys.

The “**Inbound SPI**” value set here must match the Outbound SPI value at the other end of the VPN tunnel. Conversely, the “**Outbound SPI**” must match the Inbound SPI value at the other end. Only numeric characters can be used in both these fields.

- **Status** After finalizing the settings at both ends of the VPN tunnel, click the “Connect” button to initiate the VPN tunnel. Once a connection is established, the word “**Connected**” should appear under “Status” if the connection is successful. Should the word “**Disconnected**” appear, it is an indication that a problem exists, preventing the successful creation of the tunnel. In this case, you should firstly ensure that your wiring is surely connected. Next, double-check that correct values have been entered in the VPN configuration screen. Lastly, ensure that the settings at the other end of the tunnel are correct as well.

- **Advanced Setting** To establish a VPN tunnel with another providers' VPN solution, configuration of the advanced setting is sometimes necessary. Click the “**Advanced Setting**” button and the screen shown below will appear.

Advanced Settings for Selected IPSec Tunnel

---

**Tunnel 1**

Phase 1:

Operation mode: ☒ Main mode ☐ Aggressive mode ☐ Username:

Proposal 1:

Encryption:  Authentication:  Group:  Key Lifetime:  seconds

(Note: Following three additional proposals are also proposed in Main mode: 3DES/MD5/16, 3DES/SHA/16 and 3DES/SHA/32)

Phase 2:

Proposal:

Encryption:  Authentication:  PFS:  Group:  Key Lifetime:  seconds

---

Other Settings:

☐ NetBIOS broadcast ☐ Anti-spoof ☐ Keep-Alive

☐ If IKE failed more than  times, block this unauthorized IP for  seconds

**Operation mode** There two options in this mode: **Main** and **Aggressive**. Main mode is the default and is more secure method. Aggressive mode is used when the devices at the remote end of the VPN tunnel use Aggressive mode. Mostly, it is used with dynamic IP addresses. Whenever the Main or Aggressive modes are selected, the router will accept both modes initiated by the remote VPN devices.

**Encryption** Select either DES or 3DES from the drop down list. 3DES is default as it is the more secure option.

**Authentication** Select either MD5 or SHA from the drop down list. SHA default as it is the more secure option.

**Group** Two Diffie-Hellman Groups can be selected from the drop down list: 768-bit and 1024-bit. Diffie-Hellman is a technique that uses public and private key for encryption and decryption.

**Key Lifetime** you may optionally select to have the key expire after a period of time that you specify. Enter the number of seconds you'd like the key to be available or leave the field blank for the key to last indefinitely.

**NetBIOS Broadcast** Check the box to allow NetBIOS traffic pass through the VPN tunnel.

**Anti-replay** Check the box to enable this function. This item will keep track of sequence numbers as data packets arrive and ensure security at the IP packet level.

**Keep-Alive** Check the box to re-establish the VPN tunnel connection whenever it is dropped. After the tunnel has been created, this function will keep the connection alive for a period of time.

**Unauthorized IP Blocking** Check the box will allows to block unauthorized IP addresses for a specified period of time after a specific number of IKE failures. Entered the time period and failure level in the fields indicated.

#### **Example - Establish the VPN connection**

- **Creating a tunnel between two VPN routers**



- Creating a tunnel between VPN router and VPN client with fix IP Address



- Creating a tunnel between VPN router and VPN client with dynamic IP Address



Once you are satisfied that your settings are correct, click the **“Apply”** button. Click the **“Cancel”** button to exit the screen without saving any changes.

### 4-3 DHCP Configuration

A DHCP (Dynamic Host Configuration Protocol) Server can automatically assign IP Addresses to each computer in your network. Unless you already have one in you LAN, it is highly recommended that you set your router to act as a DHCP server.

**DHCP Settings**

**DHCP Server**

Dynamic IP Address: ☒ Enable ☐ Disable

Starting IP Address:

Number of Users:

Client Lease Time:  minutes (0 means one day)

DNS(Required) 1:

DNS 2:

DNS 3:

WINS:

- **Dynamic IP Address** Select “**Enable**” to use the DHCP server option of the router. If you already have a DHCP server in your network, set the router's DHCP option to “**Disable**”.
- **Starting IP Address** Enter a numerical value, from 2 to 254, for the DHCP server to start at when assigning IP Addresses.
- **Number of Users** Enter the maximum number of PCs that you want the DHCP server to assign IP Addresses to, with the absolute maximum being 253.
- **Client Lease Time** Enter the number of time that DHCP clients (The PCs on LAN side) can use the IP Addresses assigned by Router’s DHCP server. Before the time is up, DHCP clients have to request to renew the DHCP information.
- **DNS** The IP Address of the Domain Name Server, which is currently used. Multiple DNS IP settings are common. The first DNS entry will be use in most cases.



- **DHCP Clients Table** Click the DHCP Clients Table button to show current DHCP client information.

Click the “**Apply**” button after making any changes, or click the “**Cancel**” button to exit the screen without saving any changes.

#### 4-4 Web Control

This feature allows you to restrict LAN users access to specific web sites. To block a site, you can enter either a complete URL (Internet address) or keywords included in the URL.

The screenshot shows the 'Web Control' configuration window. It features a black title bar with the text 'Web Control'. The main area has a light blue background. Under 'Control Web Access:', the 'Disable' radio button is selected. Under 'Control Type:', the 'Deny' radio button is selected. There are 20 input fields for 'Web site or Key Words', arranged in two columns of 10. At the bottom, the 'Exception IP Address:' is set to '192.168.1.0', and there are 'Apply' and 'Undo' buttons.

- **Control Web Access** Check “**Enable**” or “**Disable**” to make this function active or inactive.
- **Control Type** Check “**Allow**” to allow users on the network to access specific website listed on the location only. In contrast, to restrict users on the network to

access the website listed on the location, check “**Block**” in this item.

- **Web site or Key Words** Enter either a complete URL (Internet address) or keywords included in the URL.
- **Exception IP Address** Enter the IP Address of LAN PC that will not be restricted by this rule.

Click the “**Apply**” button after making any changes, or click the “**Cancel**” button to exit the screen without saving any changes.

#### 4-5 ToD Control

This feature allows you to limit connection availability according to a nominated time schedule.



- **Control Type** Select the control type from the drop down list and make this function active. Select “**Block Outbound**” to restrict the connection to the Internet from your LAN. Select “**Block Inbound**” to restrict any external connections from Internet to your LAN servers that were set as virtual servers or as DMZ host. Select “**Block Both**” to restrict both incoming and outgoing connections. Select “**Disable**” to turn off this function.
- **Define Schedule** Set a period of time with beginning and ending from the drop down list.

Click the “**Apply**” button after making any changes, or click

the “**Cancel**” button to exit the screen without saving any changes.

## 4-6 Access Control

The Access Control feature allows administrators to set up to 10 access policies to block or allow certain users from accessing the Internet or specific applications. Before using this function, the network PCs which you want to control the access limitation should be assigned fixed IP Addresses.

Access Control

Packet Filter: 1 (-) (Select Filter entry) Summary

Status: Disable

Name:

Direction: Inbound

MAC1: 00 - 00 - 00 - 00 - 00 - 00

MAC2: 00 - 00 - 00 - 00 - 00 - 00

MAC3: 00 - 00 - 00 - 00 - 00 - 00

MAC4: 00 - 00 - 00 - 00 - 00 - 00

MAC5: 00 - 00 - 00 - 00 - 00 - 00

IP Address: 0 - 0 - 0 - 0 ~ 0

Protocol: ALL

Port Number: 0 ~ 0

Apply Cancel

- **Packet Filter** Select the number of policy rules you want to configure. There are up to 10 rules you can set. Note that these rules are sequenced. Rule 1 has higher priority than Rule 2 and so forth.
- **Status** Select “**Allow**” to limit users/computers access to specific applications you set on this rule. Select “**Deny**”

to restrict the users/computers access to specific applications you set on this rule.

- **Name** For each rule, you can enter up to 15 characters to identify it.
- **Direction** Choose the initial network data traffic direction you wish to block. Select “**LAN**” if you want to block LAN side users/PCs set in the following “**MAC**” and “**Source IP**” fields to access certain applications on the Internet. Select “**WAN**” if you want to block WAN side users/PCs set in the following “**MAC**” and “**Source IP**” fields to access certain PCs on your LAN side.
- **MAC** This item allows network administrators to use the MAC addresses of PCs to restrict users/computers from accessing the specific application you set in this rule. A MAC address is short for Media Access Control Address and is a hardware address that uniquely identifies each node on network. Enter the MAC addresses of the computers you wish to allow/block in each field.
- **IP Address** This item allows network administrators to use IP Address of PCs to restrict users/computers from accessing the certain applications you set in this rule. Enter the range of IP addresses if you want them to be included in a controlled group with the same access limitation.

Note that if you set both “**MAC**” and “**Source IP**” in one rule, the PCs which have the MAC addresses matching in “**MAC**” field and their IP addresses matching in the “**Source IP**” field will be allowed/blocked for certain applications.

- **Protocol** Select the protocol type as “**TCP**” or “**UDP**” from the drop down list. If you are not sure which one to choose, select “**Both**”.

- **Port Number** Enter the range of port numbers that are used by the applications you wish to be blocked. For example, port 80 usually is used as destination port number when you access a web page. Note that if you don't enter any value in the "**MAC**" and "**Source IP**" column but enter the port number, for example "80", in "Destination Port", it means all the users/PCs will be allowed/denied access to certain applications related to this port, for example "web browsing".
- **Summary** Click this button to display a summary page showing all the current rules you have set.

Here is a sample of Access Control Setting. There is a PC you wish to block in your LAN side with MAC address like **00-01-36-02-B1-4F**, and an IP Address **192.168.1.101**. Either the PC's MAC address in the "**MAC**" field or the IP address included in the "**Source IP**" range that covers this PC's IP address. Enter the range of **20~80** in the "Destination Port" column, then click the "**Apply**" button. As a result, this PC with MAC address **00-01-36-02-B1-4F** and IP Address **192.168.1.101** will not be able to use the applications which use port numbers from 20 to 80, such as FTP, Telnet and web browsing.

Click the "**Apply**" button after making any changes, or click the "**Cancel**" button to exit the screen without saving any changes.

## 4-7 Virtual Server Settings

The Virtual Server Settings application allows you to set up a maximum of ten public services that can be accessed by external users of the Internet, such as a Web Address, Email, FTP etc.. Each service is provided by a dedicated network computer (server) configured with a fixed IP Address. Although the internal service addresses are not directly accessible to the external user, the Broadband Security Router is able to identify the service requested by the service port number and redirects the request to the appropriate internal IP Address/server. To use this application, it is recommended you use a fixed Public IP Address from your ISP. Note that your Broadband Security Router supports only one

server of any particular type.

