

Grandstream Networks, Inc.

WP8xx – Wi-Fi Roaming Guide



OVERVIEW

The WP8xx are a portable Wi-Fi phones designed to suit a variety of enterprises and vertical market applications, including retail, logistics, medical and security. These powerful, portable Wi-Fi phones come equipped with integrated dual-band Wi-Fi support: WP820 supports Wi-Fi 4 (802.11n), WP810/WP822/WP825 support Wi-Fi 5 (802.11ac), and WP8x6 support Wi-Fi 6 (802.11ax). They also feature advanced antenna design and roaming support, and integrated Bluetooth (all models except WP810) for pairing with headsets and mobile devices.

With the growing coverage of Wi-Fi networks, wireless access points (APs) are now widely used for small/medium enterprises, multiple-floor offices, commercial locations and branch offices to provide seamless Wi-Fi access and mobile solutions. This document provides a guideline for network administrators to deploy WP8xx in different Wi-Fi environments to achieve the best communication quality.

WP8xx WI-FI FREQUENCY AND CHANNELS

The WP8xx has built-in dual-band 802.11a/b/g/n Wi-Fi support for WP820, 802.11a/b/g/n/ac for WP810/WP822/WP825, and 802.11a/b/g/n/ac/ax for WP8x6. Below are the frequency and channels supported.

Peak Antenna Gain			Frequency Ranges	Available Channels	Channel Set
WP810	2.4GHz = 2 dBi 5GHz = 3 dBi		2.412 – 2.472 GHz 5.180 – 5.240 GHz 5.260 – 5.320 GHz 5.500 – 5.720 GHz 5.745 – 5.825 GHz	14 4 4 12 5	1-14 36, 40, 44, 48 52, 56, 60, 64 100-144 149, 153, 157, 161, 165
WP820	2.4GHz = 3 dBi 5GHz = 3 dBi				
WP822	2.4GHz = 3 dBi 5GHz = 3.5 dBi				
WP825	2.4GHz = 3 dBi 5GHz = 4 dBi				
WP816	2.4GHz = 2.54 dBi 5GHz = 4.54 dBi				
WP826	2.4GHz = 3.62 dBi 5GHz = 4.52 dBi				
WP836	WP836-ANT0	WP836-ANT1			
	2.4GHz = 4.35 dBi 5GHz = 4.16 dBi	2.4GHz = 5.76 dBi 5GHz = 3.6 dBi			

WP8xx WI-FI ROAMING

To adapt to different Wi-Fi deployment, the WP8xx series comes with several roaming options for users to configure. Below options are available for different models and can be found in Web GUI → **Network Settings** → **Wi-Fi Settings** → **Advanced Settings**.

Wi-Fi Settings

General Settings

Advanced Settings

Host name (Option 12) ?

Vendor Class ID (Option 60) ?

Grandstream WP826

Wi-Fi Signal Warning ?

Poor

Roaming Signal Threshold ?

-55

Poor Signal Scan Interval (s) ?

5

VoWLAN Target Delay ?

Low

Wi-Fi QR Code Sharing ?

☒

Wi-Fi Power-Saving Mode ?

Generic (PSM)

Wi-Fi Roaming Mode ?

Boost Mode

Enable Roaming Prompt ?

☐

WP826 Wi Fi Roaming Settings

Name	Description
Signal threshold	Sets the Wi-Fi signal threshold. When the Wi-Fi signal strength of the device drops below this configured value, the device will scan for a hotspot above the threshold value and connect to it. The valid range is [-100, -30]. - For WP820, the default value is -70. - For WP810/WP822/WP825 default value -55. - For WP816/WP826/WP836 the default value is -66
Good signal scan interval (WP820 only)	Sets the time interval for signal scanning when the Wi-Fi signal strength is higher than the signal threshold. Default is 600s, and valid range is from 5 to 600.
Poor signal scan interval	Sets the time interval for signal scanning when the Wi-Fi signal strength is lower than the signal threshold and there is no hotspot that is higher than the current signal strength. Default value is 5s, and valid range is from 5 to 600 for WP820, and from 5 to 300 for WP810/WP822/WP825/WP8x6.

WP8xx Wi-Fi Roaming Options

When the AP that WP8xx is currently connected to has signal strength lower than the configured “**Signal threshold**”, the device will try to look for a nearby AP with better RSSI.

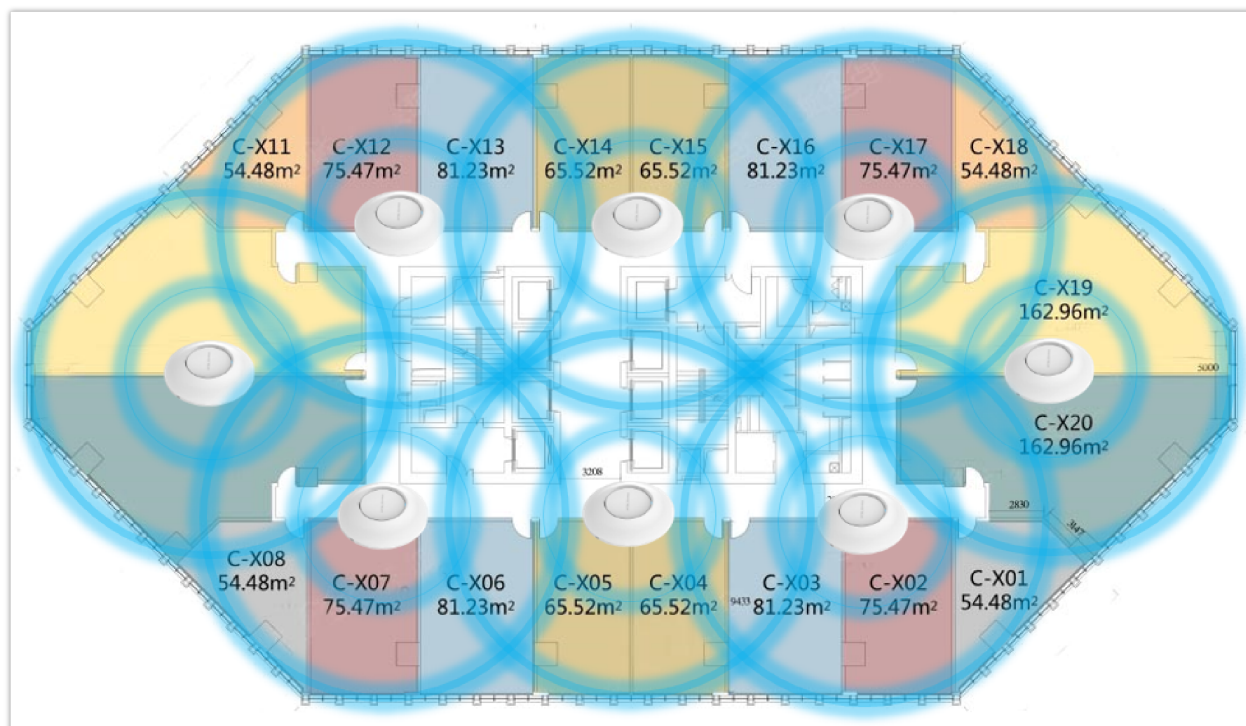
"Good signal scan interval" and **"Bad signal scan interval"** determine the scan interval for WP8xx to find out whether there is a better AP nearby to switch to. Normally if the currently connected AP has a higher RSSI than the threshold, WP8xx can scan at a longer interval, while a shorter value can be applied for "Poor signal scan interval" because the currently connected AP has lower RSSI than the threshold which means WP8xx should look for a better AP in a more aggressive way.

DEPLOYMENT REQUIREMENTS

When deploying Wi-Fi network with multiple APs for WP8xx to roam, please follow below guidelines:

1. Make sure the APs are properly powered up and connected to your network.
2. Connect your PC to the same network as the APs. This PC is used for configuring the APs and other necessary devices via web GUI.
3. Access the APs using the PC's web GUI. Configure the APs to set them up.
4. Set the same SSIDs for all the APs. SSID is case sensitive.
5. Make sure the IP addresses assigned by the APs belong to the same network segment and the same VLAN.

During deployment, the cell edge for each AP should be designed to -67dBm and there should be 20% – 30% overlap between adjacent APs at that signal level. Otherwise, WP8xx might encounter packet loss or blind area at the cell edge and it cannot hold the signal long enough to complete seamless switchover. To ensure seamless roaming, it's recommended that WP8xx can always receive RSSI -67dBm or higher from the access point.



Wireless AP Deployment

IMPORTANT WI-FI PARAMETERS ON AP

There are several important parameters on AP for Wi-Fi configuration. Configuring them properly will enhance WP8xx roaming performance.

Beacon Interval

Beacon interval defines how often the AP transmits the 802.11 beacon management frames. Usually the default value is **100ms**. It's recommended to keep it as default value on AP.

DTIM

This is the Delivery traffic indication message (DTIM) period in beacons. It's recommended to set it to **2**.

Unicast Mode and Multicast Mode

In unicast mode, the controller unicasts every multicast packet to every access point associated to the controller. In multicast mode, the controller sends multicast packets to a CAPWAP multicast group. This method reduces overhead on the controller processor and shifts the work of packet replication to your network. It's recommended to use **unicast** mode to ensure call quality.

WMM (Wi-Fi Multimedia)

WMM is a wireless QoS protocol, a subset of the 802.11e protocol. It is used to ensure that packets with high priority can be sent first so that service quality for voice, video and other applications can be guaranteed.

- **Layer 3 QoS for SIP**

This defines the layer 3 packet's QoS parameter for SIP messages in decimal pattern. The value is used for IP Precedence, Diff-Serv or MPLS. The default setting is 26 which is equivalent to the DSCP name constant CS6.

- **Layer 3 QoS for Audio**

This defines the layer 3 packet's QoS parameter for RTP messages in decimal pattern. This value is used for IP Precedence, Diff-Serv or MPLS. The default setting is 46 which is equivalent to the DSCP name constant CS6.

Band Steering

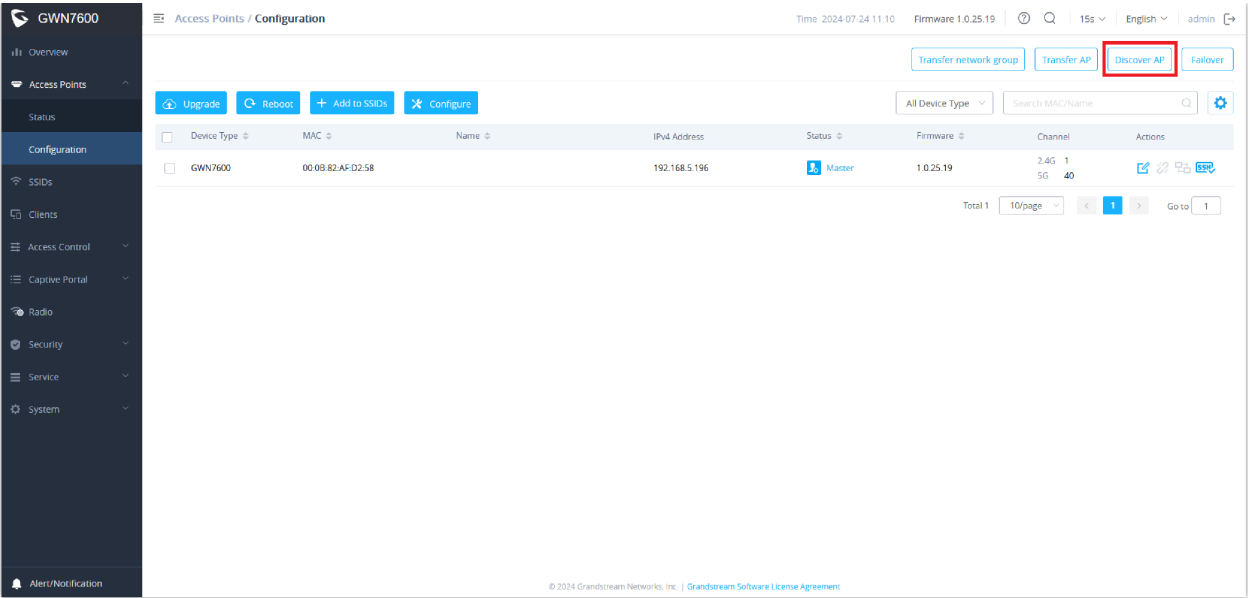
Dual band operation with Band Steering detects clients capable of 5 GHz operation and steers them to that frequency which leaves the more crowded 2.4 GHz band available for legacy clients. This helps improve end user experience by reducing channel utilization, especially in high density environments. It's recommended to enable **band steering** on the APs, which means by default 5Ghz should be used (users can switch to 2.4Ghz if 5Ghz signal is poor.)

