www.ip-com.com.cn

User Guide

11AC Dual Band Ceiling Access Point - AP345

IP-COM
World Wide Wireless

Copyright Statement

Disclaimer

Pictures, images and product specifications herein are for references only. To improve internal design, operational function, and/or reliability, IP-COM reserves the right to make changes to the products described in this document without obligation to notify any person or organization of such revisions or changes. IP-COM does not assume any liability that may occur due to the use or application of the product or circuit layout(s) described herein. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information and recommendations in this document do not constitute the warranty of any kind, express or implied.

Preface

Thank you for choosing IP-COM! Please read this user guide before you start with AP345.

Conventions

The typographical elements that may be found in this document are defined as follows.

Item	Presentation	Example
Cascading menus	>	**Network Settings** > **LAN Setup**
Parameter and value	Bold	Set **SSID** to **Tom**.
Variable	Italic	Format: *XX*:*XX*:*XX*:*XX*:*XX*:*XX*
UI control	Bold	On the **Quick Setup** page, click the **Save** button.

The symbols that may be found in this document are defined as follows.

Symbol	Meaning
Note	This format is used to highlight information of importance or special interest. Ignoring this type of note may result in ineffective configurations, loss of data or damage to device.
Tip	This format is used to highlight a procedure that will save time or resources.

Acronyms and Abbreviations

Acronym or Abbreviation	Full Spelling
AC	AP Controller
AP	Access Point
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Server
DTIM	Delivery Traffic Indication Message
GI	Guard Interval
ISP	Internet Service Provider

Acronym or Abbreviation	Full Spelling
PPP	Point to Point Protocol
SSID	Service Set Identifier
VLAN	Virtual Local Area Network

Additional Information

For more information, search this product model on our website at http://www.ip-com.com.cn

Technical Support

If you need more help, contact us by any of the following means. We will be glad to assist you as soon as possible.

☎	✉	🏠
+86-755-27653089	info@ip-com.com.cn	http://www.ip-com.com.cn

Contents

1 Introduction

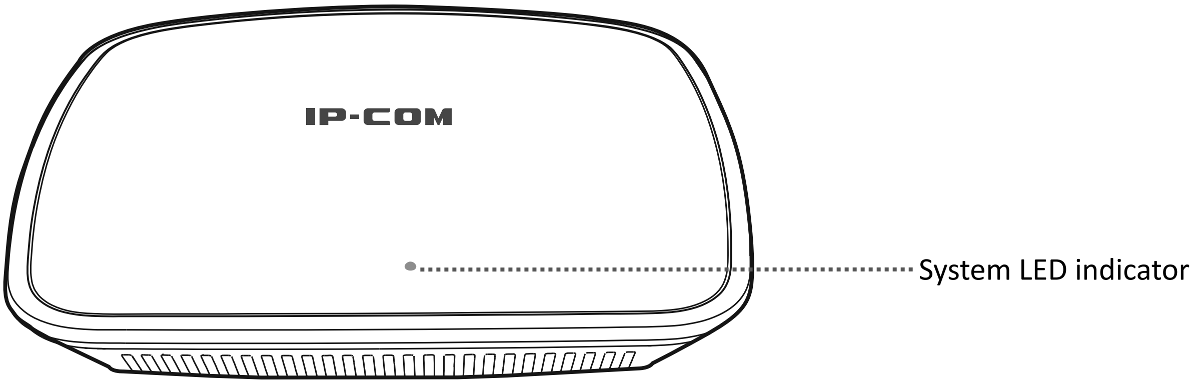
1.1 Overview

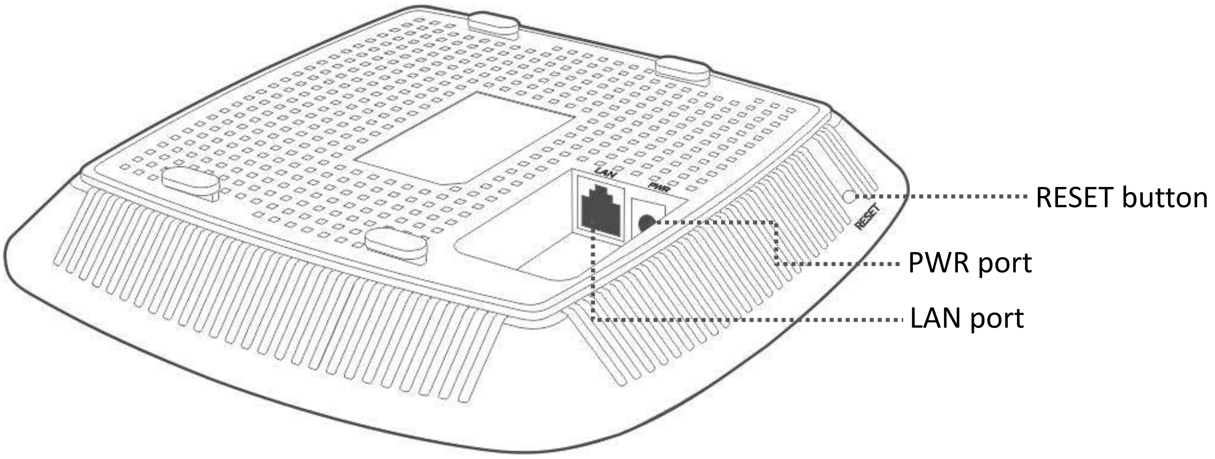
AP345 is a dual band (2.4/5 GHz) wireless access point offering a wireless transmission rate as high as 1200 Mbps. It can be powered on by DC power supply or IEEE 802.3af/at PoE power supply. Users can manage the AP through its web UI, or by an IP-COM wireless AP controller or an IP-COM router with AP controller (AC) function. In addition, its ceiling design makes it suitable for WiFi coverage in multiple places, such as hotels and enterprises.

1.2 Appearance

This section describes the LED indicator, button, ports, and bottom label of your AP.

1.2.1 LED indicator, button, and ports





- **System LED indicator**

System LED indicator	Solid on	– The system is starting. – If the indicator keeps solid on after the AP finishes startup, it indicates that the system is faulty.
	Blinking	The AP is working properly.
	Off	– The AP is not powered on. – The LED indicator has been turned off. – The AP is faulty.

- **RESET button**

When the system LED indicator blinks, hold down the RESET button for about 8 seconds. The AP is reset successfully when the system LED indicator gets solid on.

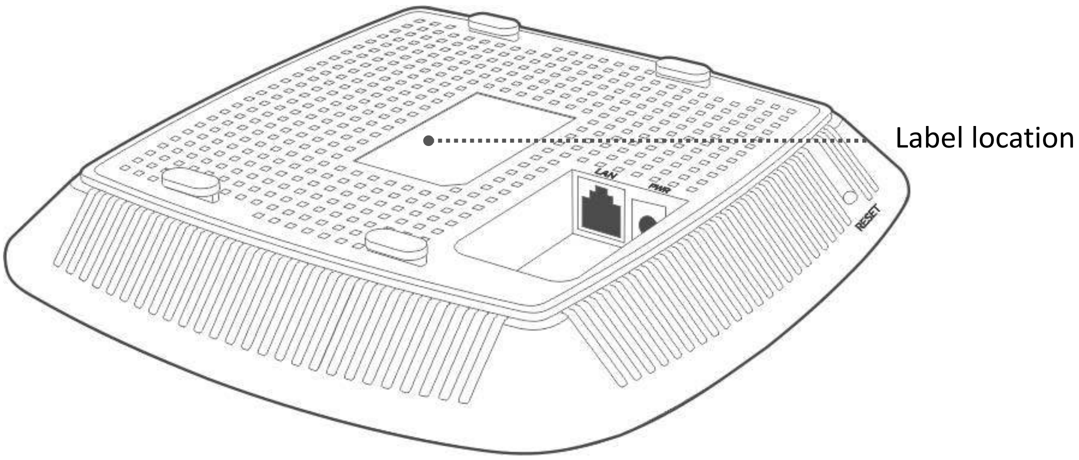
- **LAN port**

It is a 10/100 Mbps auto-negotiation port used to exchange data with other devices or connect to IEEE 802.3af/at PoE power supply using an Ethernet cable to power on the AP.

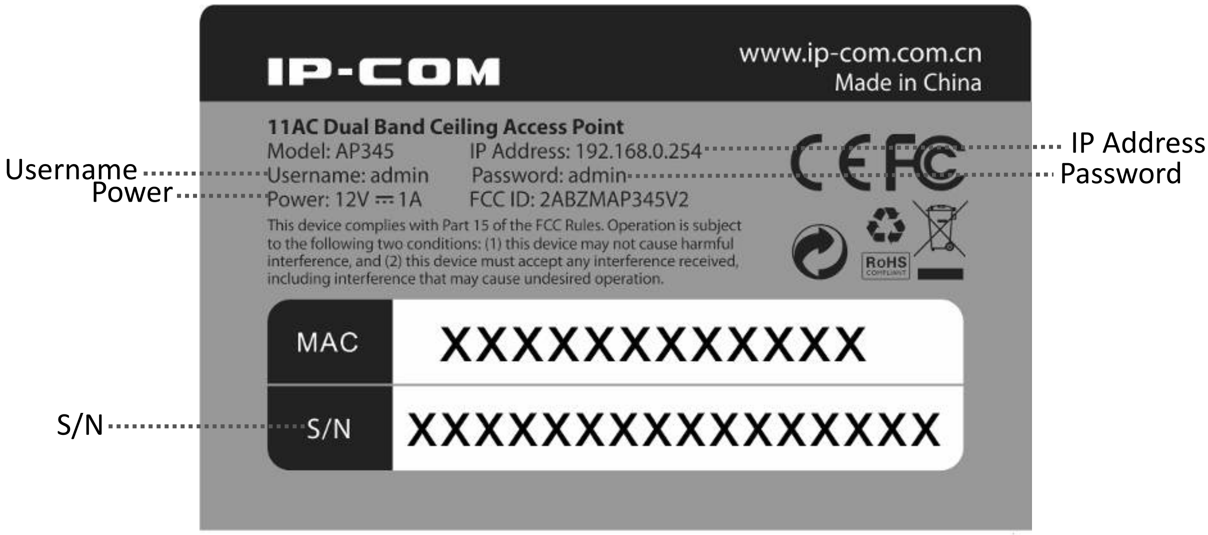
- **PWR port**

It is a power port used to connect to a DC power resource using the power adapter included in the package.

1.2.2 Bottom label



The bottom label shows the AP's default IP address, login username and password, input DC power supply, and serial number. See the following figure:


Username
Power
S/N
IP Address
Password

IP-COM

www.ip-com.com.cn
Made in China

11AC Dual Band Ceiling Access Point

Model: AP345	IP Address: 192.168.0.254
Username: admin	Password: admin
Power: 12V ⎓ 1A	FCC ID: 2ABZMAP345V2

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

RoHS COMPLIANT

MAC	XXXXXXXXXXXX
S/N	XXXXXXXXXXXXXXXXX

IP Address: It specifies the default IP address of the AP. You can use this IP address to log in to your AP's web UI when you set it for the first time. After you change the IP address, you should use the new IP address to log in to its web UI.

Username/Password: It specifies the default login username/password used to log in to the web UI of the AP. After you change the username/password, you should use the new username/password to log in to its web UI.

Power: It specifies the input DC power supply of the AP.

S/N: It specifies the serial number of the AP. If the AP is faulty, you need to provide this serial number for repair.

2 Quick Setup

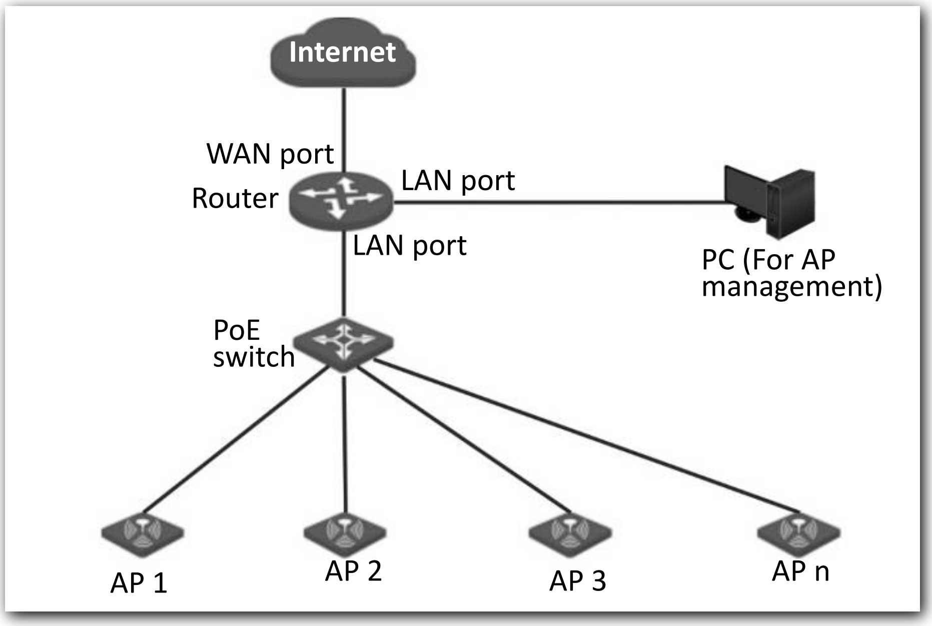
2.1 Overview

This chapter is about how to set up APs in different scenarios. Please select one according to your scenario.

2.2 Deploying the AP without an IP-COM management router/AC

1. Connect devices.
   (1) Ensure that your router is connected to the internet.
   (2) Ensure that your router and PoE switch are connected to power supply.
   (3) Connect your computer and PoE switch to LAN ports of the router using Ethernet cables.
   (4) Connect LAN port of your AP to a PoE port of your PoE switch using an Ethernet cable.

   The network topology is shown as follows:



Note

- If you choose to power on your AP using DC power supply, connect the PWR port of your AP to a DC power resource using the included power adapter.
- If you have several IP-COM APs, to avoid IP address conflict, you should connect one AP to a PoE port of your PoE switch first and set a new IP address for the AP. Then repeat this procedure to connect other APs one by one and configure new IP addresses for them respectively.

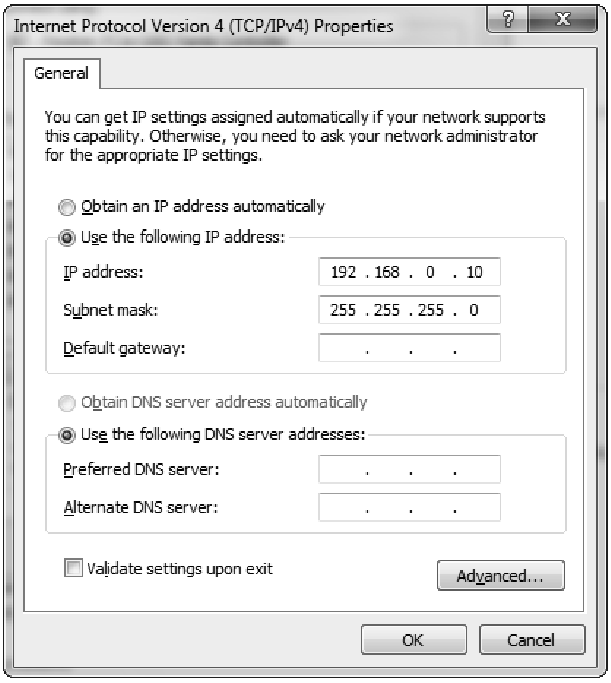
After finishing connection, ensure that the AP's LED indicator blinks and the lower-right network icon on your computer is not displayed .

2. Configure the IP address of your computer (Example: Win7).

(1) Right-click the network icon on the lower-right corner of your computer. Then click **Open Network and Sharing Center**, **Local Area Connection**, and **Properties**.

(2) Double-click **Internet Protocol Version 4 (TCP/IPv4)**, select **Use the following IP address**, set **IP address** to **192.168.0.*x*** (*x*: 2 to 253. The IP address in this example is 192.168.0.10) and **Subnet mask** to **255.255.255.0**.

(3) Click **OK**.



Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 0 . 10

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

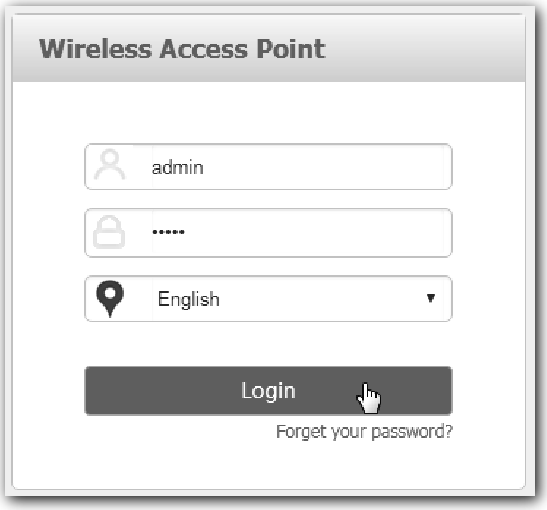
□ Validate settings upon exit

3. Log in to the web UI of your AP.

(1) Start a web browser on your computer. Enter **192.168.0.254** in the address bar, and press **Enter**.

(2) Enter the user name and password (default: **admin**/**admin**) of the AP.

(3) Click **Login**.



Wireless Access Point

admin

•••••

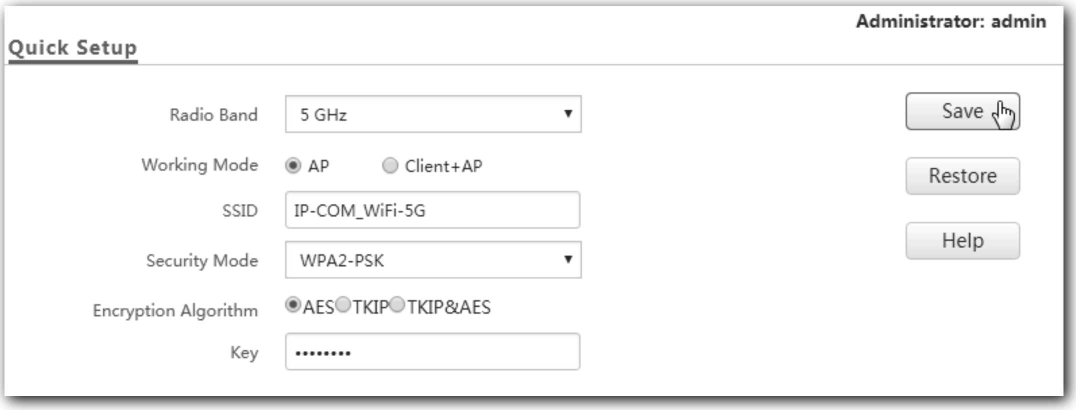
English ▼

4. Set SSID (WiFi name) and key (WiFi password) for the WiFi network of your AP.

(1) To access the configuration page, click **Quick Setup**.

(2) Configure **SSID**, **Security Mode** (WPA2-PSK is recommended), **Key** for the 2.4 GHz WiFi network, and click **Save**.

(3) Set **Radio Band** to **5 GHz**, configure **SSID**, **Security Mode** and **Key** for it as well, and click **Save**.



Quick Setup

Administrator: admin

Radio Band: 5 GHz ▼

Working Mode: ● AP ○ Client+AP

SSID: IP-COM_WiFi-5G

Security Mode: WPA2-PSK ▼

Encryption Algorithm: ● AES ○ TKIP ○ TKIP&AES

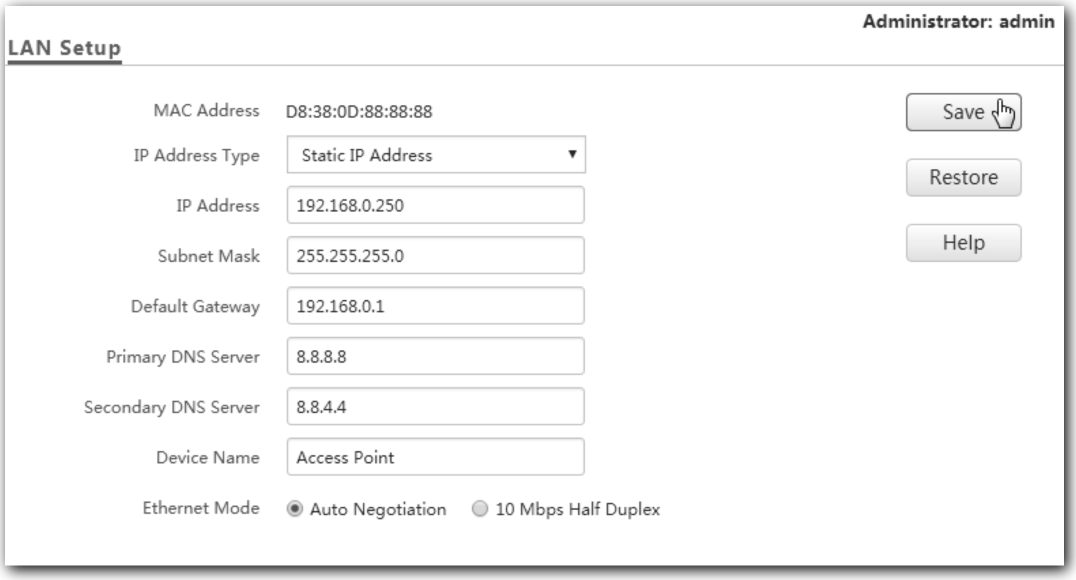
Key: ••••••••

5. Change the IP address of your AP.

(1) To access the configuration page, click **Network Settings** > **LAN Setup**.

(2) **IP Address**: Change the IP address of the AP to 192.168.0.*x* (*x*: 2 to 253), which is **192.168.0.250** in this example.

(3) Click **Save**.



MAC Address D8:38:0D:88:88:88

IP Address Type Static IP Address

IP Address 192.168.0.250

Subnet Mask 255.255.255.0

Default Gateway 192.168.0.1

Primary DNS Server 8.8.8.8

Secondary DNS Server 8.8.4.4

Device Name Access Point

Ethernet Mode ● Auto Negotiation ○ 10 Mbps Half Duplex

Wait a moment to apply the settings.

Note

The new IP address you set for the AP should not been used by other devices in the same LAN network, and the IP address of your management computer should be in the same network segment as that of the new IP address.

6. Connect your wireless devices like smart phones to the WiFi network of your AP using the WiFi name and password you set in step **4**.

---End

2.3 Deploying the AP with an IP-COM AP controller

A hotel may be deployed with lots of APs, so you are recommended to use an IP-COM AP controller (AC) to manage the APs centrally. The following describes the procedures.

1. Connect devices.

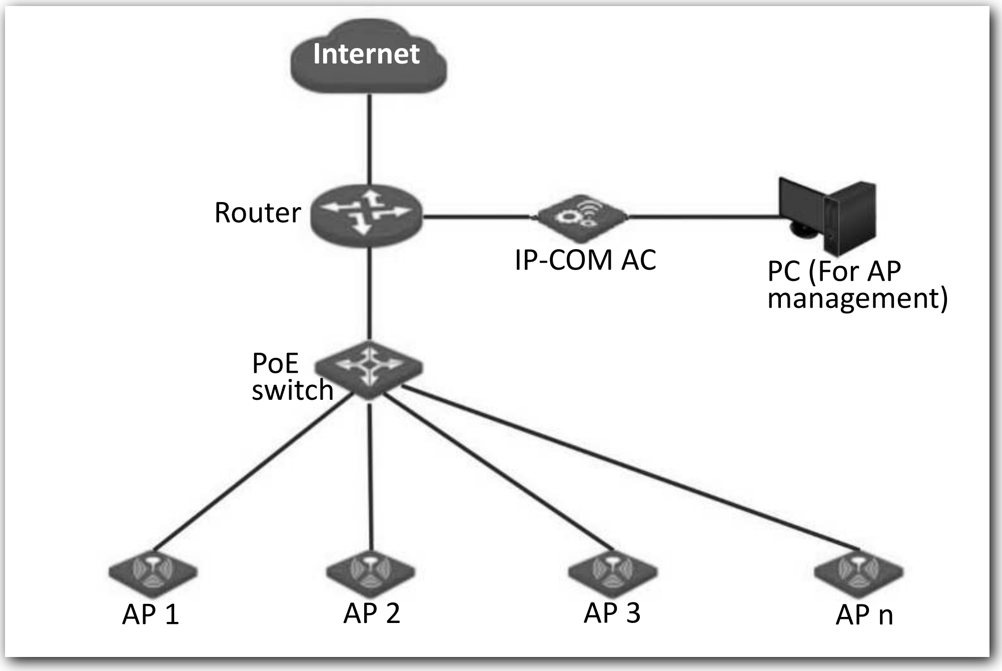
(1) Ensure that your router is connected to the internet.

(2) Ensure that your router, PoE switch and AC are connected to power supply.

(3) Connect your IP-COM AC and PoE switch to LAN ports of your router using Ethernet cables. IP-COM AC2000 is used for instructions in this example.

(4) Connect your APs to PoE ports of your PoE switch using Ethernet cables.

(5) Connect your computer to a port of your AC.



Note

If you choose to power on your AP using DC power supply, connect the PWR port of your AP to a DC power resource using the included power adapter.

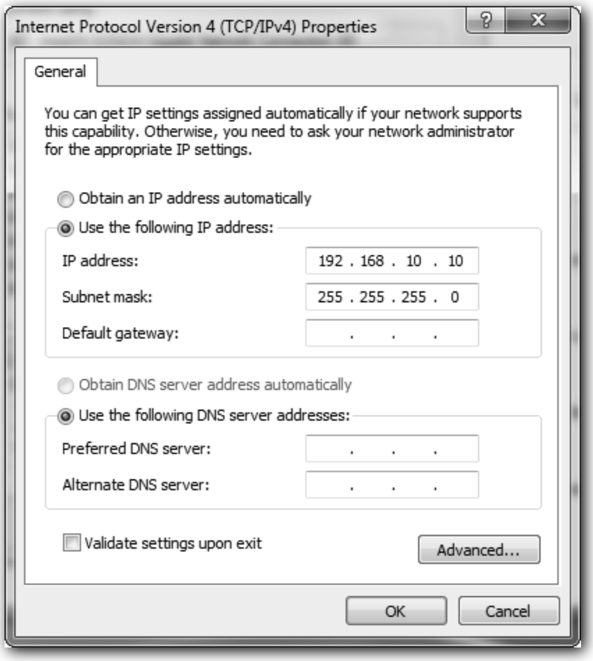
After finishing connection, ensure that the AP’s LED indicator blinks and the lower-right network icon on your computer is not displayed 🖧.

2. Set the IP address of your computer (Example: Windows 7)

(1) Right-click the network icon on the lower-right corner of your computer. Then click **Open Network and Sharing Center**, **Local Area Connection**, and **Properties**.

(2) Double-click **Internet Protocol Version 4 (TCP/IPv4)**, select **Use the following IP address**, set **IP address** to **192.168.10.*x*** (*x*: 2 to 253. The IP address in this example is 192.168.10.10) and **Subnet mask** to **255.255.255.0**.

(3) Click **OK**.



Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 10 . 10

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

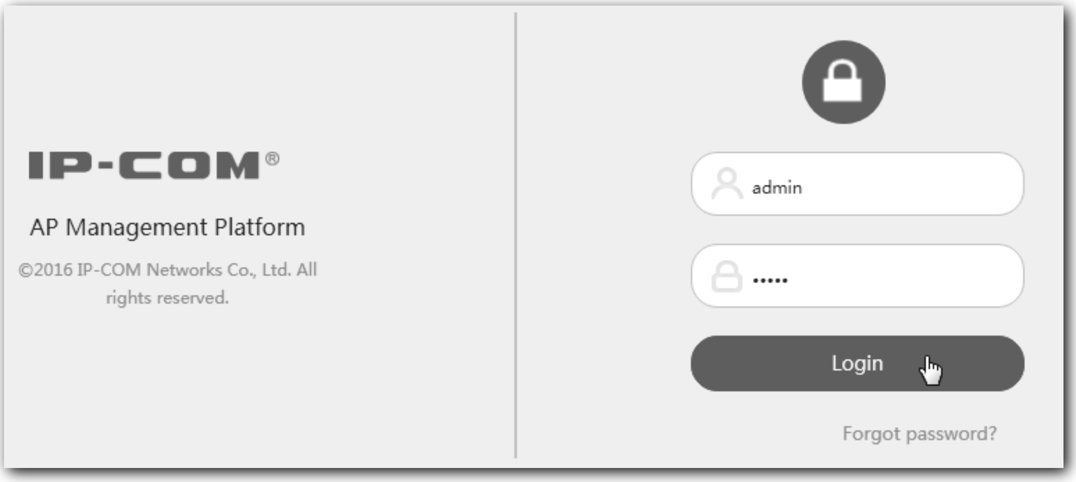
● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

□ Validate settings upon exit

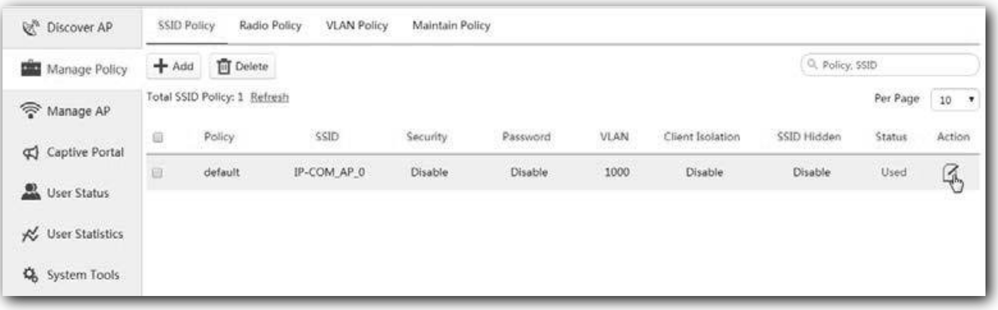
3. Log in to the web UI of the AC.
   (1) Start a web browser on the computer connected to the AC, enter the management IP address of the AC (default: **192.168.10.1**) in the address bar, and press **Enter**.
   (2) Enter the user name and password of the AC (default user name and password: **admin**/**admin**) and click **Login**.



admin

•••••

4. Configure the APs.
   (1) To access the configuration page, choose **Manage Policy**. Then click ✎ to access the detailed configuration page.

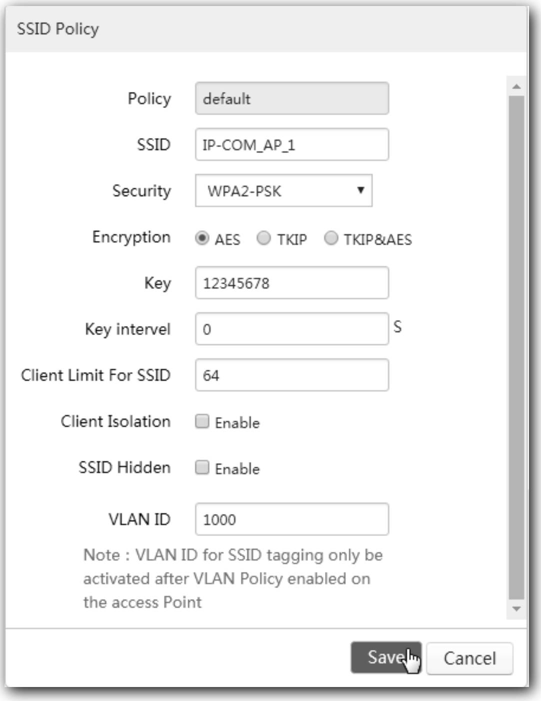


Total SSID Policy: 1 Refresh

Per Page 10

□	Policy	SSID	Security	Password	VLAN	Client Isolation	SSID Hidden	Status	Action
□	default	IP-COM_AP_0	Disable	Disable	1000	Disable	Disable	Used	

(2) **SSID**, **Security** and **Key**: Set an SSID (WiFi name), security, key (WiFi password) for your AP, and click **Save** to apply the settings.

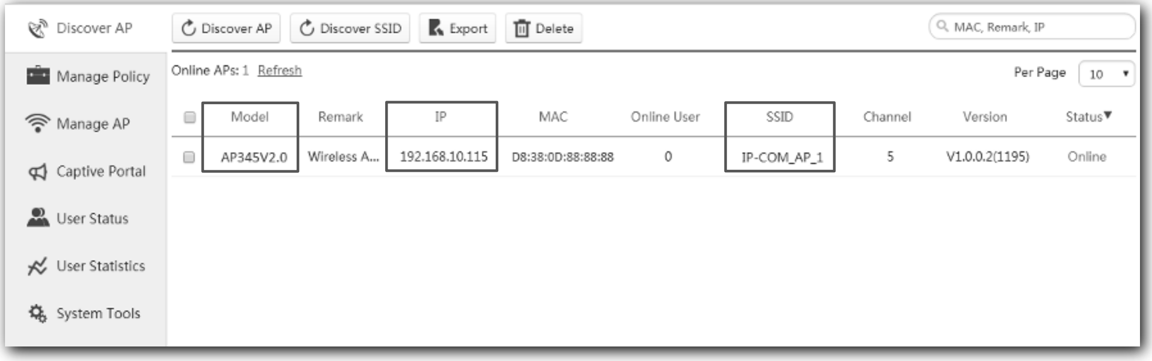


SSID Policy

Policy	default
SSID	IP-COM_AP_1
Security	WPA2-PSK
Encryption	● AES ○ TKIP ○ TKIP&AES
Key	12345678
Key intervel	0 S
Client Limit For SSID	64
Client Isolation	□ Enable
SSID Hidden	□ Enable
VLAN ID	1000

Note : VLAN ID for SSID tagging only be activated after VLAN Policy enabled on the access Point

Wait a minute. The AP will obtain the WiFi settings from the AC automatically. You can view your AP's new SSID and IP address on the **Discover AP** page.



Online APs: 1 Refresh

Per Page 10

□	Model	Remark	IP	MAC	Online User	SSID	Channel	Version	Status▼
□	AP345V2.0	Wireless A...	192.168.10.115	D8:38:0D:88:88:88	0	IP-COM_AP_1	5	V1.0.0.2(1195)	Online

5. Connect your wireless devices like smart phones to the WiFi network of your AP using the WiFi name and password you set in step **4**.

---End

2.4 Deploying the AP with an IP-COM router with AP control function

A hotel may be deployed with a large number of APs. But you can manage them centrally using an IP-COM router with AP control function. The following describes the procedure.

1. Connect devices.

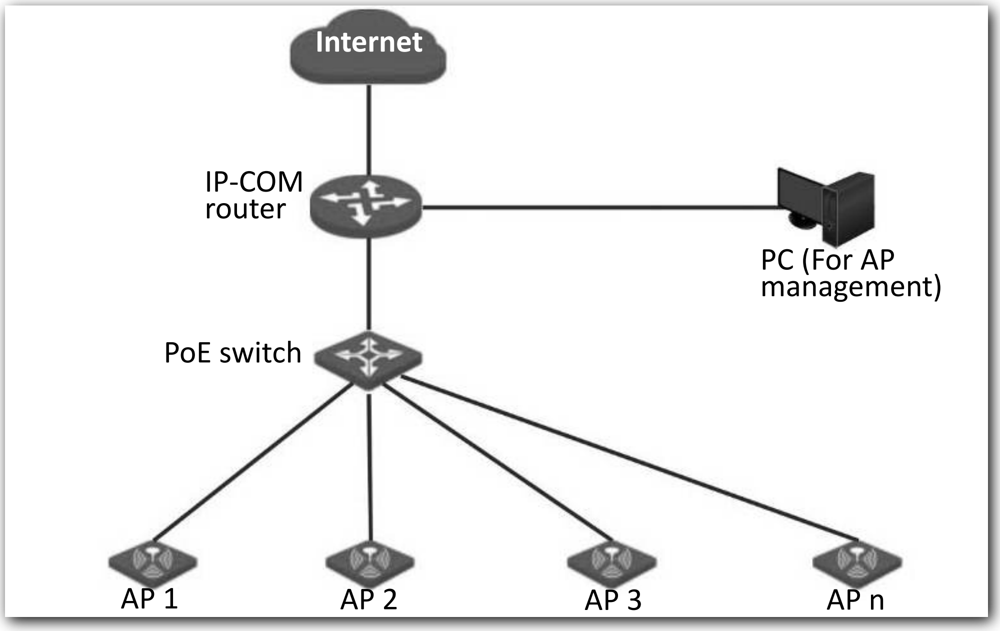
(1) Ensure that your IP-COM router is connected to the internet.

(2) Ensure that your router and PoE switch are connected to power supply.

(3) Connect your computer and PoE switch to the LAN ports of the router using Ethernet cables.

(4) Connect your APs to PoE ports of your PoE switch using Ethernet cables.

The network topology is shown as follows:



Note

If you choose to power on your AP using DC power supply, connect the PWR port of your AP to a DC power resource using the included power adapter.

After finishing connection, ensure that the AP's LED indicator blinks and the lower-right network icon on your computer is not displayed 🖧.

2. Start a web browser on your computer and log in to the web UI of the router. For details about managing your APs, refer to your router's user guide.

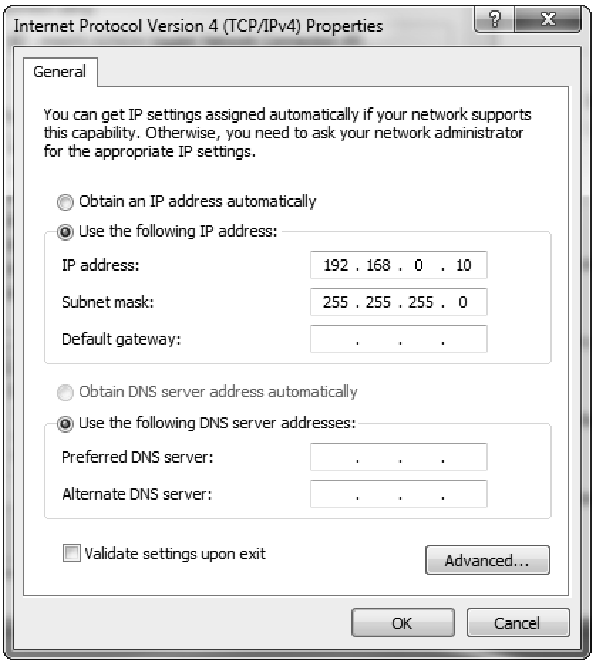
---End

3 Login

3.1 Logging in to the web UI of the AP

If you want to log in to the web UI of your AP, perform the following procedures:

1. Connect your management computer to the AP’ WiFi network or the PoE switch connected to the AP using an Ethernet cable.
2. Set IP address of your computer to **192.168.0.*x*** (*x*: 2 - 253) and subnet mask to **255.255.255.0**.



Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 0 . 10

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

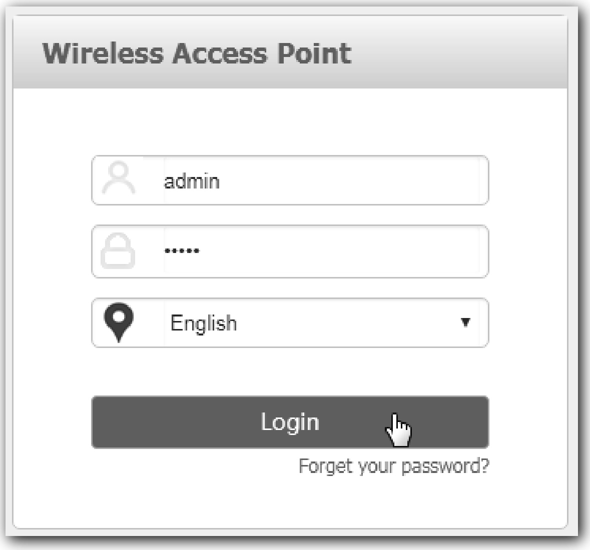
Alternate DNS server: . . .

□ Validate settings upon exit

Note

If your AP is managed by an IP-COM AC/router, the AP’s IP address may have been changed. In that case, go to the web UI of the router/AC to view the new IP address of the AP, set the IP address of your computer in the same network segment as the AP’s new IP address, then log in to the AP’s web UI using the new IP address.

3. Start a web browser on the computer, enter the IP address of the AP (default: **192.168.0.254**) in the address bar, and press **Enter**.
4. Enter the user name and password of the AP (default user name and password: **admin**/**admin**) and press **Login**.



Wireless Access Point

admin

•••••

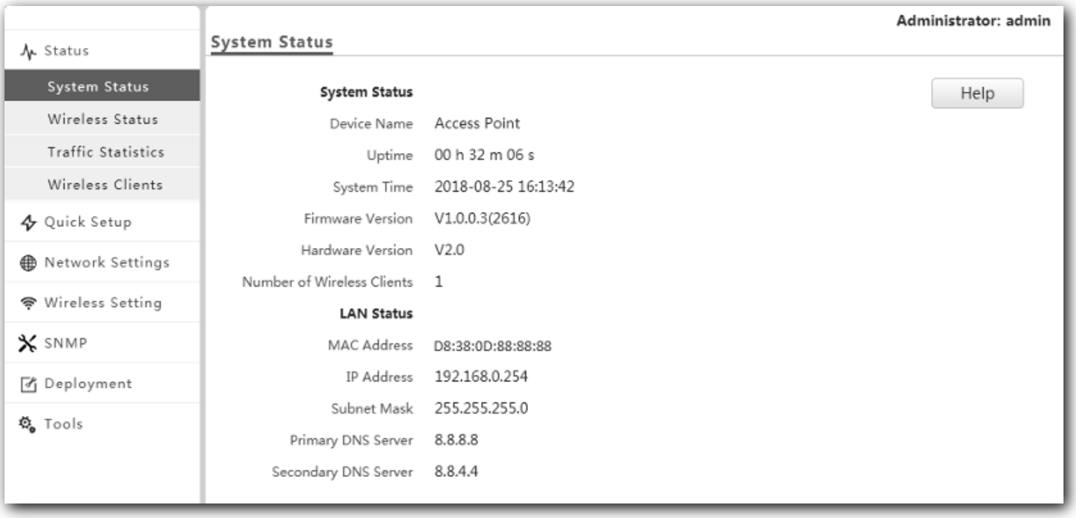
English

Note

If your AP's login page does not appear, refer to Q1 in A.2 FAQ.

