Tenda

# User Guide

www.tendacn.com

Wireless N450 Gigabit Router
F452

# Copyright Statement

# Contents

# Chapter 1 Product Overview

## 1 Package Contents

Please verify that the package contains the following items:

- Wireless Router
- Power Adapter
- Installation Guide
- Ethernet Cable
- Resource CD

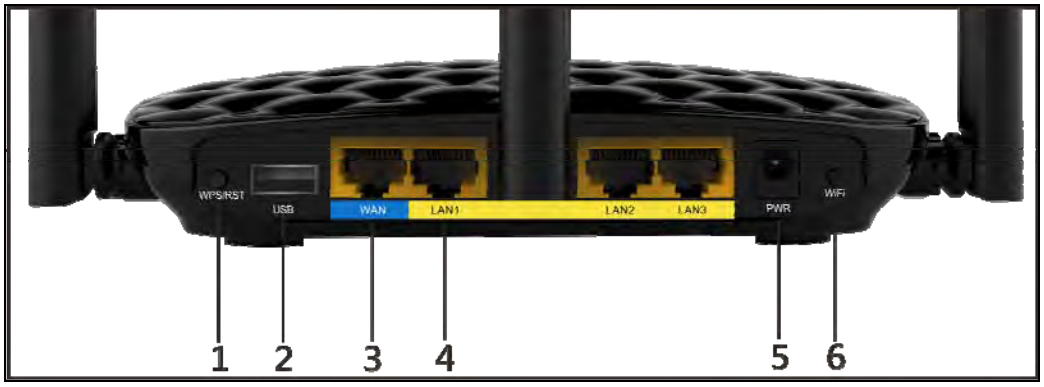
If any of the above items are incorrect, missing, or damaged, please contact your Tenda reseller for immediate replacement.

## 2 Getting to Know Your Router

### Front LED Overview


| LED | Status | Description |
|---|---|---|
| Power | Solid | Indicates a proper connection to power supply |
| | Off | Indicates an improper connection to power supply |
| SYS | Blinking | Indicates the system is functioning correctly |
| | Solid/Off | Indicates the system is functioning incorrectly |
| WPS | Blinking | Device is performing WPS authentication on a client device |
| | Off | WPS is disabled or WPS authentication finished |
| WiFi | Solid | WiFi is enabled |
| | Blinking | Transmitting data |
| | Off | WiFi is disabled |
| LAN ( 3/2/1 ) | Solid | LAN port connected correctly |
| | Blinking | LAN port is transmitting data |
| | Off | LAN port connected incorrectly |
| LAN 1 /IPTV | Solid | IPTV port is correctly connected |
| | Blinking | IPTV port is transmitting data |
| | Off | IPTV port is incorrectly connected |
| WAN | Solid | WAN port connected correctly |
| | Blinking | WAN port is transmitting data |
| | Off | WAN port connected incorrectly |
| USB | Solid | Indicates the USB port is correctly connected |
| | Off | Indicates the USB port is incorrectly connected |

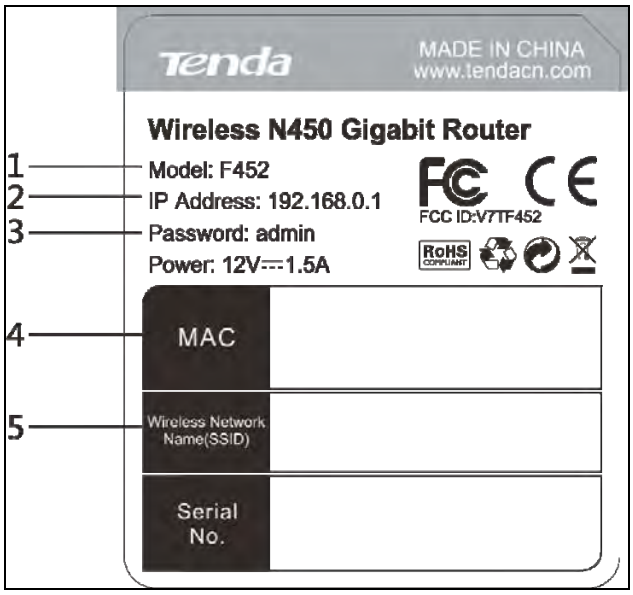
## Back Panel




1. **WPS/Reset:** WPS button/Reset button: Pressing it for about 3 second enables WPS encryption with a blinking WPS LED while pressing it for about 7 seconds restores the router to its factory default setting.
2. **USB:** USB port for connection to a USB device such as a USB printer or data storage device.
3. **WAN:** Internet port (RJ-45) for connection to an Internet-enabled DSL Modem/Cable Modem or existing Ethernet.
4. **LAN/1/2/3:** 3 LAN ports (RJ-45) for connection to PC's NIC or uplink to a hub, switch or wireless AP.

   **LAN 1/IPTV**：IPTV port for connection to a network set-top box. However, this port can also function as a LAN port if the IPTV STB option is not enabled.
5. **PWR:** The power adapter is connected and you can use the provided adapter to supply power.
6. **WiFi:** WiFi button, pressing it disables wireless. WiFi is enabled by default.

## Label




You can acquire the following information from Label:

1. Model: Displays the product model.
2. IP Address: The default IP is 192.168.0.1
3. Password: The default password is admin.
4. MAC Address: Displays the device's default MAC address.
5. SSID: Displays the device's default SSID name.

# 3 Position Your Router

For best performance, please place your router:

- Near the center of the area where your computers and other devices operate, and preferably within line of sight to your wireless devices.
- Accessible to an AC power outlet and near Ethernet cables for wired computers.
- In an elevated location such as a high shelf, keeping the number of walls and ceilings between the router and your other devices to a minimum.
- Away from electrical devices that are potential sources of interference, such as ceiling fans, home security systems, microwaves, PCs, the base of a cordless phone, or a 2.4-GHz cordless phone.
- Away from any large metal surfaces, such as a solid metal door or aluminum studs. Large expanses of other materials such as glass, insulated walls, fish tanks, mirrors, brick, and concrete can also affect your wireless signal.

# Chapter 2 Installation and Quick Setup Guide

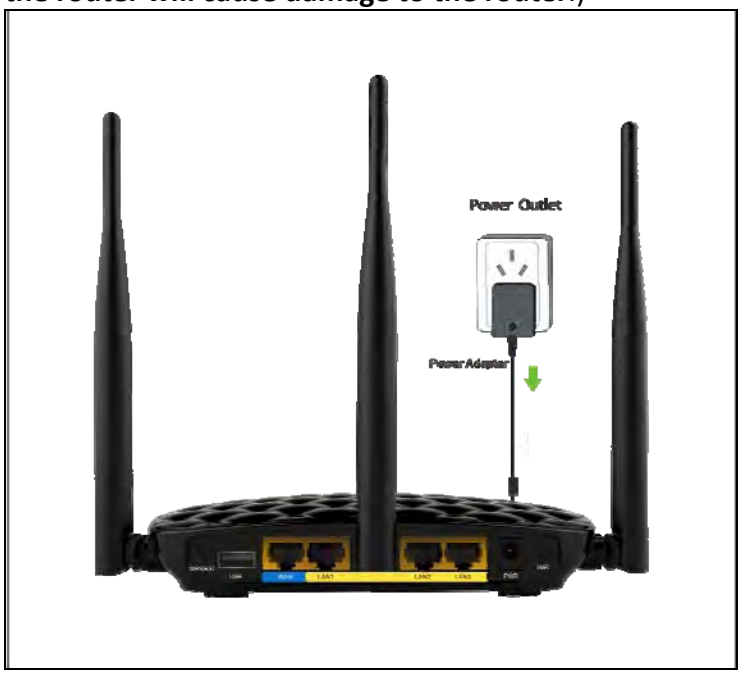
## 1 Preparation

Before connecting Ethernet cables, please verify the following items:

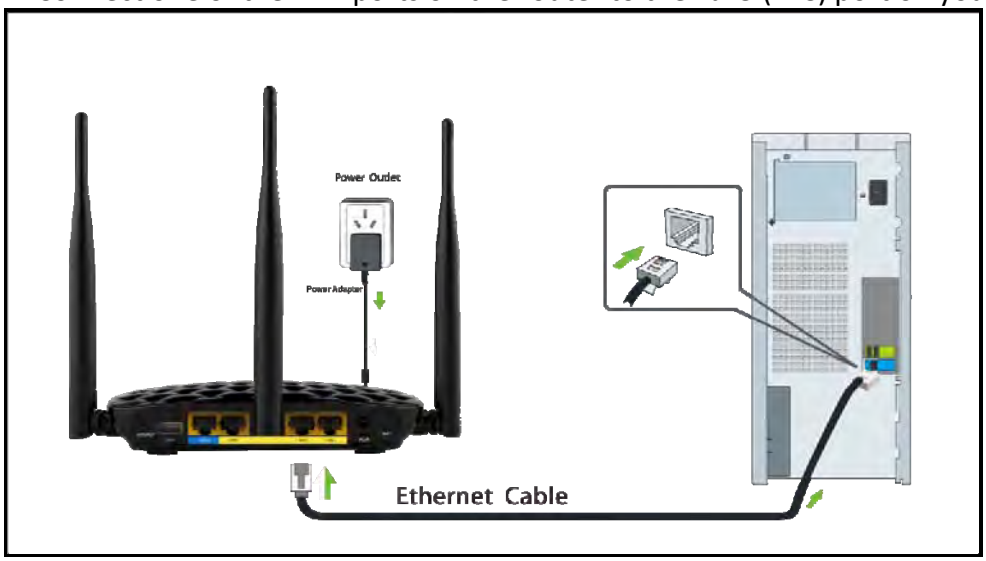
| Item | Description |
|---|---|
| Wireless Router | Used with the provided power supply |
| PC | Installed with IE8 or other better web browsers. |
| Ethernet Cable | Used for linking the PC to the router |
| Broadband Service | Provided by ISP |
| Internet Connection Type | ● If you connect to the Internet using a broadband connection that requires a username and a password provided by your ISP, please select PPPoE;<br>● If you can access Internet as soon as your computer directly connects to an Internet-enabled ADSL/Cable modem, please select Dynamic IP. |

## 2 Hardware Installation

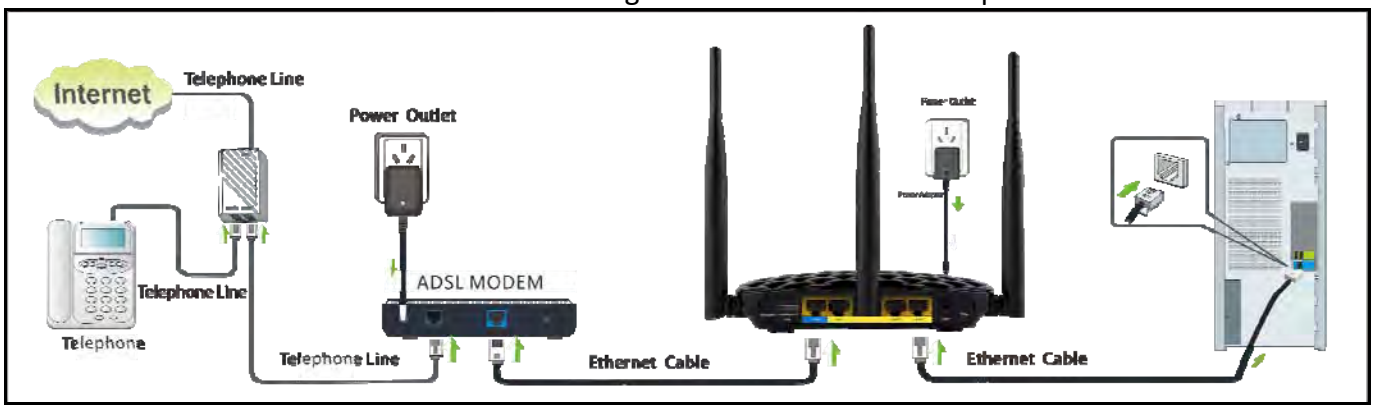
1. Connect one end of the included power adapter to the router and plug the other end into a surge protected power strip. (**Using a power adapter with a different voltage rating than the one included with the router will cause damage to the router**.)



2. Connect one of the LAN ports on the router to the RJ45 (NIC) port on your PC using an Ethernet cable.




3. Connect the Ethernet cable from the incoming Internet side to the WAN port on the router.




# 3 Internet Connection Setup

## Configure PC

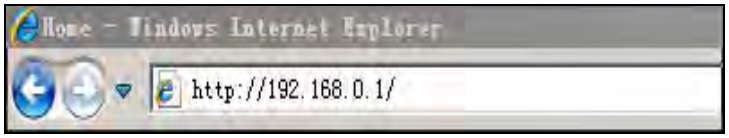
Configure your PC obtain IP address automatically. If you are not clear about this, please refer to Appendix 1 Configure PC.

## Configure Router

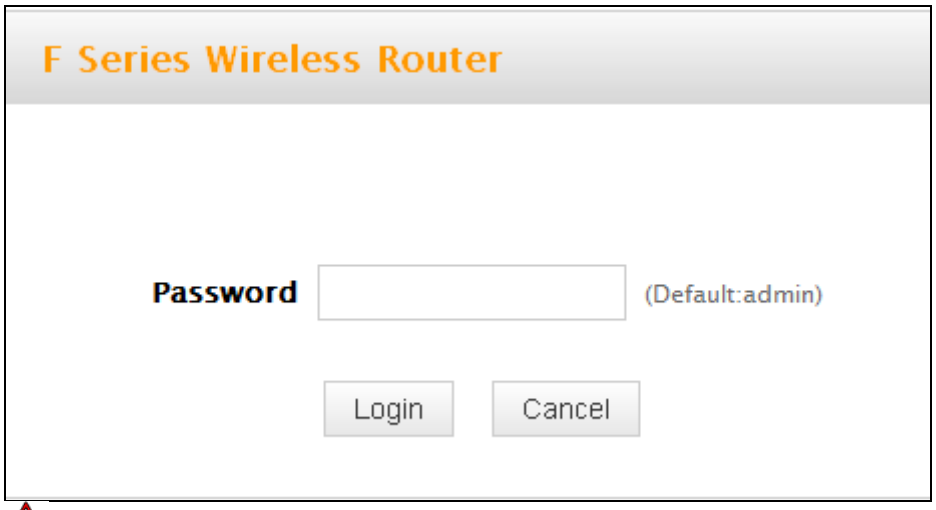
### Login to Web Utility

1. Launch a web browser, such as IE Web browser;


2. In the address bar, input 192.168.0.1 and press Enter;



3. Enter a password in the corresponding field as shown in the window below (the default is set to “admin”).

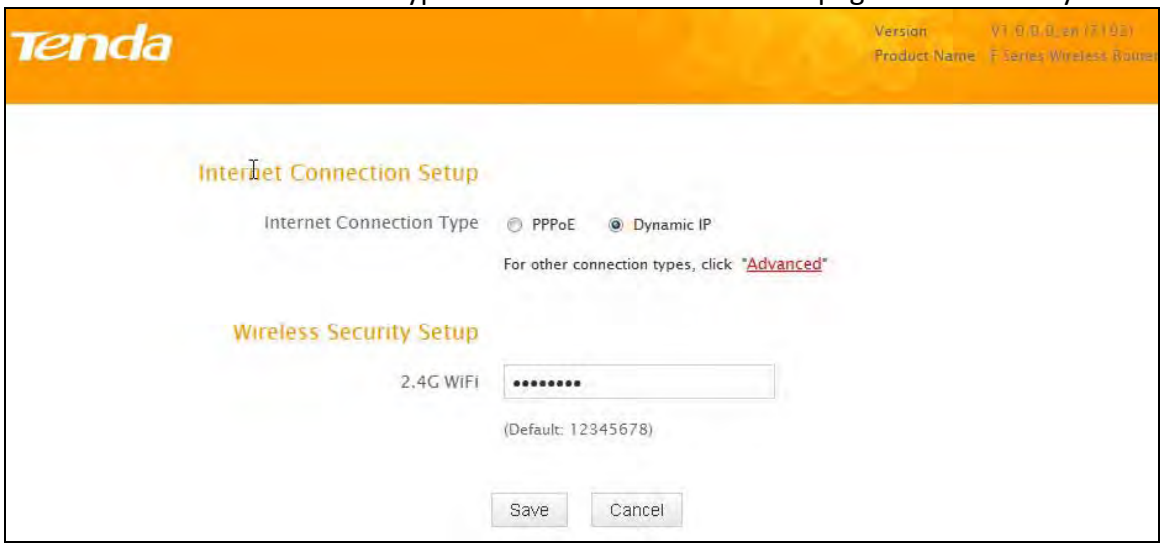



**Note**

For security purpose, please change the default password after you have logged in to the web utility.

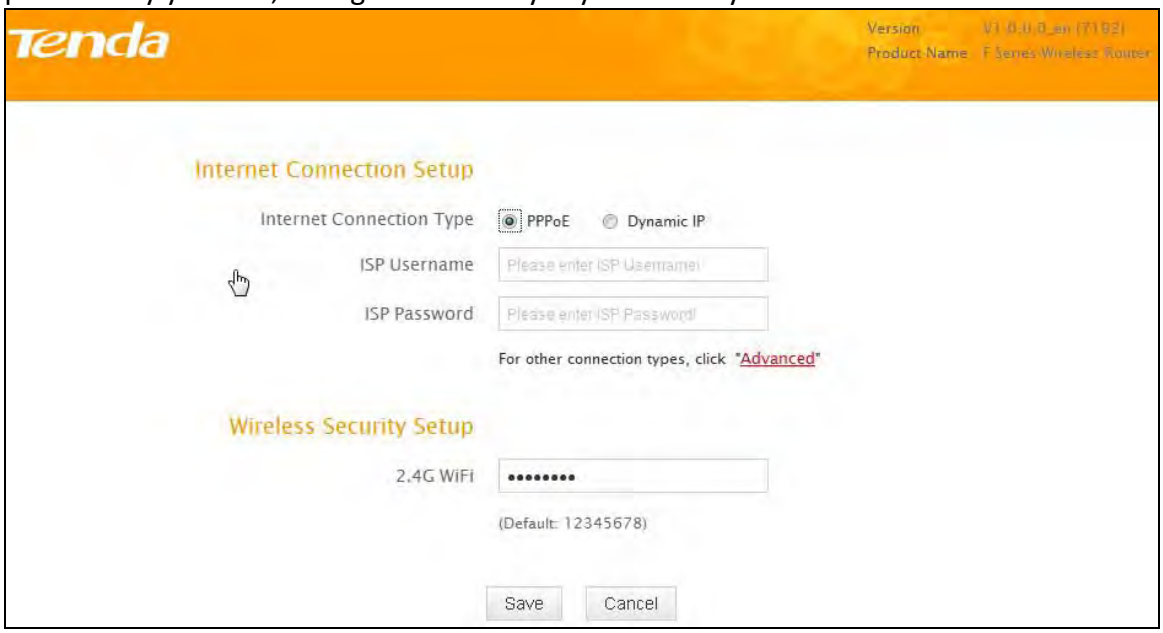
**Internet Connection Setup**

Common Internet connection types are available on the home page: PPPoE and Dynamic IP.



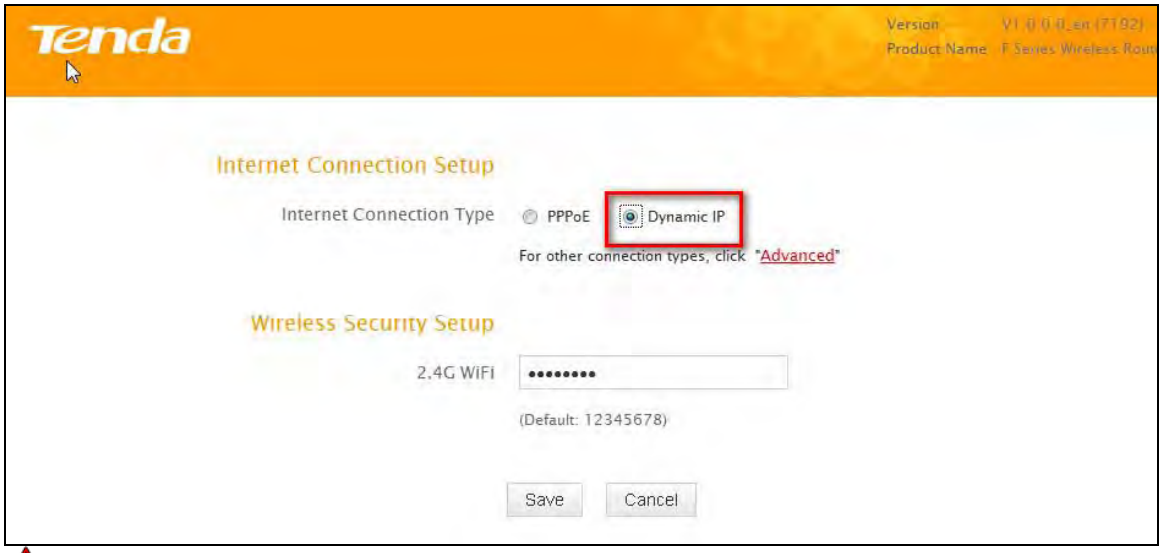

**PPPoE**

Select PPPoE (Point to Point Protocol over Ethernet) if you used to connect to the Internet using a broadband connection that requires a username and a password. Enter the user name and password provided by your ISP; configure a security key to secure your wireless network and then click OK.