For above important parameters, the following sections provide the configuration methods on APs from different vendors for network administrator's quick reference. The following table shows whether the AP has the configurations related to these parameters. Click on the brand name to quickly locate relevant configuration instructions.

GWN76XX

Wireless Configuration

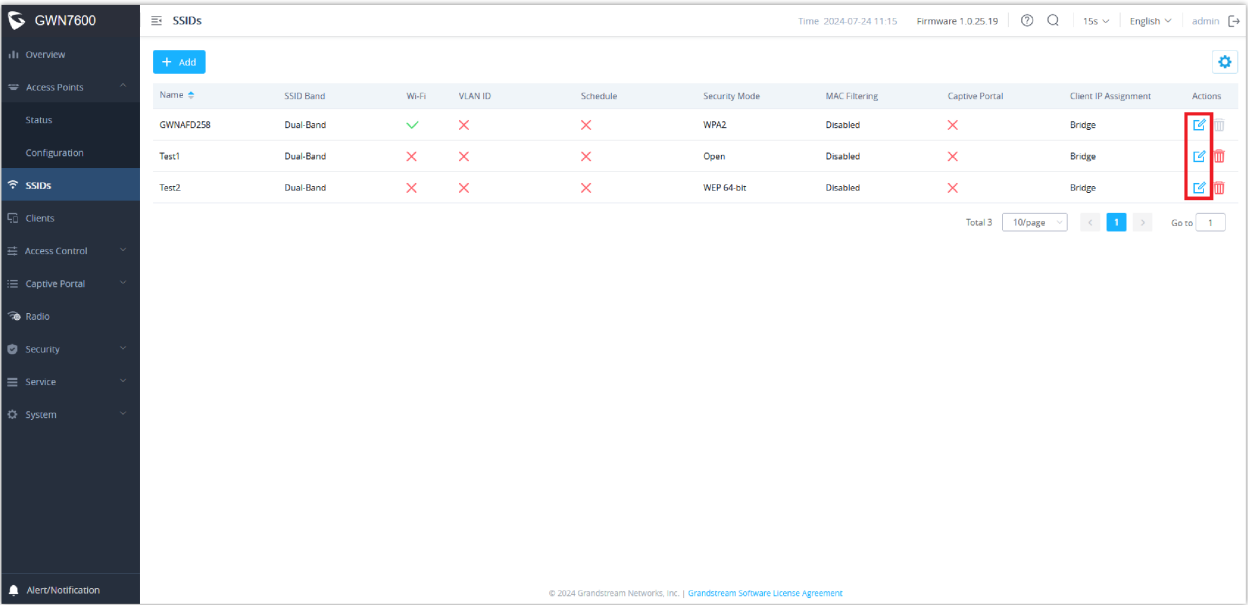
1. Open a web browser on PC and enter the GWN web address to access the GWN76XX web UI configuration page.
2. Connect to the GWN76XX Web GUI as Master and navigate to page "Access Points".
3. Click on **Discover AP**.



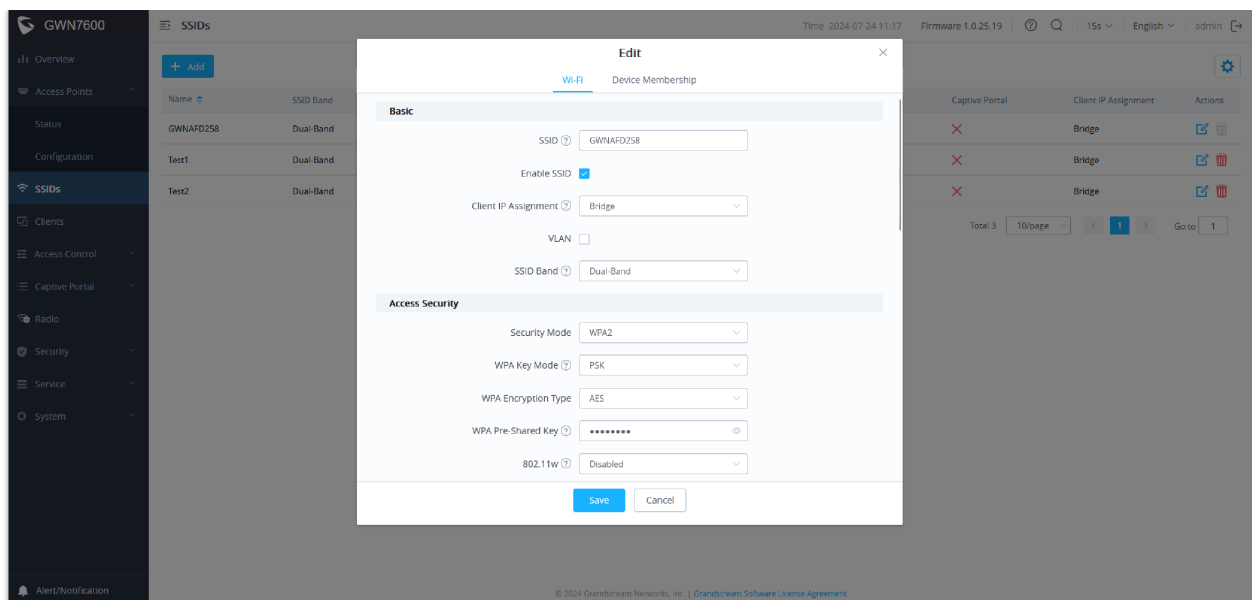
GWN76XX Access Points Configuration

4. When using GWN76XX as Master Access Point, users have the ability to create different SSIDs and adding GWN76XX Slave Access Points. Click on **Edit** to edit the SSID.

GWN76XX access points support up to 48 SSIDs depending on the model. Please refer to the product datasheet for the specific limits of each model.



GWN76XX SSID Configuration



GWN76XX Edit SSID

5. When editing or adding a new SSID, the roaming-related options are described in the table below. For all other SSID settings, see the full AP configuration table in the GWN76xx User Manual.

Field	Description
Enable Voice Enterprise	Check to enable/disable Voice Enterprise. The roaming time will be reduced once voice enterprise is enabled. 802.11k helps clients quickly identify nearby APs as roaming targets. - When the signal strength of the current AP weakens, devices scan for target APs from this list. 802.11r provides Fast BSS Transition (FT) to authenticate faster during roaming, supporting both PSK and 802.1X. 802.11v allows clients to exchange network topology and RF environment info, improving roaming performance. Note: 11R is required for enterprise audio; 11V and 11K are optional. Available only when “Security Mode” is WPA/WPA2 or WPA2.
Enable 11R	Check to enable 802.11r Fast BSS Transition. Available only when “Security Mode” is WPA/WPA2 or WPA2.
Enable 11K	Check to enable 802.11k Neighbor Report for faster roaming.
Enable 11V	Check to enable 802.11v for network-assisted roaming.
Wireless Client Limit	Configure the limit for wireless clients per SSID per radio. Example: setting 50 limits each SSID to 50 users independently. Set to 0 to disable the limit.
Client Inactivity Timeout (s)	Time after which an inactive client is removed from the AP table. Default 300 seconds. Valid range: 60–3600 seconds.

GWN7600 Roaming Parameters

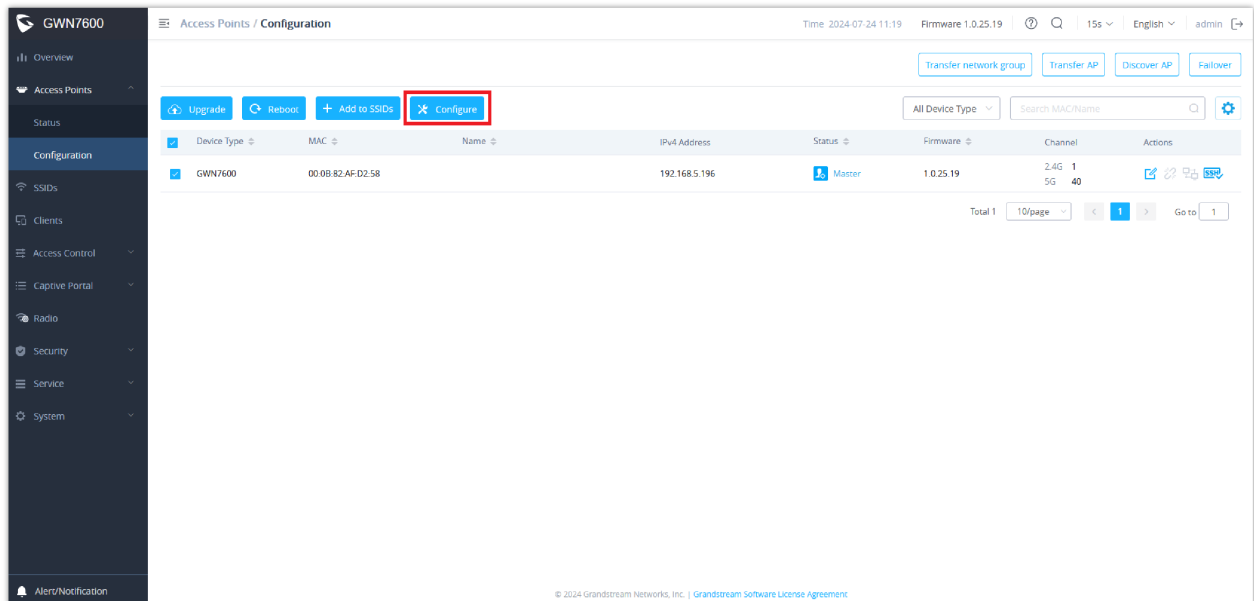
Note:

For all other SSID configuration options (security, VLAN, IP assignment, Hotspot 2.0, etc.), refer to the full AP configuration table in the [GWN76xx User Manual](#).

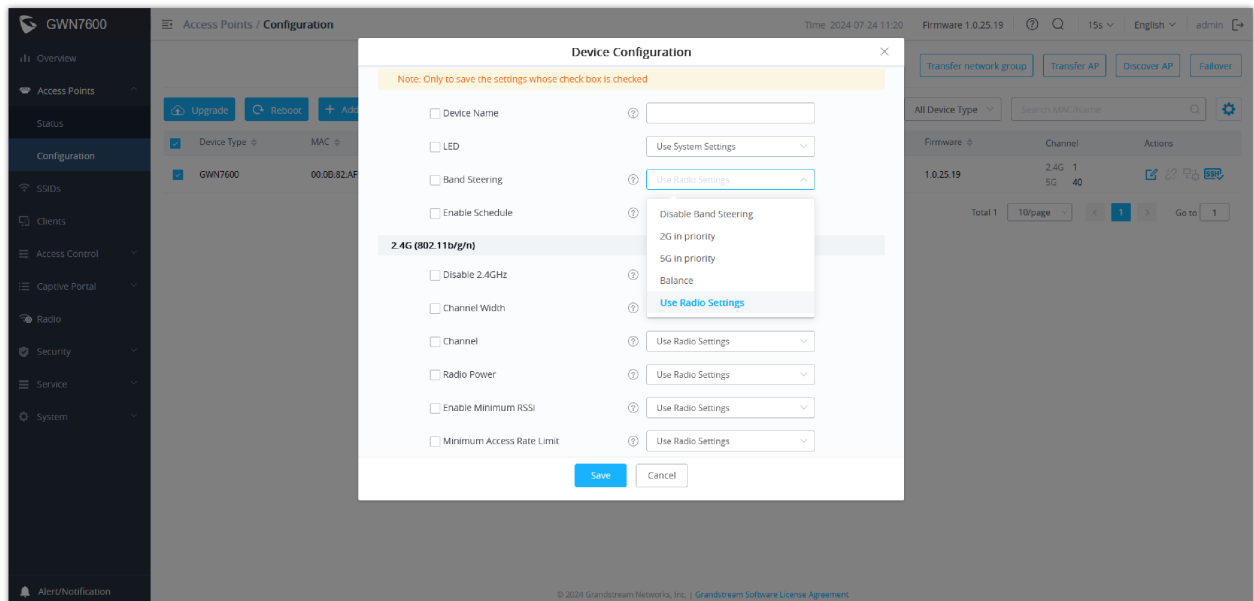
Band Steering

Band steering functions are divided into three items. Go to **Access Points** → **Configure** to configure it.