---End

Log in to the web UI of the AP successfully. See the following figure:



Administrator: admin

System Status

System Status

Device Name Access Point

Uptime 00 h 32 m 06 s

System Time 2018-08-25 16:13:42

Firmware Version V1.0.0.3(2616)

Hardware Version V2.0

Number of Wireless Clients 1

LAN Status

MAC Address D8:38:0D:88:88:88

IP Address 192.168.0.254

Subnet Mask 255.255.255.0

Primary DNS Server 8.8.8.8

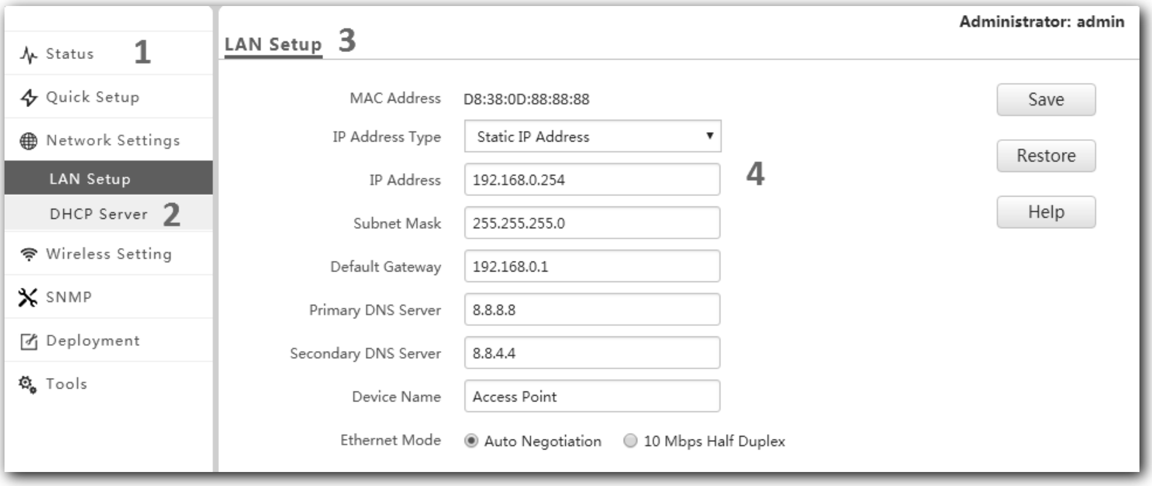
Secondary DNS Server 8.8.4.4

3.2 Logging out of the web UI of the AP

When you close the web browser, the system logs you out automatically, or if you log in to the web UI of the AP but perform no operation within the login timeout interval, the AP logs you out as well. The default login timeout interval of the AP is 5 minutes, and you can change it on the page **Tools** > **Date & Time** > **Login Timeout Interval**.

3.3 Web UI layout

The web UI of the AP is composed of four parts, including the navigation trees of two levels, tab page area, and configuration area. See the following figure.



MAC Address D8:38:0D:88:88:88
IP Address Type Static IP Address
IP Address 192.168.0.254
Subnet Mask 255.255.255.0
Default Gateway 192.168.0.1
Primary DNS Server 8.8.8.8
Secondary DNS Server 8.8.4.4
Device Name Access Point
Ethernet Mode ● Auto Negotiation ○ 10 Mbps Half Duplex

No.	Name	Description
1	Level-1 navigation bar	The navigation bars and tab pages display the function menu of the AP. When you select a function in the navigation bar, the corresponding configuration appears in the configuration area.
2	Level-2 navigation bar	
3	Tab page area	
4	Configuration area	In this area, you can view and modify configuration of the AP.

Tip

The functions and parameters dimmed on the web UI indicates that they cannot be changed in the current configuration or they are not supported by the AP. If you want to configure the functions or parameters dimmed on the web UI, you need to configure their related functions or parameters on the web UI first.

3.4 Common buttons

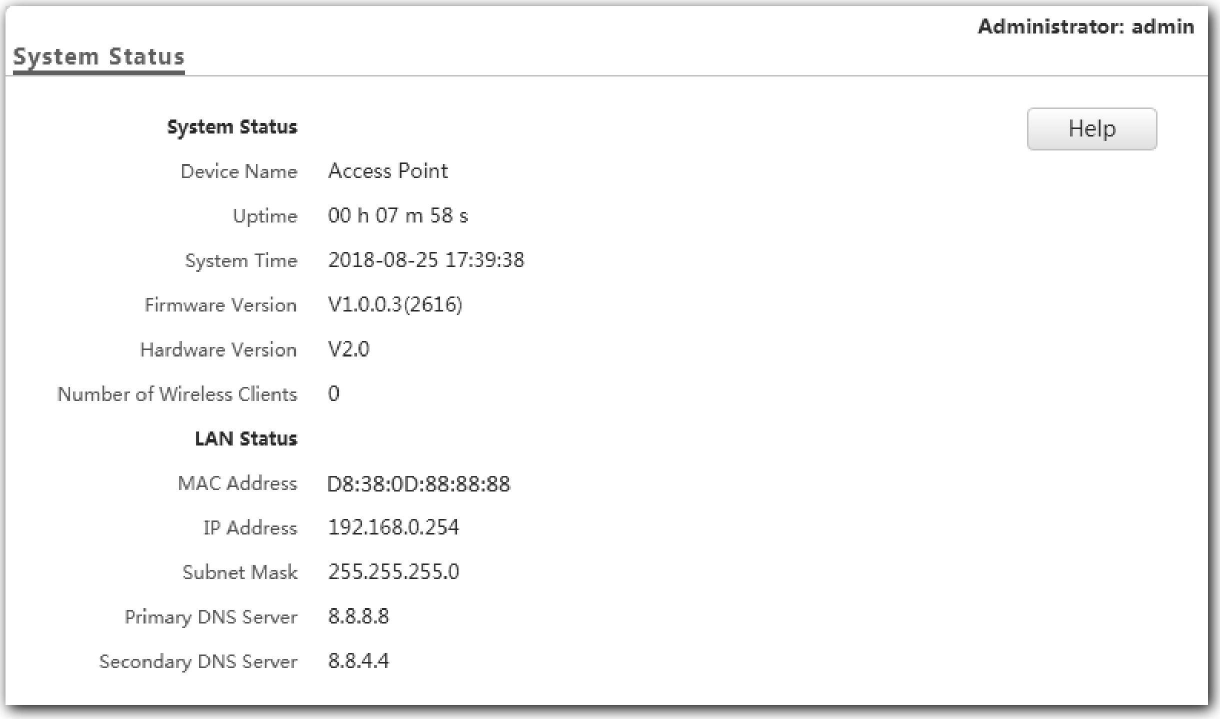
The following table describes the common buttons available on the web UI of the AP.

Button	Description
Save	Click it to save the configuration on the current page and enable the configuration to take effect.
Restore	Click it to set the configuration on the current page back to the original configuration.
Help	Click it to view corresponding help information on the page.

4 Status

4.1 System status

This page displays the system status and LAN port status of the AP. To access the page, click **Status** > **System Status**.



System Status	
Device Name	Access Point
Uptime	00 h 07 m 58 s
System Time	2018-08-25 17:39:38
Firmware Version	V1.0.0.3(2616)
Hardware Version	V2.0
Number of Wireless Clients	0
LAN Status	
MAC Address	D8:38:0D:88:88:88
IP Address	192.168.0.254
Subnet Mask	255.255.255.0
Primary DNS Server	8.8.8.8
Secondary DNS Server	8.8.4.4

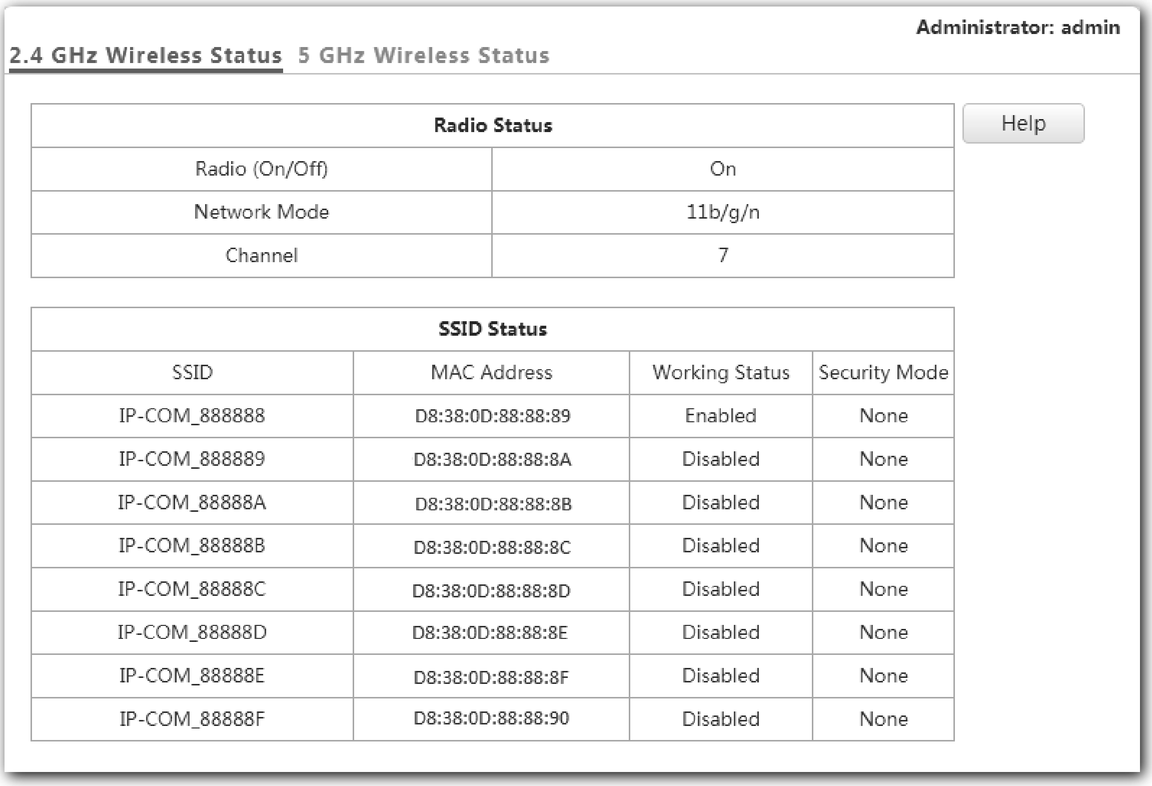
Parameter description

Parameter	Description
Device Name	It specifies the name of the AP. You can change the AP's name on **Network Settings** > **LAN Setup** page.
Uptime	It specifies the time that has elapsed since the AP starts up this time.
System Time	It specifies the current system time of the AP.
Firmware Version	It specifies the current firmware version number of the AP. If you have upgraded the firmware version of the AP, view the current firmware version here to check whether the upgrade is successful.

Parameter	Description
Hardware Version	It specifies the current hardware version number of the AP.
Number of Wireless Clients	It specifies the number of wireless devices connected to the AP currently.
MAC Address	It specifies the physical address of the AP's LAN port. If you connect the AP to other devices using Ethernet cables, the AP uses this MAC address to communicate with those devices.
IP Address	It specifies the AP's IP address used to log in to its web UI. If you want to change the IP address, access the **Network Settings** > **LAN Setup** page and perform according to the on-screen instructions.
Subnet Mask	It specifies the subnet mask of the AP's IP address.
Primary DNS Server	It specifies the primary DNS server of the AP.
Secondary DNS Server	It specifies the secondary DNS server of the AP.

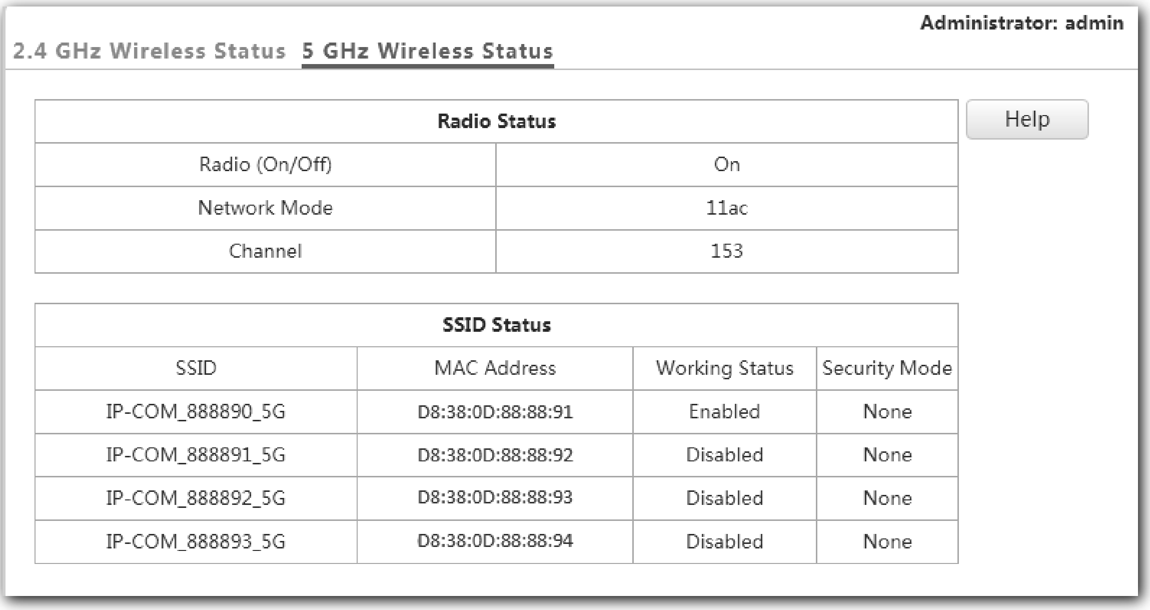
4.2 Wireless status

This page displays radio frequency and SSID status of the AP. To access the page, click **Status** > **Wireless Status**.



Radio Status	
Radio (On/Off)	On
Network Mode	11b/g/n
Channel	7

SSID Status			
SSID	MAC Address	Working Status	Security Mode
IP-COM_888888	D8:38:0D:88:88:89	Enabled	None
IP-COM_888889	D8:38:0D:88:88:8A	Disabled	None
IP-COM_88888A	D8:38:0D:88:88:8B	Disabled	None
IP-COM_88888B	D8:38:0D:88:88:8C	Disabled	None
IP-COM_88888C	D8:38:0D:88:88:8D	Disabled	None
IP-COM_88888D	D8:38:0D:88:88:8E	Disabled	None
IP-COM_88888E	D8:38:0D:88:88:8F	Disabled	None
IP-COM_88888F	D8:38:0D:88:88:90	Disabled	None



Radio Status	
Radio (On/Off)	On
Network Mode	11ac
Channel	153

SSID Status			
SSID	MAC Address	Working Status	Security Mode
IP-COM_888890_5G	D8:38:0D:88:88:91	Enabled	None
IP-COM_888891_5G	D8:38:0D:88:88:92	Disabled	None
IP-COM_888892_5G	D8:38:0D:88:88:93	Disabled	None
IP-COM_888893_5G	D8:38:0D:88:88:94	Disabled	None

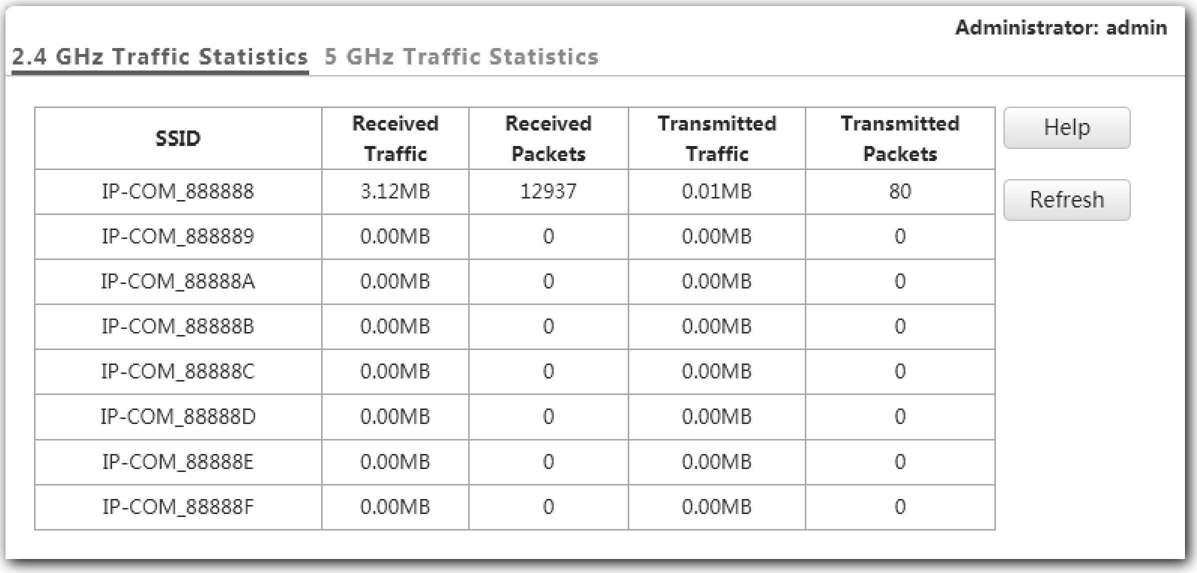
Parameter description

Parameter		Description
Radio Status	Radio (On/Off)	It specifies whether the WiFi network at the corresponding band is enabled. – **On**: It represents the WiFi network at the corresponding band is enabled. – **Off**: It represents the WiFi network at the corresponding band is disabled. You can change the radio status on the **Wireless Settings** > **Radio Settings** page.
	Network Mode	It specifies the current network mode of the AP over the 2.4/5 GHz band. You can change the network mode on the **Wireless Settings** > **Radio Settings** page.
	Channel	It specifies the current working channel of the AP over the 2.4/5 GHz band. You can change the working channel on the **Wireless Settings** > **Radio Settings** page.
SSID Status	SSID	It specifies the names of WiFi networks of the AP over the 2.4/5 GHz band. The AP supports eight WiFi networks over 2.4 GHz band and four over 5 GHz band. The first SSID in the SSID status table is the primary SSID of each band. By default, the WiFi network corresponding to the primary SSID is enabled, and the other WiFi networks are disabled.
	MAC Address	It specifies the physical address of the corresponding SSID.
	Working Status	It specifies whether the corresponding WiFi network is enabled.
	Security Mode	It specifies the security mode of the corresponding WiFi network.

4.3 Traffic statistics

To access the page, click **Status** > **Traffic Statistics**.

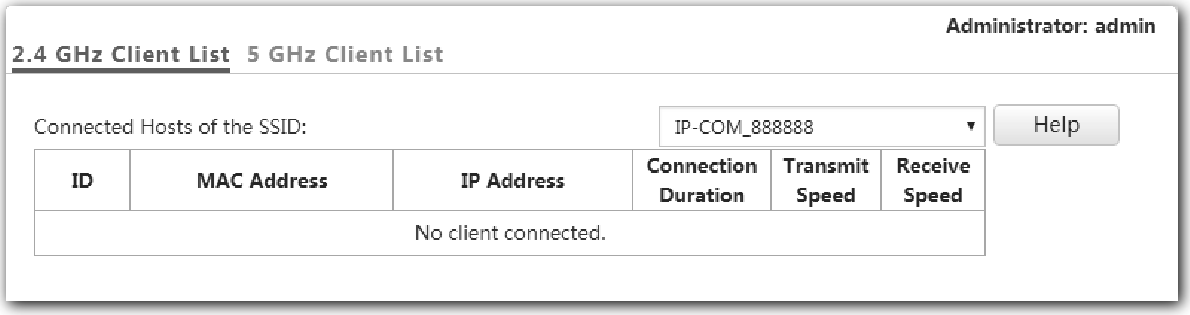
This page displays statistics about historical packets of AP’s WiFi network.



SSID	Received Traffic	Received Packets	Transmitted Traffic	Transmitted Packets
IP-COM_888888	3.12MB	12937	0.01MB	80
IP-COM_888889	0.00MB	0	0.00MB	0
IP-COM_88888A	0.00MB	0	0.00MB	0
IP-COM_88888B	0.00MB	0	0.00MB	0
IP-COM_88888C	0.00MB	0	0.00MB	0
IP-COM_88888D	0.00MB	0	0.00MB	0
IP-COM_88888E	0.00MB	0	0.00MB	0
IP-COM_88888F	0.00MB	0	0.00MB	0

4.4 Wireless clients

This page displays information about the wireless devices connected to AP's WiFi networks. To access the page, click **Status** > **Wireless Clients**.



Connected Hosts of the SSID: IP-COM_888888

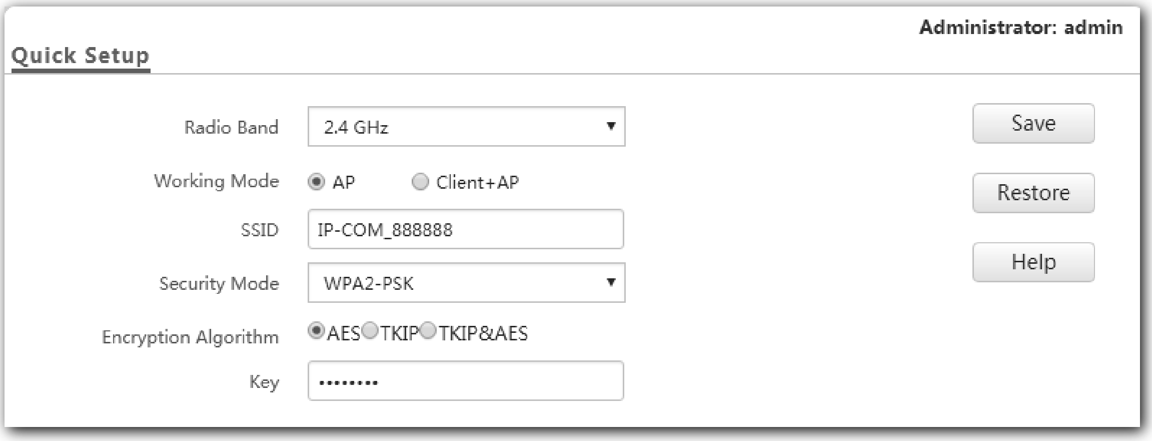
ID	MAC Address	IP Address	Connection Duration	Transmit Speed	Receive Speed
No client connected.					

By default, this page displays information about the wireless devices connected to the primary WiFi network of each band. To view information about the wireless devices connected to the other WiFi networks, select the SSIDs from the drop-down list box.

5 Working Mode

5.1 Overview

This chapter is mainly about your AP's working mode: AP and Client+AP. To access the configuration page, click **Quick Setup**. See the following figure.



Administrator: admin

Quick Setup

Radio Band: 2.4 GHz

Working Mode: ● AP ○ Client+AP

SSID: IP-COM_888888

Security Mode: WPA2-PSK

Encryption Algorithm: ● AES ○ TKIP ○ TKIP&AES

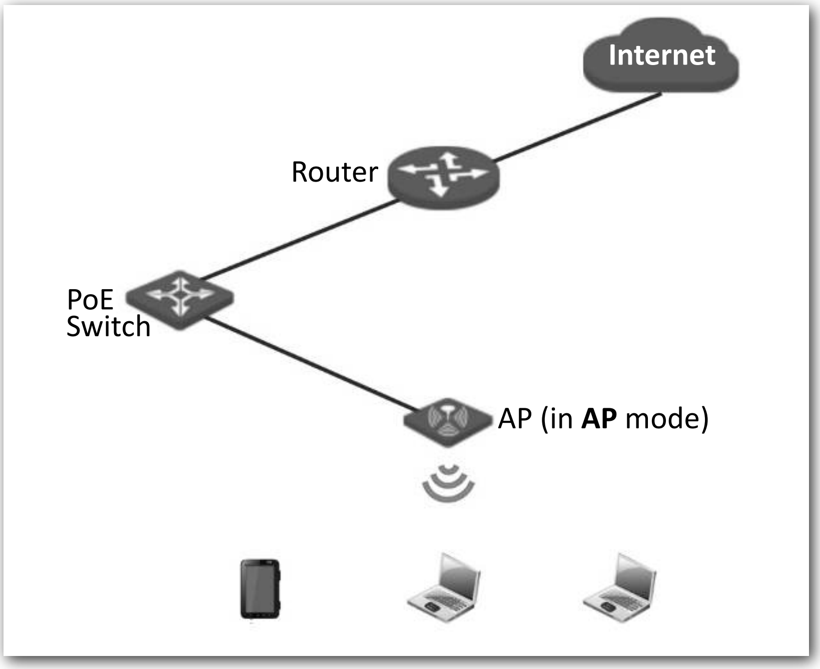
Key: ••••••••

Parameter description

Parameter	Description
Working Mode	It specifies the working mode you set for your AP, including AP mode and Client+AP mode.
SSID	It specifies the SSID (WiFi name) you set for your AP.
Security Mode	It specifies the security mode you set for your AP's WiFi network, including **None**, **WEP**, **WPA-PSK**, **WPA2-PSK**, **Mixed WPA/WPA2-PSK**, **WPA** and **WPA2**.
Key	It specifies the WiFi password you set for your AP's WiFi network.

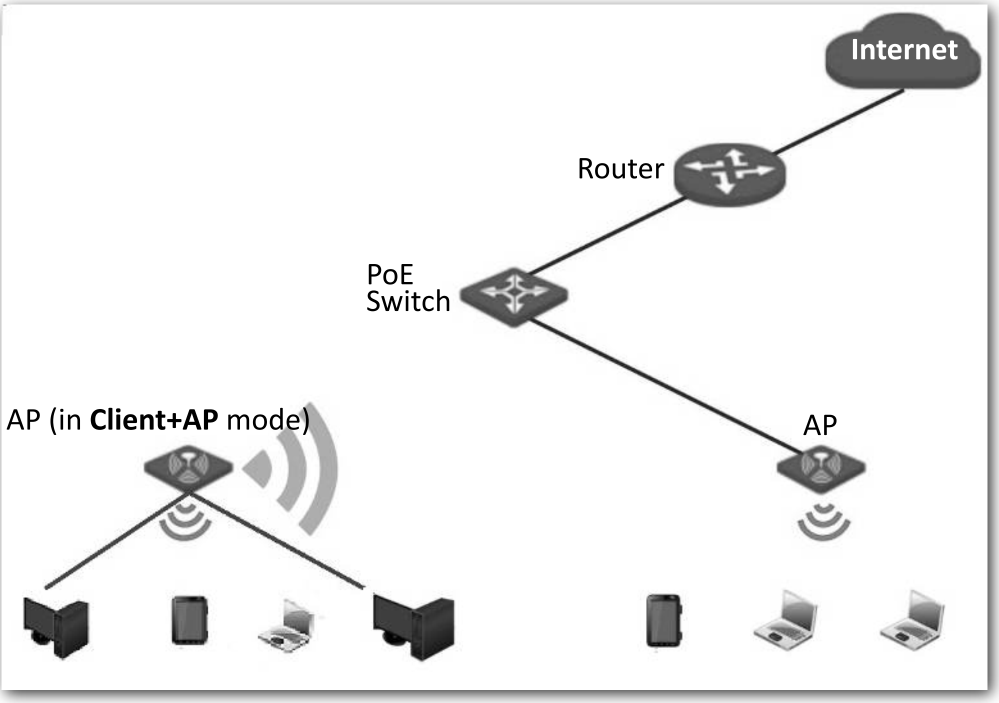
- **AP mode**

By default, the AP works in AP mode. In this mode, the AP connects to an upstream device (such as a router or PoE switch) using an Ethernet cable and converts wired signal into wireless one to offer WiFi coverage. See the following topology.



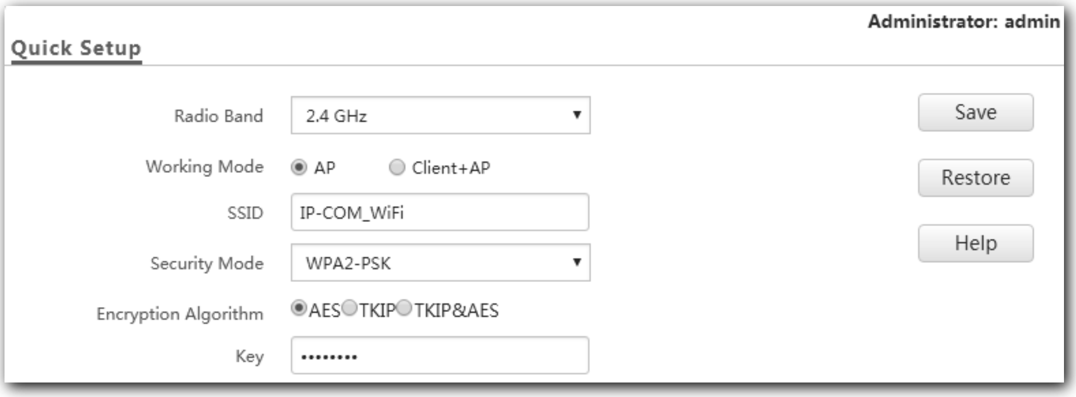
- **Client+AP mode**

In this mode, the AP is wirelessly bridged to an upstream device (such as a wireless router or AP) to extend the WiFi coverage of the upstream device. See the following topology.



5.2 Setting WiFi network in AP mode

1. Click **Quick Setup**.
2. **Radio Band**: Select the radio band according to your requirement, which is **2.4 GHz** in this example.
3. **Working Mode**: Select **AP** mode.
4. **SSID**: Set a WiFi name for the WiFi network of your AP, which is **IP-COM_WiFi** in this example.
5. **Security Mode**: Select one security mode for your AP. You are recommended to select **WPA2-PSK**.
6. **Encryption Algorithm**: Select one encryption algorithm for your AP, which is **AES** in this example.
7. **Key**: Set a WiFi password for your AP's WiFi network.
8. Click **Save**.



Administrator: admin

Quick Setup

Radio Band	2.4 GHz ▼
Working Mode	● AP ○ Client+AP
SSID	IP-COM_WiFi
Security Mode	WPA2-PSK ▼
Encryption Algorithm	●AES○TKIP○TKIP&AES
Key	••••••••

---End

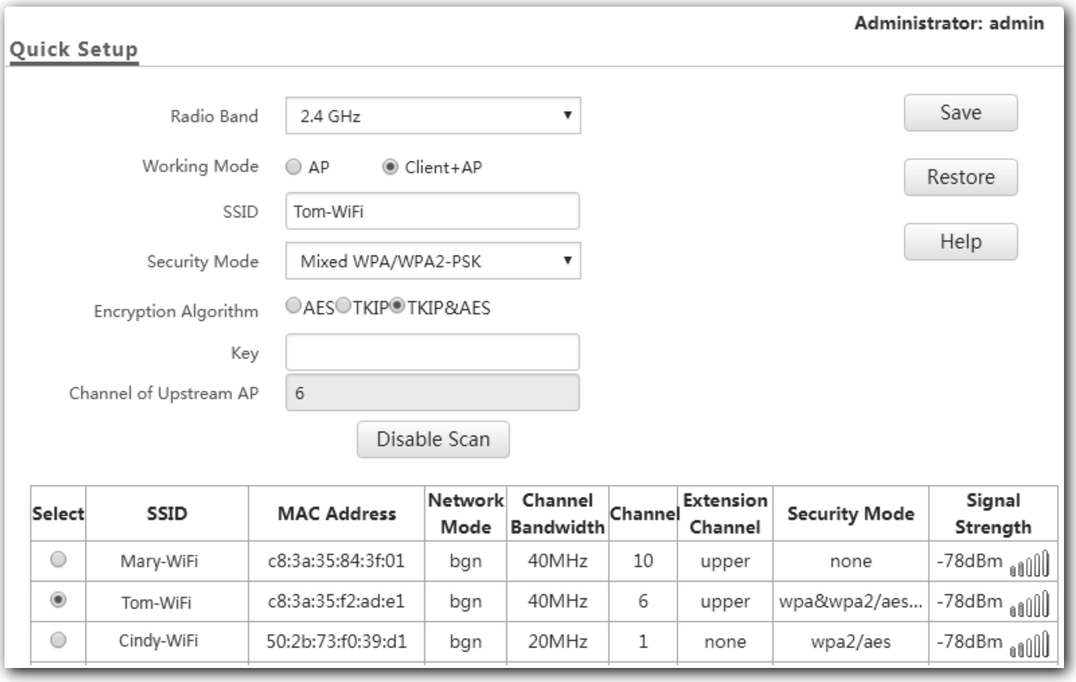
After configuration, connect wireless devices to the WiFi network of your AP using the SSID and WiFi password you set on the **Quick Setup** page.

5.3 Setting WiFi network in Client+AP mode

1. Click **Quick Setup**.
2. **Radio Band**: Select the radio band according to your requirement, which is **2.4 GHz** in this example.
3. **Working Mode**: Click **Client+AP** mode.
4. Click **Scan**.
5. Select the WiFi network you want to extend from the WiFi network list that appears, which is **Tom-WiFi** in this example.

Note

- If no WiFi network is found, click **Wireless Settings** > **Radio Settings** to ensure that **Enable Wireless** is selected, and try scanning again.
- After a WiFi network is selected, the AP identifies its SSID, security mode, encryption algorithm, channel of WiFi network and populates them automatically. However, some other parameters such as **Key** must be entered yourself.



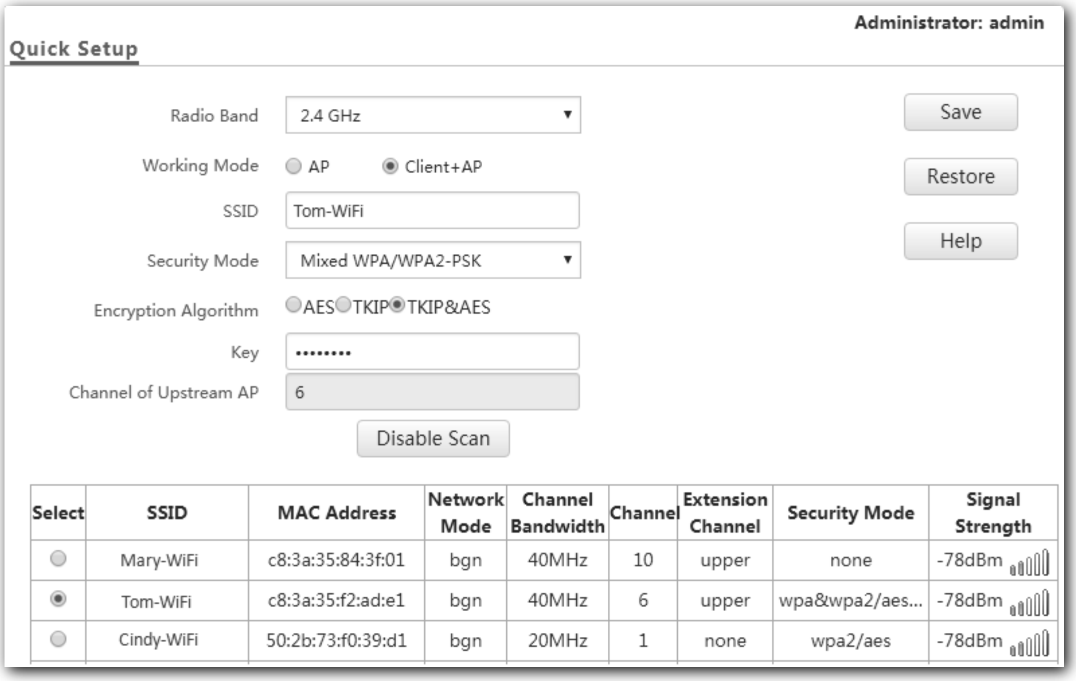
Administrator: admin

Quick Setup

Radio Band	2.4 GHz
Working Mode	○ AP ● Client+AP
SSID	Tom-WiFi
Security Mode	Mixed WPA/WPA2-PSK
Encryption Algorithm	○AES○TKIP●TKIP&AES
Key	
Channel of Upstream AP	6

Select	SSID	MAC Address	Network Mode	Channel Bandwidth	Channel	Extension Channel	Security Mode	Signal Strength
○	Mary-WiFi	c8:3a:35:84:3f:01	bgn	40MHz	10	upper	none	-78dBm
●	Tom-WiFi	c8:3a:35:f2:ad:e1	bgn	40MHz	6	upper	wpa&wpa2/aes...	-78dBm
○	Cindy-WiFi	50:2b:73:f0:39:d1	bgn	20MHz	1	none	wpa2/aes	-78dBm

6. If the WiFi network of the upstream device is encrypted, enter the WiFi password of the upstream device's in the **Key** box. Click **Save**.



Radio Band: 2.4 GHz

Working Mode: ○ AP ● Client+AP

SSID: Tom-WiFi

Security Mode: Mixed WPA/WPA2-PSK

Encryption Algorithm: ○AES ○TKIP ●TKIP&AES

Key: ••••••••

Channel of Upstream AP: 6

Select	SSID	MAC Address	Network Mode	Channel Bandwidth	Channel	Extension Channel	Security Mode	Signal Strength
○	Mary-WiFi	c8:3a:35:84:3f:01	bgn	40MHz	10	upper	none	-78dBm
●	Tom-WiFi	c8:3a:35:f2:ad:e1	bgn	40MHz	6	upper	wpa&wpa2/aes...	-78dBm
○	Cindy-WiFi	50:2b:73:f0:39:d1	bgn	20MHz	1	none	wpa2/aes	-78dBm

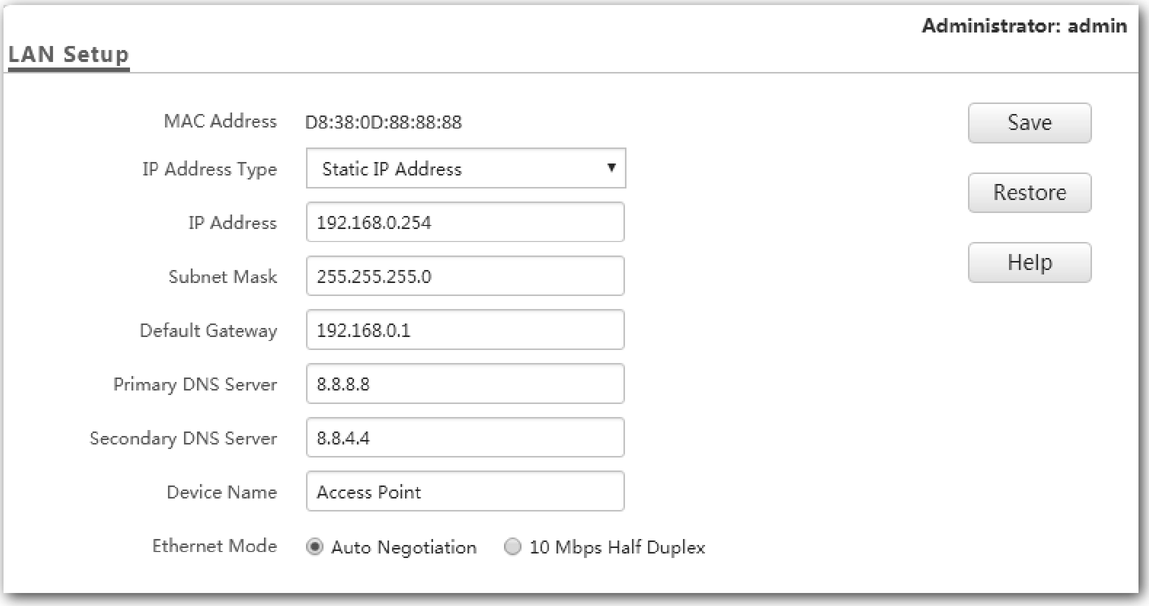
---End

After the configuration, your computer connected to the AP can access the internet directly. And you can also connect wireless devices to the AP's WiFi network using the AP's own SSID and WiFi password. If you do not know the SSID of the AP, click **Wireless Settings** > **SSID Settings**.

6 Network Settings

6.1 LAN setup

This page enables you to check the MAC address of your AP's LAN port, and set the LAN port's IP address type and other parameters. To access the page, click **Network Settings** > **LAN Setup**.



MAC Address	D8:38:0D:88:88:88
IP Address Type	Static IP Address ▾
IP Address	192.168.0.254
Subnet Mask	255.255.255.0
Default Gateway	192.168.0.1
Primary DNS Server	8.8.8.8
Secondary DNS Server	8.8.4.4
Device Name	Access Point
Ethernet Mode	● Auto Negotiation ○ 10 Mbps Half Duplex

Parameter description

Parameter	Description
MAC Address	It specifies the MAC address of the AP's LAN port.
IP Address Type	It specifies how the AP gets its IP address. The default option is **Static IP Address**. – **Static IP Address**: It indicates that the AP has static IP address information. In this condition, you need to set IP address, subnet mask, gateway, and DNS server information for the AP manually. – **DHCP**: It indicates that the AP gets IP address, subnet mask, gateway, and DNS server information from a DHCP server in your LAN network automatically.

Parameter	Description
	Tip If **IP Address Type** is set to **DHCP**, you should log in to the web UI of the AP using the AP's IP address assigned by the DHCP server. To get the AP's IP address, find it in the client list of the DHCP server.
IP Address	It specifies the IP address of the AP (default: **192.168.0.254**). You can access the web UI of the AP using this IP address.
Subnet Mask	It specifies the subnet mask of the IP address of the AP. The default subnet mask is **255.255.255.0**.
Default Gateway	It specifies the gateway IP address of the AP. Generally, to ensure that the AP can access the internet successfully, you should set the gateway IP address to the LAN IP address of the router connected to the internet.
Primary DNS Server	It specifies the IP address of the primary DNS server of the AP. If DNS proxy function is supported on your router connected to the internet, you can set the IP address of the primary DNS server to the LAN IP address of your router. Otherwise, enter a correct DNS server IP address.
Secondary DNS Server	It specifies the IP address of the secondary DNS server of the AP. This parameter is optional.
Device Name	It specifies the name of the AP.
Ethernet Mode	– **Auto Negotiation**: In this mode, this device can be powered through the LAN port using a CAT 5e or better Ethernet cable with a maximum transmission distance of 100 meters. – **10 Mbps Half Duplex**: In this mode, this device can be powered through the LAN port using a CAT 5e or better Ethernet cable with a maximum transmission distance of 150 to 200 meters.

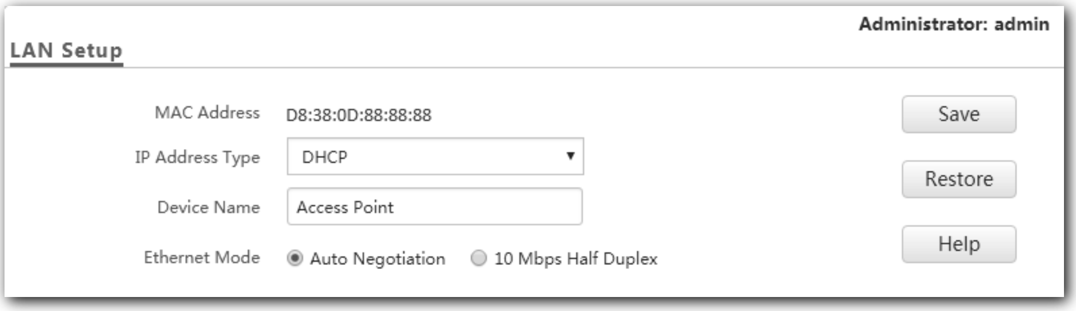
6.2 Changing the LAN IP address of the AP

6.2.1 Dynamic IP address

This IP address type enables your AP to obtain an IP address, a subnet mask, a gateway IP address, DNS server IP addresses from a DHCP server automatically. If a large number of APs are deployed, you are recommended to adopt this type to prevent IP address conflicts and reduce your workload.

Procedure:

1. To access the configuration page, click **Network Settings** > **LAN Setup**.
2. Set **IP Address Type** to **DHCP**.
3. Click **Save**.



