COMPUTER SYSTEMS SERVICING GRADE 11

Module 10

"Setting-up Router" (Advanced Configuration)

Computer Systems Servicing NCII – Grade 11
Quarter 4 – Module 10: Setting-up Router (Advanced Configuration)
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COMPUTER SYSTEMS SERVICING NCII

11

Quarter 4

Self-Learning Module 10

Setting-up Router

(Advanced Configuration)

Introductory Message

For the facilitator:

Welcome to the **Computer Systems Servicing G11** module on 3Rs Environmental Policies. This module was collaboratively designed, developed and reviewed by educators from Schools Division Office of Pasig City headed by its Officer-In-Charge Schools Division Superintendent, Ma. Evalou Concepcion A. Agustin in partnership with the Local Government of Pasig through its mayor, Honorable Vico Sotto.

The writers utilized the standards set by the K to 12 Curriculum using the Most Essential Learning Competencies (MELC) while overcoming their personal, social, and economic constraints in schooling.

This learning material hopes to engage the learners into guided and independent learning activities at their own pace and time. Further, this also aims to help learners acquire the needed 21st century skills especially the 5 Cs namely: Communication, Collaboration, Creativity, Critical Thinking and Character while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:

Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.

As a facilitator you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Moreover, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the learner:

Welcome to Computer Systems Servicing NCII. The hand is one of the most symbolized part of the human body. It is often used to depict skill, action and purpose. Through our hands we may learn, create and accomplish. Hence, the hand in this learning resource signifies that you as a learner is capable and empowered to successfully achieve the relevant competencies and skills at your own pace and time. Your academic success lies in your own hands!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning material while being an active learner.

This module has the following parts and corresponding icons:

Expectation - These are what you will be able to know after completing the lessons in the module

Pre-test - This will measure your prior knowledge and the concepts to be mastered throughout the lesson.

Recap - This section will measure what learnings and skills that you understand from the previous lesson.

Lesson- This section will discuss the topic for this module.

Activities - This is a set of activities you will perform.

Wrap Up- This section summarizes the concepts and applications of the lessons.

Valuing-this part will check the integration of values in the learning competency.

Post-test - This will measure how much you have learned from the entire module. Ito po ang parts ng module

EXPECTATIONS

After completing this lesson, you should be able to:

1. identify advanced router configuration;
2. understand the procedures in advanced router configuration;
3. appreciate the importance of performing advanced configuration.

PRETEST

Directions: Read the following statement carefully. Write **T** if the statement is correct and **F** for the wrong statement.

1. The **Status Page** displays the Router's current status and configuration.
2. TP-Link router can be set into mode as follow: Wireless Router, WISP, Access & Range Extender.
3. The wireless security function can be enabled or disabled.
4. The Wireless MAC Address Filtering feature allows you to control the wireless stations accessing the AP, which depend on the station's MAC addresses.
5. Time Settings Page allows you to set the time manually or to configure automatic time synchronization.

RECAP

Directions: Read the following statement carefully. Write **T** if the statement is correct and **F** for the wrong statement.

1. Router configurations can be done in wired and wireless mode.
2. Most Router Manufacturers use **192.168. 0.1** or **192.168. 1.1** as the default LAN IP address.
3. A browser can be used to configure router.
4. If the router cannot be accessed using the default setting, you may reset it by pressing the reset button to restore its default setup.
5. Running Quick Setup can help you configure router easily.

LESSON

Setting-up Router

(Advanced Configuration)

In the previous module, you've learned how to configure router by running QUICK SETUP. In this module, you will learn manual configurations of parameters of router to stablish a more reliable and secure network.

The following are the steps to perform manual router configuration. **Note:** The router used in this demonstration is TP-Link, but the procedures may also be applicable to other brands.

1. Connect your device to the router. You can do configuration wired or in wireless mode.

2. Open any browser and type the default LAN IP Address. Most Router Manufacturers use **192.168. 0.1** or **192.168. 1.1** as the default LAN IP address. You can also use the default access domain name ex: tplinkwifi.net for TP-Link routers.

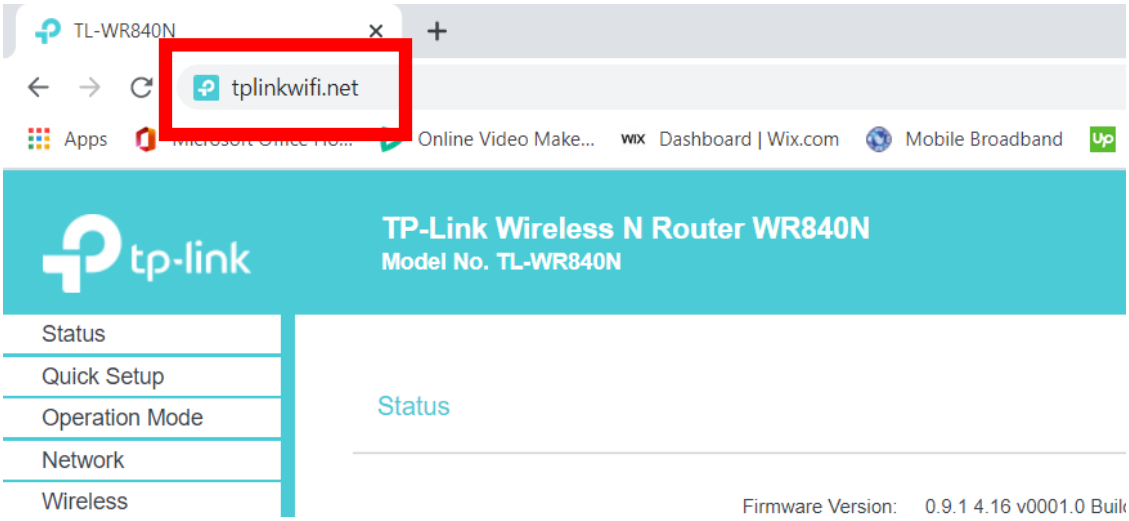

Figure 1: Typing default IP/Access in browser.

NOTE 1: Default settings of router can be seen on the device itself.

Figure 2: Sample default setting of router.

NOTE 2: If the router cannot be accessed using the default setting, you may reset it by pressing the reset button to restore its default setup.