- **2G in priority**, lead the dual client to the 2G band
- **5G in priority**, the dual client will be led to the 5G band with more abundant spectrum resources as far as possible
- **Balance**, access to the balance between these 2 bands according to the spectrum utilization rate of 2.4G and 5G.



GWN76XX Band Steering 1

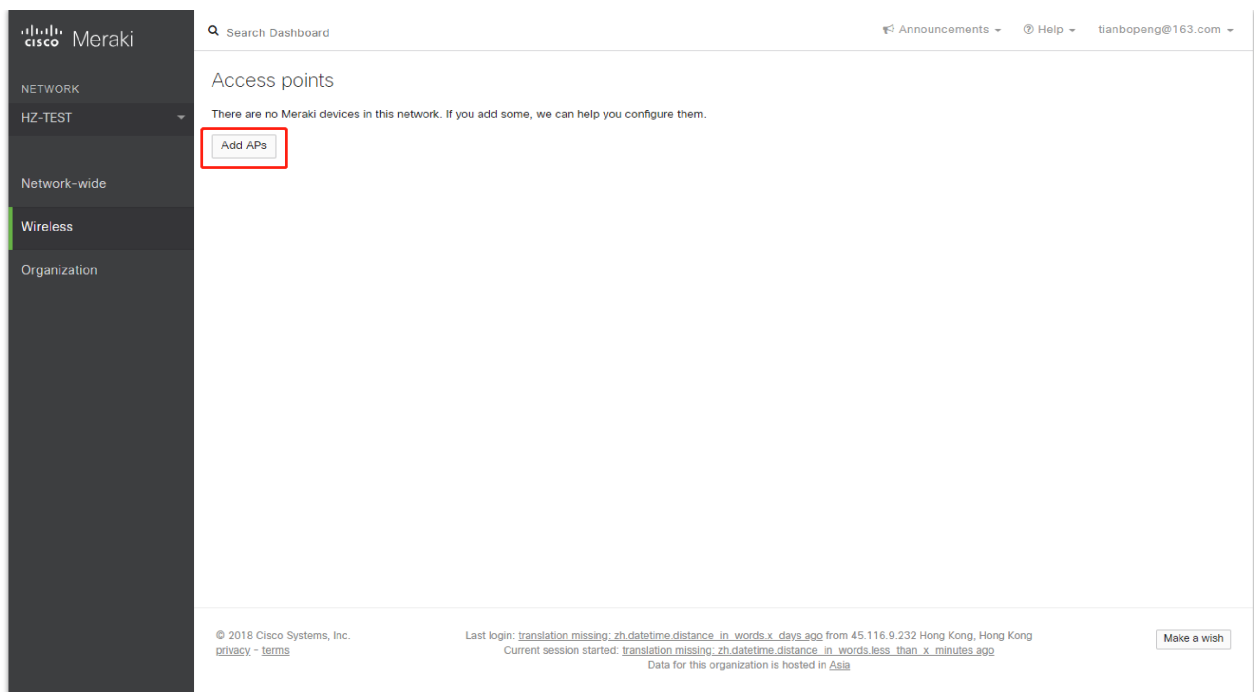


GWN76XX Band Steering 2

CISCO MERAKI

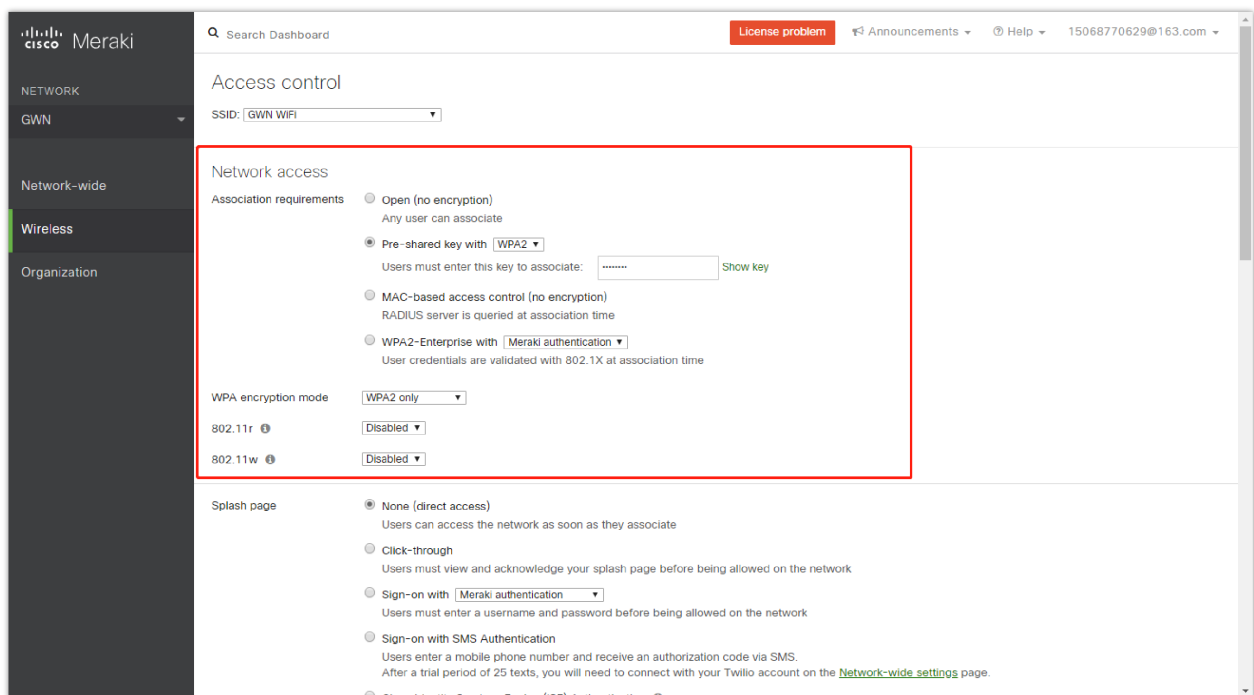
Wireless Configuration

1. Find the Dashboard “network” to which you plan to add your APs, or create a new network.
2. Add your APs to your network.



Cisco Meraki Add AP

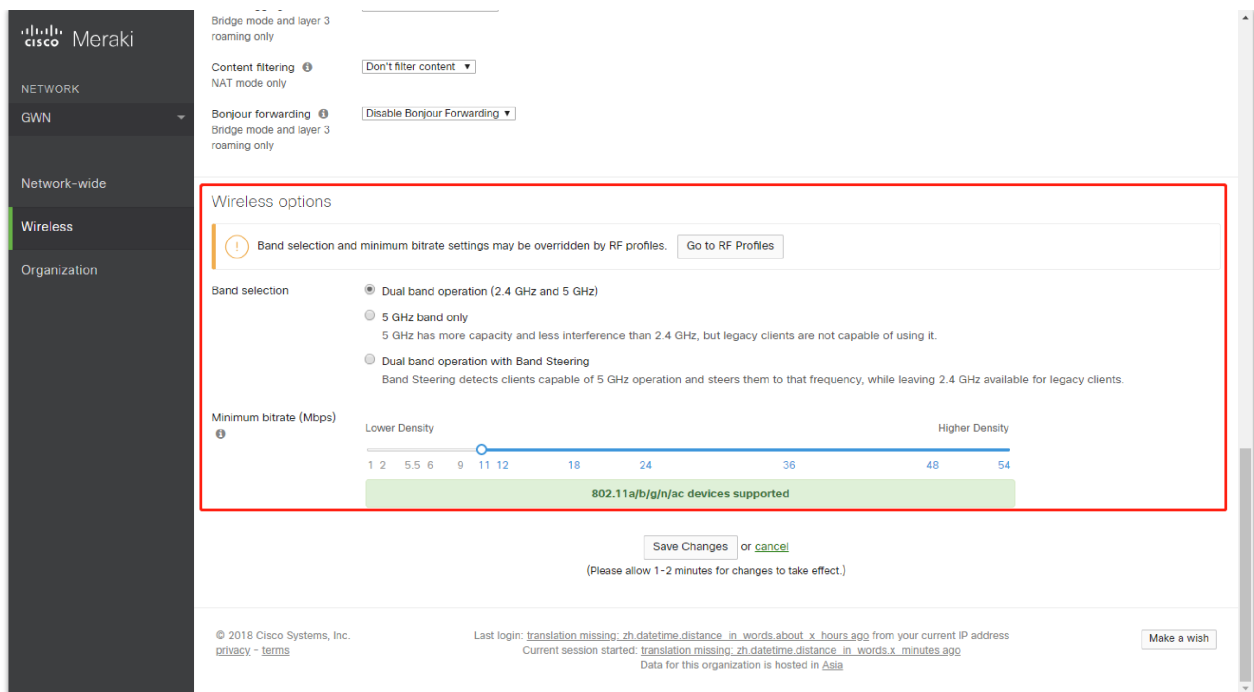
3. Make any additional configuration changes under the Configure section of Dashboard network. Please make sure to review **SSIDs, Access Control, Firewall & Traffic Shaping** configuration pages.



Cisco Meraki Additional Configurations

Band Steering

Go to **Wireless** → **Access control** → **Wireless options**.



Cisco Meraki Band Steering

Band selections are:

- **Dual band operation:** 2.4GHz and 5GHz
- **5GHz band only:** 5GHz has more capacity and less interference than 2.4GHz, but legacy clients are not capable of using it.
- **Dual band operation with Band Steering:** Band Steering detects clients capable of 5 GHz operation and steers them to that frequency, while leaving 2.4 GHz available for legacy clients.

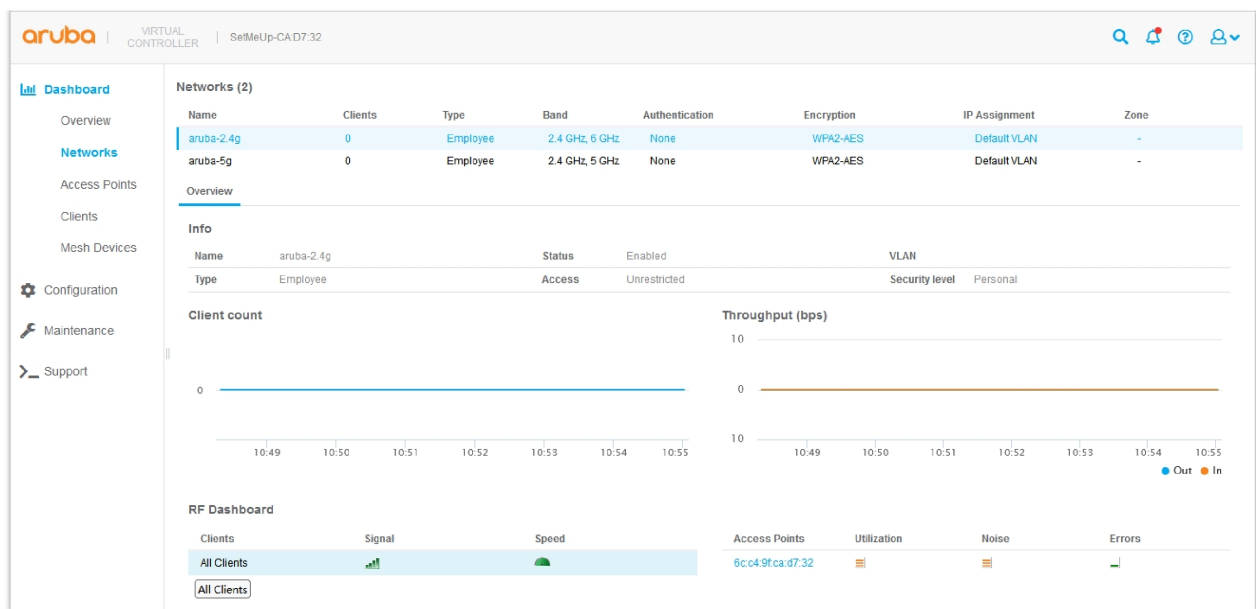
ARUBA

Wireless Configuration

This section describes how to configure SSIDs, wireless profiles, security, and firewall settings using the Aruba web interface. (Example shown using model AP-505-RW, but applies to other Aruba models)

