Wireless 802.11n 4 Ports ADSL2/2+ Router User Manual

Copyright

Trademarks

FCC Radiation Norm

This equipment has been tested and found to comply with limits for a Class B digital device pursuant to 47 CFR, Part 2 and Part 15 of the Federal Communication Commission (FCC) rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference
2. This device must accept any interference received including interferences that may cause undesired operations.

CE Radiation Norm

This equipment has been tested and found to comply with the limits of the European Council Directive 99/5/EC on the approximation of the law of the member states relating to EN 300 328 V1.4.1 (2003-04), EN 301 489-1 V1.4.1 (2002-08) and EN 301 489-17 V1.2.1 (2002-08) and EN 60950.

FCC & CE Compliance Statement

These limits are designed to provide reasonable protection against radio interference in a residential environment. This equipment can generates, uses and radiate radio frequency energy and, if not installed and used in accordance with 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 ON and OFF, the user is encouraged to try to reduce the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connect to
- Consult a dealer or an experienced technician for assistance

CAUTION!

The Federal Communication Commission warns the user that changes or modifications to the unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Contents

Chapter 1 Introduction

Congratulations on your purchase of this outstanding 4-Ports 11n Wireless ADSL2/2+ Router. This device is an IEEE 802.11n Wireless and 4 Port Switch built-in ADSL 2/2+ Router that allows ADSL/ADSL2/ADSL2+ connectivity while providing Wireless LAN capabilities for residential, industries and SOHO environments. Wireless 11n is the 300Mbps wireless networking standard that's almost 5 times faster than the widely deployed Wireless-G or the so-called 11g products found in homes, businesses, and public wireless hotspots around the world.

ADSL2/2+ is a transmission technology used to carry user data over a single twisted-pair line between the Central Office and the Customer Premises. The downstream data rates can go up to 24 Mbps and the upstream data rates can go up to 1Mbps with length reach up to 22Kft for ADSL2/2+ connection and 300Mbps transfer data rate for the 11n connection. This device allows ADSL2/2+ connectivity while providing Wireless LAN capabilities for home or office users. This asymmetric nature lends itself to applications such as Internet access and video delivery. With minimum setup, you can install and use the router within minutes.

1.1 Features

- **ADSL Standards Compliance**
  - Full rate ANSI T1.413 Issue2, ITU-T G.992.1 and ITU-T G.992.2 standards compliant.
  - ITU G.992.3, ITU G.992.5 ADSL2/2+ standards compliant.
  - Support Annex M and Annex L specification.
  - Downstream and Upstream data rates up to 24Mbps and 1Mbps.

- **ATM and PPP Protocols**
  - Support ATM AAL0, AAL2 & AAL5.
  - Support ITU-T I.610 OAM F4/F5.
  - Support up to 8 PVCs.
  - Multiple Protocols over AAL5 (RFC 2684 / RFC 1483).
  - Support Bridged and Routed Ethernet Encapsulation.
  - Support VC and LLC based Multiplexing.
  - Support PPPoA (RFC 2364) standard.
  - Support PPPoE (RFC 2516) standard.
  - Traffic classes: UBR, CBR and VBR-rt, VBR-nrt.

- **Network Protocols & Features**
  - IP Routing – RIPv1 and RIPv2.
  - Support Static Routing.
  - DHCP Server, Relay and Client.
  - Support DNS Relay.
  - Support DDNS features.
  - Support SNMP functionality.
  - Support IP QoS features.
  - Support IGMP functionality
  - Support IP Filter and MAC Filter functionality.
  - URL Blocking feature supported.
  - Support Port Forwarding features.
  - Support DMZ functionality.
  - Support NAT and NAPT (PAT) functionality with extensive ALG supported.
  - Support VPN Pass-Through.
  - Built-in Firewall features.

- **Bridging**
  - Support IEEE 802.1d Transparent Bridging.
  - Support IGMP Snooping.
  - Support MAC Learning Address features.

- **IEEE 802.11n Wireless Standards**
  - IEEE 802.11n/g/b standards compliant.
  - Support data rates up to 300Mbps (Auto-Rate Capable).
  - Support OFDM (64QAM, 16QAM, QPSK, BPSK) and DSSS (DBPSK, DQPSK, CCK) modulation.
  - Support WEP/WPA/WPA2/802.1X Encryption for data security.
  - Support Wireless Access Control functionality.
  - Support Hidden SSID.
  - Support WDS features.
  - Support WPS features.
  - Support 2.412GHZ ~ 2.484GHz frequency ranges.

- **Management**
  - Web-based Configuration / Management.
  - Support FTP/TFTP/Telnet Management / Configuration.
  - Support Remote Access Management / Configuration.
  - Firmware upgrade and Reset to default via Web management.
  - Restore factory default setting via Web or hardware reset button.
  - WAN and LAN connection statistics.
  - Support Password Authentication.
  - Device System Log.
  - Built-in Diagnostic Test.

- **UPnP**
  - Support UPnP functionality.

- **Ethernet Standards**
  - Built-in 4 Ports 10/100Mbps Ethernet Switch which compliant with IEEE 802.3x standards
  - Automatic MDI/MDI-X crossover for 100BASE-TX and 10BASE-T ports.
  - Auto-negotiation and speed-auto-sensing support.
  - Port based VLAN supported in any combination.

1.2 Scope

This document provides the descriptions and usages for the 4 Ports 11n Wireless ADSL2/2+ Router's Web pages that are used in the configuration and setting process. Both basic and advanced descriptions and concepts are discussed. To help the reader understand more about these Web pages, some questions and answers (Q&A) are appended after the definition of each Web page along with the appendices at the end of the guide.

1.3 Audience

This document is prepared for use by those customers who purchase the 4 Ports 11n Wireless ADSL2/2+ Router and using the provided or embedded firmware. It assumes the reader has a basic knowledge of ADSL/ADSL2/ADSL2+ Wireless and networking.

1.4 Document Structure

Chapter 1: Introduction, provides a brief introduction to the product and user guide.

Chapter 2: Knowing The 4 Ports 11n Wireless ADSL2/2+ Router, provides device specifications and hardware connection mechanism.

Chapter 3: Setting Up TCP/IP in Windows, provides Windows system Network's configurations.

Chapter 4: Device Administration, describes the pages found under the Admin menu. These pages allow the user to view, change, edit, update, and save the 4 Ports 11n Wireless ADSL2/2+ Router's configurations or settings.

Appendix A: Router Terms, provides an introduction to basic Router Terms.

Appendix B: Frequently Asked Questions, is a compilation of useful questions regarding the 4 Ports 11n Wireless ADSL2/2+ Router.

Appendix C: Troubleshooting Guide, is a compilation of questions and answers relating to common problems dealing with Windows networking and the 4 Ports 11n Wireless ADSL2/2+ Router Configurations.

Appendix D: UPnP Setting, provides UPnP configurations procedures under Windows XP.

Appendix E: Glossary, provides definitions of terms and acronyms of this 4 Ports 11n Wireless ADSL2/2+ Router.

1.5 System Requirement

Check and confirm that your system confirm the following minimum requirements:

- Personal computer (PC/Notebook).
- Pentium III compatible processor and above.
- Ethernet LAN card or IEEE 802.11n/g/b Wireless adaptor installed with TCP/IP protocol.
- 64 MB RAM or more.
- 50 MB of free disk space (Minimum).
- Internet Browser.
- CD-ROM Drive.

1.6 Packet Contents

The 4 Ports 11n Wireless ADSL2/2+ Router package contains the following items:

- One 4 Ports 11n Wireless ADSL2/2+ Router
- One Power Adapter
- One RJ-11 ADSL Cable
- One CAT-5 Ethernet Cable
- One CD-ROM (Driver / Manual / Quick Setup Guide)

If any of the above items are damaged or missing, please contact your dealer immediately.

Chapter 2 Knowing The 4 Ports 11n Wireless ADSL2/2+ Router

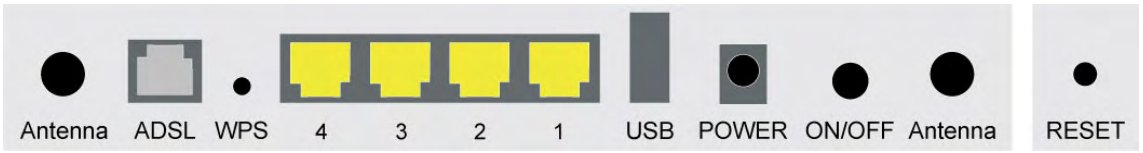
2.1 Front Panel

The 4 Ports 11n Wireless ADSL2/2+ Router's LEDs indicators display information about the device's status.

PWR	Lights up when 4 Ports 11n Wireless ADSL2/2+ Router is powered on.
1	Blinking when Port 1 of this 4 Ports 11n Wireless ADSL2/2+ Router is sending or receiving data.
2	Blinking when Port 2 of this 4 Ports 11n Wireless ADSL2/2+ Router is sending or receiving data.
3	Blinking when Port 3 of this 4 Ports 11n Wireless ADSL2/2+ Router is sending or receiving data.
4	Blinking when Port 4 of this 4 Ports 11n Wireless ADSL2/2+ Router is sending or receiving data.
WLAN	Lights up when Wireless system is ready. Blinking when router is sending or receiving data via wireless
ADSL	Lights up when a successful ADSL2/2+ connection is established. Blinking when it is attempting to make an ADSL connection with ISP.
INTERNET	Lights up when connection is established to Internet.
WPS	Blinking when WPS is in progress.

2.2 Back Panel

The back panel of the 4 Ports 11n Wireless ADSL2/2+ Router contains ADSL, Ethernet Switches, Reset, Power Adapter connection and 2.4GHz Dipole Antenna connector.



ADSL	Port for connecting to the ADSL2/2+ Service Provider.
WPS	Wi-Fi Protected Setup button
Ports 1~4	Four 10/100Mbps Ethernet Ports for connecting to the network devices
USB(option)	USB host for connecting portable HDD
Power	Power adapter connector.
ON/OFF	Power ON/OFF Switch
Antenna	2.4GHz Dipole Antenna.

RESET Button:
Reboot & Restore the 4 Ports 11g Wireless ADSL2/2+ Router to factory defaults.

To **"Reset"** the 4 Ports 11n Wireless ADSL2/2+ Router to factory defaults:

- Ensure that the device is powered on.
- Press the Reset button for more than 5 seconds and release. Wait for 30 seconds after release the Reset button. Do not power off the device during the reset process.
- The default settings are now restored after 30 seconds.

To **"Reboot"** the 4 Ports 11n Wireless ADSL2/2+ Router:

- Ensure that the device is powered on.
- Press the Reset button for 2~5 seconds and release. Wait for 30 seconds after release the Reset button.

To setup **WPS** via WPS button:

- Press the WPS button for 2 seconds and release. The Wireless LED will be blinking to establish WPS connection.

2.3 Connection Mechanism

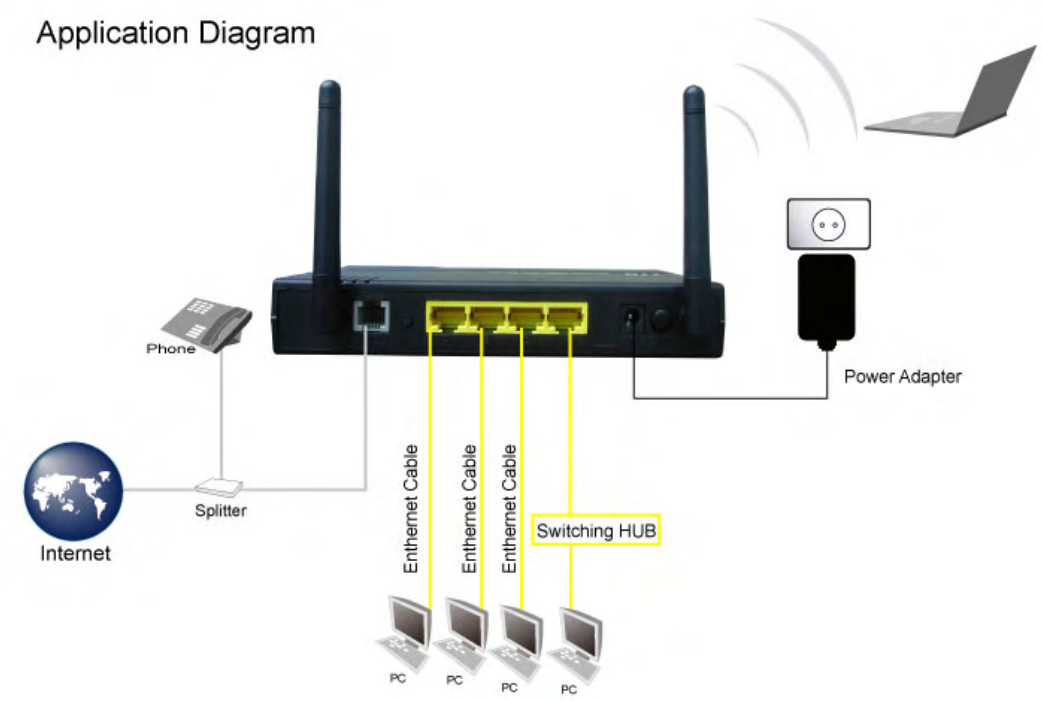
This section describes the hardware connection mechanism of 4 Ports 11n Wireless ADSL2/2+ Router on your Local Area Network (LAN) connected to the Internet, how to configure your 4 Ports 11n Wireless ADSL2/2+ Router for Internet access or how to manually configure your Internet connection.

You need to prepare the following items before you can establish an Internet connection through your 4 Ports 11n Wireless ADSL2/2+ Router:

1. A computer/notebook which must have an installed Ethernet Adaptor and an Ethernet Cable, or
2. A computer/notebook which have Wireless-b or Wireless-g wireless adaptor properly installed.
3. ADSL/ADSL2/ADSL2+ service account and configuration information provided by your Internet Service Provider (ISP). You will need one or more of the following configuration parameters to connect your 4 Ports 11n Wireless ADSL2/2+ Router to the Internet:

    a. VPI/VCI parameters
    b. Multiplexing Method or Protocol Type or Encapsulation Type
    c. Host and Domain Names
    d. ISP Login Name and Password
    e. ISP Domain Name Server (DNS) Address
    f. Fixed or Static IP Address.

Figure below shows the overall hardware connection mechanism of your 4 Ports 11n Wireless ADSL2/2+ Router.



Following are the steps to properly connect your 4 Ports 11n Wireless ADSL2/2+ Router:

1. Turn off your computer/notebook.
2. Connect the ADSL port of your 4 Ports 11n Wireless ADSL2/2+ Router to the wall jack of the ADSL/ADSL2/ADSL2+ Line with a RJ-11 cable.
3. Connect the Ethernet cable (RJ-45) from your 4 Ports 11n Wireless ADSL2/2+ Router (Switch) to the Ethernet Adaptor in your computer.
4. Connect the Power adaptor to the 4 Ports 11n Wireless ADSL2/2+ Router and plug it into a Power outlet.

The Power light will lit after turning on the 4 Ports 11g Wireless ADSL2/2+ Router.

Use the Power Adaptor exclusively in combination with the equipment supplied and do not use any other kind of power adaptor for the equipment.

5. Turn on your computer.
6. Refer to the next section to setup or configure your system's Network Adaptor.

Chapter 3 Setting up the TCP/IP in Windows

The instruction in this chapter will help you configure your computers to be able to communicate with this 4 Ports 11n Wireless ADSL2/2+ Router.

Computers access the Internet using a protocol called TCP/IP (Transmission Control Protocol/ Internet Protocol). Each computer/notebook on your network must have TCP/IP installed and selected as its networking protocol. If a Network Interface Card (NIC) is already installed in your PC, then TCP/IP is probably already installed as well.

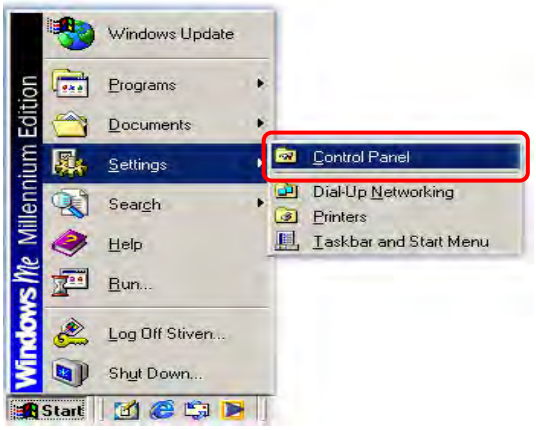
The following description assumes 4 Ports 11n Wireless ADSL2/2+ Router been set to factory default. (If not, please hold the reset button down for 5~10 seconds). The default of the 4 Ports 11n Wireless ADSL2/2+ Router's LAN IP is **192.168.1.1**.

Follow the procedures below to set your computer/notebook function as a **DHCP Client**.

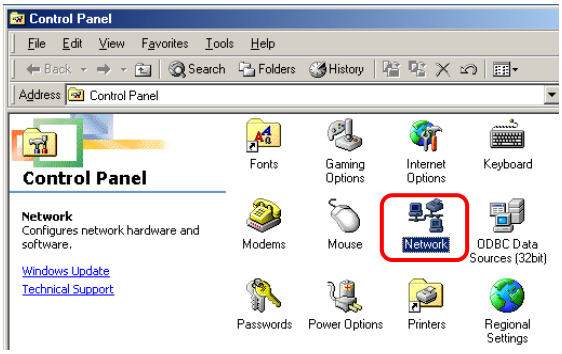
Restart and Reboot your Windows system might be necessary after setting your computer function as a DHCP Client. In order to properly activate your choice, click "OK" to restart your Windows system.

3.1 Windows ME / 98

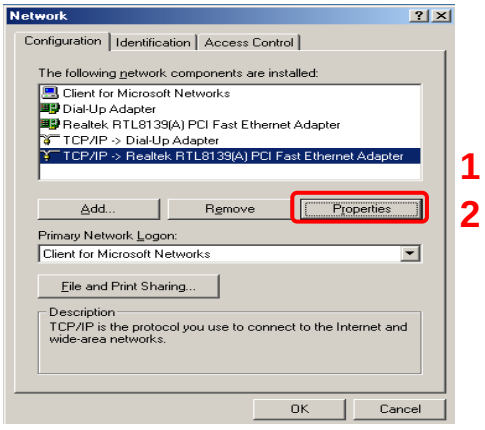
Step 1: Click **Start→Settings→Control Panel**.



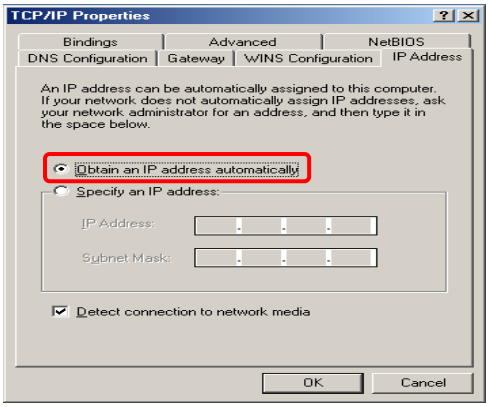
Step 2: Double-click the **Network** icon.



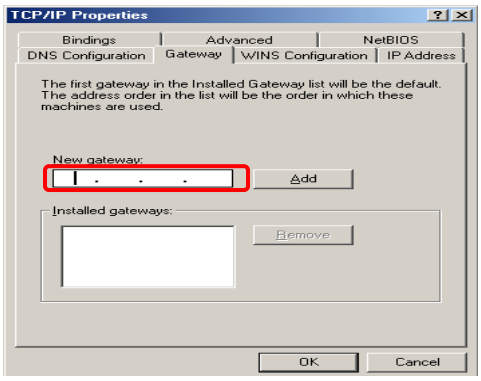
Step 3: Go to Configuration icon, select network adapter installed and click **Properties**.



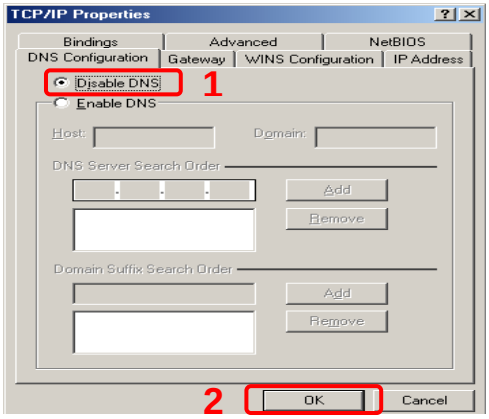
Step 4: Go to IP Address icon and select **Obtain an IP address**.



Step 5: Go to Gateway icon and erase all previous setting.

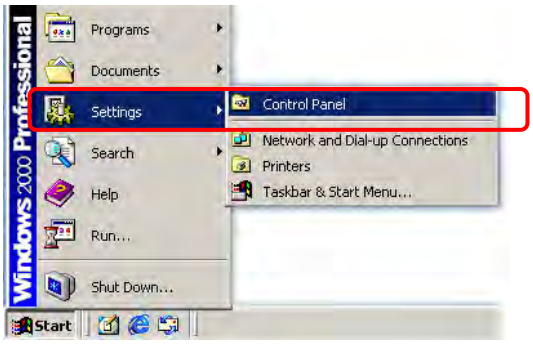


Step 6: Go to DNS Configuration icon, select **Disable DNS** and click **OK**.

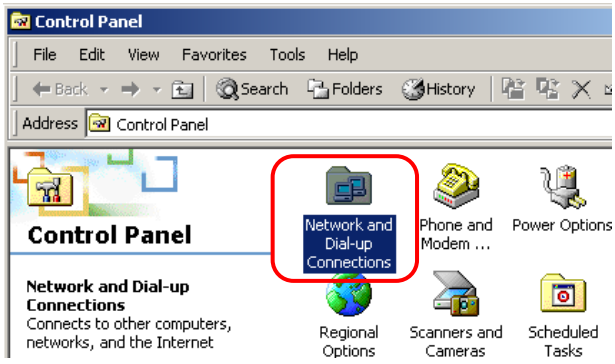


3.2 Windows 2000

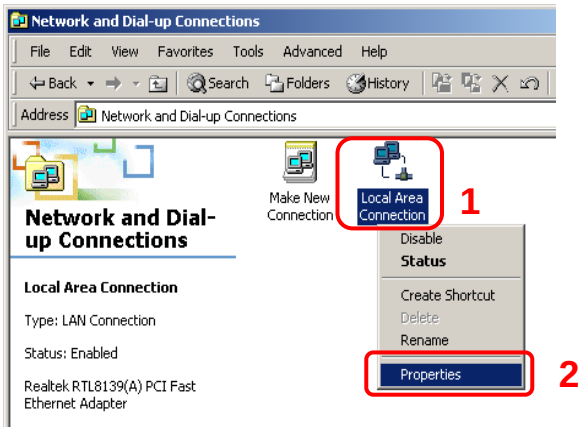
Step 1: Click **Start→Settings→Control Panel**.



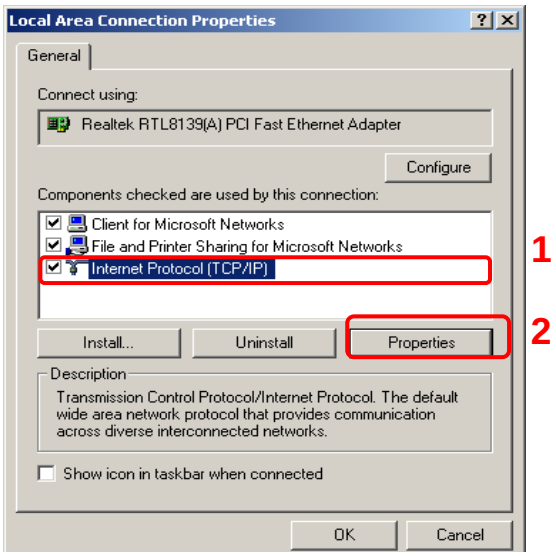
Step 2: Double-click the **Network and Dial-up Connections**.



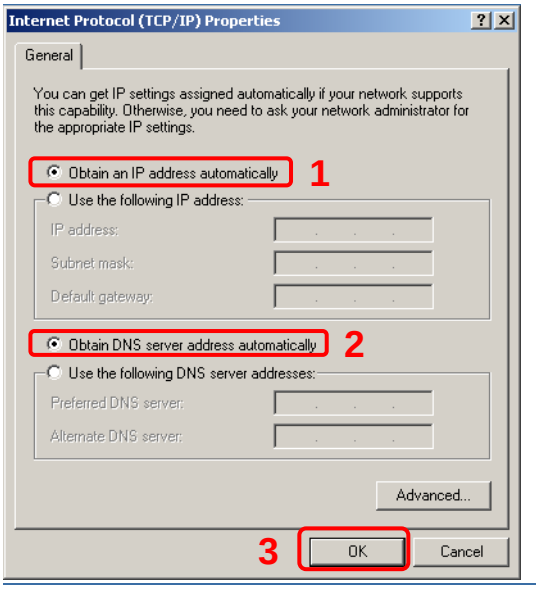
Step 3: Right Click the **Local Area Connection** and select **Properties**.



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

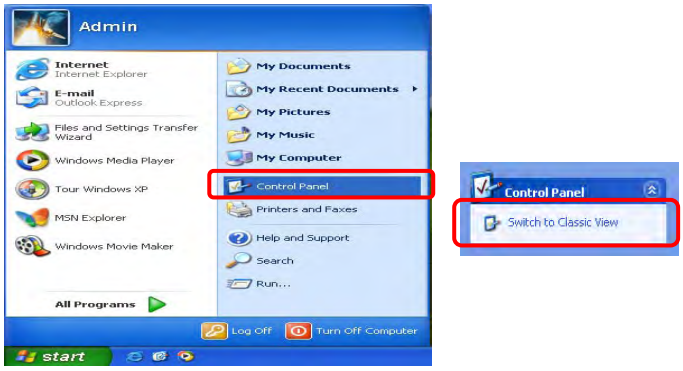


Step 5: Select **Obtain an IP address automatically** and **DNS server address automatically.** Then, click **OK**.

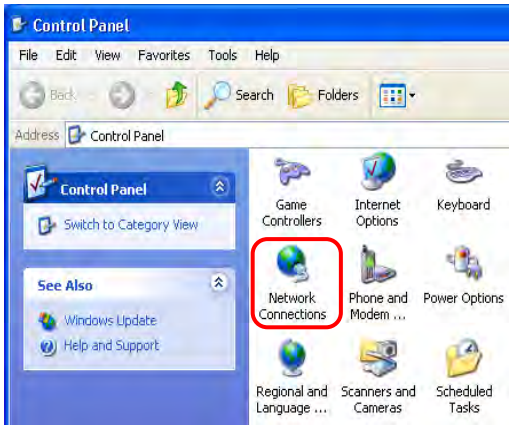


3.3 Windows XP

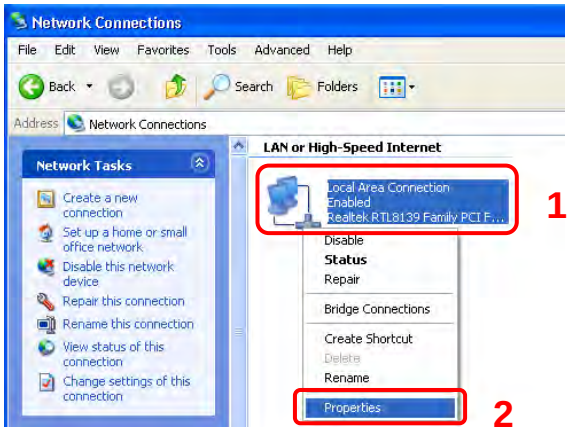
Step 1: Click **Start→Control Panel→Classic View**.



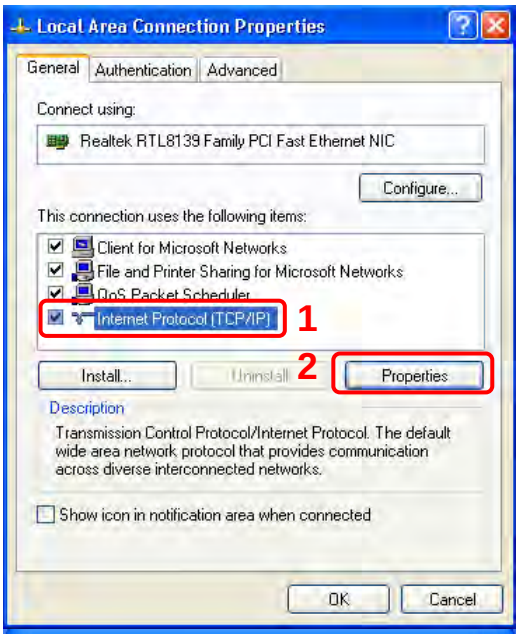
Step 2: Double-click the **Network Connections**.



Step 3: Right Click on the **Local Area Connection** and select **Properties**.

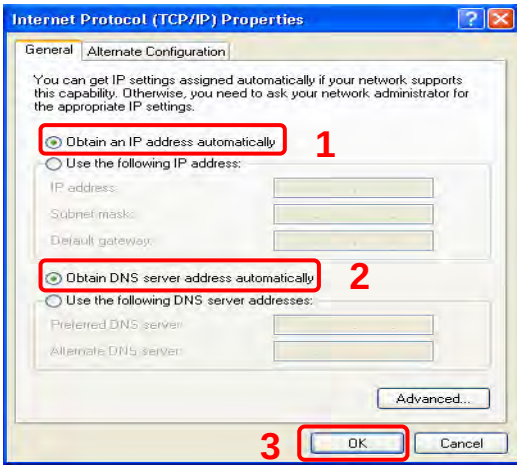


Step 4: Go to General icon, select **Internet Protocol (TCP/IP)** and click **Properties**.



Step 5: Go to General icon, select **Obtain an IP address automatically** and **DNS server address automatically**.

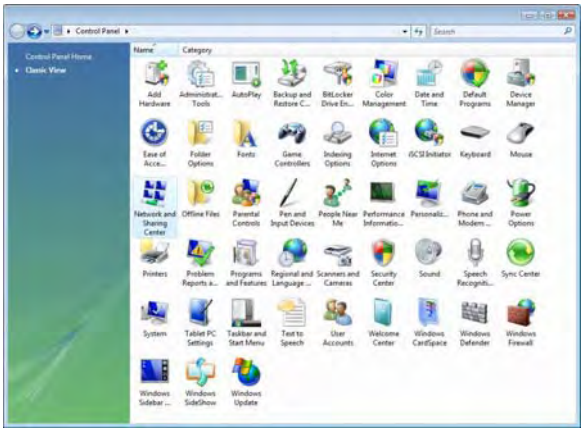
Then, click OK**.**



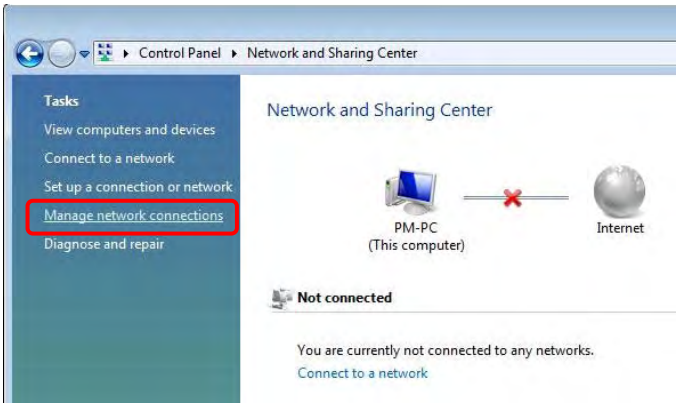
3.4 Windows Vista

Step 1: Click **Start→Control Panel**.

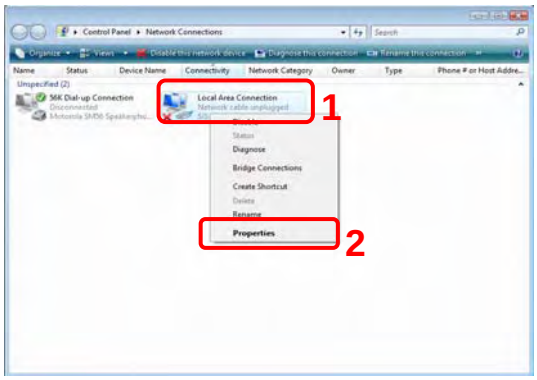
Step 2: Double-click the **Network and Sharing Center**.



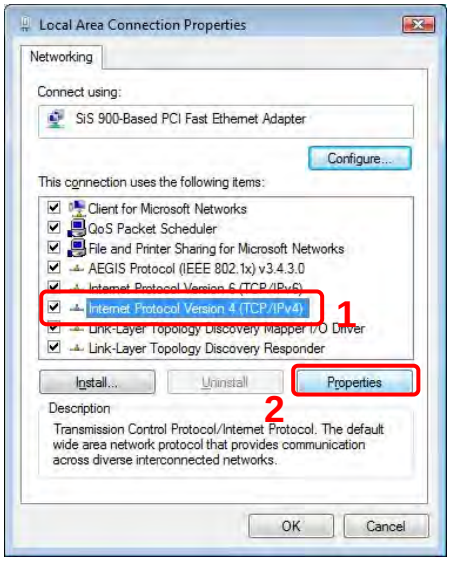
Step 3: Click on the **Manage network connections**.



Step 4: Right Click on the **Local Area Connection** and select **Properties**.

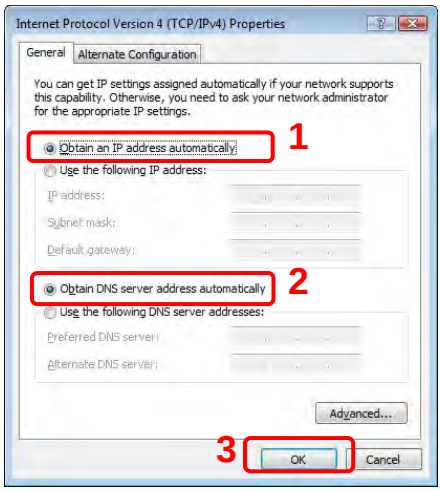


Step 5: Go to General icon, select **Internet Protocol Version 4 (TCP/Ipv4)** and click **Properties**.



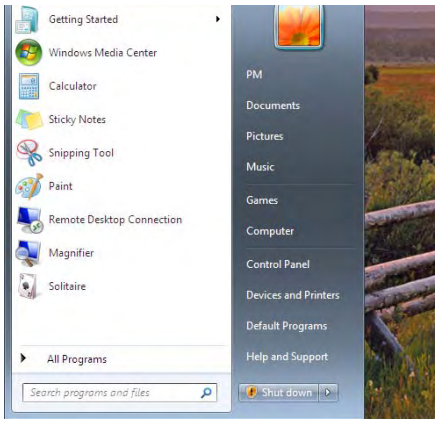
Step 6: Go to General icon, select **Obtain an IP address automatically** and **DNS server address automatically**.

Then, click OK**.**

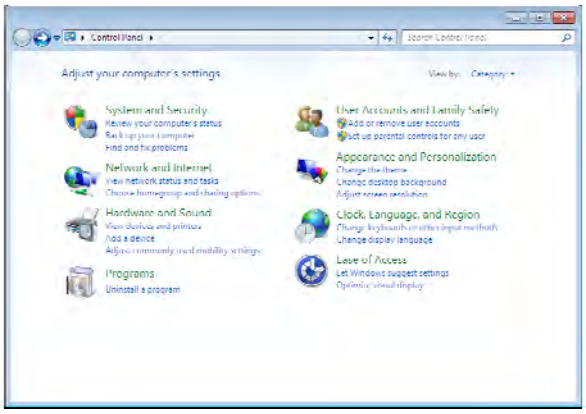


3.5 Windows 7

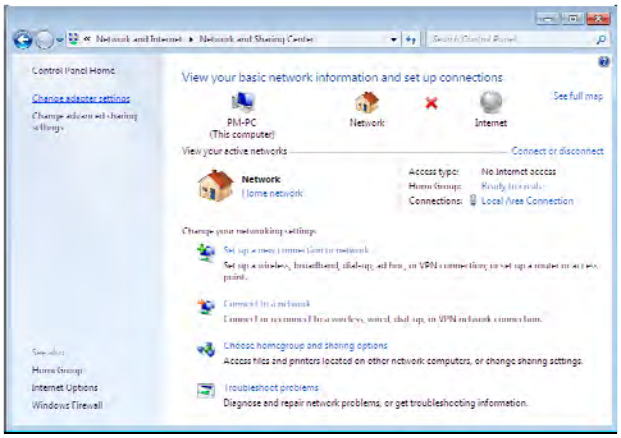
Step 1: Click **Start→Control Panel**.



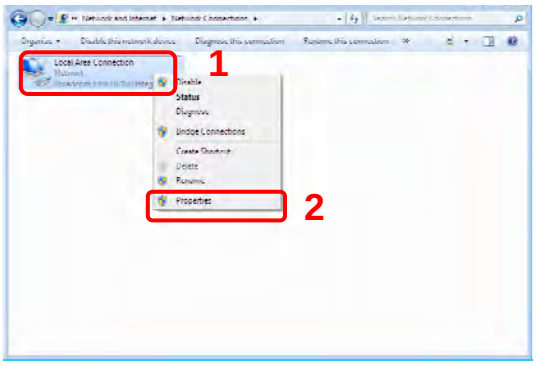
Step 2: Click the **View network status and tasks**.



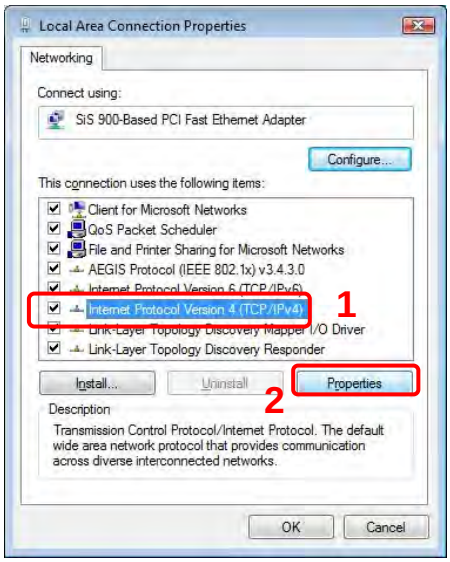
Step 3: Click on the **Change adapter settings**.



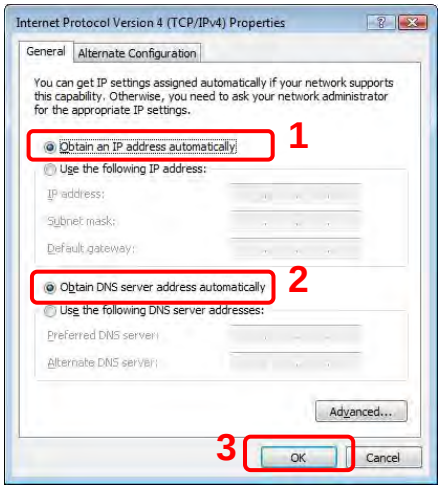
Step 4: Right click on the **Local Area Connection** and select **Properties**.



Step 5: Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.



Step 6: Go to General icon, select **Obtain an IP address automatically** and **DNS server address automatically**.



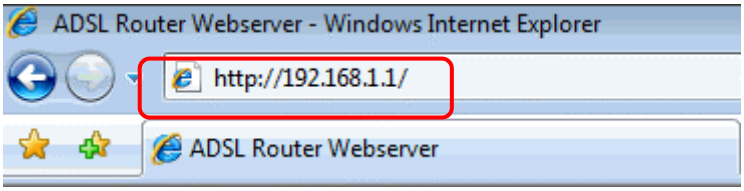
Chapter 4 Device Administration

For your convenience, an Administrative Utility has been programmed into 4 Ports 11n Wireless ADSL2/2+ Router. This chapter will explain all the functions in this utility. All the 4 Ports 11n Wireless ADSL2/2+ Router based administrative tasks are performed through this web utility.