This router also support UPnP Forwarding. You can use either Virtual Server Settings or UPnP Forwarding by clicking the button to change setting page. Please note that do not set the same function server to different IP Address in different setting pages.

Virtual Server			Redirect IP Address
Start	End	Protocol	
0	0	Both	192.168.1.0
0	0	Both	192.168.1.0
0	0	Both	192.168.1.0
0	0	Both	192.168.1.0
0	0	Both	192.168.1.0
0	0	Both	192.168.1.0
0	0	Both	192.168.1.0
0	0	Both	192.168.1.0
0	0	Both	192.168.1.0
0	0	Both	192.168.1.0

Well-known Ports

- ☐ HTTP
- ☐ FTP
- ☐ Telnet
- ☐ SMTP
- ☐ POP3
- ☐ IMAP
- ☐ SSH
- ☐ RDP
- ☐ PPTP
- ☐ RTSP
- ☐ SIP
- ☐ UPnP

PASV FTP Virtual Server

Enable ☐ Disable ☐

FTP Port: 0 Server IP: 192.168.1.0

Apply Undo

- Set up individual network computers to act as servers and configure each with a fixed IP Address.
- In the “One Page Setup” screen, ensure the “**Private IP Address**” is set to the Broadband Security Router’s default setting of 192.168.1.1. If a fixed Public IP Address is to be used, select “**Specify an IP address**” and enter the IP Address and other necessary information provided by your ISP.
- **Ports** Enter the desired service port numbers in the “**Ports**” fields. You can specify the protocol type as “**TCP**” or “**UDP**” from the drop-down list. If you are not sure which one to select, choose “**Both**”. A selection of well-known service port numbers is provided on this screen.

- **Redirect IP Address** Enter the appropriate IP Addresses of the service computers in the “**Redirect IP Address**” locations.
- **Passive FTP Virtual Server** When there is firewall filtering in your network, the Internet user may not be able to access FTP server you set in the LAN side. Setting FTP server at passive mode will be necessary.

**Enable/Disable** Click to enable/disable passive FTP function.

**FTP Port** Enter the port number (> 1024) that the FTP server will use as data connection port number. The client side should select passive mode and use the same port number entered here.

**Redirect IP Address** Enter the appropriate IP Addresses of the service computers.

**Example:** If the service port number **80~80** (representing an HTTP web address) is entered in “**Ports**” and **192.168.1.100** is entered in “**Redirect IP Address**”, then all HTTP requests from external Internet users will be directed to the PC/server with the 192.168.1.100 fixed IP Address.

Here is a list of the protocol and port ranges that are used by some common applications.

Application	Protocol	Port Range
FTP Server	TCP	21
Half Life	UDP	6003, 7002, 27010, 27015, 27025
MSN Messenger	TCP	6891-6900 (File-send)
	TCP	1863
	UDP	1863
	UDP	5190
	UDP	6901 (Voice)
PC Anywhere host	TCP	6901 (Voice)
	TCP	5631
Quake 2	UDP	5632
	UDP	27910
Quake III	UDP	27660 (first player)

		"C:\Program Files\Quake III Arena\quake3.exe" +set net_port 27660 27661 (second player)
Telnet Server	TCP	23
Web Server	TCP	80

### UPnP Forwarding

UPnP (Universal Plug and Play) is a standard introduced from Microsoft and UPnP Forum for interoperability. Currently, this function supported by this device allows you to set virtual server from Windows OS that supports UPnP, such as Windows XP.

Application Name	Ext. Port	Protocol		Int. Port	IP Address	Enable
		TCP	UDP			
FTP	21	<input checked="" type="checkbox"/>	<input type="checkbox"/>	21	192.168.1.1	<input type="checkbox"/>
Telnet	23	<input checked="" type="checkbox"/>	<input type="checkbox"/>	23	192.168.1.1	<input type="checkbox"/>
SMTP	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25	192.168.1.1	<input type="checkbox"/>
DNS	53	<input type="checkbox"/>	<input checked="" type="checkbox"/>	53	192.168.1.1	<input type="checkbox"/>
TFTP	69	<input type="checkbox"/>	<input checked="" type="checkbox"/>	69	192.168.1.1	<input type="checkbox"/>
Finger	79	<input checked="" type="checkbox"/>	<input type="checkbox"/>	79	192.168.1.1	<input type="checkbox"/>
HTTP	80	<input checked="" type="checkbox"/>	<input type="checkbox"/>	80	192.168.1.1	<input type="checkbox"/>
POP3	110	<input checked="" type="checkbox"/>	<input type="checkbox"/>	110	192.168.1.1	<input type="checkbox"/>
NNTP	119	<input checked="" type="checkbox"/>	<input type="checkbox"/>	119	192.168.1.1	<input type="checkbox"/>
SNMP	161	<input type="checkbox"/>	<input checked="" type="checkbox"/>	161	192.168.1.1	<input type="checkbox"/>
		<input type="checkbox"/>	<input checked="" type="checkbox"/>		192.168.1.1	<input type="checkbox"/>
		<input type="checkbox"/>	<input checked="" type="checkbox"/>		192.168.1.1	<input type="checkbox"/>
		<input type="checkbox"/>	<input checked="" type="checkbox"/>		192.168.1.1	<input type="checkbox"/>
		<input type="checkbox"/>	<input checked="" type="checkbox"/>		192.168.1.1	<input type="checkbox"/>
		<input type="checkbox"/>	<input checked="" type="checkbox"/>		192.168.1.1	<input type="checkbox"/>

- **UPnP Function** Check “**Enable**” will allow LAN side PCs that support UPnP to set virtual server.
- Before you enable the UPnP Forwarding, you have to set up individual network computers to act as servers and configure each with a fixed IP Address.



- In the “One Page Setup” screen, ensure the “**Private IP Address**” is set to the Router’s default setting of 192.168.1.1. If a fixed Public IP Address is to be used, select “**Specify an IP address**” and enter the IP Address and other necessary information provided by your ISP.
- **Application Name** UPnP has ten pre-setting forwarding rules, which are well-known applications. You can enter any name to present the additional settings beside those pre-setting rules.
- **Ext. Port** Most of applications usually use their individual port number for its incoming and outgoing data packets. However, some of the application may use different port number for incoming and outgoing data packets. In this case, you have to enter the port number used by incoming data packets here.
- **Protocol** Specify the protocol type as “**TCP**” or “**UDP**” which is used by specific service.
- **Int. Ports** Most of applications usually use their individual port number for its incoming and outgoing data packets. However, some of the application may use different port number for incoming and outgoing data packets. In this case, you have to enter the port number used by outgoing data packets here.
- **Enable** Check to make this forwarding setting active.
- **IP Address** Enter the appropriate IP Addresses of the service computers in the “**Redirect IP Address**” locations.

**Example:** If the service port number **80~80** (representing an HTTP web address) is entered in “**Ports**” and **192.168.1.100** is entered in “**Redirect IP Address**”, then all HTTP requests from external Internet users will be directed to the PC/server with the 192.168.1.100 fixed IP Address.

Click the “**Apply**” button after making any changes, or click the “**Cancel**” button to exit the screen without saving any

changes.

#### 4-8 Special Applications

Some applications use multiple TCP/UDP ports to transmit data. Due to the NAT, these applications cannot work with the Broadband Security Router. Port Triggering allows some of these applications to work properly. Note that only one PC can use each Port Triggering setting at any time.

	Application Name	Outgoing Port Range	Incoming Port Range
1:	<input type="text"/>	<input type="text"/> - <input type="text"/>	<input type="text"/> - <input type="text"/>
2:	<input type="text"/>	<input type="text"/> - <input type="text"/>	<input type="text"/> - <input type="text"/>
3:	<input type="text"/>	<input type="text"/> - <input type="text"/>	<input type="text"/> - <input type="text"/>
4:	<input type="text"/>	<input type="text"/> - <input type="text"/>	<input type="text"/> - <input type="text"/>
5:	<input type="text"/>	<input type="text"/> - <input type="text"/>	<input type="text"/> - <input type="text"/>
6:	<input type="text"/>	<input type="text"/> - <input type="text"/>	<input type="text"/> - <input type="text"/>
7:	<input type="text"/>	<input type="text"/> - <input type="text"/>	<input type="text"/> - <input type="text"/>
8:	<input type="text"/>	<input type="text"/> - <input type="text"/>	<input type="text"/> - <input type="text"/>
9:	<input type="text"/>	<input type="text"/> - <input type="text"/>	<input type="text"/> - <input type="text"/>
10:	<input type="text"/>	<input type="text"/> - <input type="text"/>	<input type="text"/> - <input type="text"/>

Apply Undo

- **Application name** Enter the name of application you wish to configure in the Name column to identify this setting.
- **Outgoing Port Range** Enter the port number or range numbers this application uses when it sends packets outbound. The Outgoing Control Port Numbers act as the trigger. When the Broadband Security Router detects the outgoing packets with these port numbers, it will allow the inbound packets with the Incoming Port Numbers that you set in the next column to pass through

the Broadband Security Router.

- **Incoming Control** Enter the port number or range numbers the inbound packets carry.

Click the “**Apply**” button after making any changes, or click the “**Cancel**” button to exit the screen without saving any changes.

The following is a list of port numbers used on some popular applications:

Application	Outgoing Control	Incoming Data
Battle.net	6112	6112
DialPad	7175	51200, 51201,51210
ICU II	2019	2000-2038, 2050-2051 2069, 2085,3010-3030
MSN Gaming Zone	47624	2300-2400, 28800-29000
PC to Phone	12053	12120,12122, 24150-24220
Quick Time4	554	6970-6999
wowcall	8000	4000-4020

#### 4-9 DMZ Host

The DMZ Host application allows unrestricted 2-way communication between a single LAN PC and other Internet users or servers. This application is useful for supporting special-purpose services such as video-conferencing and gaming, that require proprietary client software and/or 2-way user communication.

To use this application, you must first obtain a fixed Public IP Address from your ISP. Note that in order to provide unrestricted access, the Firewall provided by the Broadband Security Router to protect this port is disabled, thus creating a potentially serious security risk.

It is recommended that this application is disabled when it is not in use by entering “0” in the “**DMZ Host**”field.

The Multi DMZ allows you to map the public IP addresses to your LAN PCs, should you get more than one public IP address from your ISP. This function is useful to set up your servers, such as an FTP server, web server, and so on, with

public IP addresses, but still keep them within your LAN group.

With the public IP addresses, Internet users will access your servers more easily and those servers can still communicate with other PCs in your LAN by using Network Neighborhood.

**DMZ (Demilitarized Zone) Host**

This feature will open all in/out accesses for one LAN computer, especially for Internet game application. Besides, this is useful for machines that host TCP/IP services that should be fully exposed to the public network. Please enter one LAN IP Address below. Activate this feature only when required. (0 is inactive)

DMZ Host: 192.168.74.

