TP-LINK®

User Guide

TD-W8960N

300Mbps Wireless N ADSL2+ Modem Router

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FCC 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 and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.

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

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

"To comply with FCC RF exposure compliance requirements, this grant is applicable to only Mobile Configurations. The antennas 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."

This device is restricted in indoor environment only.

CE Mark Warning

CE 1588

RF Exposure Information

This device meets the EU requirements (1999/5/EC Article 3.1a) on the limitation of exposure of the general public to electromagnetic fields by way of health protection.

The device complies with RF specifications when the device used at 20 cm from your body.

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EAC

Safety Information

- When product has power button, the power button is one of the way to shut off the product; when there is no power button, the only way to completely shut off power is to disconnect the product or the power adapter from the power source.
- Don’t disassemble the product, or make repairs yourself. You run the risk of electric shock and voiding the limited warranty. If you need service, please contact us.
- Avoid water and wet locations.
- Adapter shall be installed near the equipment and shall be easily accessible.
- The plug considered as disconnect device of adapter.
- Use only power supplies which are provided by manufacturer and in the original packing of this product. If you have any questions, please don't hesitate to contact us.

Explanation of the symbols on the product label

Symbol	Explanation
⎓	DC voltage
	RECYCLING This product bears the selective sorting symbol for Waste electrical and electronic equipment (WEEE). This means that this product must be handled pursuant to European directive 2012/19/EU in order to be recycled or dismantled to minimize its impact on the environment. User has the choice to give his product to a competent recycling organization or to the retailer when he buys a new electrical or electronic equipment.

TP-LINK® TP-LINK TECHNOLOGIES CO., LTD

DECLARATION OF CONFORMITY

For the following equipment:

Product Description: **300Mbps Wireless N ADSL2+ Modem Router**

Model No.: **TD-W8960N**

Trademark: **TP-LINK**

We declare under our own responsibility that the above products satisfy all the technical regulations applicable to the product within the scope of Council Directives:

Directives 1999/5/EC, Directive 2014/30/EU, Directive 2014/35/EU, Directives 2011/65/EU, Directives 2009/125/EC

The above product is in conformity with the following standards or other normative documents

EN 300 328 V1.9.1

EN 55022: 2010 + AC: 2011

EN 61000-3-2:2014

EN 61000-3-3:2013

EN 55024: 2010

EN 60950-1: 2006 + A11: 2009 + A1: 2010 + A12: 2011 +A2: 2013

EN 50385: 2002

EN 50581: 2012

(EC) No 278/2009

(EC) No 1275/2008

(EU) No 801/2013

The product carries the CE Mark:

CE1588

Person responsible for marking this declaration:

Yang Hongliang

Product Manager of International Business

Date of issue: 2016.2.4

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Package Contents

The following contents should be found in your package:

- One TD-W8960N 300Mbps Wireless N ADSL2+ Modem Router
- One power Adapter for TD-W8960N 300Mbps Wireless N ADSL2+ Modem Router
- Quick Installation Guide
- Technical Support card
- One RJ45 cable
- Two RJ11 cables
- One ADSL splitter

Note:

Make sure that the package contains the above items. If any of the listed items are damaged or missing, please contact your distributor.

Chapter 1. Product Overview

Thank you for choosing the TD-W8960N 300Mbps Wireless N ADSL2+ Modem Router.

1.1 Overview of the Modem Router

The TD-W8960N 300Mbps Wireless N ADSL2+ Modem Router integrates 4-port Switch, Firewall, NAT-router and Wireless AP. Powered by 2x2 MIMO technology, the Wireless N router delivers exceptional range and speed, which can fully meet the need of Small Office/Home Office (SOHO) networks and the users demanding higher networking performance.

The TD-W8960N 300Mbps Wireless N ADSL2+ Modem Router utilizes integrated ADSL2+ transceiver and high speed MIPS CPU. The router supports full-rate ADSL2+ connectivity conforming to the ITU and ANSI specifications.

In addition to the basic DMT physical layer functions, the ADSL2+ PHY supports dual latency ADSL2+ framing (fast and interleaved) and the I.432 ATM Physical Layer.

The router provides up to 300Mbps wireless connection with other 802.11n wireless clients. The incredible speed makes it ideal for handling multiple data streams at the same time, which ensures your network stable and smooth. The performance of this 802.11n wireless router will give you the unexpected networking experience at speed 650% faster than 802.11g. It is also compatible with all IEEE 802.11g and IEEE 802.11b products.

With multiple protection measures, including SSID broadcast control and wireless LAN 64/128 WEP encryption, Wi-Fi protected Access (WPA2-PSK, WPA-PSK), as well as advanced Firewall protections, the TD-W8960N 300Mbps Wireless N ADSL2+ Modem Router provides complete data privacy.

The router provides flexible access control, so that parents or network administrators can establish restricted access policies for children or staff. It also supports Virtual Server and DMZ host for Port Triggering, and then the network administrators can manage and monitor the network in real time with the remote management function.

Since the router is compatible with virtually all the major operating systems, it is very easy to manage. Quick Setup Wizard is supported and detailed instructions are provided step by step in this user guide. Before installing the router, please look through this guide to know all the router's functions.

1.2 Main Features

- Complies with IEEE 802.11n to provide a wireless data rate of up to 300Mbps
- One RJ11 LINE port, four 10/100M Auto-Negotiation RJ45 LAN ports, supporting Auto MDI/MDIX
- Quick response semi-conductive surge protect circuit, reliable surge-protect function
- AFE to support Annex A and L deployments
- Provides external splitter
- Multi-user sharing a high-speed Internet connection
- Connecting the internet on demand and disconnecting from the Internet when idle for PPPoE
- Provides WPA/WPA2, WPA-PSK/WPA2-PSK data security, TKIP/AES encryption security
- Provides 64/128-bit WEP encryption security and wireless LAN ACL (Access Control List)
- Adopts Advanced DMT modulation and demodulation technology
- Adopts 300M wireless LAN transmission technology
- Supports access control, parents and network administrators can establish restricted access policies based on time of day for children or staff
- Supports Virtual Server, Port Triggering and DMZ host
- Supports UPnP, Dynamic DNS, Static Routing
- Supports bridge mode and router function
- Supports Web management
- Supports firmware upgrade
- Supports Flow Statistics
- Built-in firewall supporting IP address filtering, MAC address filtering and parental control
- Built-in DHCP server
- Supports IPv6.
- Supports Guest Network.
- Supports WPS

1.3 Panel Layout

1.3.1 The Front Panel

The router's LEDs are located on the front panel (View from left to right).

Figure 1-1

LED Explanation:

Name	Status	Indication
(Power)	On	The modem router is powered on.
	Off	The modem router is off. Please ensure that the power adapter is connected correctly.
(ADSL)	On	ADSL line is synchronized and ready to use.
	Flash	The ADSL negotiation is in progress.
	Off	ADSL synchronization fails. Please refer to **Note 1** for troubleshooting.
(Internet)	On	The network is available with a successful Internet connection.
	Off	There is no successful Internet connection or the modem router is operating in Bridge mode. Please refer to **Note 2** for troubleshooting.
(Wi-Fi)	On	Wireless is enabled.
	Flash	The modem router is sending or receiving data over Wi-Fi.
	Off	Wireless is disabled.
(WPS)	On	A wireless device has been successfully added to the network by WPS function.
	Flash	WPS handshaking is in process and will continue for about 2 minutes. Please press the WPS button on other wireless devices that you want to add to the network while the LED is flashing.
	Off	The WPS function is disabled or the wireless device fails to be added to the network in 2 minutes after WPS function is enabled. For more information, please refer to WPS Setup.
(LAN1-4)	On	There is a device connected to this LAN port.
	Flash	The modem router is sending or receiving data over this LAN port.
	Off	There is no device connected to this LAN port.

Note:

1) If the ADSL LED is off, please check your Internet connection first. Refer to **2.3 Connecting the Modem Router** for more information about how to make Internet connection correctly. If you have already made a right connection, please contact your ISP to make sure if your Internet service is available now.
2) If the Internet LED is off, please check your ADSL LED first. If your ADSL LED is also off, please refer to **Note 1**. If your ADSL LED is GREEN ON, please check your Internet configuration. You may need to check this part of information with your ISP and make sure everything have been input correctly. Refer to **4.2 Device Info** for more information.

1.3.2 The Back Panel

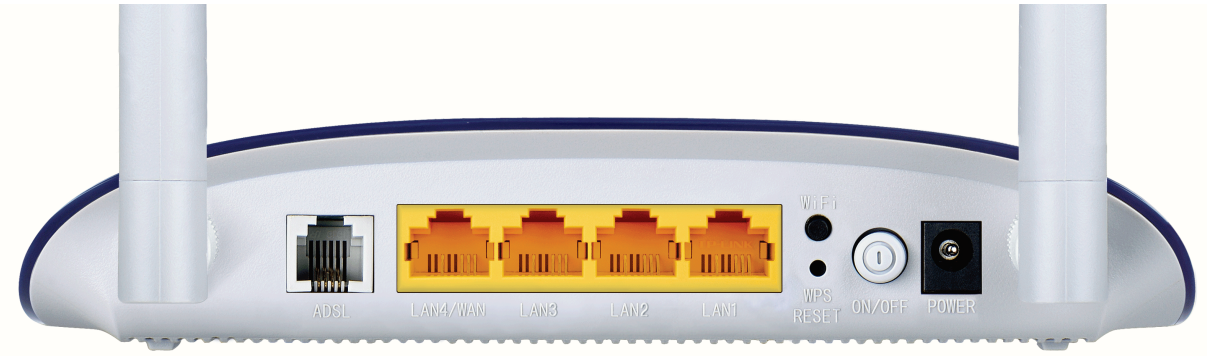


Figure 1-2

- **ADSL:** Connect to the Modem Port of Splitter or to the telephone line.
- **LAN4/WAN, LAN3, LAN2, LAN1:** Through these ports, you can connect the router to your PC or the other Ethernet network devices. Enable EWAN function and you will be able to connect to Cable/FTTH/ADSL device.
- **WiFi:** The switch for the Wi-Fi function.
- **WPS/RESET:**

1) WPS function: For details, please refer to WPS Setup.
2) Reset the modem router: With the modem router powered on, press and hold down the WPS/RESET button on the rear panel of the modem router for more than 5 seconds and then release it. If all LEDs turn on momentarily, you restore the modem router successfully.

- **ON/OFF:** The switch for the power.
- **POWER:** The Power plug is where you will connect the power adapter.
- **Wireless Antennas:** To receive and transmit the wireless data.

Chapter 2. Connecting the Modem Router

2.1 System Requirements

- Broadband Internet Access Service (DSL/Cable/Ethernet).
- PCs with a working Ethernet Adapter and an Ethernet cable with RJ45 connectors.
- TCP/IP protocol on each PC.
- Web browser, such as Microsoft Internet Explorer, Mozilla Firefox or Apple Safari.

2.2 Installation Environment Requirements

- The Product should not be located where it will be exposed to moisture or excessive heat.
- Place the router in a location where it can be connected to the various devices as well as to a power source.
- Make sure the cables and power cord are safely placed out of the way so they do not create a tripping hazard.
- The router can be placed on a shelf or desktop.
- Keep away from the strong electromagnetic radiation and the device of electromagnetic sensitive.

Generally, TD-W8960N is placed on a horizontal surface. The device also can be mounted on the wall as shown in Figure 2-1.

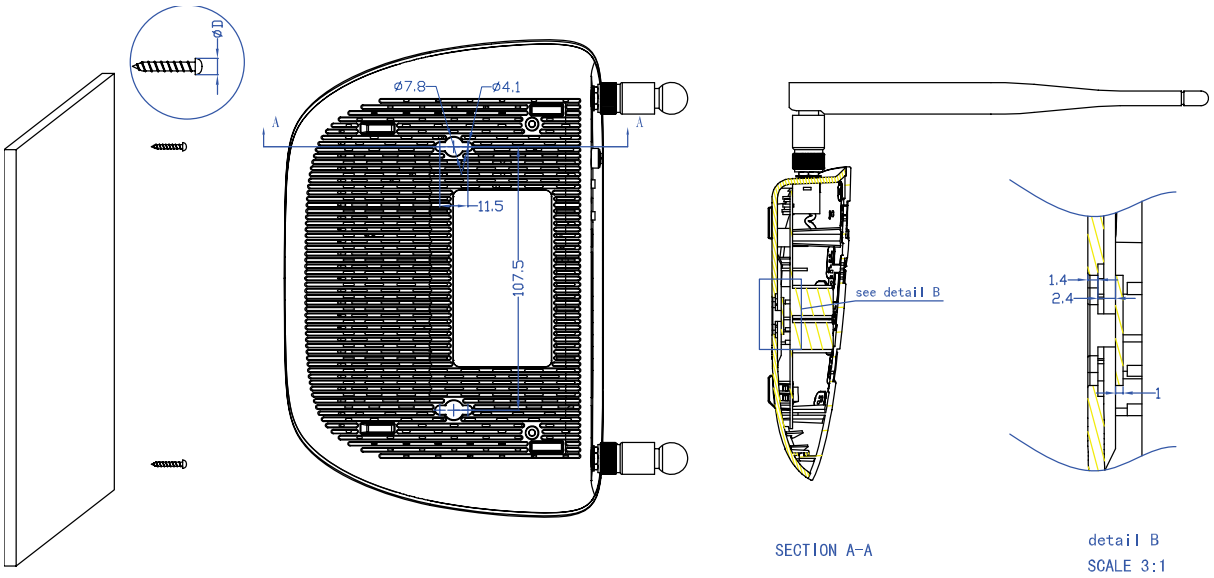


Figure 2-1 Wall-mount Install

Note:

The diameter of the screw, 4.1mm<D<7.8mm, and the distance of two screws is 107.5mm. The screw that project from the wall need around 4mm based, and the length of the screw need to be at least 20mm to withstand the weight of the product.

2.3 Connecting the Modem Router

Before installing the device, please make sure your broadband service provided by your ISP is available. If there is any problem, please contact your ISP. Before cable connection, cut off the power supply and keep your hands dry. You can follow the steps below to install it.

Step 1: Connect the ADSL Line.

Method one: Plug one end of the twisted-pair ADSL cable into the ADSL port on the rear panel of TD-W8960N, and insert the other end into the wall socket.

Method two: You can use a separate splitter. External splitter can divide the data and voice, and then you can access the Internet and make calls at the same time. The external splitter has three ports:

- LINE: Connect to the wall jack
- PHONE: Connect to the phone sets
- MODEM: Connect to the ADSL port of TD-W8960N

Plug one end of the twisted-pair ADSL cable into the ADSL port on the rear panel of TD-W8960N. Connect the other end to the MODEM port of the external splitter.

Step 2: Connect the Ethernet cable. Attach one end of a network cable to your computer's Ethernet port or a regular hub/switch port, and the other end to the LAN port on the modem router TD-W8960N.

Step 3: Power on the computers and LAN devices.

Step 4: Attach the power adapter. Connect the power adapter to the power connector on the rear of the device and plug in the adapter to an electrical outlet or power extension. The electrical outlet shall be installed near the device and shall be easily accessible.

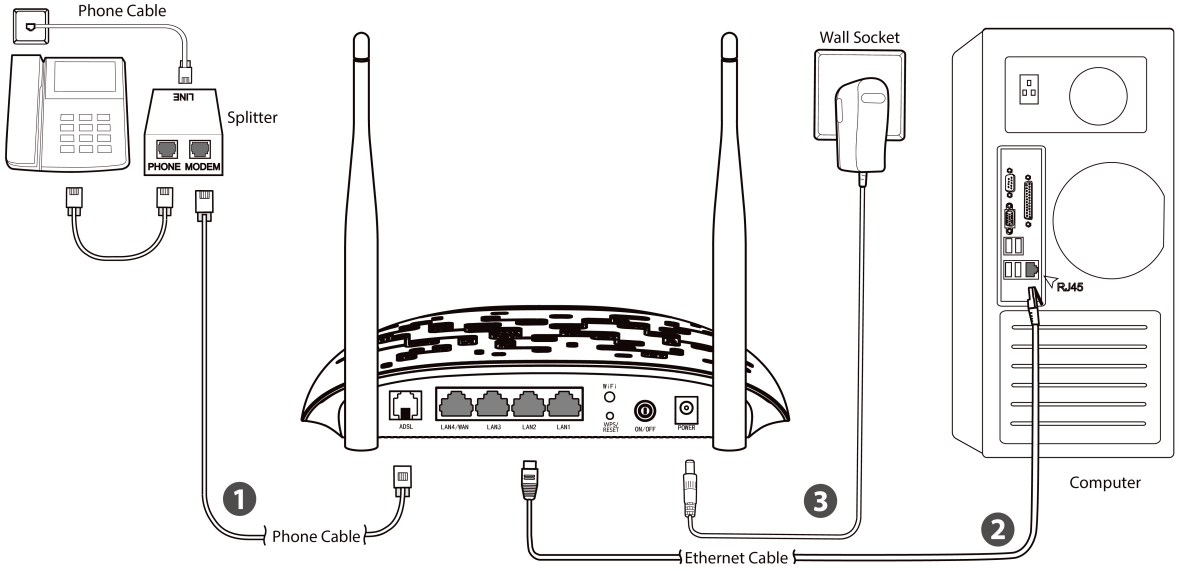


Figure 2-2

Chapter 3. Quick Installation Guide

This chapter will show you how to configure the basic functions of your TD-W8960N 300Mbps Wireless N ADSL2+ Modem Router using **Quick Setup Wizard** within minutes.

3.1 TCP/IP Configuration

The default IP address of the TD-W8960N 300Mbps Wireless N ADSL2+ Modem Router is 192.168.1.1. And the default Subnet Mask is 255.255.255.0. These values can be changed as you desire. In this guide, we use all the default values for description.

Connect the local PC to the LAN/WAN port of the Router. And then you can configure the IP address for your PC in the following way.

- Obtain an IP address automatically

  1) Set up the TCP/IP Protocol in "**Obtain an IP address automatically**" mode on your PC. If you need instructions as to how to do this, please refer to Appendix B: "Configuring the PC".

  2) Then the built-in DHCP server will assign IP address for the PC.

Now, you can run the Ping command in the command prompt to verify the network connection. Please click the **Start** menu on your desktop, select **run** tab, type **cmd or command** in the field and press **Enter**. Type ***ping 192.168.1.1*** on the next screen, and then press **Enter**.

If the result displayed is similar to the screen below, the connection between your PC and the router has been established.

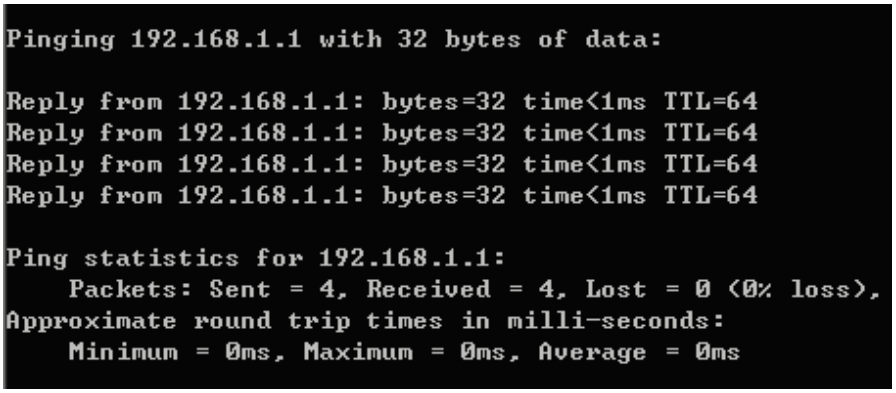


Figure 3-1

If the result displayed is similar to the screen shown below, it means that your PC has not connected to the router.

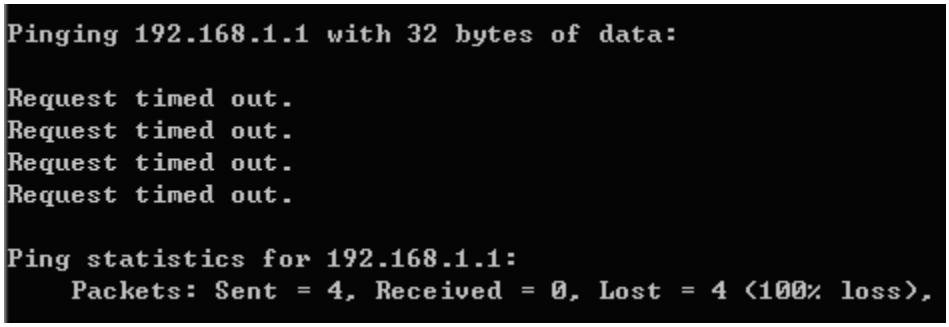


Figure 3-2

You can check it by following the steps below:

1) Is the connection between your PC and the router correct?

The LED of LAN port which you link to the device and the LEDs on your PC's adapter should be lit.

2) Is the TCP/IP configuration for your PC correct?

If the router's IP address is 192.168.1.1, your PC's IP address must be within the range of 192.168.1.2 - 192.168.1.254.

3.2 Quick Installation Guide

With a Web-based utility, it is easy to configure and manage the TD-W8960N 300Mbps Wireless N ADSL2+ Modem Router. The Web-based utility can be used on any Windows, Macintosh or UNIX OS with a Web browser, such as Microsoft Internet Explorer, Mozilla Firefox or Apple Safari.

1. To access the configuration utility, open a web-browser and type the default address http://tplinkmodem.net/ in the address field of the browser.

Figure 3-3

After a moment, a login window will appear, similar to the Figure 3-4. Enter **admin** for the Username and Password, both in lower case letters. Then click the **Login** button or press the **Enter** key.

Figure 3-4

☞ **Note:**

1) Do not mix up the username and password with your ADSL account username and password which are needed for PPP connections.

2) If the above screen does not pop up, it means that your Web-browser has been set to a proxy. Go to **Tools** menu→**Internet Options**→**Connections**→**LAN Settings**, in the screen that appears, cancel the Using Proxy checkbox, and click **OK** to finish it.

2. After your successful login, you will see the **Quick Setup Wizard**. Click **Next** to continue.

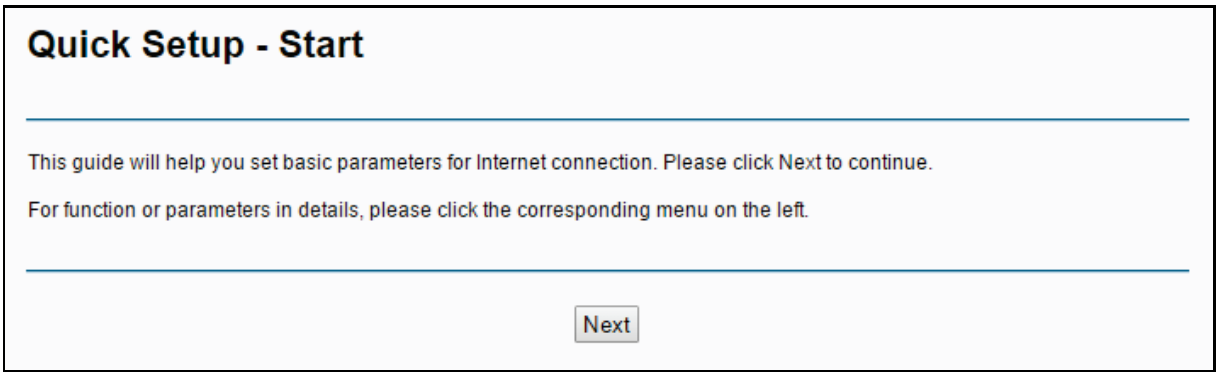


Figure 3-5

3. Choose the **WAN Type** for Internet access, and then click **Next**.

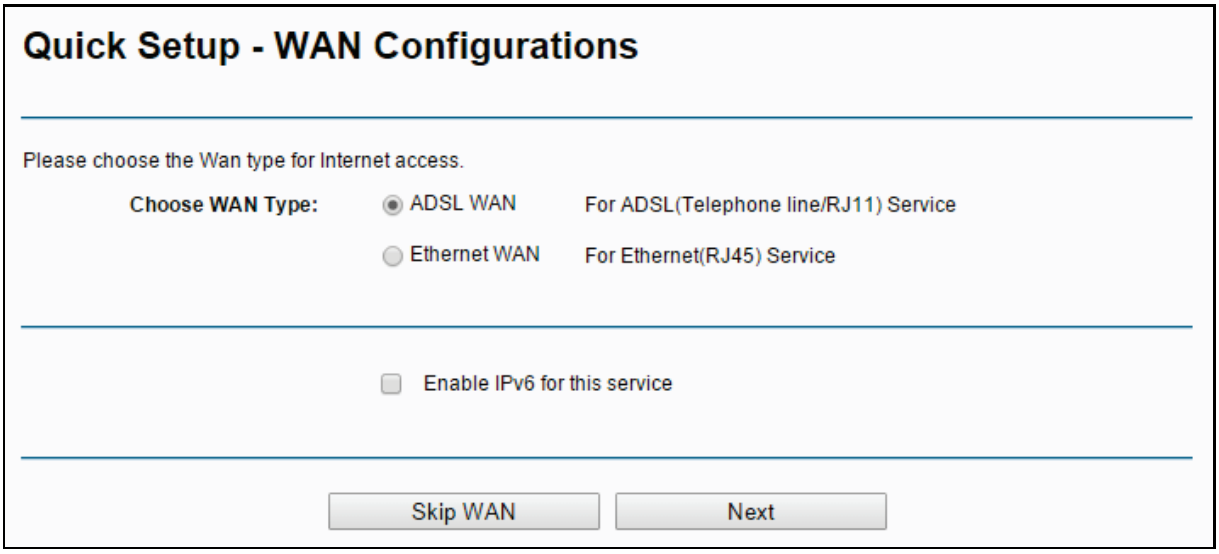


Figure 3-6

Note:

1) The Quick Setup Wizard will guide you to configure the WAN Service over ATM interface.

2) If you are unwilling to configure WAN Service now, you can click the **Skip WAN** button. Then you can configure WAN service referring to 4.4.1 Layer2 Interface.

4. If **ADSL WAN** is chosen, please select your **Country** and **ISP** from the drop-down list. Select **WAN Link Type** provided by your ISP and enter the related parameters, and then click **Next**. Here we use PPPoE as an example.

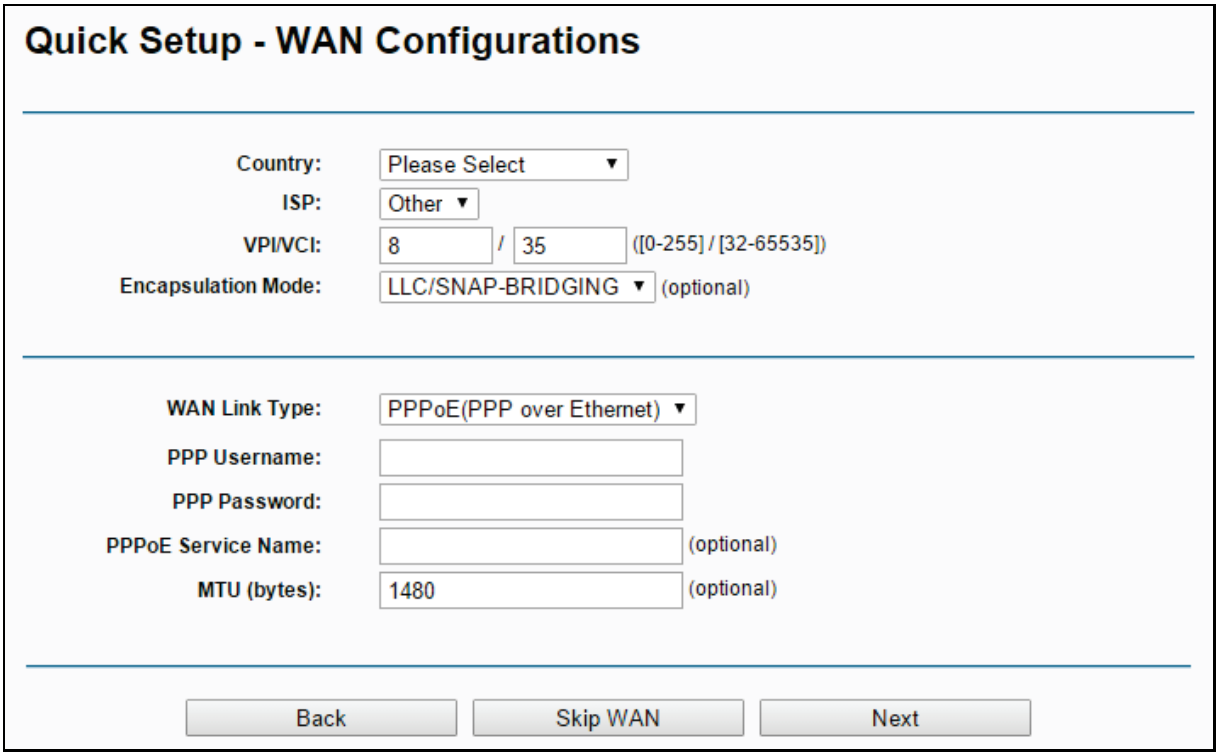


Figure 3-7

Note:

If your country or ISP is not listed, please select **Other**. Then you can manually enter the VPI/VCI values and select **WAN Link Type** provided by your ISP.

If **Ethernet WAN** is chosen, please select **WAN Link Type** provided by your ISP and enter the related parameters, then click **Next**. Here we use PPPoE as an example.

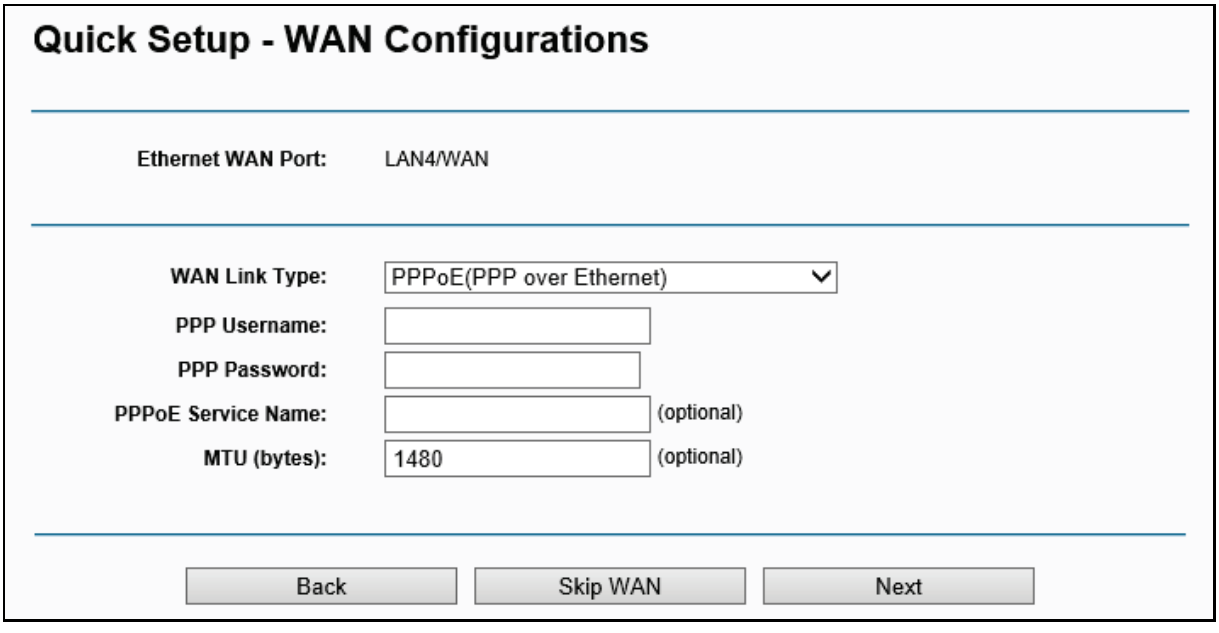


Figure 3-8

5. The WLAN function is enabled by default. You can rename your wireless network and create your own password in this page. The default wireless name is TP-LINK_XXXX, and the default wireless password which is the same as the PIN code, is printed on the bottom label. Click **Next** to continue.

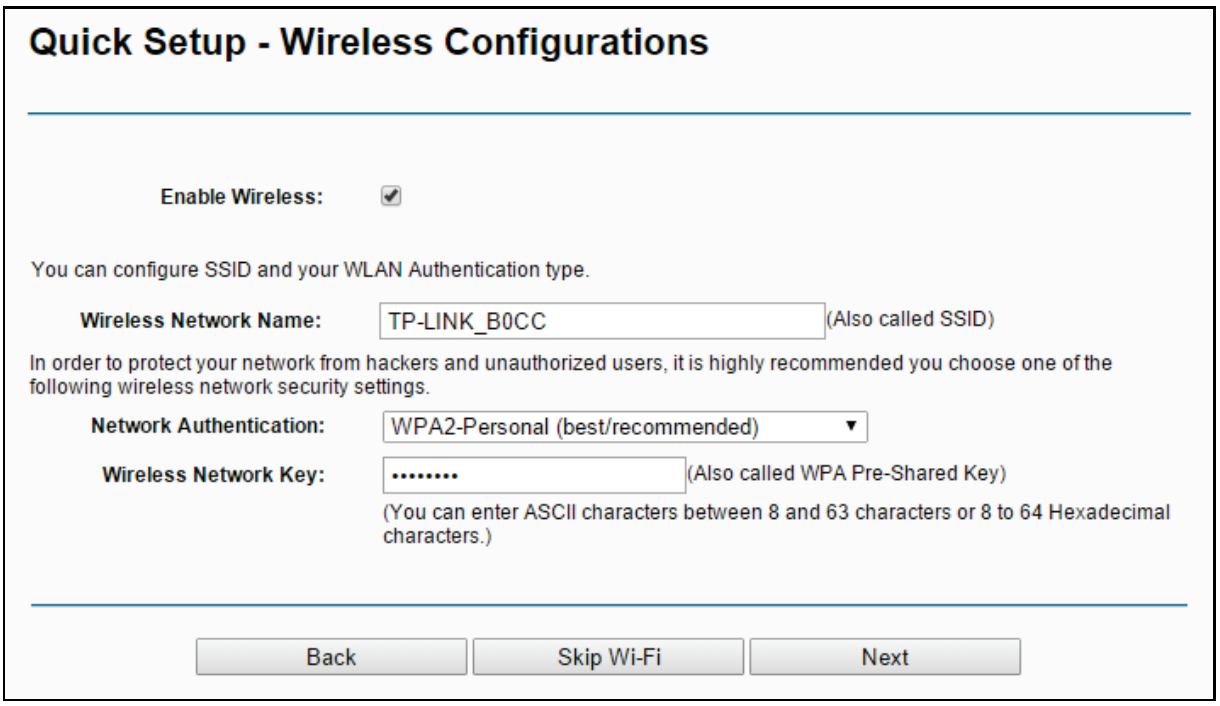


Figure 3-9

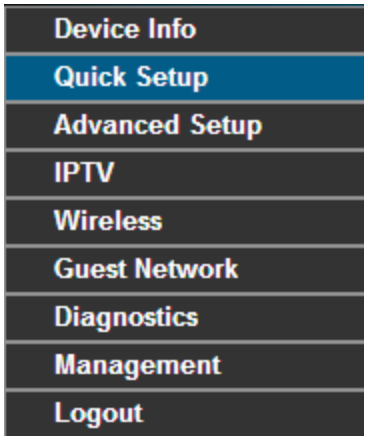
6. You will see the **Summary** screen, click **Confirm** to make your configurations take effect.

Chapter 4. Configuring the Modem Router

This chapter will show each Web page's key function and the configuration way.

4.1 Login

After your successful login, you will see the main menus on the left of the Web-based utility. On the right, there are the corresponding explanations and instructions.

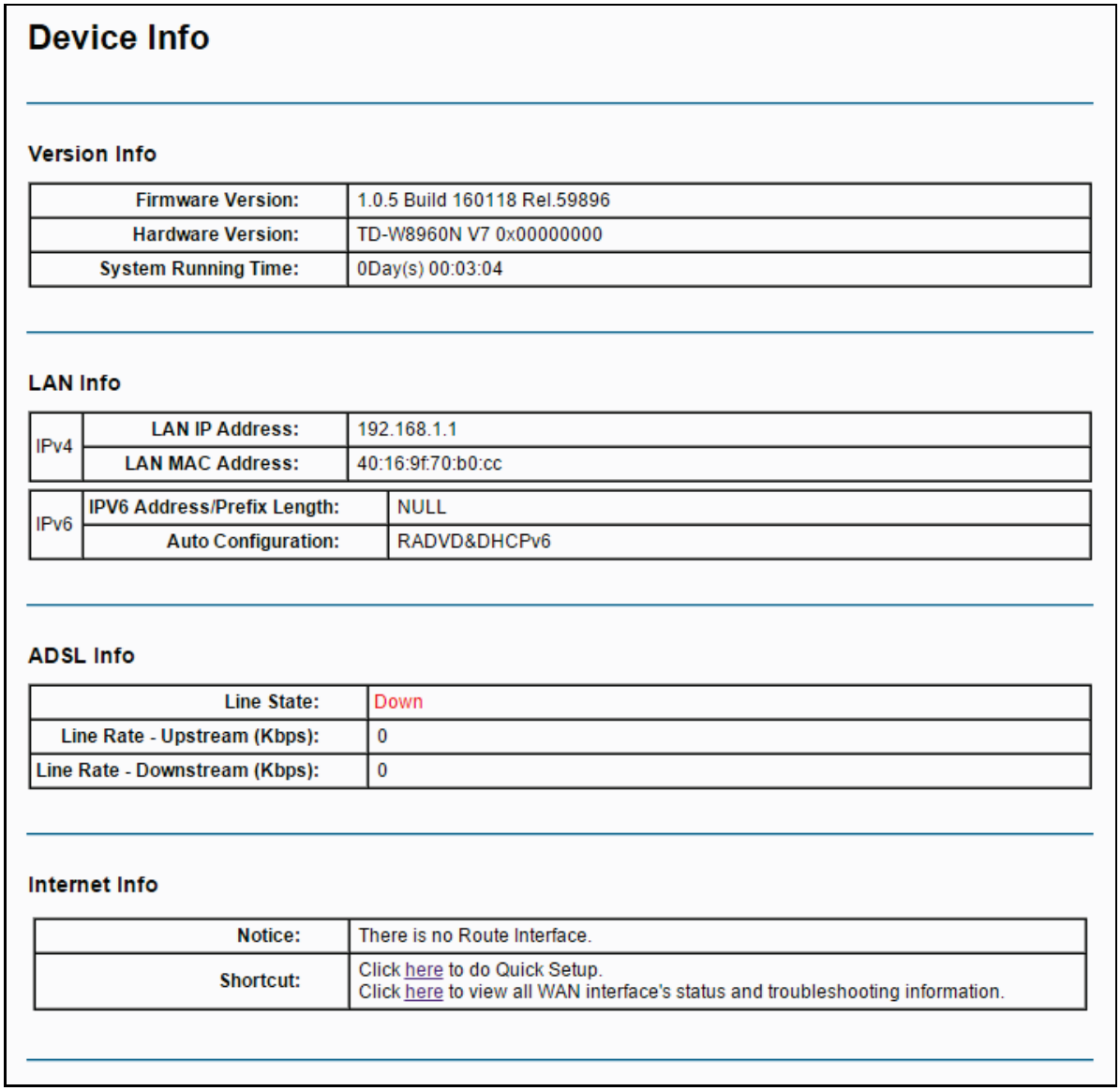


The detailed explanations for each Web page's key function are listed below.

4.2 Device Info

Choose "**Device Info**" menu, there are six submenus under the main menu: **Summary**, **WAN**, **Statistics**, **Route**, **ARP** and **DHCP**. This Device Info section mainly introduces the elementary information about the router and its current settings in use. Click any of them, and you will be able to view the corresponding information.

Choose "**Device Info**"→"**Summary**", you will see the Summary screen (shown in Figure 4-1). The first table indicates the information about the version including Software and Hardware. The second table displays the current status of the TD-W8960N connection. This information will vary depending on the settings of the router configured on the Advanced Setup screen.



Device Info

Version Info

Firmware Version:	1.0.5 Build 160118 Rel.59896
Hardware Version:	TD-W8960N V7 0x00000000
System Running Time:	0Day(s) 00:03:04

LAN Info

IPv4	LAN IP Address:	192.168.1.1
	LAN MAC Address:	40:16:9f:70:b0:cc
IPv6	IPV6 Address/Prefix Length:	NULL
	Auto Configuration:	RADVD&DHCPv6

ADSL Info

Line State:	Down
Line Rate - Upstream (Kbps):	0
Line Rate - Downstream (Kbps):	0

Internet Info

Notice:	There is no Route Interface.
Shortcut:	Click here to do Quick Setup. Click here to view all WAN interface's status and troubleshooting information.

Figure 4-1

Note:

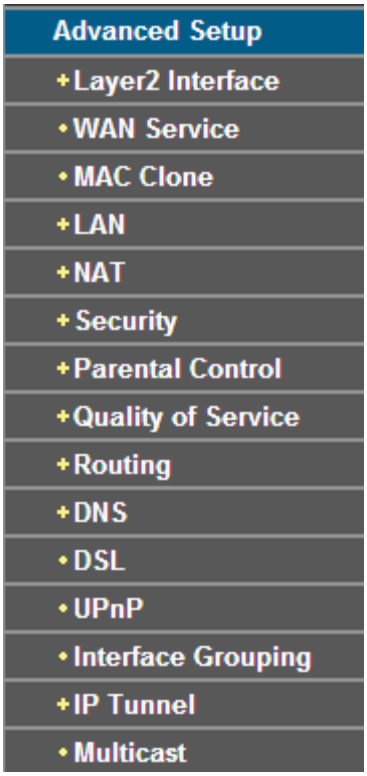
Click the other submenus under the main menu **Device Info**, and you will be able to view the corresponding information about **WAN**, **Statistics**, **Route**, **ARP** and **DHCP**.

4.3 Quick Setup

Please refer to Section 3.2 Quick Installation Guide.

4.4 Advanced Setup

Choose "**Advanced Setup**", there are many submenus under the main menu. Among the submenus, **Layer2 Interface**, **WAN Service**, **LAN** etc. are default menus, while **NAT** will appear only when you select some corresponding functions. Click any one of them, and you will be able to configure the corresponding function.