Note:

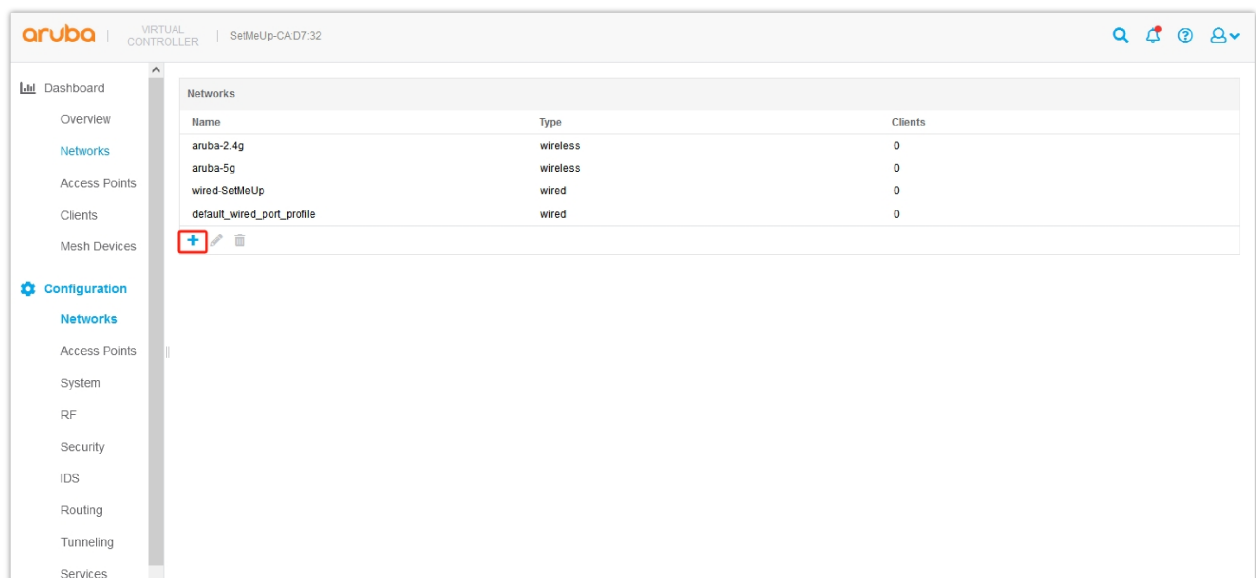
Screenshots and instructions are based on model AP-505-RW. Newer firmware versions or other models may have different menu layouts or option names.



Aruba Web

To configure WLAN settings, please complete the following steps:

1. Log in to the web end of the AP and enter the configuration – network page.
2. To create a new SSID profile, click on the “+” icon.



Aruba Creating a New SSID

3. Enter the name of the new network and click to display advanced options.
4. Configure the “Broadcast filtering”. Choose one of the following :
 - o **All.** The Instant AP drops all broadcast and multicast frames except DHCP and ARP, IGMP group queries, and IPv6 neighbor discovery protocols.
 - o **ARP.** The Instant AP drops broadcast and multicast frames except DHCP and ARP, IGMP group queries, and IPv6 neighbor discovery protocols. Additionally, it converts ARP requests to unicast and sends frames directly to the associated clients.
 - o **Disabled.** All broadcast and multicast traffic is forwarded to the wireless interfaces.

The screenshot shows the Aruba Virtual Controller configuration interface for a device named 'aruba-5g'. The left sidebar contains navigation links for Dashboard, Configuration (with sub-links for Networks, Access Points, System, RF, Security, IDS, Routing, Tunneling, Services, and DHCP Server), Maintenance, and Support. The main content area has tabs for Basic, VLAN, Security, and Access. The 'Basic' tab is active, showing 'Name & Usage' (Name: aruba-5g, Type: Wireless, Primary usage: Employee) and a red-bordered 'Broadcast/Multicast' section. This section includes 'Broadcast filtering' (Disabled), 'Multicast transmission optimization' (enabled), 'Dynamic multicast optimization' (disabled), and 'DMO channel utilization threshold' (90%). Below this is the 'Transmit Rates' section for 2.4 GHz and 5 GHz bands.

Aruba Broadcast Filtering

5. Configure network channels and select any value: 2.4GHz, 5GHz, All.

6. Click NEXT to complete VLAN, security mode, and access rules respectively. Finally, click Finish to successfully add the wireless network.

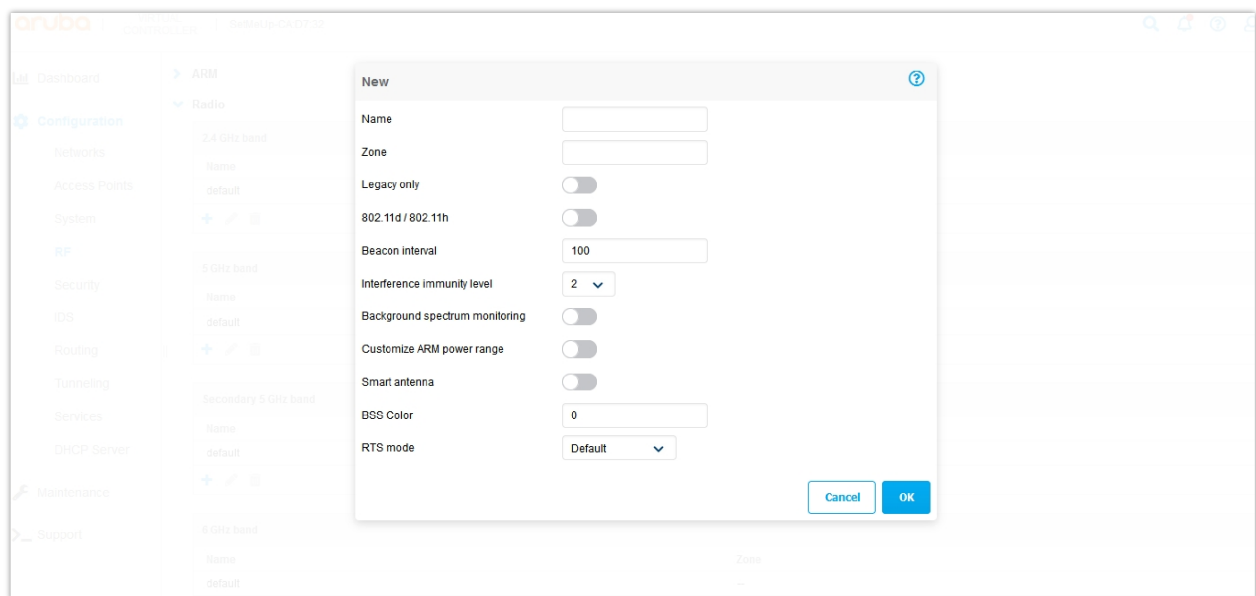
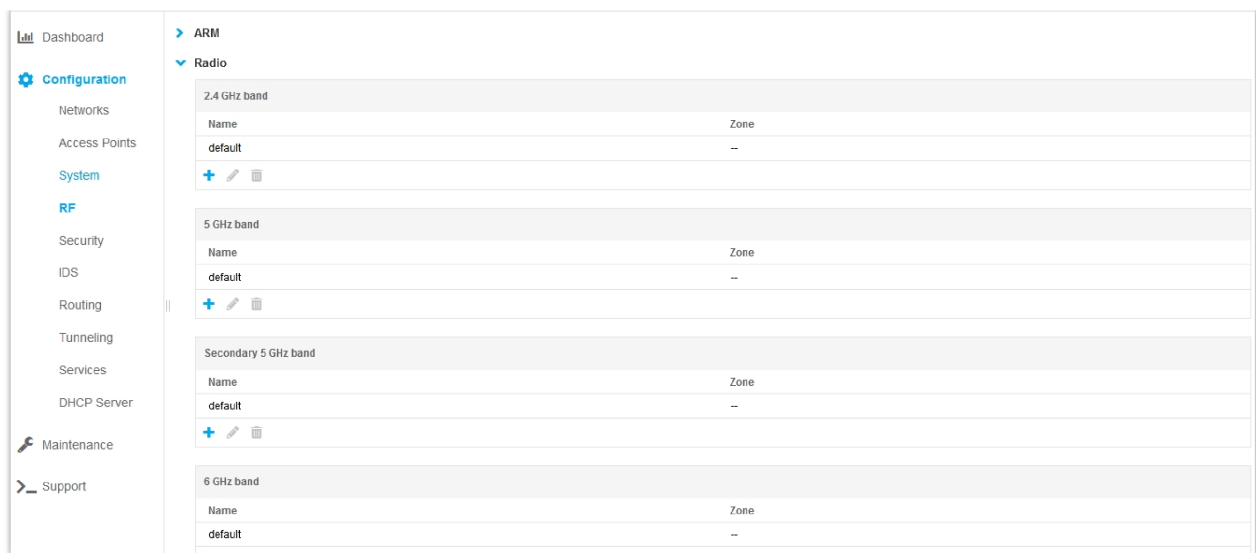
The screenshot shows the 'Access' tab in the Aruba Virtual Controller configuration for 'aruba-5g'. The 'Access Rules' section is visible, showing 'Access Rules' set to 'Unrestricted', 'Download roles' disabled, and a note: 'No restrictions on access based on destination or type of traffic'. At the bottom right, there are 'Cancel', 'Back', and 'Finish' buttons.

Aruba Configuration Completion

7. Configure Radio parameters.

To configure RF parameters for the 2.4GHz and 5GHz radio frequency bands on the AP, complete the following steps:

- Log in to the WEB end of the AP and enter the configuration – RF page.
- Click to display advanced options, click on Radio.
- Configure parameters at 2.4GHz and 5GHz.

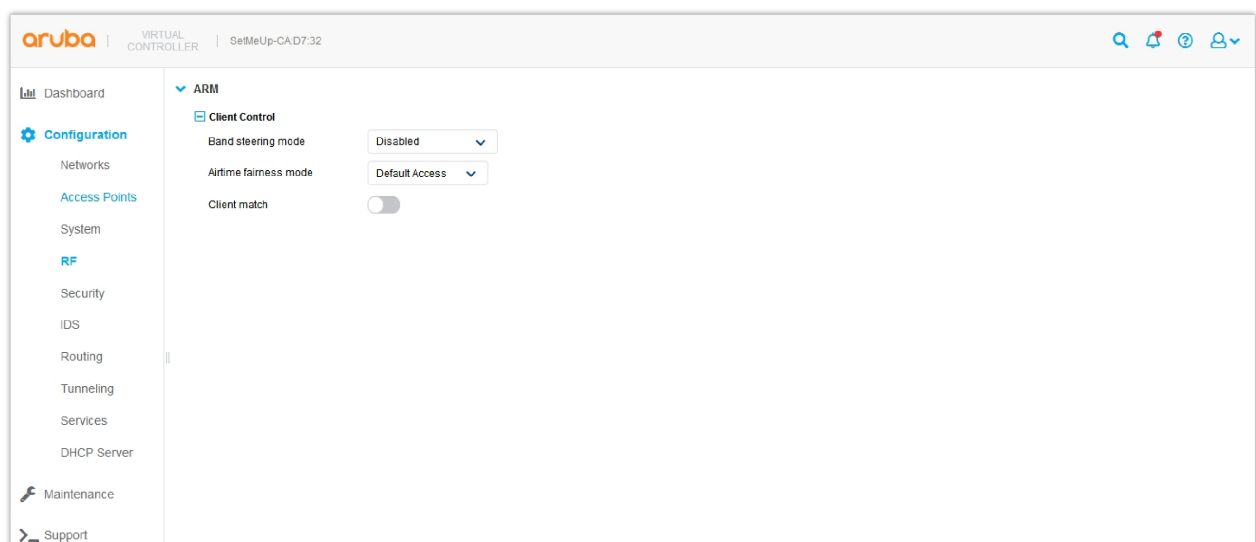


Aruba Radio

Band Steering

To configure ARM features such as band steering, and airtime fairness mode and Client Match, complete the following steps.

