USER MANUAL

WIRELESS ROUTER / HIGH SPEED ADSL 2+ MODEM

MAKING CONNECTIONS easy

ENCORE® ELECTRONICS

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Chapter 1 Introduction

The ENDSL-4R5G Wireless Router / High Speed ADSL 2+ Modem is a highly integrated wireless Internet gateway device. And, it is fully compliant with ADSL/2/2+, IEEE 802.3/3u and IEEE 802.11b/g specifications.

It supports one ADSL/2/2+ modem router for high speed ADSL/2/2+ connection to the DSL telephone line with downstream/upstream data rates up to 24Mbps and 1Mbps for Internet access, four 10/100Mbps Fast Ethernet ports and one IEEE 802.11g/b 54Mbps wireless Access Point for connections to PC hosts or other Fast Ethernet or wireless network devices. It is specially designed for all your possible network connectivity. And, you can share and enjoy higher quality multimedia and real-time applications such as online gaming, Video-on-Demand and other bandwidth consuming services. Also the feature-rich routing and NAT functions are seamlessly integrated to this device for corporation or SOHO users.

The ENDSL-4R5G is the most cost-efficient highly integrated wireless Internet gateway device you would ever need for all your LAN, wireless and Internet connectivity.

1.1 Safety Precautions

Follow the following instructions to prevent the device from risks and damage caused by fire or electric power:

- Use volume labels to mark the type of power.
- Use the power adapter packed within the device package.
- Pay attention to the power load of the outlet or prolonged lines. An overburden power outlet or damaged lines and plugs may cause electric shock or fire accident. Check the power cords regularly. If you find any damage, replace it at once.
- Proper space left for heat dissipation is necessary to avoid damage caused by overheating to the device. The long and thin holes on the device are designed for heat dissipation to ensure that the device works normally. Do not cover these heat dissipation holes.
- Do not put this device close to a place where a heat source exits or high temperature occurs. Avoid the device from direct sunshine.
- Do not put this device close to a place where it is over damp or watery. Do not spill any fluid on this device.
- Do not connect this device to any computers or electronic products, unless our customer engineer or your broadband provider instructs you to do this, because any wrong connection may cause power or fire risk.
- Do not place this device on an unstable surface or support.

1.2 LEDs and Interfaces

Front Panel

The following table describes the LEDs of the device:

LEDs	Color	Status	Description
	Green	On	The initialization of the device is successful.
		Off	The device is powered off.
	Red	On	The device is self-testing or self-testing is failed.
		Blinks	The software is upgrading.
DSL	Green	On	Connection between the device and the physical layer of the office is established.
		Slow Blinks	No signal is being detected.
		Fast Blinks	The device is handshaking with the physical layer of the office.
	Green	On	The Internet connection is normal in the routing mode (for example: PPP dial-up is successful), and no Internet data is being transmitted.
		Blinks	Internet data is being transmitted in the routing mode.
		Off	The device is in the bridge mode.
	Red	On	The Internet connection fails after successful synchronization in the routing mode (for example: PPP dial-up is failed).
4/3/2/1	Green	On	The LAN connection is normal and activated.
		Blinks	Data is being transmitted in the LAN or Internet data is being transmitted in the bridge mode.
		Off	The LAN interface is not connected.
	Green	On	The WLAN connection has been activated.
		Blinks	Data is being transmitted in the WLAN.
		Off	The WLAN connection is not activated.

LEDs	Color	Status	Description
	Green	Blinks	WPS is enabled, and is waiting for client to negotiate.
		Off	WPS is disabled.

Rear Panel

The following table describes the interfaces of the device:

Interface	Description
	Wireless antenna.
DSL	RJ-11 interface, for connecting to the ADSL interface or a splitter through a telephone cable.
LAN1/LAN2/ LAN3/LAN4	RJ-45 interface, for connecting to the Ethernet interface of a computer or the Ethernet devices through an Ethernet cable.
Power	Power interface, for connecting to the power adapter of 12 V DC, 800mA.
Reset	Reset to the factory default configuration. Keep the device powered on, and insert a needle into the hole for 3 seconds, then release it. The device is reset to the factory default configuration.
WLAN/WPS	● Press the button and hold it for 1 second, to enable WLAN. ● Press the button and hold it for 1 second and 3 seconds, it does not take effect. ● Press the button and hold it for 3 or more than 3 seconds, to initialize WPS negotiation.
	Power switch, power on or power off the device.

1.3 Features

- Compliant to the most updated ADSL2/2+ standards
- Support ADSL2+ downstream/upstream data rate up to 24M/1Mbps
- IEEE 802.11g WLAN supports up to 54Mbps transmission rate

- Support WEP, WPA, WPA2 and 802.1X based encryption
- Hardware reset button for fast default setting recovery
- WLAN/WPS button to enable/disable WLAN or WPS functionalities
- Built-in Quick Setup Wizard to easily establish ADSL connection
- Web-based management, configuration and firmware upgrade
- Embedded firewall (SPI) feature for secure data communication
- Support UPnP specification
- Support SNTP enactment
- Support TR069

1.4 Applications

- High speed DSL broadband and Internet access sharing
- Audio and video streaming and transferring
- PC files and applications sharing
- Network and on-line gaming

1.5 Specifications

- ADSL
  - Support ANSI T1.413 Issue 2
  - Support ITU G.992.1 (G.dmt) Annex A
  - Support ITU G.992.2 (G.lite) Annex A
  - Support ITU G.992.3 ADSL2 (G.dmt.bis) Annex A, L, M
  - Support ITU G.992.4 ADSL2 (G.lite.bis)
  - Support ITU G.992.5 ADSL2 plus

- IEEE 802.3/802.3u ETHERNET/FAST ETHERNET
  - Compliant with IEEE 802.3/802.3u standards
  - Support auto-negotiation function
  - Support IEEE802.3x flow control for full duplex and back pressure flow control for half duplex
  - Support MDI/MDI-X auto cross over

- IEEE 802.11b/g WIRELESS
  - IEEE 802.11b/g standards compliant
  - Frequency band: 2.4 GHz (ISM frequency bands)

- Data rate:
  - 802.11b compliant: 11, 5.5, 2, 1 Mbps (DSSS/CCK);
  - 802.11g compliant: 54, 48, 36, 24, 18, 12, 9, 6 Mbps (OFDM)
- Operating channels: 802.11b/g
  - 11: (Ch. 1-11) – N. America (default)
  - 13: (Ch. 1-13) – Europe ETSI
  - 14: (Ch. 1-14) – Japan
- Frequency range: 802.11 b/g
  - 2.412~2.462 GHz – N. America (default)
  - 2.412~2.472 GHz – Europe ETSI
  - 2.412~2.484 GHz – Japan
- Transmit output power:
  - 802.11b: 18.5 dBm ± 1.5 dBm
  - 802.11g: 14.5 dBm ±1 .5 dBm
- Transmission distance: 300 meters outdoors, 100 meters indoors coverage area (varying depending on the actual environment.)
- Security: 64/128-bit WEP, AES, TKIP, WPA, WPA2, 802.1X
- Antenna type: single external detachable antenna
- Support WPS features

- ATM
  - Support hardware ATM AAL0, AAL5 and OAM
  - Support software ATM AAL1 and AAL3/4
  - Support ATM UBR, CBR, VBR-rt and VBR-nrt traffic shaping QoS
  - Support up to 8 PVC settings with multiple sessions
  - Support auto PVC feature

- HARDWARE
  - RTL8671BH ADSL2+ home gateway chipset
  - 16 MB SDRAM
  - 4 MB serial flash ROM

- BRIDGING/ROUTING
  - RFC 2364 PPPoA
  - RFC 2516 PPPoE
  - RFC2225/RFC1577 IPoA
  - RFC 2684/1483 Bridged/Routed/MER
  - Support transparent bridging (IEEE 802.1D)
  - Dynamic and static routing (RIP v1/v2)
  - DHCP server, relay and client
  - NAT/NAPT with extensive ALG support
  - Support DNS proxy

- Support DDNS feature
- Support IGMP proxy
- Support SNTP
- Support port forwarding (virtual server) features
- Support DMZ functionality
- Support VPN pass-through

- MANAGEMENT
  - Support web-based configuration/management
  - Support firmware upgrade via HTTP/TFTP
  - Support built-in diagnostic function of circuitry connect
  - Support telnet CLI command line
  - Support hardware reset or web interface reset function
  - Support configuration files backup and restoration
  - Support system log, connection status and statistics
  - Support SNMP v1/v2C (RFC1213 MIB II, RFC 2662 ADSL line MIB, RFC 2515 ATM MIB)
  - Support SNTP enactment
  - Support TR069

- SECURITY
  - Support firewall function
  - Support revised passwords of two-level users
  - Support electronic signature (preventing different types of versions from upgrading each other)
  - Support denial of service (DoS) which detects and protects against a number of attacks (such as SYN/FIN/RST Flood, Smurf, WinNuke, Echo Scan, Xmas Tree Scan)
  - Packet filter based on IP address and port
  - Access control based on MAC address
  - PAP and CHAP authentication

- PHYSICAL
  - Dimension: 165mm (L) X 115mm (W) X 32 mm (H)
  - Weight : 292 grams

- HARDWARE INTERFACE
  - One 2.4GHz antenna connector
  - One RJ-11 ADSL port
  - Four RJ-45 LAN ports
  - One DC power jack for 12 V DC/800mA power adapter
  - One reset button for factory default setting recovery

- One WLAN/WPS button to enable/disable WLAN or WPS functionalities
- One push power button
- Status LED indicators

- ENVIRONMENTAL
  - Temperature:
    - Operating: +0 ~ +40°C
    - Storage: -20 ~ +70 °C
  - Humidity: (non-condensing)
    - Operating:10% ~ 90% RH
    - Storage:5% ~ 90% RH

- APPROVALS
  - FCC Part 15 Class B
  - CE, EN60950 (LVD) and K.21
  - UL
  - RoHS

1.6 System Requirements

Recommended system requirements are as follows:

- ADSL Internet service
- OS: Windows® 7 / Vista / XP / 2000 / ME / 98SE, Linux® and Mac®
- Browser: Internet Explorer® 5.0 or above or equivalent
- Network Adapter: 10/100 Ethernet adapter or wireless 802.11b/g adapter
- CD-ROM drive

1.7 Package Contents

- One ENDSL-4R5G device
- One DC power adapter
- One splitter (optional)
- One QIG (Quick Installation Guide)
- One CD-ROM
- One RJ-11 cable
- One RJ-45 cable

Chapter 2 Hardware Installation

Step 1 Connect the **DSL** interface of the device to the **MODEM** interface of the splitter through a telephone cable. Connect the phone to the **PHONE** interface of the splitter through a cable. Connect the incoming line to the **LINE** interface of the splitter.

The splitter has three interfaces:

- **LINE**: Connect to a wall phone jack (RJ-11 jack).
- **MODEM**: Connect to the ADSL jack of the device.
- **PHONE**: Connect to a telephone set.

Step 2 Connect the **LAN** interface of the device to the network interface card (NIC) of the computer through an Ethernet cable (MDI/MDIX).

Note:

Use twisted-pair cables to connect with the hub or switch.

Step 3 Plug one end of the power adapter to the wall outlet and connect the other end to the **Power** interface of the device.

2.1 Connection with no telephone set installed before splitter

Figure 1 displays the application diagram for the connection of the router, computer, splitter and the telephone sets, when no telephone set is placed before the splitter.

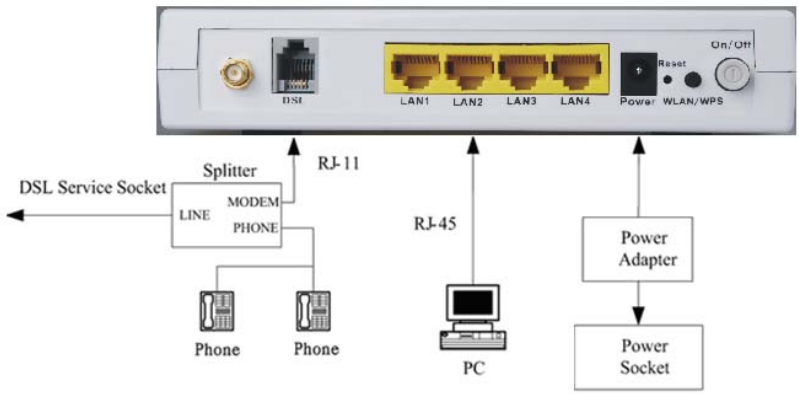


Figure 1 Connection diagram (Without connecting telephone set before the splitter)

2.2 Connection with telephone set installed before splitter

Figure 2 displays the connection when the splitter is installed close to the router.

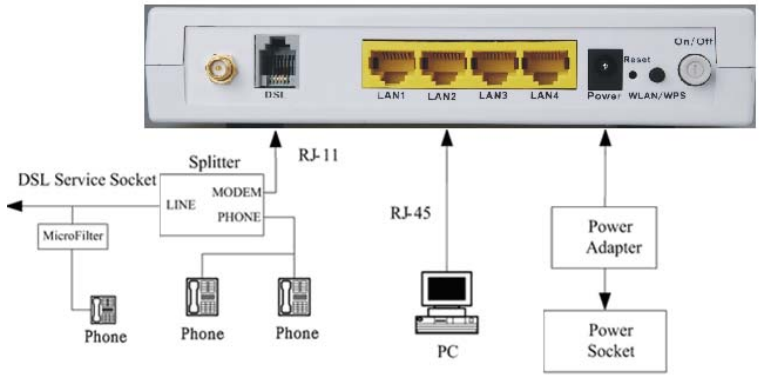


Figure 2 Connection diagram (Connecting a telephone set before the splitter)

Note:

When above connection is used, the filter must be installed close to the telephone cable. See Figure2. Do not use the splitter to replace the filter.

Installing a telephone directly before the splitter may lead to failure of connection between the device and the central office, or failure of Internet access, or slow connection speed. If you really need to add a telephone set before the splitter, you must add a micro-filter before a telephone set. Do not connect several telephones before the splitter or connect several telephones with the micro-filter.

Chapter 3 Setting up the TCP/IP Properties

This chapter describes how to configure the computer to communicate with the router.

Computers access the Internet by using the Transmission Control Protocol/Internet Protocol (TCP/IP). Each computer in your network must have installed TCP/IP driver, and it has been selected as its network protocol. If a NIC has already been installed in your computer, then TCP/IP is already installed as well.

The following description assumes that the router is set to the factory default configuration. The default LAN IP address of the router is 192.168.1.1. (If the router is not set to the factory default, keep the device powered on, and insert a needle into the reset hole for 3 seconds, then release it.)

Note:

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 reboot your Windows system.

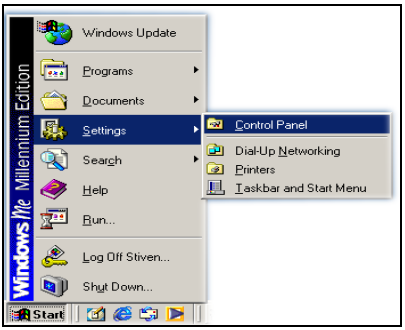
3.1 Setting up the TCP/IP Properties

You could follow the instructions and configure the NIC installed on your system as a DHCP client to get the IP address information automatically from the DSL router device.

3.1.1 Windows ME/98

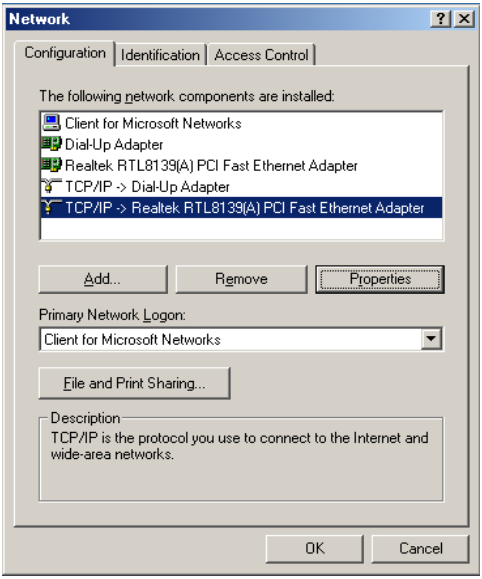
The following describes the operation procedures in Windows ME and Windows 98.

Step 1 Choose **Start** > **Settings** > **Control Panel**. The page as shown in the following figure appears.

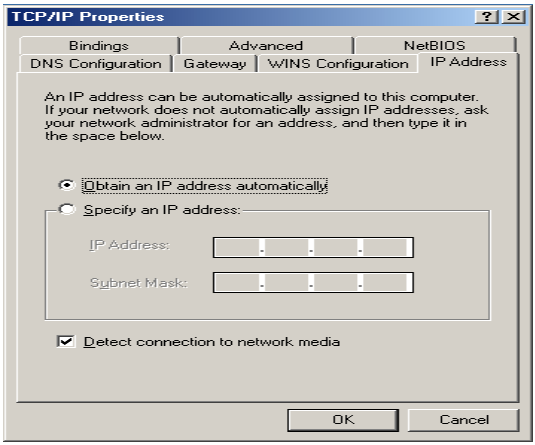


Step 2 Double-click the **Network** icon.

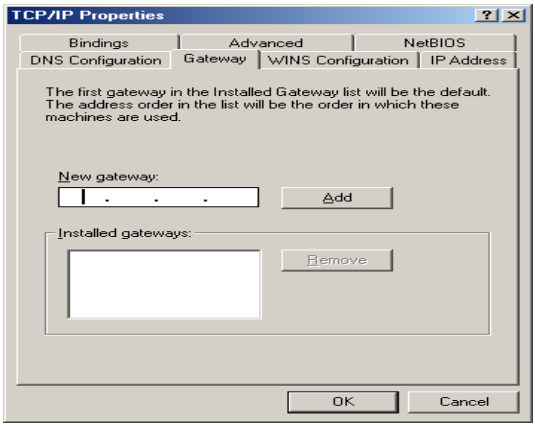
Step 3 In the **Network** window, click the **Configuration** tab, and select **TCP/IP** of the installed NIC. Then click **Properties**.



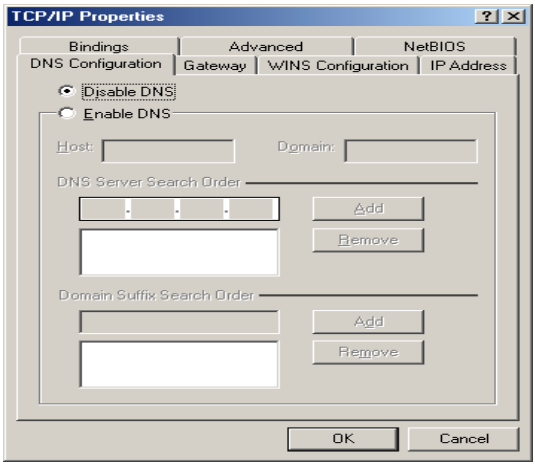
Step 4 In the **TCP/IP Properties** window, click the **IP Address** tab, and select **Obtain an IP address automatically**.



Step 5 In the **TCP/IP Properties** window, click the **Gateway** tab. In the window that is shown, delete all the previous settings.



Step 6 In the **TCP/IP Properties** window, click the **DNS Configuration** tab, and select **Disable DNS**.

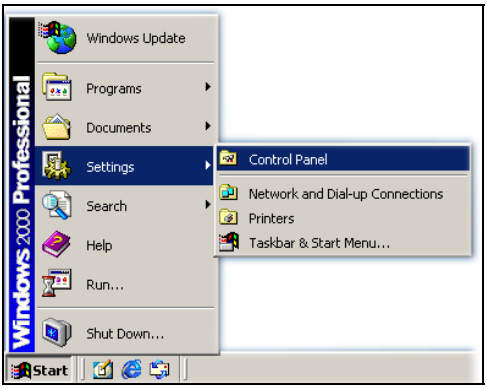


Step 7 After setting, click **OK**.

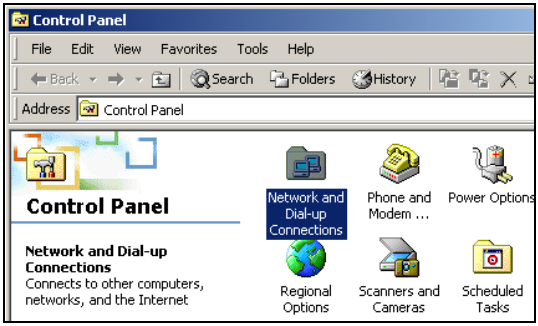
3.1.2 Windows 2000

The following describes the operation procedures in Windows 2000.

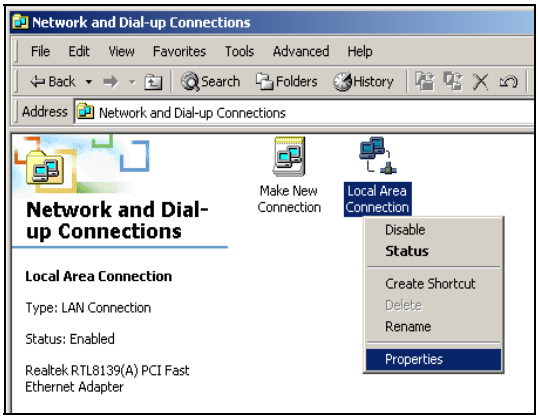
Step 1 Choose **Start** > **Settings** > **Control Panel**. The page as shown in the following figure appears.



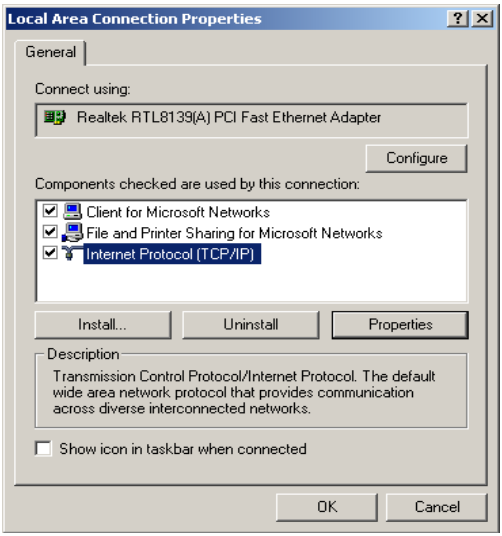
Step 2 Double-click the **Network and Dial-up Connections** icon.



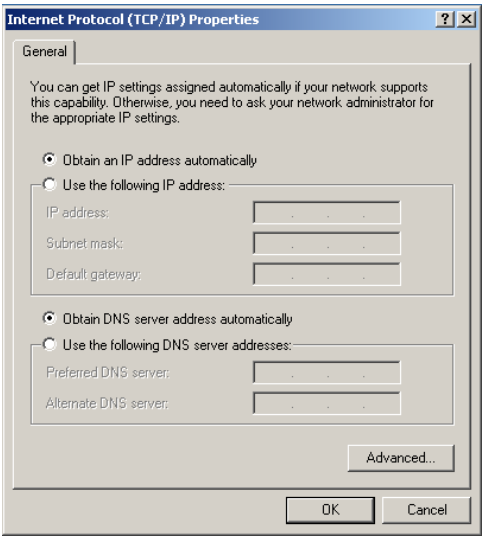
Step 3 Right-click the **Local Area Connection** icon, and then select **Properties** in the menu.



Step 4 In the **Local Area Connection Properties** window, select **Internet Protocol (TCP/IP)**. Then click **Properties**.



Step 5 Select **Obtain an IP address automatically** and **Obtain DNS server address automatically**.



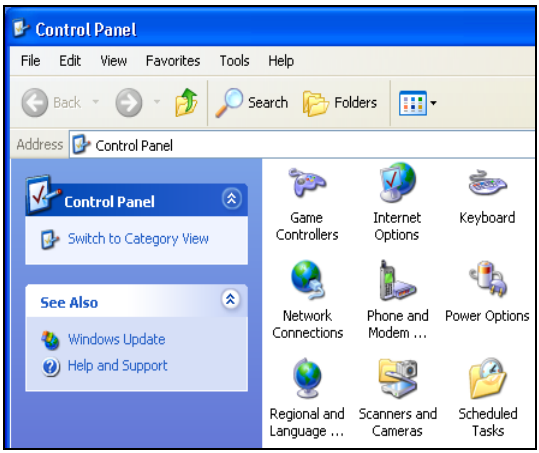
Step 6 After setting, click **OK**.