This Advanced Setup section mainly introduces how to configure the router for adequate use. The detailed explanations for each subsection are provided below.

☞ **Note:**

To completely configure the WAN Interface, you need to first select the Layer2 Interface (4.4.1 Layer2 Interface) according to the connection ISP provides for you, and then to select the type of the connection (4.4.2 WAN Service) for the further configuration.

4.4.1 Layer2 Interface

Choose "**Advanced Setup**"→"**Layer2 Interface**", and you can select WAN Service Interface (layer2 interface) over **ATM Interface** or **ETH Interface**.

- **ATM Interface:** Configure the router to access Internet as an ADSL user. ISP provides you VPI (Virtual Path Identifier), VCI (Virtual Channel Identifier) settings and the DSL Interface with RJ11 connector. (Figure 4-)
- **ETH Interface:** Configure the router to access Internet as an Ethernet user. ISP provides you Broadband Internet Service and the Ethernet Interface with RJ45 connector.

4.4.1.1 ATM Interface

Choose "**Advanced Setup**"→"**Layer2 Interface→ATM Interface**", you can Configure ATM interfaces on the screen below.

- **Add**: Click the **Add** button to add a new interface in the next screen.

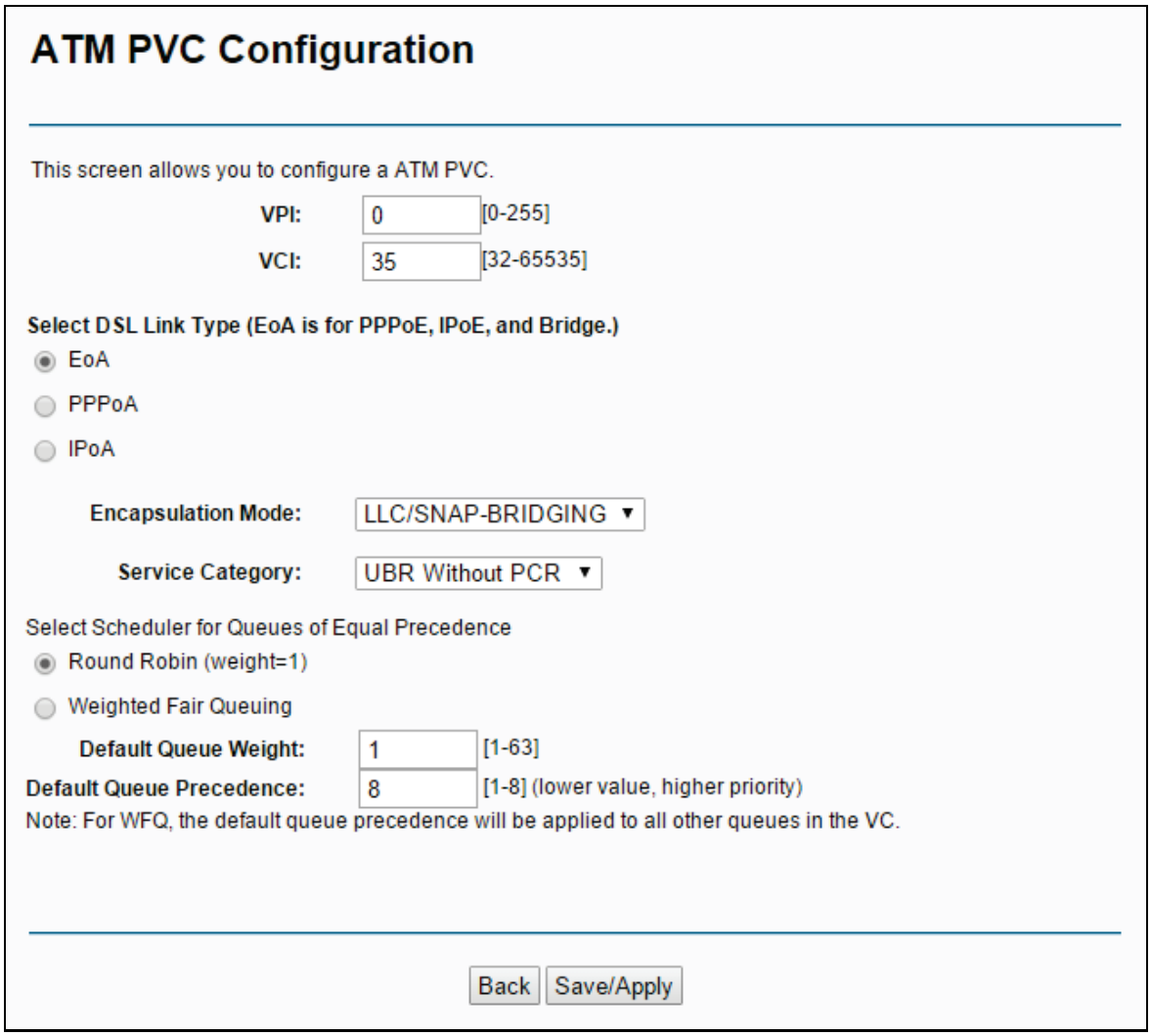


Figure 4-2

- **VPI/VCI**: the VPI and VCI values provided by your ISP. Do not change them unless it was required by your ISP.
- **DSL Link Type**: Select the DSL Link Type provided by your ISP. The options include **EoA** (it is for PPPoE, IPoE, and Bridge), **PPPoA** (PPP over ATM) and **IPoA** (IP over ATM).
- **Encapsulation Mode**: The mode of data processing over the Link Type you have selected. Use the default settings, if you are not sure.
- **Service Category**: Select the type of the service assigned by your ISP in the drop-down list. The default type is **UBR Without PCR**.

Note:

The detailed configuration about **Scheduler for Queues of Equal Precedence** will be described in **Quality of Service**.

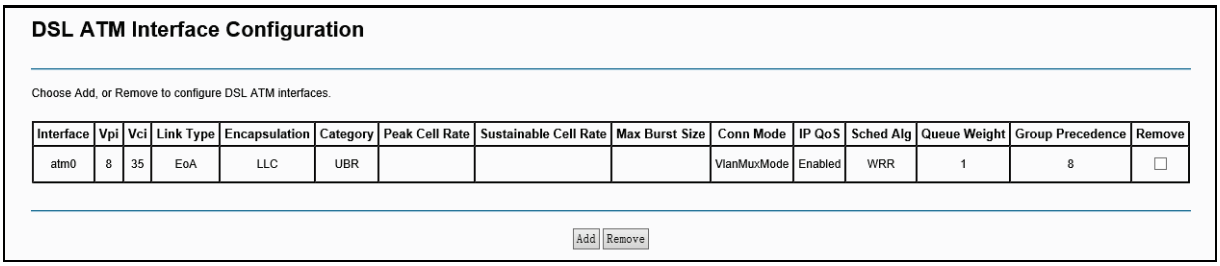


Figure 4-3

- **Remove**: Select the checkbox in the table and then click the **Remove** button, the corresponding interface will be deleted from the table.

Note:

If the interface is used by the configuration of the 4.4.2 WAN Service, you need to remove the corresponding WAN Service entry before removing it here.

4.4.1.2 ETH Interface

Choose "**Advanced Setup**"→"**Layer2 Interface→ETH Interface**", you can configure ETH WAN interfaces on the screen below.

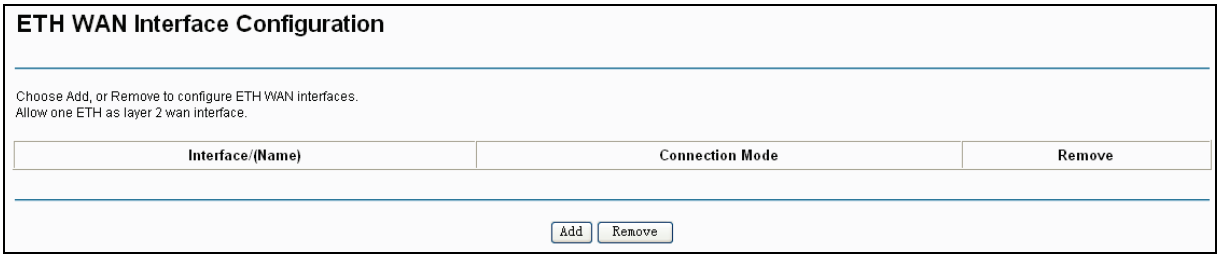


Figure 4-4

- **Add:** Click the **Add** button, and you can add a new interface in the next screen.

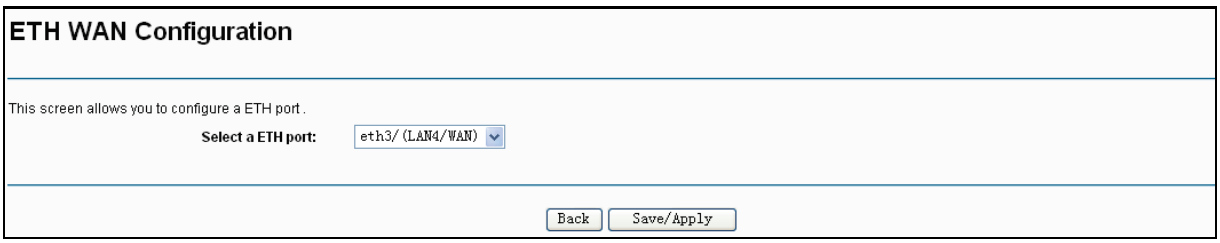


Figure 4-5

- **ETH port**: Select an ETH port to configure as the WAN port.

Click **Save/Apply** to save your settings and then you will see the screen similar to Figure 4-6.

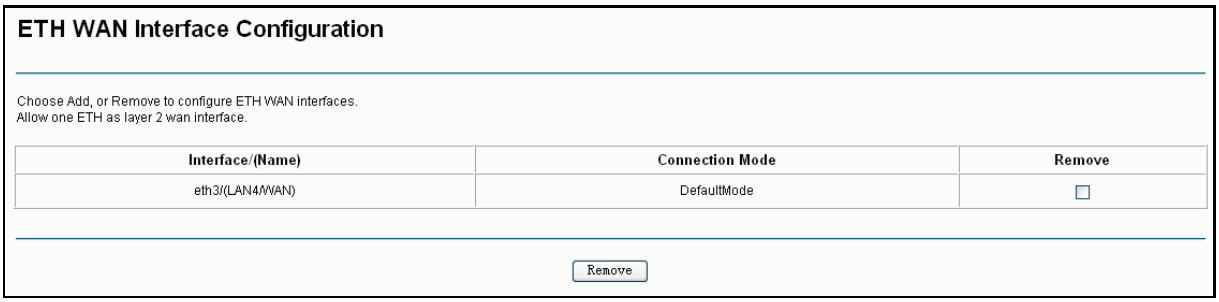


Figure 4-6

- **Remove:** Select the checkbox in the table and then click the **Remove** button, the corresponding interface will be deleted from the table.

Note:

Only one ETH is allowed to configure as the layer 2 WAN Interface.

4.4.2 WAN Service

Choose "**Advanced Setup**"→"**WAN Service**", and you will see the WAN Port Information Table in the screen similar to Figure 4-7, which describes the WAN port settings and the relevant manipulation to each interface. After you add a new Layer2 Interface, please follow the instructions below to complete the further configuration of WAN Interface. There are five different configurations for the connection types, which are PPPoE, IPoE, Bridge, PPPoA, and IPoA. You can select the corresponding types according to your needs.

Note:

Bridge mode is not available under Wireless Router Mode.

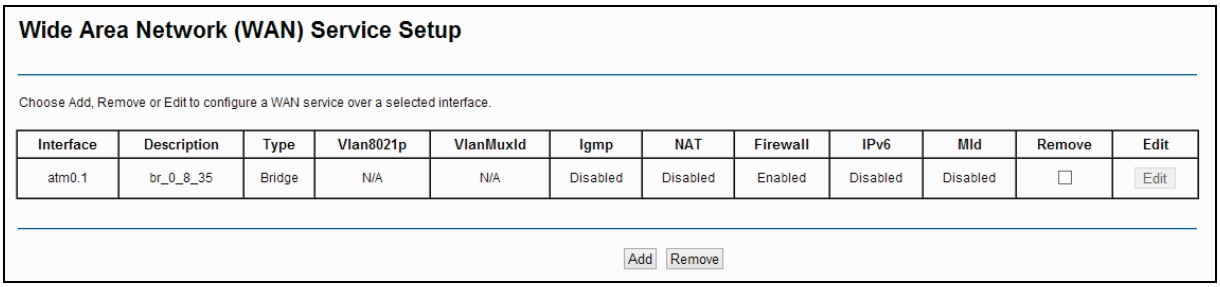


Figure 4-7

Note:

The following section adopts different VPI, VCI to introduce further configuration for the different connection types, if you need to change the configuration of ATM PVC (VPI/VCI), go to the previous section (4.4.1 Layer2 Interface) to configure them again.

4.4.2.1 ATM-EoA-PPPoE

If your ISP provides a **PPPoE** connection and you need to use an ATM Interface, follow the steps below to add a WAN service over a selected ATM interface:

1. Add a **new** ATM interface (4.4.1.1 ATM Interface).

2. Click the **Add** button and you will enter the next screen as shown in Figure 4-8. Click **Next**.

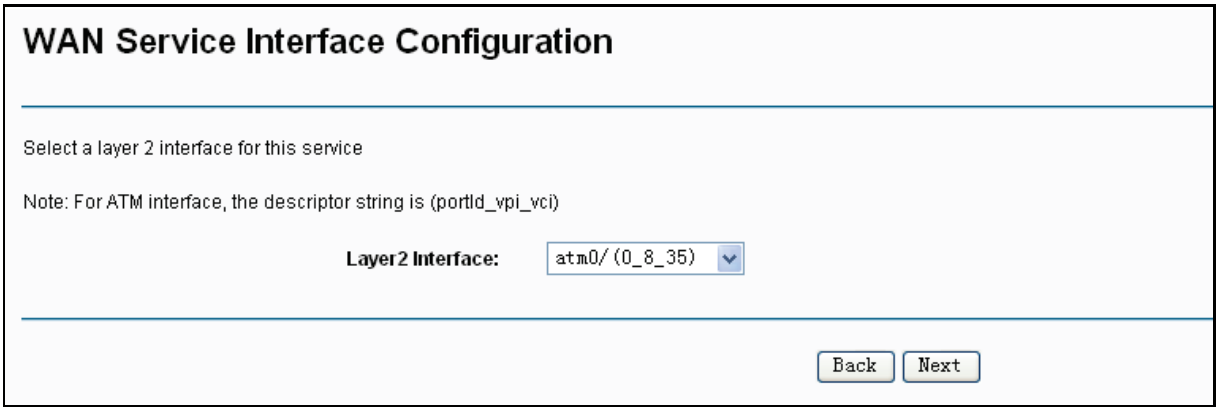


Figure 4-8

3. Select the **WAN service type**. If your ISP provides a PPPoE connection, select **PPPoE**. You can create a service name for the **Service Description** or leave it as default. Then click **Next**.

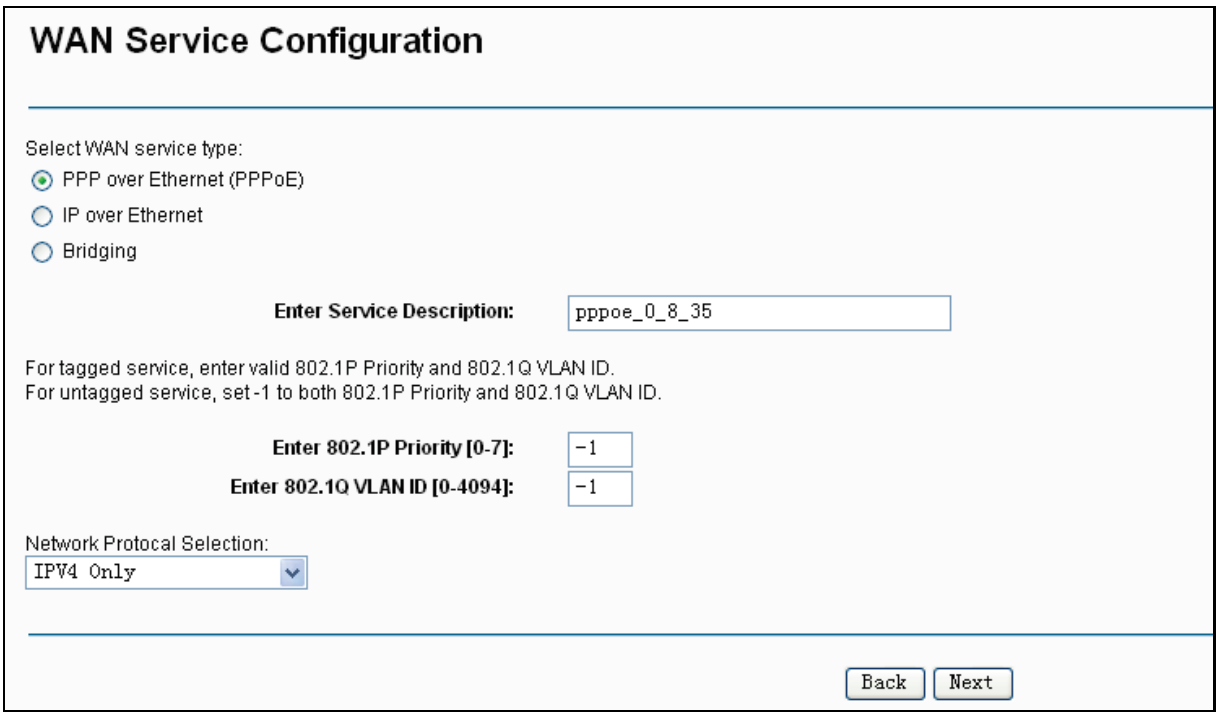


Figure 4-9

4. Enter the following parameters and then click **Next**.

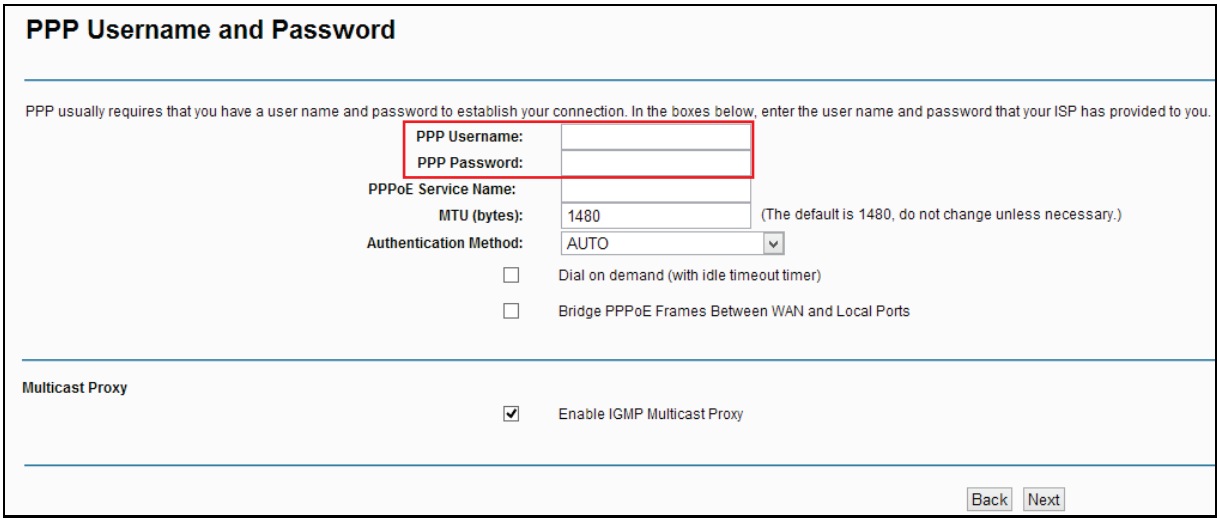


Figure 4-10

- **PPP Username/Password**: Enter the Username and Password provided by your ISP. These fields are case-sensitive.
- **PPPoE Service Name**: Enter the Service Name if it was provided by your ISP. You can leave it blank if the ISP doesn't provide it.
- **MTU (bytes)**: Maximum Transmission Unit Size. The default **MTU** value is 1480 Bytes. It is not recommended that you change the default value unless required by your ISP.
- **Authentication Method**: Select the **Authentication Method** from the drop-down list, the default method is **AUTO**, and you can leave it as a default setting.
- **Dial on demand (with idle timeout timer)**: The router will cut off the Internet connection after it has been inactive for a specific period of time (idle timeout), and it will automatically re-establish the connection as soon as you attempt to access the Internet again. If your Internet is charged by time you may want to select this option in order to save money.
- **Bridge PPPoE Frames Between WAN and Local Ports**: Select this option to enable PPP connection in your local PC.
- **Enable IGMP Multicast Proxy**: IGMP (Internet Group Management Protocol) is used to manage multicasting on TCP/IP networks. Some ISPs use IGMP to perform remote configuration for client devices, such as the router. The default value is enabled, and if you are not sure, please contact your ISP or just leave it.

5. Select a preferred wan interface as the system default gateway in Figure 4-11 and click **Next**.

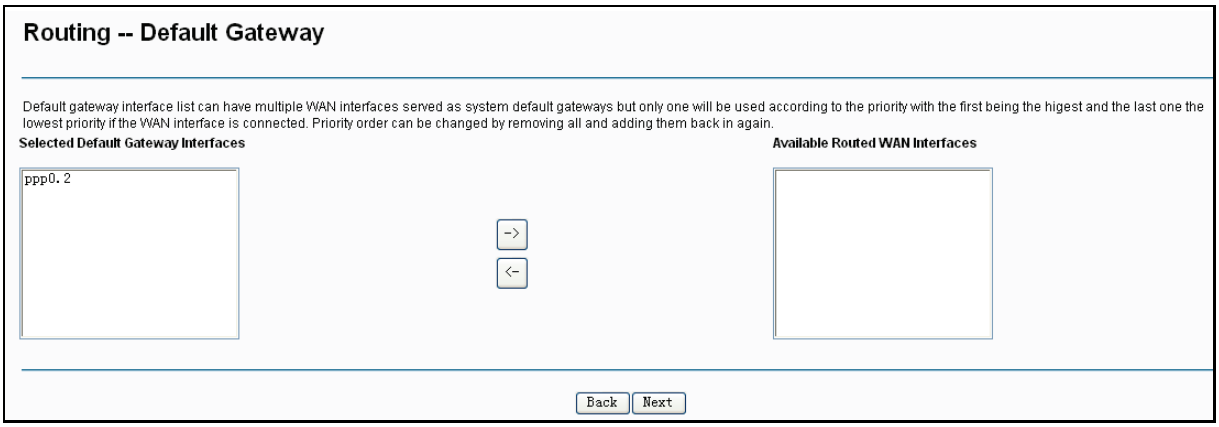


Figure 4-11

6. Configure the DNS Server Addresses and click **Next**.

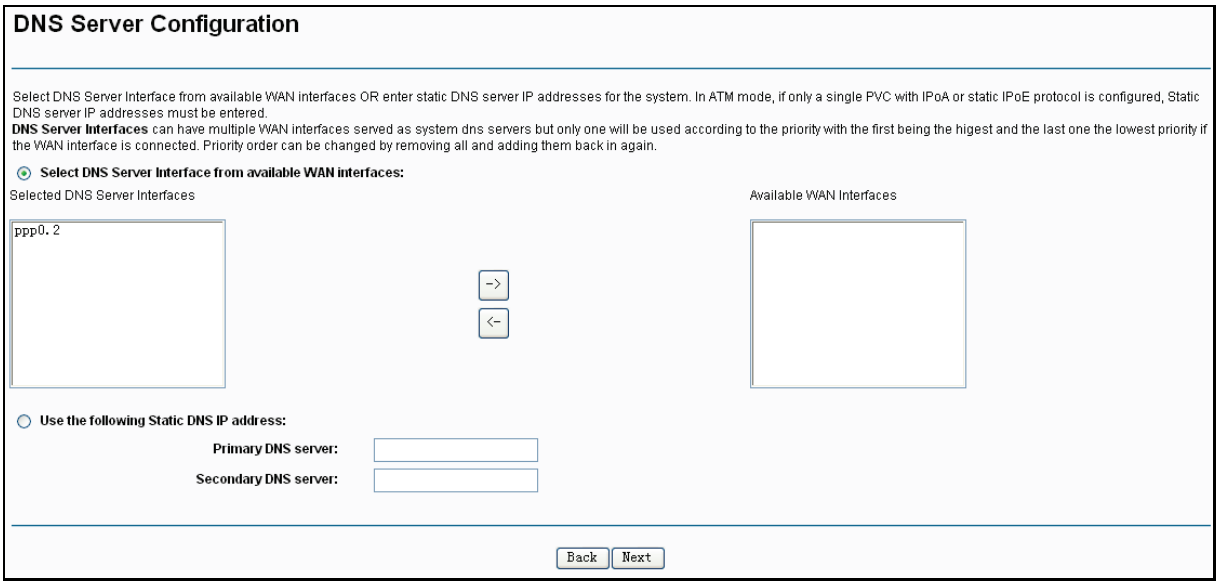


Figure 4-12

- **Select DNS Server Interface from available WAN Interfaces:** You can select this option to automatically get DNS server information from the selected WAN interface.
- **Use the following Static DNS IP Address:** You can select this option to manually enter the primary and /or optional secondary DNS server IP addresses provided by your ISP.

Note:

If only single PVC with IPoA is configured, you must enter static DNS server IP addresses.

7. On the next screen you will see the detailed settings you've made. Please click the **Save/Apply** button to save these settings.

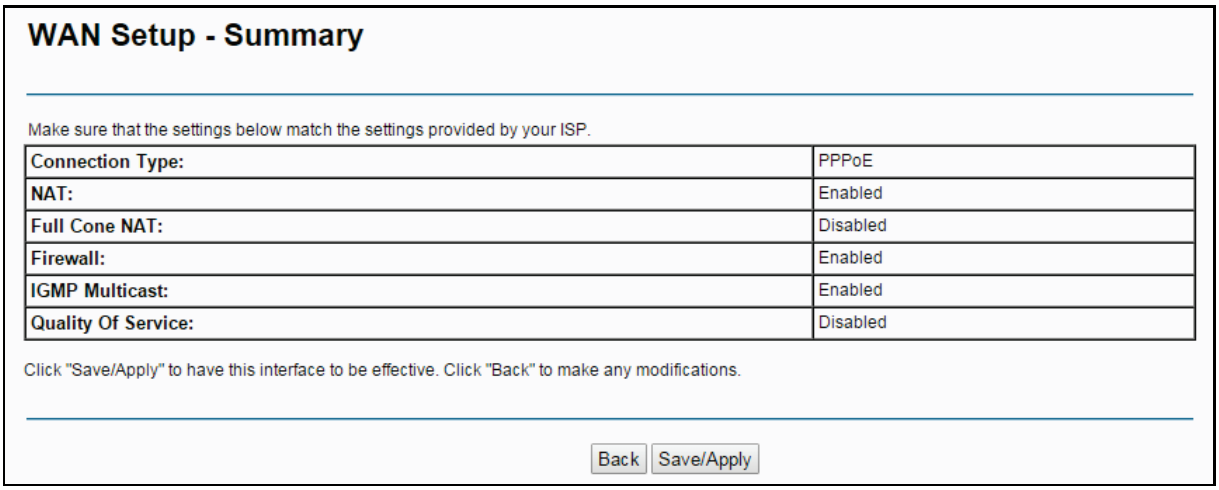


Figure 4-13

8. On the next screen you will see the WAN Port Information Table with the new configuration.

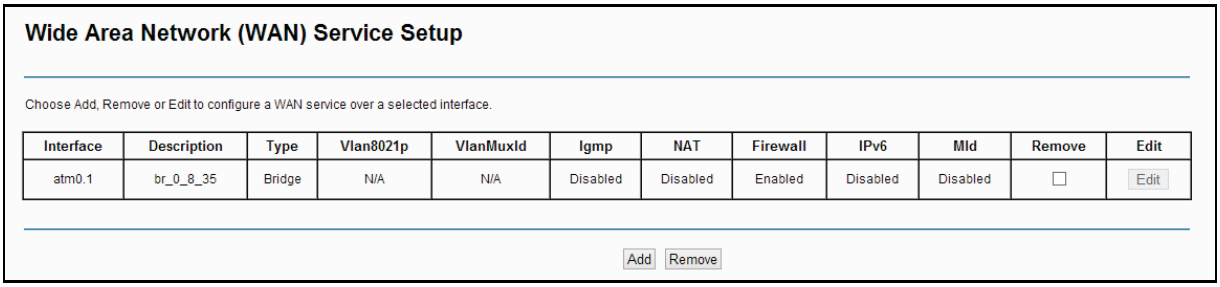


Figure 4-14

- **Remove:** Select the checkbox in the table and then click **Remove**, the corresponding interface will be deleted.

4.4.2.2 ATM-EoA-IPoE

If your ISP provides an **IPoE** connection and you need to use an ATM Interface, follow the steps below to add a WAN service over a selected ATM interface:

1. Add a **new** ATM interface (4.4.1.1 ATM Interface).
2. Click the **Add** button on the screen (as shown Figure 4-7). Select WAN Service Interface over ATM PVC on the next screen (as shown Figure 4-8).
3. If your ISP provides an IPoE connection, select **IP over Ethernet** option for the **WAN service type** on the screen (as shown Figure 4-9), and click **Next** button to continue.
4. Enter parameters in the following blanks to configure the WAN IP Address and click **Next**.

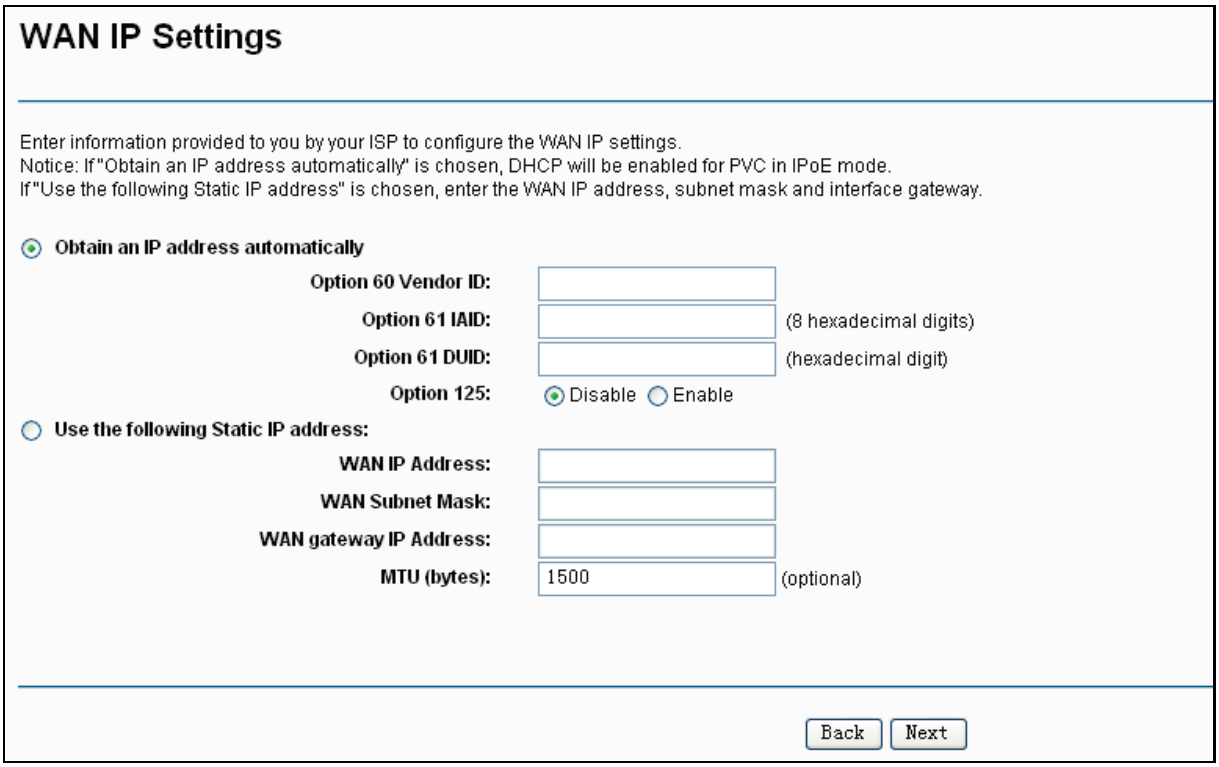


Figure 4-15

➢ **Obtain an IP address automatically:** Select this option, the router will be able to obtain IP network information dynamically from a DHCP server provided by your ISP.

☞ **Note:**

1) The response message from a DHCP server typically contains a number of configuration parameters (DHCP options) for the router. The DHCP options include IP network information, and also the vendor-specific options. In some cases, the router is implemented to perform user-defined operations (as shown below). You can implement your own treatment of all such options.

2) If the router is functioning as a DHCP client, it must identify itself in option 61 (client-identifier) in every DHCP message. DUID/IAID is portion of option 61.

- **Option 60 Vendor ID:** The option code 60 used to identify Vendor class.
- **Option 61 IAID:** IAID (Identity Association ID) assigns an Identity Association ID to individual interfaces. In cases where the device is functioning with a single DHCP client identity, it must use value 1 for IAID for all DHCP interactions. In cases where the device is functioning with multiple DHCP client identities, the values of IAID have to start at 1 for the first identity and be incremented for each subsequent identity. For example, the device may use IAID value 1 for the first physical interface and value 2 for the second. Alternatively, the device may use IAID value 1 for the virtual circuit corresponding to the first connection object in the data model and value 2 for the second connection object in the data model.
- **Option 61 DUID:** Specifies the name of the interface whose link-layer address the server is to use as its DUID (DHCP Unique Identifier). You must enter a value for this parameter or the server will not start. When the server starts, the DUID is written to the system log.

- **Option 125:** The option 125 allows DHCP server to be pre-configured with policy for handling classes of devices in a certain way without requiring DHCP server to be able to parse the unique format used in client-identifier option.

➢ **Use the following IP Address**: If you are provided with a static IP/gateway Address, please select this option, and then enter the **WAN IP Address**, **WAN Subnet Mask** and **WAN gateway IP Address** manually.

5. You will see the next screen as below. You can enable the **NAT**, **SPI Firewall**, and **IGMP Multicast**. If you are not sure about the settings, just leave the default settings. Click **Next**.

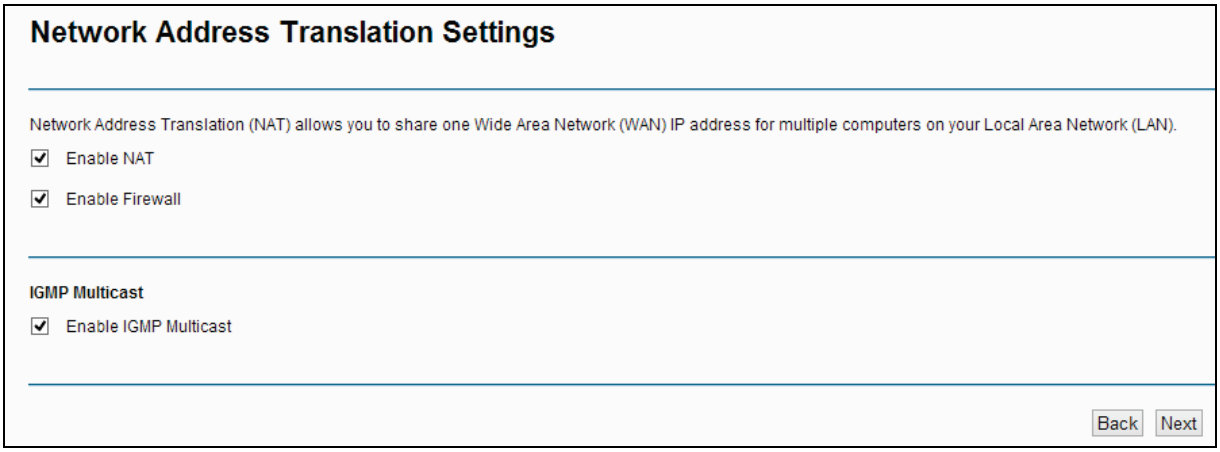


Figure 4-16

➢ **Enable NAT:** This technology translates the IP addresses of a local area network to the WAN IP address for the Internet. If this router is hosting your network's connection to the Internet, please select the checkbox. If another router exists in your network, you don't need to select the option.

➢ **Enable Firewall:** A SPI firewall enhances network's security. Select the option to use a firewall, or else without a firewall.

➢ **Enable IGMP Multicast:** This is enabled by default. This setting will not allow IGMP (Internet Group Management Protocol) packets to be forwarded to the LAN. IGMP is used to manage multicasting on TCP/IP networks. Most users will not need to enable this. Some ISPs use IGMP to perform remote configuration for client devices, such as the router. If you are unsure, check with your ISP.

Note:

If you select the **Enable NAT** checkbox, the **NAT** menu will be added to the Web-based Utility. We will describe the detailed configuration in 4.4.5 NAT.

6. Select a preferred **WAN** interface as the system default gateway and click **Next**.

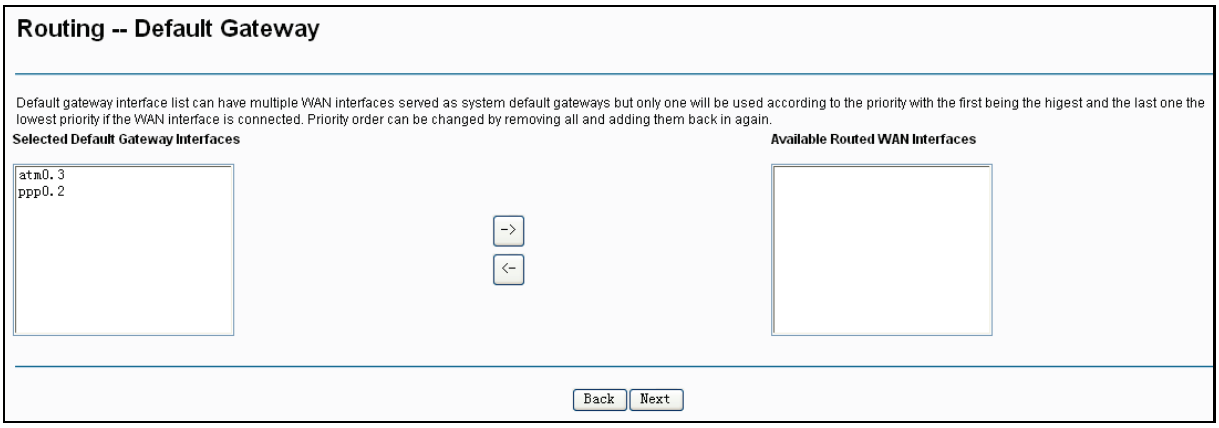


Figure 4-17

7. Configure the DNS Server Addresses on the screen as follows.

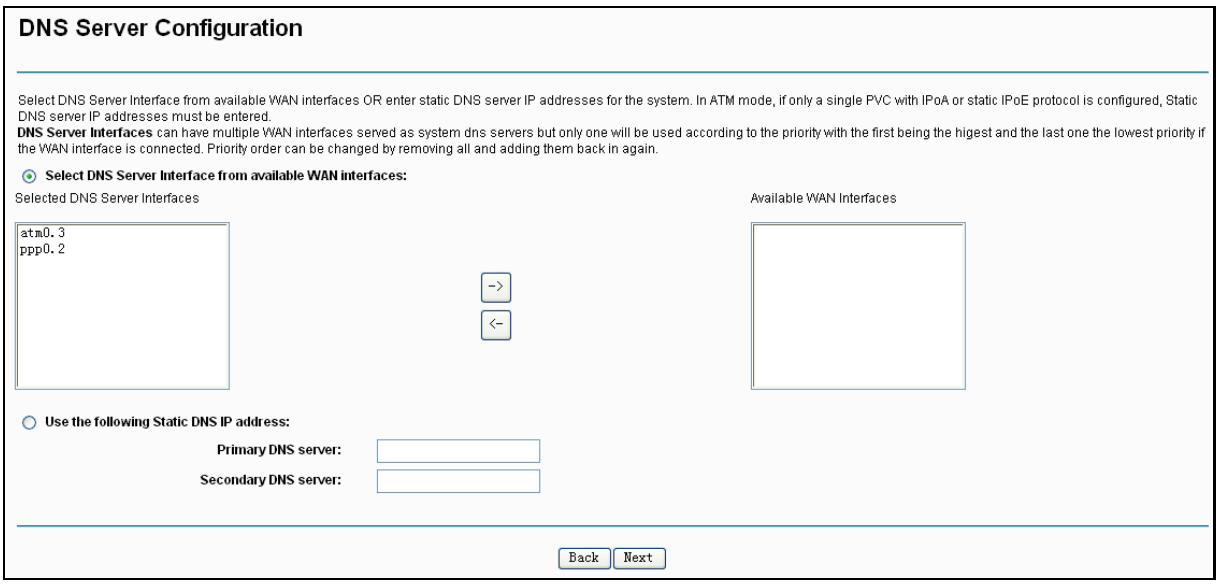


Figure 4-18

Note:

If only single PVC with IPoA is configured, you must enter static DNS server IP addresses.

8. On the next screen (as shown Figure 4-19) you will see the detailed settings you've made. Please click the **Save/Apply** button to save these settings.