1. Log in to the WEB end of the AP and enter the configuration – RF page.
2. Under Adaptive Radio Management (ARM), click on Client Control.
3. In channel switching mode, configure parameters.



Aruba Band Steering

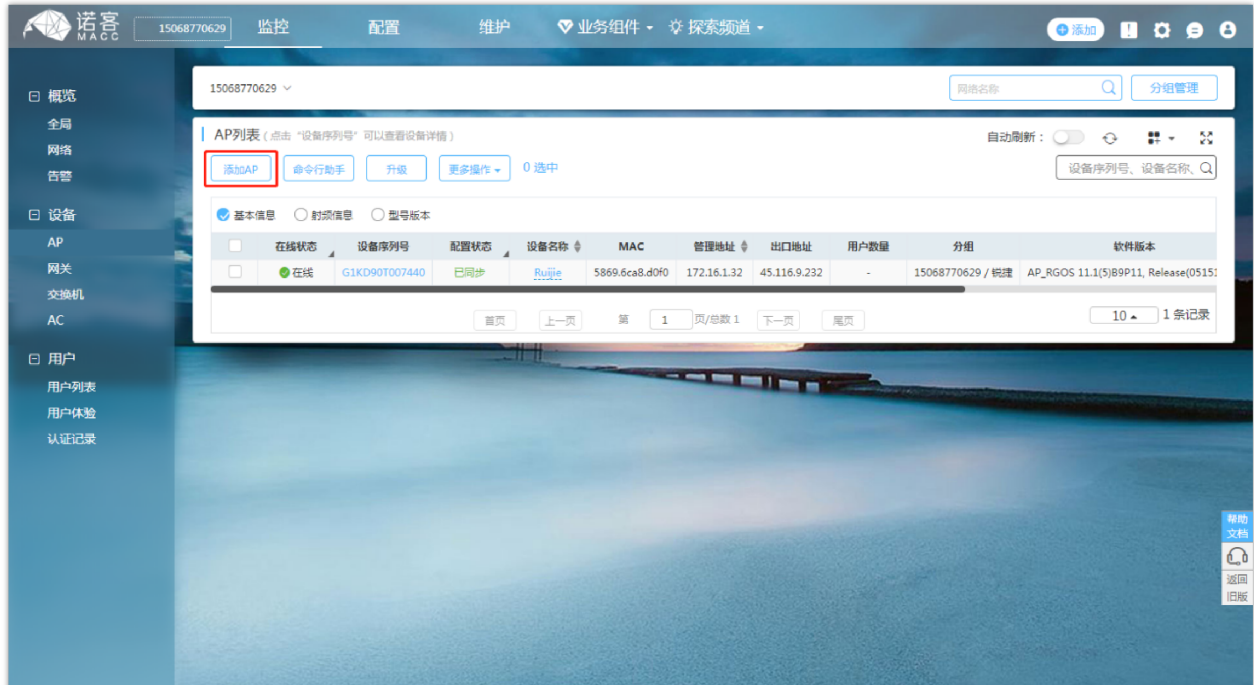
RUIJIE CLOUD

Wireless Configuration

1. Use the highlighted **add/create** control to make a new network.
2. Open the **Devices** → **AP** section for the chosen network, and use the highlighted **add** control to register the AP.



Ruijie Cloud Create New Network



Ruijie Cloud Create New AP

3. Go to **Monitoring** → **Devices** → **AC** in the menu to review the list of AC devices linked to the current account.
4. Confirm that the AC you are using is **online** and that its **configuration status** is shown as synchronized.
5. In the AP list, click the **serial number** (highlighted) to view the device details/status.



Ruijie Cloud AP List

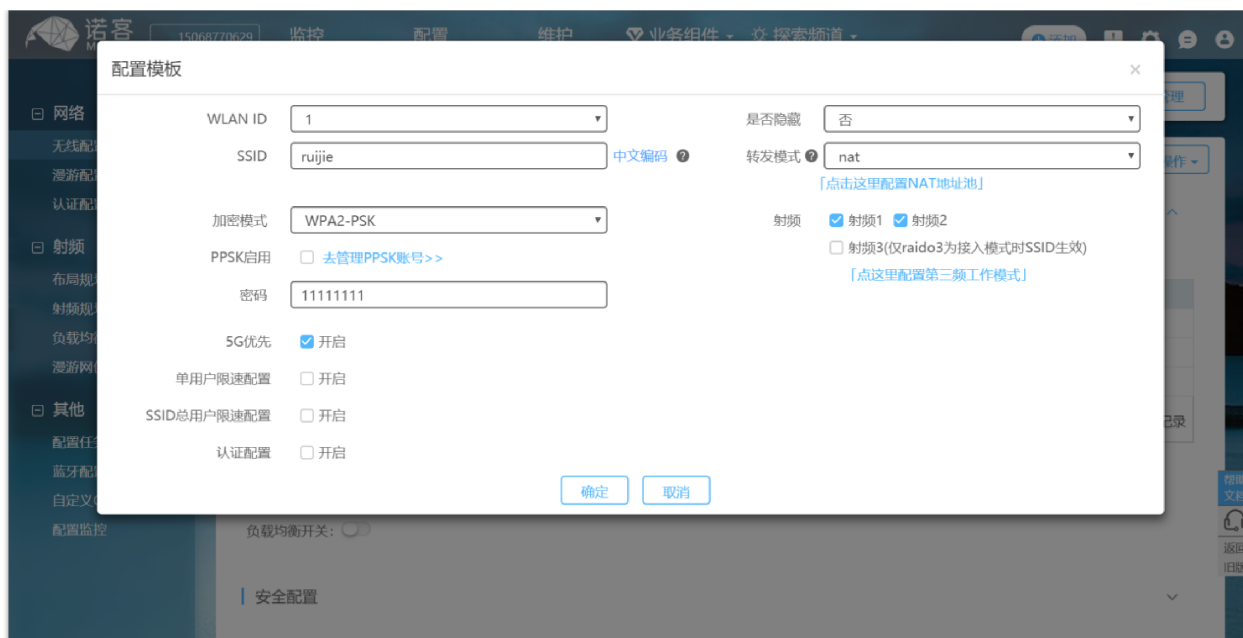
If the wireless configuration needs to be modified, the following steps can be followed:

6. Navigate to **Network** → **Wireless configuration** for your network.
7. You'll see a table of SSIDs. Use the **create** icon to add a new SSID, or the **edit** icon to change an existing one.



Ruijie Cloud Wireless Configuration

8. In the SSID settings dialog, configure parameters such as the SSID name and security type.



Ruijie Cloud Band Steering

Band Steering

If the roaming function is turned on, users can achieve seamless roaming within the network scope.

When band steering is enabled, the AP will direct wireless devices that support 5 GHz to connect to that band first. This helps reduce congestion on the 2.4 GHz band and improves overall network performance.



Ruijie Cloud Roaming Configuration

RUIJIE

This section describes how to configure WLAN settings, including creating and modifying SSIDs, setting security and frequency bands, and enabling band steering on the Ruijie web interface. *(Example shown using model RG-EAP262(E), but applies to other Ruijie models)*

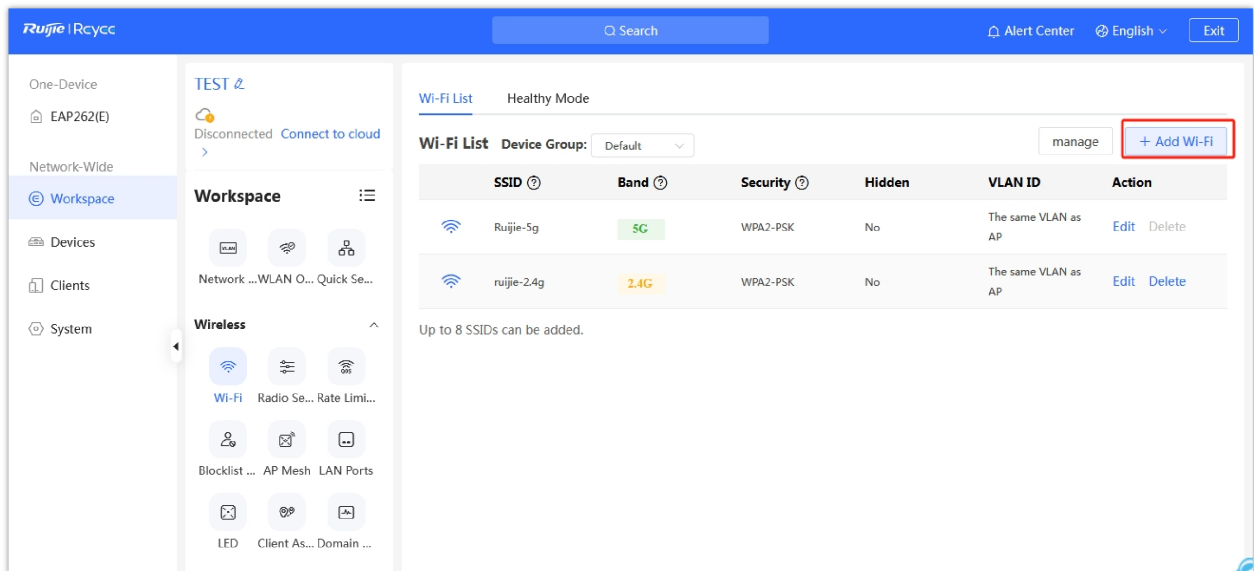
Note:

Screenshots and instructions are based on model RG-EAP262(E). Newer firmware versions or other models may have different menu layouts or option names.

Wireless Configuration

To configure WLAN settings, please complete the following steps:

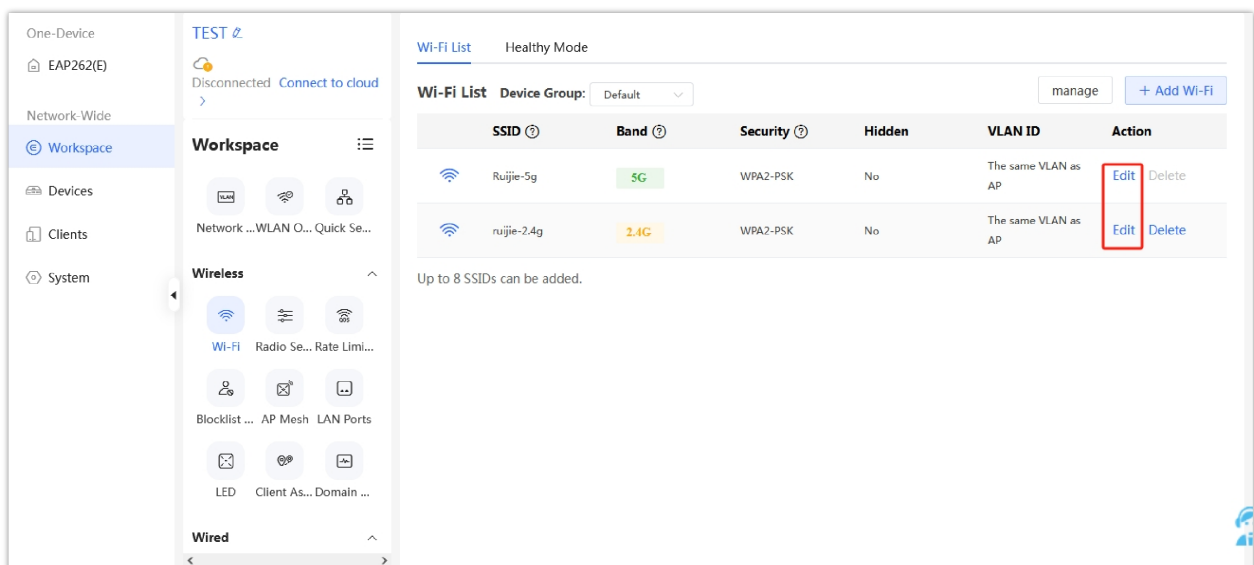
1. Log in to the WEB end of the AP, go to Network – Workbench – Wireless – Wi-Fi Settings
2. Click to “+ Add Wi-Fi”
 - **SSID:** Enter or edit the wireless network name or SSID.
 - **Password:** Enter an 8-digit password.
 - **Band:** set to 2.4GHz, 5GHz.
 - **Security:** Select the security type to be used on the wireless network.