3.1.3 Windows XP

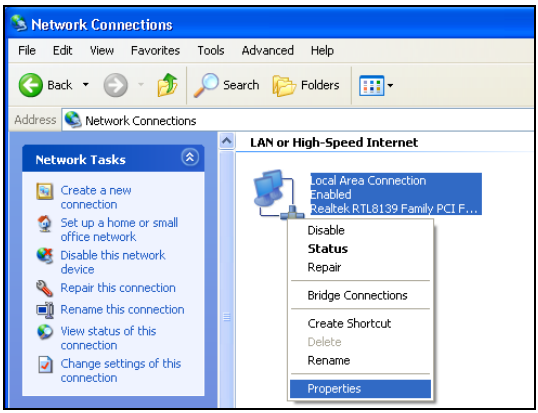
The following describes the operation procedures in Windows XP.

Step 1 Choose **Start** > **Control Panel** > **Switch to Classic View**. The page as shown in the following figure appears.

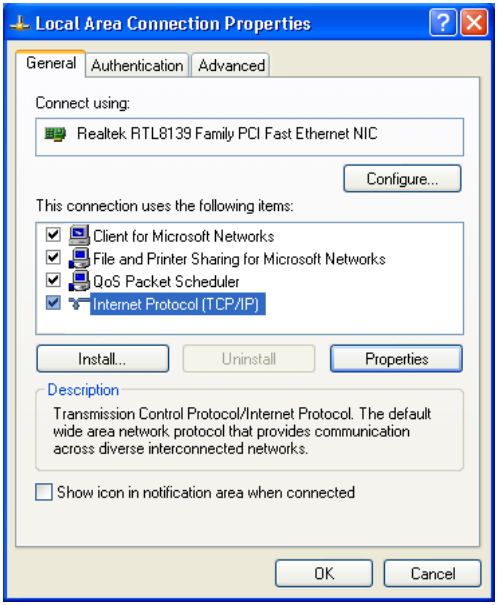
Step 2 Double-click the **Network Connections** icon.



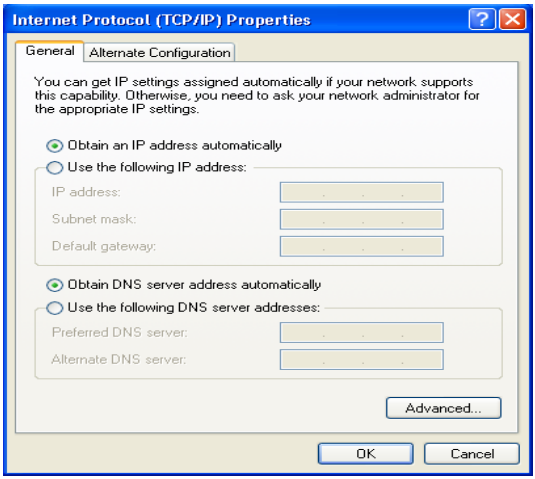
Step 3 Right-click the **Local Area Connection** icon, and then select **Properties** in the menu.



Step 4 In the **Local Area Connection Properties** window, click the **General** tab, and select **Internet Protocol (TCP/IP)**. Then click **Properties**.



Step 5 Select **Obtain an IP address automatically** and **Obtain DNS server address automatically**.



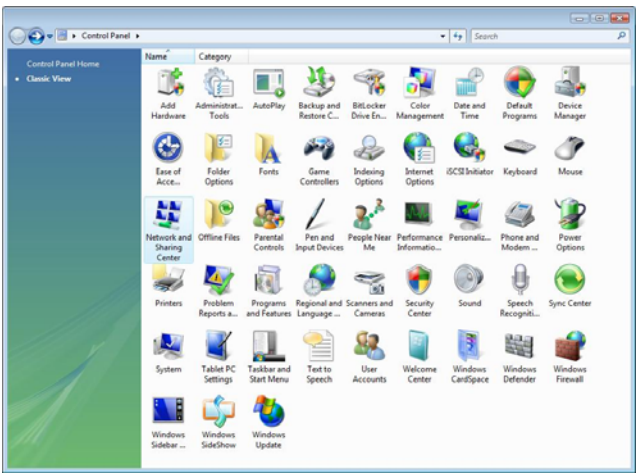
Step 6 After setting, click **OK**.

3.1.4 Windows Vista/7

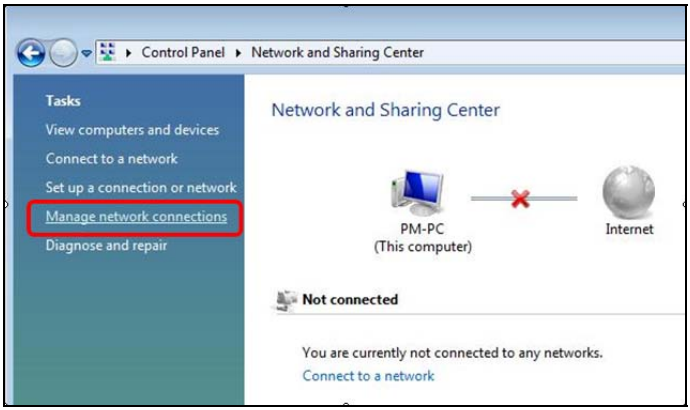
The following describes the operation procedures in Windows Vista/7 systems.

Step 1 Choose **Start** > **Control Panel**. The page as shown in the following figure appears.

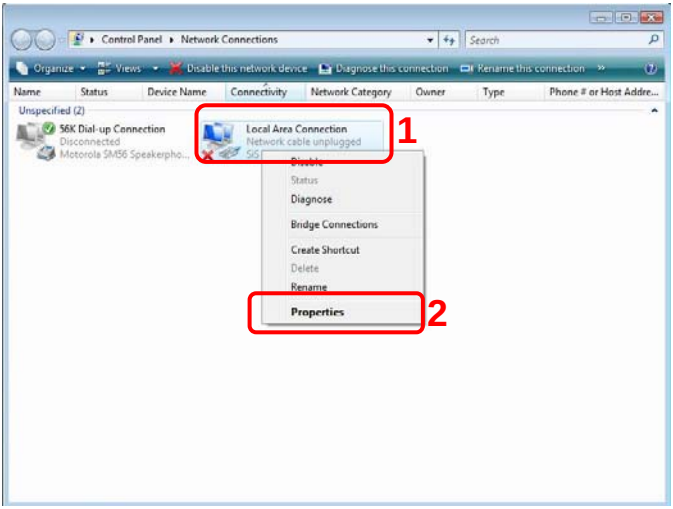
Step 2 Double-click the **Network and Sharing Center** icon.



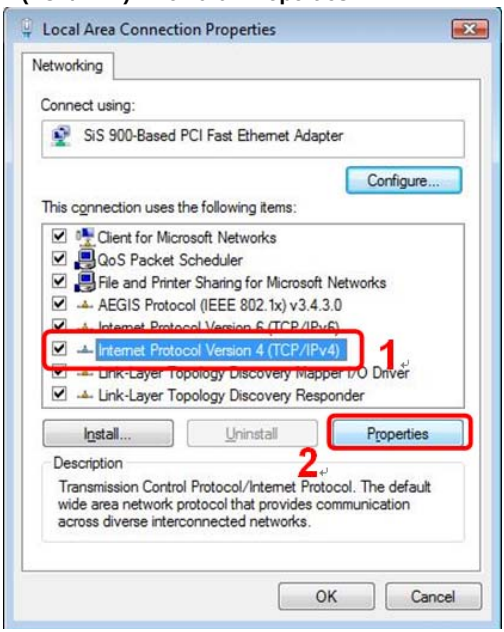
Step 3 In the left pane, select **Manage network connections**, the page as shown in the following figure appears.



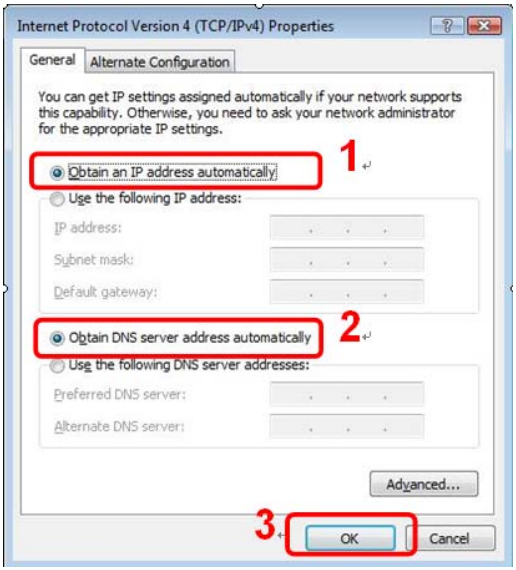
Step 4 Right-click the icon of **Local Area Connection**, and then select **Properties** in the menu.



Step 5 In the **Local Area Connection Properties** window, select **Internet Protocol Version 4 (TCP/IPV4)**. Then click **Properties**.



Step 6 Select **Obtain an IP address automatically** and **Obtain DNS server address automatically**.



Step 7 After setting, click **OK**.

3.1.5 Linux System

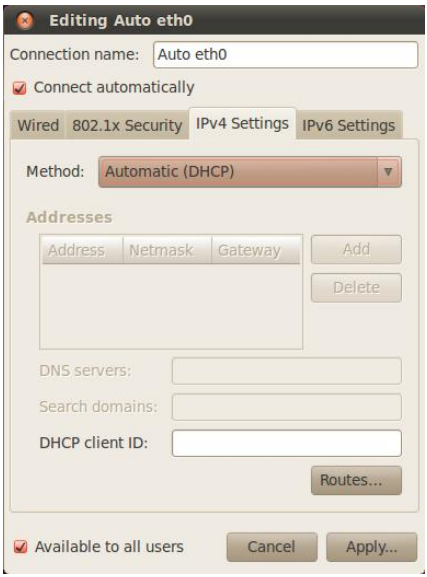
The following describes the operation procedures in Ubuntu Linux system.

Step 1 Select **Network Connections** from **Preferences** on **System** menu and the page as shown in the following figure appears. Then, select the **Wired** tab.

Step 2 Select **Auto eth0** item and click the **Edit…** button to edit the settings.

Step 3 On the **Edit Auto eht0** window, check the **IPv4 Settings** tab.

Step 4 On the **IPv4 Settings** tab, select **Automatic (DHCP)** from the **Method** pull-down menu.



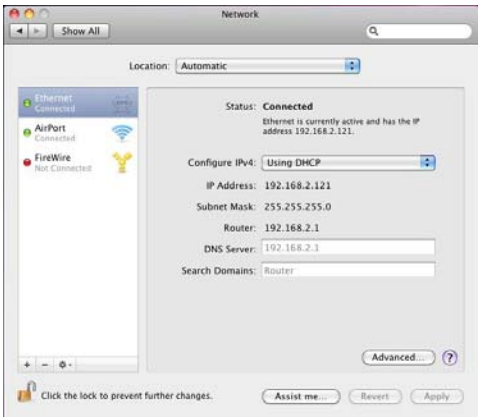
Step 5 After setting, click **Apply** button.

3.1.6 Mac System

The following describes the operation procedures in Mac OS X Version 10.6.3 system.

Step 1 Choose **System Preferences** from **Dock** on the system desktop. The page as shown in the following figure appears.

Step 2 Double-click the **Network** icon in the **Internet & Wireless** section, and you will see the figure below. Click the **Ethernet connected** from connections list on left side and select **Using DHCP** setting in **Configure IPv4** option on the right side. And, you would be able to see the IP Address assignment in the same window



Step 3 Click **Apply** button to finish the settings.

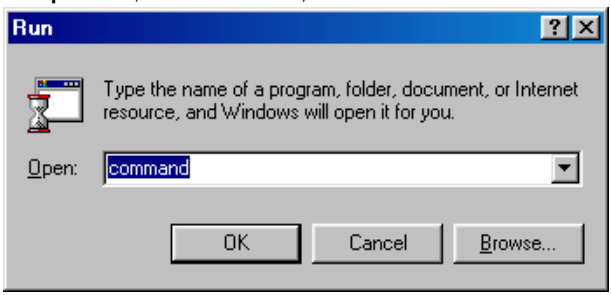
3.2 Checking the TCP/IP Configuration

After you configure the NIC of the computer and reboot the system, you can check the TCP/IP configuration by using the following utility that is provided by your Windows system.

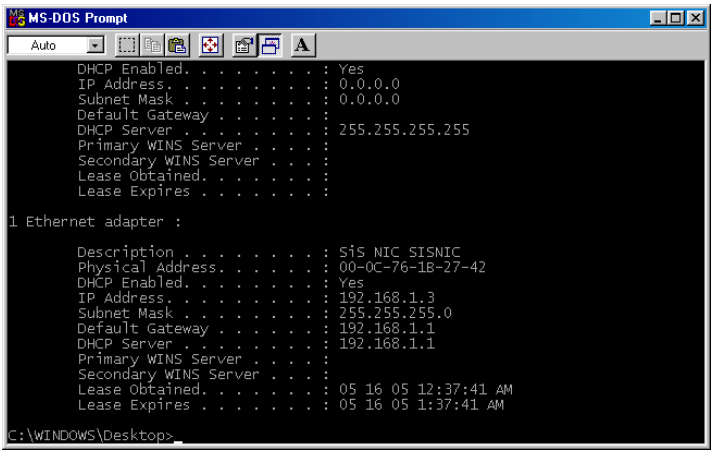
3.2.1 Windows ME/98

Step 1 Choose **Start** > **Run**.

Step 2 In the **Open** field, enter **command**, and then click **OK**.



Step 3 In the **MS-DOS Prompt** window, enter **Winipcfg**, and then press **Enter**. The page as shown in the following figure appears. All the Ethernet adapter information is displayed. You can check the configuration of the computer.



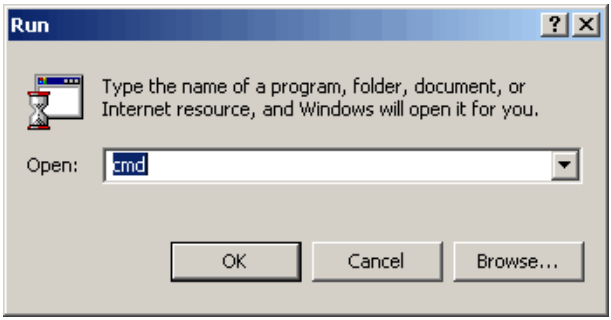
- IP Address: 192.168.1.x
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.1

Step 4 Enter **Exit**, and press **Enter**. Then the **MS-DOS Prompt** window logouts.

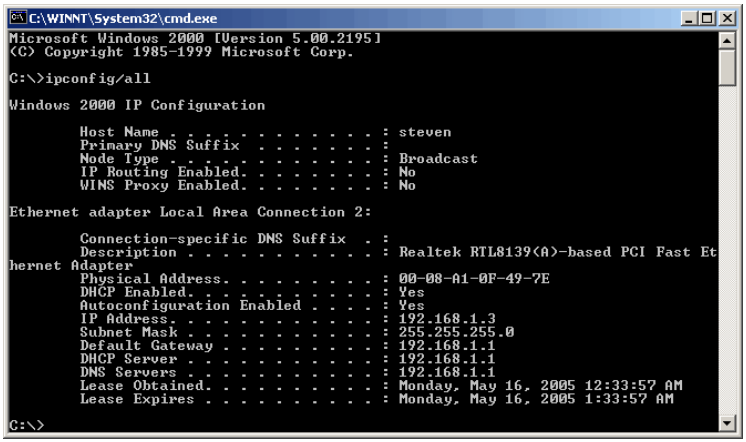
3.2.2 Windows 2000

Step 1 Choose **Start** > **Run**.

Step 2 In the **Open** field, enter **cmd**, and then click **OK**.



Step 3 In the prompt window, enter **ipconfig/all**, and then press **Enter**. The page as shown in the following figure appears. All the Ethernet adapter information is displayed. You can check the configuration of the computer.



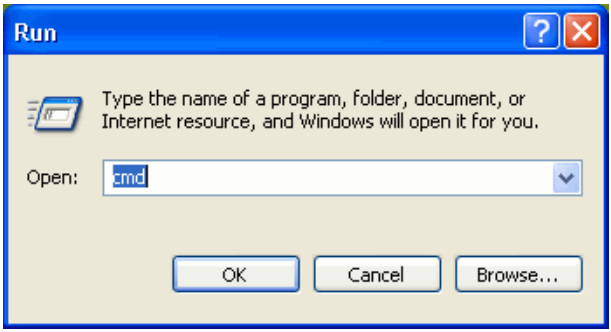
- IP Address: 192.168.1.x
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.1

Step 4 Enter **Exit**, and press **Enter**. Then the prompt window logouts.

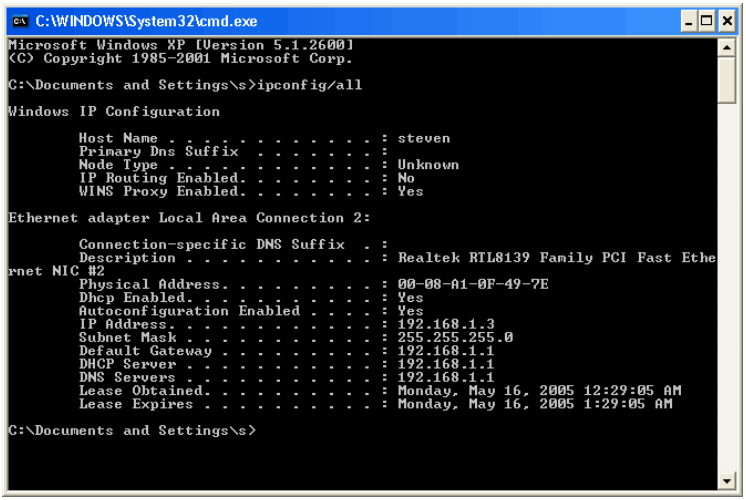
3.2.3 Windows XP/Vista/7

Step 1 Choose **Start** > **Run**.

Step 2 In the **Open** field, enter **cmd**, and then click **OK**.



Step 3 In the prompt window, enter **ipconfig/all**, and then press **Enter**. The page as shown in the following figure appears. All the Ethernet adapter information is displayed. You can check the configuration of the computer.



- IP Address: 192.168.1.x
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.1.1

Step 4 Enter **Exit**, and press **Enter**. Then the prompt window logouts.

3.2.4 Linux System

Step 1 Access the command line **Terminal** window from the **Accessories** sub-menu in the **Applications** menu.

Step 2 Use “ifconfig” command to check the IP address assignment in the command line **Terminal** window.

Chapter 4 Access the Web Configuration

This chapter describes how to configure the router by using the Web-based configuration utility.

4.1 How to Access the Router

The following is the detailed description of accessing the router for the first time.

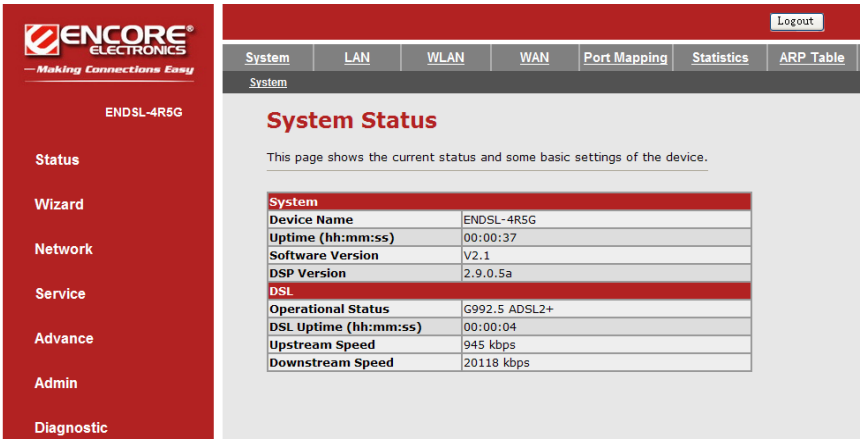
Step 1 Open the Internet Explorer (IE) or other browser software and enter **http://192.168.1.1** in the URL address field.

Step 2 In the **Login** page that is displayed, enter the user name and password.

The router supports two-level user accounts for accessing.

- The user name and password of the super user are **admin** and **admin** respectively.
- The user name and password of the common user are **user** and **user** respectively.

If you log in as a super user, the page as shown in the following figure appears. You can check, configure and modify all the settings.



If you log in as a common user, you can check the status of the router, but can not configure the most of the settings.

If there is no operation in the Web configuration page within five minutes, the router automatically logouts. You need to log in again.

Note:

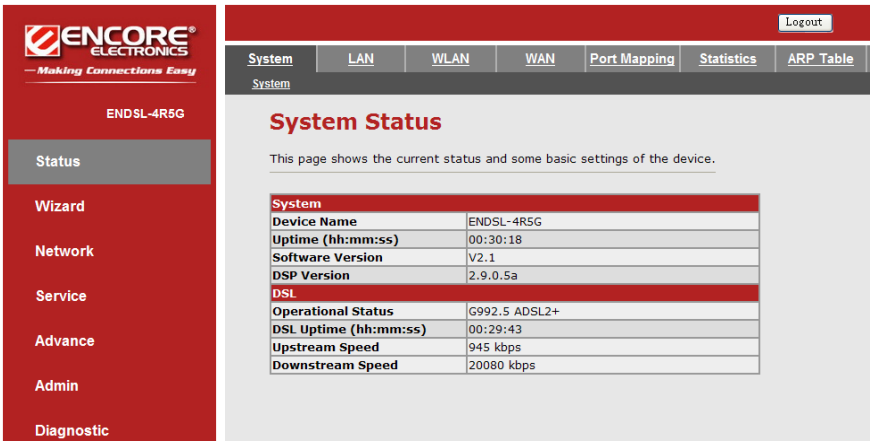
In the Web configuration page, you can click **Apply Changes** to save the settings temporarily. If you want to save the settings in this page permanently, click **Save** of **Attention** that appears at the bottom of the Web page after the configuration.

4.2 Status

In the navigation bar, click **Status**. In the **Status** page that is displayed contains: **System**, **LAN**, **WLAN**, **WAN**, **Port Mapping**, **Statistics**, and **ARP Table**.

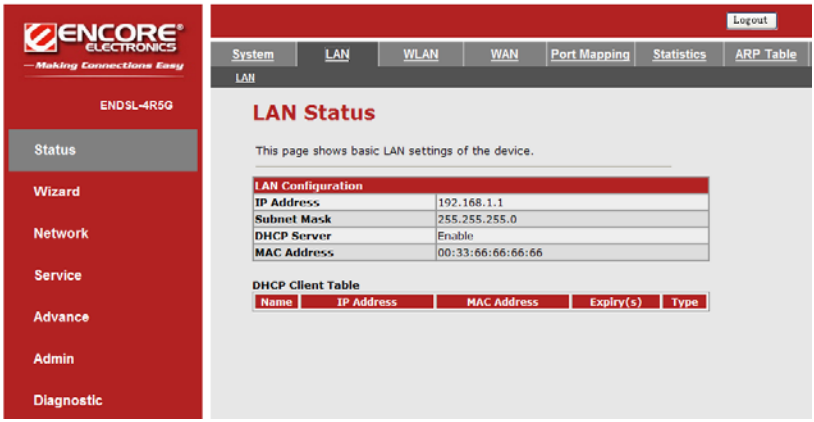
4.2.1 System

Choose **Status** > **System**. The page that is displayed shows the current status and some basic settings of the router, including uptime, software version, DSP version, upstream speed, and downstream speed.