Administrator: admin

LAN Setup

MAC Address D8:38:0D:88:88:88

IP Address Type DHCP

Device Name Access Point

Ethernet Mode ● Auto Negotiation ○ 10 Mbps Half Duplex

---End

After the configuration, if you want to log in to the web UI of your AP, first find the IP address of the AP from the client list of the DHCP server, then ensure that the IP address of your computer and the IP address of the AP belong to the same network segment, finally log in to the web UI of your AP using its new IP address.

Note

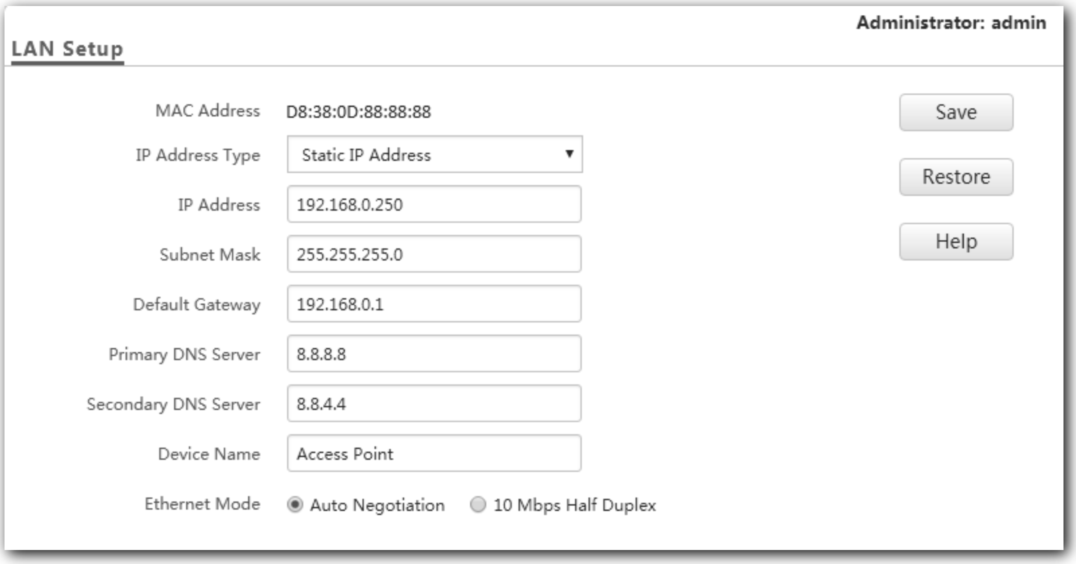
If the IP address of your computer is not in the same network segment as the new IP address of your AP, please set an IP address for your computer which is in the same network segment as the AP's new IP address. For detailed steps to set an IP address for your computer, refer to A.1 Configuring a static IP address for your computer (Example: Win7) in this user guide.

6.2.2 Static IP address

If you want to set AP's IP address yourself, set **IP Address Type** to **Static IP Address** first, then configure IP address, subnet mask, gateway IP address, and DNS server IP addresses for your AP manually. This type is recommended only when you need to deploy just a few APs.

Procedure:

1. To access the configuration page, click **Network Settings** > **LAN Setup**.
2. Set **IP Address Type** to **Static IP Address**.
3. **IP Address**: Enter the static IP address for your AP, which is **192.168.0.250** in this example.
4. **Subnet Mask**: Enter the subnet mask for your AP, which is **255.255.255.0** in this example.
5. **Gateway**: Enter the gateway for your AP, which is **192.168.0.1** in this example.
6. **Primary DNS Server**: Enter the primary DNS server for your AP, which is **8.8.8.8** in this example.
7. **Secondary DNS Server**: If this parameter is available, enter the secondary DNS server for your AP, which is **8.8.4.4** in this example. Otherwise, leave this box blank.
8. Click **Save**.



LAN Setup

Administrator: admin

MAC Address D8:38:0D:88:88:88

IP Address Type Static IP Address

IP Address 192.168.0.250

Subnet Mask 255.255.255.0

Default Gateway 192.168.0.1

Primary DNS Server 8.8.8.8

Secondary DNS Server 8.8.4.4

Device Name Access Point

Ethernet Mode ● Auto Negotiation ○ 10 Mbps Half Duplex

---End

After the configuration, if the new IP address of the AP belongs to the same network segment as the IP address of your management computer, you can log in to the web UI of the AP directly using the new IP address. Otherwise, before logging in to the AP's web UI using the new IP address, assign your computer an IP address that belongs to the same network segment as the new IP address.

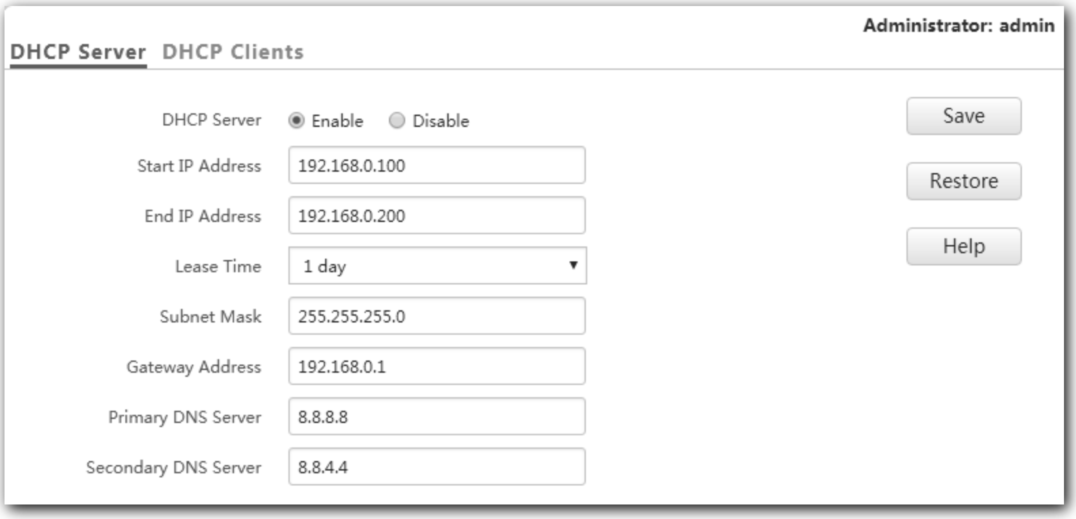
6.3 DHCP server

6.3.1 Overview

The AP supports the DHCP server function to assign IP addresses to devices connected to it. By default, this function is disabled.

6.3.2 Configuring the DHCP server

1. To access the configuration page, choose **Network Settings** > **DHCP Server**.
2. **DHCP Server**: Select **Enable**.
3. **Gateway Address**: Enter the gateway address, which is **192.168.0.1** in this example.
4. **Primary DNS Server**: Enter the primary DNS server, which is **8.8.8.8** in this example.
5. Click **Save**.



DHCP Server ● Enable ○ Disable

Start IP Address 192.168.0.100

End IP Address 192.168.0.200

Lease Time 1 day ▾

Subnet Mask 255.255.255.0

Gateway Address 192.168.0.1

Primary DNS Server 8.8.8.8

Secondary DNS Server 8.8.4.4

---End

Parameter description

Parameter	Description
DHCP Server	It specifies whether to enable the DHCP server function of the AP. By default, it is disabled.
Start IP Address	It specifies the start IP address of the DHCP server’s IP address pool. The default value is 192.168.0.100.
End IP Address	It specifies the end IP address of the DHCP server’s IP address pool. The default value is 192.168.0.200.

Parameter	Description
	Tip The start and end IP addresses must belong to the same network segment as the IP address of the AP.
Lease Time	It specifies the validity period of an IP address assigned by the DHCP server to a device. By default, it is 1 day. When half of the lease time has elapsed, the device sends a DHCP request to the DHCP server to renew the lease time. If the request succeeds, the lease time is extended based on the request. Otherwise, the device sends a request again when 7/8 of the lease time has elapsed. If the request succeeds, the lease time is extended based on the request. Otherwise, the device must request a new IP address from the DHCP server after the lease time expires. You are recommended to retain the default value.
Subnet Mask	It specifies the subnet mask assigned by the DHCP server to devices. The default value is 255.255.255.0.
Gateway Address	It specifies the gateway IP address assigned by the DHCP server to devices. Generally, it is the LAN IP address of the router connected to the internet. The default value is 192.168.0.1. Tip Only through a gateway can a LAN device access a server or host which is not in the local network segment. You are recommended to enter a gateway IP address which can access the internet. Otherwise, the device in the LAN network cannot access the internet.
Primary DNS Server	It specifies the DNS server address provided by your ISP. If you do not know it, please consult your ISP. Tip To enable devices to access the internet, set this parameter to a correct DNS server IP address or DNS proxy IP address.
Secondary DNS Server	It specifies the second DNS server address (if any) provided by your ISP. This parameter is optional, which indicates you can leave it blank if your ISP does not provide this parameter.

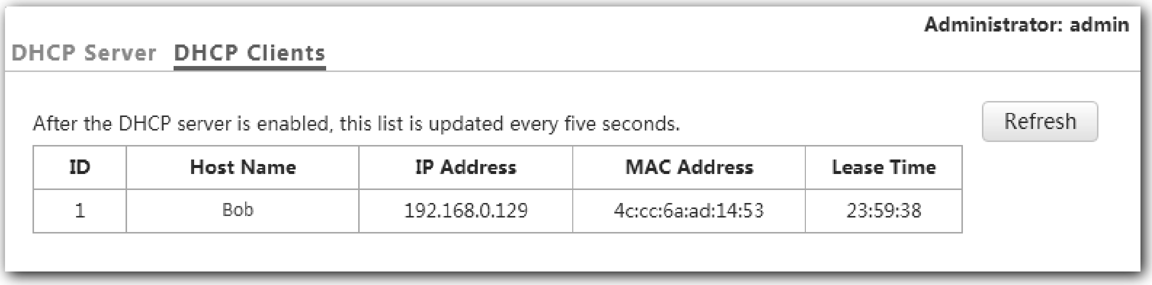
Note

If another DHCP server is available in your LAN, ensure that the IP address pool of the AP does not overlap the IP address pool of that DHCP server. Otherwise, IP address conflicts may occur.

6.3.3 DHCP clients

If the AP's DHCP server function is enabled, this module enables you to view detailed information about devices that obtain IP addresses from the AP's DHCP server, which includes host names, IP addresses, MAC addresses, and lease time.

To access the page, choose **Network Settings** > **DHCP Server** > **DHCP Clients**.



After the DHCP server is enabled, this list is updated every five seconds.

ID	Host Name	IP Address	MAC Address	Lease Time
1	Bob	192.168.0.129	4c:cc:6a:ad:14:53	23:59:38

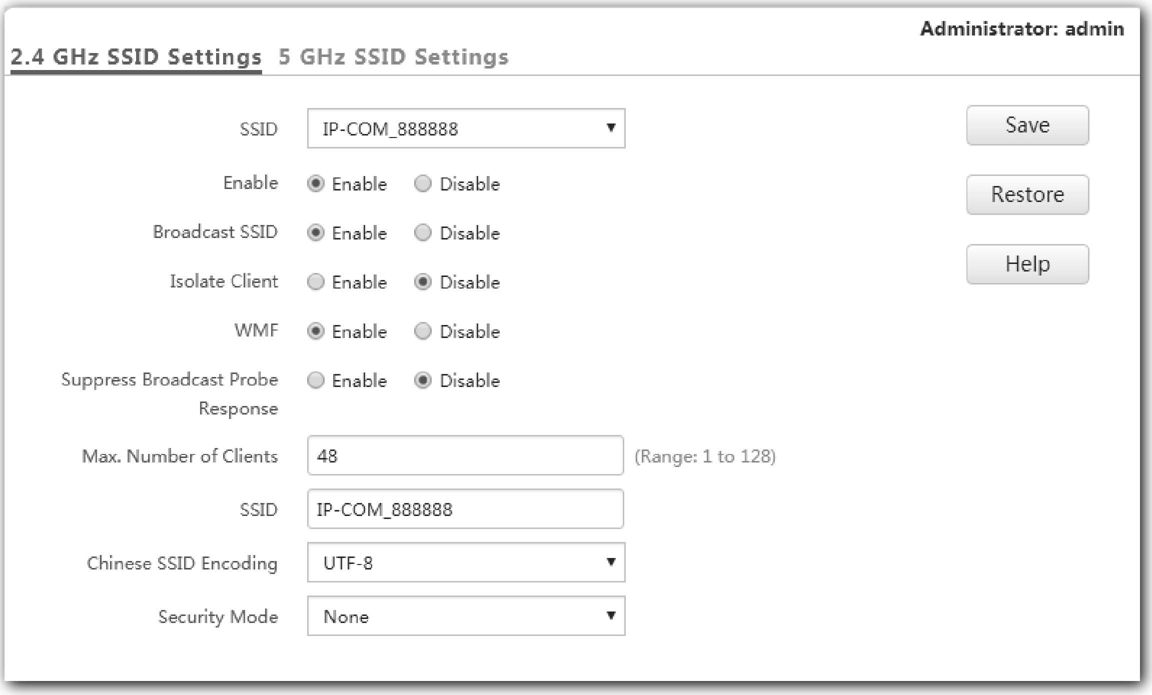
You can click **Refresh** to view the latest DHCP client list.

7 Wireless Settings

7.1 SSID settings

7.1.1 Overview

This module enables you to set SSID-related parameters of the AP. To access the configuration page, click **Wireless Settings** > **SSID Settings**.



SSID	IP-COM_888888 ▾
Enable	● Enable ○ Disable
Broadcast SSID	● Enable ○ Disable
Isolate Client	○ Enable ● Disable
WMF	● Enable ○ Disable
Suppress Broadcast Probe Response	○ Enable ● Disable
Max. Number of Clients	48 (Range: 1 to 128)
SSID	IP-COM_888888
Chinese SSID Encoding	UTF-8 ▾
Security Mode	None ▾

Broadcast SSID

When the AP broadcasts an SSID, wireless devices nearby can detect the SSID. When this parameter is set to **Disable**, the AP does not broadcast the SSID so that nearby wireless devices cannot detect the SSID. In this case, you need to enter the SSID manually on your wireless devices to connect to the WiFi network corresponding to the SSID. To some extent, disabling broadcasting SSID enhances the security of the WiFi network.

However, even though setting **Broadcast SSID** to **Disable**, a hacker can still connect to the corresponding WiFi network if he/she manages to obtain the SSID by other means.

Isolate Client

This parameter implements a function similar to the VLAN function for wired networks. It isolates the wireless devices connected to the same WiFi network, so that the wireless devices can access only the wired network connected to the AP. You can apply this function to hotspot setup in public such as hotels and airports to improve network security.

WMF

The number of wireless devices keeps increasing currently, but wired and wireless bandwidth resources are limited. Therefore, the multicast technology, which enables single-point data transmission and multi-point data reception, has been widely used in networks in order to reduce bandwidth requirements and prevent network congestion.

Nevertheless, if a large number of devices are connected to a wireless interface of a WiFi network and multicast data is intended for only one of the devices, the data is still sent to all the devices, which increases unnecessary wireless resource usage and may lead to wireless channel congestion. In addition, multicast stream forwarding over an 802.11 network is not secure, either.

The WMF function of the AP converts multicast traffic into unicast traffic and forwards the traffic to the multicast traffic destination in the WiFi network, helping save wireless resources, ensuring reliable transmission, and reducing delays.

Max. Number of Clients

This parameter specifies the maximum number of devices that can connect to the WiFi network corresponding to an SSID. If the number is reached, the WiFi network rejects new connection requests from devices. This limit helps balance load among APs.

Chinese SSID Encoding

It specifies the encoding format of Chinese SSIDs, which consists of UTF-8 (default) and GB2312. This setting is effective only when an SSID contains Chinese characters. If you want your Chinese SSID to be displayed properly, select the encoding format supported by you wireless devices.

Security Mode

A WiFi network uses radio open to the public as its data transmission medium. If the WiFi network is not protected by necessary measures, any device can connect to the network to access unprotected data over the network or the resources of the network. To ensure communication security, transmission links of WiFi network must be encrypted.

The AP supports various security modes for network encryption, including **None**, **WEP**, **WPA-PSK**, **WPA2-PSK**, **Mixed WPA/WPA2-PSK**, **WPA**, and **WPA2**.

- **None**

It indicates that any wireless device can connect to the WiFi network. This option is not recommended because it leads to network insecurity.

- **WEP**

It uses a static key to encrypt all exchanged data, and ensures that a WLAN has the same level of security as a wired LAN. However, data encrypted based on WEP can be easily cracked. In addition, WEP supports a maximum WiFi network throughput of only 54 Mbps. Therefore, this security mode is not recommended.

- **WPA-PSK, WPA2-PSK, and Mixed WPA/WPA2-PSK**

They belong to pre-shared key or personal key modes, where Mixed WPA/WPA2-PSK supports both WPA-PSK and WPA2-PSK.

WPA-PSK, WPA2-PSK, and Mixed WPA/WPA2-PSK adopt a pre-shared key for authentication, while the AP generates another key for data encryption. This prevents the vulnerability caused by static WEP keys, and makes the three security modes suitable for ensuring security of home WiFi networks. Nevertheless, because the initial pre-shared key for authentication is manually set and all devices use the same key to connect to the same AP, the key may be disclosed unexpectedly. This makes the security modes not suitable for scenarios where high security is required.

- **WPA and WPA2**

To address the key management weakness of WPA-PSK and WPA2-PSK, the WiFi Alliance puts forward WPA and WPA2, which use 802.1x to authenticate devices and generate data encryption–oriented root keys. WPA and WPA2 use the root keys to replace the pre-shared keys that set manually, but adopt the same encryption process as WPA-PSK and WPA2-PSK.

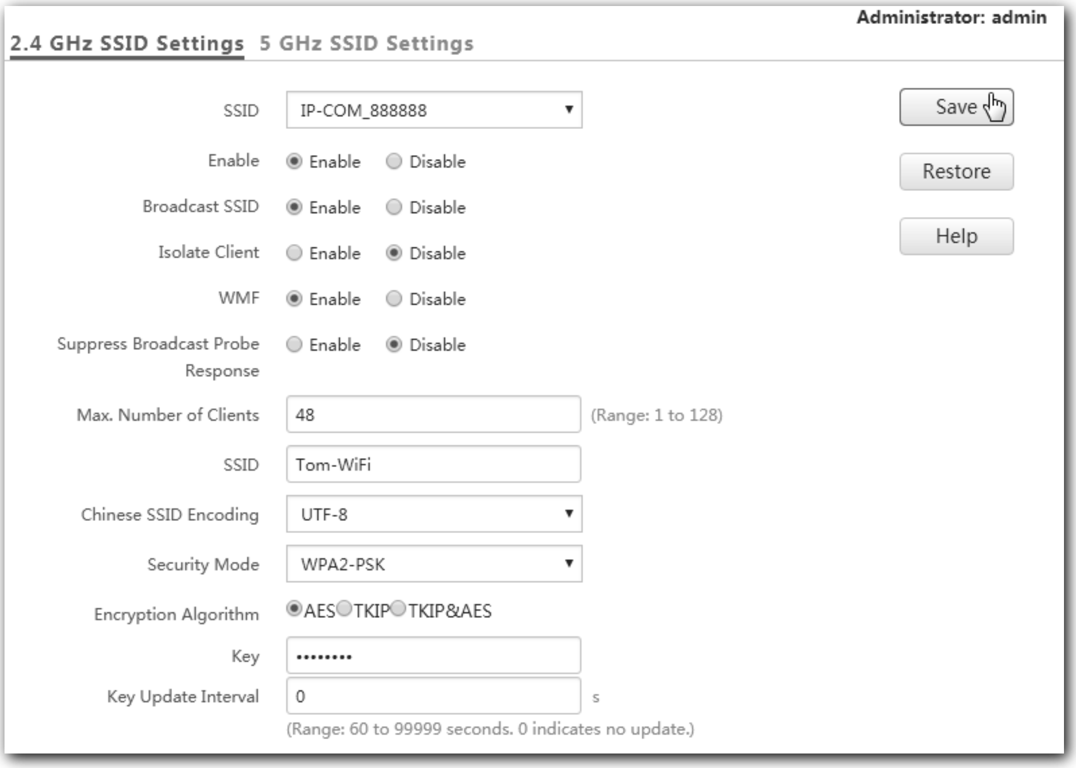
WPA and WPA2 uses 802.1x to authenticate devices and the login information of a device is managed by the device. This effectively reduces the probability of information leakage. In addition, each time a device connects to an AP that adopts the WPA or WPA2 security mode, the RADIUS server generates a data encryption key and assigns it to the device, which makes it difficult for attackers to obtain the key. These features of WPA and WPA2 security modes help increase network security significantly, making WPA and WPA2 the preferred security modes of WiFi networks that require high security.

7.1.2 Changing the SSID settings

To change the SSID settings, perform the following procedure:

1. Choose **Wireless Settings** > **SSID Settings**.
2. Click a tag page as required, which is **2.4 GHz SSID Settings** in this example.
3. Select the SSID from the **SSID** drop-down list box.
4. Change the parameters as required. Generally, you only need to set the **SSID**, and **Security Mode**, **Key** parameters.

5. Click **Save**.



SSID: IP-COM_888888

Enable: ● Enable ○ Disable

Broadcast SSID: ● Enable ○ Disable

Isolate Client: ○ Enable ● Disable

WMF: ● Enable ○ Disable

Suppress Broadcast Probe Response: ○ Enable ● Disable

Max. Number of Clients: 48 (Range: 1 to 128)

SSID: Tom-WiFi

Chinese SSID Encoding: UTF-8

Security Mode: WPA2-PSK

Encryption Algorithm: ● AES ○ TKIP ○ TKIP&AES

Key: ••••••••

Key Update Interval: 0 s
(Range: 60 to 99999 seconds. 0 indicates no update.)

---End

Parameter description

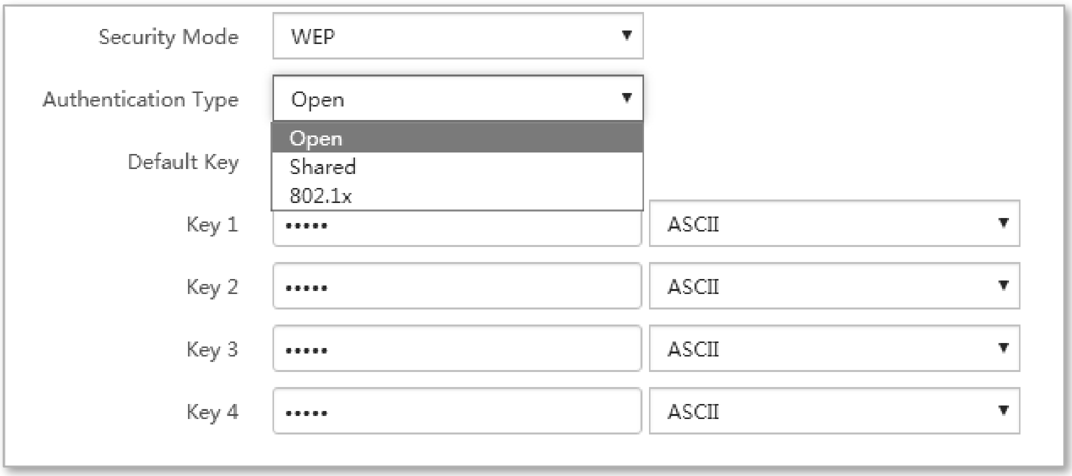
Parameter	Description
SSID	It specifies the SSID to be configured. The AP supports eight SSIDs over the 2.4 GHz band and four over the 5 GHz band. The first SSID displayed in the SSID list of the corresponding band is the primary SSID of that band.
Enable	It specifies whether to enable the selected SSID. The primary SSID of each band is enabled by default, while the others are disabled. Users can enable them if required.
Broadcast SSID	It specifies whether to broadcast the selected SSID. - **Enable**: It indicates that the AP broadcasts the selected SSID. In this case, nearby wireless devices can detect the SSID. - **Disable**: It indicates that the AP does not broadcast the selected SSID so that nearby wireless devices cannot detect the SSID. In this case, if you want to connect a wireless device to the WiFi network corresponding to the SSID, you must enter the SSID on the device manually.

Parameter	Description
	Tip This AP can hide its SSID automatically. When an SSID's connected devices number reaches its max number of clients, the AP stops broadcasting the SSID.
Isolate Client	– **Enable**: It indicates that the wireless devices connected to the AP with the selected SSID cannot communicate with each other, which improves WiFi network security. – **Disable**: It indicates that the wireless devices connected to the AP with the selected SSID can communicate with each other. By default, **Isolate Client** is disabled.
WMF	– **Enable**: It indicates that the WMF function is enabled. – **Disable**: It indicates that the WMF function is disabled. By default, WMF function is disabled.
Suppress Broadcast Probe Response	– **Enable**: It indicates that the **Suppress Broadcast Probe Response** function is enabled. After this function is enabled, this device does not respond to the requests without an SSID, saving wireless resources. – **Disable**: It indicates that the **Suppress Broadcast Probe Response** function is disabled. By default, the function is disabled.
Max. Number of Clients	It specifies the maximum number of devices that can be concurrently connected to the WiFi network corresponding to an SSID. After this upper limit is reached, the AP rejects new requests from devices for connecting to the wireless network.
SSID	If you want to change the selected SSID, enter the new SSID in this box.
Chinese SSID Encoding	It specifies the encoding format of Chinese characters in an SSID. The default value is **UTF-8**. This parameter takes effect only if the SSID contains Chinese characters.
Security Mode	It specifies the security mode of the selected SSID. The options include: None, WEP, WPA-PSK, WPA2-PSK, Mixed WPA/WPA2-PSK, WPA and WPA2. Refer to following contents for details about these options.

- **None**

It allows any wireless device to connect to the WiFi network. This option is not recommended because it leads network insecurity.

- **WEP**



Security Mode: WEP

Authentication Type: Open

Default Key

Key 1: ••••• ASCII

Key 2: ••••• ASCII

Key 3: ••••• ASCII

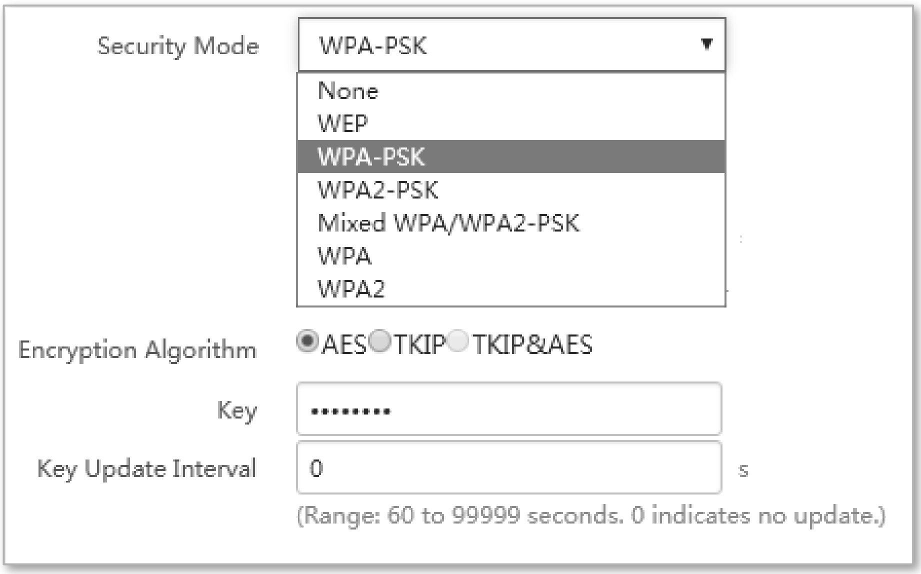
Key 4: ••••• ASCII

Parameter description

Parameter	Description
Authentication Type	It specifies the encryption type for the WEP security mode of the AP. The options include **Open**, **Shared**, and **802.1x**, and they share the same encryption process. – **Open** It specifies that authentication is not required and data exchanged is encrypted using WEP. In this case, a wireless device can connect to the wireless network corresponding to the selected SSID without being authenticated, and the data exchanged between the device and the network is encrypted in WEP security mode. – **Shared** It specifies that a shared key is used for authentication and data exchanged is encrypted using WEP. In this case, a wireless device must use a preset WEP key to connect to the wireless network corresponding to the selected SSID. The wireless device can be connected to the wireless network only if they use the same WEP key. – **802.1x** It specifies that 802.1x authentication is required and data exchanged is encrypted using WEP. In this case, ports are enabled for user authentication when valid devices connect to the wireless network corresponding to the selected SSID, and disabled when invalid devices connect to the wireless network.
Default Key	It specifies the default WEP key for the **Open** and **Shared** encryption types. For example, if **Default Key** is set to **Key 2**, a wireless device can connect to the wireless network corresponding to the selected SSID only with the password specified by **Key 2**.

Parameter	Description
ASCII	It indicates that a key selected for the **Open** or **Shared** authentication type contains hexadecimal characters. 5 or 13 ASCII characters are allowed in the key.
Hexadecimal	It indicates that a key selected for the **Open** or **Shared** authentication type contains hexadecimal characters. 10 or 26 hexadecimal characters (range: 0-9, a-f, and A-F) are allowed in the key.
RADIUS Server IP	These parameters are dedicated to the 802.1x authentication type. It specifies the IP address/port number/shared key of the RADIUS server for authentication.
RADIUS Port	
RADIUS Password	

- **WPA-PSK, WPA2-PSK, and Mixed WPA/WPA2-PSK**



Security Mode: WPA-PSK

Encryption Algorithm: ● AES ○ TKIP ○ TKIP&AES

Key: ••••••••

Key Update Interval: 0 s

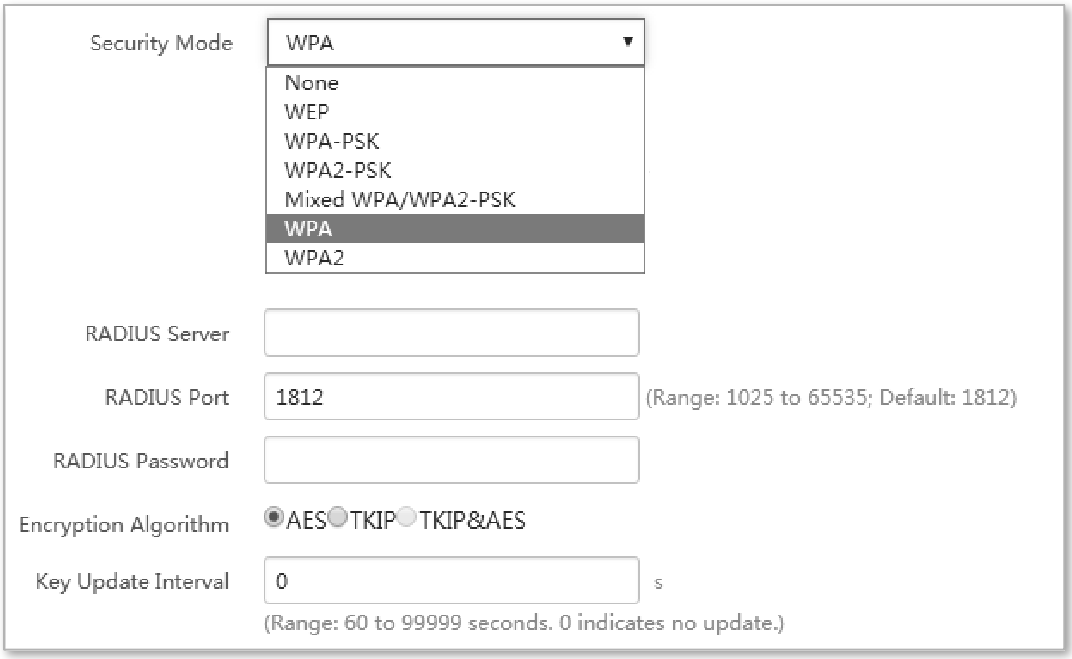
(Range: 60 to 99999 seconds. 0 indicates no update.)

Parameter description

Parameter	Description
Security Mode	It indicates the personal or pre-shared key security mode, including **WPA-PSK**, **WPA2-PSK**, and **Mixed WPA/WPA2-PSK**. – **WPA-PSK**: It indicates that the WiFi network corresponding to the selected SSID is encrypted using WPA-PSK. – **WPA2-PSK**: It indicates that the WiFi network corresponding to the selected SSID is encrypted using WPA2-PSK. – **Mixed WPA/WPA2-PSK**: It indicates that wireless devices can connect to the WiFi network corresponding to the selected SSID using either WPA-PSK or WPA2-PSK.
Encryption Algorithm	It specifies the encryption algorithm corresponding to the selected security mode. If **Security Mode** is set to **WPA-PSK**, this parameter has the **AES** and **TKIP** values. If **Security Mode** is set to **WPA2-PSK** or **Mixed**

Parameter	Description
	WPA/WPA2-PSK, this parameter has the **AES**, **TKIP**, and **TKIP&AES** values. - **AES**: It specifies the Advanced Encryption Standard. - **TKIP**: It specifies the Temporal Key Integrity Protocol. If **TKIP** is used, the maximum wireless throughput of the AP is limited to 54 Mbps. - **TKIP&AES**: It specifies that both the TKIP and AES encryption algorithms are supported. Wireless devices can connect to the WiFi network corresponding to the selected SSID using TKIP or AES.
Key	It specifies a pre-shared WPA key. A WPA key can contain 8 to 63 ASCII characters or 8 to 64 hexadecimal characters.
Key Update Interval	It specifies the automatic update interval of a WPA key for data encryption. A shorter interval results in higher data security. The value **0** indicates that a WAP key is not updated.

- **WPA and WPA2**



Security Mode: WPA

RADIUS Server:

RADIUS Port: 1812 (Range: 1025 to 65535; Default: 1812)

RADIUS Password:

Encryption Algorithm: ● AES ○ TKIP ○ TKIP&AES

Key Update Interval: 0 s

(Range: 60 to 99999 seconds. 0 indicates no update.)

Parameter description

Parameter	Description
Security Mode	The **WPA** and **WPA2** options are available for network protection with a RADIUS server. - **WPA**: It indicates that the WiFi network corresponding to the selected SSID is encrypted using WPA. - **WPA2**: It indicates that the WiFi network corresponding to the selected SSID is encrypted using WPA2.

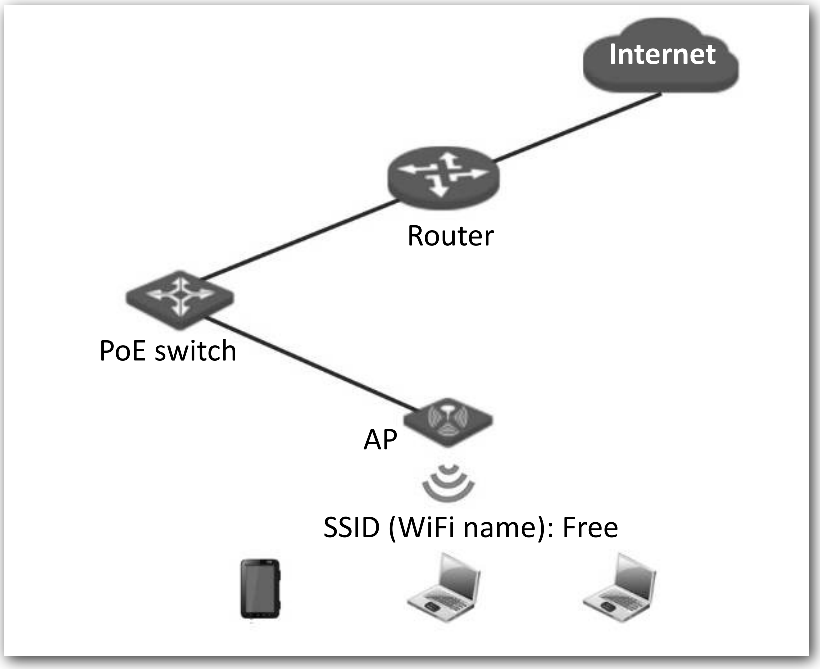
Parameter	Description
RADIUS Server	It specifies the IP address of the RADIUS server for client authentication.
RADIUS Port	It specifies the port number of the RADIUS server for client authentication.
RADIUS Password	It specifies the shared password of the RADIUS server.
Encryption Algorithm	It specifies the encryption algorithm corresponding to the selected security mode. The available options include **AES**, **TKIP**, and **TKIP&AES**. – **AES**: It specifies the Advanced Encryption Standard. – **TKIP**: It specifies the Temporal Key Integrity Protocol. – **TKIP&AES**: It specifies that both the TKIP and AES encryption algorithms are supported. Wireless devices can connect to the WiFi network corresponding to the selected SSID using TKIP or AES.
Key Update Interval	It specifies the automatic update interval of a WPA key for data encryption. A shorter interval results in higher data security. The value **0** indicates that a WAP key is not updated.

7.1.3 Examples

Setting up a non-encrypted WiFi network

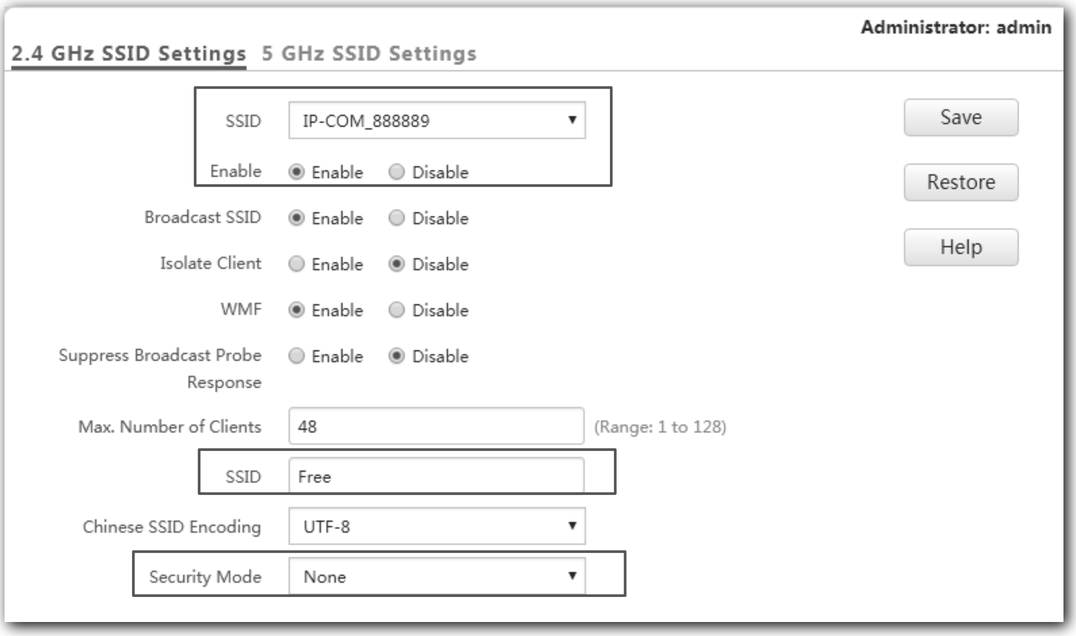
Networking requirement

In a hotel, guests can connect to the WiFi network without a password and access the internet through the WiFi network.



Procedures:

1. Choose **Wireless Settings** > **SSID Settings**.
2. If you want to set SSID of 5 GHz WiFi network, click **5 GHz SSID Settings**. And **2.4 GHz SSID Settings** is used for instructions in this example.
3. **SSID**: Select a SSID from the **SSID** drop-down list box, which is **IP-COM_888889** in this example.
4. **Enable**: Select **Enable**.
5. **SSID**: Set the value of the **SSID** box to **Free**.
6. **Security Mode**: Select **None**.
7. Click **Save**.



SSID	IP-COM_888889 ▾
Enable	● Enable ○ Disable
Broadcast SSID	● Enable ○ Disable
Isolate Client	○ Enable ● Disable
WMF	● Enable ○ Disable
Suppress Broadcast Probe Response	○ Enable ● Disable
Max. Number of Clients	48 (Range: 1 to 128)
SSID	Free
Chinese SSID Encoding	UTF-8 ▾
Security Mode	None ▾

---End

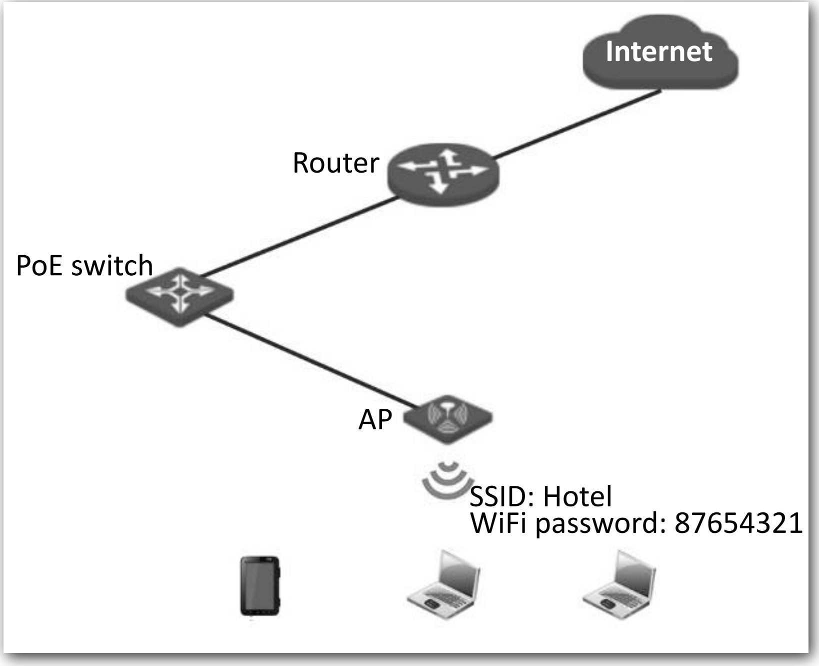
Verification

Wireless devices can connect to the WiFi network named **Free** without a password.