Ruijie Add Wi Fi

3. If you need to modify the wireless configuration, you can follow the steps below.

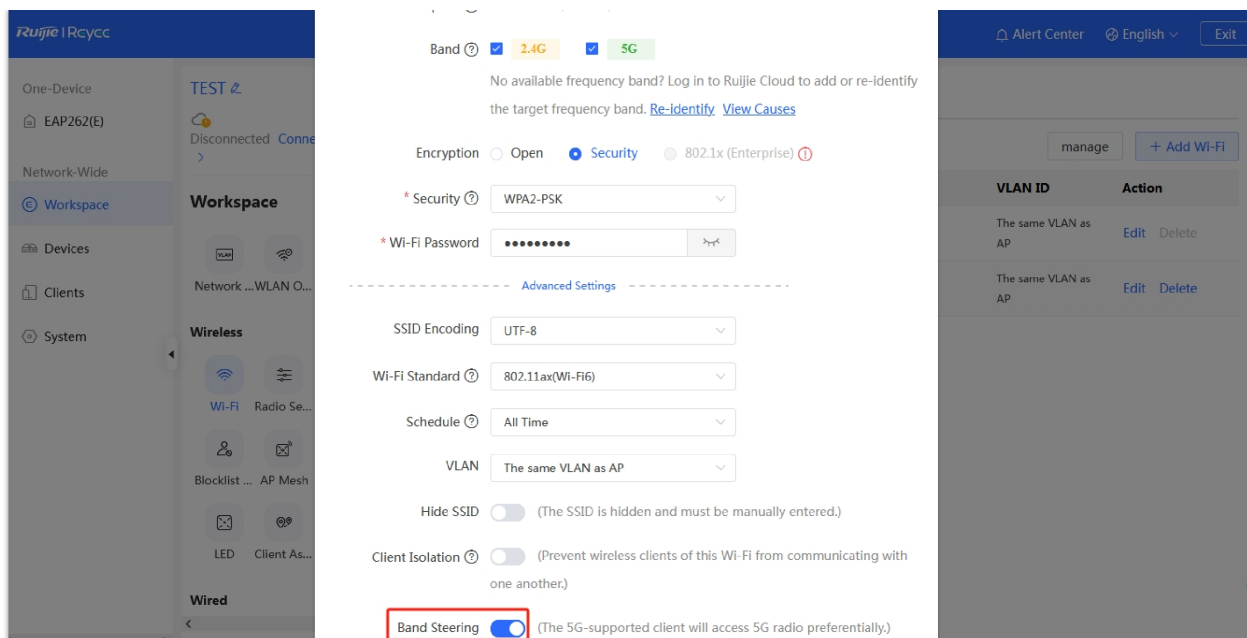
Configuration → Wireless Configuration → Wi-Fi Settings



Ruijie Edit Wi Fi

Band Steering

Band Steering (5GHz Prefer): With this option enabled, the AP will guide wireless terminals that support 5GHz to prioritize accessing the 5GHz frequency band, reducing the pressure on the 2.4GHz frequency band.



Ruijie Band steering

UBIQUITI UniFi

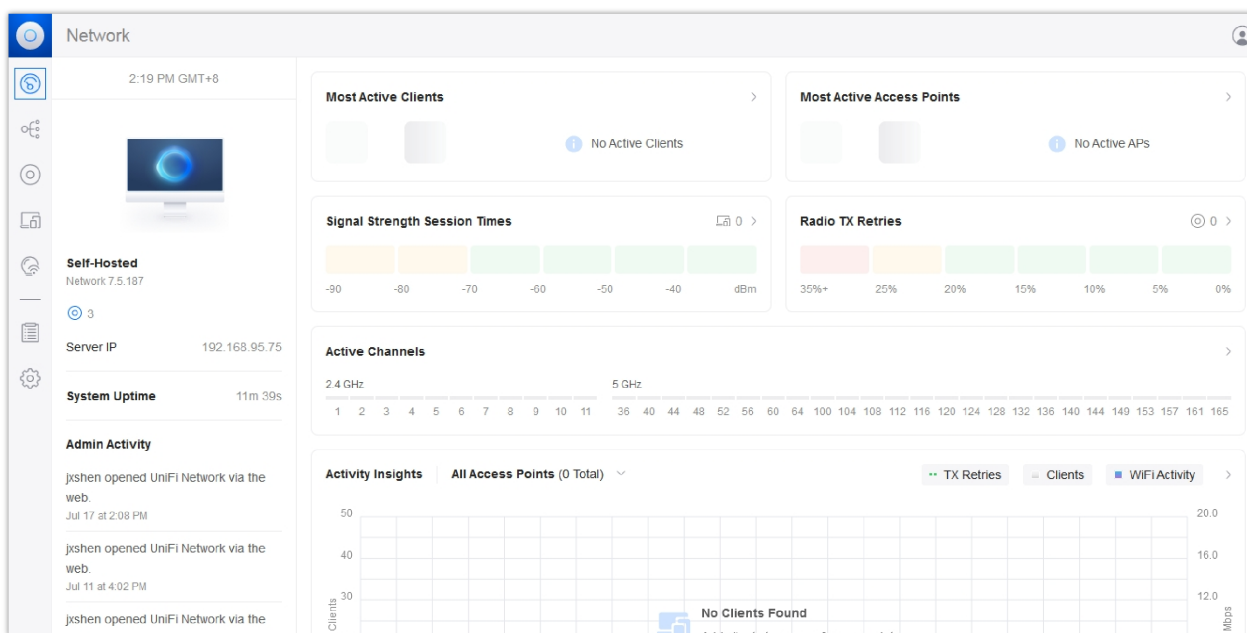
This section describes how to configure WLAN settings, including creating and editing SSIDs, setting security and frequency bands, and managing UniFi devices through the UniFi Network virtual controller. (Example shown using model U6-Enterprise-IW, but applies to other UniFi models)

Note:

Screenshots and instructions are based on model U6-Enterprise-IW. Newer firmware versions or other models may have different menu layouts or option names.

Wireless Configuration

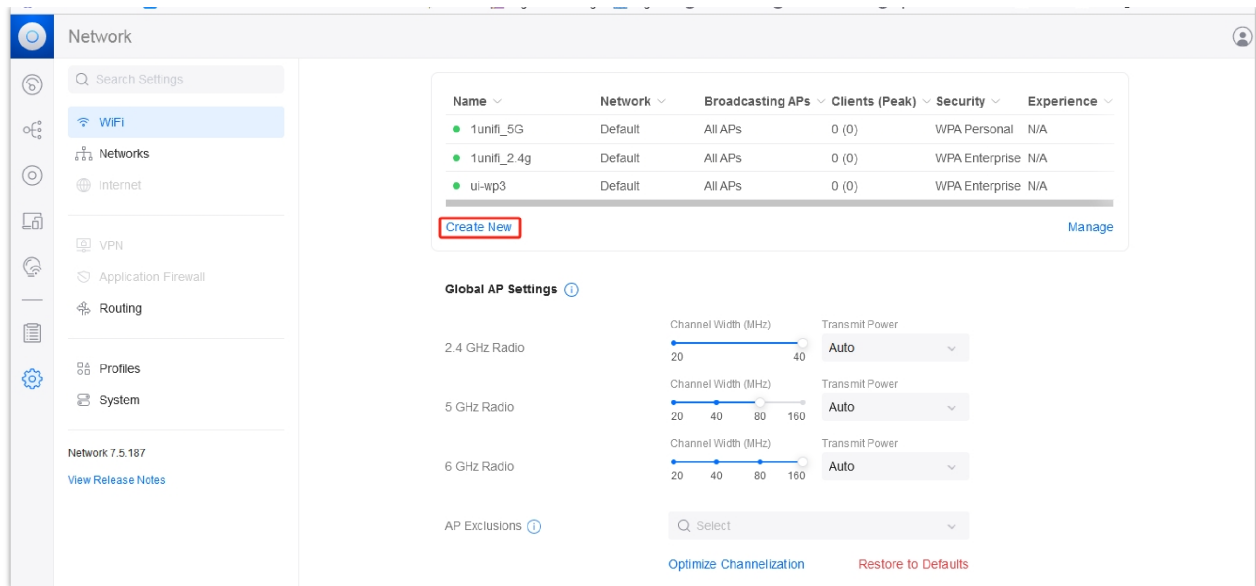
UniFi APs are managed through the UniFi Network virtual controller. After installing the virtual controller on the PC, run the controller and click to enter the web page.



UniFi Control Web

To configure WLAN settings, please complete the following steps:

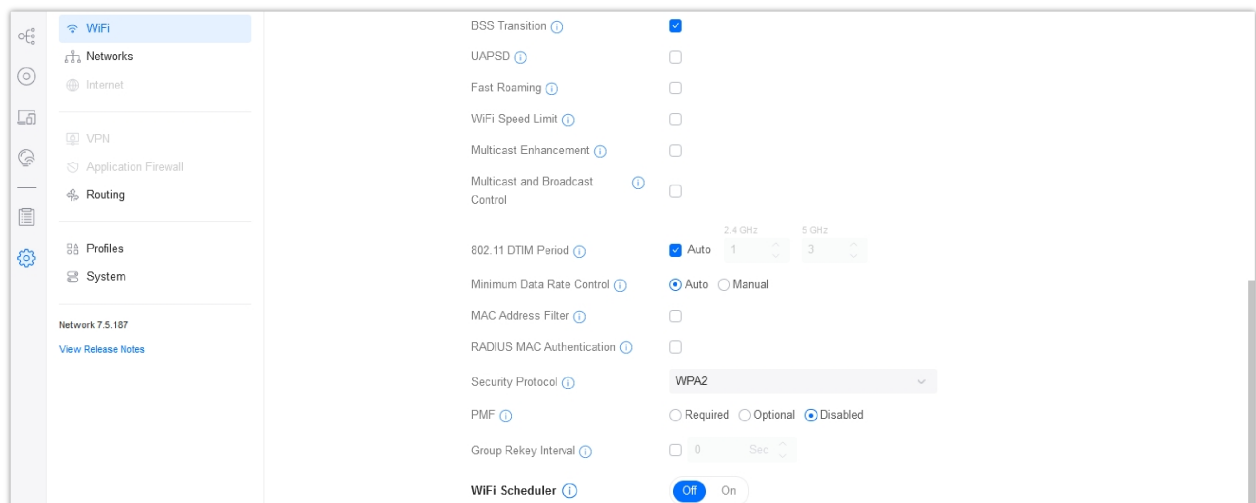
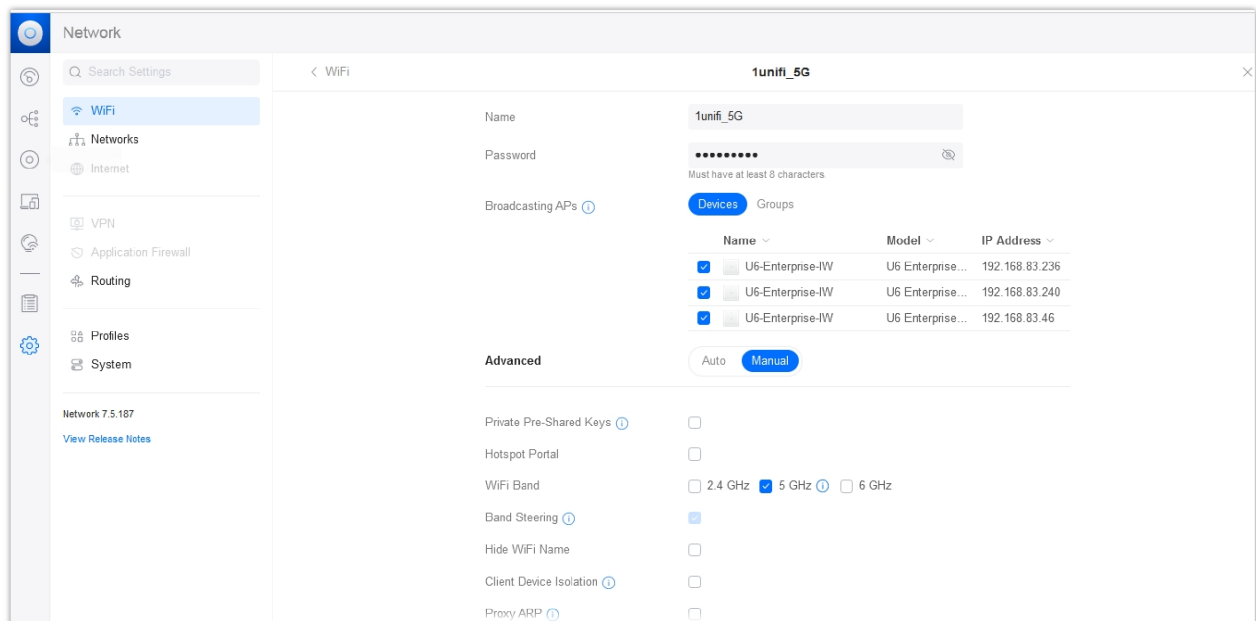
1. Enter Settings – WiFi, add a new WiFi, click “Create New”.