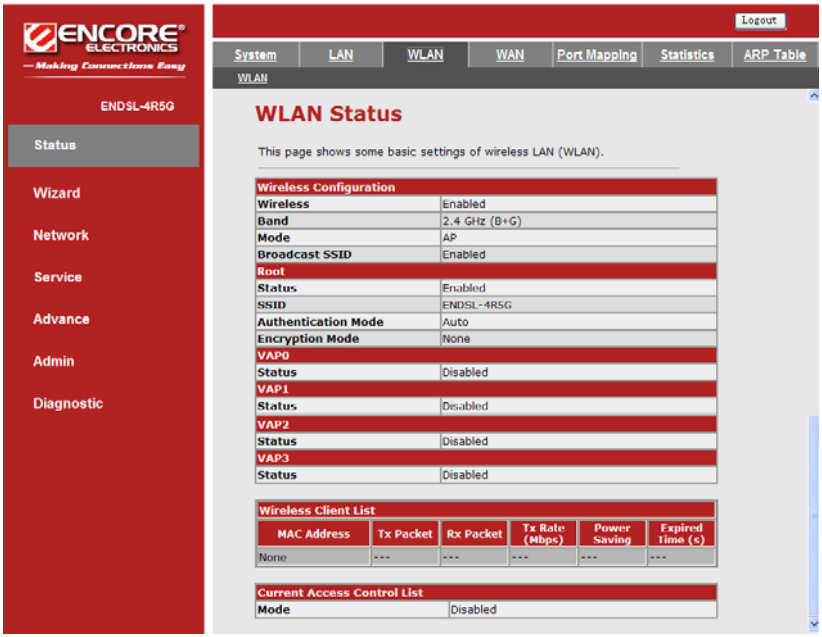
4.2.2 LAN

Choose **Status** > **LAN**. The page that is displayed shows some basic LAN settings of the router. In this page, you can view the LAN IP address, DHCP server status, MAC address, and DHCP client table. If you want to configure the LAN network, refer to Chapter 04.4.1.1 LAN IP.



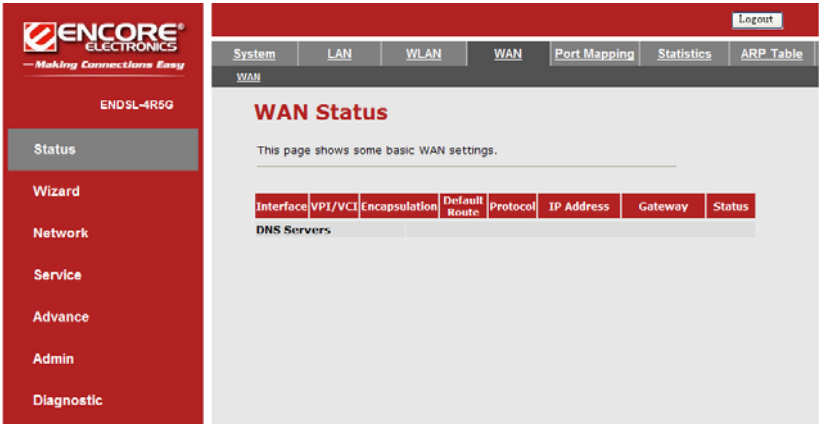
4.2.3 WLAN

Choose **Status** > **WLAN**. The page that is displayed shows some basic WLAN settings of the router. In this page, you can view basic status of wireless LAN (WLAN). If you want to configure the WAN network, refer to Chapter 00.



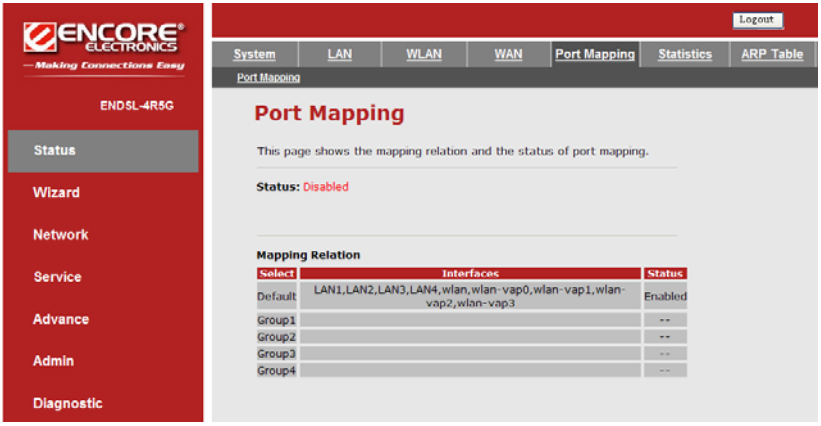
4.2.4 WAN

Choose **Status** > **WAN**. The page that is displayed shows some basic WAN settings of the router. In this page, you can view basic status of WAN and DNS server. If you want to configure the WAN network, refer to chapter 4.4.2 WAN.



4.2.5 Port Mapping

Choose **Status** > **Port Mapping**. In this page, you can view the mapping relation and the status of port mapping.

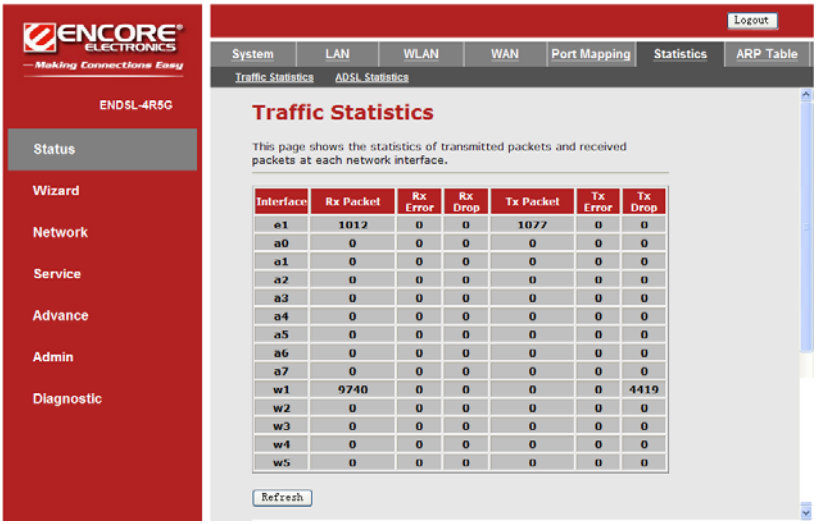


4.2.6 Statistics

Choose **Status** > **Statistics**. The **Statistics** page that is displayed contains **Traffic Statistics** and **ADSL Statistics**.

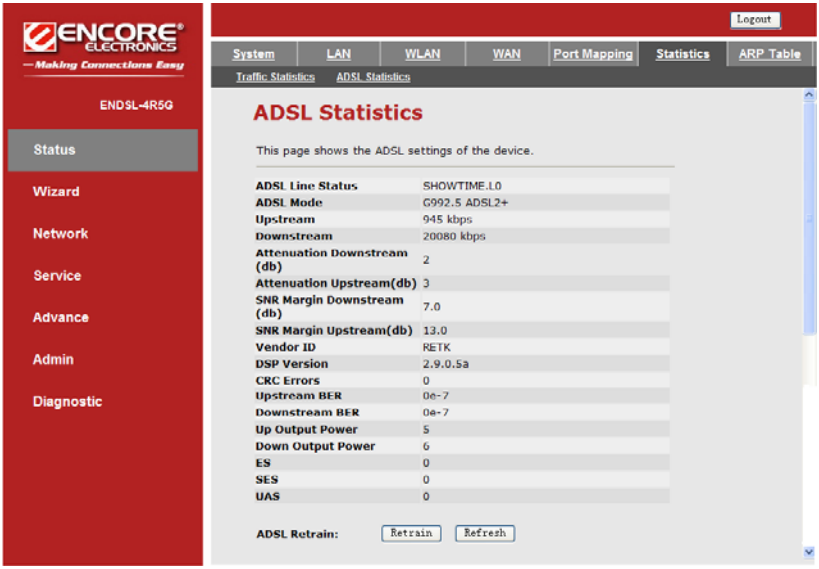
4.2.6.1 Traffic Statistics

Click **Traffic Statistics**, the page as shown in the following figure appears. In this page, you can view the statistics of transmitted packets and received packets at each network interface.



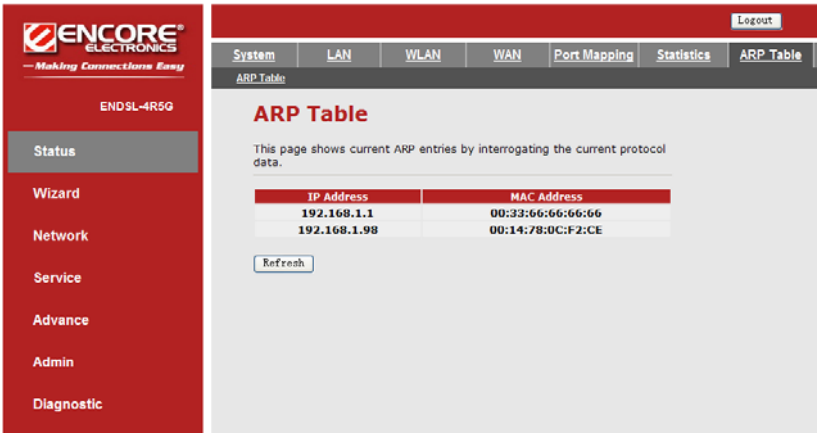
4.2.6.2 ADSL Statistics

Click **ADSL Statistics**, the page as shown in the following figure appears. In this page, you can view the ADSL line status, upstream speed, downstream speed, and other information.



4.2.7 ARP Table

Choose **Status** > **ARP Table**. In this page, you can view MAC addresses of the router and the connected devices.

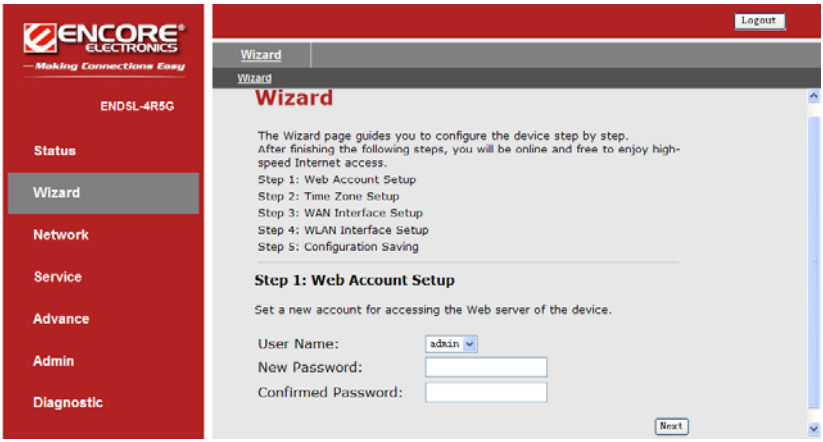


4.3 Wizard

The **Wizard** page guides fast and accurate configuration of the Internet connection and other important parameters. The following sections describe these various configuration parameters. Whether you configure these parameters or use the default ones, click **Next** to enable your Internet connection.

When subscribing to a broadband service, you should be aware of the method by which you are connected to the Internet. Your physical WAN device can be either PPP, ADSL, or both. The technical information about the properties of your Internet connection is provided by your Internet service provider (ISP). For example, your ISP should inform you whether you are connected to the Internet using a static or dynamic IP address, and the protocol that you use to communicate on the Internet.

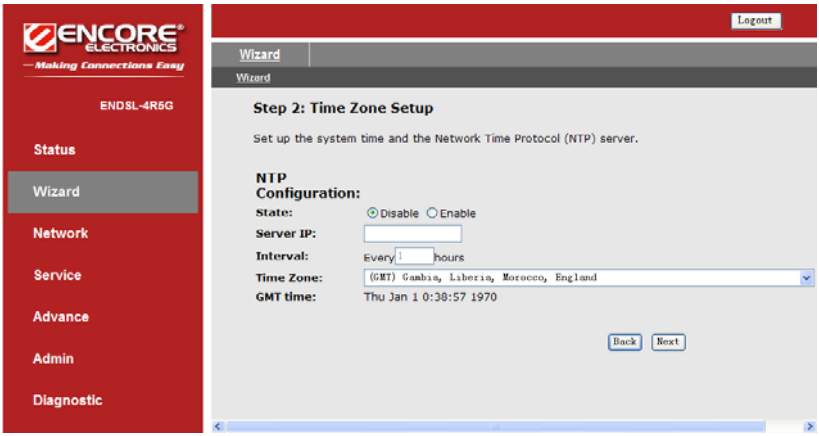
In the navigation bar, click **Wizard**. The page as shown in the following figure appears.



The following table describes the parameters in this page:

Field	Description
User Name	Select the user name for accessing the router.
New Password	Enter the password to which you want to change the old password. The password can not contain space key, %, ", ? or &.
Confirmed Password	Enter the new password again.

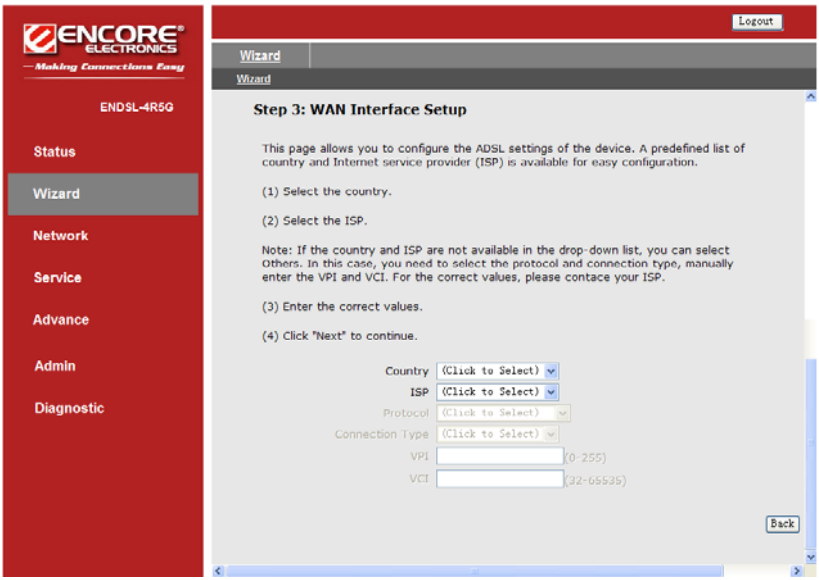
You are recommended to change the password after login for the first time. Enter the new password twice and click **Next**. The page as shown in the following figure appears. In this page, you can configure the system time and Network Time Protocol (NTP) server.



The following table describes the parameters in this page:

Field	Description
State	Disable or enable NTP. You need to enable it if you want to configure the parameters in this page.
Server IP	Enter the IP address of the specified time server manually.
Interval	Specify the interval that the router synchronizes the time with the server.
Time Zone	Select the time zone in which area you are from the drop-down list.
GMT time	It displays the Greenwich Mean Time (GMT).

After settings done, click **Next**. The page as shown in the following figure appears.



The procedure for configuring the ADSL settings of the router is as follows:

Step 1 Select the country where you are from the drop-down list.

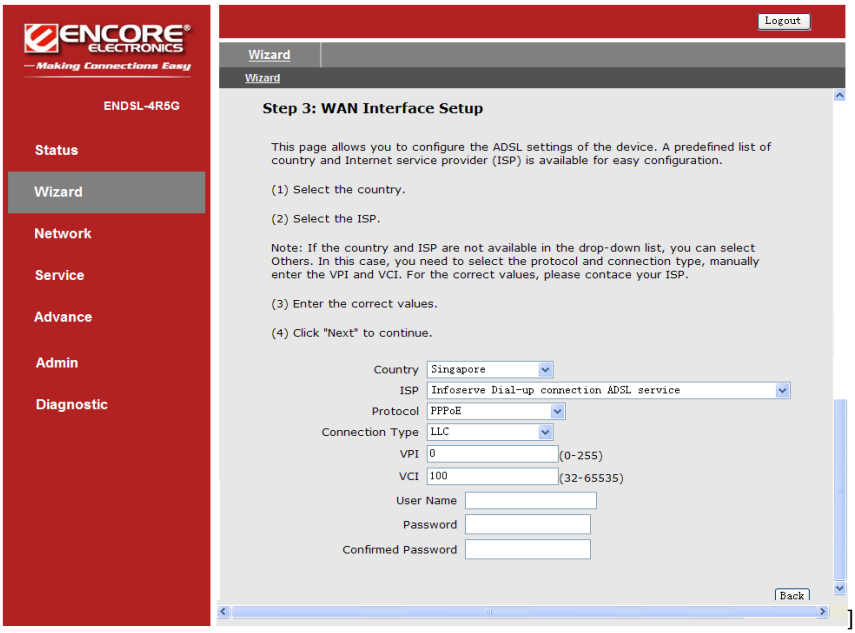
Step 2 Select the corresponding ISP from the drop-down list.

After the selection, the protocol, connection type, VPI, VCI are displayed.

Step 3 Enter the correction information for dial-up.

There are six protocols available: **PPPoE**, **PPPoA**, **1483 MER: DHCP**, **1483 MER: Static IP**, **1483 Bridged**, and **1483 Routed**.

For example, please select **Singapore** and **Infoserve Dial-up connection ADSL service** from the corresponding drop-down lists. The page as shown in the following figure appears.



4.3.1 PPPoE

In this example, select **PPPoE** as the protocol.

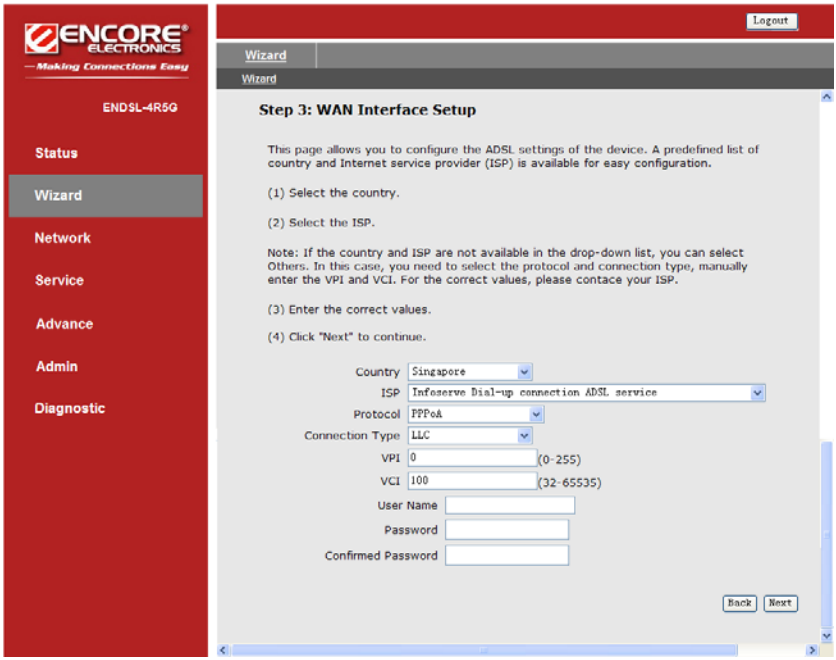
The following table describes the parameters in this page:

Field	Description
Protocol	There are six protocols available. In this example, **PPPoE** is the protocol for dial-up.
Connection Type	There are two connection types available: **VC-Mux** and **LLC**. In this example, **LLC** is the connection type.
VPI	Virtual path identifier (VPI) is the virtual path between two points in an ATM network. Its valid value is in the range of 0 to 255. In this example, VPI is set to **0**.
VCI	Virtual channel identifier (VCI) is the virtual channel between two points in an ATM network. Its valid value is in the range of 32 to 65535 (0 to 31 is reserved for local management of ATM traffic). In this example, VCI is set to **100**.
User Name	Enter the user name for PPPoE dial-up, which is provided by your ISP.

Field	Description
Password	Enter the password for PPPoE dial-up, which is provided by your ISP.
Confirmed Password	Enter the password again.

4.3.2 PPPoA

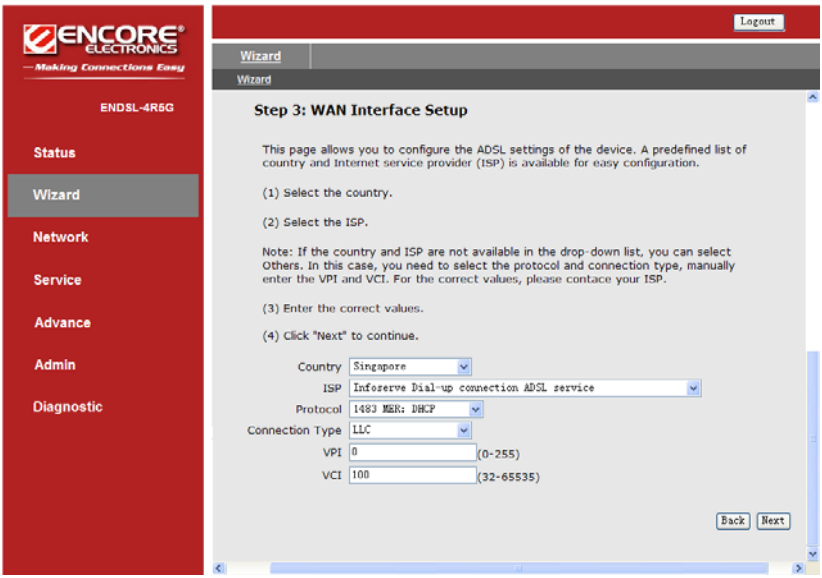
Select **PPPoA** as the protocol, the page as shown in the following figure appears.



For the parameters in this page, refer to the parameter description of **PPPoE** protocol.

4.3.3 1483 MER: DHCP

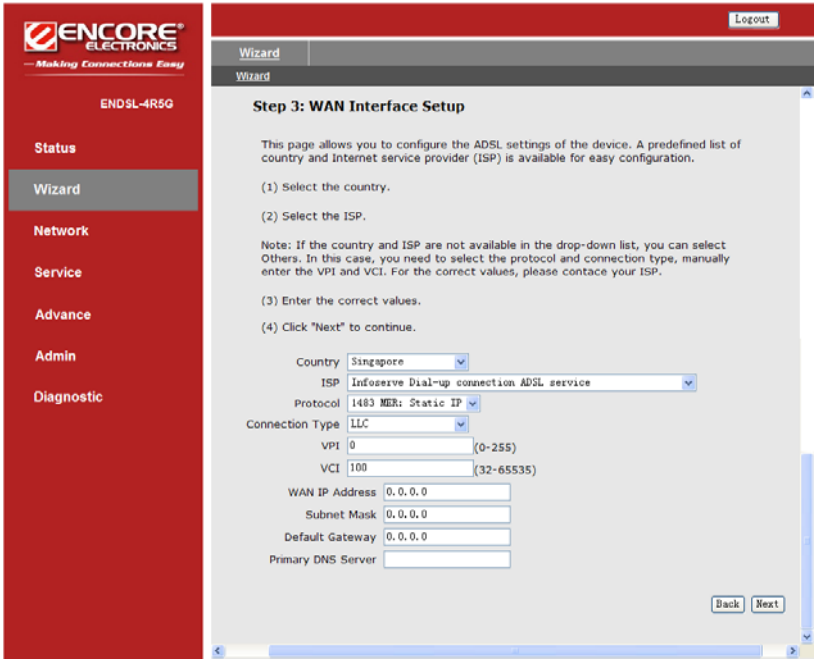
Select **1483 MER: DHCP** as the protocol, the page as shown in the following page appears.



After entering correct VPI and VCI, DHCP automatically assigns the WAN IP address, gateway and DNS information to this device.

4.3.4 1483 MER: Static IP

Select **1483 MER: Static IP** as the protocol, the page as shown in the following page appears.