Setting up a WiFi network encrypted by WPA-PSK or WPA2-PSK

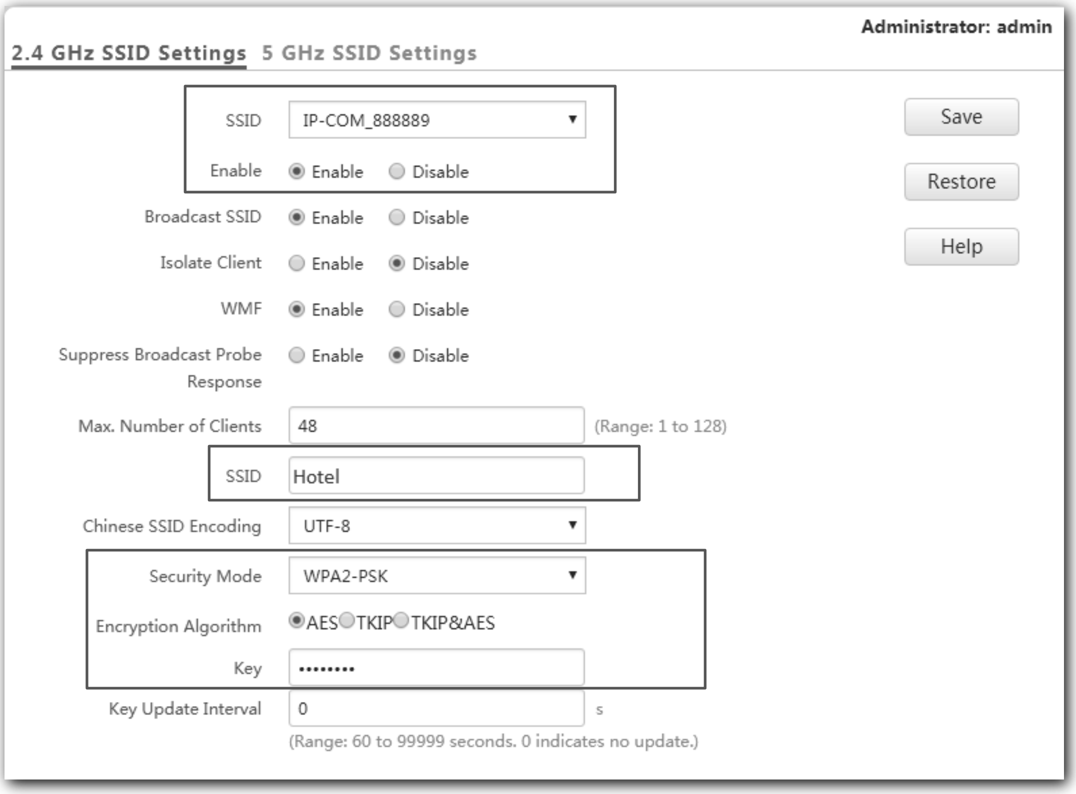
Networking requirement

WiFi network in a hotel with a certain level of security must be configured through a simply procedure. In this case, WPA-PSK or WPA2-PSK mode is recommended. See the following figure.



Procedures:

1. Choose **Wireless Settings** > **SSID Settings**.
2. If you want to set SSID of 5 GHz WiFi network, click **5 GHz SSID Settings**. And **2.4 GHz SSID Settings** is used for instructions in this example.
3. **SSID**: Select a SSID from the **SSID** drop-down list box, which is **IP-COM_888889** in this example.
4. **Enable**: Select **Enable**.
5. **SSID**: Set the value of the **SSID** box to **Hotel**.
6. **Security Mode**: Select **WPA2-PSK**.
7. **Encryption Algorithm**: Select **AES**.
8. **Key**: Enter **87654321**.
9. Click **Save**.



SSID	IP-COM_888889 ▾
Enable	● Enable ○ Disable
Broadcast SSID	● Enable ○ Disable
Isolate Client	○ Enable ● Disable
WMF	● Enable ○ Disable
Suppress Broadcast Probe Response	○ Enable ● Disable
Max. Number of Clients	48 (Range: 1 to 128)
SSID	Hotel
Chinese SSID Encoding	UTF-8 ▾
Security Mode	WPA2-PSK ▾
Encryption Algorithm	●AES○TKIP○TKIP&AES
Key	••••••••
Key Update Interval	0 s (Range: 60 to 99999 seconds. 0 indicates no update.)

---End

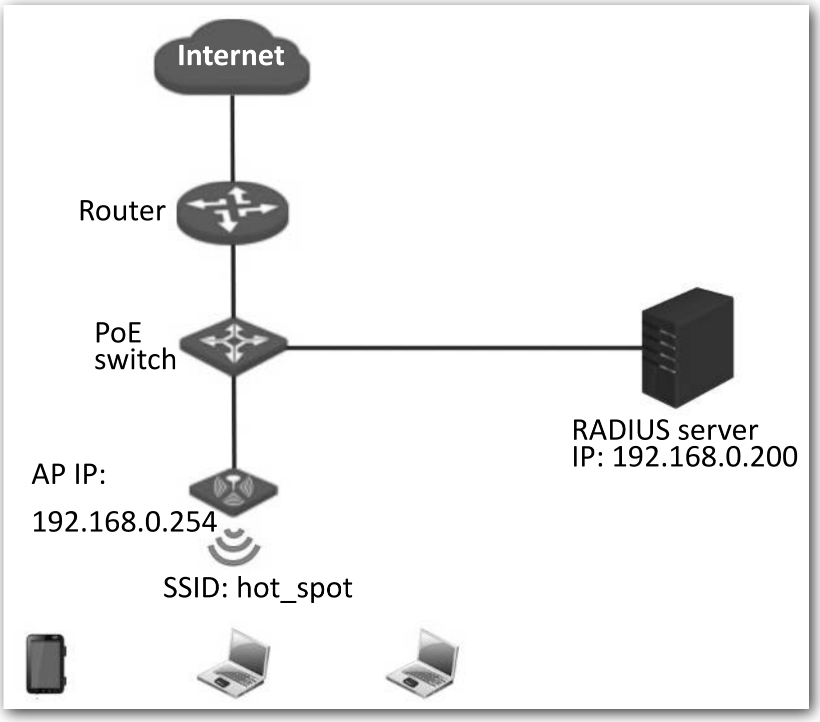
Verification

Wireless devices can connect to the WiFi network named **Hotel** using the password 87654321.

Setting up a WiFi network encrypted by WPA or WPA2

Networking requirement

In this case a highly secure WiFi network is required and a RADIUS server is available. To fulfill the requirement, WPA or WPA2 mode is recommended. See the following figure.



Procedures:

1. Configure the AP.

   Assume that the IP address of the RADIUS server is 192.168.0.200, the password is 12345678, and the port number for authentication is 1812.

   Assume that the second SSID of the AP is used.

   (1) Choose **Wireless Settings** > **SSID Settings**.

   (2) If you want to set SSID of 5 GHz WiFi network, click **5 GHz SSID Settings**. And **2.4 GHz SSID Settings** is used for instructions in this example.

   (3) Select the second SSID from the **SSID** drop-down list box.

   (4) **Enable**: Select **Enable**.

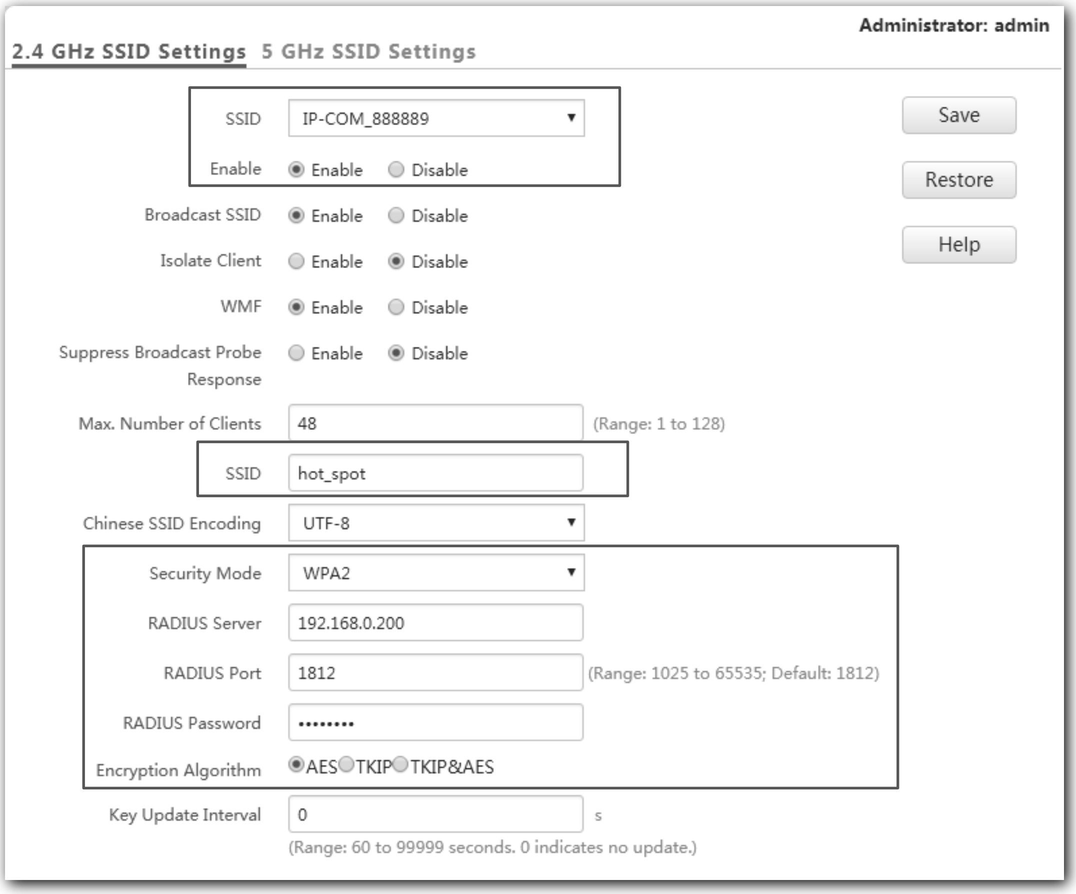
   (5) Change the value of the **SSID** text box to **hot_spot**.

   (6) Set **Security Mode** to **WPA2**.

   (7) Set **RADIUS Server IP**, **RADIUS Port**, and **RADIUS Password** to **192.168.0.200**, **1812**, and **12345678** respectively.

   (8) **Encryption Algorithm**: Select **AES**.

   (9) Click **Save**.



SSID: IP-COM_888889

Enable: ● Enable ○ Disable

Broadcast SSID: ● Enable ○ Disable

Isolate Client: ○ Enable ● Disable

WMF: ● Enable ○ Disable

Suppress Broadcast Probe Response: ○ Enable ● Disable

Max. Number of Clients: 48 (Range: 1 to 128)

SSID: hot_spot

Chinese SSID Encoding: UTF-8

Security Mode: WPA2

RADIUS Server: 192.168.0.200

RADIUS Port: 1812 (Range: 1025 to 65535; Default: 1812)

RADIUS Password: ••••••••

Encryption Algorithm: ●AES○TKIP○TKIP&AES

Key Update Interval: 0 s (Range: 60 to 99999 seconds. 0 indicates no update.)

2. Configure the RADIUS server.

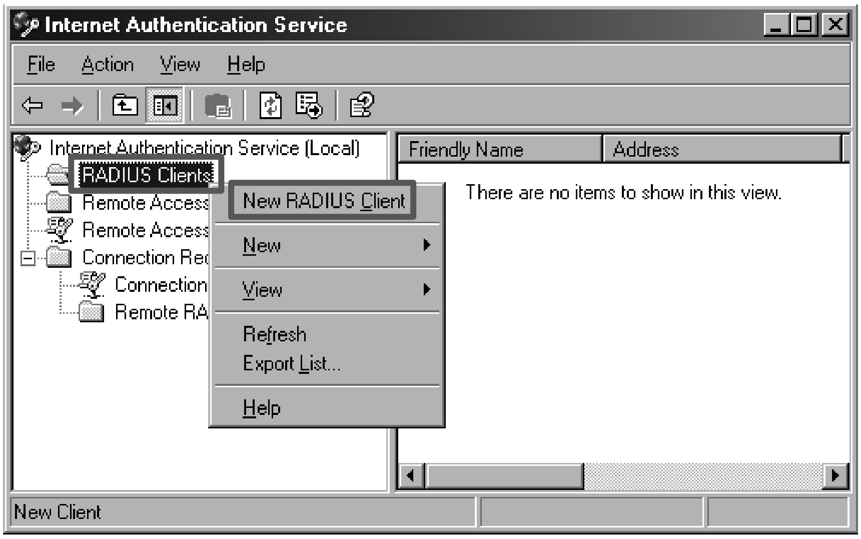
Note

Windows 2003 is used as an example to describe how to configure the RADIUS server.

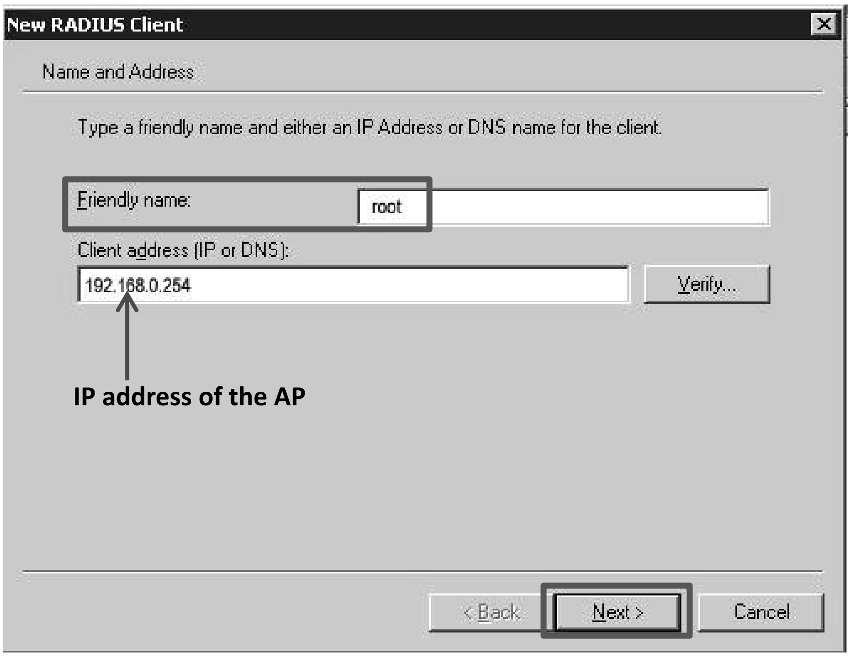
(1) Configure a RADIUS client.

In the **Computer Management** dialog box, double-click **Internet Authentication Service**, right-click **RADIUS Clients**, and choose **New RADIUS Client**.

P



Enter a RADIUS client name (which can be the name of the AP) and the IP address of the AP, and click **Next**.



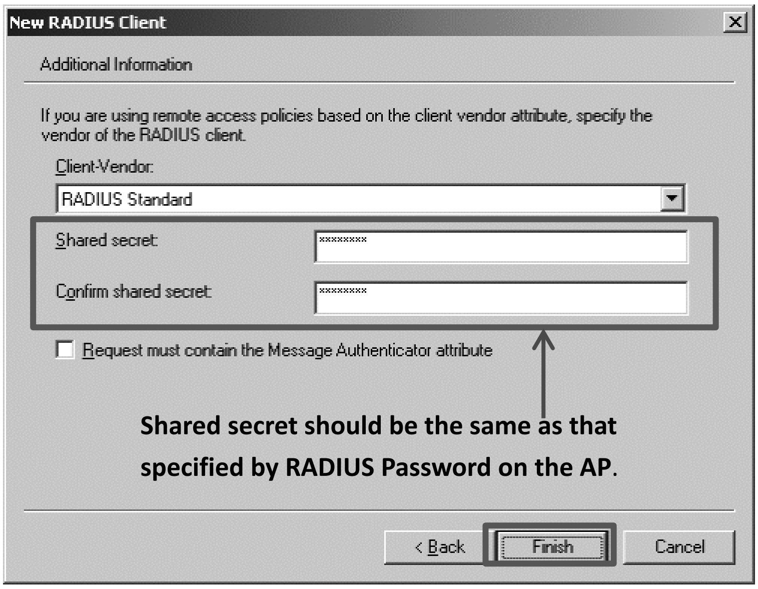
Type a friendly name and either an IP Address or DNS name for the client.

Friendly name: root

Client address (IP or DNS): 192.168.0.254

IP address of the AP

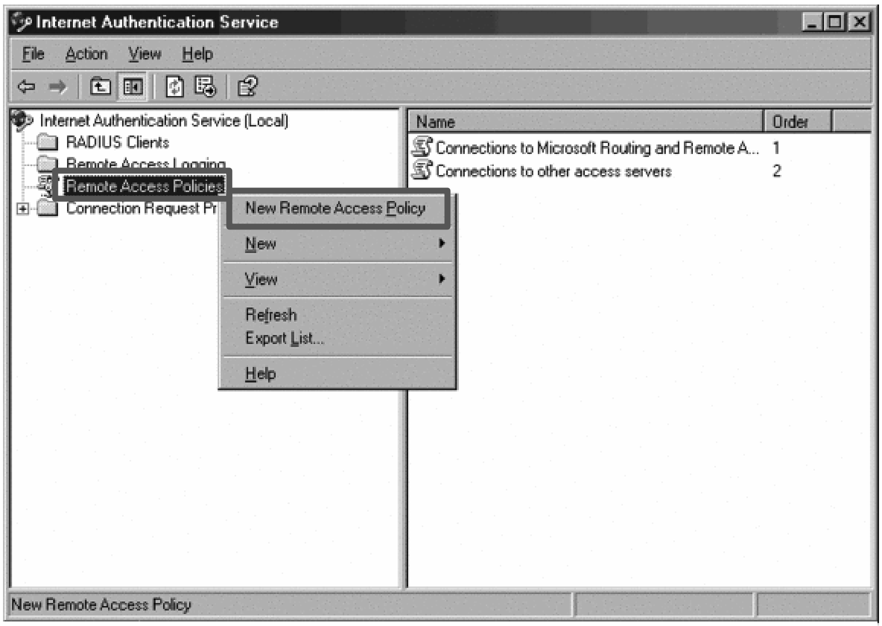
Enter **12345678** in the **Shared secret** and **Confirm shared secret** text boxes, and click **Finish**.


New RADIUS Client
Additional Information
If you are using remote access policies based on the client vendor attribute, specify the vendor of the RADIUS client.
Client-Vendor:
RADIUS Standard
Shared secret:
Confirm shared secret:
Request must contain the Message Authenticator attribute
< Back
Finish
Cancel

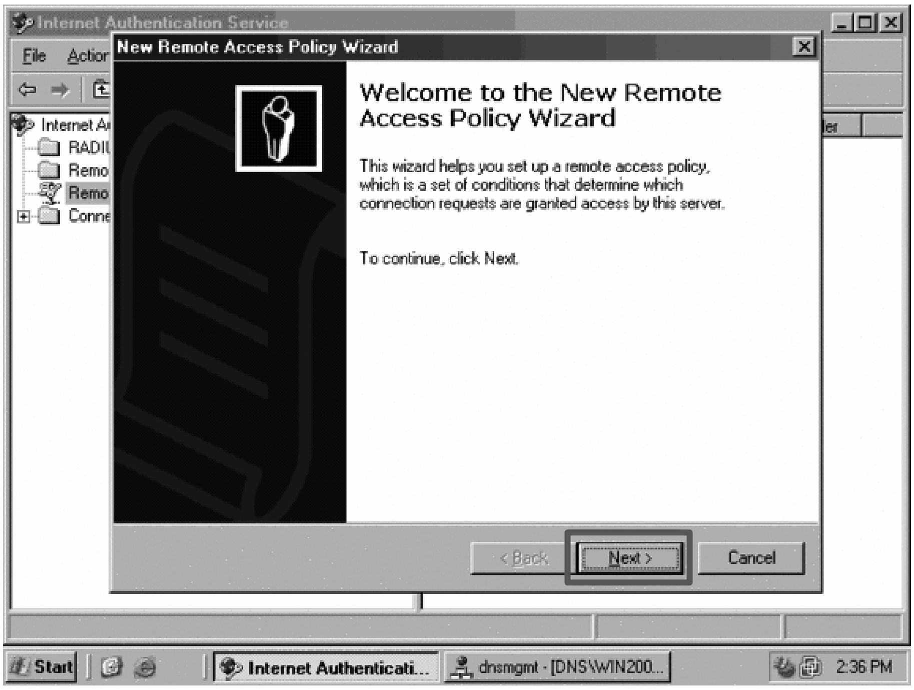
Shared secret should be the same as that specified by RADIUS Password on the AP.

(2) Configure a remote access policy.

Right-click **Remote Access Policies** and choose **New Remote Access Policy**.



In the **New Remote Access Policy Wizard** dialog box that appears, click **Next**.

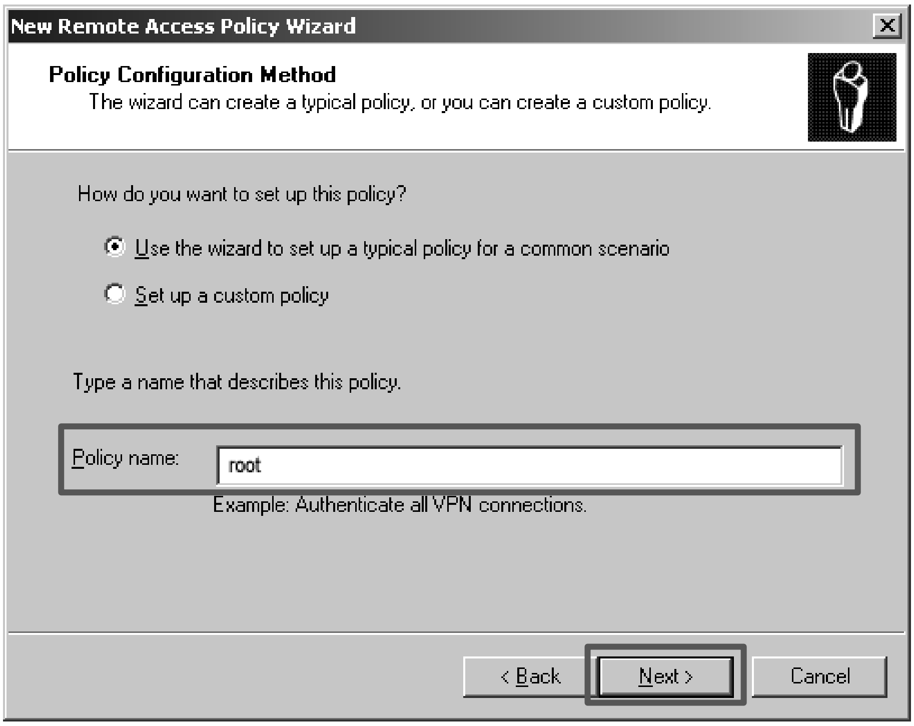


Welcome to the New Remote Access Policy Wizard

This wizard helps you set up a remote access policy, which is a set of conditions that determine which connection requests are granted access by this server.

To continue, click Next.

Enter a policy name and click **Next**.



Policy Configuration Method

The wizard can create a typical policy, or you can create a custom policy.

How do you want to set up this policy?

● Use the wizard to set up a typical policy for a common scenario

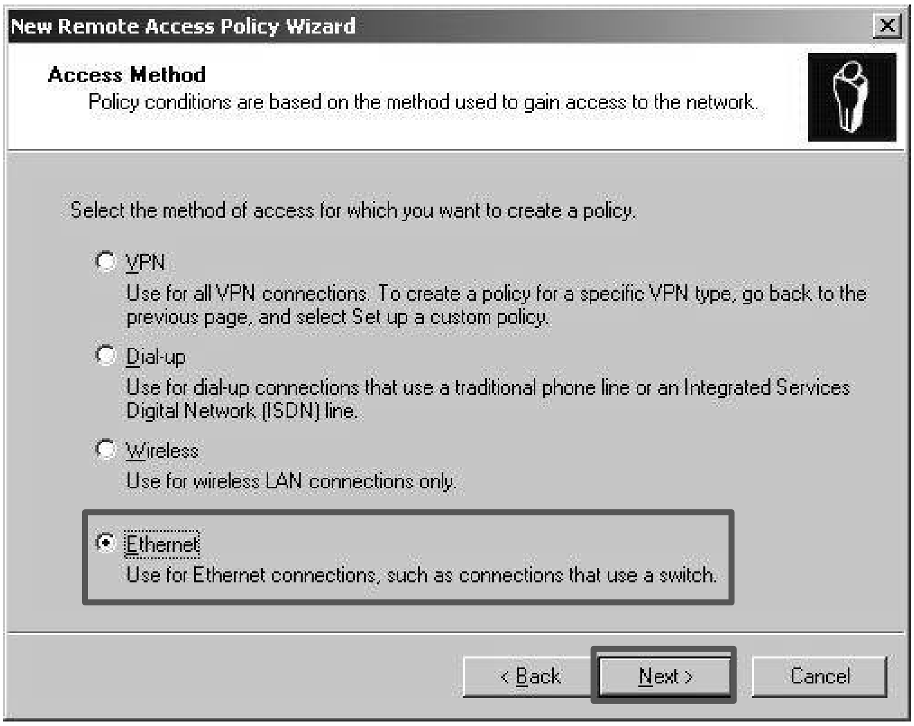
○ Set up a custom policy

Type a name that describes this policy.

Policy name: root

Example: Authenticate all VPN connections.

Select **Ethernet** and click **Next**.



New Remote Access Policy Wizard

Access Method

Policy conditions are based on the method used to gain access to the network.

Select the method of access for which you want to create a policy.

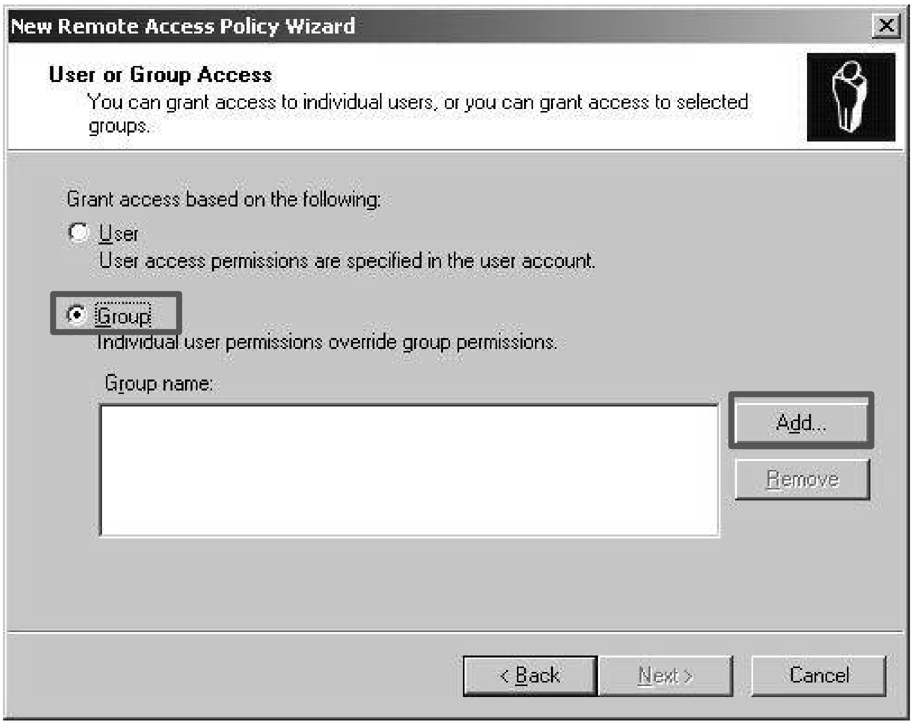
○ VPN
Use for all VPN connections. To create a policy for a specific VPN type, go back to the previous page, and select Set up a custom policy.

○ Dial-up
Use for dial-up connections that use a traditional phone line or an Integrated Services Digital Network (ISDN) line.

○ Wireless
Use for wireless LAN connections only.

● Ethernet
Use for Ethernet connections, such as connections that use a switch.

Select **Group** and click **Add**.



New Remote Access Policy Wizard

User or Group Access

You can grant access to individual users, or you can grant access to selected groups.

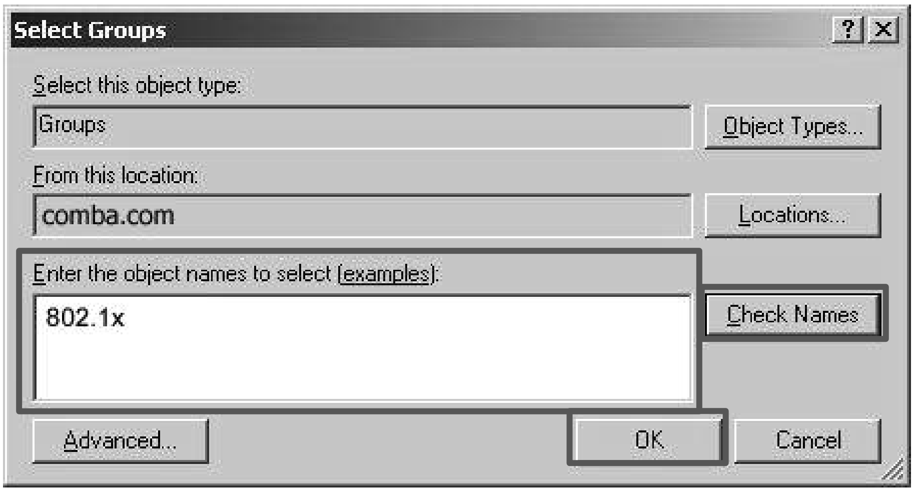
Grant access based on the following:

○ User
User access permissions are specified in the user account.

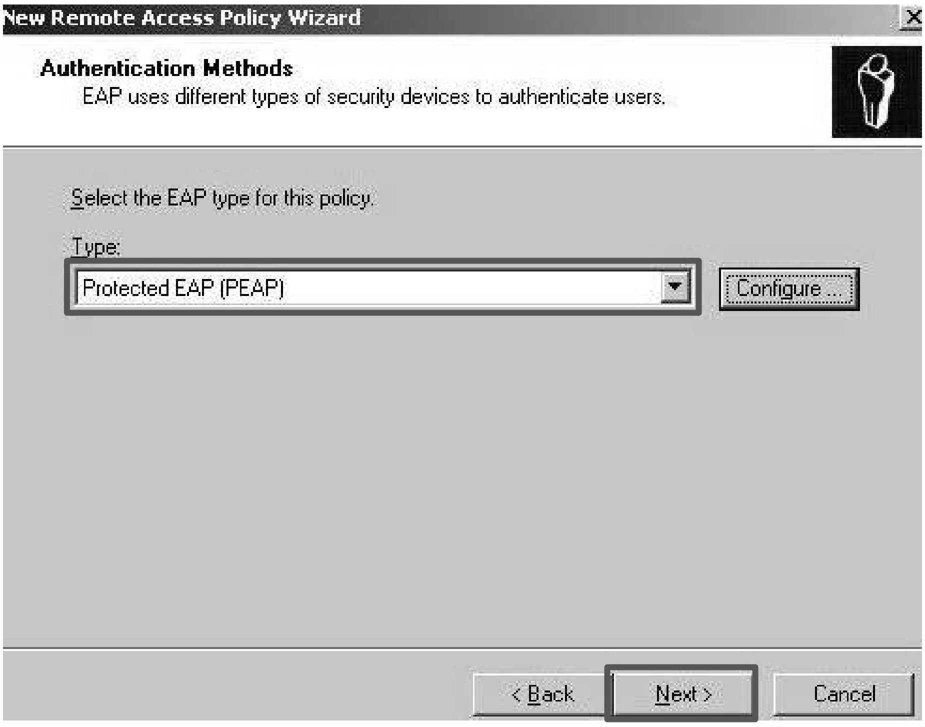
● Group
Individual user permissions override group permissions.

Group name:

Enter **802.1x** in the **Enter the object names to select** text box, click **Check Names**, and click **OK**.

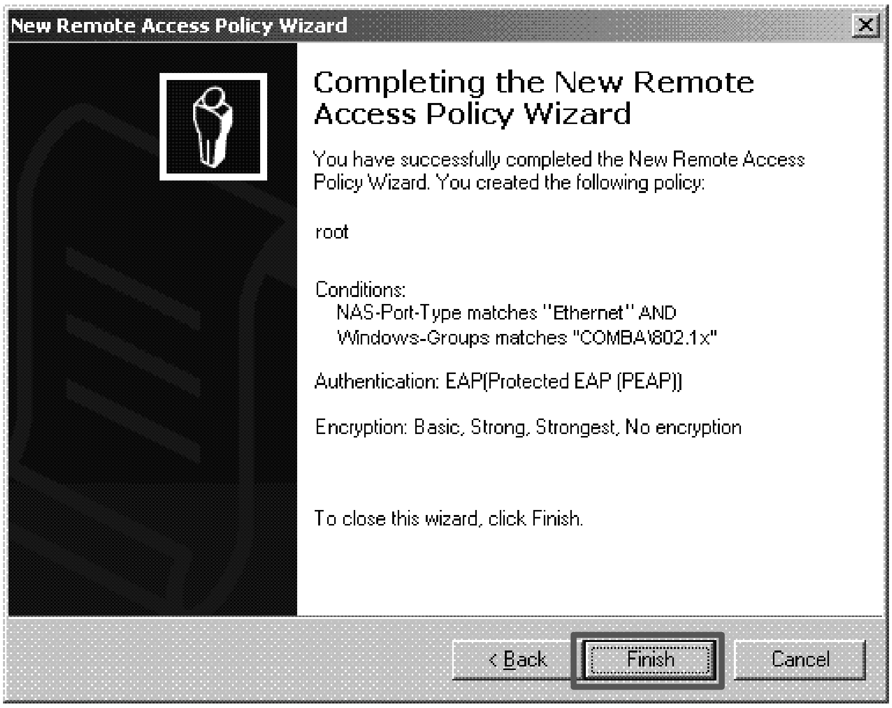


Select **Protected EAP (PEAP)** and click **Next**.



New Remote Access Policy Wizard
Authentication Methods
EAP uses different types of security devices to authenticate users.
Select the EAP type for this policy.
Type:
Protected EAP (PEAP)
Configure ...
< Back
Next >
Cancel

Click **Finish**. The remote access policy is created.



New Remote Access Policy Wizard

Completing the New Remote Access Policy Wizard

You have successfully completed the New Remote Access Policy Wizard. You created the following policy:

root

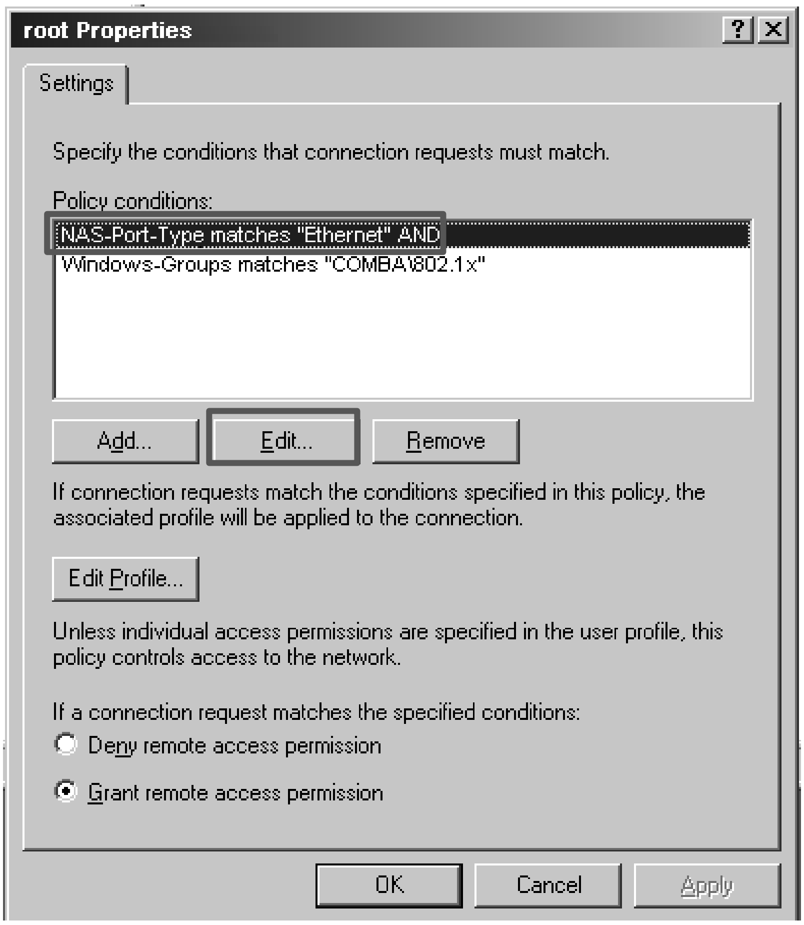
Conditions:
NAS-Port-Type matches "Ethernet" AND
Windows-Groups matches "COMBA\802.1x"

Authentication: EAP(Protected EAP (PEAP))

Encryption: Basic, Strong, Strongest, No encryption

To close this wizard, click Finish.

Right-click **root** and choose **Properties**. Select **Grant remote access permission**, select **NAS-Port-Type matches "Ethernet" AND**, and click **Edit**.



root Properties

Specify the conditions that connection requests must match.

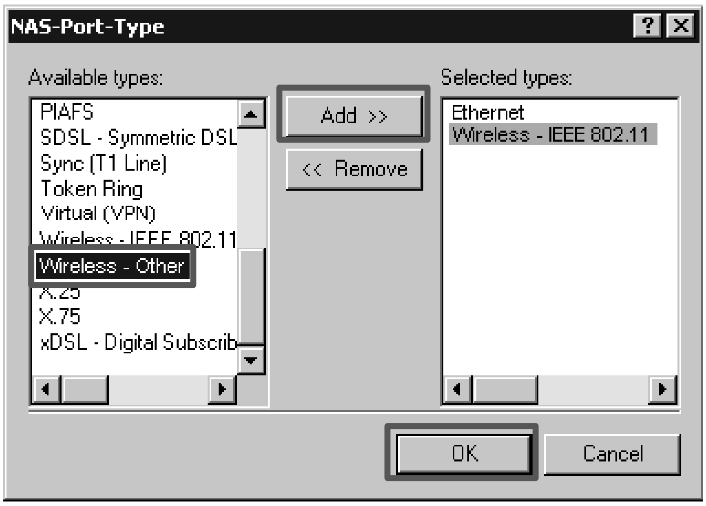
Policy conditions:
NAS-Port-Type matches "Ethernet" AND
Windows-Groups matches "COMBA\802.1x"

If connection requests match the conditions specified in this policy, the associated profile will be applied to the connection.

Unless individual access permissions are specified in the user profile, this policy controls access to the network.

If a connection request matches the specified conditions:
○ Deny remote access permission
● Grant remote access permission

Select **Wireless – Other**, click **Add**, and click **OK**.

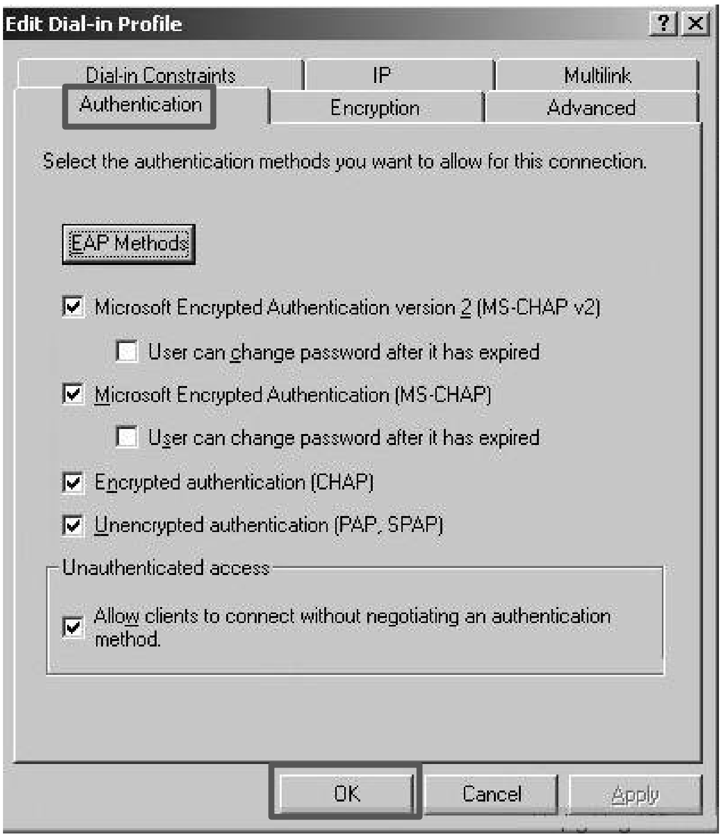


NAS-Port-Type

Available types:
- PIAFS
- SDSL - Symmetric DSL
- Sync (T1 Line)
- Token Ring
- Virtual (VPN)
- Wireless - IEEE 802.11
- Wireless - Other
- X.25
- X.75
- xDSL - Digital Subscrib

Selected types:
- Ethernet
- Wireless - IEEE 802.11

Click **Edit Dial-in Profile**, click the **Authentication** tab, configure settings as shown in the following figure, and click **OK**.



Edit Dial-in Profile

Select the authentication methods you want to allow for this connection.

☑ Microsoft Encrypted Authentication version 2 (MS-CHAP v2)

☐ User can change password after it has expired

☑ Microsoft Encrypted Authentication (MS-CHAP)

☐ User can change password after it has expired

☑ Encrypted authentication (CHAP)

☑ Unencrypted authentication (PAP, SPAP)

Unauthenticated access

☑ Allow clients to connect without negotiating an authentication method.

When a message appears, click **No**.

(3) Configure user information.

Create a user and add the user to group **802.1x**.

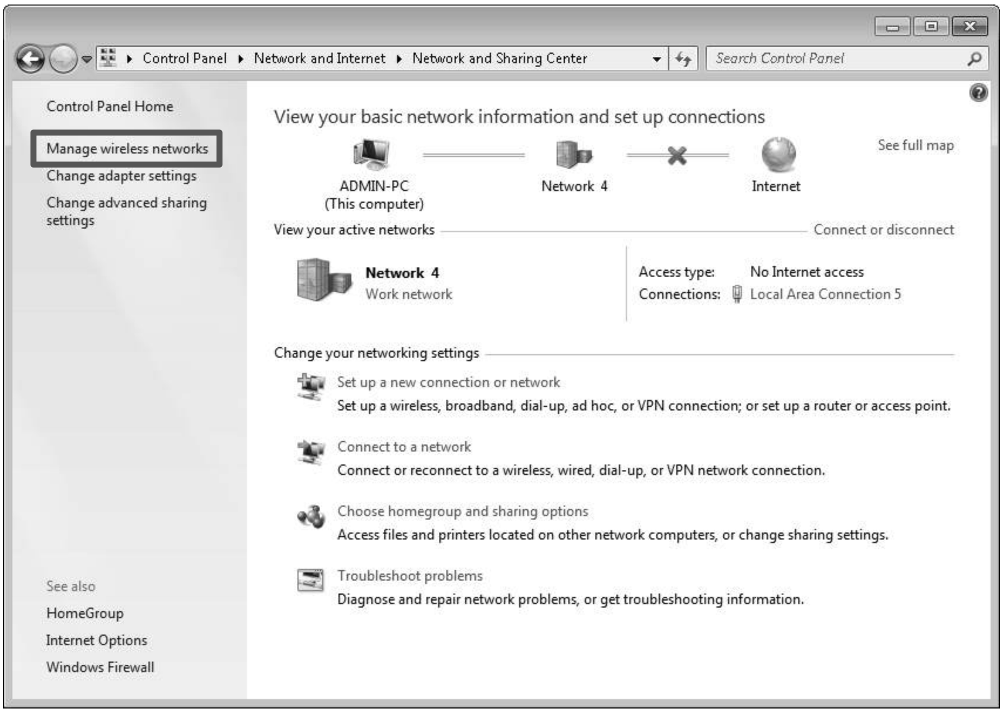
---End

3. Configure your wireless device.

Tip

Windows 7 is taken as an example to describe the procedure.

Choose **Start** > **Control Panel**, click **Network and Internet**, click **Network and Sharing Center**, and click **Manage wireless networks**.