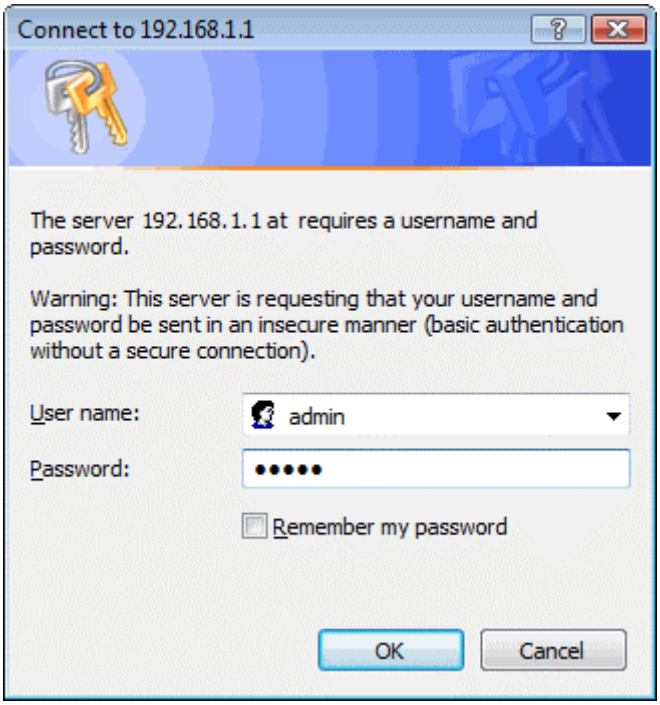
4.1 Login

To access the 4 Ports 11n Wireless ADSL2/2+ Router Configuration screens, follow the following steps will enable you to log into the 4 Ports 11n Wireless ADSL2/2+ Router:

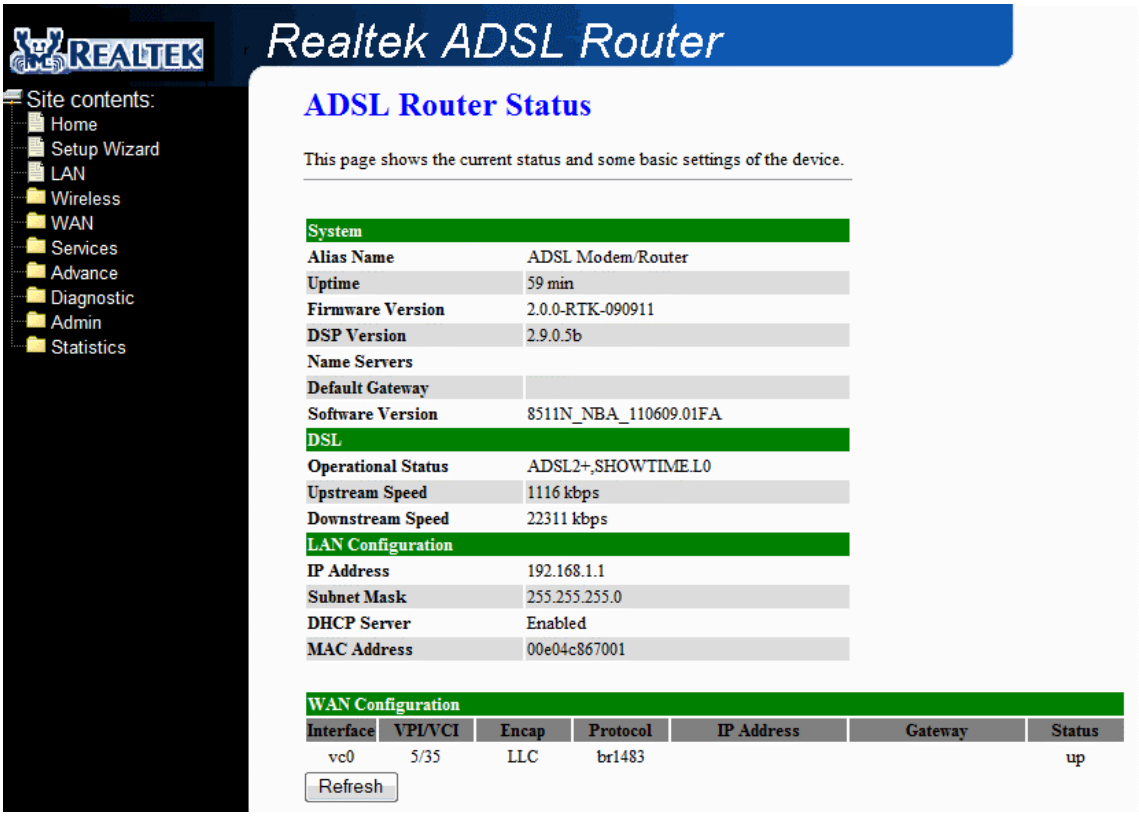
1. Launch your web browser, and enter the 4 Ports 11n Wireless ADSL2/2+ Router's IP Address: **"192.168.1.1"** in the address field then press the **"Enter"** key to login.



2. Enter your password in the Password text box. For an admin user, the default password is "**admin**".



3. Upon entering the address into the web browser, the system **HOME** page with all the device information will pop up as shown in following Figure:



This page displays the ADSL modem/router's current status and settings. This information is read-only except for the PPPoE/PPPoA channel for which user can connect/disconnect the channel on demand. Click the "Refresh" button to update the status

Function buttons in this page:

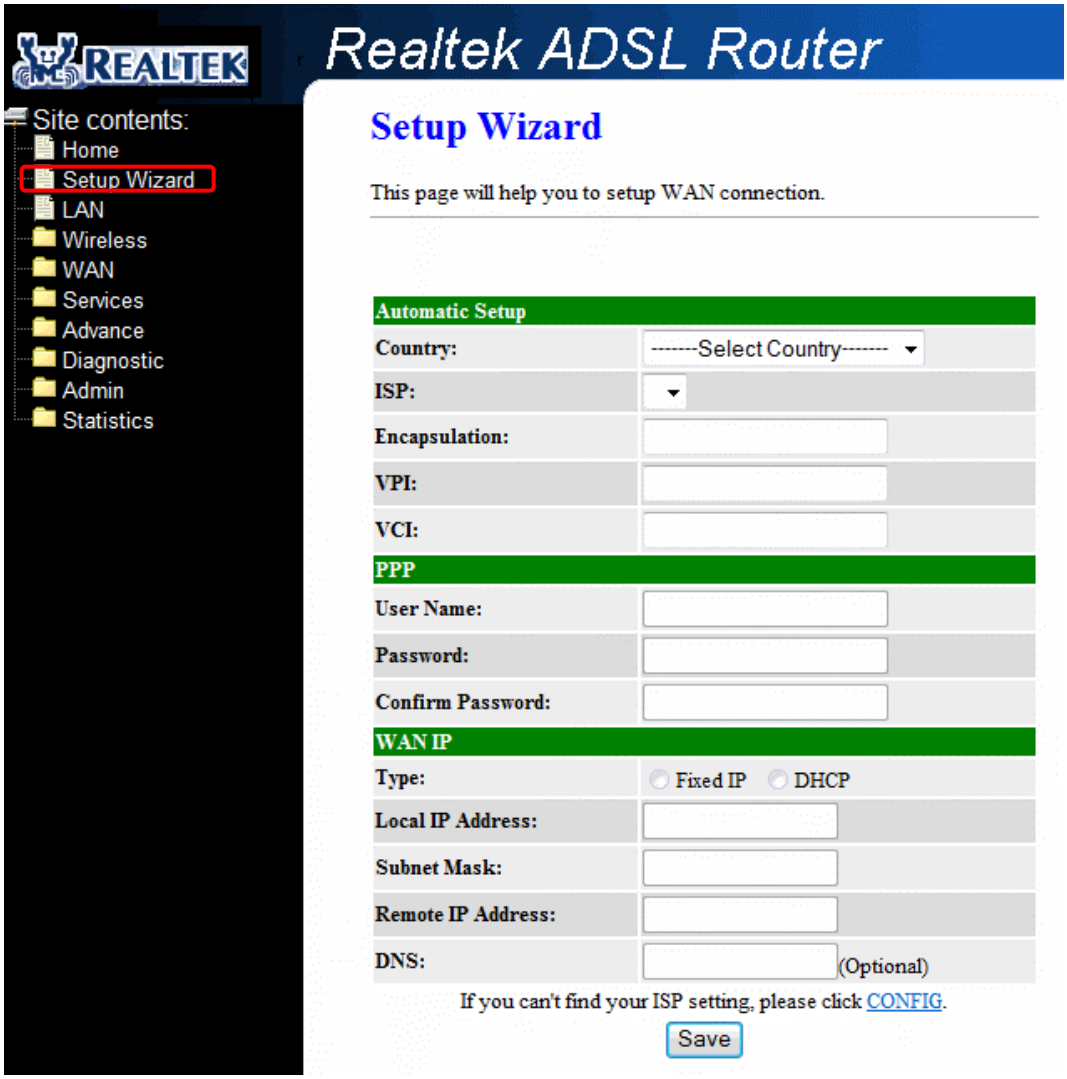
Connect / Disonnect

The two buttons take effect only when PVC is configured as PPPoE/PPPoA mode. Click Connect/Disconnect button to connect/disconnect the PPP dial up link.

4.2 Setup Wizard

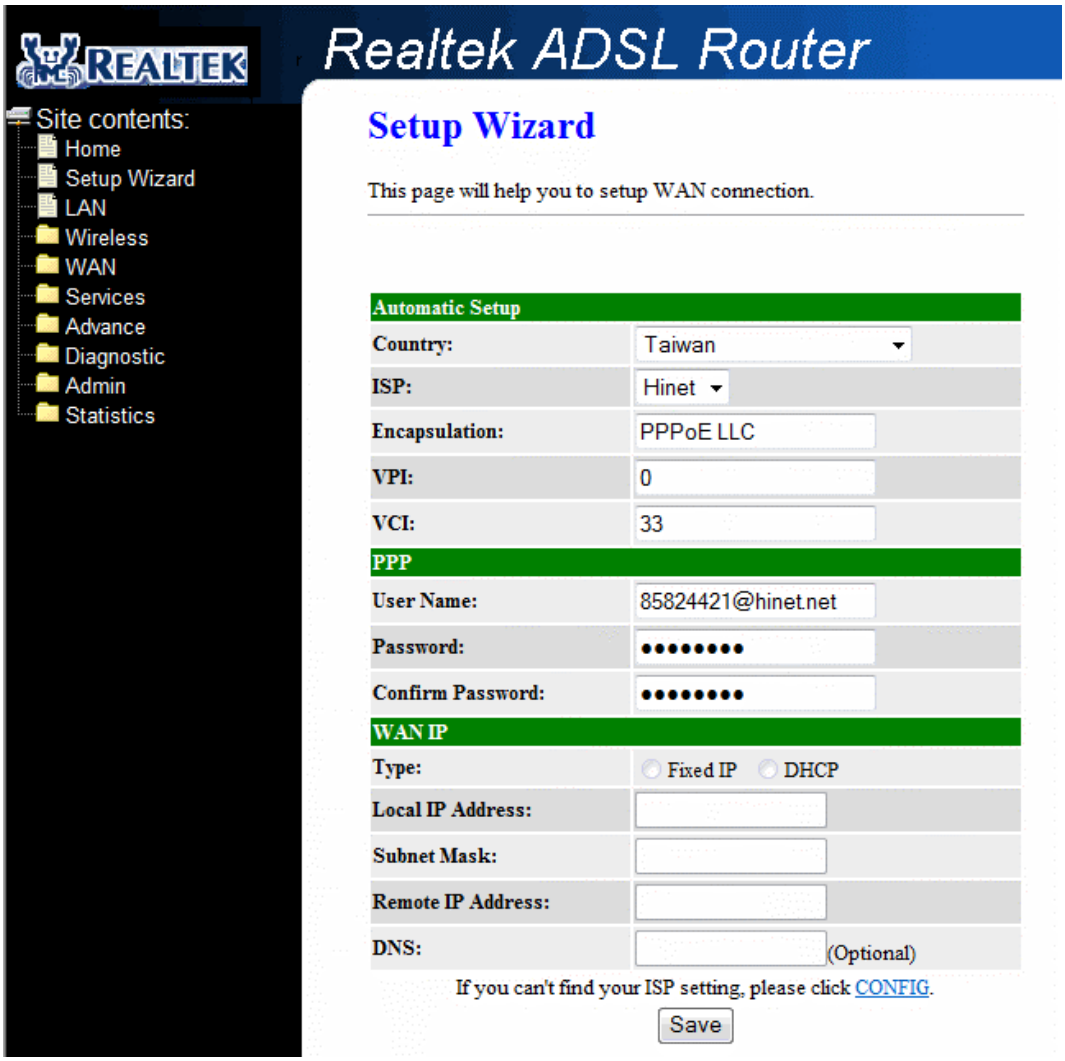
The **Setup Wizard** is a presetting wizard which meant to help you install the 4 Ports 11n Wireless ADSL2/2+ Router quickly and easily.

Click on **"Setup Wizard"** and the following screen will pop-up:



Follow the **"Steps"** describe below to complete your installation.

Step 1: Select your country from the **Country** list and the ADSL service provider from the **ISP** List (If there are more than two ISP in your country) and note the **"Encapsulation"** type and **"VPI & VCI"** setting.

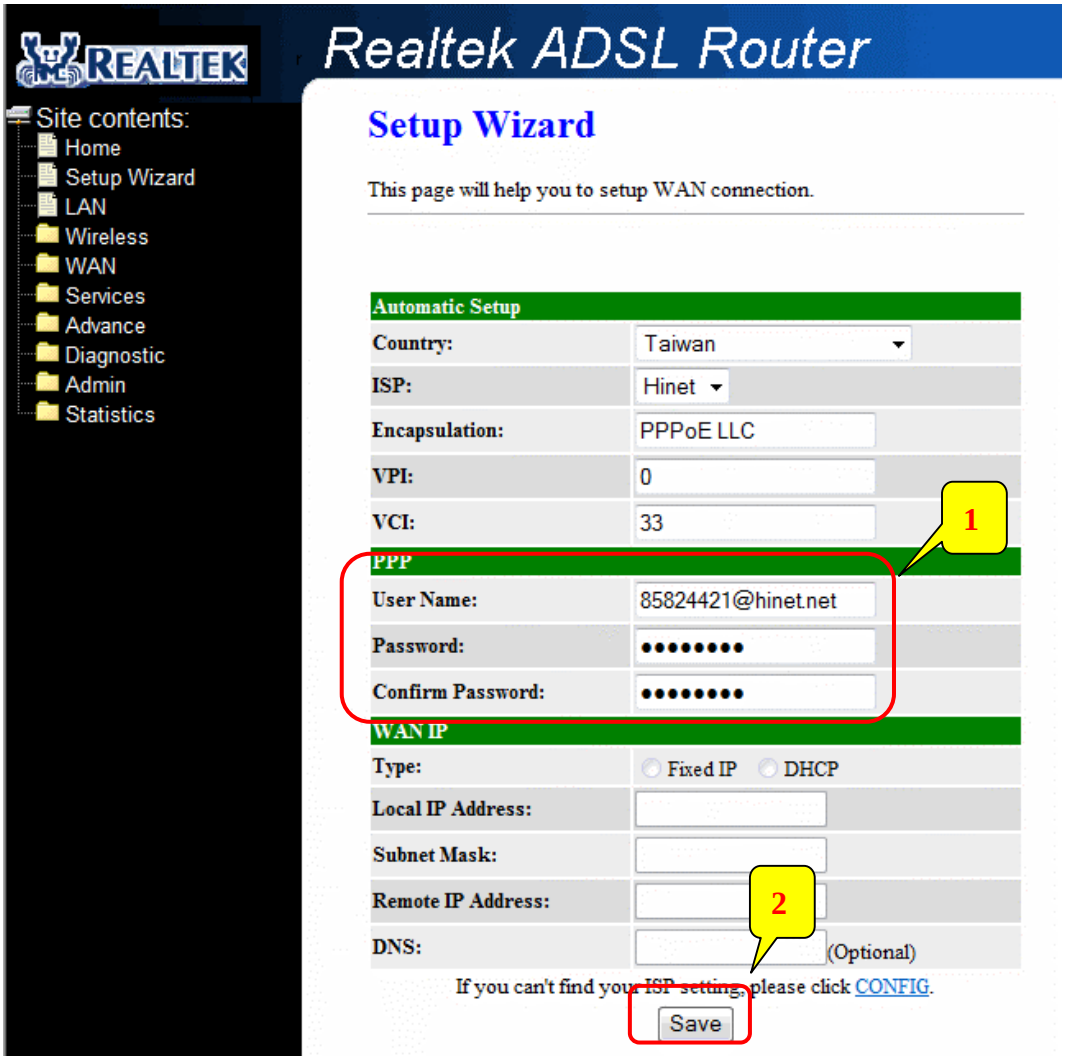


Click "CONFIG" if you can't find any available parameters from the presetting country list.

Check your ISP immediately for the setting/configuration details.

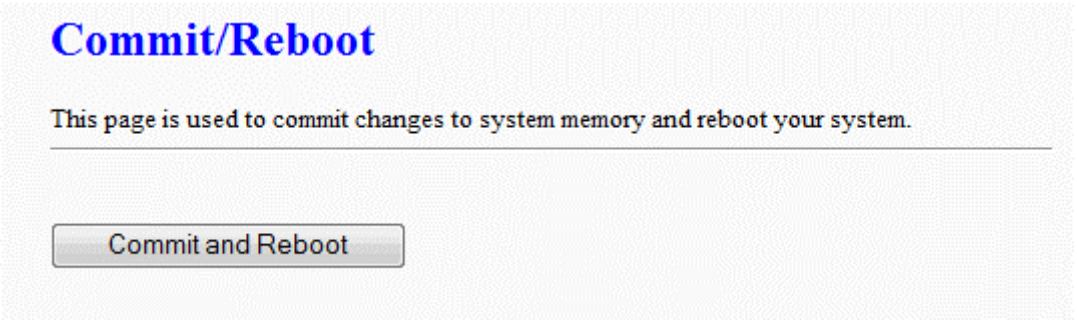
A. For countries with the following **“Encapsulation”** type , you will enter into set Username and Password window as shown below:

- ☑ **PPPoA VC-Mux**
- ☑ **PPPoA LLC**
- ☑ **PPPoE VC-Mux**
- ☑ **PPPoE LLC**



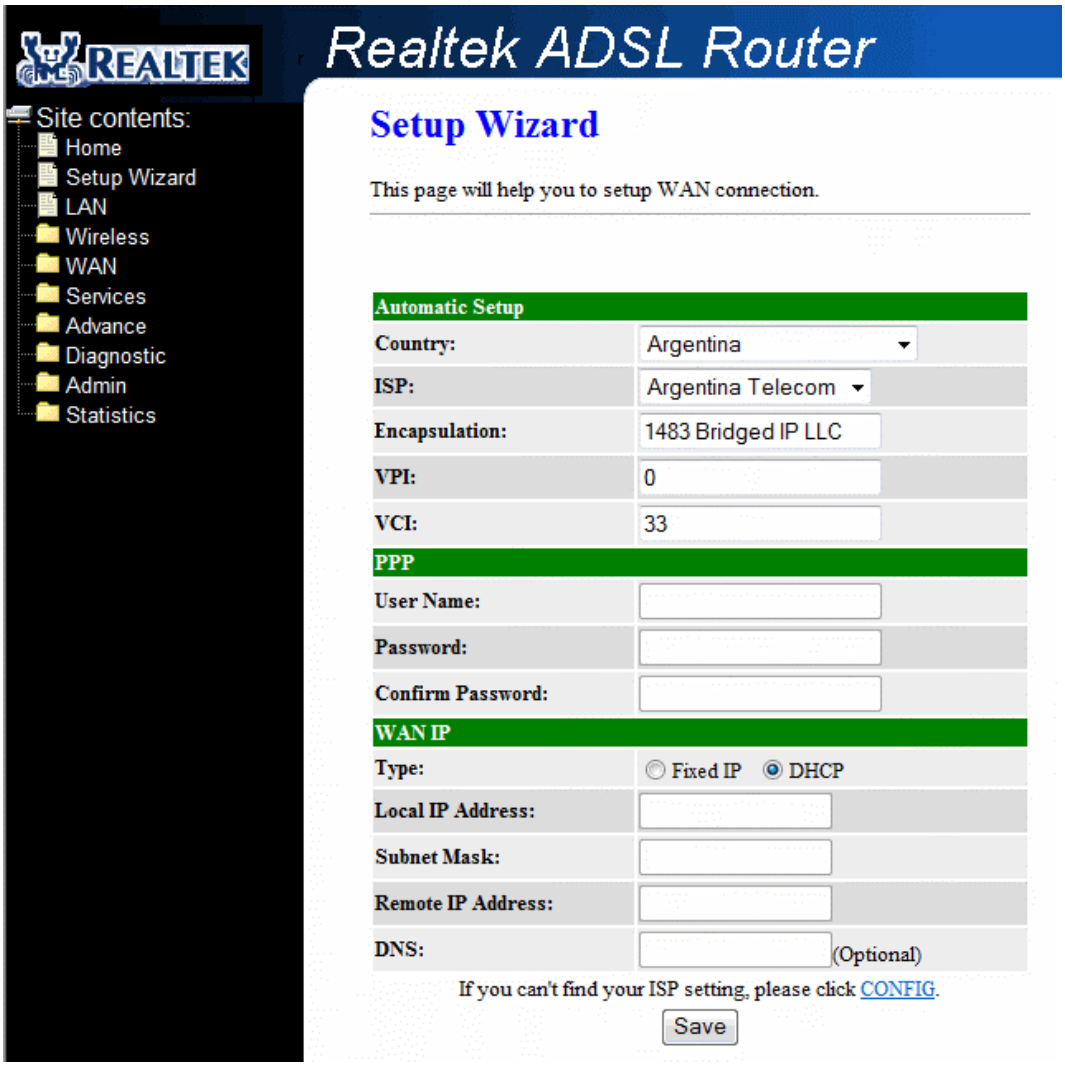
Manually enter your **“User Name”** and **“Password”** which will be provided by your Service Provider (ISP). Click **“Save”** after setup.

Click **Commit and Reboot** button to commit changes to system memory and reboot router.


Commit/Reboot
This page is used to commit changes to system memory and reboot your system.
Commit and Reboot

B. For countries with the following **"Encapsulation"** , the following window will pop-up:

- ☑ **1483 Routed IP VC-Mux**
- ☑ **1483 Routed IP LLC**
- ☑ **1483 Bridged IP VC-Mux**
- ☑ **1483 Bridged IP LLC**



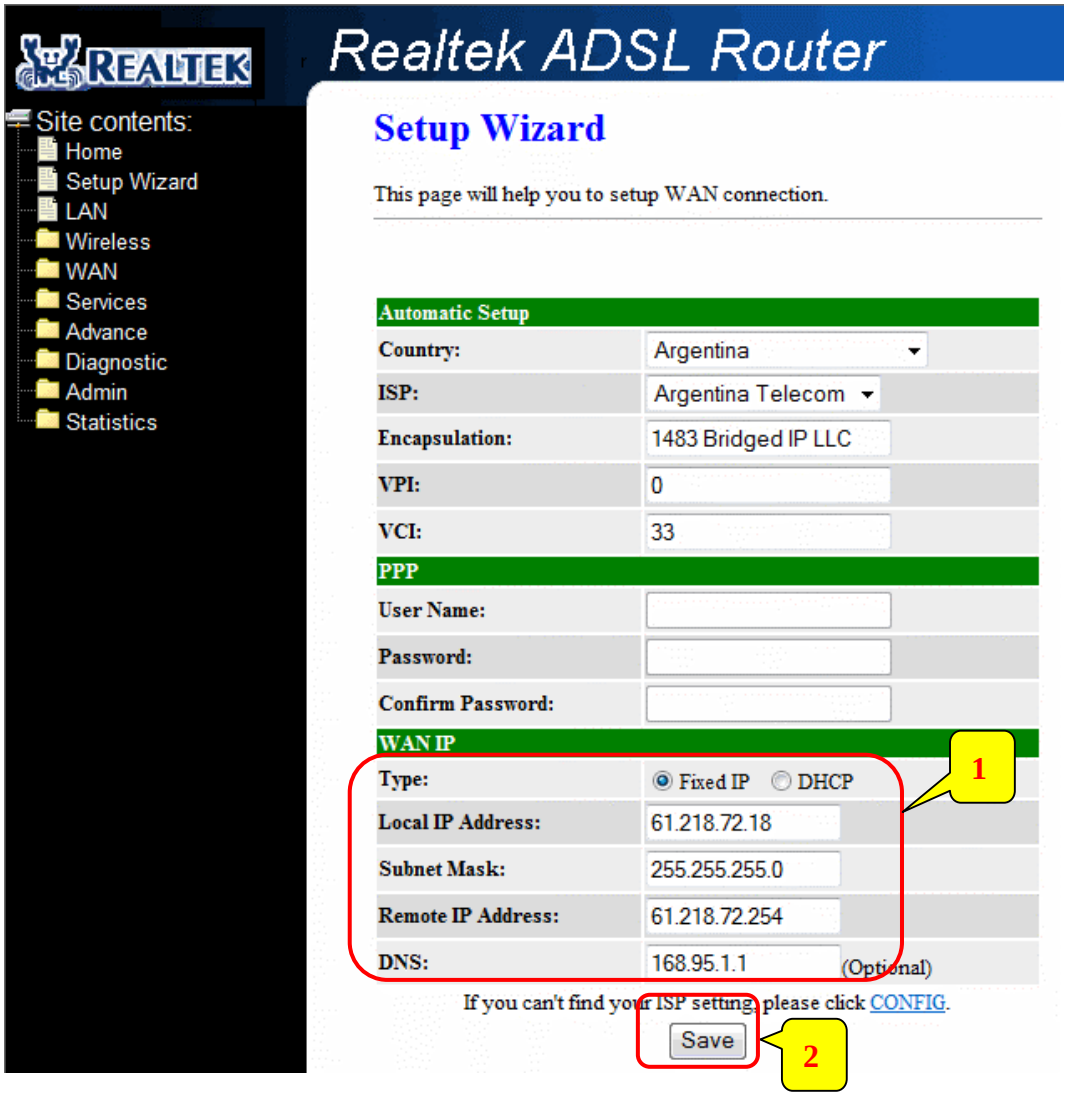
In this current window, you will find **TWO** different **Connection Type**:

- **Fixed IP (Fixed IP by ISP)**
- **DHCP (Get IP dynamically from ISP)**

Click "CONFIG" if you can't find any available parameters from the presetting country list.

Check your ISP immediately for the setting/configuration details.

- **Fixed IP:** Click the radio button to enable **Fixed IP** option .

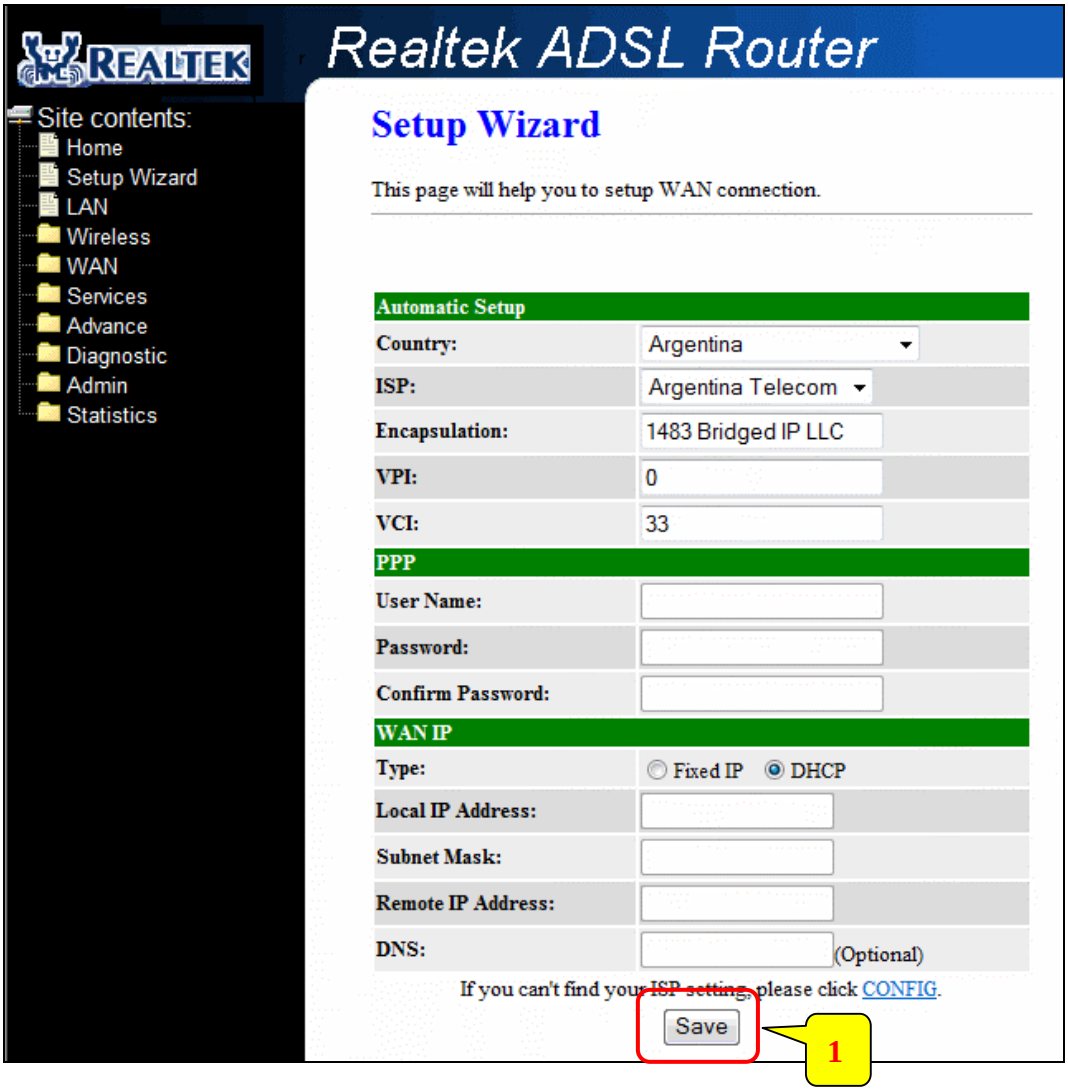


Manually enter the **"Local IP Address"**, **"Subnet Mask"**, **"Remote IP Address"(Default Gateway)** and **"DNS"** which will be provided by your ISP. Click **"Save"** after your setting.

- **Fixed IP Setup:** Fixed IP Settings are for users who have a Static IP Address (WAN side) from their ISP.

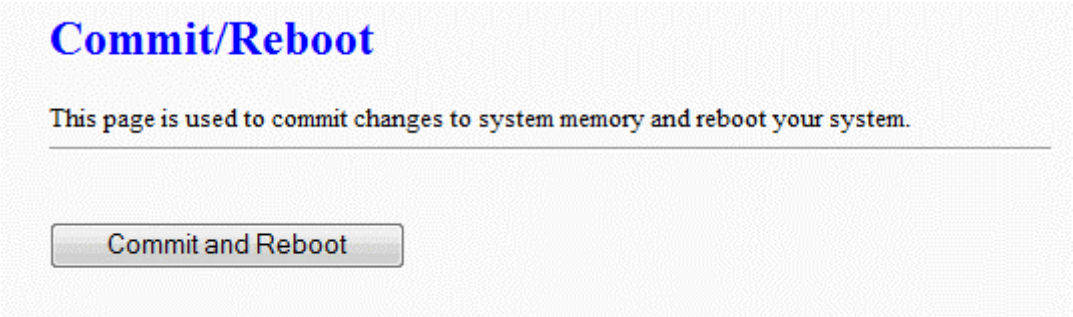
  - ☑ **Local IP Address:** This is the Static IP Address given by your ISP.
  - ☑ **Subnet Mask:** This is the Subnet Mask provided by your ISP.
  - ☑ **Remote IP Address:** This is your gateway IP address.
  - ☑ **DNS:** This is the DNS address specify by your ISP.

- **DHCP (Get IP dynamically from ISP):** Click the radio button to enable **DHCP (Get IP dynamically from ISP)** option.

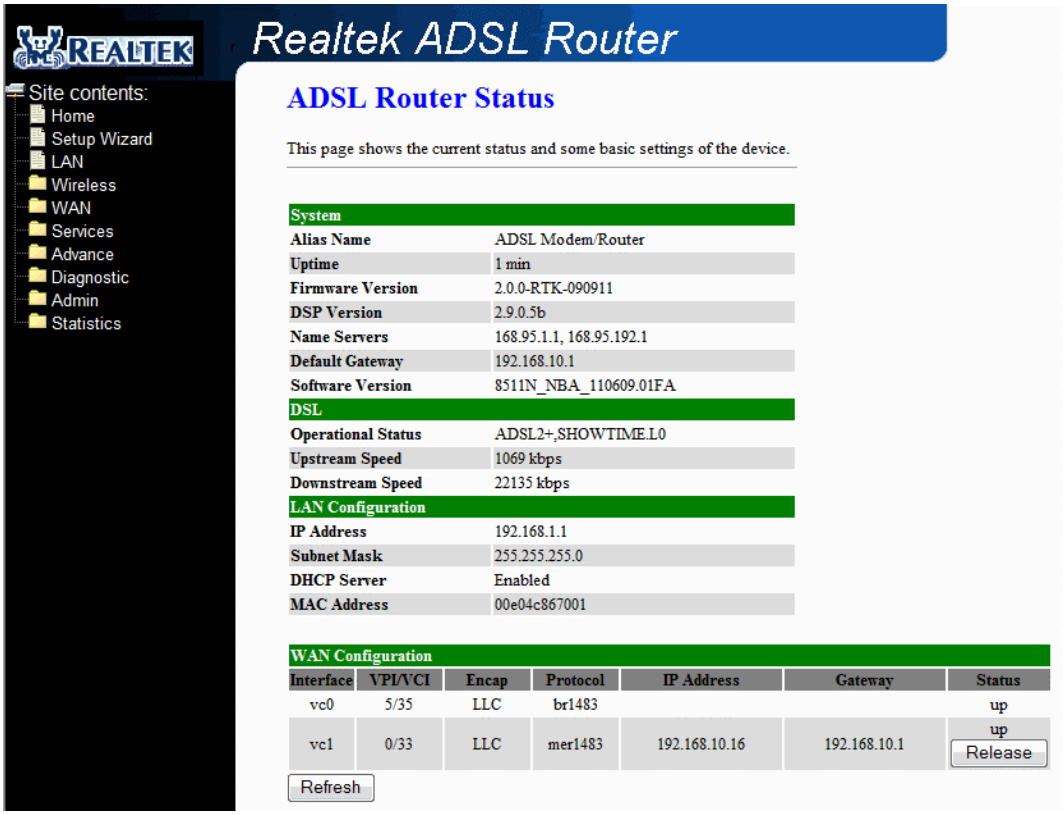


Nothing to be filled under this mode. Just click the **"Save"** button to confirm your setting.

Click **Commit and Reboot** button to commit changes to system memory and reboot router.

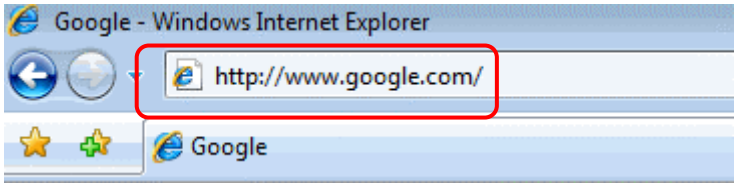


Step 2: The following page with the device setup information will be displayed.

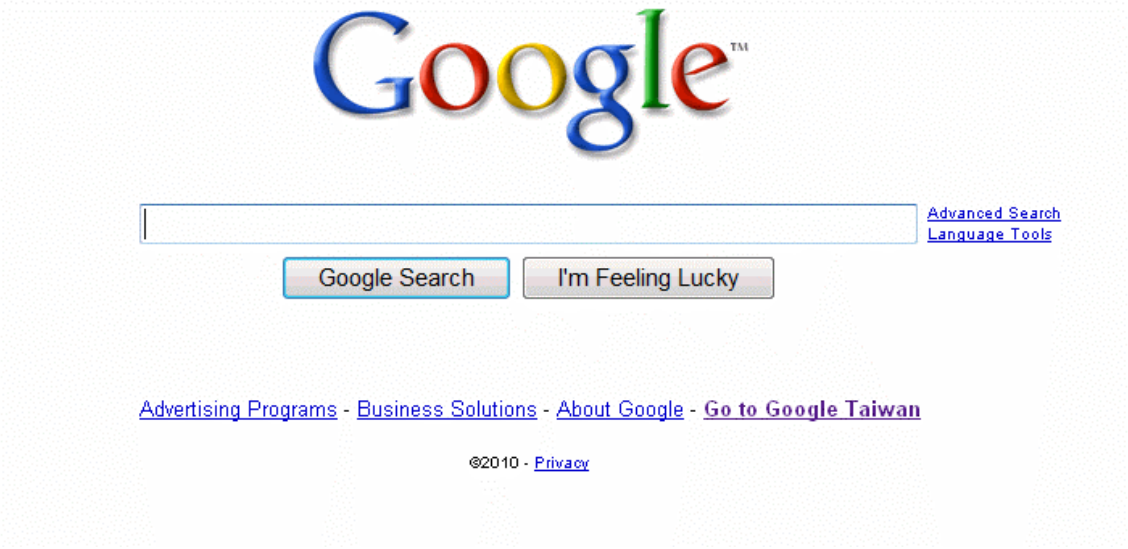


NOTE: If the final settings are different from what you'd selected in **STEP 1**, click **Setup Wizard** and redo the setup procedures or else check your dealer immediately for technical support.

Step 3: Launch your web browser, and enter the Google Website Address: **"www.google.com"** in the address field then press **"Enter"**.

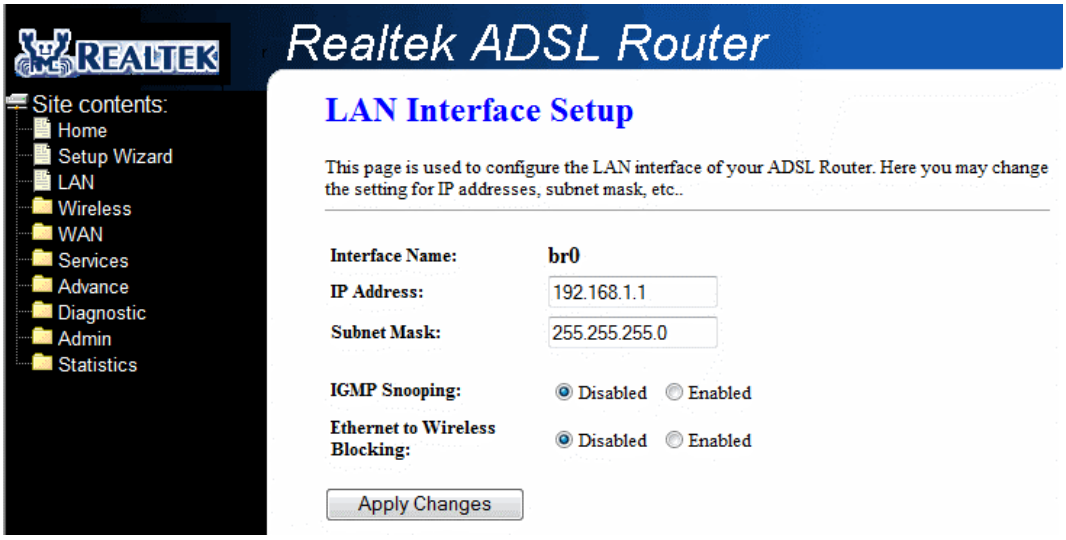


Step 4: The following Google website index page will display on your screen. This shows your ADSL connection is correctly set and access to the Internet is now available.



4.3 LAN

This page shows the current setting of LAN interface. You can set IP Address, Subnet Mask, IGMP Snooping and Ethernet to Wireless Blocking for LAN interface in this page.