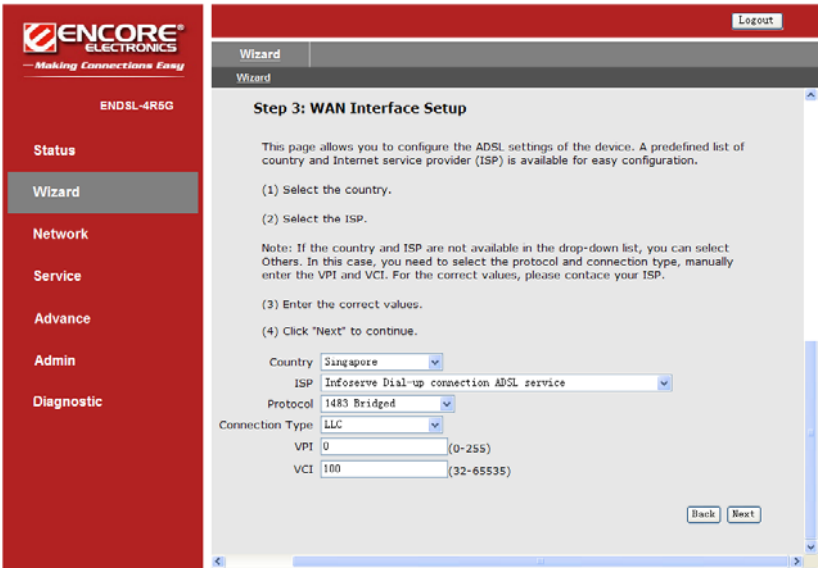
The following table describes the parameters in this page:

Field	Description
Protocol	There are six protocols available. In this example, **1483 MER: Static IP** is the protocol for dial-up.
Connection Type	There are two connection types available: **VC-Mux** and **LLC**. In this example, **LLC** is the connection type.
VPI	Virtual path identifier (VPI) is the virtual path between two points in an ATM network. Its valid value is in the range of 0 to 255. In this example, VPI is set to **0**.
VCI	Virtual channel identifier (VCI) is the virtual channel between two points in an ATM network. Its valid value is in the range of 32 to 65535 (0 to 31 is reserved for local management of ATM traffic). In this example, VCI is set to **100**.
WAN IP	Enter the IP address for WAN connection, which is provided by

Field	Description
Address	your ISP.
Subnet Mask	Enter the subnet mask of the WAN IP address, which is provided by your ISP.
Default Gateway	Enter the default gateway, which is provided by your ISP.
Primary DNS Server	Enter the DNS server, which is provided by your ISP.

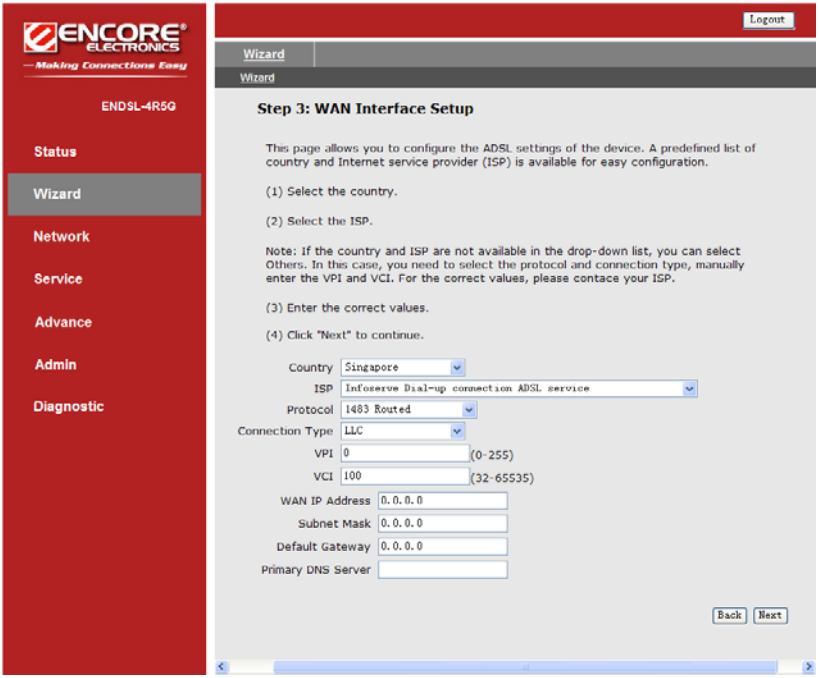
4.3.5 1483 Bridged

Select **1483 Bridged** as the connection type, the page as shown in the following figure appears.



4.3.6 1483 Routed

Select **1483 Routed** as the connection type, the page as shown in the following figure appears.



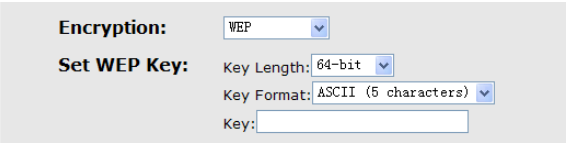
In this page, you need to enter the IP address of WAN connection, subnet mask, default gateway, and DNS server which are provided by your ISP.

For parameters in this page, refer to the parameter description of 1483 MER: Static IP.
After setting, click **Next**, the page as shown in the following page appears.

The following table describes the parameters in this page:

Field	Description
WLAN Interface	Enable or disable WLAN. You need to enable WAN interface only if you want to use WLAN and configure the parameters in this page.
Band	Select the working mode of the router. You can select **802.11b**, **802.11g**, or **Mixed (802.11b/11g)**.
SSID	The service set identification (SSID) is a unique name to identify the router in the wireless LAN. Wireless stations associating to the router must have the same SSID. Enter a descriptive name that is used when the wireless client connecting to the router. By default, the SSID is **ENDSL-4R5G**.
Encryption	Configure the wireless encryption mode. You can choose **None**, **WEP**, **WPA (TKIP)**, **WPA (AES)**, **WPA2 (AES)**, **WPA2 (TKIP)**, or **WPA2 Mixed**. ● Wired equivalent privacy (WEP) encrypts data frames before transmitting over the wireless network. ● Wi-Fi protected access (WPA) is a subset of the IEEE802.11i security specification draft. ● **WPA2 Mixed** is the collection of WPA and WPA2 encryption modes. The wireless client establishes the connection between the router through WPA or WPA2. Key differences between WPA and WEP are user authentication and improved data encryption.

Set the encryption to **WEP**, the page as shown in the following figure appears.

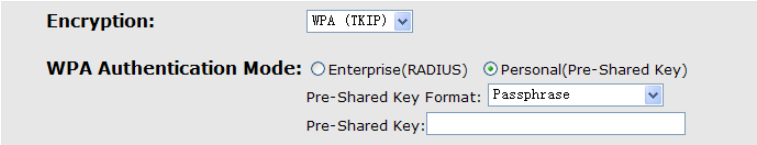


The following describes the parameters of WEP encryption:

Field	Description
Key Length	Select the WEP key length. You can select **64-bit** or **128-bit**.
Key Format	● If the key length is set to **64-bit**, you can select **ASCII (5 characters)** or **Hex (10 characters)**. ● If the key length is set to **128-bit**, you can select **ASCII**

Field	Description
	(13 characters) or **Hex (26 characters)**.
Key	The encryption key is used to encrypt the data. Both the router and wireless stations must use the same encryption key for data transmission. ● If you select **64-bit** and **ASCII (5 characters)**, enter any 5 ASCII characters. ● If you select **64-bit** and **Hex (10 characters)**, enter any 10 hexadecimal characters. ● If you select **128-bit** and **ASCII (13 characters)**, enter any 13 ASCII characters. ● If you select **128-bit** and **Hex (26 characters)**, enter any 26 hexadecimal characters.

Set the encryption to **WPA (TKIP)**, the page as shown in the following figure appears.

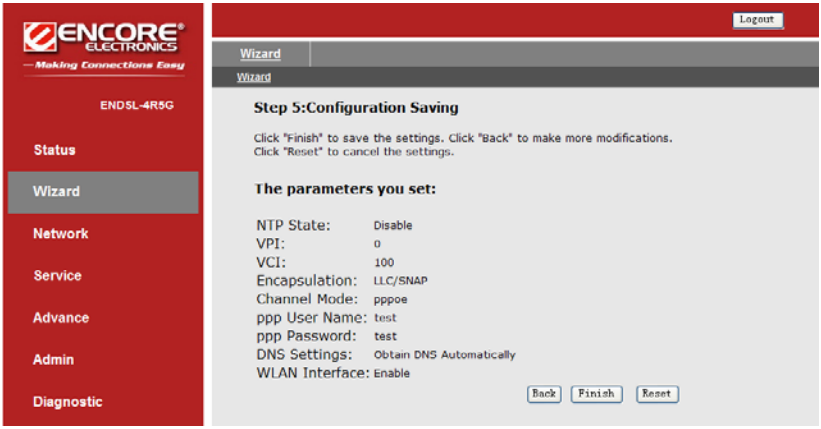


The following table describes the parameters of WPA (TKIP) encryption:

Field	Description
Enterprise (RADIUS)	If you select it, you need to enter the port, IP address, and password of the Radius server. You need to enter the user name and password provided by the Radius server when the wireless client connects the router.
Personal (Pre-Shared Key)	If you select it, you need to enter the pre-shared key in the **Pre-Shared Key** field.

For the parameters of WPA (AES), WPA2 (TKIP), WPA2 (AES), and WPA2 Mixed refer to the parameter description of WPA (TKIP).

After finishing the configuration, click **Next**. The page as shown in the following figure appears.



Click **Back** to modify the settings.

Click **Finish** to take the settings into effect temporarily.

Click **Reset** to cancel the settings.

4.4 Network

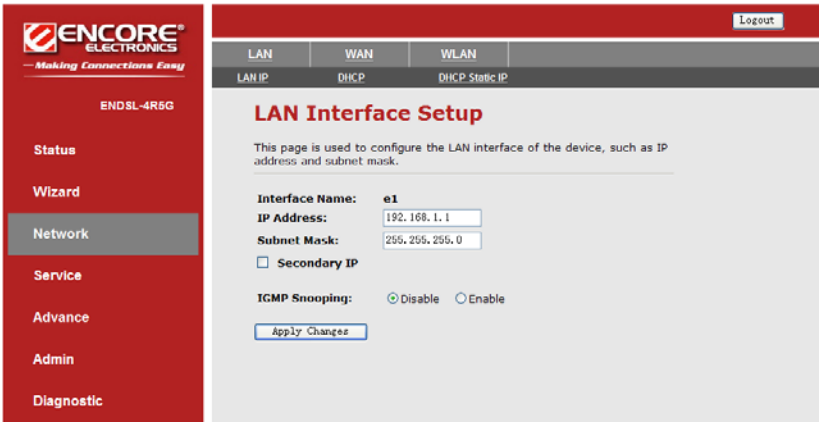
In the navigation bar, click **Network**. The **Network** page that is displayed contains **LAN**, **WAN**, and **WLAN**.

4.4.1 LAN

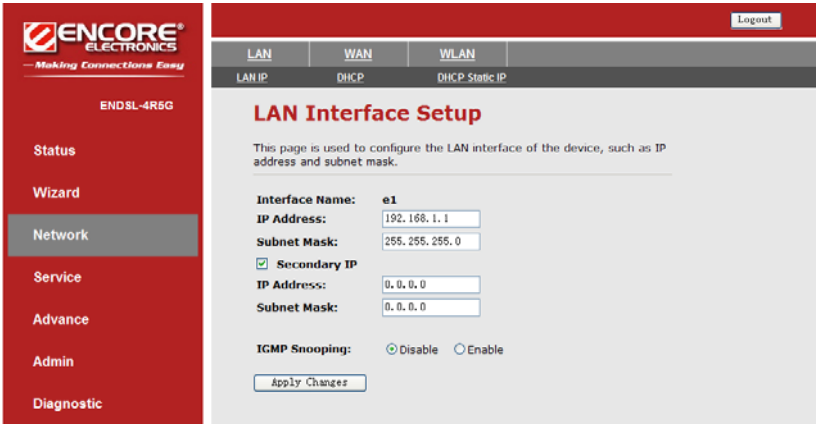
Choose **Network** > **LAN**. The **LAN** page that is displayed contains **LAN IP**, **DHCP**, and **DHCP Static IP**.

4.4.1.1 LAN IP

Click **LAN IP**, the page as shown in the following figure appears. In this page, you can change IP address of the router. The default IP address is 192.168.1.1, which is the private local IP address of the router.



By default, secondary IP is disabled. Enable the option of secondary IP if necessary, the page as shown in the following figure appears.



The following table describes the parameters in this page:

Field	Description
IP Address	Enter the IP address of LAN interface. Its valid value is in the range of 192.168.1.1 to 192.168.255.254. The default IP address is 192.168.1.1.
Subnet Mask	Enter the subnet mask of LAN interface. Its valid value is in the range of 255.255.0.0 to 255.255.255.254.
Secondary IP	Select it to enable the secondary LAN IP address. These two LAN IP addresses must be in the different network.
IGMP Snooping	Enable or disable IGMP snooping.

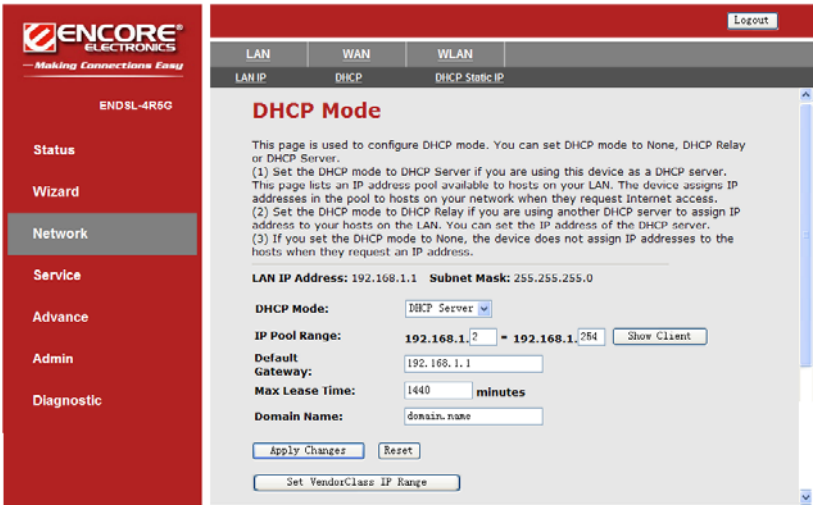
4.4.1.2 DHCP

Dynamic Host Configuration Protocol (DHCP) allows the individual computer to obtain the TCP/IP configuration from the centralized DHCP server. You can configure this router as a DHCP server or disable it. The DHCP server can assign information of IP address, IP default gateway, and DNS server to DHCP clients. This router can also act as a surrogate DHCP server (DHCP proxy) where it relays IP address assignment from an actual real DHCP server to clients. You can enable or disable DHCP server or DHCP proxy.

There are three DHCP modes available: **DHCP Server**, **DHCP Relay**, and **None**. The following describes them respectively.

DHCP Server

Click **DHCP**, the page as shown in the following figure appears.



The following table describes the parameters and buttons in this page:

Field	Description
DHCP Mode	If set to **DHCP Server**, the router can assign information of IP addresses, IP default gateway and DNS Servers to the hosts that are in Windows95, Windows NT and other systems that support the DHCP client.
IP Pool Range	It specifies the first and the last of continuous IP addresses of the IP addresses pool.
Show Client	Click it, the **Active DHCP Client Table** page appears. It shows the assigned IP addresses of the clients.
Default Gateway	Enter the IP default gateway of the IP addresses pool.
Max Lease Time	The lease time determines the period that the computers retain the assigned IP addresses before the IP addresses change.
Domain Name	Enter the domain name if you know. If you leave this blank, the domain name obtained by DHCP from the ISP is used. You must enter host name (system name) on each individual computer. The domain name can be assigned from the router through the DHCP server.

Field	Description
Set VendorClass IP Range	Click it, the **Device IP Range Table** page appears. You can configure the IP address range based on the device type.

Click **Show Client** in the **DHCP Mode** page, the page as shown in the following figure appears. In this page, you can view the IP addresses assigned to each DHCP clients.

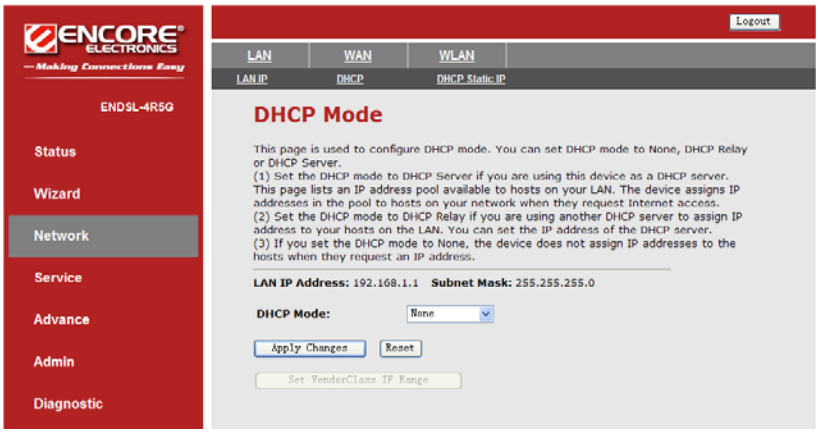
The following table describes the parameters and buttons in this page:

Field	Description
IP Address	It displays the IP address of the DHCP leased client.
MAC Address	It displays the MAC address of the DHCP client (for example, computer). Each Ethernet device has a unique MAC address. The MAC address is assigned at the factory and it consists of six pairs of hexadecimal character. For example, 00-14-78-0c-f2-ce.
Expired (s)	It displays the lease time. The lease time determines the period that the DHCP clients retain the assigned IP addresses before the IP addresses change.
Refresh	Click it to refresh this page.
Close	Click it to close this page.

Click **Set VendorClass IP Range** in the **DHCP Mode** page, the page as shown in the following figure appears. In this page, you can configure the IP address range based on the device type.

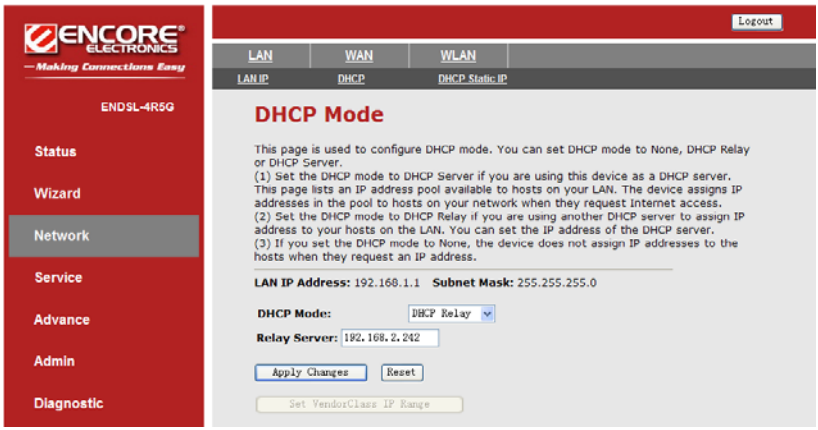
None

Select **None** from the **DHCP Mode** drop-down list, the page as shown in the following figure appears.



DHCP Relay

Select **DHCP Relay** from the **DHCP Mode** drop-down list, the page as shown in the following figure appears.

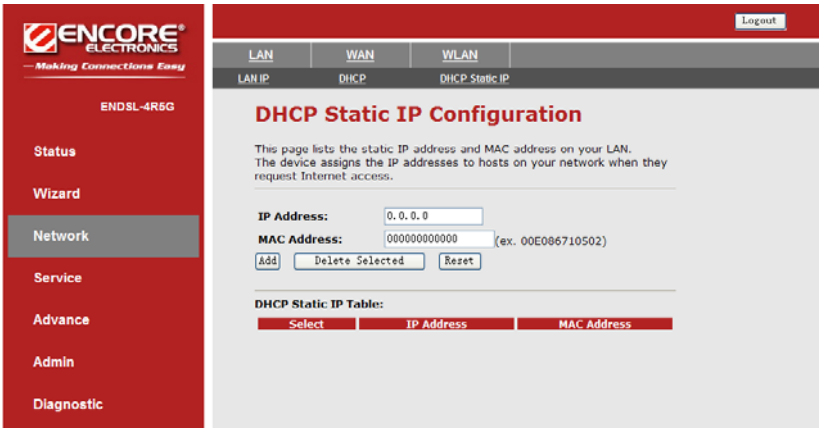


The following table describes the parameters in this page:

Field	Description
DHCP Mode	If set to **DHCP Relay**, the router acts a surrogate DHCP Server and relays the DHCP requests and responses between the remote server and the clients.
Relay Server	Enter the DHCP server address provided by your ISP.

4.4.1.3 DHCP Static IP

Click **DHCP Static IP**, the page as shown in the following figure appears. In this page, you can assign the IP addresses in the LAN to the specific individual computers based on their MAC addresses.



The following table describes the parameters and buttons in this page:

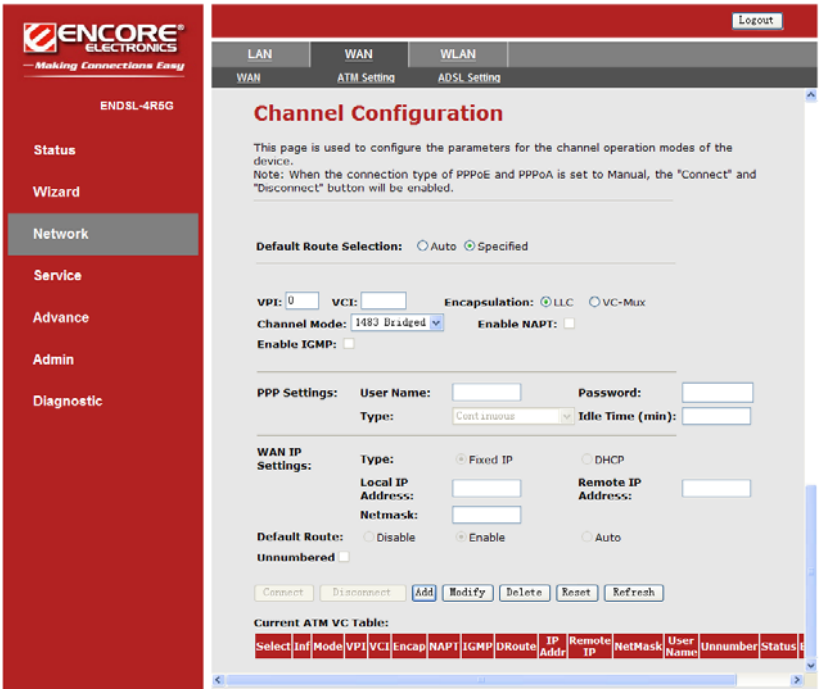
Field	Description
IP Address	It specifies the IP address from the IP addresses pool.
MAC Address	Enter the MAC address of NIC installed on a computer in the LAN.
Add	After entering the IP address and MAC address, click this button. A row will be added in the **DHCP Static IP Table**.
Delete Selected	Select a row in the **DHCP Static IP Table**, then click it. This row will be deleted.
Reset	Click it to refresh this page.
DHCP Static IP Table	It shows the assigned IP addresses based on the MAC addresses.

4.4.2 WAN

Choose **Network** > **WAN**. The **WAN** page that is displayed contains **WAN**, **ATM Setting**, and **ADSL Setting**.

4.4.2.1 WAN

Click **WAN**, the page as shown in the following figure appears. In this page, you can configure WAN interface of your router.