Multi DMZ:

WAN IP:	LAN IP:
<input type="text" value="0"/>	192.168.74. <input type="text" value="0"/>
<input type="text" value="0"/>	192.168.74. <input type="text" value="0"/>
<input type="text" value="0"/>	192.168.74. <input type="text" value="0"/>
<input type="text" value="0"/>	192.168.74. <input type="text" value="0"/>
<input type="text" value="0"/>	192.168.74. <input type="text" value="0"/>

### DMZ Host

- Before setting up a LAN PC to act as a DMZ Host, you should configure it using a fixed IP Address.
- In the **“One Page Setup”** screen, ensure the Private IP Address is set to the Broadband Security Router’s default setting of 192.168.1.1. In the Public IP Address area, select **“Specify an IP Address”**, and then enter the IP Address and other necessary information provided by your ISP.
- Click the **“DMZ Host”** option in the Advanced Menu and enter the fixed IP Address of the Exposed Host PC in the **“DMZ Host”** IP Address location. Remember, entering **“0”** will disable this application.

## Multi DMZ

11. Enter the valid public IP address in **“WAN IP”** column. Next, enter the private IP address of the PC that you wish to map to in **“LAN IP”** field. Up to five public IP addresses can be entered.
12. Click the **“Apply”** button after making any changes, or click the **“Cancel”** button to exit the screen without saving any changes.

## 4-10 Dynamic Routing

The Dynamic Routing feature allows your Broadband Security Router to exchange routing information with other routers in the network. Enabling this feature is likely to enhance performance of your Broadband Security Router.

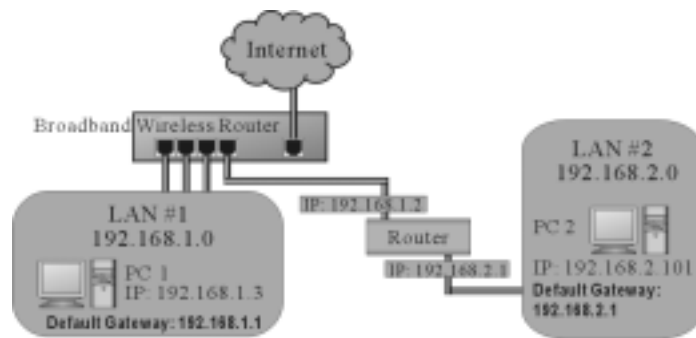


- **TX** From the drop-down list, select one of the routing information types, **“RIP-1”**, **“RIP-1 Compatible”**, or **“RIP-2”**, to enable the **“TX”** (transmit) function. **“RIP-1”** is the protocol used by older routers. Newer routers should use **“RIP-2”**. **“RIP-1 Compatible”** servers to broadcast RIP-1 and multicast RIP-2.
- **RX** From the drop-down list, select one of the routing information types, **“RIP-1”** or **“RIP-2”**, to enable the **“RX”** (receive) function.

Click the **“Apply”** button after making any changes, or click the **“Cancel”** button to exit the screen without saving any changes.

## 4-11 Static Routing

The Static Routing feature allows PCs that are connected to the Broadband Security Router, either directly or through a hub/switch (in the immediate LAN), to communicate with other PCs in the respective LAN segment which are connected to the Broadband Security Router through another router (destination LAN). Up to 20 route entries may be input into the Broadband Security Router. The diagram below gives an example of the physical connections required to use Static Routing.



In the above diagram, PC2 in LAN#2 is connected to the Broadband Security Router via another router while PC1 in LAN#1 is connected to the Broadband Security Router directly. Without configuring the Static Routing function, the two PCs would not be able to communicate with each other.

The screenshot shows the 'Static Routing Settings' window. It has a title bar 'Static Routing Settings' and a sub-header 'Static Routing'. Below the sub-header, there is a 'Select Route entry:' dropdown menu with '1' selected, and a 'Delete this entry' button. The main configuration area includes fields for 'Destination LAN IP:', 'Subnet Mask:', 'Default Gateway:', 'Hop Count:', and 'Interface:'. Each of these fields is followed by a series of input boxes for digits. At the bottom, there are three buttons: 'Show Routing Table', 'Apply', and 'Undo'.

- **Select Route entry** Select the route entry number from 1 to 20 that you wish to configure.

- **Destination LAN IP** and **Subnet Mask** Enter the IP Address and Subnet Mask of the destination LAN that the immediate LAN is to communicate with. Taking the above diagram as an example, enter *192.168.2.0* in the “**Destination LAN IP**” field and *255.255.255.0* in the “**Subnet Mask**” field.
- **Default Gateway** Enter the IP Address of the router that forwards data packets to the destination LAN. For the above example, enter *192.168.1.2* in the “**Default Gateway**” field.
- **Hop Count** Enter the number of hops required between the LANs to be connected. The Hop Count represents the “cost” of the routing transmission. The default value is 1.
- **Interface** Choose **LAN** if the Destination LAN is on your Router’s LAN side and choose **WAN** if the Destination LAN is on the Router’s WAN side.

Referring back to the above diagram, with the proper settings, PC1 would be able to access LAN 1, LAN 2 and the Internet while PC2 can only access LAN 2, LAN1.

Click the “**Apply**” button after making any changes, or click the “**Cancel**” button to exit the screen without saving any changes.

## 4-12 Wireless

This setting page allows you to configure advanced wireless functions. To set those items needs more technology background. Unless you really understand those technical terms, it would be better to leave them as default setting.

**Wireless Settings**

**Wireless**

Wireless Station Status:

Wireless Station MAC Filter: ☒ Enable ☐ Disable

Beacon Interval:  (range: 1~100)

RTS Threshold:  (range: 256~2432, \*2432)

Fragmentation Threshold:  (range: 256~2346, \*2346, even number only)

DTIM Interval:  (range: 1~65535, \*3)

Basic Rates:

Transmission Rate:

Preamble Type:

Authentication Type:

- **Wireless Station Status** The “**Active MAC Table**” shows the MAC addresses of wireless clients, which have the same ESSID and WEP key with Broadband Wireless Router. When the “MAC Filter” function is disabled, the background color is gray.

Click the “**Active MAC Table**” button will display all MAC addresses of wireless nodes on your WLAN.

#### Wireless Active MAC Table

Station	MAC Address
1	00-04-5A-0C-A4-69
2	00-02-DD-30-13-84
3	00-04-5A-C9-50-C2

If the MAC Filter function is enabled and the MAC addresses showing in this table have been entered into the “Edit MAC Filter” table, the background color of those MAC addresses will be green. Otherwise, it should be red. If the MAC addresses have been blocked (check the Filter field beside the MAC address in Edit MAC Filter table), the background color will be yellow.



- **Wireless Station MAC Filter** This function allows you to restrict wireless users to access Internet.

Click “**Edit MAC Filter Setting**” button to open the edit table.

Station	MAC Address	Filter
1:	<input type="text"/>	<input type="checkbox"/>
2:	<input type="text"/>	<input type="checkbox"/>
3:	<input type="text"/>	<input type="checkbox"/>
4:	<input type="text"/>	<input type="checkbox"/>
5:	<input type="text"/>	<input type="checkbox"/>
6:	<input type="text"/>	<input type="checkbox"/>
7:	<input type="text"/>	<input type="checkbox"/>
8:	<input type="text"/>	<input type="checkbox"/>
9:	<input type="text"/>	<input type="checkbox"/>
10:	<input type="text"/>	<input type="checkbox"/>

**Wireless MAC Entry** There are 32 sets divided into four groups in this function. You can choose each group by selecting from the pop-down list. Enter the MAC addresses of the computers you wish to block in the columns and click the Filter field beside the MAC address, and then that user will be blocked to link to WLAN and Internet. If the “Filter” field isn’t checked, that MAC address won’t be blocked. The MAC address entered here should be 12 continue alphanumeric digits without “-“ in between. Click “**Apply**” to save these changes.

- **Beacon Interval** It’s the signal sent periodically by wireless access point to provide synchronization among the stations in wireless LAN.
- **RTS Threshold** RTS packet is use to account for potential hidden stations. This feature allows you to set the size of RTS packet.
- **Fragmentation Threshold** If the length of data frame

needing transmission exceeds the fragmentation threshold you set in the column, the data frame will be fragmented. If there is significant interference or high utilization in your wireless network, the smaller fragmentation value can increase the reliability transmission. However, it is more efficient to set the large fragment size.

- **DTIM Interval** DTIM is the acronym of delivery traffic indication message. It determines how often the MAC Layer forward multicast traffic.
- **Basic rate** Leave “**Mixed**” as default setting to compatible with different wireless standard or select other rates you wish to use to connect with specific wireless standard devices. .
- **Transmission Rates** Leave “**Default**” setting or select other speed you wish to use.
- **Preamble Type** Leave “**Dynamic**” as default setting or select other type to compatible with special setting your client devices use.
- **Authentication Type** Select either Open System or Share Key as authentication type. If you are not sure, select both.

Click **Apply** after making any changes.

## 4-13 DDNS

“**DDNS**” is an acronym for Dynamic Domain Name Service. Whenever you set up the web servers, mail servers, or sometimes ftp servers, You need “**Domain Name**” to help Internet users reach your servers easily.

Internet actually runs on IP Addresses which are numerical order, for example “66.37.215.53”. These IP Address identify the location of each device connected to Internet. However, the human brain does not easily remember this numbering system, so a system that allocate domain name such as “[www.dyndns.org](http://www.dyndns.org)” provides an easier method. If you type “66.37.215.53” or “[www.dyndns.org](http://www.dyndns.org)” in the web browser’s address bar, the browser will show the

same web page. This is because both methods relate to the same web server. The “**Domain Name Servers**” used to manage the Internet will translate “[www.dyndns.org](http://www.dyndns.org)” into the IP Address “66.37.215.53” in order to allow your browser to find the web server and display the correct web page in your browser.

If your “WAN Connection Type”, as shown in One Page Setup section, is “Obtain IP Address Automatically”, “PPPoE”, or “PPTP” with dynamic IP address assigned by ISP, it will cause an error when you set up the public computer servers in your LAN side PCs. Internet users may not be able to reach your servers because your WAN side IP address may change each time you initiate the connection to your ISP. The DDNS function will help to map your IP address to your domain name when your ISP assigns a new dynamic IP Address.

Note that this DDNS function acts as the client appliance of DDNS service and is only able to be use in conjunction with the service provided by DynDNS.org. Before you begin using this function, you will need to apply to DynDNS.org to be able to use the service. Please visit [www.dyndns.org](http://www.dyndns.org) for further information.