Fields in this page:

Field	Description
IP Address	The IP address your LAN hosts use to identify the device's LAN port.
Subnet Mask	LAN subnet mask.
IGMP Snooping	Enable/Disable the IGMP snooping function for the multiple bridged LAN ports.
Ethernet to Wireless Blocking	Enable/Disable the Ethernet to Wireless Blocking function

Function buttons in this page:

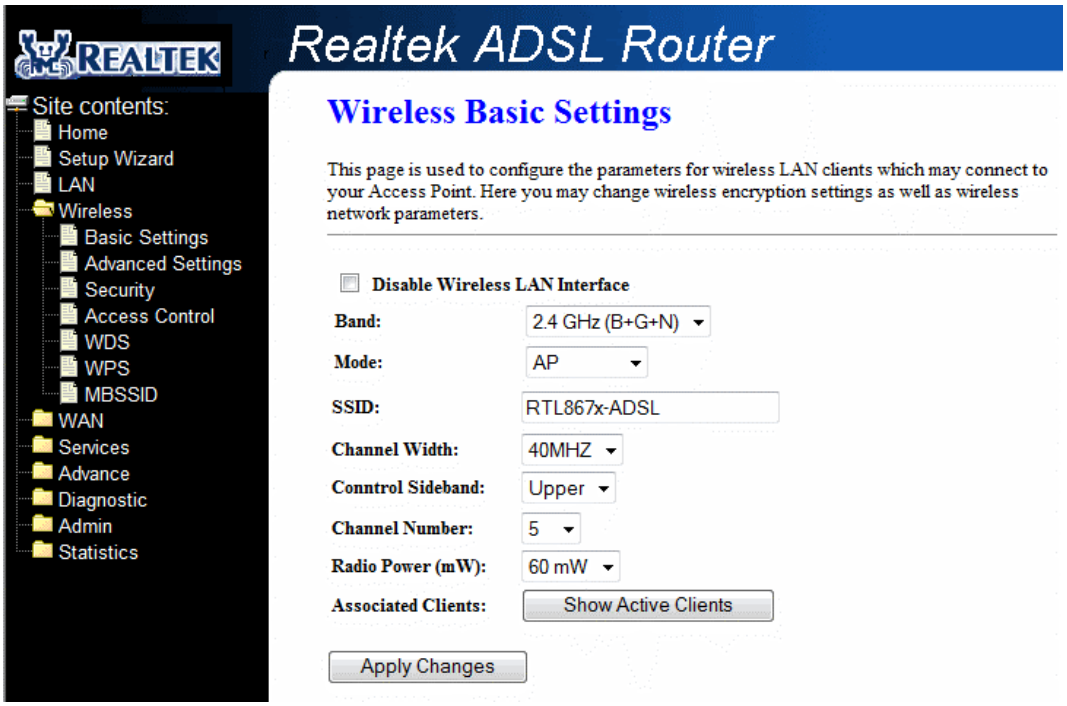
Apply Changes

Click to save the setting to the configuration. New parameters will take effect after save into flash memory and reboot the system. See section "Admin" for save details.

4.4 Wireless

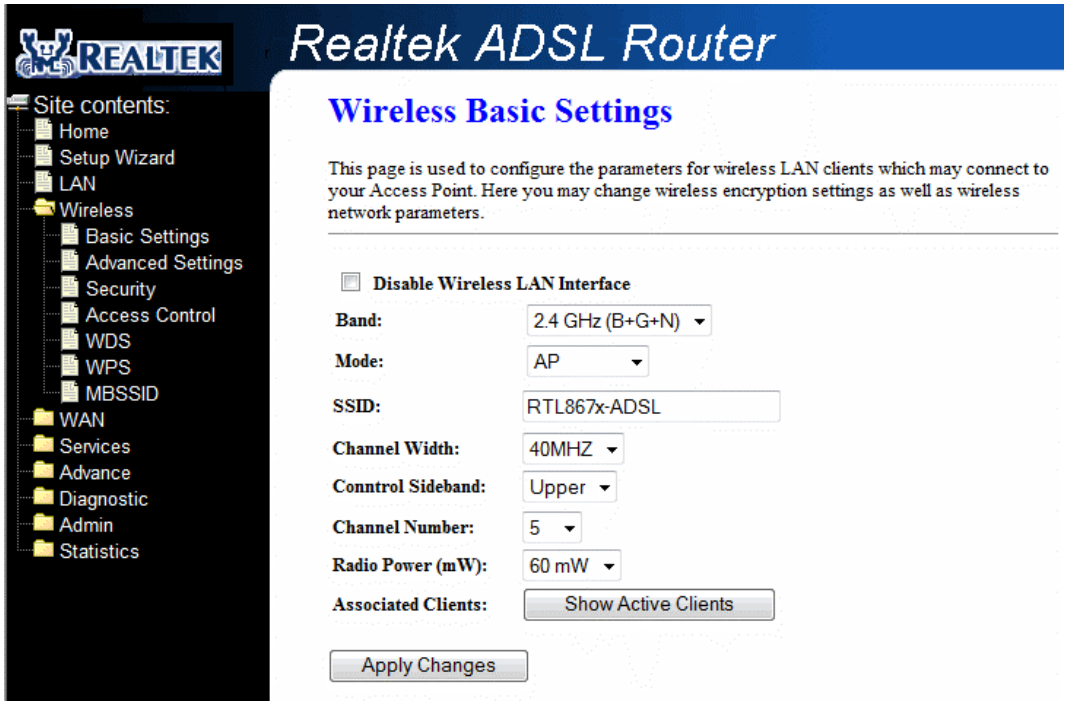
You can view Wireless link in the left navigation bar. Following are the options available under Wireless:

- Basic Settings
- Advanced Settings
- Security
- Access Control
- WDS
- WPS
- MBSSID



4.4.1 Wireless – Basic Settings

To configure the wireless basic settings, click on the **Basic Settings** link (Wireless > Basic Settings) in the left navigation bar. A screen is displayed as shown in following figure.



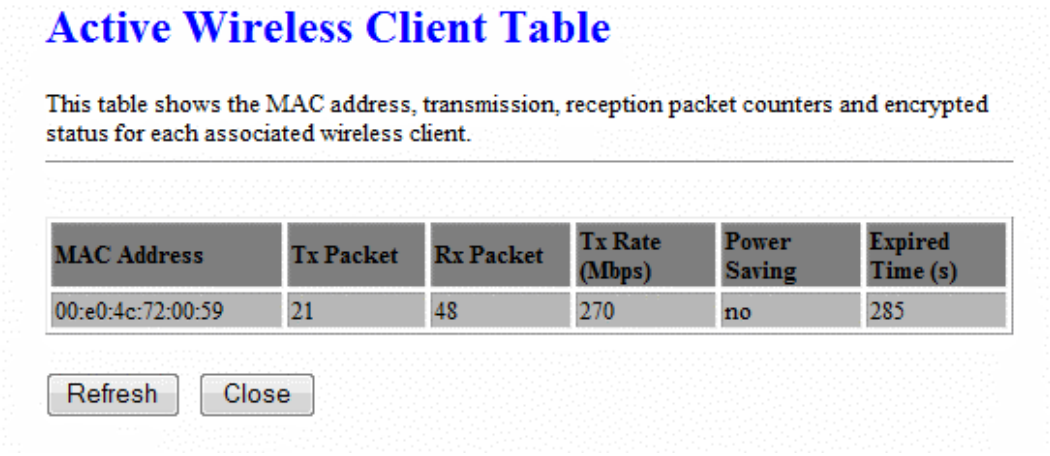
Fields in this page:

Field	Description
Disable Wireless LAN Interface	Check it to disable the wireless function for ADSL router.
Band	Select the appropriate band from the list provided to correspond with your network setting.
Mode	The selections are: AP, AP+WDS.
SSID	The Service Set Identifier (SSID) or network name. It is case sensitive and must not exceed 32 characters, which may be any keyboard character. The mobile wireless stations shall select the same SSID to be able to communicate with your ADSL router.
Channel Width	The selections are 40MHz or 20MHz.
Control Sideband	Specify if the extension channel should be in the **Upper** or **Lower** sideband. Control and the secondary extension channels are only applicable if your ADSL router is operating at 40 MHz bandwidth and the band is configured as 2.4GHz(B+G+N), 2.4GHz(G+N) or 2.4GHz(N).
Channel Number	Select the appropriate channel from the list provided to correspond with your network settings. You shall assign a different channel for each AP to avoid signal interference.
Radio Power (mW)	The AP Radio Power. Select 60mW, 30mW or 15mW power level from the drop down manual. The default Radio Power level is 60mW. It's recommended to leave this setting as its default.

Function buttons in this page:

- **Associated Clients**

  Click **Show Active Clients** button and it will show the clients currently associated with the ADSL router.

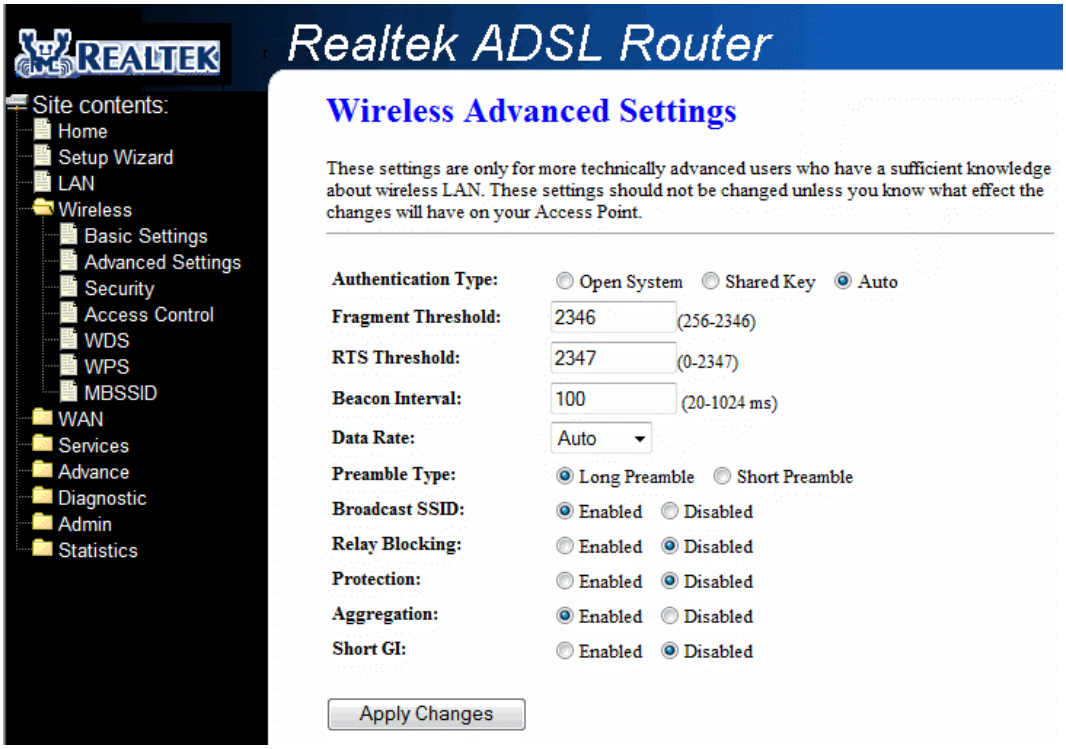


- **Apply Changes**

  Change the settings. New parameters will take effect after save into flash memory and reboot the system. See section “Admin” for save details.

4.4.2 Wireless – Advanced Setting

This page allows advanced users who have sufficient knowledge of wireless LAN. These setting shall not be changed unless you know exactly what will happen for the changes you made on your DSL router.



Fields in this page:

Field	Description
Authentication Type	**Open System:** Open System authentication is not required to be successful while a client may decline to authenticate with any particular other client. **Shared Key:** Shared Key is only available if the WEP option is implemented. Shared Key authentication supports authentication of clients as either a member of those who know a shared secret key or a member of those who do not. IEEE 802.11 Shared Key authentication accomplishes this without the need to transmit the secret key in clear. Requiring the use of the WEP privacy mechanism. **Auto:** Auto is the default authentication algorithm. It will change its authentication type automatically to fulfill client's requirement.
Fragment Threshold	This value should remain at its default setting of 2346. It specifies the maximum size for a packet before data is fragmented into multiple packets. If you experience a high packet error rate, you may slightly increases the "Fragment Threshold" value within the value range of 256 to 2346. Setting this value too low may result in poor network performance. Only minor modifications of this value are recommended.
RTS Threshold	This value should remain at its default setting of 2347. Should you encounter inconsistent data flow, only minor modifications are recommended. If a network packet is smaller than the preset "RTS threshold" size, the RTS/CTS mechanism will not be enabled. The ADSL modem (or AP) sends Request to Send (RTS) frames to

	a particular receiving station and negotiates the sending of a data frame. After receiving an RTS, the wireless station responds with a Clear to Send (CTS) frame to acknowledge the right to begin transmission.
Beacon Interval	The Beacon Interval value indicates the frequency interval of the beacon. Enter a value between 20 and 1024. A beacon is a packet broadcast by the ADSL modem (or AP) to synchronize the wireless network. The default is 100.
Data Rate	The rate of data transmission should be set depending on the speed of your wireless network. You should select from a range of transmission speeds, or you can select *Auto* to have the ADSL modem (or AP) automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the AP and a wireless client. The default setting is *Auto*.
Preamble Type	The Preamble Type defines the length of the CRC (Cyclic Redundancy Check) block for communication between the AP and mobile wireless stations. The preamble consists of the Synchronization and Start Frame Delimiter (SFD) fields. The sync field is used to indicate the delivery of a frame to wireless stations, to measure frequency of the radio signal, to perform corrections if needed. The SFD at the end of the Preamble is used to mark the start of the frame. If you are not using any 802.11b devices in your network, you can configure the Preamble type to **Short** for optimum performance. The **Long** Preamble type should be used when both 802.11g and 802.11b devices exist on your network. Note that high network traffic areas should use the *short preamble* type. CRC is a common technique for detecting data transmission errors.
Broadcast SSID	If this option is enabled, the device will automatically transmit their network name (SSID) into open air at regular interval. This feature is intended to allow clients to dynamically discover and roam between WLANs; if this option is disabled, the device will hide its SSID. When this is done, the station cannot directly discover its WLAN and MUST be configure with the SSID. Note that in a home Wi-Fi network, roaming is largely unnecessary and the SSID broadcast feature serves no useful purpose. You should disable this feature to improve the security of your WLAN.
Relay Blocking	When **Relay Blocking** is enabled, wireless clients will not be able to directly access other wireless clients.
Protection	Prevent from interference of 11b device. Do not disable protection if there is a possibility that 802.11b or 802.11g devices will use your wireless network. Disabled protection to maximize 802.11n throughput under most conditions.
Aggregation	Aggregating data unit.
Short GI	Short guard interval.

Function buttons in this page:

Apply Changes

Change the settings. New parameters will take effect after save into flash memory and reboot the system. See section “Admin” for save details.

4.4.3 Wireless – Security

This screen allows you to setup the wireless security. Turn on WEP or WPA by using encryption keys could prevent any unauthorized access to your WLAN.

Fields in this page:

Field	Description
SSID Type	There are Root,VAP0, VAP1, VAP2, VAP3.
Encryption	There are 4 types of security to be selected. To secure your WLAN, it's strongly recommended to enable this feature. **WEP:** Make sure that all wireless devices on your network are using the same encryption level and key. Click *Set WEP Key* button to set the encryption key. **WPA (TKIP):** WPA uses Temporal Key Integrity Protocol (TKIP) for data encryption. TKIP utilized a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers. **WPA2 (AES):** WPA2, also known as 802.11i, uses Advanced Encryption Standard (AES) for data encryption. AES utilized a symmetric 128-bit block data encryption. **WAP2 Mixed**: The AP supports WPA (TKIP) and WPA2 (AES) for data encryption. The actual selection of the encryption methods will depend on the clients.
Use 802.1x Authentication	Check it to enable 802.1x authentication. This option is selectable only when the "Encryption" is choose to either *None* or *WEP.* If the "Encryption" is *WEP*, you need to further select the WEP key length to be either *WEP 64bits* or *WEP 128bits.*
WPA Authentication Mode	There are 2 types of authentication mode for WPA. **Enterprise (RADIUS):** Enterprise RADIUS uses an external RADIUS server to perform user authentication. To use WPA RADIUS, enter the IP address of the RADIUS server, the RADIUS port (default is 1812) and the shared secret from the RADIUS server. Please refer to "Authentication RADIUS Server" setting below for

	RADIUS setting. The WPA algorithm is selected between TKIP and AES, please refer to “WPA cipher Suite” below. **Pre-Shared Key:** Pre-Shared Key authentication is based on a shared secret that is known only by the parties involved. To use WPA Pre-Shared Key, select key format and enter a password in the “Pre-Shared Key Format” and “Pre-Shared Key” setting respectively. Please refer to “Pre-Shared Key Format” and “Pre-Shared Key” setting below.
Pre-Shared Key Format	**PassPhrase:** Select this to enter the Pre-Shared Key secret as user-friendly textual secret. **Hex (64 characters):** Select this to enter the Pre-Shared Key secret as hexadecimal secret.
Pre-Shared Key	Specify the shared secret used by this Pre-Shared Key. If the “Pre-Shared Key Format” is specified as *PassPhrase*, then it indicates a passphrase of 8 to 63 bytes long; or if the “Pre-Shared Key Format” is specified as *Hex*, then it indicates a 64-hexadecimal number.
Authentication RADIUS Server	If the *WPA-RADIUS* is selected at “WPA Authentication Mode”, the port (default is 1812), IP address and password of external RADIUS server are specified here.

Function buttons in this page:

Apply Changes

Change the settings. New parameters will take effect after save into flash memory and reboot the system. See section “Admin” for save details.

4.4.4 Wireless – Access Control

This page allows administrator to have access control by enter MAC address of client stations. When Enable this function, MAC address can be added into access control list and only those clients whose wireless MAC address are in the access control list will be able to connect to your DSL router.

Fields in this page:

Field	Description
Wireless Access Control Mode	The Selections are: **Disable** Disable the wireless ACL feature. **Allow Listed** When this option is selected, no wireless clients except those whose MAC addresses are in the current access control list will be able to connect (to this device). **Deny Listed** When this option is selected, all wireless clients except those whose MAC addresses are in the current access control list will be able to connect (to this device).
MAC Address	Enter client MAC address and press “Apply Changes” button to add client MAC address into current access control list.

Function buttons for the setting block:

Apply Changes

Click to add this entry into the **Current Access Control List**.

The Current Access Control List lists the client MAC addresses. Any wireless client with its MAC address listed in this access control list will be able to connect to the device. You can select the entries at the Select column and apply to the following function buttons.

Function buttons for the **Current Access Control List**:

Delete Selected

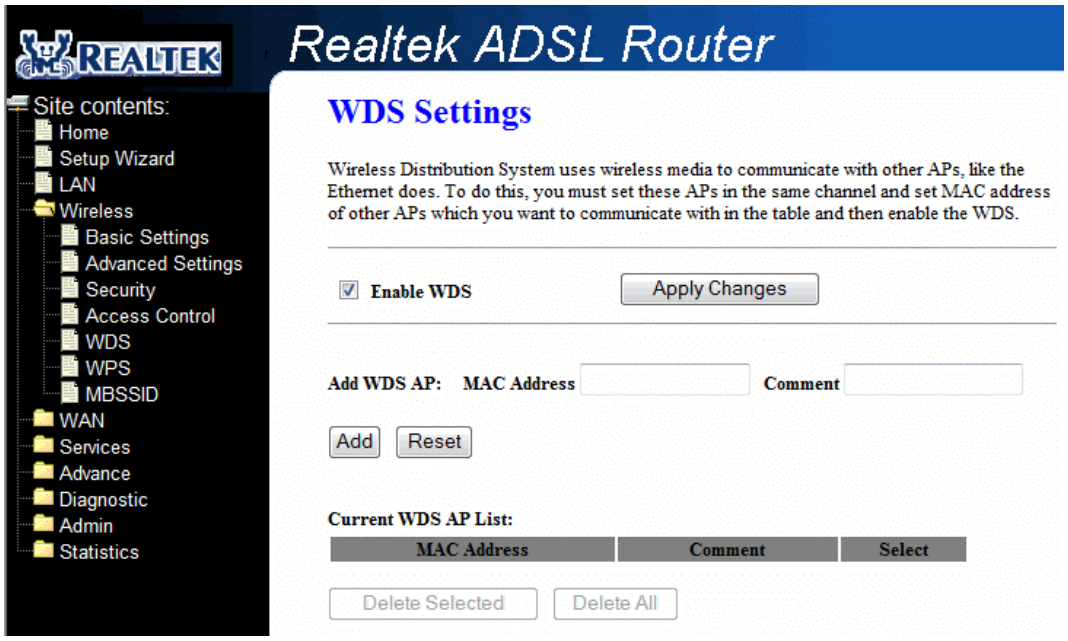
Delete the selected entries from the list.

Delete All

Flush the list.

4.4.5 Wireless – WDS

Wireless Distribution System (WDS) is a system that interconnects BSS to build a premise wide network. The DSL device supports the WDS protocol, which allows a point to point link to be established between two APs. Only if you select AP+WDS mode on the Basic Settings page, this WDS page can be configured.



Fields in this page:

Field	Description
Enable WDS	Check to enable the WDS function.
Add WDS AP	This is where you enter the MAC address of the peer AP's wireless interface that you are connecting to.

Function buttons for the setting block:

Apply Changes

Click to add this entry into the **Current WDS AP List**.

The Current WDS AP List lists the peer MAC addresses of the WDS link. Any AP with its MAC address listed in this WDS AP list may have a WDS link to the device. You can select the entries at the Select column and apply to the following function buttons.

Function buttons for the **Current WDS AP List**:

Delete Selected

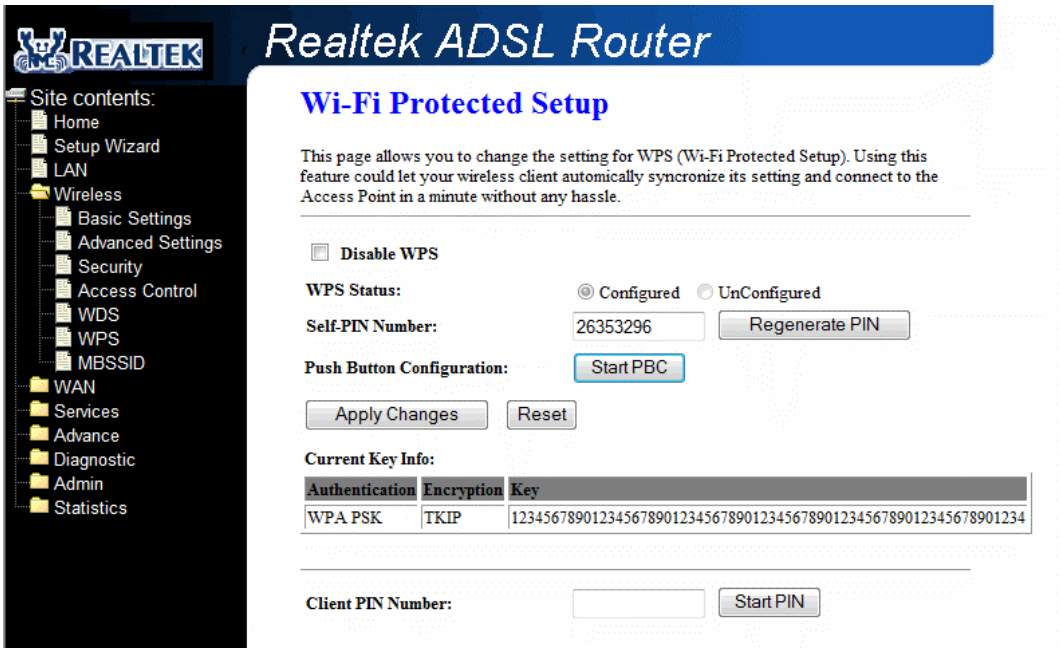
Delete the selected entries from the list.

Delete All

Flush the list.

4.4.6 Wireless – WPS

This page allows you to change the setting for WPS(Wi-Fi Protected Setup). Using this feature could let your wireless client automatically synchronize its setting and connect to the Access Point in a minute without any hassle.



Fields in this page:

Field	Description
Disable WPS	Check to disable the WPS function.
Self-PIN Number	Fill in the PIN number of AP.

Function buttons for this setting block:

- **Regenerate PIN**

  Click to regenerate PIN number of AP.

- **Start PBC**

  Click to start PBC.

- **Apply Changes**

  Click to apply the new configuration.

- **Reset**

  Click to abort change and recover the previous configuration.

Function buttons for client PIN number:

- **Start PIN**

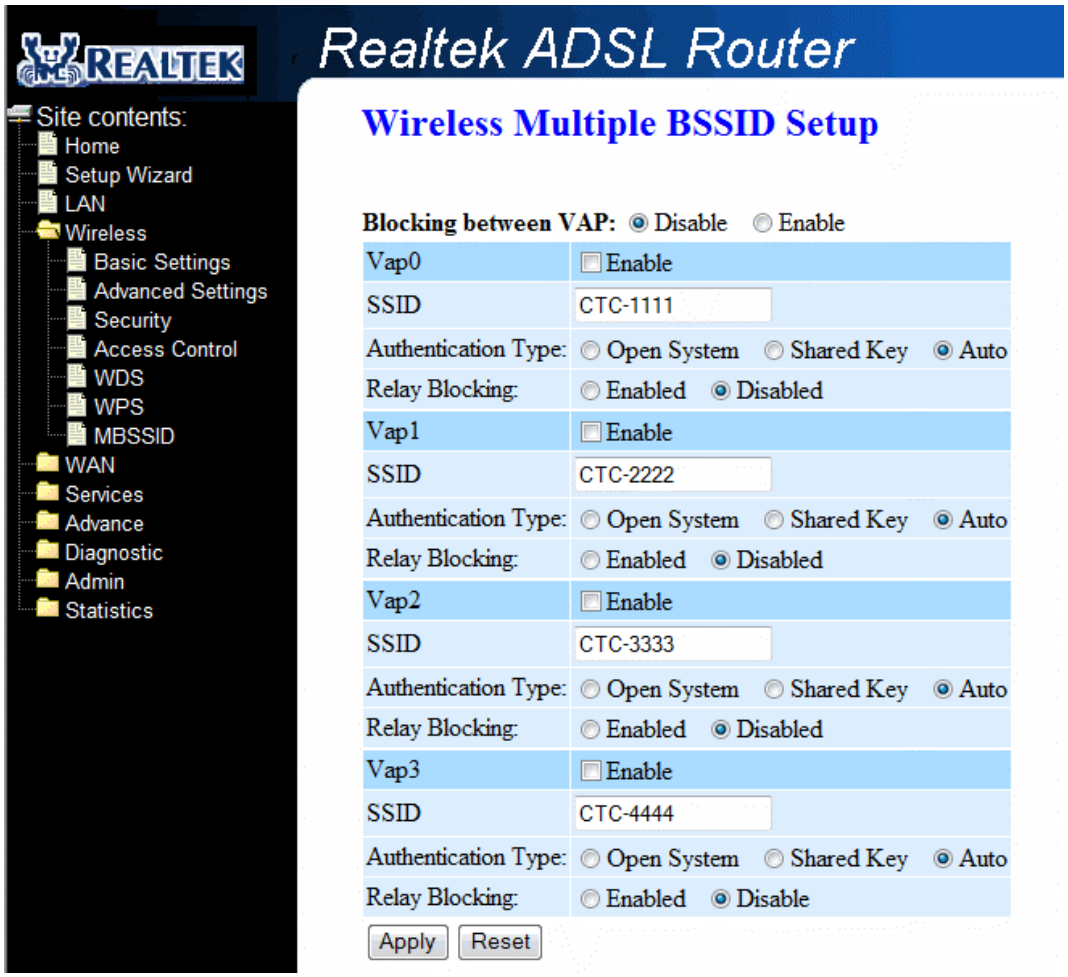
  Click to Start WPS via the client PIN number.

4.4.7 Wireless – MBSSID

The SSID is a unique identifier that wireless networking devices use to establish and maintain wireless connectivity. Multiple Broadcast service set identifier (**MBSSID**) can support 8 separate SSIDs. This logically divides the access point into several virtual access points all within a single hardware platform.is a system that interconnects BSS to build a premise wide network. You can configure your 4-Ports 11n Wireless ADSL2/2+ Router as **MBSSID** function using the **Wireless – MBSSID** page.

Here are some possible settings you could assign to each SSID:

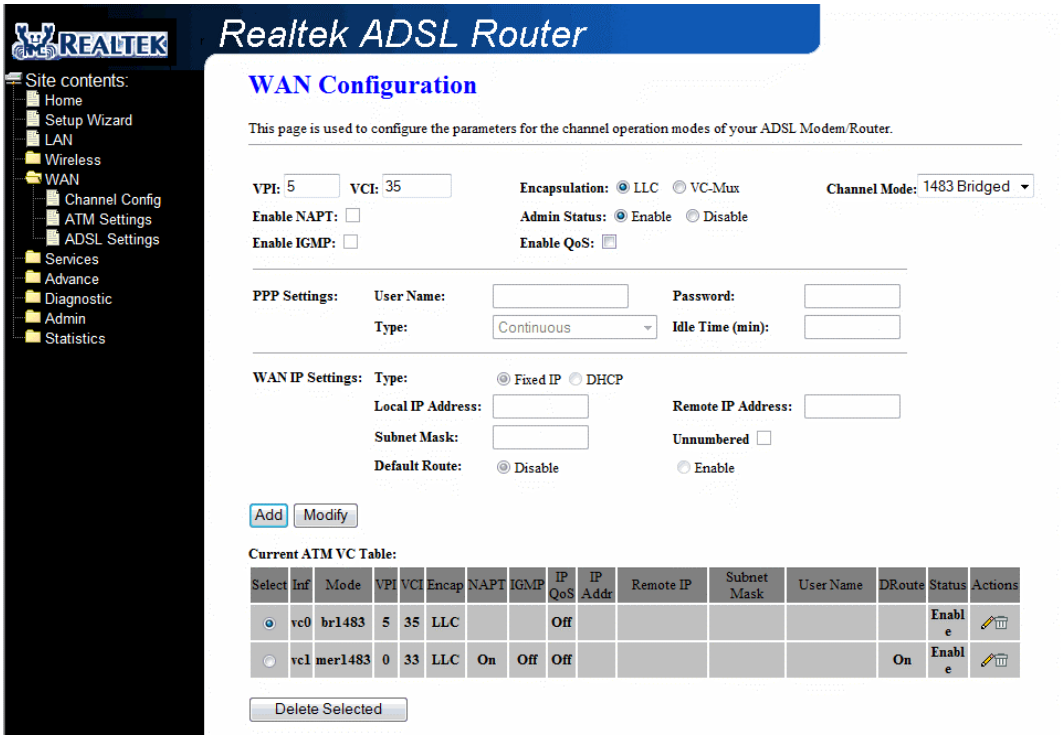
- **Virtual Local Area Network**. If your network uses VLANs, you can assign an SSID to VLAN1, and the access point groups client devices using that SSID into VLAN1. This enables the separation of wireless applications based on security and performance requirements. For example, you could enable encryption and authentication on one SSID to protect private applications and no security on another SSID to maximize open connectivity for public usage.
- **SSID broadcasting**. In some cases, such as public Internet access applications, you can broadcast the SSID to enable user radio cards to automatically find available access points. For private applications, it's generally best to not broadcast the SSID for security reasons -- it invites intruders. Multiple SSIDs means you can mix and match the broadcasting of SSIDs.
- **Maximum number of client associations**. You can set the number of users that can associate via a particular SSID, which makes it possible to control usage of particular applications. This can help provide a somewhat limited form of bandwidth control for particular applications.



- **Blocking between VAP**: Disable/Enable blocking between VAP.
- **Enable:** Enables/disables multiple SSID.
- **SSID:** Set the SSID manually. The SSID is up to 32 characters.
- **Authentication Type:** Open system, Shared Key and Auto.
- **Relay Blocking:** Enabled/Disabled Relay Blocking.
- **Apply:** Click Apply to confirm your setting.
- **Reset:** Click Reset to give up all your current setting

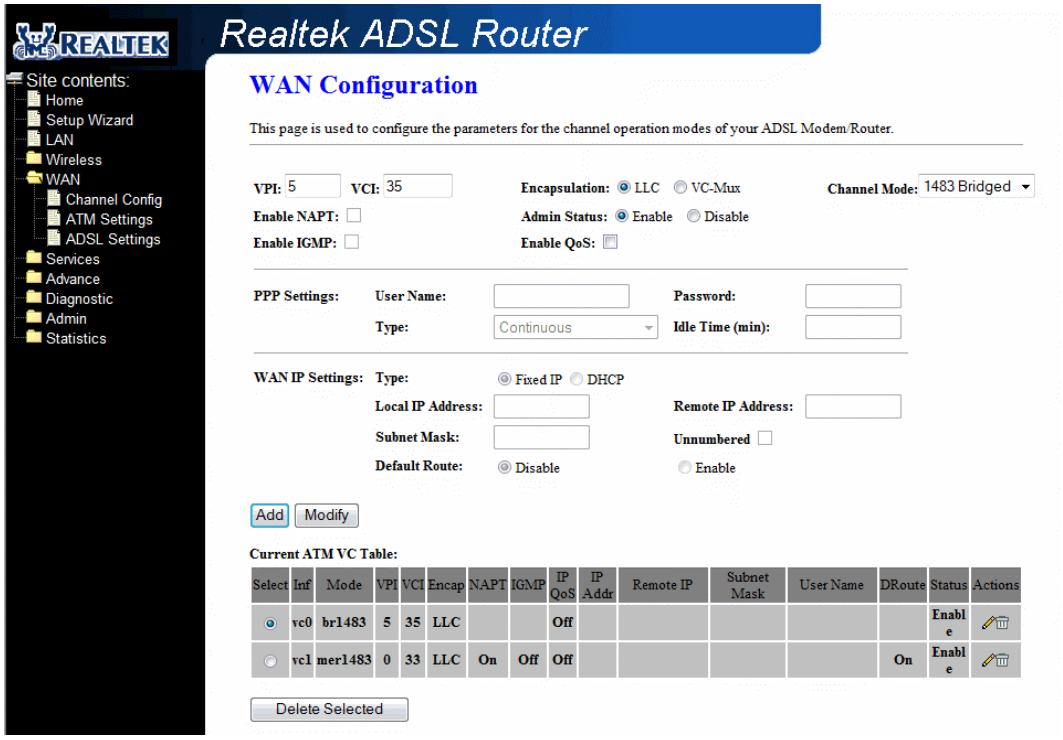
4.5 WAN

There are three sub-menu for WAN configuration: [Channel Config], [ATM Settings], and [ADSL Settings].



4.5.1 WAN – Channel Config

ADSL router comes with 8 ATM Permanent Virtual Channels (PVCs) at the most. There are mainly three operations for each of the PVC channels: add, delete and modify. And there are several channel modes to be selected for each PVC channel. For each of the channel modes, the setting is quite different accordingly. Please reference following section for details.



Function buttons in this page:

Add

Click **Add** to complete the channel setup and add this PVC channel into configuration.

Modify

Select an existing PVC channel by clicking the radio button at the **Select** column of the **Current ATM VC Table** before we can modify the PVC channel. After selecting an PVC channel, we can modify the channel configuration at this page. Click **Modify** to complete the channel modification and apply to the configuration.

Delete Selected

Select an existing PVC channel to be deleted by clicking the radio button at the **Select** column of the **Current ATM VC Table**. Click **Delete** to delete this PVC channel from configuration.

Before the 4 Ports 11n Wireless ADSL2/2+ Router will pass any data between the LAN interface(s) and the WAN interface, the WAN side of the modem must be configured. Depending upon your ADSL service provider or your ISP, you will need some (or all) of the information outlined below before you can properly configure the WAN:

- Your ADSL account Username and Password
- Your ADSL line VPI and VCI setting
- Your ADSL encapsulation type or multiplexing (Either LLC or VC. Check your ISP for detail)
- Your ADSL Training Mode or Handshaking Mode (default is MMODE)

For **PPPoA** or **PPPoE** users, you also need these values from your ISP:

- Your account Username
- Your account Password

For **RFC 1483** users, you may need these values from your ISP:

- Your ADSL fixed Internet IP address
- Your Subnet Mask
- Your Default Gateway address
- Your primary DNS IP address

Since multiple users can use the 4 Ports 11n Wireless ADSL2/2+ Router, the 4 Ports 11n Wireless ADSL2/2+ Router can simultaneously support multiple connection types; hence, you must set up different profiles for each connection. The 4 Ports 11n Wireless ADSL2/2+ Router supports the following protocols:

- PPPoE
- PPPoA
- 1483 Bridged
- 1483 MER
- 1483 Routed

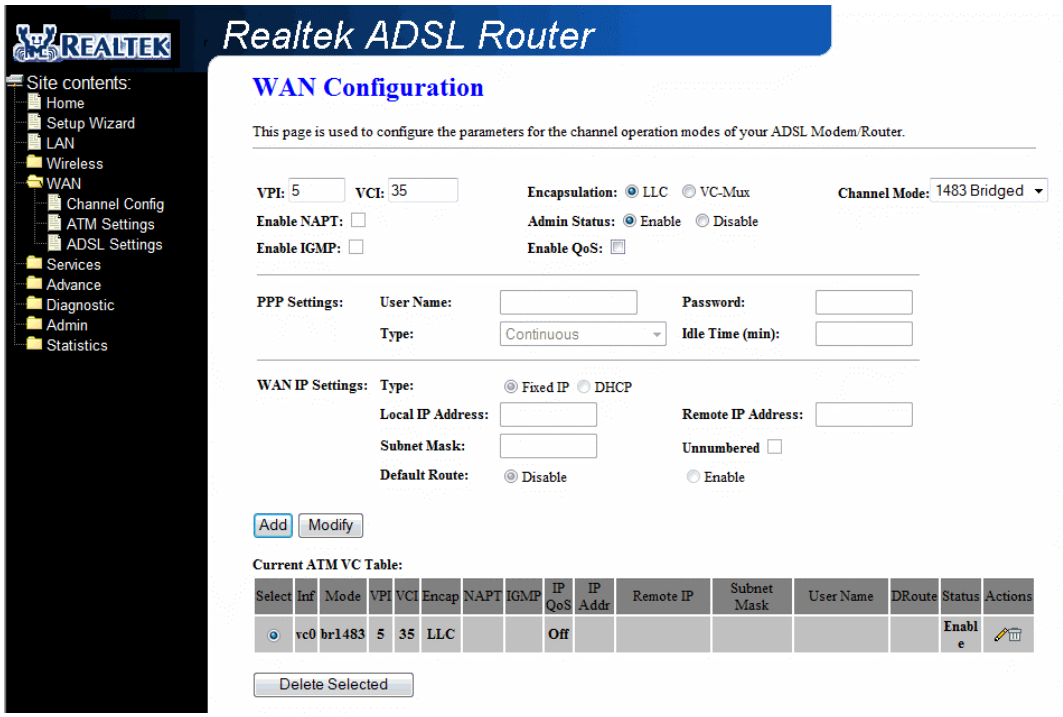
The **WAN** setup configuration page enable the user to create, save, delete and select connection profiles as required. (In many cases, only one connection profile will be required and only one connection profile will be used at one time).

4.5.1.1 WAN – Channel config – Bridge Mode

ADSL router is bridge mode enabled by factory default. There is a 1483-bridged mode PVC 5/35 in system.

1483 Bridged: When 1483 Bridged mode is selected, the following screen will pop-up. A Bridged connection basically disables the routing, firewall and NAT features of the 4 Ports 11n Wireless ADSL2/2+ Router. In a 1483 Bridged connection, the 4 Ports 11n Wireless ADSL2/2+ Router acts as a modem or hub, and just transmits packets between the WAN interface and the LAN interface. A 1483 Bridged connection assumes that another device is providing the routing functionality that is now disabled in the 4 Ports 11n Wireless ADSL2/2+ Router.

LLC and VC-Mux are two different methods of encapsulating the PPP packet. Contact your ISP to make sure which encapsulation is being supported.



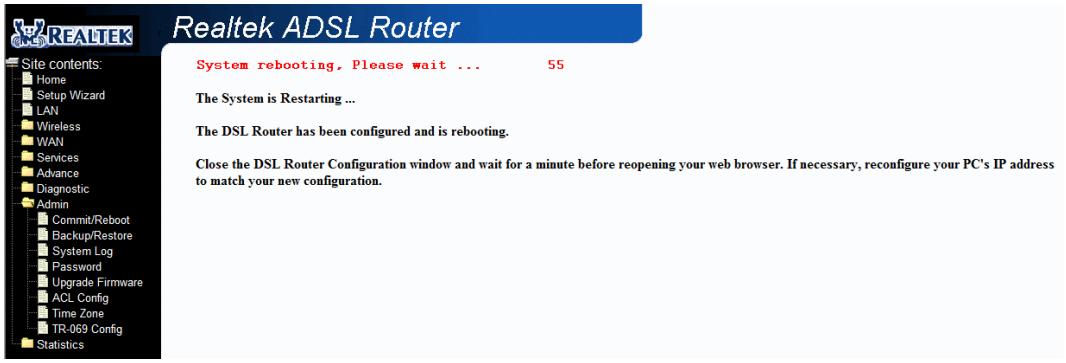
■ Channel:

- ☑ **VPI:** Virtual Path Identifier is a virtual path used for cell routing that is identified by an 8-bit field in the ATM cell header. The VPI field specifies this 8-bit identifier for routing.
- ☑ **VCI:** A Virtual Channel Identifier is a virtual channel that is identified by a unique numerical tag that is defined by a 16-bit field in the ATM cell header. The purpose of the virtual channel is to identify where the cell should travel. The VCI field specifies this 16-bit numerical tag that determines the destination.
- ☑ **Encapsulation:** There are 2 Encapsulation type:
  - ◆ LLC
  - ◆ VC-Mux
- ☑ **Channel Mode:** Select **"1483 Bridged"** from the drop down manual.