The following table describes the parameters in this page:

Field	Description
Default Route Selection	You can select **Auto** or **Specified**.
VPI	VPI is the virtual path between two points in an ATM network. Its valid value is in the range of 0 to 255.
VCI	VCI is the virtual channel between two points in an ATM network. Its valid value is in the range of 32 to 65535. (0 to 31 is reserved for local management of ATM traffic)
Encapsulation	You can select **LLC** or **VC-Mux** mode.
Channel Mode	You can select **1483 Bridged**, **1483 MER**, **PPPoE**, **PPPoA**, or **1483 Routed** mode.
Enable NAPT	Select it to enable network address port translation (NAPT). If you do not select it and you want to access

Field	Description
	the Internet normally, you must add a route on the uplink equipment. Otherwise, the access to the Internet fails. Normally, it is required to enable NAPT.
Enable IGMP	Enable or disable IGMP.
PPP Settings	
User Name	Enter the correct user name for PPP dial-up, which is provided by your ISP.
Password	Enter the correct password for PPP dial-up, which is provided by your ISP.
Type	You can select **Continuous**, **Connect on Demand**, or **Manual**.
Idle Time (min)	If you select **Connect on Demand**, you need to enter the idle timeout time. Within this preset minutes, if the router does not detect the flow of the user continuously, the router automatically disconnects the PPPoE and PPPoA connection.
WAN IP Settings	
Type	You can select **Fixed IP** or **DHCP**. ● If you select **Fixed IP**, you need to enter the local IP address, remote IP address and subnet mask. ● If you select **DHCP**, the router is a DHCP client, the WAN IP address is assigned by the remote DHCP server.
Local IP Address	Enter the IP address of WAN interface that is provided by your ISP.
Remote IP Address	Enter the gateway IP address that is provided by your ISP.
Net mask	Enter the subnet mask of the local IP address.
Unnumbered	Select it to enable IP unnumbered.
Add	After configuring the parameters in this page, click it to add a new PVC setting into the **Current ATM VC Table**.
Modify	Select one PVC settings in the **Current ATM VC Table**, and then modify the parameters of this PVC. After setting, click it to take this PVC setting into effect.
Current ATM VC Table	This table shows the existed PVC settings. It shows the Interface name, channel mode, VPI/VCI, encapsulation mode, local IP address, remote IP address and other information. The maximum item of this table is eight.

Field	Description
	Click it, the **PPP Interface-Modify** page appears. You can modify the PVC's parameters.

The following describes how to configure the PPPoE (0/32) connection:

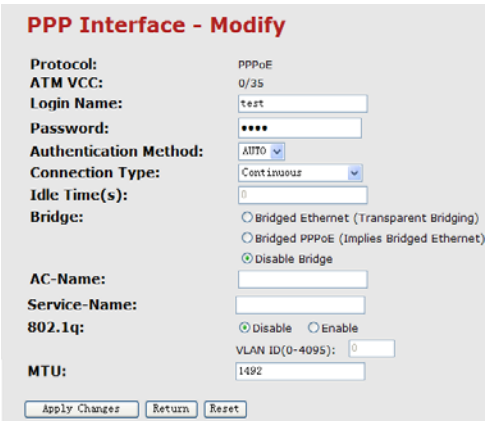
Step 1 Set the VPI to **0**, VCI to **32**.

Step 2 Select **PPPoE** as the channel mode.

Step 3 Enter the user name and password for PPPoE dial-up, which are provided by your ISP.

Step 4 Click  in the **Current ATM VC Table** to check or edit the setting.

The page as shown in the following figure appears. In this page, you can configure parameters of this PPPoE PVC setting.



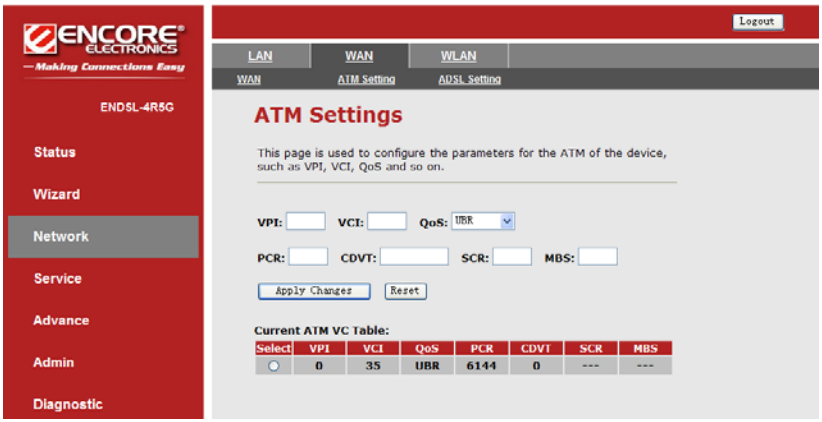
The following table describes the parameters and buttons in this page:

Field	Description
Protocol	It displays the protocol type used for this WAN connection. In this example, it is **PPPoE**.
ATM VCC	It displays the ATM virtual circuit connection assigned for this PPP interface (VPI/VCI).
Login Name	The login name provided by your ISP.
Password	The password provided by your ISP.
Authentication Method	You can select **AUTO**, **CHAP**, or **PAP**.
Connection Type	You can select **Continuous**, **Connect on Demand**, or **Manual**.
Idle Time (s)	If the connection type is set to **Connect on Demand**, you need to enter the idle timeout time. Within the

Field	Description
	preset minutes, if the router does not detect the flow of the user continuously, the router automatically disconnects the PPPoE and PPPoA connection.
Bridge	You can select **Bridged Ethernet**, **Bridged PPPoE**, or **Disable Bridge**.
AC-Name	Enter the accessed equipment type.
Service-Name	Enter the service name.
Apply Changes	Click it to save the settings in this page temporarily.
Return	Click it to return to the **Channel Configuration** page.
Undo	Click it to refresh this page without any settings changed.

4.4.2.2 ATM Setting

Click **ATM Setting**, the page as shown in the following figure appears. In this page, you can configure the parameters of the ATM, including QoS, PCR, CDVT, SCR, and MBS.



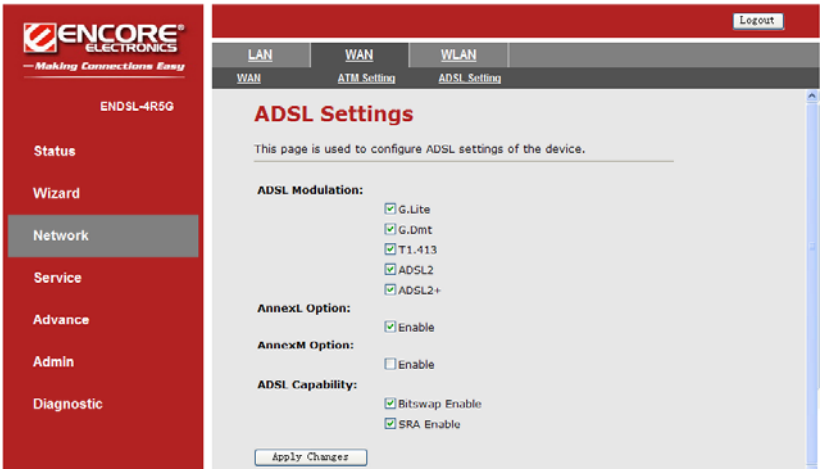
The following table describes the parameters in this page:

Field	Description
VPI	The virtual path identifier of the ATM PVC.
VCI	The virtual channel identifier of the ATM PVC.
QoS	The QoS category of the PVC. You can select **UBR**, **CBR**, **rt-VBR**, or **nrt-VBR**.

Field	Description
PCR	Peak cell rate (PCR) is the maximum rate at which cells can be transmitted along a connection in the ATM network. Its value ranges from 1 to 65535.
CDVT	Cell delay variation tolerance (CDVT) is the amount of delay permitted between ATM cells (in microseconds). Its value ranges from 0 to 4294967295.
SCR	Sustain cell rate (SCR) is the maximum rate that traffic can pass over a PVC without the risk of cell loss. Its value ranges from 0 to 65535.
MBS	Maximum burst size (MBS) is the maximum number of cells that can be transmitted at the PCR. Its value ranges from 0 to 65535.

4.4.2.3 ADSL Setting

Click **ADSL Setting**, the page as shown in the following figure appears. In this page, you can select the DSL modulation. Mostly, you may need to remain this as factory default settings. The router supports these modulations: **G.lite**, **G.Dmt**, **T1.413**, **ADSL2**, **ADSL2+**, **Annex L** and **M**. The router negotiates the modulation modes with the DSLAM.

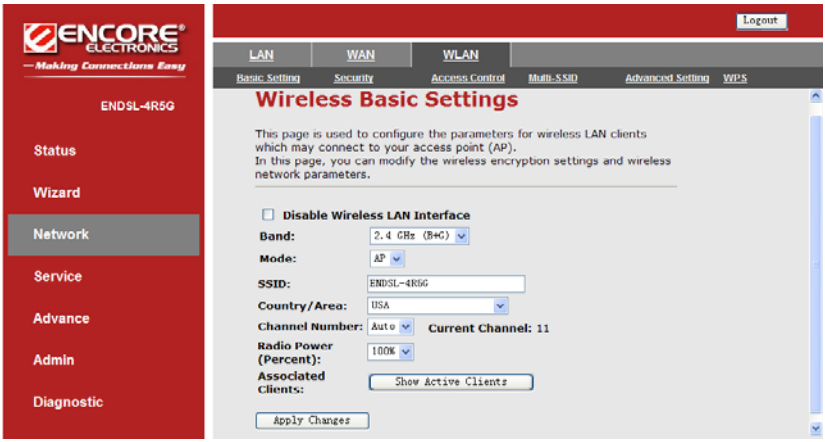


4.4.3 WLAN

Choose **Network** > **WLAN**. In the **WLAN** page that is displayed, it contains **Basic Setting**, **Security**, **Access Control**, **Multi-SSID**, **Advanced Setting**, and **WPS**.

4.4.3.1 Basic Setting

Click **Basic Setting**, the page as shown in the following figure appears. In this page, you can configure the parameters for wireless LAN clients that may connect to the router.



The following table describes the parameters and buttons in this page:

Field	Description
Disable Wireless LAN Interface	Check this option if you do not use the WLAN. In default setting, it is not checked.
Band	Select the working mode of the router. You can select **2.4 GHz (B)**, **2.4 GHz (G)**, or **2.4 GHz (B + G)**. By default, the band is **2.4 GHz (B + G)**.
Mode	Select the WLAN mode of the router, which is varied accordingly to your application. By default, the WLAN mode of the router is **AP**.
SSID	The service set identification (SSID) is a unique name to identify the router in the wireless LAN. Wireless stations associating to the router must have the same SSID. Enter a descriptive name that is used when the wireless client connecting to the router.
Country/Area	Select the country/Area where you are from the drop-down list to meet the RF regulations.
Channel Number	A channel is the radio frequency used by 802.11b/g wireless devices. There are 11 channels (from 1 to 11)

Field	Description
	available, which depends on the geographical area. You may have a choice of channels (for your region) and you should use a different channel from an adjacent AP to reduce the interference. Interference and degrading performance occurs when radio signal from different AP's overlaps. Select a channel from the drop-down list.
Radio Power (Percent)	Select the transmission power of the radio signal. It is recommended to select the default value **100%**.
Show Active Clients	Click it to view the information of the wireless clients that are connected to the router.

Click **Show Active Clients**, the page as shown in the following figure appears. This table shows information of the wireless clients that connect to the router, including MAC addresses, transmitted packets, received packets.

4.4.3.2 Security

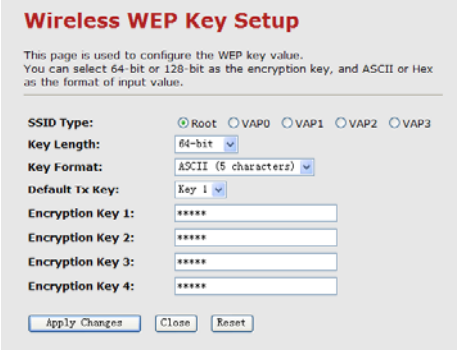
Click **Security**, the page as shown in the following figure appears.

The following table describes the parameters and the buttons in this page:

Field	Description
Encryption	Select the wireless encryption mode. You can select **None**, **WEP**, **WPA (TKIP)**, **WPA (AES)**, **WPA2 (AES)**, **WPA2 (TKIP)**, or **WPA2 Mixed**. ● Wired equivalent privacy (WEP) encrypts data frames before transmitting over the wireless network. ● Wi-Fi protected access (WPA) is a subset of the IEEE 802.11i security specification draft. ● WPA2 Mixed is the collection of WPA and WPA2 encryption modes. The wireless client establishes the connection between the router through WPA or WPA2. Key differences between WPA and WEP are user authentication and improved data encryption.
Set WEP Key	It is available when you set the encryption mode to **WEP**. Click it, the **Wireless WEP Key Setup** page appears.
WPA Authentication Mode	● Select **Personal (Pre-Shared Key)**, enter the pre-shared key in the **Pre-Shared Key** field.

Field	Description
	● Select **Enterprise (RADIUS)**, enter the port, IP address, and password of the Radius server. You need to enter the user name and password provided by the Radius server when the wireless client connects the router. If the encryption is set to **WEP**, the router uses 802.1X authentication, which is Radius authentication.

Click **Set WEP Key**, and the page as shown in the following figure appears.



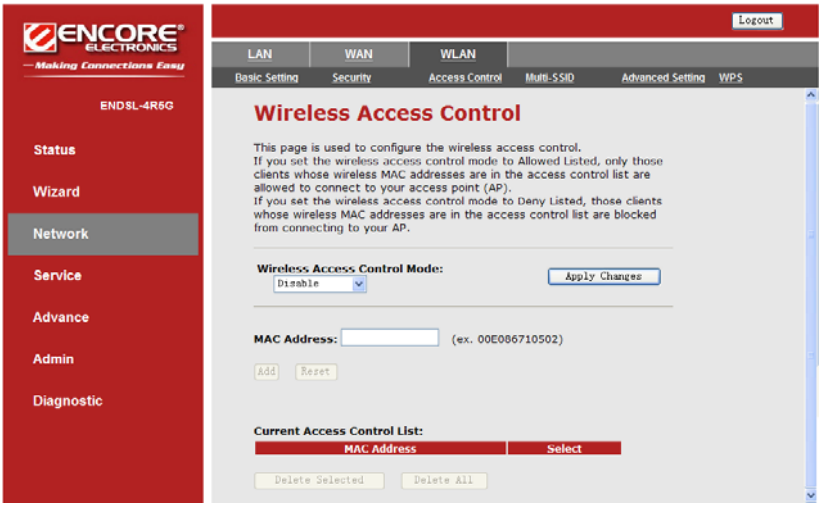
The following describes the parameters and buttons in this page:

Field	Description
Key Length	Select the WEP key length. You can select **64-bit** or **128-bit**.
Key Format	● If the key length is set to **64-bit**, you can select **ASCII (5 characters)** or **Hex (10 characters)**. ● If the key length is set to **128-bit**, you can select **ASCII (13 characters)** or **Hex (26 characters)**.
Default Tx Key	Select the index of WEP Key. You can select **Key 1**, **Key 2**, **Key 3**, or **Key 4**.
Encryption Key 1 to Key 4	The encryption keys are used to encrypt the data. Both the router and wireless stations must use the same encryption key for data transmission. ● If you select **64-bit** and **ASCII (5 characters)**, enter any 5 ASCII characters. ● If you select **64-bit** and **Hex (10 characters)**, enter any 10 hexadecimal characters. ● If you select **128-bit** and **ASCII (13 characters)**, enter any 13 ASCII characters.

Field	Description
	● If you select **128-bit** and **Hex (26 characters)**, enter any 26 hexadecimal characters.
Apply Changes	Click it to save the settings in this page temporarily.
Close	Click it to close this page.
Reset	Click it to refresh this page.

4.4.3.3 Access Control

Click **Access Control**, the page as shown in the following figure appears. In this page, you can configure the access control of the wireless clients.

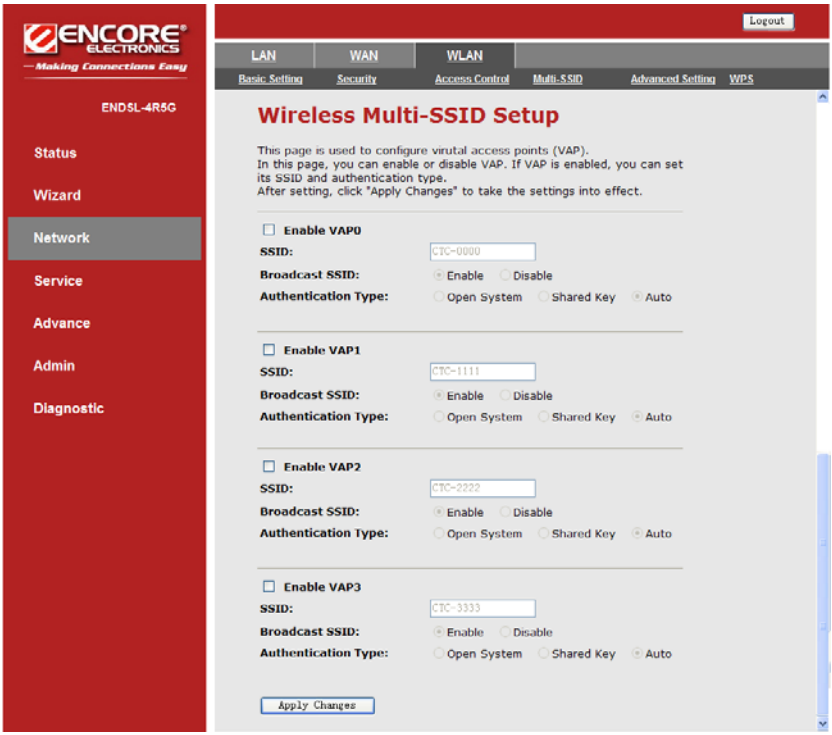


Select **Allow Listed** from the **Wireless Access Control Mode** drop-down list to enable the white list function. Only the devices whose MAC addresses are listed in the **Current Access Control List** can access the router.

Select **Deny Listed** from the **Wireless Access Control Mode** drop-down list to enable the black list function. The devices whose MAC addresses are listed in the **Current Access Control List** are blocked to access the router.

4.4.3.4 Multi-SSID

Click **Multi-SSID**, the page as shown in the following figure appears.



The following table describes parameters in this page:

Field	Description
Enable VAP0	Select it to enable virtual access point (VAP). You need to enable VAP, if you want to configure the parameters in this page.
SSID	The service set identification (SSID) is a unique name to identify the router in the wireless LAN.
Broadcast SSID	Select whether the router broadcasts SSID or not. You can select **Enable** or **Disable**. ● Select **Enable**, the wireless client searches the router through broadcasting SSID. ● Select **Disable** to hide SSID, the wireless clients can not search the SSID.
Authentication Type	Select the authentication mode of the router. You can select **Open System**, **Shared Key**, or **Auto**.

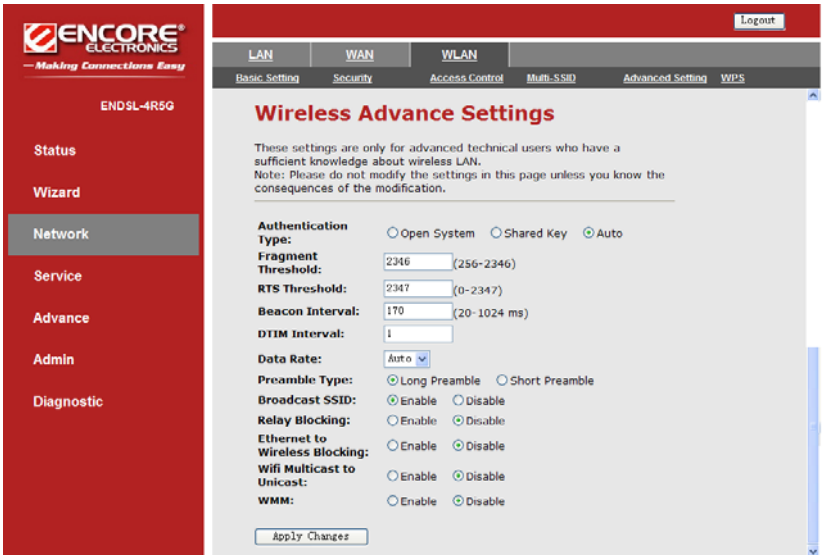
Field	Description
	● In the open system, the wireless client can directly connect to the device ● In the encryption authentication, the wireless client connects to the router through the shared key.

4.4.3.5 Advanced Setting

Click **Advanced Setting**, the page as shown in the following figure appears. In this page, you can configure the wireless advanced parameters. It is recommended to keep the default values.

Note:

The parameters in the **Wireless Advance Settings** page are suggested to be modified by the professional wireless engineer only, and it is recommended to keep the default values.



The following table describes the parameters in this page:

Field	Description
Authentication	Select the router operating in the open system or encryption authentication. You can select **Open System**, **Shared Key**, or **Auto**. ● In the open system, the wireless client can directly

Field	Description
	connect to the device ● In the encryption authentication, the wireless client connects to the router through the shared key.
Data Rate	Select the transmission rate of the wireless data. You can select **Auto**, **1 M**, **2 M**, **5.5 M**, **11 M**, **6 M**, **9 M**, **12 M**, **18 M**, **24 M**, **36 M**, **48 M**, or **54 M**.
Broadcast SSID	Select whether the router broadcasts SSID or not. You can select **Enable** or **Disable**. ● Select **Enable**, the wireless client searches the router through broadcasting SSID. ● Select **Disable** to hide SSID, the wireless clients can not search the SSID.
Relay Blocking	Wireless isolation. Select **Enable** option, the wireless clients that are connected to the router can not intercommunicate with each other.
Ethernet to Wireless Blocking	Whether the wireless network can communicate with the Ethernet network or not.

4.4.3.6 WPS

Click **WPS**, the page as shown in the following figure appears.

Disable WPS: Select it to disable WPS. You need to enable WPS if you want to configure the parameters in this page.

There are three methods for WPS authentication, you can choose one of them:

- Press the **WLAN/WPS** button on the rear panel of the router for 3 seconds or more than 3 seconds.

- In this page, click **Regenerate PIN** to generate a new PIN code. Then click **Start PCB** and press the **WPS** button at the wireless client simultaneously. The wireless client automatically establishes the connection with the router through the encryption mode. In this case, you need not to enter the key.
- The wireless client generates PIN. In this page, enter PIN of the wireless client in the **Client PIN Number** field, then click **Start PIN** to establish the connection.

Note:

The wireless client establishes the connection with the router through WPS negotiation. The wireless client must support WPS.

4.5 Service

In the navigation bar, click **Service**. The **Service** page that is displayed contains **DNS**, **Firewall**, **UPnP**, **IGMP Proxy**, **TR-069**, and **ACL**.

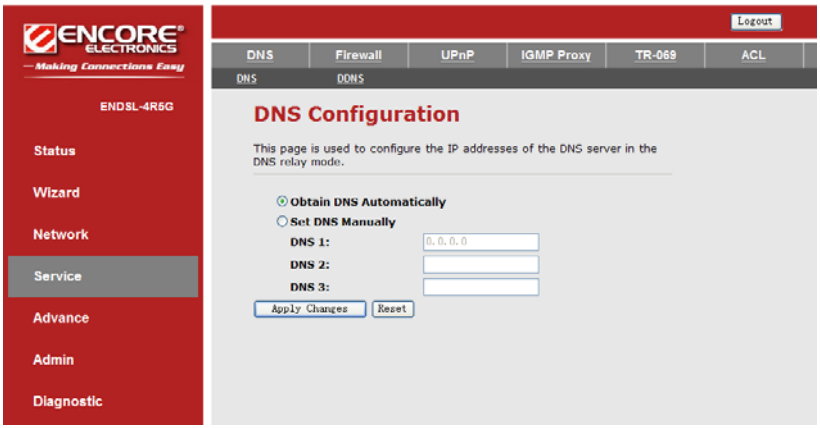
4.5.1 DNS

Choose **Service** > **DNS**. The **DNS** page that is displayed contains **DNS** and **DDNS**.

4.5.1.1 DNS

Click **DNS**, the page as shown in the following figure appears.

Domain name system (DNS) is an Internet service that translates the domain name into IP address. Because the domain name is alphabetic, it is easier to remember. The Internet, however, is based on IP addresses. Every time you use a domain name, a DNS service translates the name into the corresponding IP address. For example, the domain name www.example.com might translate to 198.105.232.4. The DNS system has its own network. If one DNS server does not know how to translate a particular domain name, it asks another one, and so on, until the correct IP address is returned.