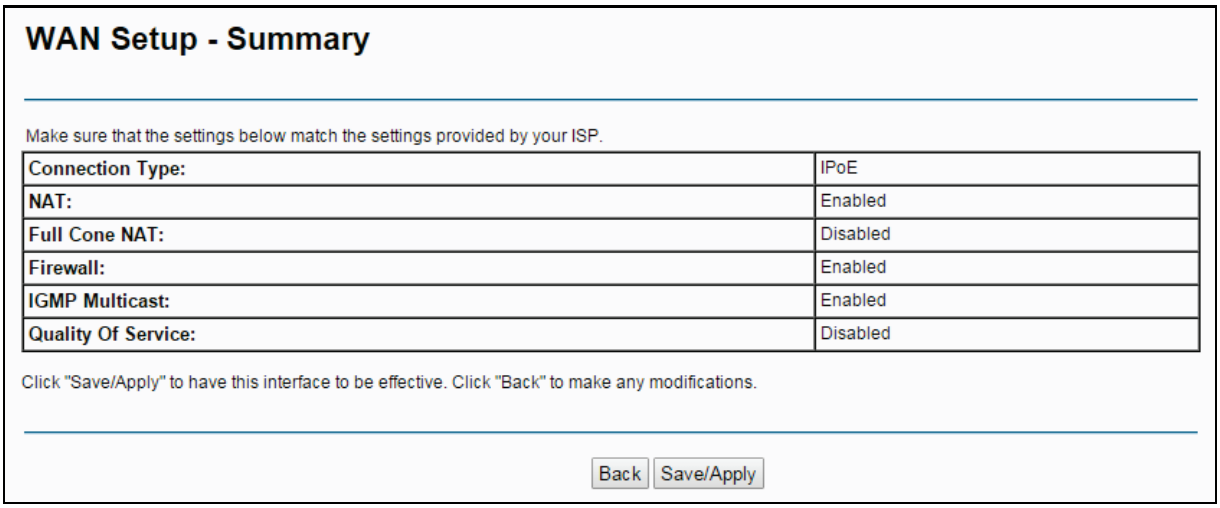


Figure 4-19

4.4.2.3 ATM-EoA-Bridging

If you want to adopt the **Bridge** service and you need to use an ATM Interface, follow the steps below to add a WAN service over a selected ATM interface:

1. Add a new ATM interface (see 4.4.1.1 ATM Interface).
2. Click the **Add** button on the screen Figure 4-7. Select WAN Service Interface over ATM PVC on the next screen (as shown Figure 4-8).
3. Select **Bridging** option for the **WAN service type** on the screen (as shown Figure 4-9), and click **Next** button to continue.
4. On the screen (as shown Figure 4-13) you will see the detailed settings you've made. Please click the **Save/Apply** button to save these settings.

4.4.2.4 ATM-PPPoA

If your ISP provides a **PPPoA** connection and you need to use an ATM Interface, follow the steps below to add a WAN service over a selected ATM interface:

1. Add a new ATM interface and select **PPPoA** option for DSL Link Type (see 4.4.1.1 ATM Interface).
2. Click the **Add** button on the screen Figure 4-7 and the next configuration is similar to **PPPoE**, (see section 4.4.2.1 ATM-EoA-PPPoE**)**. The difference is that you don't need to set the **PPPoE Service Name** and **Bridge PPPoE Frames Between WAN and Local Ports** on the screen of Figure 4-10.

4.4.2.5 ATM-IPoA

If your ISP provides an **IPoA** connection and you need to use an ATM Interface, follow the steps below to add a WAN service over a selected ATM interface.

1. Add a new ATM interface and select **IPoA** option for DSL Link Type (see 4.4.1.1 ATM Interface).
2. Click the **Add** button on the screen Figure 4-7 and the next configuration is similar to **IPoE** (see section 4.4.2.2 ATM-EoA-IPoE). The difference is that you have to manually set the

Static IP Address on the screen of Figure 4-15, and the Static IP Address for DNS Server on the screen of Figure 4-18.

4.4.2.6 ETH-PPPoE

If your ISP provides a **PPPoE** connection and you need to use an **ETH** Interface, follow the steps below to add a WAN service over a selected ETH interface:

1. Add a new **ETH** interface on the screen of 4.4.1.2 ETH Interface.
2. Click the **Add** button on the screen Figure 4-7 and the following configuration is similar to **PPPoE** over ATM interface (see section 4.4.2.1 ATM-EoA-PPPoE).

4.4.2.7 ETH-IPoE

If your ISP provides an **IPoE** connection and you want to use an **ETH** Interface, follow the steps below to add a WAN service over a selected ETH interface:

1. Add a new **ETH** interface on the screen of 4.4.1.2 ETH Interface.
2. Click the **Add** button on the screen Figure 4-7 and the next configuration is similar to **IPoE** over ATM interface (see section 4.4.2.2 ATM-EoA-IPoE).

4.4.3 MAC Clone

Choose menu "**Advanced Setup**"→"**MAC Clone**", you can configure the MAC address of the WAN Interface as shown below.

The WAN Interface List displays the Lay2 Interfaces you have configured on the section 4.4.1 Layer2 Interface and its default MAC Address. If you have not configured corresponding WAN Service for the interface on the section 4.4.2 WAN Service, the blank for MAC Address will display "Need a corresponding WAN Service".

The last one of WAN Interface List displays your PC's current address.

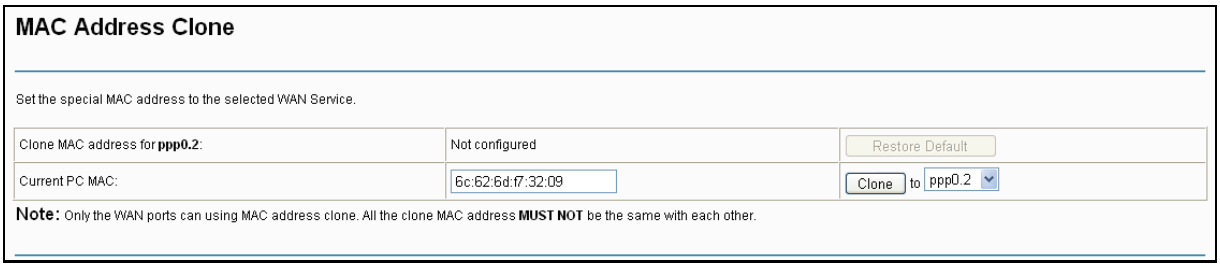


Figure 4-20

Type the new value for the WAN Interface whose MAC Address you want to change.

You can select corresponding WAN Interface from the drop-down list and click **Clone** button to clone your current PC MAC.

Click **Restore Default** button to restore the WAN Interface's default MAC Address.

Note:

Only the WAN Ports can use MAC Address Clone function. All the clone MAC addresses must not be the same with each other.

4.4.4 LAN

Choose "**Advanced Setup**"→"**LAN**", and you will see the LAN screen (shown in Figure 4-21), the section allows you to configure the router's LAN ports settings.

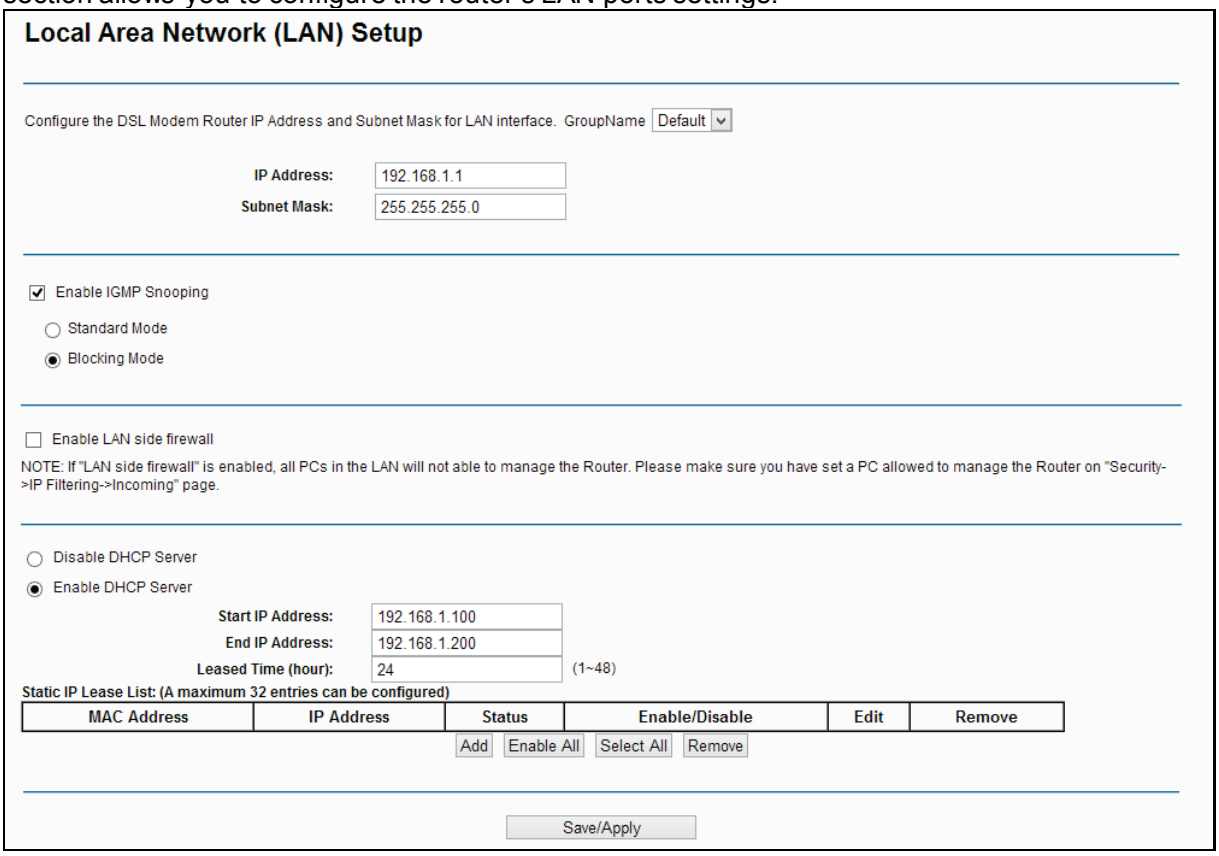


Figure 4-21

- **IP Address:** Enter the router's local IP Address, then you can access to the Web-based Utility via the IP Address, the default value is 192.168.1.1.
- **Subnet Mask:** Enter the router's Subnet Mask, the default value is 255.255.255.0.
- **Enable IGMP Snooping:** If you select the option, please choose the IGMP Mode: Standard Mode or Blocking Mode.
- **Enable LAN side firewall:** You can click the checkbox to enable LAN side firewall.
- **DHCP Server:** These settings allow you to configure the router's Dynamic Host Configuration Protocol (DHCP) server function. The DHCP server is enabled by default for the router's Ethernet LAN interface. DHCP service will supply IP settings to computers which are configured to automatically obtain IP settings that are connected to the router though the Ethernet port. If you enable the DHCP server, the router becomes the default gateway for DHCP client connected to it. Keep in mind that if you change the IP address of the router, you must change the range of IP addresses in the pool used for DHCP on the LAN.
  - **Start IP Address:** Enter a value for the DHCP server to start with when issuing IP addresses. Because the default IP address for the router is 192.168.1.1, the default Start IP Address is **192.168.1.100**, and the Start IP Address must be 192.168.1.2 or greater, but smaller than 192.168.1.254.

- **End IP Address:** Enter a value for the DHCP server to end with when issuing IP addresses. The End IP Address must be smaller than 192.168.1.254. The default End IP Address is **192.168.1.200**.
- **Leased Time (hour):** The Leased Time is the amount of time in which a network user will be allowed to connect to the router with their current dynamic IP address. Enter the amount of time, in hours, then the user will be "leased" this dynamic IP address. The default is **24** hours.

➢ **Static IP Lease List**: The function allows you to specify a reserved IP address for a PC on the LAN, that PC will always obtain the assigned IP address each time when it accesses the DHCP server. Reserved IP addresses should be assigned to servers that require permanent IP settings. Click the **Add Entries** button in Figure 4-21, and then you will set the rule in the screen as below.

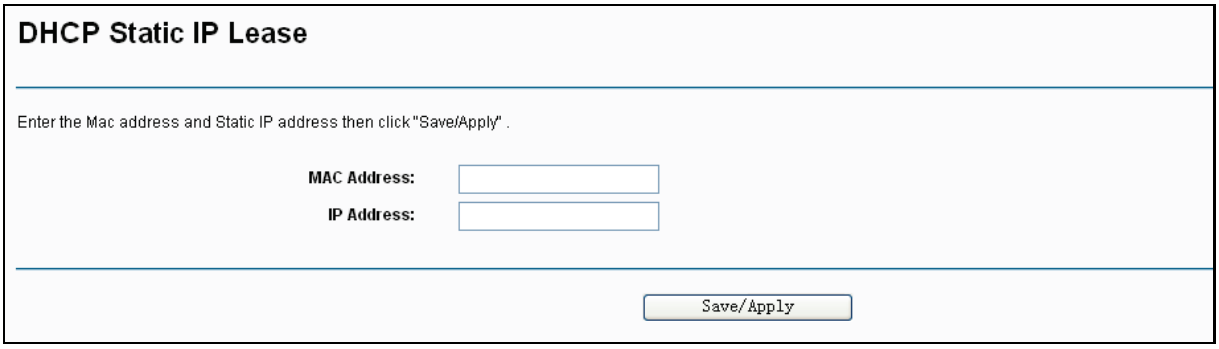


Figure 4-22

- MAC Address: The MAC address of the computer on the LAN which you want to reserve an IP.
- IP Address: The IP address you want to reserved for the computer.

4.4.4.1 IPv6 LAN Config

Choose "**Advanced Setup**"→"**LAN**" →"**IPv6 LAN Config**", and you will see the LAN screen (shown in Figure 4-23), here you can configure LAN IPv6 interface for your modem router.

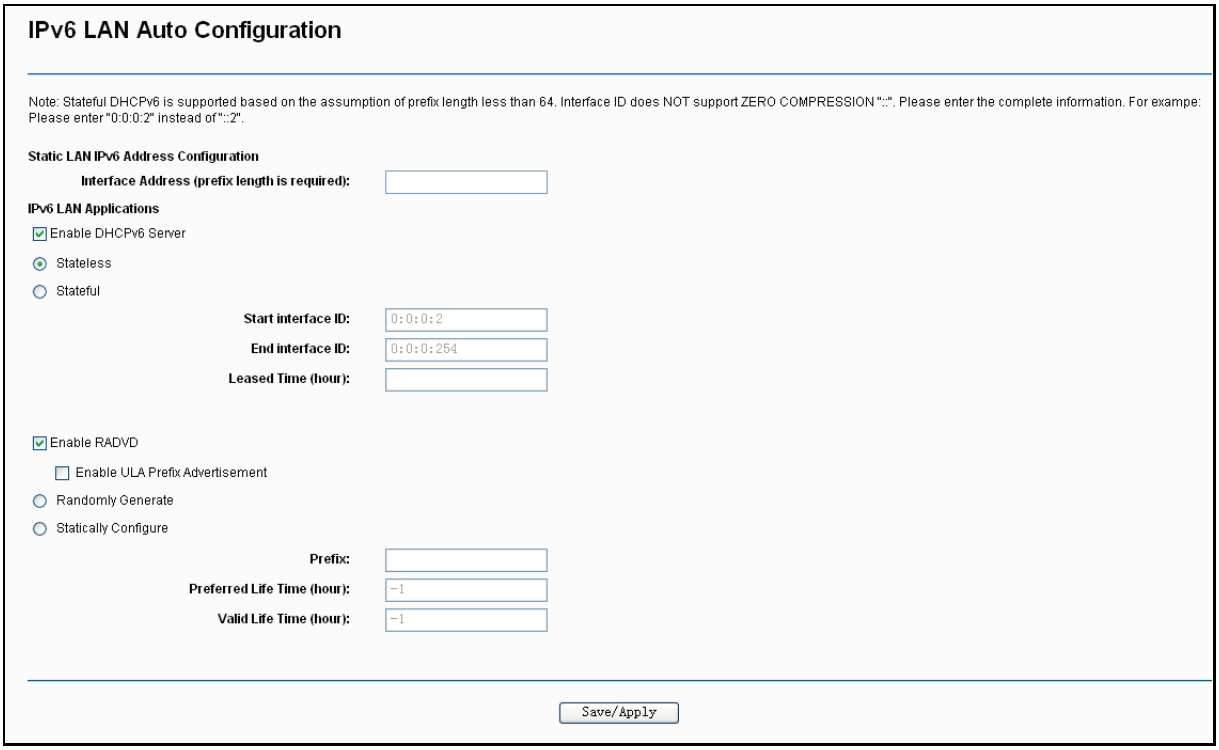


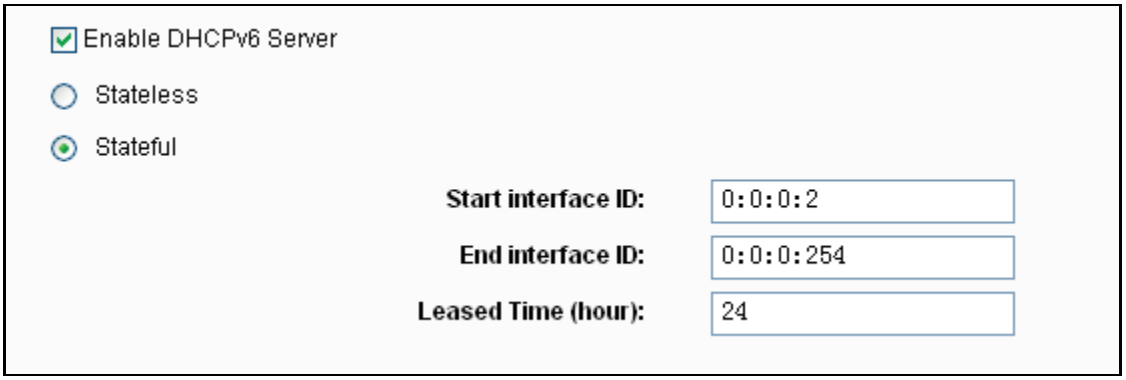
Figure 4-23

- **Interface Address (prefix length is required):** Here enter your interface address with its prefix length.
- **IPv6 LAN Applications:** Select a type to assign IPv6 addresses to the computers in your LAN. DHCPv6 Server and RADVD are provided.

  For DHCPv6 Server:

  1) If **Stateless** is selected, it doesn't need to be configured.

  2) If **Stateful** is selected, please complete the following parameters.



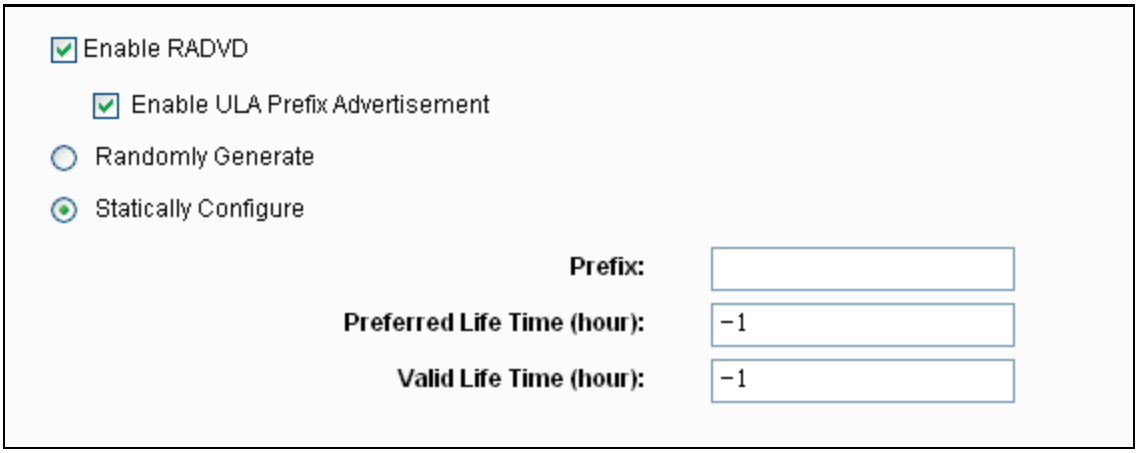
- **Start interface ID:** Enter a value for the DHCPv6 server to start with when issuing IPv6 addresses.
- **End interface ID:** Enter a value for the DHCPv6 server to end with when issuing IPv6 addresses.
- **Leased Time (hour):** The Leased Time is the amount of time in which a network user will be allowed to connect to the modem router with their current dynamic IPv6 address. Enter the amount of time, in hours, then the user will be "leased" this dynamic IPv6

address. After the dynamic IPv6 address has expired, the user will be automatically assigned a new dynamic IPv6 address. The default is 24 hours.

For RADVD:

1) If **Randomly Generate** is selected, it doesn't need to be configured.

2) If **Statically Configure** is selected, please complete the following parameters.



- **Prefix:** Enter a value for the site prefix.

Click **Save/Apply** to make the configuration take effect.

4.4.5 NAT

NAT (Network Address Translation) allows you to share one WAN (Wide Area Network) IP address for multiple computers on your LAN (Local Area Network).

Note:

When you select **PPPoA** or **PPPoE** for the WAN Setup, or when you select **Enable NAT** for the type of **IPoA** and **IPoE** connection (4.4.2 WAN Service), you will see the **NAT** menu in the Web-based Utility (shown in Figure 4-24).

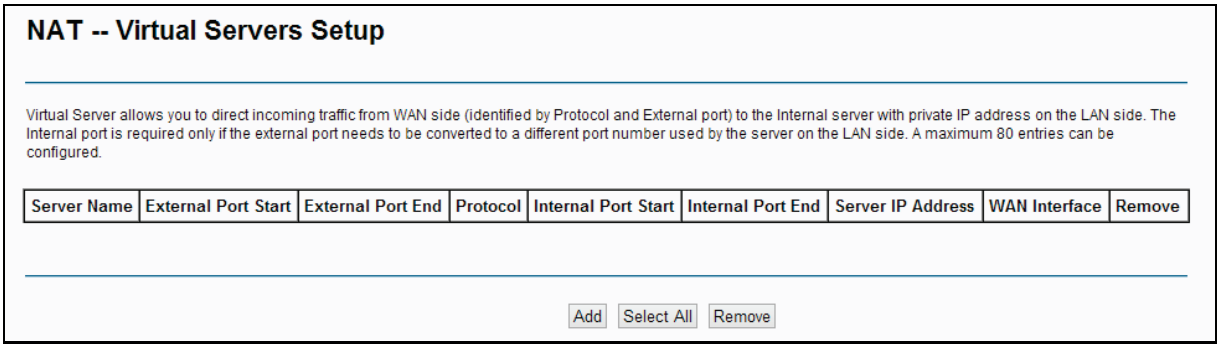
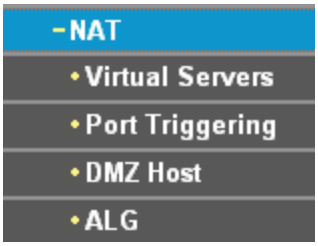


Figure 4-24

Choose "**Advanced Setup**"→"**NAT**", there are 4 submenus under the main menu**: Virtual Servers**, **Port Triggering, DMZ Host** and **ALG**. Click any of them, and you will be able to configure the corresponding function.



4.4.5.1 Virtual Servers

Choose "**Advanced Setup**"→"**NAT**"→"**Virtual Servers**", you can set up virtual servers on the screen below (shown in Figure 4-25).

Virtual servers can be used for setting up public services on your LAN, such as DNS, Email and FTP. A virtual server is defined as a service port, and all requests from the Internet to this service port will be redirected to the computer specified by the server IP. Any PC that was used for a virtual server must have a static or reserved IP Address because its IP Address may change when using the DHCP function.

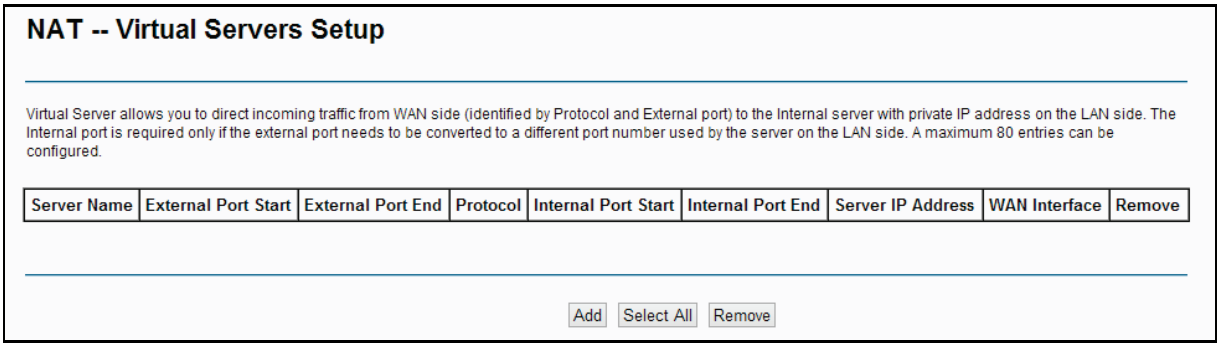


Figure 4-25

- **Virtual Server Table:** The table indicates the information about the Virtual Server entries.
  - **Server Name:** This is the name of the **Virtual Server**. It is exclusive and must be filled in.
  - **External Port Start:** The base number of External Ports. You can type a service port or leave it blank.
  - **External Port End:** The end number of External Ports. You can type a service port or leave it blank.
  - **Protocol:** The protocol used for this application, **TCP**, **UDP**, or **TCP/UDP**.
  - **Internal Port Start:** The base number of Internal Ports. You can type a service port or leave it blank.
  - **Internal Port End:** The end number of Internal Ports. You can type a service port or leave it blank.
  - **Server IP Address:** The IP Address of the PC providing the service application.
  - **WAN Interface:** The WAN Service Interface providing the service application.
- **Add:** Click the **Add** button to add a new entry.
- **Remove:** Select the checkbox in the table (shown in Figure 4-25) and then click the **Remove** button, then the corresponding entry will be deleted in the table.

To add a virtual server entry:

1. Click the **Add** button on the preceding screen Figure 4-25, and then you will see the new Virtual Server in the next screen as shown in Figure 4-26.

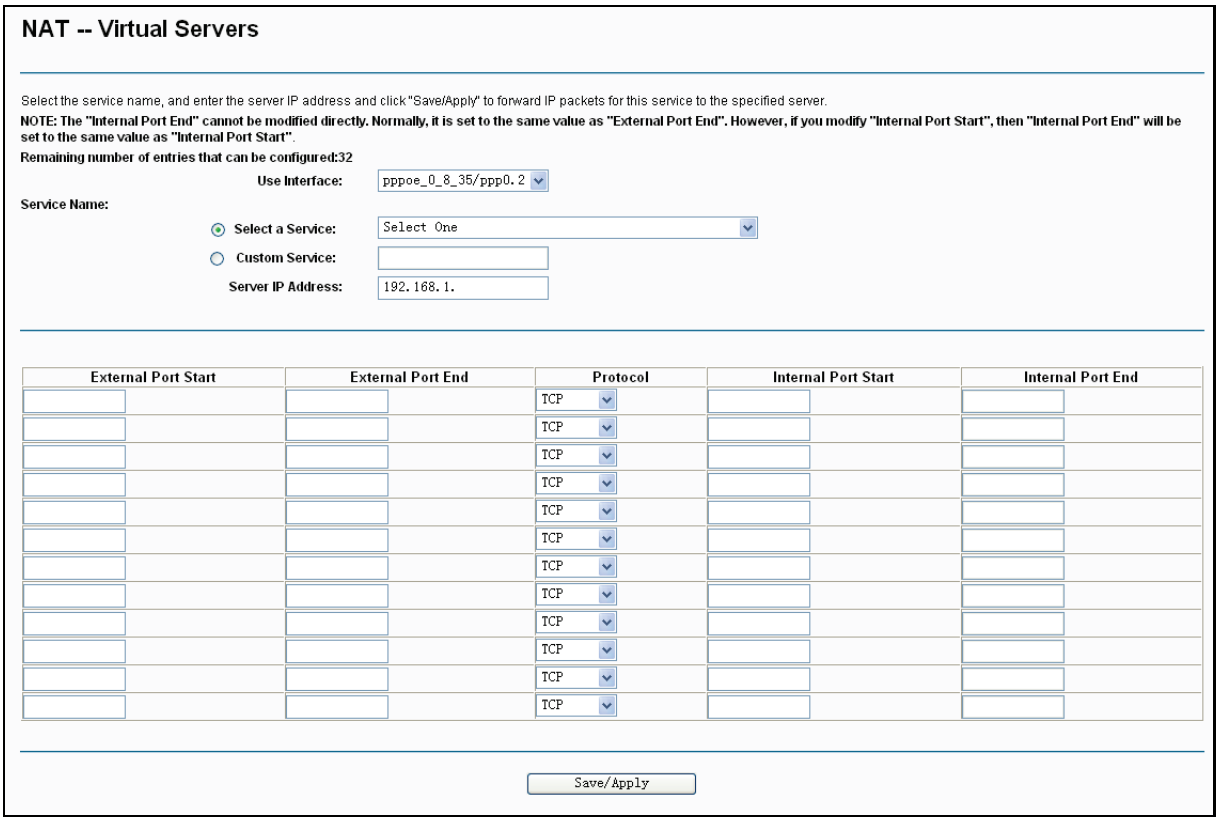


Figure 4-26

2. Select the Interface which you want to use from the drop-down list.
3. Select the service which you want to use from the drop-down list. If the list does not have the service you need, type the name of the custom service in the text box.
4. Type the IP Address of the computer in the **Server IP Address** text box.
5. Enter the External Port Start, External Port End, Internal Port Start and Internal Port End in the table, and then select the protocol used for this Virtual Server, **TCP**, **UDP** or **All**.
6. Click **Save/Apply** to enable virtual server and then you will see your setting as shown in Figure 4-25.

Note:

If you select the service from the drop-down list, the External Port Start, External Port End, Internal Port Start, Internal Port End and the Protocol will be added in the table automatically. You only need to enter the Server IP Address for the Virtual Server.

4.4.5.2 Port Triggering

Choose "**Advanced Setup**"→"**NAT**"→"**Port Triggering**", you can set Port Triggering on the screen (shown in Figure 4-27).

Some applications require that specific ports in the router's firewall should be opened for access by remote devices. Port Trigger dynamically opens up the 'Open Ports' in the firewall when an

application on the LAN initiates a TCP/UDP connection to a remote device using the triggering ports. The router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the open ports. A maximum 32 entries can be configured.

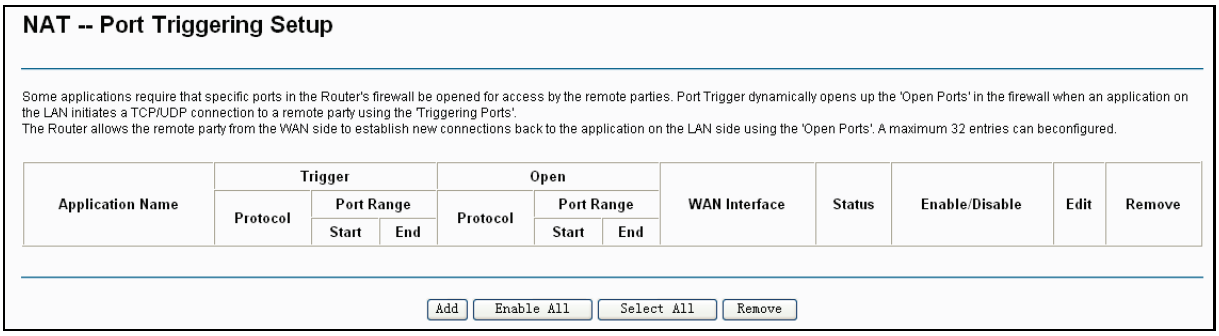


Figure 4-27

- **Port Triggering Table:** The table indicates the information about the Port Triggering entries.
  - **Application (Name):** This is the name of the **Port Triggering**. It is exclusive and must be filled.
  - **Trigger:** It includes the Protocol and the Start and End value of the Trigger Ports.
  - **Open:** It includes the Protocol and the Start and End value of the Open Ports.
  - **WAN Interface:** The WAN Service Interface setting the Port Triggering.
- **Add:** Click the button to add a new entry.
- **Remove:** Select the checkbox in the table (shown in Figure 4-27) and then click the **Remove** button, then the corresponding entry will be deleted in the table.

To add a new Port Triggering:

1. Click the **Add** button in Figure 4-27, and then you will see the new Port Triggering in the next screen as shown in Figure 4-28.

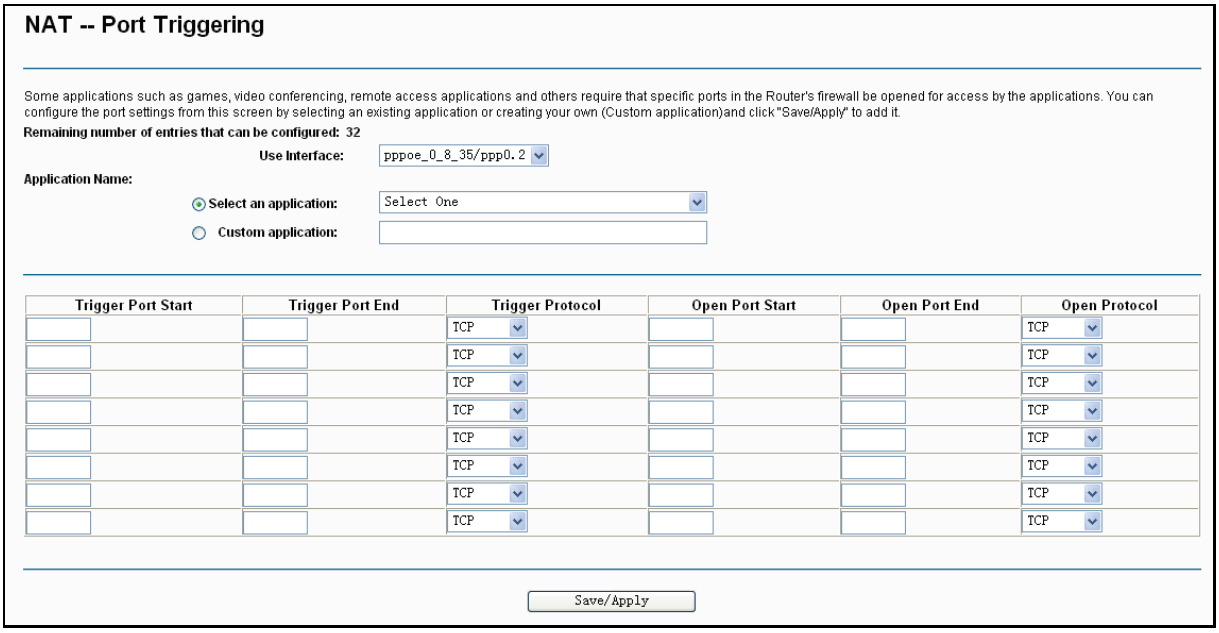


Figure 4-28

2. Select the application from the drop-down list. If the list does not have the application that you want, select the **Custom application** radio button, and type the name of the custom application in the text box.
3. Enter the **Trigger Port Start**, **Trigger Port End**, **Open Port Start** and **Open Port End** in the table, and then select the **Trigger protocol** and **Open protocol**, **TCP**, **UDP** or **All**.
4. Click **Save/Apply** to enable the settings and then you will see your settings as shown in Figure 4-27.

Note:

If you select the application from the drop-down list, the External Port Start, External Port End, Internal Port Start, Internal Port End and the Protocol will be added in the table automatically.

4.4.5.3 DMZ Host

Choose "**Advanced Setup**"→"**NAT**"→"**DMZ Host**", you can set up DMZ Host on the screen (shown in Figure 4-29).

The DMZ host feature can make a local host exposed to the Internet for a special-purpose service, such as online gaming or video conferencing.

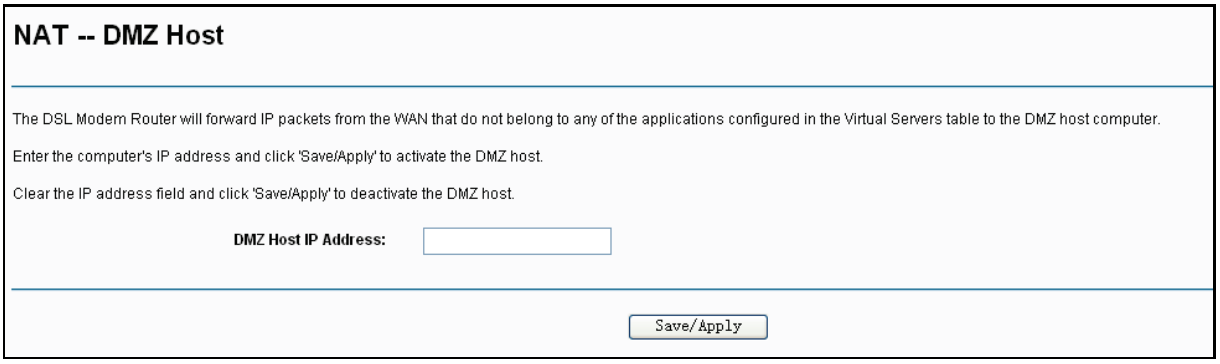


Figure 4-29

To add a new DMZ Host:

You can enter the computer's IP address and then click **Save/Apply** to activate the DMZ host you set on this page.

Note:

DMZ host forwards all the ports at the same time. Any PC whose port is being forwarded must have its DHCP client function disabled and should have a new static IP Address assigned to it because its IP Address may change while using the DHCP function.

4.4.5.4 ALG

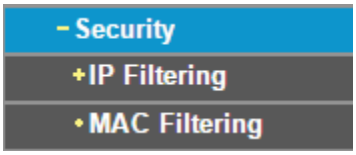
Choose "**Advanced Setup**"→"**NAT**"→"**ALG**", and then you can configure the basic security in the screen.

Figure 4-30

Click the **Save/Apply** button to save your settings.

4.4.6 Security

Choose "**Advanced Setup**"→"**Security**", and you will see the security screen including **IP Filtering** and **MAC Filtering** (only effective in Bridging mode) submenus.



4.4.6.1 IP Filtering

The IP address filtering feature makes it possible for administrators to control user's access to the Internet, which is based on user's IP. You can configure Outgoing Filtering or Incoming Filtering rules according to your needs.

Set up an Outgoing IP Filtering rule:

The Outgoing IP Filtering feature allows you to control some IP traffic from LAN to access to some specifically addresses. By default, all outgoing IP traffic from LAN is allowed, but some IP traffic can be **BLOCKED** by setting up filters.

1. Click the **Add** button in Figure 4-31

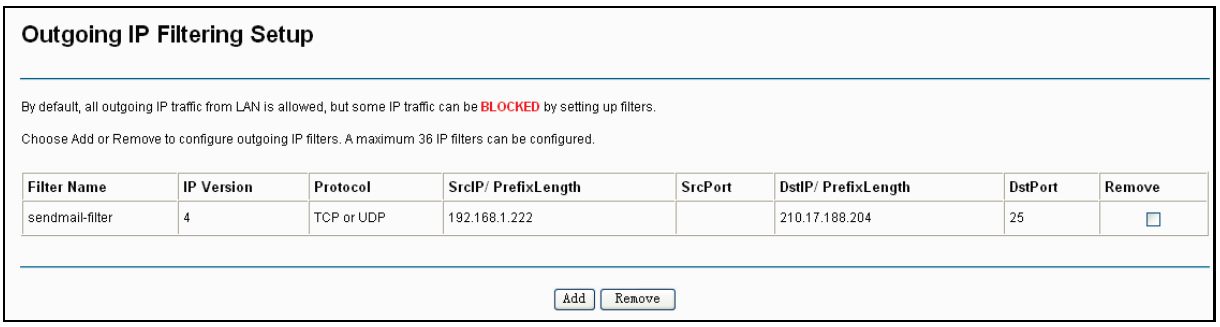


Figure 4-31

2. Then you will see the next screen as shown in Figure 4-32.

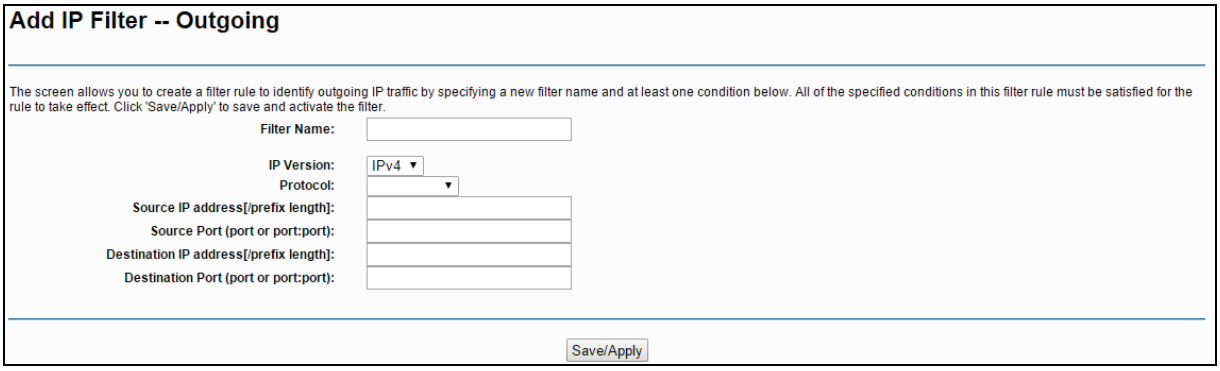


Figure 4-32

3. Enter the **Filter name** for the rule, it is exclusive and must be filled.
4. Select the **protocol** in the drop-down list for the connection between the Source IP address and Destination IP address.
5. Enter a **Source IP Address** in dotted-decimal notation format and then type **Source Port** (port or port**:** port) in the text boxes separately.
6. Enter a **Destination IP Address** in dotted-decimal notation format and then type **Destination Port** (port or port**:** port) in the text boxes separately.
7. Click **Save/Apply** to save this entry.

Set up an Incoming IP Filtering rule:

When the firewall is enabled on a WAN or LAN interface, all incoming IP traffic is BLOCKED. However, some IP traffic can be **ACCEPTED** by setting up filters.