**Dynamic IP**

Select DHCP (Dynamic IP) if you can access Internet as soon as your computer directly connects to an Internet-enabled ADSL/Cable modem; configure a security key (8-63 characters) to secure your wireless network and then click OK.



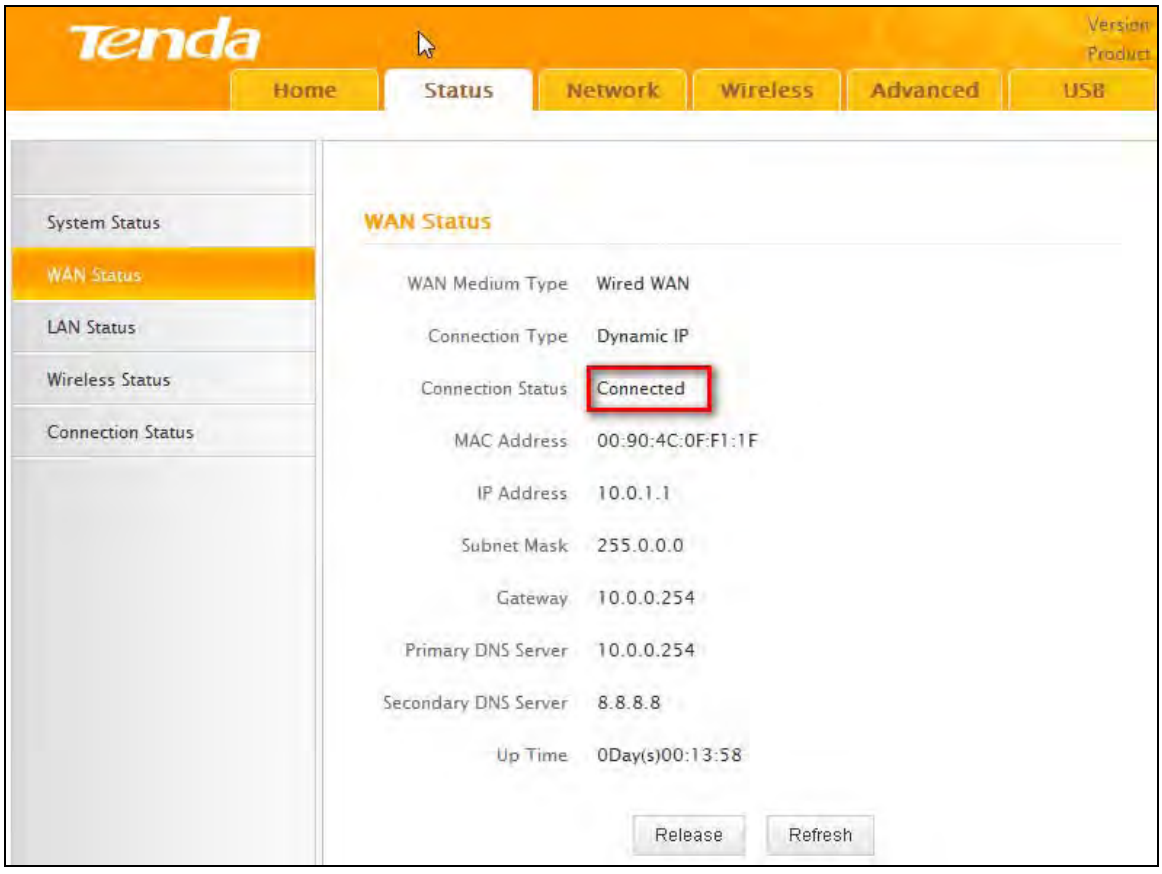

**Note**

1. DHCP is the default Internet connection type;
2. If you are not sure about your PPPoE username and password, contact your Internet service provider (ISP) for help. For other Internet connection types, please go to section 2.2: WAN.

## 4 Verify Internet Connection Settings

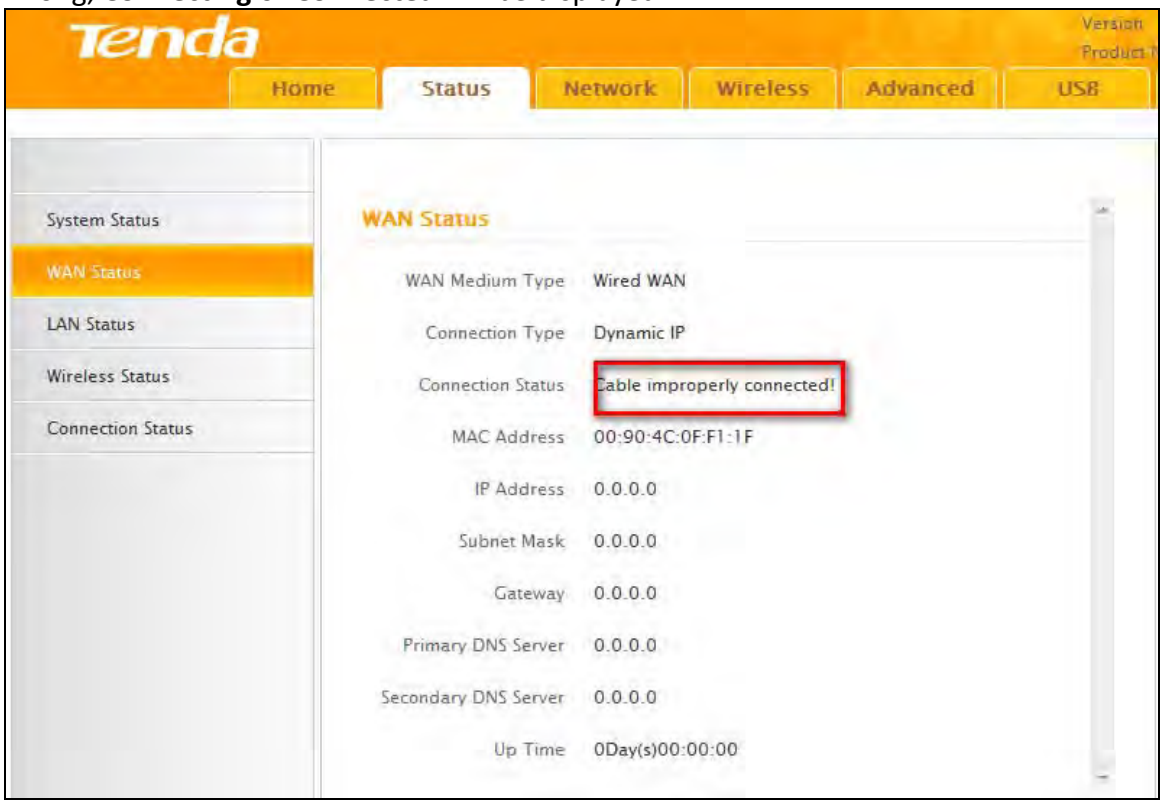
System automatically skips to the status page when you finish all needed settings on the home page. Here you can see the system status and WAN connection status of the device.

1. If you find **Connected** and a WAN IP address displayed there (as shown below), you have got a wired internet access now.




2. If connection status displays **Cable improperly connected** and there is no WAN IP address displayed (as seen below), connection between the Internet-enabled modem and your device may have failed. Please double check or re-connect all involved devices and cables properly and then refresh the page. If nothing is

wrong, **Connecting** or **Connected** will be displayed.




3. If **Connecting** is displayed and no WAN IP address is seen, try refreshing the page five times. And if it still displays **Connecting** try steps below:

1). Contact your ISP for assistance.

2). Read the connection diagnostic info on WAN status.

**Note**

The following diagnostic info will be displayed on particular occasions for your reference:

1). You have connected to Internet successfully.

2). You might have entered a wrong user name and/or a wrong password. Please contact your ISP for the correct user name and password and enter them again.

3). Ethernet cable is not connected or not properly connected to the WAN port on the device. Please reconnect it properly.

4). No response is received from your ISP. Please verify that you can access Internet when you directly connect your PC to an Internet-enabled modem. If not, contact your local ISP for help.

# 5 Connect to Device Wirelessly

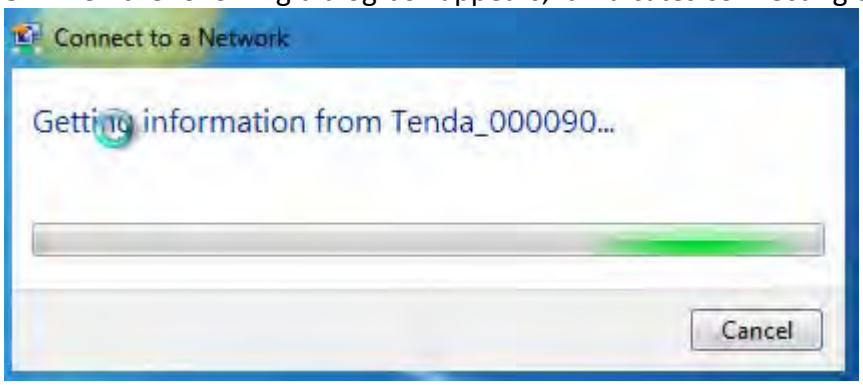
Having finished above settings, you can search the device's wireless network (SSID) from your wireless devices (notebook, iPad, iPhone, etc) and enter a security key to connect to it wirelessly. Desktop computers should be equipped with wireless network cards.

## WIN7 OS

1. Click on the icon  at the bottom of the right corner on your desktop;

2. Select the network you wish to connect, such as Tenda-000090;


3. When the following dialog box appears, it indicates connecting to the network;




4. Enter your security key and click **OK**;


5. When displaying Connected, you have connected to network successfully.

**Tips** ----------

If you cannot find the icon  at the bottom of the right corner on your desktop, please refer to Appendix 2 Join a Wireless Connection>Win7 OS.

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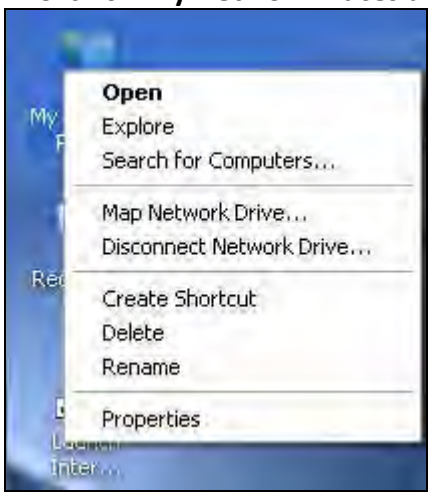
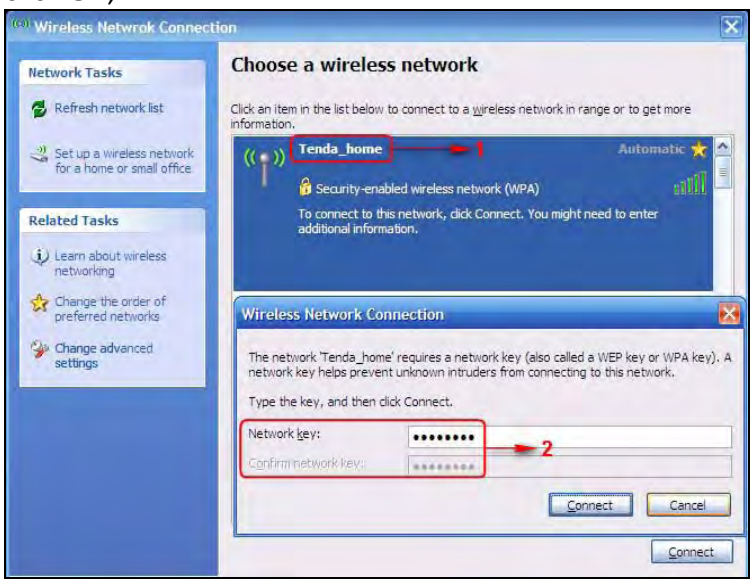
## Windows XP OS

1. Click on **My Network Places** and select **Properties**;

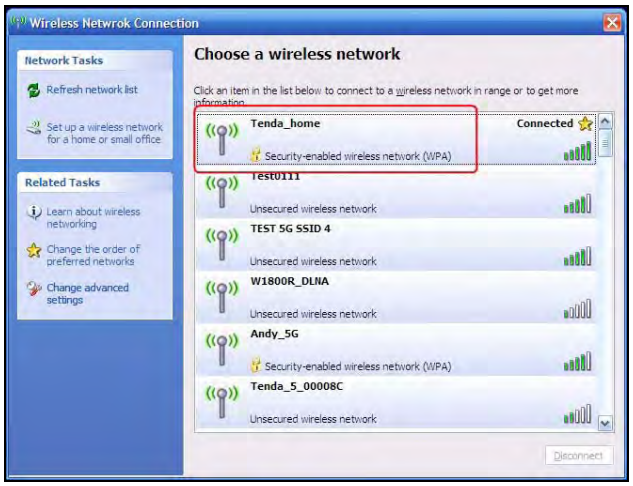



2. Click **Local Area Connection** and select **View Available Wireless Networks;**


3. Select the SSID you wish to connect, such as Tenda_home, click **Connect**, enter the security key and then click **OK**;



4. You can access Internet via the device when **Connected** appears next to the wireless network name you selected.



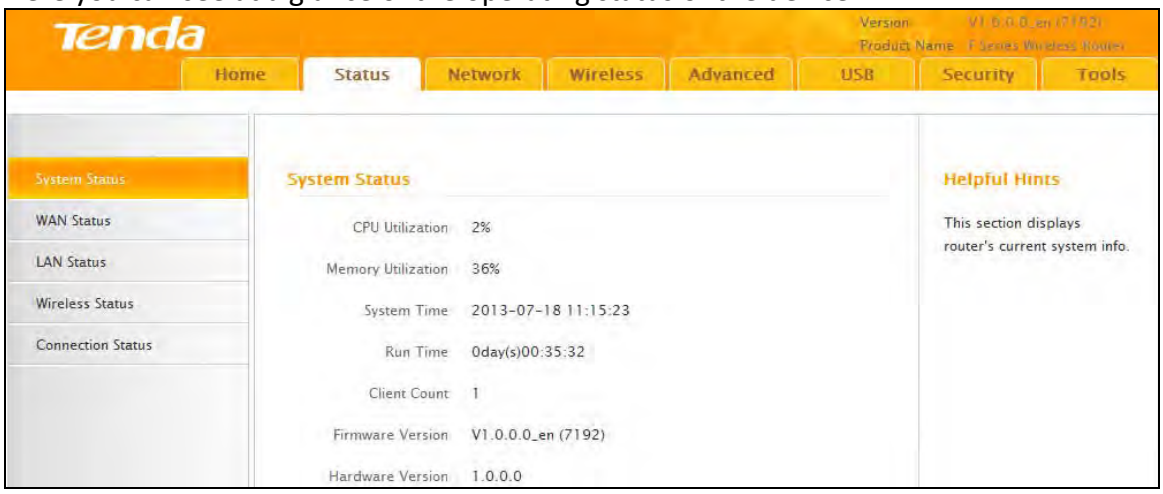
# Chapter 3 Configurations

This chapter describes the Web based configurations for easier management of your router. During the configuration operation, if you are not clear about a certain feature, simply read the related helpful info below.

## 1 Status

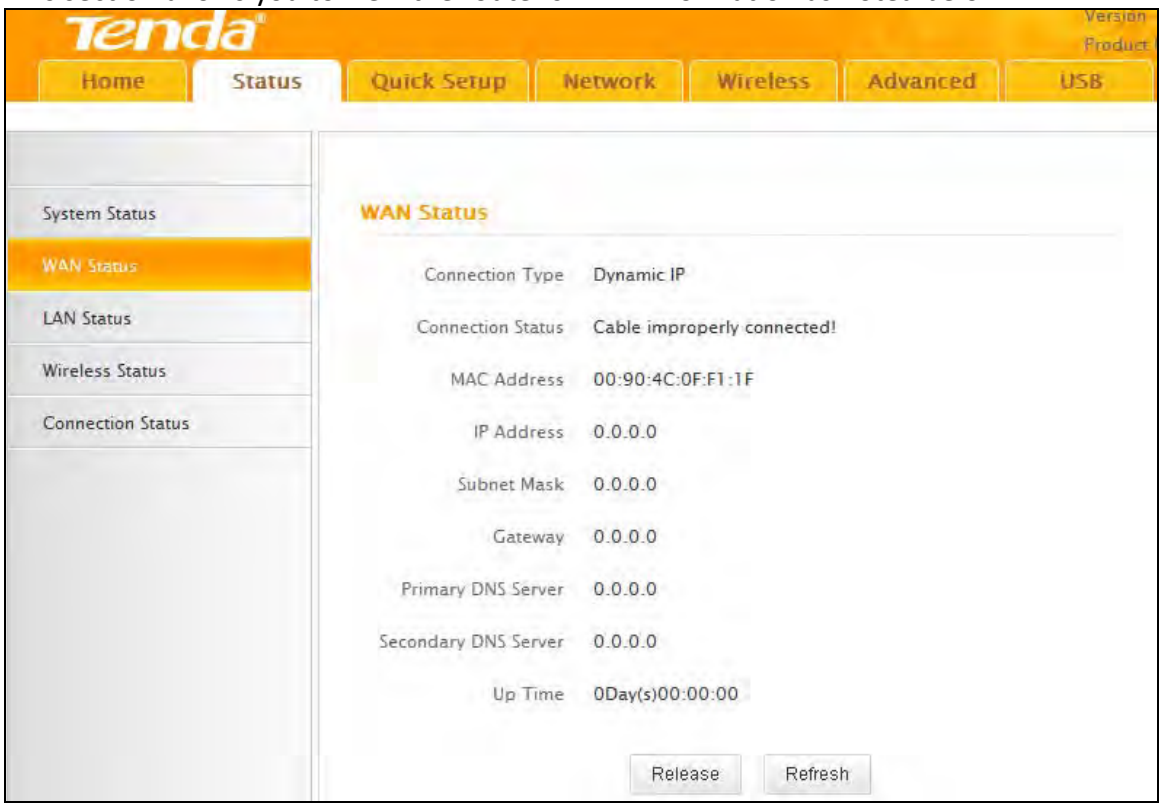
### 1.1 System Status

Here you can see at a glance of the operating status of the device.




### 1.2 WAN Status

This section allows you to view the router's WAN information as noted below:




- Connection Type: Displays the current Internet connection type.
- Connection Status: Displays the WAN connection status: Disconnected, Connecting, or Connected.
- MAC Address: Displays the WAN MAC address.
- IP Address: Displays the WAN IP address.
- Subnet Mask: Displays the WAN subnet mask.
- Gateway: Displays the WAN gateway address.

- Primary DNS Server: Displays the primary WAN DNS address.
- Secondary DNS Server: Displays the secondary WAN DNS address (if any).
- Up Time: Displays the time duration indicating how long the router has been connected to the ISP.

## 1.3 LAN Status

This section allows you to view the router's MAC, IP, and subnet mask information.


- MAC Address: Displays the router's LAN MAC address.
- IP Address：Displays the current LAN IP address.
- Subnet Mask: Displays the current LAN subnet mask.

## 1.4 Wireless Status

This section allows you to view the wireless information of 2.4Ghz band.

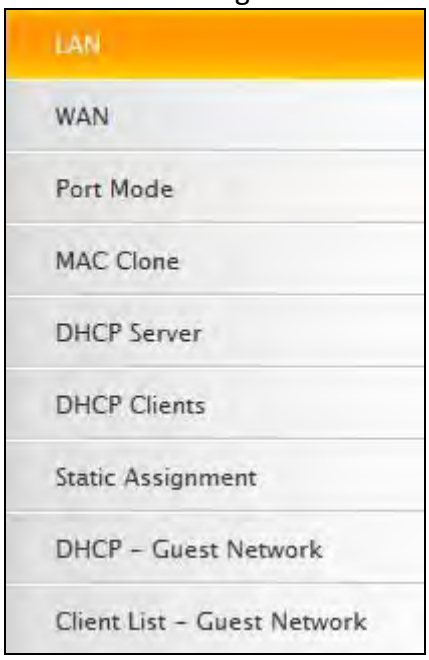

- Wireless Radio: Displays whether wireless is enabled or not.
- Wireless MAC address: Displays the MAC address of the router's wireless interface.
- SSID: Displays the current SSID.
- 802.11 Mode: Displays the currently active network mode.
- Country: Displays the current country selection.
- Channel: Displays the current channel.
- Security Mode: Displays the current security Mode.

## 1.5 Connection Status

This section displays the info of currently connected clients (if any) including IP and MAC addresses, etc.

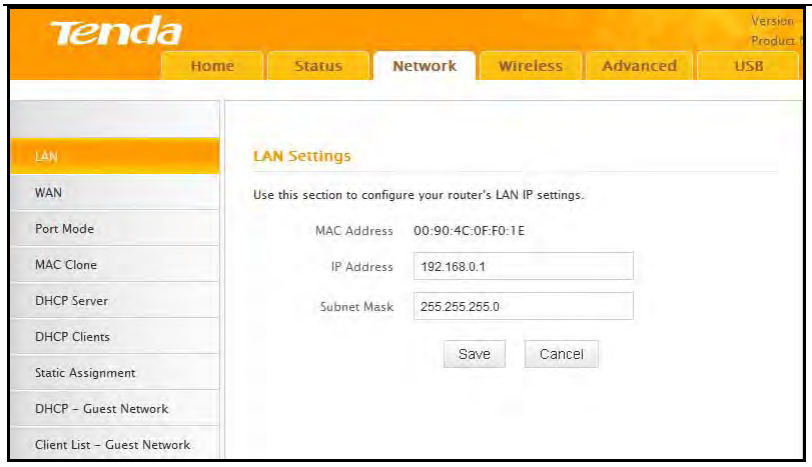

# 2 Network

**Network** menu includes the following nine submenus. Clicking any of them enters the corresponding interface for configuration. Details are explained below:




## 2.1 LAN

This section allows you to configure your router's LAN IP settings.