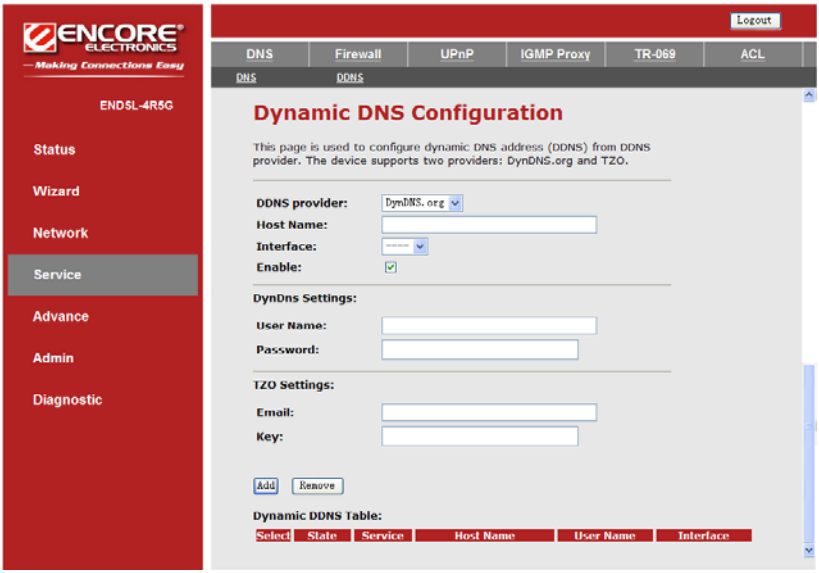


The following table describes the parameters in this page:

Field	Description
Obtain DNS Automatically	Select it, the router accepts the first received DNS assignment from one of the PPPoA, PPPoE or MER enabled PVC(s) during the connection establishment.
Set DNS Manually	Select it and then enter the primary and optional secondary DNS server IP addresses.

4.5.1.2 DDNS

Click **DDNS**, the page as shown in the following figure appears. This page is used to configure dynamic DNS address (DDNS) from DDNS provider. The router supports two providers: DynDNS.org and TZO.



The following table describes the parameters in this page:

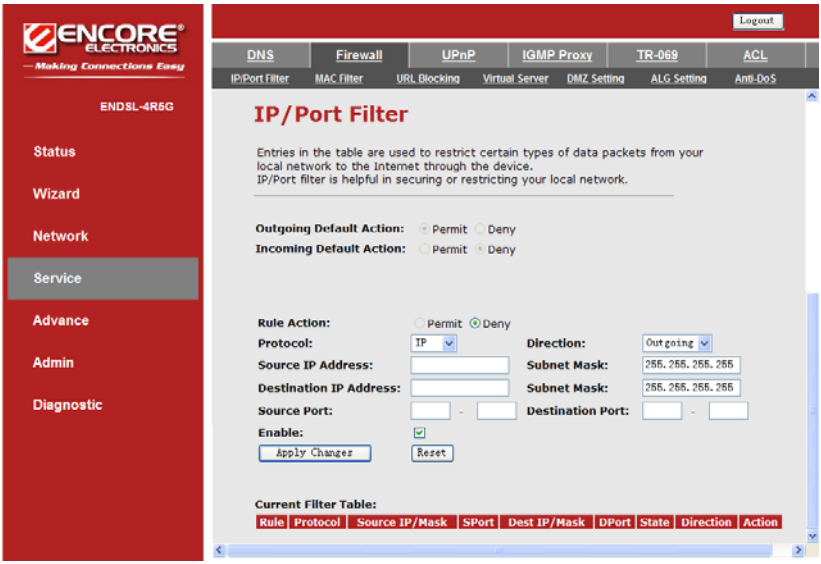
Field	Description
DDNS provider	Select the DDNS provider name from the drop-down list. You can select **DynDNS.org** or **TZO**.
Host Name	Enter the DDNS identifier.
Interface	Select the WAN interface of the router.
Enable	Enable or disable DDNS.
User Name	Enter the user name provided by DDNS provider.
Password	Enter the password provided by DDNS provider.
Email	Enter the email provided by DDNS provider.
Key	Enter the key provided by DDNS provider.

4.5.2 Firewall

Choose **Service > Firewall**. The **Firewall** page that is displayed contains **IP/Port Filter**, **MAC Filter**, **URL Blocking**, **Virtual Server**, **DMZ Setting**, **ALG Setting**, and **Anti-DoS** functions.

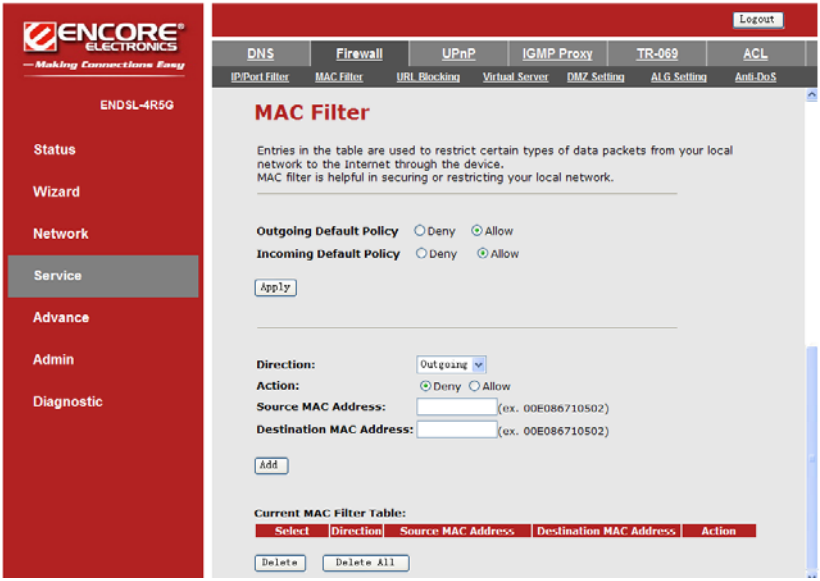
4.5.2.1 IP/Port Filter

Click **IP/Port Filter**, the page as shown in the following figure appears. Entries in the table are used to restrict certain types of data packets from your local network to the Internet through the gateway. IP/Port filter is helpful in securing or restricting your local network.



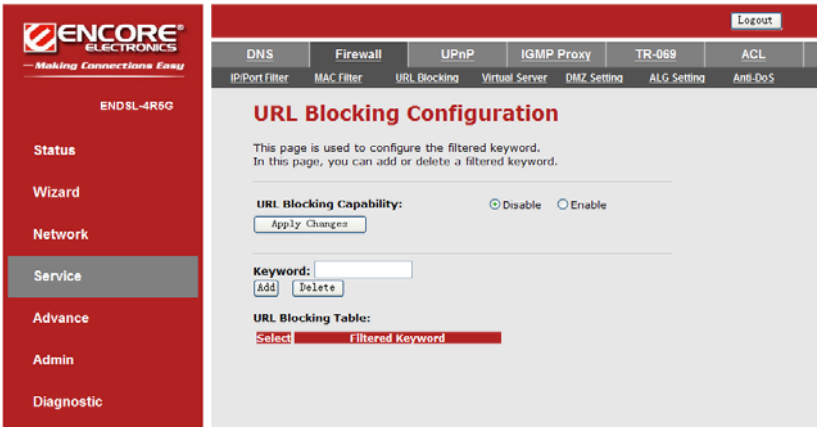
4.5.2.2 MAC Filter

Click **MAC Filter**, the page as shown in the following figure appears. Entries in the table are used to restrict certain types of data packets from your local network to the Internet through the gateway. MAC filter is helpful in securing or restricting your local network.



4.5.2.3 URL Blocking

Click **URL Blocking**, the page as shown in the following figure appears. This page is used to block a fully qualified domain name (FQDN), such as tw.yahoo.com and filtered keyword. You can add or delete FQDN and filtered keyword.

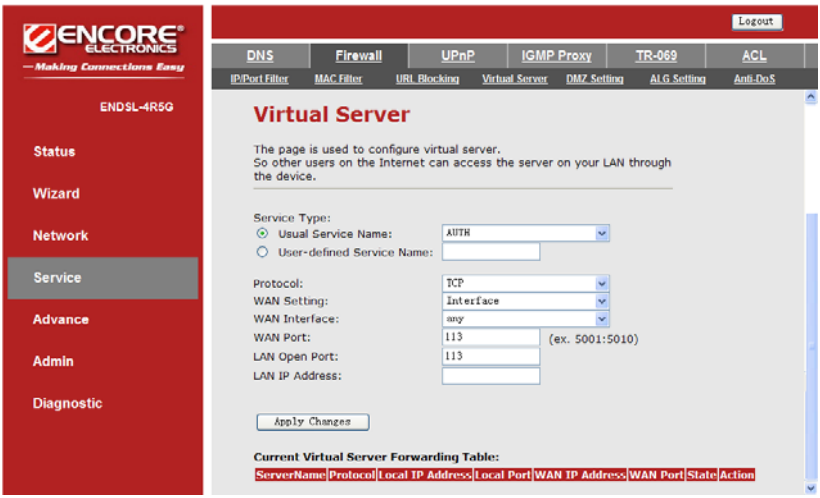


The following table describes the parameters and buttons in this page:

Field	Description
URL Blocking Capability	Disable or Enable URL blocking. ● Select **Disable** indicates turning off URL blocking and keyword filtering. ● Select **Enable** indicates blocking access to the URLs and keywords specified in the **URL Blocking Table**.
Keyword	Enter the keyword for blocking.
Add	Click it to add the keyword to the **URL Blocking Table**.
Delete	Select a row in the **URL Blocking Table** and click it to delete the row.
URL Blocking Table	A list of the URL (s) to which access is blocked.

4.5.2.4 Virtual Server

Click **Virtual Server**, the page as shown in the following figure appears. In this page, you can configure the virtual server. Other users on the Internet access to the server on your LAN through the IP address of the router.



The following table describes the parameters in this page:

Field	Description
Service Type	You can select the common service type, such as **AUTH**, **DNS**, or **FTP**. You can also define a service name. ● If you select the common service type, the corresponding WAN communication port/service host communication port has the default settings. ● If you define service type, you need to enter the corresponding port.
Protocol	Select the transport layer protocol that the service type uses. You can select **TCP** or **UDP**.
WAN Setting	You can select **Interface** or **IP Address**.
WAN Interface	Select the router port that uses virtual server.
WAN Port	Enter the access port in the WAN.
LAN Open Port	Enter the port number of the specified service type.
LAN IP Address	Enter the IP address of the virtual server. It is in the same network segment with LAN IP address of the router.

4.5.2.5 DMZ Setting

De-Militarized Zone (DMZ) is used to provide Internet services without sacrificing unauthorized access to the local network. Typically, the DMZ host can be a device accessible to Internet traffic, such as a Web (HTTP) server, a FTP server, a SMTP (e-mail) server or a DNS server.

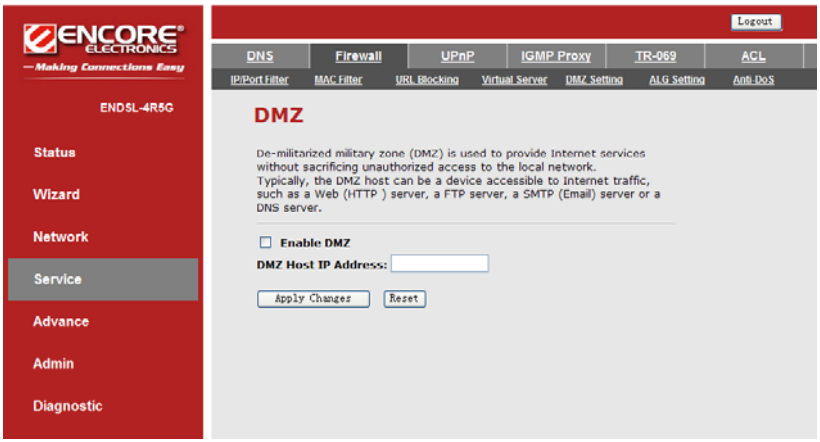
Click **DMZ Setting**, the page as shown in the following figure appears.

The procedure for configuring DMZ is as follows:

Step 1 Select **Enable DMZ** to enable DMZ.

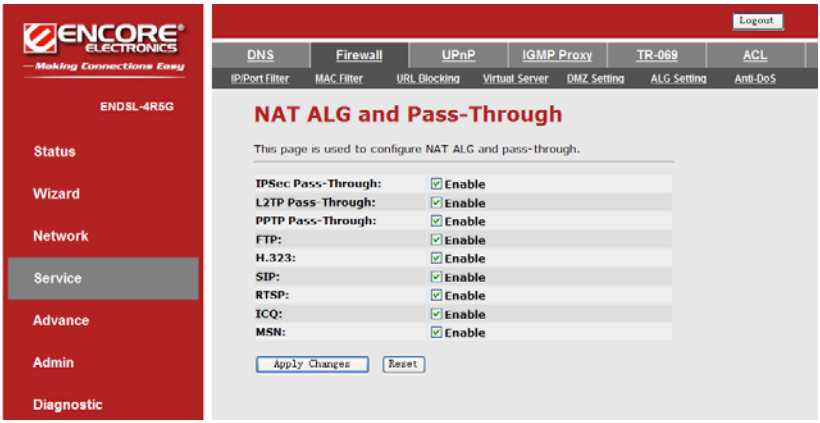
Step 2 Enter a local IP address of the DMZ host in your LAN.

Step 3 Click **Apply Changes** to save the settings in this page temporarily.



4.5.2.6 ALG Setting

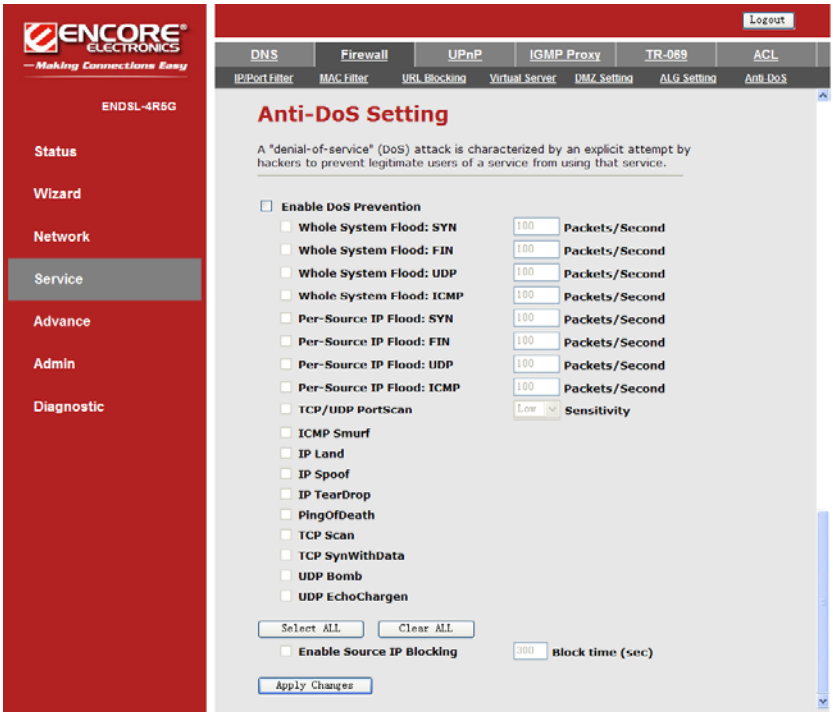
Click **ALG Setting**, the page as shown in the following figure appears.



4.5.2.7 Anti-DoS

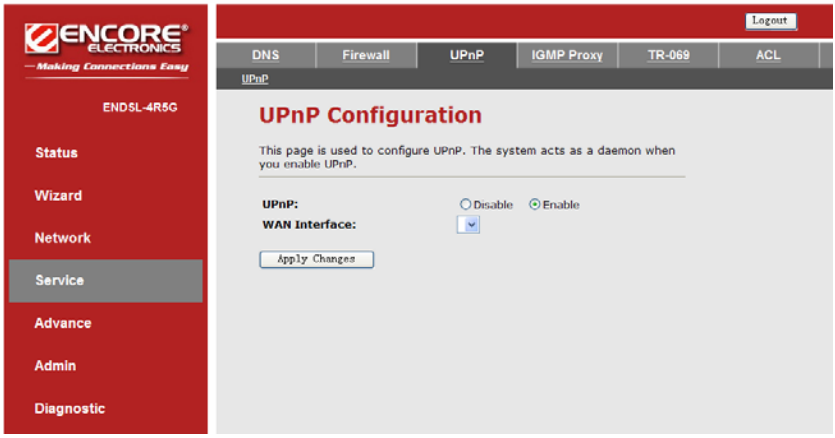
A "denial-of-service" (DoS) attack is an explicit attempt by hackers to prevent legitimate users of a service from using that service.

Click **Anti-DoS**, the page as shown in the following figure appears. In this page, you can enable the router to prevent the DoS attack.



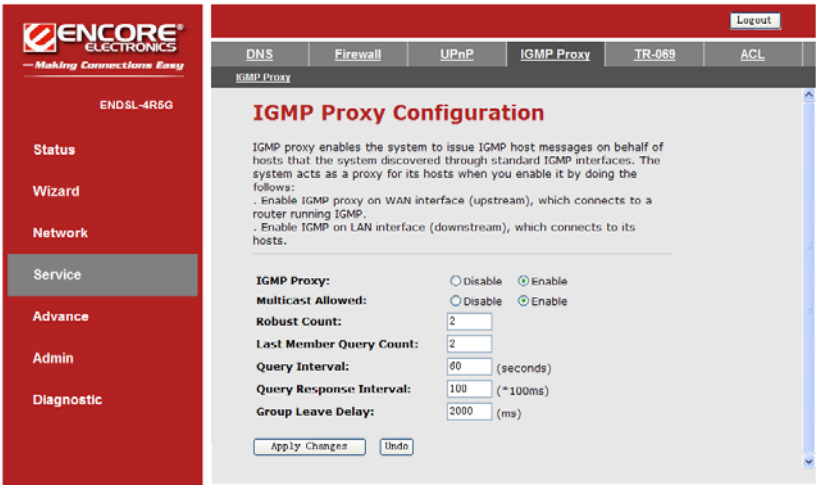
4.5.3 UPnP

Choose **Service > UPnP**, the page as shown in the following figure appears. This page is used to configure universal plug-n-play (UPnP). The system acts as a UPnP device in your LAN after you enable it.



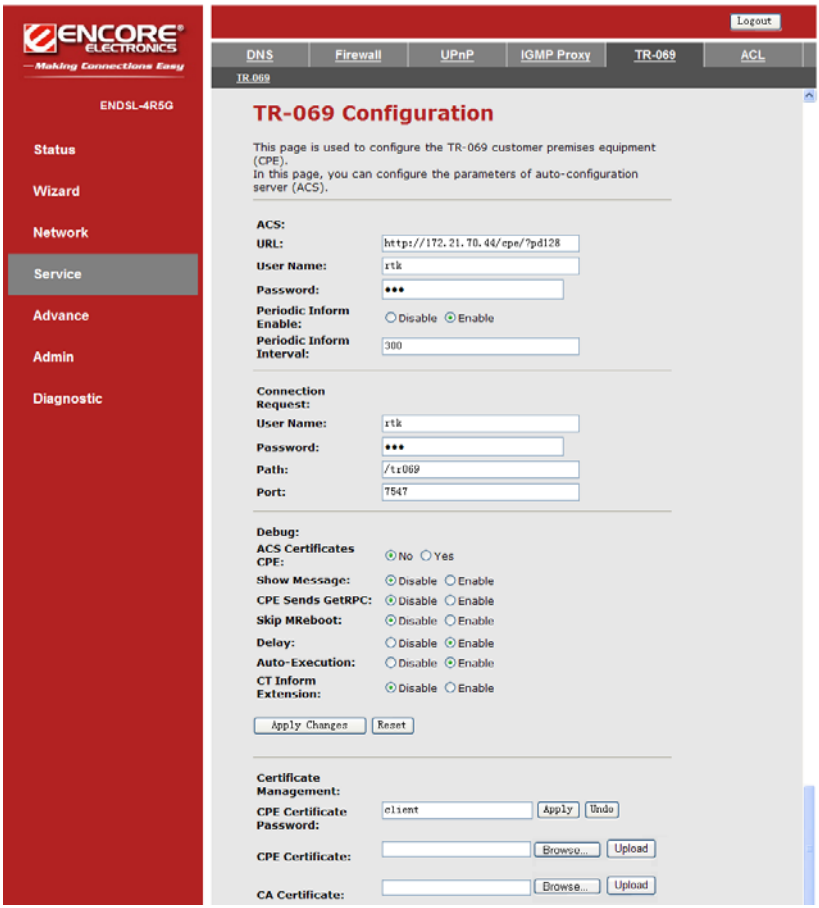
4.5.4 IGMP Proxy

Choose **Service > IGMP Proxy**, the page as shown in the following figure appears. IGMP proxy enables the system to issue IGMP host messages on behalf of hosts that the system discovered through standard IGMP interfaces. The system acts as a proxy for its hosts after you enable it.



4.5.5 TR069

Choose **Service > TR069**. The page as shown in the following figure appears. This page is used to configure TR-069 customer premises equipment (CPE). In this page, you can configure the parameters of auto-configuration server (ACS).



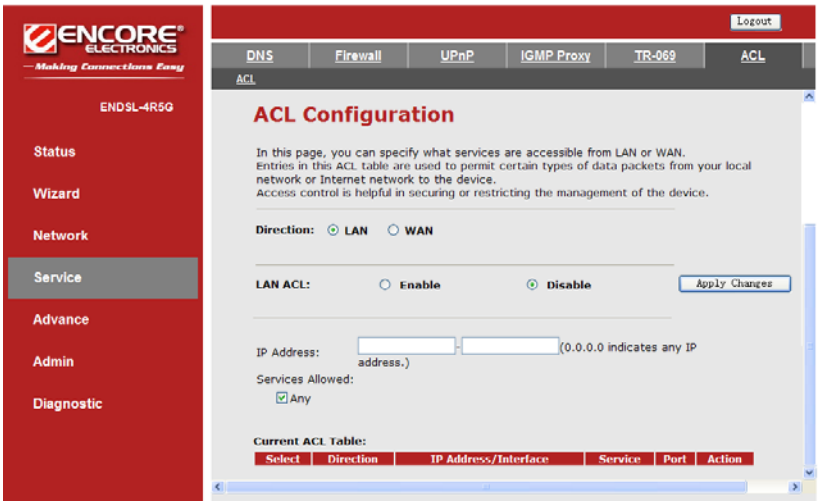
The following table describes the parameters and buttons in this page.

Field	Description
ACS	
URL	The URL of the ACS to connect to.
User Name	The user name for logging in to the ACS.
Password	The password for logging in to the ACS.
Periodic Inform Enable	Select **Enable** to periodically connect to the ACS

Field	Description
	to check for configuration updates.
Periodic Inform Interval	Specify the amount of time between connections to ACS.
Connection Request	
User Name	The username to connect the router from the ACS.
Password	The password to connect the router from the ACS.
Debug	
ACS Certificates CPE	Specify whether to check the ACS certification of the router.
Show Message	Select **Enable** to display ACS SOAP messages on the serial console.
CPE Sends GetRPC	Select **Enable**, the CPE contacts the ACS to obtain configuration updates.
Skip MReboot	Specify whether to send an MReboot event code in the inform message.
Delay	Specify whether to start the TR-069 program after a short delay.
Auto-Execution	Specify whether to automatically start the TR-069 after the router is powered on.
CT Inform Extension	Specify whether to support China Telecom extension inform type.
Certificate Management	
CPE Certificate Password	The certificate password of the router.
CPE Certificate	Click it to browse and upload the certificate for the router.
CA Certificate	Click it to browse and upload the CA certificate for the router.