View your basic network information and set up connections

View your active networks

Access type: No Internet access

Connections: Local Area Connection 5

Change your networking settings

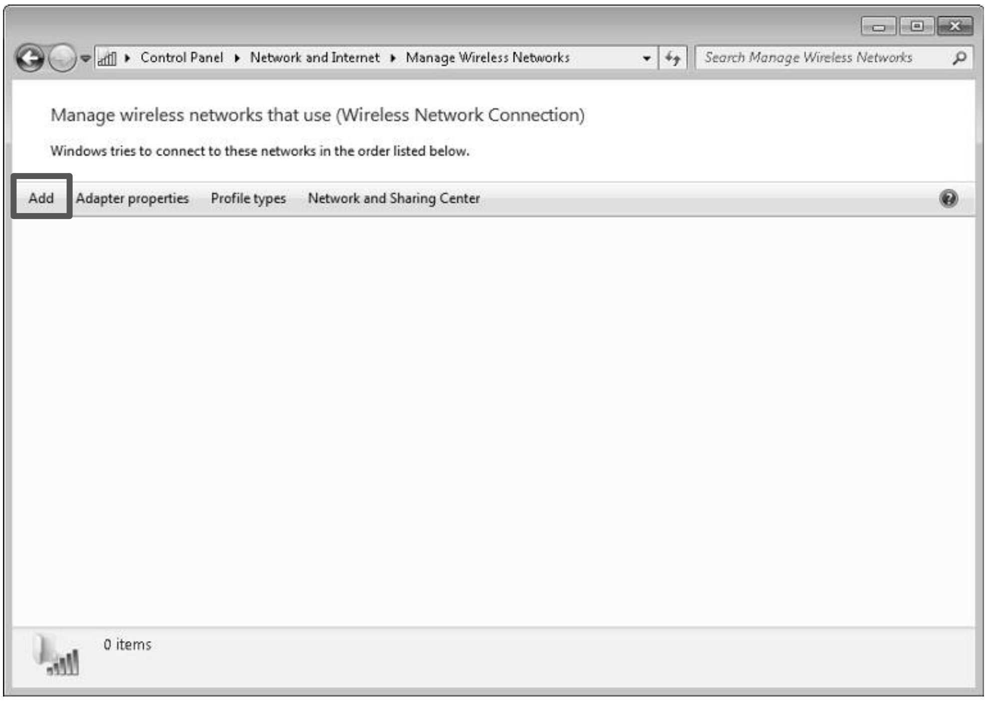
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.

Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

Choose homegroup and sharing options
Access files and printers located on other network computers, or change sharing settings.

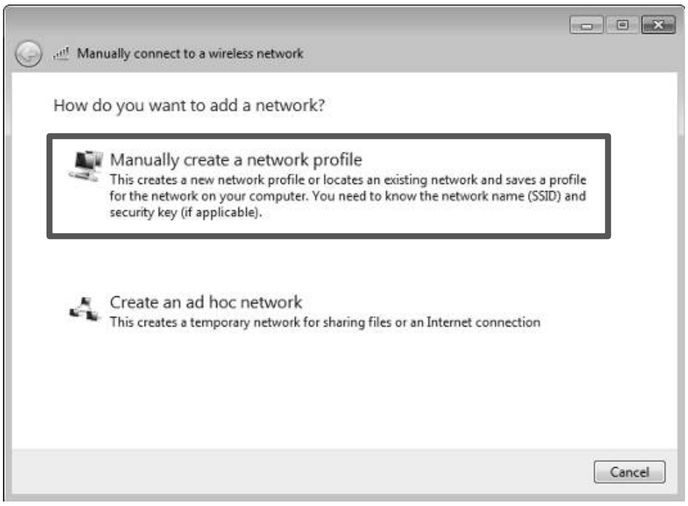
Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.

Click **Add**.



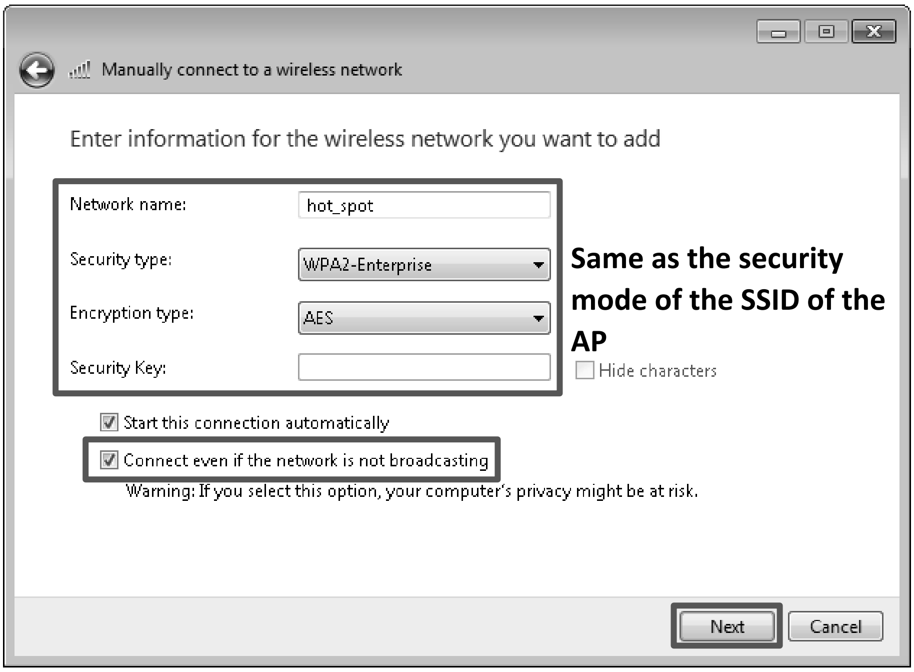
Control Panel ▸ Network and Internet ▸ Manage Wireless Networks
Search Manage Wireless Networks
Manage wireless networks that use (Wireless Network Connection)
Windows tries to connect to these networks in the order listed below.
Add
Adapter properties
Profile types
Network and Sharing Center
0 items

Click **Manually create a network profile**.



Manually connect to a wireless network
How do you want to add a network?
Manually create a network profile
This creates a new network profile or locates an existing network and saves a profile for the network on your computer. You need to know the network name (SSID) and security key (if applicable).
Create an ad hoc network
This creates a temporary network for sharing files or an Internet connection
Cancel

Enter WiFi network information, select **Connect even if the network is not broadcasting**, and click **Next**.



Manually connect to a wireless network

Enter information for the wireless network you want to add

Network name: hot_spot

Security type: WPA2-Enterprise

Encryption type: AES

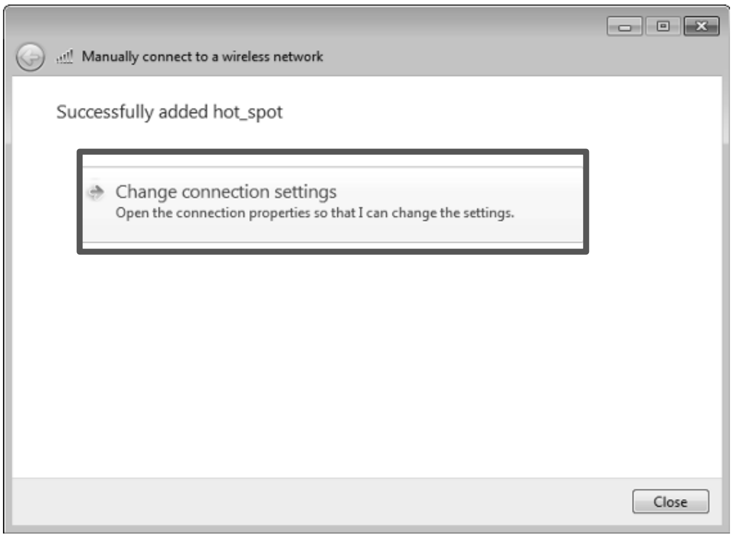
Security Key:

Same as the security mode of the SSID of the AP

□ Hide characters
☑ Start this connection automatically
☑ Connect even if the network is not broadcasting
Next
Cancel

Warning: If you select this option, your computer's privacy might be at risk.

Click **Change connection settings**.



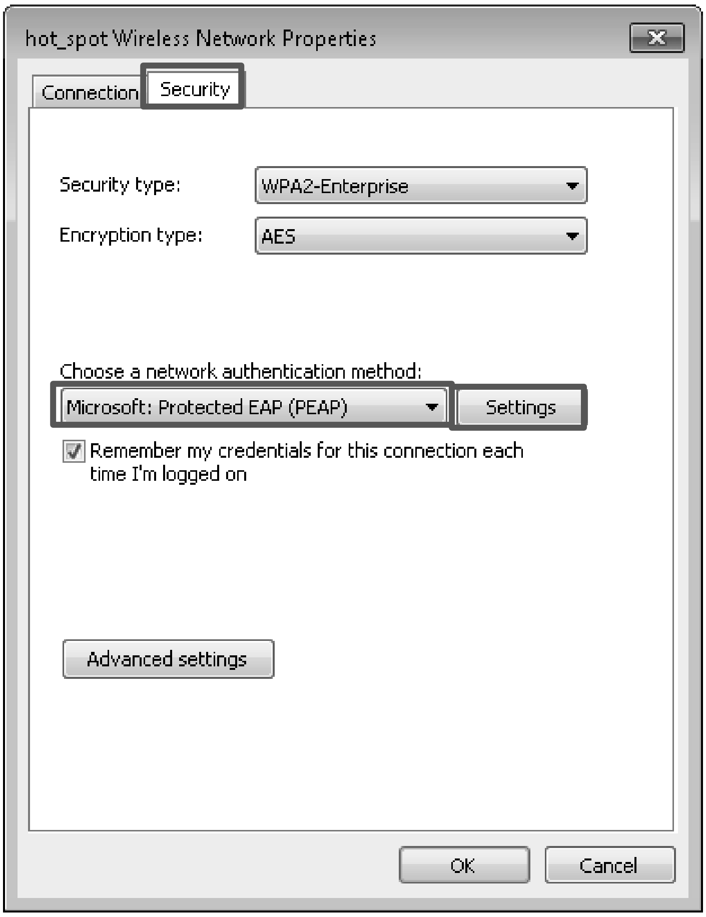
Manually connect to a wireless network

Successfully added hot_spot

Change connection settings

Open the connection properties so that I can change the settings.

Click the **Security** tab, select **Microsoft: Protected EAP (PEAP)**, and click **Settings**.



hot_spot Wireless Network Properties

Security type: WPA2-Enterprise

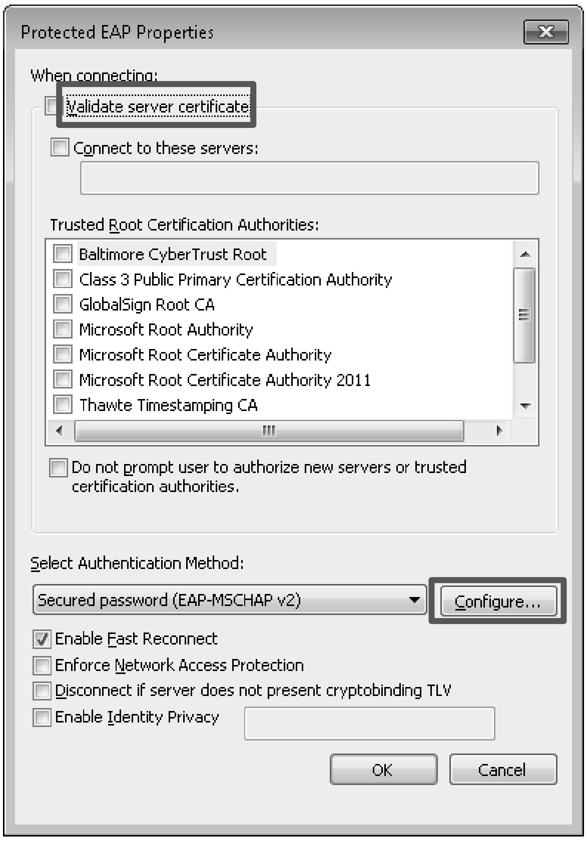
Encryption type: AES

Choose a network authentication method:

Microsoft: Protected EAP (PEAP)

☑ Remember my credentials for this connection each time I'm logged on

Deselect **Validate server certificate** and click **Configure**.



Protected EAP Properties

When connecting:

□ Validate server certificate

□ Connect to these servers:

Trusted Root Certification Authorities:

- □ Baltimore CyberTrust Root
- □ Class 3 Public Primary Certification Authority
- □ GlobalSign Root CA
- □ Microsoft Root Authority
- □ Microsoft Root Certificate Authority
- □ Microsoft Root Certificate Authority 2011
- □ Thawte Timestamping CA

□ Do not prompt user to authorize new servers or trusted certification authorities.

Select Authentication Method:

Secured password (EAP-MSCHAP v2)

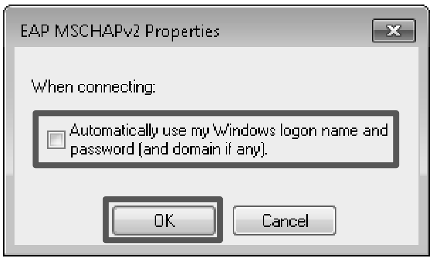
☑ Enable Fast Reconnect

□ Enforce Network Access Protection

□ Disconnect if server does not present cryptobinding TLV

□ Enable Identity Privacy

Deselect **Automatically use my Windows logon name and password (and domain if any)** and click **OK**.

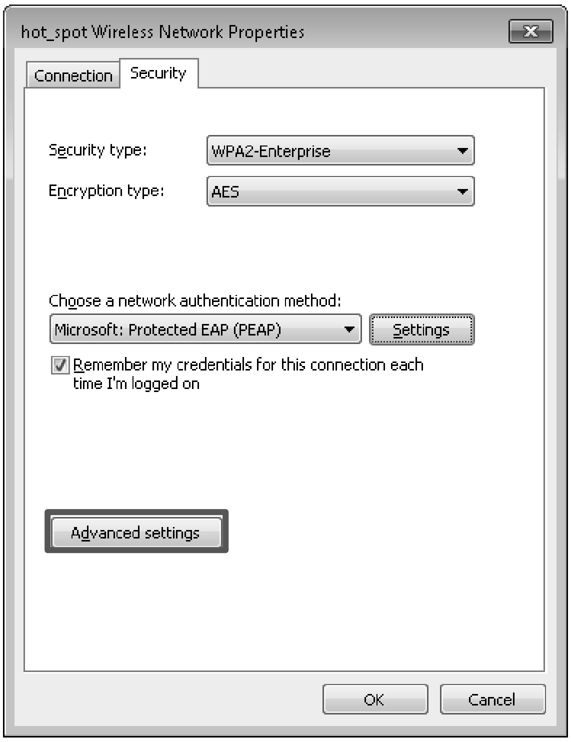


EAP MSCHAPv2 Properties

When connecting:

□ Automatically use my Windows logon name and password (and domain if any).

Click **Advanced settings**.



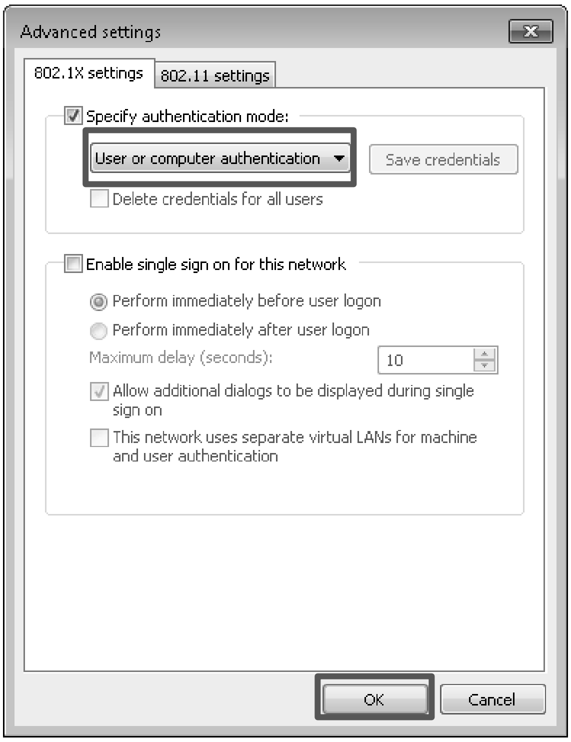
Security type: WPA2-Enterprise

Encryption type: AES

Choose a network authentication method:
Microsoft: Protected EAP (PEAP)

☑ Remember my credentials for this connection each time I'm logged on

Select **User or computer authentication** and click **OK**.



☑ Specify authentication mode:
User or computer authentication

□ Delete credentials for all users

□ Enable single sign on for this network

● Perform immediately before user logon

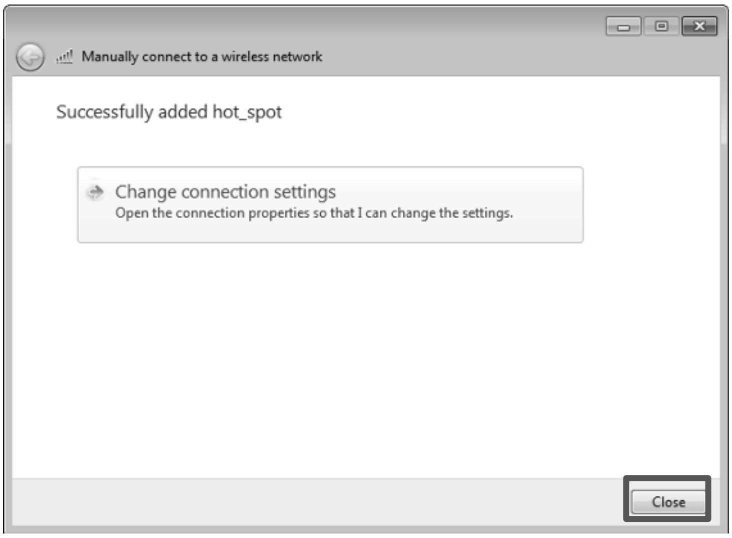
○ Perform immediately after user logon

Maximum delay (seconds): 10

☑ Allow additional dialogs to be displayed during single sign on

□ This network uses separate virtual LANs for machine and user authentication

Click **Close**.

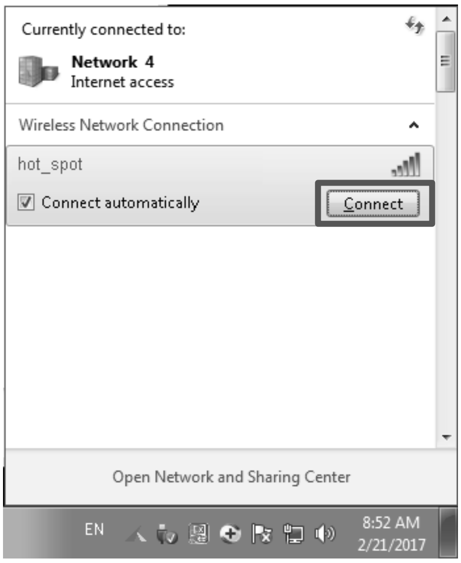


Manually connect to a wireless network

Successfully added hot_spot

Change connection settings
Open the connection properties so that I can change the settings.
Close

Click the network icon in the lower-right corner of the desktop and choose the WiFi network of the AP, which is **hot_spot** in this example.



Currently connected to:

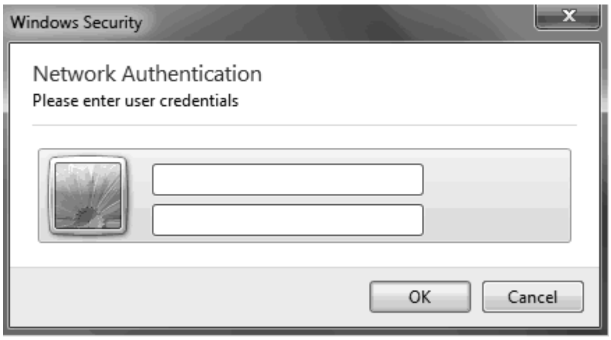
Network 4
Internet access

Wireless Network Connection

hot_spot

☑ Connect automatically

In the **Windows Security** dialog box that appears, enter the user name and password set on the RADIUS server and click **OK**.



Windows Security

Network Authentication
Please enter user credentials

---End

Verification

Wireless devices can connect to the WiFi network named **hot_spot**.

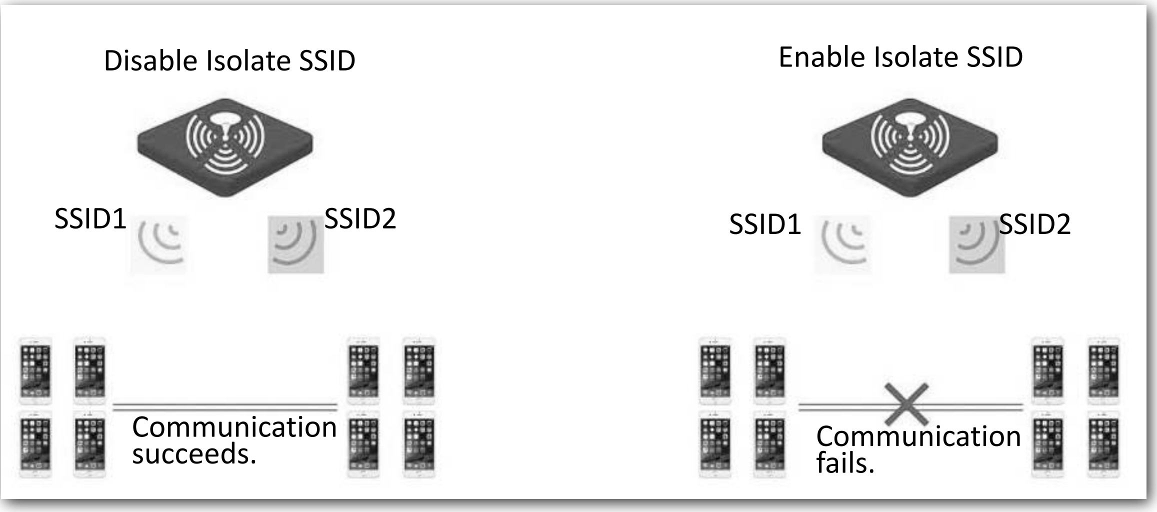
7.2 Radio settings

7.2.1 Overview

This module is used to set radio parameters of the AP, such as country/region and network mode. It also enables you to turn on/off the Isolate SSID function. The following describes the Isolate SSID function briefly.

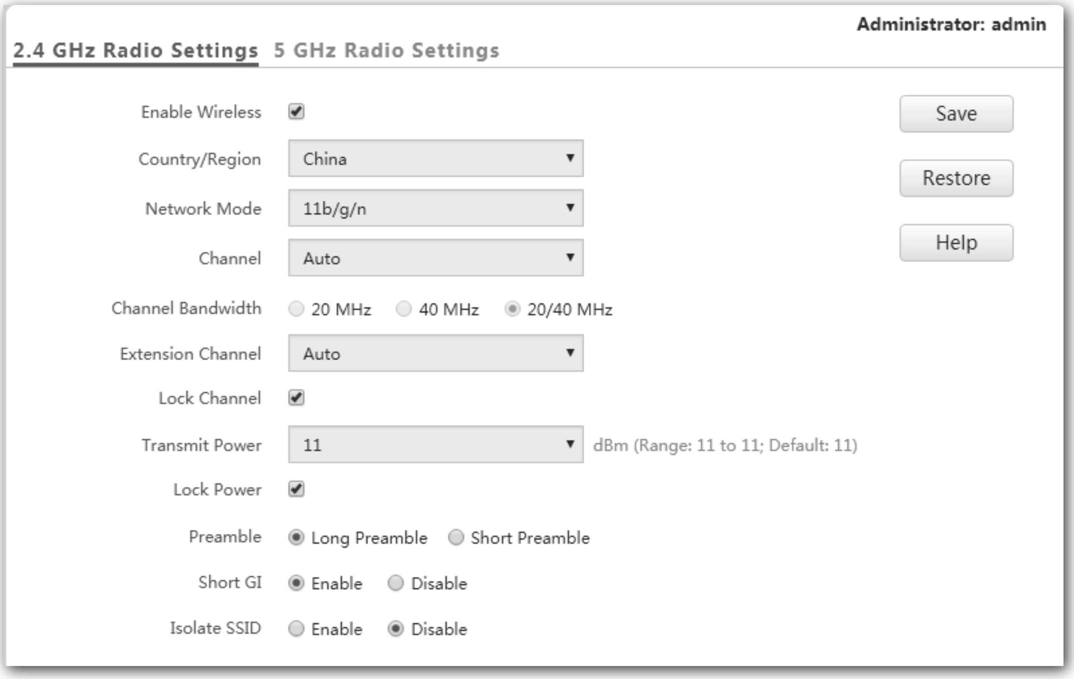
Isolate SSID

This function isolates the wireless devices connected to different WiFi networks of the AP. For example, if user A connects to the WiFi network corresponding to SSID1, whereas user B connects to the WiFi network corresponding to SSID2, the two users cannot communicate with each other after Isolate SSID is enabled.



7.2.2 Changing the radio settings

1. Choose **Wireless Settings** > **Radio Settings**.
2. Click a tag page as required, which is **2.4 GHz Radio Settings** in this example.
3. Change the parameters as required. Generally, you only need to change the **Enable Wireless**, **Channel**, and **Lock Channel** settings.
4. Click **Save**.



Enable Wireless ☑

Country/Region: China

Network Mode: 11b/g/n

Channel: Auto

Channel Bandwidth: ○ 20 MHz ○ 40 MHz ● 20/40 MHz

Extension Channel: Auto

Lock Channel ☑

Transmit Power: 11 dBm (Range: 11 to 11; Default: 11)

Lock Power ☑

Preamble: ● Long Preamble ○ Short Preamble

Short GI: ● Enable ○ Disable

Isolate SSID: ○ Enable ● Disable

---End

Parameter description

Parameter	Description
Enable Wireless	It specifies whether to enable the radio function of the AP.
Country/Region	It specifies the country or region where the AP is used. This parameter helps comply with channel regulations of the country or region.
Network Mode	It specifies the WiFi network mode of the AP, which includes 11b, 11g, 11b/g, and 11b/g/n. This parameter can be set if **Lock Channel** is not selected. – **11b**: Only wireless devices compliant with 802.11b can connect to the 2.4 GHz WiFi network of the AP. – **11g**: Only wireless devices compliant with 802.11g can connect to the 2.4 WiFi networks of the AP. – **11b/g**: Only wireless devices compliant with 802.11b or 802.11g can connect to the 2.4 WiFi networks of the AP. – **11b/g/n**: Wireless devices compliant with 802.11b or 802.11g, or they work at 2.4 GHz and compliant with 802.11n, can connect to the 2.4 WiFi networks of the AP. – **11a**: Only wireless devices compliant with 802.11a can connect to the 5 GHz WiFi network of the AP. – **11ac**: Only wireless devices compliant with 802.11ac can connect to the 5 GHz WiFi network of the AP. – **11a/n**: Wireless devices compliant with 802.11a / 802.11n and work at 5 GHz can connect to the 5 WiFi networks of the AP.

Parameter	Description
Channel	It specifies the operating channel of the AP. This parameter can be set if **Lock Channel** is not selected. If you select **Auto** from the drop-down-list box, the AP adjusts its operating channel automatically according to the ambient environment.
Channel Bandwidth	It specifies the wireless channel bandwidth of the AP. This parameter can be set if the AP works in 802.11b/g/n, 802.11ac or 802.11a/n mode and **Lock Channel** is not selected. – **20 MHz**: It indicates that the AP can use only 20 MHz channel bandwidth. – **40 MHz**: It indicates that the AP can use only 40 MHz channel bandwidth. – **20/40 MHz**: It indicates that the AP automatically adjusts its channel bandwidth to 20 MHz or 40 MHz according to the ambient environment. – **80 MHz**: It indicates that the AP can use only 80 MHz channel bandwidth.
Extension Channel	It specifies the wireless extension channel of the AP.
Lock Channel	It is used to lock the channel settings of the AP. If this parameter is selected, channel settings including **Country/Region**, **Network Mode**, **Channel**, **Channel Bandwidth**, and **Extension Channel** cannot be changed.
Transmit Power	It specifies the transmit power of the AP. If the AP has a higher transmit power, its WiFi coverage is wider. However, reasonably decreasing the transmit power will improve the AP’s WiFi network performance and security.
Lock Power	It specifies whether the current transmit power settings of the AP can be changed. If you tick this box, the current transmit power could not be changed.
Preamble	It specifies a group of bits located at the beginning of a packet, according to which the receiver of the packet can perform synchronization and prepare for receiving data. By default, the Long Preamble option is selected for compatibility with old network adopters installed on wireless devices. To achieve better synchronization performance of networks, you can select the Short Preamble option.
Short GI	It specifies short guard interval. Propagation delay of WiFi signal will happen to the receiving port during transmission. If the following data block is sent too fast, it will interfere the previous data block. A short guard interval can be used to circumvent this interference. Enabling the short GI function can yield a 10% improvement in data throughput. By default, this function is enabled.

Parameter	Description
Isolate SSID	It specifies whether to isolate the wireless devices connected to the AP with different SSIDs. – **Disable**: It specifies the Isolate SSID function is disabled, so that the wireless devices connected to the AP with different SSIDs can communicate with each other. – **Enable**: It specifies the Isolate SSID function is enabled, so that the wireless devices connected to the AP with different SSID cannot communicate with each other, which improves WiFi network security.

7.3 Radio optimization

7.3.1 Overview

WiFi scenarios

WiFi scenarios are mainly divided into two types: ordinary ones and high-density ones.

- **Ordinary WiFi scenarios**

They include WiFi network in places of wide WiFi coverage, such as offices, schools warehouses and hospitals. In general, comparing with a greater maximum number of clients, greater WiFi coverage is preferred in these scenarios.

- **High-density WiFi scenarios**

They include WiFi network in large-scale places where a lot of end-user devices are used. Many APs are deployed for WiFi coverage in these places, such as meeting rooms, classrooms, stadiums, airports and train stations. In general, comparing with greater WiFi coverage, a greater maximum number of clients is preferred in these scenarios.

Performance optimization parameters

To fulfill different WiFi requirements in different WiFi scenarios, this AP supports several radio optimization parameters for users to have better WiFi network.

- **Prioritize 5 GHz**

In general, channels of 2.4 GHz WiFi network are used more frequently and widely than those of 5 GHz WiFi network. But many channels of 2.4 GHz WiFi network are overlapped and congested, and interference between WiFi signals is strong as well. Comparatively, 5 GHz WiFi network provides more channels which are not overlapped. However, when devices supporting both 2.4 and 5 GHz WiFi signals connect to WiFi network, they connect to 2.4 GHz WiFi network first. This makes the channels of 2.4 GHz WiFi network more congested and wastes those of 5 GHz WiFi network.

When 5 GHz WiFi signal strength AP receives from an end-user device is higher than AP’s 5 GHz threshold value, prioritize 5 GHz function of the AP enables the device to connect to AP’s 5 GHz WiFi network first, making more devices to connect to 5 GHz WiFi network and improving network performance in 2.4 GHz WiFi network.

Note

Before the prioritize 5 GHz function is enabled, you should ensure both the 2.4 GHz and 5 GHz WiFi network are enabled, and SSIDs, security modes and WiFi password of 2.4 GHz and 5 GHz WiFi network are the same as each other.

- **Air Interface Scheduling**

FIFO (First in first out) is used in traditional packet scheduling. In WiFi environment of mixed rates, high-speed users have stronger transmission capability, higher spectrum efficiency, but less air interface time, while low-speed users have weaker transmission capability, lower spectrum efficiency, but more air interface time, which reduces AP's throughput rate and working efficiency.

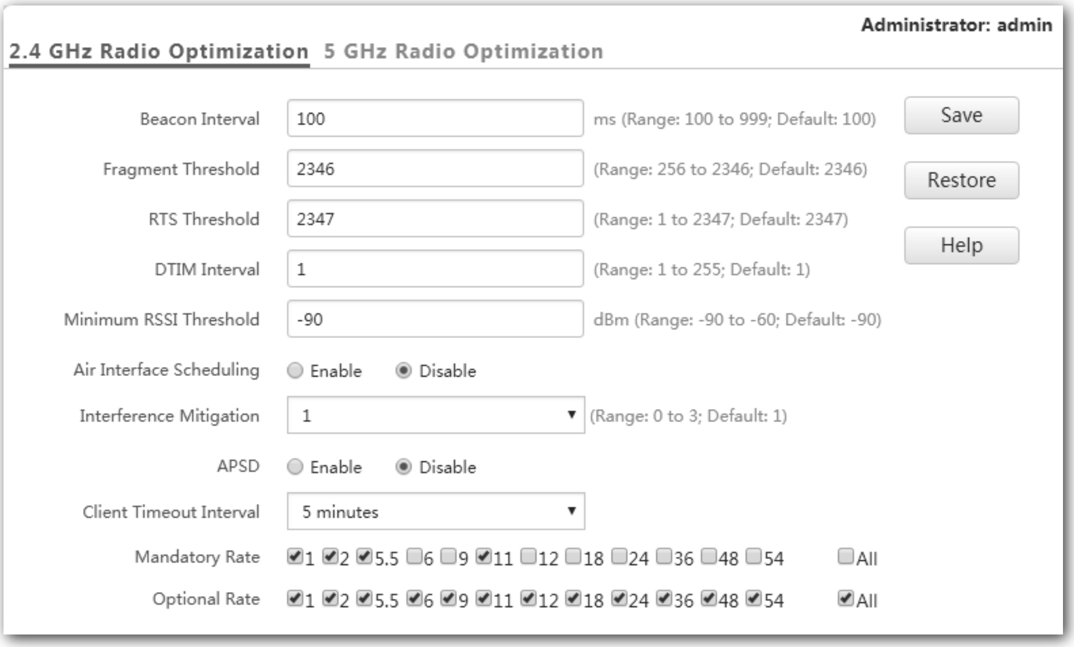
Air interface scheduling of this AP distributes downlink transmission time to users fairly, making users of different speeds get the same downlink transmission time, achieving higher throughput rate and greater concurrent users for the AP.

7.3.2 Changing the radio optimization settings

Note

It is recommended to change the settings only under the instruction of professional personnel, so as to prevent wireless performance from getting worse.

1. Choose **Wireless Settings** > **Radio Optimization**.
2. Click a tag page as required, which is **2.4 GHz Radio Optimization** in this example.
3. Change the parameter settings as required.
4. Click **Save**.



Beacon Interval	100	ms (Range: 100 to 999; Default: 100)
Fragment Threshold	2346	(Range: 256 to 2346; Default: 2346)
RTS Threshold	2347	(Range: 1 to 2347; Default: 2347)
DTIM Interval	1	(Range: 1 to 255; Default: 1)
Minimum RSSI Threshold	-90	dBm (Range: -90 to -60; Default: -90)
Air Interface Scheduling	○ Enable ● Disable	
Interference Mitigation	1 ▾	(Range: 0 to 3; Default: 1)
APSD	○ Enable ● Disable	
Client Timeout Interval	5 minutes ▾	
Mandatory Rate	☑1 ☑2 ☑5.5 □6 □9 ☑11 □12 □18 □24 □36 □48 □54	□All
Optional Rate	☑1 ☑2 ☑5.5 ☑6 ☑9 ☑11 ☑12 ☑18 ☑24 ☑36 ☑48 ☑54	☑All

---End

Parameter description

Parameter	Description
Beacon Interval	It specifies the interval for transmitting the Beacon frame. The Beacon frame is transmitted at the specified interval to announce the presence of a wireless network. Generally, a smaller interval enables wireless devices to connect to the AP more quickly, while a larger interval ensures higher data transmission speed for the AP.
Fragment Threshold	It specifies the threshold of a fragment. Unit of this parameter is byte. Fragmenting is a process that divides a frame into several fragments, which are transmitted and acknowledged separately. If the size of a frame exceeds this threshold, the frame is fragmented. In an environment of high error rate, you can reduce the threshold to enable the AP to resend only the fragments that have not been sent successfully, so as to increase the frame throughput. In an environment without interference, you can increase the threshold to reduce the number of acknowledgement times, so as to increase the frame throughput.
RTS Threshold	It specifies the frame length threshold for triggering the RTS/CTS mechanism. Unit of this parameter is byte. If a frame exceeds this threshold, the RTS/CTS mechanism is triggered to reduce conflicts. Set the RTS threshold based on the actual situation. An excessively small value increases the RTS frame transmission frequency and bandwidth requirement. A higher RTS frame transmission frequency enables a WiFi network to recover from conflicts quicker. For a WiFi network with high user density, you can reduce this threshold for reducing conflicts. The RTS mechanism requires some network bandwidth. Therefore, it is triggered only when frames exceed this threshold.
DTIM Interval	It specifies the interval for transmitting the Delivery Traffic Indication Message (DTIM) frame. Unit of this parameter is Beacon. A countdown starts from this value. The AP transmits broadcast and multicast frames in its cache only when the countdown reaches zero. For example, if **DTIM Interval** is set to **1**, the AP transmits all cached frames after each beacon frame is transmitted.
Minimum RSSI Threshold	Set a minimum strength of received signals acceptable to the AP. If the strength of the signals transmitted by a wireless device is weaker than this threshold, the wireless device cannot connect to the AP. If there are multiple APs, an appropriate Minimum RSSI Threshold ensures that wireless devices can connect to the AP' WiFi networks with strong signals.
Prioritize 5	It specifies whether to enable the Prioritize 5 GHz function. If the function is enabled, devices supporting 5 GHz WiFi network connects to AP's 5 GHz

Parameter	Description
GHz	WiFi network first. Otherwise, devices connects to 2.4GHz or 5 GHz WiFi network randomly. This parameter only appears on the **5 GHz Radio Optimization** page.
5 GHz Threshold	When Prioritize 5 GHz function is enabled, if the 5 GHz WiFi signal strength AP receives from end user is higher than the 5 GHz threshold value, end users connect to AP's 5 GHz WiFi network first. Otherwise, end users connect to 2.4 GHz WiFi network first.
Air Interface Scheduling	Used to enable/disable the air interface scheduling function. It helps equal clients' transmission time, thus improving the experience of clients with high transmission rate.
Interference Mitigation	Select an interference mitigation mode for your AP. – **0**: The energy detection mechanism is disabled. – **1**: The energy detection mechanism is enabled. When the received signal strength is weaker than -70 dBm, this device stops transmitting data, so as to prevent packet loss due to interference. – **2**: The energy detection mechanism is enabled. When the received signal strength is weaker than -50 dBm, this device stops transmitting data, so as to prevent packet loss due to interference. – **3**: The energy detection mechanism is enabled. When the received signal strength is weaker than -70 dBm, this device automatically switches to a better channel.
APSD	It enables the AP to reduce power consumption after a specified period during which no traffic is transmitted or received by the AP. By default, it is disabled.
MU-MIMO	Multi-User Multiple-Input Multiple-Output. After this function is enabled, AP can communicate with multiple users concurrently, avoiding WiFi network congestion and improving communication. This parameter only appears on the **5 GHz Radio Optimization** page.
Client Timeout Interval	It specifies the wireless device disconnection interval of the AP. The AP disconnects a wireless device if no traffic is transmitted or received by the wireless client within the interval.
Mandatory Rate	Select the transmission rate sets you want the AP to support. Wireless devices must supports the basic rate sets you select, or they cannot connect to the AP's WiFi networks.
Optional Rate	Select the transmission rate sets you want the AP to support. Unlike the basic rate sets, it is acceptable for wireless devices not to support the supported rate sets you select.

7.4 Frequency analysis

7.4.1 Overview

This module consists of two functions: frequency analysis and rouge AP detection.

- **Frequency analysis**

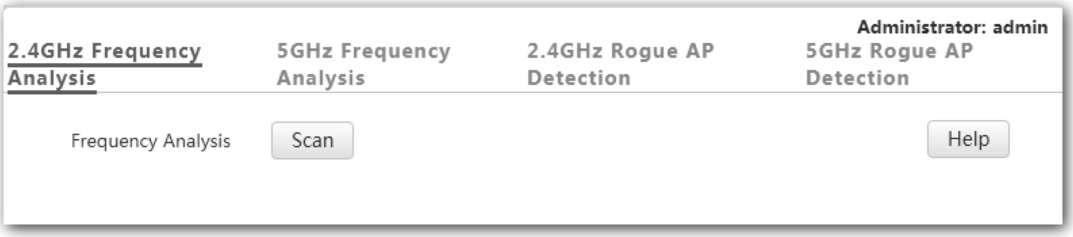
This function enables you to check number of signals in every channel and the channel usage. You can select a channel with a low usage for your AP to improve wireless data transmission.

- **Rouge AP detection**

This function enables you to know about the wireless signals near the AP, including information about SSID, MAC address, channel and signal strength.

7.4.2 Checking frequency analysis

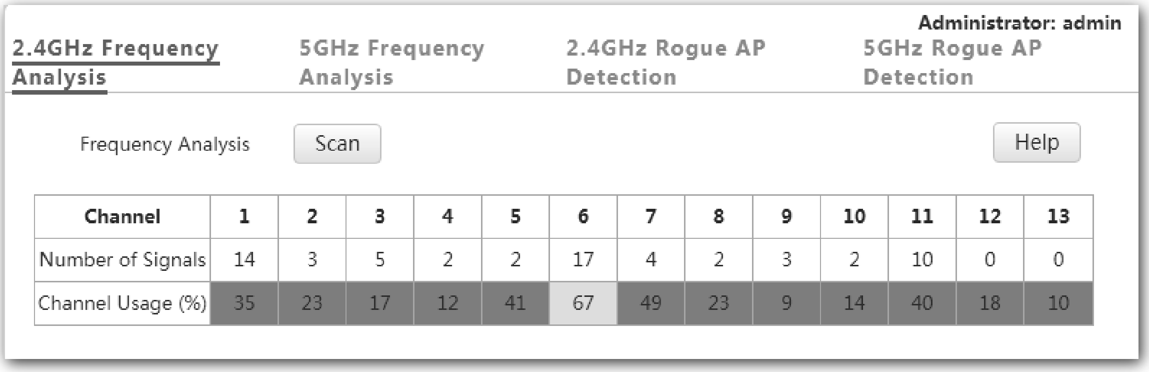
1. To access the configuration page, click **Wireless Settings** > **Frequency Analysis**.
2. Click **2.4GHz Frequency Analysis** or **5GHz Frequency Analysis** based on your need.
3. **Frequency Analysis**: Click **Scan**.



---End

After clicking **Scan**, you can select a channel with a low usage for your AP based on the results.

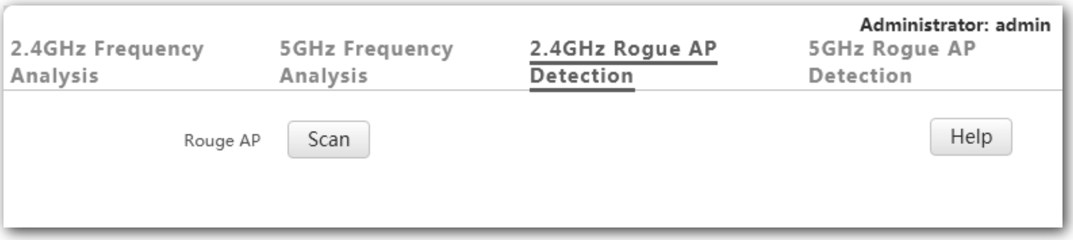
- If the underpainting of the channel usage is green, it indicates the channel is not congested.
- If the underpainting of the channel usage is yellow, it indicates the channel is congested.
- If the underpainting of the channel usage is red, it indicates the channel is so congested that it nearly could not be used.