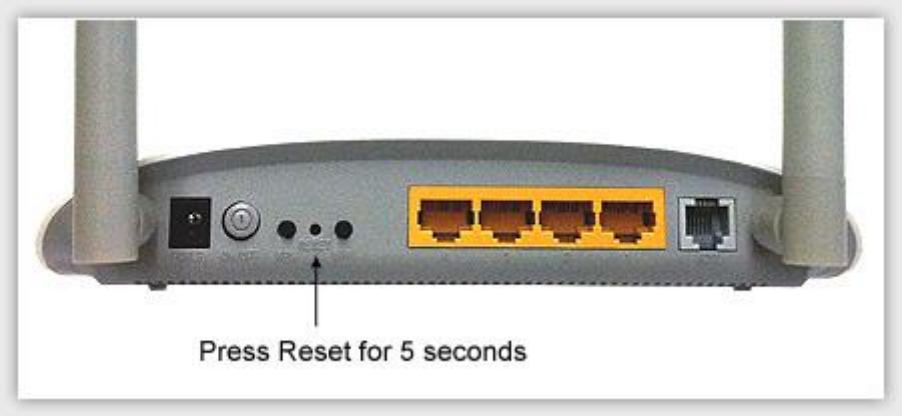

Figure 2a: Reset button

3. Enter the default username & password.

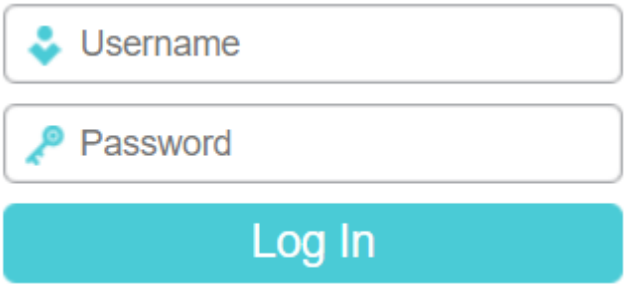

Figure 3: Log-in form

Once you successfully entered the username and password, the firmware of the router will open.

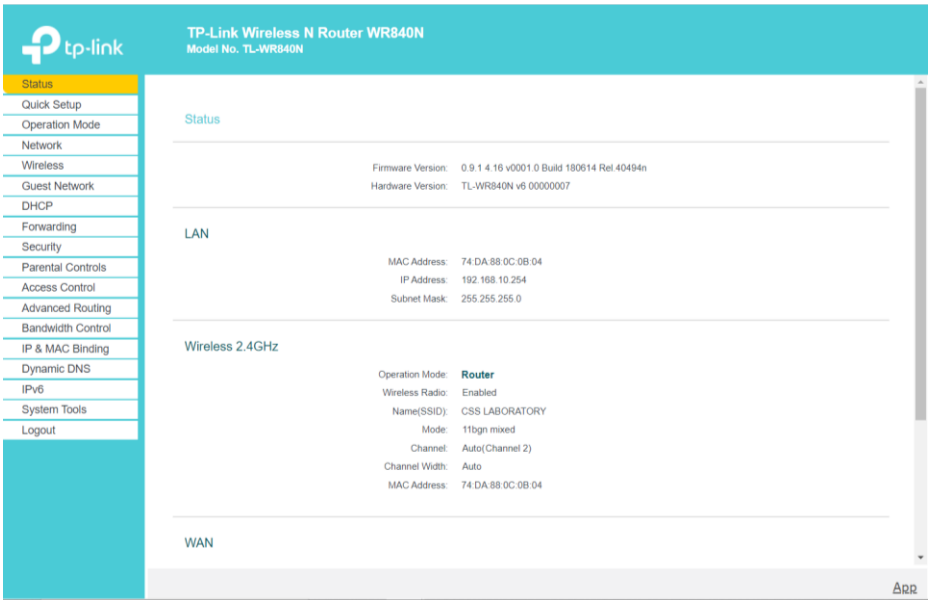

Figure 4: Status Page

The **Status Page** displays the Router's current status and configuration.

4. On the left menu, choose **OPERATION MODE**. TP-Link router can be set into mode as follow: Wireless Router, WISP, Access & Range Extender.

- **Wireless Router (Default):** In this mode, the device enables multiple users to share the Internet connection via Ethernet port. The LAN devices share the same IP from ISP through Wireless port. While connecting to Internet, the Ethernet port works as a WAN port.
- **WISP:** In this mode, the device enables multiple users to share Internet connection from WISP. The LAN port devices share the same IP from WISP through Wireless port. While connecting to WISP, the Wireless port works as a WAN port. The Ethernet port acts as a LAN port.
- **Access Point:** In this mode, this device can be connected to a wired network and transform the wired access into wireless that multiple devices can share together, especially for a home, office or hotel where only wired network is available.
- **Range Extender:** In this mode, this device can copy and reinforce the existing wireless signal to extend the coverage of the signal, especially for a large space to eliminate signal-blind corners.

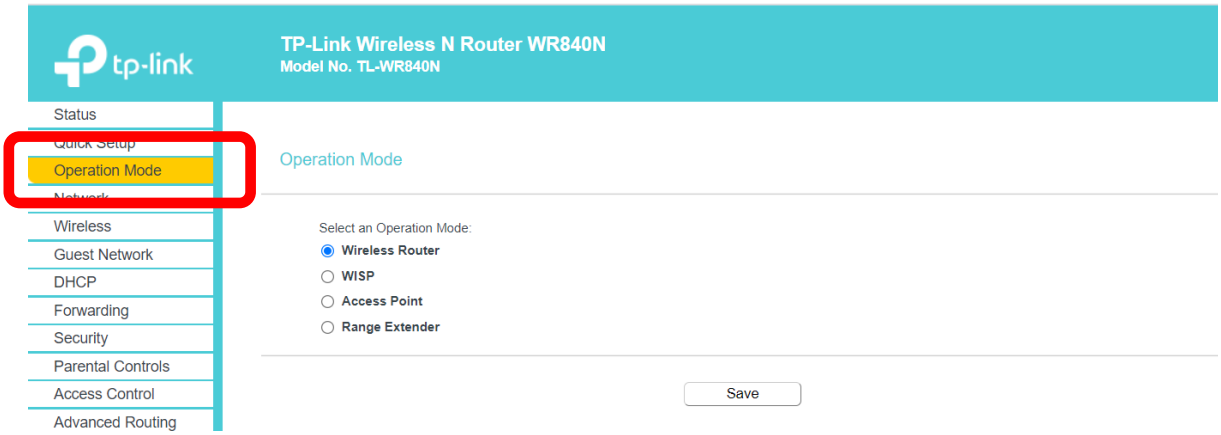

Figure 6: Operation Mode.

In this part, we will choose Wireless Router as operation mode of our device. Then click Save.