- IP Address: The router's LAN IP. The default is 192.168.0.1 and you can change it according to your needs.
- Subnet Mask: Router's LAN subnet mask. The default is 255.255.255.0.

**Note**

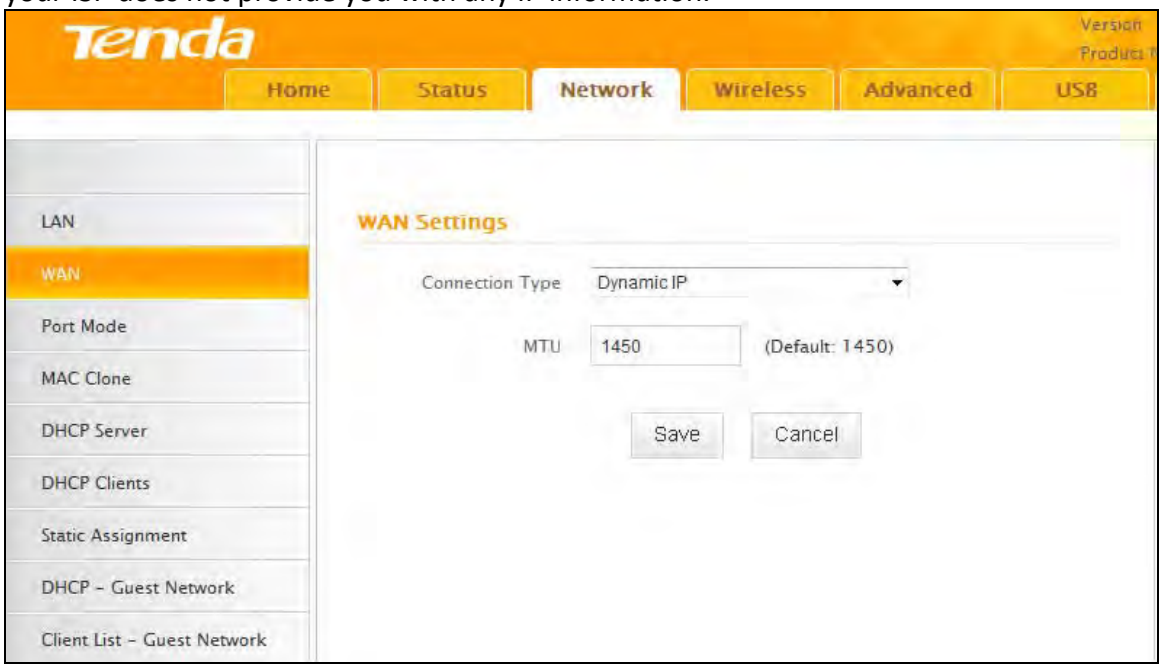
If you change the LAN IP address, you must use the new one to log on to the web utility.

## 2.2 WAN

There are three types of Internet connection: Dynamic IP (DHCP), Static IP, and PPPoE(including dual access).

**Dynamic IP**

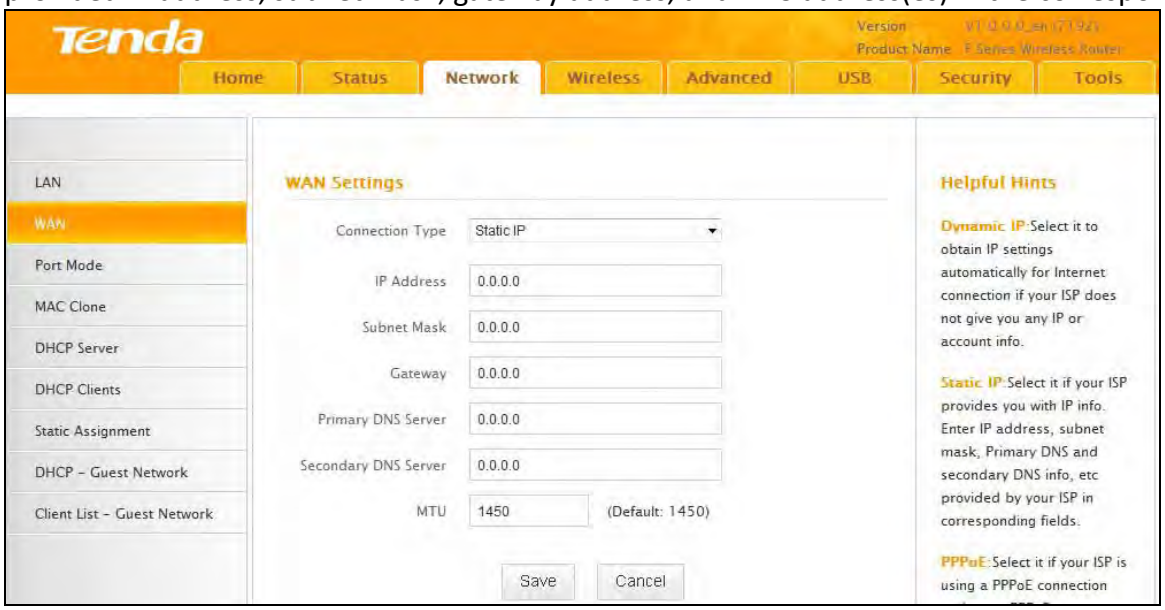
Select Dynamic IP (DHCP) to obtain IP Address information automatically from your ISP. Select this option if your ISP does not provide you with any IP information.




- Connection Type: Displays a list of available Internet connection types.
- MTU: Maximum Transmission Unit. The default value is1450.

**Static IP**

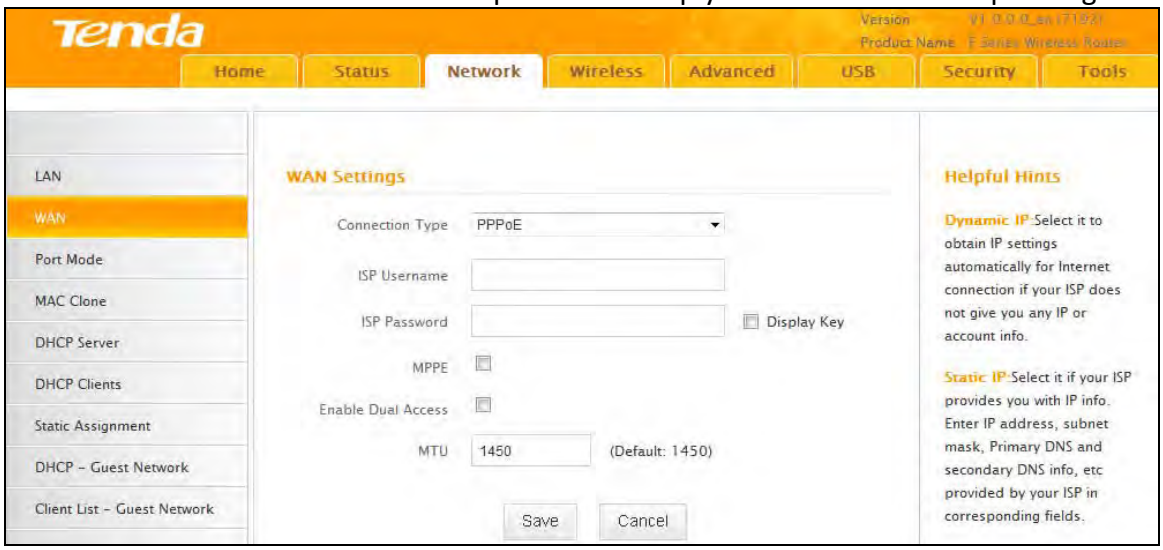
Select Static IP Address if your ISP provides all the connection information. You will need to enter the provided IP address, subnet mask, gateway address, and DNS address(es) in the corresponding fields.




- Connection Type: Displays a list of available Internet connection types.
- IP Address: Enter the IP address provided by your ISP. Consult your local ISP if you are not clear.
- Subnet mask: Enter the subnet mask provided by your ISP. Consult your ISP if you are not clear.
- Gateway: Enter the gateway address provided by your ISP. Consult your local ISP if you are not clear.
- Primary/Secondary DNS Server: Enter the Primary and Secondary DNS Server Addresses. Consult your local ISP if you are not clear.
- MTU: Maximum Transmission Unit. The factory default is 1450.

**PPPoE**

Select PPPoE (Point to Point Protocol over Ethernet) if your ISP uses a PPPoE connection and provides you with a PPPoE user name and a PPPoE password. Simply enter them in corresponding fields.




- Connection Type: Displays a list of available Internet connection types.
- ISP User Name: Enter the PPPoE User Name provided by your ISP. Consult your ISP if you are not clear.
- ISP Password: Enter the PPPoE Password provided by your ISP. Consult your ISP if you are not clear.
- MPPE: Select whether to enable the MPPE authentication method.
- Enable Dual Access: Select whether to enable Dual Access.
- MTU: Maximum Transmission Unit. The factory default is 1450.

**Tips** ----------

1. It is not advisable to change the factory default MTU value unless necessary, an improper MTU value may degrade your network performance or even lead to network malfunction.
2. If you want to active new settings you've changed, you must reboot the device.

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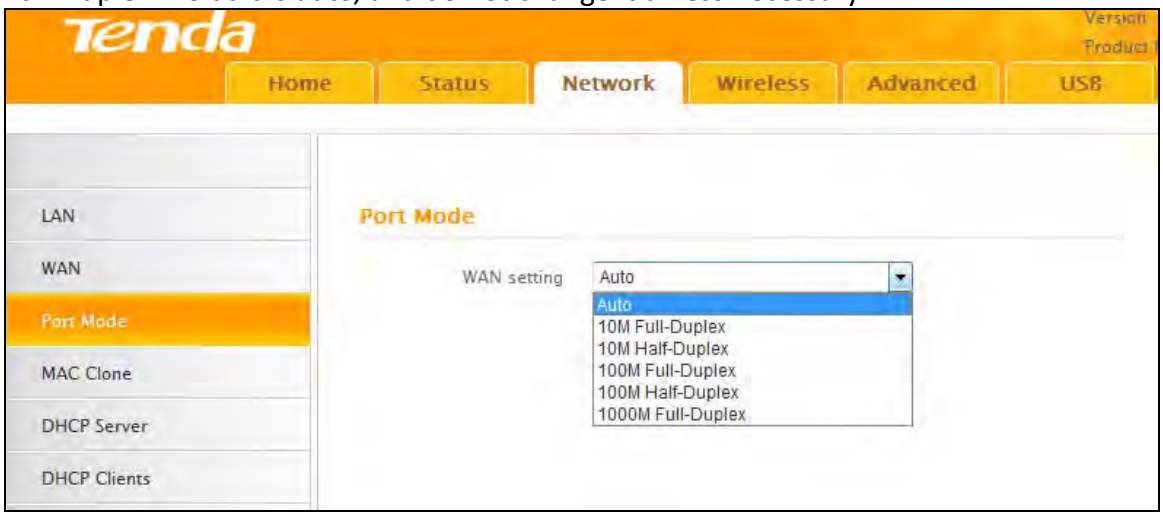
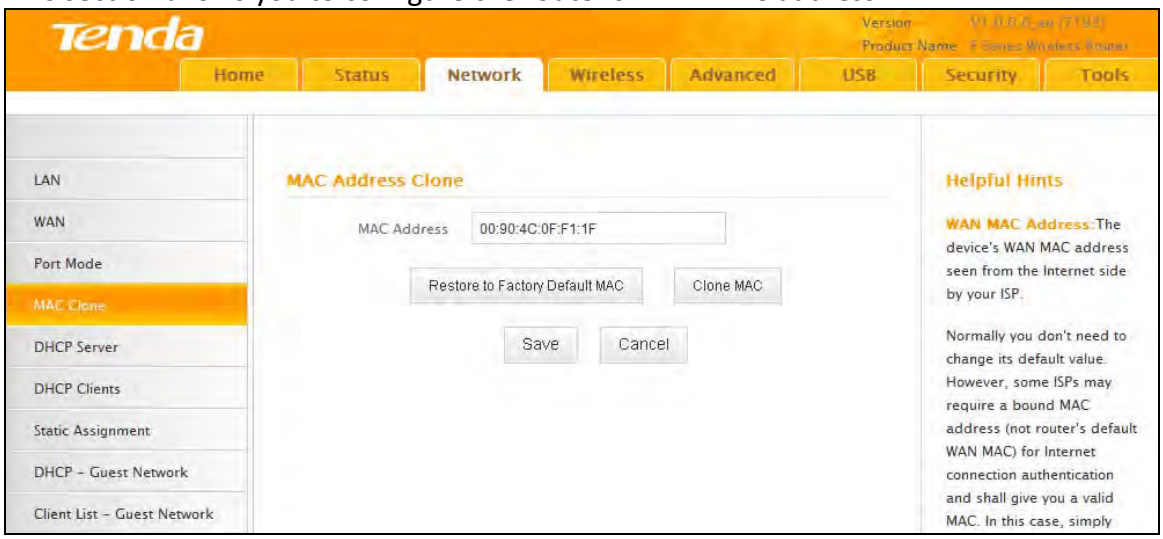
## 2.3 Port Mode

Mode includes auto,10M Half-Duplex,10M Full-Duplex,100M Half-Duplex,100M Full-Duplex,1000M Full-Duplex. Default is auto, and do not change it unless necessary.




## 2.4 MAC Clone

This section allows you to configure the router's WAN MAC address.



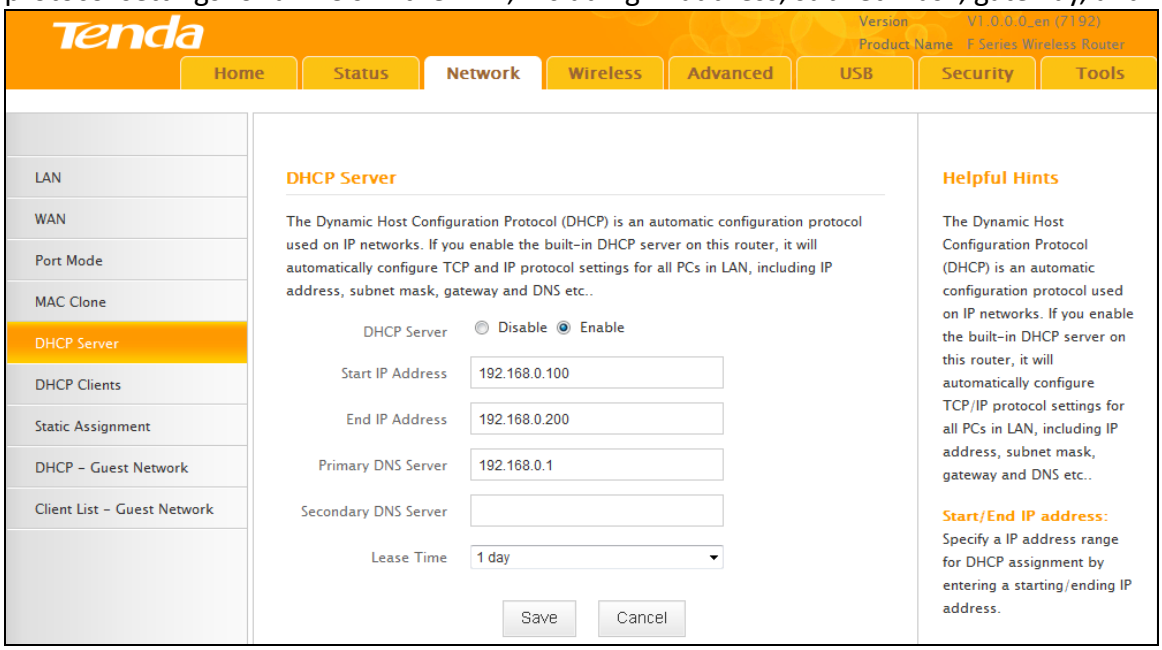

- MAC Address: Configure the router's WAN MAC address.
- Restore to Factory Default MAC: Reset the router's WAN MAC to factory default.
- Clone MAC: Clicking this button copies the MAC address of your PC to the MAC Address field in the router.

**Note**

1. Normally you don't need to change the default WAN MAC value. However, some ISP's may require the client PC's MAC address for Internet connection authentication. In this case, simply enter the MAC address in the WAN MAC Address field or click the **Clone MAC** button. Note that the WAN MAC address in the **Status** interface will be updated accordingly once you have changed it.
2. Remember to reboot the router to activate the new WAN MAC. DO NOT use the **Clone MAC** feature unless required by your ISP.
3. Only the MAC addresses of the PCs on the LAN can be cloned to the router.

## 2.5 DHCP Server

The Dynamic Host Configuration Protocol (DHCP) is an automatic configuration protocol used on IP networks. If you enable the built-in DHCP server on this device, it will automatically configure the TCP/IP protocol settings for all PC's in the LAN, including IP address, subnet mask, gateway, and DNS.




- DHCP Server: Select whether to enable or disable the router's DHCP server feature.
- Start IP Address: Enter the starting IP address for the DHCP server's IP assignment.
- End IP Address: Enter the ending IP address for the DHCP server's IP assignment.
- Lease Time: The length of time for the IP address lease.

**Tips** ----------

1. The device has enabled the DHCP server by default and it is not advisable to disable it unless necessary.
2. To apply the DHCP server settings to all PC's on your LAN, you must set all PC's to "Obtain an IP address automatically" and "Obtain DNS server address automatically".

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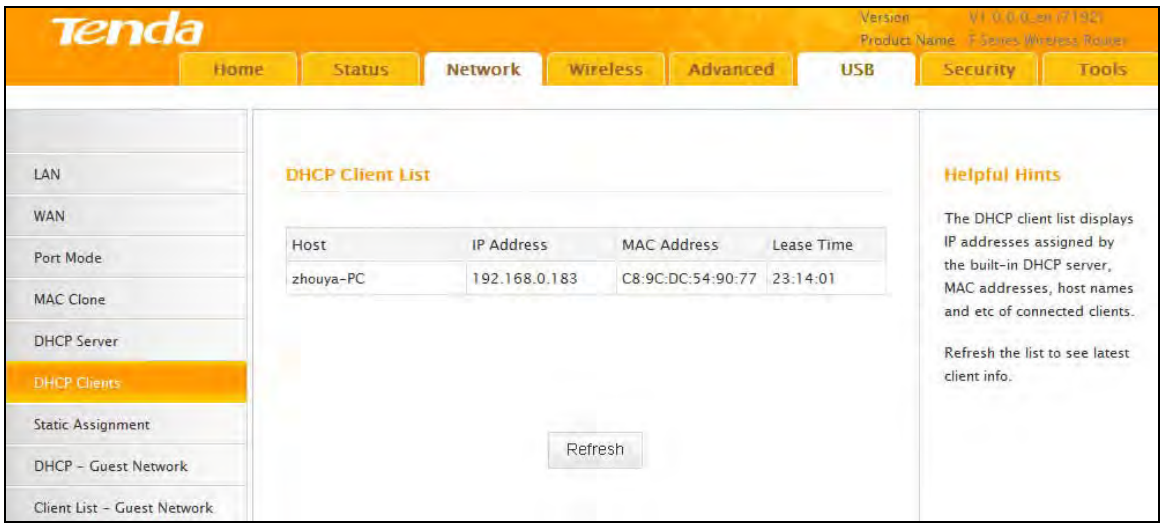
## 2.6 DHCP Clients

This list displays the DHCP dynamic client list, which includes host name, IP address, MAC address, and lease time information.

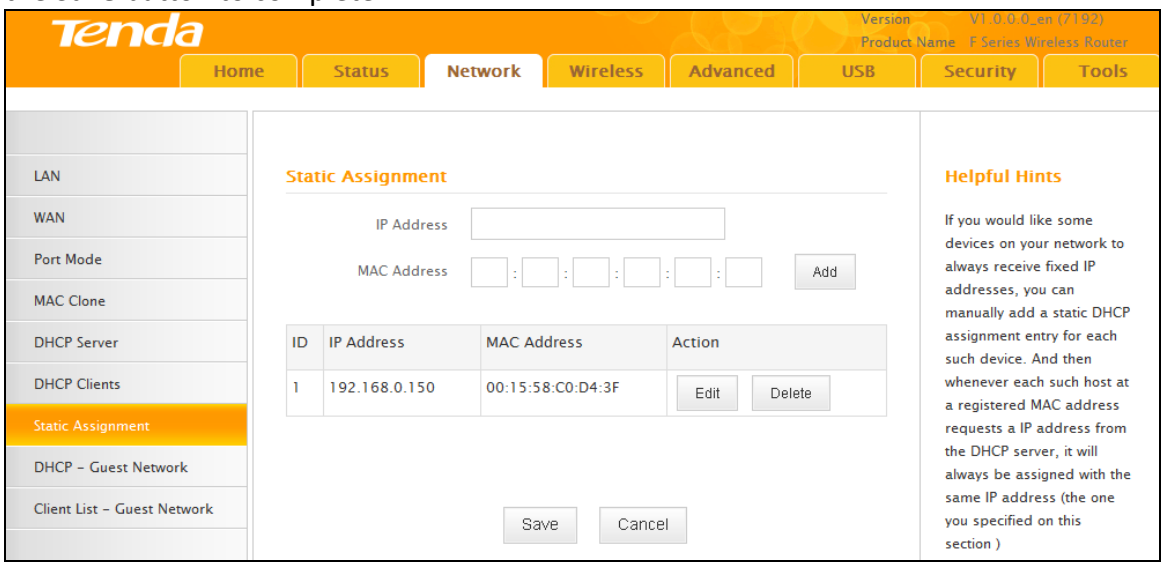



- Host: Displays clients' host names.
- IP Address: Displays IP addresses that clients obtained from the DHCP server.
- MAC Address: Displays the MAC address of a given host.
- Lease Time: Remaining time for a corresponding IP address lease.