Channel	1	2	3	4	5	6	7	8	9	10	11	12	13
Number of Signals	14	3	5	2	2	17	4	2	3	2	10	0	0
Channel Usage (%)	35	23	17	12	41	67	49	23	9	14	40	18	10

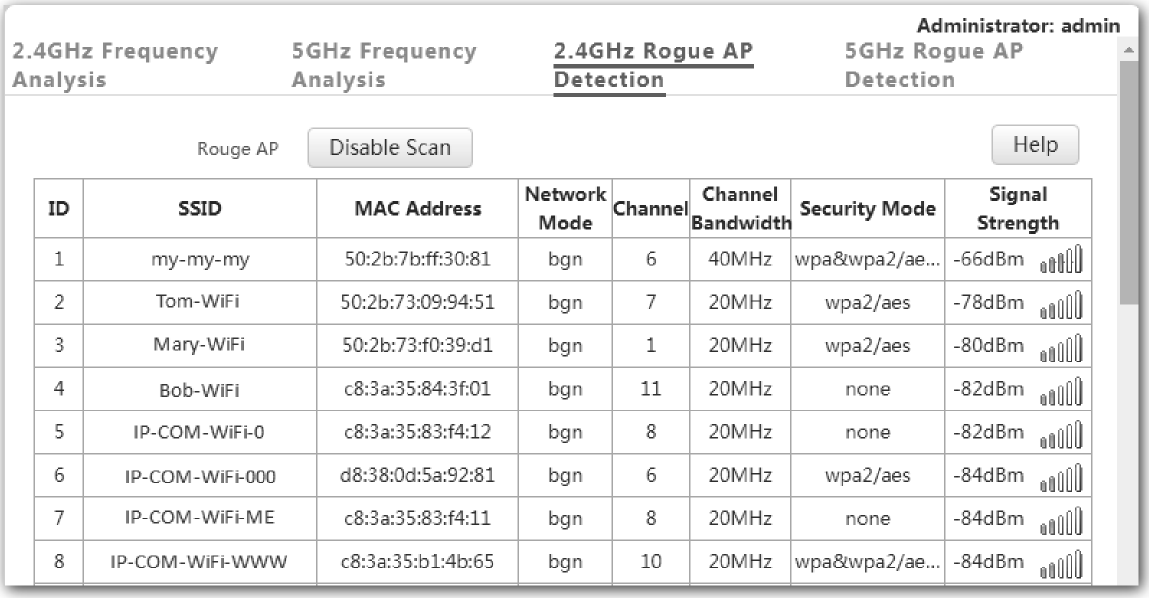
7.4.3 Detecting rogue APs

1. To access the configuration page, click **Wireless Settings** > **Frequency Analysis**.
2. Click **2.4GHz Rogue AP Detection** or **5GHz Rogue AP Detection** based on your need.
3. **Rogue AP**: Click **Scan**.



---End

Wait a minute. Then the scanning result appears. See the following figure:



ID	SSID	MAC Address	Network Mode	Channel	Channel Bandwidth	Security Mode	Signal Strength
1	my-my-my	50:2b:7b:ff:30:81	bgn	6	40MHz	wpa&wpa2/ae...	-66dBm
2	Tom-WiFi	50:2b:73:09:94:51	bgn	7	20MHz	wpa2/aes	-78dBm
3	Mary-WiFi	50:2b:73:f0:39:d1	bgn	1	20MHz	wpa2/aes	-80dBm
4	Bob-WiFi	c8:3a:35:84:3f:01	bgn	11	20MHz	none	-82dBm
5	IP-COM-WiFi-0	c8:3a:35:83:f4:12	bgn	8	20MHz	none	-82dBm
6	IP-COM-WiFi-000	d8:38:0d:5a:92:81	bgn	6	20MHz	wpa2/aes	-84dBm
7	IP-COM-WiFi-ME	c8:3a:35:83:f4:11	bgn	8	20MHz	none	-84dBm
8	IP-COM-WiFi-WWW	c8:3a:35:b1:4b:65	bgn	10	20MHz	wpa&wpa2/ae...	-84dBm

7.5 WMM settings

7.5.1 Overview

802.11 networks offer wireless access services based on the Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) channel competition mechanism, which allows all wireless devices to fairly compete for channels. All the services implemented over WiFi networks share the same channel competition parameters. Nevertheless, different services usually have different requirements for bandwidth, delay, and jitter. This requires wireless networks to offer accessibility based on the services implemented over the networks.

WMM is a wireless QoS protocol used to ensure that packets with high priorities are transmitted first. This ensures better experience of voice and video service over WiFi networks.

WMM involves the following terms:

- Enhanced Distributed Channel Access (EDCA): It is a channel competition mechanism to ensure that packets with higher priorities are assigned more bandwidth and transmitted earlier.
- Access Category (AC): The WMM mechanism divides WLAN traffic by priority in descending order into the AC-VO (voice stream), AC-VI (video stream), AC-BE (best effort), and AC-BK (background) access categories. The access categories use queues with different priorities to send packets. The WMM mechanism ensures that packets in queues with higher priorities have more opportunities to access channels.

According to the 802.11 protocol family, all devices listen on a channel before using the channel to send data. If the channel stays idle for or longer than a specified period, the devices wait a random backoff period within the contention window. The device whose backoff period expires first can use the channel. The 802.11 protocol family applies the same backoff period and contention window to all devices across a network to ensure that the devices have the same channel contention opportunity.

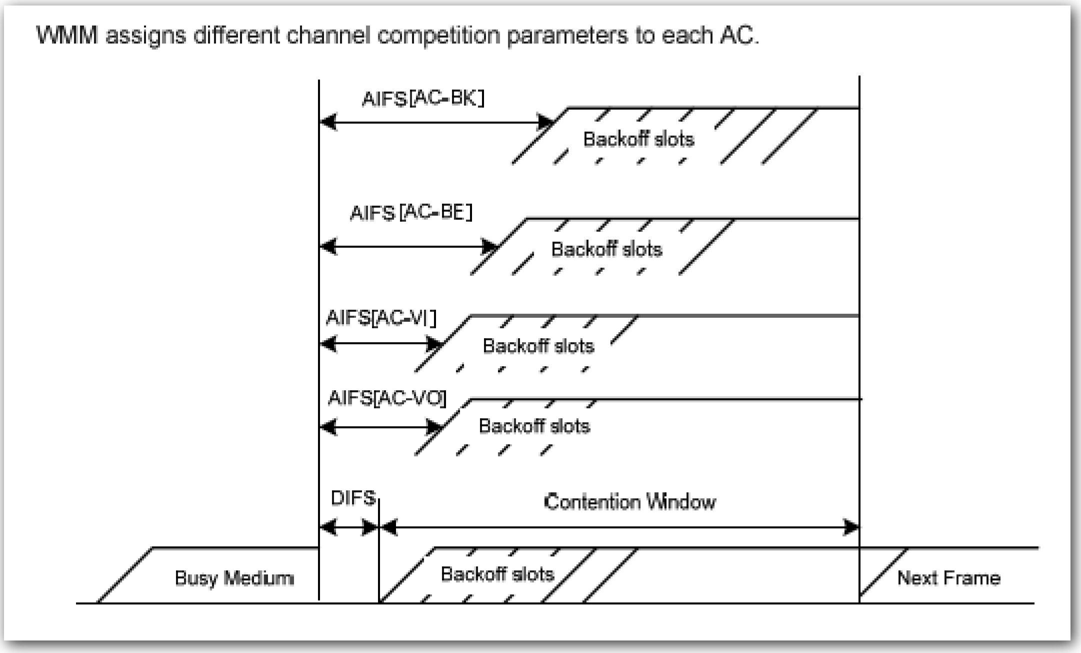
- **EDCA Parameters**

WMM changes the contention mechanism of 802.11 networks by dividing packets into four ACs, among which the ACs with higher priorities have more opportunities to access channels. The ACs help achieve different service levels.

WMM assigns each AC a set of EDCA parameters for channel contention, including:

- Arbitration Inter Frame Spacing Number (AIFSN): Different from the fixed distributed inter-frame spacing (DIFS) specified in the 802.11 protocol family, AIFSN varies across ACs. A greater AIFSN indicates a longer backoff period. See AIFS in the following figure.
- Contention window minimum (CWmin) and contention window maximum (CWmax) specify the average backoff period. The period increases along with these two values. See the backoff slots in the following figure.
- Transmission Opportunity (TXOP): It specifies the maximum channel use duration after successful channel contention. The duration increases along with this value. The

value **0** indicates that a device can send only one packet through a channel after winning contention for the channel.



- **ACK Policies**

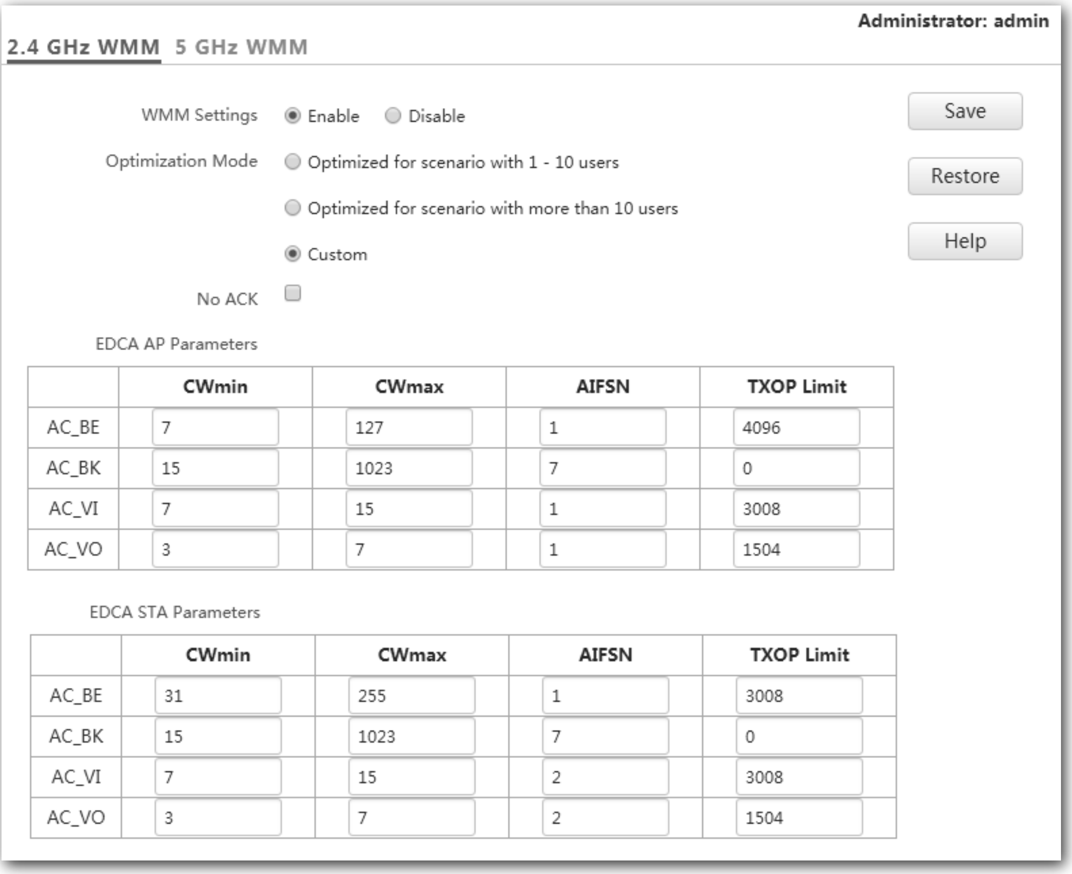
WMM specifies the Normal ACK and No ACK policies.

- According to the No ACK policy, no ACK packet is used during wireless packet transmission to acknowledge packet reception. This policy is applicable to scenarios where interference is mild and can effectively improve transmission efficiency. In case of strong interference, lost packets are not sent again if this policy is adopted. This leads a higher packet loss rate and reduces the overall performance.
- According to the Normal ACK policy, each time a receiver receives a packet, it sends back an ACK packet to acknowledge packet reception.

7.5.2 Changing the WMM settings

By default, the WMM function of the AP is enabled and the **Optimized for scenario with more than 10 users** mode is adopted. The following procedures describe how to set the WMM settings:

1. Choose **Wireless Settings** > **WMM Setting**.
2. Click a tag page as required, which is **2.4 GHz WMM** in this example.
3. Set **WMM Settings** to **Enable**.
4. **Optimization Mode**: Select the required WMM optimization mode. If you select **Custom**, set the WMM parameters as required.
5. Click **Save**.



Administrator: admin

2.4 GHz WMM 5 GHz WMM

WMM Settings ● Enable ○ Disable

Optimization Mode ○ Optimized for scenario with 1 - 10 users

○ Optimized for scenario with more than 10 users

● Custom

No ACK □

EDCA AP Parameters

	CWmin	CWmax	AIFSN	TXOP Limit
AC_BE	7	127	1	4096
AC_BK	15	1023	7	0
AC_VI	7	15	1	3008
AC_VO	3	7	1	1504

EDCA STA Parameters

	CWmin	CWmax	AIFSN	TXOP Limit
AC_BE	31	255	1	3008
AC_BK	15	1023	7	0
AC_VI	7	15	2	3008
AC_VO	3	7	2	1504

---End

Parameter description

Parameter	Description
WMM Settings	– **Enable**: It is used to enable the WMM function. – **Disable**: It is used to disable the WMM function.
Optimization Mode	It specifies the WMM optimization modes supported by the AP: – **Optimized for scenario with 1 - 10 users**: If 10 or less devices are connected to the AP, you are recommended to select this mode to increase device throughput. – **Optimized for scenario with more than 10 users**: If more than 10 devices are connected to the AP, you are recommended to select this mode to ensure device connectivity. – **Custom**: This mode enables you to set the WMM EDCA parameters for manual optimization.
No ACK	This item appears only after you set your **Optimization Mode** as **Custom**. – If the box is ticked, the No ACK policy is adopted. – If the box is unticked, the Normal ACK policy is adopted.
EDCA Parameters	For details, refer to section 7.5.1 Overview.

7.6 Access control

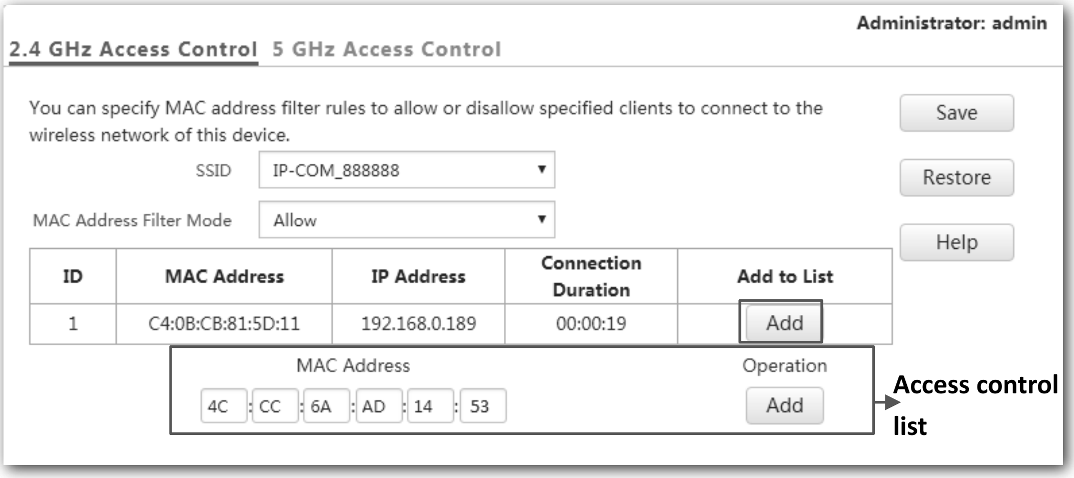
7.6.1 Overview

It specifies that you can allow/disallow wireless devices with specified MAC addresses to access the AP's WiFi networks. The AP supports the following MAC address filter modes:

- **Disable**: It indicates that the access control function is disabled.
- **Allow**: It indicates that only the wireless devices with the specified MAC addresses can access the specific WiFi network of AP.
- **Disallow**: It indicates that only the wireless devices with the specified MAC addresses cannot access the specific WiFi network of AP.

7.6.2 Configuring access control

1. Choose **Wireless Settings** > **Access Control**.
2. Click a tag page as required, which is **2.4 GHz Access Control** in this example.
3. From the **SSID** drop-down list box, select the SSID on which the address access control function is implemented.
4. Select an access control mode from the **MAC Address Filter Mode** drop-down list box.
   - If you select **Disable**, the Access Control function will be disabled.
   - If you select **Allow** or **Disallow**, enter the MAC addresses you want to control in the access control list and click **Add**.
   - If you want to control a wireless device that has been connected to the AP, directly click **Add** corresponding to the device.
5. Click **Save**.



You can specify MAC address filter rules to allow or disallow specified clients to connect to the wireless network of this device.

SSID: IP-COM_888888

MAC Address Filter Mode: Allow

ID	MAC Address	IP Address	Connection Duration	Add to List
1	C4:0B:CB:81:5D:11	192.168.0.189	00:00:19	Add

MAC Address	Operation
4C : CC : 6A : AD : 14 : 53	Add

Access control list

---End

Parameter description

Parameter	Description
SSID	It specifies the SSID on which the MAC address access control is implemented.
MAC Filter Mode	It specifies the mode to disallow/allow device with specific MAC addresses to access the selected SSID, or allow all devices to access the selected SSID. – **Disable**: It indicates that access control function is disabled. – **Allow**: It indicates that only the wireless devices in the access control list can access the specific WiFi network with the selected SSID. – **Disallow**: It indicates that only the wireless devices in the access control list **cannot** access the specific WiFi network with the selected SSID.

7.6.3 Example

Networking requirement

2.4 GHz WiFi network with a SSID **Hotel WiFi** has been set up in a hotel. However, it is required that only staffs are allowed to connect to this WiFi network.

It is recommended for the administrator to configure AP's access control function. Assume that these staffs have three wireless devices with the following three MAC addresses:

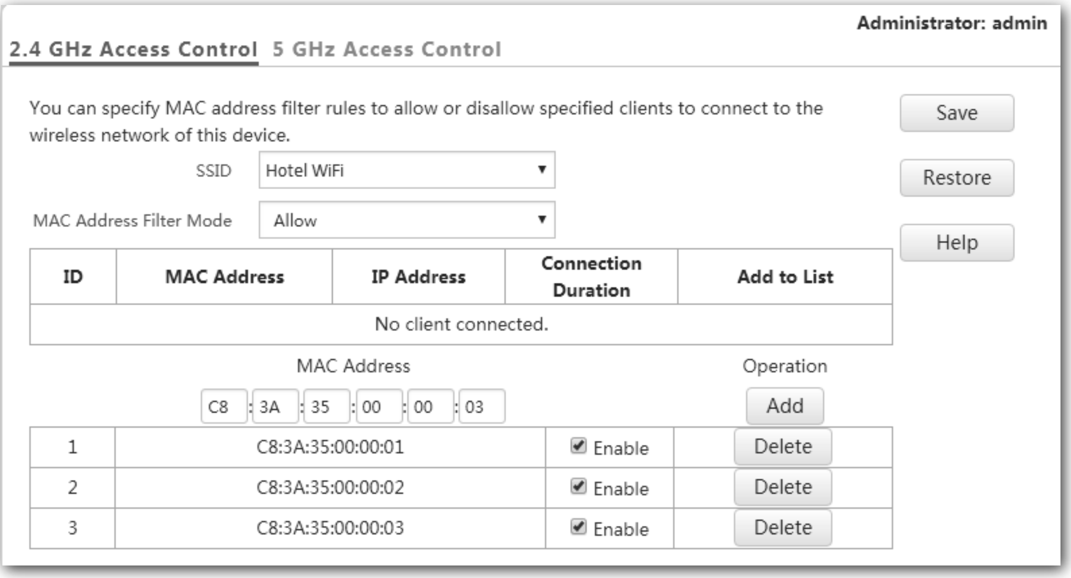
C8:3A:35:00:00:01

C8:3A:35:00:00:02

C8:3A:35:00:00:03

Procedures: (**2.4 GHz Access Control** is used here because **Hotel WiFi** is 2.4 GHz WiFi network.)

1. Choose **Wireless Settings** > **Access Control**.
2. **SSID**: Select **Hotel WiFi** from the **SSID** drop-down list box.
3. **MAC Address Filter Mode**: Select **Allow** from the drop-down list box.
4. **MAC Address**: Enter **C8:3A:35:00:00:01** in the access control list and click **Add**. Repeat this step to add **C8:3A:35:00:00:02** and **C8:3A:35:00:00:03** as well.
5. Click **Save**.



You can specify MAC address filter rules to allow or disallow specified clients to connect to the wireless network of this device.

SSID: Hotel WiFi

MAC Address Filter Mode: Allow

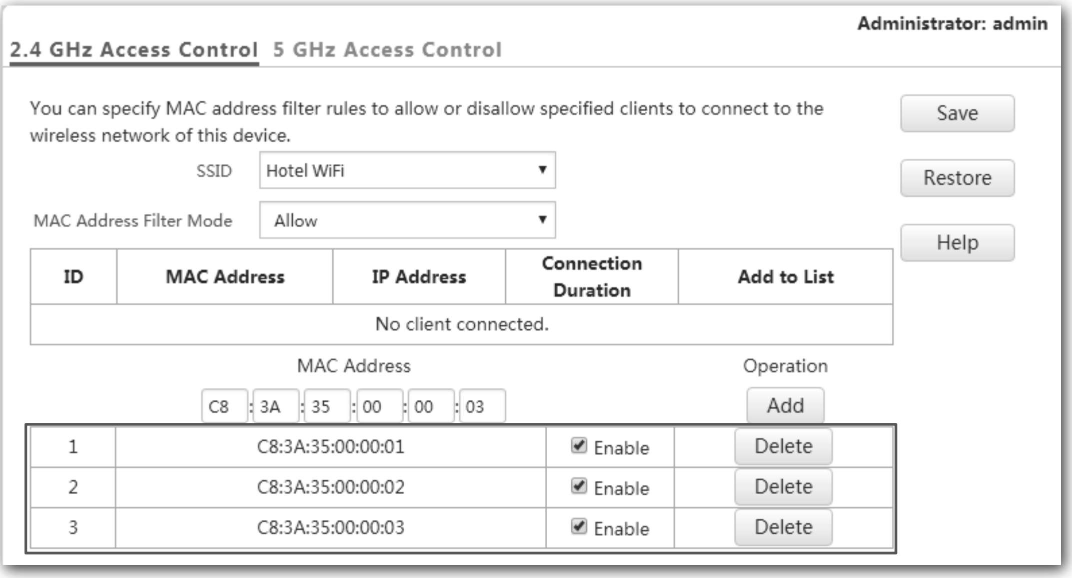
ID	MAC Address	IP Address	Connection Duration	Add to List
No client connected.				

MAC Address: C8 : 3A : 35 : 00 : 00 : 03 — Operation: Add

1	C8:3A:35:00:00:01	☑ Enable	Delete
2	C8:3A:35:00:00:02	☑ Enable	Delete
3	C8:3A:35:00:00:03	☑ Enable	Delete

---End

The following figure shows the result after the configuration:



You can specify MAC address filter rules to allow or disallow specified clients to connect to the wireless network of this device.

SSID: Hotel WiFi

MAC Address Filter Mode: Allow

ID	MAC Address	IP Address	Connection Duration	Add to List
No client connected.				

MAC Address: C8 : 3A : 35 : 00 : 00 : 03 — Operation: Add

1	C8:3A:35:00:00:01	☑ Enable	Delete
2	C8:3A:35:00:00:02	☑ Enable	Delete
3	C8:3A:35:00:00:03	☑ Enable	Delete

Verification

Only the three wireless devices on the access control list can connect to the **Hotel WiFi** WiFi network.

7.7 Advanced settings

7.7.1 Overview

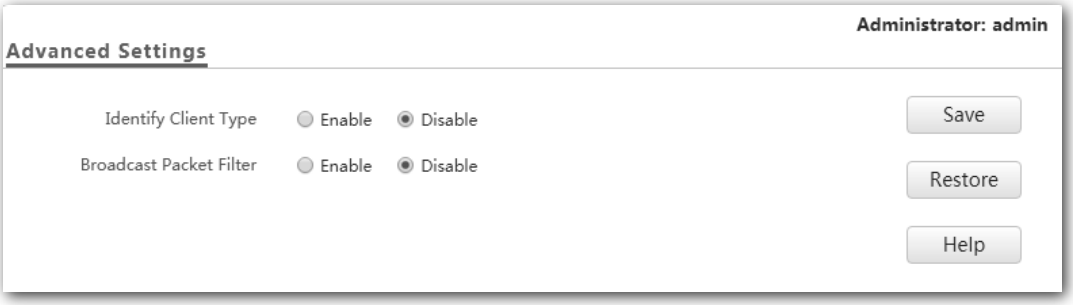
This module enables you to make AP's WiFi network and wireless transmission more efficiently through enabling identifying client type and filtering broadcast packet. By default, these two functions are disabled.

7.7.2 Changing the advanced settings

Note

You are recommended to configure the broadcast packet filter function only under the instructions of professional personnel, so as to prevent decreasing the WiFi performance of the AP.

1. Choose **Wireless Settings** > **Advanced Settings**.
2. **Identify Client Type**, **Broadcast Packet Filter**, **Filter Mode**: Set the parameters as required.
3. Click **Save**.



Administrator: admin

Advanced Settings

Identify Client Type ○ Enable ● Disable

Broadcast Packet Filter ○ Enable ● Disable

---End

Parameter description

Parameter	Description
Identify Client Type	It specifies whether to recognize and display operating systems of the devices connected to AP's WiFi networks. – **Disable**: Click the circle beside it to disable the identifying client type function. – **Enable**: Click the circle beside it to enable the identifying client type function. After this function is enabled, you can see operating systems of connected devices on **Status** > **Wireless clients** page.
Broadcast Packet Filter	It specifies whether to enable the filtering broadcast packet function. By default, AP will forward lots of invalid broadcast packets, which may affect normal packets transmission. However, this function can filter broadcast packets and reduce airtime consumption, ensuring bandwidth of normal packets transmission. – **Disable**: Click the circle beside it to disable the filtering broadcast packet function. – **Enable**: Click the circle beside it to enable the filtering broadcast packet function.
Filter Mode	It specifies what packets AP will accept after users enable filtering broadcast packet function, consisting the following two modes: – **Only accept DHCP and ARP packets**: It indicates that the AP filters all broadcast or multicast packets except DHCP and ARP broadcast packets. – **Only accept ARP packets**: It indicates that the AP filters all broadcast or multicast packets except ARP broadcast packets.

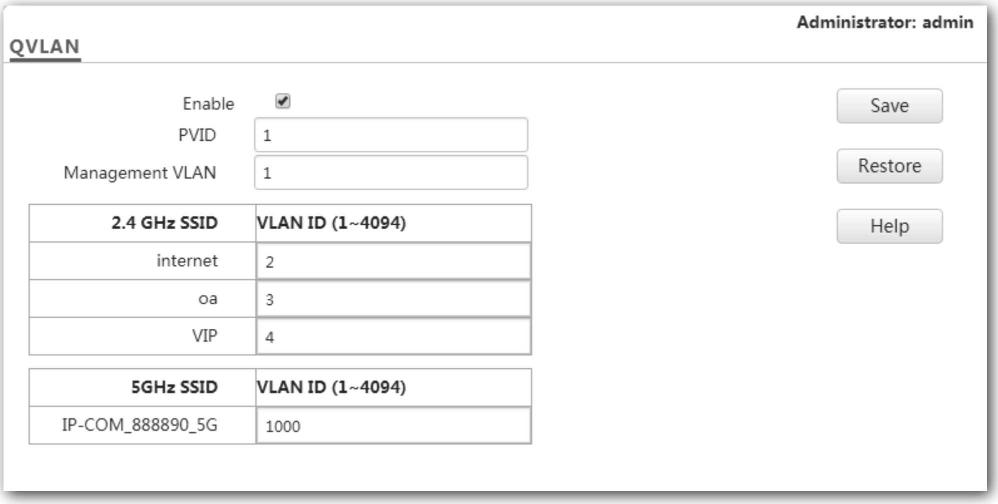
7.8 QVLAN settings

7.8.1 Overview

This AP supports the IEEE 802.1q VLAN function and can work with switches supporting that function to establish multiple VLANs. Devices connecting to VLANs with different VLAN IDs cannot communicate with each other. By default, the AP's QVLAN function is disabled.

7.8.2 Configuring the QVLAN settings

1. Choose **Wireless Settings** > **QVLAN Settings**.
2. Set the parameters as required. Generally, you only need to set the **Enable**, **2.4 GHz SSID VLAN ID** and **5 GHz SSID VLAN ID** settings.
3. Click **Save**.


Administrator: admin

QVLAN

Enable ☑

PVID 1

Management VLAN 1

2.4 GHz SSID	VLAN ID (1~4094)
internet	2
oa	3
VIP	4

5GHz SSID	VLAN ID (1~4094)
IP-COM_888890_5G	1000

---End

Parameter description

Parameter	Description
Enable	It specifies whether to enable the QVLAN function of the AP. By default, it is disabled.
PVID	It specifies the ID of the default native VLAN of the trunk port of the AP. The default value is **1**.
Management VLAN	It specifies the ID of the AP management VLAN. The default value is **1**. After changing the management VLAN, you can manage the AP only after connecting your computer or AP controller to the new management VLAN.

Parameter	Description
2.4 GHz SSID	It specifies the currently enabled SSID(s) over the 2.4 GHz band of the AP.
5 GHz SSID	It specifies the currently enabled SSID(s) over the 5 GHz band of the AP.
VLAN ID	It specifies the VLAN IDs corresponding to SSIDs. By default, this value is **1000**. After the QVLAN function is enabled, the wireless ports corresponding to SSIDs functions as access ports. The PVID of an access port is the same as its VLAN ID.

If the QVLAN function is enabled, tagged data received by a port of the AP is forwarded to the other ports of the VLAN corresponding to the VID in the data, whereas untagged data received by a port of the AP is forwarded to the other ports of the VLAN corresponding to the PVID of the port that receives the data.

The following table describes how ports of different link types process transmitted and received data.

Port	Method to process received data		Method to process transmitted data
	Tagged data	Untagged data	
Access	Forward the data to other ports of the VLAN corresponding to the VID in the data.	Forward the data to the other ports of the VLAN corresponding to the PVID of the port that receives the data.	Transmit data after removing tags from the data.
Trunk			If the VID and PVID of a port are the same, transmit data after removing tags from the data. If the VID and PVID of a port are different, transmit data without removing tags from the data.

7.8.3 Example

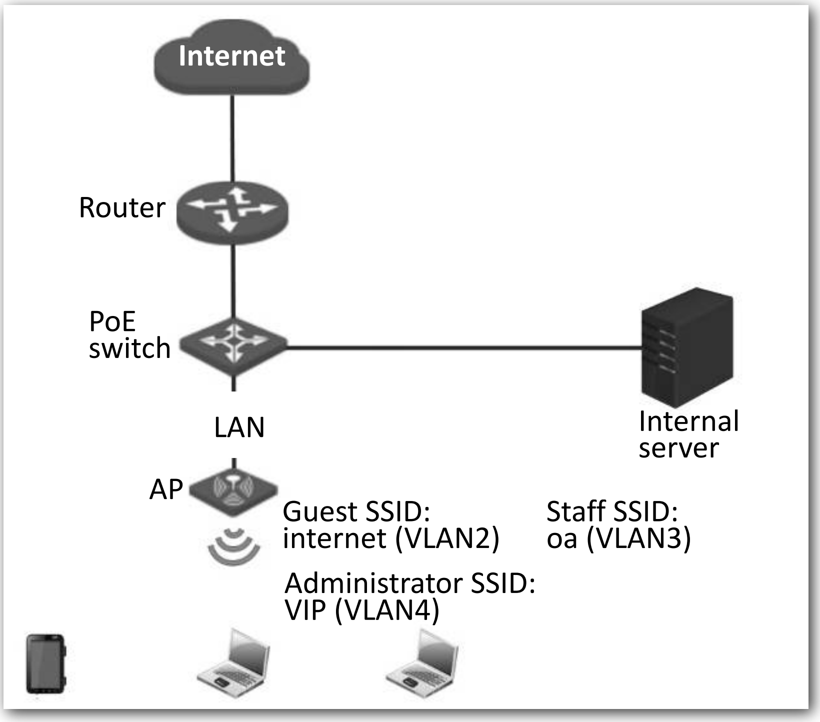
Networking requirement

A hotel has the following WiFi network coverage requirements:

- Guests are allowed to connect to VLAN 2 and only able to access the internet.
- Hotel staffs are allowed to connect to VLAN 3 and only able to access the intranet.
- Hotel administrators are allowed to connect to VLAN 4, able to access both the intranet and the internet.

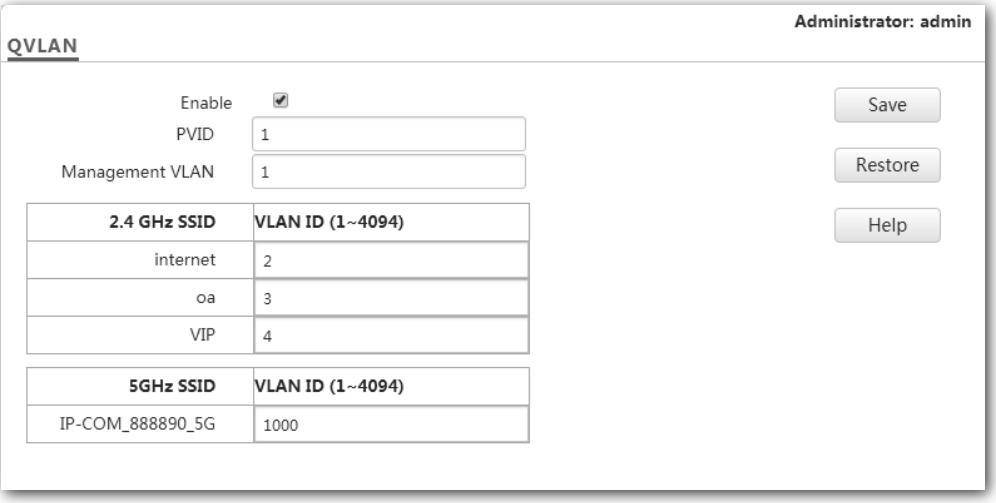
Assume that the SSID for guests is **internet**, the SSID for staffs is **oa** and the SSID for administrators is **VIP**. The SSIDs are enabled and configured successfully on the AP.

Network topology



Procedures:

1. Configure the AP.
   (1) Log in to the web UI of the AP and choose **Wireless** > **QVLAN Settings**.
   (2) Select the **Enable** check box.
   (3) Change the VLAN ID of SSID **internet** to **2**, VLAN ID of SSID **oa** to **3** and VLAN ID of SSID **VIP** to **4**.
   (4) Click **Save**.



Enable ☑

PVID	1
Management VLAN	1

2.4 GHz SSID	VLAN ID (1~4094)
internet	2
oa	3
VIP	4

5GHz SSID	VLAN ID (1~4094)
IP-COM_888890_5G	1000

Wait for the automatic reboot of the AP.

2. Configure the switch.

   Create IEEE 802.1Q VLANs described in the following table on the switch.

Port Connected To	Accessible VLAN ID	Port Type	PVID
AP	1, 2, 3, 4	Trunk	1
Internal server	3, 4	Trunk	1
Router	2, 4	Trunk	1

   Retain the default settings of other ports. For details, refer to the user guide of the switch.

3. Configure the router and the internal server.

   To ensure your wireless devices connected to the AP can access the internet, you should configure QVLAN function on your router and internal server which support QVLAN function. Detailed VLAN parameters are listed as follows:

   VLAN parameters configured on your router:

Port Connected To	Accessible VLAN ID	Port Type	PVID
Switch	2, 4	Trunk	1

   VLAN parameters configured on your internal server:

Port Connected To	Accessible VLAN ID	Port Type	PVID
Switch	3, 4	Trunk	1

   For configuration details, refer to the user guides of your router and internal server.

   ---End

Verification

Wireless devices connected to the SSID **internet** can access only the internet. Wireless devices connected to the SSID **oa** can access only the intranet. Wireless devices connected to the SSID **VIP** can access both the internet and the intranet.

8 SNMP

8.1 Overview

The Simple Network Management Protocol (SNMP) is the most widely used network management protocol in TCP/IP networks. SNMP enables you to remotely manage all your network devices compliant with this protocol, such as monitoring the network status, changing network device settings, and receiving network event alarms.

SNMP supports managing devices bought from various vendors automatically, regardless of physical differences among the devices.

8.1.1 SNMP management framework

The SNMP management framework consists of SNMP manager, SNMP agent, and Management Information Base (MIB).

- **SNMP manager**: It is a system that controls and monitors network nodes using the SNMP protocol. Network Management System (NMS) is the most widely used SNMP manager in network environments. An NMS can be a dedicated network management server, or an application that implements management functions in a network device.
- **SNMP agent**: It is a software module in a managed device. This module is used to manage data about the device and report the management data to an SNMP manager.
- **MIB**: It is a collection of managed objects, defining a series of attributes of managed objects, including names, access permissions, and data types of objects. Each SNMP agent has its own MIB. An SNMP manager can read and/or write objects in the MIB based on the permissions assigned to the SNMP manager.

An SNMP manager manages SNMP agents in an SNMP network. The SNMP manager exchanges management information with the SNMP agents using the SNMP protocol.

8.1.2 Basic SNMP operations

The AP supports the following basic SNMP operations:

- **Get**: An SNMP manager performs this operation to query the SNMP agent of the AP for values of one or more objects.

- **Set**: An SNMP manager performs this operation to set values of one or more objects in the MIB of the SNMP agent of the AP.

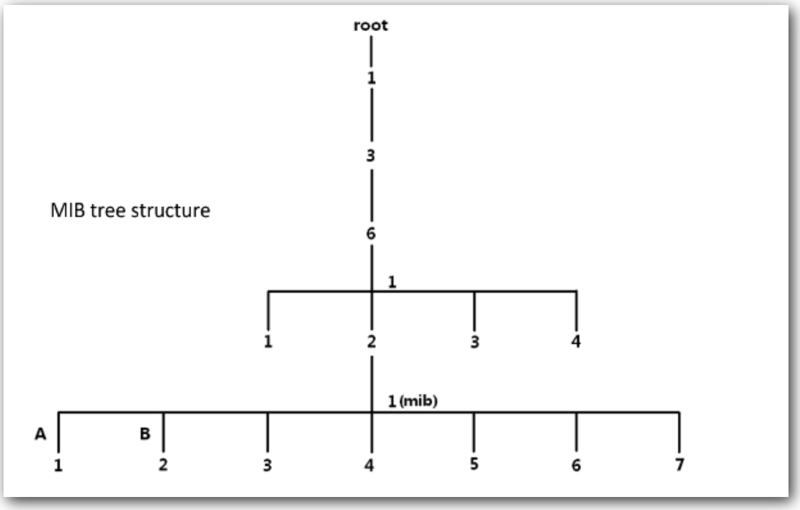
8.1.3 SNMP protocol version

The AP is compatible with SNMP V1 and SNMP V2C and adopts the community authentication mechanism. Community name is used to define the relationship between an SNMP agent and an SNMP manager. If the community name contained in an SNMP packet is rejected by a device, the packet is discarded. A community name functions as a password to control SNMP agent access attempts of SNMP managers.

SNMP V2C is compatible with SNMP V1 and provides more functions than SNMP V1. Compared with SNMP V1, SNMP V2C supports more operations (GetBulk and InformRequest) and data types (such as Counter64), and provides more error codes for better distinguishing errors.

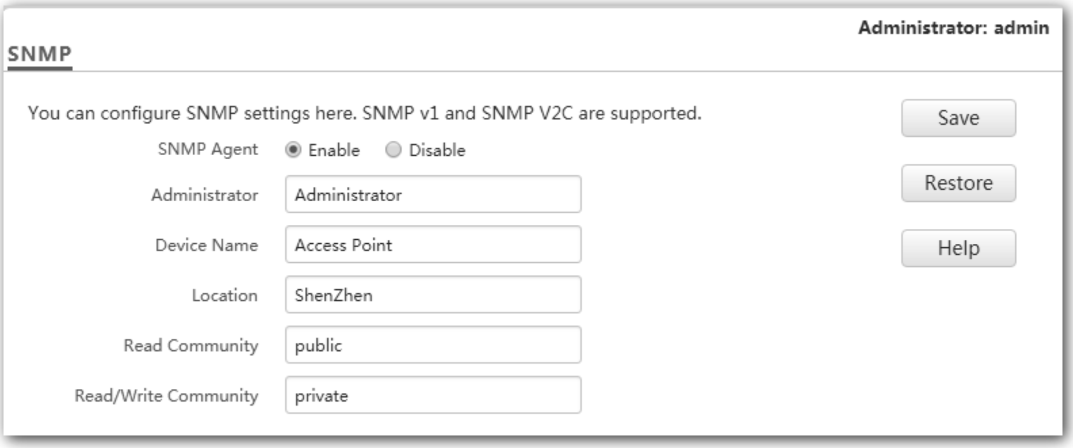
8.1.4 MIB introduction

An MIB adopts a tree structure. The nodes of the tree indicate managed objects. A path consisting of digits and starting from the root can be used to uniquely identify a node. This path is calling an object identifier (OID). The following figure shows the structure of an MIB. In the figure, the OID of A is 1.3.6.1.2.1.1, whereas the OID of B is 1.3.6.1.2.1.2.



8.2 Configuring the SNMP function

1. Click **SNMP** and set **SNMP Agent** to **Enable**.
2. Set related SNMP parameters.
3. Click **Save**.



You can configure SNMP settings here. SNMP v1 and SNMP V2C are supported.