UniFi Create New Wi Fi

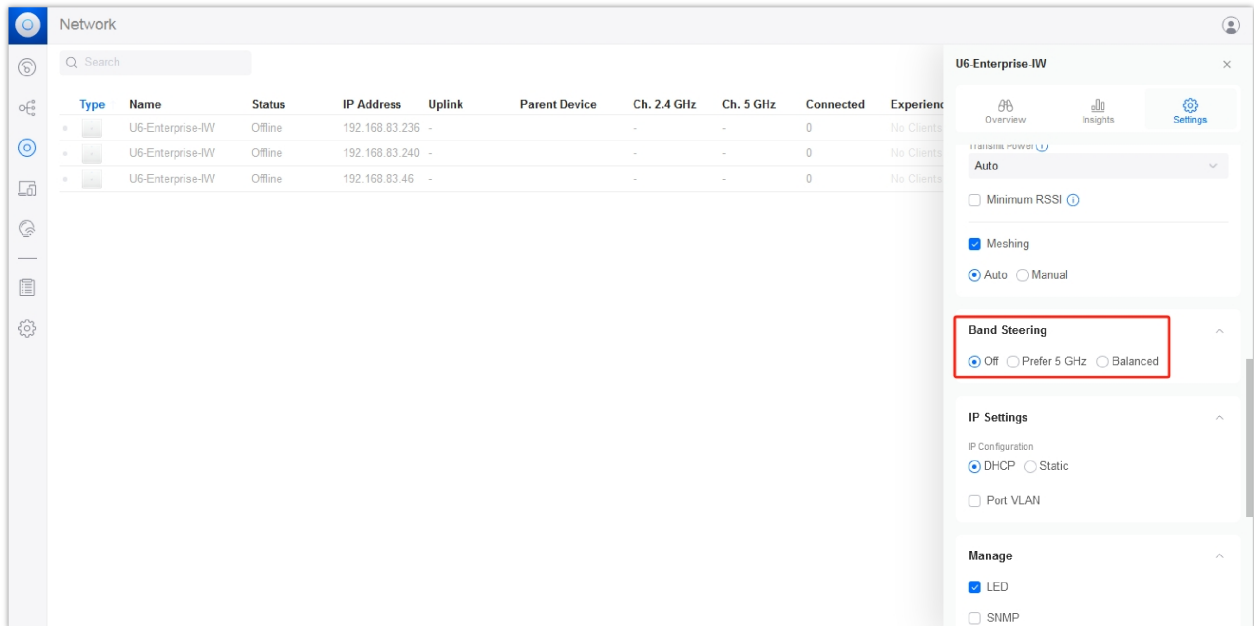
2. Create or edit WiFi

- **Name:** Enter or edit the wireless network name or SSID.
- **Password:** Enter an 8-digit password.
- **Broadcasting APs:** Select the UniFi device as the access point and apply this SSID.
- **WiFi band:** Set to 2.4GHz/5GHz.
- **Security:** Select the security Protocol type to be used on the wireless network.



Band Steering

Device displays a list of UniFi devices discovered by the UniFi controller. You can click on any device in the list to enter the settings and change that setting.



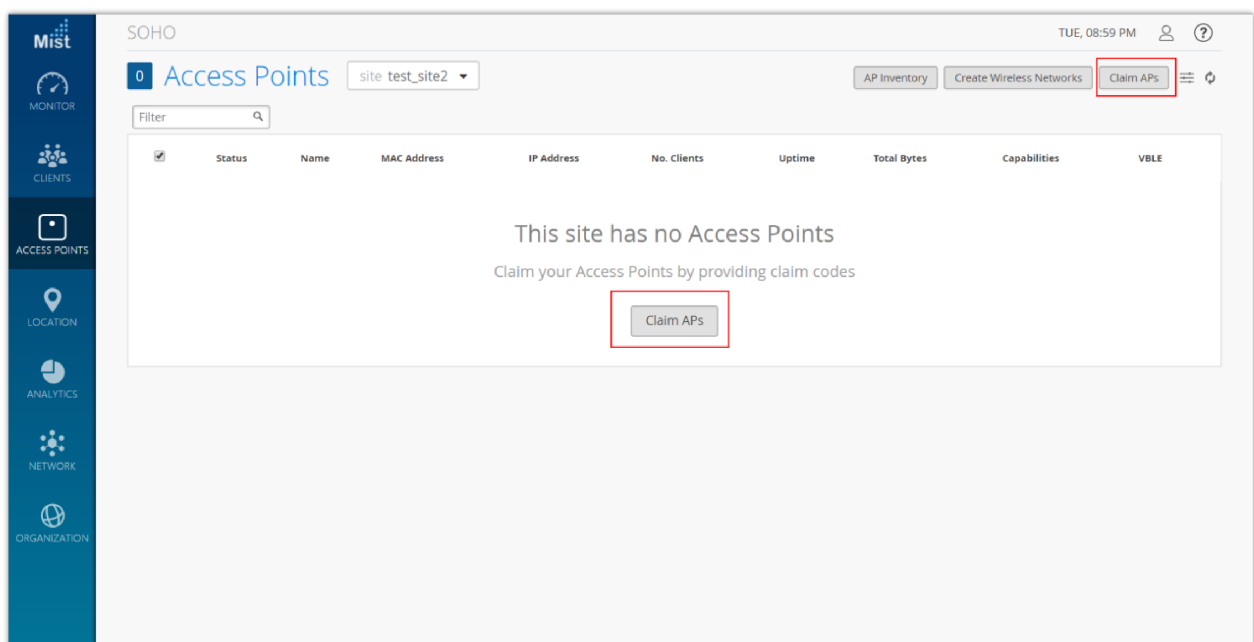
Unifi Band Steering

MIST

Wireless Configuration

1. Claim the AP.

Click on **Access Points** on the left-hand navigation bar. If you have a claim code for the AP, enter it by clicking **the Claim APs** button in the top right of the Access Points screen. Then, fill in the code and click the **Claim** button to add the AP. After that, click to select the new AP in the list and enter a name in the **Name** field.



Mist Claim APs

2. Setting up a WLAN

Click on **Networks** on the left-hand navigation bar, then select **WLANs**. Select appropriate options for WLAN Status.

The screenshot shows the 'New WLAN' configuration page in the Mist interface. The page is titled 'SOHO' and 'WLANs: New WLAN'. It features a sidebar with navigation options: MONITOR, CLIENTS, ACCESS POINTS, LOCATION, ANALYTICS, NETWORK, and ORGANIZATION. The main content area is divided into several sections: SSID (New WLAN), Labels (+), WLAN Status (Enabled/Disabled, Hide SSID, No Static IP Devices), Radio Band (2.4G and 5G, 2.4G, 5G), Band Steering (Enable), Data Rates (Compatible, No Legacy, High Density, Custom Rates), Security (WPA-2/PSK with passphrase, WPA-2/EAP, Open Access, More Options), Fast Roaming (Default, .11r), VLAN (Untagged, Tagged, Pool, Dynamic), Guest Portal (No portal, Show guest portal), Custom Forwarding (Custom Forwarding to Eth0 + PoE), SSID Scheduling (Enabled, Disabled), and Filtering (Wired to Wireless) (ARP, Broadcast/Multicast). A red box highlights the SSID, Labels, and WLAN Status sections.

Mist New WLAN

3. Filtering

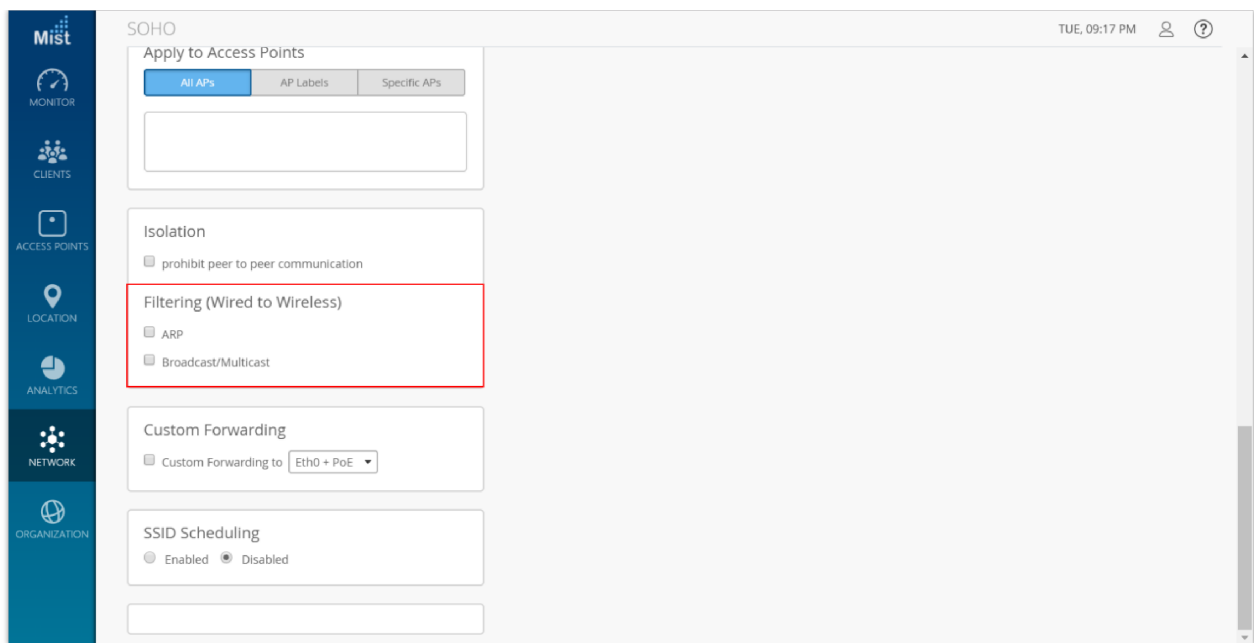
By default Mist supports Proxy ARP.

- **ARP Filter:** When ARP filter is enabled, we block all ARP broadcast requests from going to the specified wireless Interface. When ARP filter is disabled, Proxy ARP will try to resolve the Ethernet address of requests, and if not known, will flood the original request to any Interface not being ARP filtered.
- **Broadcast / Multicast Filter:** When Enabled, this filter will BLOCK ALL Broadcast and Multicast packets on a specified Interface, except:

- a) ARP's (as handled above)
- b) DHCP broadcast transactions.
- c) IPv6 Neighbor discovery frames. (ICMPv6).