## 2.7 Static Assignment

If you would like some devices on your network to always have fixed IP addresses, you can use this feature and manually add a static DHCP assignment entry for each device.

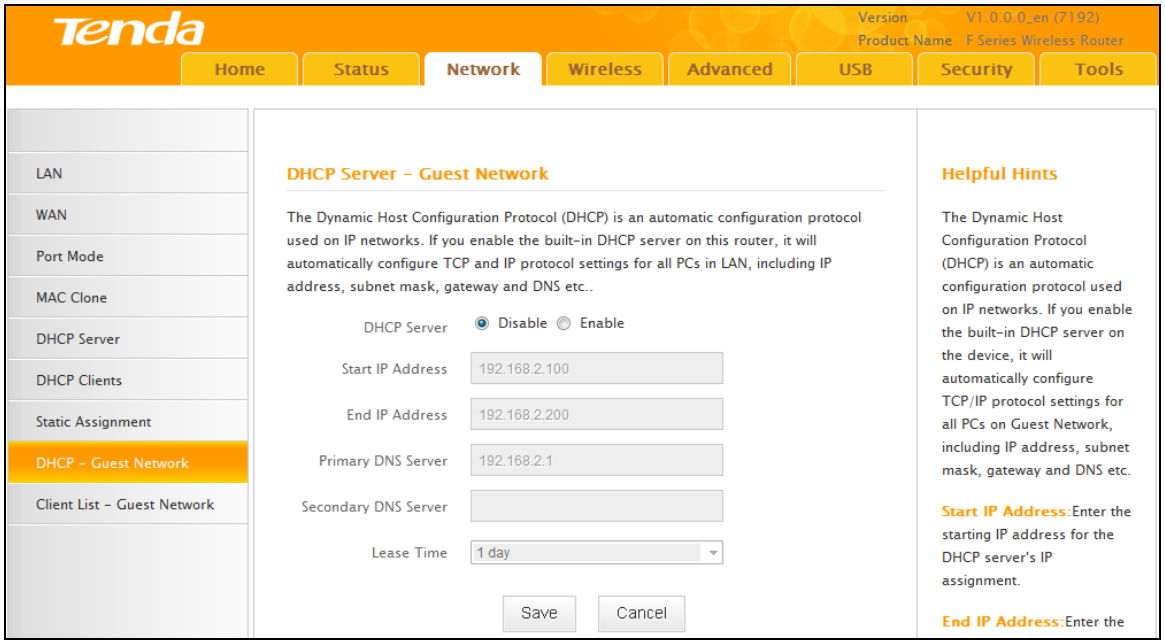
For example: To have a PC at the MAC address of 00:15:58:c0:d4:3f always receive the same IP address of 192.168.0.150, simply enter the IP and MAC addresses in the corresponding fields and click **Add** and then the **Save** button to complete.




- IP Address: Enter the IP address for static DHCP assignment.
- MAC Address: Enter the MAC address of a computer to always receive the same IP address you specify.
- Add: Click it to add a new IP-MAC static assignment entry to list.
- Edit: Click it to change an existing entry.
- Delete: Click to remove an existing entry.

## 2.8 DHCP-Guest Network

If you enable the built-in DHCP server for the Guest Network on the router it will automatically configure the TCP/IP protocol settings for all PC's on the Guest Network, including IP address, subnet mask, gateway, and DNS.




- DHCP Server: Select whether to enable or disable the router's DHCP server feature.
- Start IP Address: Enter the starting IP address for the DHCP server's IP assignment.

- End IP Address: Enter the ending IP address for the DHCP server's IP assignment.
- Lease Time: The length of time for the IP address lease.

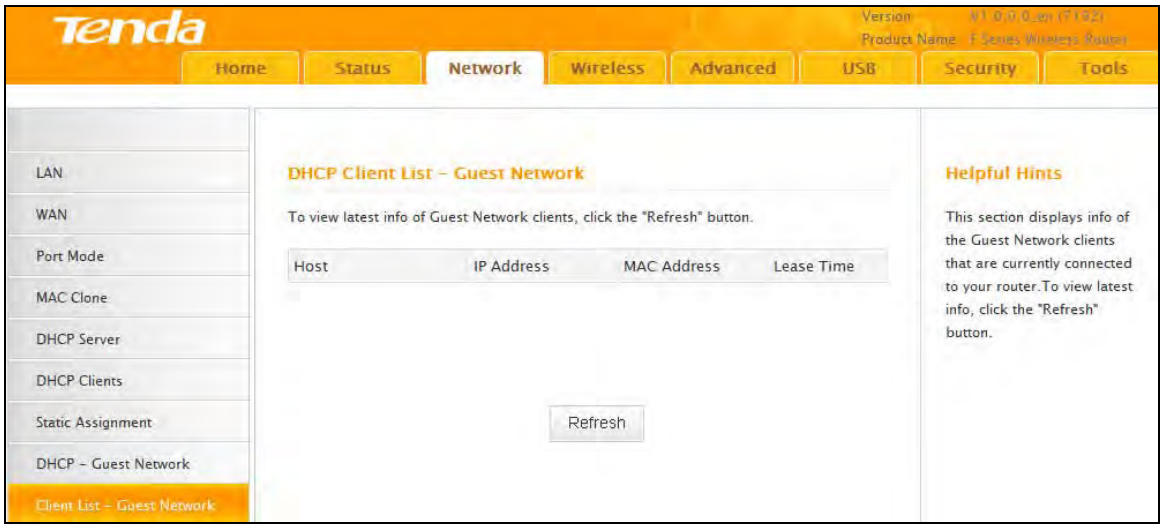
**Tips** ----------

The IP address configured in DHCP-guest network should not be in the same network segment as that of DHCP server's.

---

## 2.9 Client List-Guest Network

This list displays the DHCP dynamic client list, which includes host name, IP address, MAC address, and lease time information.

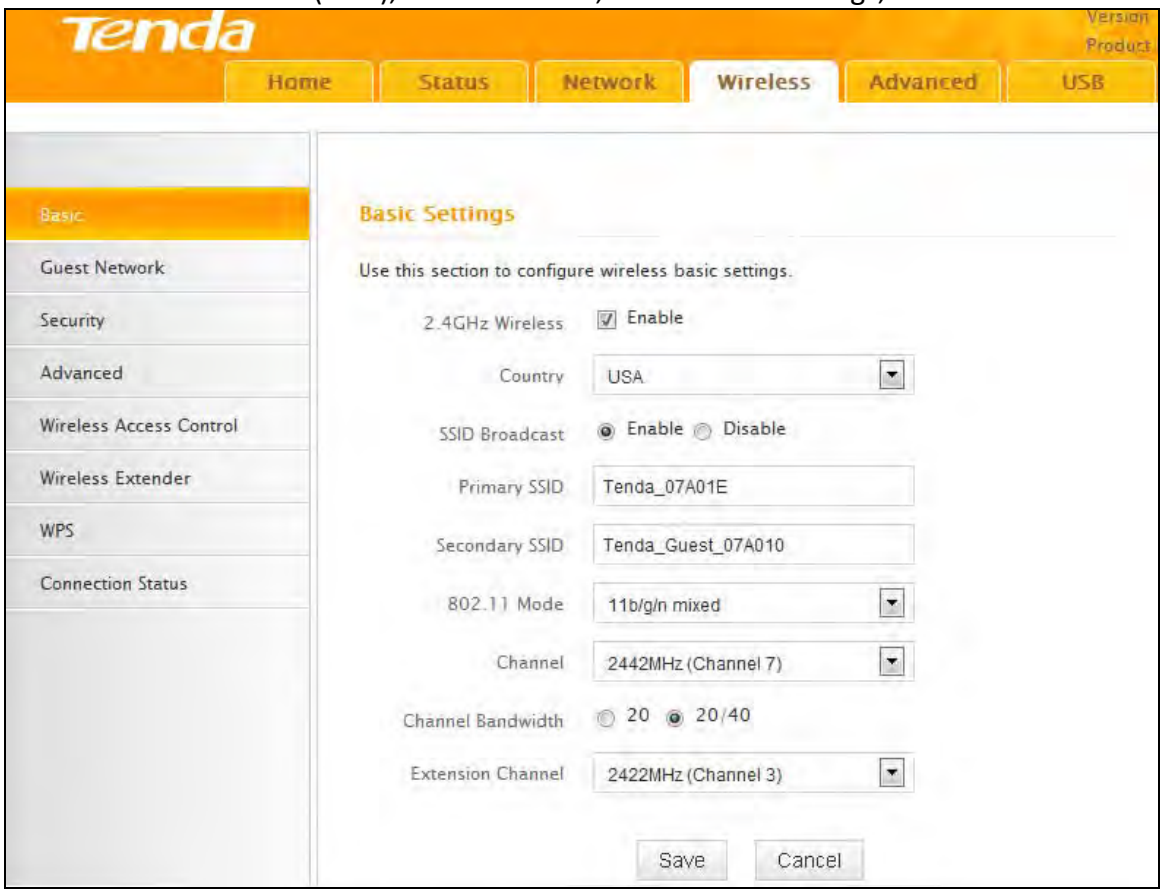


# 3 Wireless

The **Wireless** tab includes 8 submenus: Basic, Guest Network, Security, Advanced, Wireless Access Control, Wireless Extender, WPS, and Connection Status. Clicking any of them enters the corresponding interface for configuration. Details are explained below:


## 3.1 Basic

This section allows you to manage your wireless network. You can select your country, configure the wireless network name (SSID), network mode, and channel settings, etc.



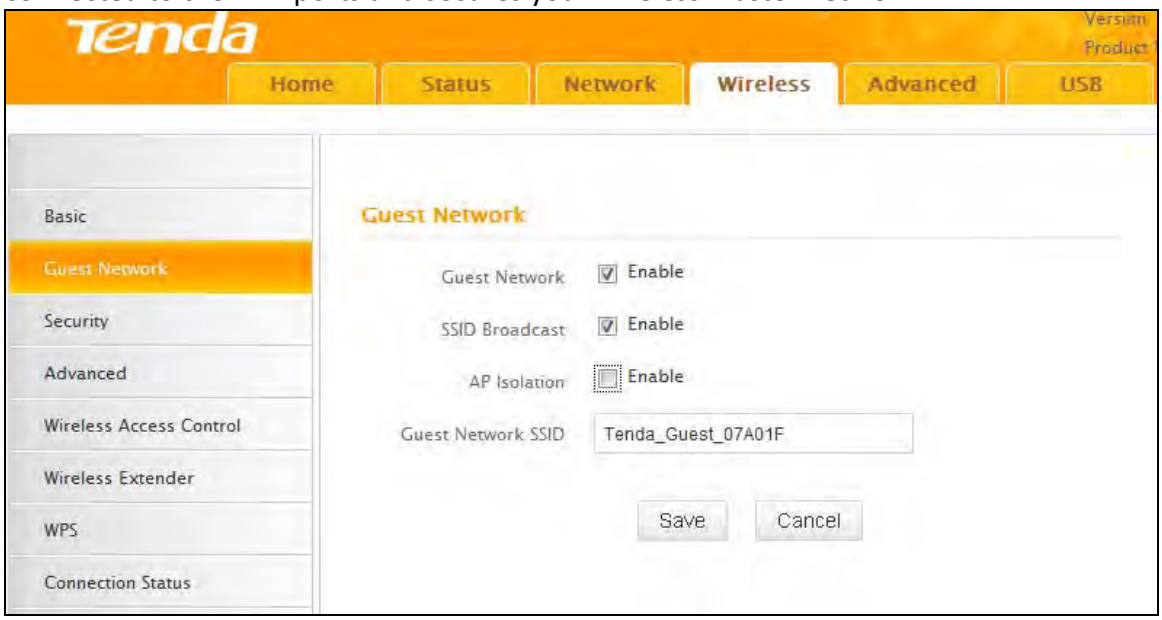

- 2.4GHz Wireless Network: Check/uncheck to enable/disable the 2.4GHz wireless feature. If disabled, all 2.4GHz-based features will be disabled accordingly.
- Country: Select your country from the drop-down list. There are 12 options available.
- SSID Broadcast: Select Enable/Disable to make your wireless network visible/ invisible to any wireless

clients within coverage when they perform a scan to available networks. By default, it is enabled. When disabled, wireless clients will have to first know this SSID and manually enter it on their devices if they want to connect to the SSID.

- SSID ：Service Set Identifier, is the unique name of a wireless network.
- 802.11 Mode: Select a correct mode according to your wireless clients. The default mode is 11b/g/n mixed.
- Channel: For optimal wireless performance, you may select the least used channel. It is advisable that you select an unused channel from the drop down list, or “Auto” to let the router detect and select the best possible channel for your wireless network to operate on.
- Channel Bandwidth: Select a proper channel bandwidth to enhance wireless performance. When there only 11n or a mix of 11b/g/n wireless clients, please select the 802.11n mode of 20/40M frequency band, but when there are only non-11n wireless clients, select the 20M frequency band mode
- Extension Channel：Available only in 11b/g/n mixed mode.

## 3.2 Guest Network

The Guest Network feature allows guests to access the Internet and other users on the guest network, while disallowing them to access the router’s web manager, users on the master network, and clients connected to the LAN ports and secures your wireless master network.



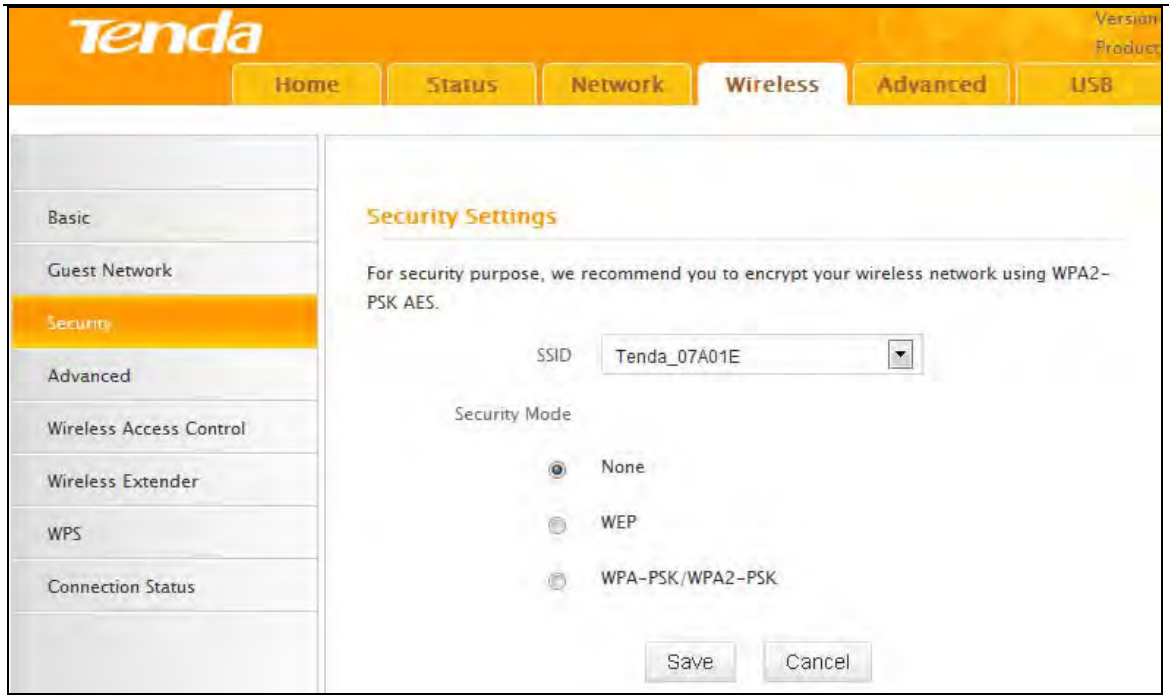

- Guest Network: Select to enable/disable the guest network feature.
- SSID Broadcast: Check to enable/disable the SSID feature, making your wireless network visible/ invisible to any wireless clients within coverage when they perform a scan to available networks. By default, it is enabled, but when disabled, wireless clients will have to first know this SSID and manually enter it on their devices if they want to connect to the SSID.
- AP Isolation: If enabled, clients connecting to the guest network will be mutually inaccessible.
- Guest Network SSID：Service Set Identifier, is the configured unique name of the guest network.

**Note**

AP Isolation is disabled by default. If enabled, clients connecting to the guest network will be mutually inaccessible.

## 3.3 Security

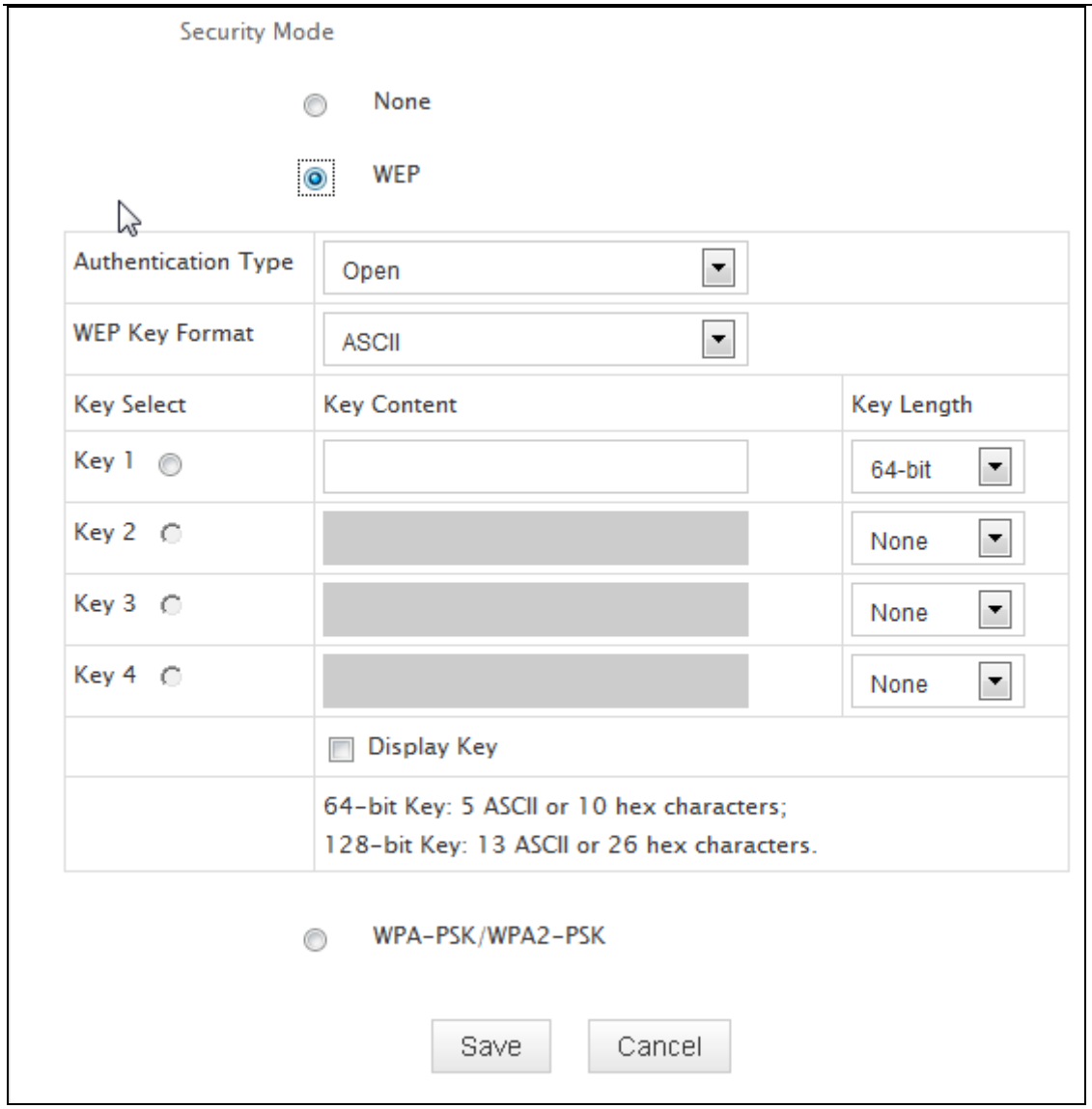
This section allows you to encrypt your wireless network to block unauthorized accesses and malicious packet sniffing.




Three security modes are available: None, WEP, and WPA-PSK/WPA2-PSK.