1. Click the **Add** button in Figure 4-33.

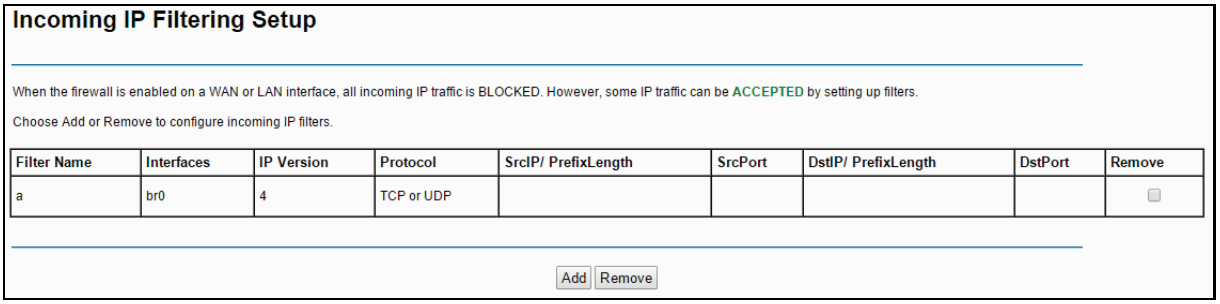


Figure 4-33

2. Then you will see the next screen as shown in Figure 4-34

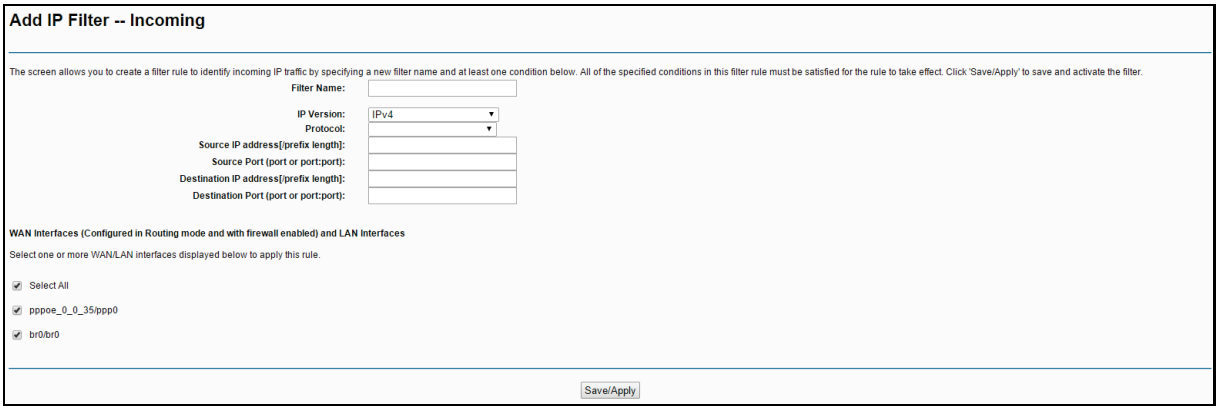


Figure 4-34

3. Enter the **Filter name** for the rule, it is exclusive and must be filled.
4. Select the **protocol** in the drop-down list for the connection between the Source IP address and Destination IP address.
5. Enter a **Source IP Address** in dotted-decimal notation format and then type **Source Port** (port or port**:** port) in the text boxes separately.
6. Enter a **Destination IP Address** in dotted-decimal notation format and then type **Destination Port** (port or port**:** port) in the text boxes separately.
7. Select one or more WAN/LAN interfaces displayed to apply this rule.
8. Click **Save/Apply** to save this entry.

☞ Note:

When you add an IP Filtering entry, you must configure at least one condition on the preceding screen except the Filter name. If you leave the Protocol blank, it means that the rule is effective to all protocols, if you leave the Source IP Address and/or Destination IP Address blank, it suggests that all Source IP Addresses and/or Destination IP Addresses are controlled by the rule, if you leave the Source Port and/or Destination Port blank, it suggests that all Source Ports and/or Destination Ports are controlled by the rule.

4.4.6.2 MAC Filtering

Choose "**Advanced Setup**"→"**Security**"→"**MAC Filtering**", you can configure MAC Filtering rules on the screen as shown in Figure 4-35. The section allows you to control access to the Internet by users on your local network based on their MAC Address.

☞ **Note:**

MAC Filtering is only effective on ATM PVC(s) configured in Bridging mode.

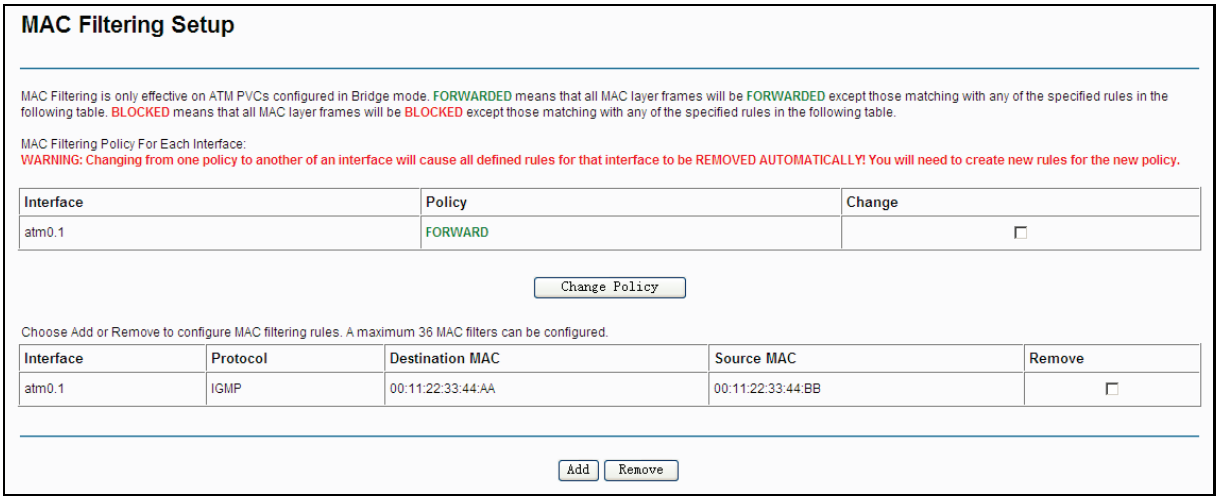


Figure 4-35

- **Change Policy:** There are two policies for the MAC filters**: FORWARDED** and **BLOCKED**. Select the **Change** checkbox and click the **Change Policy** button to change from one policy to another. When you set **FORWARDED**, it means that all MAC layer frames will be **forwarded** except those matching with any of the specified rules in the table (shown in Figure 4-35). While **BLOCKED** means that all MAC layer frames will be **blocked** except those matching with any of the specified rules in the preceding table.
- **Add:** Click the **Add** button, and then you can add a new MAC Filter in the next screen (shown in Figure 4-35).
- **Remove:** Select the checkbox in the table (shown in Figure 4-35) and then click the **Remove** button, and then the corresponding entry will be deleted in the table.

To add a MAC Filtering rule:

1. Click the **Add** button in Figure 4-35, and you will see the next screen similar to in Figure 4-36.

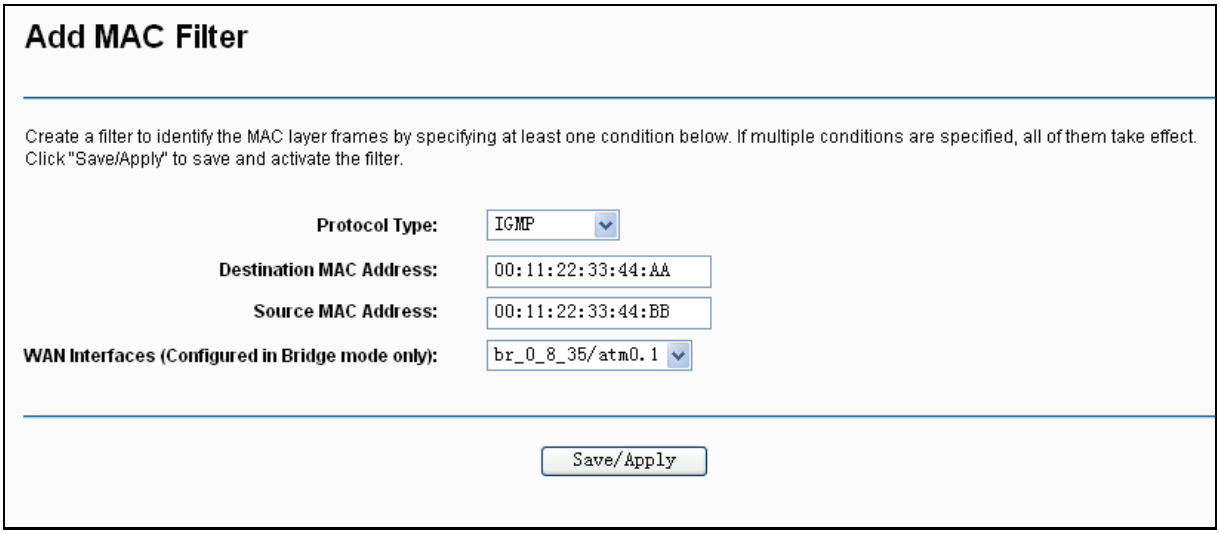
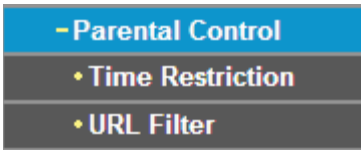


Figure 4-36

2. Select **Protocol Type** in the drop-down list for the rule.
3. Enter **Destination MAC Address** and **Source MAC Address** in the text box.
4. Select the **WAN interfaces** from the drop-down list.

5. Click **Save/Apply** to save this entry and then you will see your settings as shown in Figure 4-36.

4.4.7 Parental Control



Choose "**Advanced Setup**"→"**Parental Control**". You can configure the Parental Control function on the screen as shown in Figure 4-37. Time Restriction allows you to control the Internet activities of the children by restricting the time of surfing. URL Filter limits the computers you choose to access certain websites. These two features work independently.

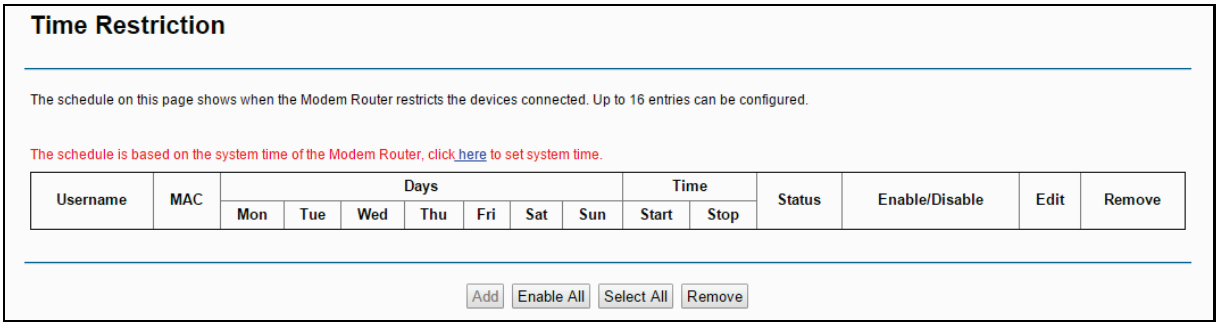


Figure 4-37

4.4.7.1 Time Restriction

This feature allows you add time of day restriction to a special device connected to the router.

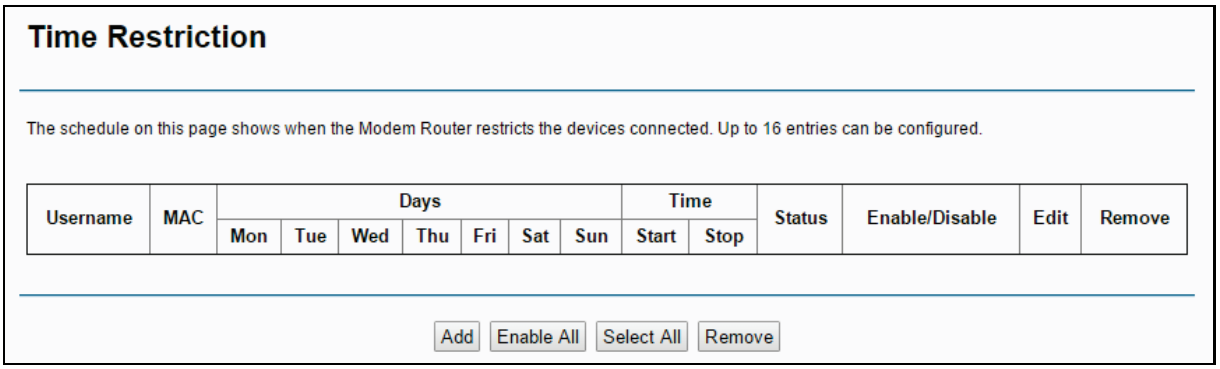


Figure 4-38

To add a Time Restriction entry:

1. Click the **Add** button in Figure 4-38, and then you will see the next screen as shown in Figure 4-39.

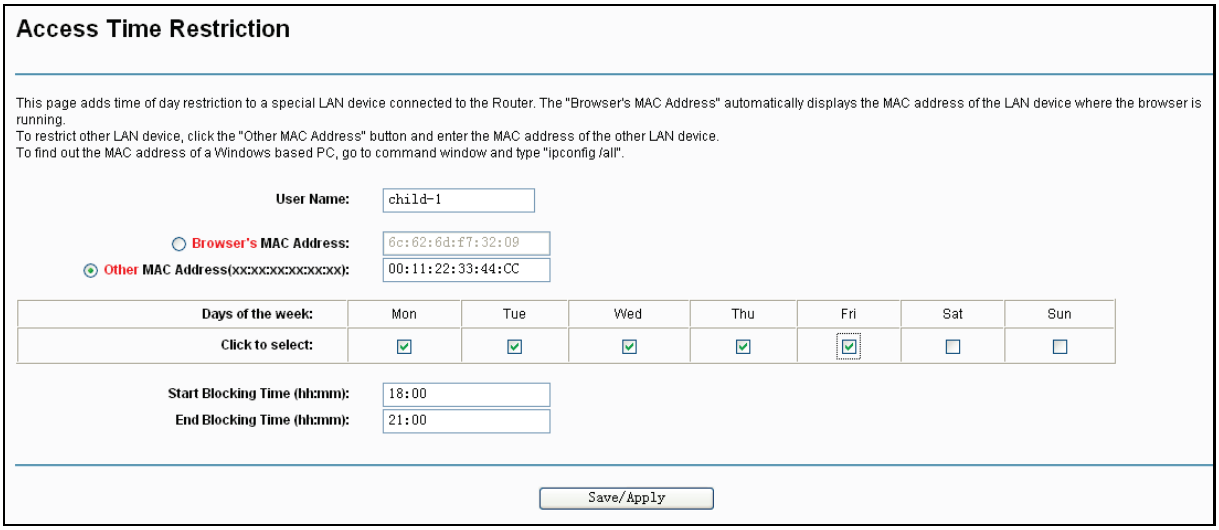


Figure 4-39

2. Enter the **User Name** of the LAN device connected to the router.
3. To restrict the device where the browser is running, select the **Browser's MAC Address** radio button. The MAC Address has been automatically displayed in the text box. To restrict other LAN devices, click **Other MAC Address** radio button and enter the MAC address of the other LAN device.
4. Select the day to allow the rule to take effect in the table.
5. Enter the **Start Blocking Time** and **End Blocking Time** in the text box separately, and then the device controlled will be unable to connect to the internet during that time.
6. Click **Save/Apply** to save this entry and then you will see your settings as shown in Figure 4-38.

Note:

The Time Restriction will not work correctly before the time of the device is set in "**Management → Internet Time**".

4.4.7.2 URL Filter

This feature allows you to configure the filter rules based on URL to control the computers in the LAN to access the specified websites, and it is independent of Time Restriction feature.

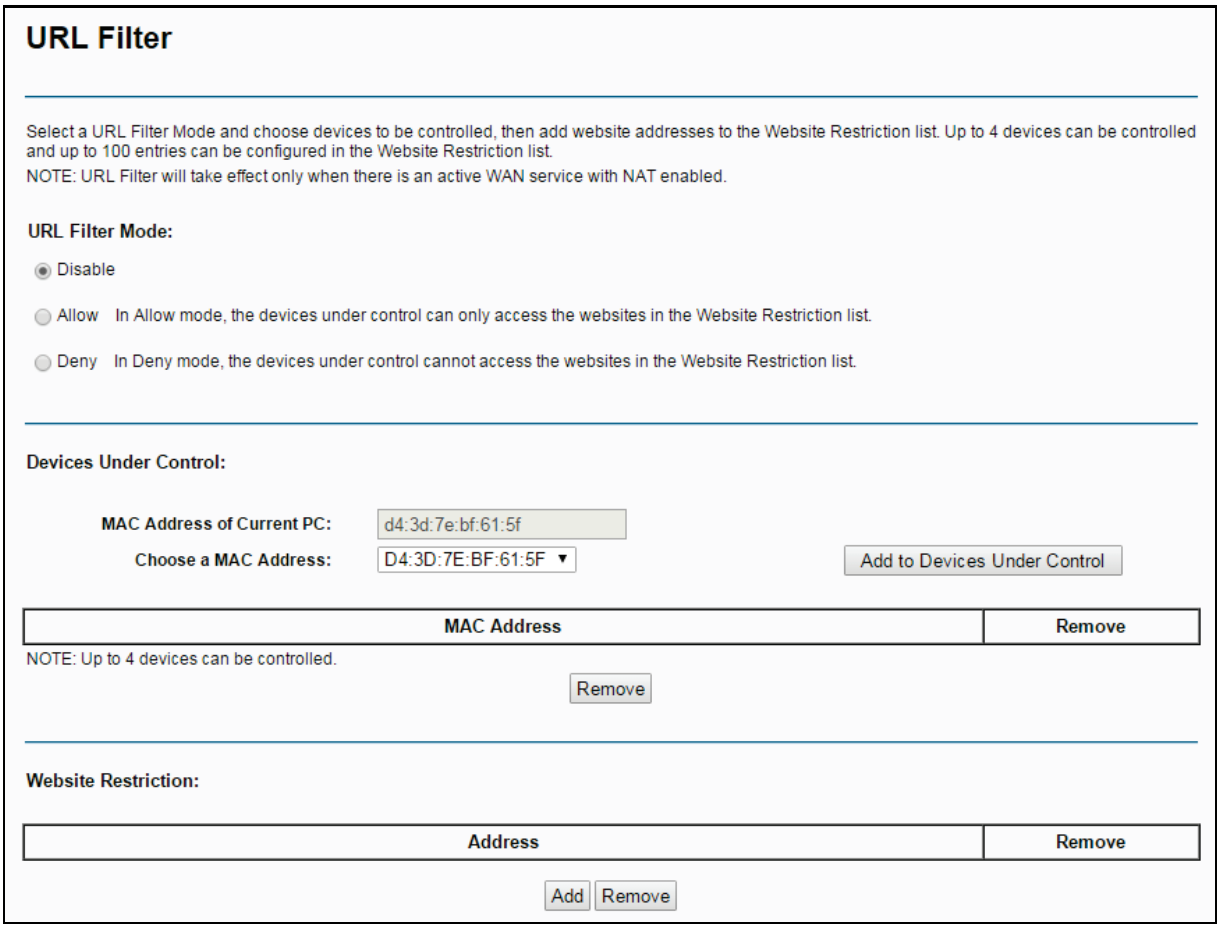


Figure 4-40

To set up the URL Filter:

1. Check the **Allow** or **Deny** radio button. Here we take **Deny** for example.
2. Focus on the **Devices Under Control** section. Choose the MAC Address of the computer you want to control and click the **Add to Devices Under Control** button.
3. Focus on the **Website Restriction** section. Click the **Add** button and then you will see the next screen, as shown in the following picture. Enter a URL address such as a website, then click **Save/Apply**.

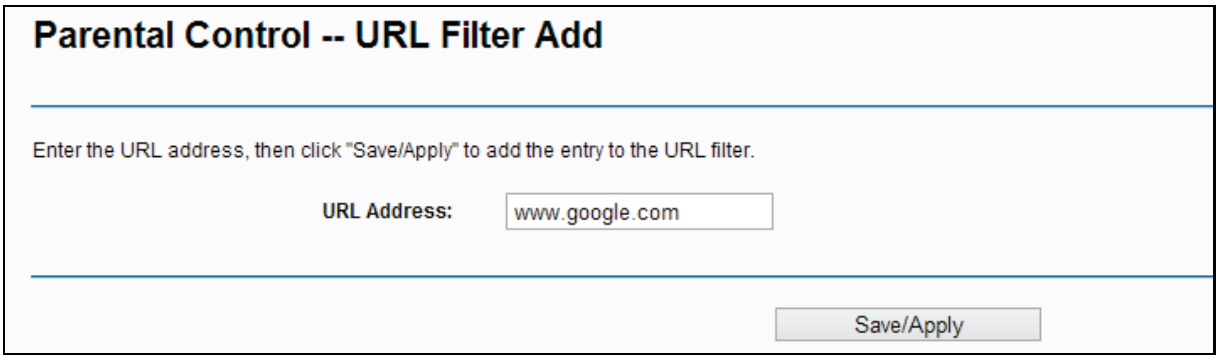
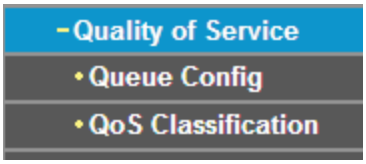


Figure 4-41

4.4.8 Quality of Service



Choose "**Advanced Setup**"→"**Quality of Service**", you can enable QoS (Quality of Service) on the screen shown in Figure 4-42. QoS helps to prioritize data as it enters your router. By attaching special identification marks or headers to incoming packets, QoS determines which queue the packets enter, based priority. This is useful when there are certain types of data you want to give higher priority, such as voice data packets give higher priority than Web data packets. This option will provide better service of selected network traffic over various technologies.

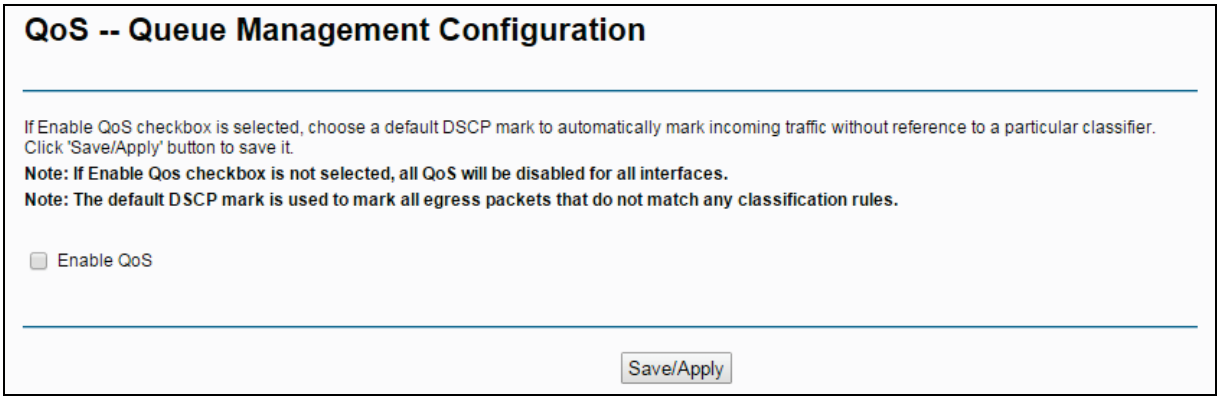


Figure 4-42

Select the **Enable QoS** checkbox to enable all QoS for all interfaces, and click **Save/Apply** to save the current configuration.

4.4.8.1 Queue Config

Choose "**Advanced Setup**"→"**Quality of Service**"→"**Queue Config**", you can set up virtual servers on the screen below.

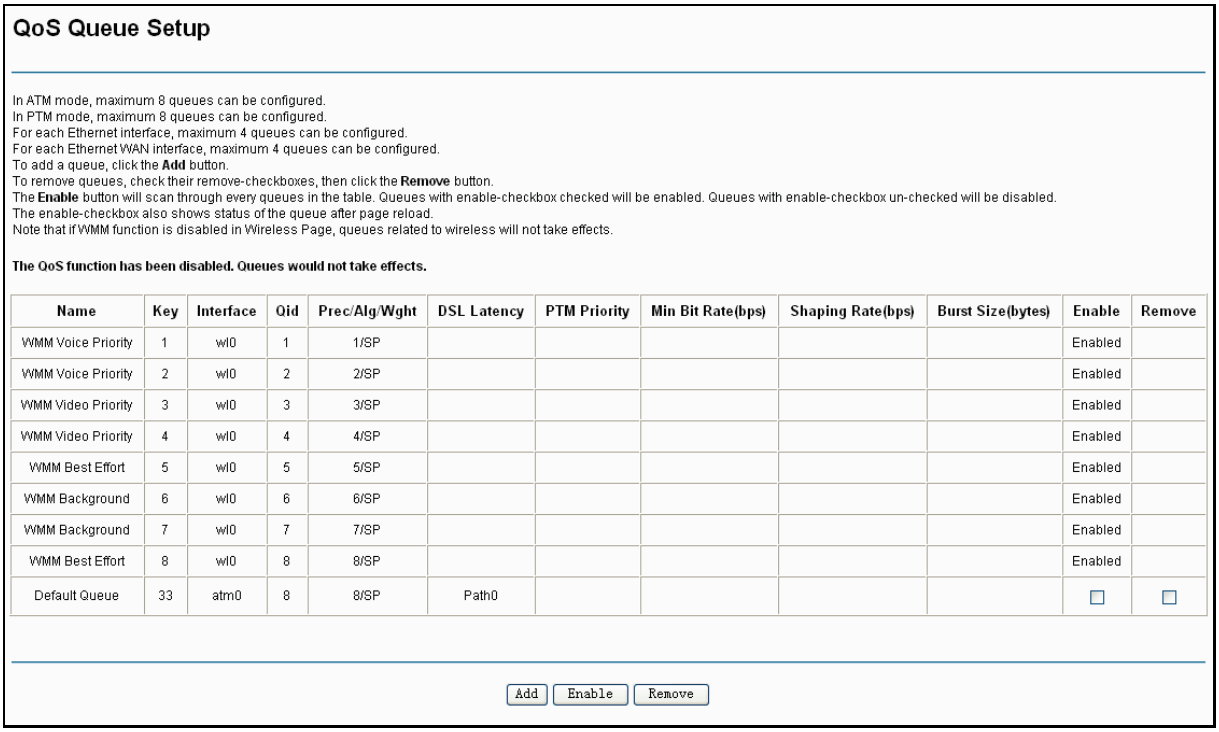


Figure 4-43

Click the **Add** button in Figure 4-43, and you can configure the QoS queue entry on the next screen as shown in Figure 4-44.

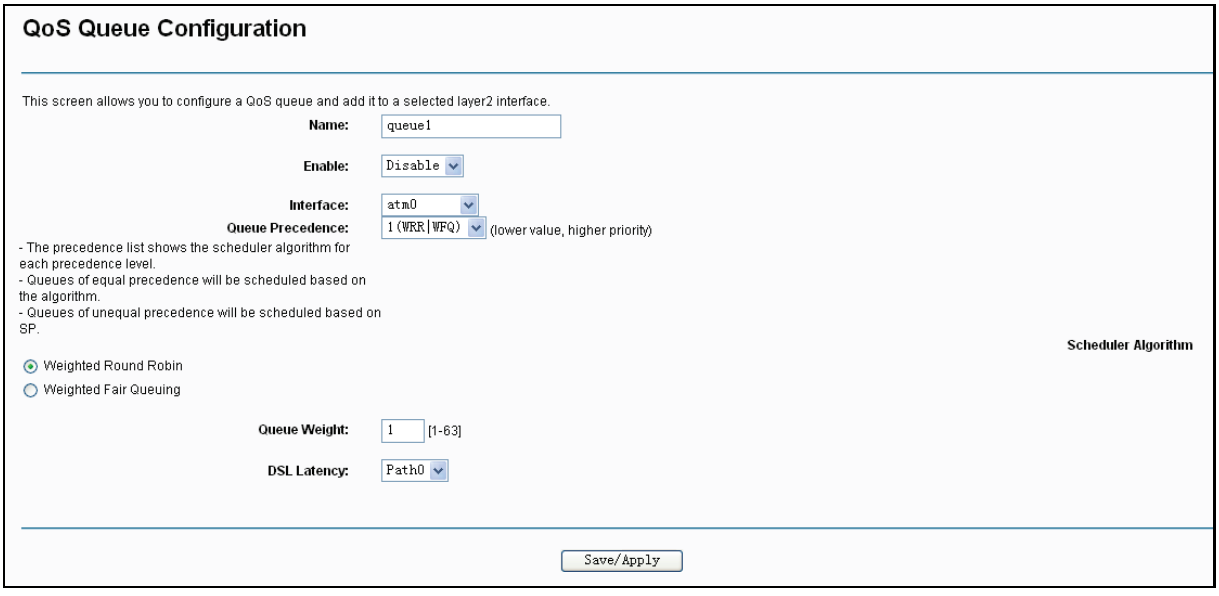


Figure 4-44

- **Name**: Set a name for the entry.
- **Enable**: Select Enable option to take this entry effect.
- **Interface**: Assigned a specific Wan Service for this QoS queue entry.
- **Precedence**: Specify precedence for this QoS queue entry.
- **DSL Latency**: Select latency path for the type of data transmission, only Path0 is available for this router.

After you specify the condition, click **Save/Apply** to save the entry and then you will see you settings as shown in Figure 4-43.

Note:

1) Lower integer values for precedence imply higher priority for this queue relative to others.
2) The queue entry configured here will be used by the classifier to place ingress packets appropriately.

4.4.8.2 QoS Classification

This section will guide you to create a traffic class rule to classify the upstream traffic, assign queue which defines the precedence and the interface and optionally overwrite the IP header DSCP byte.

A rule consists of a class name and at least one condition below. All of the specified conditions in this classification rule must be satisfied for the rule to take effect.

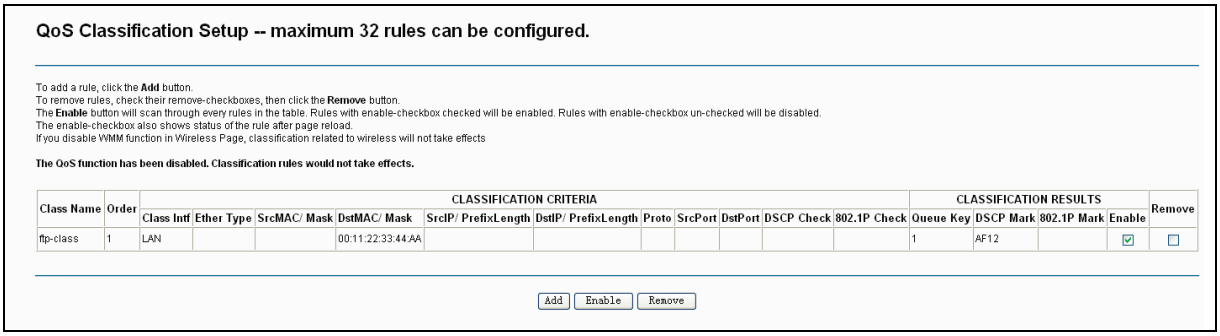


Figure 4-45

Click the **Add** button in Figure 4-45, and you can configure the QoS on the next screen.

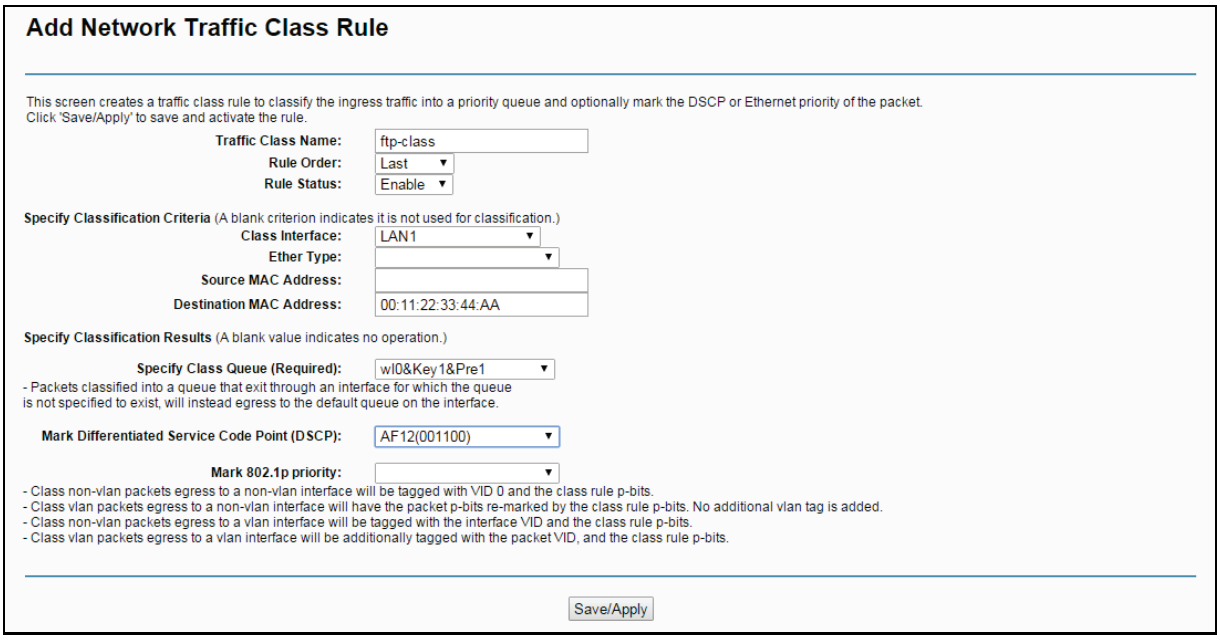
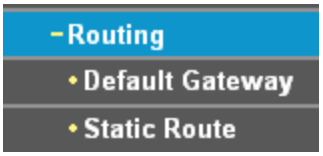


Figure 4-46

After you specify the condition, click **Save/Apply** to save the entry.

4.4.9 Routing

Choose "**Advanced Setup**"→"**Routing**", it includes 2 menus**: Default Gateway** and **Static Route**. The detailed descriptions are provided below.



4.4.9.1 Default Gateway

Choose "**Advanced Setup**"→"**Routing**"→"**Default Gateway**", you can see the Default Gateway screen.

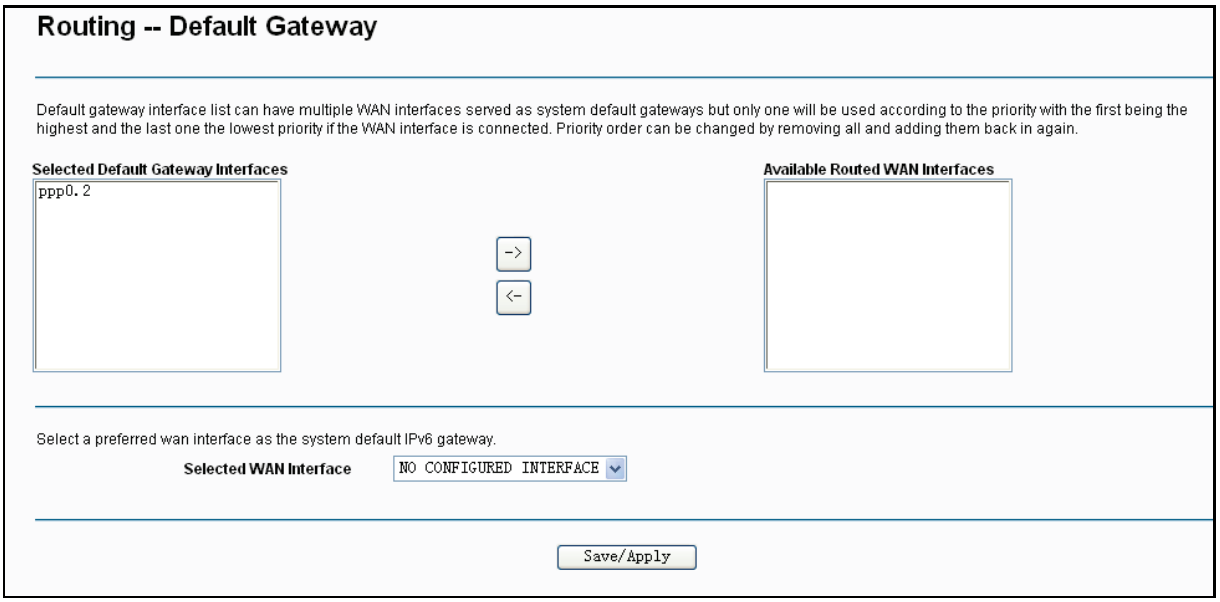


Figure 4-47

4.4.9.2 Static Route

Choose "**Advanced Setup**"→"**Routing**"→"**Static Route**". You can see the Static Route screen, this screen allows you to configure the static routes (shown in Figure 4-48). A static route is a pre-determined path that network information must travel to reach a specific host or network.

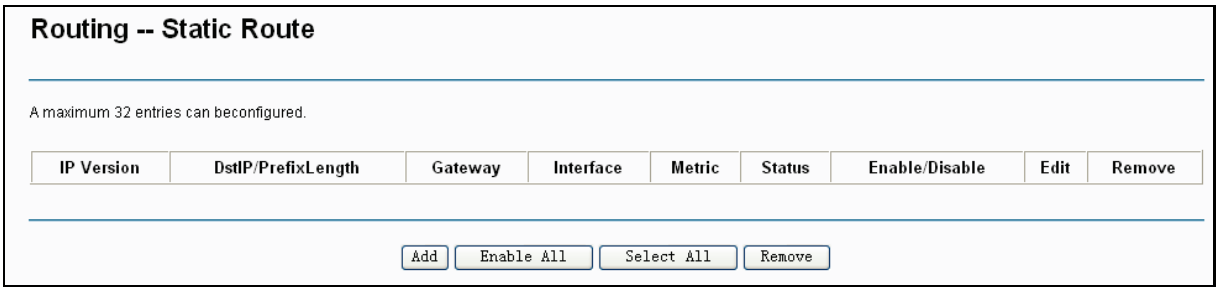


Figure 4-48

To add static routing entries:

1. Click the **Add** button in Figure 4-48, and you will see the screen as shown in Figure 4-49.

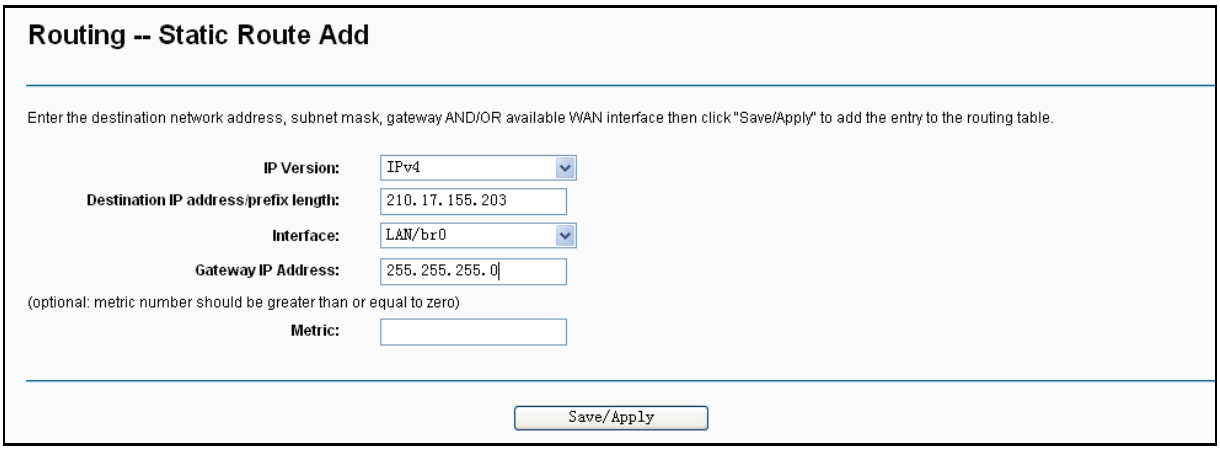


Figure 4-49

2. Enter the following data:

- **IP Version:** Select the version of IP.
- **Destination IP Address/prefix length:** The **Destination IP Address** is the address of the network or host that you want to assign to a static route.
- **Interface:** Select the Interface name in the text box, or else, the default Use Interface will be adopted for the Static Route.
- **Gateway IP Address:** If you select the IPoE or IPoA mode for **Interface**, the screen above will display this item, you should type the Gateway address correctly, and the other option for **Interface** will adopt the default Gateway address for the Static Route.

3. Click **Save/Apply** to and then you will see you settings as shown in Figure 4-48.

To remove a static routing entry:

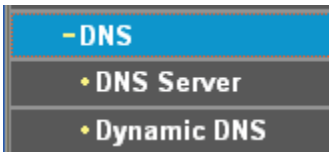
1. Select the **Remove** checkbox according to the entry in the Figure 4-48.
2. Click the **Remove** button, and the entry will be deleted.

Note:

Gateway IP address should be correctly configured if IP based Interface (IPoE, IPoA) is selected.

4.4.10 DNS

When you select the connection type **PPPoE**, **PPPoA** or **IPoA** for WAN configuration, you will see the **DNS** menu in the Web-based Utility. It includes **DNS Server** and **Dynamic DNS** submenus.



4.4.10.1 DNS Server

Choose "**Advanced Setup**"→"**DNS**"→"**DNS Server**", and you can see the **DNS Server Configuration** screen as shown in Figure 4-50.

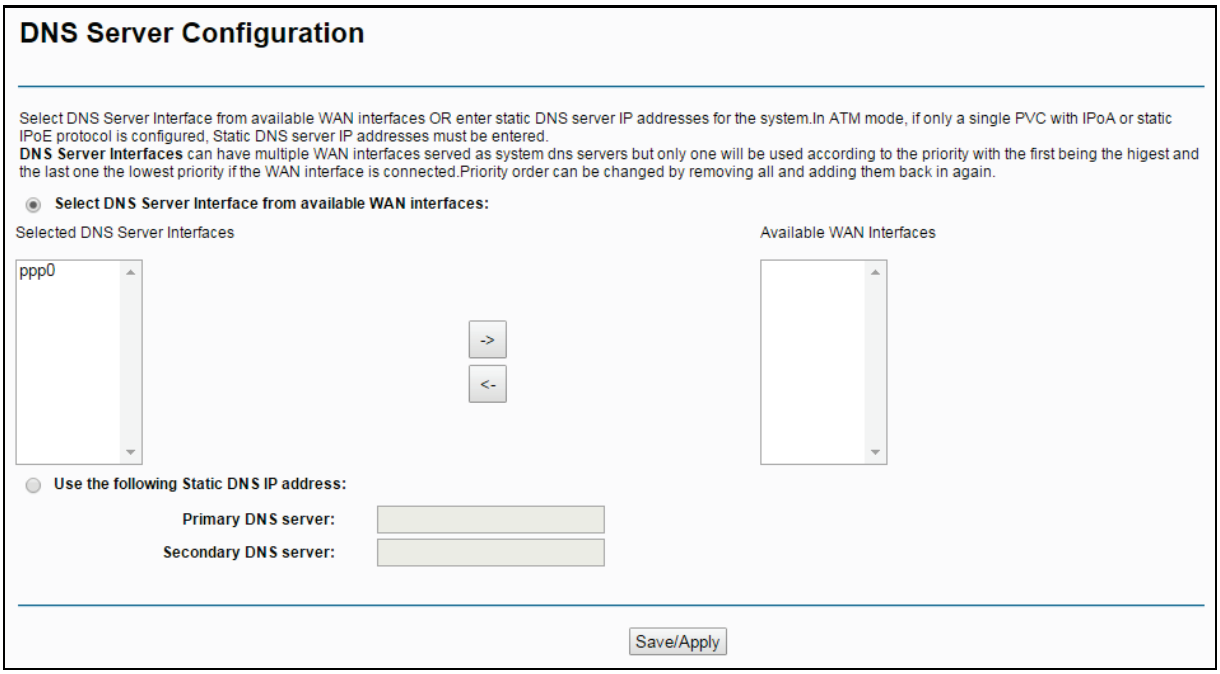


Figure 4-50

For PPPoA, PPPoE enabled PVC(s), please select the **Select DNS Server Interface from available WAN interfaces** checkbox, this modem router will accept automatically the first received DNS assignment from the selected configured WAN interface during the connection establishment.

