User Guide

For TP-Link Omada Access Points

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About This User Guide

When using this guide, notice that features available in the EAP may vary by model and software version. Availability of the EAP may also vary by region or ISP. All images, steps, and descriptions in this guide are only examples and may not reflect your actual experience.

Some models featured in this guide may be unavailable in your country or region. For local sales information, visit *https://www.tp-link.com*.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure the accuracy of the contents, but all statements, information, and recommendations in this document do not constitute the warranty of any kind, express or implied. Users must take full responsibility for their application of any product.

Conventions

Unless otherwise noted, the introduction in this guide takes EAP245 as an example.

Wireless Speed, Range and Connected Devices Disclaimer

Maximum wireless transmission rates are the physical rates derived from IEEE Standard 802.11 specifications. Range and coverage specifications along with the number of connected devices were defined according to test results under normal usage conditions. Actual wireless transmission rate, wireless coverage, and number of connected devices are not guaranteed, and will vary as a result of 1) environmental factors, including building materials, physical objects and obstacles, 2) network conditions, including local interference, volume and density of traffic, product location, network complexity, and network overhead and 3) client limitations, including rated performance, location, connection quality, and client condition.

MU-MIMO Disclaimer (for EAPs that support MU-MIMO)

MU-MIMO capability requires client devices that also support MU-MIMO.

Seamless Roaming Disclaimer (for EAPs that support Seamless Roaming)

Seamless roaming requires both the access point and client devices to support 802.11k and 802.11v protocols.

Lightning and Electro-Static Discharge Protection Disclaimer (for Outdoor EAPs)

Protection against lightning and electro-static discharge may be achieved through proper product setup, grounding and cable shielding. Refer to the instruction manual and consult an IT professional to assist with setting up this product.

More Info

Some models featured in this guide may be unavailable in your country or region. For local sales information, visit *https://www.tp-link.com*.

For technical support, latest software, and management app, visit *https://www.tp-link.com/support*.

The Quick Installation Guide can be found where you find this guide or inside the package of the EAP.

The authentication information can be found where you find this guide.

Specifications can be found on the product page at *https://www.tp-link.com*.

To ask questions, find answers, and communicate with TP-Link users or engineers, please visit *https://community.tp-link.com* to join TP-Link Community.

If you have any suggestions or needs on the product guides, welcome to email *techwriter@tp-link.com.cn*.

Overview

Omada series products provide wireless coverage solutions for small-medium business and households. They can either work independently as standalone APs or be centrally managed by Omada Software Controller, Omada Hardware Controller (OC200/OC300), or Omada Cloud-Based Controller, providing a flexible, richly-functional but easily configured wireless network for small-medium business and households.

1 Quick Start

This chapter introduces how to build a wireless network using the EAPs and how to complete the basic settings. Follow the steps below:

1.1 Determine the Management Method

1.2 Connect Network Devices

1.3 Log in to the EAP and Change the SSID

1.4 Configure and Manage the EAP

1.1 Determine the Management Method

Before building your network, choose a proper method to manage your EAPs. You have the following two options:

■ Controller Mode

If you want to manage a large-scale network centrally, choose Controller Mode. In Controller Mode, you can configure and monitor mass EAPs, switches, and gateways via Omada SDN Controller. For detailed instructions, go to the Support Webpage of Omada Controller and download the User Guide.

■ Standalone Mode

If you want to manage only a few EAPs, choose Standalone Mode. In Standalone Mode, you can singly configure and monitor your EAPs via Omada APP or a web browser, and each EAP has its own management page.

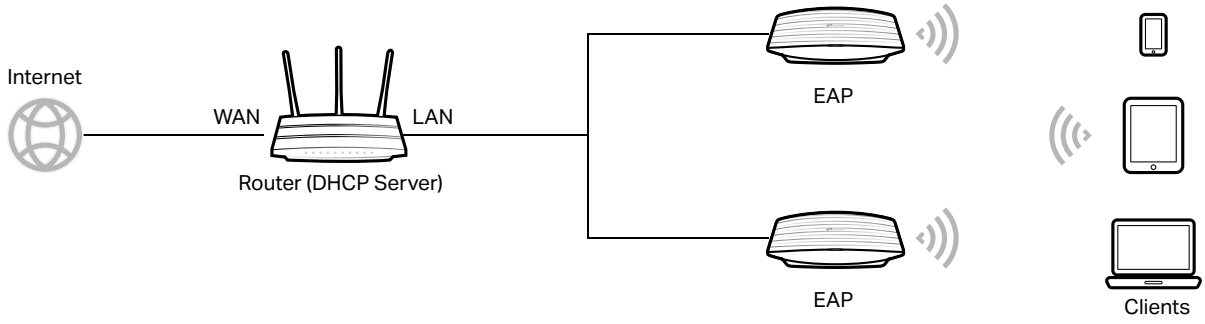
This chapter introduces how to start configuring the EAP in Standalone Mode.

Note:

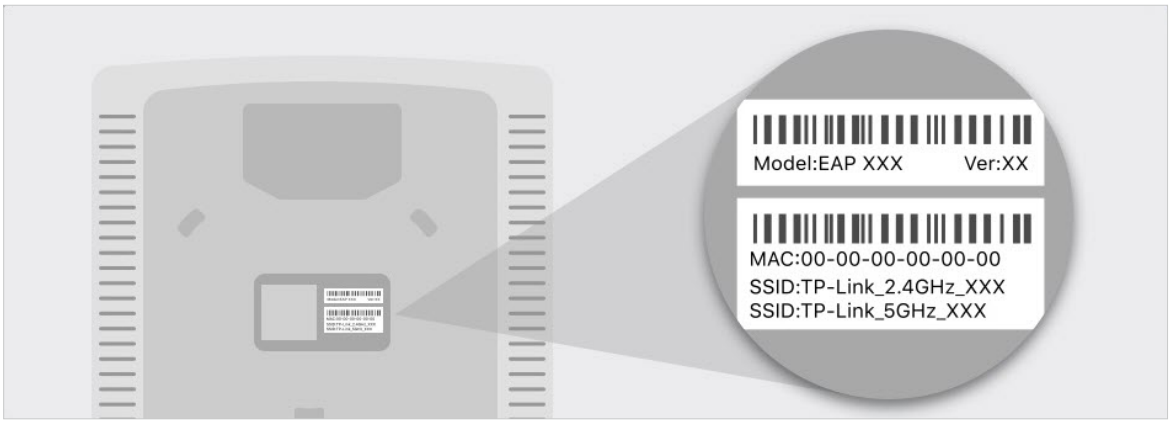
- Standalone Mode is inaccessible while the EAP is managed by a controller. To turn the EAP back to Standalone Mode, you can forget the EAP on the controller or reset the EAP.
- To make your EAPs discovered by the controller, you need to configure *5.2 Controller Settings* in certain scenarios.

1.2 Connect Network Devices

To connect your EAPs to the local network, refer to the following topology.



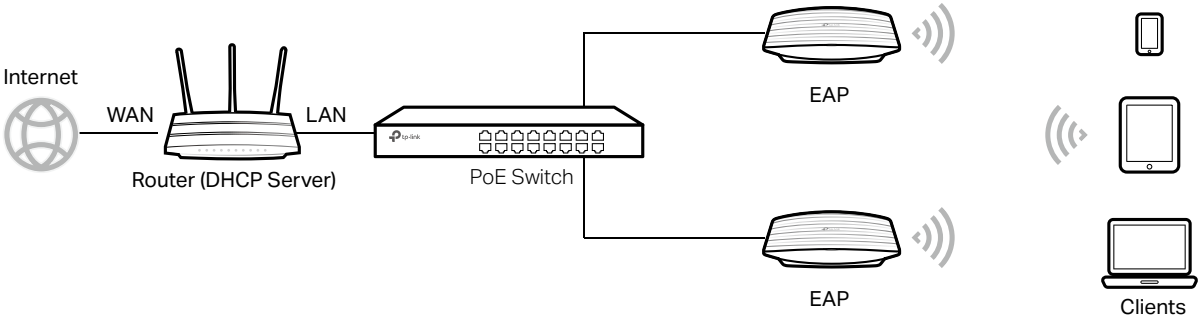
1. Connect the WAN port (or Internet port) of the router to the internet.
2. Connect your EAPs to the LAN port of the router.
3. Connect your wireless clients such as phones, tablets and laptops to the WiFi of the EAP. The default SSID is printed at the bottom of the EAP.



Now you can surf the internet on your phones, tablets and laptops. If you cannot access the internet, follow the FAQ to troubleshoot the problem.

Tips:

- If you want to power your EAPs using a PoE switch, refer to the following topology.



- The router is the gateway of the network, and devices in the LAN surf the internet via the router. At the same time, the router acts as a DHCP server to assign dynamic IP addresses to the EAPs and clients.
- The dual-band EAP has two default SSIDs named **TP-Link_2.4GHz_XXXXXX** on the 2.4GHz band and **TP-Link_5GHz_XXXXXX** on the 5GHz band, and the single-band EAP has a default SSID named **TP-Link_2.4GHz_XXXXXX** on the 2.4GHz band.

1.3 Log in to the EAP and Change the SSID

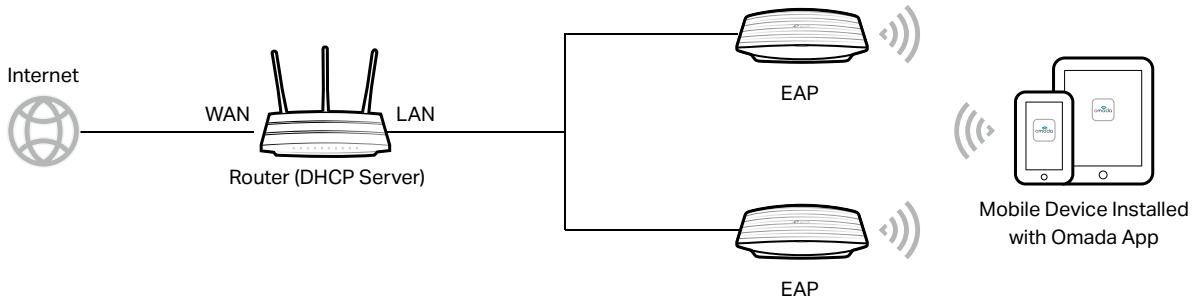
By default, anyone can connect to the WiFi of EAP without authentication, because the default SSID has no password. For security purposes, we recommend changing the default SSID.

Log in to the EAP before changing the default SSID. You can use either Omada App on your mobile device or the web browser on your PC. Choose a method from the following sections and follow the instructions.

Tips:

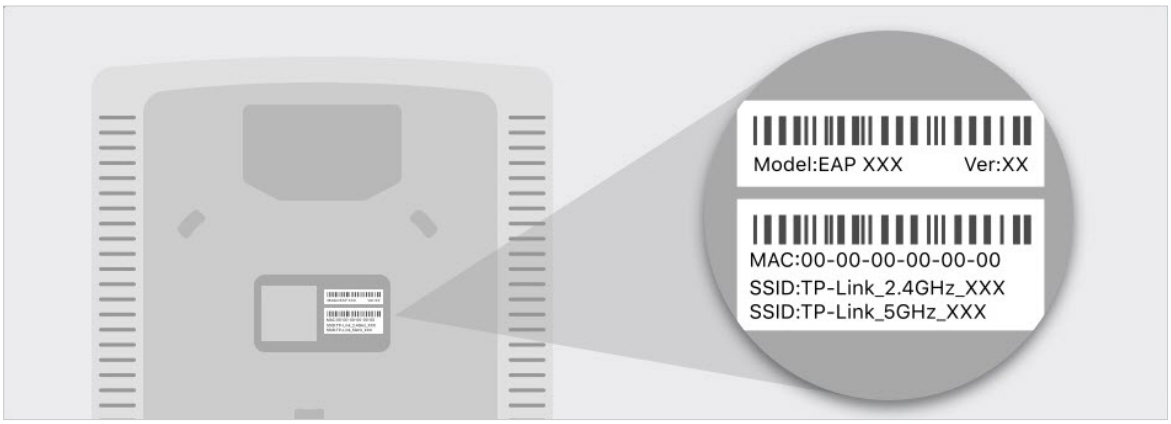
- Only one user is allowed to log in to the EAP at one time.
- Omada app is designed to help you quickly configure some basic settings. To configure advanced functions, use the web browser on your PC.
- Omada app is only compatible with certain firmware versions of the EAP. To check the firmware versions of the supported EAPs, please refer to https://www.tp-link.com/omada_compatibility_list.

Using Omada App on Your Mobile Device

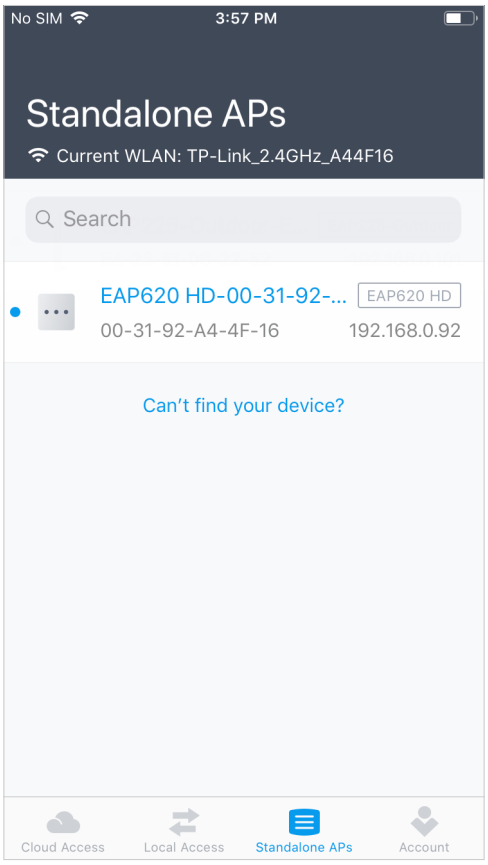


1. To install Omada App, launch the Apple App Store (iOS) or Google Play store (Android) and search "TP-Link Omada" or simply scan the QR code to download and install the app.

2. Connect your mobile device to the WiFi of the EAP. The default SSID is printed at the bottom of the EAP.



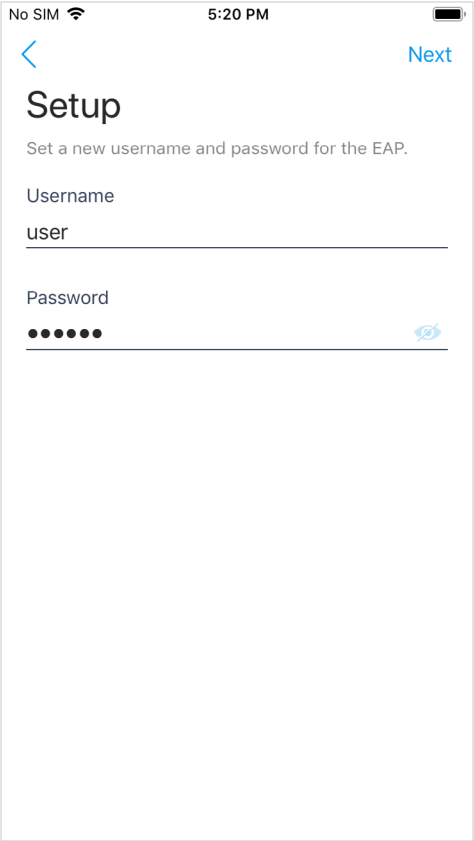
3. Launch the Omada app, tap **Standalone APs** and wait for the EAP to be discovered.



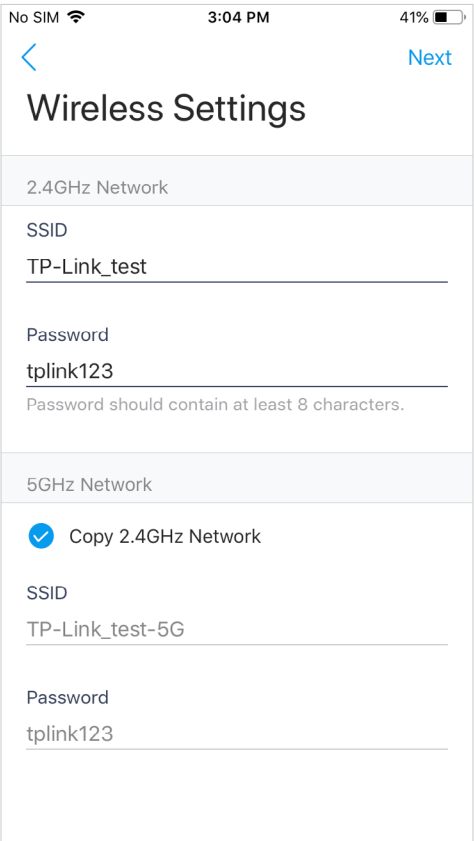
Tips:

All the EAPs in the same subnet will be discovered by Omada app and shown on the page.

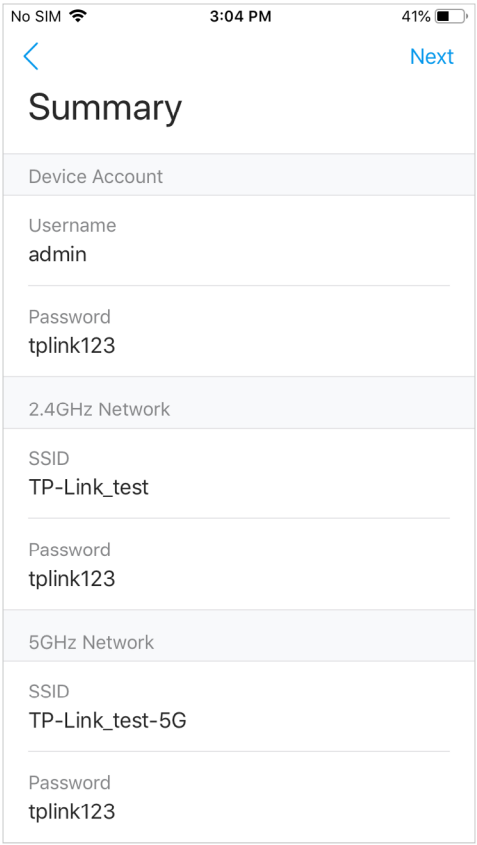
4. Tap on the EAP appearing on the page. Set a new username and password for your login account of the EAP.



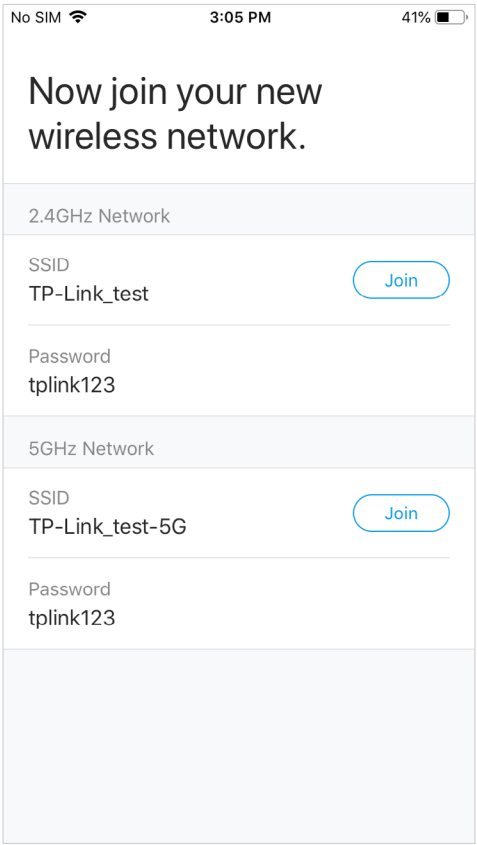
5. Change the SSID and password to keep your wireless network secure. Tap **Next**.