**WEP**

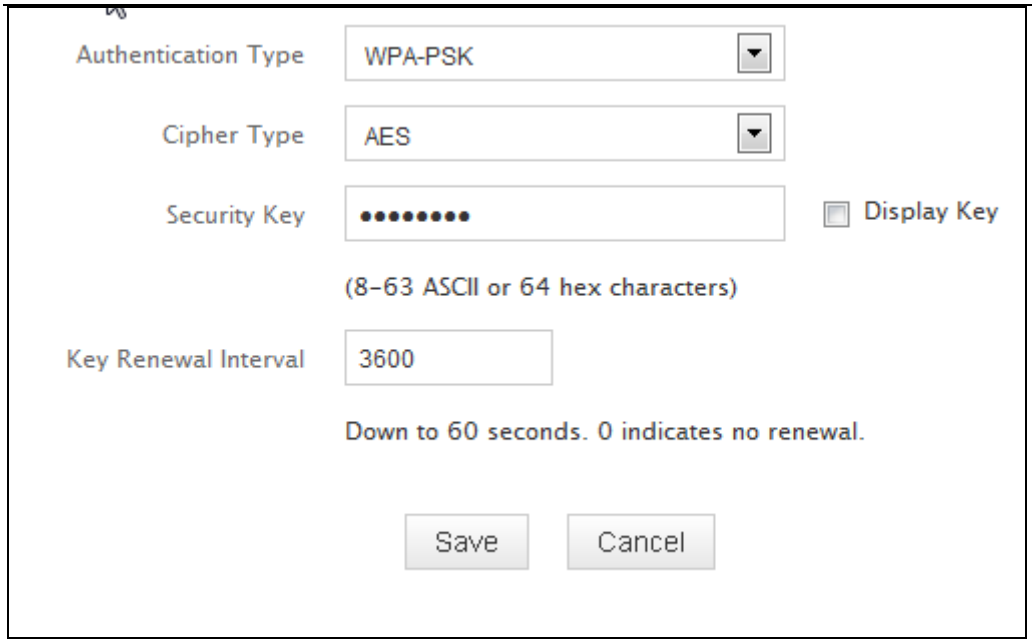
WEP is intended to provide data confidentiality comparable to that of a traditional wired network. Two methods of authentication can be used with WEP: Open System authentication and Shared Key authentication.




- Authentication Type: Select Open or Shared from the drop-down list.
- WEP Key Format: Select Hex or ASCII from the drop-down list.
- Key Select: Select a key from the preset keys 1-4 for current use.

**WPA-PSK**

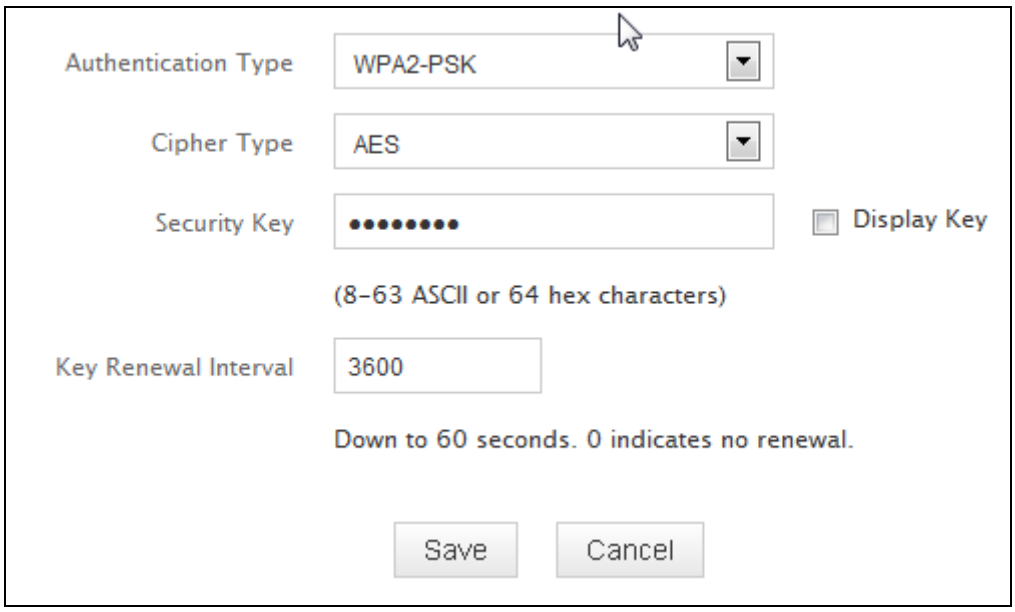
The WPA protocol implements the majority of the IEEE 802.11i standard. It enhances data encryption through the Temporal Key Integrity Protocol (TKIP) which is a 128-bit per-packet key, meaning that it dynamically generates a new key for each packet. WPA also includes a message integrity check feature to prevent data packets from being tampered with. Only authorized network users can access the wireless network. WPA adopts enhanced encryption algorithm over WEP.




- Cipher Type: Select AES (advanced encryption standard) or TKIP (temporary key integrity protocol) &AES.
- Security Key: Enter a security key, which must be between 8-63 ASCII characters long.
- Key Renewal Interval: Enter a valid time period for the key to be changed.

**WPA2-PSK**

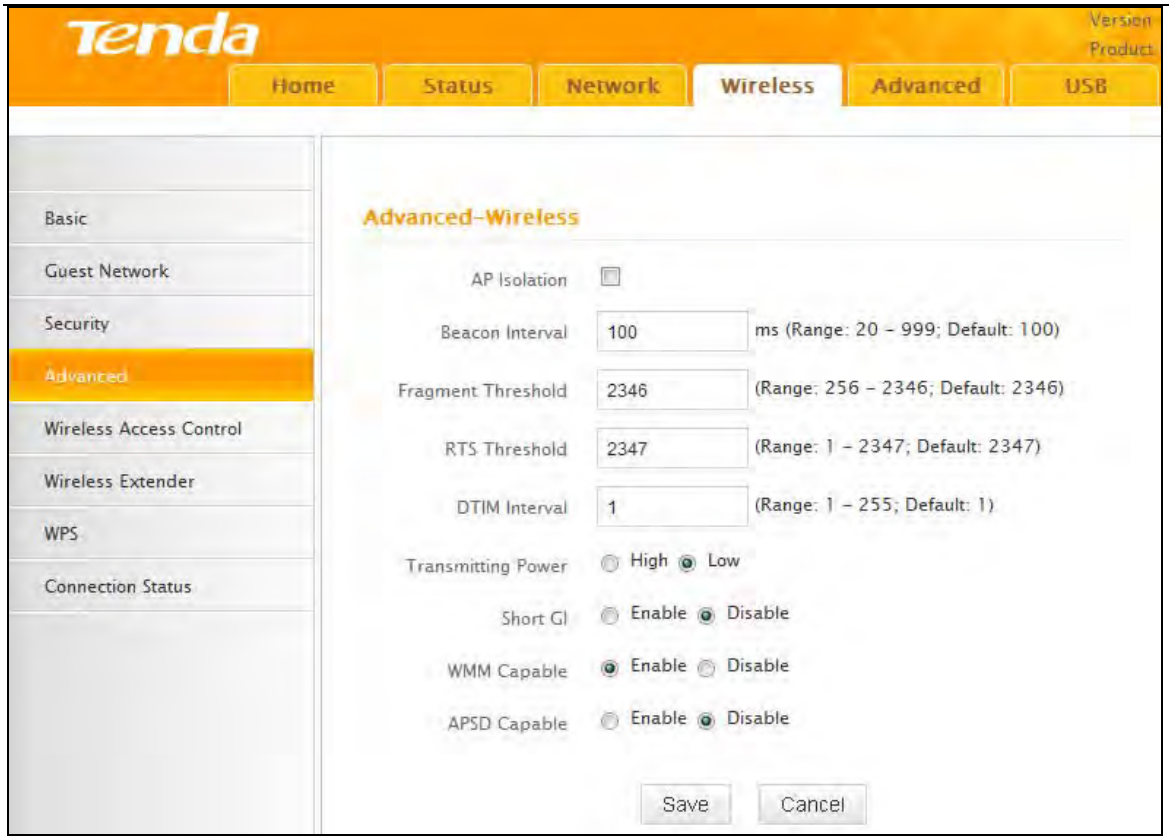
WPA2 is based on 802.11i and uses Advanced Encryption Standard (AES) instead of TKIP. It is more secured than WPA and WEP.




- Cipher Type: Select AES (advanced encryption standard) or TKIP (temporary key integrity protocol) &AES.
- Security Key: Enter a security key, which must be between 8-63 ASCII characters long.
- Key Renewal Interval: Enter a valid time period for the key to be changed.

## 3.4 Advanced

This section allows you to configure advanced settings, including AP Isolation, Beacon interval ， Fragment threshold, RTS threshold, and DTIM interval, etc.




- AP Isolation: Isolates clients connecting to the master SSID.
- Beacon Interval: A time interval between any two consecutive Beacon packets sent by an Access Point to synchronize a wireless network. DO NOT change the default value of 100 unless necessary.
- Fragment Threshold: Specify a Fragment Threshold value. Any wireless packet exceeding the preset value will be divided into several fragments before transmission. DO NOT change the default value of 2346 unless necessary.
- RTS Threshold: If a packet exceeds such set value, RTS/CTS scheme will be used to reduce collisions. Set it to a smaller value provided that there are distant clients and interference. For normal SOHO, it is recommended to keep the default value unchanged, otherwise, the router performance may be degraded.
- DTIM Interval: A DTIM (Delivery Traffic Indication Message) Interval is a countdown informing clients of the next window for listening to broadcast and multicast messages. When such packets arrive in the router's buffer, the router will send DTIM (delivery traffic indication message) and DTIM interval to alert clients of the receiving packets.
- WMM-Capable: WMM is QoS for your wireless network. Enabling this option may better stream wireless multimedia data (such as video or audio).
- ASPD Capable：Select to enable/disable the auto power saving mode.

## 3.5 Wireless Access Control

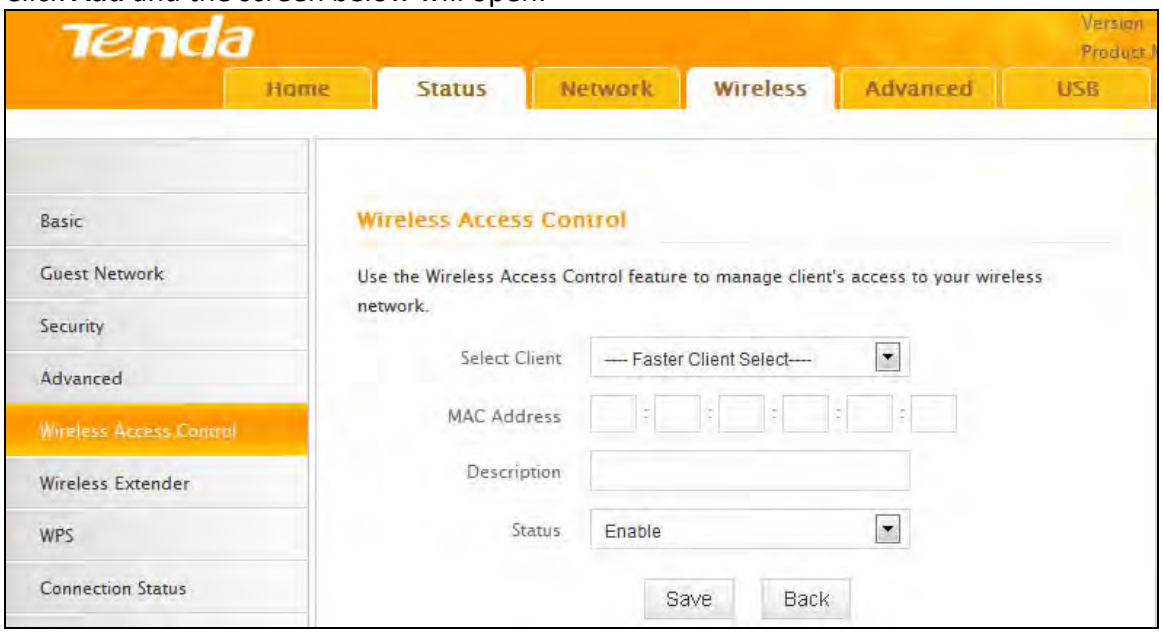
The MAC-based Wireless Access Control feature can be used to allow or disallow clients to connect to your wireless network.


- Filter Mode:

Deny Access to Wireless Network: Blocks only devices at specified MAC addresses from connecting to your wireless network.

Allow Access to Wireless Network: Allow only devices at specified MAC addresses to connect to your wireless network.

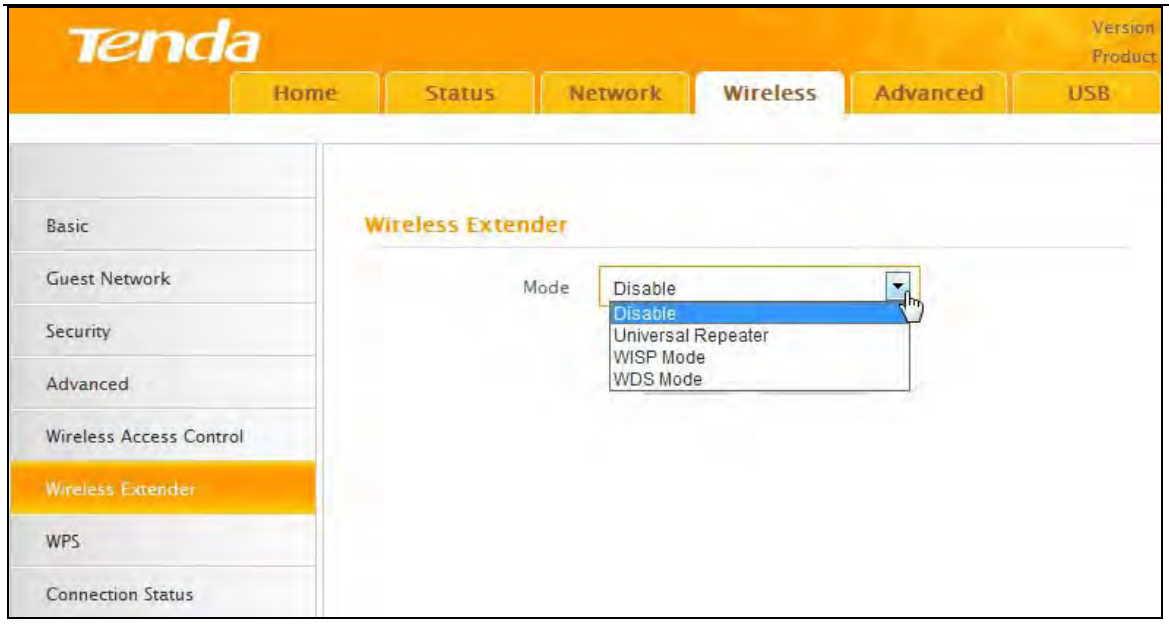
Click **Add** and the screen below will open:




- MAC Address: Enter the MAC address of a wireless client.
- Description: Briefly describe the new entry.
- Status: Select Enable/Disable to enable/disable a corresponding entry.

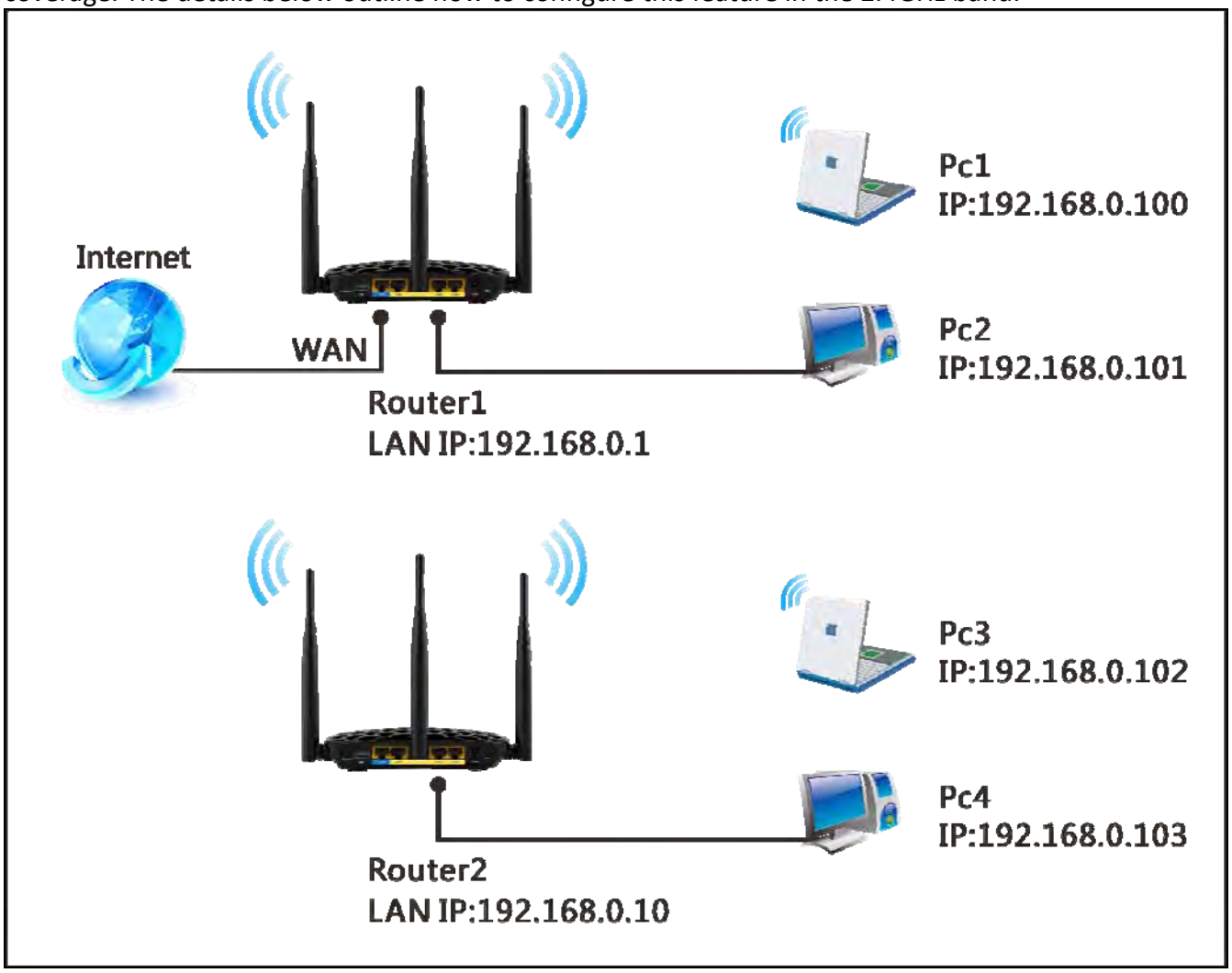
## 3.6 Wireless Extender

Here you can set the Bridge mode (Universal Repeater, WISP, WDS) to extend wireless coverage.




**WDS**

WDS (Wireless Distribution System), this feature can be used to extend your existing 2.4Ghz network coverage. The details below outline how to configure this feature in the 2.4GHz band.

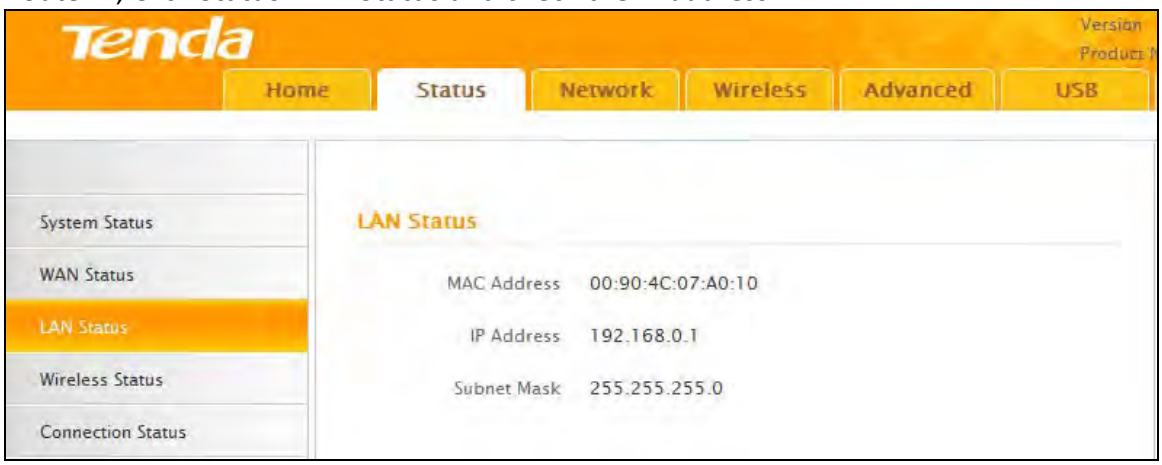



**For example:**

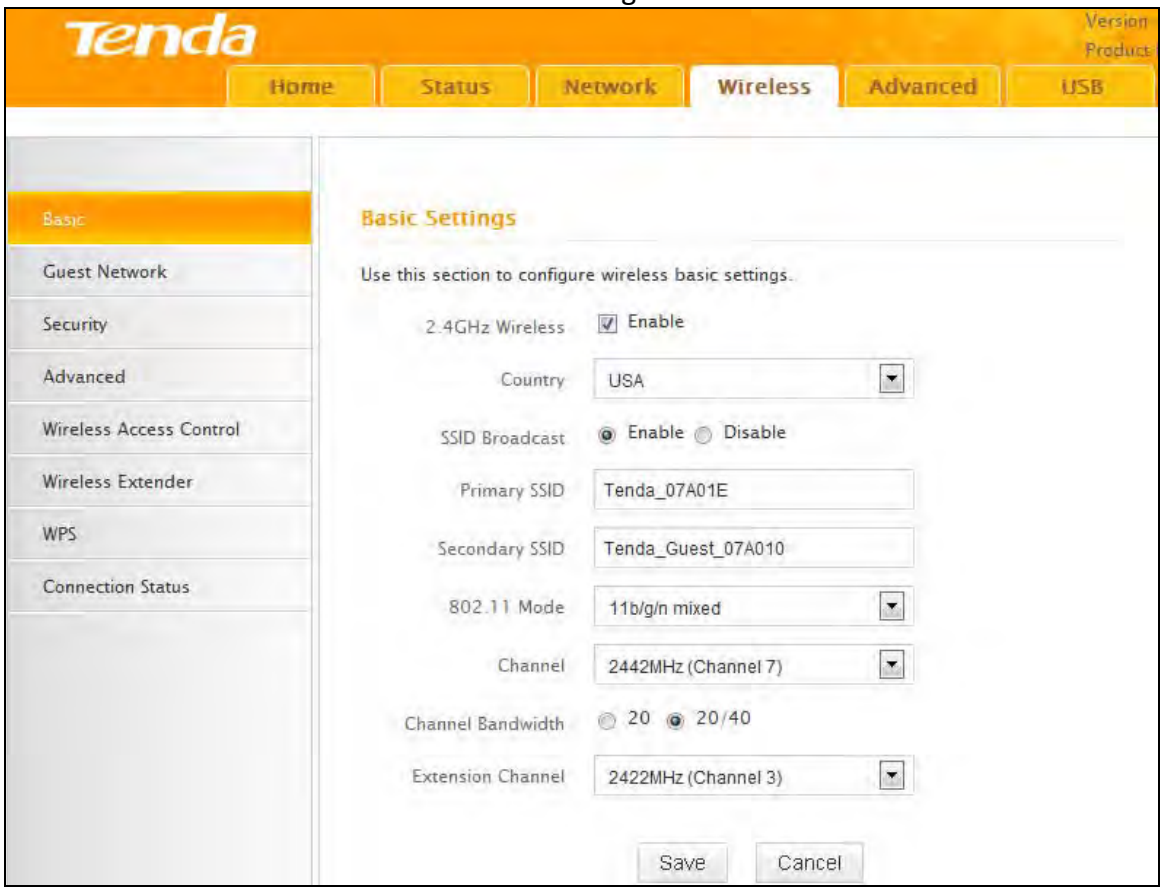
As seen in the figure above, PC1 and PC2 access Internet via a wireless connection to Router 1. While PC3 and PC4 are too far to directly connect to Router 1 for Internet access. Now you can use the WDS bridge feature to let PC3 and PC4 access Internet.