**DDNS Settings**

DDNS service allows you to assign a fixed domain name to a dynamic WAN IP address. This allows you to host your own Web, FTP or other type of TCP/IP server in your LAN.

Before configuring DDNS, you need to visit [www.dyndns.org](http://www.dyndns.org) and register a domain name. (The DDNS service is provided by DynDNS.org)

**DDNS Services:** ☒ Enable ☐ Disable

**Username:**  (max. 15 characters)

**Password:**  (max. 16 characters)

**Host Name:**  .  .

**Your IP Address:** 0.0.0.0

**Status:** DDNS function is disabled.

- **DDNS Service** check the “**Enable**” option if you wish to activate this function.
- **Username** After you have applied for the DDNS service from DynDNS.org, you will be issued with a Username. Enter this username in the “**Username**” field.

- **Password** DynDNS.org, will also issue you with a password. Enter the detail in the “**Password**” field.
- **Host Name** DynDNS.org, will provide you with a Host Name. Enter this name in the “**Host Name**” field.
- **Your IP Address** This will display the IP Address currently assigned by your ISP.
- **Status** This display the current status of the DDNS function.

Click the “**Apply**” button after making any changes, or click the “**Cancel**” button to exit the screen without saving any changes.

## Chapter 5: Management

This chapter provides information on using Macintosh computers in your network. The instructions given here are for system software version 8.0 or above, which comes with the TCP/IP Protocol preloaded and supports DHCP Addressing.

### 5-1 Device Administration Settings

This feature allows the administrator to manage the Broadband Security Router by setting certain parameters. For security reasons, it is strongly recommended that you set Passwords and so that only authorized persons are able to manage this Broadband Security Router. If the Password is left blank, all users on your network can access this router simply by entering the unit's IP Address into their web browser's location window.

The screenshot displays the 'Device Administration Settings' web page. At the top, the title 'Device Administration Settings' is centered. Below it, the 'Administrator Password' section contains two password fields: 'Password Change' and 'Password Confirm', both masked with asterisks. The 'SNMP Function' section has radio buttons for 'Enable' and 'Disable', with 'Disable' selected. Below this are four 'SNMP Community' fields (1, 2, 3, 4) with corresponding 'Read-Only' or 'Read-Write' dropdown menus. The 'WAN Mac Change' section shows a MAC address field with the value '00:00:00:00:00:00' and a note '(original: 00-90-42-00-08-31)'. The 'External Admin.' section has radio buttons for 'Enable' and 'Disable', with 'Disable' selected. The 'MTU' section has radio buttons for 'Enable' and 'Disable', with 'Enable' selected, and a 'Size' field set to '1490'. The 'Block WAN Request' section has radio buttons for 'Enable' and 'Disable', with 'Enable' selected. The 'IPSec Pass Through' section has radio buttons for 'Enable' and 'Disable', with 'Enable' selected. The 'PPTP Pass Through' section has radio buttons for 'Enable' and 'Disable', with 'Enable' selected. The 'PPPoE Pass Through' section has radio buttons for 'Enable' and 'Disable', with 'Disable' selected. The 'Remote Upgrade' section has radio buttons for 'Enable' and 'Disable', with 'Disable' selected. The 'Reset Device' section has radio buttons for 'Yes' and 'No', with 'No' selected. The 'Factory Defaults' section has radio buttons for 'Yes' and 'No', with 'No' selected. At the bottom, there are 'Apply' and 'Undo' buttons.

- **Administrator Password** Enter the password you want to use into the “**Password Change**” field and re-enter it into the “**Password Confirm**” field for confirmation. Be sure that the password is less than 64 characters long and without any special characters or spaces.
- **SNMP Function** As with the Password, SNMP community allows authorized persons to access this router through the SNMP Management tool. The Broadband Router provides three fields to enter these communities. The default words *Public* and *Private* are well-known communities that allow authorized persons who know the IP Address of this router to access the read-only information about this router or have the authority to change the configuration. Also, the administrator can define any specific community and configure its limits as Read-Only or Read-Write from the right side drop-down box.
- **WAN MAC Change** The WAN MAC address can be changed from the original values if necessary. Some ISPs require users to change the WAN MAC address to a registered one when users change their access equipment.
- **External Admin.** Check “**Enable**” to allow you to configure the Broadband Security Router from the WAN side. To access the setting page from the external side, enter “**http://<WAN IP Address>:8080**” into the web browser address bar and press the “**Enter**” key.
- **MTU** Check **Enable** if you want to set a maximum limitation for incoming and outgoing packet size. Enter the maximum packet size you wish to set in the “**Size**” column.
- **Block WAN Request** To prevent hacker intruding your network, check the **Enable** option to enable this function to reject all the unauthorized requests from WAN side.

- **IPSec Pass Through** Check the **Enable** to allow the IPSec packets to pass through the Broadband Router if there is LAN PC using IPSec for data communication with other Internet device.
- **PPTP Pass Through** Check the **Enable** to allow the PPTP packets to pass through the Broadband Router if there is LAN PC using PPTP for data communication with other Internet device.
- **PPPoE Pass Through** Check the **Enable** to allow the PPPoE packets to pass through the Broadband Router if there is LAN PC using PPPoE for data communication with other Internet device.
- **Remote Upgrade** Check **Enable** if you want to allow the authorized remote users to upgrade firmware from WAN side.
- **Reset Device** Select **“Yes”** if you want to clear a connection, reboot, and re-initialize the unit without affecting any of your configuration setting.
- **Factory Defaults** Select **“Yes”** if you want to return all the router’s current settings to their factory defaults. Note that do not restore the factory defaults unless it is absolutely necessary.

Click the **“Apply”** button after making any changes, or click the **“Cancel”** button to exit the screen without saving any changes.

## 5-2 Status Monitor

This screen shows the router’s current status. All of the information provided is read-only.

**Status Monitor**

Product Name: Broadband High-Performance Router  
 Firmware Version: 1.03.0, Apr 30 2003

Login  
 Disable

**Internet**

Current Time	Not Available
Public IP Address	0.0.0.0
Public Subnet Mask	255.255.255.0
Default Gateway IP Address	0.0.0.0
Domain Name Server 1	0.0.0.0
Domain Name Server 2	0.0.0.0
Domain Name Server 3	0.0.0.0

DHCP Release    DHCP Renew

**Intranet**

Private IP Address	192.168.1.1
Subnet Mask	255.255.255.0

DHCP Clear Table

- **Firmware Version** This field shows the installed version of the firmware.
- **Login** This column shows the login information of PPPoE or PPTP. You can manually initiate the connection or make a disconnection by clicking the appropriate buttons. Be aware that, if you make a disconnection here, “**Connect-on- demand**” will not function until the connection button is clicked. Note that “Login” won’t show any information if you selected “**Obtain IP automatically**” or “**Static IP**” on the OnePage Setup page.
- **Internet** This section shows the IP settings status of the router as seen by external users of the Internet. If you selected “**Get IP Address Automatically**”, “**PPPoE**”, or “**PPTP**” in the OnePage Setup, the “**IP Address**”, “**Subnet Mask**”, “**Default Gateway**”, and “**Domain Name Server**” (DNS) will show the information retrieved from the DHCP server or ISP which is



currently being used. If you selected “**Static IP**” in “One Page Setup: Public IP Address”, the information will be the same as your input.

**DHCP Release:** Click this button to eliminate the IP address obtained from DHCP server.

**DHCP Renew:** Click this button to refresh the IP address from DHCP server.

Note that the “DHCP Release” and “DHCP Renew” button only show up when you select “**Get IP Address Automatically**” in the OnePage Setup.

- **Intranet** This section displays the current “**Private IP Address**” and “**Subnet Mask**” of the router, as seen by users of your internal network.
- **DHCP Clients Table** If the router is setup to act as a DHCP server, the LAN side IP Address distribution table will appear by clicking this button.

### 5-3 Log

The Log application provides the administrator with the ability to trace Internet connection. With viewing the Log information, an administrator can send the record to a specific LAN PCs to have the real time monitor.

- **Access Log** check the “**Enable**” option if you want to activate this function.
- **Send Log To** Enter the IP address of the PC that you wish to use to view the Log information.
- **View Log** Click this button to view the log on-line.
- **Send Log via E-mail** The Firewall log can be sent via e-mail.
- **Denial of Service Thresholds** The threshold is used to determine the attempt of establishing connection is DoS attack or not.
- **SMTP Mail Server** The domain name of IP Address of your ISP’s outgoing e-mail server. You may find this information when you apply for e-mail service from your ISP.
- **E-mail Alert to** Enter the e-mail address you wish to send to.
- **Return Address** Enter the e-mail address you wish to send to if the alert e-mail cannot be sent to the address above.

- **Log Schedule** Select from the drop down list that when you wish the alert e-mail will be send:

**When Log is Full** The alert e-mail will be sent when log space is full. They are about 30 entries.

**Hourly** The alert e-mail will be sent by each hour.

**Daily** The alert e-mail will be sent by each day at midnight.

**Weekly** The alert e-mail will be sent by each week. When this item is select.

- **Day of Sending Alert** When “Weekly” is selected as Log Schedule, you can select which day in a week to send the alert e-mail.

Click the “**Apply**” button after making any changes, or click the “**Cancel**” button to exit the screen without saving any changes.

## 5-4 Backup & Restore

This function allows you to save router’s configuration as backup, or retrieve the configuration file you saved before to turn the setting back.

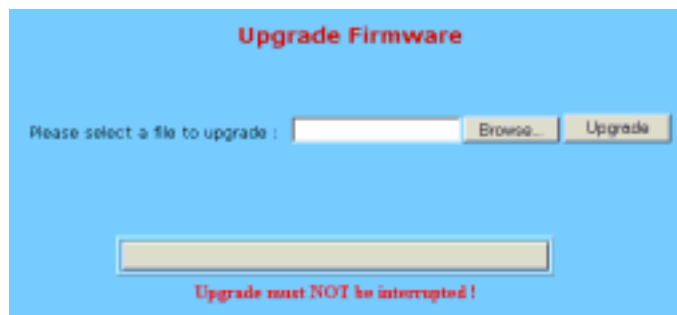


- **Backup** Click “Backup” button save the current configuration as a backup file.

- **Restore** Enter path of the configuration file you saved on the PC. You can choose “Browsing” to view the folders and select the file. Click “Restore” to retrieve it.

## 5-5 Upgrade Firmware

This setting page allows you to upgrade the latest version firmware to keep your router up-to-date. Before you upgrade the firmware, you have to get the latest firmware and save it on the PC you use to configure the router.



- **Select a file to upgrade** Enter path of the latest firmware you saved on the PC. You can choose “Browsing” to view the folders and select the firmware.
- **Upgrade** After you enter or select the path, click “Upgrade” to proceed firmware upgrade process. Please note that don’t power off the router during the firmware upgrading.