4.5.6 ACL

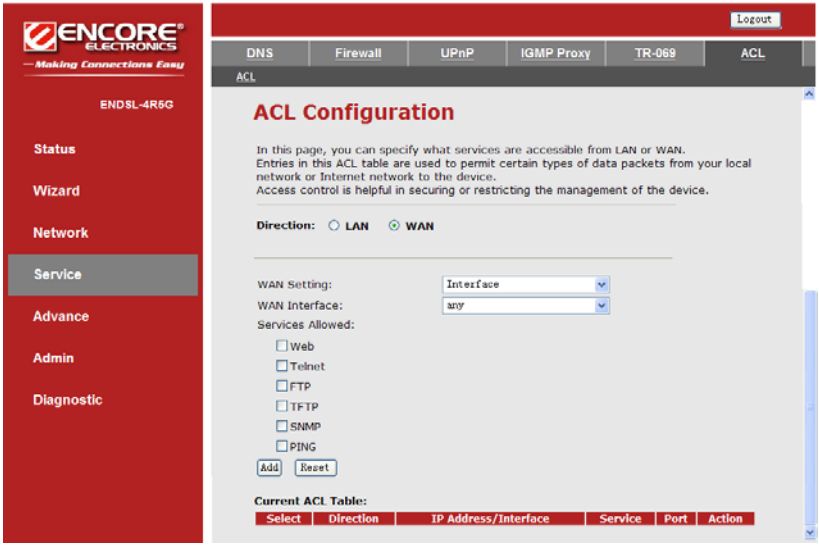
Choose **Service > ACL**, the page as shown in the following figure appears. In this page, you can permit the data packets from LAN or WAN to access the router. You can configure the IP address for access control list (ACL). If ACL is enabled, only the effective IP address in the ACL can access the router.



The following table describes the parameters and buttons in this page:

Field	Description
Direction	Select the router interface. You can select **LAN** or **WAN**. In this example, **LAN** is selected.
LAN ACL	Enable or disable ACL. You need to enable it, if you want to use ACL and configure the parameters.
IP Address	Enter the IP address of the specified interface. Only the IP address that is in the same network segment with the IP address of the specified interface can access the router.
Services Allowed	You can select the following services from LAN or WAN: **Web**, **Telnet**, **FTP**, **TFTP**, **SNMP**, or **PING**. You can also select all the services.
Add	After setting the parameters, click it to add the **Current ACL Table**.
Reset	Click it to refresh this page.

Set direction of the data packets to **WAN**, the page as shown in the following figure appears.



The following table describes the parameters and buttons in this page:

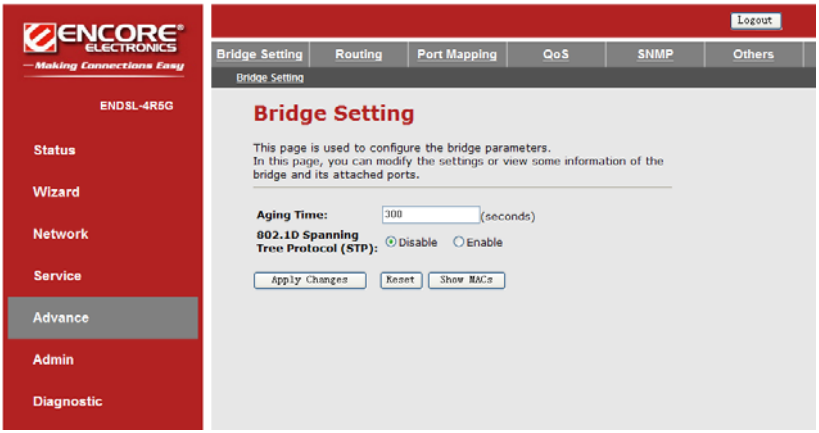
Field	Description
Direction	Select the router interface. You can select **LAN** or **WAN**. In this example, **WAN** is selected.
WAN Setting	You can select **Interface** or **IP address**.
WAN Interface	Select the interface that permits data packets from WAN to access the router.
IP Address	Enter the IP address in the WAN. Only the IP address that is in the same network segment with the IP address in the WAN can access the router.
Services Allowed	You can select the following services from WAN: **Web**, **Telnet**, **FTP**, **TFTP**, **SNMP**, or **PING**. You can also select all the services.
Add	After setting the parameters, click it to add an entry to the **Current ACL Table**.
Reset	Click it to refresh this page.

4.6 Advance

In the navigation bar, click **Advance**. The **Advance** page that is displayed contains **Bridge Setting**, **Routing**, **Port Mapping**, **QoS**, **SNMP**, and **Others** settings

4.6.1 Bridge Setting

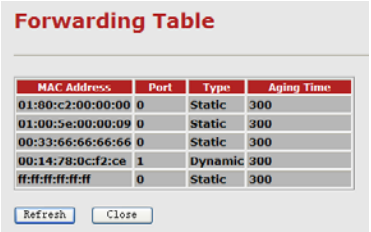
Choose **Advance** > **Bridge Setting**, the page as shown in the following figure appears. This page is used to configure the bridge parameters. In this page, you can modify the settings or view some information of the bridge and its attached ports.



The following table describes the parameters and button in this page:

Field	Description
Aging Time	If the host is idle for 300 seconds (the default value), its entry is deleted from the bridge table.
802.1D Spanning Tree Protocol (STP)	Disable or Enable 802.1d Spanning Tree Protocol (STP). Select **Enable** to provide path redundancy while preventing undesirable loops in your network.
Show MACs	Click it to show a list of the learned MAC addresses for the bridge.

Click **Show MACs**, the page as shown in the following figure appears. This table shows a list of learned MAC addresses for this bridge.

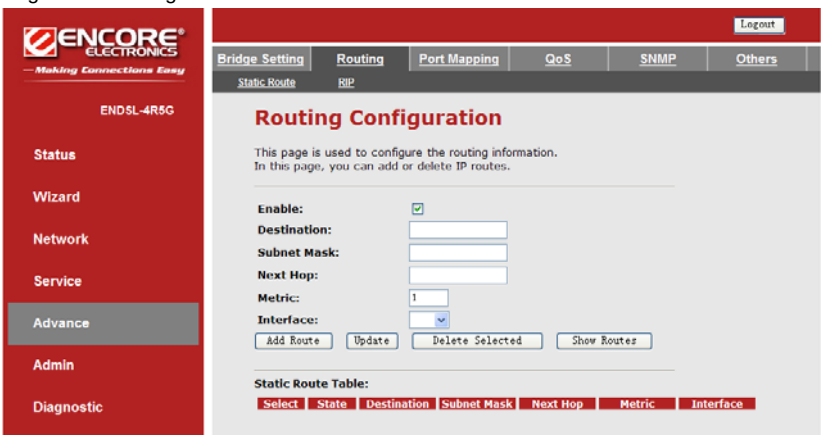


4.6.2 Routing

Choose **Advance** > **Routing**. The **Routing** page that is displayed contains **Static Route** and **RIP** settings.

4.6.2.1 Static Route

Click **Static Route**, the page as shown in the following figure appears. In this page, you can configure the routing information. You can add or delete IP routes.

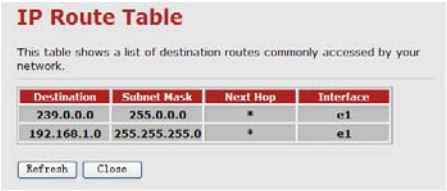


The following table describes the parameters and buttons in this page:

Field	Description
Enable	Select it to use static IP routes.
Destination	Enter the IP address of the destination device.
Subnet Mask	Enter the subnet mask of the destination device.
Next Hop	Enter the IP address of the next hop in the IP route to the destination device.
Metric	The metric cost for the destination.
Interface	Select the interface for the specified route.
Add Route	Click it to add the new static route to the **Static Route Table**.
Update	Select a row in the **Static Route Table** and modify the parameters. Then click it to save the settings in this page

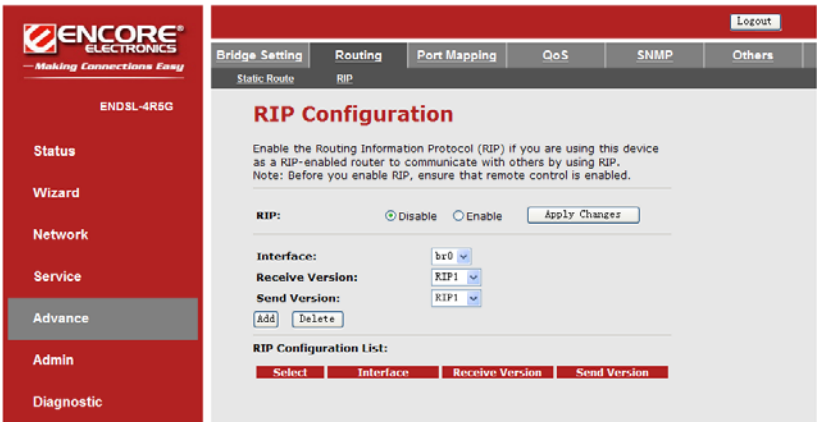
Field	Description
	temporarily.
Delete Selected	Select a row in the **Static Route Table** and click it to delete the row.
Show Routes	Click it, the **IP Route Table** appears. You can view a list of destination routes commonly accessed by your network.
Static Route Table	A list of the previously configured static IP routes.

Click **Show Routes**, the table as shown in the following figure appears. The table shows a list of destination routes commonly accessed by your network.



4.6.2.2 RIP

Click **RIP**, the page as shown in the following figure appears. If the device is used as a RIP-enabled router to communicate with other devices by using Routing Information Protocol (RIP), you need to enable RIP. In this page, you can configure the parameters of RIP, including the interface, received version, transmitted version.

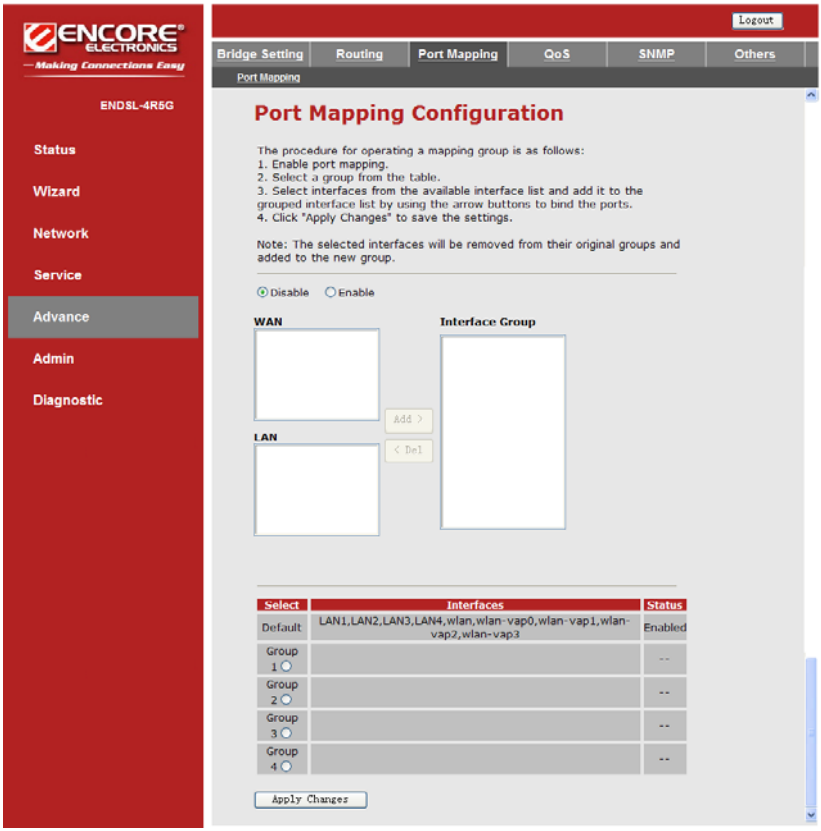


The following table describes the parameters and buttons in this page:

Field	Description
RIP	Select **Enable**, the router communicates with other RIP-enabled devices.
Apply Changes	Click it to save the settings in this page temporarily.
Interface	Select the interface of the router that uses RIP.
Receive Version	Select the interface version that receives RIP messages. You can select **RIP1**, **RIP2**, or **Both**. ● **RIP1** indicates that the router receives RIP v1 messages. ● **RIP2** indicates that the router receives RIP v2 messages. ● **Both** indicates that the router receives both of RIP v1 and v2 messages.
Send Version	Select the working mode for sending RIP messages. You can select **RIP1** or **RIP2**. ● **RIP1** indicates that the router broadcasts RIP v1 messages only. ● **RIP2** indicates that the router multicasts RIP v2 messages only.
Add	Click it to add a specified RIP interface to the **RIP Configuration List**.
Delete	Select a row in the **RIP Configuration List** and click it to delete the row.
RIP Configuration List	A list of the router interfaces that enable RIP.

4.6.3 Port Mapping

Choose **Advance** > **Port Mapping**, the page as shown in the following figure appears. In this page, you can bind the WAN interface and the LAN interface into the same group.



The procedure for operating a mapping group is as follows:

Step 1 Enable port mapping.

Step 2 Select a group from the table.

Step 3 Select the interfaces from the WAN and LAN and bind the required interfaces into an interface group by clicking the arrow button.

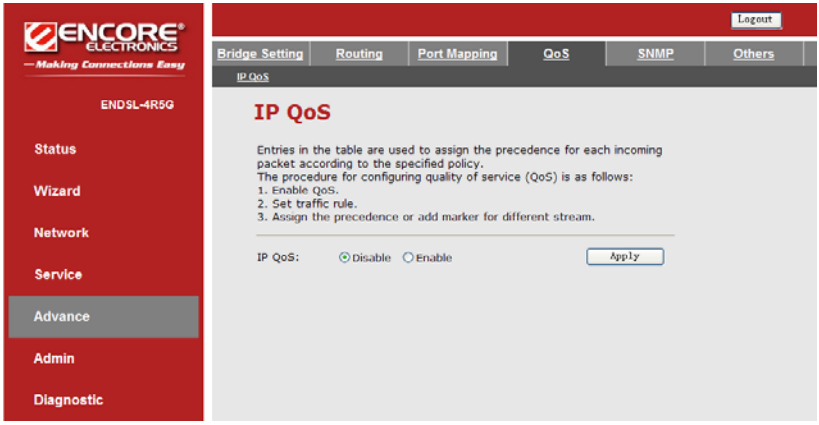
Step 4 Click **Apply Changes** to take the settings into effect.

Note:

The selected interfaces are removed from the original groups and added to a new group.

4.6.4 QoS

Choose **Advance > QoS**, the page as shown in the following figure appears. Entries in this table are used to assign the precedence for each incoming packet according to physical LAN port, TCP/UDP port number, source IP address, destination IP address, and other information.

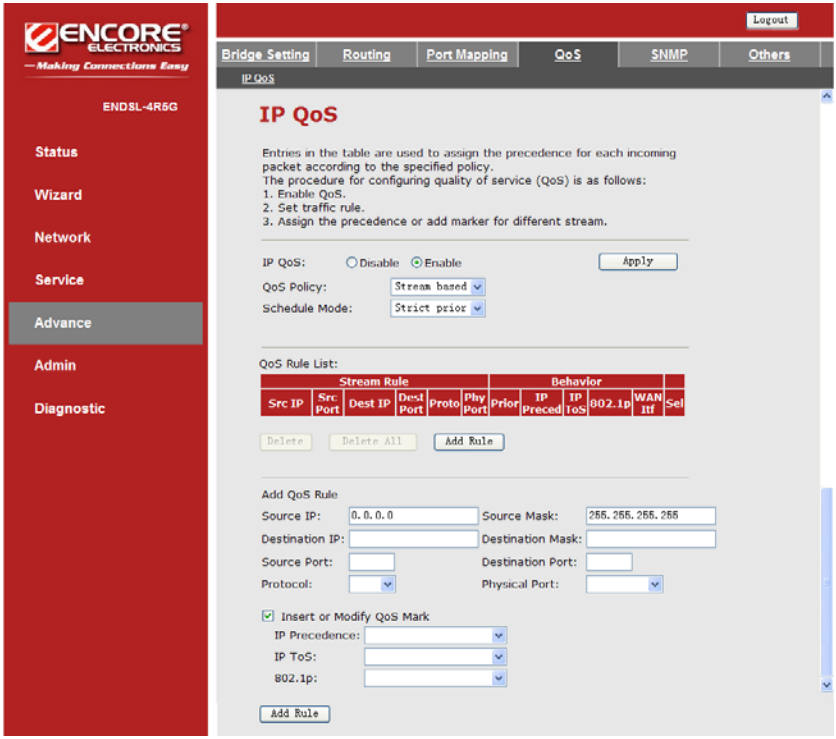


The procedure for configuring quality of service (QoS) is as follows:

Step 1 Enable IP QoS and click **Apply** to enable IP QoS.

Step 2 Click **Add Rule** to add a new IP QoS rule.

The page as shown in the following figure appears.



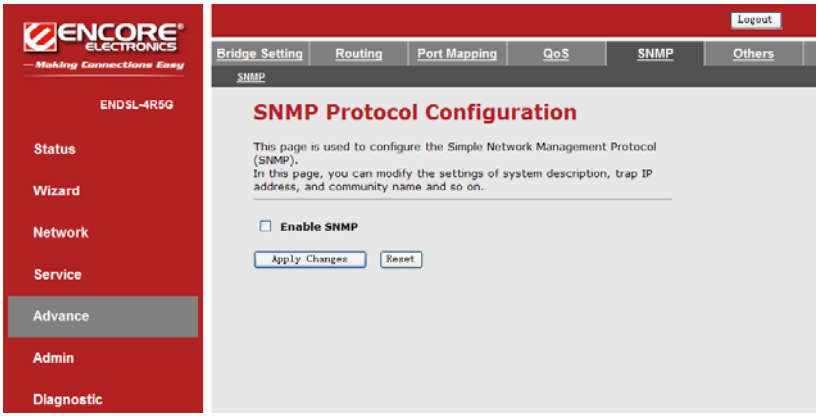
The following table describes the parameters and buttons in this page:

Field	Description
IP QoS	Disable or enable QoS. By default, IP QoS is disabled. You need to enable IP QoS, and then you can configure the parameters in this page.
QoS Policy	You can select **Stream based**, **802.1p based**, or **DSCP based**.
Schedule Mode	You can select **Strict prior** or **WFQ (4:3:2:1)**.
Source IP	Enter the IP address of the source data packet.
Source Mask	Enter the subnet mask of the source IP address.
Destination IP	Enter the IP address of the destination data packet.
Destination Mask	Enter the subnet mask of the destination IP address.
Source Port	Enter the port of the source data packet.

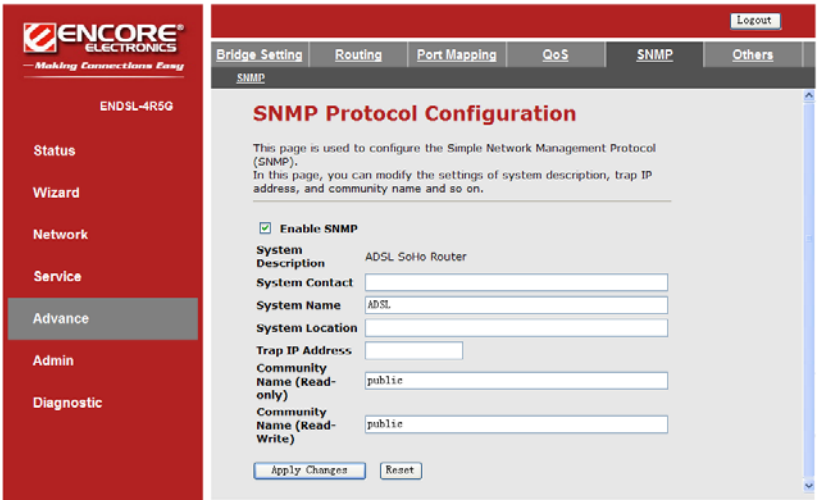
Field	Description
Destination Port	Enter the port of the destination data packet.
Protocol	The protocol responds to the IP QoS rules. You can select **TCP**, **UDP**, or **ICMP**.
Physical Port	The LAN interface responds to the IP QoS rules, including four LAN interfaces, one AP interface, and four VAP interfaces.
Set Priority	The priority of the IP QoS rules. P0 is the highest priority and P3 is the lowest.
IP Precedence	Set the priority in the ToS of the IP data packet. The priority is in the range of 0 to 7.
IP ToS	The type of IP ToS for classifying the data package You can select **Normal Service**, **Minimize Cost**, **Maximize Reliability**, **Maximize Throughput**, or **Minimize Delay**.
802.1p	The priority is in the range of 0 to 7.
Delete	Select a row in the **QoS Rule List** and click it to delete the row.
Delete All	Select all the rows in the **QoS Rule List** and click it to delete the rows.

4.6.5 SNMP

Choose **Advance** > **SNMP**, the page as shown in the following figure appears. In this page, you can configure the parameters of Simple Network Management Protocol (SNMP).



By default, SNMP is disabled. Check the option of **Enable SNMP**, the page as shown in the following figure appears.

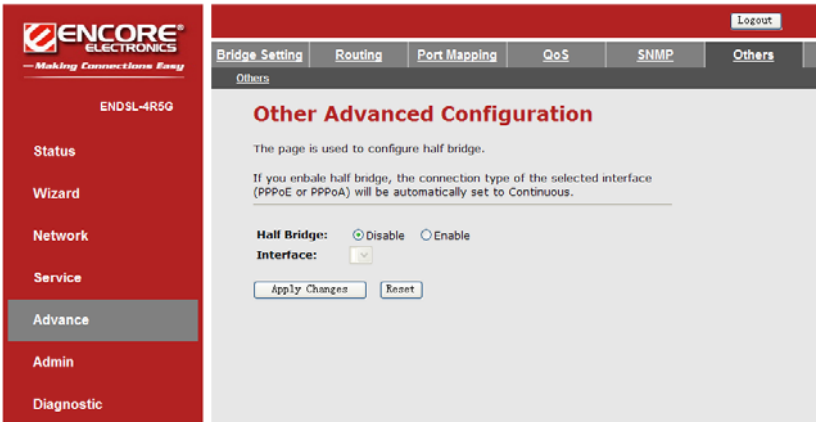


The following table describes the parameters in this page:

Field	Description
Enable SNMP	eck it to enable SNMP. You need to enable SNMP if you want to use SNMP and configure the parameters in this page.
Trap IP Address	Enter the IP address of trap host. The trap information is sent to the host.
Community name (Read-only)	The network administrators must use this password to read the information of this router.
Community name (Read-Write)	The network administrators must use this password to configure the information of the router.

4.6.6 Others

Choose **Advance** > **Others**, the page as shown in the following figure appears. In this page, you can configure half bridge.

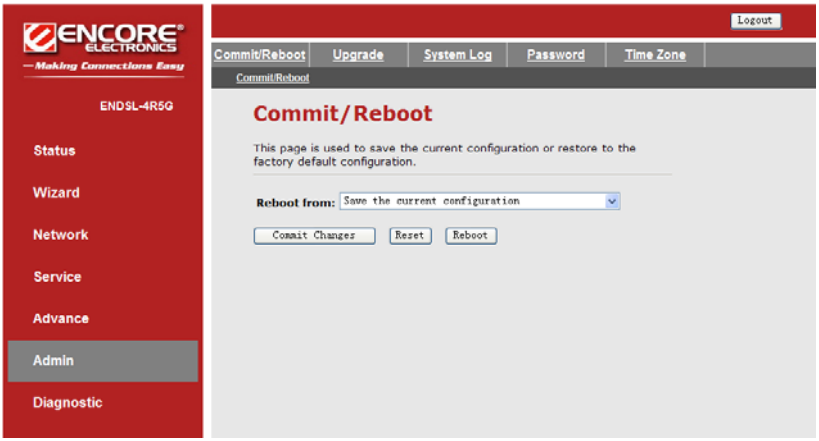

ENCORE ELECTRONICS
Making Connections Easy
ENDSL-4R5G
Status
Wizard
Network
Service
Advance
Admin
Diagnostic
Logout
Bridge Setting
Routing
Port Mapping
QoS
SNMP
Others
Others
Other Advanced Configuration
The page is used to configure half bridge.
If you enbale half bridge, the connection type of the selected interface (PPPoE or PPPoA) will be automatically set to Continuous.
Half Bridge:
Disable
Enable
Interface:
Apply Changes
Reset

4.7 Admin

In the navigation bar, click **Admin**. The **Admin** page that is displayed contains **Commit/Reboot**, **Upgrade**, **System Log**, **Password**, and **Time Zone** settings.