5. Next to be configured is the **Network.** In this part you'll decide to choose a type of network for WAN, LAN, set IPTV and MAC Cloning.

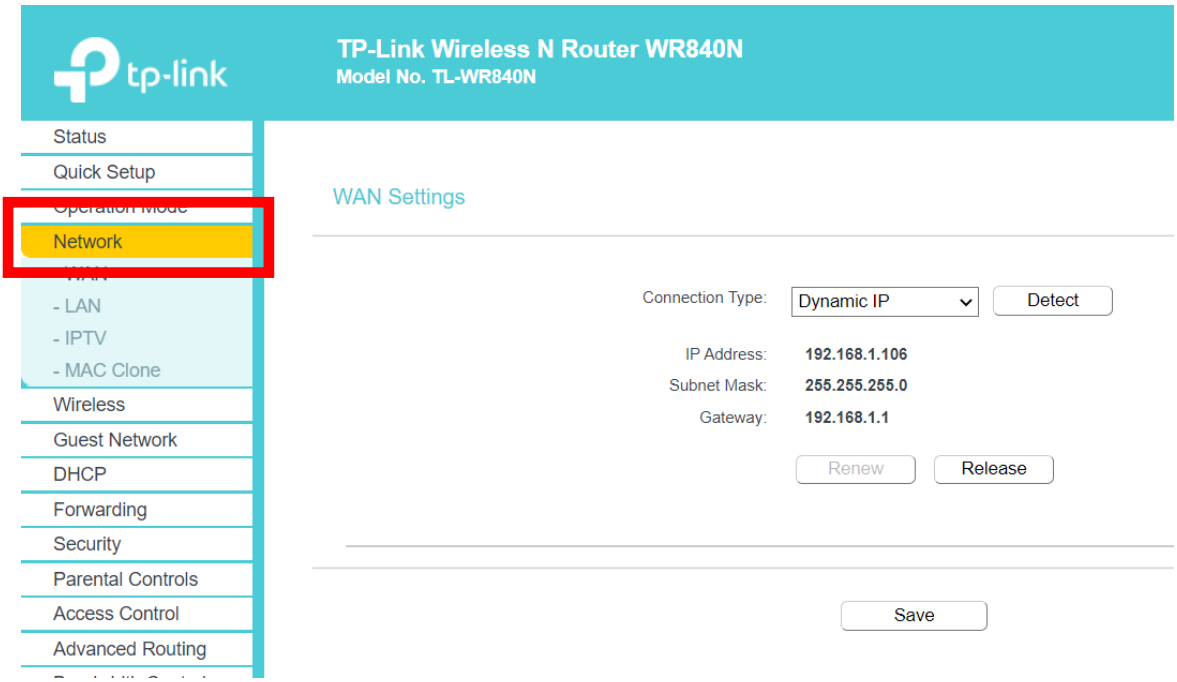

Figure 7: Network Tab

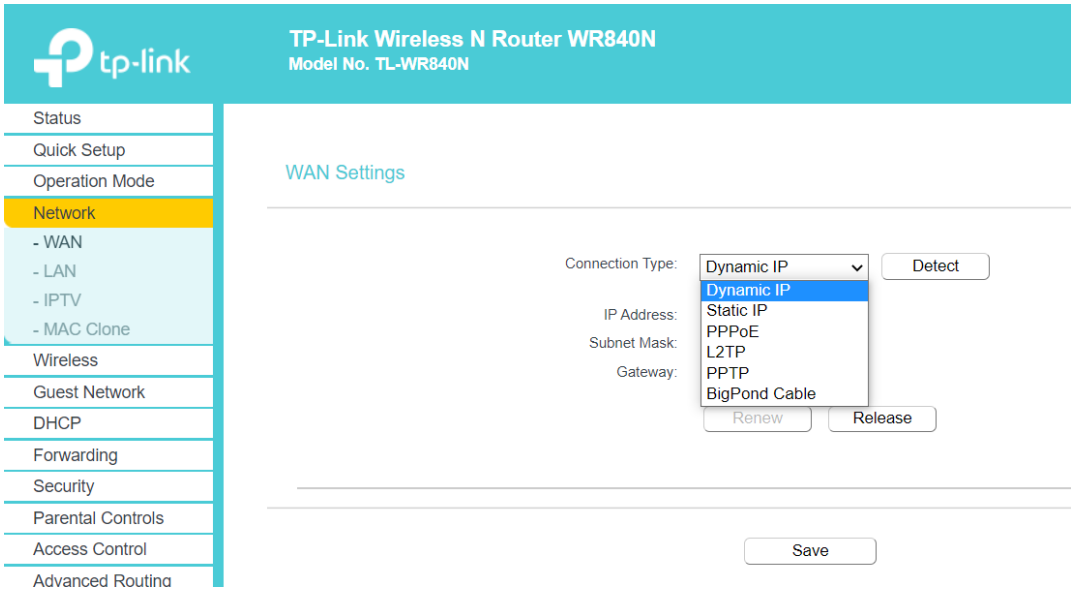

Figure 8: WAN Settings

WAN Connection Type:

- If your ISP is running a DHCP server, select the **Dynamic IP** option.
- If your ISP provides a static or fixed IP Address, Subnet Mask, Gateway and DNS setting, select the **Static IP** option.
- If your ISP provides a PPPoE connection, select **PPPoE** option.
- If your ISP provides BigPond Cable (or Heart Beat Signal) connection, please select **BigPond Cable** option.
- If your ISP provides L2TP connection, please select **L2TP** option.
- If your ISP provides PPTP connection, please select **PPTP** option.
- If you don't know how to choose the appropriate connection type, click the **Detect** button to allow the Router to automatically search your Internet connection for servers and protocols. The connection type will be reported when an active Internet service is successfully detected by the Router. This report is for your reference only. To make sure the connection type your ISP provides, please refer to the ISP. The various types of Internet connections that the Router can detect are as follows:
  - ✓ **PPPoE** - Connections which use PPPoE that requires a user name and password.
  - ✓ **Dynamic IP** - Connections which use dynamic IP address assignment.
  - ✓ **Static IP** - Connections which use static IP address assignment.