## 5-6 Diagnostic-Ping/Tracert

This function allows you to test the connection between router and LAN or between router and Internet.

## Ping

The screenshot shows a web-based interface titled "Diagnostic-Ping". It features several input fields for configuring a ping test: "Source IP" is a dropdown menu showing "192.168.1.1"; "Destination IP" is a text box with "192.168.1.0"; "Packet Number" is a text box with "1" and a range "(1 ~ 4)" in parentheses; "Packet Size" is a text box with "60" and a range "(60 ~ 1514)" in parentheses; "Time Between" is a text box with "1000" and "(milliseconds)" in parentheses; "Timeout" is a text box with "5000" and "(milliseconds)" in parentheses. Below these fields is a "Start" button. At the bottom, the "Ping Result" section displays "Pkt Sent: 0", "Pkt Recv: 0", and "Avg Rtt: 0".

- **Source IP** You can chose to issue the ping test from the LAN side by selecting Router's private IP Address or from the WAN side by selecting Router's WAN IP Address.
- **Destination IP** Enter the IP Address of destination device you want to ping. If Router's LAN IP address is selected as Source IP, you only can ping LAN side device and vice versa.
- **Packet Number** Enter the packet numbers you wish to use to ping the destination device. The maximum numbers are four.
- **Packet Size** Enter the numbers of packet size you wish to use to ping the destination device. The maximum packet sizes are 1514.
- **Time Between** Enter the numbers of time between two packets.
- **Time out** Enter the number of time regarding as no response after starting to ping the destination device.
- **Ping Result** The result will show the numbers of

sending packet, numbers of packet receiving, and the average return time.

### Tracert



- **Tracert Host** Enter the IP Address of destination device that you wish to trace the route between Router and that device. Click “Tracert” button to start this test.
- **Trace Message** The result show the routing information between Router and destination device.

## Chapter 6: Macintosh Setup

This chapter provides information on using Macintosh computers in your network. The instructions given here are for system software version 8.0 or above, which comes with the TCP/IP Protocol preloaded and supports DHCP Addressing.

### 6-1 Hardware Connections

Connect your Macintosh computer to your Advanced Wireless 11g Router. If you have a newer computer, there will be a Ethernet port on the back. Older computers will need to have an Ethernet card installed. See your computer's User's Manual for instructions on Ethernet card installation.

### 6-2 Computer Network Configuration

It is assumed that your computer's system software already has TCP/IP installed. You may manually configure your computer with a fixed IP Address or have an IP Address dynamically assigned to it by the Advanced Wireless 11g Router's DHCP server.

#### 6-2.1 Dynamic IP Addressing using DHCP Server.

1. From the **“Apple”** menu, select **“Control Panel”** and click on **“TCP/IP”**.
2. In the **“TCP/IP (A New Name For Your Configuration)”** window, select **“Ethernet”** in the **“Connect via”** location from the drop-down list.
3. In the **“Setup”** area:
  - Select **“Using DHCP Server”** in the **“Configure”** location from the drop-down list.
  - No other data needs to be entered.
  - Close the window.
4. Click **“Save”** from the file menu, then **“Quit”** TCP/IP.
5. Restart the computer.

## 6-2.2 Manual Configuration of Fixed IP Addresses

1. From the **“Apple”** menu, select **“Control Panel”** and click on **“TCP/IP”**.
2. In the **“TCP/IP (A New Name For Your Configuration)”** window, select **“Ethernet”** in the **“Connect via”** location from the drop-down list.
3. In the **“Setup”** area:
  - Select **“Manually”** in the **“Configure”** location from the drop-down list.
  - In the **“IP Address”** location, enter the IP Address that you want to assign to the computer. (see the notes on Fixed IP Addresses 2-4 above).
  - Enter **“255.255.255.0”** in the **“Subnet Mask”** location.
  - Enter **“192.168.1.1”** (the Advanced Wireless 11g Router’s default IP Address) in the **“Router Address”** location.
  - Enter the ISP’s IP Address in the **“Name Server”** location if your ISP has provided the information.
  - Close the window.
4. Click **“Save”** from the file menu then **“Quit”** TCP/IP.
5. Restart the computer.

## 6-3 Advanced Wireless 11g Router Configuration

To configure your Advanced Wireless 11g Router, use your Web Browser and follow the instructions given in Chapter 3: Internet Access, section 3.3. To configure advanced settings, see Chapter 4: Advanced Applications.

## 6-4 Adding Advanced Wireless 11g Router to Existing Network

If the Advanced Wireless 11g Router is to be added to an existing Macintosh computer network, the computers will have to be configured to connect to the Internet via the Advanced Wireless 11g Router.

1. From the **“Apple”** menu, select **“Control Panel”** and click on **“TCP/IP”**.
2. From the **“File”** menu, select **“Configurations”** and select your



existing network configuration. Click **“Duplicate”**.

3. Rename your existing configuration. Click **“OK”**, and **“Make Active”**.
4. In the Setup area:
  - Select **“Manually”** in the **“Configure”** location from the drop-down list.
  - In the **“IP Address”** location, enter the IP Address that you want to assign to the computer. (see the note on fixed IP Addresses 2-4 above).
  - Enter **“255.255.255.0”** in the **“Subnet Mask”** location.
  - Enter **“192.168.1.1”** (the Advanced Wireless 11g Router’s default IP Address) in the **“Router Address”** location.
  - Enter the ISP’s IP Address in the **“Name Server”** location if your ISP has provided the information.
  - Close the window.
5. Click **“Confirm”**. TCP/IP is now configured for manual IP Addressing.
6. Configure your Advanced Wireless 11g Router (see 5.3 above).

## Chapter 7: Trouble Shooting

This chapter provides solutions to problems you may encounter during installation and operation of your Advanced Wireless 11g Router.

### Hardware

**T:** The Power LED is off.

Check that the power cable is properly connected to the Advanced Wireless 11g Router, the power adapter and the socket.

**T:** The LAN Link LED is off.

Check that the computer, hub or switch is properly connected to the Advanced Wireless 11g Router.

Check that the computer's Ethernet card is properly installed.

Check that the Advanced Wireless 11g Router and the computer are on the same network segment. If you are not sure, initiate the DHCP function (4-1) and set your computer to obtain an IP address automatically (3-3).

Check that the computer is using an IP address in the range of 192.168.1.2 ~ 192.168.1.254 and is therefore compatible with the Advanced Wireless 11g Router's default IP address of 192.168.1.1 (3-3). Check also the Subnet Mask is set to 255.255.255.0

**T:** The DIAG LED stays lit.

The DIAG LED should light up when the device is first powered up to indicate it is checking for proper operation. After a few seconds, the LED should go off. If it stays lit, the device is experiencing a problem. Please contact your dealer.

**T:** Why can't I configure the Advanced Wireless 11g Router?

First, check whether the Advanced Wireless 11g Router is properly installed or not, including the LAN and WAN connections, and that all devices are switched on.

Next, check the IP configuration of your PC:

- For Windows 95/98 users: run Winipcfg.exe or Winipcfg from *Run* on the *Start* menu. If there are no IP addresses shown, click Release All and then click Renew All to get the IP addresses.

For Windows NT 4.0 users: run Ipconfig.exe or Ipconfig from *Run* on the *Start* menu and follow the instruction as above.

- Ensure that your PC and the Advanced Wireless 11g Router are on the same network segment. If you are not sure, initiate the DHCP function and set you PC to obtain an IP address automatically.
- Ensure that your PC is using an IP Address within the range 192.168.1.2 to 192.168.1.254 and thus compatible with the Advanced Wireless 11g Router default IP address of 192.168.1.1
- Finally, use the *Ping* command in MS-DOS mode to verify the network connection:
- *Ping* 127.0.0.1 to check the TCP/IP stack of your computer
- *Ping* gateway IP (Default: 192.168.1.1) to check the internal link of network.

Note if you're not able to view the web configuration screen for the Advanced Wireless 11g Router, make sure that you remove any proxy setting within your Internet browser, or remove the dial-up settings within your browser.

**T:** What can I do if I have forgotten the password for the Advanced Wireless 11g Router?

You have to reset the Broadband Gateway back to the factory default setting by pushing the Reset button for longer than 3 seconds. Refer to the user's manual to re-configure the settings.

**T:** I cannot access my ISP's home page, why?

Some ISPs, such as @Home, require that their host name be specifically configured into your computer before you can surf their local web pages. If you are unable to access your ISP's home page, enter your ISP's Domain Name into the OnePage Setup (3-3) to enable all computers in your LAN access to it. If you only want to allow computers to access these home pages, open the TCP/IP Properties window (2-4) on these computers, click the **"DNS Configuration"** tab and enter your ISP's Domain Name in the **"Domain Name Search Suffix"** location.

## **Client Side (Computers)**

**T:** I can't browse in the Internet via the Advanced Wireless 11g Router

Check that the LAN Link/ACT LED on the front panel is lit to indicate proper connection between the computer and the Advanced Wireless 11g Router.

Check if both ends of the network cable are properly connected.

Check that TCP/IP is installed on your computer (2-4).

For Windows 95/98, use a MS-Dos prompt to run “winipcfg” (“Ipconfig” for Windows NT). Check that the computer’s IP Address is within the range of 192.168.1.2 ~ 192.168.1.254 and the Subnet Mask is 255.255.255.0. If you are using a fixed IP address, also check the Default Gateway IP Address and DNS address in **“More”**.

Check that the values as stated above are the same in Status Monitor (4-7).

**T:** I get a time out error when I enter a URL or IP address.

Check whether other computers work. If they do, ensure the computer’s IP settings are correct (IP Address, Subnet Mask, Gateway IP Address and DNS) (3-3).

Check the Advanced Wireless 11g Router’s settings are correct (3-3).

## Appendix A: Frequently Asked Questions

**Q:** What is the maximum number of IP Addresses the Advanced Wireless 11g Router can support?

The Advanced Wireless 11g Router can support up to 253 IP Addresses in the range of 192.168.1.2~192.168.1.254.

**Q:** Where should the Advanced Wireless 11g Router be installed on the network?

In a typical environment, the Advanced Wireless 11g Router should be installed between the ADSL/Cable modem and your LAN. Connect the Advanced Wireless 11g Router to the Ethernet port of the ADSL/Cable modem, and connect your PCs to the RJ45 jack on the LAN side.

**Q:** Does the Advanced Wireless 11g Router support IPX or AppleTalk?

No. The Advanced Wireless 11g Router was designed to provide a multiple user LAN with shared Internet access and supports only the TCP/IP Protocol. If your Novell or Apple system is configured with TCP/IP, the Advanced Wireless 11g Router can support them.