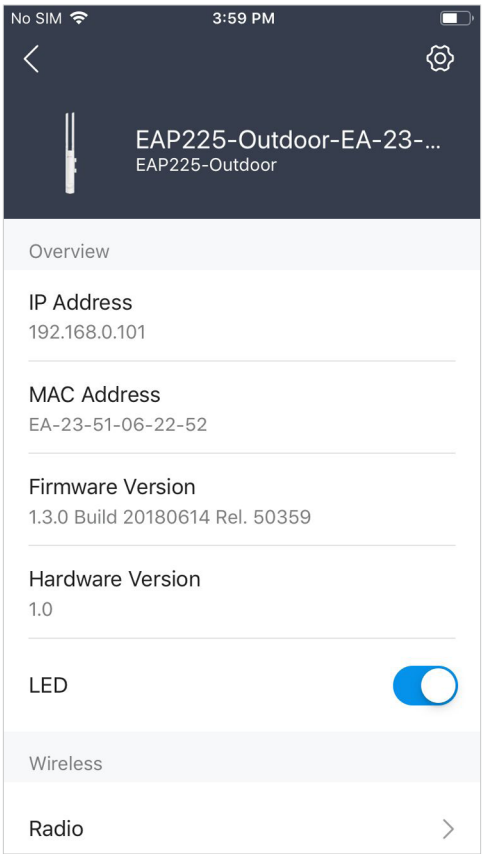
6. Confirm the settings in the summary page. Tap Next, and the settings will take effect in several minutes.



7. To join your new wireless network, select the SSID and tap **Join**.

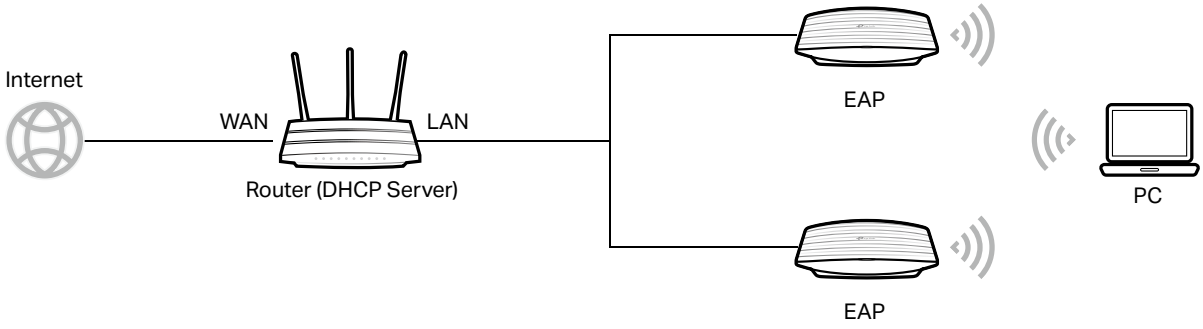


8. Tap **Continue** to go to the managment page. In this page, you can view the information and settings of the EAP. If you want to change the settings incuding radio, SSID and device account, tap ⚙.

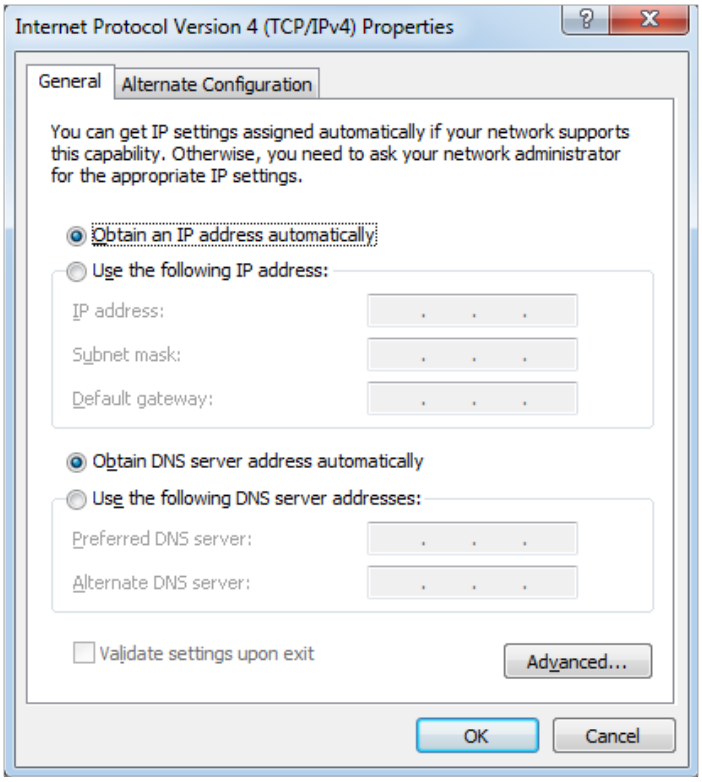


Now you can connect your phones, tablets and laptops to the new WiFi. If you cannot access the internet, follow the FAQ to troubleshoot the problem.

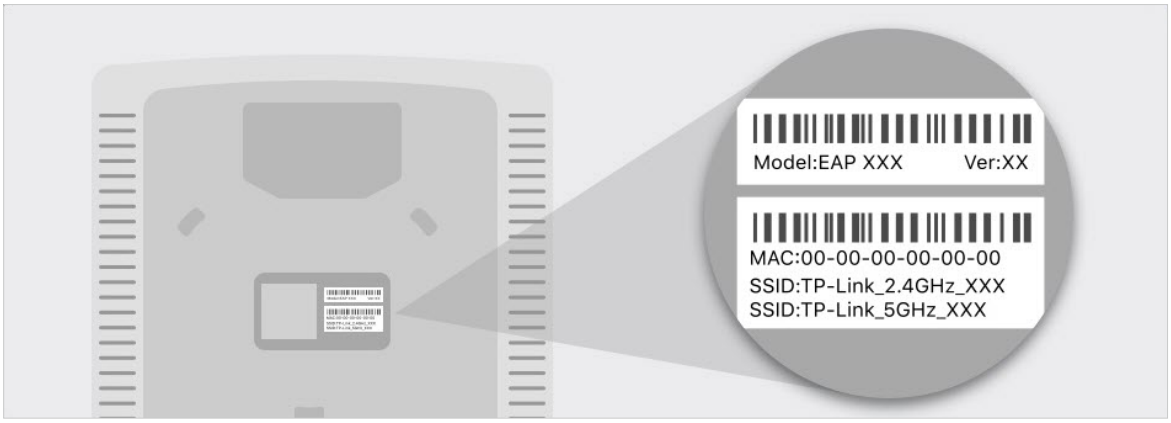
Using Web Browser on Your PC and Connecting to the WiFi



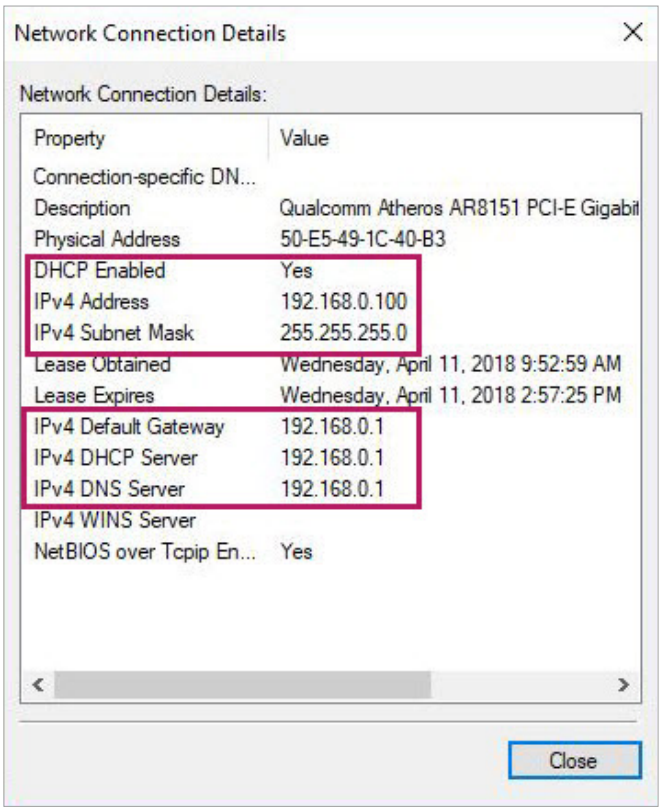
1. Set your PC to obtain an IP address automatically.



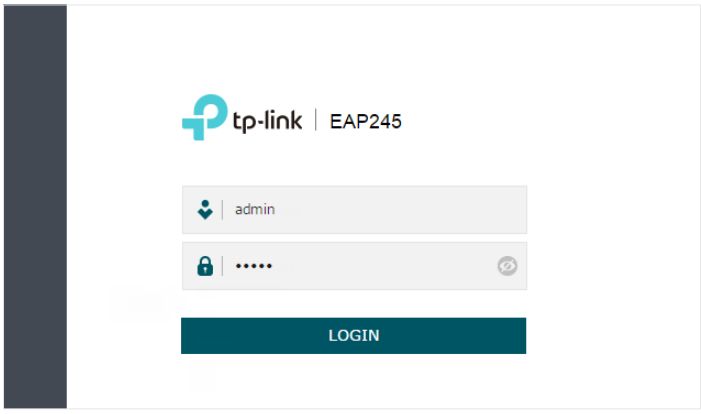
2. Connect your PC to the WiFi of the EAP. The default SSID is printed at the bottom of the EAP.



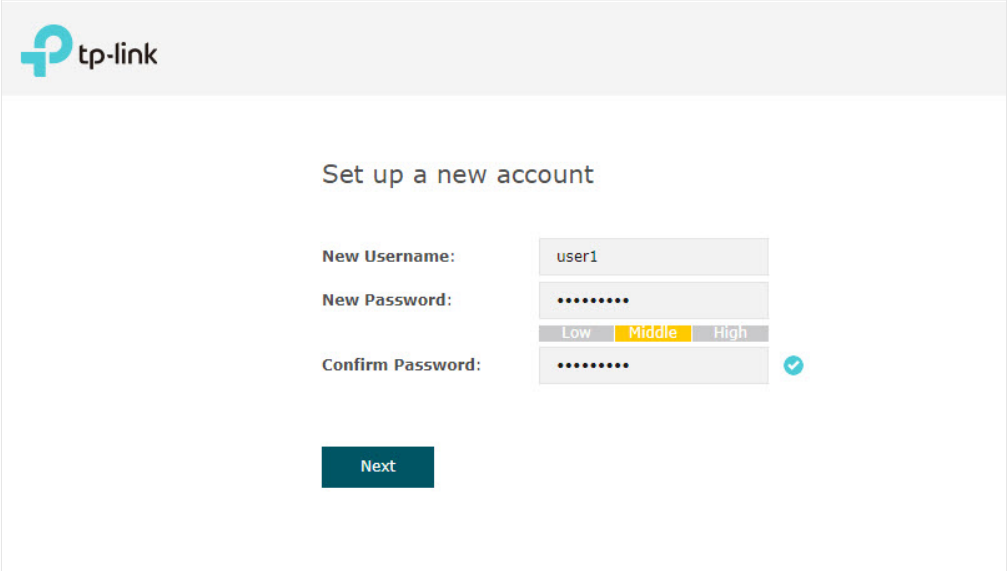
3. Make sure that your PC has got the IP address, default gateway, and DNS server from the DHCP server.



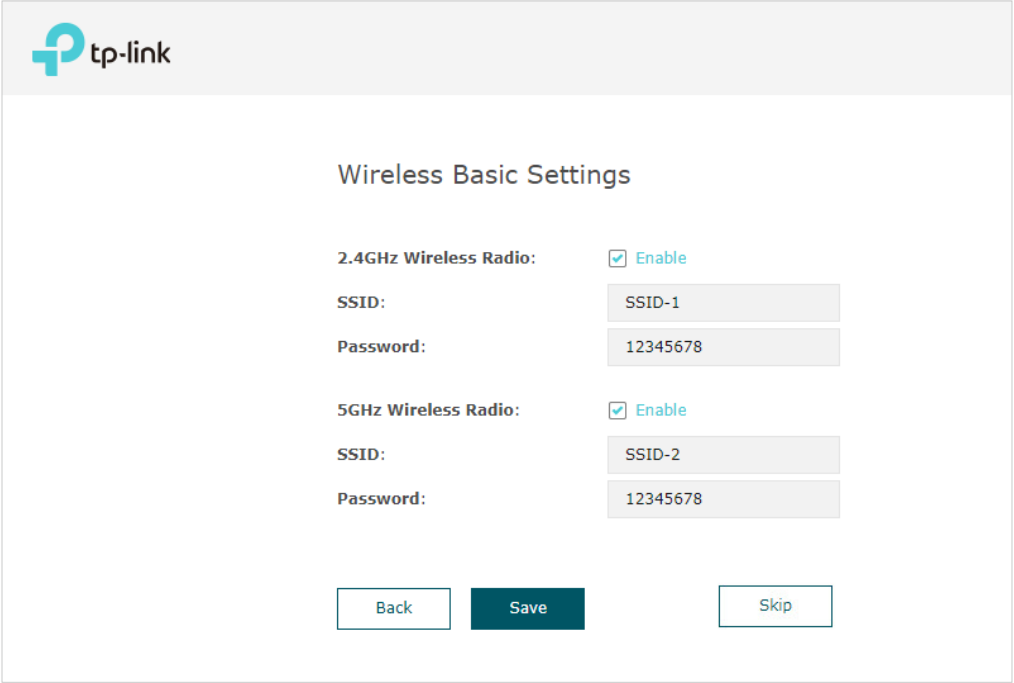
4. To log in to the EAP, launch a web browser and enter **http://tplinkeap.net** in the address bar. The login page will appear. By default, both the username and password are **admin**.



5. After logging in to the EAP, follow the step-by-step instructions to complete the basic configurations. In the pop-up window, configure a new username and a new password for your user account, then click **Next**.



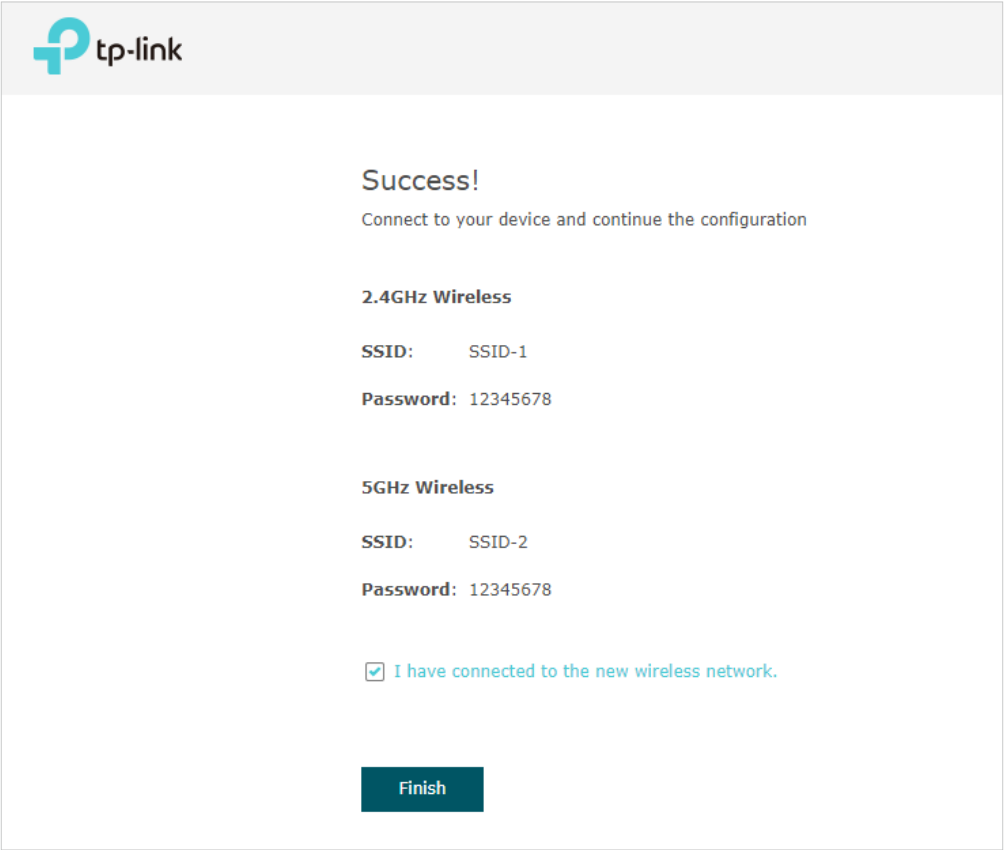
6. Configure the SSID and password. For the dual-band EAP, you can configure the SSID and password for both 2.4GHz and 5GHz. Click **Save**.



Tips:

You can skip this step and configure wireless settings later on the management page. If needed, you can also create more SSIDs. For detailed instructions, refer to *2.1 Configure the Wireless Parameters*.

7. The following page will appear. Make sure that your device has connected to the new wireless network and tick the checkbox. Then click **Finish**.



Now you can connect your phones, tablets and laptops to the new WiFi. If you cannot access the internet, follow the FAQ to troubleshoot the problem.

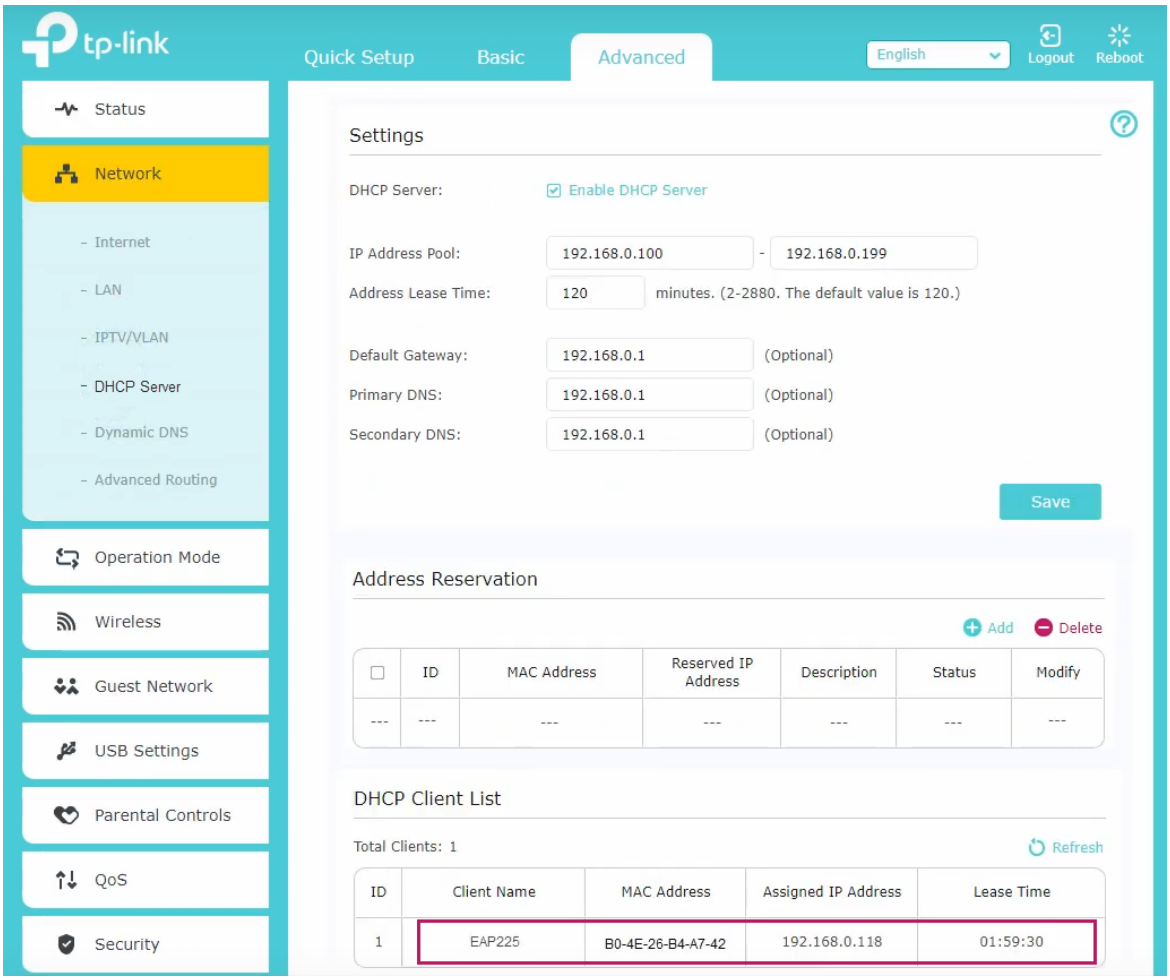
Using Web Browser on Your PC and Connecting to the Ethernet

1. Get the IP address of the EAP. There are two methods.

   - Using DHCP Client List of the Router

   Log in to the router which acts as the DHCP server. In the DHCP client list, find the IP address of your EAP according to its MAC address. The MAC address can be found at

the bottom of the EAP. In the following figure, for example, the IP address of the EAP is **192.168.0.118**.