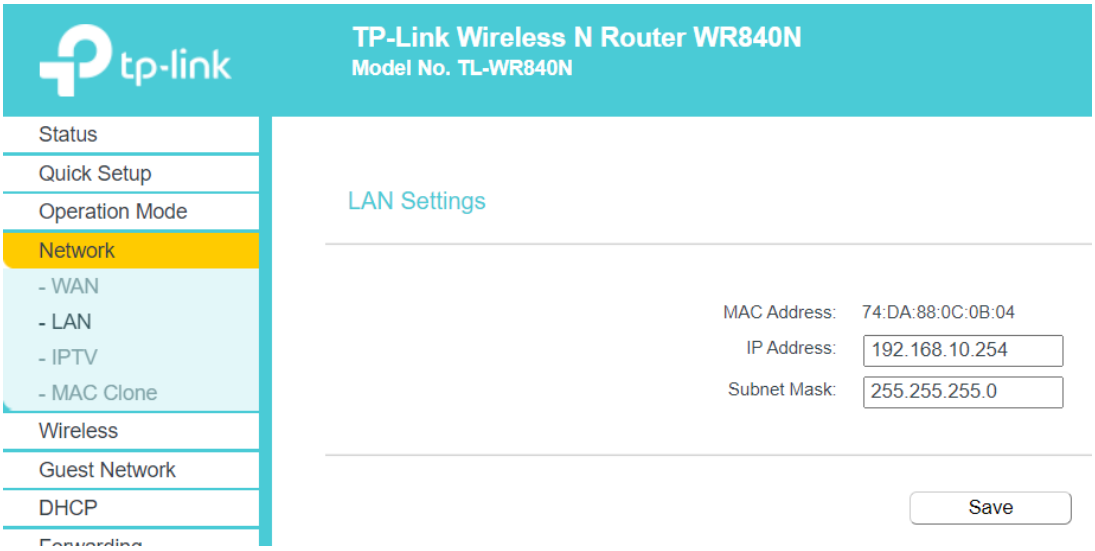

Figure 9: LAN Settings

You can configure the IP parameters of LAN on this page.

- **MAC Address** - The physical address of the LAN ports, as seen from the LAN. The value cannot be changed.
- **IP Address** - Enter the IP address of your Device in dotted-decimal notation (factory default - 192.168.0.1).
- **Subnet Mask** - An address code that determines the size of the network. Usually it is 255.255.255.0.

Note:

- ✓ If you change the IP address, you must use the new IP address to login to the Device.
- ✓ If the new LAN IP address you set is not in the same subnet with the previous one, the IP Address pool in the DHCP server will be configured automatically, but the Virtual Server and DMZ Host will not take effect until they are re-configured
- ✓ Click the **Save** button to save your settings.

6. Wireless Settings.

A. Basic Wireless Settings

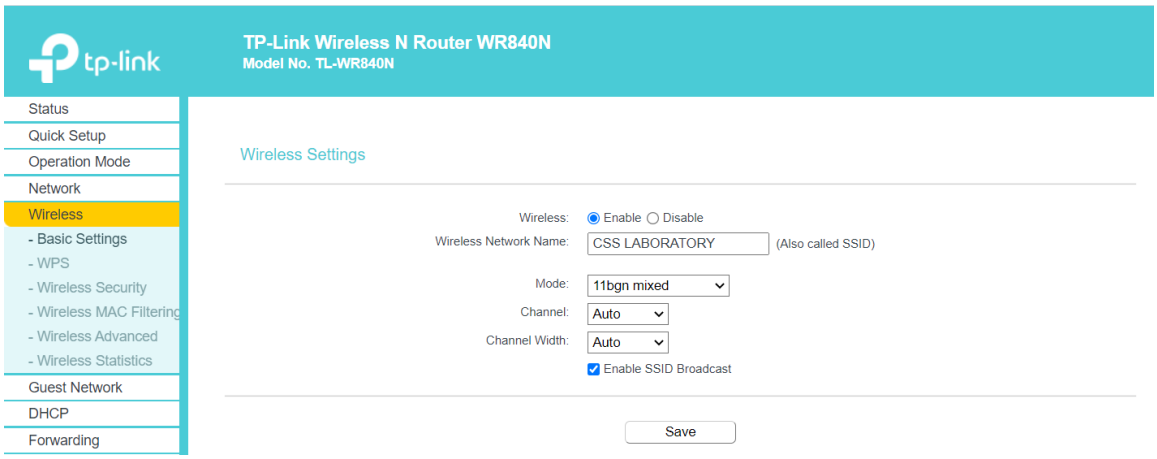

Figure 10: Basic Wireless Settings

The operating distance or range of your wireless connection varies significantly based on the physical placement of the Router. For best results, place your Router:

- Near the center of the area in which your wireless stations will operate.
- In an elevated location such as a high shelf.
- Away from the potential sources of interference, such as PCs, microwaves, and cordless phones.
- With the Antenna in the upright position.
- Away from large metal surfaces.

Proceed on the following:

- **Wireless Network Name** - Enter a value of up to 32 characters. The same Name (SSID) must be assigned to all wireless devices in your network.
- **Mode** - You can choose the appropriate "Mixed" mode.
- **Channel Width** - The bandwidth of the wireless channel.
- **Channel** - 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. If you select auto, then AP will choose the best channel automatically.

- **Enable SSID Broadcast** - If you select the **Enable SSID Broadcast** checkbox, the wireless router will broadcast its name (SSID) on the air.

B. WPS (Wi-Fi Protected Setup)

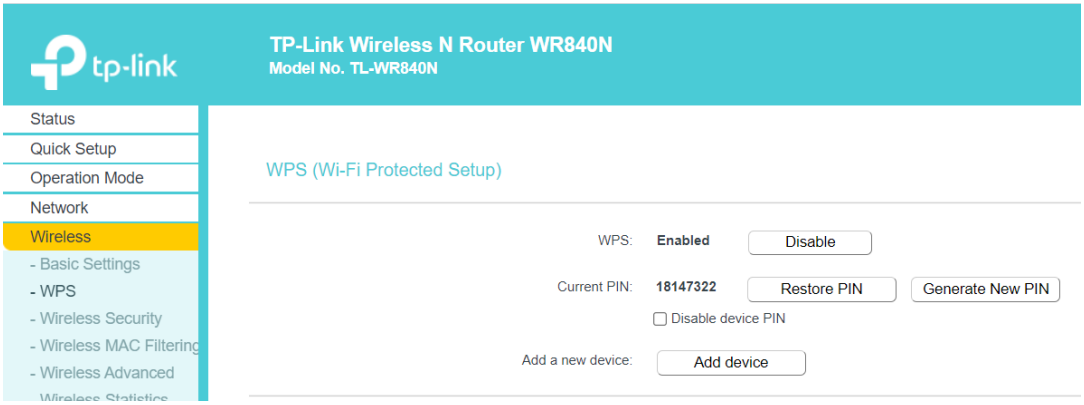

Figure 11: WPS Setup

WPS function will help you add a new device to the network quickly. If the new device supports Wi-Fi Protected Setup and is equipped with a configuration button, you can add it to the network by pressing the configuration button on the device and then press the button on the Router within two minutes. The status LED on the Router will be on for five minutes if the device has been successfully added to the network. If the new device supports Wi-Fi Protected Setup and the connection way using PIN, you can add it to the network by entering the Router's PIN.