For single PVC with IPoA, static IPoE protocol, please select the **Use the following Static DNS IP address** checkbox, and enter the primary and /or optional secondary DNS server IP addresses provided by your ISP.

Click the **Save/ Apply** button to save the new configuration.

4.4.10.2 Dynamic DNS

Choose "**Advanced Setup**"→"**DNS**"→"**Dynamic DNS**", you can see the **Dynamic DNS** screen, this screen allows you to configure the Dynamic DNS (shown in Figure 4-51).

The modem router offers a Dynamic Domain Name System (**DDNS**) feature. DDNS lets you assign a fixed host and domain name to a dynamic Internet IP Address. The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your modem router to be more easily accessed from various locations on the Internet.

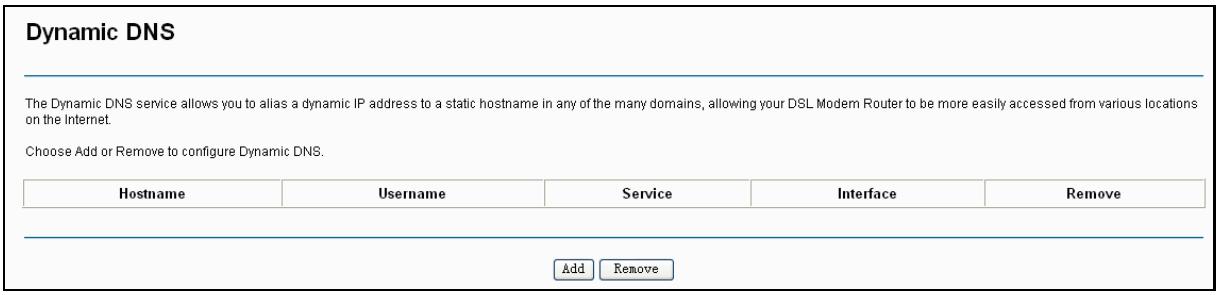


Figure 4-51

To add a DDNS entry:

1. Click the **Add** button (pop-up after Figure 4-51), and then you will set the DDNS in the next screen (shown in Figure 4-52).

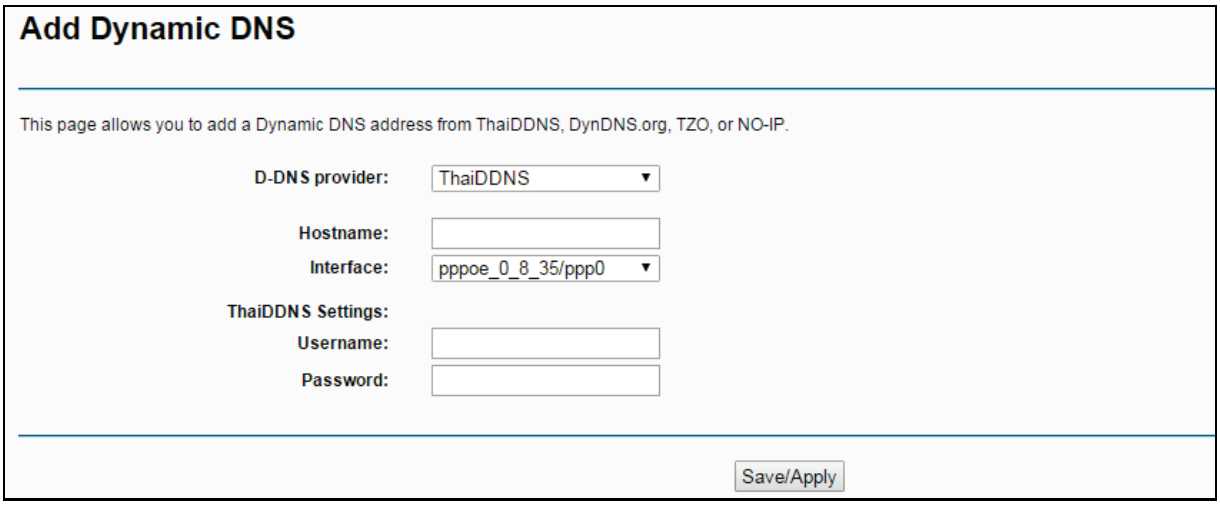
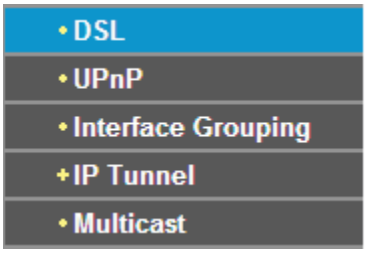


Figure 4-52

2. Select **D-DNS provider** in the drop-down list.
3. Enter the **Hostname** of the DNS Server, and select the corresponding **Interface** for the DDNS, you can leave it default.
4. Type the **User Name** and **Password** for your DDNS account.

Click **Save/Apply** to save your settings.

4.4.11 DSL



Choose "**Advanced Setup**"→"**DSL**", you can see the DSL Settings screen, this screen allows you to configure the DSL (shown in Figure 4-53).

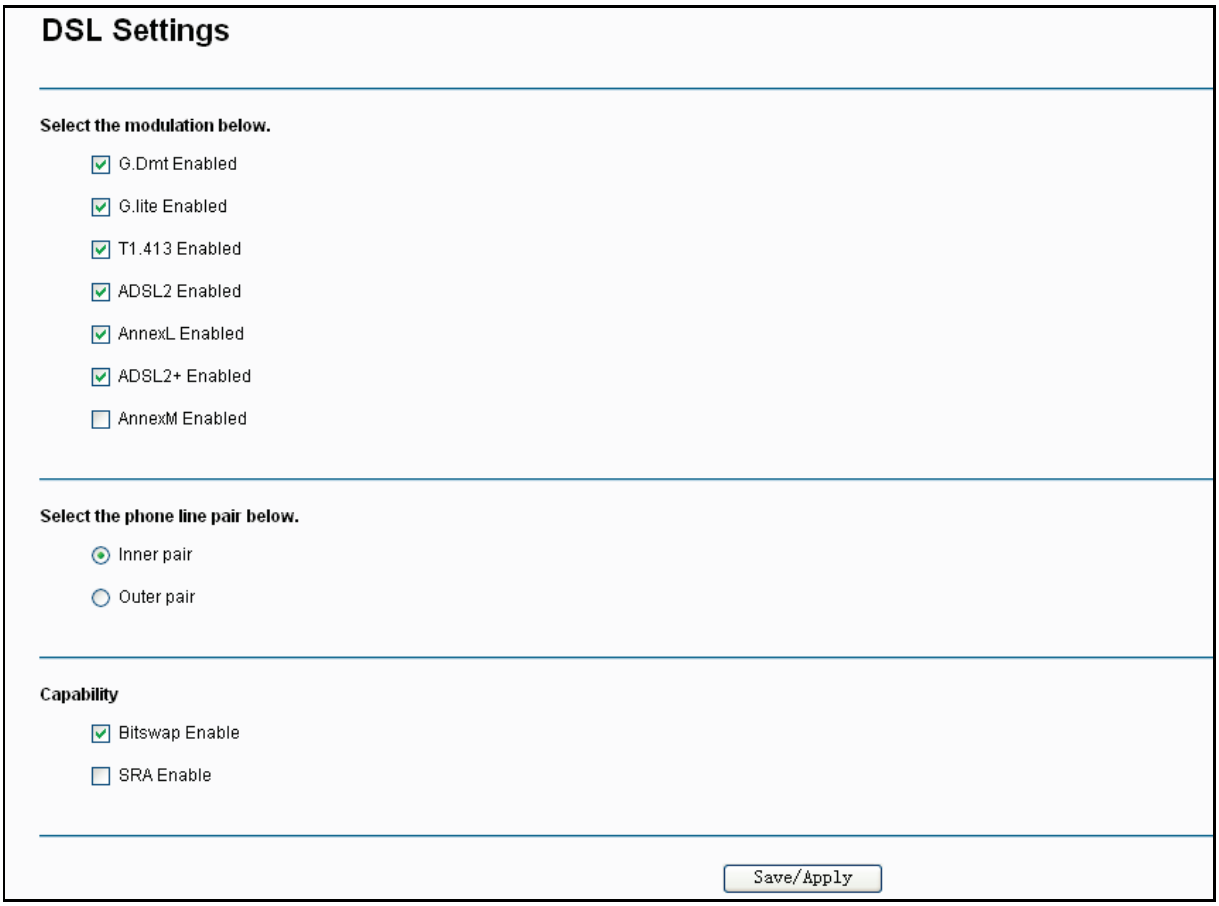


Figure 4-53

You can select the modulation type, phone line pair and the capability of Bitswap or SRA. After you set them up, click **Save/Apply** to save the configurations.

4.4.12 UPnP

Choose "**Advanced Setup**"→"**UPnP**", you can Enable or Disable the UPnP (Universal Plug and Play) protocol on the screen.

UPnP (Universal Plug and Play) is a distributed, open networking standard that uses TCP/IP for simple peer-to-peer network connectivity between devices. An UPnP device can dynamically join a network, obtain an IP address, convey its capabilities and learn about other devices on the network. In turn, a device can leave a network smoothly and automatically when it is no longer in use. UPnP broadcasts are only allowed on the LAN.

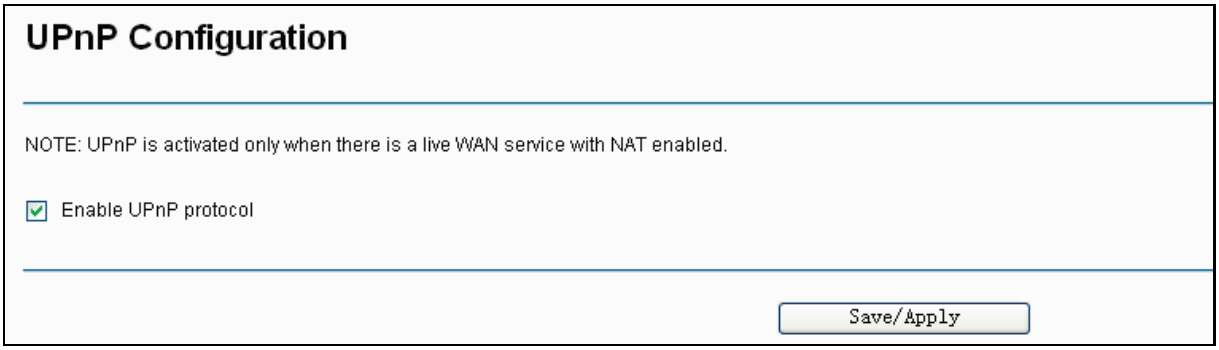


Figure 4-54

Select the checkbox and click **Save/Apply** to enable the UPnP function.

4.4.13 Interface Grouping

Choose "**Advanced Setup**"→"**Interface Grouping**", you can configure multiple ports to PVC and bridging groups to perform as an independent network.

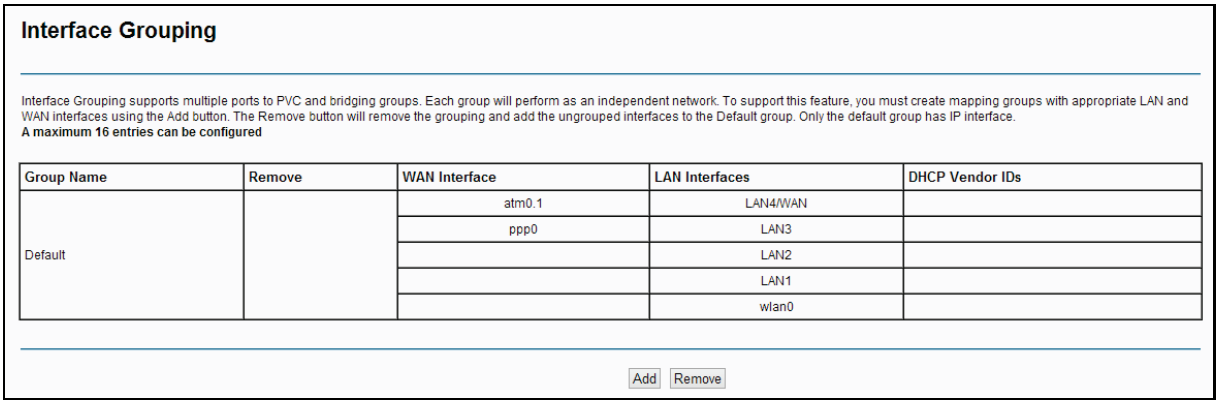


Figure 4-55

To support this feature, you must create mapping groups with appropriate LAN and WAN interfaces using the **Add** button. The **Remove** button will remove the grouping and add the ungrouped interfaces to the Default group. Only the default group has IP interface.

To create a new interface group:

1. Click the **Add** button. You can add a new interface group in the next screen.

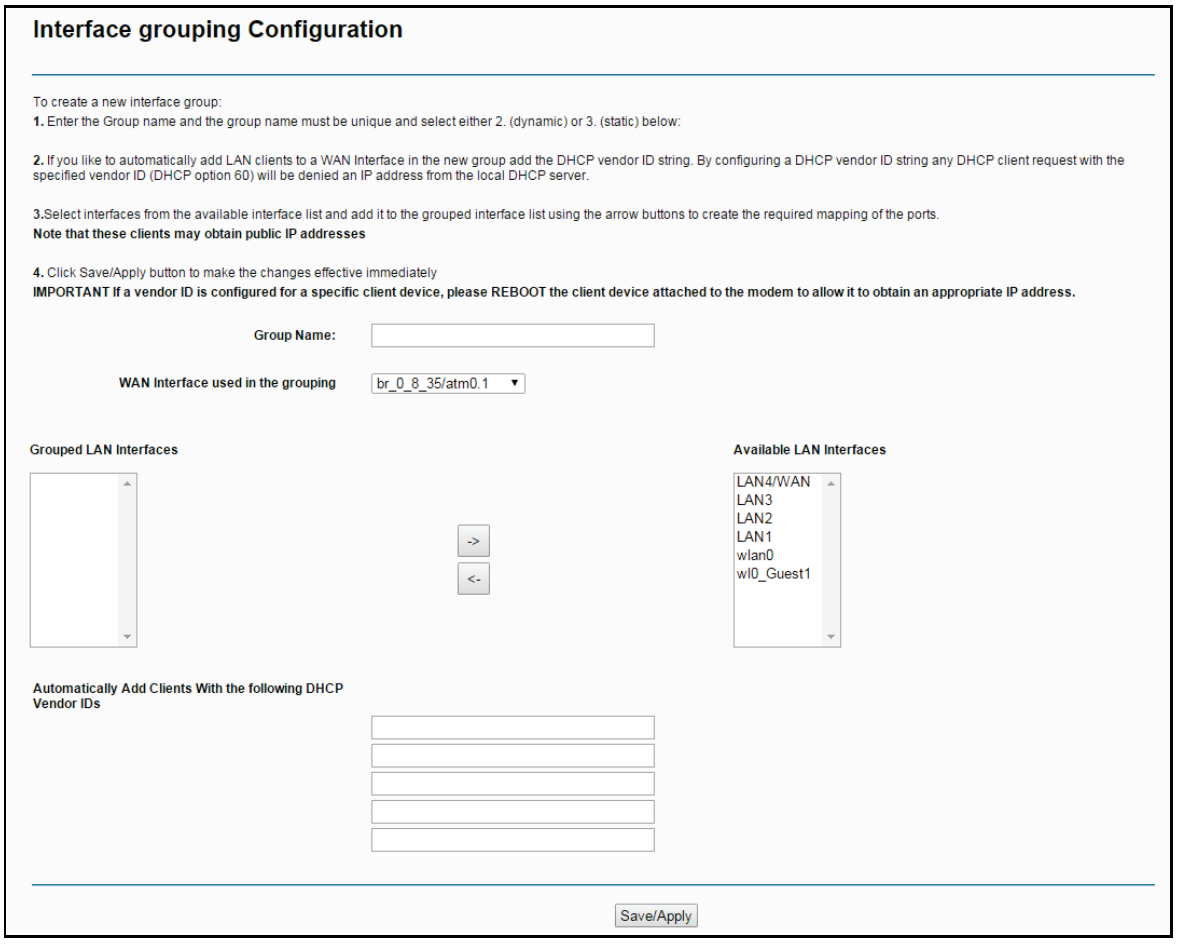


Figure 4-56

2. Enter a unique name for Group.
3. Select the Interface which you want to use from the drop-down list.

Note:

If you like to automatically add LAN clients to a WAN Interface in the new group add the DHCP vendor ID string. By configuring a DHCP vendor ID string any DHCP client request with the specified vendor ID (DHCP option 60) will be denied an IP address from the local DHCP server.

4. Select interfaces from the available interface list and add it to the grouped interface list using the arrow buttons to create the required mapping of the ports.

Note:

These clients may obtain public IP addresses.

5. Click **Save/Apply** to make the entry effective immediately.

Note:

If a vendor ID is configured for a specific client device, please REBOOT the client device attached to the modem to allow it to obtain an appropriate IP address.

4.4.14 IP Tunnel

IPv6 tunnel is a kind of transition mechanism to enable IPv6-only hosts to reach IPv4 services and to allow isolated IPv6 hosts and networks to reach each-other over IPv4-only infrastructure before IPv6 completely supplants IPv4. It is a temporary solution for networks that do not support native dual-stack, where both IPv6 and IPv4 run independently.

Choose "**Advanced Setup**"→"**IP Tunnel**", it includes two menus**: IPv6inIPV4 and IPv4inIPv6**, The detailed descriptions are provided below.

4.4.14.1 IPv6inIPv4

Choose "**Advanced Setup**"→"**IP Tunnel**"→"**IPv6inIPv4**". You can see the 6in4 tunnel configuration screen, this screen allows you to configure the static routes (shown in Figure 4-57).

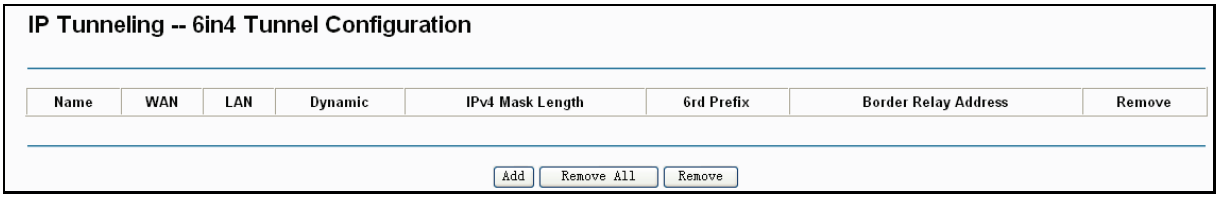


Figure 4-57

Click the **Add** button in Figure 4-57, and you can configure the 6in4 tunnel on the next screen as shown in Figure 4-58.

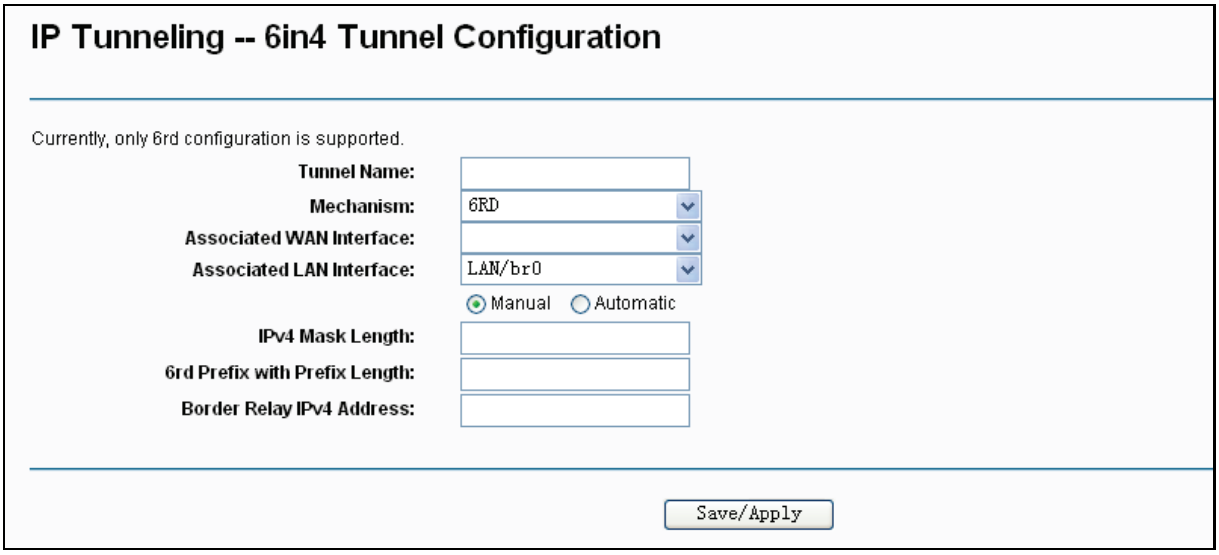


Figure 4-58

- **Mechanism:** 6RD, this type is used in the situation that your WAN connection is IPv4 while LAN connection is IPv6.
- **Associated WAN Interface:** Select a WAN connection from the drop-down list. Only the connected WAN connections can be shown in the drop-down list.
- **Associated LAN Interface:** Select a LAN connection from the drop-down list. Only the connected LAN connections can be shown in the drop-down list.
- **IPv4 Mask Length:** The length of the selected WAN connection's IPv4 mask.
- **6rd Prefix with Prefix Length:** The length of the 6rd prefix.
- **Border Relay IPv4 Address:** The IPv4 address of the border relay router of 6RD tunnel.

Click **Save/Apply** to make the configuration take effect.

Note:

In this type, there should not have any IPv6 WAN connections. If there are IPv6 WAN connections, the page will prompt you to delete all the IPv6 WAN connections.

4.4.14.2 IPv4inIPv6

Choose "**Advanced Setup**"→"**IP Tunnel**"→"**IPv4inIPv6**". You can see the 4in6 tunnel configuration screen, this screen allows you to configure the static routes (shown in Figure 4-59).

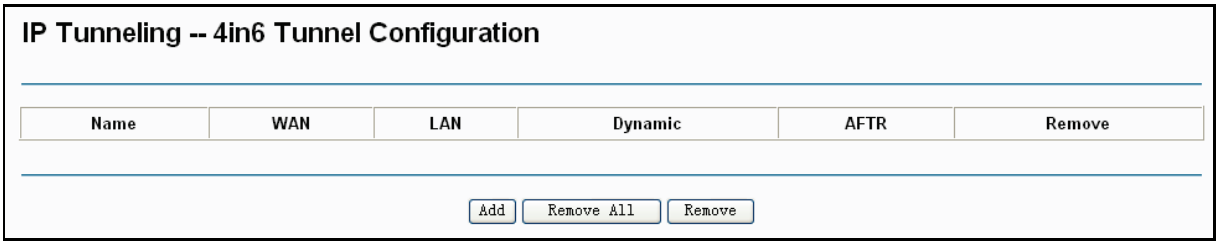


Figure 4-59

Click the **Add** button in Figure 4-59, and you can configure the 6in4 tunnel on the next screen as shown in Figure 4-60.

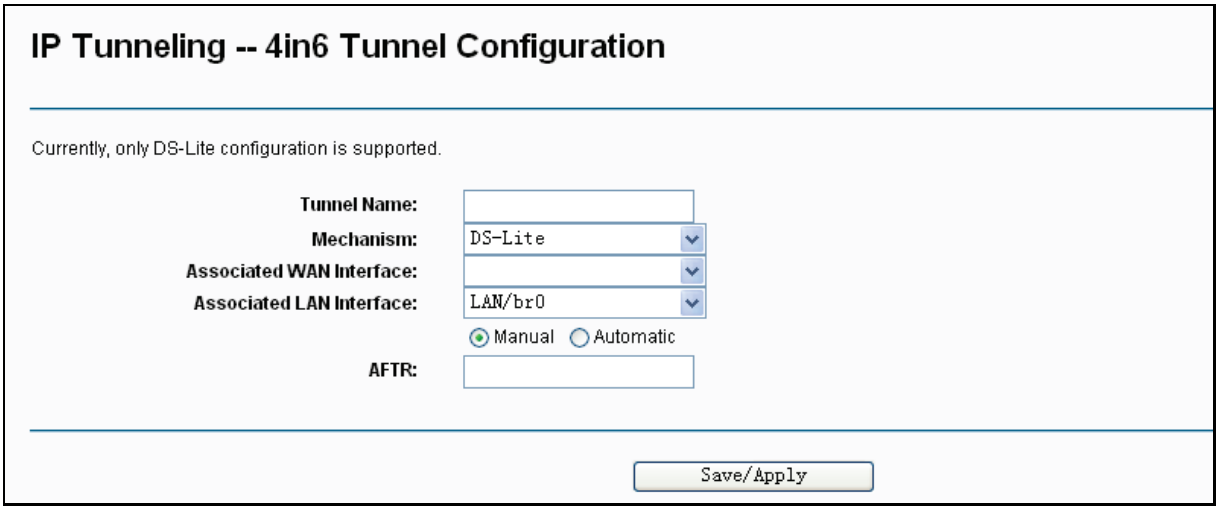


Figure 4-60

- **Mechanism:** DS-Lite, this type is used in the situation that your WAN connection is IPv6 while LAN connection is IPv4.
- **Associated WAN Interface:** Select a WAN connection from the drop-down list. Only the connected WAN connections can be shown in the drop-down list.
- **Associated LAN Interface:** Select a LAN connection from the drop-down list. Only the connected LAN connections can be shown in the drop-down list.
- **AFTR:** Enter the IPv6 address of the remote node.

Click **Save/Apply** to make the configuration take effect.

Note:

In this type, there should not be any IPv4 WAN connections. If there are IPv4 WAN connections, the page will prompt you to delete all the IPv4 WAN connections.

4.4.15 Multicast

Choose "**Advanced Setup**"→"**Multicast**", you can configure the IGMP protocol on the screen.

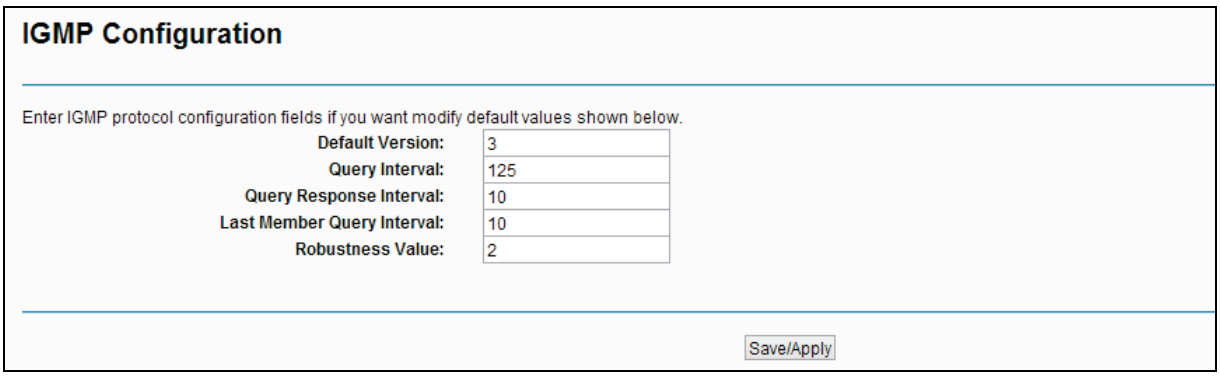


Figure 4-61

Click **Save/Apply** to save your settings.

4.5 IPTV

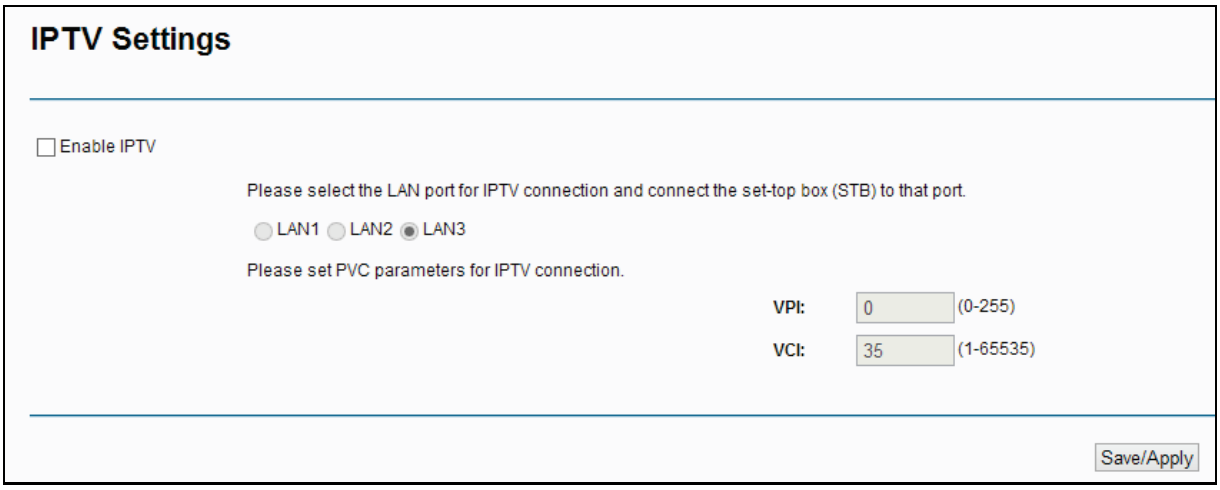


Figure 4-62

- **Enable IPTV:** Check this box to enable IPTV. If you enable IPTV, please make sure the following settings are correct.
- **VPI (0-255):** Identifies the virtual path between endpoints in an ATM network. The valid range is from 0 to 255. Please input the value provided by your ISP.
- **VCI (1-65535):** Identifies the virtual channel endpoints in an ATM network. The valid range is from 1 to 65535 (1 to 31 is reserved for well-known protocols). Please input the value provided by your ISP.

Click the **Save/Apply** button to save your settings.

4.6 Wireless

Choose "**Wireless**", there are six submenus to configure Wireless LAN settings. Click any of them, and you will be able to configure the corresponding function. The detailed explanations for each submenu are provided below.

4.6.1 Basic

Choose "**Wireless**"→"**Basic**", you will see the screen of **Wireless--Basic** settings shown as below. The basic settings for wireless networking are set on this screen.

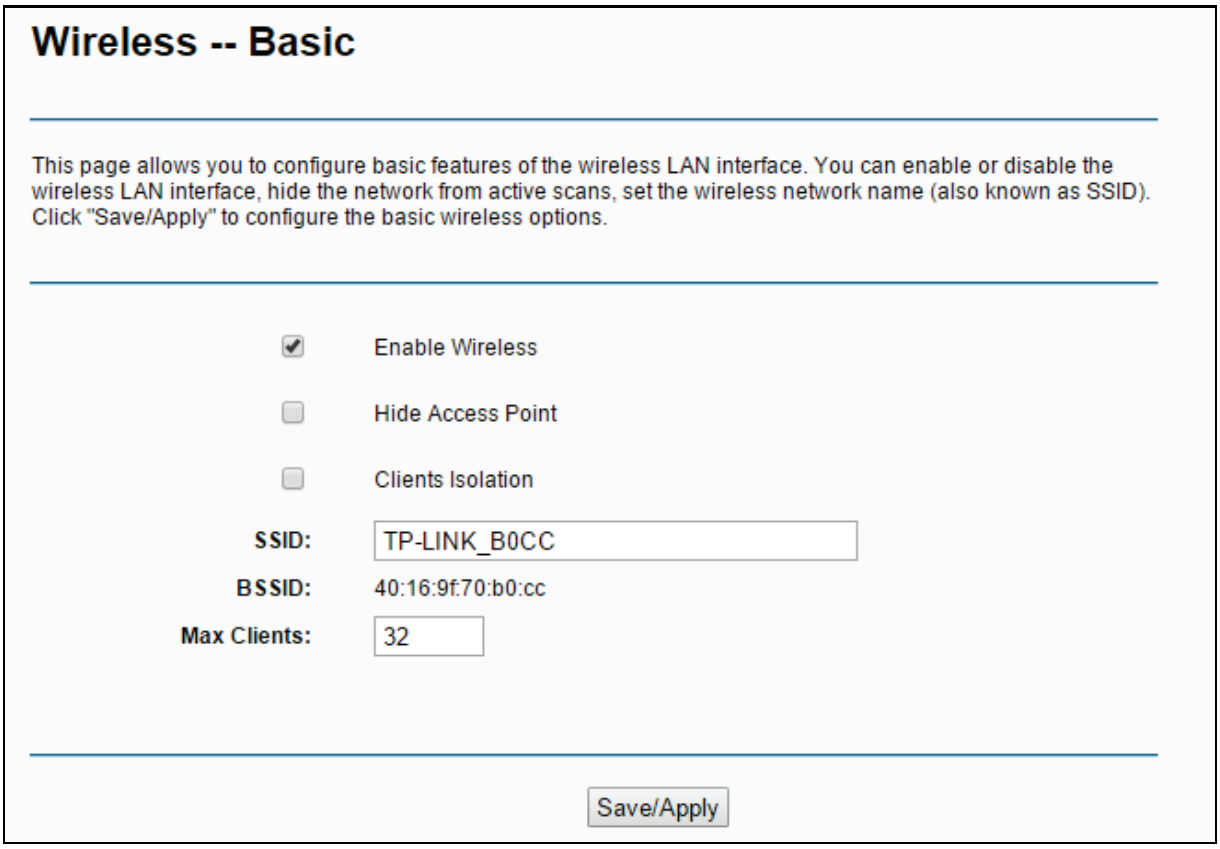


Figure 4-63

This page allows you to configure basic features of the wireless LAN interface. You can enable or disable the wireless LAN interface, hide the network from active scans and set the wireless network name (also known as SSID).

- **Enable Wireless:** If you want to use wireless features, you must select “Enable Wireless”. If you deselect “Enable Wireless” option, the wireless network will be disabled.
- **Hide Access Point:** When wireless clients survey the local area for wireless networks to associate with, you can select this option to avoid being surveyed.
- **Clients Isolation:** Select this option to enable AP isolation function so that stations associated to the AP will not be able to communicate with each other.
- **SSID:** SSID (Wireless network name) shared among all points in a wireless network. The SSID must be identical for all devices in the wireless network. It is case-sensitive and must not exceed 32 characters (use any of the characters on the keyboard). Make sure this setting is the same for all stations in your wireless network. Type the desired SSID in the space provided.
- **BSSID:** Show the MAC address of the router’s wireless network.
- **Max Clients:** The maximum number of wireless clients that can connect to the router.

Click **Save/Apply** to save your settings.

4.6.2 Security

Choose “**Wireless**”→ “**Security**”, you will see the screen of **Wireless--Security** settings shown as below. You can configure security features of the wireless LAN interface by manually setting the network authentication or through WPS (Wi-Fi Protected Setup) method.

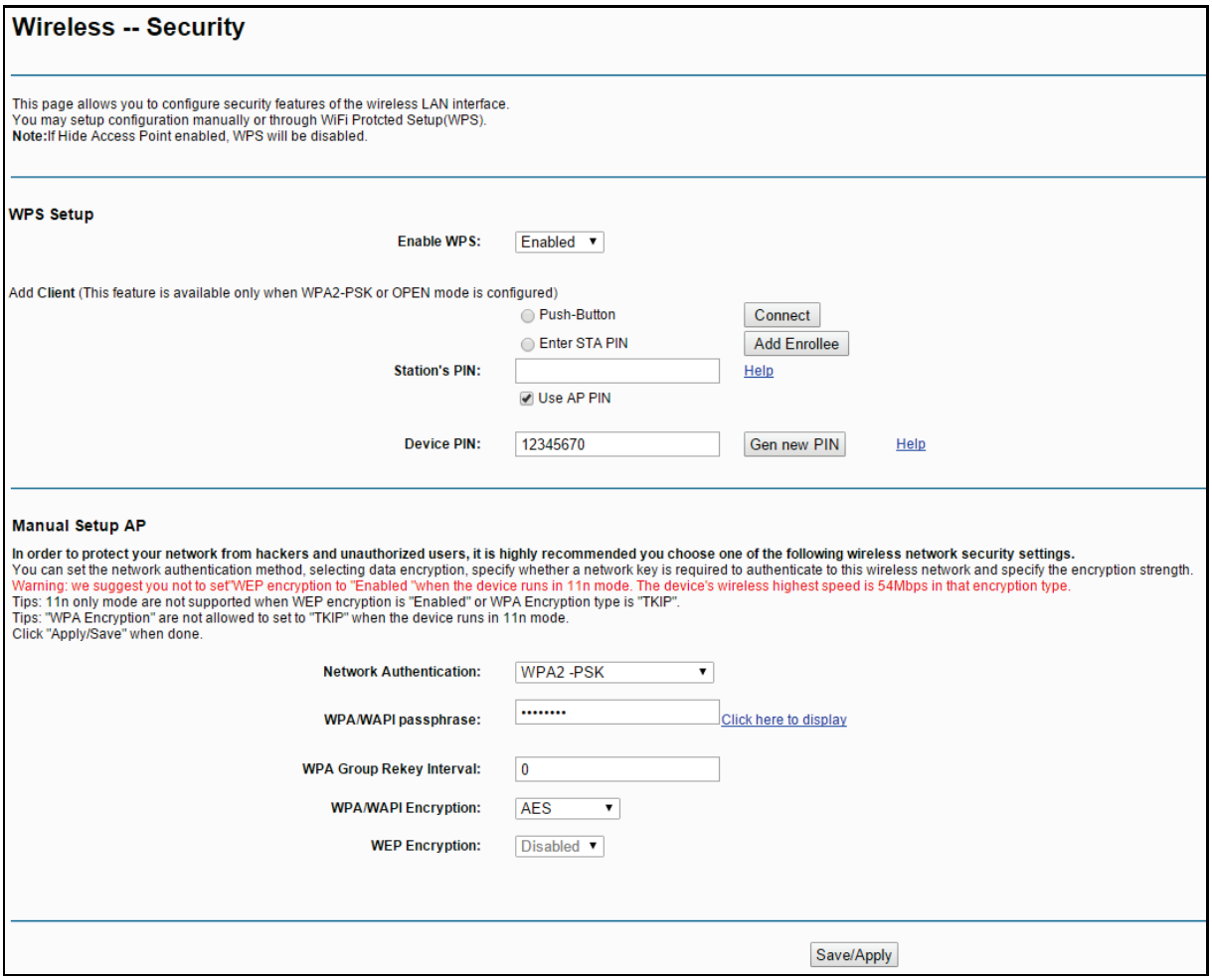


Figure 4-64

4.6.2.1 WPS Setup

This section will guide you to add a new wireless device to an existing network quickly by **WPS** (or called QSS) method.

Note:

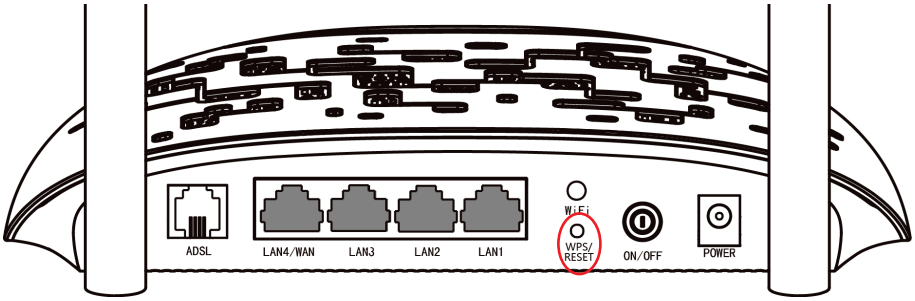
1) This feature is available only when WPA2-PSK or OPEN mode is configured.
2) To build a successful connection by WPS, you should also do the corresponding configuration of the new device for WPS function meanwhile.

I. By PBC

If the wireless adapter supports WPS and the Push Button Configuration (PBC) method, you can add it to the network by PBC with the following two methods.

Method One: Hardware push button.

Step 1: Press the **WPS/RESET** button on the back panel of the router.



Step 2: Press and hold the WPS button of the adapter (if it has one) for 2 or 3 seconds.

Step 3: Wait for a while until the following screen of adapter appears. Click **OK** to complete the WPS configuration.

Figure 4-65

Method Two: Client's contiguration utility

Step 1: Click **Push-Button** on Figure 4-66, you will see the screen as shown below. Then click **Connect**.