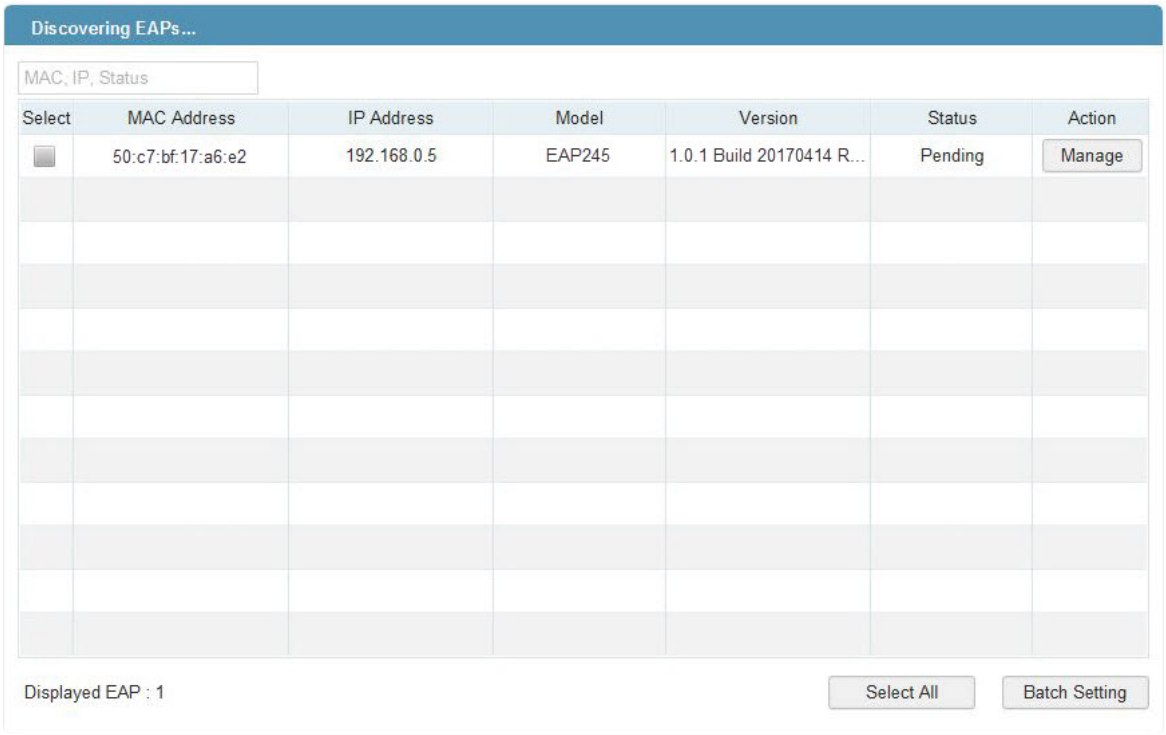
Tips:

When the DHCP server is not available in your network, the EAP has the DHCP fallback IP address, which is **192.168.0.254** by default.

- Using EAP Discovery Utility

Go to https://www.tp-link.com/download/EAP-Controller.html#EAP_Discovery_Tool to download, install and launch EAP Discovery Utility on your PC. EAP Discovery Utility can

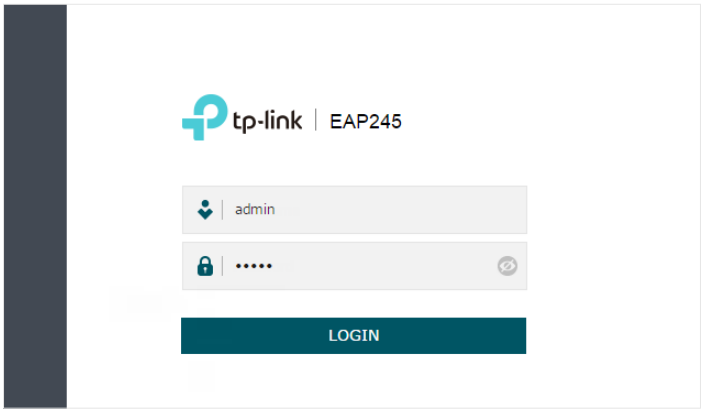
scan all EAPs in the same network segment, and find the IP address of the EAP. In the following figure, for example, the IP address of the EAP is **192.168.0.5**.



Tips:

Some EAP models only works with certain software version of Discovery Utility. If your Discovery Utility can't discover your EAP anyway, try a different software version.

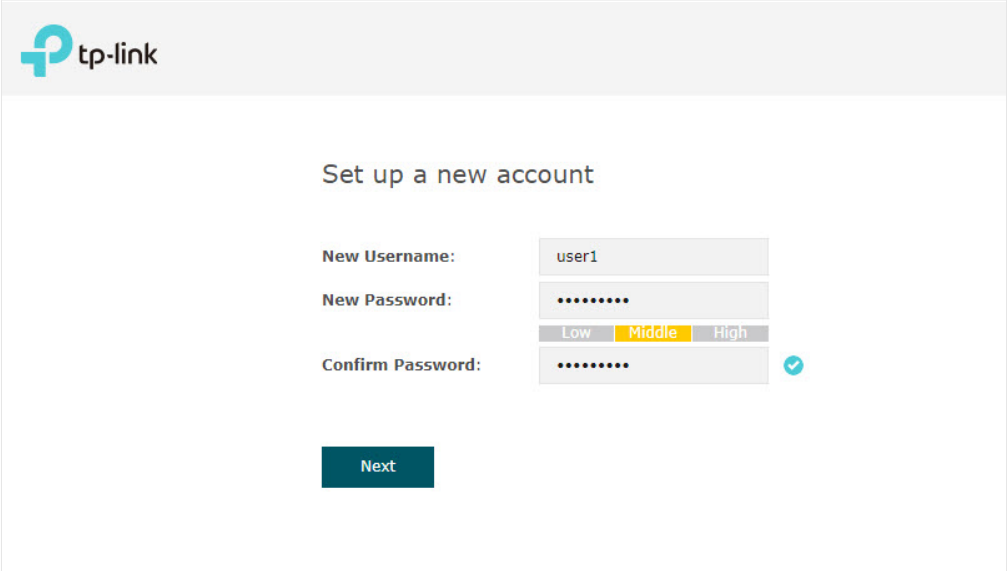
2. To log in to the EAP, launch a web browser and enter the IP address of the EAP in the address bar. The login page will appear. By default, both the username and password are **admin**.



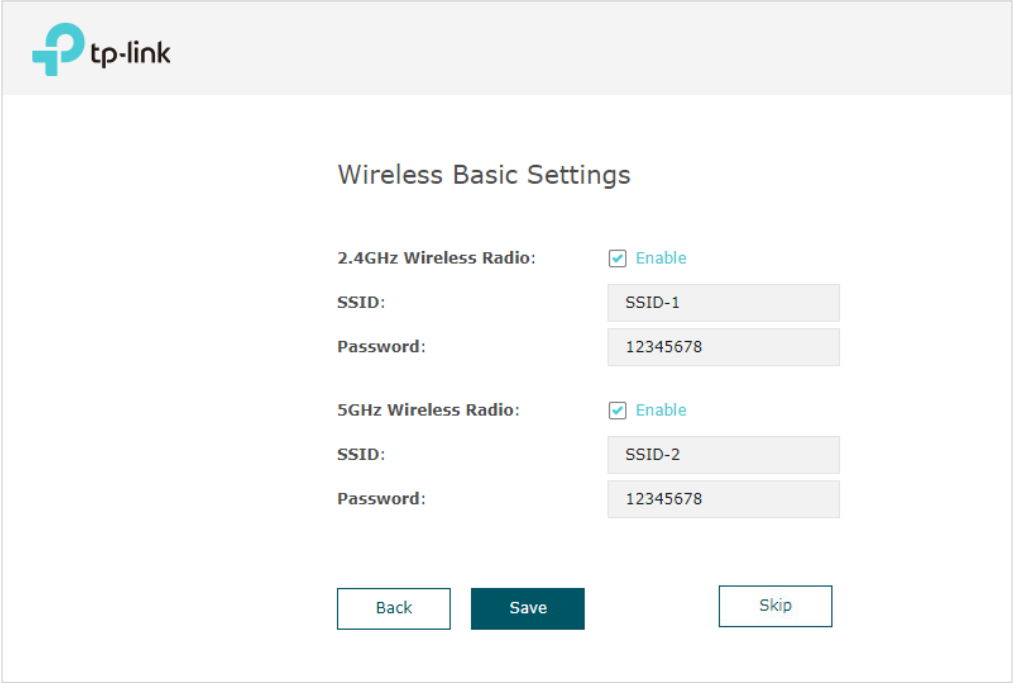
Tips:

To facilitate access to the EAP, you can set a static IP address for the EAP and remember it well or write it down. But make sure that this IP address is not being used by other devices in the same LAN. For detailed instructions about how to set a static IP address for the EAP, refer to *4.1 Manage the IP Address of the EAP*.

3. After logging in to the EAP, follow the step-by-step instructions to complete the basic configurations. In the pop-up window, configure a new username and a new password for your user account, then click **Next**.



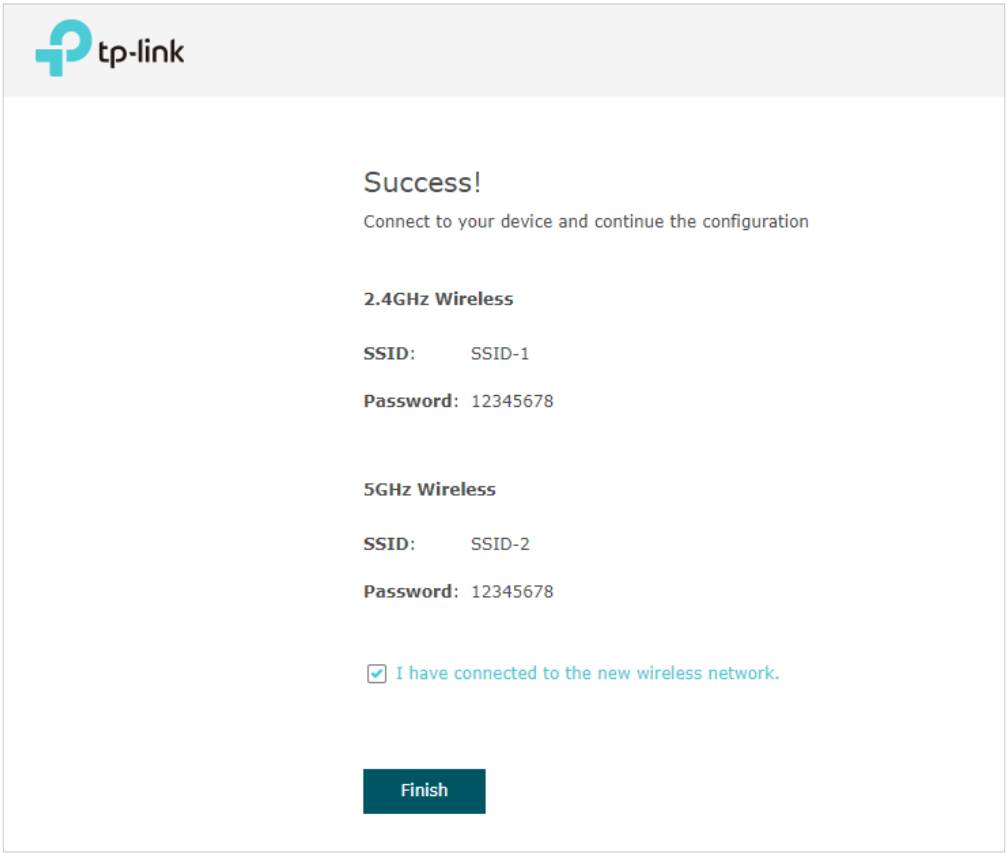
4. Configure the SSID and password. For the dual-band EAP, you can configure the SSID and password for both 2.4GHz and 5GHz. Click **Save**.



Tips:

You can skip this step and configure wireless settings later on the management page. If needed, you can also create more SSIDs. For detailed instructions, refer to *2.1 Configure the Wireless Parameters*.

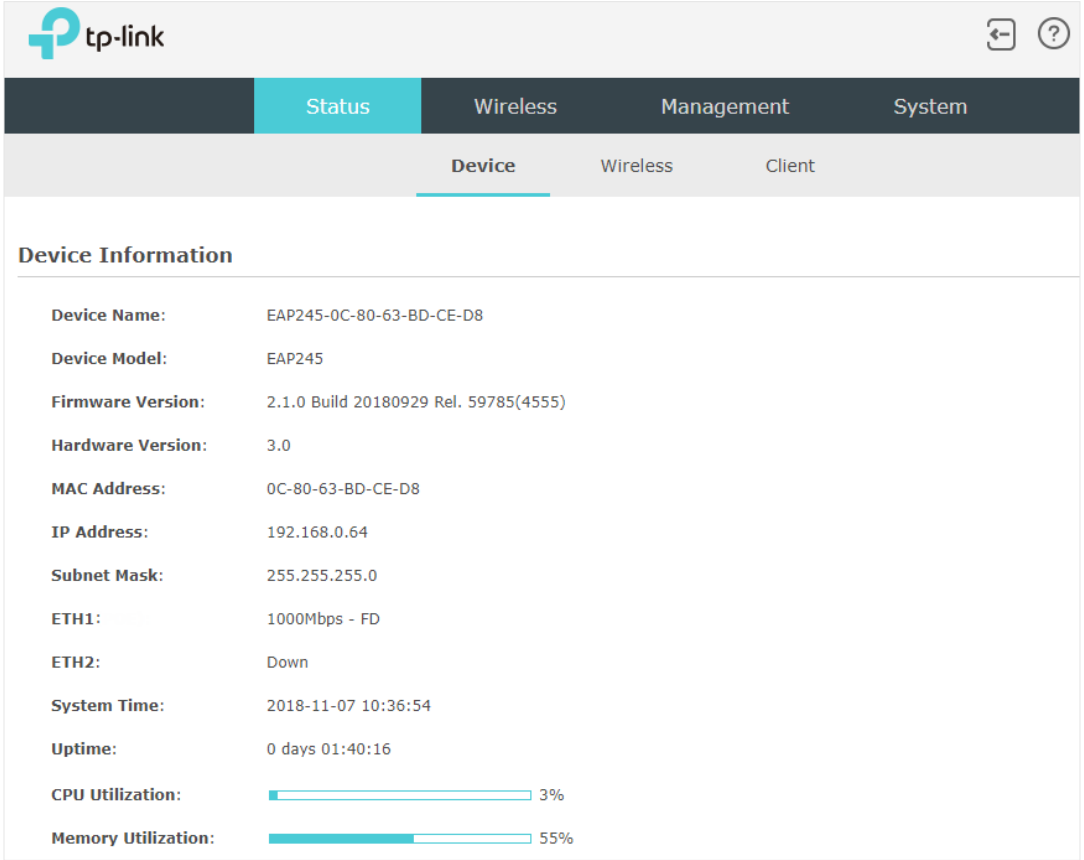
5. The following page will appear. Make sure that your device has connected to the new wireless network and tick the checkbox. Then click **Finish**.



Now you can connect your phones, tablets and laptops to the new WiFi. If you cannot access the internet, follow the FAQ to troubleshoot the problem.

1.4 Configure and Manage the EAP

If you use the web browser to configure your EAP, you can configure more advanced functions according to your needs, and manage it conveniently on the web page.



On the top of the page, you can click to log out and click to open the technical support website.

There are four tabs: **Status, Wireless, Management** and **System**. The following table introduces what you can configure under each tab, and the following chapters discuss these topics in detail.

Status	You can view the information of the EAP, wireless traffic and clients.
Wireless	You can configure the wireless parameters and advanced features, such as Portal, VLAN, MAC Filtering, Scheduler, Band Steering, QoS and Rogue AP Detection.
Management	You can manage the EAP using the management features, such as System Logs, Web Server, Management Access, LED Control, SSH and SNMP.
System	You can configure the system parameters, including the login account and the system time. In addition, you can reboot and reset the EAP, backup and restore the configuration, and upgrade the EAP using the new firmware file.