- **WPS Status** - Enable or disable the WPS function here.
- **Current PIN** - The current value of the Router's PIN displayed here. The default PIN of the Router can be found in the label or User Guide.
- **Restore PIN** - Restore the PIN of the Router to its default.
- **Generate New PIN** - Click this button, and then you can get a new random value for the Router's PIN. You can ensure the network security by generating a new PIN.

- **Add Device** - You can add the new device to the existing network manually by clicking this button.

  Note: The WPS function cannot be configured if the Wireless Function of the Router is disabled. Please make sure the Wireless Function is enabled before configuring the WPS.

C. Wireless Security Settings

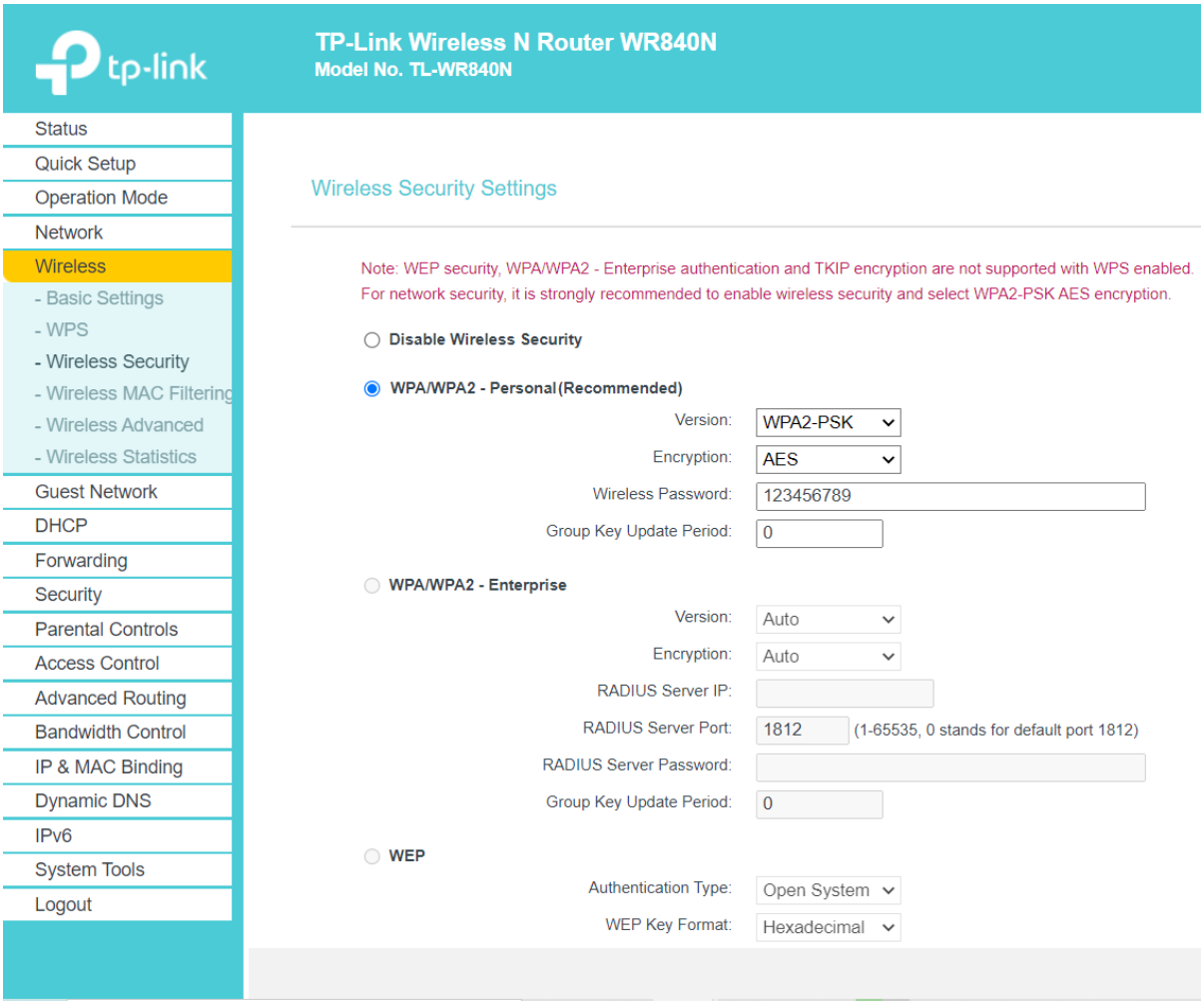

Figure 12: Wireless Security Settings

You can select one of the following security options:

- **Disable Wireless Security** - The wireless security function can be enabled or disabled. If disabled, the wireless stations will be able to connect the device without encryption. It is recommended strongly that you choose one of following options to enable security.

- **WPA/WPA2 - Personal** - Select WPA based on pre-shared passphrase.
- **WPA/WPA2 - Enterprise** - Select WPA based on Radius Server.
- **WEP** - Select 802.11 WEP security.

Each security option has its own settings as described follows:

WPA/WPA2 - Personal Version:

- **Version** - You can select one of following versions,
- **Auto** - Select **WPA-PSK** or **WPA2-PSK** automatically based on the wireless station's capability and request.
- **WPA-PSK** - Pre-shared key of WPA.
- **WPA2-PSK** - Pre-shared key of WPA2.
- **Encryption** - You can select either **Auto**, or **TKIP** or **AES**.
- **Wireless Password** - You can enter **ASCII** or **Hexadecimal** characters. For **Hexadecimal**, the length should be between 8 and 64 characters; for **ASCII**, the length should be between 8 and 63 characters.
- **Group Key Update Period** - Specify the group key update interval in seconds. The value can be either 0 or at least 30. Enter 0 to disable the update.