4.7.1 Commit/Reboot

Choose **Admin** > **Commit/Reboot**, the page as shown in the following figure appears. In this page, you can reset the router to the factory default configuration, save the current configuration or restart the router.



The following table describes the parameter and button in this page:

Field	Description
Reboot from	You can select **Save the current configuration** or **Restore to the factory default configuration**. ● **Save the current configuration:** Save the current configuration, and then the router automatically reboots. ● **Restore to the factory default configuration:** Reset to the factory default configuration, and then the the router automatically reboots.
Reboot	Click it to reboot the router.

4.7.2 Upgrade

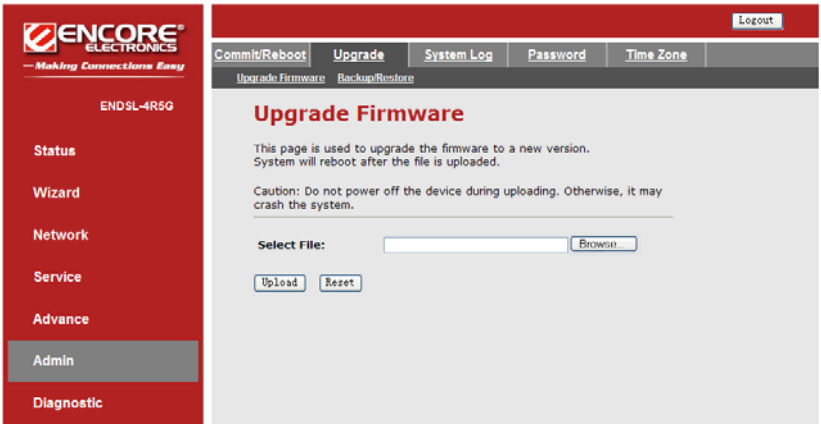
Choose **Admin > Upgrade**. The **Upgrade** page that is displayed contains **Upgrade Firmware** and **Backup/Restore** functions.

4.7.2.1 Upgrade Firmware

Click **Upgrade Firmware**, the page as shown in the following figure appears. In this page, you can upgrade the firmware of the router.

Caution:

Do not turn off the router or press the Reset button while the procedure is in progress. Otherwise, it may crash the system.



The following table describes the parameter and buttons in this page:

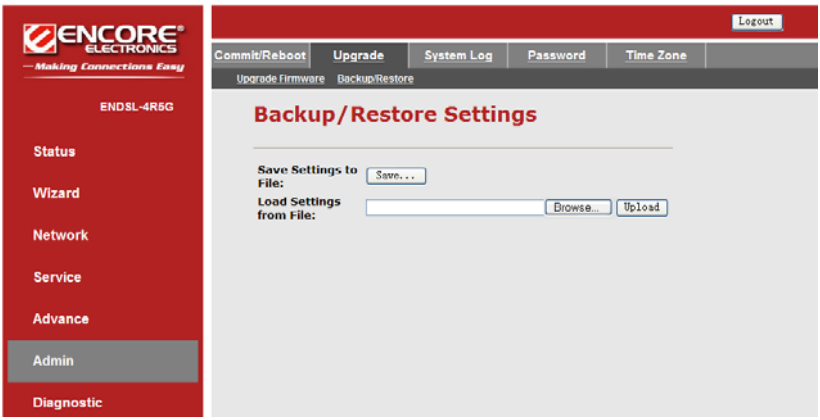
Field	Description
Select File	Click **Browse** to select the firmware file.
Upload	After selecting the firmware file, click it to starting upgrading the firmware file.
Reset	Click it to start selecting the firmware file again.

4.7.2.2 Backup/Restore

Click **Backup/Restore**, the page as shown in the following figure appears. In this page, you can back up the current configuration to a file and restore the configuration from the file that was saved previously.

Caution:

Do not turn off the router or press the Reset button while the procedure is in progress. Otherwise, it may crash the system.



The following table describes the parameters and buttons in this page:

Field	Description
Save Settings to File	Click **Save** to select the path for backup. Then you can save the configuration file of the router.
Load Settings from File	Click **Browse** to select the configuration file.
Upload	After selecting the configuration file of the router, click it to start uploading the configuration file of the router.

4.7.3 System Log

Choose **Admin > System Log**, the page as shown in the following figure appears. In this page, you can view the system log according to the log level.

4.7.4 Password

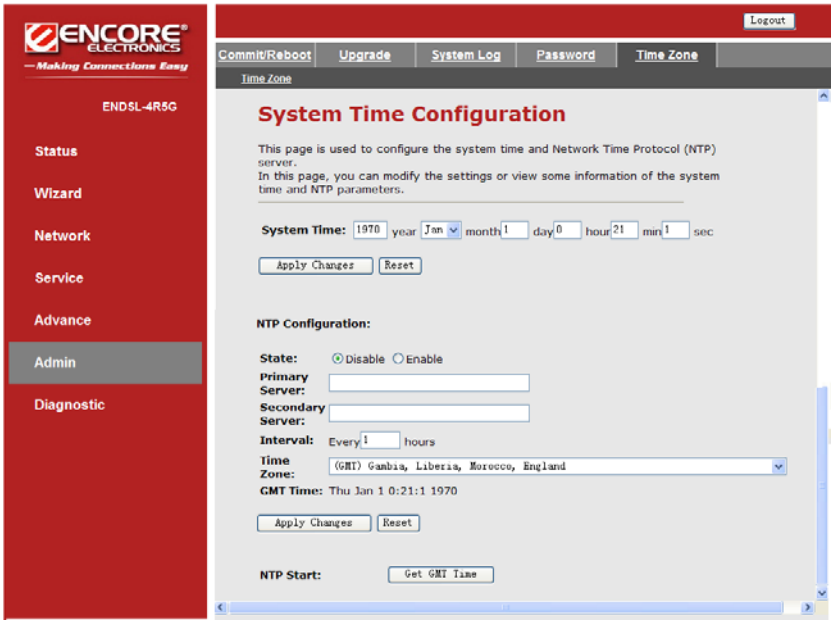
Choose **Admin** > **Password**, the page as shown in the following figure appears. In this page, you can change the password of the user. By default, the user name and password of the super user are **admin** and **admin** respectively. The user name and password of the common user are **user** and **user** respectively.

The following table describes the parameters in this page:

Field	Description
User Name	Select the user name for accessing the router. You can select **admin** or **user** from the drop-down list.
New Password	Enter the password to which you want to change the old password.
Confirmed Password	Enter the new password again.
Restore to the Default Password	Select it, and the password will be restored to the default password.

4.7.5 Time Zone

Choose **Admin** > **Time Zone**, the page as shown in the following figure appears. In this page, you can set the system time manually or obtain the system time from the time server.



The following table describes the parameters in this page:

Field	Description
System Time	Set the system time manually.
NTP Configuration	
State	Enable or disable NTP. You need to enable NTP if you want to configure the parameters of NTP.

Field	Description
Primary Server	Set the primary NTP server manually.
Secondary Server	Set the secondary NTP server manually.
Time Zone	Select the time zone in which area you are from the drop-down list.

Chapter 5 Diagnostic

In the navigation bar, click **Diagnostic**. The **Diagnostic** page that is displayed contains **Ping**, **ATM Loopback**, **ADSL** and **Diagnostic Test** tools.

5.1 Ping

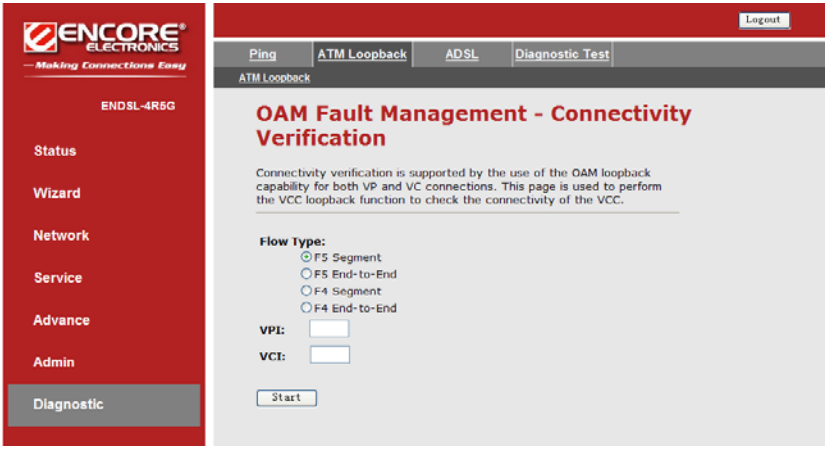
Choose **Diagnostic** > **Ping**, the page as shown in the following figure appears.

The following table describes the parameter and button in this page:

Field	Description
Host	Enter the IP address.
Ping	Click it to start to ping the host address.

5.2 ATM Loopback

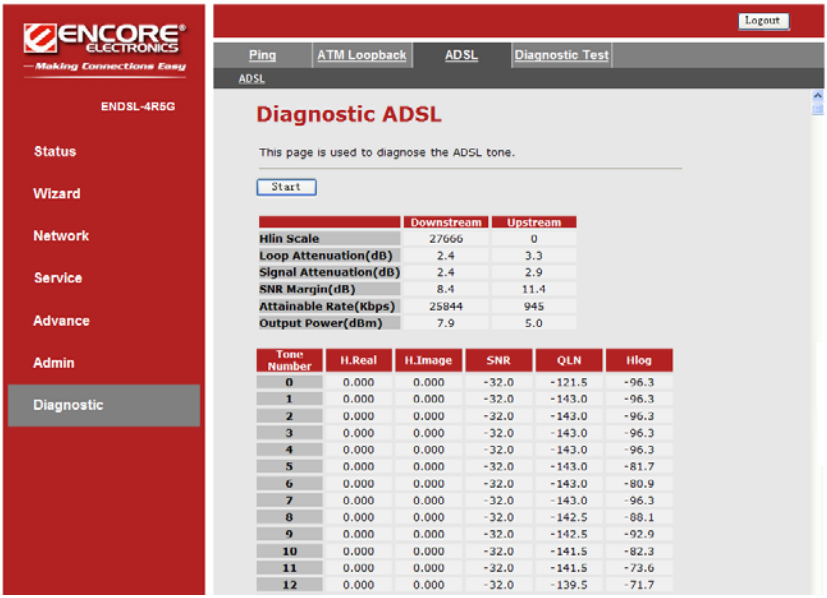
Choose **Diagnostic** > **ATM Loopback**, then the page as shown in the following figure appears. In this page, you can use VCC loopback to check the connectivity of the VCC. The ATM loopback test is useful for troubleshooting problems with the DSLAM and ATM network.



After selecting the flow type and entering the VPI and VCI, then click **Start** to start testing.

5.3 ADSL

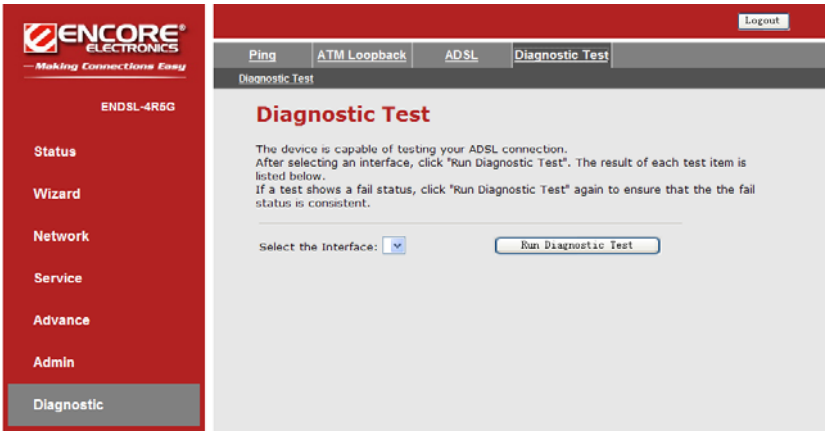
Choose **Diagnostic** > **ADSL**, the page as shown in the following figure appears. In this page, you can diagnose the ADSL tone.



Click **Start** to start diagnosing ADSL tone.

5.4 Diagnostic Test

Choose **Diagnostic > Diagnostic Test**, the page as shown in the following figure appears. In this page, you can test the ADSL connection. You can also view the LAN connection, WLAN connection, ADSL connection, and Internet connection.



Click **Run Diagnostic Test** to start testing.

Appendix A Frequently Asked Questions

This Frequently Asked Questions addresses common questions regarding Wireless ADSL 2+ Modem Router settings.

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

(1) **How do I determine if a link has been established between the Ethernet card (NIC) and the Wireless ADSL 2+ Modem Router?**

Answer. A ping test would determine if a connection is established between your Wireless ADSL 2+ Modem Router and computer. Using, the ping command, ping the IP address of the Wireless ADSL 2+ Modem 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 has been established between the Wireless ADSL 2+ Modem Router and the Internet?**

Answer. 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) **How can I find/verify Ethernet MAC Addresses of my Wireless ADSL 2+ Modem Router and/or computer?**

Answer. Refer to **Status – Info** section for details.

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

Answer. If you are having difficulties getting any Internet game, server, or application to function properly, consider exposing one computer to the Internet using De-Militarized Zone (DMZ) setting. Refer to **Advance – Port Forwarding** section for the setting detail.

(5) **I need to upgrade the firmware.**

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

(6) **I forgot my password.**

Answer. Reset the Wireless ADSL 2+ Modem Router to factory default by pressing the Reset button for 5~10 seconds and then releasing it.

If you are still getting prompted for a password when saving settings, then perform the following steps:

1. Access the Wireless ADSL 2+ Modem Router's web-based utility by going to http://192.168.1.1 or the IP address of the Wireless ADSL 2+ Modem Router. Enter the default username and password **admin**, and click the **Tools – User Management** tab.
2. Enter a different password in the Wireless ADSL 2+ Modem Router Password field, and enter the same password in the second field to confirm the password.
3. Click the **Submit** button then click **SAVE** button to activate your setting.

(7) **What is MAC Address?**

Answer. The MAC is short for **Me**dia **A**ccess **C**ontrol Address. It is a hardware address that uniquely identifies each node of an Ethernet networking device. This address is usually permanent.

(8) **What is NAT (Network Address Translation) and what is it used for?**

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

(9) **What can I do when I am not able to get the web configuration page shown for this Wireless ADSL 2+ Modem Router?**

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

(10) **What is DMZ (De-Militarized zone)?**

Answer. DMZ allows one IP Address (computer) to be exposed to the Internet. Some applications require multiple TCP/IP ports to be opened. It is recommended that you set your computer with static IP address if you want to use DMZ features. And, be aware to add extra protection and security to the computer exposed.

(11) **What is the maximum number of local IP addresses supported by this Wireless ADSL 2+ Modem Router?**

Answer. The Wireless ADSL 2+ Modem Router can support up to 253 IP addresses in one Class C IP domain.

(12) **What is ad-hoc mode?**

Answer. When a wireless network is set to be 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.

(13) **What is infrastructure mode?**

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

(14) **What is roaming?**

Answer. 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.

(15) **What is ISM band?**

Answer. 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.

(16) **What is IEEE 802.11b standard?**

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

(17) **What is IEEE 802.11g standard?**

Answer. IEEE 802.11g is an extension standard to 802.11 that applies to Wireless LAN and provides maximum 54Mbps transmission speed in the 2.4 GHz band.

(18) **What is BSS ID?**

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

(19) **What is SSID?**

Answer. 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.

(20) **What is WEP?**

Answer. It is 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.

(21) **What is WPA?**

Answer. 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.

(22) **Where could I get more product information or technical supports?**

Answer. Please check the Support section on our web site http://www.encore-usa.com.

Appendix B Troubleshooting Guide

This Troubleshooting Guide provides answers to common problems regarding the Wireless ADSL 2+ Modem Router settings, connections, and computer settings.

(1) **The Wireless ADSL 2+ Modem Router does not work (None of the LEDs light up)**

Answer. Check the following:

1. Make sure that you are using the correct power adapter for your Wireless ADSL 2+ Modem Router device.
2. Make sure that the power adapter is plugged into a power socket.
3. Make sure the power switch is on if you are using the power extension cable.

(2) **I changed the LAN IP Address in the LAN configuration page and my PC is no longer able to detect the Wireless ADSL 2+ Modem Router.**

Answer. After changing the LAN IP Address of the Wireless ADSL 2+ Modem Router, proceed to the following steps to refresh IP address of the PC before the PC is able to recognize the Wireless ADSL 2+ Modem Router:

1. Click **"Start"** → **"Run"**.
2. In the Open field, enter **"cmd"** then click **"OK"**.
3. In the command prompt, type **"ipconfig/release"** and then press **"Enter"** (for Windows 2000/XP Operating System).
4. Type **"ipconfig/renew"** then press **"Enter"**.

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

Answer. 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.

(4) **Failed to configure the Wireless ADSL 2+ Modem Router through web browser (By a client PC in LAN)**

Answer. Check the following:

1. Check the hardware connection of the Wireless ADSL 2+ Modem Router's LAN port. The LED will light 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: 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**
– **Subnet Mask: 255.255.255.0**
– **Default Gateway IP: 192.168.1.1**

(5) **I forgot or lost my Administrator Password.**

Answer. Reset the Wireless ADSL 2+ Modem Router to factory default by pressing the **"Reset"** button for 5~10 seconds.

If you are still getting prompted for a password when saving settings:

1. Access the Router's web interface by going to **http://192.1681.1.**
2. Enter the default **"username"** and **"password"**, and then clicks **"Enter"** to login.
3. Click on **"Tools"** and then click "**User Management"**.
4. Enter a new **"Password"** and new **"Username"** in the **"Username"** and "**Password"** fields, and enter the same password in the second password field to confirm the password.
5. Click **"Submit"** after setup then click **SAVE** button to activate your setting.

(6) **I need to upgrade the Firmware.**

Answer. 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 **Tools - Update** section for the upgrading process.

(7) **Testing LAN path to your Wireless ADSL 2+ Modem Router.**

Answer. To verify whether the LAN path from your PC to your Wireless ADSL 2+ Modem Router is properly connected, you can **"Ping"** the LAN IP address of Wireless ADSL 2+ Modem Router with the following procedure:

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 adapter installation and configurations.
4. Verify that the IP addresses for your Wireless ADSL 2+ Modem Router and your workstations are correct and the IP addresses are on the same subnet.

(8) **No wireless connectivity.**

Answer. Check the following:

1. Make sure that both of wireless client adapter and the Wireless ADSL 2+ Modem Router are 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).

(9) **Poor wireless connectivity or range reachable.**

Answer. Check the following:

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

(10) **Failed to connect with the Wireless ADSL 2+ Modem Router via Wireless LAN card.**

Answer. Ensure that the WL ACT LED indicator of the Wireless ADSL 2+ Modem Router is correctly illuminated.

Check whether your Wireless LAN settings (e.g. SSID, Channel Number) are the same as your Wireless ADSL 2+ Modem Router.

Check whether you have used the same WEP Key Encryption for both your Wireless LAN client and your Wireless ADSL 2+ Modem Router

Appendix C 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.

802.11g: 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.

802.1x: The 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. It is 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. It is a method of data transferring in which data is organized into 53-byte cell units. ATM cells are processed asynchronously in relation to other cells.

BC: Broadcast Communication. A sender transmits to everyone in the network.
BER: Bit Error Rate. It is the percentage of bits that contains errors relative to the total number of bits transmitted.

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

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

CBR: Constant Bit Rate. A constant transfer rates 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. It is typically more secure than PAP and CHAP. It 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 end, or LAN side.

CRC: Cyclic Redundancy Checking. It is a method for checking errors in a data transmission between two computers or devices. 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. It is 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 an IP address or provide a permanent static address to those computers who need it (servers, etc.).

DMZ: Demilitarized Zone. It is 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.

DSCP: Differentiated Services Code Point. It is a 6-bit field defined in the header of IPv4 and IPv6 IP packets for packet classification purposes.

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 error 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: To break 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. It is 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 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, the G.dmt is a form of ADSL that uses Discrete Multi-Tone (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 (the 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 can be transmitted and received on the same signal medium, but not simultaneously. Half Duplex lines are bi-directional.

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 de-multiplexes 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 has 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 sub-layer. 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 network interface adapter of 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 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 un-fragmented 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 IP addresses of individual devices 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 network (WAN) the ability to distinguish a device on the inside network (LAN), as the inside network has a private set of IP addresses 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 set of 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: The 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 port of the ADSL device. 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 an IP address.

SNAP: Sub-Network 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 is, the better the signal quality is.

Subnet Mask: Short for Sub-Network 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.

ToS: type of service. It is a byte defined in the IPv4 header which is used for various purposes over the years and mostly for the IP precedence.

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 be 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 transferring, 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 data transferring.

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.

WFQ: weighted fair queuing. It is a data packet scheduling technique which allows different data flows to be queued in different priorities.

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.

Appendix D Regulatory notes and statements

Wireless LAN, Health and Authorization for use

Radio frequency electromagnetic energy is emitted from Wireless LAN devices. The energy levels of these emissions however are far much less than the electromagnetic energy emissions from wireless devices like for example mobile phones. Wireless LAN devices are safe for use frequency safety standards and recommendations. The use of Wireless LAN devices may be restricted in some situations or environments for example:

·On board of airplanes, or

·In an explosive environment, or

·In case the interference risk to other devices or services is perceived or identified as harmful

In case the policy regarding the use of Wireless LAN devices in specific organizations or environments (e.g. airports, hospitals, chemical/oil/gas industrial plants, private buildings etc.) is not clear, please ask for authorization to use these devices prior to operating the equipment.

Regulatory Information/disclaimers

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The Manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, of the substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government regulations arising from failing to comply with these guidelines.

USA-FCC (Federal Communications Commission) statement

This device complies with Part 15 of FCC Rules.

Operation is subject to the following two conditions:

1. This device may not cause interference, and

2. This device must accept any interference, including interference that may cause undesired operation of this device.

FCC Radio Frequency Exposure statement

This Wireless LAN radio device has been evaluated under FCC Bulletin OET 65 and found compliant to the requirements as set forth in CFR 47 Sections 2.1091, 2.1093, and 15.247 (b) (4) addressing RF Exposure from radio frequency devices. The radiated output power of this Wireless LAN device is far below the FCC radio frequency exposure limits. Nevertheless, this device shall be used in such a manner that the potential for human contact during normal operation is minimized.

When nearby persons has to be kept to ensure RF exposure compliance, in order to comply with RF exposure limits established in the ANSI C95.1 standards, the distance between the antennas and the user should not be less than 20 cm.

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it 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 can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

1. Reorient or relocate the receiving antenna.

2. Increase the distance between the equipment and the receiver.

3. Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.

4. Consult the dealer or an experienced radio/TV technician for help.

Export restrictions

This product or software contains encryption code that may not be exported or transferred from the US of Canada without an approved US Department of Commerce export license.

Safety Information

Your device contains a low power transmitter. When device is transmitted it sends out radio frequency (RF) signal.

CAUTION: To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use on the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

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.

CE Mark Warning

This is a Class B product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

Protection requirements for health and safety – Article 3.1a

Testing for electric safety according to EN 60950 has been conducted. These are considered relevant and sufficient.

Protection requirements for electromagnetic compatibility (EMC) – Article 3.1b

Testing for electromagnetic compatibility according to EN 301 489-1, EN 301 489-17 and EN 55024 has been conducted. These are considered relevant and sufficient.

Effective use of the radio spectrum – Article 3.2

Testing for radio test suites according to EN 300 328 has been conducted. These are considered relevant and sufficient.

CE in which Countries where the product may be used freely:

Germany, UK, Italy, Spain, Belgium, Netherlands, Portugal, Greece, Ireland, Denmark, Luxembourg, Austria, Finland, Sweden, Norway and Iceland.

France: except the channel 10 through 13, law prohibits the use of other channels.

Caution

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

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MAKING CONNECTIONS easy

Our local tech support specialists are ready to help 24/7

LIVE SUPPORT*

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