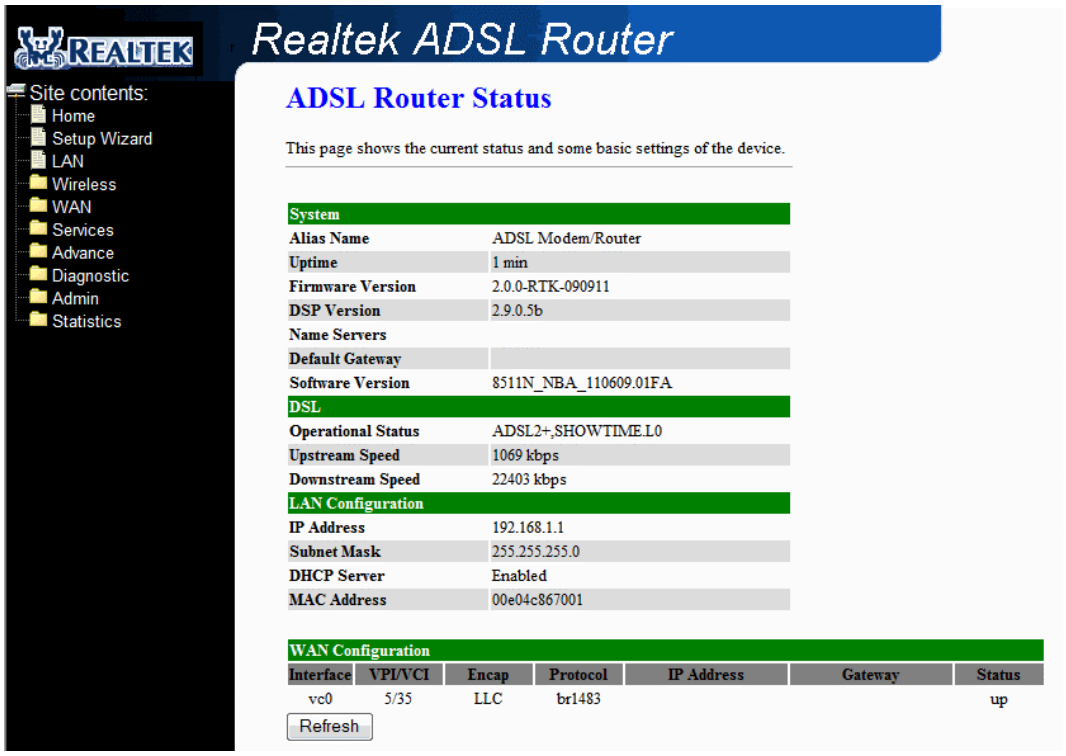
Configuration Procedure:

1. From the **WAN – Channel Config** page, click and select 1483 Bridged connection mode from the Channel Mode drop down manual. The default 1483 Bridged connection setup is displayed.
2. Under the **Channel** mode, enter the values of **VPI** and **VCI** settings.
3. Click the radio button and elect the Encapsulation type (LLC or VC-Mux).

   Note: Your ADSL service provider or your ISP will supply these. In this case the ADSL service provider is using LLC.
4. Click **"Add"** button after setup.
5. You can **"Edit"** ( ) or **"Delete"** ( ) the existing connection profile under the **Actions** column.
6. Click "Admin/ Commit/Reboot". Press "Commit" to save the settings into flash memory.
7. The new settings will take effect after reboot the system.
8. The following window display indicates the system restarting process.

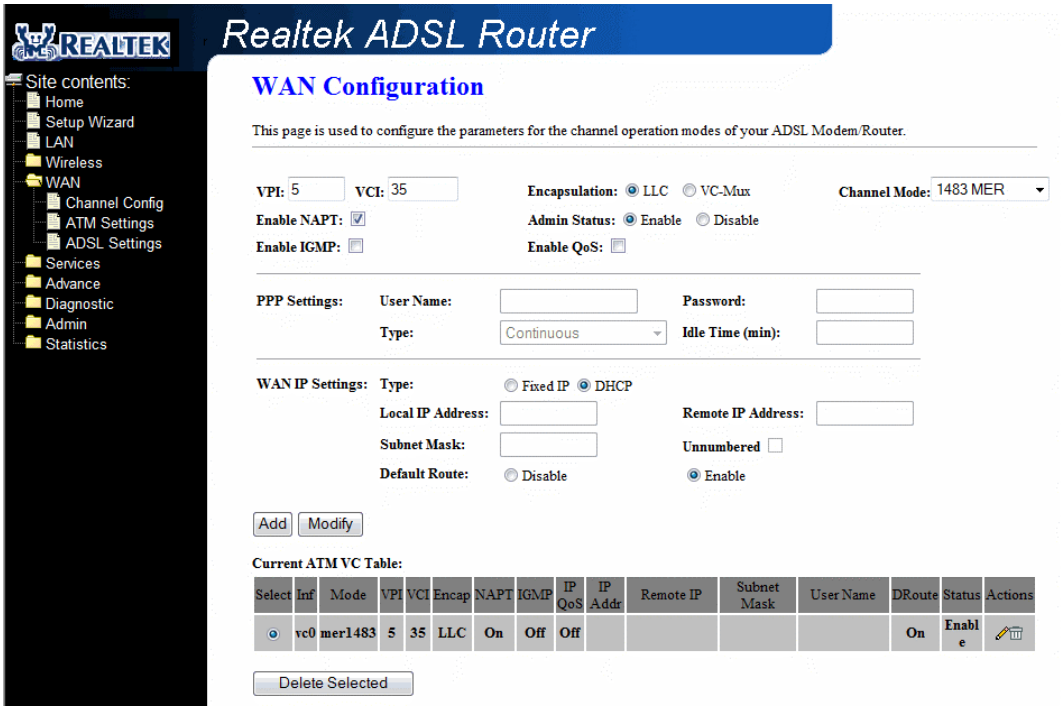


9. The following screen display after the system rebooting process. The System Home page will shows all the connection status and system information.



4.5.1.2 WAN – Channel config – MER(Mac Encapsulation Routing) Mode

1483 MER: 1483 MER also commonly known as 1483 Bridged Router mode. When 1483 MER mode is selected, the following screen will pop-up. Most Internet users are provided with a dynamic IP address by their ISP for each session, however certain situations call for a Fixed (Or Static) IP address. Fixed (Or Static) is used whenever a known Fixed (Or Static) IP is assigned. The accompanying information such as the Subnet mask and the gateway should also be specified. Up to three Domain Name Server (DNS) addresses can also be specified. These servers would enable you to have access to other web servers. Valid IP addresses range is from 0.0.0.0 to 255.255.255.255.



■ Channel:

- ☑ **VPI:** Virtual Path Identifier is a virtual path used for cell routing that is identified by an 8-bit field in the ATM cell header. The VPI field specifies this 8-bit identifier for routing.
- ☑ **VCI:** A Virtual Channel Identifier is a virtual channel that is identified by a unique numerical tag that is defined by a 16-bit field in the ATM cell header. The purpose of the virtual channel is to identify where the cell should travel. The VCI field specifies this 16-bit numerical tag that determines the destination.
- ☑ **Encapsulation:** There are 2 Encapsulation type:
  - ◆ LLC
  - ◆ VC-Mux
- ☑ **Channel Mode:** Select **"1483 MER"** from the drop down manual.
- ☑ **Enable NAPT:** Select **"Disable"** or **"Enable"** the NAPT functionality. Default setting is **"Enable".**

■ WAN IP:

☑ **Type:** Click the radio button to select **"Fixed IP"** or **"DHCP"** mode.

- ◆ **Fixed IP:** You need to fill in the **"Local IP Address"**, **"Subnet Mask"**, **"Remote IP Address"** which will be provided by your ADSL Service provider or ISP.
- ◆ **DHCP:** Dynamic Host Configuration Protocol (DHCP) allows the 4 Ports 11n Wireless ADSL2/2+ Router to automatically obtain the IP address from the server. This option is commonly used in situations where the IP address is dynamically assigned and is not known prior to assignment.

☑ **Default Route:** Click the radio button to **"Enable"** or **"Disable"** the Default Route functionality.

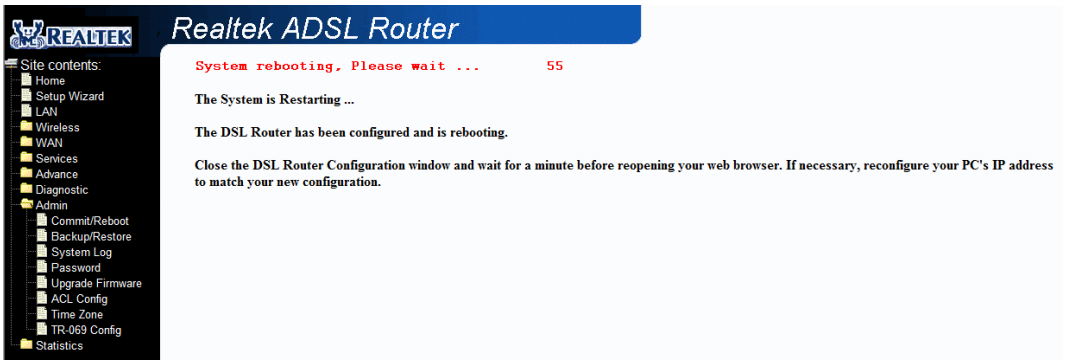
Configuration Procedure :

1. From the **WAN – Channel Config** page, click and select 1483 MER connection mode from the Channel Mode drop down manual. The default 1483 MER connection setup is displayed.
2. Under the **Channel** mode, enter the values of **VPI** and **VCI** settings.
3. Click the radio button and elect the Encapsulation type (LLC or VC-Mux).

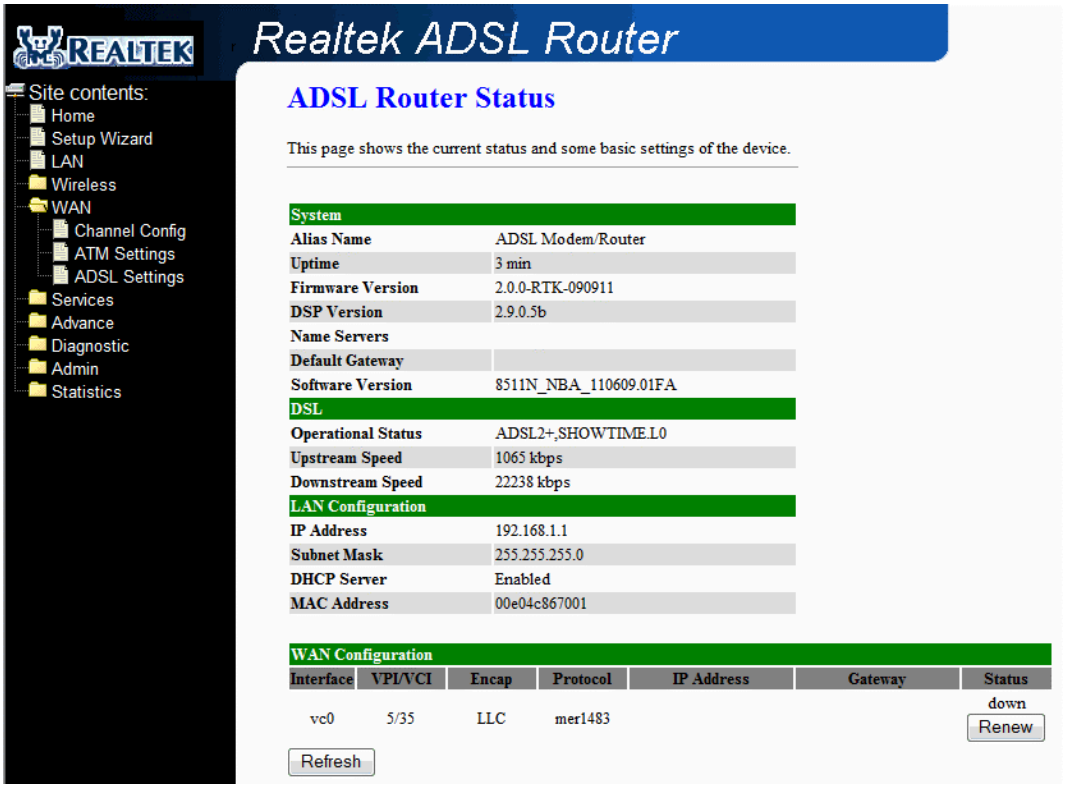
   Note: Your ADSL service provider or your ISP will supply these. In this case the ADSL service provider is using LLC.
4. Check the radio button to **"Enable"** or **"Disable"** the NAPT setting. Leave as its default setting if your ADSL provider or ISP didn't provide any setting information.

   Note: **NAPT:** Network Address and Port Translation: An extension of NAT, NAPT maps many private internal addresses into one IP address. The outside network (WAN) can see this one IP address but it cannot see the individual device IP addresses translated by the NAPT.

5. Under the **WAN IP** mode, enter the **"Local IP Address"**, **"Subnet Mask"** and **"Remote IP Address"** if you are using the **Fixed IP** (Or Static IP) mode. These information/data will be provided by your ADSL Service provider or ISP.
6. Under the **WAN IP** mode, if you select DHCP as your connection type, nothing needed to fill. In this case the ADSL service provider is using Dynamic IP (Or DHCP) mode.
7. Check the radio button to **"Enable"** or **"Disable"** the Default Route setting. Leave as its default setting if your ADSL provider or ISP didn't provide any setting information.
8. Click **"Add"** button after setup.
9. You can **"Edit"** ( ) or **"Delete"** ( ) the existing connection profile under the **Actions** column.
10. Click "Admin/ Commit/Reboot". Press "Commit" to save the settings into flash memory.
11. The new settings will take effect after reboot the system.
12. The following window display indicates the system restarting process.



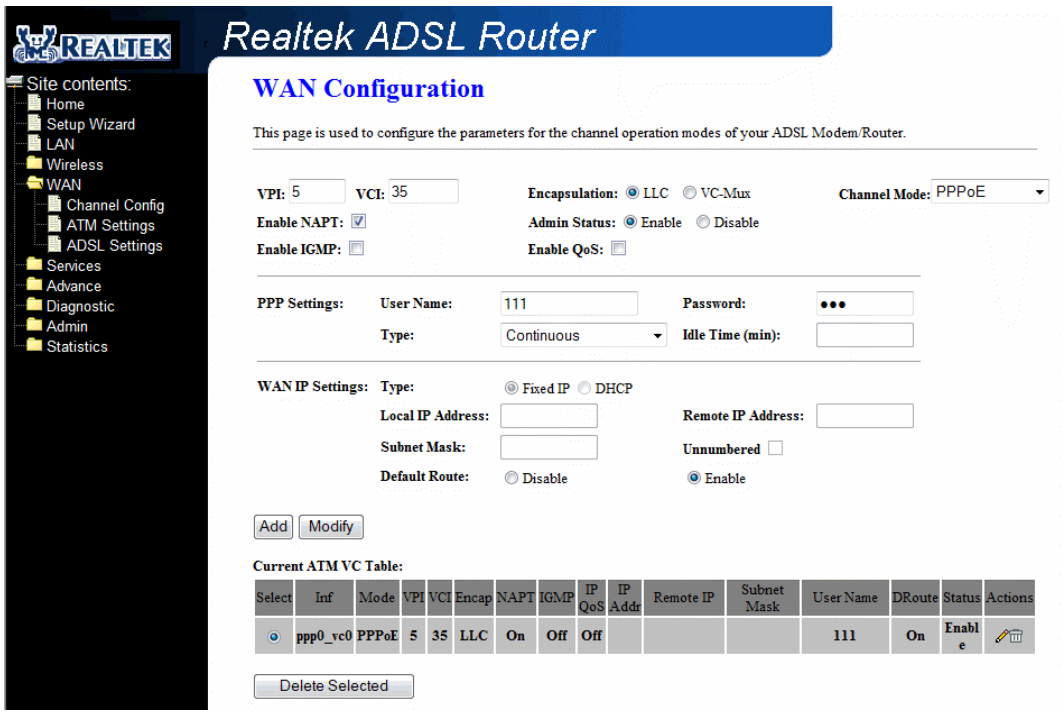
13. The following screen display after the system rebooting process. The System Home page will shows all the connection status and system information.



4.5.1.3 WAN – Channel config – PPPoE Mode

PPPoE: When **PPPoE Mode** is selected from the **Channel Mode** drop down manual, the following screen display. Point-to-Point Protocol (PPP) is a method of establishing a network connection between network hosts. PPPoE, also known as RFC 2516, adapts PPP to work over Ethernet for ADSL connections. PPPoE provides a mechanism for authenticating users by providing User Name and Password fields and it is a connection type provided by many ISP or Telecom.

LLC and VC-Mux are two different methods of encapsulating the PPP packet. Contact your ISP to make sure which encapsulation is being supported.



- **Channel:**
  - ☑ **VPI:** Virtual Path Identifier is a virtual path used for cell routing that is identified by an 8-bit field in the ATM cell header. The VPI field specifies this 8-bit identifier for routing.
  - ☑ **VCI:** A Virtual Channel Identifier is a virtual channel that is identified by a unique numerical tag that is defined by a 16-bit field in the ATM cell header. The purpose of the virtual channel is to identify where the cell should travel. The VCI field specifies this 16-bit numerical tag that determines the destination.
  - ☑ **Encapsulation:** There are 2 Encapsulation type:
    - ◆ LLC
    - ◆ VC-Mux
  - ☑ **Channel Mode:** Select **"PPPoE"** from the drop down manual.
  - ☑ **Enable NAPT:** Select **"Disable"** or **"Enable"** the NAPT functionality. Default setting is **"Enable"**.

- **PPP:**
  - ☑ **User Name:** Manually enter your PPPoE User Name which will be provided by your ADSL service provider or ISP.
  - ☑ **Password:** Manually enter your PPPoE Password which will be provided by your ADSL service provider or ISP.
  - ☑ **Type:** Select your connection type from the drop down manual. This 4 Ports 11n Wireless ADSL2/2+ Router provides 3 connection type:
    - ◆ Continues (Default Setting)
    - ◆ Connect on Demand
    - ◆ Manual

- **WAN IP:**

  - ☑ **Default Route:** Click the radio button to **"Enable"** or **"Disable"** the default Route functionality. Default setting is **Enable**.

Configuration Procedure :

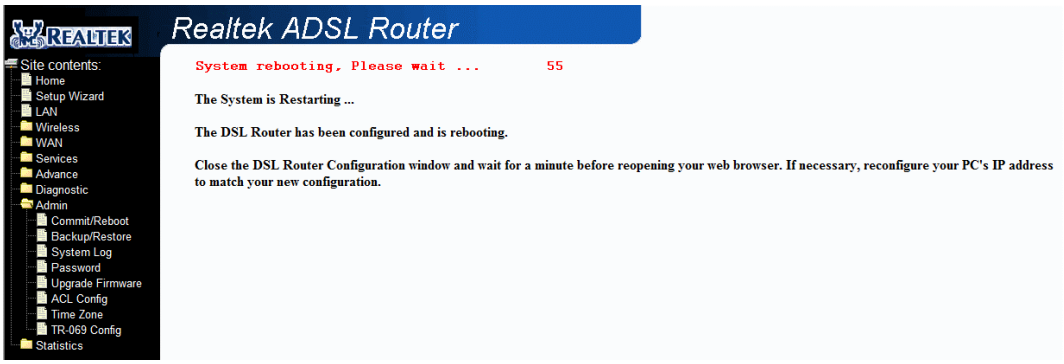
1. From the **WAN – Channel Config** page, click and select **PPPoE** connection mode from the Channel Mode drop down manual. The default **PPPoE** connection setup is displayed.
2. Select the Channel Mode to "PPPoE". Set the parameters VPI/VCI and Encapsulation mode according to the ISP setting.
3. Click the radio button and select the Encapsulation type (LLC or VC-Mux).

   Note: Your ADSL service provider or your ISP will supply these. In this case the ADSL service provider is using LLC.

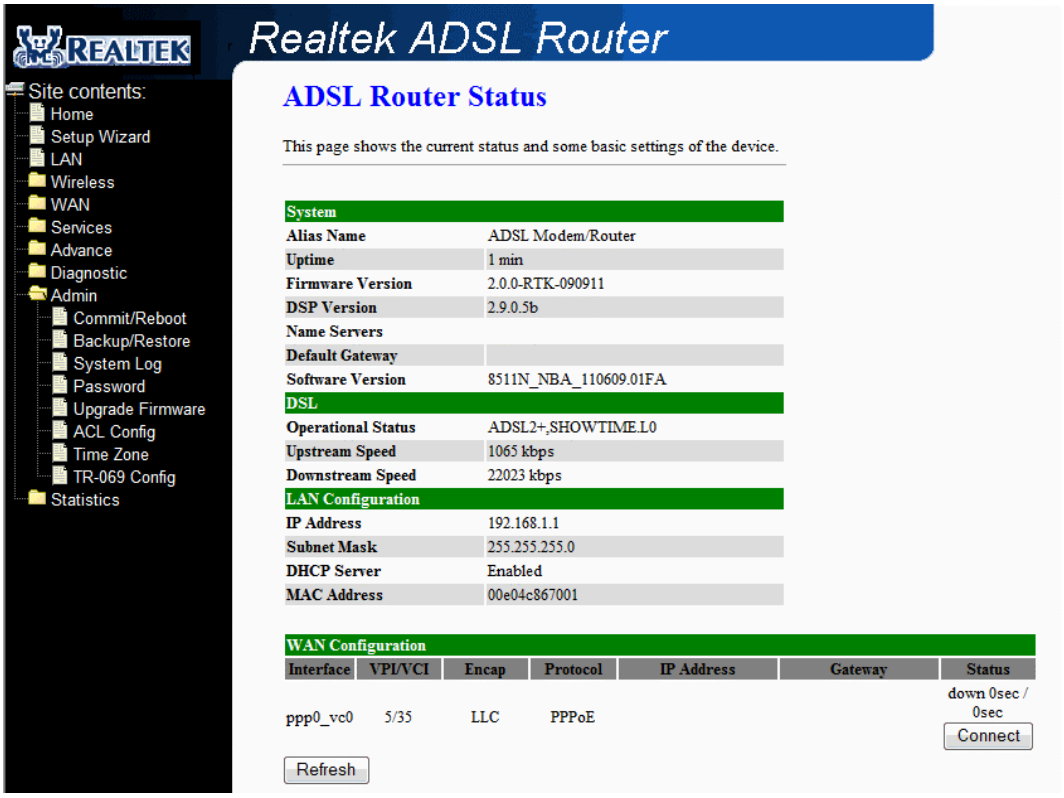
4. Check the radio button to **"Enable"** or **"Disable"** the NAPT setting. Leave as it's default setting if your ADSL provider or ISP didn't provide any setting information.

   Note: NAPT: Network Address and Port Translation: An extension of NAT, NAPT maps many private internal addresses into one IP address. The outside network (WAN) can see this one IP address but it cannot see the individual device IP addresses translated by the NAPT.

5. Enter your **Username** and **Password** which will be provided by your ADSL provider or ISP.
6. Select the Connection Type form the drop down manual or leave as it's default setting (Continuous).
7. Click the radio button to **"Enable"** or **"Disable"** the Default Route functionality or leave as its default (Enable).
8. Click **"Add"** button after setup.
9. You can **"Edit"** ( ) or **"Delete"** ( ) the existing connection profile under the **Actions** column.
10. Click "Admin/ Commit/Reboot". Press "Commit" to save the settings into flash memory.
11. The new settings will take effect after reboot the system.
12. The following window display indicates the system restarting process.



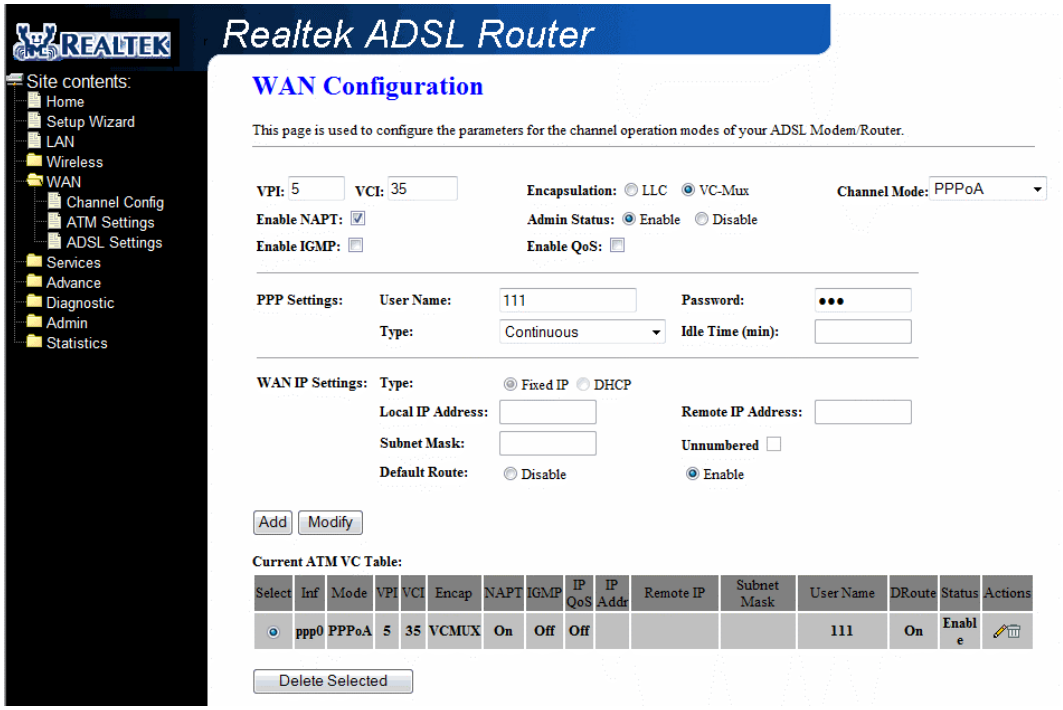
13. The following screen display after the system rebooting process. The System Home page will shows all the connection status and system information.



4.5.1.4 WAN – Channel config – PPPoA Mode

PPPoA: When **PPPoA** mode is selected, the following screen will pop-up. PPPoA is also known as RFC 2364. It is a method of encapsulating PPP packets over ATM cells which are carried over the ADSL line. PPP or Point-to-Point protocol is a method of establishing a network connection/session between network hosts. It usually provides a mechanism of authenticating users.

LLC and VC-Mux are two different methods of encapsulating the PPP packet. Contact your ISP to make sure which encapsulation is being supported.



■ Channel:

- ☑ **VPI:** Virtual Path Identifier is a virtual path used for cell routing that is identified by an 8-bit field in the ATM cell header. The VPI field specifies this 8-bit identifier for routing.
- ☑ **VCI:** A Virtual Channel Identifier is a virtual channel that is identified by a unique numerical tag that is defined by a 16-bit field in the ATM cell header. The purpose of the virtual channel is to identify where the cell should travel. The VCI field specifies this 16-bit numerical tag that determines the destination.
- ☑ **Encapsulation:** There are 2 Encapsulation type:
  - ◆ LLC
  - ◆ VC-Mux
- ☑ **Channel Mode:** Select **"PPPoA"** from the drop down manual.
- ☑ **Enable NAPT:** Select **"Disable"** or **"Enable"** the NAPT functionality. Default setting is **"Enable"**.

■ PPP:

- ☑ **User Name:** Manually enter your PPPoA User Name which will be provided by your ADSL service provider or ISP.
- ☑ **Password:** Manually enter your PPPoA Password which will be provided by your ADSL service provider or ISP.
- ☑ **Connection Type:** Select your connection type from the drop down manual. This 4 Ports 11n Wireless ADSL2/2+ Router provides 3 connection type:
  - ◆ Continues (Default Setting)
  - ◆ Connect on Demand
  - ◆ Manual

■ WAN IP:

- ☑ **Default Route:** Click the radio button to **"Enable"** or **"Disable"** the default Route functionality.

Configuration Procedure :

1. From the **WAN – Channel Config** page, click and select **PPPoA** connection mode from the Channel Mode drop down manual. The default **PPPoA** connection setup is displayed.
2. Select the Channel Mode to "PPPoA". Set the parameters VPI/VCI and Encapsulation mode according to the ISP setting.
3. Click the radio button and select the Encapsulation type (LLC or VC-Mux).

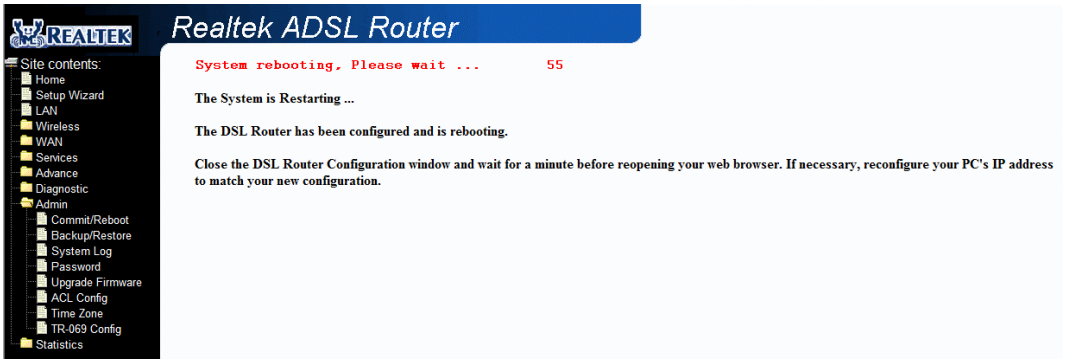
   Note: Your ADSL service provider or your ISP will supply these. In this case the ADSL service provider is using LLC.

4. Check the radio button to **"Enable"** or **"Disable"** the NAPT setting. Leave as it's default setting if your ADSL provider or ISP didn't provide any setting information.

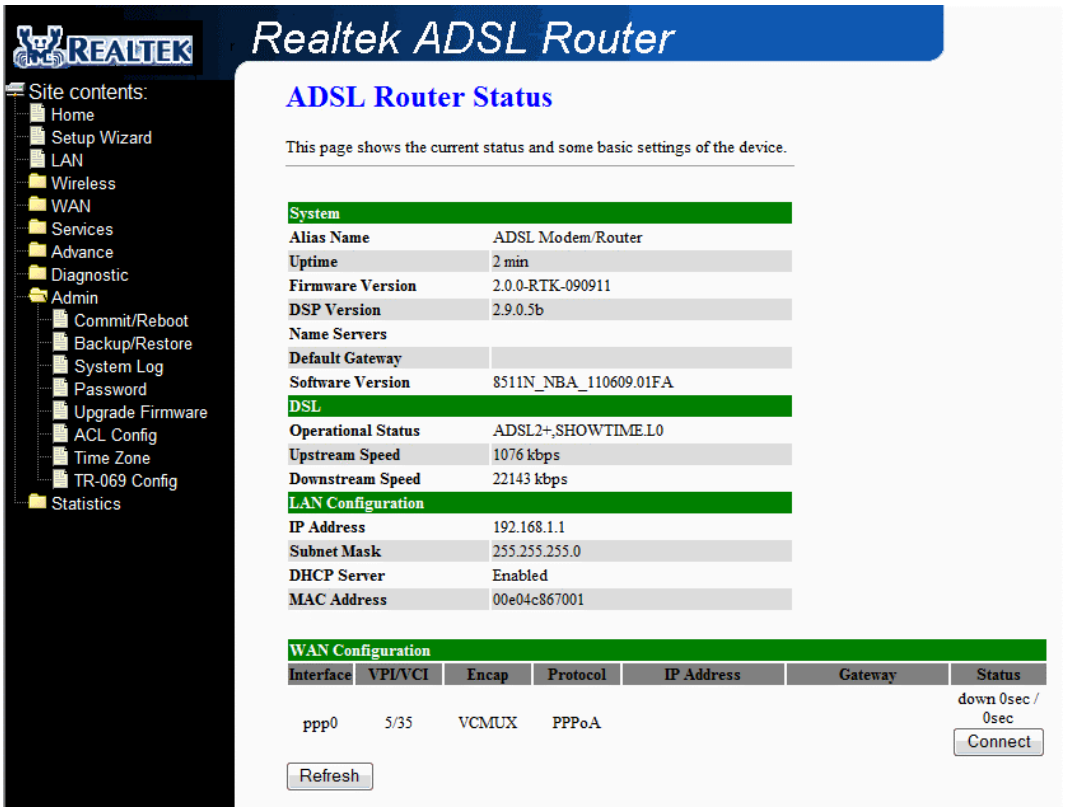
   Note: NAPT: Network Address and Port Translation: An extension of NAT, NAPT maps many private internal addresses into one IP address. The outside network (WAN) can see this one IP address but it cannot see the individual device IP addresses translated by the NAPT.

5. Enter your **Username** and **Password** which will be provided by your ADSL provider or ISP.
6. Select the Connection Type form the drop down manual or leave as it's default setting (Continuous).
7. Click the radio button to **"Enable"** or **"Disable"** the Default Route functionality or leave as its default (Enable).
8. Click **"Add"** button after setup.
9. You can **"Edit"** ( ) or **"Delete"** ( ) the existing connection profile under the **Actions** column.
10. Click "Admin/ Commit/Reboot". Press "Commit" to save the settings into flash memory.
11. The new settings will take effect after reboot the system.

12. The following window display indicates the system restarting process.

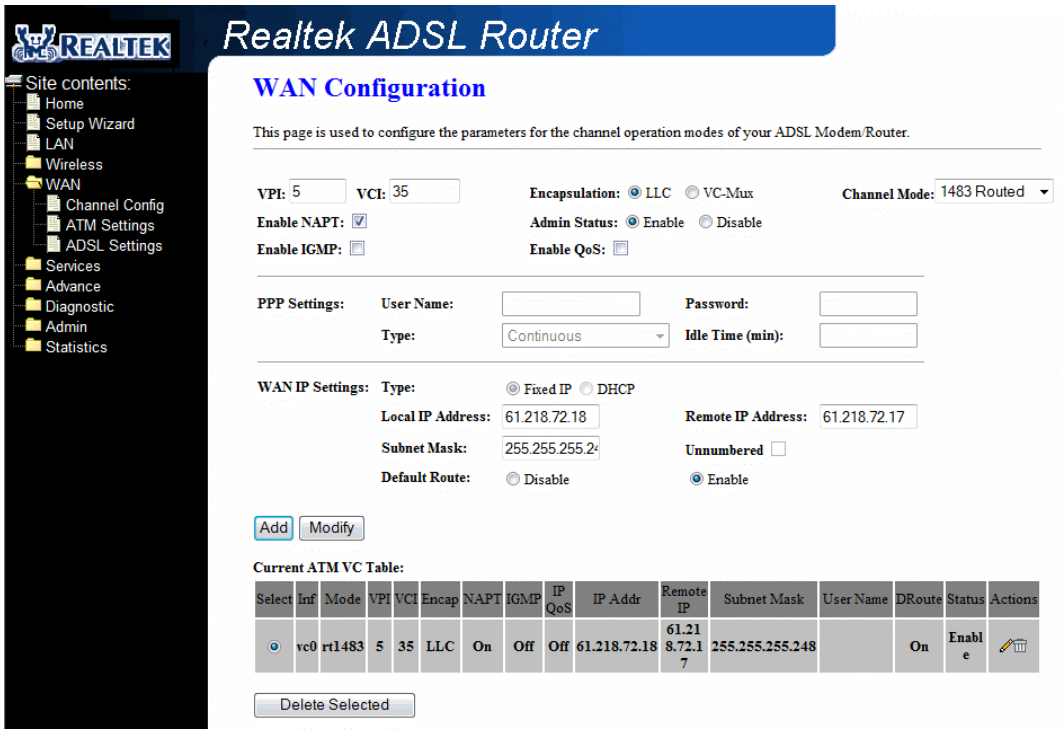


13. The following screen display after the system rebooting process. The System Home page will shows all the connection status and system information.



4.5.1.5 WAN – Channel config – 1483 Routed Mode

1483 Routed: When **1483 Routed** mode is selected, the following screen will pop-up. Fixed (Or Static) is used whenever a known Fixed (Or Static) IP is assigned. The accompanying information such as the **Subnet mask**, **Local IP Address** and the **Remote IP Address**s should also be specified. Up to three Domain Name Server (**DNS**) addresses can also be specified (Click **Services – DNS – DNS Server** configuration page and fill in the DNS server IP address provided by your ISP). These servers would enable you to have access to other web servers. Valid IP addresses range is from 0.0.0.0 to 255.255.255.255.



■ Channel:

- ☑ **VPI:** Virtual Path Identifier is a virtual path used for cell routing that is identified by an 8-bit field in the ATM cell header. The VPI field specifies this 8-bit identifier for routing.
- ☑ **VCI:** A Virtual Channel Identifier is a virtual channel that is identified by a unique numerical tag that is defined by a 16-bit field in the ATM cell header. The purpose of the virtual channel is to identify where the cell should travel. The VCI field specifies this 16-bit numerical tag that determines the destination.
- ☑ **Encapsulation:** There are 2 Encapsulation type:
  - ◆ LLC
  - ◆ VC-Mux
- ☑ **Channel Mode:** Select **"1483 Routed"** from the drop down manual.
- ☑ **Enable NAPT:** Select **"Disable"** or **"Enable"** the NAPT functionality. Default setting is **"Enable"**.

- **WAN IP:**

  ☑ **Type:** Click the radio button to select **"Fixed IP"** mode.

  - **Fixed IP:** You need to fill in the **"Local IP Address"**, **"Subnet Mask"** and **"Remote IP Address"** which will be provided by your ADSL Service provider or ISP. You need to go to **Services – DNS – DNS Server** configuration page to fill in your DNS setting.

  ☑ **Default Route:** Click the radio button to **"Enable"** or **"Disable"** the Default Route functionality.

Configuration Procedure :

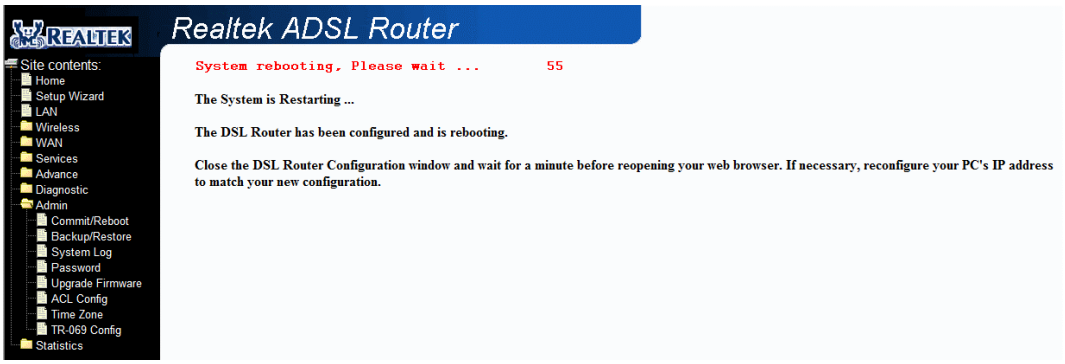
1. From the **WAN – Channel Config** page, click and select **1483 Routed** connection mode from the Channel Mode drop down manual. The default 1483 Routed connection setup is displayed.
2. Under the **Channel** mode, enter the values of **VPI** and **VCI** settings.
3. Click the radio button and elect the Encapsulation type (LLC or VC-Mux).

   Note: Your ADSL service provider or your ISP will supply these. In this case the ADSL service provider is using LLC.