**Q:** Does the Advanced Wireless 11g Router support 100Mb Ethernet?

Yes, the Advanced Wireless 11g Router supports both 10Mb & 100Mb Ethernet on the LAN side.

**Q:** What is "NAT" and what is it used for?

The Network Address Translation (NAT) Protocol translates multiple IP Addresses on a private LAN into a single public IP Address that is accessible to the Internet. NAT not only provides the basis for multiple IP Address sharing but also adds to the LAN's security since the multiple IP Addresses of LAN computers are never transmitted directly to the Internet.

**Q:** How can Advanced Wireless 11g Router share single user account to multiple users?

Advanced Wireless 11g Router combines the following technologies to enable this function.

NAT (Network Address Translation): NAT is a technology which can create a private network domain behind a public IP. It is usually used as a firewall. It can also be used when there are not enough IP Address.

DHCP (Dynamic Host Configuration Protocol): DHCP is a protocol used to assign IP Address to internal computers automatically. It can save a lot of IP configuration. This protocol is supported by Windows 95/NT, Mac OS, and many other popular OS.

DNS (Domain name service): DNS is a protocol which translates a Domain Name to IP Addresses that Internet host can handle. Addressing systems using Domain name, like www.yahoo.com, is easier to use than an IP address, such as 204.71.177.70.

**Q:** What operating systems does Advanced Wireless 11g Router series support?

Advanced Wireless 11g Router uses standard TCP/IP protocol, it can be operated as long as you have the TCP/IP protocol installed in your operating system (For example: Windows 9x, Windows NT, Windows 2000, etc.)

**Q:** Can I use multiple E-mail accounts if I use Advanced Wireless 11g Router?

Yes, you can. Some people think having one Internet account mean that they can only have one E-mail account. However, E-mail is set by mailbox accounts and is different to the account you use to connect to your ISP. If you want more E-mail accounts, you should contact your ISP or you can browse the Internet to apply for a free E-mail account.

**Q:** Can Internet users access LAN computers?

Advanced Wireless 11g Router uses NAT to router all in/out packets. All external users can only see the IP of the Advanced Wireless 11g Router but cannot access LAN computers. The LAN computers are well protected with the Advanced Wireless 11g Router's natural firewall.

**Q:** When should I use DMZ host?

Enable DMZ host when you want to have unrestricted communication between your PC and the Internet, for example, playing Internet games (i.e. Ages of Empire) or having multimedia conferences (i.e. NetMeeting).

**Q:** Does the Advanced Wireless 11g Router support PPTP or VPN packets pass through?

Yes. Advanced Wireless 11g Router supports single session PPTP pass through.

**Q:** Does the Advanced Wireless 11g Router series support IPsec?

Yes. Advanced Wireless 11g Router supports single session IPsec pass through.

## **Appendix B: Technical Specifications**

### **Standards Compliance**

IEEE 802.3 10BASE-T

IEEE 802.3u 100BASE-TX

IEEE 802.11g Wireless

### **Interface**

One 10/100Mbps Ethernet RJ45 port on WAN

Four 10/100Mbps auto-sensing Ethernet RJ-45 ports and one uplink port on LAN

Wireless access point

### **Management**

Web-based UI Management

### **LED Display**

Power / DMZ / DIAG

Enable/Activity for Wireless interface

Link/Activity for both WAN and LAN port(s)

Full Duplex/Collision for WAN and LAN port(s)

100 for WAN and LAN port(s)

### **Environment**

Operation Temperature: 0 ~ 45 degrees C (32 ~ 113 degrees F)

Storage Temperature: -20 ~ 65 degrees C (-4 ~ 149 degrees F)

Humidity: 0 ~ 90% non-condensing

### **Dimension**

150 (L) x 190 (W) x 39 (H) mm

### **Power**

External, DC 5V, 2A

### **Mounting**

Desktop / Wall-mounting

## Appendix C: Configuring IPSec between a Microsoft Windows 2000 or XP PC and Broadband VPN Router

This document illustrates the steps of Microsoft Windows 2000 (or XP) PC establishing a secure IPSec tunnel with this **Broadband VPN Router**. You can find detailed information on configuring the Microsoft Windows 2000 server at the Microsoft website:

Microsoft KB Q252735 - How to Configure IPSec Tunneling in Windows 2000  
<http://support.microsoft.com/support/kb/articles/Q252/7/35.asp>

Microsoft KB Q257225 - Basic IPSec Troubleshooting in Windows 2000  
<http://support.microsoft.com/support/kb/articles/Q257/2/25.asp>

### C-1 Environment

#### Windows XP or Windows 2000

IP Address: 140.111.1.2 (*Note: ISP provided IP Address; this is only an example.*)

Subnet Mask: 255.255.255.0

#### Broadband VPN Router

WAN

IP Address: 140.111.1.1 (*Note: ISP provided IP Address, this is only an example.*)

Subnet Mask: 255.255.255.0

LAN

IP Address: 192.168.1.1

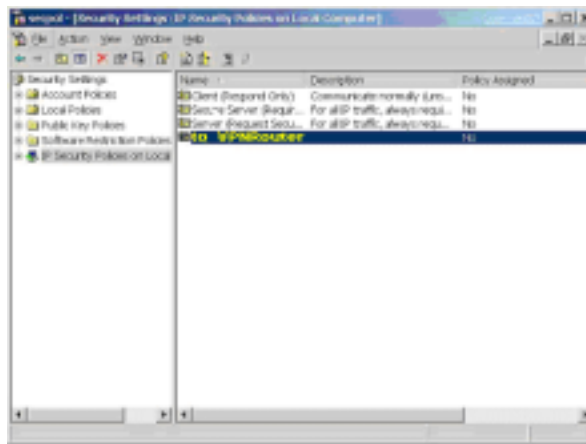
Subnet Mask: 255.255.255.0

### C-2 Steps in Windows 2000/XP

#### C-2.1 Create IPSec Policy

1. Click **Start** button, select **Run**, and type **secpol.msc** in the **open** field.
2. Right-click **IP Security Policies on Local Computer**, and then click **Create IP Security Policy**.
3. Click **Next**, and then type a name for your policy (for example, "to\_VPNRouter").
4. Deselect the **Activate the default response rule** check box, and then click **Next** button.
5. Click the **Finish** button, making sure the **Edit** check box is checked.

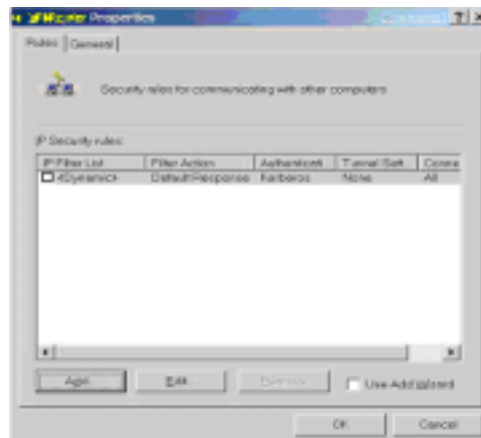




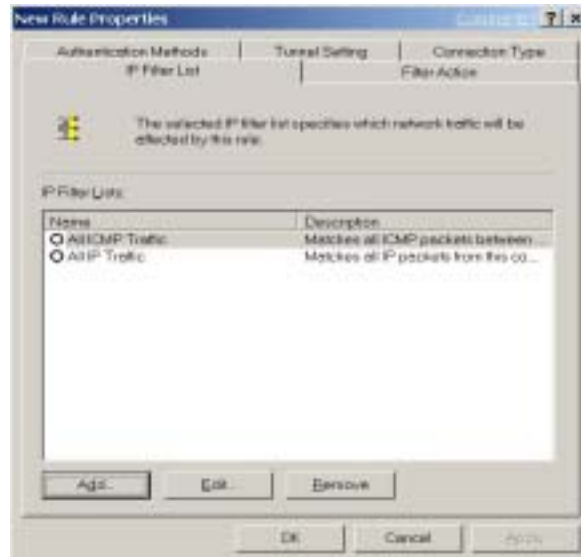
## 7-2.2 Build 2 Filter Lists: “WinXP→Broadband VPN Router” and “Broadband VPN Router→WinXP”.

### [Filter List 1] WinXP→ Broadband VPN Router

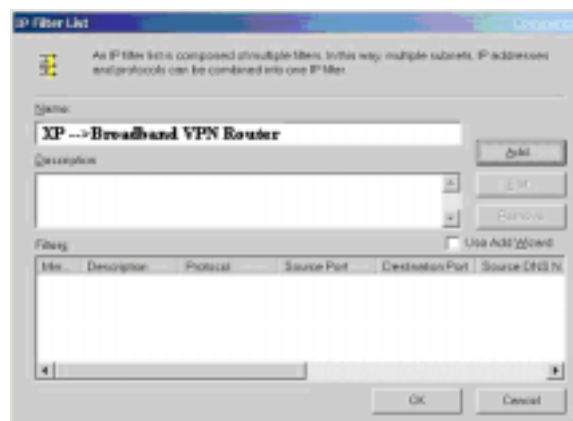
1. In the **to\_VPNRouter Properties**, deselect the **Use Add Wizard** check box, and then click **Add** button to create a new rule.



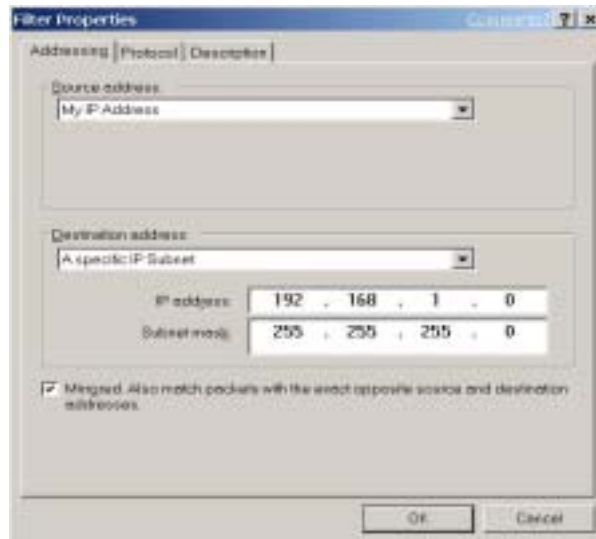
2. From the **IP Filter List** tab, click the **Add** button.



3. Type an appropriate name **“XP→Broadband VPN Router”** for the filter list, deselect the **Use Add Wizard** check box, and then click **Add** button.