WPA/WPA2 – Enterprise Version:

- **Version** - You can select one of following versions,
- **Auto** - Select **WPA** or **WPA2** automatically based on the wireless station's capability and request.
- **WPA** - Wi-Fi Protected Access.
- **WPA2** - WPA version 2.
- **Encryption** - You can select either **Auto**, or **TKIP** or **AES**.
- **Radius Server IP** - Enter the IP address of the Radius Server.
- **Radius Server Port** - Enter the port that radius service used. (1-65535, 0 stands for default port 1812)
- **Radius Server Password** - Enter the password for the Radius Server.
- **Group Key Update Period** - Specify the group key update interval in seconds. The value can be either 0 or at least 30. Enter 0 to disable the update.

WEP:

- **Authentication Type** - You can select one of following types,
- **Auto** - Select **Shared Key** or **Open System** authentication type automatically based on the wireless station's capability and request.
- **Shared Key** - Select 802.11 Shared Key authentication.
- **Open System** - Select 802.11 Open System authentication.
- **WEP Key Format** - You can select **ASCII** or **Hexadecimal** format. ASCII Format stands for any combination of keyboard characters in the specified length. Hexadecimal format stands for any combination of hexadecimal digits (0-9, a-f, A-F) in the specified length.
- **WEP Key settings** - Select which of the four keys will be used and enter the matching WEP key information for your network in the selected key radio button. These values must be identical on all wireless stations in your network.
- **Key Type** - You can select the WEP key length (**64-bit**, or **128-bit**.) for encryption. "Disabled" means this WEP key entry is invalid.
- For **64-bit** encryption - You can enter 10 hexadecimal digits (any combination of 0-9, a-f, A-F, and null key is not permitted) or 5 ASCII characters.
- For **128-bit** encryption - You can enter 26 hexadecimal digits (any combination of 0-9, a-f, A-F, and null key is not permitted) or 13 ASCII characters.

  Note: If you do not set the key, the wireless security function is still disabled even if you have selected Shared Key as Authentication Type. Be sure to click the **Save** button to save your settings on this page.

D. Wireless MAC Filtering

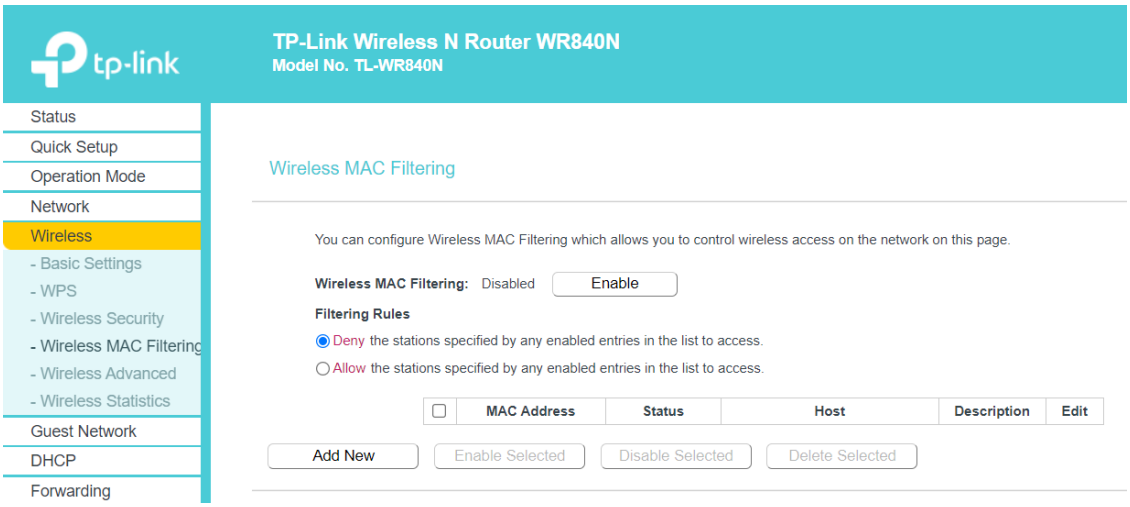

Figure 13: Wireless MAC Filtering

The Wireless MAC Address Filtering feature allows you to control the wireless stations accessing the AP, which depend on the station's MAC addresses.

- **MAC Address** - The wireless station's MAC address that you want to access.
- **Description** - A simple description of the wireless station.
- **Status** - The status of this entry , either **Enabled** or **Disabled**.
- **Host** - The wireless name.

To disable the Wireless MAC Address Filters feature, keep the default setting, **Disable**.

To set up an entry, click **Enable**, and follow these instructions: First, you must decide whether the specified wireless stations can or cannot access the AP. If you desire that the specified wireless stations can access the AP, please select the radio button **Allow the stations specified by any enabled entries in the list to access**, otherwise, select the radio button **Deny the stations specified by any enabled entries in the list to access**.

To Add a Wireless MAC Address filtering entry, clicking the **Add New** button, and following these instructions:

1. Enter the appropriate MAC Address into the **MAC Address** field. The format of the MAC Address is XX:XX:XX:XX:XX:XX (X is any hexadecimal digit). For example, 00:0A:EB:B0:00:0B.
2. Enter a simple description of the wireless station in the **Description** field. For example, Wireless station A.
3. **Status** - Select **Enabled** or **Disabled** for this entry on the **Status** pull-down list.
4. Click the **Save** button to save this entry.

To add another entries, repeat steps 1~4.

To edit an existing entry:

1. Click the **Edit** button in the **Edit** column in the MAC Address Filtering Table.
2. Enter the value as desired in the **Add or Modify Wireless MAC Address Filtering entry** page, and click the **Save** button.
   You can click the **Enable Selected** button to make the selected Entries enabled, click the **Disable Selected** button to make the selected Entries disabled, click the **Delete Selected** button to delete the selected entries.
   Note: If you enable the function and select the **Allow the stations specified by any enabled entries in the list to access** for **Filtering Rules**, and there are not any enable entries in the list, thus, no wireless stations can access the AP.