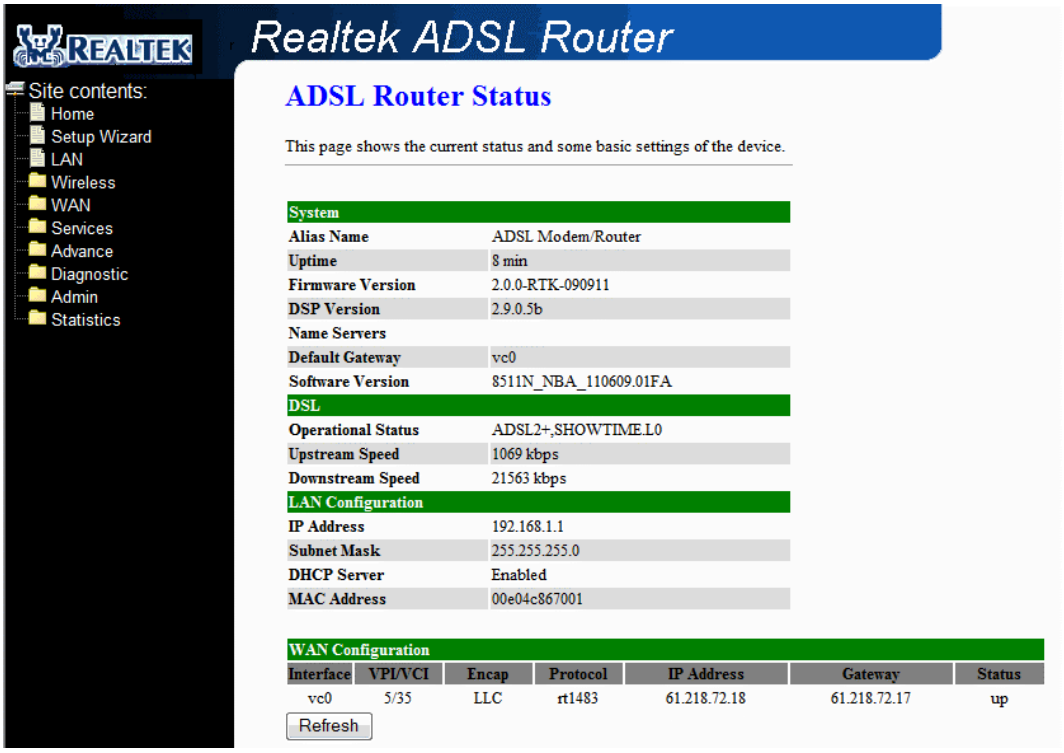
4. Check the radio button to **"Enable"** or **"Disable"** the NAPT setting. Leave as its default setting if your ADSL provider or ISP didn't provide any setting information.

   Note: **NAPT:** Network Address and Port Translation: An extension of NAT, NAPT maps many private internal addresses into one IP address. The outside network (WAN) can see this one IP address but it cannot see the individual device IP addresses translated by the NAPT.

5. Under the **WAN IP** mode, enter the **"Local IP Address"**, **"Subnet Mask"**, **"Remote IP Address"** and **"DNS"** setting if you are using the **Fixed IP** (Or Static IP) mode. These information/data will be provided by your ADSL Service provider or ISP.
6. Check the radio button to **"Enable"** or **"Disable"** the Default Route setting. Leave as its default setting if your ADSL provider or ISP didn't provide any setting information.
7. Click **"Add"** button after setup.
8. You can **"Edit"** ( ) or **"Delete"** ( ) the existing connection profile under the **Actions** column.
9. Click "Admin/ Commit/Reboot". Press "Commit" to save the settings into flash memory.
10. The new settings will take effect after reboot the system.
11. The following window display indicates the system restarting process.

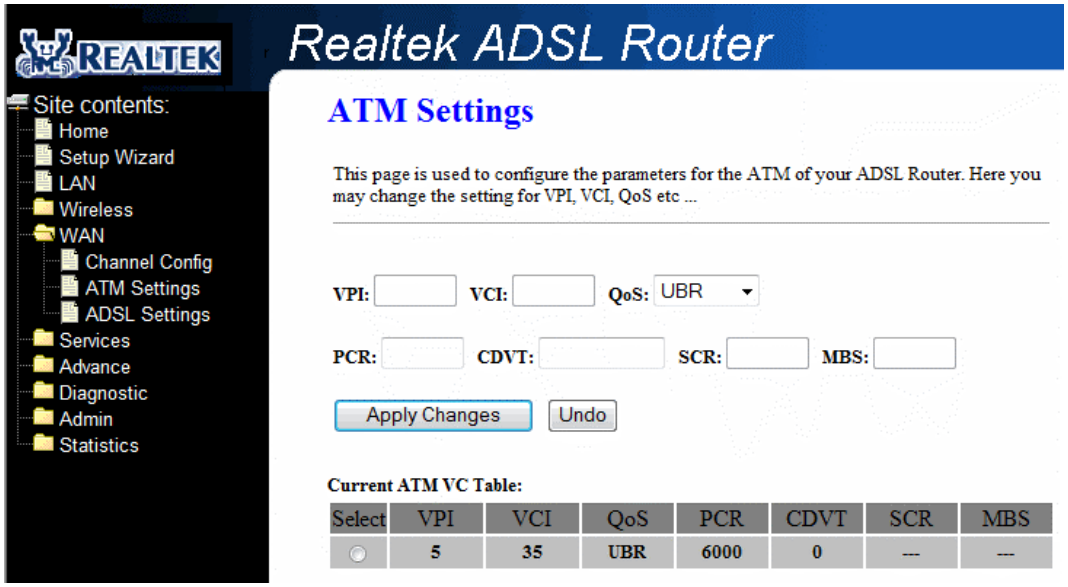


12. The following screen display after the system rebooting process. The System Home page will shows all the connection status and system information.



4.5.2 WAN – ATM Settings

The page is for ATM PVC QoS parameters setting. The DSL device support 4 QoS mode – UBR,CBR,rt-VBR,nrt-VBR.



Fields in this page:

Field	Description
VPI	Virtual Path Identifier. This is read-only field and is selected on the **Select** column in the Current ATM VC Table.
VCI	Virtual Channel Identifier. This is read-only field and is selected on the **Select** column in the Current ATM VC Table. The VCI, together with VPI, is used to identify the next destination of a cell as it passes through to the ATM switch.
QoS	Quality of Server, a characteristic of data transmission that measures how accurately and how quickly a message or data is transferred from a source host to a destination host over a network. The four QoS options are: – UBR (Unspecified Bit Rate): When UBR is selected, the SCR and MBS fields are disabled. – CBR (Constant Bit Rate): When CBR is selected, the SCR and MBS fields are disabled. – nrt-VBR (non-real-time Variable Bit Rate): When nrt-VBR is selected, the SCR and MBS fields are enabled. – rt-VBR (real-time Variable Bit Rate): When rt-VBR is selected, the SCR and MBS fields are enabled.
PCR	Peak Cell Rate, measured in cells/sec., is the cell rate which the source may never exceed.
CDVT	Cell Delay Variation Time. The Cell Delay Variation is a term used in ATM (Asynchronous Transfer Mode) to describe the time difference that is acceptable between cells being presented at the receiving host. Available only when VBR QoS

	is chosen.
SCR	Sustained Cell Rate, measured in cells/sec., is the average cell rate over the duration of the connection.
MBS	Maximum Burst Size, a traffic parameter that specifies the maximum number of cells that can be transmitted at the peak cell rate.

Function buttons in this page:

Apply Changes

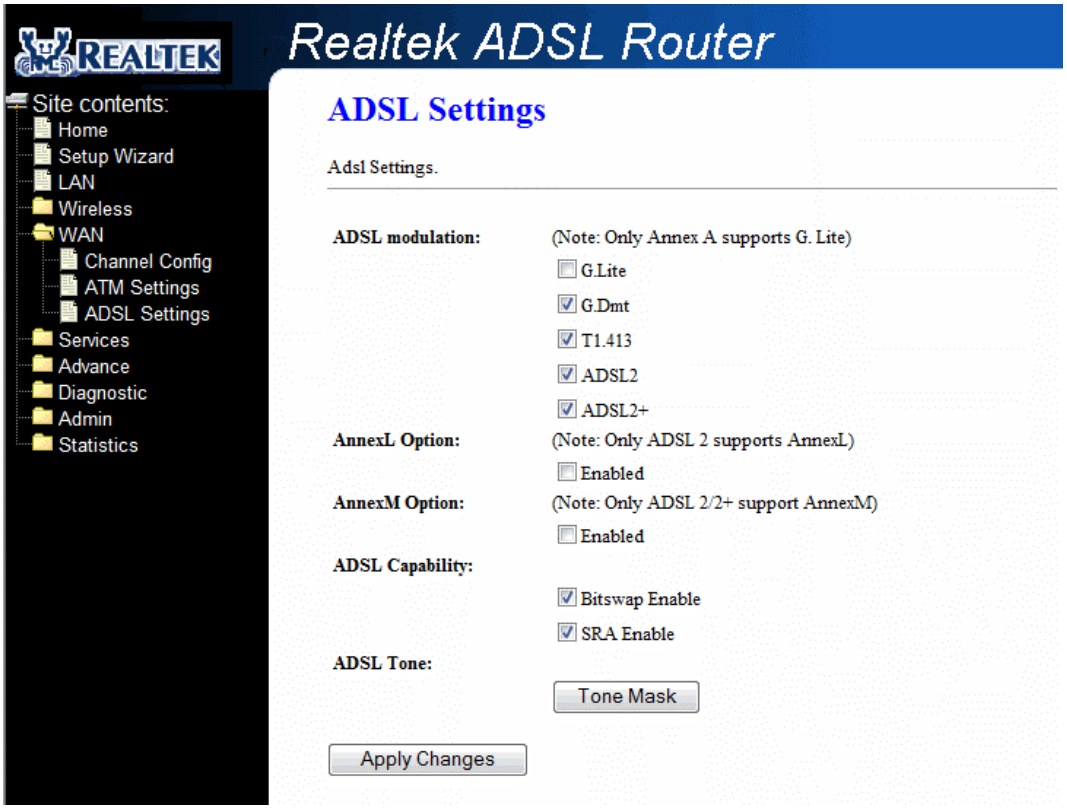
Set new PVC OoS mode for the selected PVC. New parameters will take effect after save into flash memory and reboot the system. See section “Admin” for save details.

Undo

Discard your settings.

4.5.3 WAN – ADSL Settings

The ADSL setting page allows you to select any combination of DSL training modes.



Fields in this page:

Field	Description
ADSL modulation	Choose prefered xdsl standard protocols. G.lite : G.992.2 Annex A G.dmt : G.992.1 Annex A T1.413 : T1.413 issue #2 ADSL2 : G.992.3 Annex A ADSL2+ : G.992.5 Annex A
AnnexL Option	Enable/Disable ADSL2/ADSL2+ Annex L capability.
AnnexM Option	Enable/Disable ADSL2/ADSL2+ Annex M capability.
ADSL Capability	“Bitswap Enable” : Enable/Disable bitswap capability. “SRA Enable” : Enable/Disable SRA (seamless rate adaptation) capability.

Function buttons in this page:

Tone Mask

Choose tones to be masked. Mased tones will not carry any data.

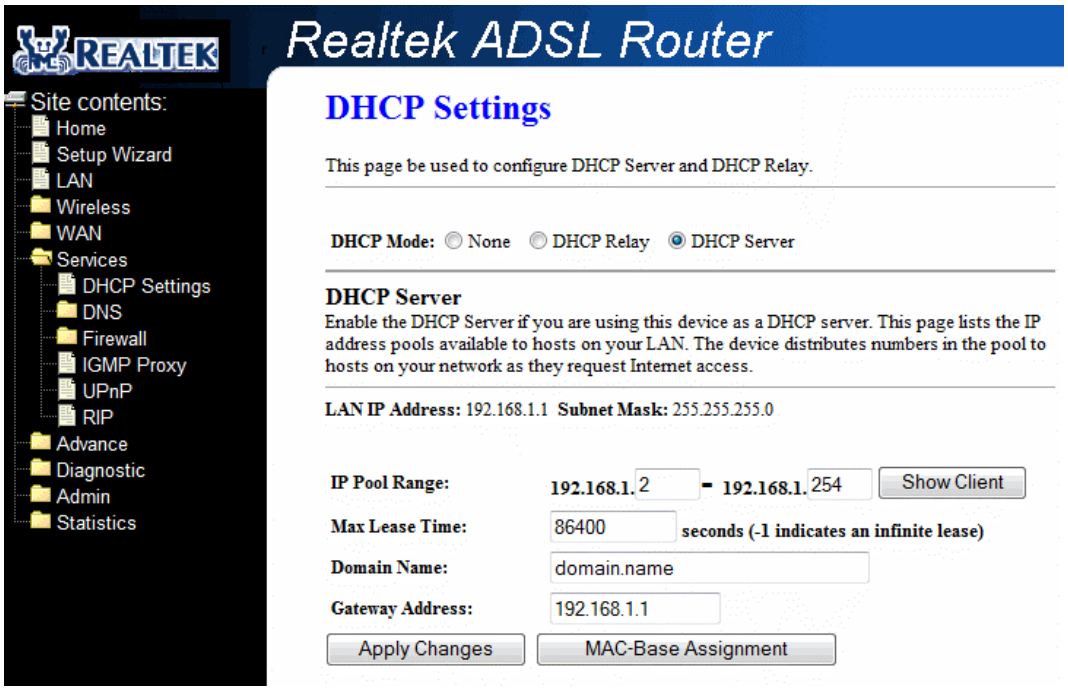
Apply Changes

Click to save the setting to the configuration and the modem will be retrained.

4.6 Service

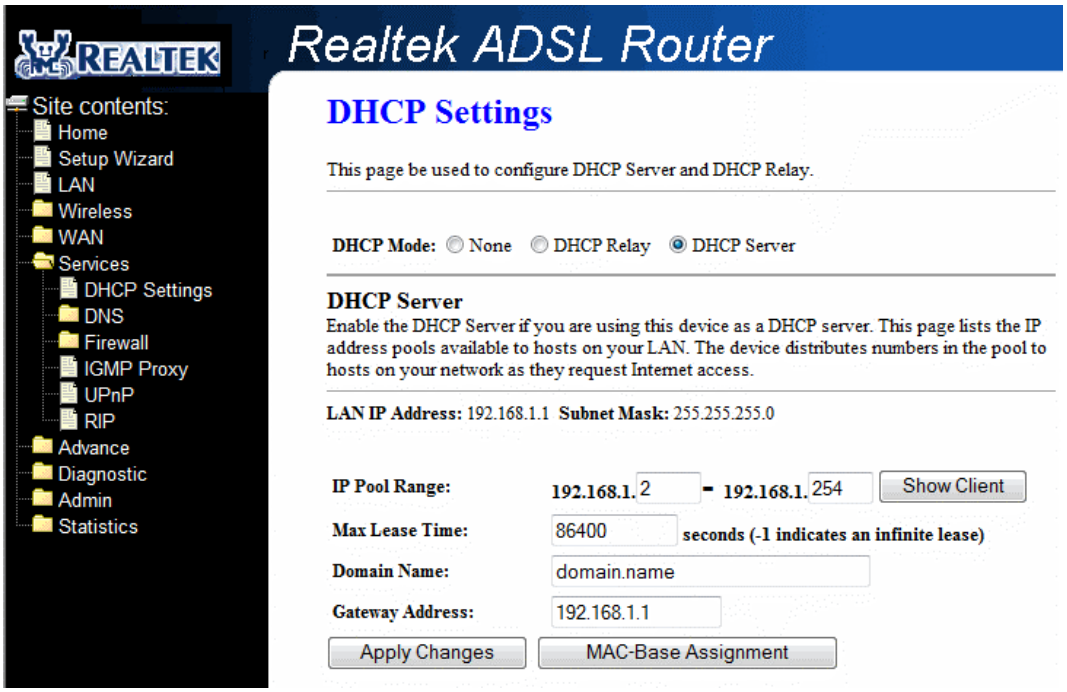
You can view Service link in the left navigation bar. Following are the options available under Service:

- DHCP Settings
- DNS
- Firewall
- IGMP Proxy
- UPnP
- RIP



4.6.1 Service – DHCP Settings

You can configure your network and DSL device to use the Dynamic Host Configuration Protocol (DHCP). This page provides DHCP instructions for implementing it on your network by selecting the role of DHCP protocol that this device wants to play. There are two different DHCP roles that this device can act as: DHCP Server and DHCP Relay. When acting as DHCP server, you can setup the server parameters at the **DHCP Server** page; while acting as DHCP Relay, you can setup the relay at the **DHCP Relay** page.



DHCP Server configuration

By default, the device is configured as a DHCP server, with a predefined IP address pool of 192.168.1.2 through 192.168.1.254 (subnet mask 255.255.255.0).

Field	Description
IP Pool Range	Specify the lowest and highest addresses in the pool.
Max Lease Time	The Lease Time is the amount of time that a network user is allowed to maintain a network connection to the device using the current dynamic IP address. At the end of the Lease Time, the lease is either renewed or a new IP is issued by the DHCP server. The amount of time is in units of seconds. The default value is 86400 seconds (1 day). The value –1 stands for the infinite lease.
Domain Name	A user-friendly name that refers to the group of hosts (subnet) that will be assigned addresses from this pool.
Gateway Address	Specify the IP Address of Gateway.

Function buttons in this page:

Apply Changes

Set new DHCP server configuration. New parameters will take effect after save into flash memory and

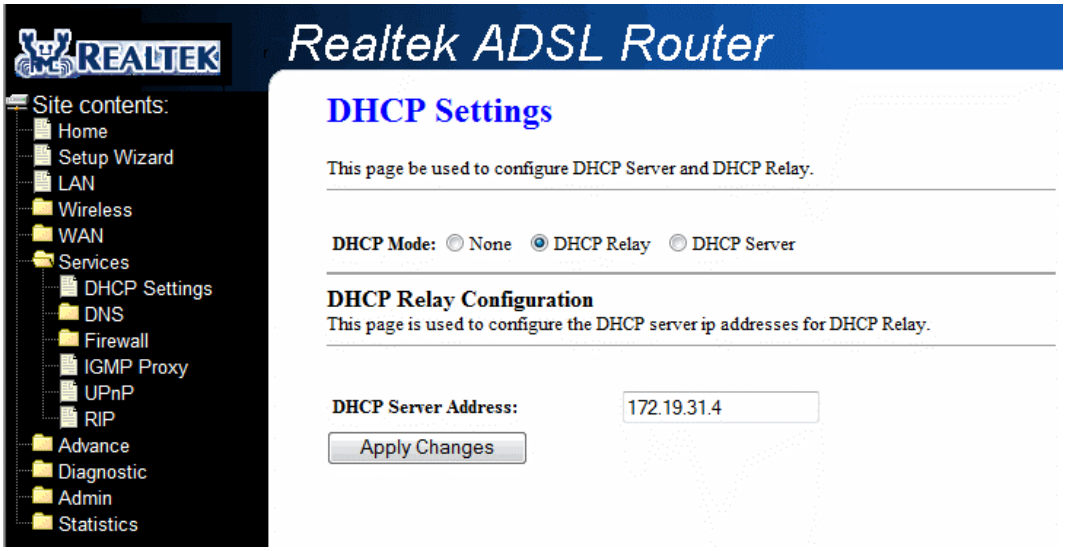
reboot the system. See section “Admin” for save details.

Undo

Discard your changes.

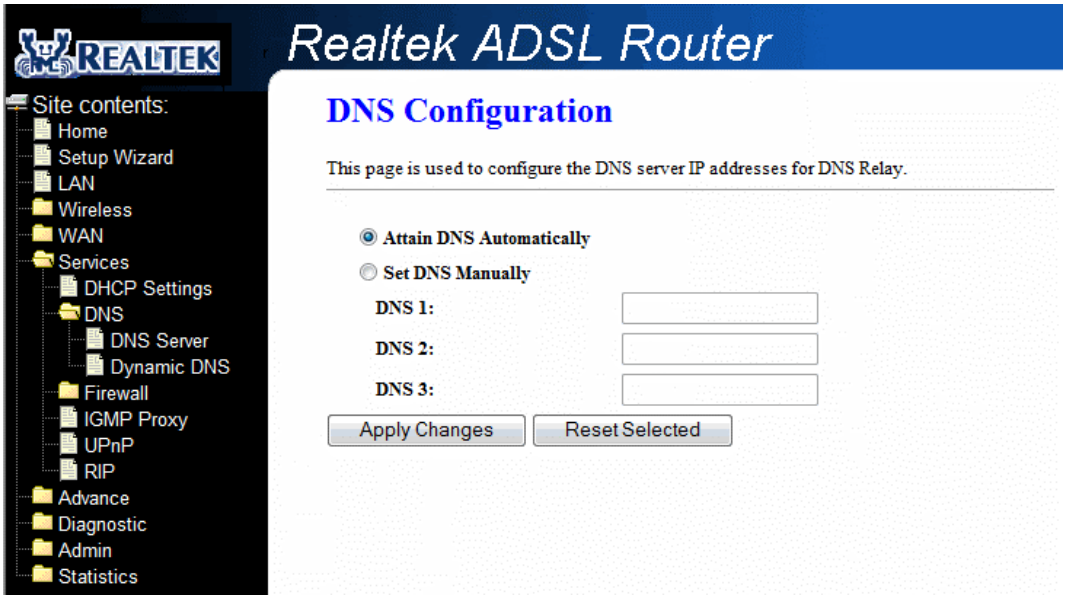
DHCP Relay configuration

Some ISPs perform the DHCP server function for their customers’ home/small office network. In this case, you can configure this device to act as a DHCP relay agent. When a host on your network requests Internet access, the device contacts your ISP to obtain the IP configuration, and then forward that information to the host. You should set the DHCP mode after you configure the DHCP relay.



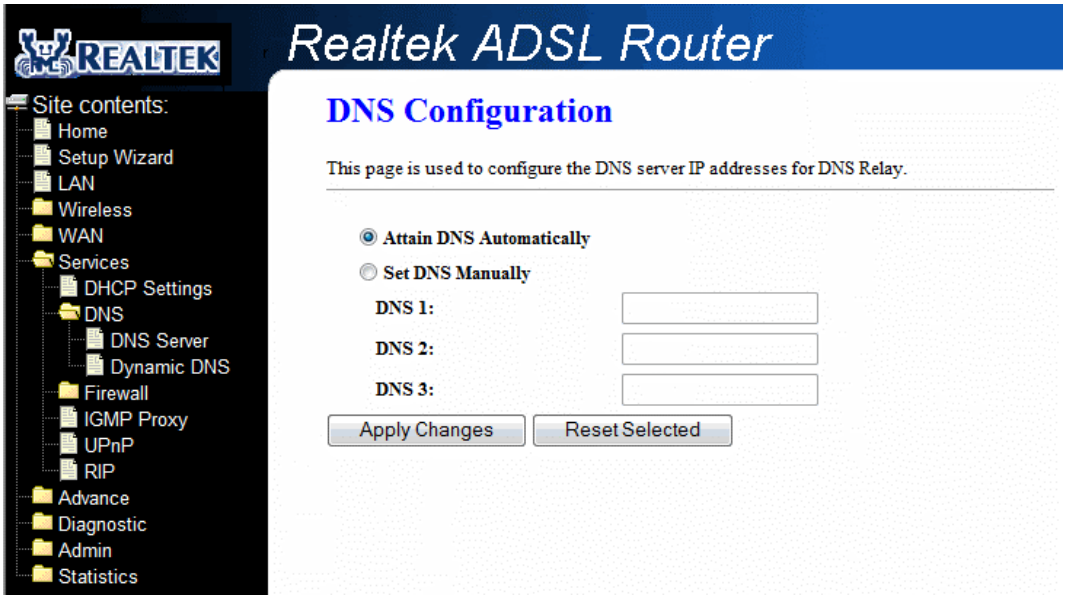
4.6.2 Service – DNS

There are two submenus for the DNS Configuration: [DNS Server] and [Dynamic DNS]



4.6.2.1 Service – DNS – DNS Server

This page is used to select the way to obtain the IP addresses of the DNS servers.



Field	Description
Attain DNS Automatically	Select this item if you want to use the DNS servers obtained by the WAN interface via the auto-configuration mechanism.
Set DNS Manually	Select this item to configure up to three DNS IP addresses.

Function buttons in this page:

Apply Changes

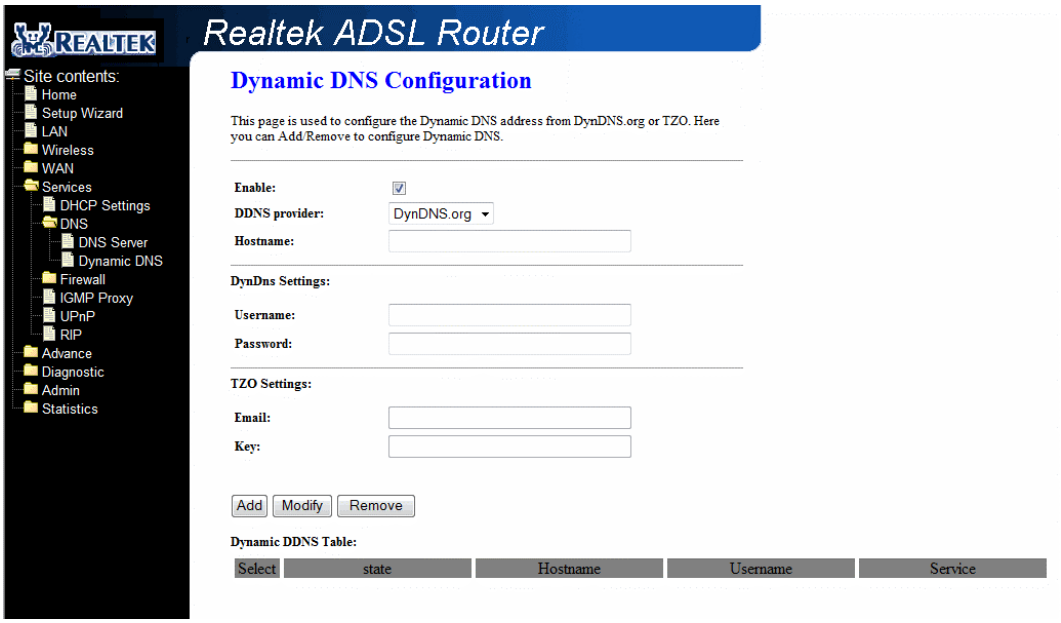
Set new DNS relay configuration. New parameters will take effect after save into flash memory and reboot the system. See section “Admin” for save details.

Reset Selected

Discard your changes.

4.6.2.2 Service – DNS – DDNS Server

Each time your device connects to the Internet, your ISP assigns a different IP address to your device. In order for you or other users to access your device from the WAN-side, you need to manually track the IP that is currently used. The Dynamic DNS feature allow you to register your device with a DNS server and access your device each time using the same host name. The **Dynamic DNS** page allows you to enable/disable the Dynamic DNS feature.



On the **Dynamic DNS** page, configure the following fields:

Field	Description
Enable	Check this item to enable this registration account for the DNS server.
DDNS provider	There are two DDNS providers to be selected in order to register your device with: DynDNS and TZO. A charge may occur depends on the service you select.
Hostname	Domain name to be registered with the DDNS server.
Username	User-name assigned by the DDNS service provider.
Password	Password assigned by the DDNS service provider.
Email	Email assigned by the DDNS service provider.
Key	Key assigned by the DDNS service provider.

Function buttons in this page:

Add

Click Add to add this registration into the configuration.

Modify

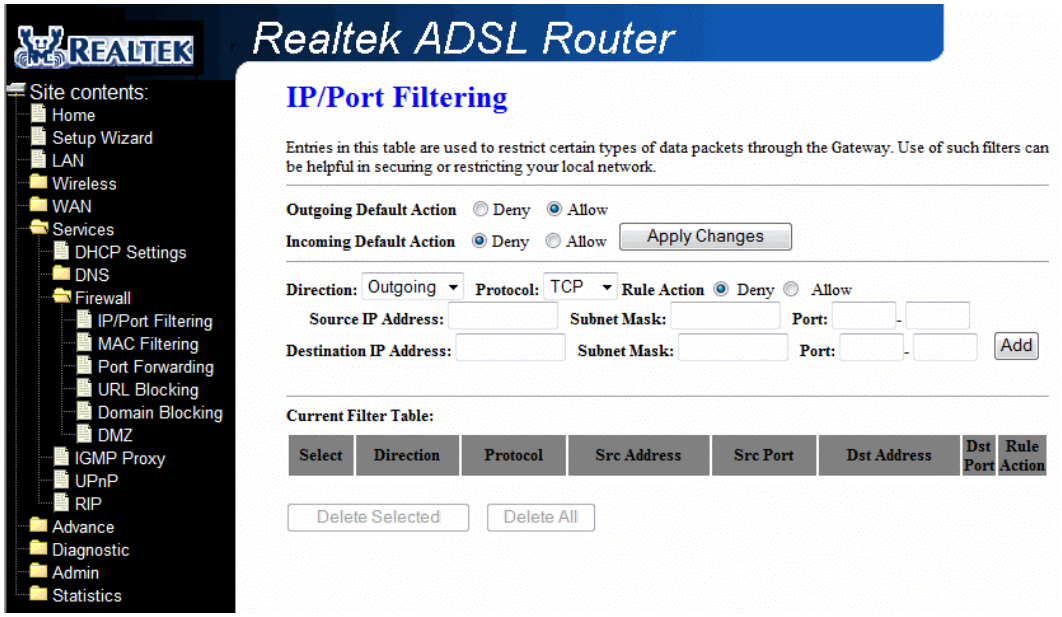
Click Modify to modify this registration into the configuration.

Remove

Select an existing DDNS registration by clicking the radio button at the **Select** column of the **Dynamic DNS Table**. Click **Remove** button to remove the selected registration from the configuration.

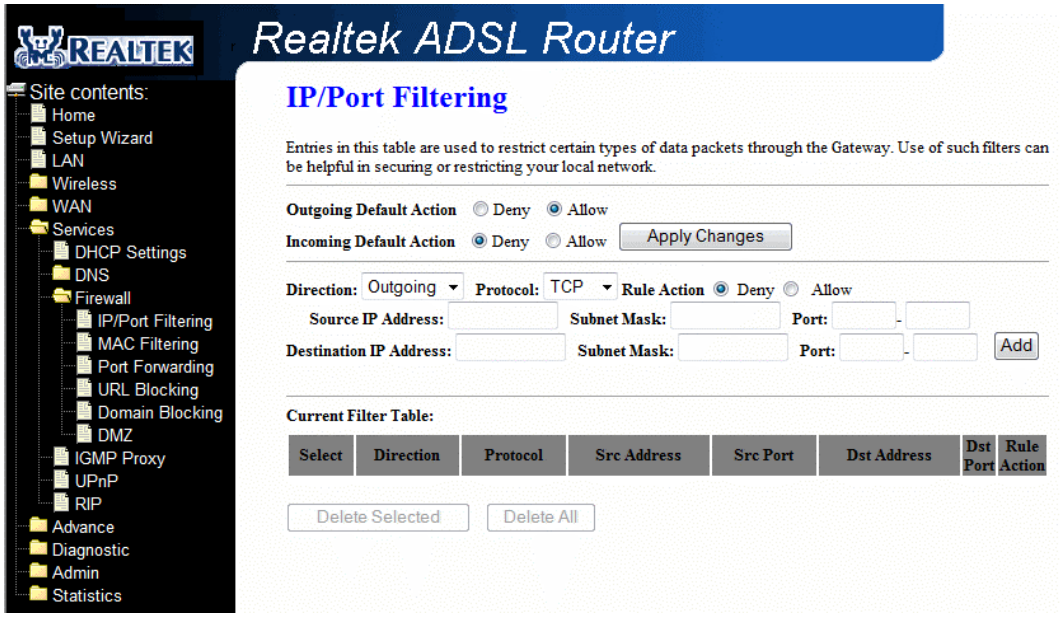
4.6.3 Service – Firewall

Firewall contains several features that are used to deny or allow traffic from passing through the device.



4.6.3.1 Service – Firewall – IP/Port Filtering

The IP/Port filtering feature allows you to deny/allow specific services or applications in the forwarding path.



Fields on the first setting block:

Field	Description
Outgoing Default Action	Specify the default action on the LAN to WAN forwarding path.
Incoming Default Action	Specify the default action on the WAN to LAN forwarding path.

Function button for this first setting block:

Apply Changes

Click to save the setting of default actions to the configuration.

Fields on the second setting block:

Field	Description
Rule Action	Deny or allow traffic when matching this rule.
Direction	Traffic forwarding direction.
Protocol	There are 3 options available: TCP, UDP and ICMP.
Source IP Address	The source IP address assigned to the traffic on which filtering is applied.
Subnet Mask	Subnet-mask of the source IP.
Port	Starting and ending source port numbers.
Destination IP Address	The destination IP address assigned to the traffic on which filtering is applied.
Subnet Mask	Subnet-mask of the destination IP.
Port	Starting and ending destination port numbers.

Function buttons for this second setting block:

Add

Click to add the rule entry to the configuration.

Function buttons for the **Current Filter Table**:

Delete Selected

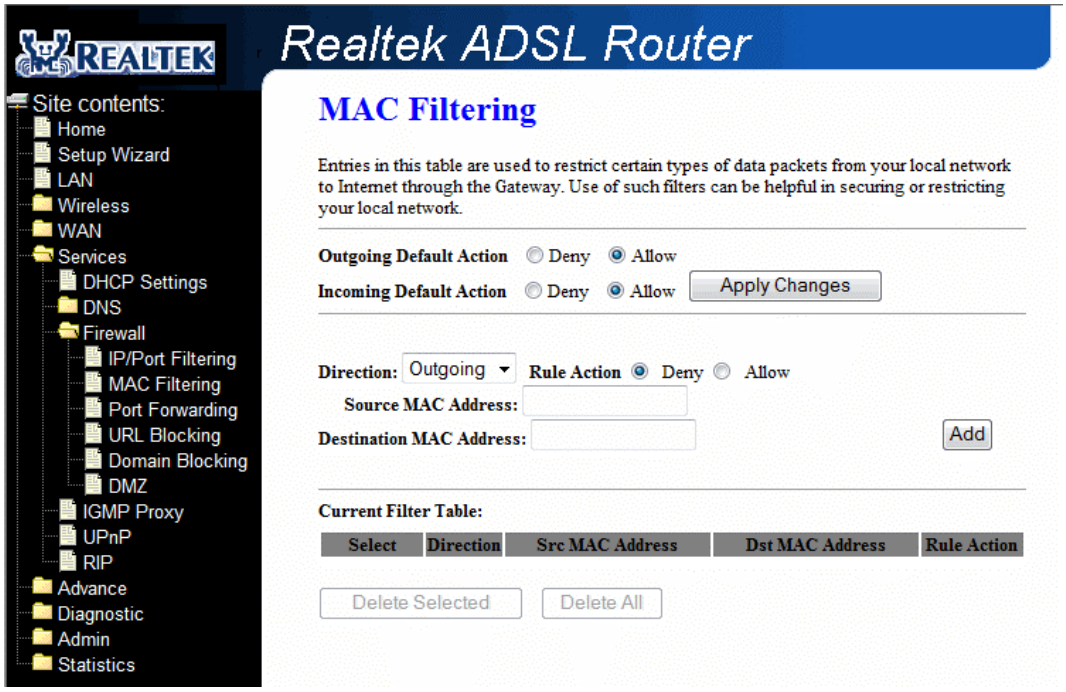
Delete selected filtering rules from the filter table. You can click the checkbox at the **Select** column to select the filtering rule.

Delete All

Delete all filtering rules from the filter table.

4.6.3.2 Service – Firewall – MAC Filtering

The MAC filtering feature allows you to define rules to allow or deny frames through the device based on source MAC address, destination MAC address, and traffic direction.



Fields on the first setting block:

Field	Description
Outgoing Default Action	Specify the default action on the LAN to WAN bridging/forwarding path.
Incoming Default Action	Specify the default action on the WAN to LAN bridging/forwarding path.

Function button for this first setting block:

Apply Changes

Click to save the setting of default actions to the configuration.

Fields on the second setting block:

Field	Description
Rule Action	Deny or allow traffic when matching this rule.
Direction	Traffic bridging/forwarding direction.
Source MAC Address	The source MAC address. It must be xxxxxxxxxxxx format. Blanks can be used in the MAC address space and are considered as don't care.
Destination MAC Address	The destination MAC address. It must be xxxxxxxxxxxx format. Blanks can be used in the MAC address space and are considered as don't care.

Function buttons for this second setting block:

Add

Click to add the rule entry to the configuration.

Function buttons for the **Current Filter Table**:

Delete Selected

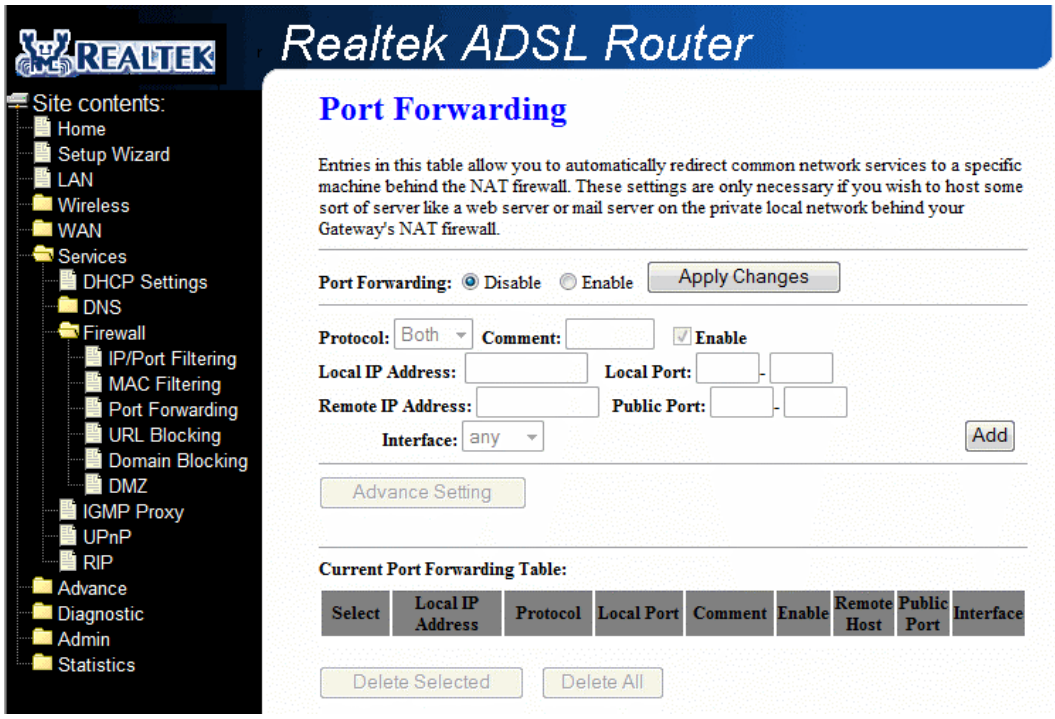
Delete selected filtering rules from the filter table. You can click the checkbox at the **Select** column to select the filtering rule.

Delete All

Delete all filtering rules from the filter table.

4.6.3.3 Service – Firewall – Port Forwarding

Firewall keeps unwanted traffic from the Internet away from your LAN computers. Add a Port Forwarding entry will create a tunnel through your firewall so that the computers on the Internet can communicate to one of the computers on your LAN on a single port.



Fields in this page:

Field	Description
Port Forwarding	Enable/Disable the port-forwarding feature.
Protocol	There are 3 options available: TCP, UDP and Both.
Comment	Fill in the port forwarding name.
Enable	Check this item to enable this entry.
Local IP Address	IP address of your local server that will be accessed by Internet.
Local Port	The destination port number that is made open for this application on the LAN-side.
Remote IP Address	The source IP address from which the incoming traffic is allowed. Leave blank for all.
Public Port	The destination port number that is made open for this application on the WAN-side
Interface	Select the WAN interface on which the port-forwarding rule is to be applied.

Function buttons for the setting block:

Apply Changes

Click to save the enable/disable the port forwarding to the configuration.

Add

Click to add the rule entry to the configuration.

Function buttons for the **Current Port Forwarding Table**:

Delete Selected

Delete the selected port forwarding rules from the forwarding table. You can click the checkbox at the **Select** column to select the forwarding rule.