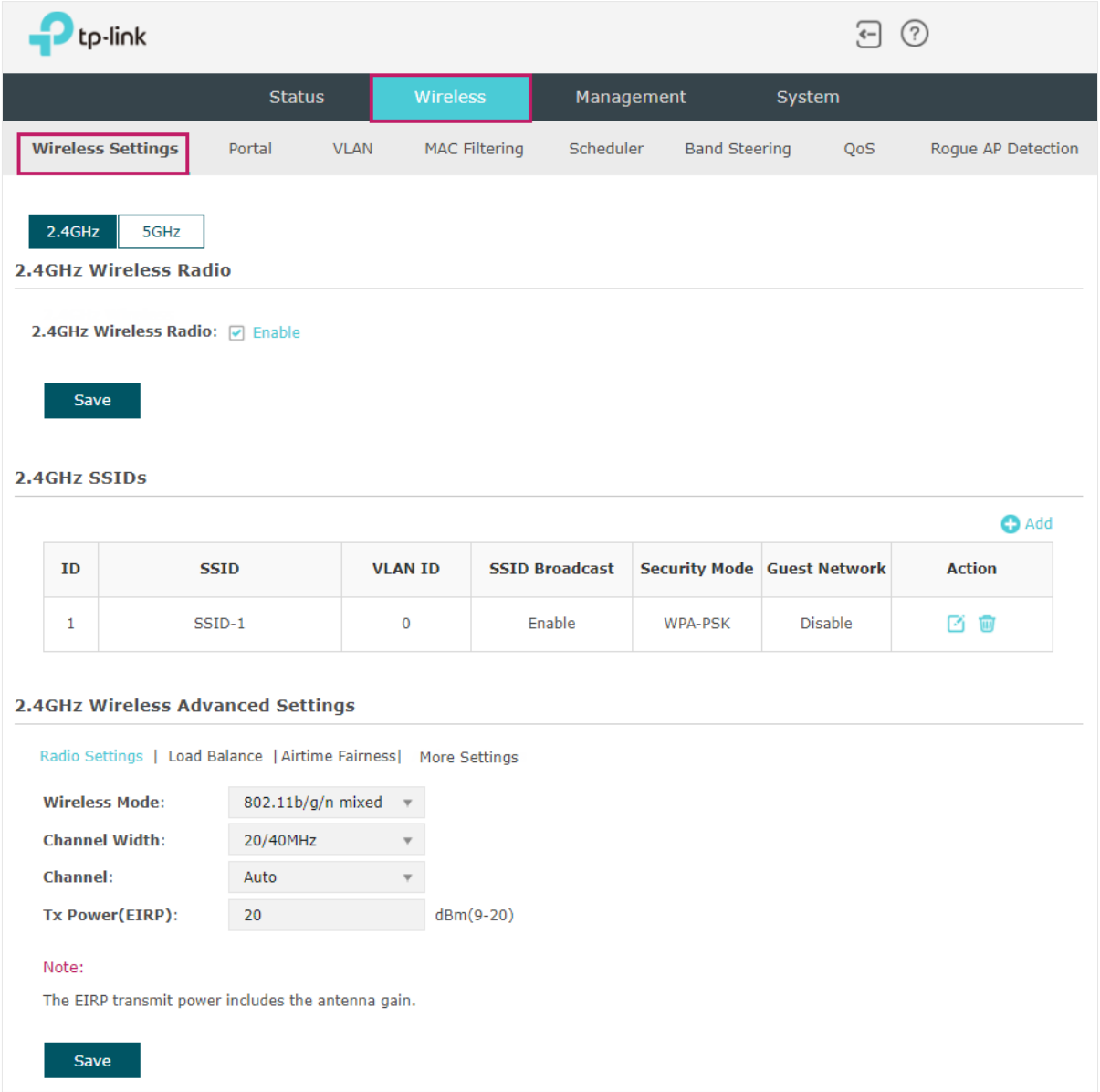
2 Configure the Network

This chapter introduces how to configure the network parameters and the advanced features of the EAP, including:

- *2.1 Configure the Wireless Parameters*
- *2.2 Configure Portal Authentication*
- *2.3 Configure VLAN*
- *2.4 Configure MAC Filtering*
- *2.5 Configure Scheduler*
- *2.6 Configure Band Steering*
- *2.7 Configure QoS*
- *2.8 Configure Rogue AP Detection*

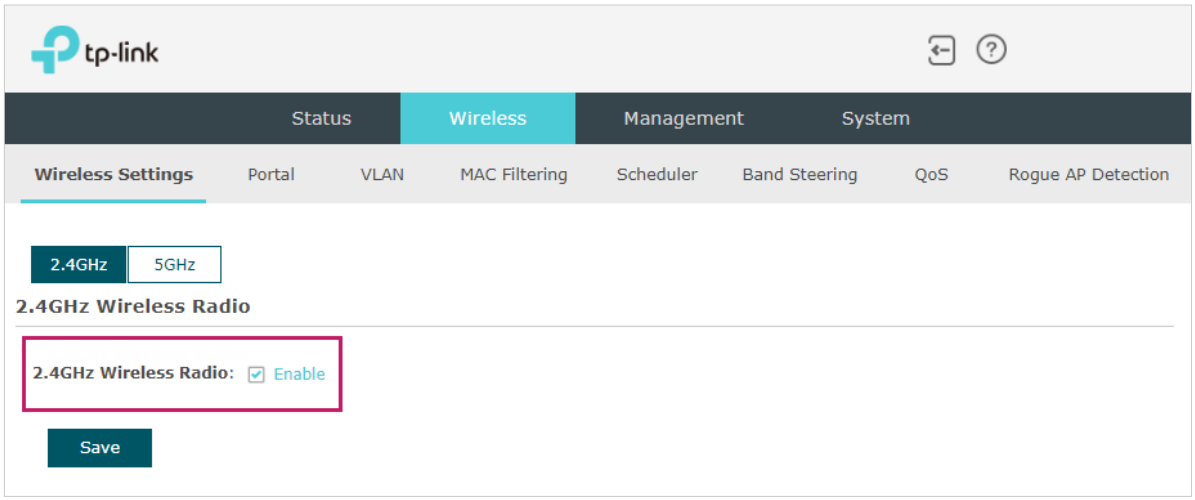
2.1 Configure the Wireless Parameters

To configure the wireless parameters, go to the **Wireless > Wireless Settings** page.



For a dual-band EAP, there are two bands: 2.4GHz and 5GHz. The wireless parameters are separately set on each band. You can click 2.4GHz 5GHz to select a band and configure the wireless parameters on this band.

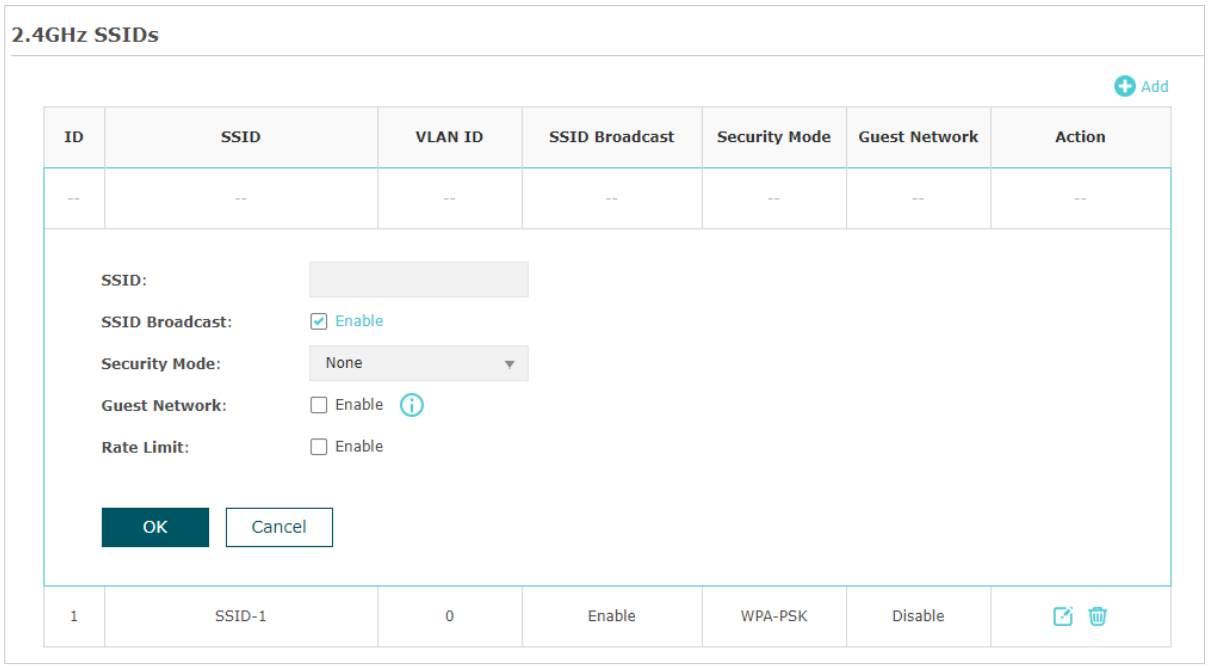
Before configuring the wireless parameters on each band, check the box to enable 2.4GHz or 5GHz Wireless Radio. Only when this option is enabled will the wireless radio on 2.4GHz or 5GHz band works.



Demonstrated with 2.4GHz, the following sections introduce these contents: *2.1.1 Configure SSIDs* and *2.1.2 Configure Wireless Advanced Settings*.

2.1.1 Configure SSIDs

SSID (Service Set Identifier) is used as an identifier for a wireless LAN, and is commonly called as the "network name". Clients can find and access the wireless network through the SSID. For one EAP, you can build up to eight SSIDs per frequency band.



Follow the steps below to create an SSID on the EAP:

1. If your EAP is a dual-band device, click 2.4GHz 5GHz to choose a frequency band on which the new SSID will be created.

2. Click Add to add a new SSID on the chosen band.

Tips:

You can also click to edit the specific SSID which already exists in the list. And you can click to delete the SSID in the list.

3. Configure the following required parameters for this SSID:

SSID	Specify a name for the wireless network.
SSID Broadcast	With the option enabled, EAP will broadcast the SSID to the nearby hosts, so that those hosts can find the wireless network identified by this SSID. If this option is disabled, users must enter the SSID manually to connect to the EAP.
Security Mode	Select the security mode of the wireless network. There are four options: *None*: Clients can access the wireless network without authentication. *WEP*/ *WPA-Enterprise*/ *WPA-Personal*: Clients need to pass the authentication before accessing the wireless network. For network security, we recommend that you encrypt your wireless network. The following sections will introduce how to configure these security modes.
Guest Network	With this option enabled, guest network will block clients from reaching any private IP subnet.
Rate Limit	With this option enabled, the download and upload rate of each client which connects to the SSID will be limited to balance bandwidth usage. You can limit the download and upload rate for some specific clients by configuring rate limit in client list, refer to *View Client Information* to get more details. Note that the download and upload rate will be limited to the smaller value if you set the limit value both in SSID and client configuration.

4. Click **OK** to create the SSID.

Following is the detailed instructions about how to configure *WEP*, *WPA-Enterprise* and *WPA-Personal*.

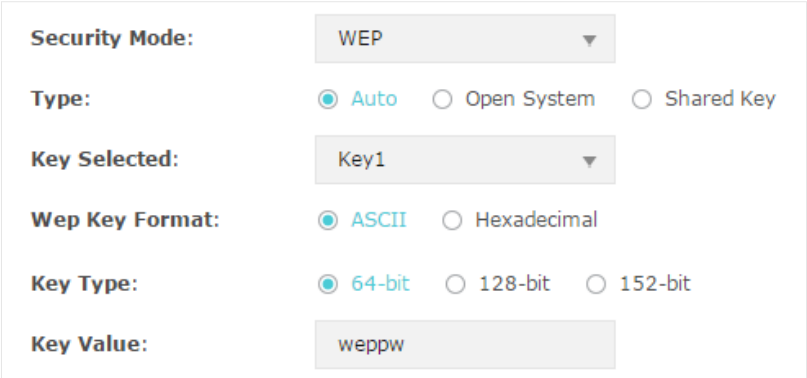
- **WEP**

WEP (Wired Equivalent Privacy) is a traditional encryption method. It has been proved that WEP has security flaws and can easily be cracked, so WEP cannot provide effective

protection for wireless networks. Since WPA-Personal and WPA-Enterprise are much safer than WEP, we recommend that you choose WPA-Personal or WPA-Enterprise if your clients also support them.

Note:

WEP is not supported in 802.11n mode or 802.11ac mode. If WEP is applied in 802.11n, 802.11 ac or 802.11n/ac mixed mode, the clients may not be able to access the wireless network. If WEP is applied in 802.11b/g/n mode (2.4GHz) or 802.11a/n (5GHz), the EAP may work at a low transmission rate.



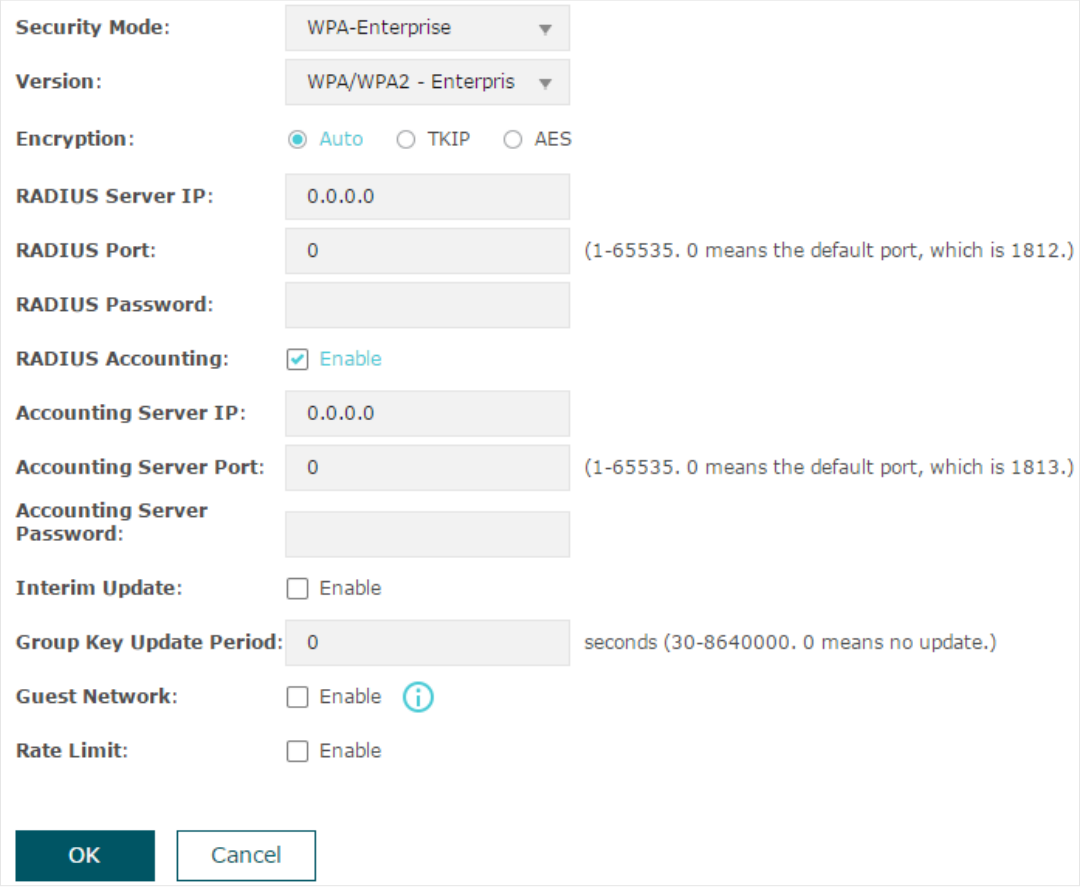
The following table detailedly introduces how to configure each item:

Type	Select the authentication type for WEP. **Auto:** The EAP can select Open System or Shared Key automatically based on the wireless capability and request of the clients. **Open System:** Clients can pass the authentication and associate with the wireless network without password. However, correct password is necessary for data transmission. **Shared Key:** Clients have to input the correct password to pass the authentication, otherwise the clients cannot associate with the wireless network or transmit data.
Key Selected	Select one key to specify. You can configure four keys at most.
WEP Key Format	Select ASCII or Hexadecimal as the WEP key format. **ASCII:** With this format selected, the WEP key can be any combination of keyboard characters of the specified length. **Hexadecimal:** With this format selected, the WEP key can be any combination of hexadecimal digits (0-9, a-f, A-F) with the specified length.
Key Type	Select the WEP key length for encryption. **64Bit:** Enter 10 hexadecimal digits or 5 ASCII characters. **128Bit:** Enter 26 hexadecimal digits or 13 ASCII characters. **152Bit:** Enter 32 hexadecimal digits or 16 ASCII characters.

Key Value	Enter the WEP keys. The length and valid characters are determined by the key format and key type.

- **WPA-Enterprise**

WPA-Enterprise (Wi-Fi Protected Access-Enterprise) is a safer encryption method compared with WEP and WPA-Personal. It requires a RADIUS server to authenticate the clients via 802.1X and EAP (Extensible Authentication Protocol). WPA-Enterprise can generate different passwords for different clients, which ensures higher network security. But it also costs more to maintain the network, so it is more suitable for business networks.



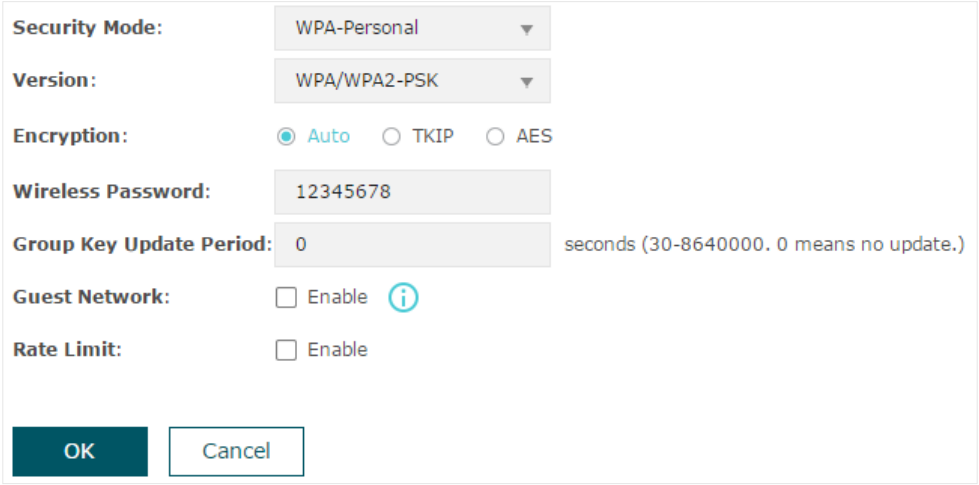
The following table introduces how to configure each item:

Version	Select the version of WPA-Enterprise according to your needs. If you select WPA/WPA2-Enterprise, the EAP automatically decides whether to use WPA-Enterprise or WPA2-Enterprise during the authentication process.

Encryption	Select the Encryption type. Note that some encryption type is only available under certain circumstances. **Auto:** The default setting is Auto and the EAP will select TKIP or AES automatically based on the client device's request. **TKIP:** Temporal Key Integrity Protocol. TKIP is not supported in 802.11n mode, 802.11ac mode or 802.11n/ac mixed mode. If TKIP is applied in 802.11n, 802.11 ac or 802.11n/ac mixed mode, the clients may not be able to access the wireless network. If TKIP is applied in 11b/g/n mode (2.4GHz) or 11a/n mode(5GHz), the device may work at a low transmission rate. **AES:** Advanced Encryption Standard. It is securer than TKIP.
RADIUS Server IP	Enter the IP address of the RADIUS Server.
RADIUS Port	Enter the port number of the RADIUS Server.
RADIUS Password	Enter the shared secret key of the RADIUS server.
RADIUS Accounting	Enable or disable RADIUS accounting feature.
Accounting Server IP	Enter the IP address of the accounting server.
Accounting Server Port	Enter the port number of the accounting server.
Accounting Server Password	Enter the shared secret key of the accounting server.
Interim Update	With this option enabled, you can specify the duration between accounting information updates. By default, the function is disabled. Enter the appropriate duration between updates for EAPs in **Interim Update Interval**.
Interim Update Interval	With Interim Update enabled, specify the appropriate duration between updates for EAPs. The default duration is 600 seconds.
Group Key Update Period	Specify an update period of the encryption key. The update period instructs how often the EAP should change the encryption key. 0 means that the encryption key does not change at anytime.

- ## WPA-Personal

WPA-Personal is based on a pre-shared key. It is characterized by high safety and simple settings, so it is mostly used by common households and small businesses.



The following table introduces how to configure each item:

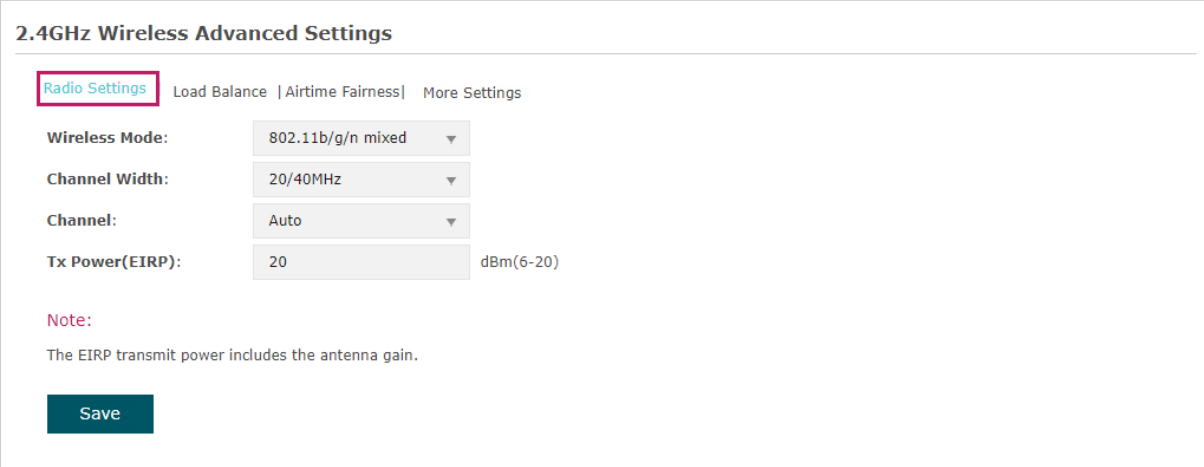
Version	Select the version of WPA-Personal according to your needs. If you select WPA/WPA2-PSK, the EAP automatically decides whether to use WPA-PSK or WPA2-PSK during the authentication process.
Encryption	Select the Encryption type. Note that some encryption type is only available under certain circumstances. **Auto:** The default setting is Auto and the EAP will select TKIP or AES automatically based on the client device's request. **TKIP:** Temporal Key Integrity Protocol. TKIP is not supported in 802.11n mode, 802.11ac mode or 802.11n/ac mixed mode. If TKIP is applied in 802.11n, 802.11 ac or 802.11n/ac mixed mode, the clients may not be able to access the wireless network. If TKIP is applied in 11b/g/n mode (2.4GHz) or 11a/n mode(5GHz), the device may work at a low transmission rate. **AES:** Advanced Encryption Standard. It is securer than TKIP.
Wireless Password	Configure the wireless password with ASCII characters. • For ASCII, the length should be between 8 and 63 and the valid characters contain numbers, letters (case-sensitive) and common punctuations.
Group Key Update Period	Specify an update period of the encryption key. The update period instructs how often the EAP should change the encryption key. 0 means that the encryption key does not change at anytime.