Before you get started:

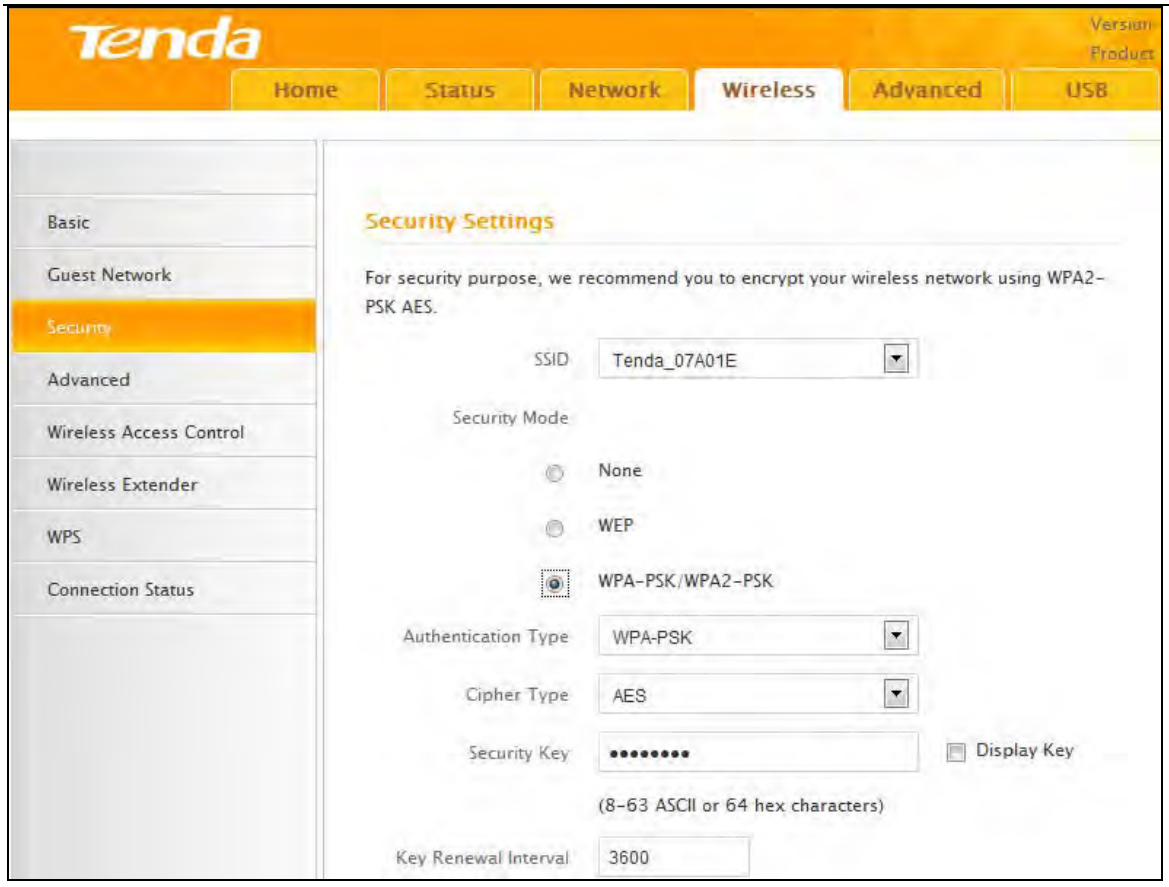
1. View and note down the wireless security settings: security mode, cipher type, security key, etc. on Router 1; Click **Status**>**LAN Status** and check the IP address.




2. Click **Wireless**>**Basic** to check the basic settings of Router 1.




3. Click **Wireless**>**Security** to check wireless security settings of Router 1.




4. Verify that DHCP server is enabled on Router 1: Click **Network**>**DHCP Server**.


5. Set the LAN IP address of Router 2 to a different address yet on the same net segment as Router 1.

**As shown below:**

Router 1:

LAN IP: 192.168.0.1;

Subnet Mask: 255.255.255.0;

Router 2:

LAN IP：192.168.0.10;

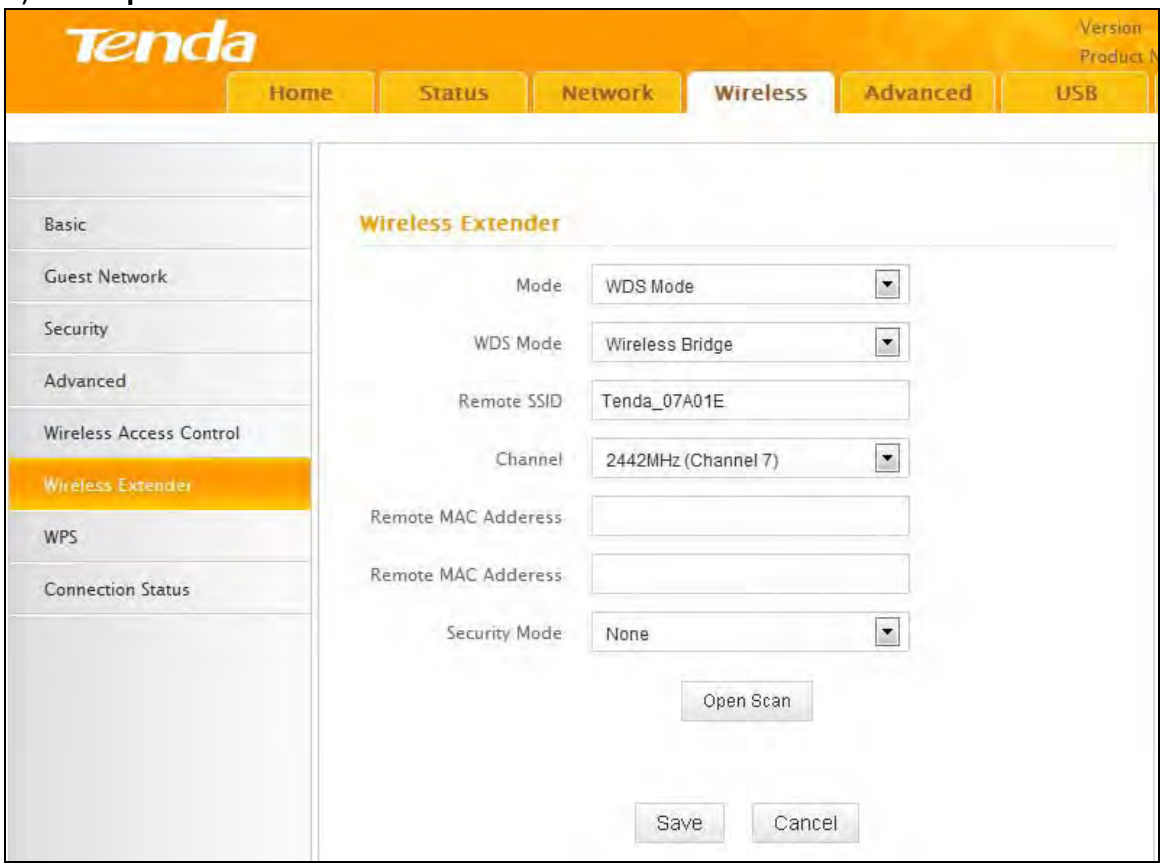
Subnet Mask: 255.255.255.0;

**Then do as follows:**

1. Configure Router 2:

1) Wireless Working Mode: Select WDS Bridge Mode.

2) Click **Open Scan** to search for Router 1.




3) Select the wireless network to connect and click **OK**.

4) Verify that the SSID, channel, and AP MAC address on the page match those of the added wireless network. If not, manually correct them.

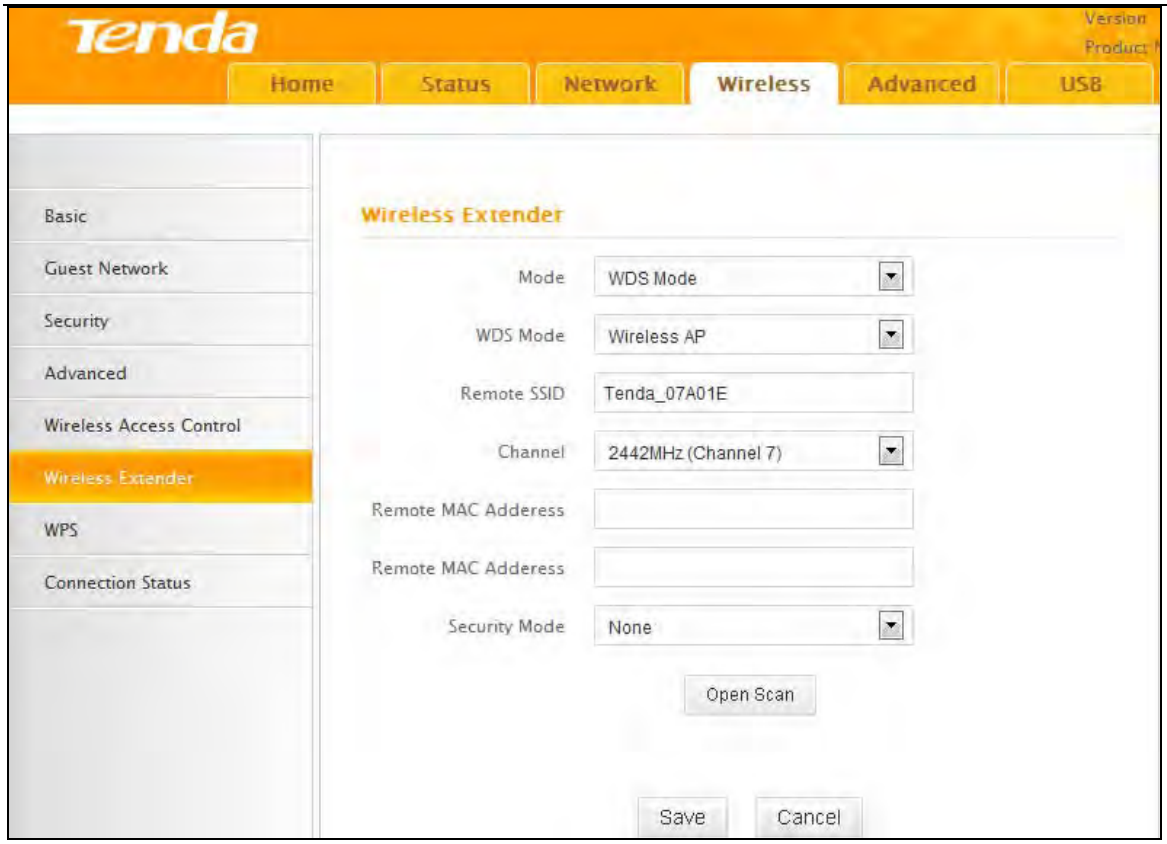
5) Close **Scan** and click **Save** to save your settings.

6) Go to Wireless Security page and set the wireless security settings exactly as they are on the link partner (Router 1).

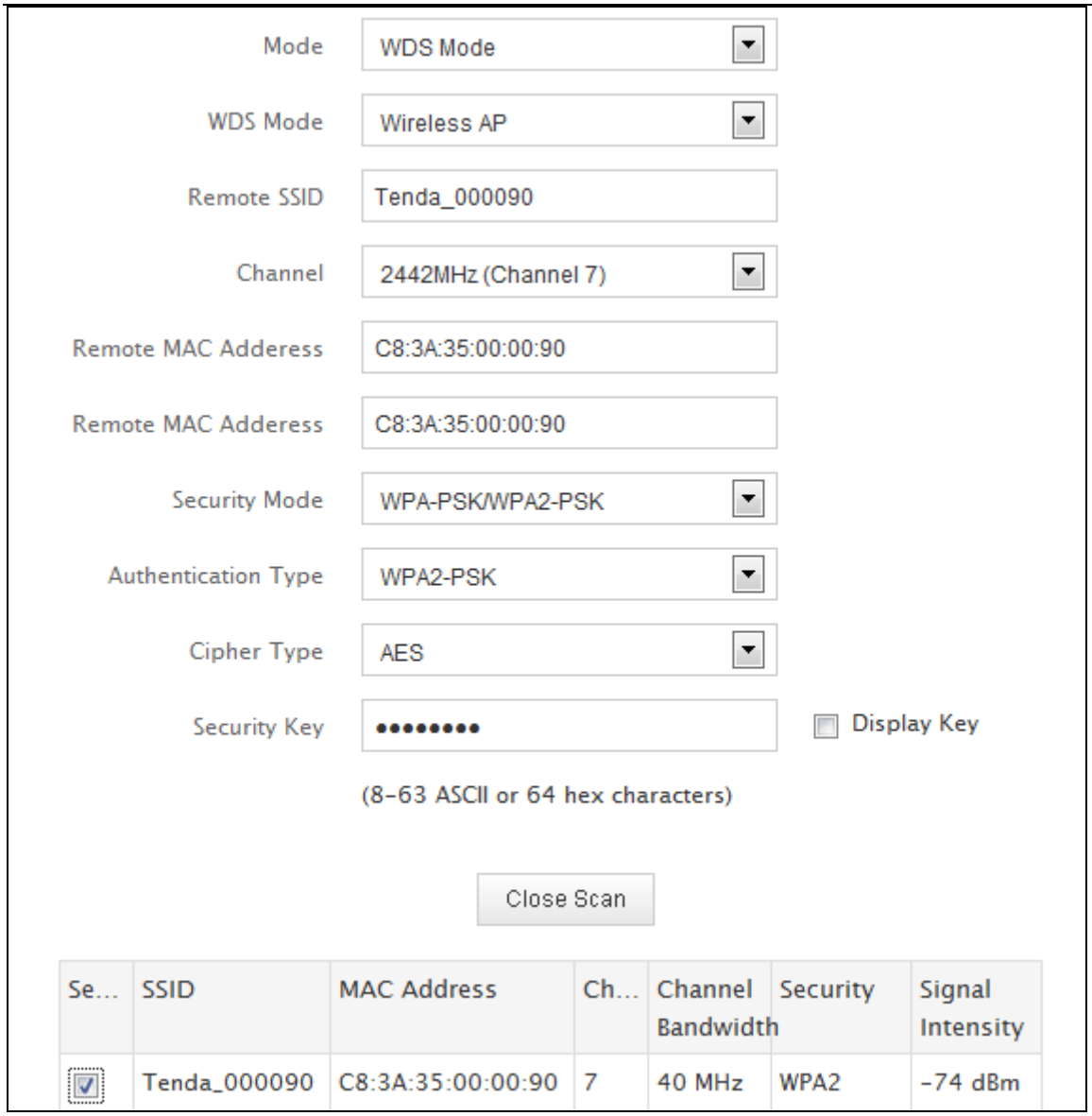
7) Go to **DHCP Server** to disable the DHCP on Router 2. Now you have finished all settings on Router 2 required for WDS.

**2. Configure Router 1:**

**1.** Go to wireless section on Router 1 and specify **WDS (**or **WDS Bridge)** as its wireless working mode.

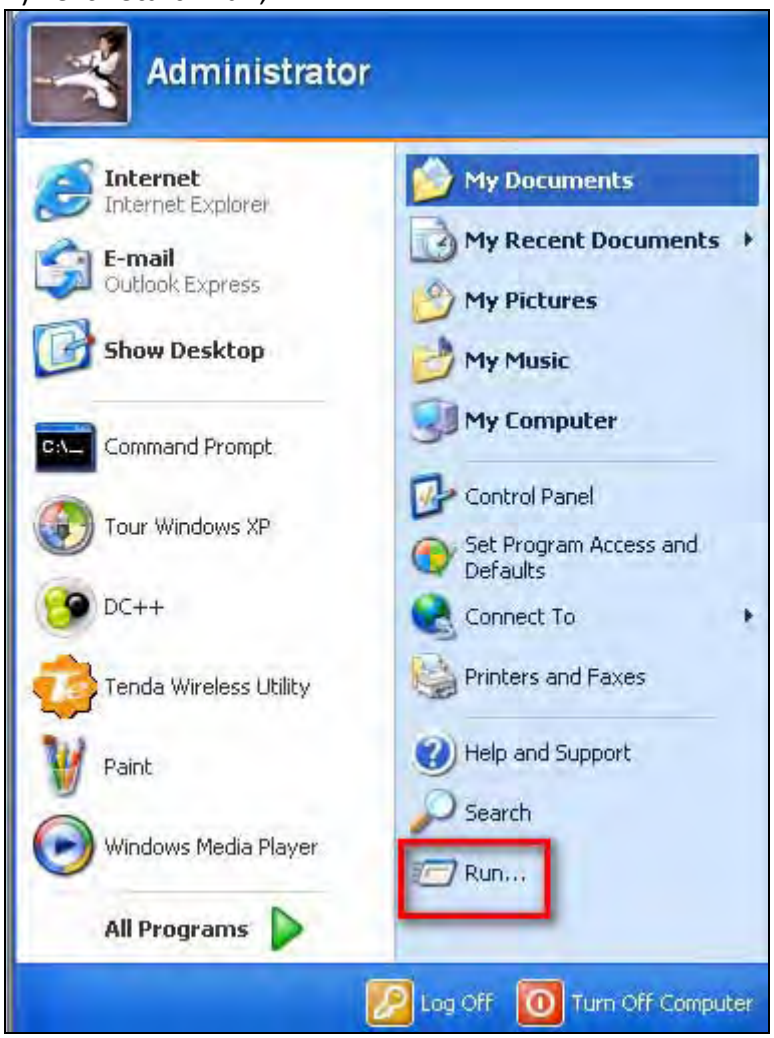



**2.** Manually enter Router 2's MAC address (Also, you can use the **Open Scan** option as mentioned above) and click **Save** to finish your settings.