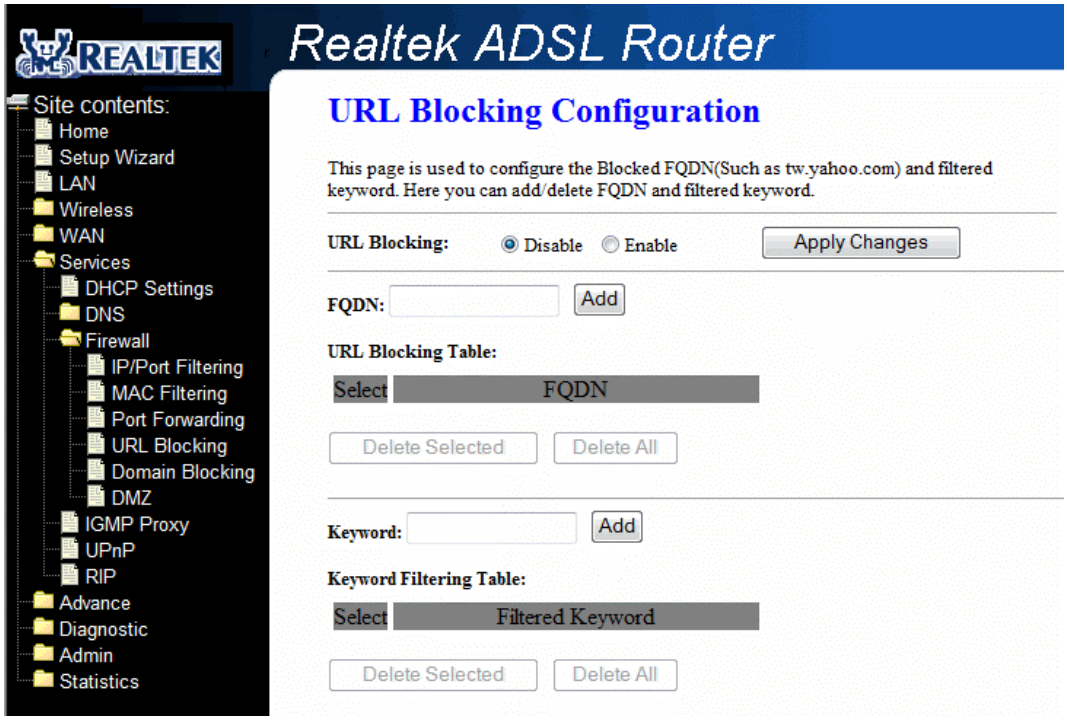
Delete All

Delete all forwarding rules from the forwarding table.

4.6.3.4 Service – Firewall – URL Blocking

A URL is a web address that is normally typed into a web browser. For instance www.yahoo.com, www.msn.com are all URLs. URL Blocking allows you to block URLs based upon keywords that you enter into a box. Blocking URLs prevents people on your network from accessing these websites. These keywords may be full URL's or they may just be words.

FQDN (Fully Qualified Domain Name) means the complete domain name for a specific computer (host) on the Internet. It provides enough information so that it can be converted into a physical IP address. The FQDN consists of host name and domain name. For example, **www.google.com** is the FQDN on the Web for the publisher of this database. The **WWW** is the host. On the Web, there are millions of hosts named WWW in order to maintain uniformity. **GOOGLE.COM** is the domain name, with **.COM** being the top level domain (TLD) name.



Fields in this page:

Field	Description
URL Blocking	Enable/Disable the URL Blocking feature.
FQDN	The complete domain name for a specific computer (host) on the Internet.
Keyword	Enter the filtered keyword.

Function buttons for the setting block:

Apply Changes

Click to save the enable/disable the URL Blocking to the configuration.

Function buttons for the **URL Blocking Table**:

Add

Click to add the FQDN to the configuration.

Delete Selected

Delete the selected FQDN from the URL Blocking table. You can click the checkbox at the **Select** column to select the FQDN entry.

Delete All

Delete all FQDN entry from the URL Blocking table.

Function buttons for the **Keyword Filtering Table**:

Add

Click to add the keyword to the configuration.

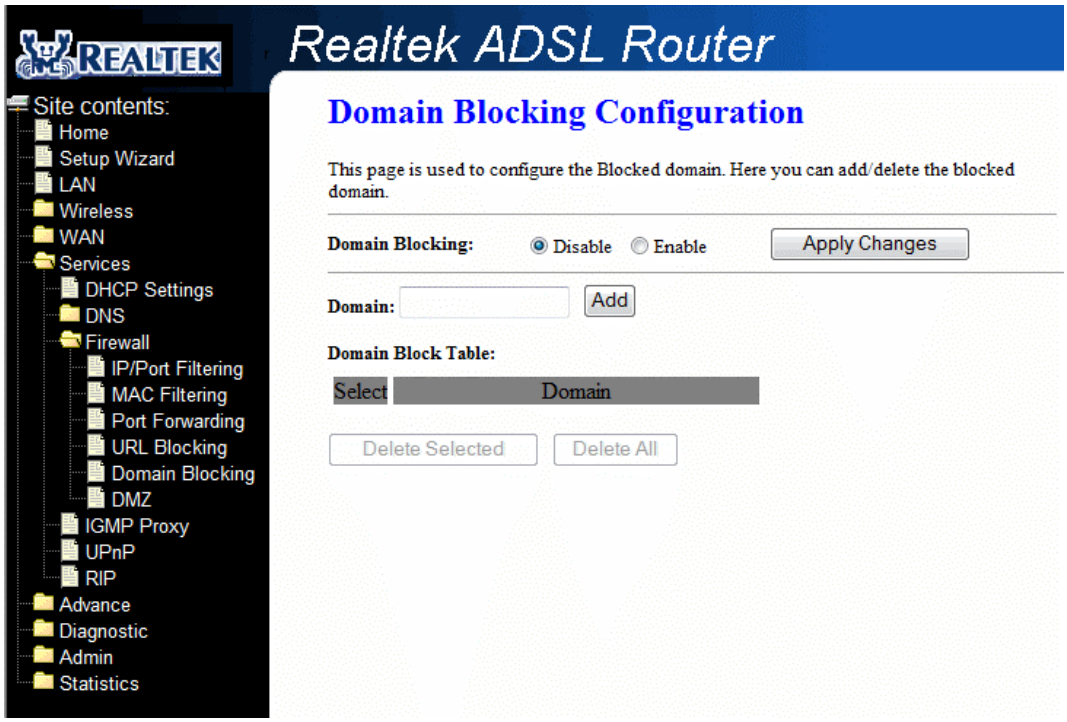
Delete Selected

Delete the selected keyword from the Keyword Filtering table. You can click the checkbox at the **Select** column to select the keyword entry.

Delete All

Delete all keyword entry from the keyword filtering table.

4.6.3.5 Service – Firewall – Domain Blocking



Fields in this page:

Field	Description
Domain Blocking	Enable/Disable the Domain Blocking feature.
Domain	The complete domain name on the Internet.

Function buttons for the setting block:

Apply Changes

Click to save the enable/disable the URL Blocking to the configuration.

Function buttons for the **Domain Blocking Table**:

Add

Click to add the Domain to the configuration.

Delete Selected

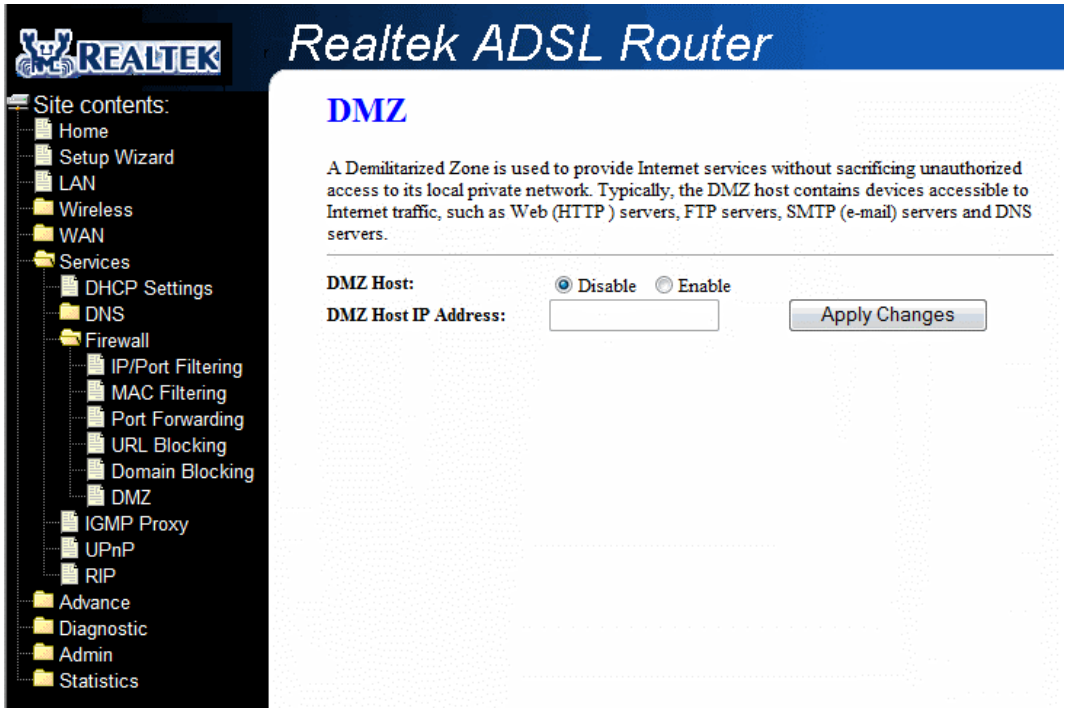
Delete the selected Domain from the Domain Blocking table. You can click the checkbox at the **Select** column to select the Domain entry.

Delete All

Delete all Domain entry from the Domain Blocking table.

4.6.3.6 Service – Firewall – DMZ

A DMZ (Demilitarized Zone) allows a single computer on your LAN to expose all of its ports to the Internet. Enter the IP address of that computer as a DMZ (Demilitarized Zone) host with unrestricted Internet access. When doing this, the DMZ host is no longer behind the firewall.



Fields in this page:

Field	Description
DMZ Host	Enable/Disable the DMZ feature.
DMZ Host IP Address	IP address of the local host. This feature sets a local host to be exposed to the Internet.

Function buttons in this page:

Apply Changes

Click to save the setting to the configuration.

4.6.4 Service – IGMP Proxy

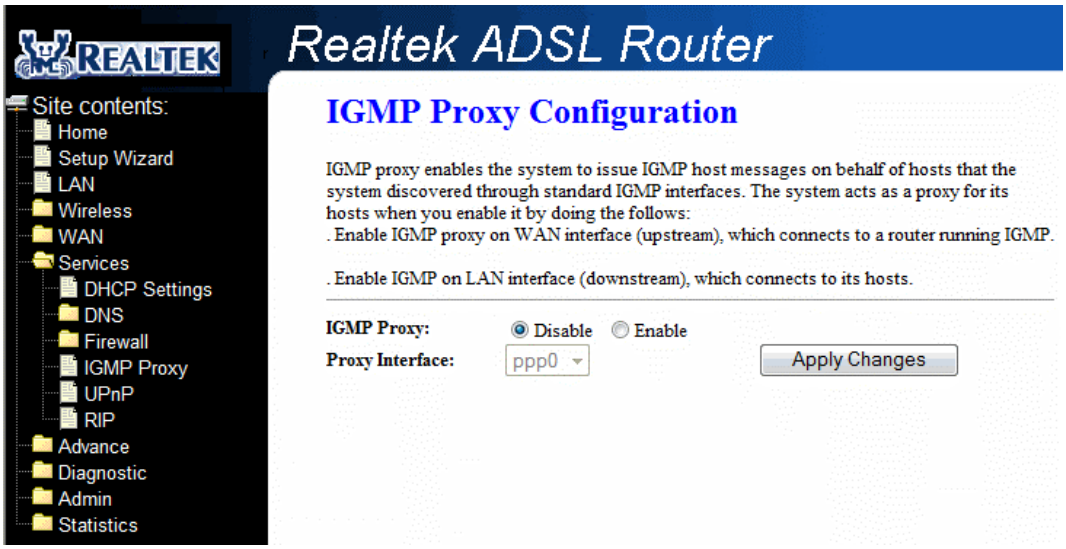
Multicasting is useful when the same data needs to be sent to more than one hosts. Using multicasting as opposed to sending the same data to the individual hosts uses less network bandwidth. The multicast feature also enables you to receive multicast video stream from multicast servers.

IP hosts use Internet Group Management Protocol (IGMP) to report their multicast group memberships to neighboring routers. Similarly, multicast routers use IGMP to discover which of their hosts belong to multicast groups. This device supports IGMP proxy that handles IGMP messages. When enabled, this device acts as a proxy for a LAN host making requests to join and leave multicast groups, or a multicast router sending multicast packets to multicast group on the WAN side.

When a host wishes to join a multicast group, it sends IGMP REPORT message to the device's IGMP downstream interface. The proxy sets up a multicast route for the interface and host requesting the video content. It then forwards the Join to the upstream multicast router. The multicast IP traffic will then be forwarded to the requesting host. On a leave, the proxy removes the route and then forwards the leave to the upstream multicast router.

The IGMP Proxy page allows you to enable multicast on WAN and LAN interfaces. The LAN interface is always served as downstream IGMP proxy, and you can configure one of the available WAN interfaces as the upstream IGMP proxy.

- Upstream: The interface that IGMP requests from hosts is sent to the multicast router.
- Downstream: The interface data from the multicast router are sent to hosts in the multicast group database.



Fields in this page:

Field	Description
IGMP Proxy	Enable/disable IGMP proxy feature
Proxy Interface	The upstream WAN interface is selected here.

Function buttons in this page:

Apply Changes

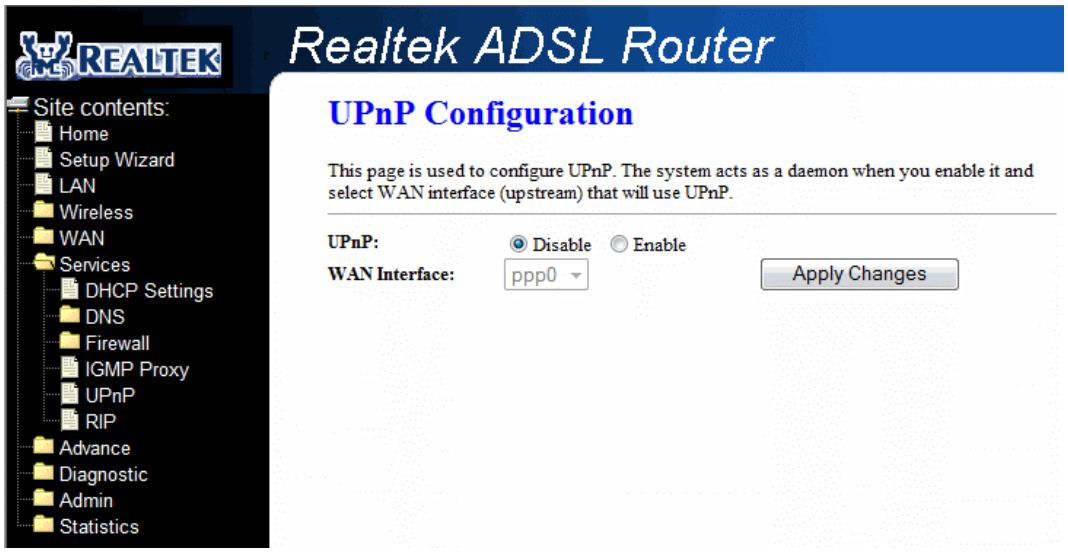
Click to save the setting to the configuration.

4.6.5 Service – UPnP

The DSL router supports a control point for Universal Plug and Play (UPnP) version 1.0, and supports two key features: **NAT Traversal** and **Device Identification**. This feature requires one active WAN interface. In addition, the host should support this feature. In the presence of multiple WAN interfaces, select an interface on which the incoming traffic is present.

With NAT Traversal, when an UPnP command is received to open ports in NAT, the application translates the request into system commands to open the ports in NAT and the firewall. The interface to open the ports on is given to UPnP when it starts up and is part of the configuration of the application.

For Device Identification, the application will send a description of the DSL device as a control point back to the host making the request.



Fields in this page

Field	Description
UPnP	Enable/disable UPnP feature.
WAN Interface	Select WAN interface that will use UPnP from the drop-down lists.

Function buttons in this page:

Apply Changes

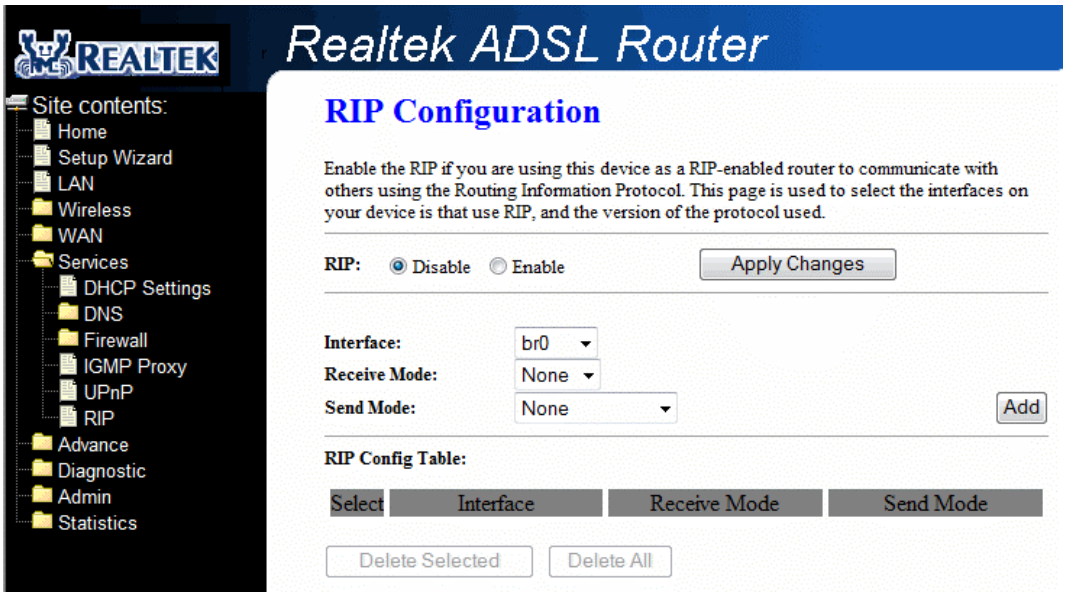
Click to save the setting to the system configuration.

4.6.6 Service – RIP

RIP is an Internet protocol you can set up to share routing table information with other routing devices on your LAN, at your ISP's location, or on remote networks connected to your network via the ADSL line. Most small home or office networks do not need to use RIP; they have only one router, such as the ADSL Router, and one path to an ISP. In these cases, there is no need to share routes, because all Internet data from the network is sent to the same ISP gateway.

You may want to configure RIP if any of the following circumstances apply to your network:

- Your home network setup includes an additional router or RIP-enabled PC (other than the ADSL Router). The ADSL Router and the router will need to communicate via RIP to share their routing tables.
- Your network connects via the ADSL line to a remote network, such as a corporate network. In order for your LAN to learn the routes used within your corporate network, they should both be configured with RIP.
- Your ISP requests that you run RIP for communication with devices on their network..



Fields on the first setting block:

Field	Description
RIP	Enable/disable RIP feature.

Function buttons for the first setting block in this page:

Apply Changes

Click to save the setting of this setting block to the system configuration

Fields on the second setting block:

Field	Description
Interface	The name of the interface on which you want to enable RIP.
Receive Mode	Indicate the RIP version in which information must be passed to the DSL device in

	order for it to be accepted into its routing table.
Send Mode	Indicate the RIP version this interface will use when it sends its route information to other devices.

Function buttons for the second setting block in this page:

Add

Add a RIP entry and the new RIP entry will be display in the table

Delete Selected

Delete the selected RIP entry. You can click the checkbox at the **Select** column to select the RIP entry.

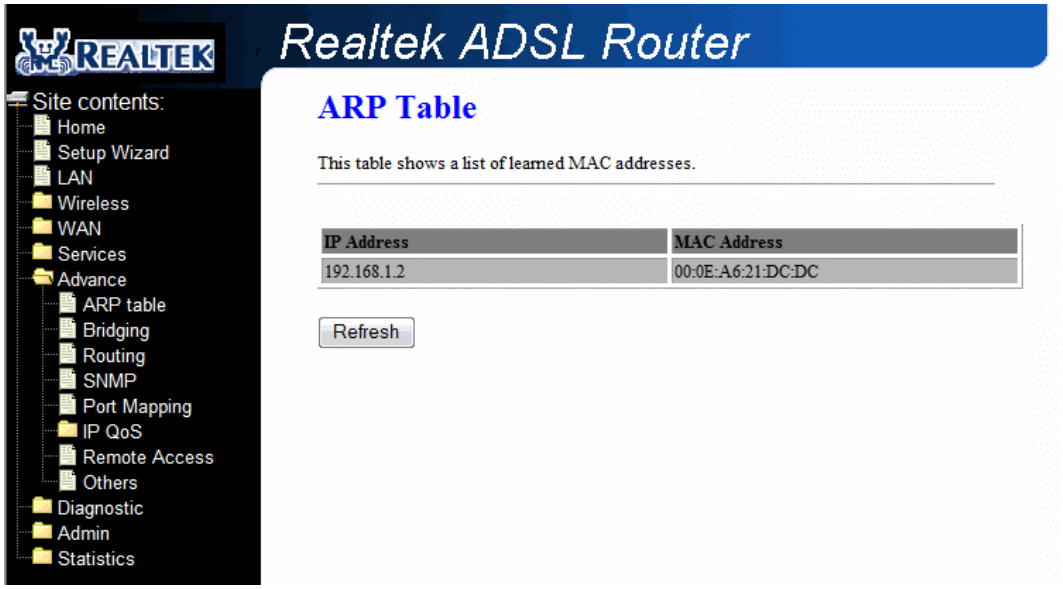
Delete All

Delete all RIP entry from the RIP Config table.

4.7 Advance

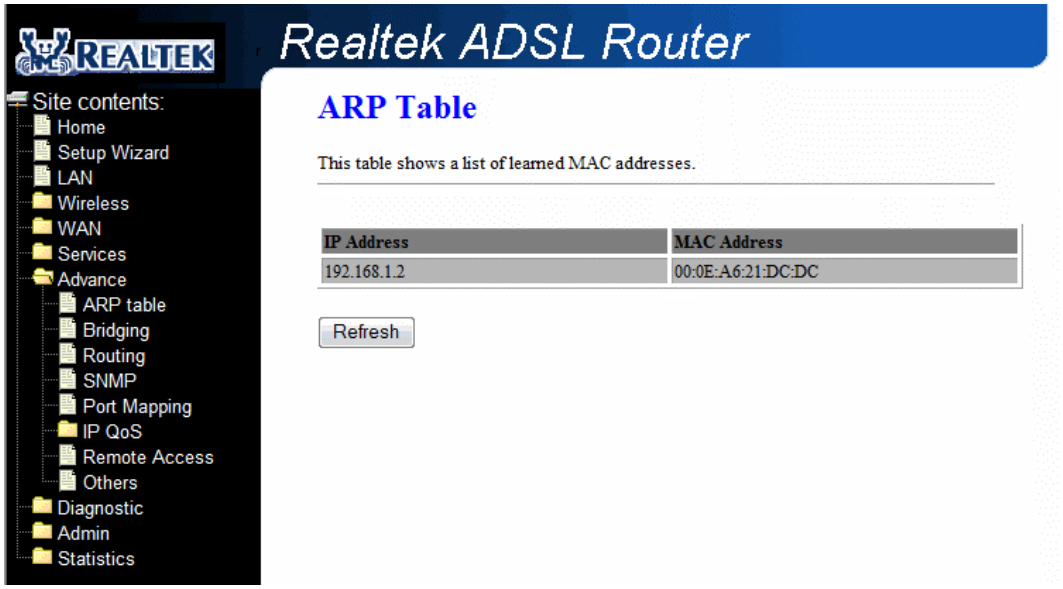
You can view Advance link in the left navigation bar. Following are the options available under Advance:

- ARP table
- Bridging
- Routing
- SNMP
- Port Mapping
- IP QoS
- Remote Access
- Others



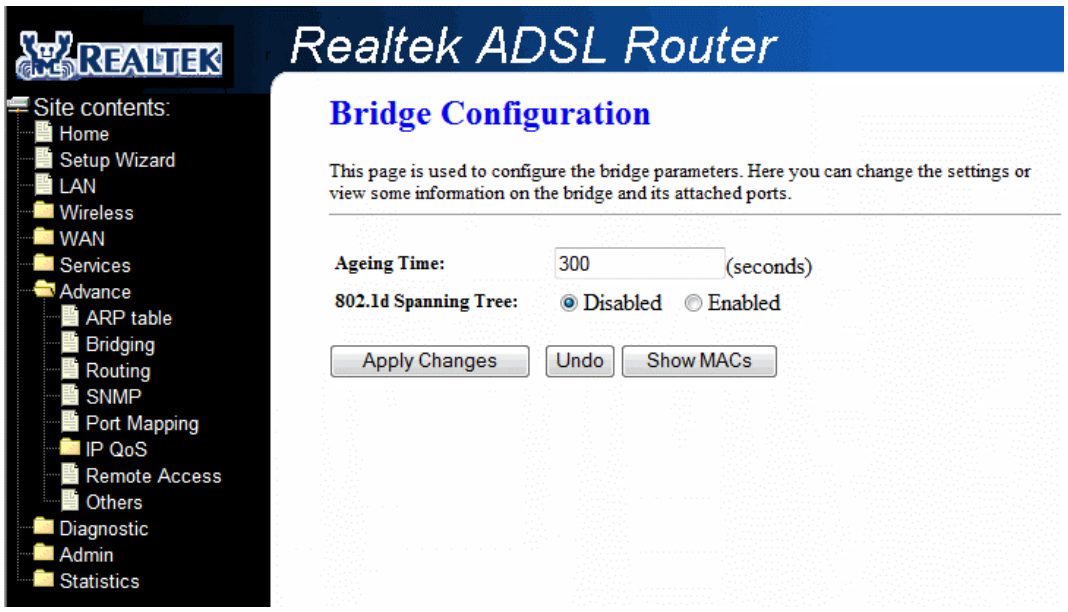
4.7.1 Advance – ARP table

ARP table shows a list of learned MAC address.



4.7.2 Advance – Bridging

You can enable/disable Spanning Tree Protocol and set MAC address aging time in this page.



Fields in this page:

Field	Description
Ageing Time	Set the Ethernet address ageing time, in seconds. After [Ageing Time] seconds of not having seen a frame coming from a certain address, the bridge will time out (delete) that address from Forwarding DataBase (fdb).
802.1d Spanning Tree	Enable/disable the spanning tree protocol

Function buttons in this page:

Apply Changes

Save this bridge configuration. New configuration will take effect after saving into flash memory and rebooting the system. See section “Admin” for details.

Show MACs

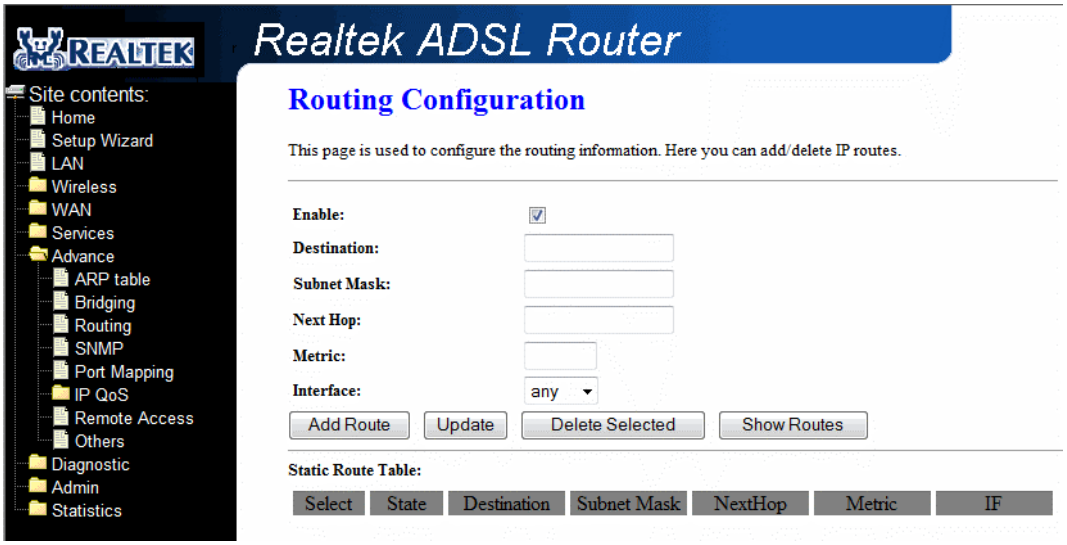
List MAC address in forwarding table.

4.7.3 Advance – Routing

The Routing page enables you to define specific route for your Internet and network data. Most users do not need to define routes. On a typical small home or office LAN, the existing routes that set up the default gateways for your LAN hosts and for the DSL device provide the most appropriate path for all your Internet traffic.

- On your LAN hosts, a default gateway directs all Internet traffic to the LAN port(s) on the DSL device. Your LAN hosts know their default gateway either because you assigned it to them when you modified your TCP/IP properties, or because you configured them to receive the information dynamically from a server whenever they access the Internet.
- On the DSL device itself, a default gateway is defined to direct all outbound Internet traffic to a route at your ISP. The default gateway is assigned either automatically by your ISP whenever the device negotiates an Internet access, or manually by user to setup through the configuration.

You may need to define routes if your home setup includes two or more networks or subnets, if you connect to two or more ISP services, or if you connect to a remote corporate LAN.



Fields in this page:

Field	Description
Enable	Check to enable the selected route or route to be added.
Destination	The network IP address of the subnet. The destination can be specified as the IP address of a subnet or a specific host in the subnet. It can also be specified as all zeros to indicate that this route should be used for all destinations for which no other route is defined (this is the route that creates the default gateway).
Subnet Mask	The network mask of the destination subnet. The default gateway uses a mask of 0.0.0.0.
Next Hop	The IP address of the next hop through which traffic will flow towards the destination subnet.
Metric	Defines the number of hops between network nodes that data packets travel. The

	default value is 0, which means that the subnet is directly one hop away on the local LAN network.
Interface	The WAN interface to which a static routing subnet is to be applied.

Function buttons in this page:

Add Route

Add a user-defined destination route.

Update

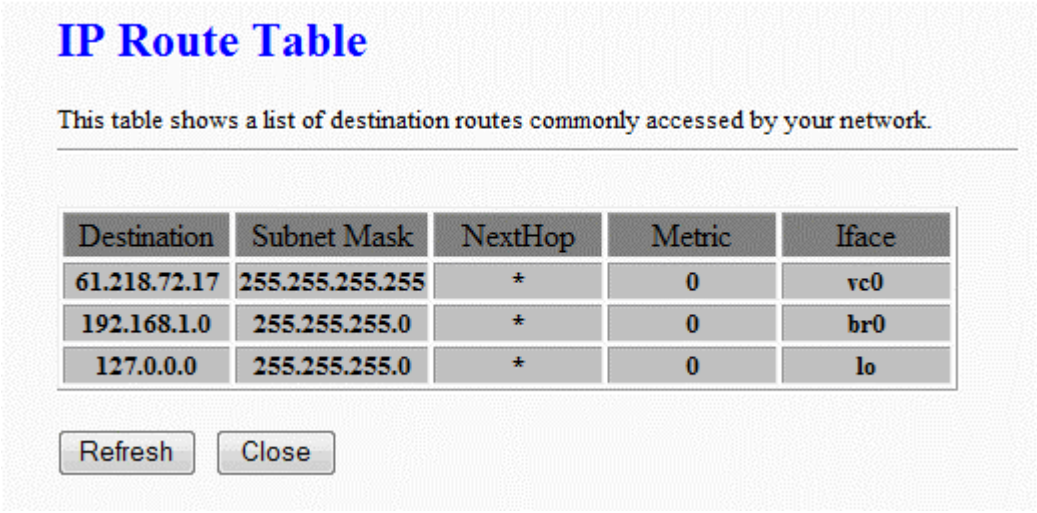
Update the selected destination route on the **Static Route Table**.

Delete Selected

Delete a selected destination route on the **Static Route Table**.

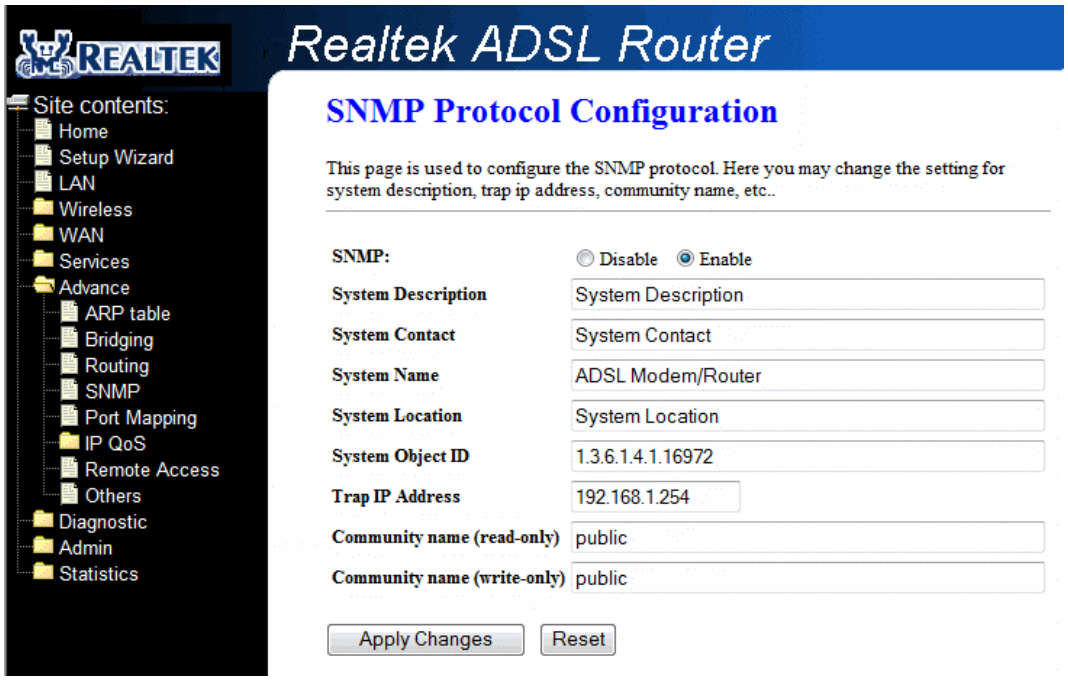
Show Routes

Click this button to view the DSL device's routing table. The IP Route Table displays, as shown in Figure.



4.7.4 Advance – SNMP

Simple Network Management Protocol (SNMP) is a troubleshooting and management protocol that uses the UDP protocol on port 161 to communicate between clients and servers. The DSL device can be managed locally or remotely by SNMP protocol.



Fields in this page:

Field	Description
SNMP	Enable/disable SNMP Feature.
System Description	System description of the DSL device.
System Contact	Contact person and/or contact information for the DSL device.
System Name	An administratively assigned name for the DSL device.
System Location	The physical location of the DSL device.
System Object ID	Vendor object identifier. The vendor's authoritative identification of the network management subsystem contained in the entity.
Trap IP Address	Destination IP address of the SNMP trap.
Community name (read-only)	Name of the read-only community. This read-only community allows read operation to all objects in the MIB.
Community name (write-only)	Name of the write-only community. This write-only community allows write operation to the objects defines as read-writable in the MIB.

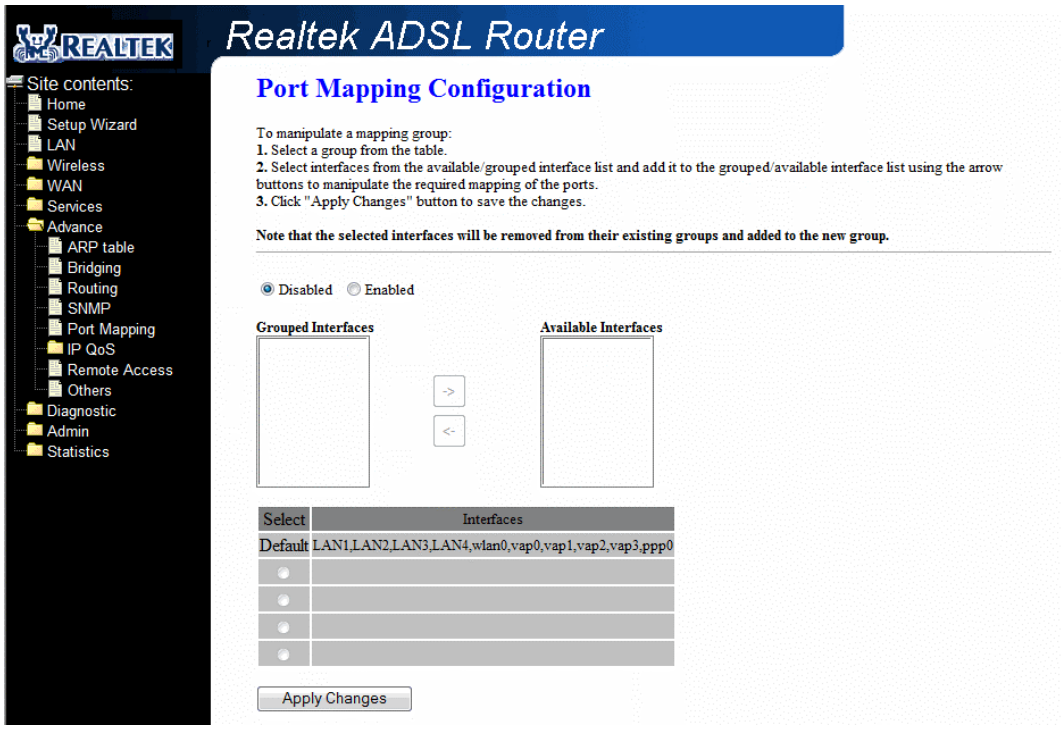
Function buttons in this page:

Apply Changes

Save SNMP configuration. New configuration will take effect after saving into flash memory and rebooting the system. See section "Admin" for details.

4.7.5 Advance – Port Mapping

The DSL device provides multiple interface groups. Up to five interface groups are supported including one default group. The LAN and WAN interfaces could be included. Traffic coming from one interface of a group can only be flowed to the interfaces in the same interface group. Thus, the DSL device can isolate traffic from group to group for some application. By default, all the interfaces (LAN and WAN) belong to the default group, and the other four groups are all empty. It is possible to assign any interface to any group but only one group.



Fields in this page:

Field	Description
Enabled/Disabled	Radio buttons to enable/disable the interface group feature. If disabled, all interfaces belong to the default group.
“Interface groups	To manipulate a mapping group: 1. Select a group from the table. 2. Select interfaces from the available/grouped interface list and add it to the grouped/available interface list using the arrow buttons to manipulate the required mapping of the ports. 3. Click “Apply Changes” button to save the changes.

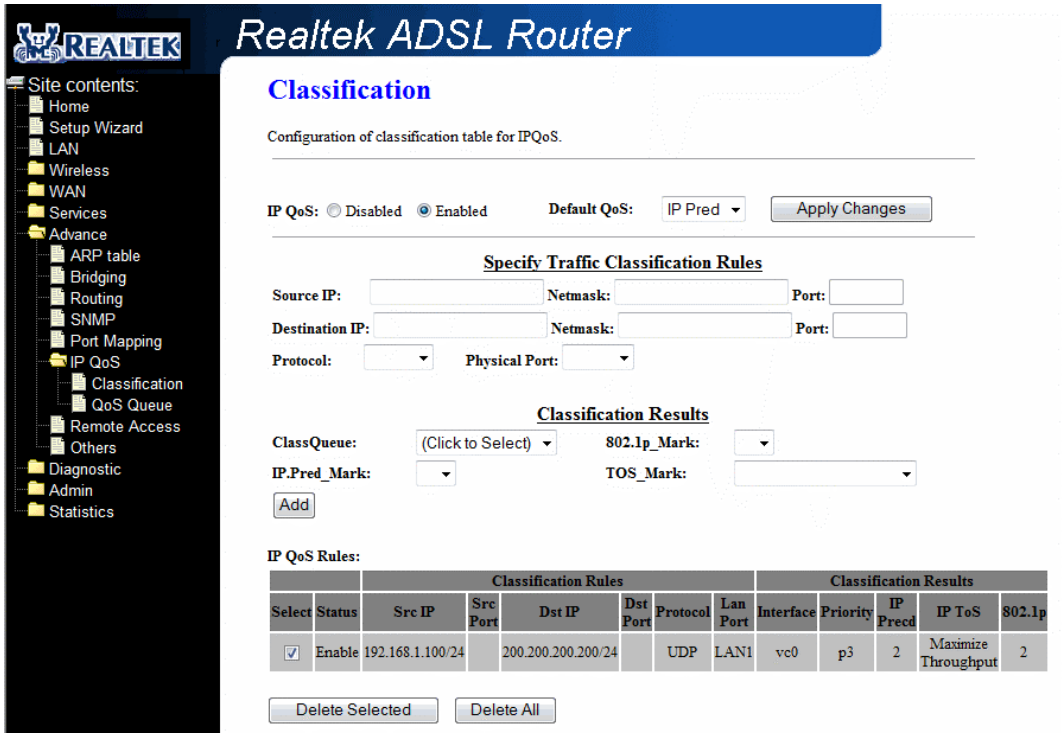
Function buttons in this page:

Apply Changes

Save configuration to system. New configuration will take effect after saving into flash memory and rebooting the system. See section “Admin” for details.