2.1.2 Configure Wireless Advanced Settings

Proper wireless parameters can improve the performance of your wireless network. This section introduces how to configure the advanced wireless parameters of the EAP, including *Radio Setting*, *Load Balance*, *Airtime Fairness* and *More Settings*.

Radio Setting

Radio settings directly control the behavior of the radio in the EAP and its interaction with the physical medium; that is, how and what type of signal the EAP emits.



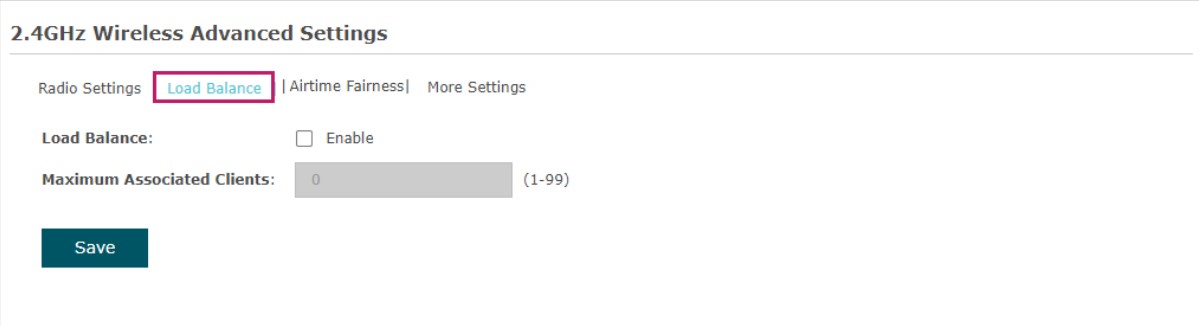
Select the frequency band (2.4GHz/5GHz) and configure the following parameters.

Wireless Mode	Select the IEEE 802.11 mode the radio uses. • For 2.4GHz: **802.11b/g/n/ax mixed:** All of 802.11b, 802.11g, 802.11n, and 802.11ax clients operating in the 2.4GHz frequency can connect to the EAP. Note that 802.11ax is only available for certain devices. **802.11b/g/n mixed**: All of 802.11b, 802.11g, and 802.11n clients operating in the 2.4GHz frequency can connect to the EAP. **802.11b/g mixed**: Both 802.11b and 802.11g clients can connect to the EAP. **802.11n only**: Only 802.11n clients can connect to the EAP. • For 5GHz: **802.11a/n/ac/ax mixed**: All of 802.11a, 802.11n, 802.11ac, and 802.11ax clients operating in the 5GHz frequency can connect to the EAP. Note that 802.11ax is only available for certain devices. **802.11a/n/ac mixed**: All of 802.11a, 802.11n, and 802.11ac clients operating in the 5GHz frequency can connect to the EAP. **802.11n/ac mixed**: Both 802.11n clients and 802.11ac clients operating in the 5GHz frequency can connect to the EAP. **802.11ac only**: Only 802.11ac clients can connect to the EAP.
Channel Width	Select the channel width of the EAP. The available options differ among different EAPs. For some EAPs, available options include **20MHz**, **40MHz** and **Auto**. For some EAPs, available options include **20MHz**, **40MHz**, **80MHz** and **Auto**. For other EAPs, available options include **20MHz**, **40MHz**, **80MHz**, **160MHz** and **Auto.** When the radio mode includes 802.11n, we recommend you set the channel bandwidth to 20/40 MHz or 20/40/80MHz to improve the transmission speed. However, you may choose a lower bandwidth due to the following reasons: • To increase the available number of channels within the limited total bandwidth. • To avoid interference from overlapping channels occupied by other devices in the environment. • Lower bandwidth can concentrate higher transmit power, increasing stability of wireless links over long distances.

Channel Limit	Check the box to enable the Channel Limit function. With this function enabled, the wireless frequency 5150MHz~5350MHz will be disabled. This function can influence the available options in Channel. This feature is only available on certain devices. To check whether your device supports this feature, refer to the actual web interface.
Channel	Select the channel used by the EAP. For example, 1/2412MHz means that the channel is 1 and the frequency is 2412MHz. By default, the channel is automatically selected, and we recommend that you keep the default setting.
Tx Power (EIRP)	Specify the transmit power value. If this value is set to be larger than the maximum transmit power that is allowed by the local regulation, the regulated maximum transmit power will be applied in the actual situation. ***Note:*** In most cases, it is unnecessary to use the maximum transmit power. Specifying a larger transmit power than needed may cause interference to the neighborhood. Also it consumes more power and reduces longevity of the device.

Load Balance

With the Load Balance feature, you can limit the maximum number of clients who can access the EAP. In this way, you can achieve rational use of network resources.



Follow the steps below to configure Load Balance:

1. Click 2.4GHz 5GHz to choose a frequency band on which the load balance feature will take effect.
2. Check the box to enable Load Balance.
3. Specify the maximum number of clients who can connect to the EAP at the same time. While the number of connected clients has reached the limit and there are more clients requesting to access the network, the EAP will disconnect those with weaker signals.
4. Click **Save**.

Airtime Fairness

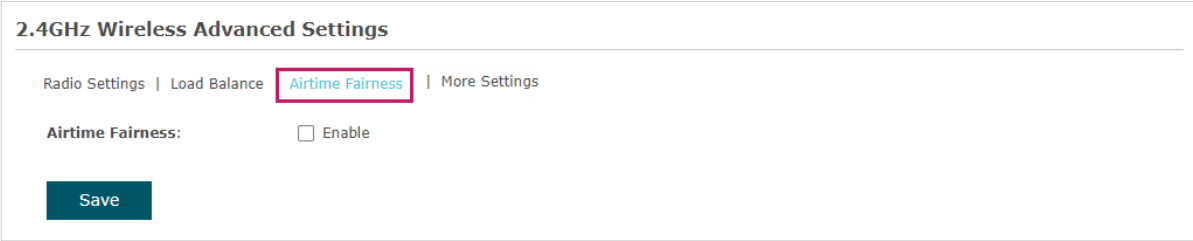
Note:

Airtime Fairness is only available on certain devices. To check whether your device supports this feature, refer to the actual web interface.

With Airtime Fairness enabled, each client connected to the EAP can get the same amount of time to transmit data, avoiding low-data-rate clients to occupy too much network bandwidth.

Compared with the relatively new client devices, some legacy client devices support slower wireless rate. If they communicate with the same EAP, the slower clients take more time to transmit and receive data compared with the faster clients. As a result, the overall wireless throughput of the network decreases.

Therefore we recommend you check the box to enable this function under multi-rate wireless networks. In this way, the faster clients can get more time for the data transmission and the network overall throughput can be improved.

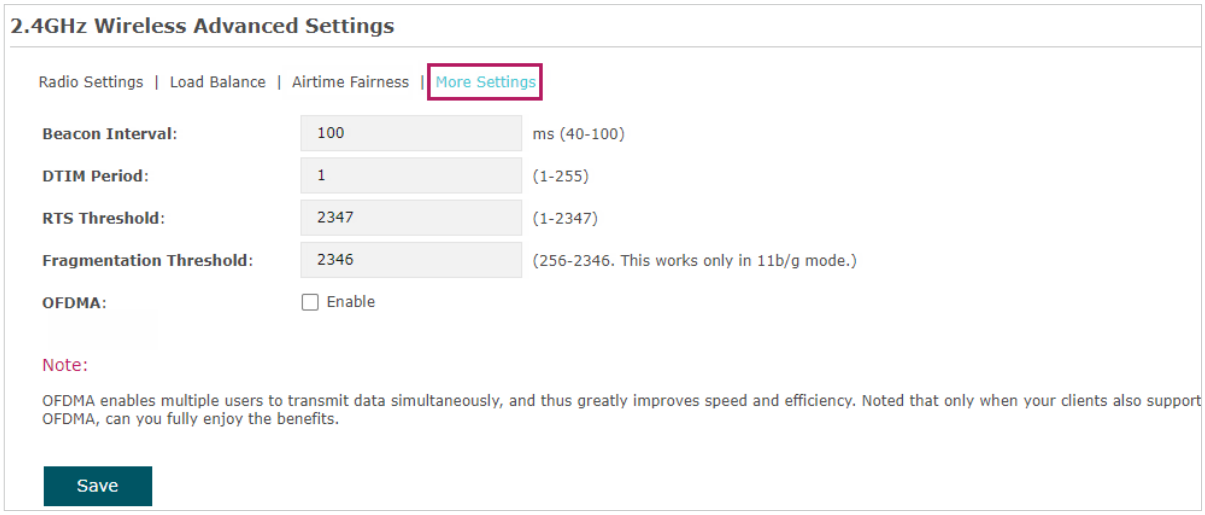


Note:

With Airtime Fairness enabled, 50 wireless clients at most can connect to the EAP in 2.4GHz band.

More Settings

Proper wireless parameters can improve the network's stability, reliability and communication efficiency. The advanced wireless parameters consist of Beacon Interval, DTIM Period, RTS Threshold, Fragmentation Threshold, and OFDMA.



The following table introduces how to configure each item:

Beacon Interval	Beacons are transmitted periodically by the EAP to announce the presence of a wireless network for the clients. **Beacon Interval** determines the time interval of the beacons sent by the EAP. You can specify a value between 40 and 100ms. The default is 100ms.
DTIM Period	The DTIM (Delivery Traffic Indication Message) is contained in some Beacon frames. It indicates whether the EAP has buffered data for client devices. The **DTIM Period** indicates how often the clients served by this EAP should check for buffered data still on the EAP awaiting pickup. You can specify the value between 1-255 Beacon Intervals. The default value is 1, indicating that clients check for buffered data at every beacon. An excessive DTIM interval may reduce the performance of multicast applications, so we recommend you keep the default value.

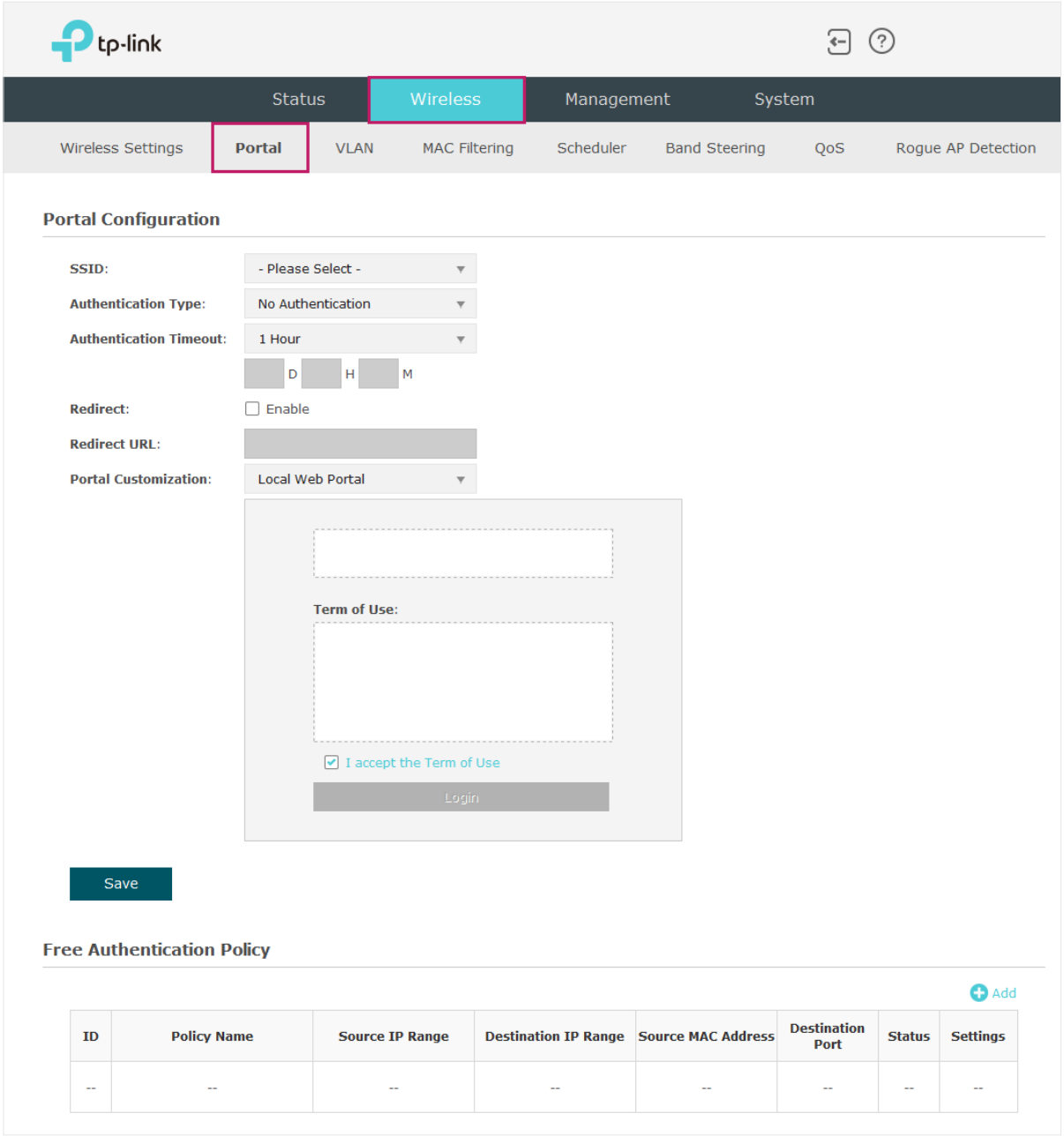
RTS Threshold	RTS/CTS (Request to Send/Clear to Send) is used to improve the data transmission efficiency of the network with hidden nodes, especially when there are lots of large packets to be transmitted. When the size of a data packet is larger than the **RTS Threshold**, the RTS/CTS mechanism will be activated. With this mechanism activated, before sending a data packet, the client will send an RTS packet to the EAP to request data transmitting. And then the EAP will send CTS packet to inform other clients to delay their data transmitting. In this way, packet collisions can be avoided. For a busy network with hidden nodes, a low threshold value will help reduce interference and packet collisions. But for a not-so-busy network, a too low threshold value will cause bandwidth wasting and reduce the data throughput. The recommended and default value is 2347 bytes.
Fragmentation Threshold	The fragmentation function can limit the size of packets transmitted over the network. If the size of a packet exceeds the **Fragmentation Threshold**, the fragmentation function is activated and the packet will be fragmented into several packets. Fragmentation helps improve network performance if properly configured. However, a too low fragmentation threshold may result in poor wireless performance caused by the extra work of dividing up and reassembling of frames and increased message traffic. The recommended and default value is 2346 bytes.
OFDMA	OFDMA enables multiple users to transmit data simultaneously, and thus greatly improves speed and efficiency. Only when your clients also support OFDMA, can you fully enjoy the benefits. This feature is only available on certain devices. To check whether your device supports this feature, refer to the actual web interface.

2.2 Configure Portal Authentication

Portal authentication provides authentication service to the clients that only need temporary access to the wireless network, such as the customers in a restaurant or in a supermarket. To access the network, these clients need to enter the authentication login page and use the correct login information to pass the authentication. In addition, you can customize the authentication login page and specify a URL which the authenticated clients will be redirected to.

In this module, you can also configure Free Authentication Policy, which allows the specific clients to access the specific network resources without authentication.

To configure portal authentication, go to the **Wireless > Portal** page.

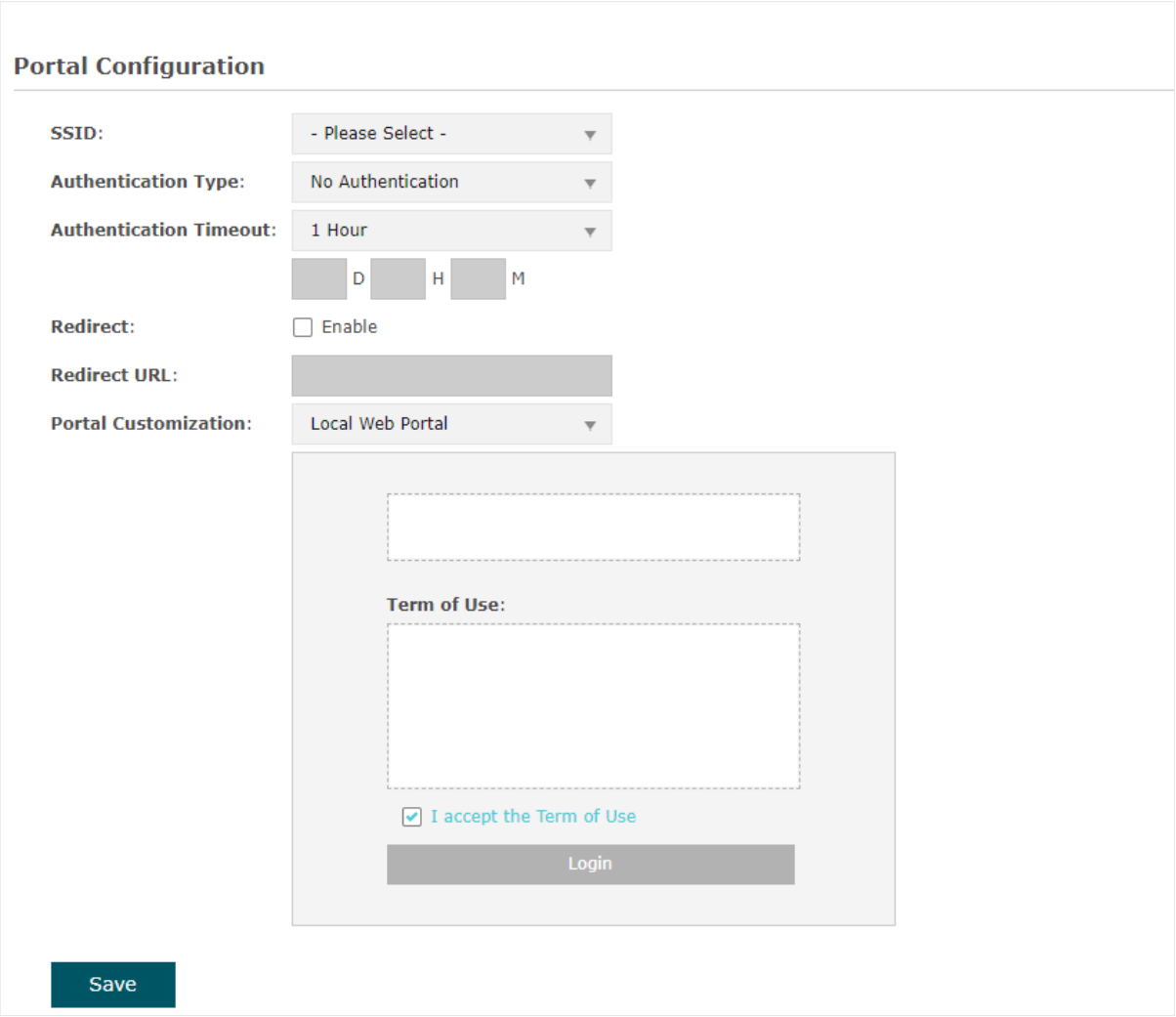


Configure Portal

Three portal authentication types are available: *No Authentication*, *Local Password* and *External RADIUS Server*. The following sections introduce how to configure each authentication type.