7. DHCP

A. Settings

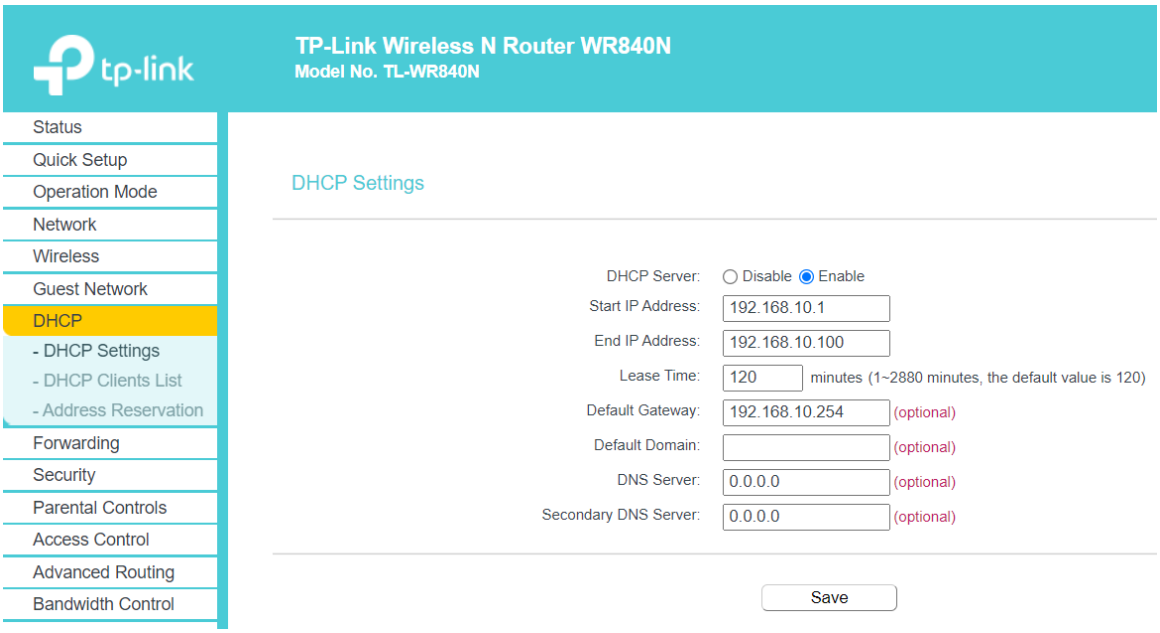

Figure 14: DHCP Settings

The device is set up by default as a DHCP (Dynamic Host Configuration Protocol) server, which provides the TCP/IP configuration for all the PCs that are connected to the device in the LAN.

- **DHCP Server - Enable** or **Disable** the server. If you disable the Server, you must have another DHCP server within your network or else you must configure the IP address of the computer manually.
- **Start IP Address -** This field specifies the first address in the IP Address pool. 192.168.0.100 is the default start IP address.
- **End IP Address** - This field specifies the last address in the IP Address pool. 192.168.0.199 is the default end IP address.
- **Lease Time** - The **Address Lease Time** is the length of time a network user will be allowed to keep connecting to the device with the current DHCP Address. Enter the amount of time, in minutes, that the DHCP address will be "leased". The time range is 1~2880 minutes. The default value is 120 minutes.

- **Default Gateway -** (Optional) Suggest to input the IP Address of the LAN port of the device, default value is 192.168.0.1.
- **Default Domain** - (Optional) Input the domain name of your network.
- **DNS Server -** (Optional) Input the DNS IP address provided by your ISP. Or consult your ISP.
- **Secondary DNS Server** - (Optional) You can input the IP Address of another DNS server if your ISP provides two DNS servers.

Note: To use the DHCP server function of the device, you should configure all computers in the LAN as "Obtain an IP Address automatically" mode. This function will take effect until the device reboots.

Click **Save** to save the changes.

B. DHCP Client List

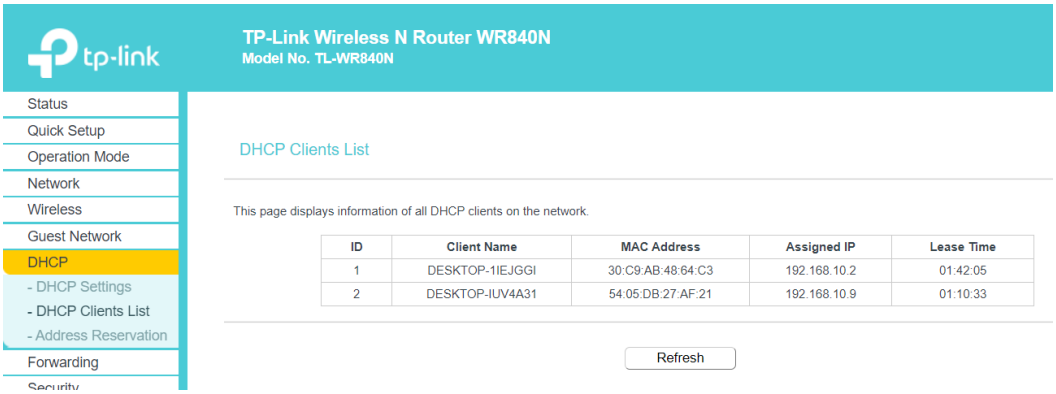

Figure 15: DHCP List

This page shows **Client Name**, **MAC Address**, **Assigned IP** and **Lease Time** of each DHCP Client connected to the device.

- **Client Name** - The name of the DHCP client.
- **MAC Address** - The MAC address of the DHCP client.
- **Assigned IP** - The IP address that the device has allocated to the DHCP client.

- **Lease Time** - The time of the DHCP client leased.

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

C. DHCP Address Reservation

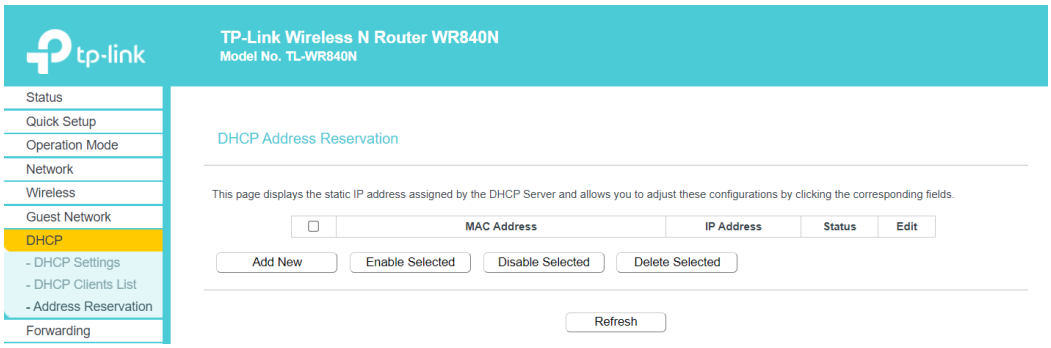

Figure 16: DHCP Address Reservation

When you specify a reserved IP address for a PC in the LAN, that PC will always receive the same IP address each time when it accesses the DHCP server. Reserved IP addresses could be assigned to servers that require permanent IP settings.