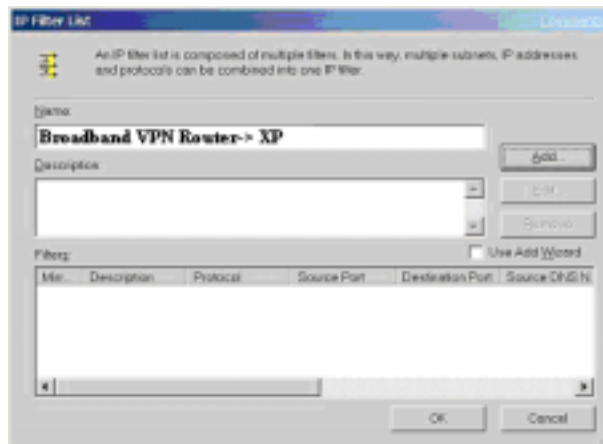
4. In the **Source address** area, click **My IP Address**.
5. In the **Destination address** field, select **A specific IP Subnet**, and fill in the **IP Address “192.168.1.0”** and **Subnet mask “255.255.255.0”**.



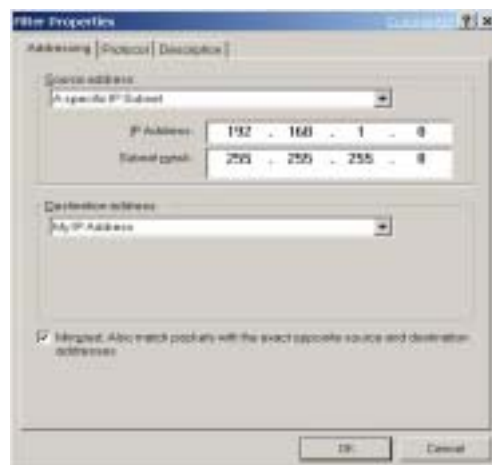
6. If you want to type a description for your filter, click the **Description** tab.
7. Click **OK** button. Then click **OK**(for WinXP) or **Close** (for Win2000) button on the **IP Filter List** Window.

#### **[Filter List 2] Broadband VPN Router→WinXP**

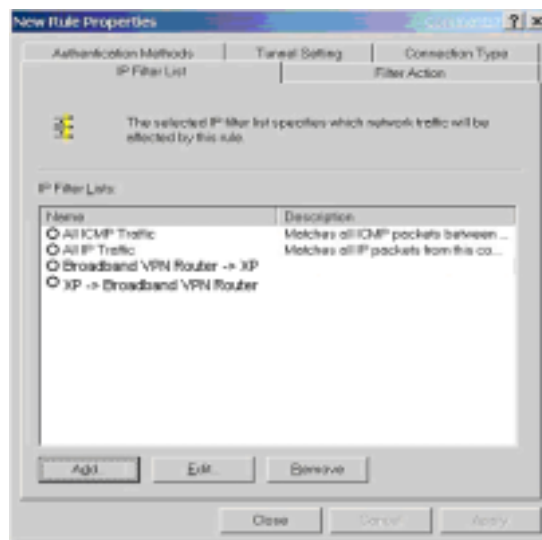
8. On the **IP Filter List** tab, click the **Add** button.
9. Type an appropriate name "**Broadband VPN Router→XP**" for the filter list, click to clear the **Use Add Wizard** check box, and then click **Add**.



10. In the **Source address** area, click **A specific IP Subnet**, and fill in the **IP Address** “**192.168.1.0**” and **Subnet mask** “**255.255.255.0**”.
11. In the **Destination address** area, click **My IP Address**.

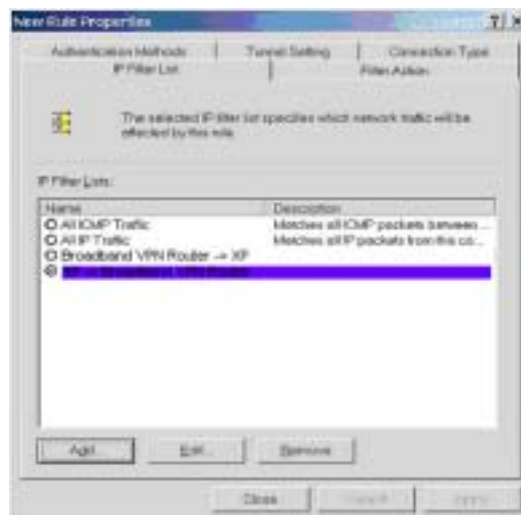


12. If you want to type a description for your filter, click the **Description** tab.
13. Click **OK**, and then click **OK**.



### 7-2.3 Configure Individual Rule of 2 Tunnels [Tunnel 1] WinXP→Broadband VPN Router

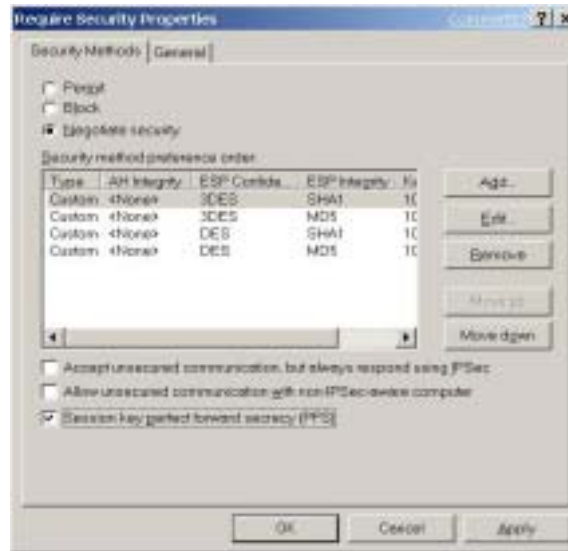
1. From the **IP Filter List** tab, click the filter list “**XP→Broadband VPN Router**”.



2. From the **Filter Action** tab, click the filter action “**Require Security**”, and click the **Edit** button.



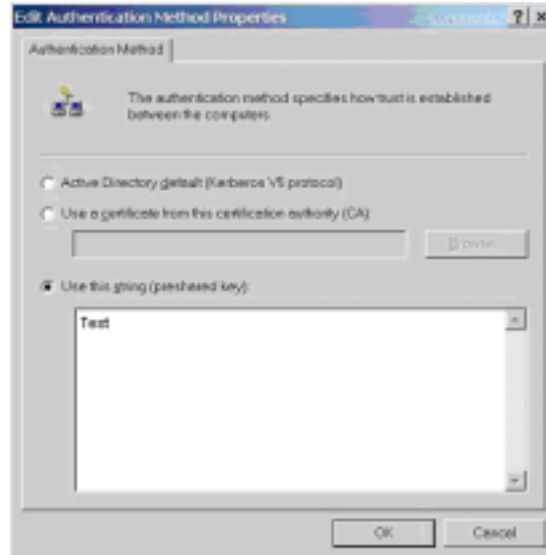
3. Check that the **Negotiate security** option is enabled, and deselect the **Accept unsecured communication**, but **always respond using IPsec** check box.
4. Select the **Session key Perfect Forward Secrecy (PFS)** and remember to check the **PFS** option on the **Broadband VPN Router**, and then click the **OK** button.



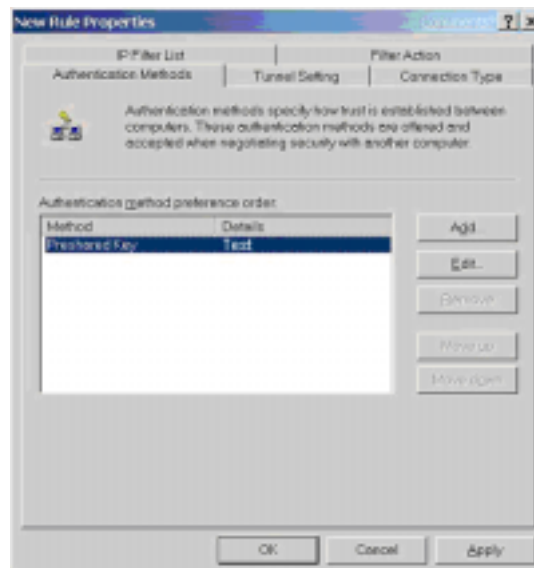
5. From the **Authentication Methods** tab, click the **Edit** button.



6. Change the authentication method to **“Use this string (pre-shared key)”**, enter the string **“Test”**, and then click the **OK** button.



This new Preshared key will be displayed in **Authentication method preference order**. Click the **OK** button to continue.



7. From the **Tunnel Setting** tab, click **The tunnel endpoint is specified by this IP Address** box, and then type the WAN



IP Address “**140.111.1.1**”(Note: *ISP provided IP Address; this is only an example.*)of **Broadband VPN Router**.

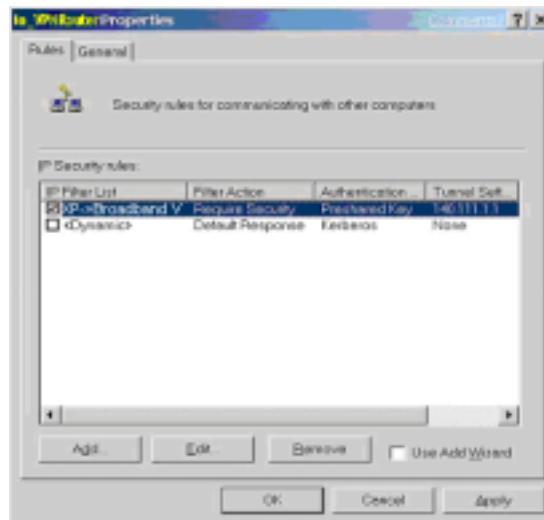


8. From the **Connection Type** tab, select **All network connections**, and then click the **OK** or **Close** button to finish this rule.



**[Tunnel 2] Broadband VPN Router→ WinXP**

9. In the **to\_VPNRouter Properties**, deselect the **Use Add Wizard** check box, and then click the **Add** button to create the second IP Filter.



10. On the **IP Filter List** tab, click the filter list “**Broadband VPN Router→XP**”.



11. From the **Filter Action** tab, click the filter action “**Require Security**”.



12. From the **Authentication Methods** tab, click the **Edit** button.

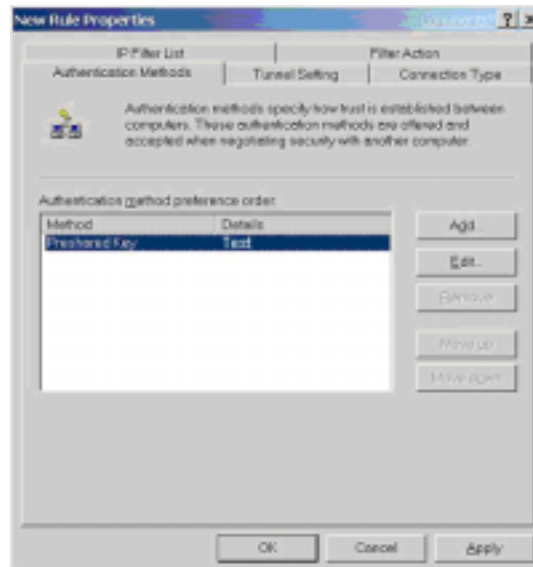


13. Change the authentication method to “**Use this string (preshared key)**”, enter the string “**Test**”, and then click the **OK** button.