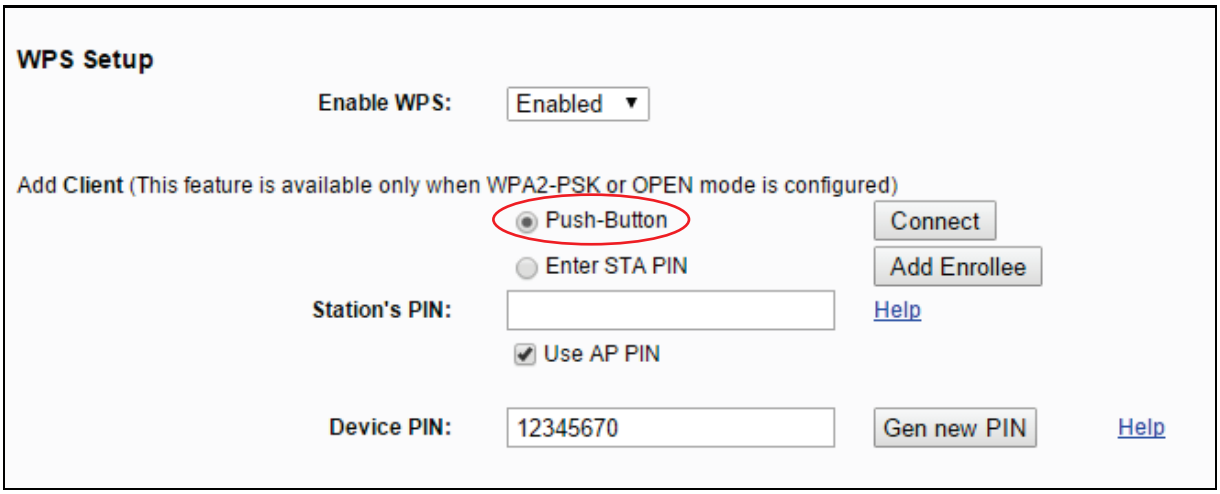


Figure 4-66

Step 2: For the configuration of the wireless adapter, please choose "**Push the button on my access point or wireless router**" in the configuration utility of the WPS as below, and click **Connect**.

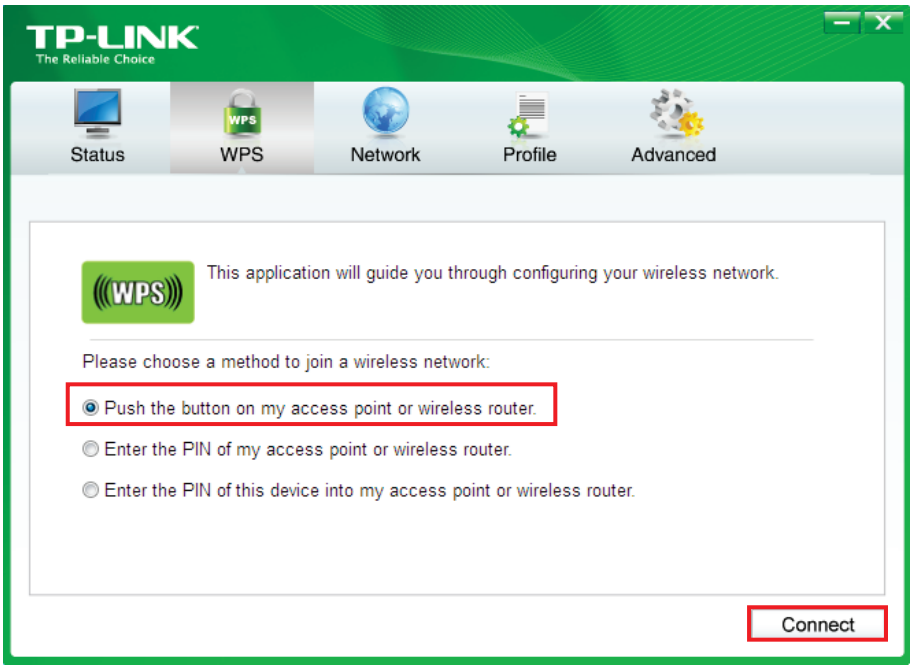


Figure 4-67

Step 3: Wait for a while until the following screen appears. Click **OK** to complete the WPS configuration.

Figure 4-68

II. By PIN

If the new device supports Quick Security Setup and the PIN method, you can add it to the network by PIN with the following two methods.

Method One: Enter the PIN of wireless adapter into my router.

Step 1: Select the **Enter STA PIN** radio box and enter the PIN code of the wireless adapter in the field under as shown below. Then click **Add Enrollee**.

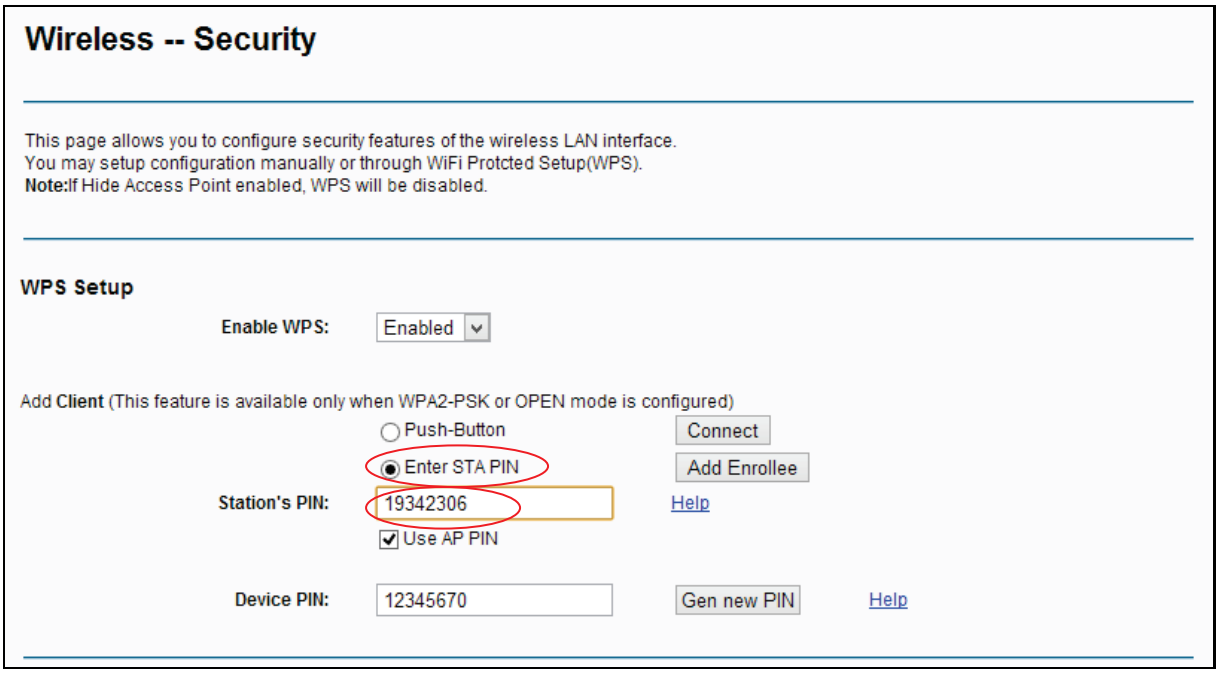


Figure 4-69

Note:

The PIN code of the adapter is always displayed on the WPS configuration screen.

Step 2: For the configuration of the wireless adapter, please choose "**Enter the PIN of this device into my access point or wireless router**" in the configuration utility of the WPS

as below, and click **Connect**.

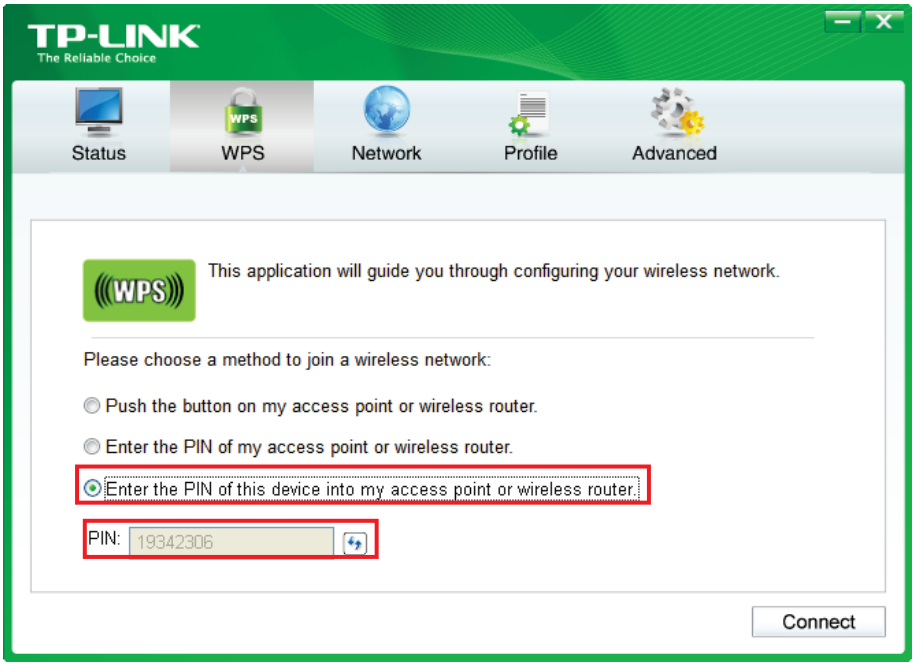


Figure 4-70

Note:

In this example, the default PIN code of this adapter is 19342306 as the preceding figure shows.

Method Two: Enter the PIN of my router into the wireless adapter.

Step 1: Select **Use AP PIN** and get the Device PIN generated by the router as shown below. You can click **Gen New PIN** to get a new PIN code for router.

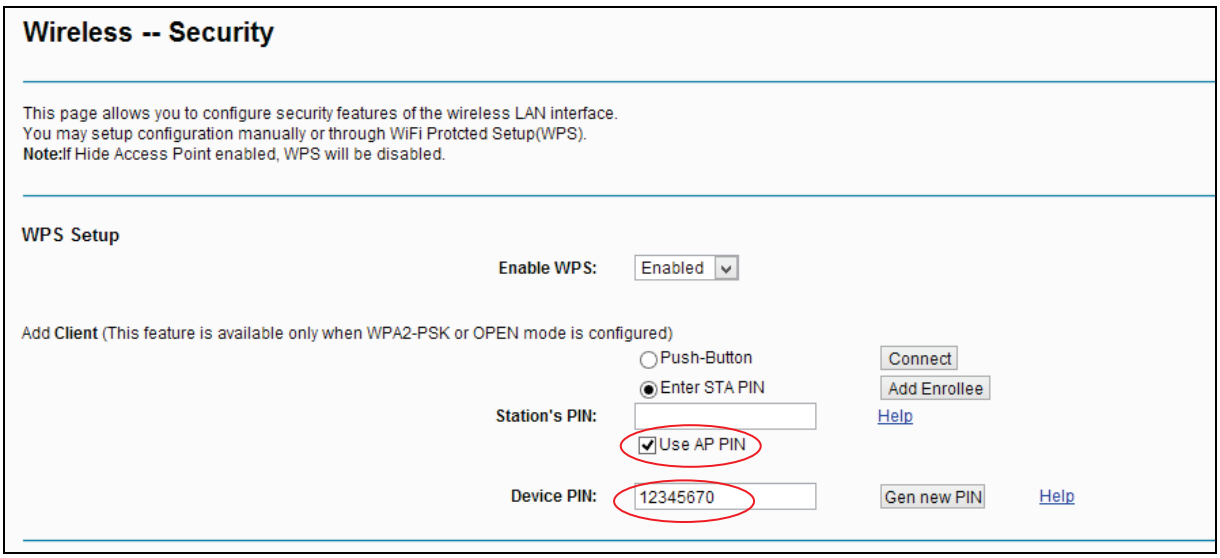


Figure 4-71

Step 2: For the configuration of the wireless adapter, please choose "**Enter the PIN of my access point or wireless router**" in the configuration utility of the WPS as below, and enter the PIN code of the router into the field after "**Device PIN**". Then click **Connect**.

Figure 4-72

4.6.2.2 Manual Setup AP

Follow the instructions below to configure security features of the wireless LAN interface manually. You can set the network authentication method, select data encryption, specify whether a network key is required to authenticate to this wireless network and specify the encryption strength.

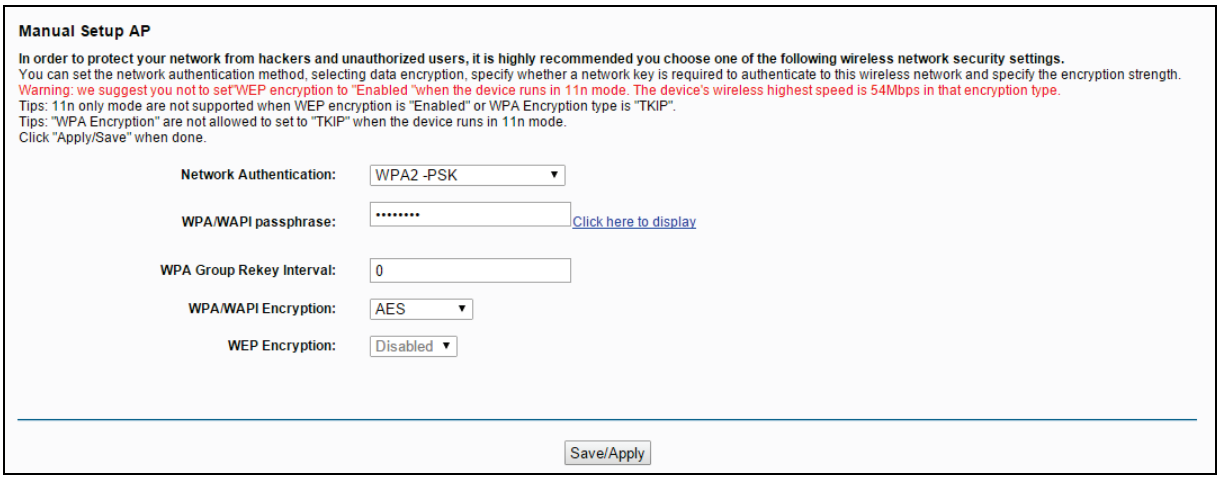


Figure 4-73

- **Network Authentication:** Select an authentication type from the drop-down list. Options available are: Open, Shared, WPA, WPA-PSK, WPA2, WPA2-PSK, Mixed WPA2/WPA, and Mixed WPA2/WPA-PSK.

Note:

For most users, it is recommended to use the default Wireless LAN Performance settings. Any changes made to these settings may adversely affect your wireless network. Under certain circumstances, changes may benefit performance. Carefully consider and evaluate any changes to these wireless settings.

1. WEP

WEP is a basic encryption method offering two levels of encryption, 64-bit and 128-bit encryption. To configure the WEP encryption, there are two ways.

- Keep the Network Authentication of **Open (insecurity)** and select **Enabled** from the WEP Encryption drop-down list, as shown in Figure 4-74. **Open (insecurity)** with WEP encryption disable allows any wireless station to associate with the access point.
- Select **Shared** from the Network Authentication drop-down list, as shown in Figure 4-75. **Shared** must enable WEP encryption. Network using **Open** or **Shared** authentication with WEP encryption only allows stations using the same network key encryption to associate with it. Follow the instructions below to configure the Shared Keys.

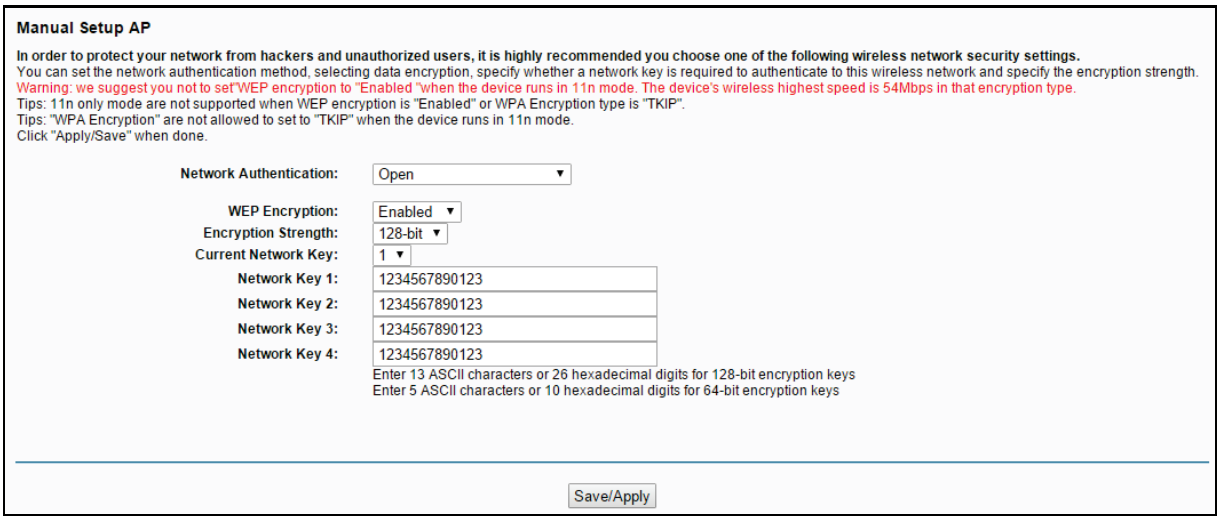


Figure 4-74

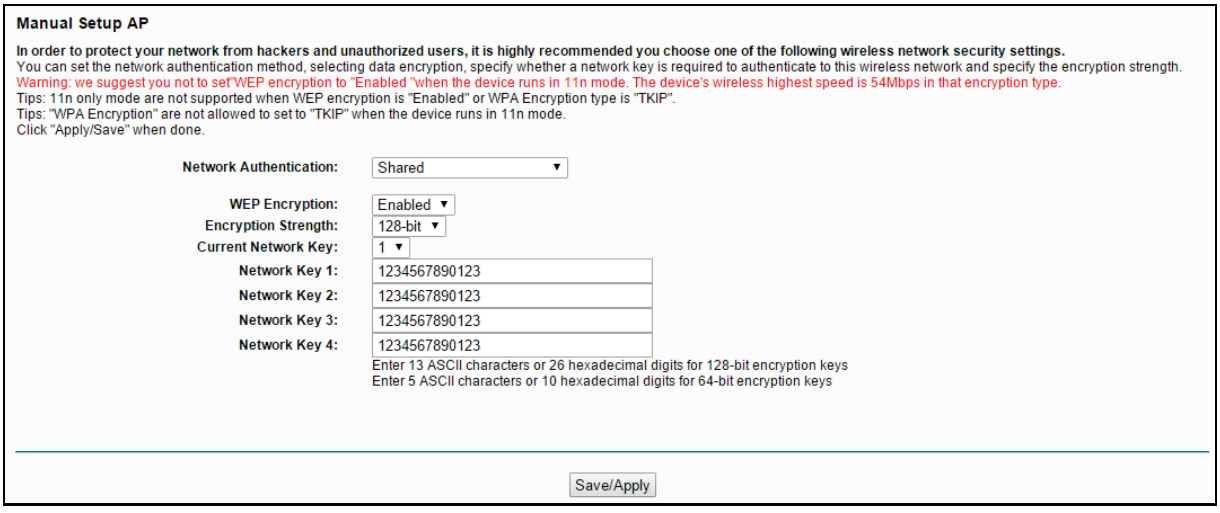


Figure 4-75

- **Encryption strength:** Select the appropriate level of encryption, 64-bit or 128-bit.
- **Current Network Key:** To indicate which WEP key to use, select a transmission key number.
- **Network Key 1-4:** If you want to manually enter the WEP keys, then enter them in the network Key 1-4 fields.

Configure WEP Settings

1. Select **Shared** from the **Network Authentication** drop-down list. The menu will change to offer the appropriate settings.
2. Select **64-bit** from the **WEP Encryption** drop-down list.
3. Select "**1**" from **Current Network Key** drop-down list.
4. Type in the password in the **Network Key 1** field.
5. Click **Save/Apply** to save the new configuration.

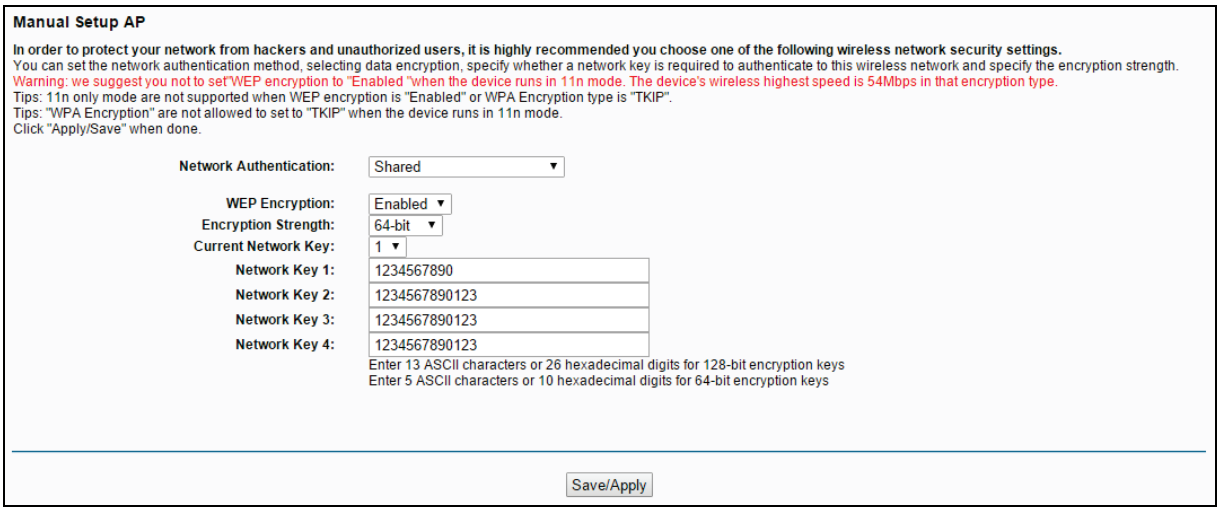


Figure 4-76

Note:

We use **Network Authentication** Shared, **Encryption Strength** 64-bit, **Current Network Key** "1" and enter 10 hexadecimal digits"1234567890" in the **Network Key 1** for example, as shown in Figure 4-76 above.

2. WPA

WPA security for wireless communication has been developed to overcome some of the shortcomings of WEP. WPA combines the key generation with the authentication services of a RADIUS server.

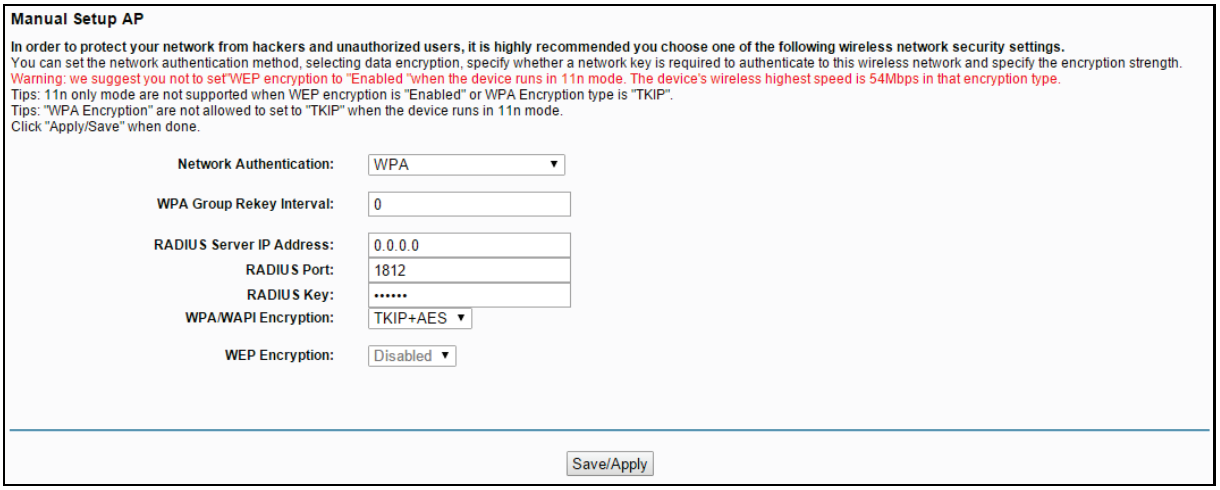


Figure 4-77

- **WPA Group ReKey Interval:** Enter the Key Renewal period, which tells the router how often it should change encryption keys.
- **RADIUS Server IP Address:** The IP address of the RADIUS server.
- **RADIUS Port:** The port of the RADIUS server. The default number is 1812.
- **RADIUS key:** The password of the RADIUS Server.
- **WPA/WPAI Encryption:** Select the encryption you want to use: AES or TKIP+AES (AES is an encryption method stronger than TKIP).

Configure WPA settings

1. Select **WPA** from the **Network Authentication** drop-down list. The menu will change to offer the appropriate settings.
2. Change the **WPA Group Rekey Interval** as desired.
3. Type in the IP address of the RADIUS server used in the **RADIUS Server IP Address** field.
4. Change the **RADIUS Port** if necessary.
5. Type in the password in the **RADIUS Key** field.
6. Use the default setting **TKIP+AES** of WPA/WPAI Encryption.
7. Click **Save/Apply** to save the new configuration.

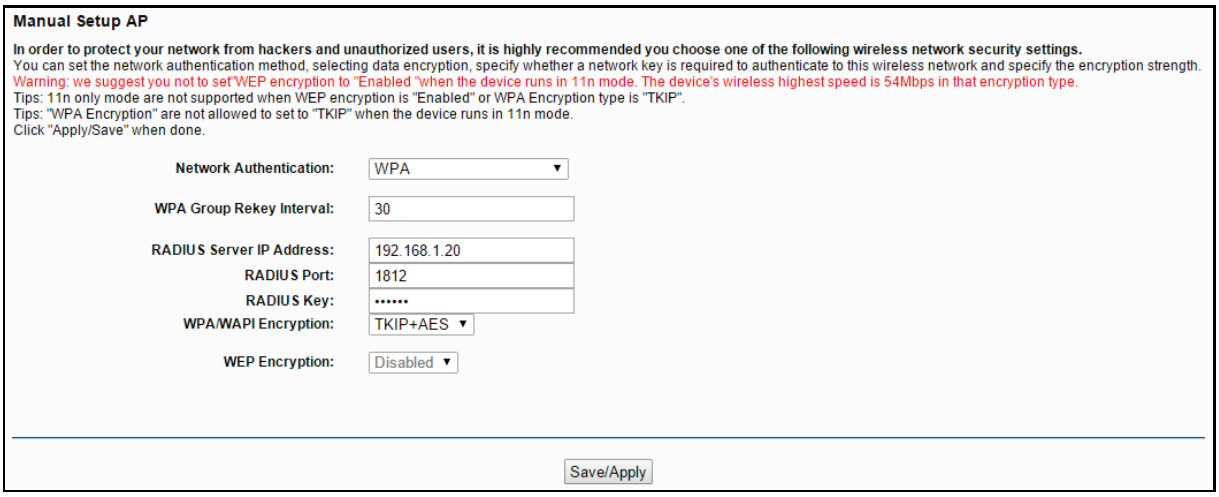


Figure 4-78

3. WPA-PSK

WPA-PSK requires a shared key and does not use a separate server for authentication. PSK keys can be ASCII or Hex type.

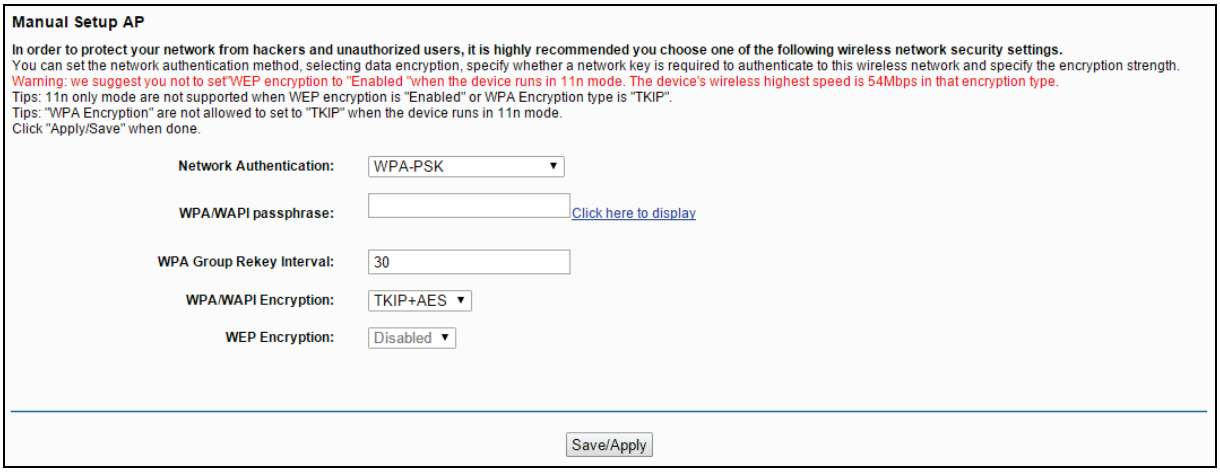


Figure 4-79

- **WPA/WAPI passphrase:** WPA/WAPI passphrase is also called Wireless Network Key. In this field, enter the key shared by the router and your other network devices. It must have 8-63 ASCII characters or 8-64 Hexadecimal digits.
- **Click here to display:** Click it to show you the WPA Pre-Shared Key.

Configure WPA-PSK settings

1. Select **WPA-PSK**. The menu will change to offer the appropriate settings as the picture show above.
2. WPA-Personal requires a shared key. Type the key in the space provided. PSK keys can be ASCII or Hex type.
3. Change the Group Key Interval as desired or use the default setting.
4. Click **Save/Apply** to save the new configuration.

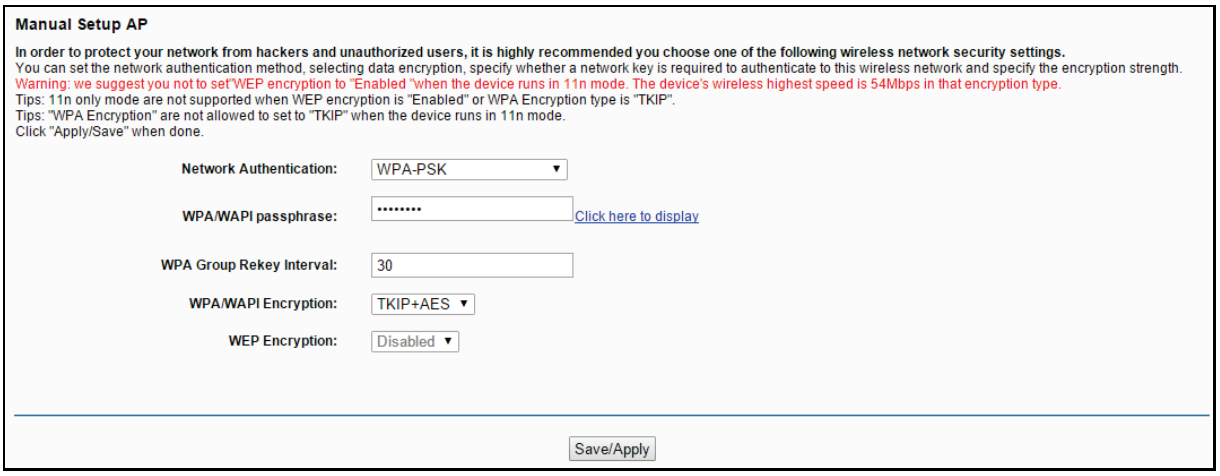


Figure 4-80

Note:

If you click the option “Click here to display”, the Figure 4-81 will pop-up, and it shows the password you have set. In addition, it won't show the blank characters in both ends of the password phrase.

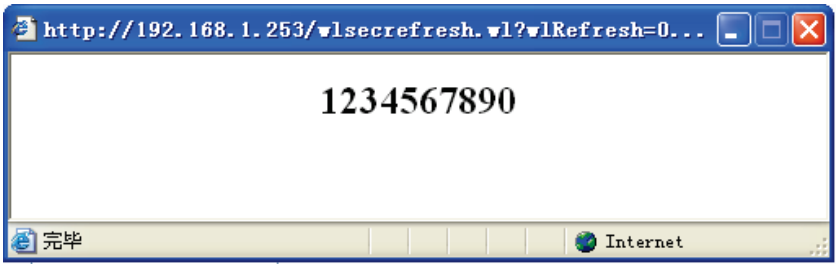


Figure 4-81

4. WPA2

To configure WPA2, select the WPA2 option from the drop-down list. The menu will change to offer the appropriate settings. The steps of these settings are similar to WPA settings.

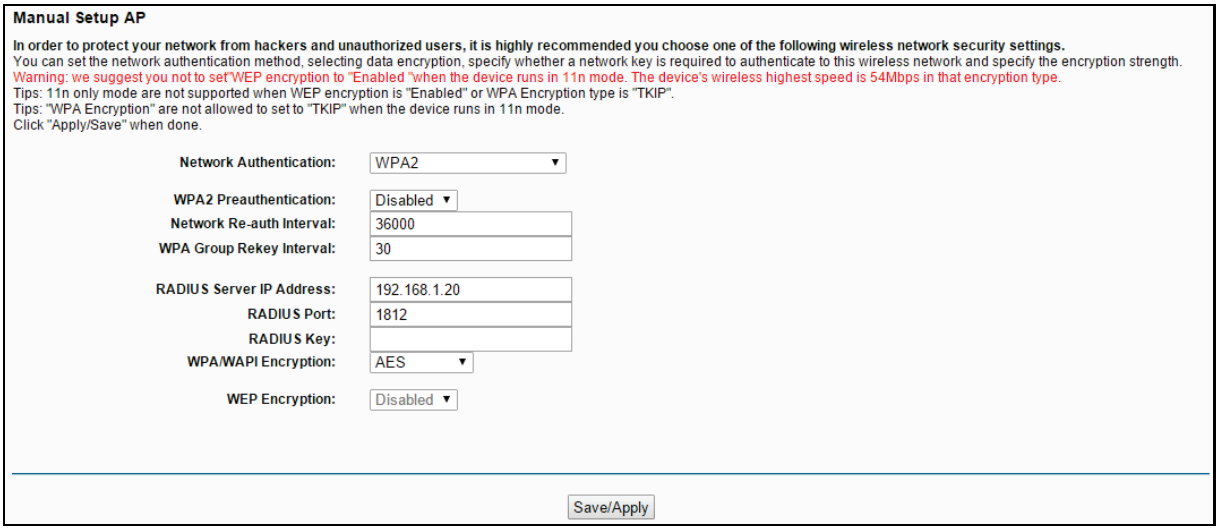


Figure 4-82

- **WPA2 Preauthentication:** Select Enable from the drop-down list, Stations will authenticate with the AP during the scanning process, and once association is required, the station has been already authenticated.
- **Network Re-auth Interval:** Enter a value in seconds as the frequency interval to enable periodic Network Re-authentication function, while leave it blank or enter “0” to disable it.

5. WPA2 -PSK

To configure WPA2 -PSK settings, select the WPA2 -PSK option from the drop-down list. The menu will change to offer the appropriate settings. WPA2 -PSK requires a shared key and does not use a separate server for authentication. PSK keys can be ASCII or Hex type.

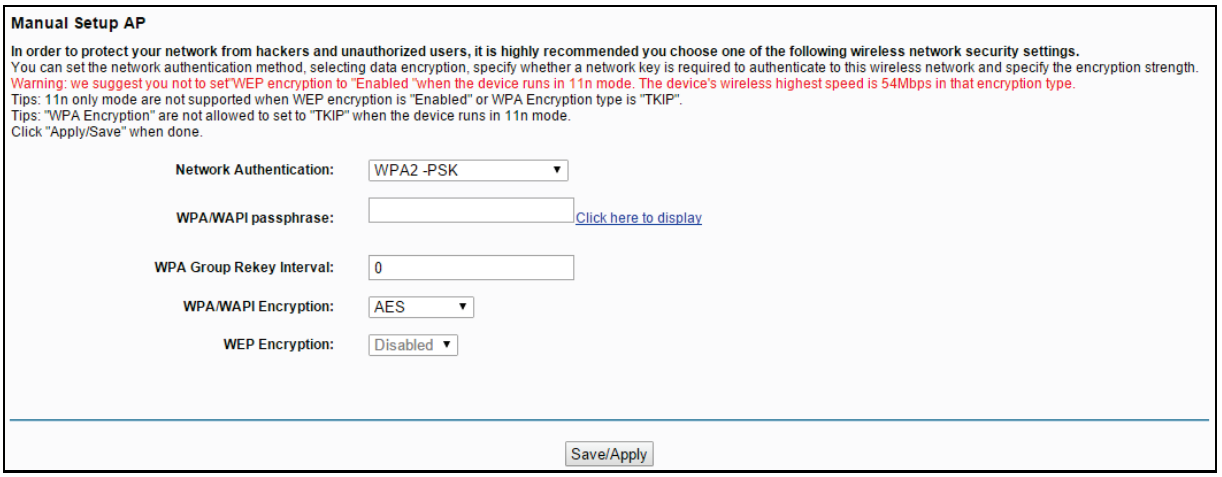


Figure 4-83

6. Mixed WPA2/WPA

To configure Mixed WPA2/WPA settings, select the Mixed WPA2/WPA option from the drop-down list. The menu will change to offer the appropriate settings. The steps to these settings are similar to those for WPA-PSK.

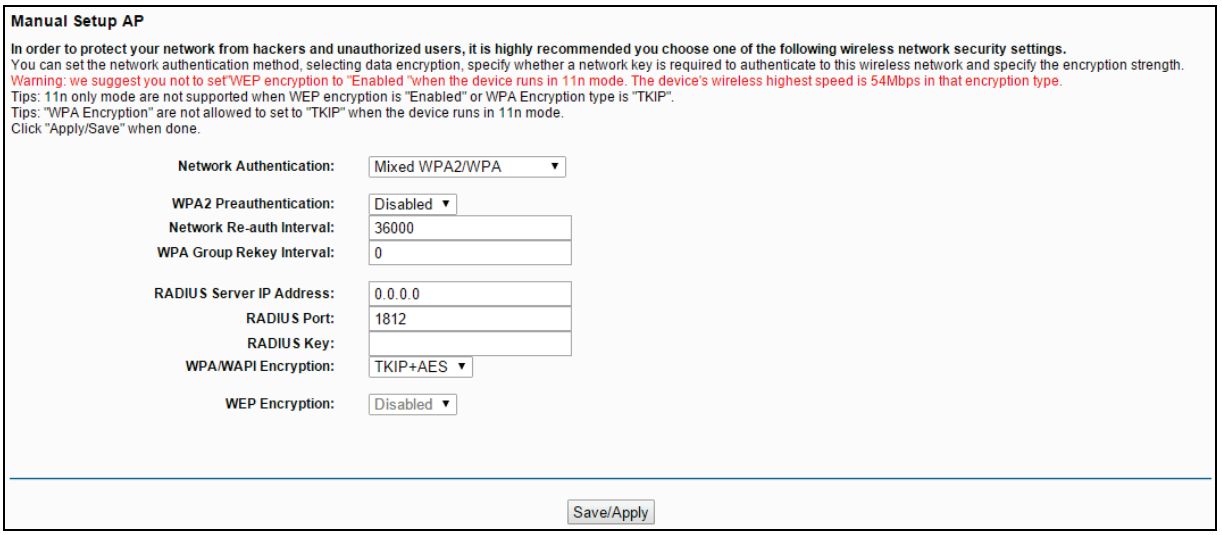


Figure 4-84

7. Mixed WPA2/WPA -PSK

To configure Mixed WPA2/WPA -PSK settings, select the Mixed WPA2/WPA -PSK option from the drop-down list. The menu will change to offer the appropriate settings. The steps of this setting are the same with WPA-PSK.

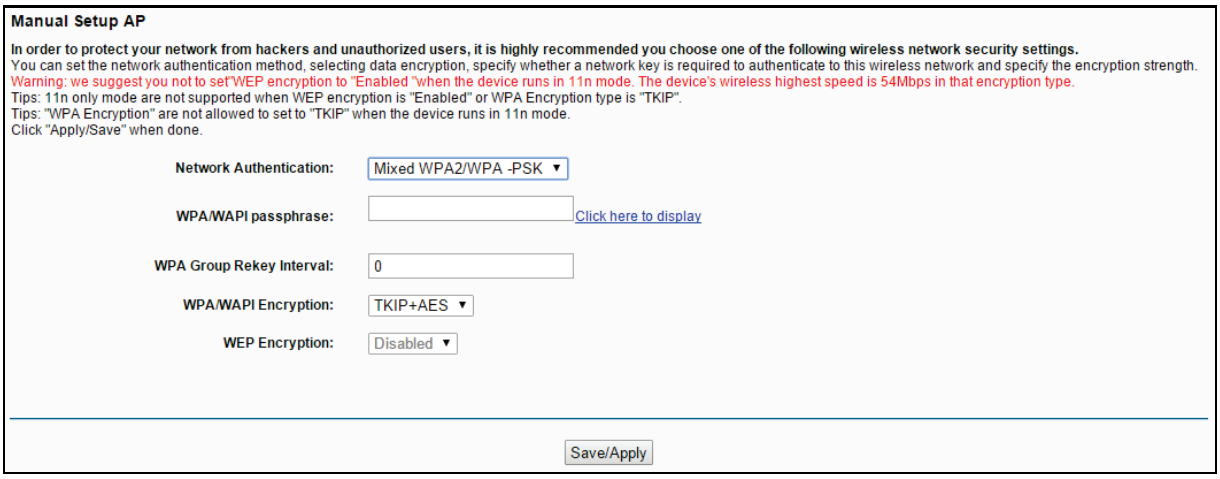


Figure 4-85

4.6.3 Wireless Schedule

Choose menu "**Wireless**"→"**Wireless Schedule**", you can configure the Task Schedule as shown below.