SNMP Agent ● Enable ○ Disable

Administrator: Administrator

Device Name: Access Point

Location: ShenZhen

Read Community: public

Read/Write Community: private

---End

Parameter description

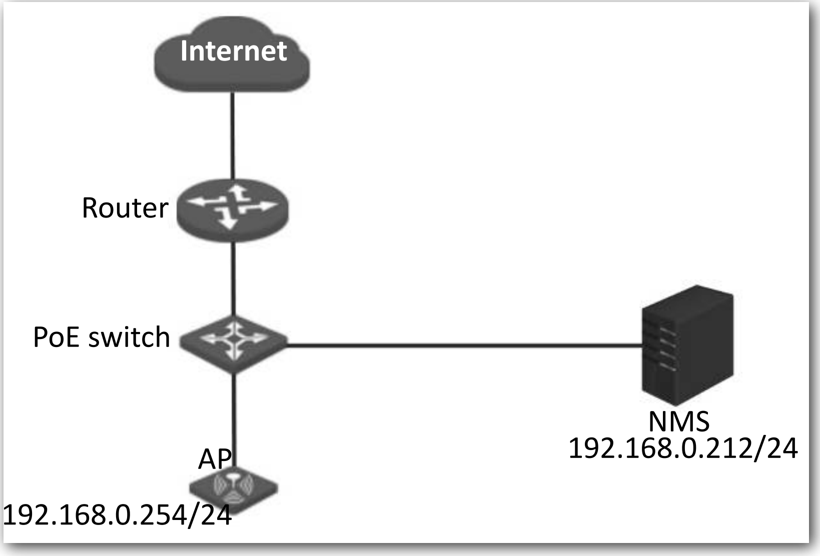
Parameter	Description
SNMP Agent	It specifies whether to enable the SNMP agent function of the AP. By default, it is disabled. An SNMP manager and the SNMP agent can communicate with each other only when their SNMP versions are the same. Currently, the SNMP agent function of the AP supports SNMP V1 and SNMP V2C.
Administrator	It specifies the administrator's name of the AP. The default name is **Administrator**. You can change the administrator's name if required.
Device Name	It specifies the device name of the AP. By default, the device name is **Access Point**. You can change it if required. Tip You are recommended to change the AP name so that you can identify your AP easily when managing the AP using SNMP.
Location	It specifies the location where the AP is used. You can change the location according to your actual situation.
Read Community	It specifies the read password shared between SNMP managers and the SNMP agent. The default password is **public**. The SNMP agent function of the AP allows an SNMP manager to use the password to read variables in the MIB of the AP.

Parameter	Description
Read/Write Community	It specifies the read/write password shared between SNMP managers and the SNMP agent. The default password is **private**. The SNMP agent function of the AP allows an SNMP manager to use the password to read/write variables in the MIB of the AP.

8.3 Example

Networking requirement

- The AP connects to an NMS over an LAN network. This IP address of the AP is 192.168.0.254/24 and the IP address of the NMS is 192.168.0.212/24.
- The NMS uses SNMP V1 or SNMP V2C to monitor and manage the AP.



Procedure:

1. **Configure the AP**.

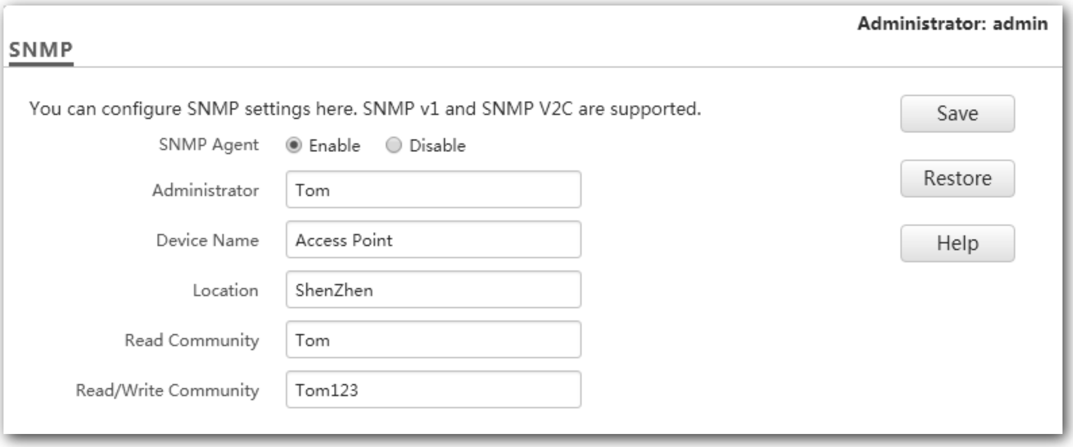
   Assume that the administrator name is **Tom**, read community is **Tom**, and read/write community is **Tom123**.

   (1) Log in to the web UI of the AP and choose **SNMP**.

   (2) Set **SNMP Agent** to **Enable**.

   (3) Set the SNMP parameters.

   (4) Click **Save**.



You can configure SNMP settings here. SNMP v1 and SNMP V2C are supported.

SNMP Agent ● Enable ○ Disable

Administrator: Tom

Device Name: Access Point

Location: ShenZhen

Read Community: Tom

Read/Write Community: Tom123

2. **Configure the NMS**.

On an NMS that uses SNMP V1 or SNMP V2C, set the read community to **Tom** and read/write community to **Tom123**. For details about how to configure the NMS, refer to the user guide of the NMS.

---End

Verification

After the configuration, the NMS can connect to the SNMP agent of the AP and can query and set some parameters on the SNMP agent through the MIB.

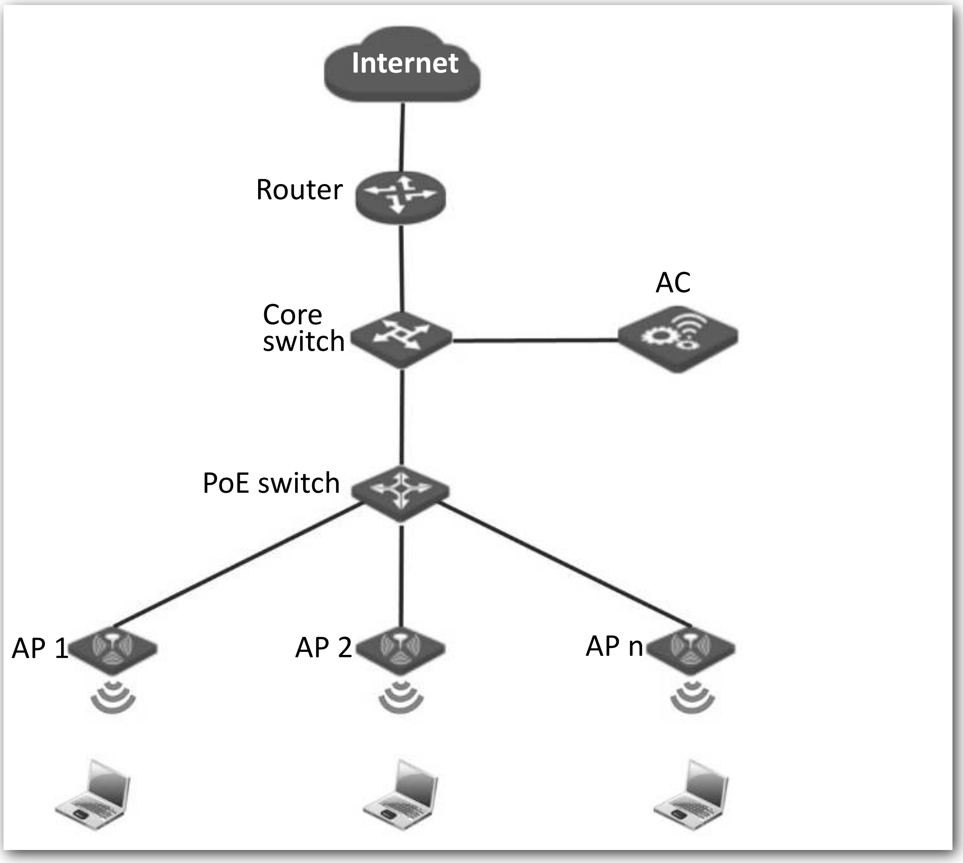
9 Deployment

9.1 Overview

If a large number of APs are deployed, you are recommended to adopt an IP-COM AP controller to manage the APs in a centralized manner, such as AC1000/2000/3000. The AP supports two deployment modes: local deployment and cloud deployment. By default, the AP is in local deployment mode.

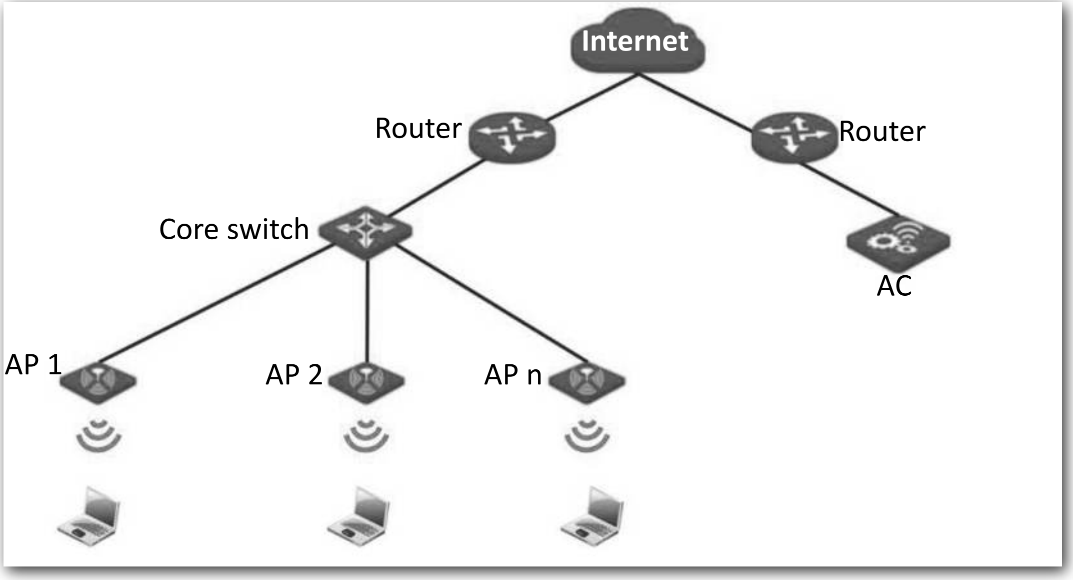
- **Local deployment**

If you need to deploy many APs in a small area, you are recommended to set the AP in the local deployment mode, which uses a local AC (in Sub AC mode) to manage the APs in a centralized manner. The following figure shows the topology for the local deployment mode.



- **Cloud deployment**

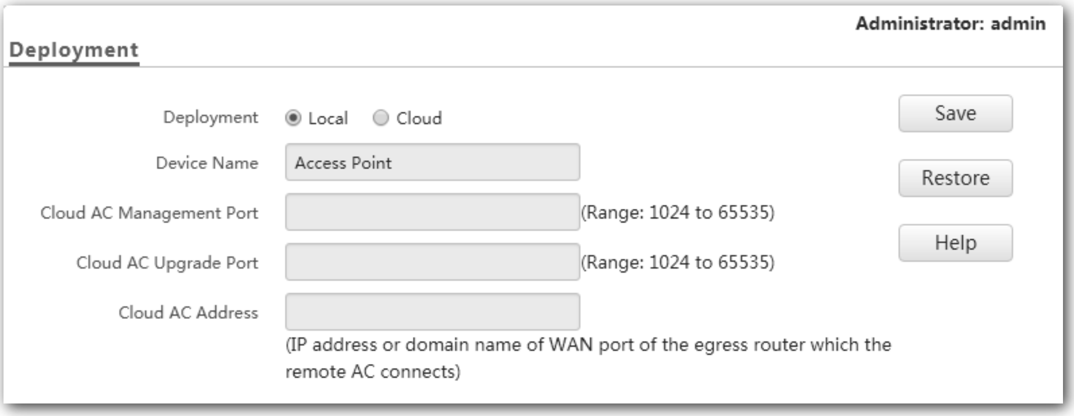
If you need to deploy many APs distributed across a large area, you are recommended to select the cloud deployment mode, which uses an AC (in Cloud AC mode) over the internet to manage the APs in a centralized manner. The following figure shows the topology for the cloud deployment mode.



9.2 Configuring the deployment mode

9.2.1 Configuring the local deployment mode

1. Click **Deployment**, and select **Local**.
2. Click **Save**.



Administrator: admin

Deployment

Deployment ● Local ○ Cloud

Device Name: Access Point

Cloud AC Management Port: (Range: 1024 to 65535)

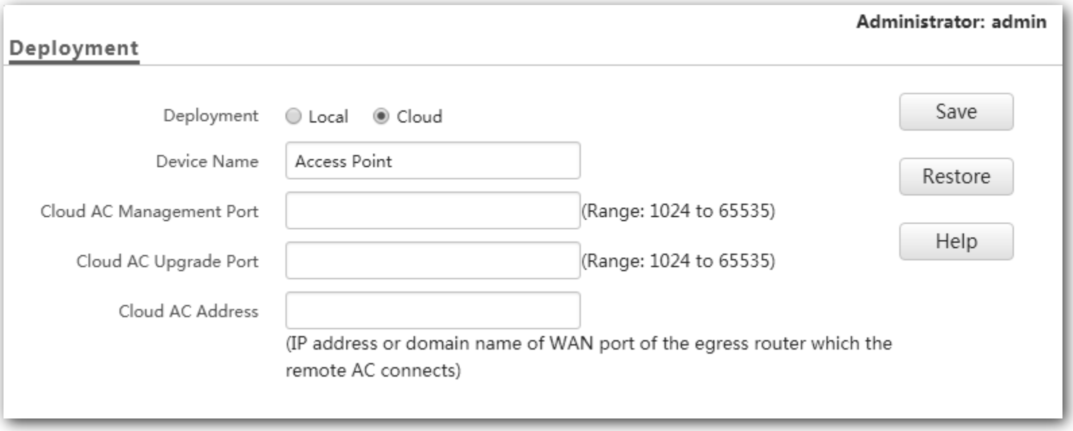
Cloud AC Upgrade Port: (Range: 1024 to 65535)

Cloud AC Address: (IP address or domain name of WAN port of the egress router which the remote AC connects)

---End

9.2.2 Configuring the cloud deployment mode

1. Click **Deployment**, and select **Cloud**.
2. Set related parameters, including device name, cloud AC address, cloud AC manage port and cloud AC upgrade port.
3. Click **Save**.



Administrator: admin

Deployment

Deployment ○ Local ● Cloud

Device Name: Access Point

Cloud AC Management Port: (Range: 1024 to 65535)

Cloud AC Upgrade Port: (Range: 1024 to 65535)

Cloud AC Address: (IP address or domain name of WAN port of the egress router which the remote AC connects)

---End

Parameter description

Parameter	**Description**
Deployment	It specifies the deployment mode of the AP. The default option is **Local**. – **Local**: It indicates that the AP can be managed only through the AC connected to the same local network. – **Cloud**: In this mode, the AP can be managed only by a cloud AC or a cloud server. To adopt the cloud deployment mode, you should set the device name, cloud AC address, cloud AC manage port and cloud AC upgrade port for your AP as well.
Device Name	It specifies the device name of the AP. You are recommended to change the device name so that you can quickly locate the AP when managing the AP remotely.
Cloud AC Address	It specifies the WAN IP address of the router to which the cloud AC connects, or the domain name to which the router's WAN IP address is bound.
Cloud AC Manage Port	It specifies port of the egress router to which the cloud AC connects for managing this device.
Cloud AC Upgrade Port	It specifies port of the egress router to which the cloud AC connects for upgrading this device.

10 Tools

10.1 Firmware upgrade

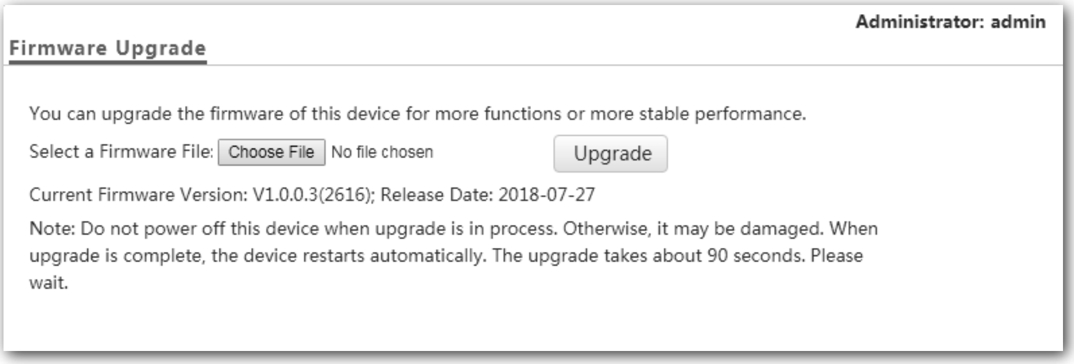
This function enables users to upgrade the AP's firmware for more functions and higher stability.

Note

To prevent damaging the AP, ensure that the new firmware version is applicable to the AP before upgrading the firmware, and keep powering on the AP during an upgrade.

Procedures:

1. Download the latest firmware version for the AP from http://www.ip-com.com.cn to your local computer.
2. Log in to the web UI of the AP and click **Tools** > **Firmware Upgrade**.
3. Click **Choose File** and select the downloaded firmware file for upgrade.
4. Click **Upgrade**.



You can upgrade the firmware of this device for more functions or more stable performance.

Select a Firmware File: No file chosen

Current Firmware Version: V1.0.0.3(2616); Release Date: 2018-07-27

Note: Do not power off this device when upgrade is in process. Otherwise, it may be damaged. When upgrade is complete, the device restarts automatically. The upgrade takes about 90 seconds. Please wait.

---End

Wait until the progress bar completes. Then log in to the web UI of the AP again. Click **Status** > **System Status** and check whether the upgrade is successful according to the **Firmware Version** parameter.

Note

After the firmware is upgraded, you are recommended to restore the factory settings of the AP and configure the AP again, so as to ensure stability of the AP and proper operation of new functions.

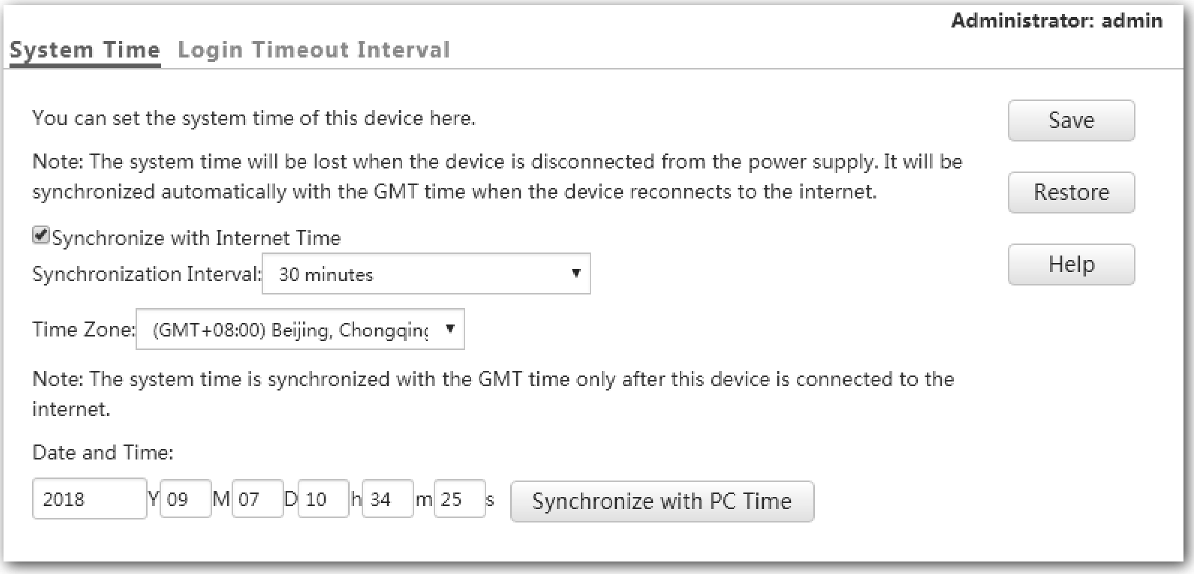
10.2 Date & time

This module enables you to set the system time and login timeout interval of your AP.

10.2.1 System time

Ensure that the system time of the AP is correct, so that logs can be recorded correctly and the reboot schedule can be executed correctly.

To access the page, click **Tools** > **Date & Time**.



You can set the system time of this device here.

Note: The system time will be lost when the device is disconnected from the power supply. It will be synchronized automatically with the GMT time when the device reconnects to the internet.

☑ Synchronize with Internet Time

Synchronization Interval: 30 minutes

Time Zone: (GMT+08:00) Beijing, Chongqin(

Note: The system time is synchronized with the GMT time only after this device is connected to the internet.

Date and Time:

2018 Y 09 M 07 D 10 h 34 m 25 s Synchronize with PC Time

The AP allows you to set its system time by synchronizing the time with the internet or setting the time manually. By default, the AP is configured to synchronize the system time with the internet.

Parameter description

Parameter	Description
Synchronize with Internet Time	Tick the box beside this item to synchronize the AP's system time with the internet time.
Synchronization Interval	It specifies the interval at which the AP synchronizes its system time with the internet time.
Synchronize with PC Time	Click this parameter to synchronize the AP's system time with the system time of the computer used to manage the AP.

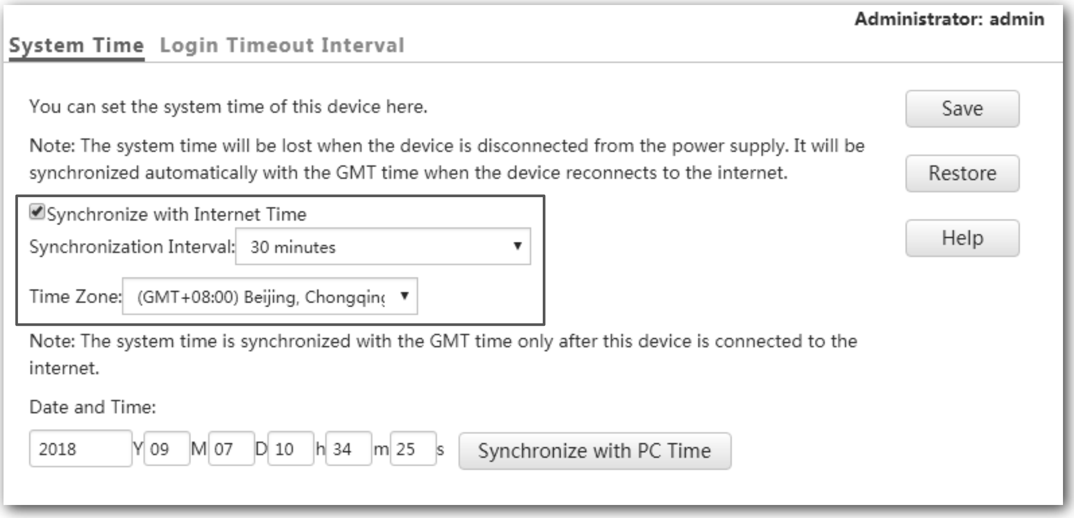
Configuring AP to synchronizing with internet time

The AP automatically synchronizes its system time with a time server of the internet, which enables the AP to correct its system time automatically after being connected to the internet.

For details about how to connect the AP to the internet, refer to Quick setup.

Procedures:

1. Click **Tools** > **Date & Time** > **System Time**.
2. Tick the **Synchronize with Internet Time** box.
3. **Synchronization Interval**: Select a desired value from the drop-down-list box. The default value **30 minutes** is recommended.
4. Set **Time Zone** to the time zone of your location.
5. Click **Save**.



You can set the system time of this device here.

Note: The system time will be lost when the device is disconnected from the power supply. It will be synchronized automatically with the GMT time when the device reconnects to the internet.

☑Synchronize with Internet Time

Synchronization Interval: 30 minutes

Time Zone: (GMT+08:00) Beijing, Chongqin

Note: The system time is synchronized with the GMT time only after this device is connected to the internet.

Date and Time:

2018 Y 09 M 07 D 10 h 34 m 25 s

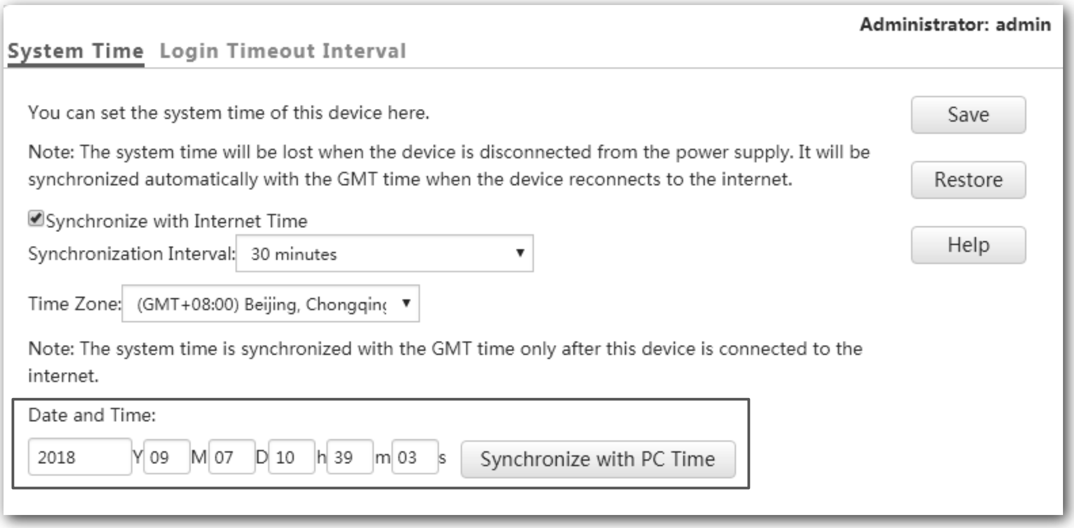
---End

Configuring date and time manually for AP

Users can manually set the system time for APs. If you choose to set date and time for your AP manually, you need to set the system time each time after the AP reboots.

Procedures:

1. Click **Tools** > **Date & Time** > **System Time**.
2. Enter a correct date and time, or click **Synchronize with PC Time** to synchronize the system time of the AP with the system time of the computer used to manage the AP.
3. Click **Save**.



Administrator: admin

You can set the system time of this device here.

Note: The system time will be lost when the device is disconnected from the power supply. It will be synchronized automatically with the GMT time when the device reconnects to the internet.

☑ Synchronize with Internet Time

Synchronization Interval: 30 minutes

Time Zone: (GMT+08:00) Beijing, Chongqin

Note: The system time is synchronized with the GMT time only after this device is connected to the internet.

Date and Time: 2018 Y 09 M 07 D 10 h 39 m 03 s

Note

If you decide to synchronize the system time of the AP with the system time of the computer used to manage the AP, make sure the computer's system time is correct.

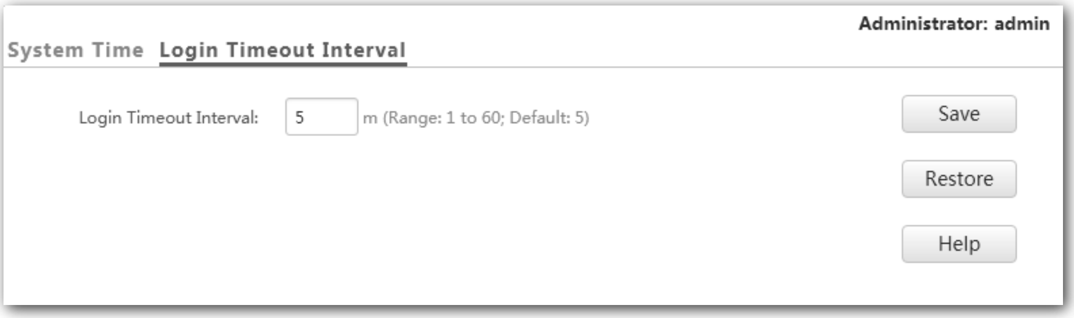
---End

10.2.2 Login timeout interval

If you log in to the web UI of the AP and perform no operation within the login timeout interval, the AP logs you out automatically. The default login timeout interval is 5 minutes.

Configuring the login timeout interval:

1. Click **Tools** > **Date & Time,** and click the **Login Timeout Interval** tab.
2. Set the login timeout interval as required.
3. Click **Save**.



Administrator: admin

Login Timeout Interval: 5 m (Range: 1 to 60; Default: 5)

---End

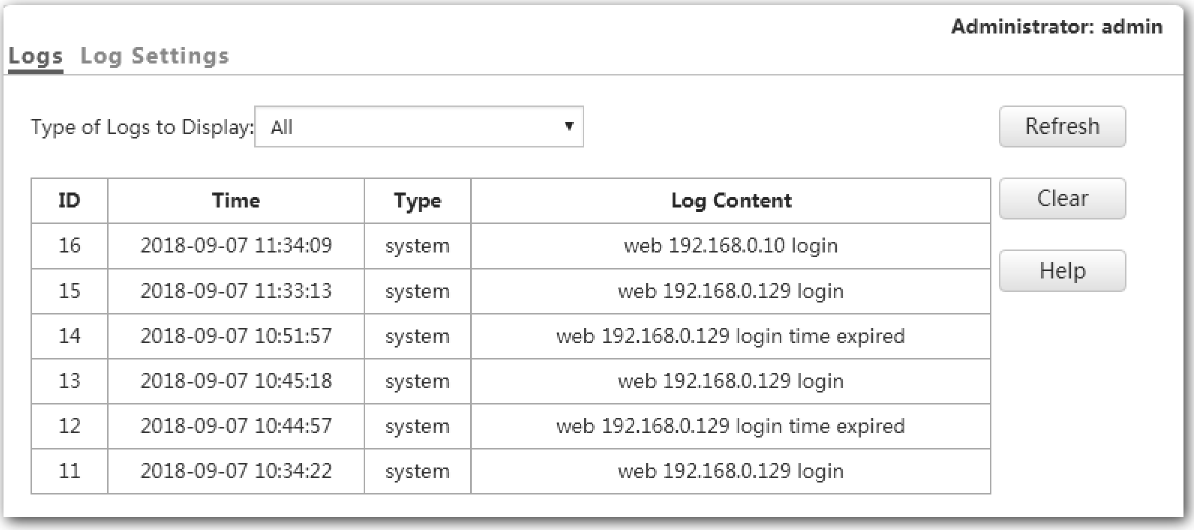
10.3 Logs

This module enables you to view logs and configure log settings.

10.3.1 Logs

Logs record various events that occur to the AP and the operations that users perform on the AP after the AP starts. In case of system faults, refer to the logs during troubleshooting.

To access the page, click **Tools** > **Logs**.



Type of Logs to Display: All

ID	Time	Type	Log Content
16	2018-09-07 11:34:09	system	web 192.168.0.10 login
15	2018-09-07 11:33:13	system	web 192.168.0.129 login
14	2018-09-07 10:51:57	system	web 192.168.0.129 login time expired
13	2018-09-07 10:45:18	system	web 192.168.0.129 login
12	2018-09-07 10:44:57	system	web 192.168.0.129 login time expired
11	2018-09-07 10:34:22	system	web 192.168.0.129 login

To ensure that the logs are recorded correctly, make sure that AP's system time is correct. You can correct the system time by clicking **Tools** > **Date & Time** > **System Time**.

To view the latest logs of the AP, click **Refresh**. To clear the current logs, click **Clear**.

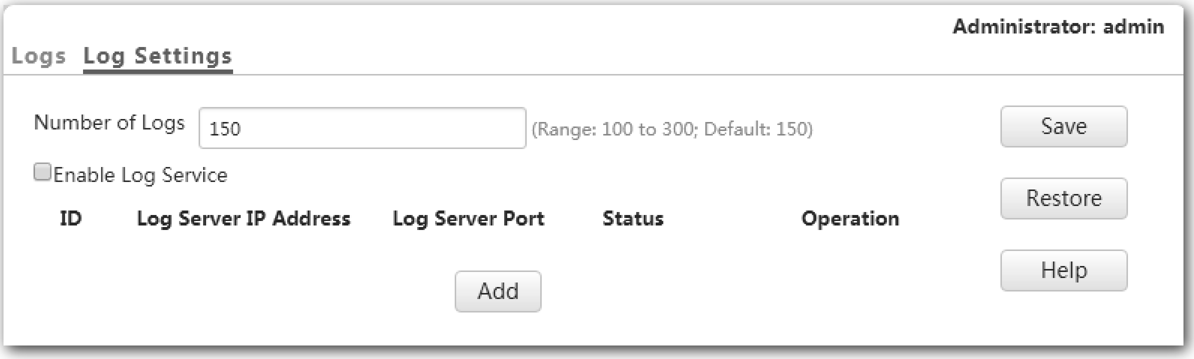
Note

When the AP reboots, the previous logs are lost. And the AP reboots when one of the followings happens: the AP is powered on after a power failure; the QVLAN function is configured; the firmware is upgraded; an AP configuration is backed up or restored or the AP is restored to factory settings.

10.3.2 Configuring log settings

To access the page, click **Tools** > **Logs** > **Log Settings**.

On this page, you can set the number of displayed logs and configure the log server function.



Number of Logs: 150 (Range: 100 to 300; Default: 150)

□ Enable Log Service

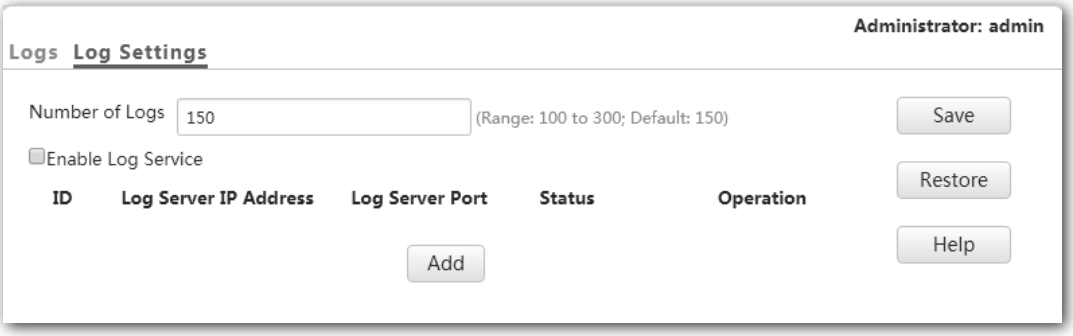
ID	Log Server IP Address	Log Server Port	Status	Operation

Setting the number of displayed logs

By default, the AP can display a maximum of 150 logs. You can change the number as required.

Procedure:

1. To access the page, click **Tools** > **Logs** > **Log Settings**.
2. **Number of Logs**: Change the number of logs as required within the range of 100 to 300.
3. Click **Save**.



Number of Logs: 150 (Range: 100 to 300; Default: 150)

□ Enable Log Service

ID	Log Server IP Address	Log Server Port	Status	Operation

---End

Configuring the log server settings

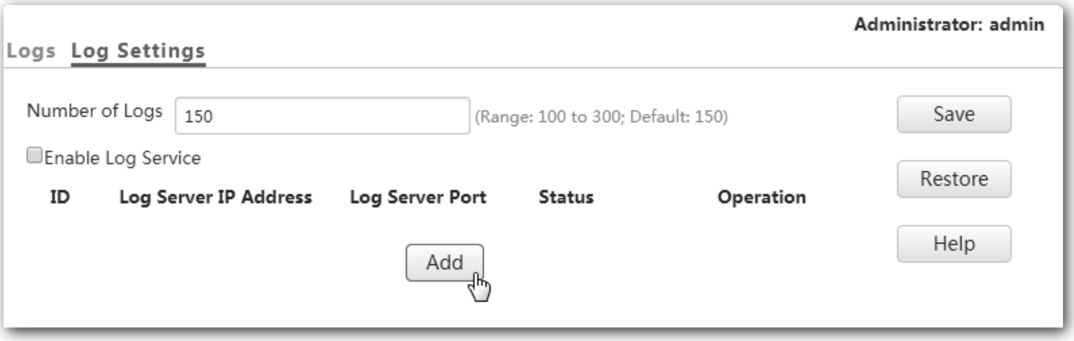
After you specify a log server, the AP sends its logs to the log server. You can view all the historical logs of the AP on the log server.

Note

To ensure that system logs can be sent to a log server, choose **Network Settings** > **LAN Setup** and set the IP address, subnet mask, and gateway of the AP to communicate with the log server.

Adding a log server

1. To access the page, click **Tools** > **Logs** > **Log Settings**.
2. Click **Add**.

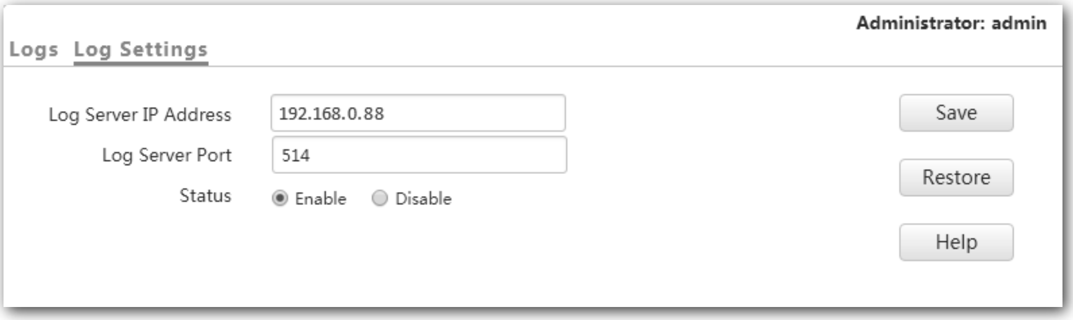


Number of Logs 150 (Range: 100 to 300; Default: 150)

□Enable Log Service

ID	Log Server IP Address	Log Server Port	Status	Operation

3. Set parameters as follows:
   - **Log Server IP Address**: Enter the IP address of your log server, which is **192.168.0.88** in this example.
   - **Log Server Port**: Enter the log server’s UDP port number used to send and receive system logs. The default port number 514 is recommended.
   - **Status**: Choose **Enable**.
4. Click **Save**.

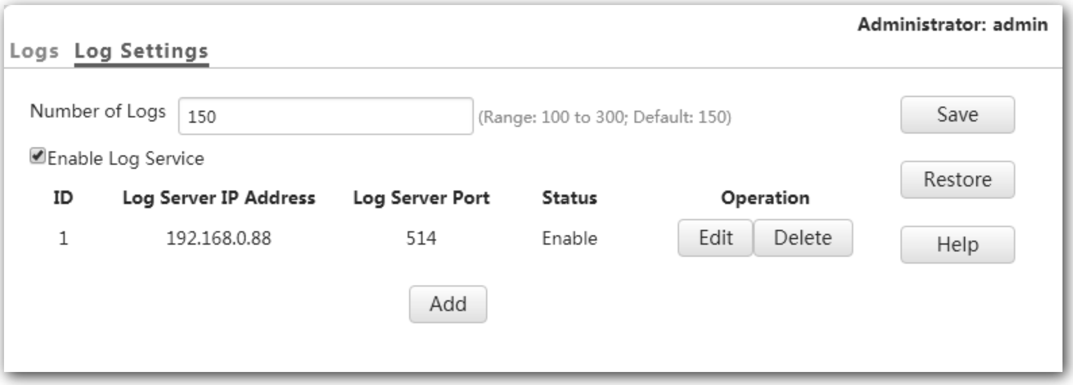


Log Server IP Address 192.168.0.88

Log Server Port 514

Status ● Enable ○ Disable

5. Tick the box beside the **Enable Log Service** item.
6. Click **Save**.



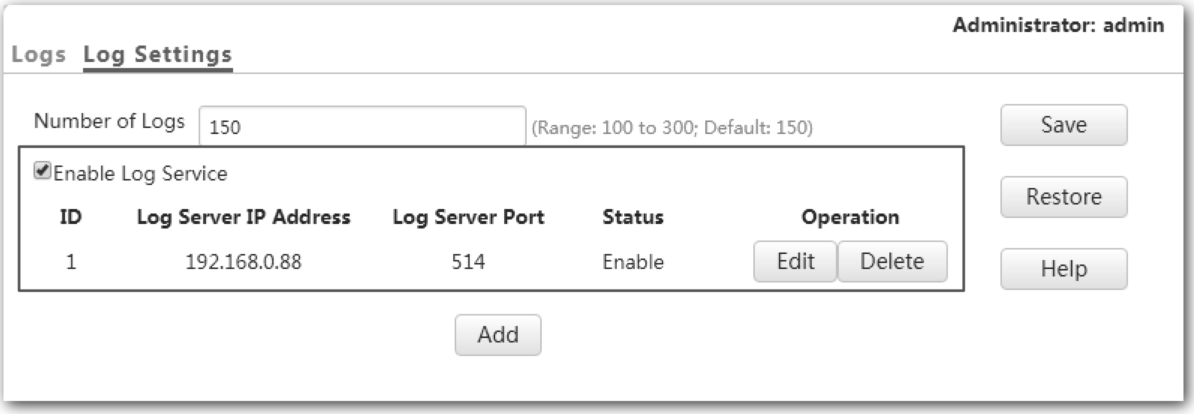
Number of Logs: 150 (Range: 100 to 300; Default: 150)

☑Enable Log Service

ID	Log Server IP Address	Log Server Port	Status	Operation
1	192.168.0.88	514	Enable	Edit Delete

---End

The following figure shows the configuration:



Number of Logs: 150 (Range: 100 to 300; Default: 150)

☑Enable Log Service

ID	Log Server IP Address	Log Server Port	Status	Operation
1	192.168.0.88	514	Enable	Edit Delete

Changing log server settings

1. To access the page, click **Tools** > **Logs** > **Log Settings**.
2. Click **Edit** corresponding to the log server settings to be changed.
3. Change the parameter settings as required.
4. Click **Save**.

---End

Deleting log server settings

1. To access the page, click **Tools** > **Logs** > **Log Settings**.
2. Click **Delete** corresponding to the log server settings to be deleted.

---End

10.4 Configuration

This module enables you to back up the current configuration of the AP, restore a previous configuration of the AP, and restore the AP to factory settings.

10.4.1 Backup and restoring configurations

The backup function enables you to back up the current configuration of the AP to a local computer. The restoration function enables you to restore the AP to previous configuration.

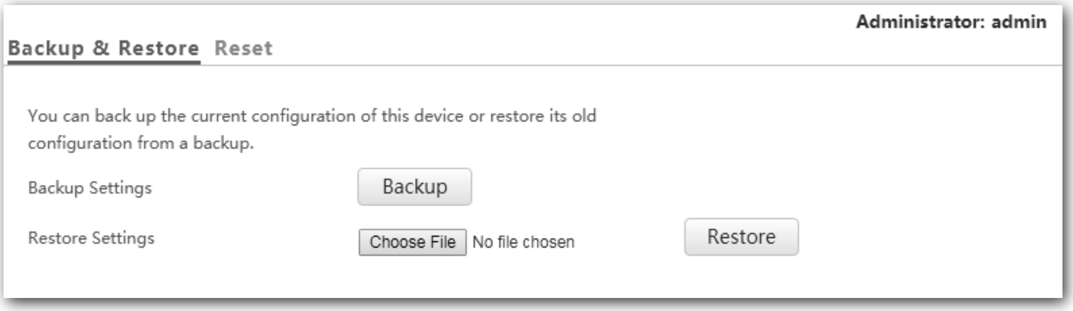
If the AP enters the optimum condition after you greatly change the configuration of the AP, you are recommended to back up the new configuration, so that you can restore it after upgrading or resetting the AP.

Note

If you need to apply same or similar configuration to many APs, you can configure one of the APs, back up its configuration, and use the backup configuration file to restore the configuration of other APs.