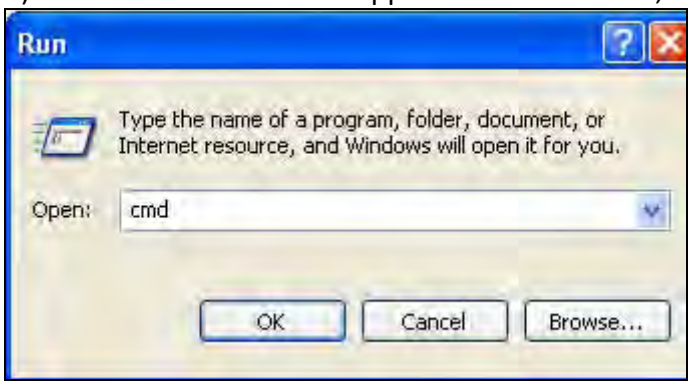

Mode
WDS Mode
WDS Mode
Wireless AP
Remote SSID
Tenda_000090
Channel
2442MHz (Channel 7)
Remote MAC Adderess
C8:3A:35:00:00:90
Remote MAC Adderess
C8:3A:35:00:00:90
Security Mode
WPA-PSK/WPA2-PSK
Authentication Type
WPA2-PSK
Cipher Type
AES
Security Key
Display Key
(8-63 ASCII or 64 hex characters)
Close Scan
Se...
SSID
MAC Address
Ch...
Channel Bandwidth
Security
Signal Intensity
Tenda_000090
C8:3A:35:00:00:90
7
40 MHz
WPA2
-74 dBm

After the above configurations, you can verify the connection by pinging Router 2's IP. Steps are as follows (Take Windows XP OS for example):

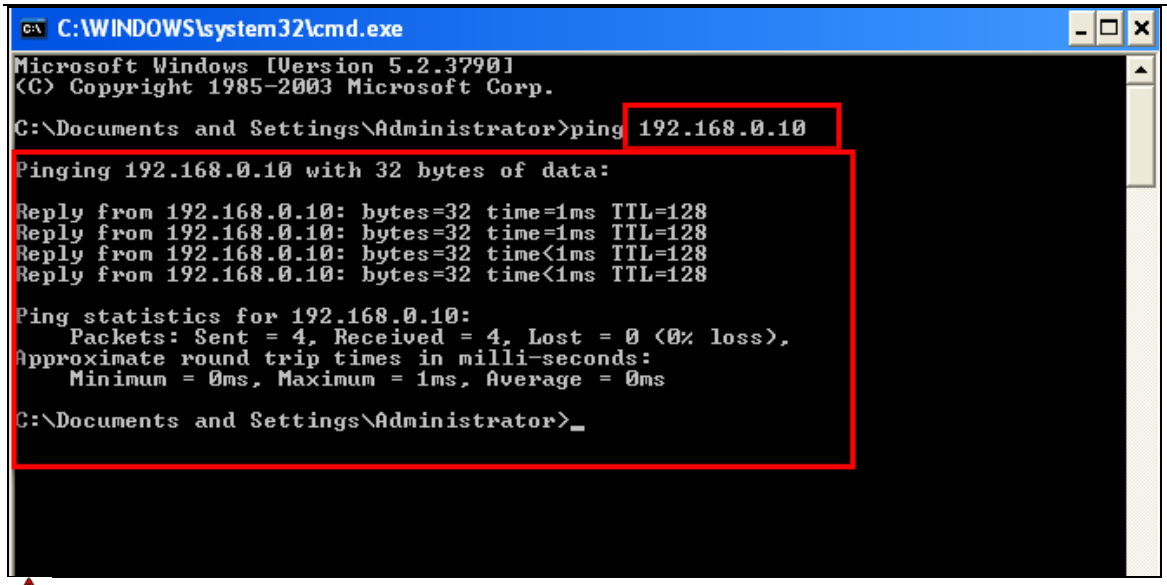
1) Click **Start** >**Run**;




2) Then the below screen appears and enter cmd;




3) Input ping 192.168.0.10 in the screen and press Enter. If the folllowing screen appears, it indicates you have finished the configuration successfully.




**Note**

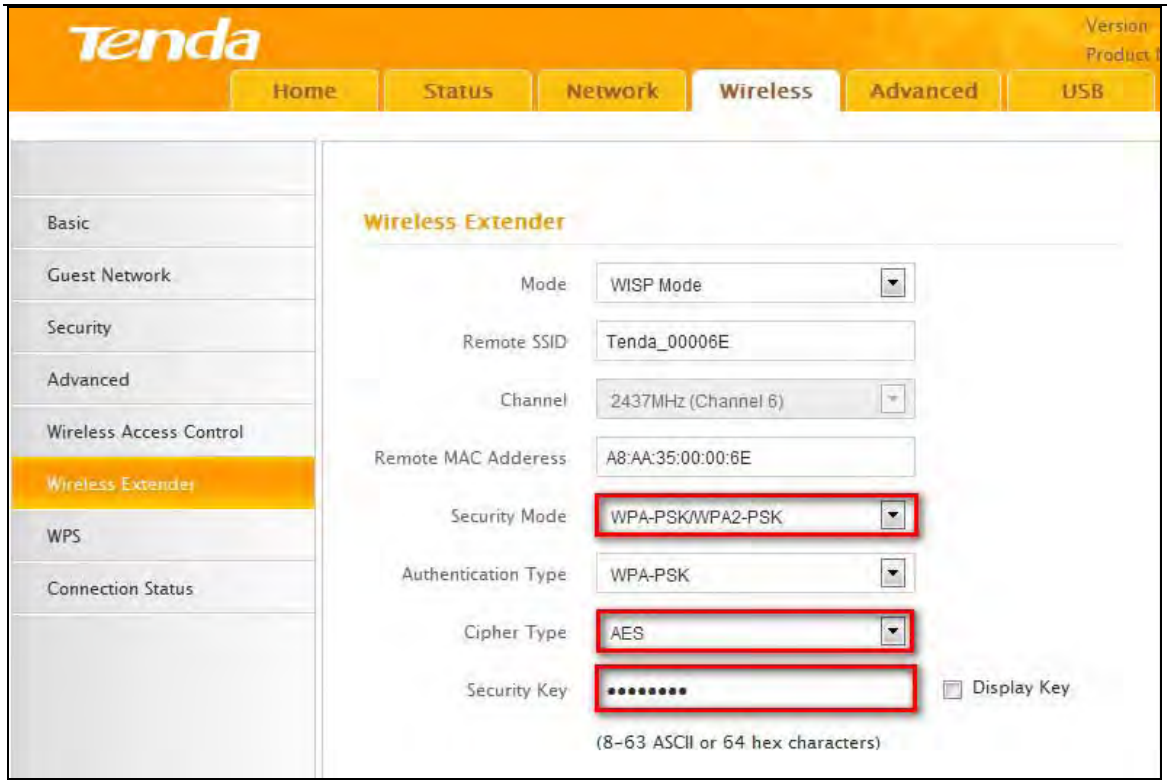
1. WDS feature can only be implemented between 2 WDS-capable wireless devices. Additionally, the SSID, channel, security settings, and security key must be exactly the same on both such devices.
2. Note that the two devices involved must have different IP addresses on the same IP net segment. In addition, it is advisable to disable the DHCP server on either device.

### WISP Mode

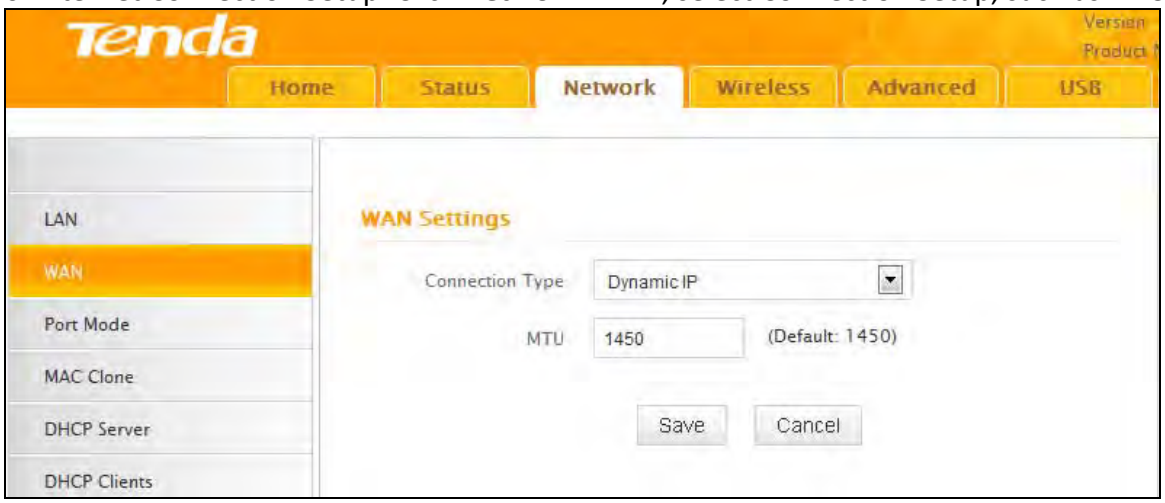
If your router acquires Internet access from a wireless Access Point, please select WISP mode. Specific steps are as follows:

1. Click **Wireless**>**Wireless Extender**, select **WISP mode** and click **Open Scan**.

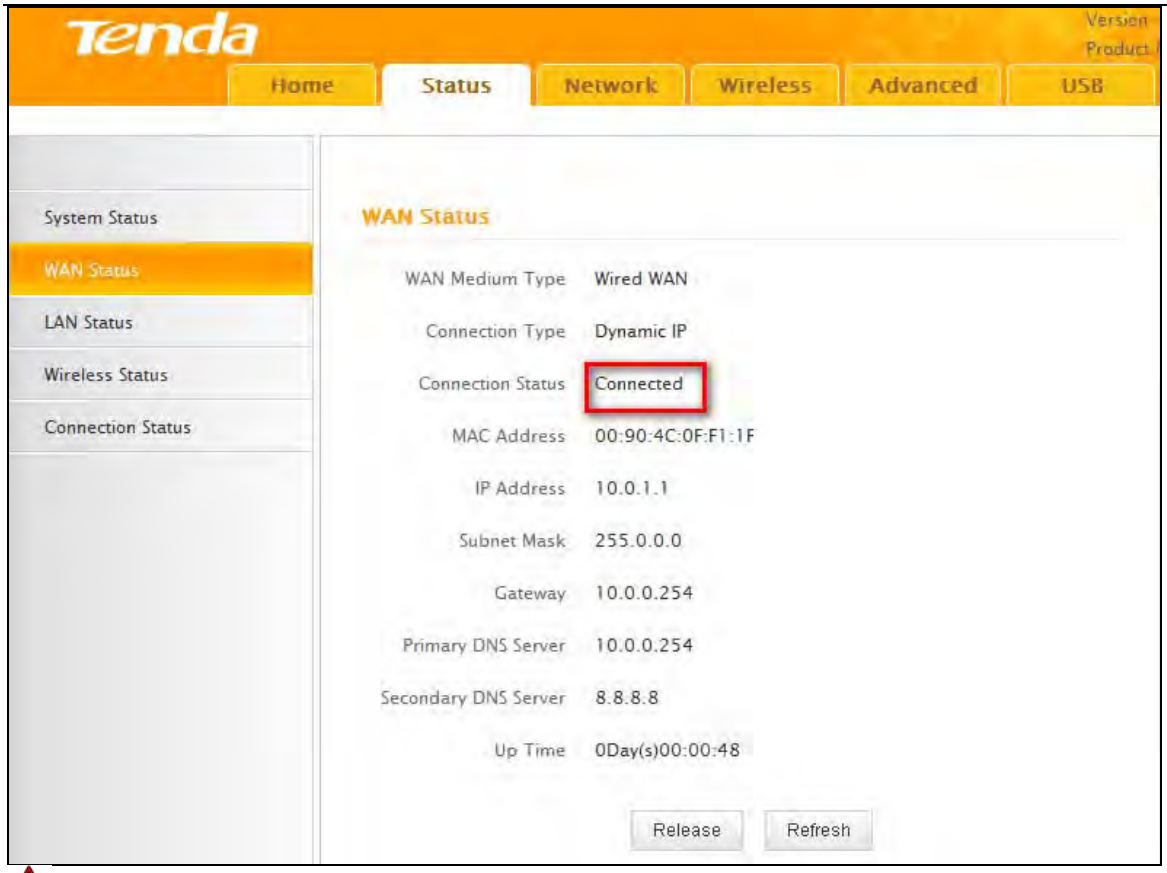

2. Click **Open Scan**, select the AP you wish to connect and click **OK**.
3. View and note down the wireless security settings: security mode, cipher type, security key.




4. Click **Close Scan** and **Save**.
5. Save the settings and the router will reboot automatically.
6. Internet Connection Setup: Click **Network**>**WAN**, select Connection Setup, such as DHCP, and click **Save**.




7. Click **Status**>**WAN Status** and the connection status displays **Connected**.



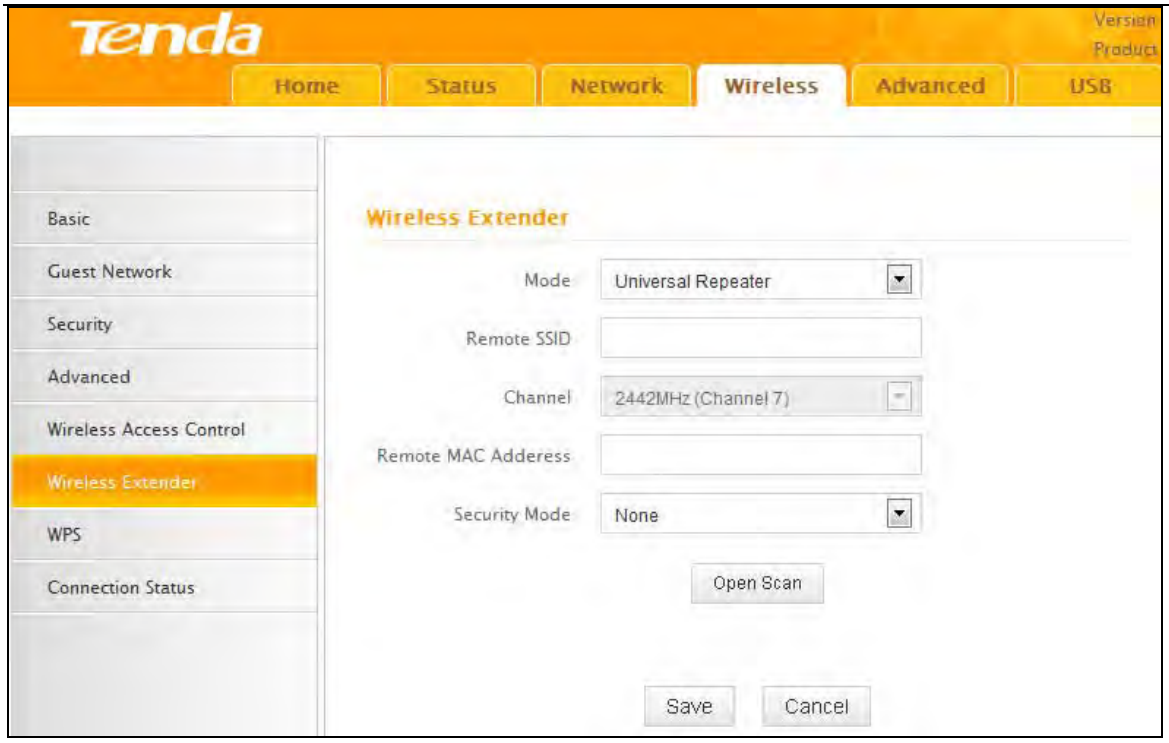

**Note**

1. When the settings finished, remember to enter **Connection Setup** to set up Internet connection.
2. Verify that the SSID, channel, and security mode on the page match those of the added wireless network. If not, manually correct them.
3. For the normal wireless connection between two routers, do not change this router's SSID settings, including SSID, channel, security mode and security key.

**Universal Repeater**

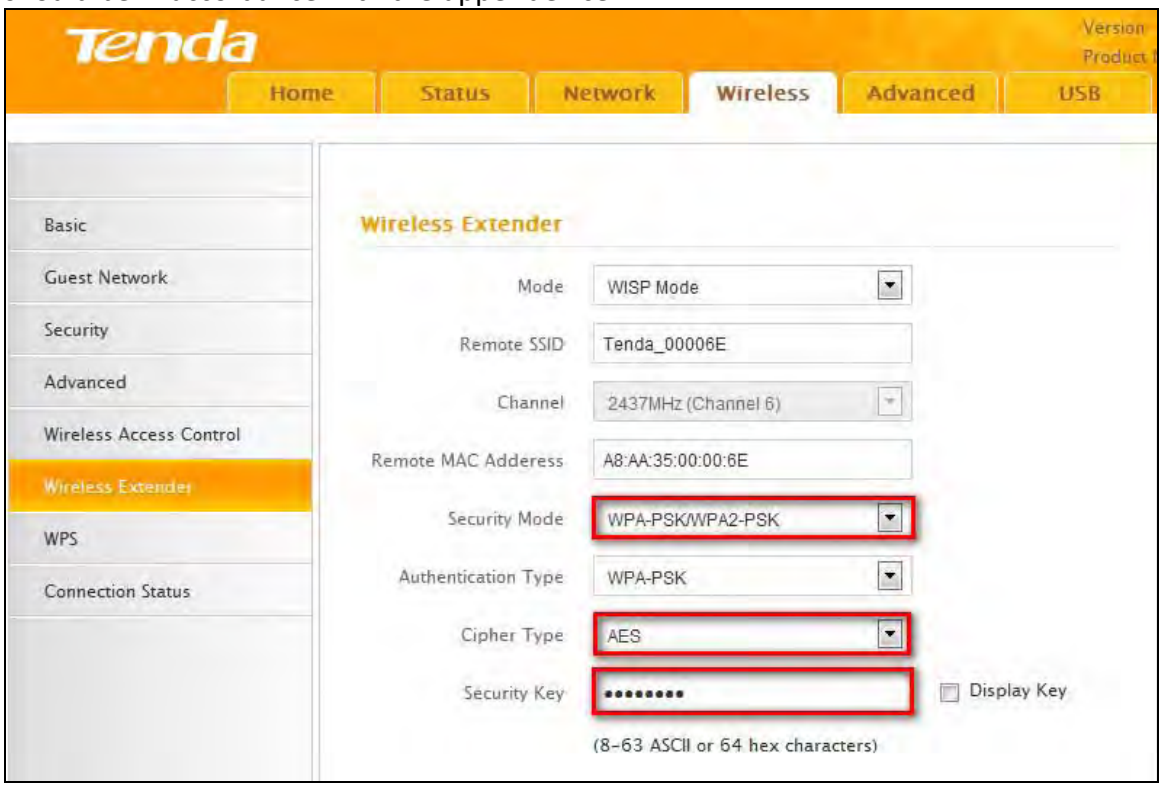
In this mode, the router will relay data to an associated root AP and AP function is enabled meanwhile. The wireless repeater relays signal between its stations and the root AP for greater wireless range. Steps are shown as below:

1. Click **Wireless>Wireless Extender**, select **Universal Repeater** in the extender mode and click **Open Scan**.




2. Click **Open Scan**, select the AP you wish to connect and click **OK**.

3. View and note down the wireless security settings: security mode, cipher type, security key, etc., which should be in accordance with the upper device.

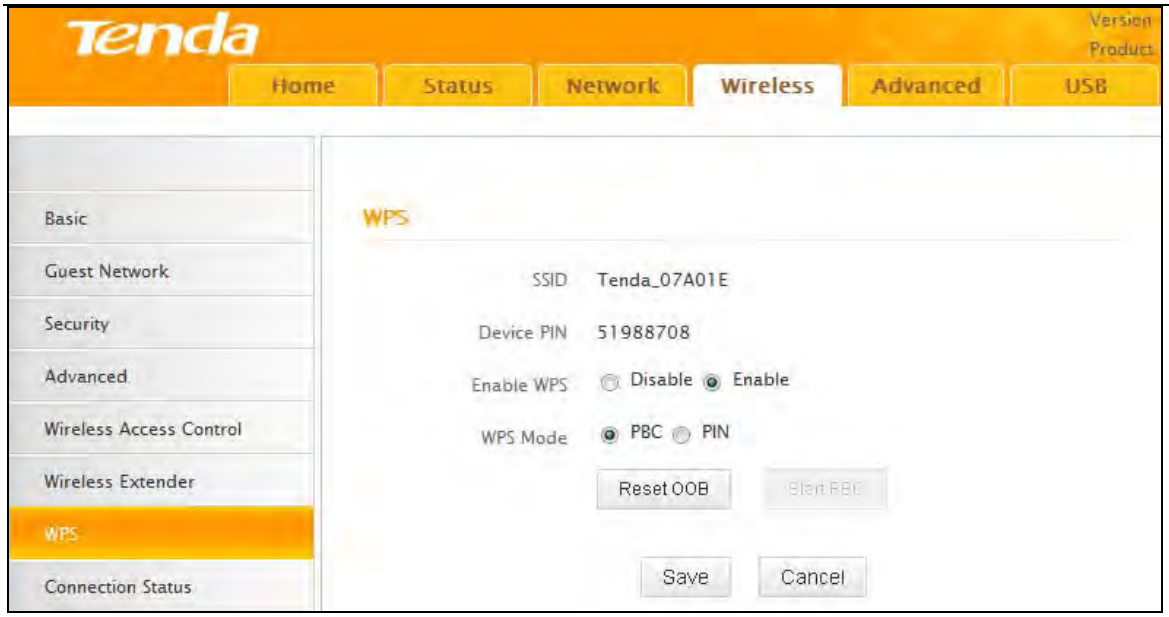



4. Click **Close Scan** and **OK**.

5. Save the settings and the router will restart automatically.

## 3.7 WPS

Wi-Fi Protected Setup makes it easy for home users who know little of wireless security to establish a secure wireless home network, as well as to add new devices to an existing network without entering long passphrases or configuring complicated settings. Simply enter a PIN code or press the software PBC button or hardware WPS button (if equipped) and a secure wireless connection can be established.




- Enable WPS: Select to enable/disable the WPS encryption.
- WPS Mode: Select PBC (Push-Button Configuration) or PIN.
- Reset OOB: When selected, the WPS LED turns off and the WPS function will be disabled automatically. The WPS server on the router enters idle mode and will not respond to any client's WPS connection request.

**Operation Instructions:**

PBC: The WPS LED will blink for 2 minutes after you press the hardware WPS button on the router for 1 second, and means that the PBC encryption method is successfully enabled. An authentication routine will be performed between your router and the WPS/PBC enabled wireless client device during this time, if it succeeds, the wireless client device will connect to your router and the WPS LED will turn off. Repeat the steps above if you want to add more wireless client devices to the router.