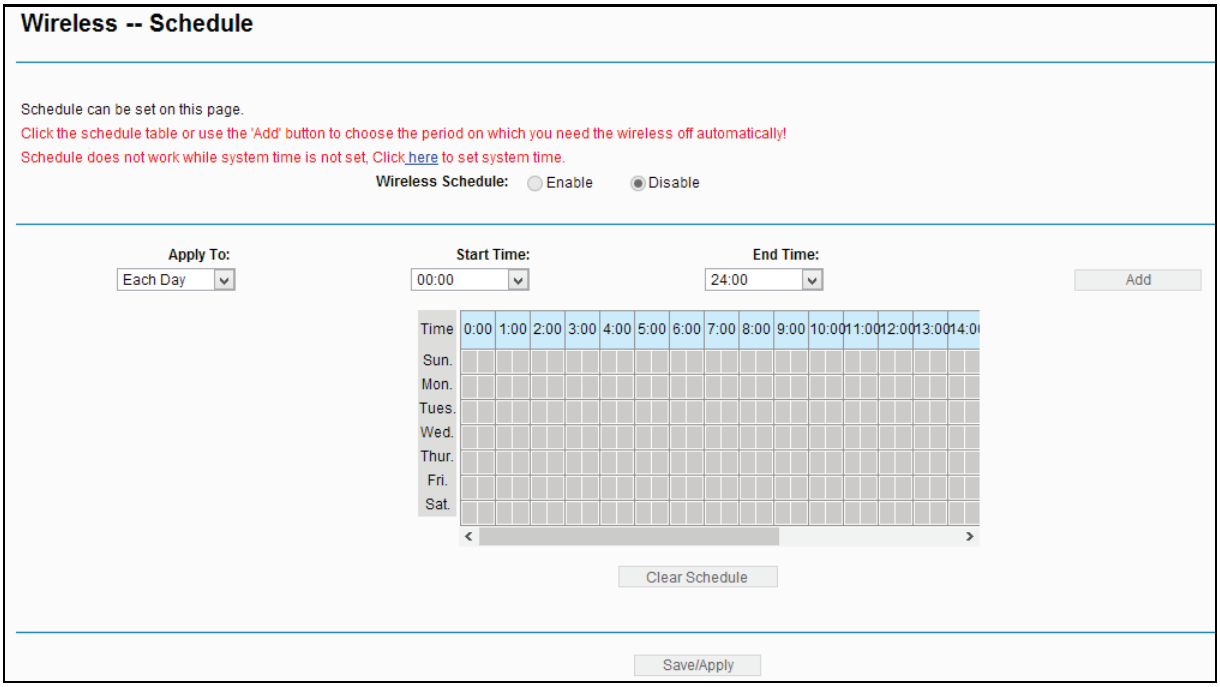


Figure 4-86

☞ Note:

The time you set is the period you need the wireless off.

Before configuring the wireless schedule, please set system time first which refer to 4.8.5 Internet Time, then you can enable or disable Wireless Schedule.

- **Apply To:** Select the day or days you need the wireless off.
- **Start Time, End Time:** You can select all day-24 hours or you may enter the **Start Time** and **End Time** in the corresponding field.
- **Add:** Click this button to add your selected time to the below table.

Click the **Clear Schedule** button to clear your settings in the table.

Click **Save** to complete the settings.

4.6.4 MAC Filter

Choose "**Wireless**"→"**MAC Filter**", you will see the screen of **Wireless--MAC Filter** settings shown as below.

Figure 4-87

Wireless access can be filtered by using the MAC addresses of the wireless devices transmitting within your network's RADIUS. To filter wireless users by MAC Address, either permitting or blocking access. If you do not wish to filter users by MAC Address, select Disabled.

- **Disabled:** Select this option to disable MAC Filter function.
- **Allow:** Select this option to enable MAC Filter function that allow wireless access by the devices listed on this screen.
- **Deny:** Select this option to enable MAC Filter function that block wireless access from the devices listed on this screen.
- **Add:** Click this button to add the MAC Address.
- **Remove:** Select the item of the MAC Address and click this button to remove it.

When you click the **Add** button, the pop-up picture shown below, and then you can type the MAC Address in the **MAC Address** field.

Note:

The form of MAC Address must be "**xx:xx:xx:xx:xx:xx**", like "**00:13:0A:55:FF:09**".

Figure 4-88

When you finished making changes to the MAC Filter List screen, click **Save/Apply** to save the changes.

4.6.5 Wireless Bridge

Choose "**Wireless**"→"**Wireless Bridge**", you will see the screen of **Wireless--Bridge** settings shown as below. You can configure wireless bridge features of the wireless LAN interface and click **Save/Apply** button to save the current configuration.

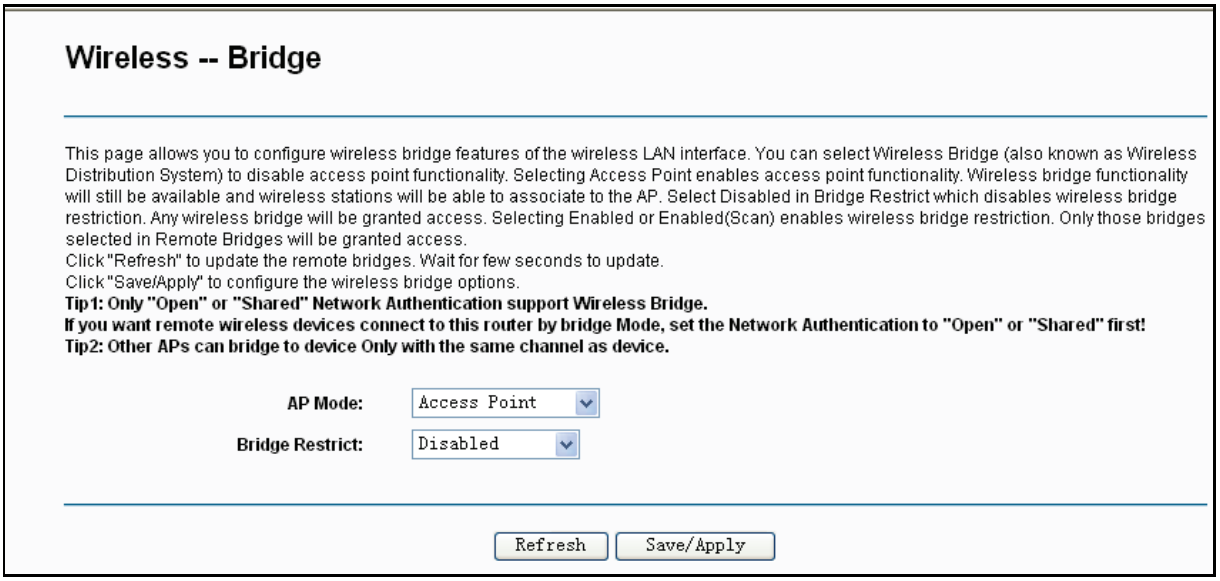


Figure 4-89

- **AP Mode**: Select an AP Mode from the drop-down list. Options available are: Access Point and Wireless Bridge.
  - **Access Point**: Select this option to allow wireless stations including AP clients to access.
  - **Wireless Bridge**: Also known as WDS (Wireless Distribution System), it will bridge the wireless stations in bridge mode.
- **Bridge Restrict**:
  - **Disabled**: Select this option to disables wireless bridge restriction, that any wireless bridge will be granted access.
  - **Enabled**: Select this option (as shown below) to enables wireless bridge restriction, please enter the MAC address of the Remote Bridges that you want to connect with, and only these Remote Bridges are granted access.

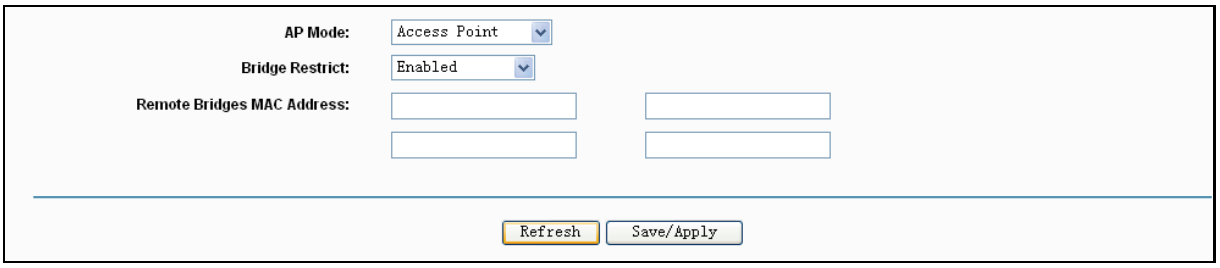


Figure 4-90

- **Enabled (Scan)**: Select this option to enables wireless bridge restriction, and it will scan the environment for APs that exist around the device. Only those selected AP will be granted access.
- **Refresh:** Click this button to scan and display the APs.

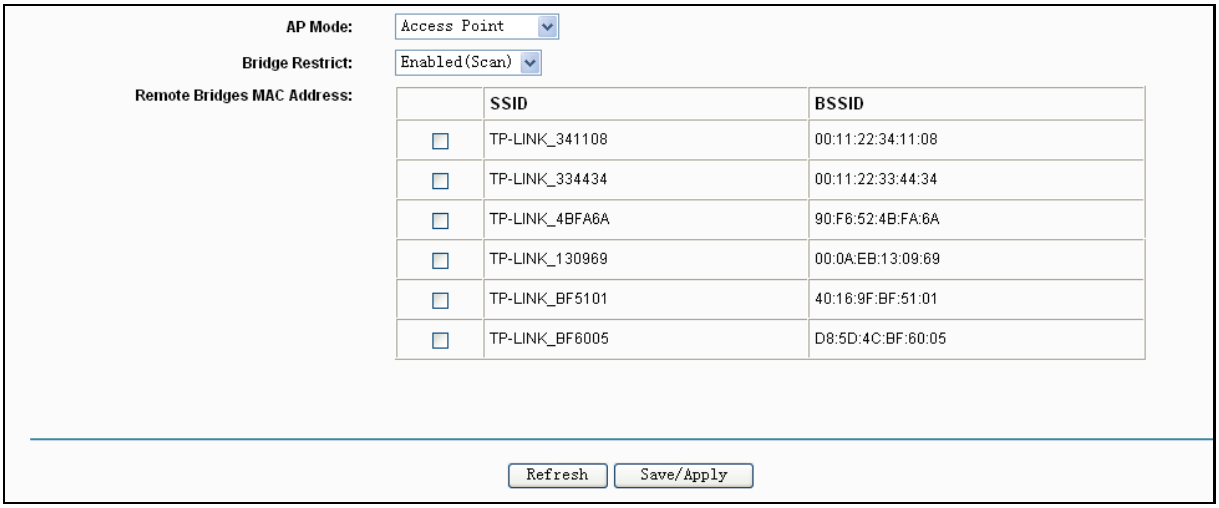


Figure 4-91

Note:

1) Only Open or Shared authentication method support wireless bridge, you should choose "**Wireless**"→"**Security**" to change authentication method to "open" or "shared" mode first.

2) The AP that our router bridges to also should input our router's BSSID (MAC Address).

4.6.6 Advanced

Choose "**Wireless**"→"**Advanced**", you will see the screen of **Wireless--Advanced** settings shown as below.

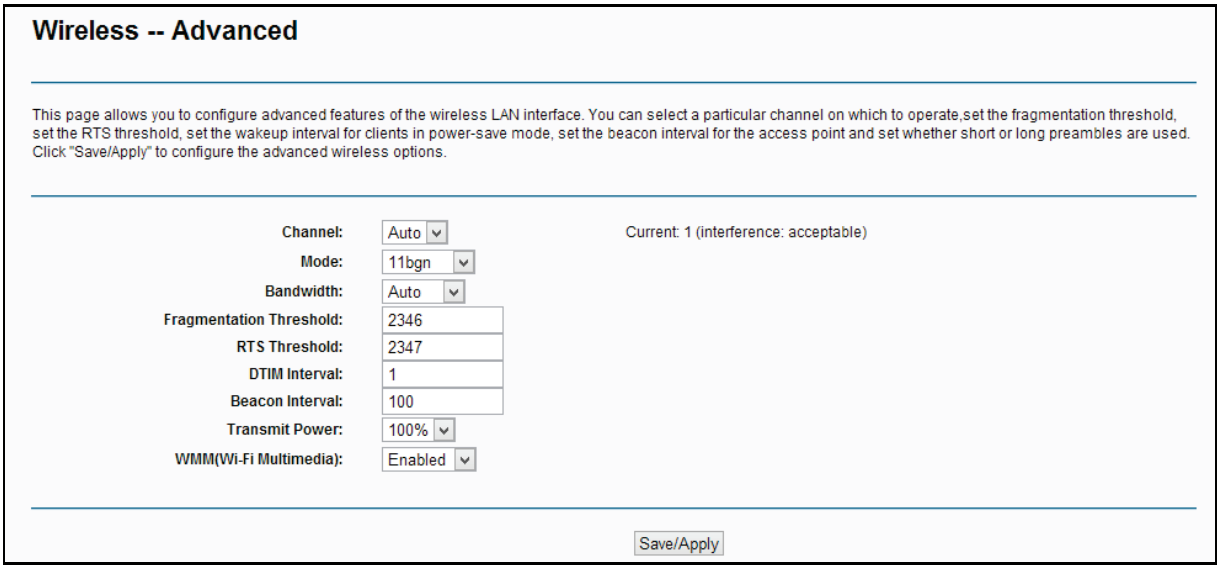


Figure 4-92

- **Channel:** Select the channel you want to use from the drop-down List. This field determines which operating frequency will be used. It is not necessary to change the wireless channel unless you notice interference problems with another nearby access point.
- **Mode**: In the drop-down list you can select "11b", "11g", "11bg", "11bgn" and "11n only". "11bgn" allows both 802.11b, 802.11g and 802.11n wireless stations to connect to the router.
- **Bandwidth**: Select the Bandwidth you want to use from the drop-down List. If bigger bandwidth is selected, device could transmit and receive data with higher speed.

- **Fragmentation Threshold:** This value specifies the maximum size for a packet before data is fragmented into multiple packets. If you experience a high packet error rate, you may slightly increase the Fragmentation Threshold. Setting the Fragmentation Threshold too low may result in poor network performance. Only minor reduction of the default value is recommended. In most cases, it should remain at its default value of 2346.
- **RTS Threshold:** Should you encounter inconsistent data flow, only minor reduction of the default value 2347 is recommended. If a network packet is smaller than the preset RTS threshold size, the RTS/CTS mechanism will not be enabled. The router sends Request to Send (RTS) frames to a particular receiving station and negotiates the sending of a data frame. After receiving an RTS, the wireless station responds with a Clear to Send (CTS) frame to acknowledge the right to begin transmission. This mechanism can provide you a quiet communication channel by notifying other stations not to send packet for a period of time. In most cases, keep its default value of 2347.
- **DTIM Interval:** This value, between 1 and 255, indicates the interval of the Delivery Traffic Indication Message (DTIM). A DTIM field is a countdown field informing clients of the next window for listening to broadcast and multicast messages. The countdown unit is measured by the amounts of beacon frames received. When the router has buffered broadcast or multicast messages for associated clients, it sends the next DTIM with a DTIM Interval value. Its clients hear the beacons and awaken to receive the broadcast and multicast messages. The default value is 1.
- **Beacon Interval:** Enter a value between 20-1000 milliseconds. The beacons are the packets sent by the modem router to synchronize a wireless network. Beacon Interval value determines the time interval of the beacons. The default value is 100.
- **Transmit Power:** This option will allow you to configure the wireless transmit power. High transmit power will extend the wireless signal range of the device and make the signal transmit more legible. Low transmit power with the smaller wireless signal range that will decrease the probability of interrupt by other Wi-Fi device.
- **WMM (Wi-Fi Multimedia):** This function can guarantee the packets with high-priority messages being transmitted preferentially. It is strongly recommended.

4.6.7 Station info

Choose "**Wireless**"→"**Station Info**", you will see the screen of **Wireless--Authenticated Stations** setting shown as below.

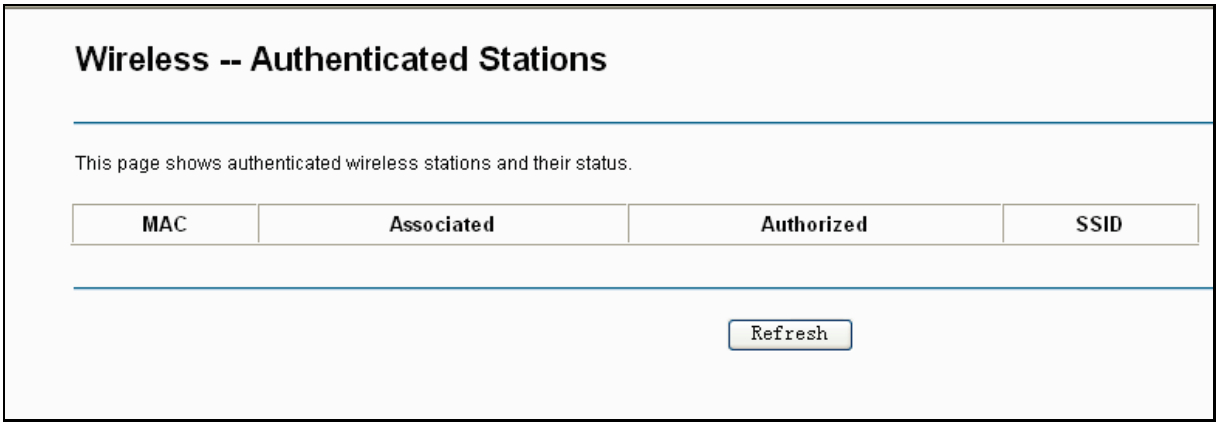


Figure 4-93

This page shows authenticated wireless stations and their status.

- **MAC**: Displays the connected wireless station's MAC address.
- **Associated**: Displays whether the wireless station has associated with the access point.
- **Authorized**: Displays the information of Authentication.
- **SSID**: Displays the connected wireless station's SSID.

You cannot change any of the values on this page. To update this page and to show the current connected wireless stations, click on the **Refresh** button.

4.7 Guest Network

There are two submenus under the Guest Network menu: **Basic** and **Station list**. Click any of them, and you will be able to scan or configure the corresponding function. The detailed explanations for each submenu are provided below.

4.7.1 Basic

Choose menu "**Guest Network**"→"**Basic**", and you will see the screen as shown in Figure 4-94. This feature allows you to create a separate network for your guests without allowing them to access your main network and the computers connected to it.

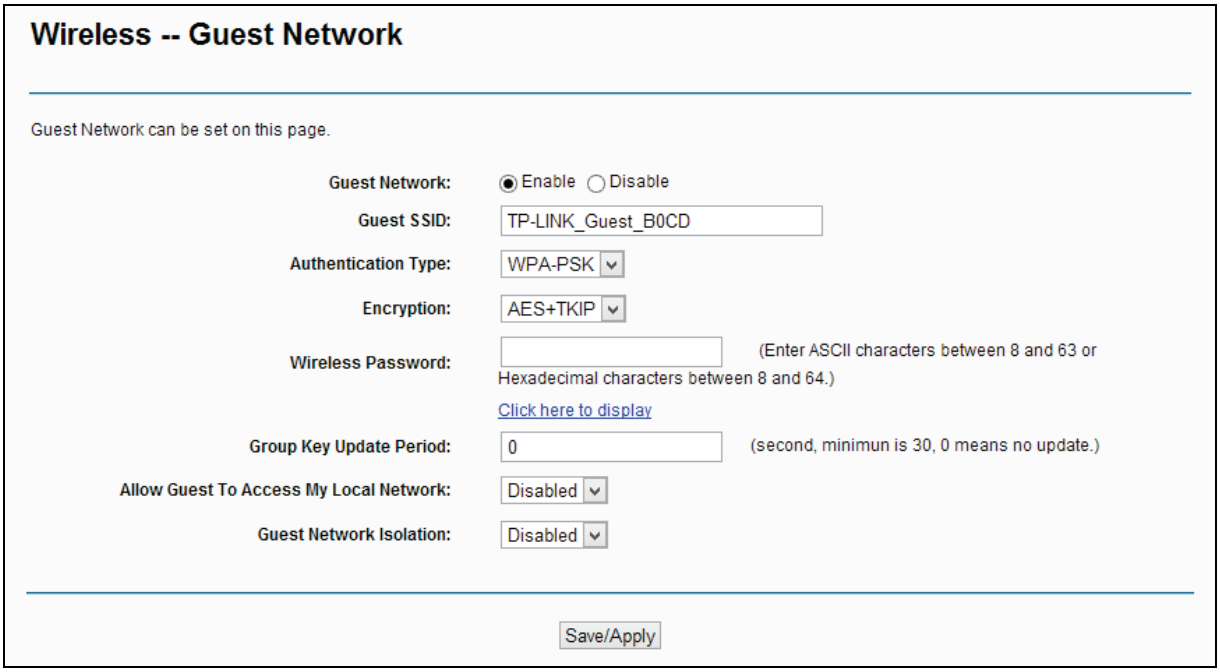


Figure 4-94

You can enable or disable Guest Network. When you enable this function, you could set wireless parameters for Guest Network.

- **Guest SSID:** The guest network name. When setting up a Guest network, it is strongly recommended to use a name that easily distinguishes it from your primary network.
- **Authentication Type:** Select the Authentication Type from the drop-down list.

- **Encryption:** You can select either **AES**, or **AES+TKIP.**
- **Wireless Password:** Enter the wireless password for the Guest Network as you like. You also can click **Click here to display** to see the wireless password.
- **Group Key Update Period:** Specify the group key update interval in seconds. The value should be 30 or above. Enter 0 to disable the update.
- **Allow Guest To Access My Local Network**: The guests have access to your Local Network, but cannot login the modem router's web management interface.
- **Guest Network Isolation:** This function can isolate wireless clients on your guest network from each other. Client isolation is disabled by default.

Click **Save/Apply** to save your settings.

4.7.2 Station list

Choose menu "**Guest Network**"→"**Station list**", you can see the MAC Address, Associated, Authorized and SSID.

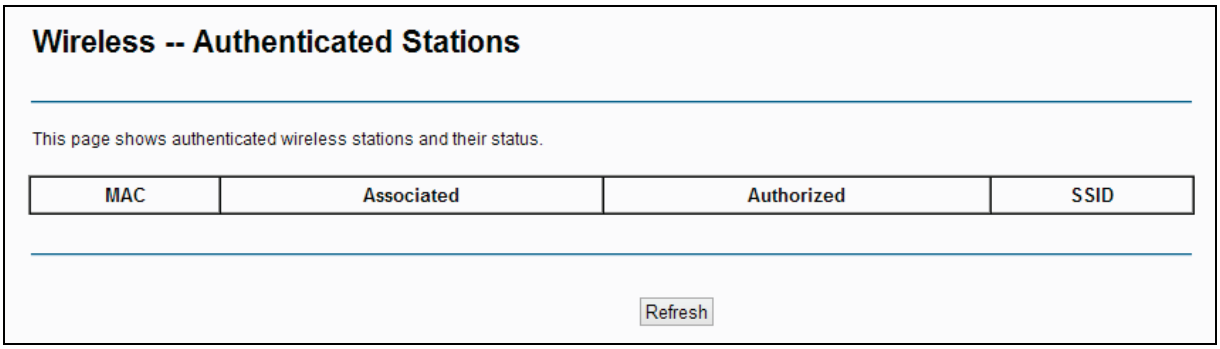


Figure 4-95

- **MAC:** Displays the connected wireless station's MAC address.
- **Associated**: Displays whether the wireless station has associated with the access point.
- **Authorized**: Displays the information of Authentication.
- **SSID**: Displays the connected wireless network's SSID.

You cannot change any of the values on this page. To update this page and to show the current connected wireless stations, click on the **Refresh** button.

4.8 Diagnostics

Choose "**Diagnostics**", you will see the Diagnostics screen. This section describes the result of the test for the ENET (Ethernet) Connection, Wireless Connection and ADSL Synchronization. You can refer to the **Help** menu to get more information about the corresponding test.

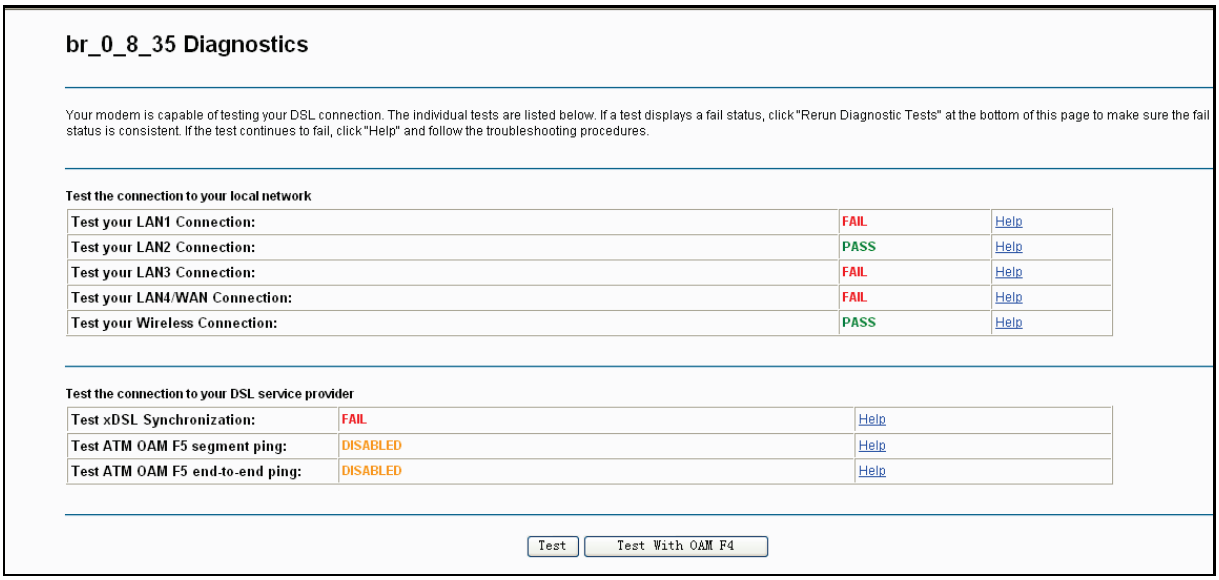
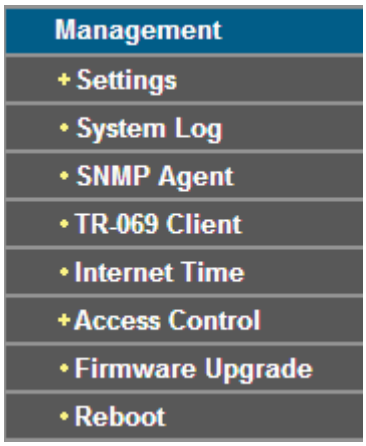


Figure 4-96

4.9 Management

Choose "**Management**", there are eight submenus under the main menu. They are **Settings**, **System Log**, **SNMP Agent**, **TR-069 Client**, **Internet Time**, **Access Control**, **Update Firmware** and **Reboot**. Click any of them, and you will be able to configure the corresponding function.



4.9.1 Settings

This section provides three important functions for managing the router; they are **Export**, **Import** and **Restore Default** (shown in Figure 4-97). The detailed manipulations are described below.

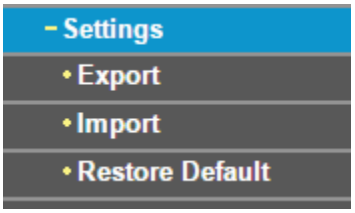


Figure 4-97

4.9.1.1 Export

Choose "**Management**"→"**Settings**"→"**Export**", you can see the **Export** screen, which allows you to save the current configuration of the router as a backup file.

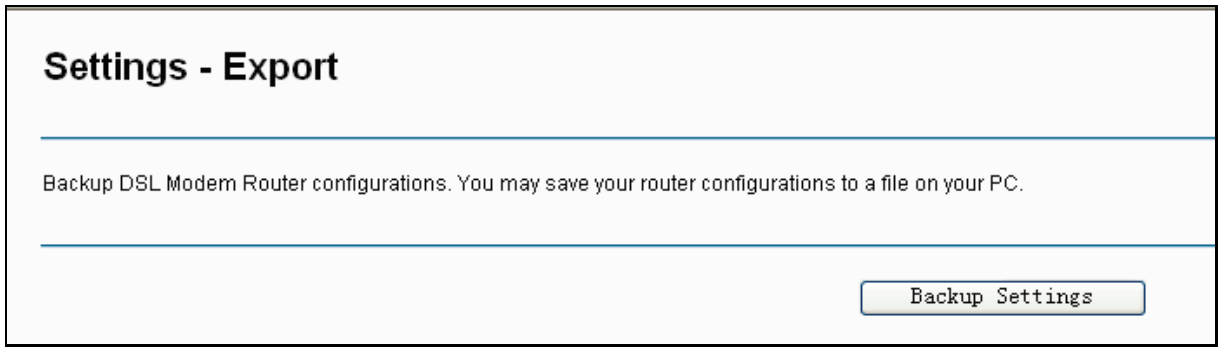


Figure 4-98

To back up the router's current settings:

1. Click the **Backup Settings** button on the preceding screen (pop-up Figure 4-98), the following screen will then appear.

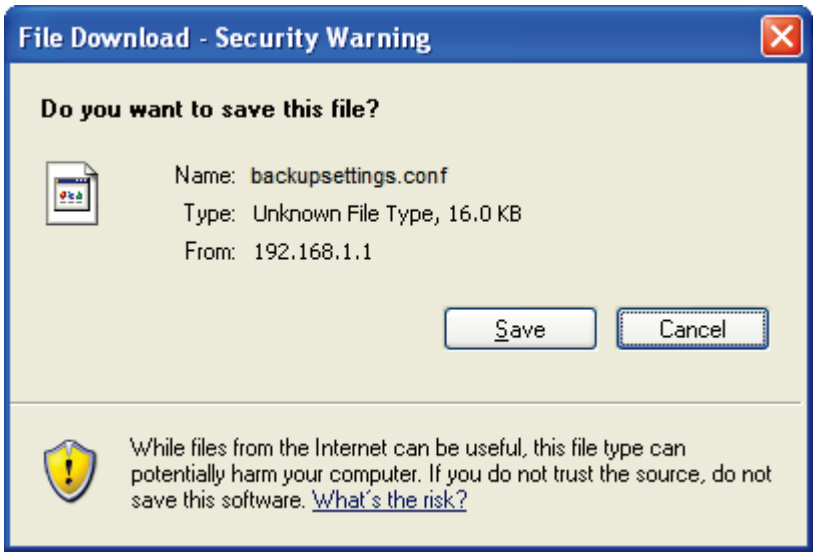


Figure 4-99

2. Click the **Save** button, and save the file as the appointed file (shown in Figure 4-100).

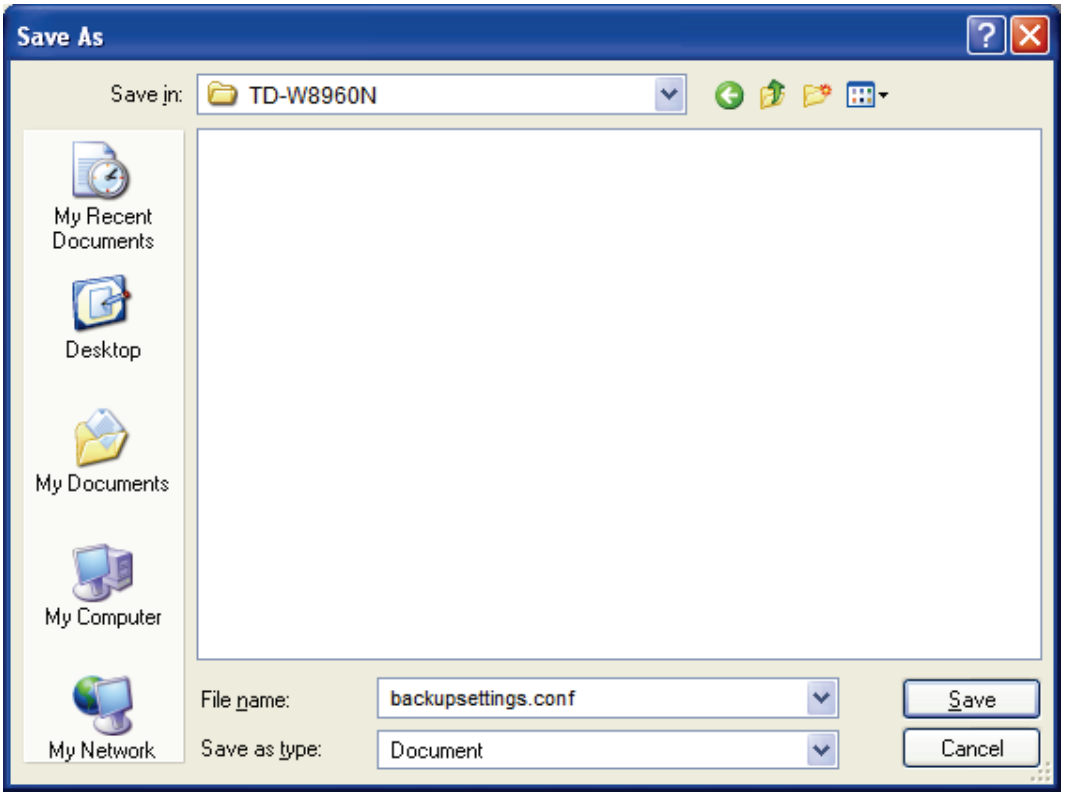


Figure 4-100

4.9.1.2 Import

Choose "**Management**"→"**Settings**"→"**Import**", you can see the **Import** screen, this screen (shown in Figure 4-101) allows you to update the router's settings.

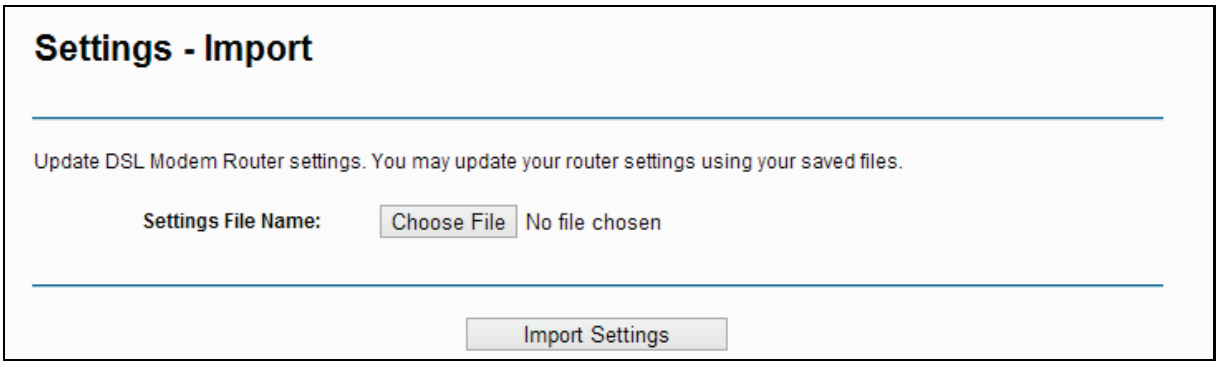


Figure 4-101

To update the router's settings:

1. Click the **Choose File** button to locate the update file for the device, and you can also enter the exact path to the Setting file in the text box.
2. After you have selected the file for updating the settings, click the **Import Settings** button.

☞ **Note:**

The router will reboot upon completion. This process will take a while, don't turn off the router or press the **Reset** button while processing.

4.9.1.3 Restore Default

Choose "**Management**"→"**Settings**"→"**Restore Default**", you can see the **Restore Default** screen, this screen (shown in Figure 4-102) allows you to restore the router's configuration to the factory defaults on the screen.

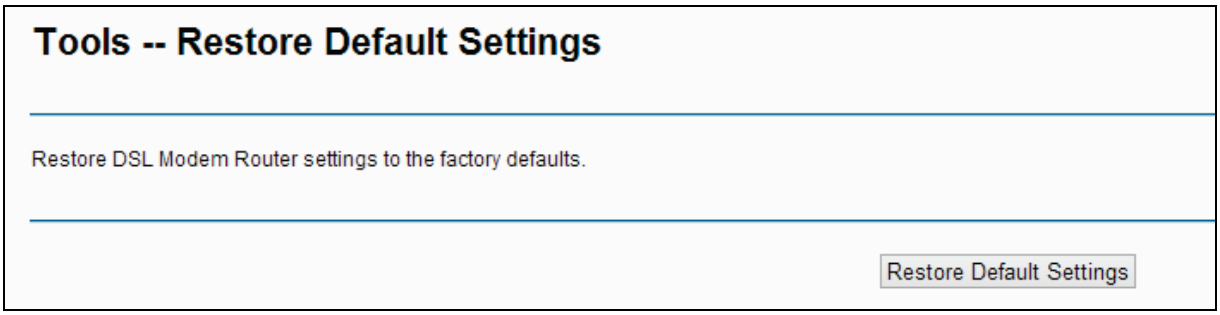


Figure 4-102

- **Restore Default Settings:** Click this button to restore the router's configuration to the factory defaults, and then follow the on-screen instructions to complete it.
- **Account and Password:** The default **account name** and **password** are both admin.
- The default **IP Address:** 192.168.1.1.
- The default **Subnet Mask:** 255.255.255.0.

4.9.2 System Log

Choose "**Management**"→"**System Log**", you can see the **System Log** screen, which allows you to view the system log and configure the system log options.

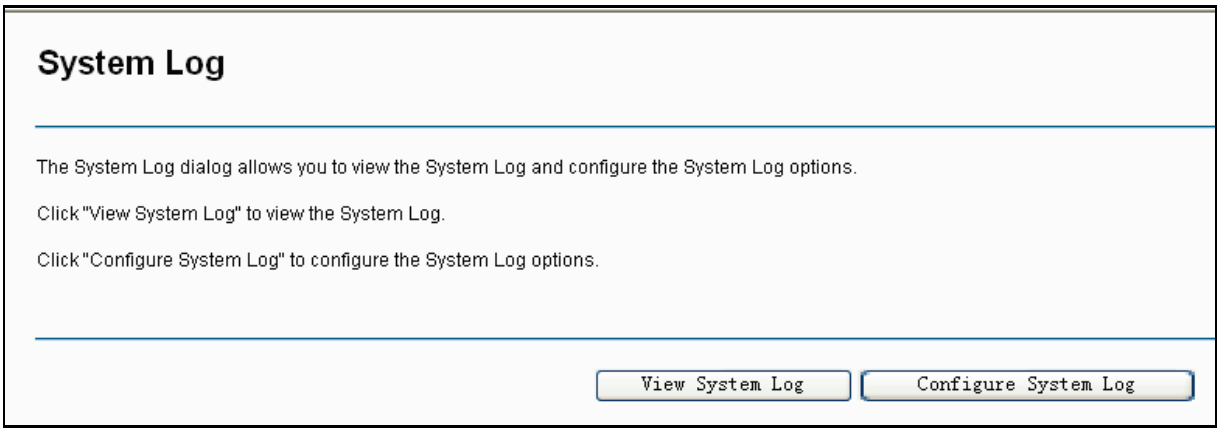


Figure 4-103

To View the System Log:

Click the **View System Log** button, you will see the screen (shown in Figure 4-104) which displays the router's recent logs.

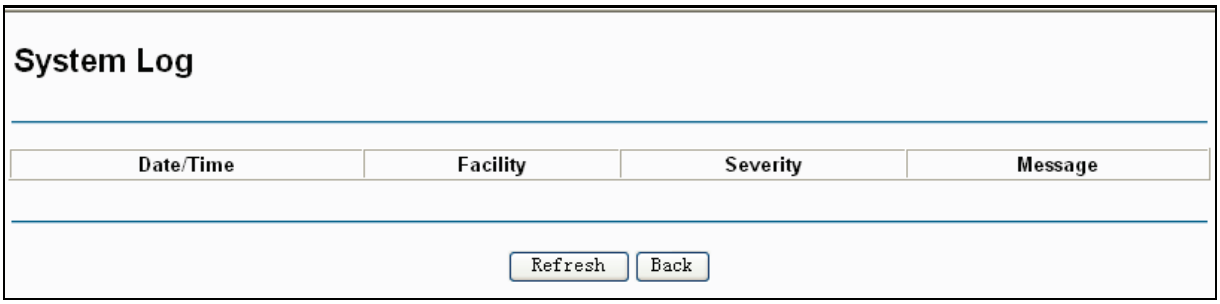


Figure 4-104

- **Refresh:** Click the button, the information in the table will be updated.
- **Back:** Click the button, the screen will back to the previous page.

To Configure the System Log Settings:

Click the **Configure System Log** button (shown in Figure 4-103), you will see the screen below.

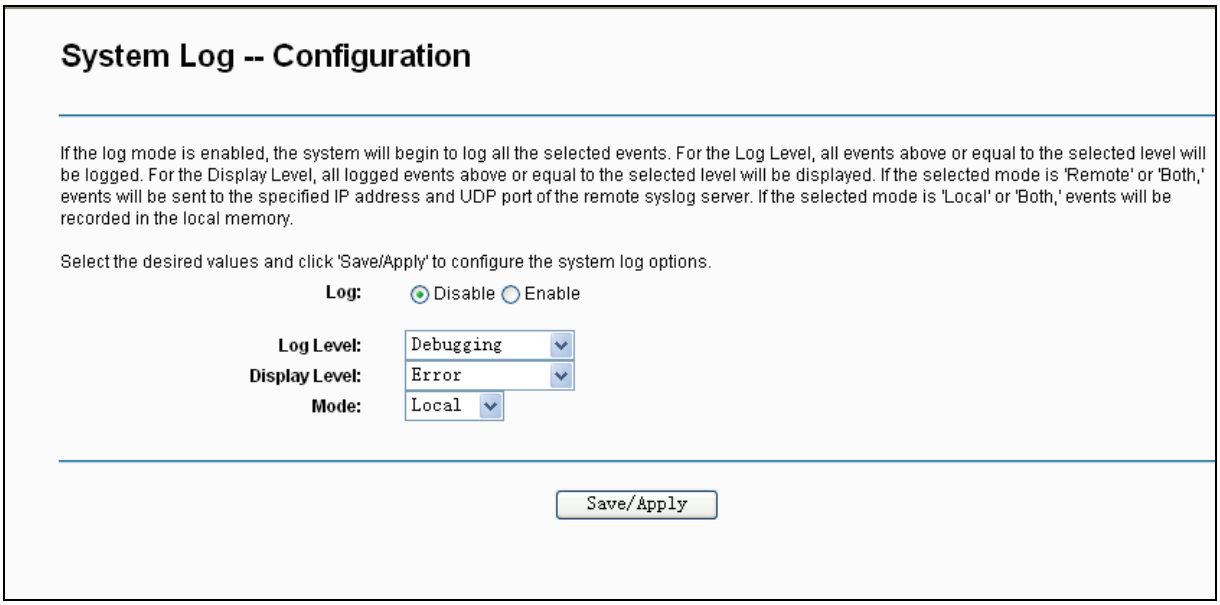


Figure 4-105

- **Disable/Enable:** Select the **Enable** to log the events, if you don't want to log these events, please select **Disable**.
- **Log Level:** Select the Log level in the drop-down list, for the Log level, all events above or equal to the selected level will be logged.
- **Display Level:** Select the Display level in the drop-down list, for the Display Level, all logged events above or equal to the selected level will be displayed.
- **Mode:** Select the mode to record the events. If the selected mode is **Local,** events will be recorded in the local memory. If the selected mode is **Remote**, events will be sent to the specified IP address and UDP port of the remote system log server. If the selected mode is **Both**, events will be sent to the local memory and the remote system log server.