4.7.6 Advance – IP QoS

The DSL device provides a control mechanism that can provide different priority to different users or data flows. The QoS is enforced by the QoS rules in the QoS table. QoS rule contains two configuration blocks: **Traffic Classification** and **Action**. The **Traffic Classification** enables you to classify packets on the basis of various fields in the packet and perhaps the physical ingress port. The **Action** enables you to assign the strictly priority level for and mark some fields in the packet that matches the Traffic Classification rule. You can configure any or all field as needed in these two QoS blocks for a QoS rule.



Fields on the first setting block of this page:

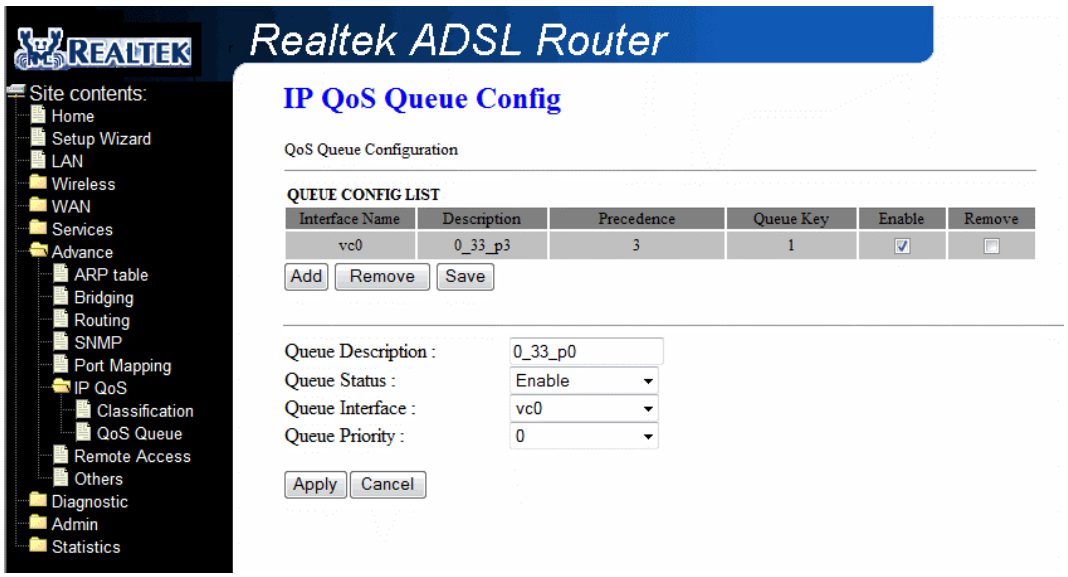
Field	Description
IP QoS	Enable/disable the IP QoS function.
Default QoS	Select IP Pred or 802.1p for default QoS.
Source IP	The IP address of the traffic source.
Source Netmask	The source IP netmask. This field is required if the source IP has been entered.
Source Port	The source port of the selected protocol. You cannot configure this field without entering the protocol first.
Destination IP	The IP address of the traffic destination.
Destination Netmask	The destination IP netmask. This field is required if the destination IP has been entered.
Destination Port	The destination port of the selected protocol. You cannot configure this field without entering the protocol first.
Protocol	The selections are TCP, UDP, ICMP and the blank for none. This field is required if the source port or destination port has been entered.
Physical Port	The incoming ports. The selections include LAN ports, wireless port, and the blank

	for not applicable.

Fields on the second setting block of this page:

Field	Description
ClassQueue	Select a QoS Queue.
IP_Pred_Mark	Select this field to mark the IP precedence bits in the packet that match this classification rule.
802.1p_Mark	Select this field to mark the 3-bit user-priority field in the 802.1p header of the packet that match this classification rule. Note that this 802.1p marking is workable on a given PVC channel only if the VLAN tag is enabled in this PVC channel.
TOS_Mark	Select this field to mark the IP TOS bits in the packet that match this classification rule.

QoS Queue:



Function button for this first setting block:

Apply Changes

Click to save the setting of default actions to the configuration.

Function buttons for this second setting block:

Add

Click to add the rule entry to the configuration.

Function buttons for the **IP QoS Rules Table**:

Delete Selected

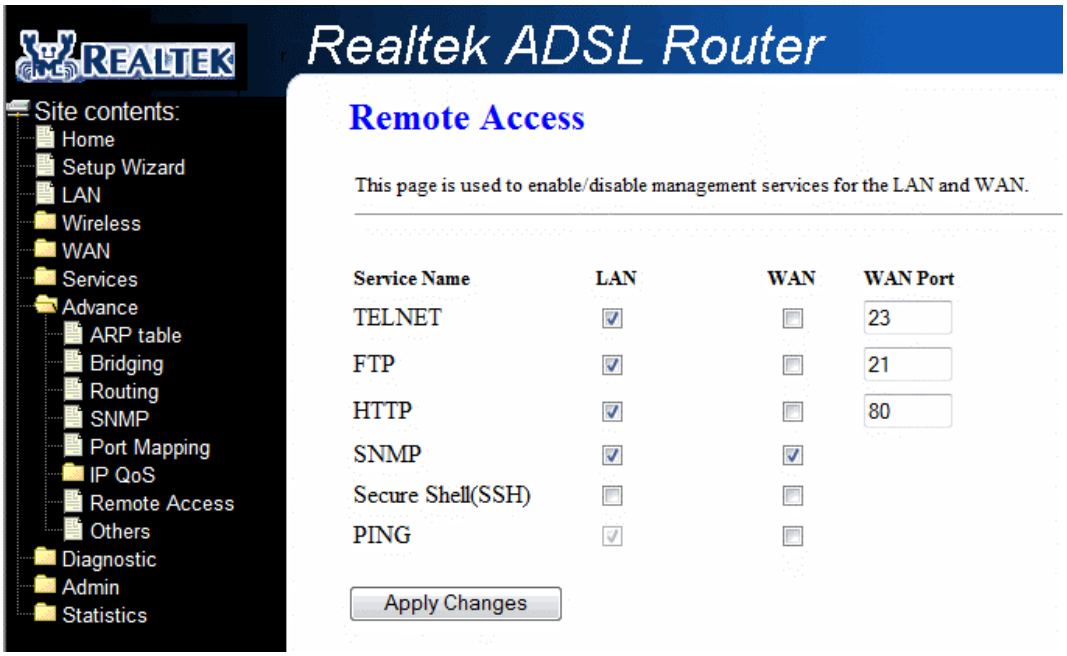
Delete selected IP QoS rules from the table. You can click the checkbox at the **Select** column to select the IP QoS rule.

Delete All

Delete all IP QoS rules from the IP QoS Rules table.

4.7.7 Advance – Remote Access

The Remote Access function can secure remote host access to your DSL device from LAN and WLAN interfaces for some services provided by the DSL device.



Fields in this page:

Field	Description
LAN	Check/un-check the services on the LAN column to allow/un-allow the services access from LAN side; and “WAN”:
WAN	Check/un-check the services on the WAN column to allow/un-allow the services access from WAN side.
WAN Port	This field allows the user to specify the port of the corresponding service. Take the HTTP service for example; when it is changed to 8080, the HTTP server address for the WAN side is http://dsl_addr:8080, where the dsl_addr is the WAN side IP address of the DSL device.

Function buttons in this page:

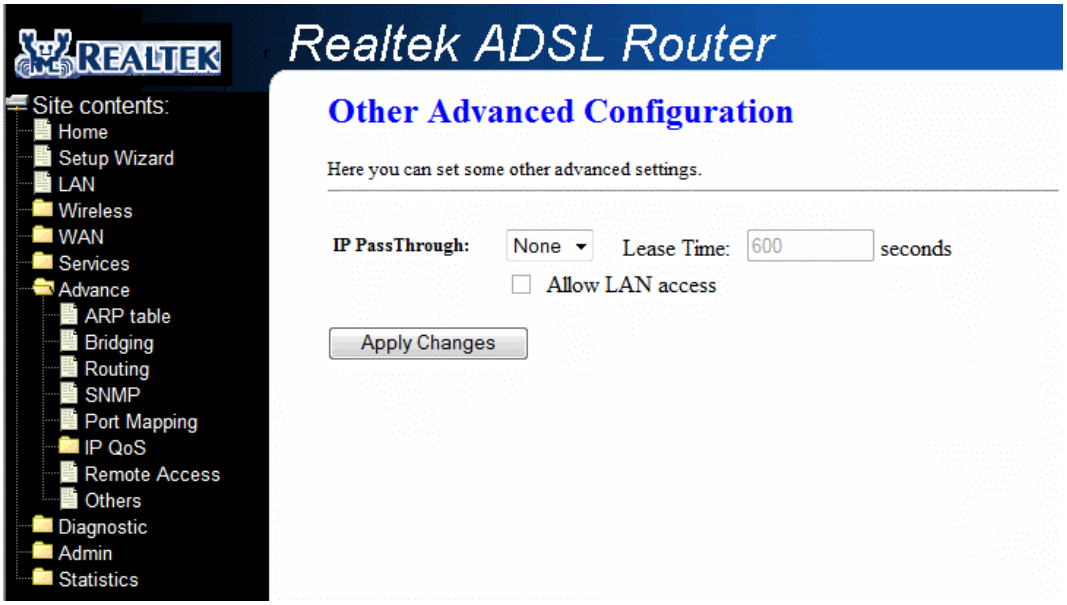
Apply Changes

Save configuration to system.

4.7.8 Advance – Others

IP Pass Through: Although the Router mode is capable of terminating the PPP in the modem and hence does not require PPPoE client software on the host PC, there are some disadvantages to Router mode when only single-user support is required. For instance, Router mode uses NAT which requires ALG support. **IP Pass Through** also terminates the PPP in the modem and does not require a PPPoE client on the PC. However, **IP Pass Through** does not use NAT and is not limited by ALGs. **IP Pass Through** will work with Ethernet interface to the PC.

When **IP Pass Through** is enabled, only one PC is able to access the Internet, and the DHCP server will duplicate the WAN IP address from the ISP to the local client PC. Only the PC with the WAN IP address can access the Internet.



Fields in this page:

Field	Description
IP PassThrough	Select the WAN connection profile from the drop down manual on which the rule will take effect.
Lease Time	The Lease time is the amount of time a network user will be allowed to connect with DHCP server.
Allow LAN Access	Click to enable **LAN Access**.

Function buttons in this page:

Apply Changes

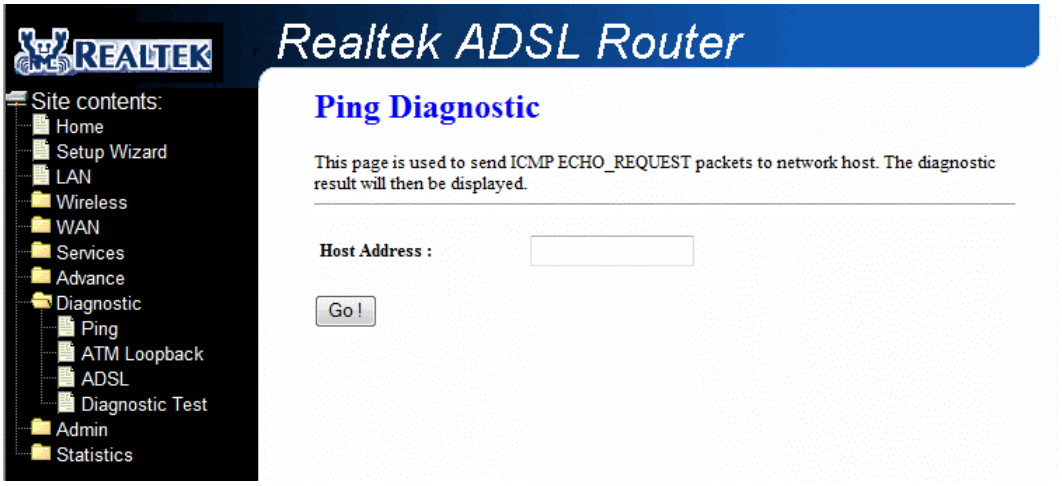
Save configuration to system.

4.8 Diagnostic

The **Diagnostics** page allows you to run a series of diagnostic tests of your system software and hardware connections.

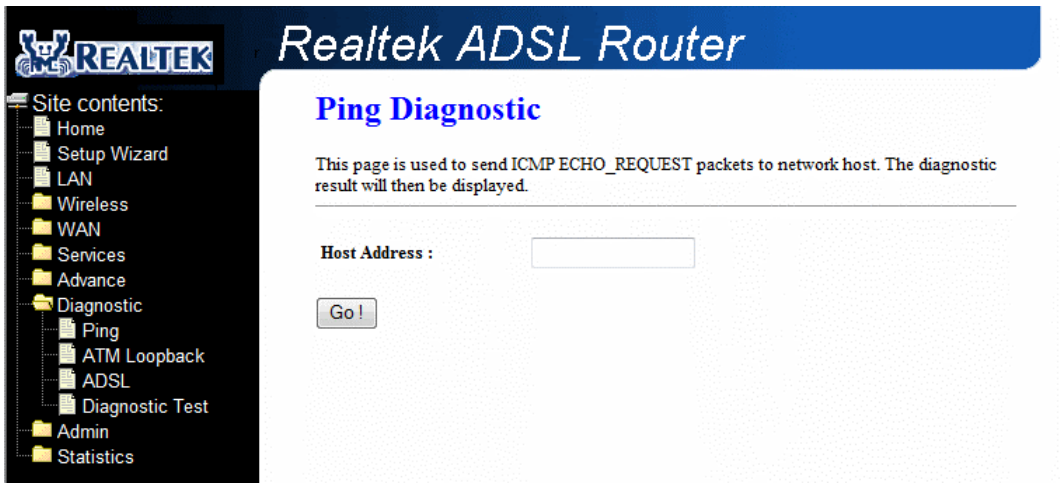
You can view Diagnostic link in the left navigation bar. Following are the options available under Diagnostic:

- Ping
- ATM Loopback
- ADSL
- Diagnostic Test



4.8.1 Diagnostic – Ping

Once you have your DSL device configured, it is a good idea to make sure you can ping the network. A ping command sends a message to the host you specify. If the host receives the message, it sends messages in reply. To use it, you must know the IP address of the host you are trying to communicate with and enter the IP address in the Host Address field. Click Go! To start the ping command, the ping result will then be shown in this page.



Fields in this page:

Field	Description
Host Address	The IP address you want to ping.

4.8.2 Diagnostic – ATM Loopback

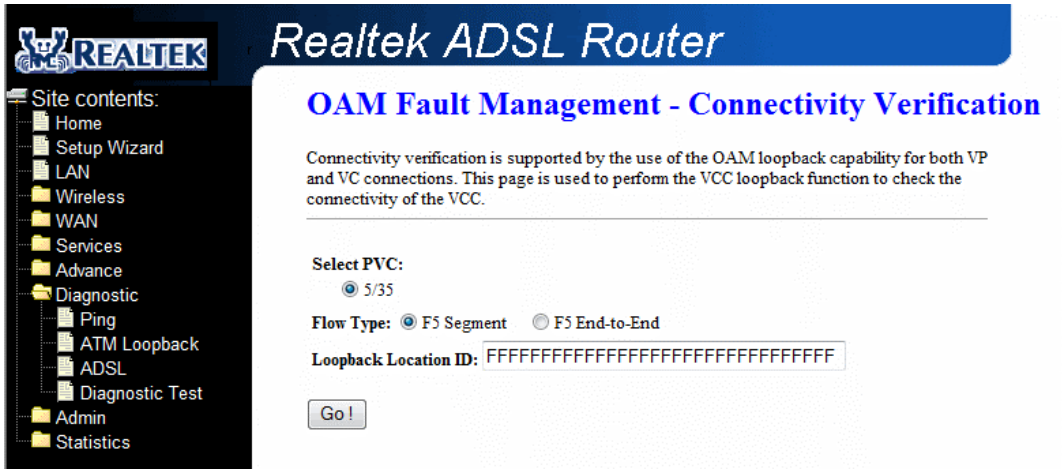
In order to isolate the ATM interface problems, you can use ATM OAM loopback cells to verify connectivity between VP/VC endpoints, as well as segment endpoints within the VP/VC. ATM uses F4 and F5 cell flows as follows:

- F4: used in VPs
- F5: used in VCs

An ATM connection consists of a group of points. This OAM implementation provides management for the following points:

- Connection endpoint: the end of a VP/VC connection where the ATM cell are terminated
- Segment endpoint: the end of a connection segment

This page allows you to use ATM ping, which generates F5 segment and end-to-end loop-back cells to test the reach ability of a segment endpoint or a connection endpoint.

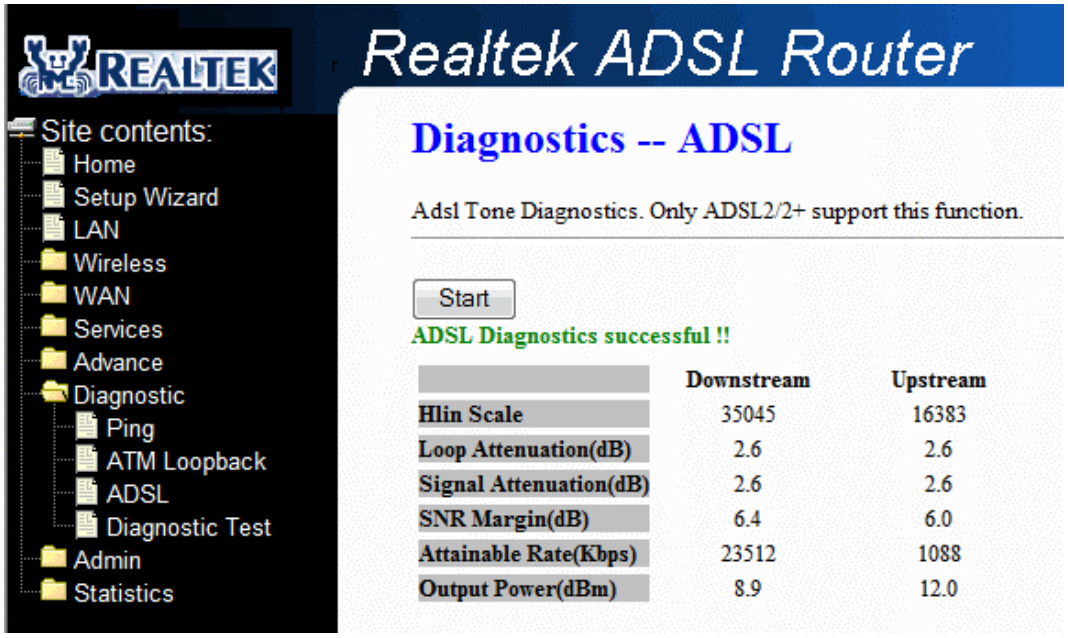


Fields in this page:

Field	Description
Select PVC	Select the PVC channel you want to do the loop-back diagnostic.
Flow Type	The ATM OAM flow type. The selection can be F5 Segment or F5 End-to-End.
Loopback Location ID	The loop-back location ID field of the loop-back cell. The default value is all 1s (ones) to indicate the endpoint of the segment or connection.

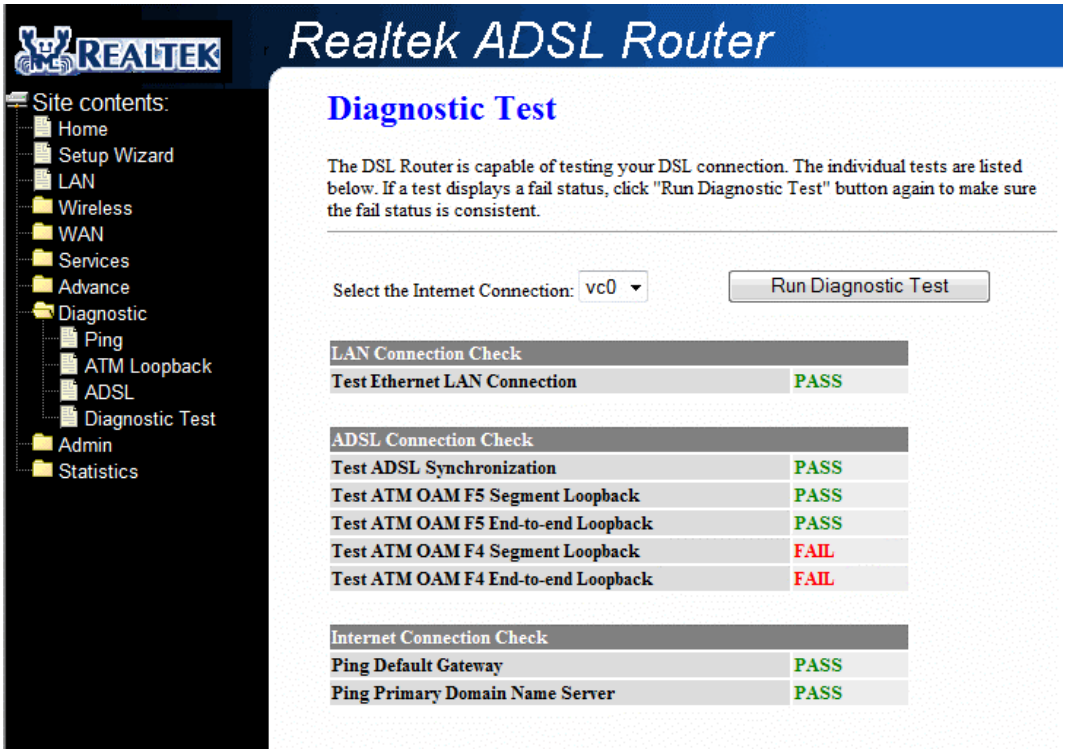
4.8.3 Diagnostic – ADSL

This page shows the ADSL diagnostic result. Click **Start** button to start the ADSL diagnostic.



4.8.4 Diagnostic – Diagnostic Test

The Diagnostic Test page shows the test results for the connectivity of the physical layer and protocol layer for both LAN and WAN sides.



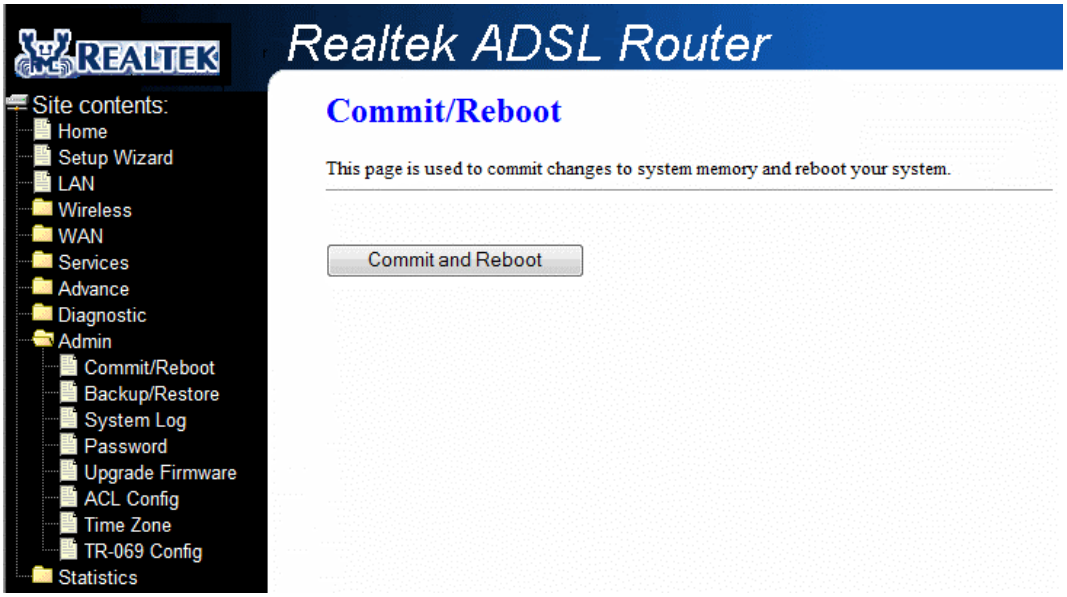
Fields in this page:

Field	Description
Select the Internet Connection	The available WAN side interfaces are listed. You have to select one for the WAN side diagnostic.

4.9 Admin

4.9.1 Admin – Commit/Reboot

Whenever you use the Web configuration to change system settings, the changes are initially placed in temporary storage. These changes will be lost if the device is reset or turn off. To save your change for future use, you can use the commit function.



Function buttons in this page:

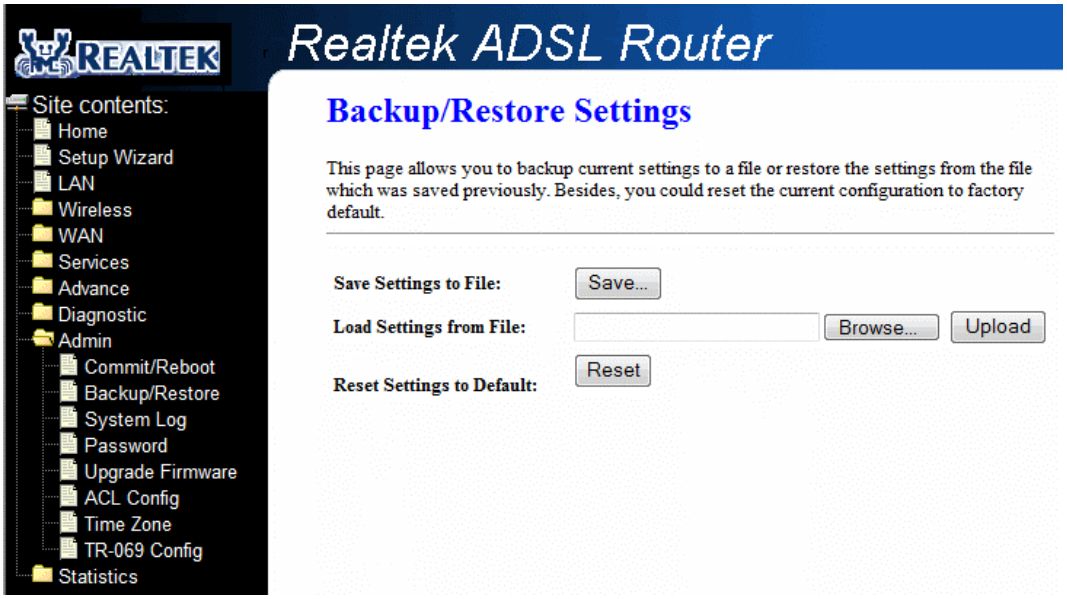
Commit and Reboot

Whenever you use the web console to change system settings, the changes are initially placed in temporary storage. To save your changes for future use, you can use the Commit/Reboot function. This function saves your changes from RAM to flash memory and reboot the system.

IMPORTANT! Do not turn off your modem or press the Reset button while this procedure is in progress.

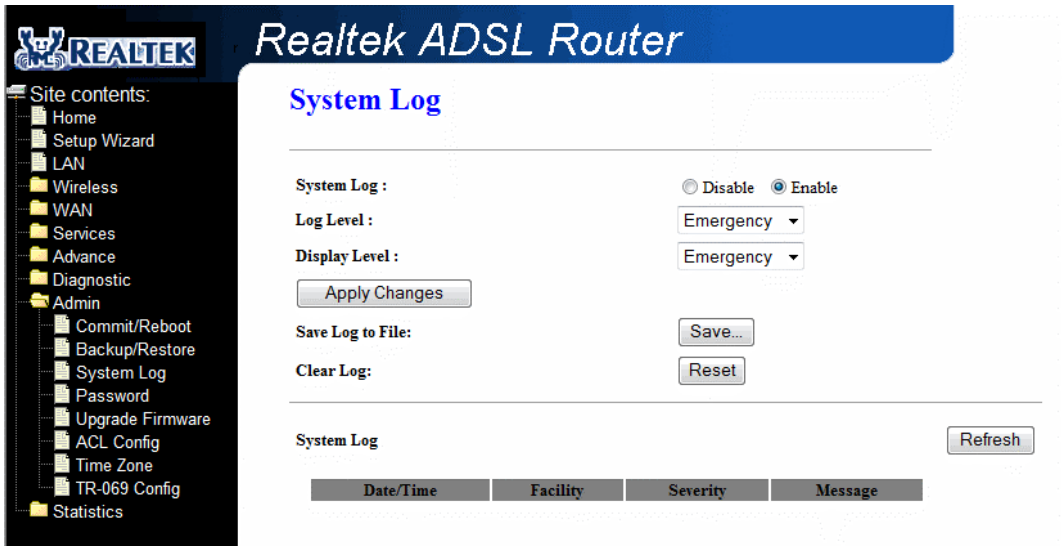
4.9.2 Admin – Backup/Restore

This page allows you to backup and restore your configuration into and from file in your host.



4.9.3 Admin – System log

This page shows the system log.



Fields in this page:

Field	Description
System Log	Enable/disable System log.
Log Level	Select log level.
Display Level	Select display level.

Function buttons for the first setting block in this page:

Apply Changes

Click to save the setting of this setting block to the system configuration.

Fields on the second setting block:

Field	Description
Save Log to File	Click Save button to save log.
Clear Log	Click Reset button to clear log.

4.9.4 Admin – Password

The first time you log into the system, you use the default password. There are two-level logins: **admin** and **user**. The **admin** and **user** password configuration allows you to change the password for administrator and user.

Fields in this page:

Field	Description
User Name	Selection of user levels are: admin and user.
Old Password	Enter the old password for this selected login.
New Password	Enter the new password here.
Confirmed Password	Enter the new password here again to confirm.

Function buttons in this page:

Apply Changes

Save configuration to system.

4.9.5 Admin – Upgrade Firmware

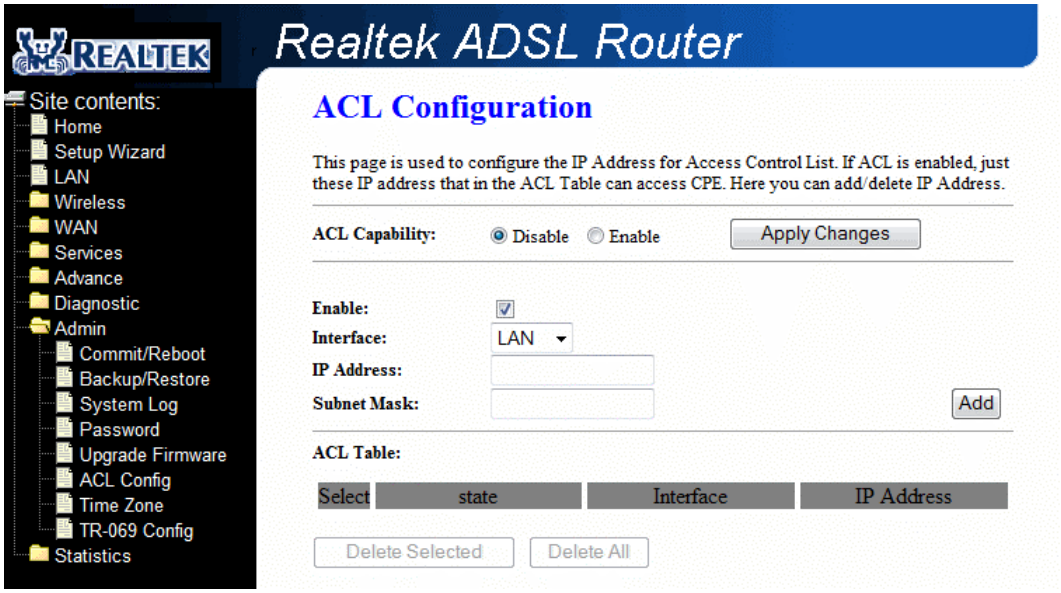
To upgrade the firmware for the DSL device:

- Click the **Browse** button to select the firmware file.
- Confirm your selection.
- Click the **Upload** button to start upgrading.

IMPORTANT! Do not turn off your DSL device or press the Reset button while this procedure is in progress.

4.9.6 Admin – ACL

The Access Control List (ACL) is a list of permissions attached to the DSL device. The list specifies who is allowed to access this device. If ACL is enabled, all hosts cannot access this device except for the hosts with IP address in the ACL table.

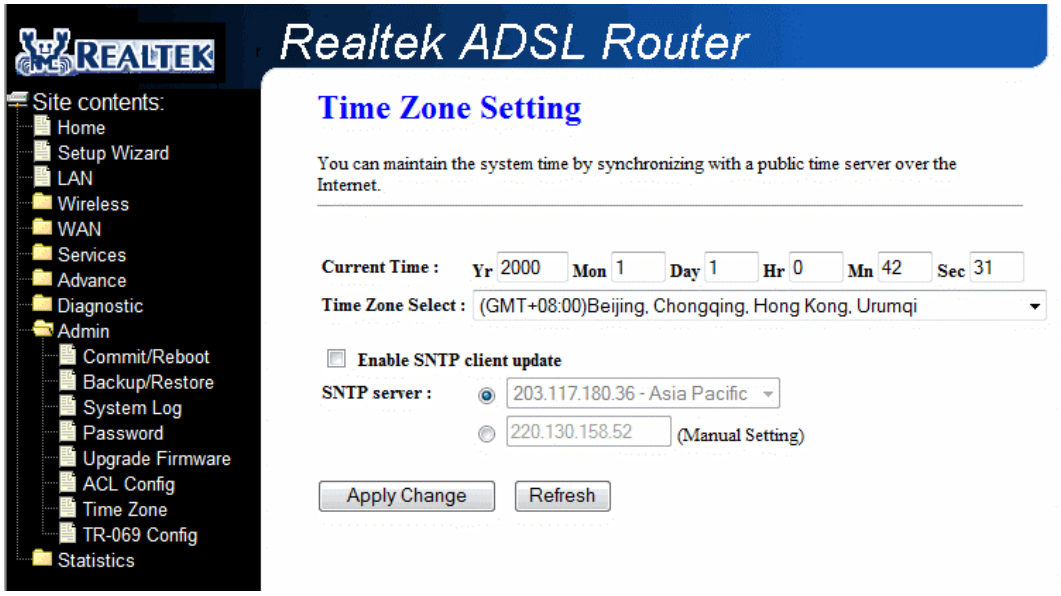


Fields in this page:

Field	Description
ACL Capability	Enable/disable the ACL function
Enable	Check to enable this ACL entry
Interface	Select the interface domain: LAN or WAN
IP Address	Enter the IP address that allows access to this device.

4.9.7 Admin – Time Zone

Simple Network Timing Protocol (SNTP) is a protocol used to synchronize the system time to the public SNTP servers. The DSL device supports SNTP client functionality in compliance with IETF RFC2030. SNTP client functioning in daemon mode which issues sending client requests to the configured SNTP server addresses periodically can configure the system clock in the DSL device



Fields in this page:

Field	Description
Current Time	The current time of the specified time zone. You can set the current time by yourself or configured by SNTP.
Time Zone Select	The time zone in which the DSL device resides.
Enable SNTP client update	Enable the SNTP client to update the system clock.
SNTP server	The IP address or the host name of the SNTP server. You can select from the list or set it manually.

Function buttons in this page:

Apply Changes

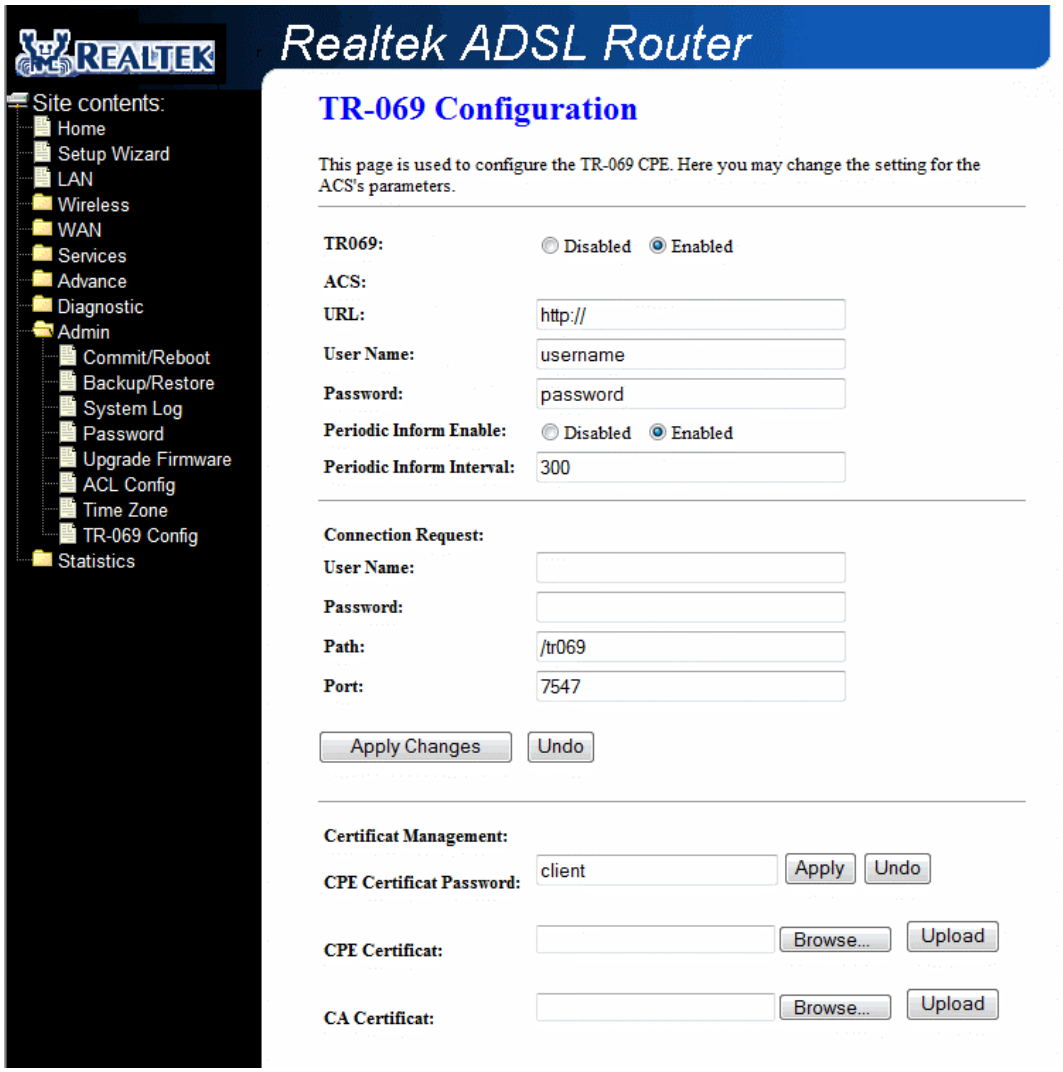
Click to save the setting to the configuration.

4.9.8 Admin – TR-069

TR-069 is CPE Management Protocol from WAN side, intended for communication between a CPE and Auto-Configuration Server (ACS). The CPE WAN Management Protocol defines a mechanism that encompasses secure auto-configuration of a CPE, and also incorporates other CPE management functions into a common framework.

The CPE WAN Management Protocol is intended to support a variety of functionalities to manage a collection of CPE, including the following primary capabilities:

- Auto-configuration and dynamic service provisioning
- Software/firmware image management
- Status and performance monitoring
- Diagnostics



Fields in this page:

Field	Description
ACS URL	URL of the auto configuration server (ACS) provided by the ISP.
Username	The username/password are used when the ACS wants to initiate a connection with

	the router. The username/password are provided by the ISP.
Password	The username/password are used when the ACS wants to initiate a connection with the router. The username/password are provided by the ISP.
Periodic Inform Interval	Enable/disables the router to connect to the ACS periodically. If you enable this feature, you should enter a value in the **Periodic Inform Interval** field.
Connection Request	
Username	Username used to authenticate an ACS making a Connection Request to the CPE.
Password	Password used to authenticate an ACS making a Connection Request to the CPE.
Path	Enter the path. The path is provided by the ISP.
Port	Enter the port number. The port is provided by the ISP.
Certificate Management	
CPE Certificate Password	Enter CPE Certificate password
CPE Certificate	Click Browse button and upload the CPE certificate
CA Certificate	Click Browse button and upload the CA certificate

Function buttons in this page:

Apply Changes

Click to save the setting to the configuration.