- **MAC Address** - The MAC Address of the PC that you want to reserve an IP address for.
- **IP Address** - The IP address that the device reserved.
- **Status** - It shows whether the entry is enabled or not
- **Edit** - To edit or delete an existing entry.

To Reserve IP Addresses, you can follow these steps:

1. Enter the MAC Address (The format for the MAC Address is XX:XX:XX:XX:XX:XX) and the IP address in dotted-decimal notation of the computer you wish to add.
2. Click the **Save** button.

To edit a IP Address, you can follow these steps:

1. Select the reserved address entry as you desired, edit it. If you wish to delete the entry, select the entry and click the **Delete Selected** button.
2. If you wish to delete the entry, select the entry and click the **Delete Selected** button.
3. Click the **Save** button.

Click the **Add New** button to add a new Address Reservation entry.

Click the **Enable Selected** button to enable the selected entries in the table.

Click the **Disable Selected** button to disable the Selected entries in the table.

Click the **Delete Selected** button to delete selected the entries in the table.

8. System Tools

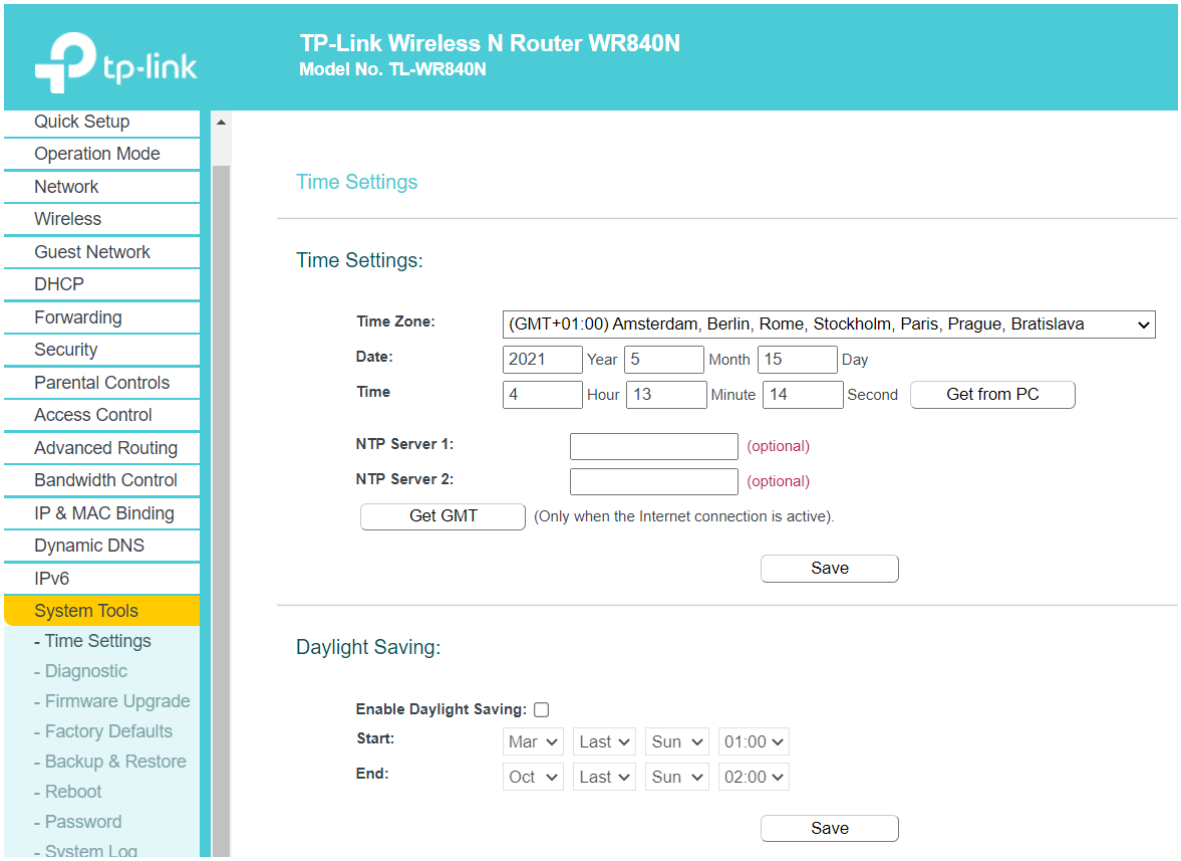

Figure 17: System Tools

Time Settings Help

This page allows you to set the time manually or to configure automatic time synchronization. The device can automatically update the time from an NTP server via the Internet.

Time Zone - Select your local time zone from this pull-down list.

To set time manually:

1. Select your local time zone.
2. Enter the **Date**.
3. Enter the **Time**.
4. Click **Save**.

For automatic time synchronization:

1. Enter the address or domain of the **NTP Server 1** or **NTP Server 2**.
2. Click the **Get GMT** button to get GMT from the Internet.

To set up daylight saving:

1. Select the **Enable Daylight Saving** checkbox to enable daylight saving function.
2. Select the correct **Start** time and **End** time of daylight saving range.
3. Click **Save**.

Note:

1. This setting will be used for some time-based functions such as firewall functions. These time dependant functions will not work if time is not set. Therefore, it is important to specify time settings as soon as you successfully login to the device.
2. The time will be lost if the device is turned off.
3. The device will automatically obtain GMT from the Internet if it is configured accordingly.
4. In daylight saving configuration, if the end time is earlier than start time, it means the end time is at the next year.
5. After you enable daylight saving function, it will take action in one minute.

VALUING

DIRECTION: Read the following question/s carefully. State your answer in two to three sentences each number on the space provided.

What do you think are the importance of manually router configuration?

_____
_____
_____
_____
_____
_____.

POST TEST

Directions: Read the following statement carefully. Write **T** if the statement is correct and **F** for the wrong statement.

1. The **Status Page** displays the Router's current status and configuration.
2. TP-Link router can be set into mode as follow: Wireless Router, WISP, Access & Range Extender.
3. The wireless security function can be enabled or disabled.
4. The Wireless MAC Address Filtering feature allows you to control the wireless stations accessing the AP, which depend on the station's MAC addresses.
5. Time Settings Page allows you to set the time manually or to configure automatic time synchronization.

KEY TO CORRECTION

Pretest	Recap	Posttest
1. T	1. T	1. T
2. T	2. T	2. T
3. T	3. T	3. T
4. T	4. T	4. T
5. T	5. T	5. T