• No Authentication

With this authentication type configured, clients can pass the authentication and access the network without providing any login information. They only need to accept the term of use on the authentication page.



Follow the steps below to configure No Authentication as the portal authentication type:

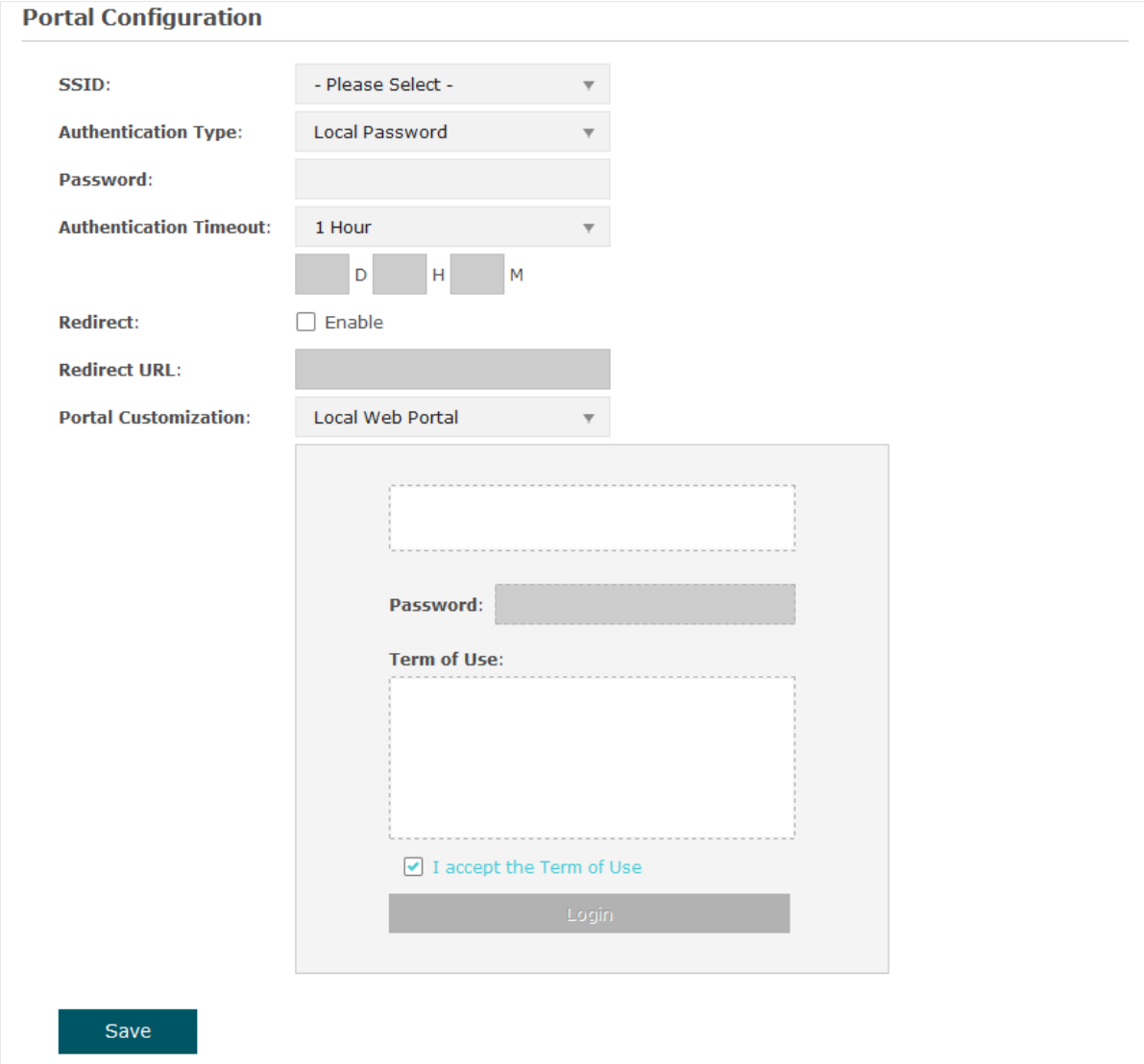
1. Select the SSID on which the portal will take effect.
2. Select **No Authentication** as the authentication type.
3. Configure the relevant parameters as the following table shows:

Authentication Timeout	Specify the value of authentication timeout. A client's authentication will expire after the authentication timeout and the client needs to log in to the authentication page again to access the network. Options include **1 Hour, 8 Hours, 24 Hours, 7 Days,** and **Custom**. With **Custom** selected, you can customize the time in days, hours, and minutes.
Redirect	With this function configured, the newly authenticated client will be redirected to the specific URL.
Redirect URL	With **Redirect** enabled, you also need to enter the URL in this field. The newly authenticated client will be redirected to this URL.
Portal Customization	Configure the authentication page. **Local Web Portal** is the only available option in this authentication type. Enter the title and term of use in the two boxes. The EAP uses its built-in web server to provide this authentication page for clients. To pass the authentication, clients only need to check the box of **I accept the Term of Use** and click the **Login** button.

4. Click **Save**.

- ## Local Password

With this authentication type configured, clients are required to provide the correct password to pass the authentication.



Follow the steps below to configure Local Password as the portal authentication type:

1. Select the SSID on which the portal will take effect.
2. Select **Local Password** as the authentication type.
3. Configure the relevant parameters as the following table shows:

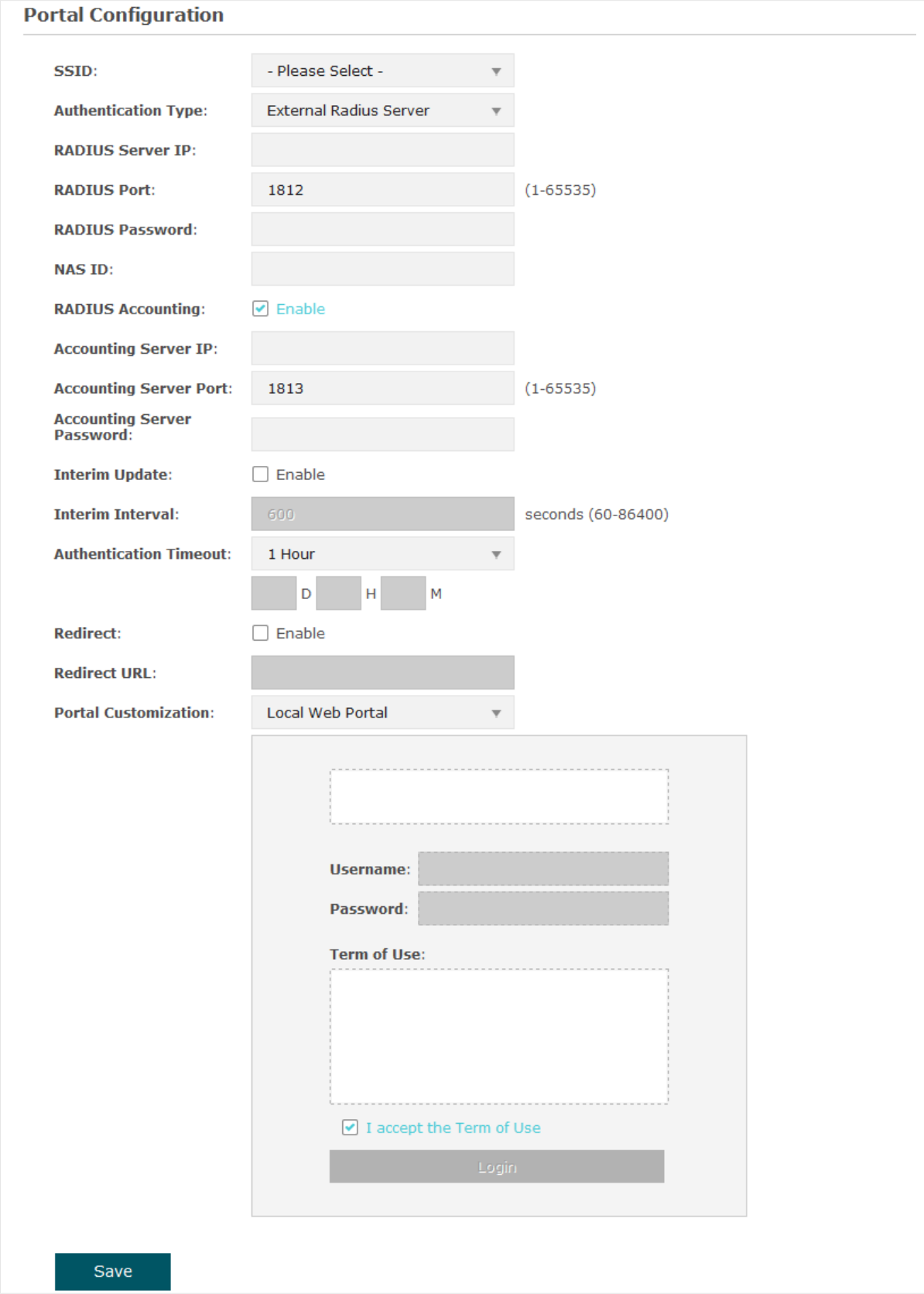
Password	Specify a password for authentication.

Authentication Timeout	Specify the value of authentication timeout. A client's authentication will expire after the authentication timeout and the client needs to log in to the authentication page again to access the network. Options include **1 Hour, 8 Hours, 24 Hours, 7 Days,** and **Custom**. With **Custom** selected, you can customize the time in days, hours, and minutes.
Redirect	With this function configured, the newly authenticated client will be redirected to the specific URL.
Redirect URL	With **Redirect** enabled, you also need to enter the URL in this field. The newly authenticated client will be redirected to this URL.
Portal Customization	Configure the authentication page. **Local Web Portal** is the only available option is this authentication type. Enter the title and term of use in the two boxes. The EAP uses its built-in web server to provide this authentication page for clients. To pass the authentication, clients need to provide the correct password in the **Password** field, check the box of **I accept the Term of Use** and click the **Login** button.

4. Click **Save**.

- ## External RADIUS Server

If you have a RADIUS server on the network to authenticate the clients, you can select **External Radius Server**. Clients need to provide the correct login information to pass the authentication.



Follow the steps below to configure External Radius Server as the portal authentication type:

1. Select the SSID on which the portal will take effect.
2. Build a RADIUS server on the network and make sure that it is reachable by the EAP.
3. Go to the **Portal** configuration page on the EAP. Select **External Radius Server** as the authentication type.

3. Configure the relevant parameters as the following table shows:

RADIUS Server IP	Enter the IP address of RADIUS server.
RADIUS Port	Enter the port of the RADIUS server.
RADIUS Password	Enter the password of the RADIUS server.
NAS ID	Configure a Network Access Server Identifier (NAS ID) using 1 to 64 characters on the portal. The NAS ID is sent to the RADIUS server by the EAP through an authentication request packet. With the NAS ID which classifies users to different groups, the RADIUS server can send a customized authentication response.
RADIUS Accounting	Enable or disable RADIUS accounting feature.
Accounting Server IP	Enter the IP address of the accounting server.
Accounting Server Port	Enter the port number of the accounting server.
Accounting Server Passsword	Enter the shared secret key of the accounting server.
Interim Update	With this option enabled, you can specify the duration between accounting information updates. By default, the function is disabled. Enter the appropriate duration between updates for EAPs in **Interim Update Interval**.
Interim Interval	With Interim Update enabled, specify the appropriate duration between updates for EAPs. The default duration is 600 seconds.
Authentication Timeout	Specify the value of authentication timeout. A client's authentication will expire after the authentication timeout and the client needs to log in to the authentication page again to access the network. Options include **1 Hour, 8 Hours, 24 Hours, 7 Days,** and **Custom**. With **Custom** selected, you can customize the time in days, hours, and minutes.

Redirect	With this function configured, the newly authenticated client will be redirected to the specific URL.
Redirect URL	With **Redirect** enabled, you also need to enter the URL in this field. The newly authenticated client will be redirected to this URL.
Portal Customization	Configure the authentication page. There are two options: **Local Web Portal** and **External Web Portal**. • Local Web Portal Enter the title and term of use in the two boxes. The EAP uses its built-in web server to provide this authentication page for clients. To pass the authentication, clients need to provide the correct username and password in the **Username** and **Password** fields, check the box of **I accept the Term of Use** and click the **Login** button. • External Web Portal With External Web Portal configured, the authentication page will be provided by the web portal server built on the network. To configure External Web Portal, you need to complete the following configurations: 1. Build an external web portal server on your network and make sure that it is reachable by the EAP. 2. On this configuration page, enter the URL of the authentication page provided by the external portal server. **Portal Customization:** External Web Portal **External Web Portal URL:** 3. Add the external web portal server to the **Free Authentication Policy** list. In this way, clients can access the web portal server before authenticated. For details about how to configure Free Authentication Policy, refer to *Configure Free Authentication Policy*.

4. Click **Save**.

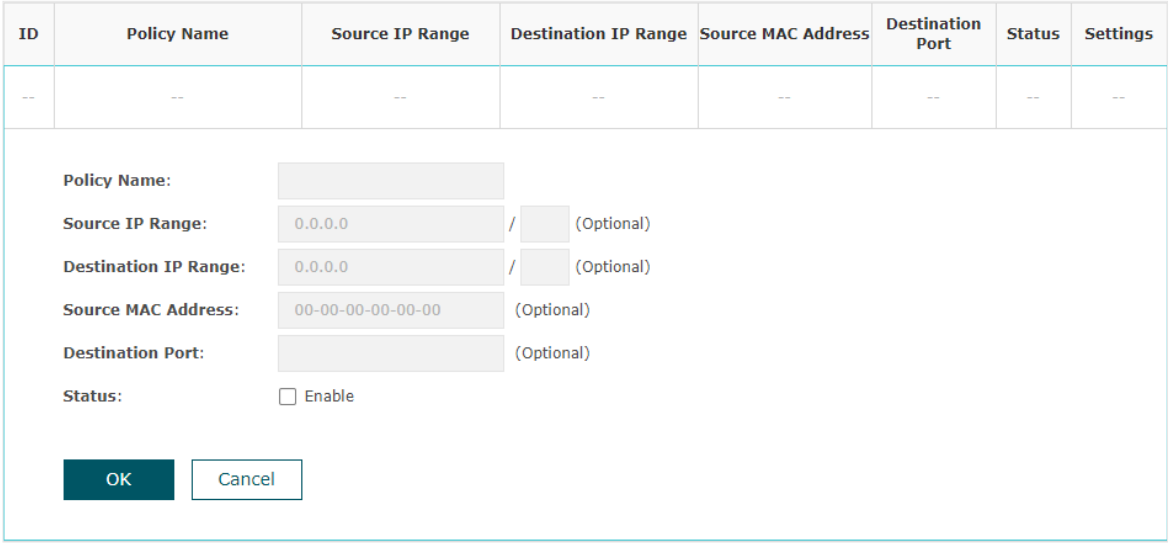
Configure Free Authentication Policy

Free Authentication Policy allows some specific clients to access the specific network resources without authentication. For example, you can set a free authentication policy to allow clients to visit the external web portal server before authenticated. In this way,

the clients can visit the login page provided by the web portal server and then pass the subsequent authentication process.

Follow the steps below to add free authentication policy.

1. In the **Free Authentication Policy** section, click Add to load the following page.



2. Configure the following parameters. When all the configured conditions are met, the client can access the network without authentication.

Policy Name	Specify a name for the policy.
Source IP Range	Specify an IP range with the subnet and mask length. The clients in this IP range can access the network without authentication. Leaving the field empty means that clients with any IP address can access the specific resources.
Destination IP Range	Specify an IP range with the subnet and mask length. The devices in this IP range can be accessed by the clients without authentication. Leaving the field empty means that all devices in the LAN can be accessed by the specific clients.
Source MAC Address	Specify the MAC address of the client, who can access the specific resources without authentication. Leaving the field empty means that clients with any MAC address can access the specific resources.

Destination Port	Specify the port number of the service. When using this service, the clients can access the specific resources without authentication. Leaving the field empty means that clients can access the specific resources no matter what service they are using.
Status	Check the box to enable the policy.

Tips:

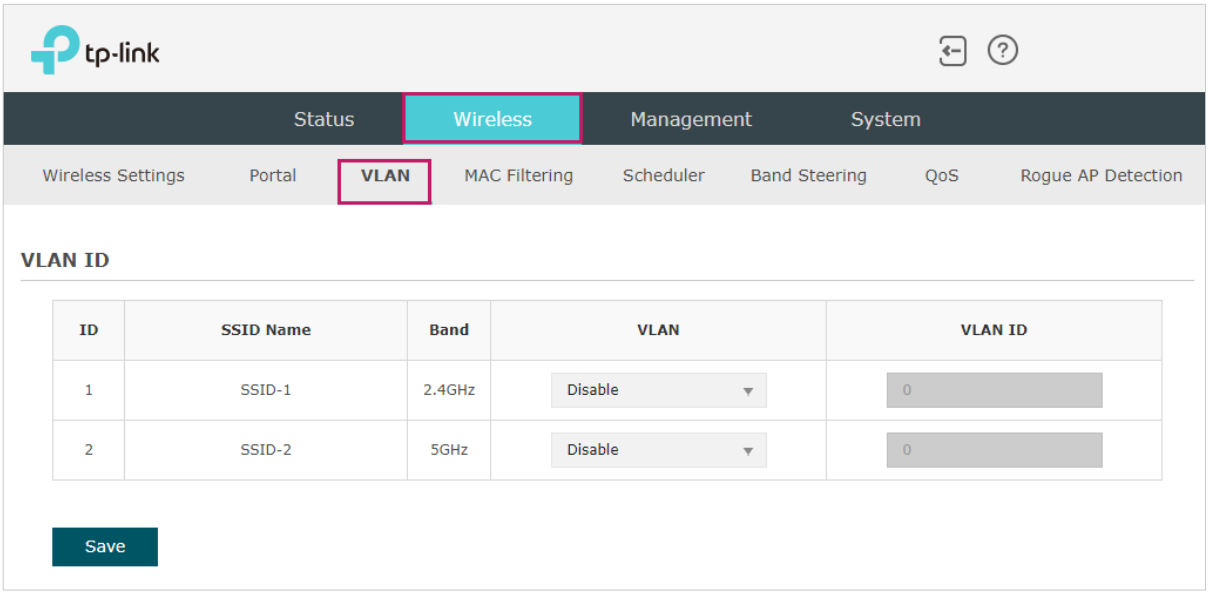
When External Web Portal is configured in the portal configuration, you should set the IP address and subnet mask of the external web server as the **Destination IP Range**. As for **Source IP Range, Source MAC Address** and **Destination Port**, you can simply keep them as empty or configure them according to your actual needs.

3. Click **OK** to add the policy.

2.3 Configure VLAN

Wireless VLAN is used to set VLANs for the wireless networks. With this feature, the EAP can work together with the switches supporting 802.1Q VLAN. Traffic from the clients in different wireless networks is added with different VLAN tags according to the VLAN settings of the wireless networks. Then the wireless clients in different VLANs cannot directly communicate with each other. Note that the traffic from the wired clients will not be added with VLAN tags.

To configure VLAN for the wireless network, go to the **Wireless > VLAN** page.