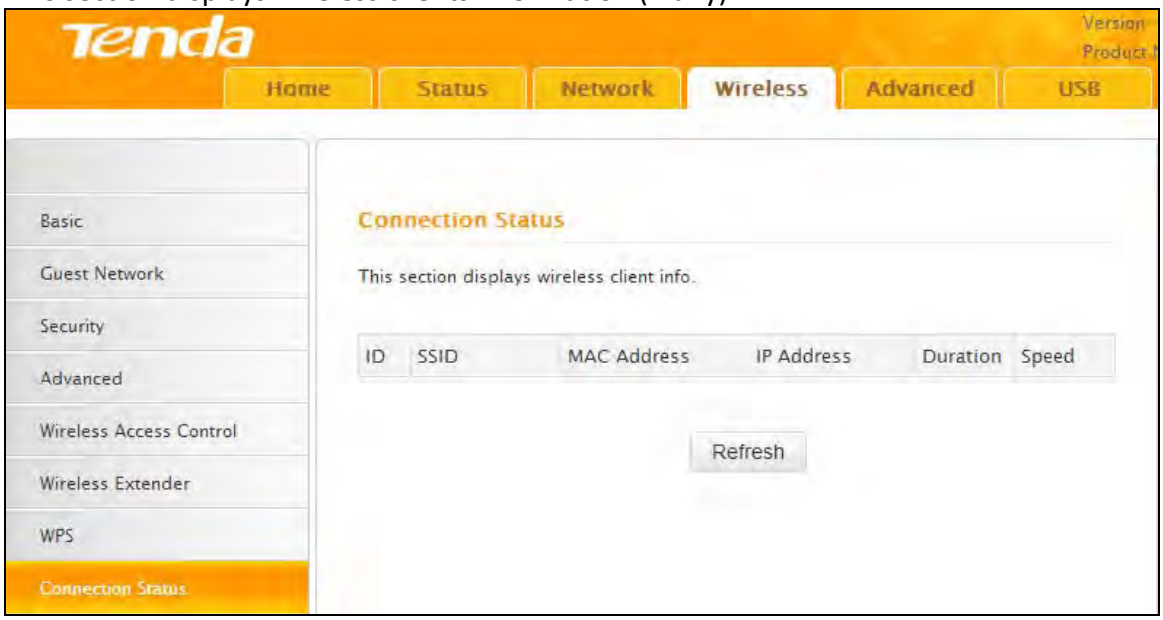
PIN: To use this option, you must know the PIN code from the wireless client and enter it in the corresponding field on your router while using the same PIN code on the client side for this connection.

**Note**

To use the WPS encryption, the wireless adapter must be WPS-capable.

## 3.8 Connection Status

This section displays wireless clients information (if any).

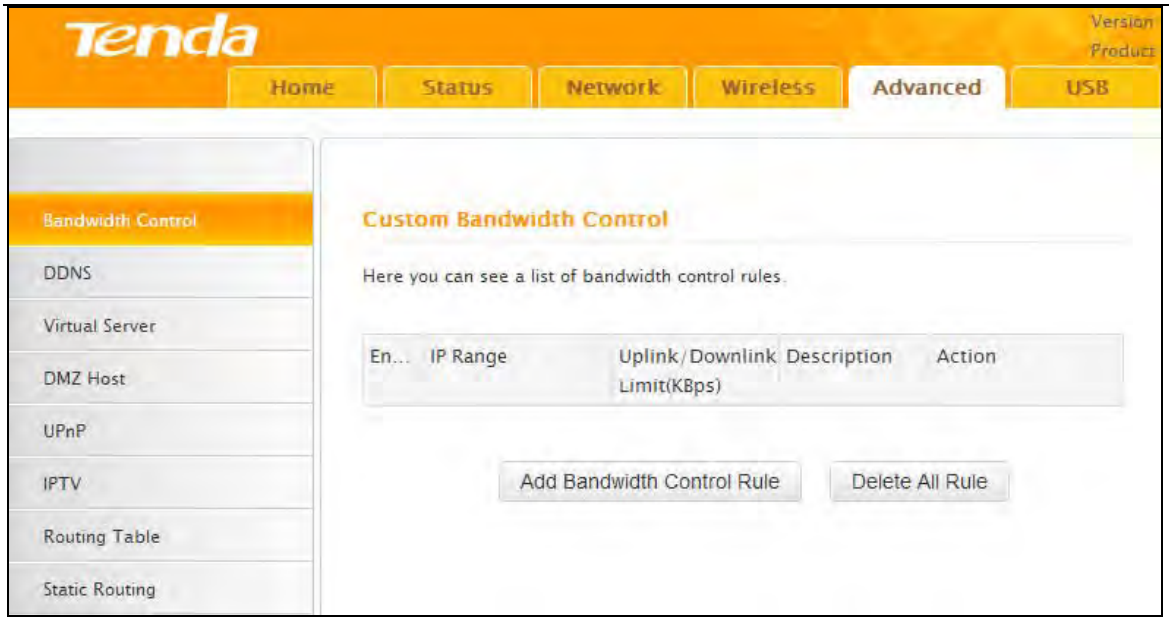



# 4 Advanced Applications

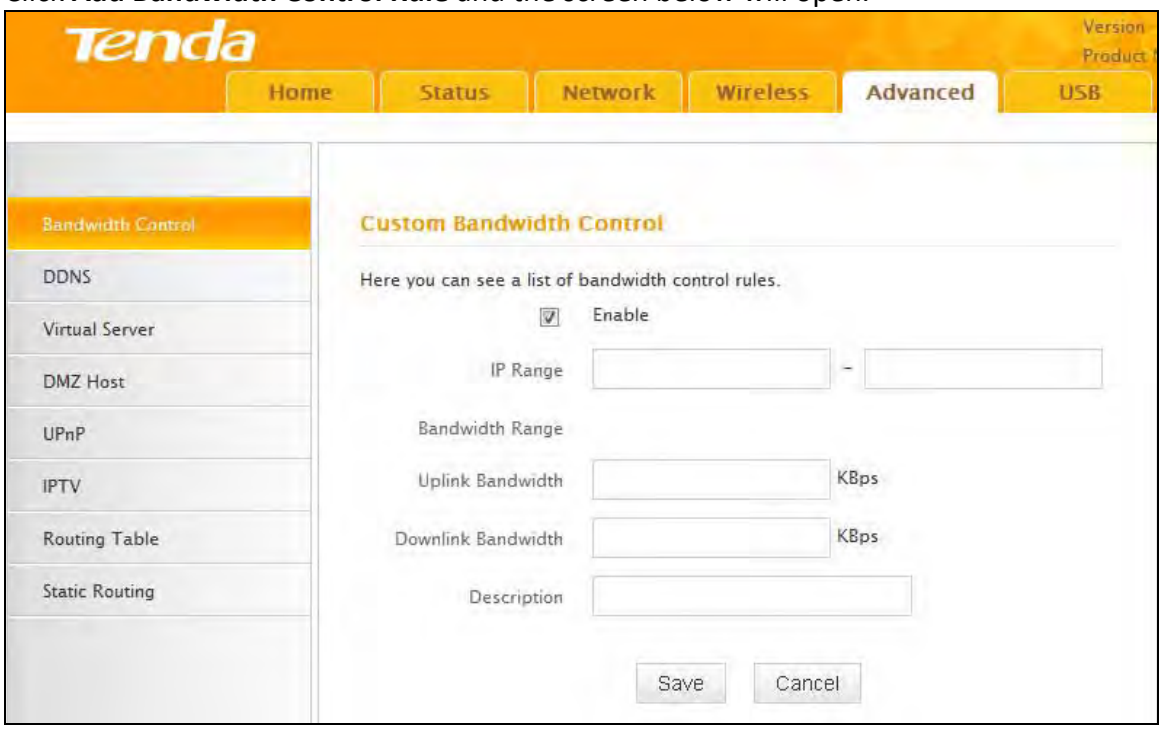
The **Advanced** tab includes the following 8 submenus: Bandwidth Control, DDNS, Virtual Server, DMZ Host, UPnP, IPTV, Routing Table, and Static Routing. Clicking any of them enters the corresponding interface for configuration. Details are explained below:


## 4.1 Bandwidth Control

To better manage bandwidth allocation and optimize network performance, use the Bandwidth Control feature.




Click **Add Bandwidth Control Rule** and the screen below will open.

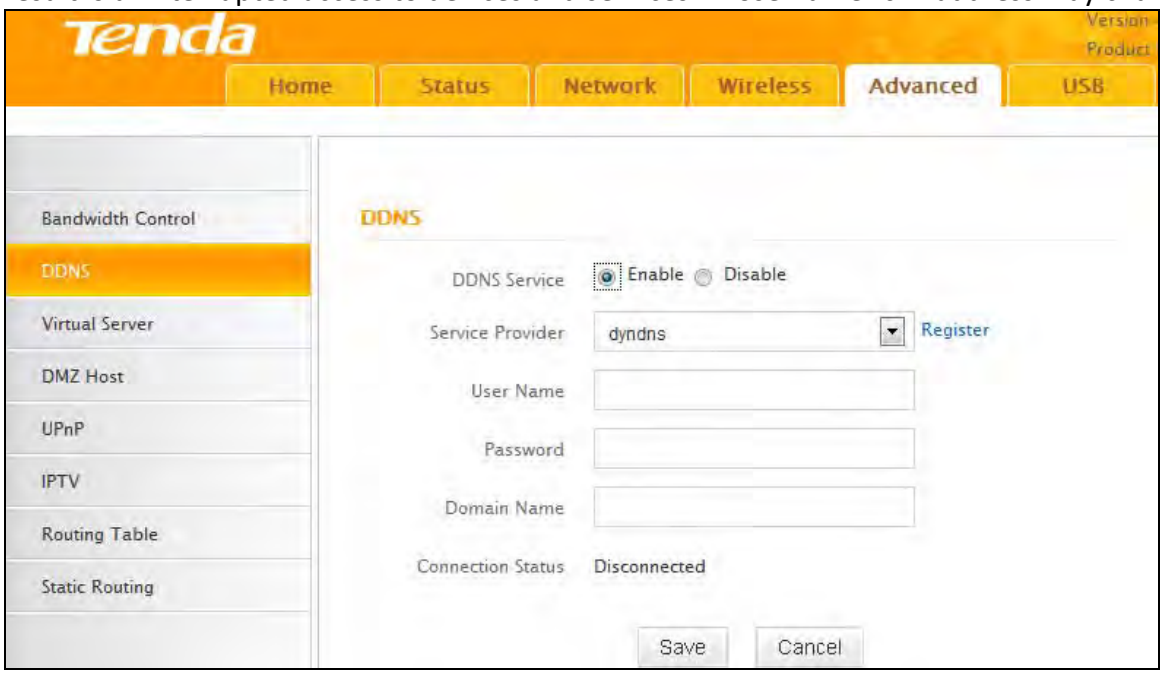



- Enable: Check/uncheck to enable/disable current entry. When disabled, corresponding entry will not take effect.
- IP Range: Enter a single IP or an IP range.
- Uplink Bandwidth: Max uplink traffic.
- Downlink Bandwidth : Max downlink traffic.
- Description: Briefly describe the current entry.

## 4.2 DDNS

Dynamic DNS or DDNS is a term used for the updating in real time of Internet Domain Name System (DNS) name servers. We use a numeric IP address allocated by Internet Service Provider (ISP) to connect to Internet. The address may either be stable ("static"), or may change from one session on the Internet to the next ("dynamic"). However, a numeric address is inconvenient to remember and an address which changes unpredictably makes connection impossible. The DDNS provider allocates a static host name to the user. Whenever the user is allocated a new IP address it is communicated to the DDNS provider by software

running on a computer or network device at that address. The provider distributes the association between the host name and the address to the Internet's DNS servers so that they may resolve DNS queries. The result is uninterrupted access to devices and services whose numeric IP address may change is maintained.

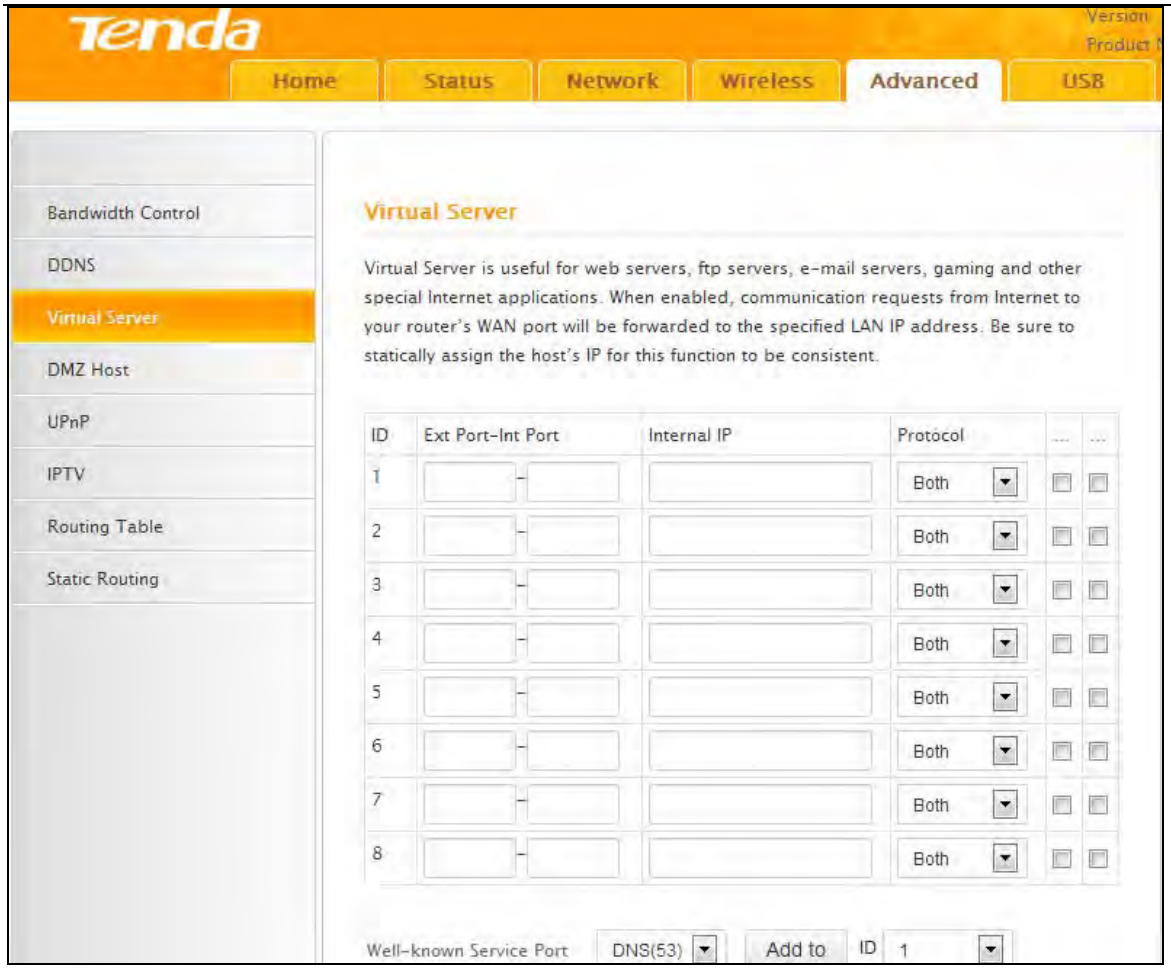



- Service Provider: Select your DDNS service provider from the drop-down menu.
- User Name: Enter the DDNS user name registered with your DDNS service provider.
- Password: Enter the DDNS Password registered with your DDNS service provider.
- Domain Name: Enter the DDNS domain name with your DDNS service provider.
- Connection Status: Displays current status of connection with the DDNS server.

Click **Save** to save your settings.

## 4.3 Virtual Server

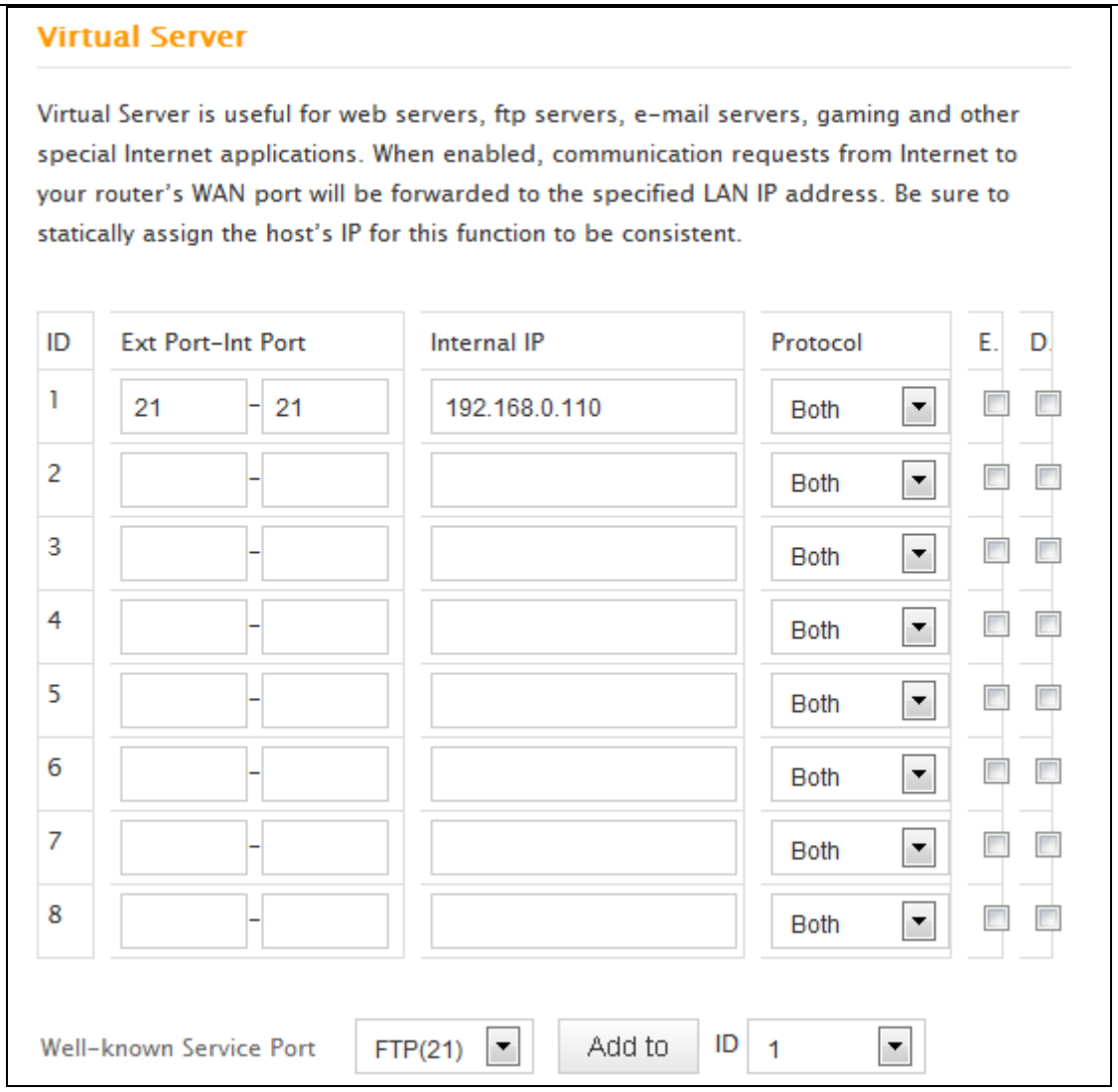
The Virtual Server feature grants Internet users access to services on your LAN. It is useful for hosting online services such as FTP, Web, or game servers. For each Virtual Server, you define a WAN port on your router for redirection to an internal LAN IP Address.




- Ext Port - Int Port: External Port - Internal Port, enter the WAN/LAN service ports.
- Internal IP: The IP address of a computer used as a server in LAN.
- Protocol: Includes TCP, UDP, and Both. Select “Both” if you are not sure about which protocol to use
- Enable: The corresponding entry takes effect only if you checked this option.
- Delete: Remove a corresponding entry
- Well-known Service Port: The well-known Service Port lists widely used protocol ports. Simply select a port, an entry ID, and click the "Add to" button to transfer the selected port to the corresponding fields of the selected entry. In case you cannot find the port you will need to enter it manually.

**Example:** You want to share some large files with your friends who are not in your LAN, however, it is not convenient to transfer such large files across the network. You can set up your own PC as a FTP server and use the Virtual Server feature to let your friends access these files. Assuming that the static IP address of the FTP server (Namely, your PC) is 192.168.0.110, you will want your friends to access this FTP server on the default port of 21 using the TCP protocol, details are explained below:

1. Enter 21 in both Ext Port and Int Port fields or select FTP from **Well-known Service Port** and an entry ID 21 will be automatically transferred to the corresponding fields of the selected entry.
2. Enter 192.168.0.110 for the IP Address, select TCP and then select **Enable**.




3. Click **Save** to save your settings.

Now, your friends only need to enter ftp://xxx.xxx.xxx.xxx:21 in their browsers to access your FTP server. xxx.xxx.xxx.xxx, Assuming the router's WAN IP address is 172.16.102.89, then your friends need to enter "ftp://172.16.102.89: 21" in their browsers.

**Note**

If you include port 80 in this section, you must set the port for remote (web-based) management to a different number other than 80, such as 8080, otherwise the virtual server feature may not take effect.

## 4.4 DMZ Host

In some cases, a computer may need to be completely exposed to the Internet for implementation of a 2-way communication. To do so, we will set it as a DMZ host.