This new Preshared key will be displayed in **Authentication**

**method preference order.** Click the **OK** button to continue.



14. From the **Tunnel Setting** tab, click **The tunnel endpoint is specified by this IP Address** box, and then type the Windows 2000/XP IP Address “**140.111.1.2**”.

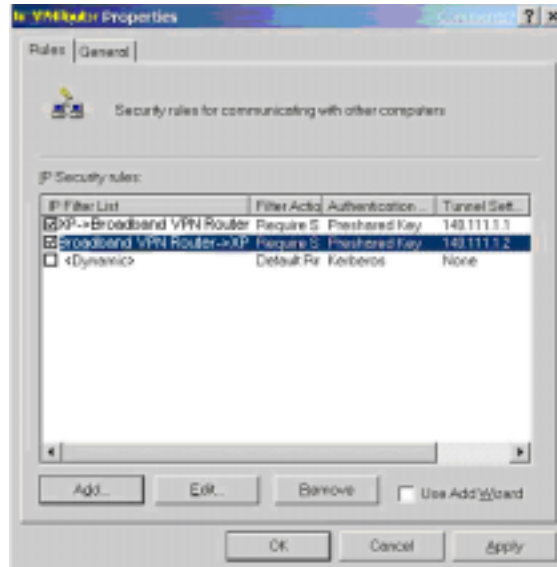


15. From the **Connection Type** tab, select **All network**

**connections**, and then click the **OK**(for WinXP) or **Close**(for Win2000) button to finish.

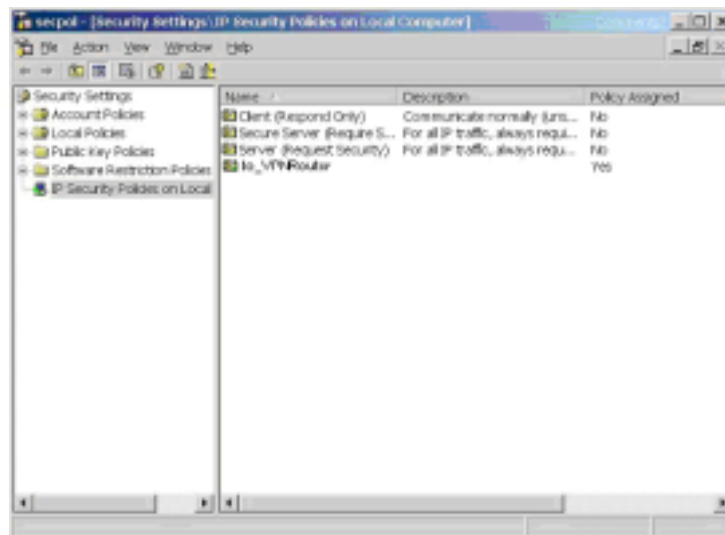


16. From the **Rules** tab, click the **OK** button to back to the **secpol** screen.



## 7-2.4 Assign New IPsec Policy

1. In the **IP Security Policies on Local Computer** MMC snap-in, right-click policy named **“to\_VPNRouter”**, and then click **Assign**. A green arrow appears in the folder icon.



## **Appendix D: Glossary**

### **10Base-T / 100Base-T**

The adaptation of the Ethernet standard for Local Area Networks (LANs). 10Base-T uses a twisted pair cable with maximum lengths of 100 meters and transmits data at 10Mbps maximum. 100Base-T is similar, but uses two different twisted pair configurations and transmits at 100Mbps maximum.

### **Ad-hoc Network**

Also known as the peer-to-peer network, an ad-hoc network allows all PCs participating in a wireless network and being within range, to communicate with each other. User's in the same ad-hoc network can share files, printers, and other network resources.

### **Adapter**

A device that makes the connection to a network segment, such as Ethernet and modem cards and adapters.

### **ADSL**

Asymmetric Digital Subscriber Line (ADSL), as its name indicates, is an asymmetrical data transmission technology with higher traffic rate downstream and lower traffic rate upstream. ADSL technology satisfies the bandwidth requirements of applications which demand "asymmetric" traffic, such as web surfing, file downloads and telecommuting.

### **Bandwidth**

The amount of data that can be transmitted in a fixed amount of time.

### **Browser**

A software application used to locate and display Web pages. Examples include Netscape Navigator and Microsoft Internet Explorer.

### **BSS**

BSS is the acronym of Basic Service Set that consists of a wireless access point and a group of wireless client PCs.



## **Communication Protocols**

Communication between devices requires they agree on the format in which the data is to be transmitted, sent and received. The communication protocols are a set of rules that define the data format.

### **Cookie**

A Cookie is a piece of data stored on your PC that a web server can retrieve later to identify your machine. It is normally a text with ID number, but can include other information.

### **DHCP**

DHCP, short for Dynamic Host Configuration Protocol, is a protocol for assigning dynamic IP Addresses to devices on a network. Dynamic Addressing means that a device can have a different IP Address each time it connects to the network.

### **Domain Name**

A name that identifies one or more IP Addresses. For example, the domain name microsoft.com represents about a dozen IP Addresses. Domain names are used in URLs to identify particular Web pages. For example, in the URL <http://www.pcwebopedia.com/index.html>, the domain name is pcwebopedia.com.

### **DoS**

DoS is the abbreviation for Denial of Service. This occurs when a computer or network is overwhelmed to the point that it can no longer function normally. For example, a hacker may use fake IP addresses to accumulate numerous connections to flood the server he wants to attack.

### **DDNS**

DDNS is an acronym for Dynamic Domain Name Service. It helps map the domain name of a host which has a dynamic public IP address to the IP address that **is** allocated each time the ISP assigns a new IP address.

### **DNS**

Short for Domain Name Server, DNS translates domain names into IP Addresses and help us recognize and remember domain names as they are alphabetic in form. The Internet actually runs on numbered IP Addresses. DNS

servers translate domain names into their respective IP Addresses.

### **DSSS**

Also known as Direct Sequence Spread Spectrum, it is a radio transmission method that continuously changes frequencies.

### **Ethernet**

One of the most common Local Area Network (LAN) protocols. Ethernet uses a bus topology which supports a data transfer rate of 10 Mbps.

### **ESS**

ESS is an acronym for Extend Service Set that consists of several BSS's.

### **Firewall**

A security system used to enforce an access control policy between an organisation's networks and the Internet.

### **IEEE**

Short for Institute of Electrical and Electronics Engineers, an organization best known for developing standards for the computer and electronics industry.

### **Internet**

A global network connecting millions of computers for the exchange of data, news and opinions.

### **Intranet**

A network based on the TCP/IP Protocol (an internet) belonging to an organization, and accessible only by that organization's members, employees, or others with authorization.

### **Infrastructure Network**

Unlike "Ad-hoc" network, where users on a wireless LAN send data to each other directly, users' on an "Infrastructure" network send data to the other point through a dedicated access point. Additionally, the access point enables users on a wireless LAN to

access an existing wired network to take advantage of sharing the wired networks resources, such as files, printers, and Internet access.

### **IP Address**

An identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP Protocol route messages based on the IP Address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be from zero to 255.

### **IPSec**

Internet Protocol Security is a security standard for network transmission. It provides authentication and packet encryption over the Internet.

### **ISP**

Short for Internet Service Provider, a company that provides access to the Internet, usually for a monthly fee. The ISP provides a software package, username, password and access phone number allowing users to log on to the Internet, browse the World Wide Web and send and receive e-mail.

### **Local Area Network (LAN)**

A computer network that spans a relatively small area. Most LANs are confined to a single building or group of buildings. However, one LAN can be connected to other LANs over any distance via telephone lines and radio waves. A system of LANs connected in this way is called a wide area network (WAN)

### **MAC Address**

Short for Media Access Control Address and in a hardware address that uniquely identifies each node of a network.

### **NAT**

Short for Network Address Translation, a routing protocol that allows global IP Addresses to be translated into multiple private IP Addresses for use on internal LAN networks. The explosion in the use of the Internet has created a critical problem for the Internet Assigned Numbers Authority (IANA) which is in charge of assigning IP Addresses to Internet users, ISPs etc.. NAT is a technology that has been introduced to help maximize the utilization of

assigned IAN and global IP Addresses.

### **Network Protocol**

Network protocols encapsulate and forward data packets from one interface to another.

### **PAP/CHAP ISP**

Short for Password Authentication Protocol and Challenge Handshake Authentication Protocol. Most ISPs use either one for user identification. If your ISP doesn't support these two protocols, contact your ISP for an authentication script.

### **PPP**

Short for Point-to-Point Protocol, a communications protocol for transmitting information over standard telephone lines between devices from different manufacturers.

### **PPPoE**

Short for PPP over Ethernet, relying on two widely accepted standards, Ethernet and the Point-to-Point Protocol. It's a communications protocol for transmitting information between devices from different manufacturers over an Ethernet.

### **PPTP**

Short for Point to Point Tunneling Protocol, PPTP encapsulates the packet for transmission over the Internet. It is similar to creating a private "tunnel" over a large public network and has almost equal security to a private network without actually leasing a private line.

### **Protocol**

An agreed format for transmitting, sending and receiving data between two devices.

### **Roaming**

The ability for a wireless device moving from one access point's range to another without losing the connection.

## **Router**

An Internet device that routes requests for information to other routers until the information's location is found and the data can be transmitted back to the origin of the request.

## **SPI**

SPI is an acronym for Stateful Packet Inspection. The SPI engine examines not just the headers of the packet, but also the packet contents, it can then determine more about the packet than just its source and destination information. Moreover, stateful inspection firewalls also close off ports until a connection to the specific port is requested.

## **TCP/IP**

Short for Transmission Control Protocol and Internet Protocol, the suite of communications protocols that enable hosts on the Internet to connect and exchange streams of data.

## **VPN**

VPN is an acronym for Virtual Private Network. Via access control and encryption, VPN brings the same security to data transmission through the Internet as if it being transmitted through a private network. It not only takes advantage of economies of scale but also ensures high level security while the packet is sent over the large public network.

## **Wide Area Network (WAN)**

A system of LANs being connected by telephone lines and radio waves. Although some WANs may be privately owned, they are usually considered a means of public access.

## **WEP**

An acronym for **Wired Equivalent Privacy**. It is an encryption mechanism used to protect your wireless data communications. WEP uses a combination of 64-bit/128-bit keys to encrypt data that is transmitted between all points in a wireless network to insure data security. It is described in the IEEE 802.11 standard.

61NB-WB361-200