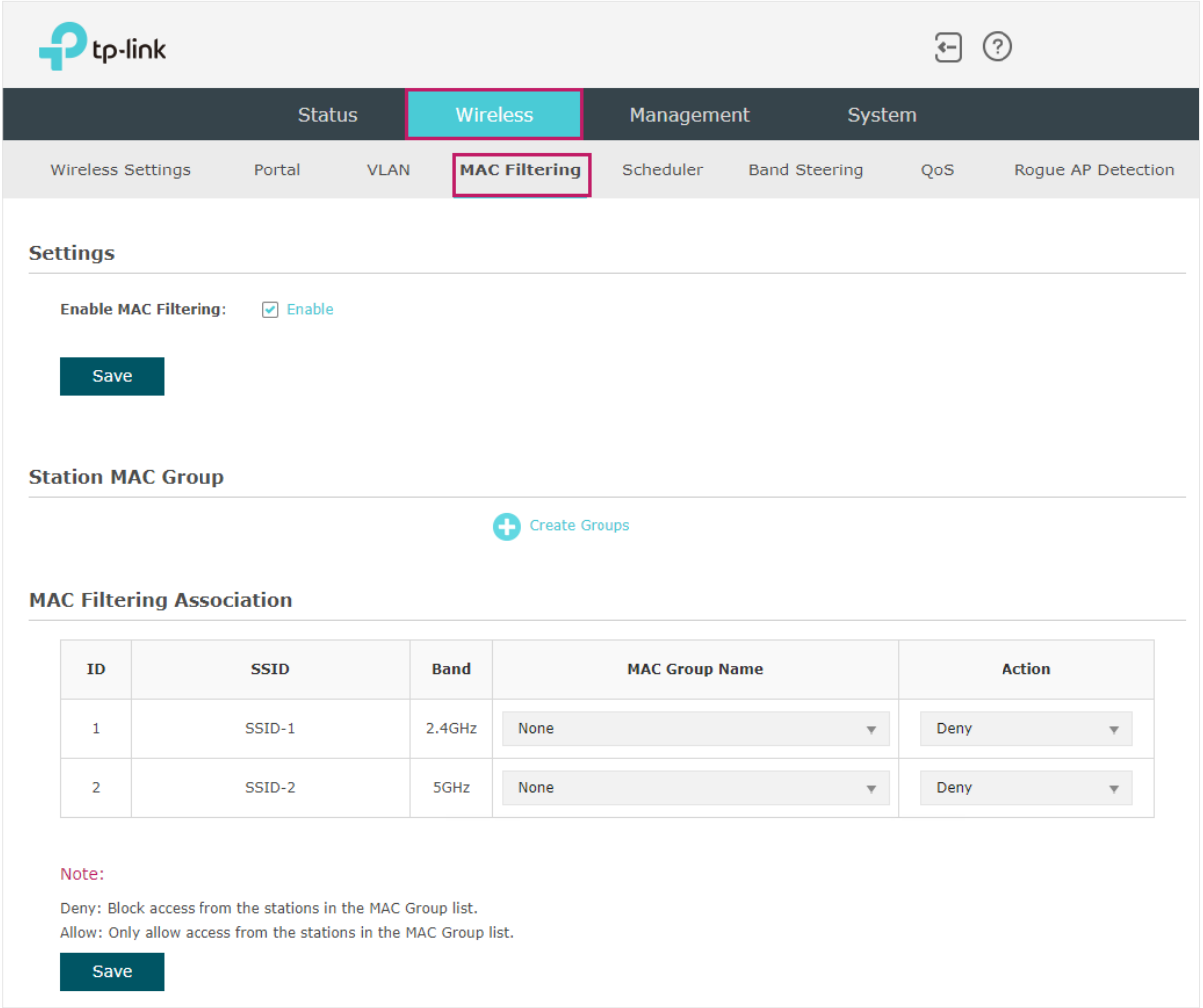
Follow the steps below to configure VLAN on this page.

1. Select the specific SSID in the list to configure the VLAN.
2. In the **VLAN** column and select **Enable** to enable the VLAN function on the SSID.
3. Specify the VLAN ID for the wireless network in the **VLAN ID** column. Every VLAN ID represents a different VLAN. It supports maximum 8 VLANs per frequency band. The VLAN ID range is 0 to 4094. 0 is used to disable VLAN tagging.
4. Click **Save**.

2.4 Configure MAC Filtering

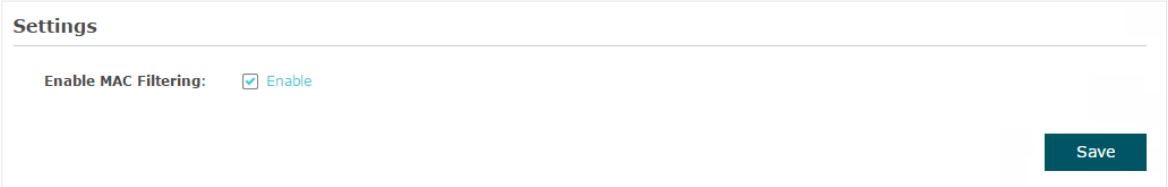
MAC Filtering is used to allow or block the clients with specific MAC addresses to access the network. With this feature you can effectively control clients' access to the wireless network according to your needs.

To configure MAC Filtering, go to the **Wireless > MAC Filtering** page.

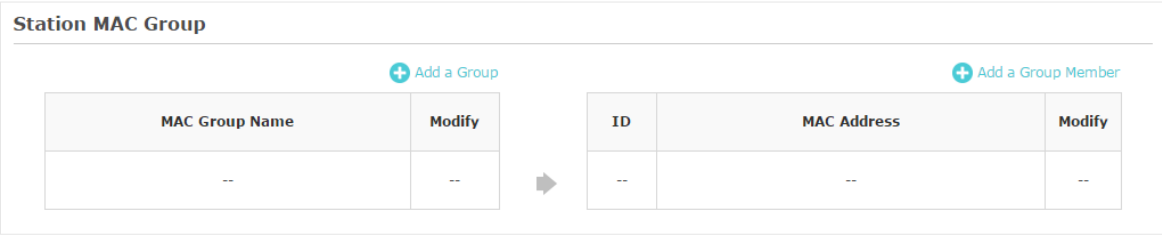


Follow the steps below to configure MAC Filtering on this page:

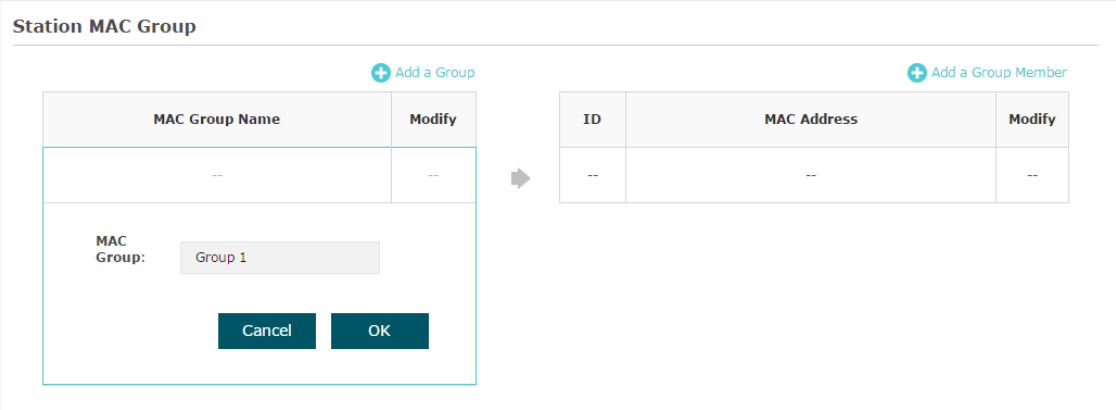
1. In the **Settings** section, check the box to enable **MAC Filtering**, and click **Save**.



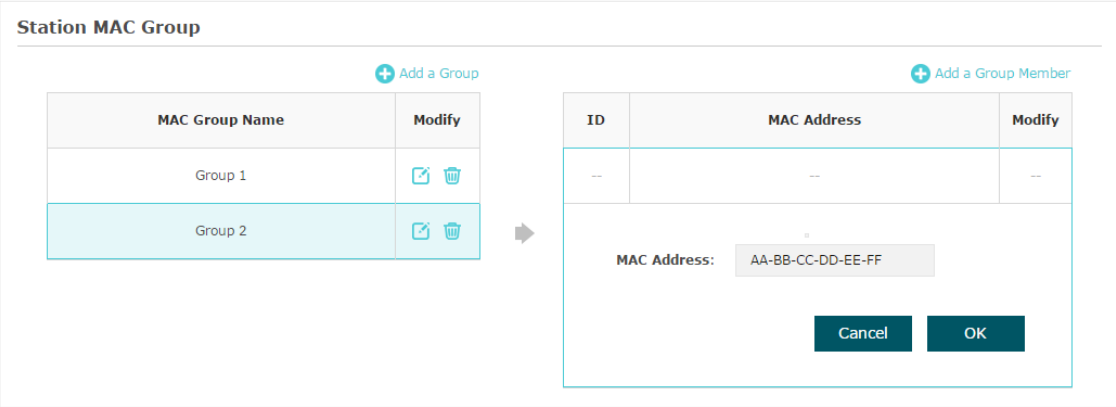
2. In the **Station MAC Group** section, click Create Groups and the following page will appear.



1) Click Add a Group and specify a name for the MAC group to be created. Click **OK**. You can create up to eight MAC groups.

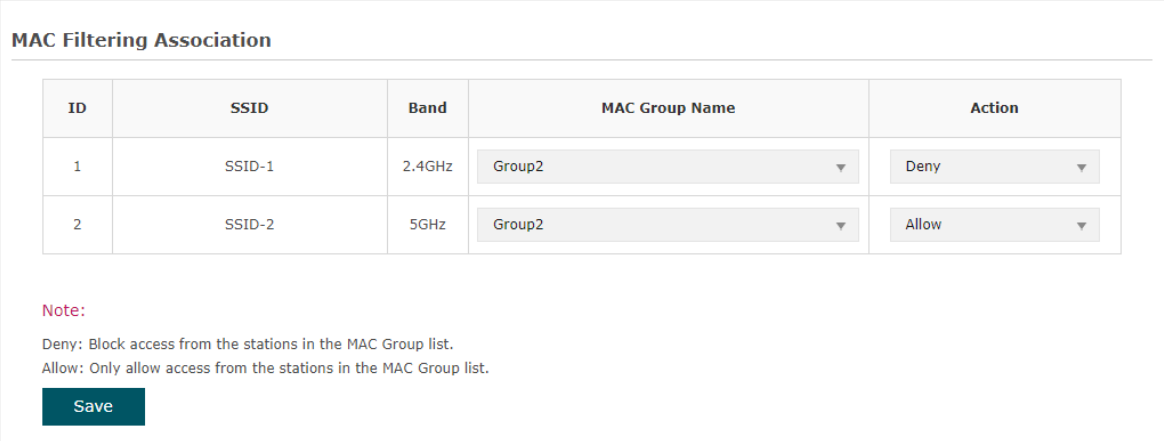


2) Select a MAC group in the group list (the color of the selected one will change to blue). Click Add a Group Member to add group members to the MAC group. Specify the MAC address of the host and click **OK**. In the same way, you can add more MAC addresses to the selected MAC group.



3. In the **MAC Filtering Association** section, configure the filtering rule. For each SSID, you can select a MAC group in the **MAC Group Name** column and select the filtering rule **(Allow/Deny)** in the **Action** column. Click **Save**.

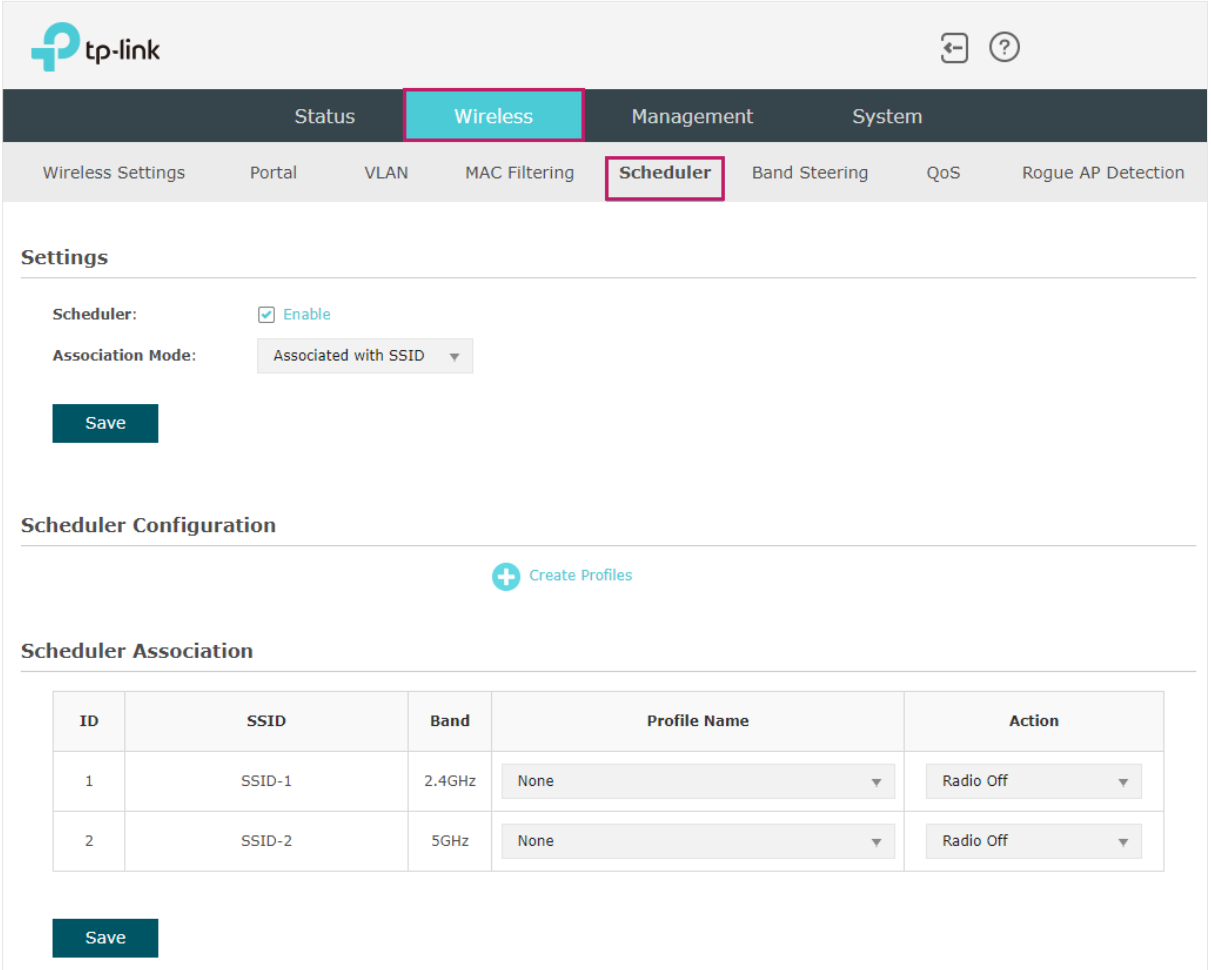
For example, the following configuration means that the hosts in Group 2 are denied to access the SSID **SSID-1** on the 2.4GHz band and allowed to access the SSID **SSID-2** on the 5GHz band.



2.5 Configure Scheduler

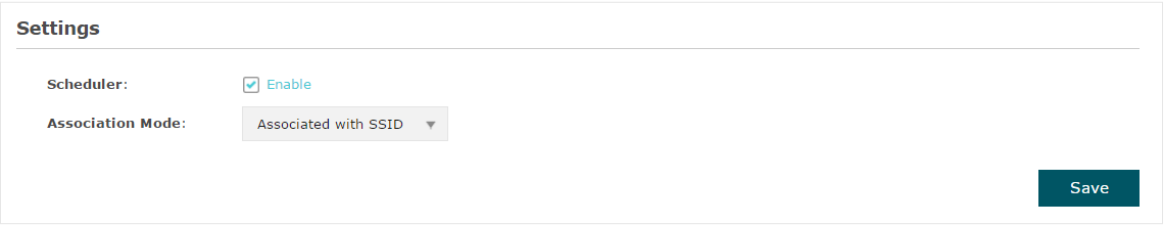
With the Scheduler feature, the EAP or its wireless network can automatically turn on or off at the time you set. For example, you can schedule the radio to operate only during the office working time to reduce power consumption.

To configure Scheduler, go to the **Wireless > Scheduler** page.

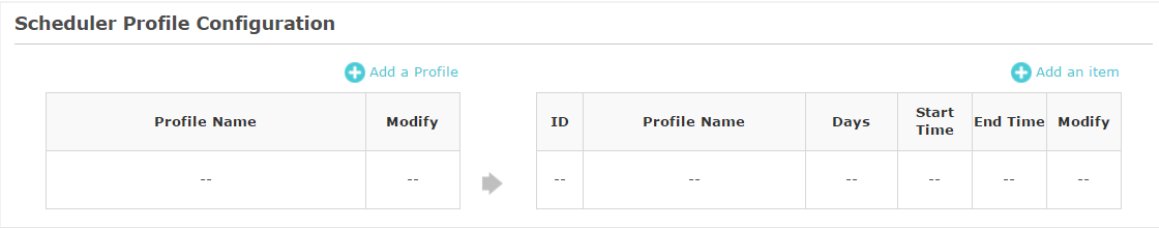


Follow the steps below to configure Scheduler on this page:

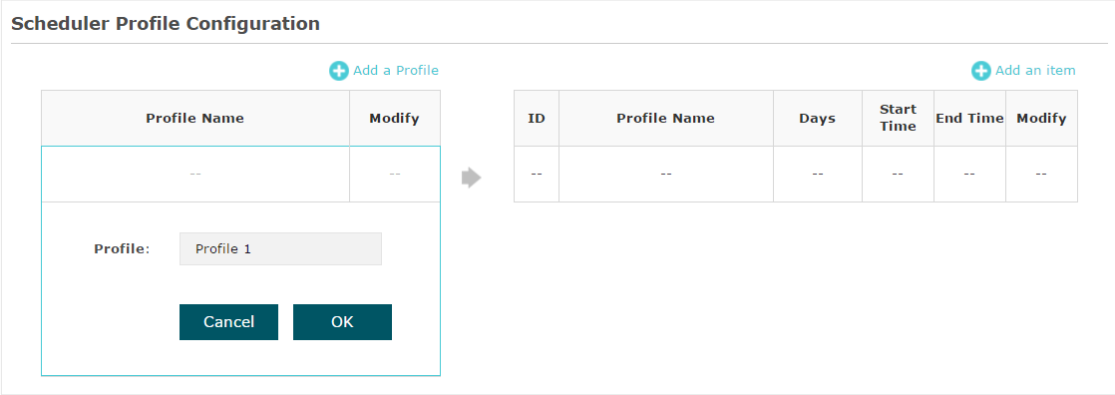
1. In the **Settings** section, check the box to enable **Scheduler** and select the **Association Mode**. There are two modes: **Associated with SSID** (the scheduler profile will be applied to the specific SSID) and **Associated with AP** (the profile will be applied to all SSIDs on the EAP). Then click **Save**.