Backup the current configuration

1. Click **Tools** > **Configuration** > **Backup & Restore**.
2. Click **Backup**.

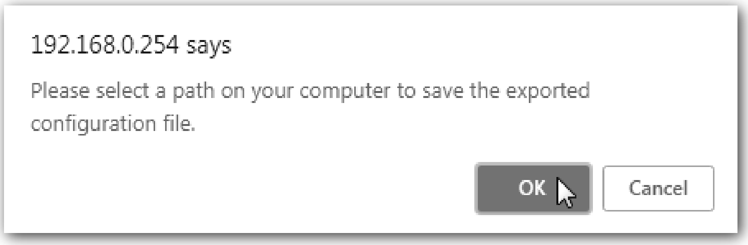


You can back up the current configuration of this device or restore its old configuration from a backup.

Backup Settings Backup

Restore Settings Choose File No file chosen Restore

3. Click **OK**.


192.168.0.254 says

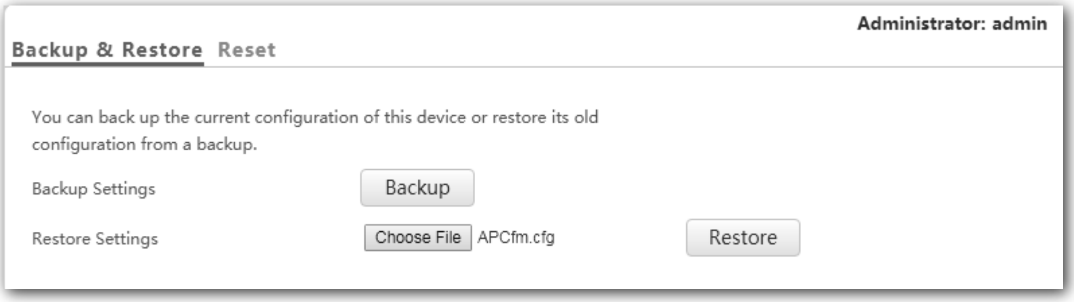
Please select a path on your computer to save the exported configuration file.

---End

A configuration file called as **APCfm.cfg** will be downloaded.

Restoring previous configuration

1. Click **Tools** > **Configuration** > **Backup & Restore**.
2. Click **Choose File** and select the configuration file to be restored.
3. Click **Restore**.



Administrator: admin

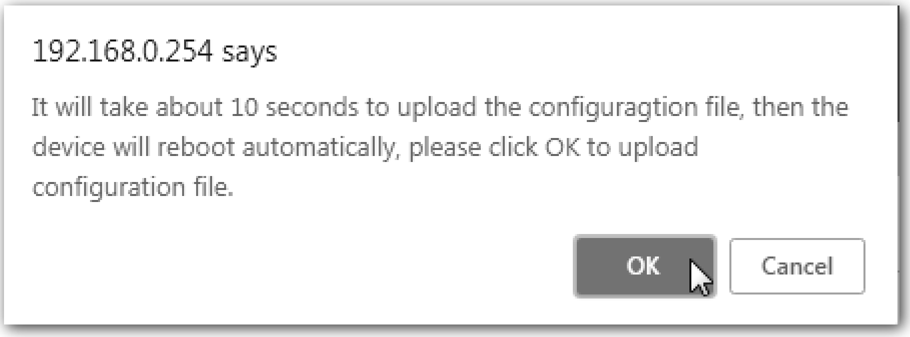
Backup & Restore Reset

You can back up the current configuration of this device or restore its old configuration from a backup.

Backup Settings Backup

Restore Settings Choose File APCfm.cfg Restore

4. Click **OK**.



192.168.0.254 says

It will take about 10 seconds to upload the configuragtion file, then the device will reboot automatically, please click OK to upload configuration file.

---End

A progress bar will appear after you click **OK**. And the AP is restored to previous configuration after the progress bar ends.

10.4.2 Resetting the AP

If you cannot locate a fault of the AP or forget the login password of the AP, you can reset the AP to restore its factory settings and then configure it again. The AP can be reset using web UI or hardware.

After you reset the AP, the login IP address of the AP is changed to **192.168.0.254**, and the user name and password of the AP are changed to **admin**.

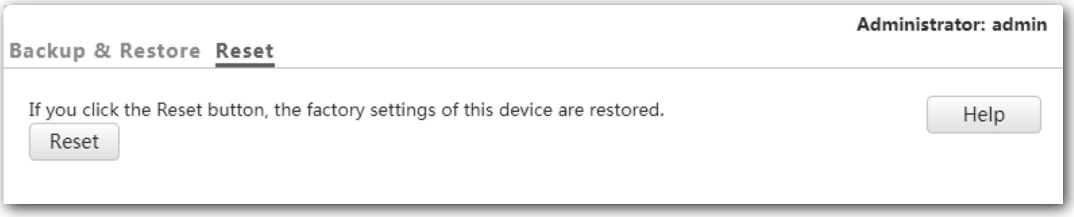
Note

- AP’s configuration is lost if you restore it to the factory settings. And you need to reconfigure the AP to connect to the internet. Therefore, restore the factory settings of the AP only when necessary.

- To prevent damages, ensure that the AP is connected to power supply properly when the AP is reset.

Resetting the AP through web UI

1. Click **Tools** > **Configuration** and click the **Reset** tab.
2. Click the **Reset** button.



Administrator: admin

Backup & Restore Reset

If you click the Reset button, the factory settings of this device are restored.

Reset

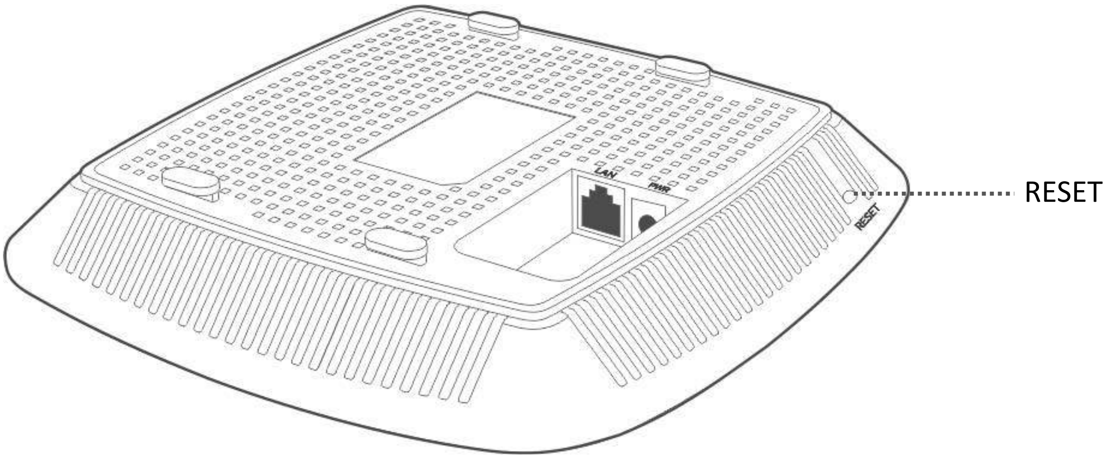
Help

---End

Resetting the AP using hardware

This method enables you to reset the AP without logging in to its web UI.

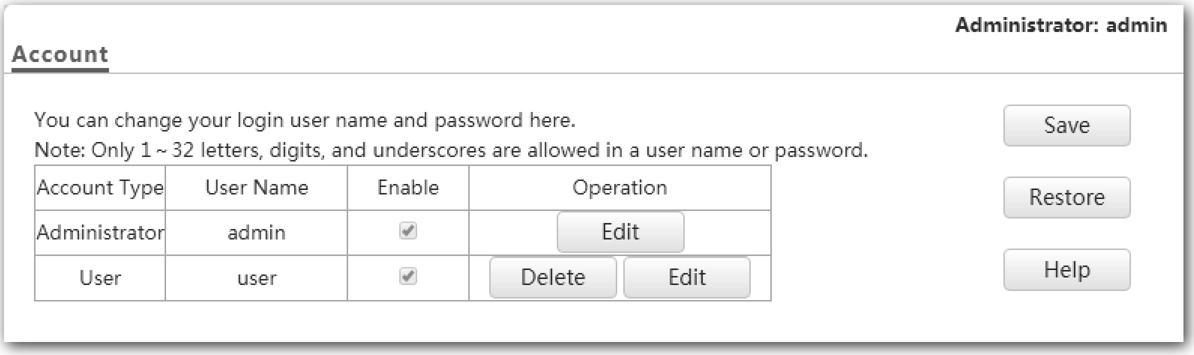
After the LED indicator blinks, hold down the RESET button for about 8 seconds. The AP is reset successfully when the LED indicator gets solid on.



10.5 Account

This page enables you to change the AP's login account information such as user name and password to prevent unauthorized login.

To access the configuration page, click **Tools** > **Account**.



You can change your login user name and password here.
Note: Only 1 ~ 32 letters, digits, and underscores are allowed in a user name or password.

Account Type	User Name	Enable	Operation
Administrator	admin	☑	Edit
User	user	☑	Delete Edit

Parameter description

Parameter	Description
Access Type	It specifies the account used to log in to the AP's web UI. - **Administrator**: It specifies the account enabling you to view and modify settings of the AP. - **User**: It specifies the account only enabling you to view settings of the AP.
User Name	It specifies the user name of an account. By default, the AP has one administrator account and one user account. Both the default user name and password of the administrator account are **admin**, and both the user name and password of the user account are **user**.
Enable	It specifies whether an account is enabled. - The administrator account is enabled for all time. - The user account is enabled by default but you can disable it if required.
Operation	- **Change**: Used to change the user name and password of the account corresponding to the button. - **Delete**: Used to delete the user account. Note Changing, deleting, or adding an account succeeds only after you click **Save**.

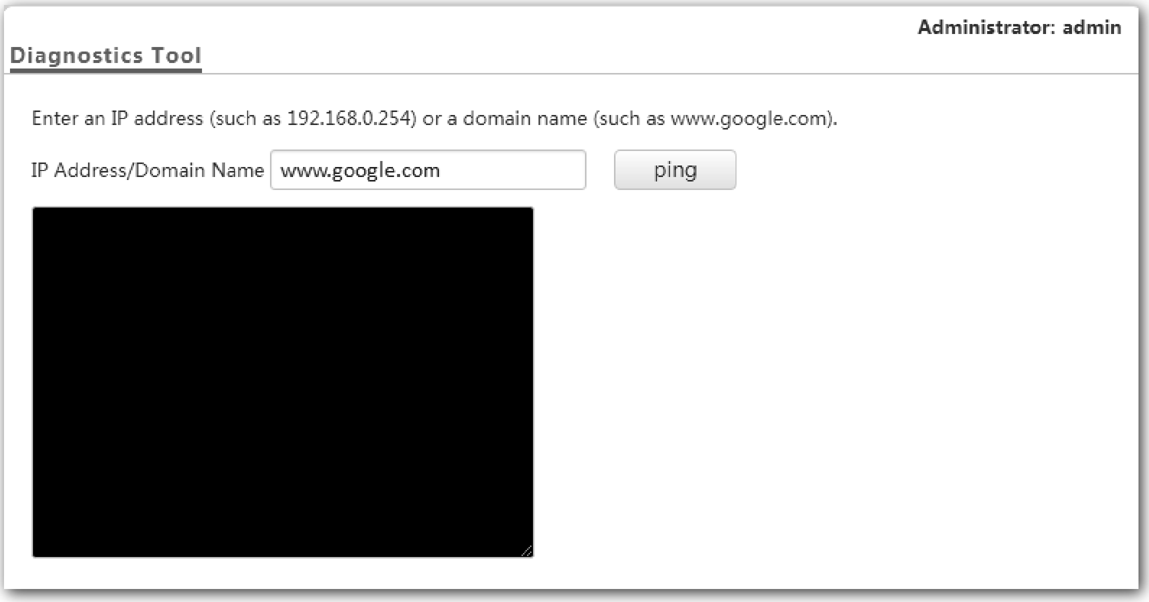
10.6 Diagnostics tool

If the network connection fails, you can use the diagnostics tool included in the AP to locate the faulty node.

10.6.1 Locating the faulty node

The link www.google.com is used as an example.

1. Click **Tools** > **Diagnostics Tool**.
2. Enter the IP address or domain name to be pinged in the **Input** box, which is **www.google.com** in this example.
3. Click **ping**.



Administrator: admin

Diagnostics Tool

Enter an IP address (such as 192.168.0.254) or a domain name (such as www.google.com).

IP Address/Domain Name: www.google.com

---End

The diagnosis result will be displayed in a few seconds in the black text box.

10.7 Reboot device

This module enables you to manually reboot the AP or configure the AP to reboot automatically.

Note

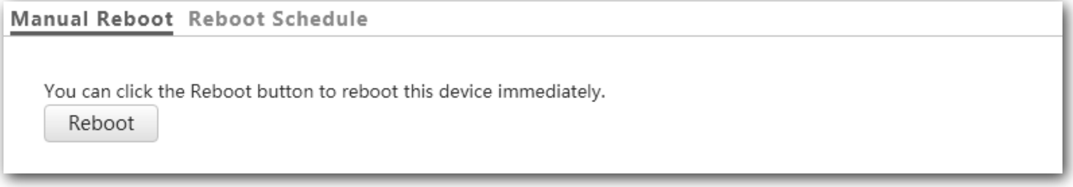
When the AP reboots, all connections are released. You are recommended to reboot the AP in spare time.

10.7.1 Manual reboot

If a setting does not take effect, you can try rebooting the AP to resolve the problem.

Procedures:

1. To access the page, click **Tools** > **Reboot Device**.
2. Click **Reboot**.



You can click the Reboot button to reboot this device immediately.

---End

10.7.2 Reboot schedule

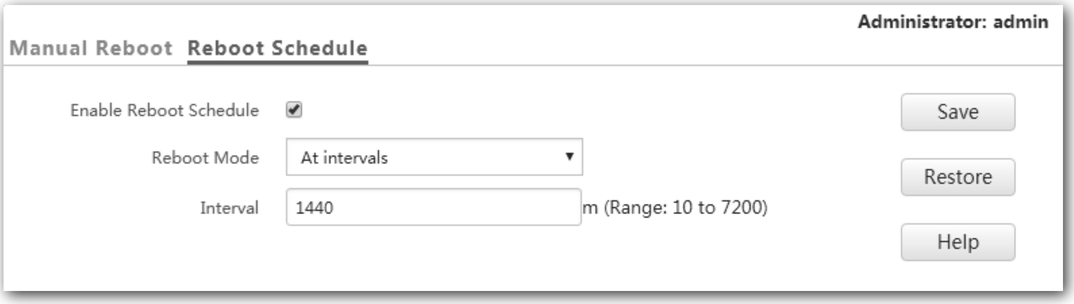
This function enables the AP to reboot automatically as scheduled. You can use this function to prevent wireless performance degradation or network instability that occurs after AP is online for a long time. The AP can reboot:

- **At intervals**: In this mode, the AP reboots at the interval you set.
- **At specified time**: In this mode, the AP reboots regularly at the time you set.

Configuring the AP to reboot at an interval

1. Click **Tools** > **Reboot Device** and click the **Reboot Schedule** tab.
2. Tick the **Enable Reboot Schedule** box.

3. **Reboot Mode**: Select **At Intervals**.
4. **Interval**: Set your required value, such as **1440** in this example.
5. Click **Save**.



Administrator: admin

Enable Reboot Schedule ☑

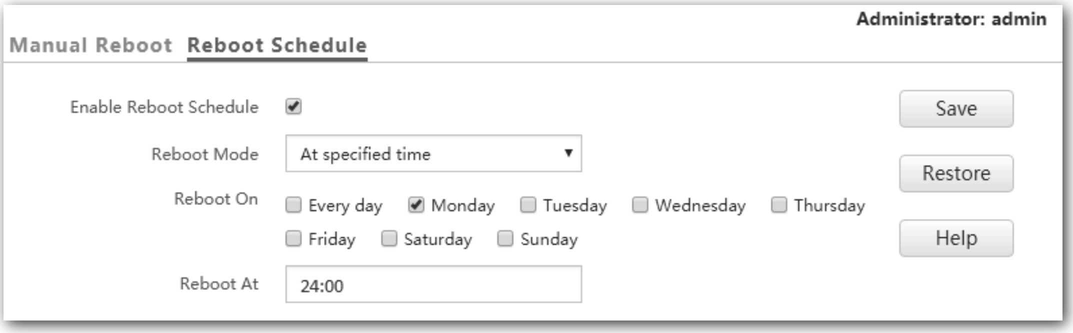
Reboot Mode: At intervals

Interval: 1440 m (Range: 10 to 7200)

---End

Configuring the AP to reboot at specified time

1. Click **Tools** > **Reboot Device** and click the **Reboot Schedule** tab.
2. Tick the **Enable Reboot Schedule** box.
3. **Reboot Mode**: Select **At specified time**.
4. **Reboot On**: Select the required day(s) when the AP reboots, which is **Monday** in this example.
5. **Reboot At**: Set the time when the AP reboots, which is **24:00** in this example.
6. Click **Save**.



Administrator: admin

Enable Reboot Schedule ☑

Reboot Mode: At specified time

Reboot On: □ Every day ☑ Monday □ Tuesday □ Wednesday □ Thursday □ Friday □ Saturday □ Sunday

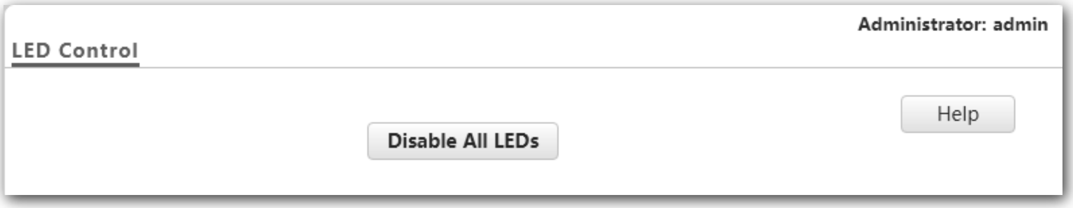
Reboot At: 24:00

10.8 LED control

This function enables you to turn on/off the LED indicator of the AP. By default, the LED indicator is turned on.

Turning off the LED indicator:

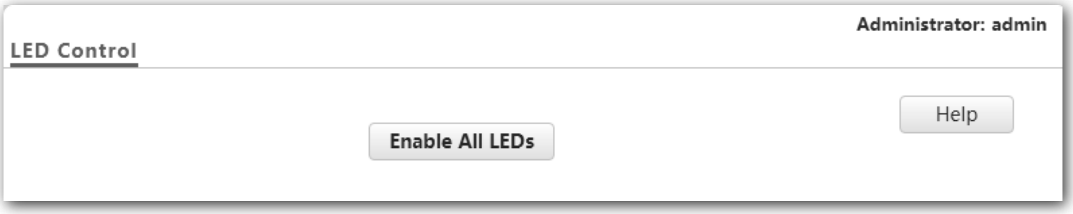
1. Click **Tools** > **LED Control**.
2. Click **Disable All LEDs**.



---End

Turning on the LED indicator:

1. Click **Tools** > **LED Control**.
2. Click **Enable All LEDs**.



---End

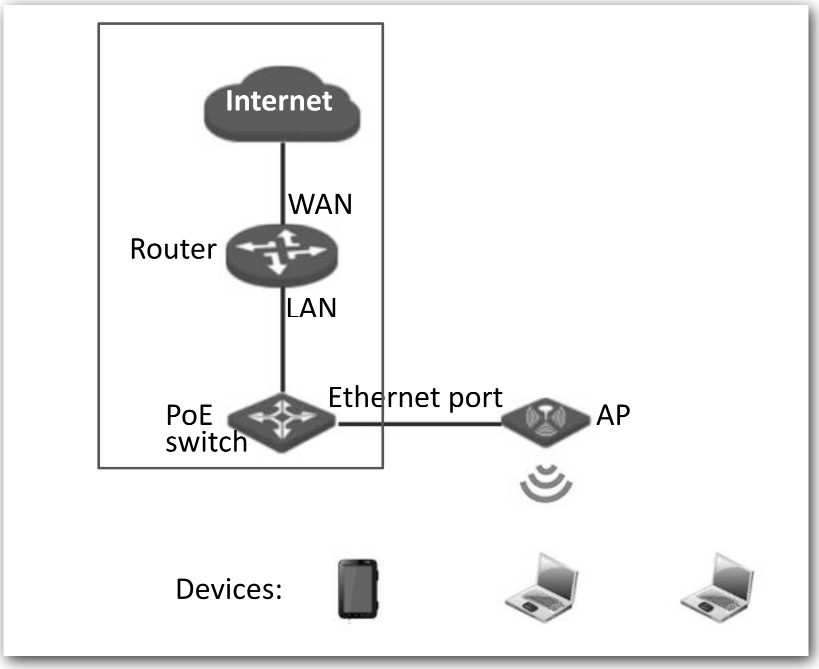
10.9 Uplink check

10.9.1 Overview

In AP mode, the AP connects to its upstream network using the LAN port. If a critical node between the LAN port and the upstream network fails, the AP as well as the wireless devices connected to the AP cannot access the upstream network. If uplink detection is enabled, the AP regularly pings specified hosts through the LAN port. If all the hosts are not reachable, the AP stops its wireless service and wireless devices cannot find the SSIDs of the AP. The device can reconnect to the AP only after the connection between the AP and the upstream networks is recovered.

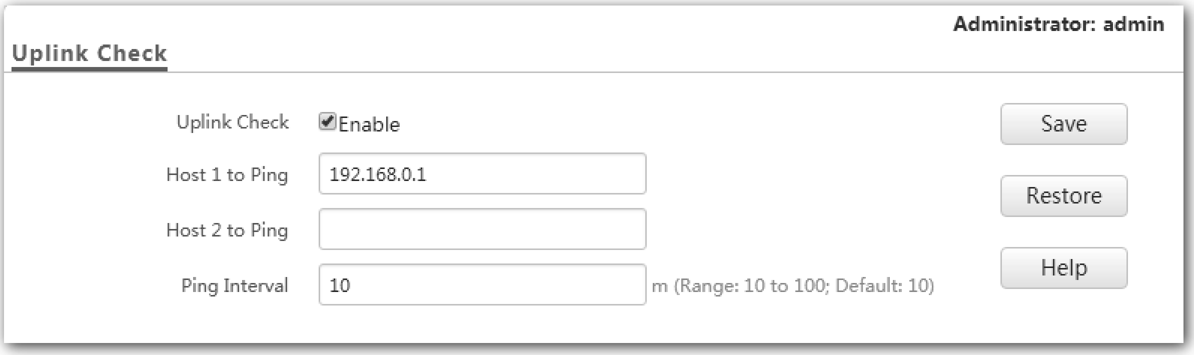
If the uplink of the AP with uplink check enabled is faulty, wireless devices can connect to the upstream network through another nearby AP that works properly.

See the following topology (The LAN port serves as the uplink port).



10.9.2 Configuring uplink check

1. Click **Tools** > **Uplink Check**.
2. **Uplink Check**: Tick the **Enable** box.
3. **Host 1 to Ping**/**Host 2 to Ping**: Enter the IP address(es) of the host to be pinged through the LAN port of the AP, such as the IP address of the switch or router directly connected to the AP.
4. **Pinging Interval**: Enter the interval at which the AP detects its uplink.
5. Click **Save**.



Administrator: admin

Uplink Check

Uplink Check	☑ Enable
Host 1 to Ping	192.168.0.1
Host 2 to Ping	
Ping Interval	10 m (Range: 10 to 100; Default: 10)

---End

Note

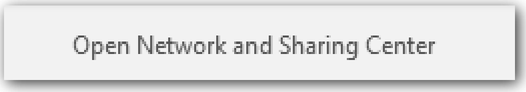
Host 1 to Ping is not bound with **Host 2 to Ping**, which indicates that you can enter IP address either in **Host 1 to Ping** or **Host 2 to Ping**, or enter IP addresses for both of these two parameters.

Appendix

A.1 Configuring a static IP address for your computer (Example: Win7)

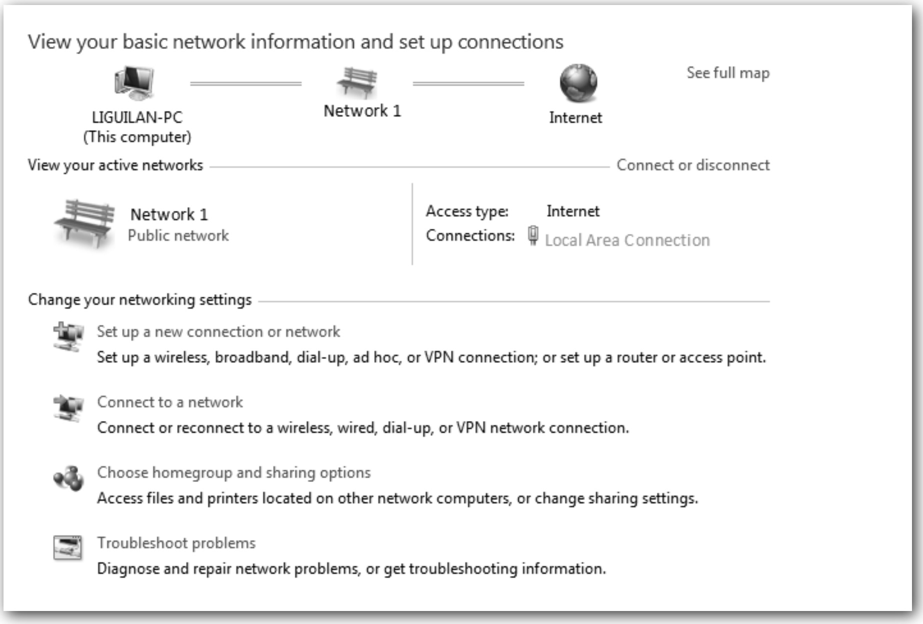
Procedures:

1. Right-click 🖧 in the lower-right corner of the desktop and choose **Open Network and Sharing Center**.



Open Network and Sharing Center

2. Click **Local Area Connection**.



View your basic network information and set up connections

View your active networks — Connect or disconnect

Network 1
Public network

Access type: Internet
Connections: Local Area Connection

Change your networking settings

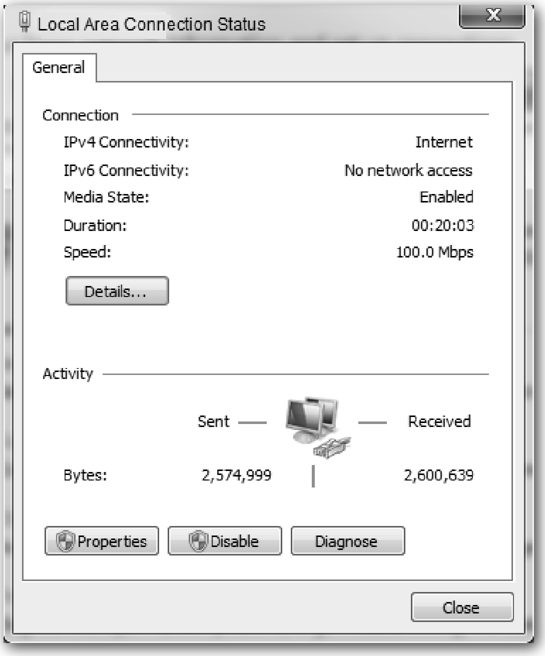
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.

Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

Choose homegroup and sharing options
Access files and printers located on other network computers, or change sharing settings.

Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.

3. Click **Properties**.



Local Area Connection Status

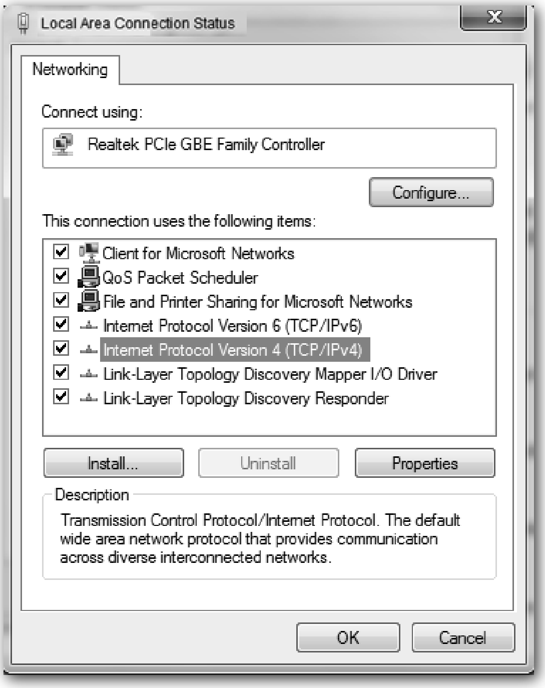
General

Connection

IPv4 Connectivity:	Internet
IPv6 Connectivity:	No network access
Media State:	Enabled
Duration:	00:20:03
Speed:	100.0 Mbps

	Sent	Received
Bytes:	2,574,999	2,600,639

4. Double-click **Internet Protocol Version 4 (TCP/IPv4)**.



Local Area Connection Status

Networking

Connect using:

Realtek PCIe GBE Family Controller

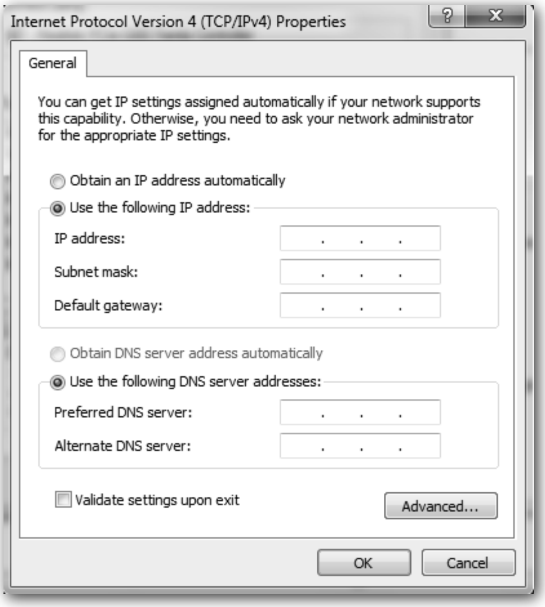
This connection uses the following items:

- ☑ Client for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

5. Select **Use the following IP address** and **Use the following DNS server address**.



Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: . . .

Subnet mask: . . .

Default gateway: . . .

○ Obtain DNS server address automatically

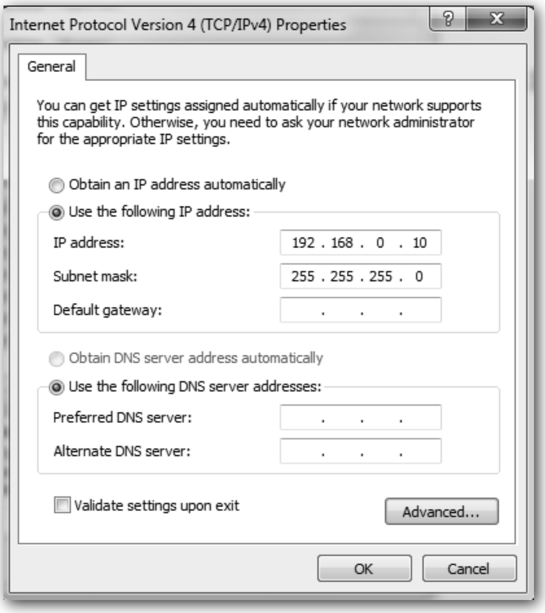
● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

□ Validate settings upon exit

6. **IP address**, **Subnet mask**: Set a static IP address, subnet mask for your computer, which is **192.168.0.10** and **255.255.255.0** in this example, and click **OK**.



Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 192 . 168 . 0 . 10

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

○ Obtain DNS server address automatically

● Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

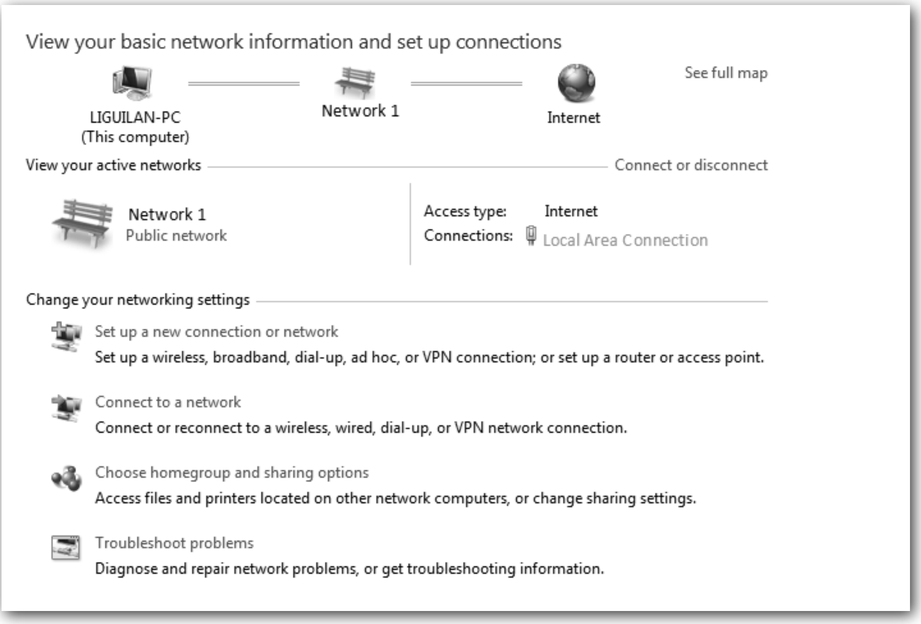
□ Validate settings upon exit

Verification

Configuration succeeds. You can check whether your configuration is successful on the **Network Connection Details** page. Procedures are as follows:

1. Right-click in the lower-right corner of the desktop and choose **Open Network and Sharing Center**.

2. Click **Local Area Connection**.



View your basic network information and set up connections

View your active networks — Connect or disconnect

Network 1
Public network

Access type: Internet
Connections: Local Area Connection

Change your networking settings

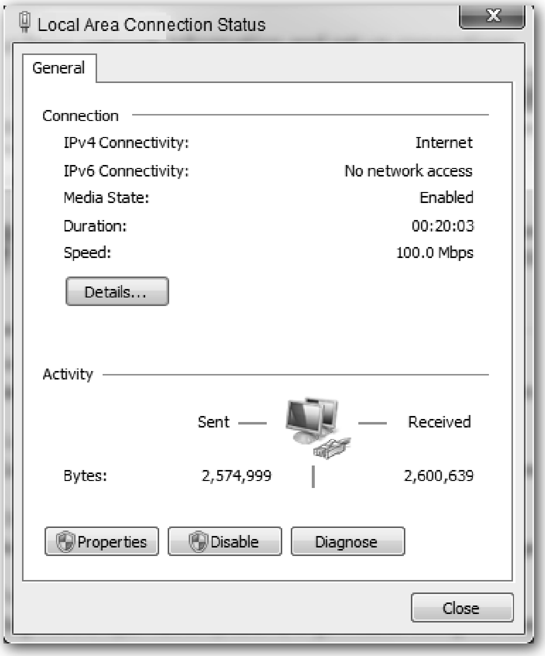
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.

Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.

Choose homegroup and sharing options
Access files and printers located on other network computers, or change sharing settings.

Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.

3. Click **Details**.



Local Area Connection Status

General

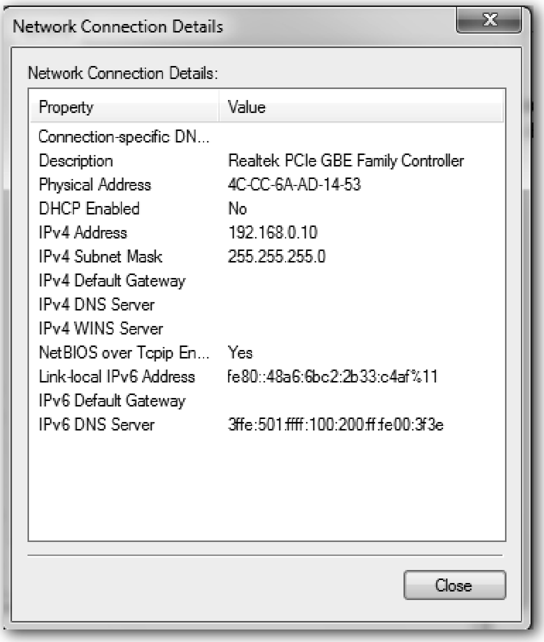
Connection

IPv4 Connectivity:	Internet
IPv6 Connectivity:	No network access
Media State:	Enabled
Duration:	00:20:03
Speed:	100.0 Mbps

Activity

	Sent	Received
Bytes:	2,574,999	2,600,639

4. Check whether your configuration is successful on the **Network Connection Details** page. Parameters in **IPv4 Address**, **IPv4 Subnet Mask** represent the IP address, subnet mask of your computer.



Property	Value
Connection-specific DN...	
Description	Realtek PCIe GBE Family Controller
Physical Address	4C-CC-6A-AD-14-53
DHCP Enabled	No
IPv4 Address	192.168.0.10
IPv4 Subnet Mask	255.255.255.0
IPv4 Default Gateway	
IPv4 DNS Server	
IPv4 WINS Server	
NetBIOS over Tcpip En...	Yes
Link-local IPv6 Address	fe80::48a6:6bc2:2b33:c4af%11
IPv6 Default Gateway	
IPv6 DNS Server	3ffe:501:ffff:100:200:ff:fe00:3f3e

A.2 FAQ

Q1: **I cannot access the web UI of the AP after entering 192.168.0.254**. **What should I do**?

A1: Try the following solutions and log in again:

- Ensure that all your Ethernet cables are properly connected.
- If there is no AC or IP-COM router in the network, ensure that the IP address of your computer has been set to 192.168.0.*x* (*x*: 2 to 253), and the IP address is not used by any other devices in the same network.
- Clear the cache of your web browser or replace the web browser.
- Disable the firewall of your computer or replace your computer.
- If two or more APs are connected in the network without an AC/IP-COM management router, an IP address conflict may happen. You should leave only one AP in the network first and set a new IP address 192.168.0.x (x: 2 to 253) for the AP. Then repeat this procedure to change the IP addresses of the other APs. Meanwhile, make sure that the IP address of your computer is in the same network segment with your APs' new IP addresses. Then try logging in to the web UI of your APs using their new IP addresses.
- If the AP has been managed by the AC or IP-COM router, the AP's IP address may be no longer 192.168.0.254. In that case, go to the web UI of the **AC**/**router** to view the new IP address of the AP, and then log in to the AP's web UI using the new IP address.
- If the problem still persists, hold the **RESET** button down for 8 seconds to restore the AP to factory settings, and then try logging in again.

Q2: **My AP controller (AC) cannot find my AP**. **What should I do**?

A2: Check the following items:

- Ensure that all the devices in the network are connected properly and the LED of the AP blinks.
- If VLANs have been defined in your network, verify that the corresponding VLAN has been added to your AP controller.
- Reboot your AP.
- Ensure that the firmware versions of your AP and AC are the latest firmware versions available on http://www.ip-com.com.cn.
- Reset your AP.

Method to reset: When the system LED indicator blinks, hold down the **RESET** button for about 8 seconds. The AP is reset successfully when the system LED indicator gets solid on.

A.3 Default parameter values

The following table lists the default parameter values of the AP.

Parameter			Default Value
Login	Management IP address		192.168.0.254
	Account	Administrator	User name: admin
			Password: admin
	Account	User	User name: user
			Password: user
Quick Setup	Working Mode		AP Mode
LAN Setup	IP Address Type		Static
	IP Address		192.168.0.254
	Subnet Mask		255.255.255.0
	Gateway		192.168.0.1
	Primary DNS Server		8.8.8.8
	Secondary DNS Server		8.8.4.4
	Device Name		Access Point
	Ethernet Mode		Auto Negotiation
DHCP Server	DHCP Server		Disable
	Start IP Address		192.168.0.100
	End IP Address		192.168.0.200
	Lease Time		1 day
	Subnet Mask		255.255.255.0
	Gateway		192.168.0.1
	Primary DNS Server		8.8.8.8
	Secondary DNS Server		8.8.4.4
SSID Settings	SSID	2.4 GHz	The AP allows 8 SSIDs over the 2.4 GHz band. SSID is IP-COM_XXXXXX, and “XXXXXX” ranges from the last 6 digits of the AP’s LAN MAC address to the sum of the 6 digits and 7. As the primary SSID, the first SSID in the drop-down-list box is enabled by default, and the other SSIDs are disabled.

Parameter			Default Value
		5 GHz	The AP allows 4 SSIDs over the 5 GHz band. SSID is IP-COM_XXXXXX, and "XXXXXX" ranges from the sum of last 6 digits of the AP's LAN MAC address and 8 to the sum of the 6 digits and 11. As the primary SSID, the first SSID in the drop-down-list box is enabled by default, and the other SSIDs are disabled.
	Broadcast SSID		Enable
	Isolate Client		Disable
	WMF		Enable
	Suppress Broadcast Probe Response		Disable
	Max. Number of Clients		48
	Chinese SSID Encoding		UTF-8
	Security Mode		None
Radio Settings	Enable Wireless		Enable
	Network Mode	2.4 GHz	11b/g/n
		5 GHz	11ac
	Channel		Auto
	Channel Bandwidth	2.4 GHz	20/40 MHz
		5 GHz	80 MHz
	Lock Channel		Enable
	Transmit Power	2.4 GHz	11 dBm
		5 GHz	14 dBm
	Lock Power		Enable
	Preamble		Long Preamble
	Short GI		Enable
	Isolate SSID		Disable
Radio Optimization	Beacon Interval		100 ms
	Fragment Threshold		2346
	RTS Threshold		2347

Parameter			Default Value
	DTIM Interval		1
	Minimum RSSI Threshold		-90 dBm
	Prioritize 5 GHz		Disable
	5 GHz Threshold		-80 dBm
	Interference Mitigation		1
	APSD		Disable
	MU-MIMO		Disable (For 5GHz)
	Client Timeout Interval		5 minutes
	Mandatory Rate	2.4GHz	1, 2, 5.5, 11
		5GHz	6, 12, 24
	Optional Rate	2.4GHz	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54
		5GHz	6, 9, 12, 18, 24, 36, 48, 54
WMM Settings	WMM Settings		Enable
	WMM Optimization Mode		Optimized for scenario with more than 10 users
Access Control	MAC Address Filter Mode		Disable
Advanced Settings	Identify Client Type		Disable
	Broadcast Packet Filter		Disable
QVLAN Settings	QVLAN Status		Disable
	PVID		1
	Management VLAN		1
	2.4G SSID VLAN ID		1000
	5G SSID VLAN ID		1000
SNMP	SNMP Agent		Disable
	Administrator		Administrator
	Device Name		Access Point
	Location		ShenZhen
	Read Community		public
	Read/Write Community		private

Parameter			Default Value
Deployment			Local Deployment
Tools	Date & Time	System Time	**Synchronize with Internet Time** is enabled. Synchronization Interval: 30 minutes
		Login Timeout Interval	5 minutes
	Type of Logs to Display		All
	Log Server Settings		None
	Reboot Schedule		Disable
	LED Control		Enable All LEDs
	Uplink Check		Disable