4.9.3 SNMP Agent

Choose "**Management**"→"**SNMP Agent**", you can see the SNMP-Configuration screen as shown below.

SNMP (Simple Network Management Protocol) has been widely applied in the computer networks currently, which is used for ensuring the transmission of the management information between any two nodes. In this way, network administrators can easily search and modify the information on any node on the network. Meanwhile, they can locate faults promptly and implement the fault diagnosis, capacity planning and report generating.

An **SNMP Agent** is an application running on the router that performs the operational role of receiving and processing SNMP messages, sending responses to the SNMP manager, and sending traps when an event occurs. So a router containing SNMP "agent" software can be monitored and/or controlled by SNMP Manager using SNMP messages.

An **SNMP Manager** or SNMP Service is an application that performs the operational roles of generating SNMP messages/requests to modify and retrieve management information, and receiving the requested information and trap-event reports that are generated by the SNMP agent. SNMP Manager is the third-party management system. Monitor one is an SNMP Manager.

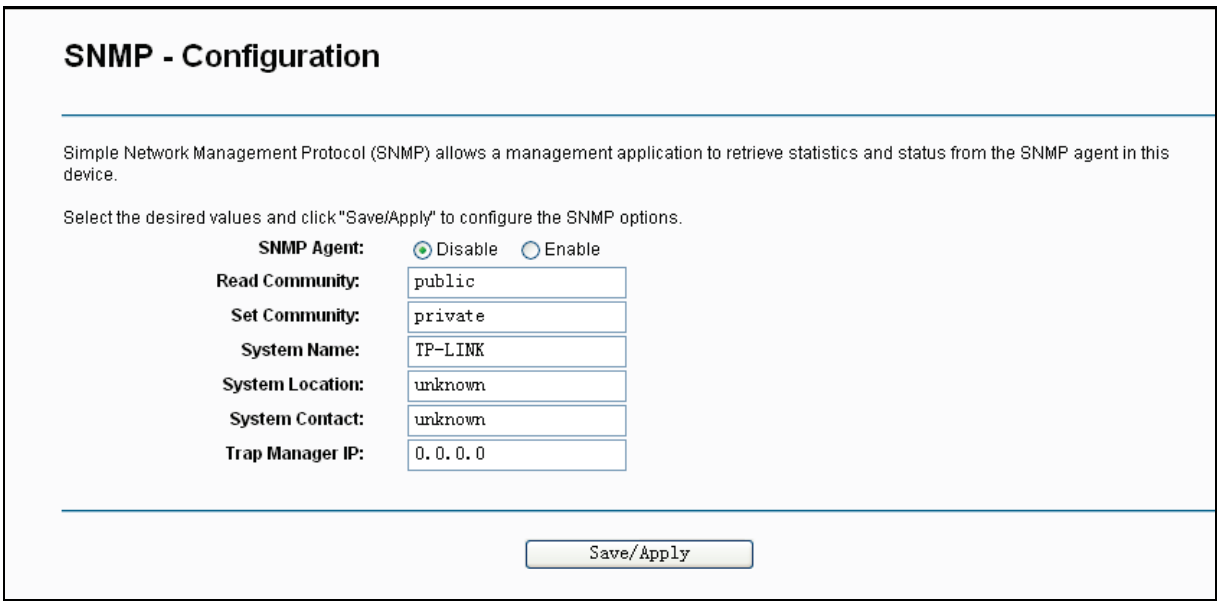


Figure 4-106

- **SNMP Agent:** You can select the checkbox to disable or enable the function.

Note:

SNMP Community string provides a simple method of authentication between the router (SNMP Agent) and a remote network manager (SNMP Manager). You can specify the community string as the password to authenticate the management station to the router.

- **Read Community:** This field allows you to specify the SNMP Community string which provides read-only access to the router that the community is only permitted to read the device configuration. The default value is “public”.
- **Set Community:** This field allows you to specify the SNMP Community string which provides read and write access to the router that the community has the authority to read and change the device configuration. The default value is “private”.
- **System Name:** Enter alphanumeric string to specify an SNMP community string name. Your router (SNMP agents) will expose management data on the managed systems as this "system name".
- **System Location:** The person to notify when problems occur.

- **System Contact:** The location of the person that is identified as the system contact.
- **Trap Manager IP:** Enter the IP address of the SNMP Manager，where the SNMP Agent forwards trap notifications.

Select the desired values and click **Save/Apply** to configure the SNMP options.

4.9.4 TR-069 Client

Choose "**Management**"→"**TR-069 Client**", you can see the TR-069 client screen as shown below.

TR-069（WAN Management Protocol）allows an Auto-Configuration Server (ACS) to perform auto-configuration, provision, collection, and diagnostics to this device.

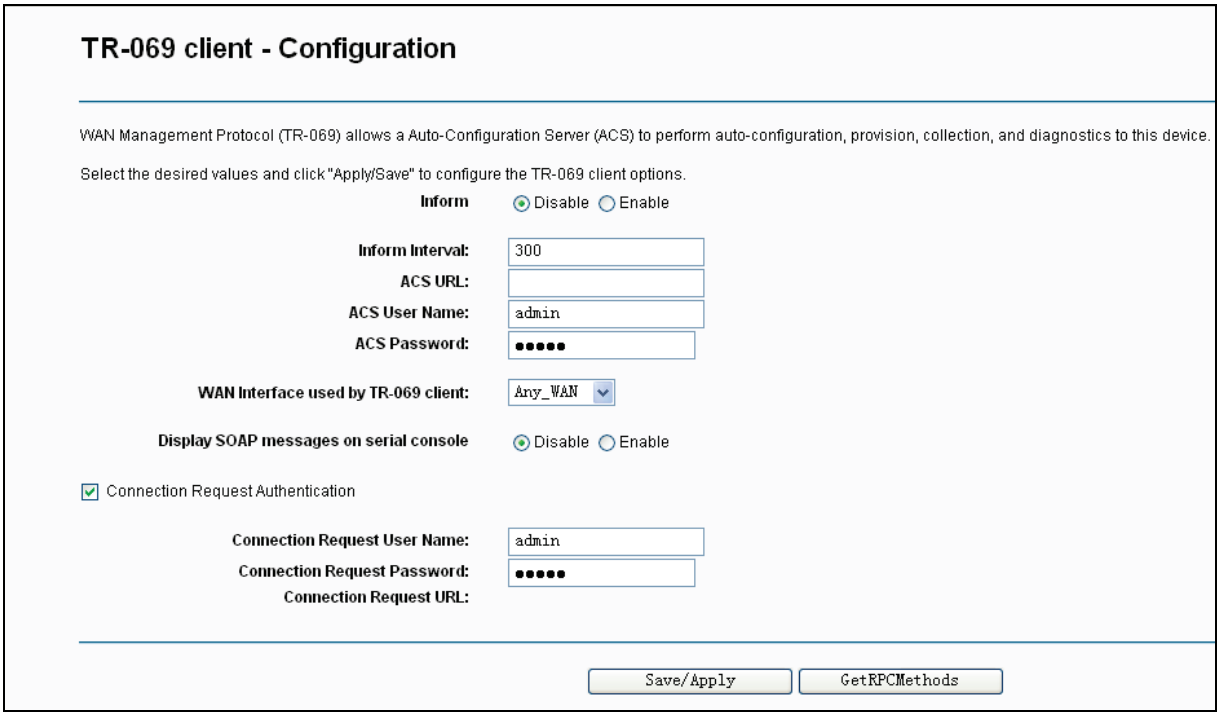


Figure 4-107

- **Inform:** You can select the checkbox to disable or enable the function of TR-069 client.
- **Inform Interval:** Type the interval time of your router contact with the **ACS**.
- **ACS URL:** Please accept this information from your ISP. And through **ACS** (Auto-Configuration Server) you can perform auto-configuration, provision, collection, and diagnostics to this router.
- **ACS User Name:** Please accept this User Name information from your ISP.
- **ACS Password:** Please accept the Password information from your ISP.

Note:

If you want to log on the **ACS**, you must own the **ACS User Name** and **ACS Password**.

- **WAN Interface used by TR-069 Client**: Please select the WAN Interface from the drop-down list to perform this function.
- **Connection Request User Name:** Type the Connection Request User Name, set it yourself.
- **Connection Request Password:** Type the Connection Request Password, set it yourself.

Note:

The Connection Request User Name and Connection Request Password are used for **ACS** log on the router and manage it.

Select the desired values and click **Save/Apply** to configure the TR-069 client options.

4.9.5 Internet Time

Choose "**Management**"→"**Internet Time**", you can see the Time settings screen as shown below. Here you can configure the time of the router.

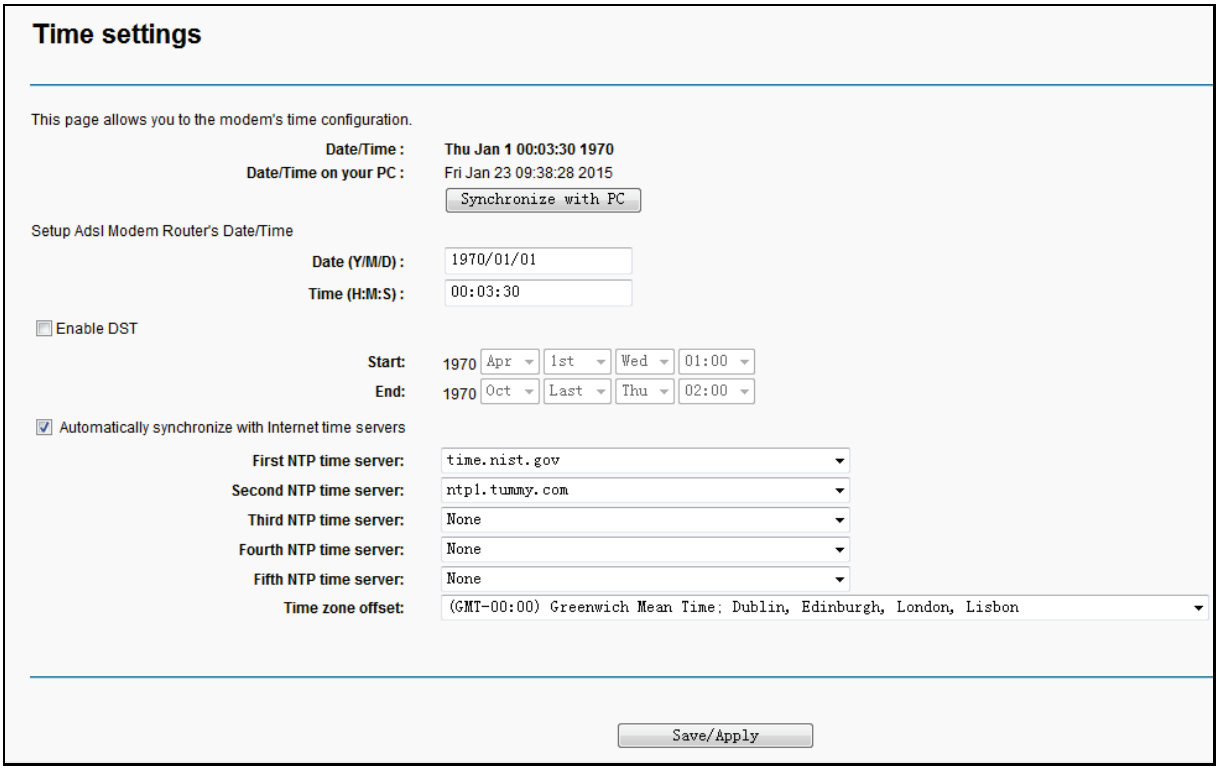
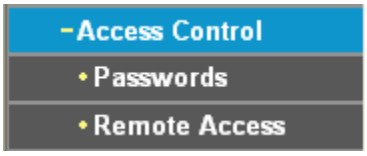


Figure 4-108

- **Enable DST:** Select the checkbox to enable daylight saving function.

4.9.6 Access Control



There are two submenus under the Access Control menu: **Passwords** and **Remote Access**. The detailed explanations for each submenu are provided below.

4.9.6.1 Password

Choose "**Management**"→"**Access Control**"→"**Password**", you can see the screen (shown in Figure 4-109) which allows you to change the factory default password of the router. The default password is the same as the user name, which is admin/admin, support/support, and user/user respectively.

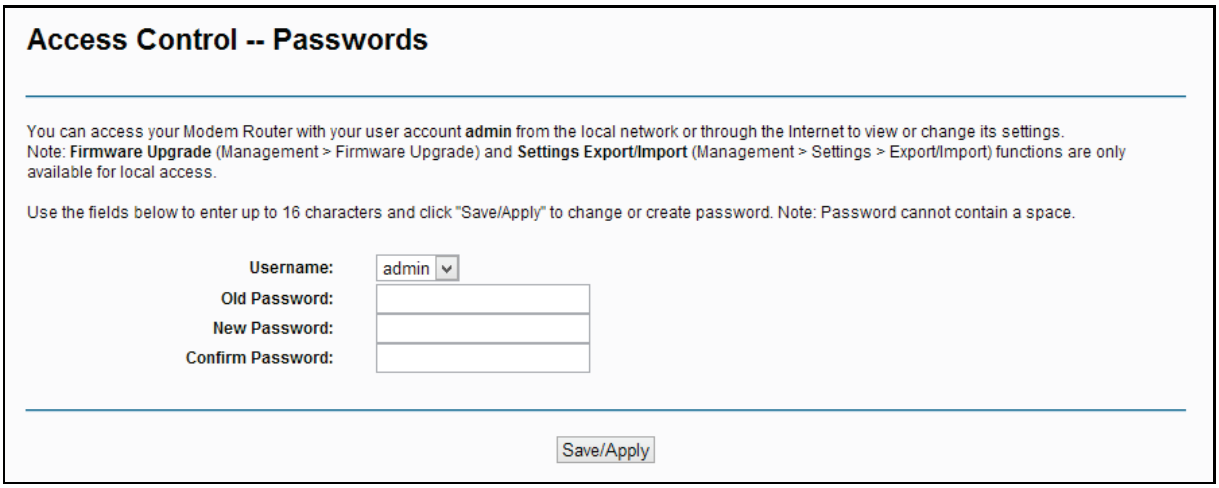


Figure 4-109

To change the password:

1. Enter the **Old Password** in the text box.
2. Enter the **New Password** and **Confirm Password**. The Confirm Password should be the same as the New Password.
3. Click **Save/Apply** to make your change take effect.

Note:

1) Access to your DSL modem router is controlled through the account **admin**. You have unrestricted access to change and view configuration of your DSL modem router if you access from the local area network. If you access via the Internet, **Firmware Upgrade** (Management > Firmware Upgrade) and **Settings Export/Import** (Management > Settings > Export/Import) functions are unavailable
2) **Admin** can do remote management. For security reasons, please change its default password when remote access function is enabled.
3) The password cannot contain a space, and its maximum length is 16 characters.

4.9.6.2 Remote Access

Choose "**Management**"→"**Access Control**"→"**Remote Access**", you can see the screen (shown in Figure 4-110) which allows you to change the factory default password of the router.

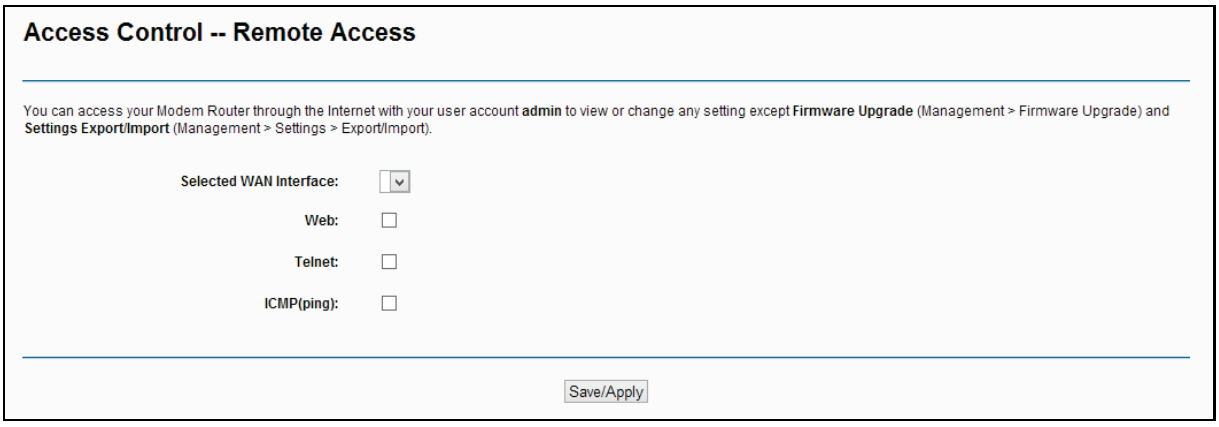


Figure 4-110

- **Web**：Select this box, you can access your modem router via web.
- **Telnet:** Select this box, you can access your modem router via command line.
- **ICMP(ping):** Select this box, PC in public network can ping the WAN address of the modem router.

Click **Save/Apply** to make your change take effect.

4.9.7 Firmware Upgrade

Choose "**Management**"→"**Firmware Upgrade**", you can see the screen (shown in Figure 4-111) which allows you to upgrade the latest version software to keep the router up to date.

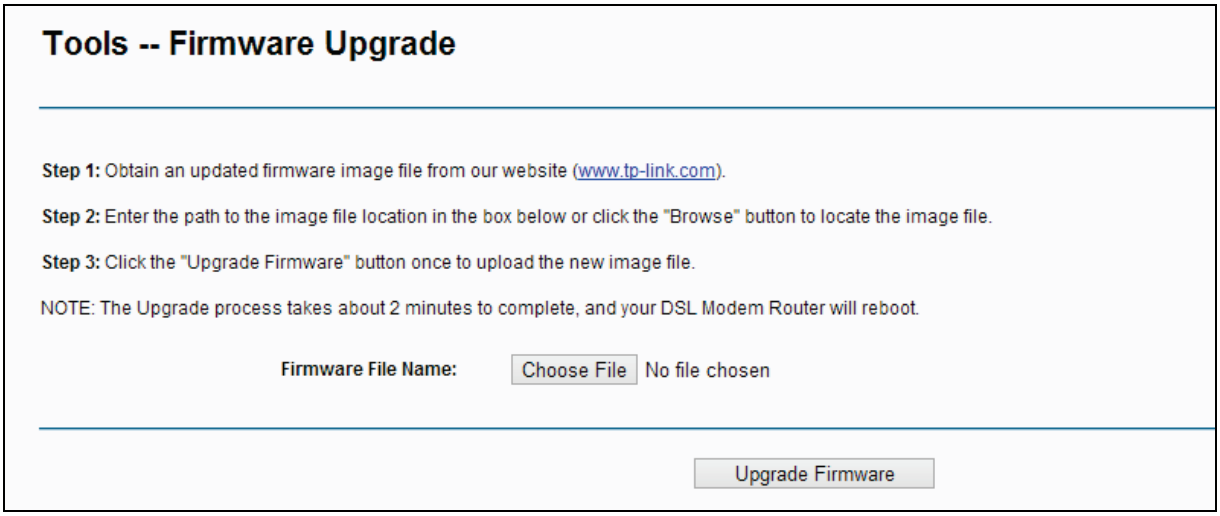


Figure 4-111

- **Choose File:** Click the button to locate the latest software for the device.
- **Upgrade Firmware:** After you have selected the latest software, click the button.

To upgrade the router's software:

1. Download the latest software upgrade file from the TP-LINK website (http://www.tp-link.com).
2. Click **Choose File** to view the folders and select the image file or enter the exact path to the image file location in the text box.
3. Click the **Upgrade Firmware** button.

Note:

1) There is no need to upgrade the firmware unless the new firmware has a new feature you want to use. However, when experiencing problems caused by the router itself, you can try to upgrade the firmware.
2) Before upgrading the router's firmware, you should write down some of your customized settings to avoid losing important configuration settings of the router.
3) Do not turn off the router or press the RESET button while the software is being updated.
4) The router will reboot after the Upgrading is finished.

4.9.8 Reboot

Choose "**Management**"→"**Reboot**", you can see the screen (shown in Figure 4-112) which allows you to reboot the router.

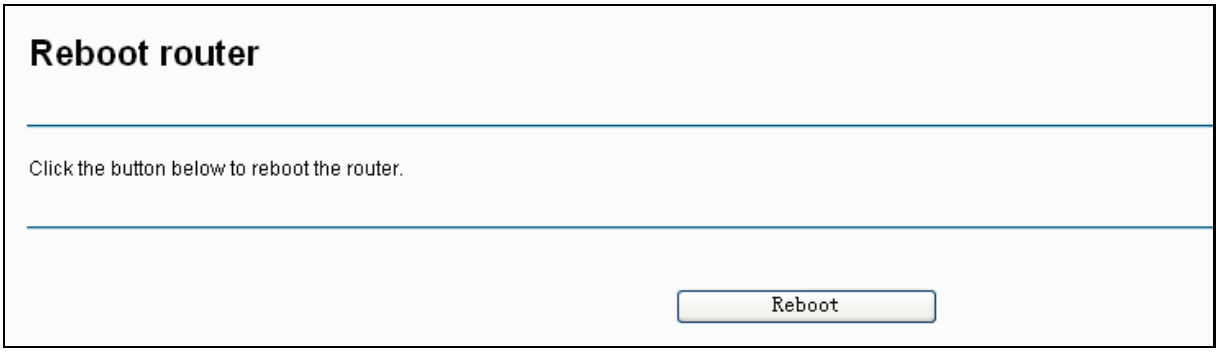


Figure 4-112

Note:

1) After you clicked the Reboot button, please wait for a while before reopening your web browser.
2) Do not turn off the router or press the **RESET** button while the router is rebooting.
3) If necessary, reconfigure your PC's IP address to match your new configuration.

4.10 Logout

Choose "**Logout**", and you will back to the login screen as shown in Figure 4-113.

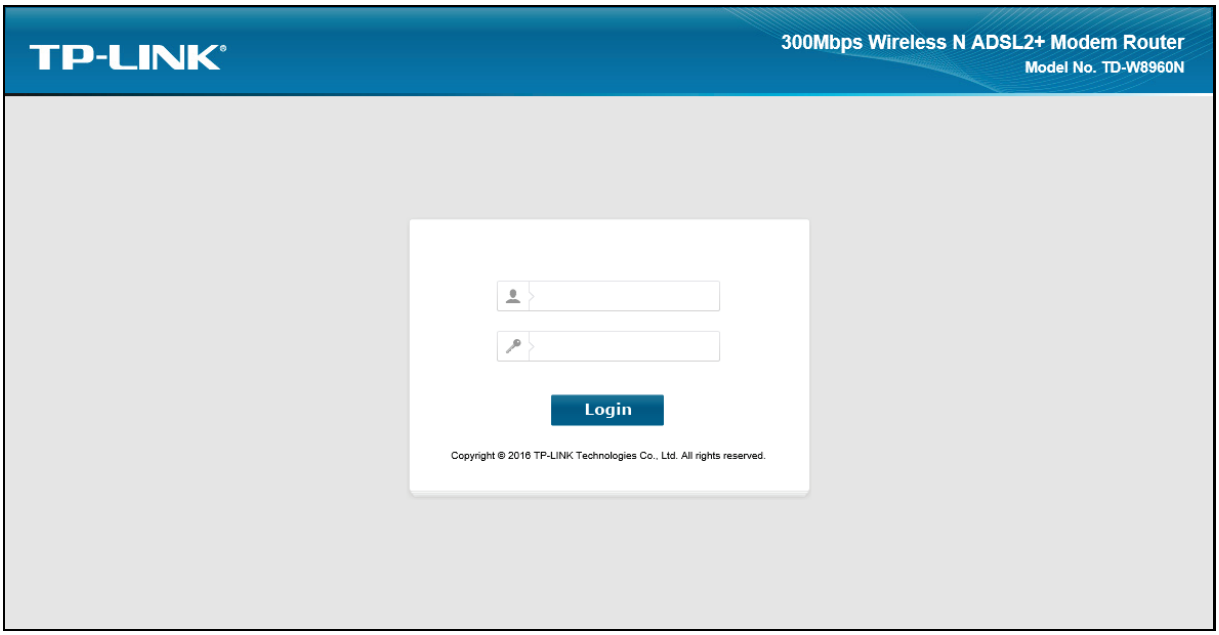


Figure 4-113

Appendix A: Specifications

General	
Standards	ANSI T1.413.I2, ITU G.992.1, ITU G.992.2, ITU G.992.3, ITU G.992.5, IEEE 802.1p, IEEE 802.3, IEEE 802.3u, IEEE 802.11e, IEEE 802.11b , IEEE 802.11g , 802.11n, TR100, TR-067, TR-069
Protocols	TCP/IP, IPoA , PPPoA , PPPoE, SNTP, HTTP, DHCP, ICMP, NAT
Ports	LAN Ports: Four 10/100M Auto-Negotiation RJ45 ports（Auto MDI/MDIX)
	Line Port: One RJ11 port
Cabling Type	10BASE-T: UTP category 3, 4, 5 cable (maximum 100m) EIA/TIA-568 100Ω STP (maximum 100m)
	100BASE-TX: UTP category 5, 5e cable (maximum 100m) EIA/TIA-568 100Ω STP (maximum 100m)
LED	Power, ADSL, Internet, WLAN, WPS, 1,2,3,4(LAN),
Safety & Emissions	FCC, CE

Wireless	
Frequency Band	2.4~2.4835GHz
Radio Data Rate	11n: up to 300Mbps（Automatic） 11g: 54/48/36/24/18/12/9/6Mbps（Automatic） 11b: 11/5.5/2/1Mbps（Automatic）
Frequency Expansion	DSSS(Direct Sequence Spread Spectrum)
Modulation	DBPSK, DQPSK, CCK, OFDM, 16-QAM, 64-QAM
Security	WEP/WPA/WPA2/WPA2-PSK/WPA-PSK
Sensitivity @PER	270M: -62dBm@10% PER 130M: -64dBm@10% PER 54M: -68dBm@10% PER 11M: -85dBm@8% PER 6M: -88dBm@10% PER 1M: -90dBm@8% PER

Environmental and Physical	
Temperature	Operating: 0℃~40℃ (32℉~104℉)
	Storage: -40℃~70℃(-40℉~158℉)
Humidity	Operating: 10% ~ 90% RH, Non-condensing
	Storage: 5% ~ 90% RH, Non-condensing

Appendix B: Configuring the PC

In this section, we'll introduce how to install and configure the TCP/IP correctly in Windows XP. First make sure your Ethernet Adapter is working, refer to the adapter's manual if necessary.

1. Configure TCP/IP component

1) On the Windows taskbar, click the **Start** button, and then click **Control Panel**.

2) Click the **Network and Internet Connections** icon, and then click on the **Network Connections** tab in the appearing window.

3) Right click the icon that showed below, select Properties on the prompt page.

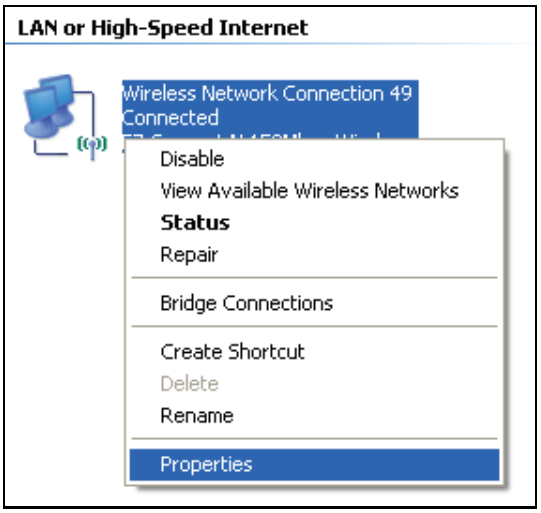


Figure B-0-1

4) In the prompt page that showed below, double click on the **Internet Protocol (TCP/IP)**.

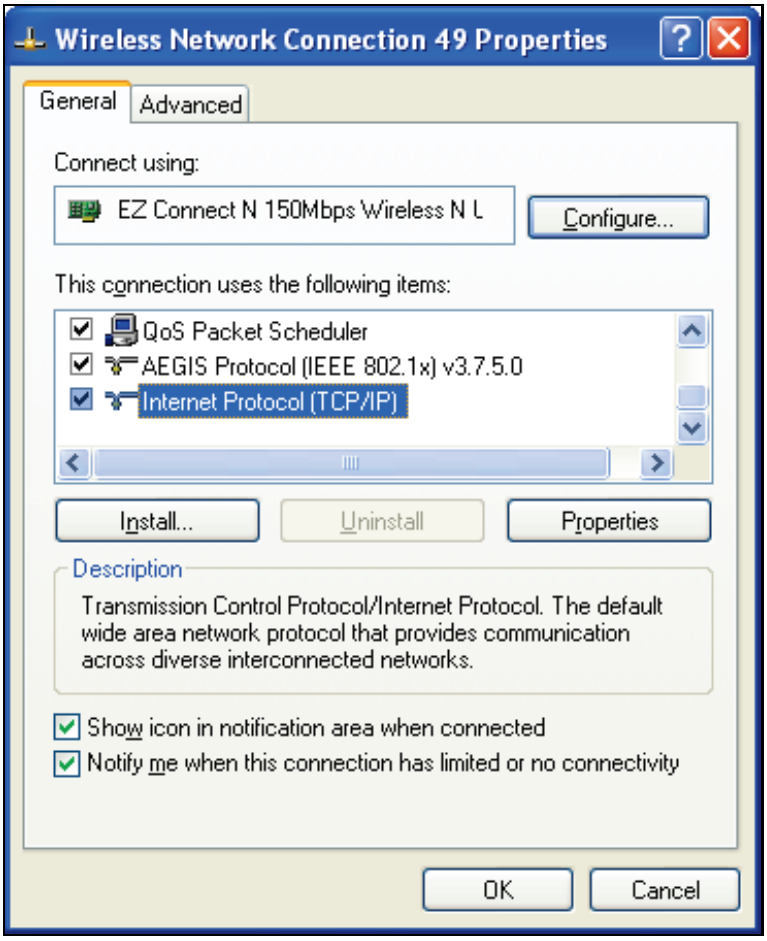


Figure B-0-2

5) The following **TCP/IP Properties** window will display and the **IP Address** tab is open on this window by default.

Now you have two ways to configure the **TCP/IP** protocol below:

➢ **Setting IP address automatically**

Select **Obtain an IP address automatically**, Choose **Obtain DNS server automatically**, as shown in the Figure below:

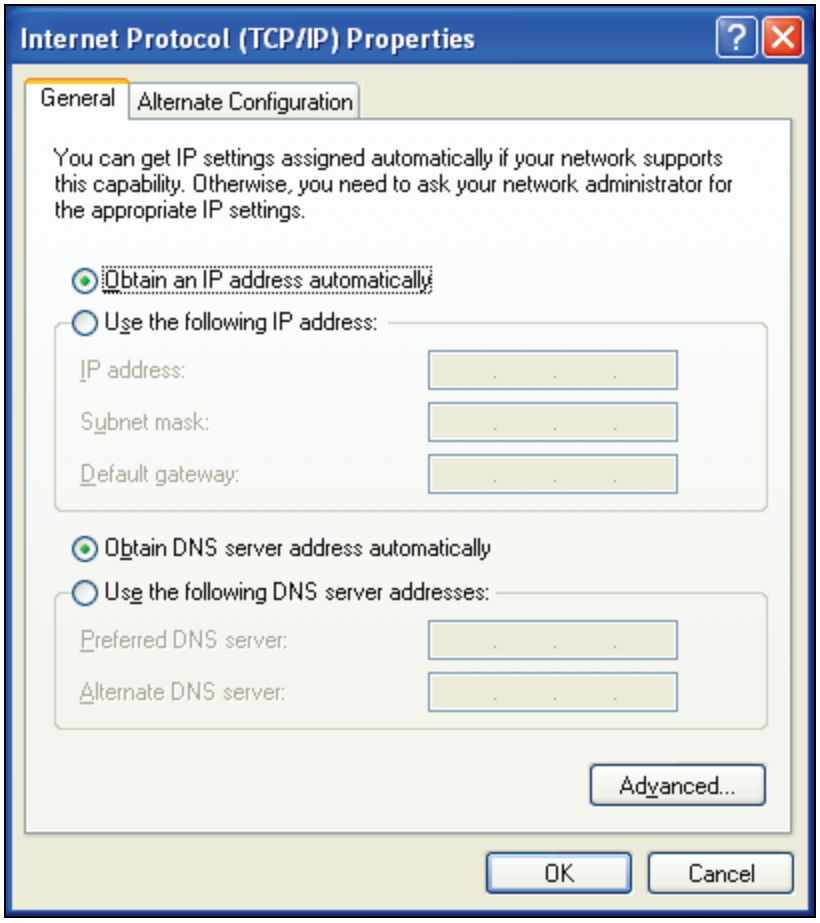


Figure B-0-3

Note:

For Windows 98 OS or before, the PC and Router may need to be restarted.

➢ **Setting IP address manually**

1 Select **Use the following IP address** radio button. And the following items available

2 If the modem router's LAN IP address is 192.168.1.1, specify the **IP address** as 192.168.1.x (x is from 2 to 254), and the **Subnet mask** as 255.255.255.0.

3 Type the modem router's LAN IP address (the default IP is 192.168.1.1) into the **Default gateway** field.

4 Select **Use the following DNS server addresses**. In the **Preferred DNS Server** field you can enter the same value as the **Default gateway** or type the local DNS server IP address.

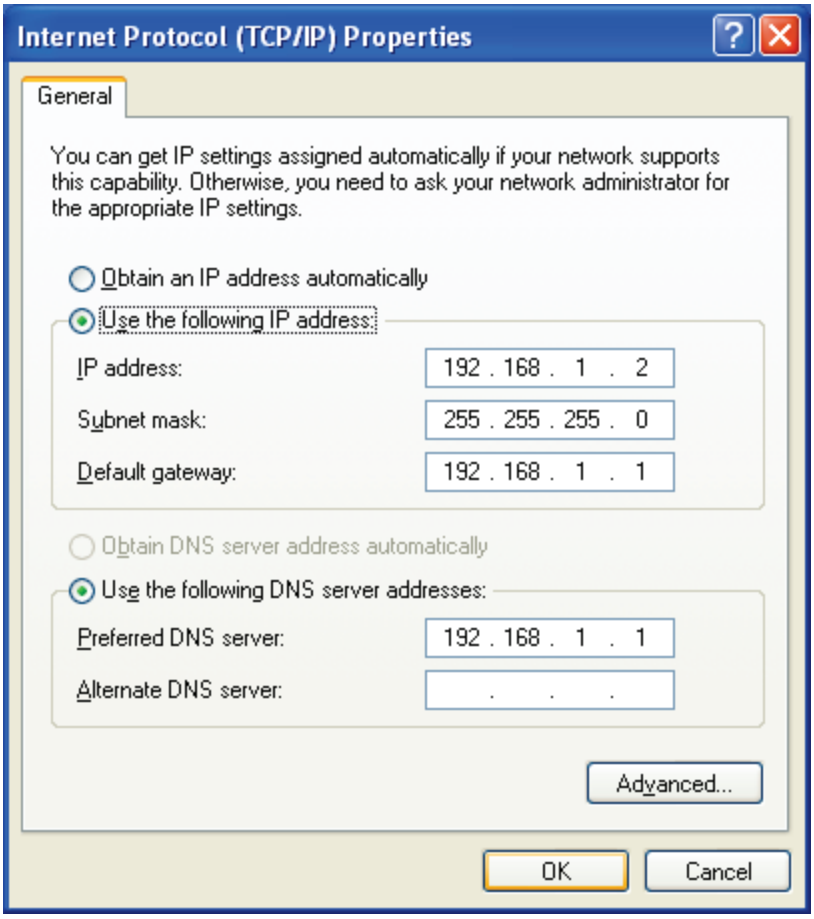


Figure B-0-4

Now:

Click **OK** to keep your settings.

Appendix C: Troubleshooting

T1. What can I do if I don't know or forget my password?

- For default wireless password: Please refer to the "Wireless Password/PIN" labeled on the bottom of the modem router.
- For the web management page password: Reset the modem router first and then use the default username and password: admin/admin.

T2. How do I restore my modem router's configuration to its factory default settings?

- With the modem router powered on, press and hold down the **WPS/RESET** button on the rear panel of the modem router for more than 5 seconds and then release it. If all LEDs turn on momentarily, you restore the modem router successfully.
- Log into the Web Management page of the modem router, and go to **Management** > **Settings** > **Restore Default**, click Restore Default Settings and wait until the reset process is complete.

☞ **Note**:

Once the modem router is reset, the current configuration settings will be lost and you will need to re-configure the router.

T3. What can I do if I cannot access the web-based configuration page?

1) Configure your computer's IP Address.

For Mac OS X

- Click the **Apple** icon on the upper left corner of the screen.
- Go to "**System Preferences** -> **Network**".
- Select **Airport** on the left menu bar, and then click **Advanced** for wireless configuration; or select **Ethernet** for wired configuration.
- In the **Con-figure IPv4** box under **TCP/IP**, select **Using DHCP**.
- Click **Apply** to save the settings.

For Windows 7

- Click "**Start** -> **Control Panel** -> **Network and Internet** -> **View network status** -> **Change adapter settings**".
- Right-click **Wireless Network Connection** (or **Local Area Connection**), and then click **Properties**.
- Select **Internet Protocol Version 4 (TCP/IPv4)**, and then click **Properties**.
- Select **Obtain an IP address automatically** and **Obtain DNS server address automatically**. Then click **OK**.

For Windows XP

- Click "**Start -> Control Panel -> Network and Internet Connections -> Network Connections**".
- Right-click **Wireless Network Connection (or Local Area Connection)**, and then click **Properties**.

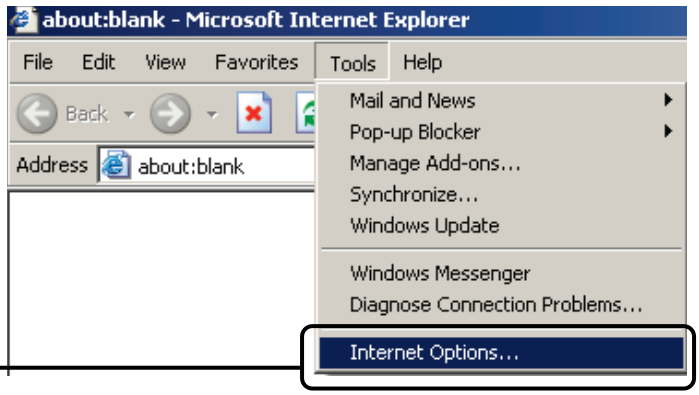
- Select **Internet Protocol (TCP/IP)**, and then click **Properties**.
- Select **Obtain an IP address automatically** and **Obtain DNS server address automatically**. Then click **OK**.

For Windows 8

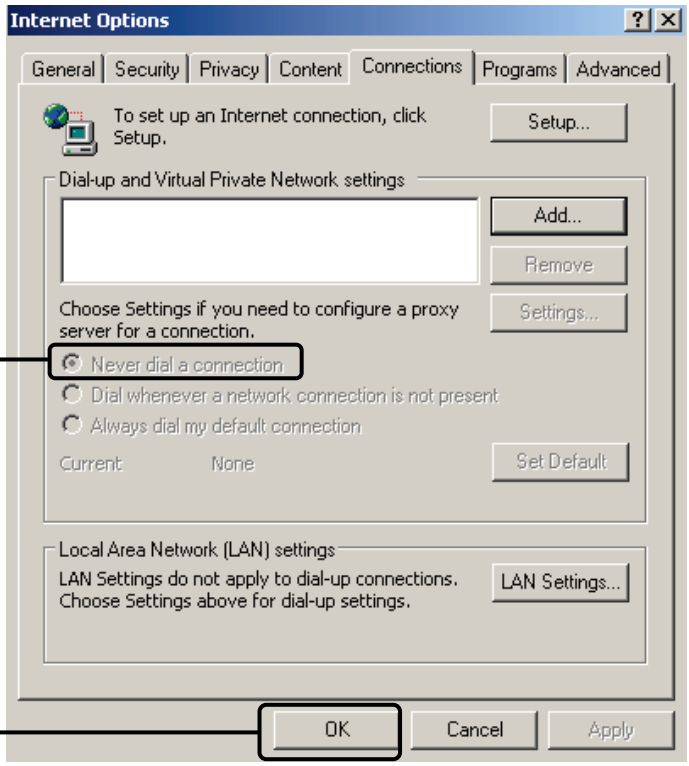
- Move your mouse to the lower right corner and you will see **Search** icon in the Popups. Go to " -> **Apps**". Type **Control Panel** in the search box and press **Enter**, then you will go to **Control Panel**.
- Click "**View network status and tasks** > **Change adapter settings**".
- Right-click "**Ethernet**" and then select **Properties**.
- Double-click **Internet Protocol Version 4 (TCP/IPv4)**. Select **Obtain an IP address automatically**, choose **Obtain DNS server address automatically** and then click **OK**.

2) Configure your IE browser

Open your IE browser, click **Tools** tab and you will see the following screen.



Click **Internet Options**



Select **Never dial a connection**

Click **OK**

Now, try to log on to the Web-based configuration page again after the above settings have been configured. If you still cannot access the configuration page, please restore your modem router's factory default settings and reconfigure your modem router following the instructions in 3.2 Quick Installation Guide. Please feel free to contact our Technical Support if the problem still exists.

T4. What can I do if I cannot access the Internet?

1) Make sure the telephone and Ethernet cables are plugged in correctly.
2) Try to log into the web management page of the modem router using the default address at http://tplinkmodem.net. If you can, try the following answers. If you cannot, change your computer to obtain an IP address automatically from the modem router.
3) Consult your ISP and make sure all the VPI/VCI, WAN Link Type, account username and password are correct. If they are not, please replace them with the correct settings and try again.
4) Restore the modem router to its factory default settings and reconfigure the modem router by following the instructions in 3.2 Quick Installation Guide.
5) Please contact our Technical Support if the problem still exists.