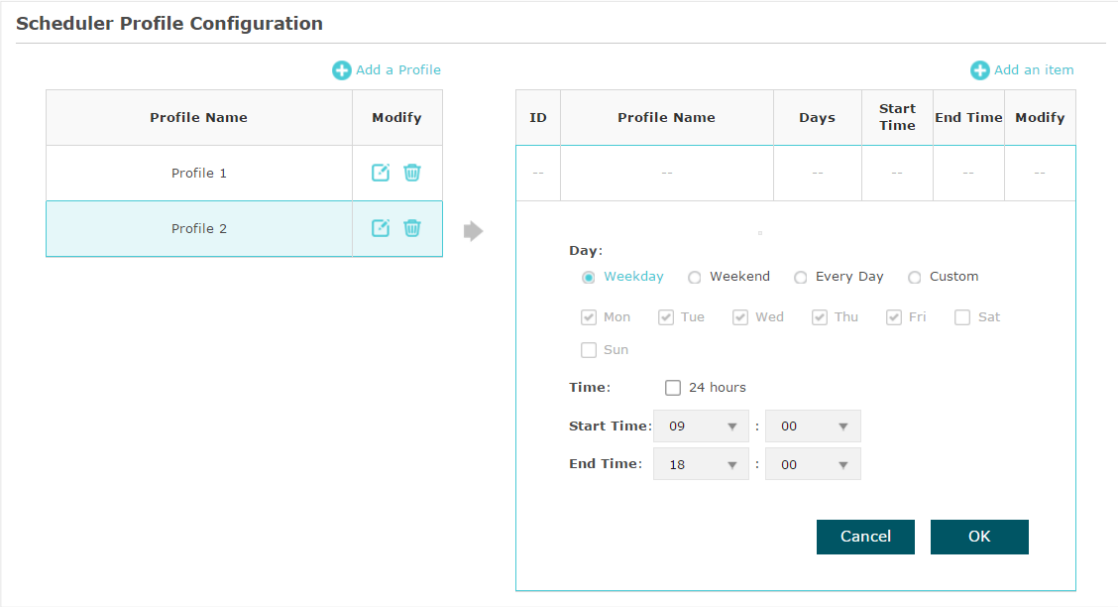
2. In the **Scheduler Profile Configuration** section, click Create Profiles and the following page will appear.



1) Click Add a Profile and specify a name for the profile to be created. Click **OK**. You can create up to eight profiles.



2) Select a profile in the list (the color of the selected one will change to blue). Click Add an item to add time range items to the profile. Specify the **Day, Start Time** and **End Time** of the time range, and click **OK**.



Tips:

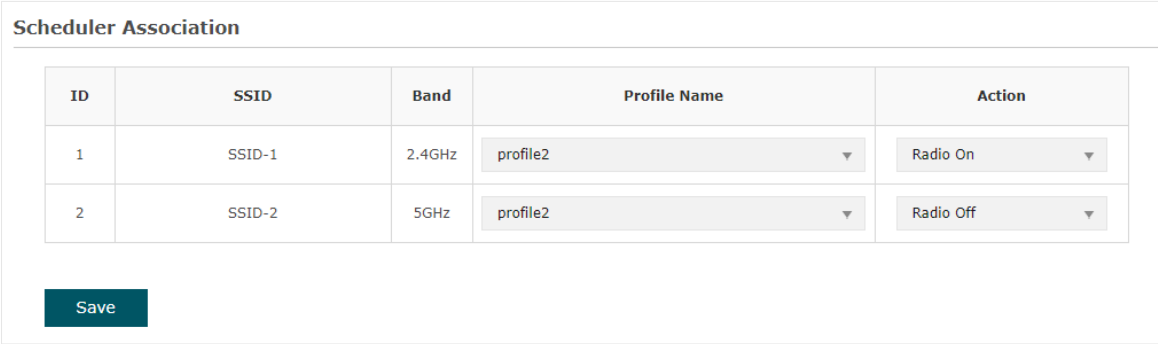
You can add up to eight time range items for one profile. If there are several time range items in one profile, the time range of this profile is the sum of all of these time ranges.

3. In the **Scheduler Association** section, configure the scheduler rule. There are two association modes: *Association with SSID* and *Association with AP*. The following sections introduce how to configure each mode.

■ Association with SSID

If you select **Association with SSID** in step 1, the Scheduler Association table will display all the SSIDs on the EAP. For each SSID, you can select a profile in the **Profile Name** column and select the scheduler rule **(Radio On/Radio Off)** in the **Action** column. Then click **Save**.

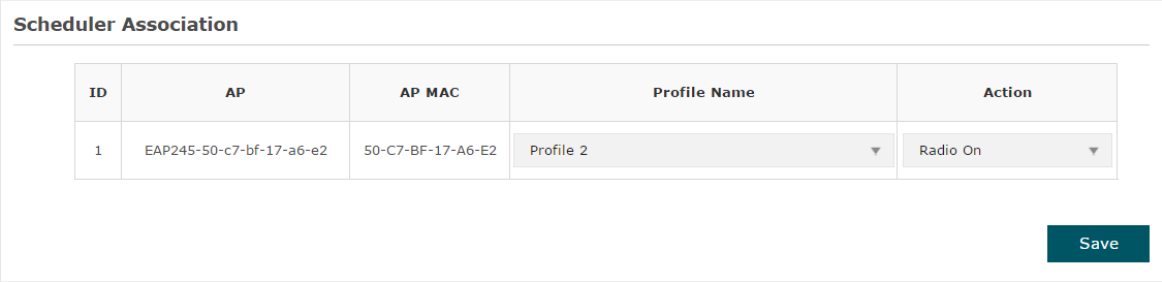
For example, the following configuration means that during the time range defined in Profile2, the radio of SSID **SSID-1** is on and the radio of SSID **SSID-2** is off.



■ Association with AP

If you select **Association with AP** in step 1, the Scheduler Association table will display the name and MAC address of the EAP. Select a profile in the **Profile Name** column and select the scheduler rule **(Radio On/Radio Off)** in the **Action** column. Then click **Save**.

For example, the following configuration means that during the time range defined in Profile2, the radio of all SSIDs on the EAP is on.



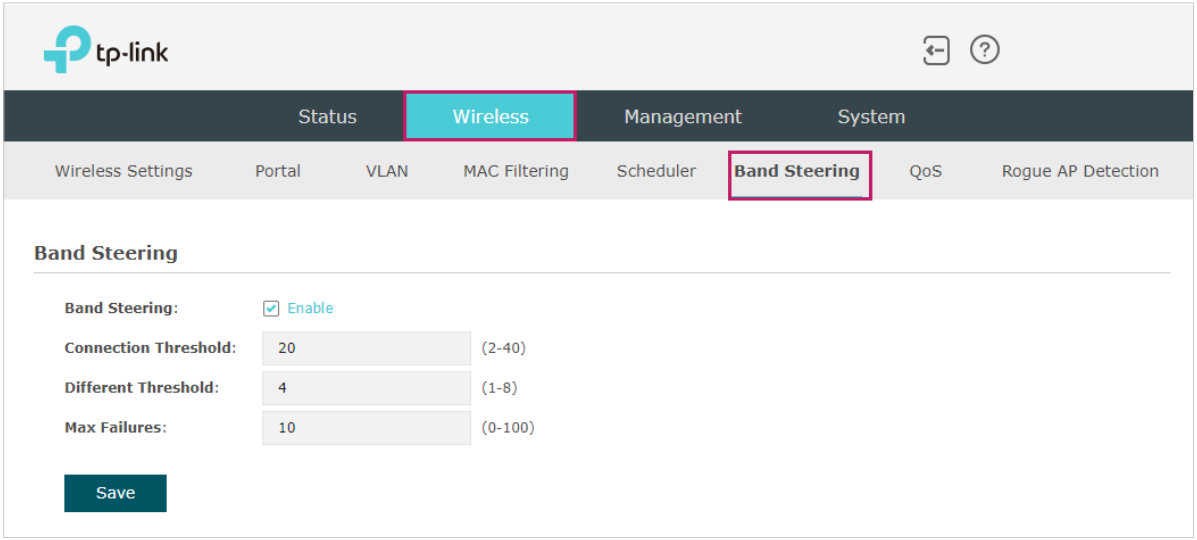
2.6 Configure Band Steering

A client device that is capable of communicating on both the 2.4GHz and 5GHz frequency bands will typically connect to the 2.4GHz band. However, if too many client devices are connected to an EAP on the 2.4GHz band, the efficiency of communication will be diminished. Band Steering can steer dual-band clients to the 5GHz frequency band which supports higher transmission rates and more client devices, and thus to greatly improve the network quality.

Note:

Only the dual-band EAP products support Band Steering.

To configure Band Steering, go to the **Wireless > Band Steering** page.



Follow the steps below to configure Band Steering on this page:

1. Check the box to enable Band Steering function.
2. Configure the following parameters to balance the clients on both frequency bands:

Connection Threshold/Difference Threshold	**Connection Threshold** defines the maximum number of clients connected to the 5GHz band. The value of **Connection Threshold** is from 2 to 40, and the default is 20. **Difference Threshold** defines the maximum difference between the number of clients on the 5GHz band and 2.4GHz band. The value of **Difference Threshold** is from 1 to 8, and the default is 4. When the following two conditions are both met, the EAP prefer to refuse the connection request on 5GHz band and no longer steer other clients to the 5GHz band: 1.The number of clients on the 5GHz band reaches the **Connection Threshold** value. 2.The difference between the number of clients on the 2.4GHz band and 5GHz band reaches the **Difference Threshold** value.
Max Failures	If a client repeatedly attempts to associate with the EAP on the 5GHz band and the number of rejections reaches the value of **Max Failures**, the EAP will accept the request. The value is from 0 to 100, and the default is 10.

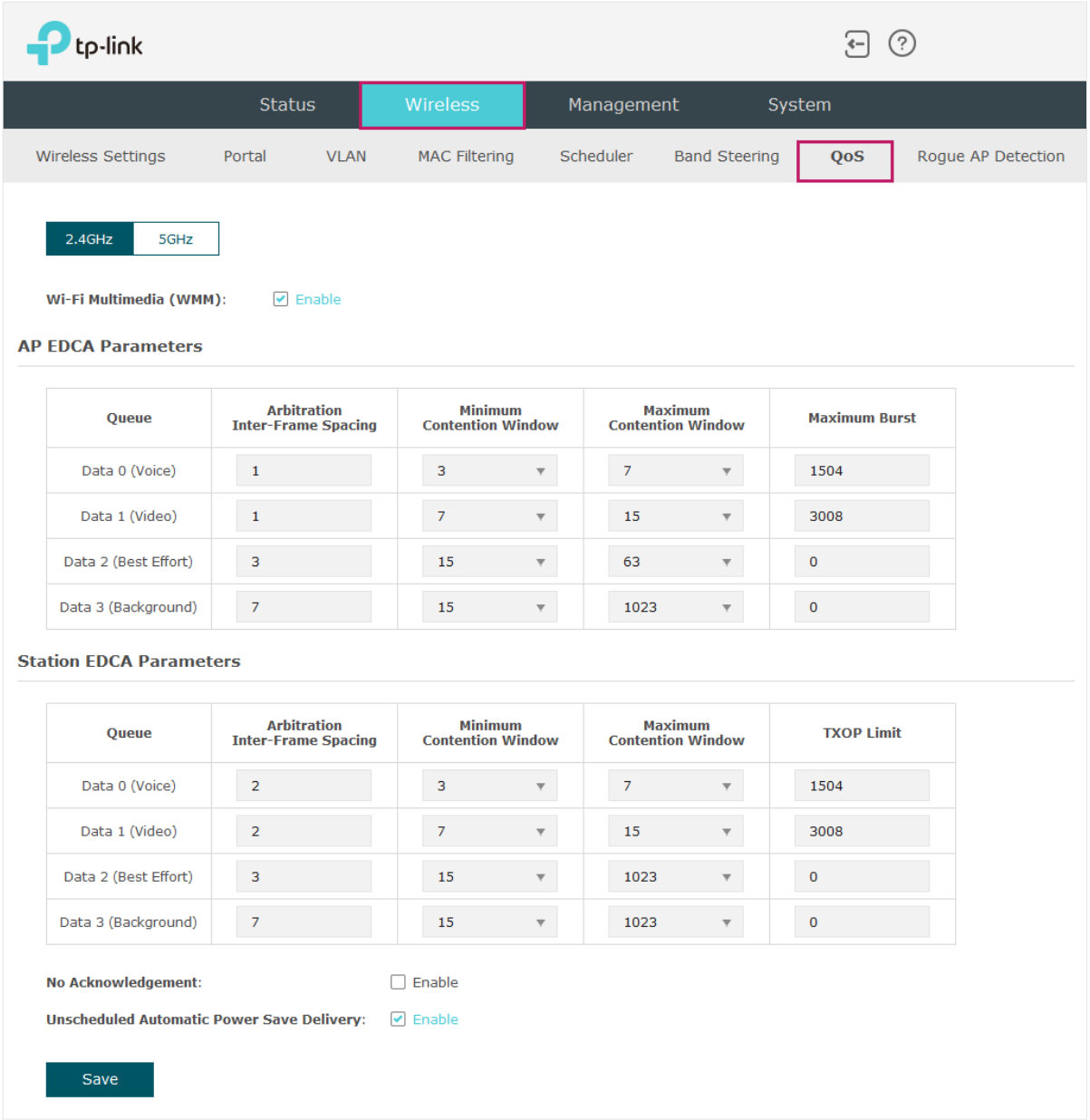
3. Click **Save**.

2.7 Configure QoS

Quality of service (QoS) is used to optimize the throughput and performance of the EAP when handling differentiated wireless traffic, such as Voice-over-IP (VoIP), other types of audio, video, streaming media, and traditional IP data.

In QoS configuration, you should set parameters on the transmission queues for different types of wireless traffic and specify minimum and maximum wait time for data transmission. In normal use, we recommend that you keep the default values.

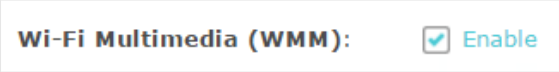
To configure QoS, go to the **Wireless > QoS** page.



Follow the steps below to configure QoS on this page:

1. Click 2.4GHz 5GHz to choose a frequency band to be configured.

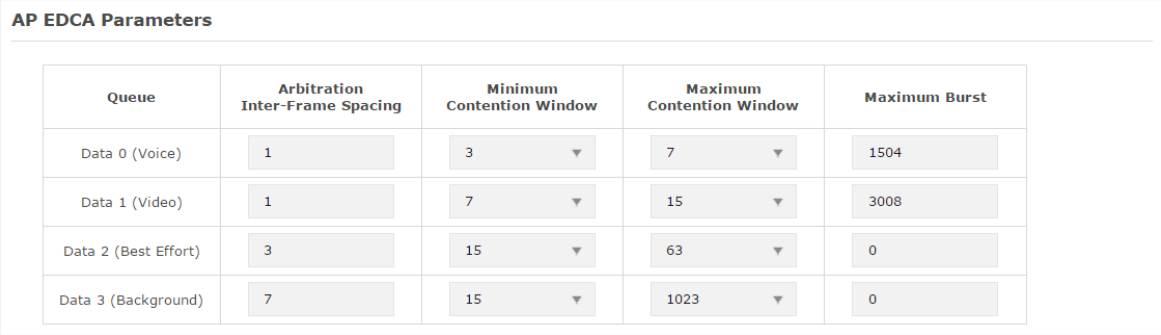
2. Check the box to enable **Wi-Fi Multimedia (WMM)**. With WMM enabled, the EAP uses the QoS function to guarantee the high priority of the transmission of audio and video packets.



Note:

If **802.11n only** mode is selected in 2.4GHz (or **802.11n only, 802.11ac only,** or **802.11 n/ac mixed** mode selected in 5GHz), the WMM should be enabled. If WMM is disabled, the **802.11n only** mode cannot be selected in 2.4GHz (or **802.11n only, 802.11ac only,** or **802.11 n/ac mixed** mode in 5GHz).

3. In the **AP EDCA Parameters** section, configure the AP EDCA ((Enhanced Distributed Channel Access) parameters. AP EDCA parameters affect traffic flowing from the EAP to the client station. The following table detailedly explains these parameters.



AP EDCA Parameters

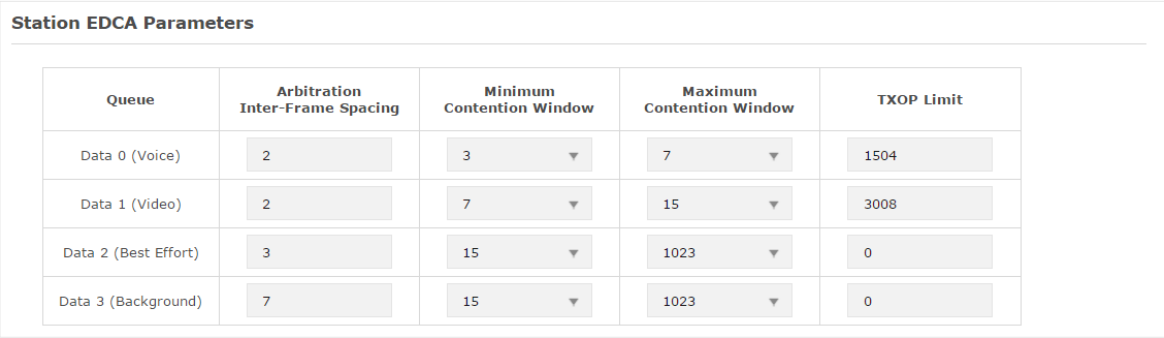
Queue	Arbitration Inter-Frame Spacing	Minimum Contention Window	Maximum Contention Window	Maximum Burst
Data 0 (Voice)	1	3	7	1504
Data 1 (Video)	1	7	15	3008
Data 2 (Best Effort)	3	15	63	0
Data 3 (Background)	7	15	1023	0

The following table detailedly explains these parameters:

Queue	Displays the transmission queue. By default, the priority from high to low is Data 0, Data 1, Data 2, and Data 3. The priority may be changed if you reset the EDCA parameters. **Data 0 (Voice):** Highest priority queue, minimum delay. Timesensitive data such as VoIP and streaming media are automatically sent to this queue. **Data 1 (Video):** High priority queue, minimum delay. Time-sensitive video data is automatically sent to this queue. **Data 2 (Best Effort):** Medium priority queue, medium throughput and delay. Most traditional IP data is sent to this queue. **Data 3 (Background):** Lowest priority queue, high throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).
Arbitration Inter-Frame Space	A wait time for data frames. The wait time is measured in slots. Valid values are from 0 to 15.

Minimum Contention Window	A list to the algorithm that determines the initial random backoff wait time (window) for retry of a transmission. This value cannot be higher than the value of Maximum Contention Window.
Maximum Contention Window	The upper limit (in milliseconds) for the doubling of the random backoff value. This doubling continues until either the data frame is sent or the Maximum Contention Window size is reached. This value must be higher than the value of Minimum Contention Window.
Maximum Burst	Maximum Burst specifies the maximum burst length allowed for packet bursts on the wireless network. A packet burst is a collection of multiple frames transmitted without header information. The decreased overhead results in higher throughput and better performance.

4. In the **Station EDCA Parameters** section, configure the station EDCA (Enhanced Distributed Channel Access) parameters. Station EDCA parameters affect traffic flowing from the client station to the EAP.



Station EDCA Parameters

Queue	Arbitration Inter-Frame Spacing	Minimum Contention Window	Maximum Contention Window	TXOP Limit
Data 0 (Voice)	2	3	7	1504
Data 1 (Video)	2	7	15	3008
Data 2 (Best Effort)	3	15	1023	0
Data 3 (Background)	7	15	1023	0

The following table detailedly explains these parameters:

Queue	Displays the transmission queue. By default, the priority from high to low is Data 0, Data 1, Data 2, and Data 3. The priority may be changed if you reset the EDCA parameters. **Data 0 (Voice):** Highest priority queue, minimum delay. Timesensitive data such as VoIP and streaming media are automatically sent to this queue. **Data 1 (Video):** High priority queue, minimum delay. Time-sensitive video data is automatically sent to this queue. **Data 2 (Best Effort):** Medium priority queue, medium throughput and delay. Most traditional IP data is sent to this queue. **Data 3 (Background):** Lowest priority queue, high throughput. Bulk data that requires maximum throughput and is not time-sensitive is sent to this queue (FTP data, for example).