Undo

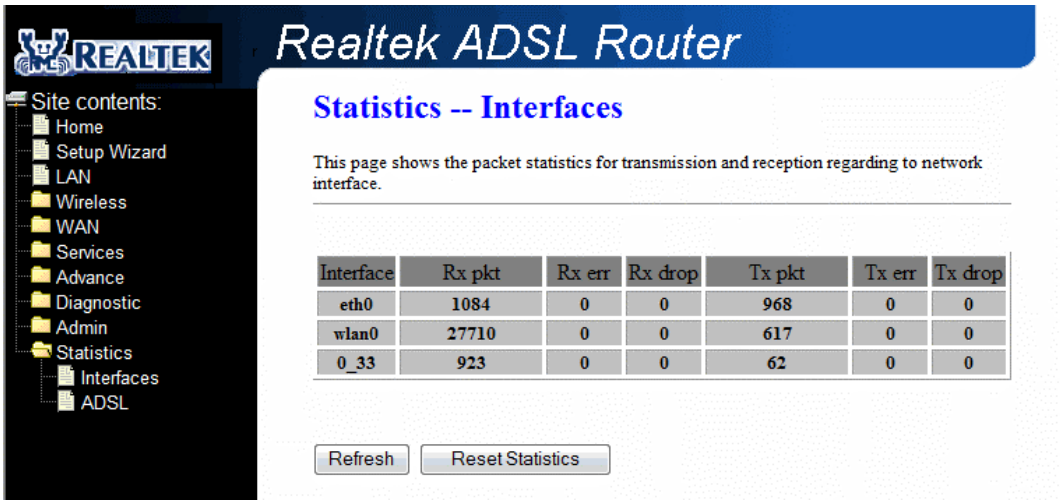
Discard your changes.

4.10 Statistics

The DSL device shows the different layer of network statistics information.

4.10.1 Statistics – Interface

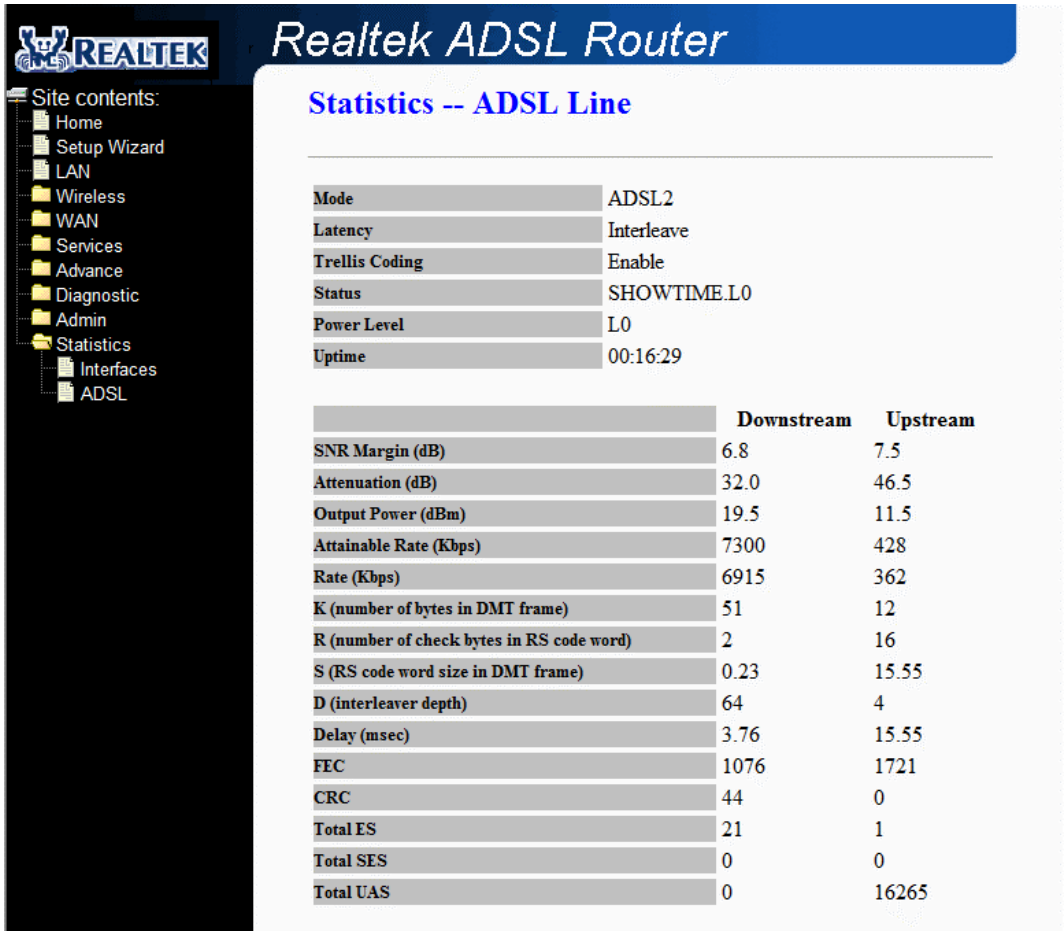
You can view statistics on the processing of IP packets on the networking interfaces. You will not typically need to view this data, but you may find it helpful when working with your ISP to diagnose network and Internet data transmission problems.



To display updated statistics showing any new data since you opened this page, click **Refresh**.

4.10.2 Statistics – ADSL

This page shows the ADSL line statistic information.



Appendix A: Router Terms

What is a firewall?

A firewall is a device that protects one network from another, while allowing communication between the two. A firewall incorporates the functions of the NAT router, while adding features for dealing with a hacker intrusion or attack. Several known types of intrusion or attack can be recognized when they occur. When an incident is detected, the firewall can log details of the attempt, and can optionally send email to an administrator notifying them of the incident. Using information from the log, the administrator can take action with the ISP of the hacker. In some types of intrusions, the firewall can fend off the hacker by discarding all further packets from the hacker's IP address for a period of time.

What is NAT?

NAT stands for Network Address Translation. Another name for it is Connection Sharing. What does this mean? Your ISP provides you with a single network address for you to access the Internet through. However, you may have several machines on your local network that want to access the Internet at the same time. The router provides NAT functionality that converts your local network addresses to the single network address provided by your ISP. It keeps track of all these connections and makes sure that the correct information gets to the correct local machine.

Occasionally, there are certain programs that don't work well through NAT. Some games, and some specialty applications have a bit of trouble. The router contains special functionality to handle the vast majority of these troublesome programs and games. NAT does cause problems when you want to run a SERVER though. When running a server, please see the DMZ section below.

What is a DMZ?

DMZ really stands for Demilitarized Zone. It is a way of separating out part of your local network so that is more open to the Internet. Suppose that you want to run a web-server, or a game server. Normal servers like these are blocked from working by the NAT functionality. The solution is to "isolate" the single local computer into a DMZ. This makes the single computer look like it is directly on the Internet, and others can access this machine.

Your machine isn't really directly connected to the Internet, and it really has an internal local network address. When you provide the servers network address to others, you must provide the address of the router. The router "fakes" the connection to your machine.

You should use the DMZ when you want to run a server that others will access from the Internet. Internal programs and servers (like print servers, etc) should NOT be connected to the DMZ

What is a Gateway?

The Internet is so large that a single network cannot handle all of the traffic and still deliver a reasonable level of service. To overcome this limitation, the network is broken down into smaller segments or subnets that can deliver good performance for the stations attached to that segment. This segmentation solves the problem of supporting a large number of stations, but introduces the problem of getting traffic from one subnet to another.

To accomplish this, devices called routers or gateways are placed between segments. If a machine wishes to contact another device on the same segment, it transmits to that station directly using a simple discovery technique. If the target station does not exist on the same segment as the source station, then the source actually has no idea how to get to the target.

One of the configuration parameters transmitted to each network device is its default gateway. This address is configured by the network administrators and it informs each personal computer or other network device where to send data if the target station does not reside on the same subnet as the source. If your machine can reach all stations on the same subnet (usually a building or a sector within a building), but cannot communicate outside of this area, it is usually because of an incorrectly configured default gateway.

Appendix B: Frequently Asked Questions

The Frequently Asked Questions addresses common questions regarding 4 Ports 11n Wireless ADSL2/2+ Router settings.

Some of these questions are also found throughout the guide, in the sections to which they reference.

1. **How do I determine if a link between the Ethernet card (NIC) and the 4 Ports 11n Wireless ADSL2/2+ Router has been established?**

Ans. A ping test would determine if a connection is established between your 4 Ports 11n Wireless ADSL2/2+ Router and computer. Using, the ping command, ping the IP address of the 4 Ports 11n Wireless ADSL2/2+ Router, in this case, 192.168.1.1 (default). For more information on Ping Testing, refer to Appendix C: Troubleshooting Guide. Alternatively, if the Ethernet LINK LED is solidly on, then the Ethernet link is established.

2. **How do I determine if a link between the 4 Ports 11n Wireless ADSL2/2+ Router and the Internet has been established?**

Ans. Similar to the previous question, a ping test would determine whether or not a connection is established. However, this time use a URL instead of and IP Address, such as www.google.com. Alternatively, if the ADSL LED is solidly on, then the ADSL link is established.

3. **I can't get the Internet game, server, or application to work properly.**

Ans. If you are having difficulties getting any Internet game, server, or application to function properly, consider exposing one computer to the Internet using DeMilitarized Zone (DMZ) setting. Refer to **Service–Firewall–DMZ** section for the setting detail.

4. **I need to upgrade the firmware.**

Ans. In order to upgrade the firmware with the latest features, check with your local dealer or ISP for technical support.

5. I forgot my password.

Ans. Reset the 4 Ports 11n Wireless ADSL2/2+ Router to factory default by pressing the Reset button for more than 5 seconds and then releasing it.

6. What is ad-hoc mode?

Ans. When a wireless network is set to ad-hoc mode, the wireless-equipped computers are configured To communicate directly with each other, peer-to-peer without the use of an access point.

7. What is infrastructure mode?

Ans. When a wireless network is set to infrastructure mode, the wireless network is configured to communicate with a network through a wireless access point.

8. What is roaming?

Ans. Roaming is the ability of a portable computer user to communicate continuously while moving freely throughout an area greater than that covered by a single access point. Before using the roaming function, the computer must make sure that it is the same channel number with the access point of dedicated coverage area.

9. What is ISM band?

Ans. The FCC and their counterparts outside of the U.S. have set aside bandwidth for unlicensed use in the ISM (Industrial, Scientific and Medical) band. Spectrum in the vicinity of 2.4 GHz, in particular, is being made available worldwide. This presents a truly revolutionary opportunity to place convenient high-speed wireless capabilities in the hands of users around the globe.

10. What is MAC Address?

Ans. Short for **Me**dia **A**ccess **C**ontrol Address. It is a hardware address that uniquely identifies each node of a Ethernet networking device. This address is usually permanent.

11. What is IEEE 802.11b standard?

Ans. IEEE 802.11b is an extension standards to 802.11 that applies to Wireless LAN and provides 11Mbps transmission speed in the 2.4 GHz band.

12. What is IEEE 802.11n standard?

Ans. IEEE 802.11n is an extension standards to 802.11 that applies to Wireless LAN and provides 54Mbps transmission speed in the 2.4 GHz band.

13. What is NAT (Network Address Translation) and what is it used for?

Ans. NAT translates multiple IP Address on the private LAN to one public IP Address (in WAN) that is sent out to the Internet. NAT adds a level security since the IP address of a PC connected to the private LAN is never transmitted on the Internet.

14. What can I do when I am not able to get the web configuration screen for this 4 Ports 11n Wireless ADSL2/2+ Router?

Ans. Remove the proxy settings on your Internet Browsers or remove the dial-up settings on your browser.

15. What is DMZ (DeMilitarized zone)?

Ans. DMZ allows one IP Address (computer) to be exposed to the Internet. Some applications require multiple TCP/IP ports to be open. It is recommended that you set your computer with a static IP if you want to use DMZ features.

16. What is BSS ID?

Ans. A specific Ad-Hoc LAN is called a Basic Service Set (BSS). Computers in a BSS must be configured with the same BSS ID.

17. What is SSID?

Ans. Short for Service Set Identifier. SSID is a 32 character unique identifier attached to the header of packets sent over a WLAN that acts as a password when a mobile device tries to connect to the BSS. The SSID differentiates one WLAN from another, so all Access Point and all devices attempting to connect to a specific WLAN must use the same SSID. A device will not be permitted to join the BSS unless it can provide the unique SSID.

18. What is WEP?

Ans. Short for **W**ired **E**quivalent **P**rivacy. WEP is a security protocol for wireless local area networks defined in the 802.11b standard. WEP is designed to provide the same level of security as that of a wired LAN. WEP aims to provide security by encrypting data over radio waves so that it is protected as it is transmitted from one end point to another.

19. What is WPA?

Ans. Wi-Fi Protected Access (WPA) is a specification of standards-based, interoperable security enhancements that increase the level of data protection and access control for existing and future wireless LAN systems.

20. What is the maximum IP addresses supported by this 4 Ports 11n Wireless ADSL2/2+ Router?

Ans. The 4 Ports 11n Wireless ADSL2/2+ Router can support up to 253 IP addresses.

Appendix C: Troubleshooting Guide

The Troubleshooting Guide provides answers to common problems regarding the 4 Ports 11n Wireless ADSL2/2+ Router settings, connections, and computer settings.

1. The 4 Ports 11n Wireless ADSL2/2+ Router does not work (None of the LEDs light up)

Ans. Check the following:

1. Make sure that the 4 Ports 11n Wireless ADSL2/2+ Router is plugged into a power socket.
2. Make sure that you are using the correct power supply for your 4 Ports 11n Wireless ADSL2/2+ Router device.
3. Make sure the power switch on the 4 Ports 11n Wireless ADSL2/2+ Router is turned on.

2. I changed the LAN IP Address in the LAN configuration page and my PC is no longer able to detect the 4 Ports 11n Wireless ADSL2/2+ Router.

Ans. After changing the LAN IP Address of the 4 Ports 11n Wireless ADSL2/2+ Router, proceed to the following step before a PC is able to recognize the 4 Ports 11n Wireless ADSL2/2+ Router:

1. Click **"Start"** → **"Run"**.
2. In the open field, enter **"cmd"** then click **"OK"**.
3. In the command prompt, type **"ipconfig/release"** then press **"Enter".**
4. Type **"ipconfig/renew"** then press **"Enter"**.

3. No wireless connectivity.

Ans. Check the following:

1. Make sure both wireless client adapter and the 4 Ports 11n Wireless ADSL2/2+ Router is allowed to connect through wireless channels as defined for local regulatory domain.
2. Make sure that the WLAN client is configured for the correct wireless settings (SSID, WEP).

4. Poor wireless connectivity or reach.

Ans. Check the following:

1. Choose automatic channel selection or be careful to select a DSSS channel that doesn't interfere with other radio channels.
2. Check the location of the 4 Ports 11n Wireless ADSL2/2+ Router in the building.
3. Make sure both WLAN client adapter and the 4 Ports 11n Wireless ADSL2/2+ Router is allowed to connect through wireless channels as defined for local regulatory domain.

5. LAN (Link/Act) LED does not light up.

Ans. Check the following:

1. Make sure that the LAN cables are securely connected to the 10/100Base-T port.
2. Make sure that you are using the correct cable type for your Ethernet equipment.
3. Make sure the computer's Ethernet port is configured for auto-negotiation.

6. Failed to configure the 4 Ports 11n Wireless ADSL2/2+ Router through web browser (By a client PC in LAN)

Ans. Check the following:

1. Check the hardware connection of the 4 Ports 11n Wireless ADSL2/2+ Router's LAN port. The LED will lit when a proper connection is made.
2. Check your Windows TCP/IP setting (Refer to Chapter 3 for setting details).
3. Open the Windows System Command Prompt:
   - For Windows 9x/ME: Manually enter **winipcfg**, then press **Enter**.
   - For Windows 2000/XP/Vista/Win7: Manually enter **ipconfig/all**, then press **Enter**.
4. You should have the following information listed on your Window System:
   - **IP Address: 192.168.1.x**
   - **Submask: 255.255.255.0**
   - **Default Gateway IP: 192.168.1.1**

7. I forgot or lost my Administrator Password.

Ans. Reset the 4 Ports 11n Wireless ADSL2/2+ Router to factory default by pressing the **"Reset"** button for more than 5 seconds.

8. I need to upgrade the Firmware.

Ans. In order to upgrade the Firmware with the latest features, check your local dealer or ISP for technical support. Before proceed the upgrading process, check the following details:

1. Download the latest Firmware and save at your pointed location.
2. Read the firmware release note carefully before proceed the upgrading process.
3. Refer to **Admin – Upgrade Firmware** section for the upgrading process.

9. Testing LAN path to your 4 Ports 11n Wireless ADSL2/2+ Router.

Ans. To verify whether the LAN path from your PC to your 4 Ports 11n Wireless ADSL2/2+ Router is

properly connected, you can **"Ping"** the 4 Ports 11n Wireless ADSL2/2+ Router with the following procedures:

1. From the Windows toolbar, click **"Start"** and select **"Run".**
2. In the open field, type **"Ping 192.168.1.1"** and click **"OK"**
3. If the path is working, you should see the message in the following format:
   Reply from 192.168.1.1 bytes = 32 time < 10ms TTL = 60
4. If the path is not working, you should see the following message:
   Request timed out

If the path is not functioning correctly:

1. Make sure the LAN port LED indicator is on.
2. Check whether you are using the correct LAN cable.
3. Check your Ethernet Adaptor installation and configurations.
4. Verify that the IP address for your 4 Ports 11n Wireless ADSL2/2+ Router and your workstation are correct and that the addresses are on the same subnet.

10. Failed to connect with the 4 Ports 11n Wireless ADSL2/2+ Router via Wireless LAN card.

Ans. Ensure that the WL ACT LED indicator of the 4 Ports 11n Wireless ADSL2/2+ Router is correctly illuminated.

1. Check whether your Wireless LAN setting (e.g. SSID, Channel Number) is the same as your 4 Ports 11n Wireless ADSL2/2+ Router.
2. Check whether you'd used the same WEP Key Encryption for both your Wireless LAN and your 4 Ports 11n Wireless ADSL2/2+ Router.

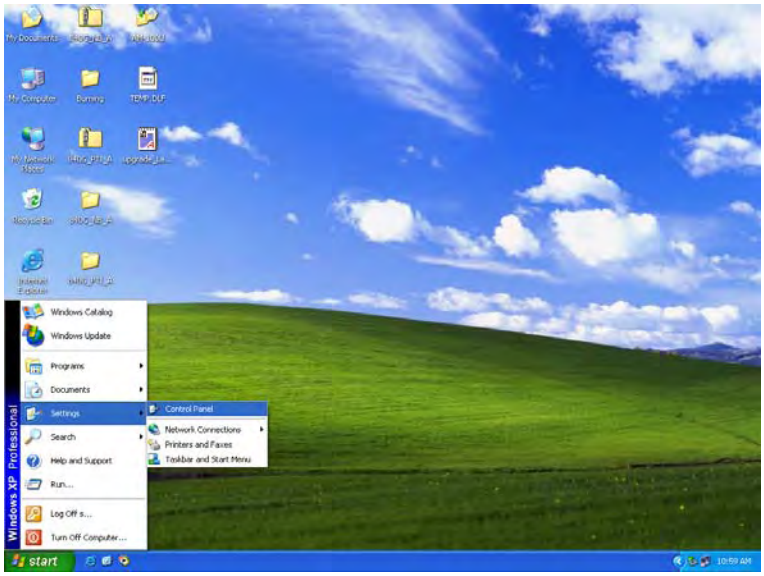
Appendix D: UPnP Setting on Windows XP (Optional)

D.1 Adding UPnP:

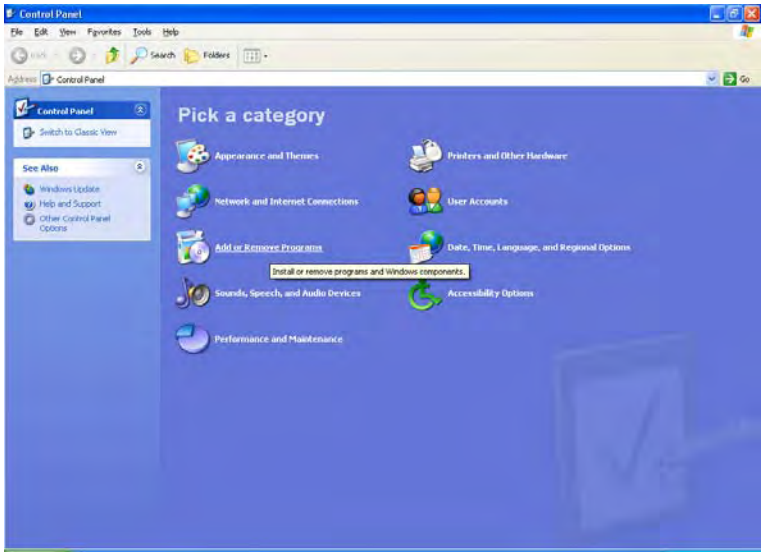
If you are running Microsoft Windows XP, it is recommended to add the UPnP component to your system.

Proceed as follows:

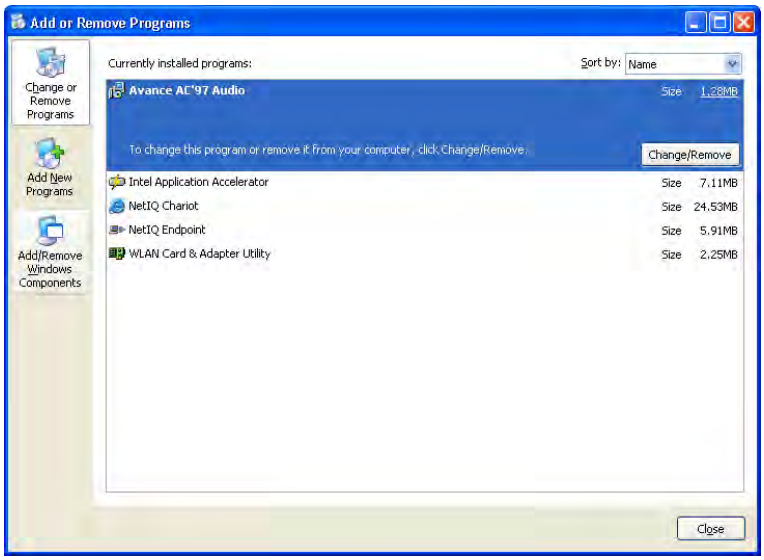
1. Click **"Start"** → **"Settings"** then **"Control Panel"**.



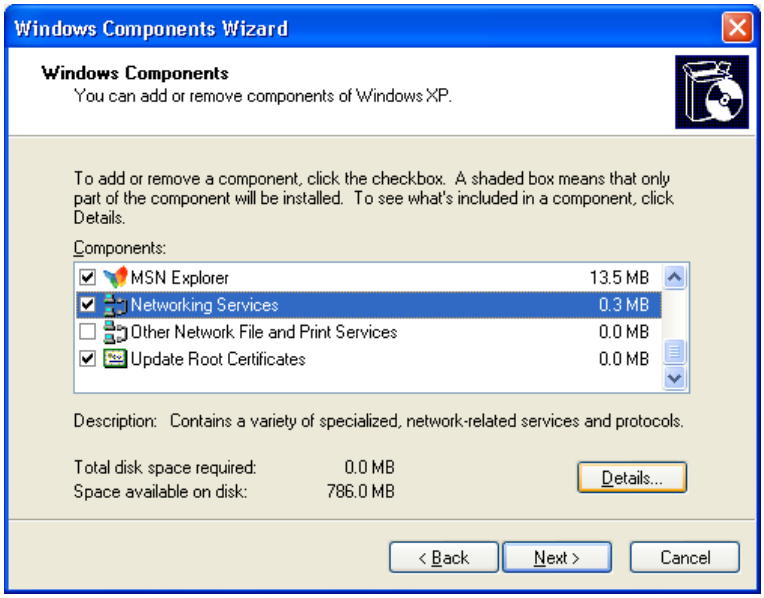
2. The **"Control Panel"** window appears. Click **"Add or Remove Programs"**.



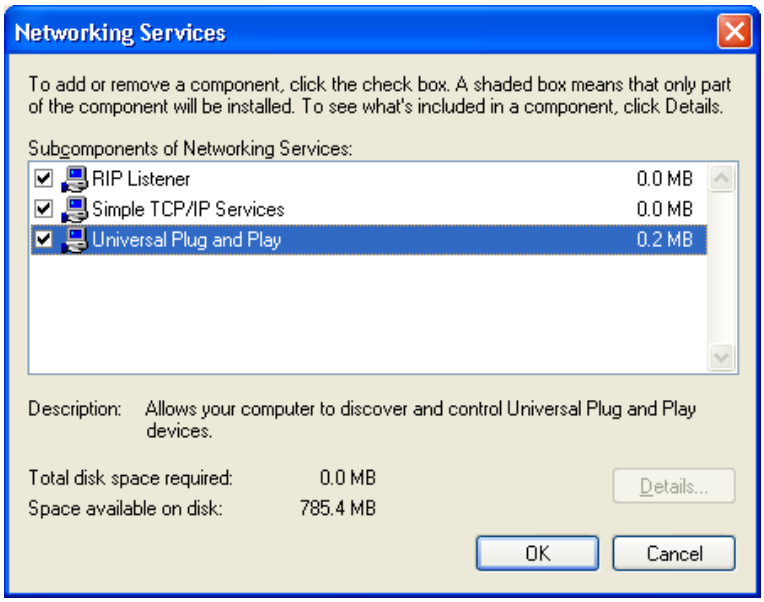
3. The **"Add or Remove Programs"** window appears. Click **"Add/Remove Windows Components"**.



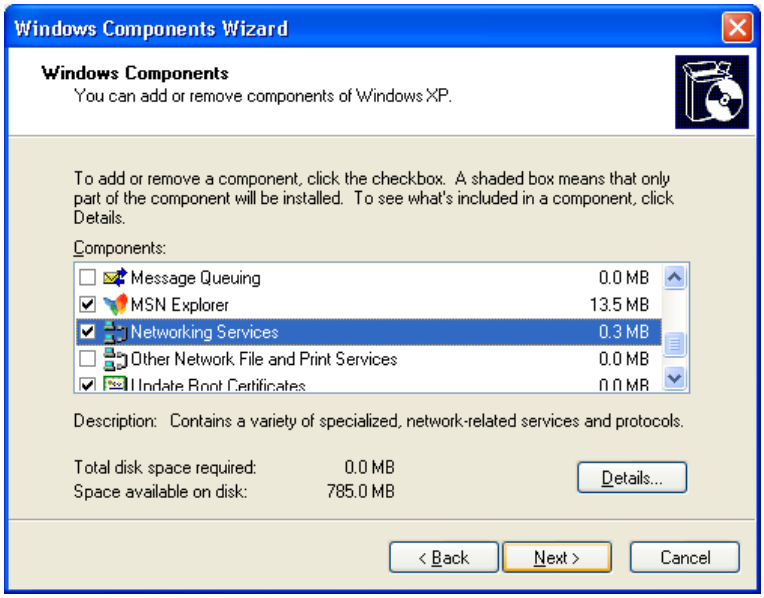
4. The **"Windows Components Wizard"** appears. Select **"Networking Services"** in the Components list and click **"Details"**.



5. The **"Networking Services"** window appears. Select **"Universal Plug and Play"** and click **"OK"**.



6. Click **"Next"** to start the installation and follow the instructions in the Windows Components Wizard.



Note : ***System may ask for original Windows XP CD-ROM. Insert the CD-ROM and direct Windows to the proper location of the CD-ROM.***

Restart your Windows system to activate your setting might be necessary. Click "OK" to restart your Windows system.

7. A **“Completing the Windows Components Wizard”** will appears indicating the installation was successful. Click **“Finish”** to quit.

Appendix E: Glossary

The Glossary provides an explanation of terms and acronyms discussed in this user guide.

10BASE-T: IEEE 802.3 specification for 10 Mbps Ethernet over twisted pair wiring.

100BASE-Tx: IEEE 802.3 specification for 100 Mbps Ethernet over twisted pair wiring.

802.11b: IEEE specification for wireless networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz.

802.11n: IEEE specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz.

802.11x: 802.1x defines port-based, network access control used to provide authenticated network access and automated data encryption key management. The IEEE 802.1x draft standard offers an effective framework for authenticating and controlling user traffic to a protected network, as well as dynamically varying encryption keys.

AP: Access Point: A station that transmits and receives data in a WLAN (Wireless Local Area Network). An access point acts as a bridge for wireless devices into a LAN.

ATM: Asynchronous Transfer Mode: A method of transfer in which data is organized into 53-byte cell units. ATM cells are processed asynchronously in relation to other cells.

BC: Broadcast: Communication in which a sender transmits to everyone in the network.

BER: Bit Error Rate: Percentage of Bits that contain errors relative to the total number of bits transmitted.

Bridge: A device that connects two networks and decides which network the data should go to.

Bridge Mode: Bridge Mode is used when there is one PC connected to the LAN-side Ethernet or USB port. IEEE 802.1D method of transport bridging is used to bridge between the WAN (ADSL) side and the LAN (Ethernet or USB) side, i.e., to store and forward.

CBR: Constant Bit Rate: A constant transfer rate that is ideal for streaming (executing while still downloading) data, such as audio or video files.

Cell: A unit of transmission in ATM, consisting of a fixed-size frame containing a 5-octet header and a 48-octet payload.

CHAP: Challenge Handshake Authentication Protocol: Typically more secure than PAP, CHAP uses username and password in combination with a randomly generated challenge string which has to be authenticated using a one-way hashing function.

CLP: Cell Loss Priority: ATM cells have two levels of priority, CLP0 and CLP1. CLP0 is of higher priority, and in times of high traffic congestion, CLP1 error cells may be discarded to preserve the Cell Loss Ratio of the CLP0 cells.

CO: Central Office: In a local loop, a Central Office is where home and office phone lines come together and go through switching equipment to connect them to other Central Offices. The distance from the Central Office determines whether or not an ADSL signal can be supported in a given line.

CPE: Customer Premises Equipment. This specifies equipment on the customer, or LAN, side.

CRC: Cyclic Redundancy Checking: A method for checking errors in a data transmission between two computers. CRC applies a polynomial function (16 or 32-bit) to a block of data. The result of that polynomial is appended to the data transmission. Upon receipt, the destination computer applies the same polynomial to the block of data. If the host and destination computer share the same result, the transmission was successful. Otherwise, the sender is notified to re-send the data block.

DHCP: Dynamic Host Configuration Protocol: A communications protocol that allows network administrators to manage and assign IP addresses to computers within the network. DHCP provides a unique address to a computer in the network which enables it to connect to the Internet through Internet Protocol (IP). DHCP can lease and IP address or provide a permanent static address to those computers who need it (servers, etc.).

DMZ: Demilitarized Zone: A computer Host or network that acts as a neutral zone between a private network and a public network. A DMZ prevents users outside of the private network from getting direct access to a server or any computer within the private network. The outside user sends requests to the DMZ, and the DMZ initiates sessions in the public network based on these requests. A DMZ cannot initiate a session in the private network, it can only forward packets to the private network as they are requested.

DNS: Domain Name System: A method to locate and translate Domain Names into Internet Protocol (IP) addresses, where a Domain Name is a simple and meaningful name for an Internet address.

DSL: Digital Subscriber Line: A technology that provides broadband connections over standard phone lines.

DSLAM: Digital Subscriber Line Access Multiplexer: Using multiplexing techniques, a DSLAM receives signals from customer DSL lines and places the signals on a high-speed backbone line. DSLAMs are typically located at a telephone company's CO (Central Office).

Encapsulation: The inclusion of one data structure within another. For example, packets can be encapsulated in an ATM frame during transfer.

FEC: Forward Error Correction: An error correction technique in which a data packet is processed through an algorithm that adds extra error correcting bits to the packet. If the transmitted message is received in error, these bits are used to correct the errored bits without retransmission.

Firewall: A firewall is a method of implementing common as well as user defined security policies in an effort to keep intruders out. Firewalls work by analyzing and filtering out IP packets that violate a set of rules defined by the firewall administrator. The firewall is located at the point of entry for the network. All data inbound and outbound must pass through the firewall for inspection.

Fragmentation: Breaking a packet up into smaller packets that is caused either by the transmission medium being unable to support the original size of the packet or the receiving computer not being able to receive a packet of that size. Fragmentation occurs when the sender's MTU is larger than the receiver's MRU.

FTP: File Transfer Protocol. A standardized internet protocol which is the simplest way to transfer files from one computer to another over the internet. FTP uses the Internet's TCP/IP protocols to function.

Full Duplex: Data transmission can be transmitted and received on the same signal medium and at the same time. Full Duplex lines are bidirectional.

G.dmt: Formally G.992.1, G.dmt is a form of ADSL that uses Discrete MultiTone (DMT) technology. G.dmt incorporates a splitter in its design.

G.lite: Formally G.992.2, G.lite is a standard way to install ADSL service. G.lite enables connections speeds up to 1.5 Mbps downstream and 128 kbps upstream. G.lite does not need a splitter at the user end because splitting is preformed at the remote end (telephone company).

Gateway: A point on the network which is an entrance to another network. For example, a router is a gateway that connects a LAN to a WAN.

Half Duplex: Data transmission can be transmitted and received on the same signal medium, but not simultaneously. Half Duplex lines are bidirectional.

HEC: Headed Error Control: ATM error checking by using a CRC algorithm on the fifth octet in the ATM cell header to generate a check character. Using HEC, either a single bit error in the header can be corrected or multiple bit errors in the header can be detected.

HNP: Home Network Processor

Host: In context of Internet Protocol, a host computer is one that has full two way access to other computers on the Internet.

IAD: Integrated Access Device: A device that multiplexes and demultiplexes communications in the CPE

onto and out of a single telephone line for transmission to the CO.

IP: Internet Protocol: The method by which information is sent from one computer to another through the Internet. Each of these host computers have a unique IP address which distinguishes it from all the other computers on the internet. Each packet of data sent includes the sender's IP address and the receiver's IP address.

LAN: Local Area Network: A group of computers, typically covering a small geographic area, that share devices such as printers, hard disk drives, scanners, and optical drives. Computers in a LAN typically share an internet connection through some sort of router that connects the computers to a WAN.

LLC: Logical Link Control: Provides an interface point to the MAC sublayer. LLC Encapsulation is needed when several protocols are carried over the same Virtual Circuit.

MAC Address: Media Access Control Address: A unique hardware number on a computer or device that identifies it and relates it to the IP address of that device.

MC: Multicast: Communication involving a single sender and multiple specific receivers in a network.

MRU: Maximum Receive Unit: MRU: Maximum Receive Unit (MRU) is the largest size packet that can be received by the modem. During the PPP negotiation, the peer of the PPP connection will indicate its MRU and will accept any value up to that size. The actual MTU of the PPP connection will be set to the smaller of the two (MTU and the peer's MRU). In the normal negotiation, the peer will accept this MRU and will not send packet with information field larger than this value.

MSS: Maximum Segment Size: The largest size of data that TCP will send in a single, unfragmented IP packet. When a connection is established between a LAN client and a host in the WAN side, the LAN client and the WAN host will indicate their Maximum Segment Size during the TCP connection handshake.

MTU: Maximum Transmission Unit: The largest size packet that can be sent by the modem. If the network stack of any packet is larger than the MTU value, then the packet will be fragmented before the transmission. During the PPP negotiation, the peer of the PPP connection will indicate its MRU and will accept any value up to that size. The actual MTU of the PPP connection will be set to the smaller of the two (MTU and the peer's MRU).

NAPT: Network Address and Port Translation: An extension of NAT, NAPT maps many private internal addresses into one IP address. The outside network (WAN) can see this one IP address but it cannot see the individual device IP addresses translated by the NAPT.

NAT: Network Address Translation: The translation of an IP address of one network to a different IP address known by another network. This gives an outside (WAN) network the ability to distinguish a device on the inside (LAN) network, as the inside network has a private set of IP address assigned by the DHCP server not known to the outside network.

PAP: Password Authentication Protocol: An authentication protocol in which authorization is done through a user name and password.

PDU: Protocol Data Unit: A frame of data transmitted through the data link layer 2.

Ping: Packet Internet Groper: A utility used to determine whether a particular device is online or connected to a network by sending test packets and waiting for a response.

PPP: Point-to-Point Protocol: A method of transporting and encapsulating IP packets between the user PC and the ISP. PPP is full duplex protocol that is transmitted through a serial interface.

Proxy: A device that closes a straight connection from an outside network (WAN) to an inside network (LAN). All transmissions must go through the proxy to get into or out of the LAN. This makes the internal addresses of the devices in the LAN private.

PVC: Permanent Virtual Circuit: A software defined logical connection in a network; A Virtual Circuit that is permanently available to the user.

RIP: Routing Information Protocol: A management protocol that ensures that all hosts in a particular network share the same information about routing paths. In a RIP, a host computer will send its entire routing table to another host computer every X seconds, where X is the supply interval. The receiving host computer will in turn repeat the same process by sending the same information to another host computer. The process is repeated until all host computers in a given network share the same routing knowledge.

RIPv1: RIP Version 1: One of the first dynamic routing protocols introduced used in the internet, RIPv1 was developed to distribute network reach ability information for what is now considered simple topologies.

RIPv2: RIP Version 2: Shares the same basic concepts and algorithms as RIPv1 with added features such as subnet masks, authentication, external route tags, next hop addresses, and multicasting in addition to broadcasting.

Router Mode: Router Mode is used when there is more than one PC connected to the LAN-side Ethernet and/or USB port. This enables the ADSL WAN access to be shared with multiple nodes on the LAN. Network Address Translation (NAT) is supported so that one WAN-side IP address can be shared among multiple LAN-side devices. DHCP is used to serve each LAN-side device and IP address.

SNAP: SubNetwork Attachment Point.

SNMP: Simple Network Management Protocol: Used to govern network management and monitor devices on the network. SNMP is formally described in RFC 1157.

SNR: Signal-to-Noise Ratio: Measured in decibels, SNR is a calculated ratio of signal strength to background noise. The higher this ratio, the better the signal quality.

Subnet Mask: Short for SubNetwork Mask, subnet mask is a technique used by the IP protocol to filter messages into a particular network segment, called a subnet. The subnet mask consists of a binary pattern that is stored in the client computer, server, or router. This pattern is compared with the incoming IP address to determine whether to accept or reject the packet.

TCP: Transfer Control Protocol: Works together with Internet Protocol for sending data between computers over the Internet. TCP keeps track of the packets, making sure that they are routed efficiently.

TFTP: Trivial File Transfer Protocol: A simple version of FTP protocol that has no password authentication or directory structure capability.

Trellis Code: An advanced method of FEC (Forward Error Correction). When enabled, it makes for better error checking at the cost of slower packet transmission. Setting Trellis Code to Disabled will cause increased packet transmission with decreased error correction.

TTL: Time To Live: A value in an IP packet that indicates whether or not the packet has been propagating through the network too long and should be discarded.

UBR: Unspecified Bit Rate: A transfer mode that is usually used in file transfers, email, etc. UBR can vary depending on the data type.

USB: Universal Serial Bus: A standard interface between a computer and a peripheral (printer, external drives, digital cameras, scanners, network interface devices, modems, etc.) that allows a transfer rate of 12Mbps.

UDP: User Datagram Protocol: A protocol that is used instead of TCP when reliable delivery is not required. Unlike TCP, UDP does not require an acknowledgement (handshake) from the receiving end. UDP sends packets in one-way transmissions.

VBR-nrt: Variable Bit Rate – non real time: With VBR-nrt, cell transfer is variable upon certain criteria.

VC: Virtual Circuit: A virtual circuit is a circuit in a network that appears to be a physically discrete path, but is actually a managed collection of circuit resources that allocates specific circuits as needed to satisfy traffic requirements.

VCI: Virtual Channel Identifier: A virtual channel identified by a unique numerical tag that is defined by a 16-bit field in the ATM cell header. The purpose of the virtual channel is to identify where the cell should travel.

VC-Mux: Virtual Circuit based Multiplexing: In VC Based Multiplexing, the interconnect protocol of the carried network is identified implicitly by the VC (Virtual Circuit) connecting the two ATM stations (each protocol must be carried over a separate VC).

VPI: Virtual Path Identifier: Virtual path for cell routing indicated by an eight bit field in the ATM cell header.

WAN: Wide Area Network: A WAN covers a large geographical area. A WAN is consisted of LANs and the Internet is consisted of WANs.

WPA: Wi-Fi Protected Access (WPA) is a specification of standards-based, interoperable security enhancements that increase the level of data protection and access control for existing and future wireless LAN systems.

WPS: Wi-Fi Protected Setup is a standard for easy and secure establishment of a wireless home network