All other broadcasts will be blocked, including IPv6 Broadcasts/Multicasts, and ALL MDNS frames. (IPv4 & IPv6)

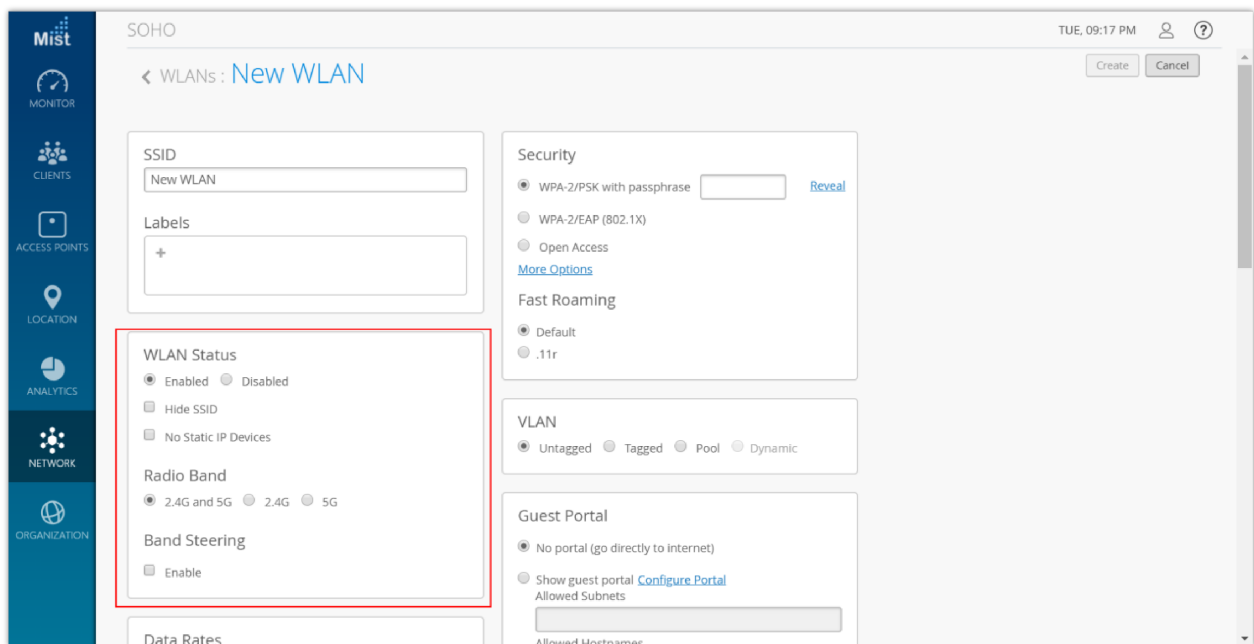
- **Allow MDNS Checkbox:** This option ONLY has any effect when #2 (the Broadcast / Multicast filter is ENABLED). When selected, this option will ALLOW mDNS packets to be transmitted through the specified interface. This includes IPv4 and IPv6 mDNS. If Not selected, then the Broadcast/Multicast filter will treat mDNS frames just like any other broadcast/multicast frame, and block them.



Mist Filtering

Band Steering

Enable Band steering under **Network** → **WLANs**. Make sure both 2.4GHz and 5GHz radios are enabled on your WLAN to be able to use Band Steering mode.



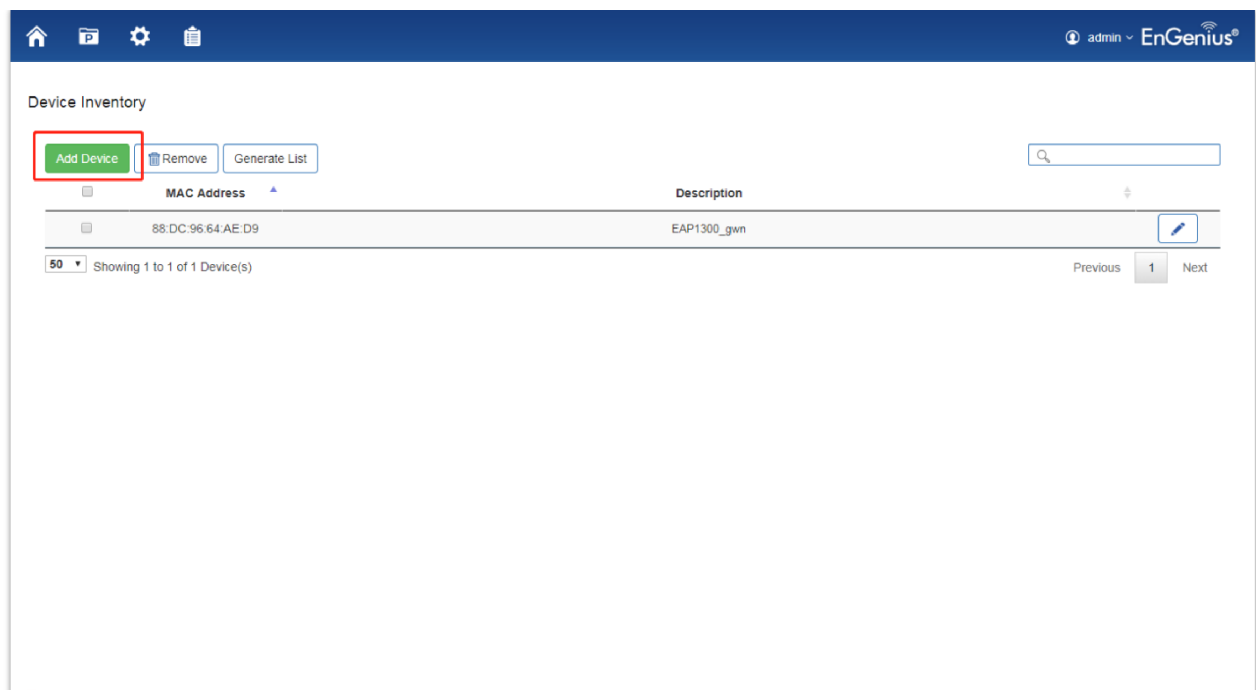
Mist Band Steering

EZMASTER

Wireless Configuration

1. Adding devices to ezMaster Device Inventory.

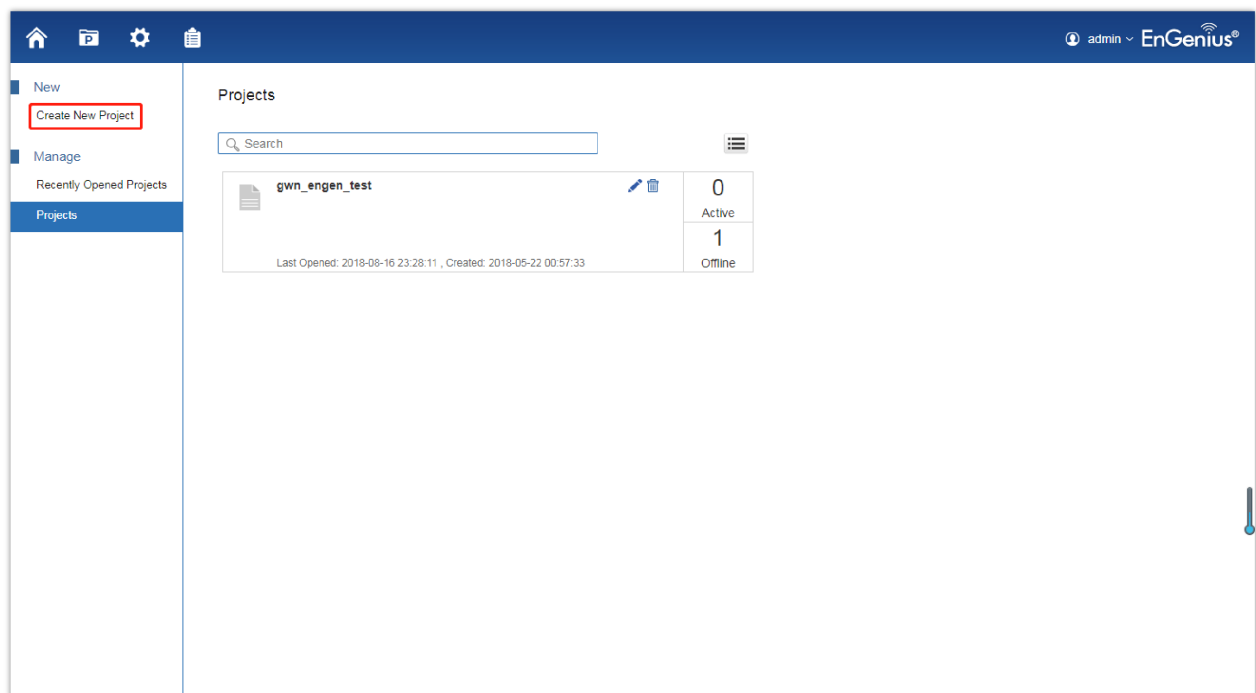
Enter the MAC Address, Check Code and Description of the device you want to register.



ezMaster Add Device

2. Managing devices using ezMaster.

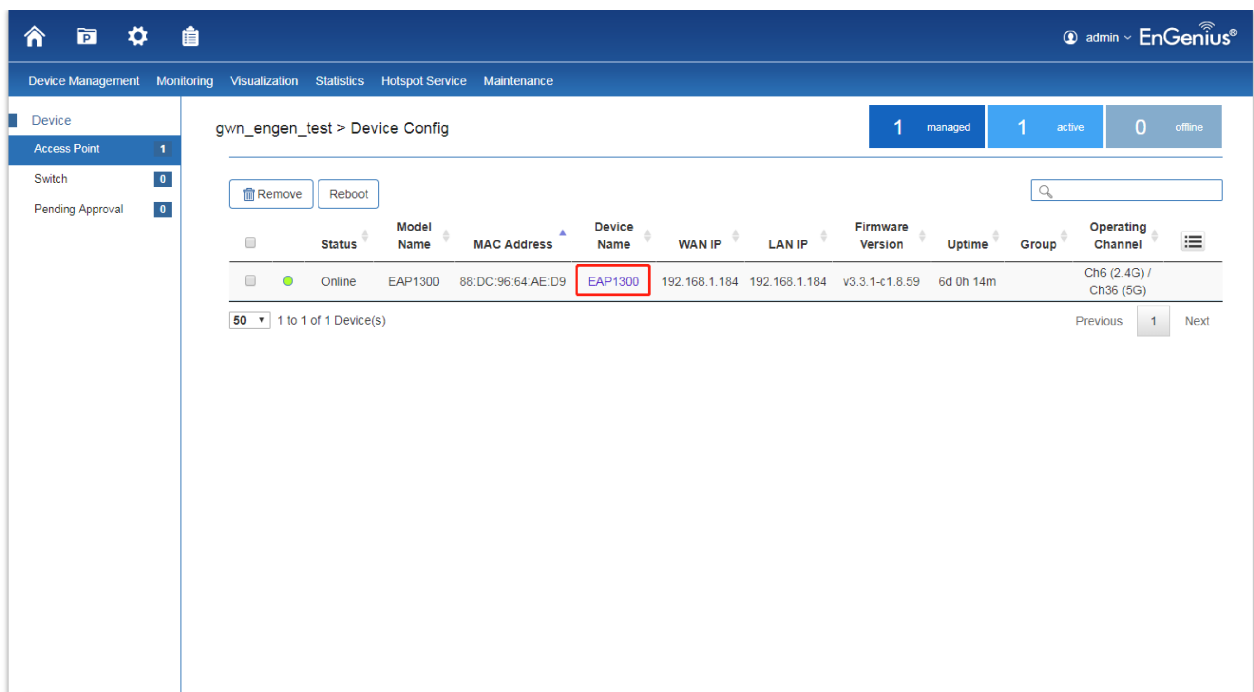
In order to start managing and monitoring Neutron devices, these devices must first be added to a project. Make sure that your Neutron device is connected to a network with a DHCP server and can access the Internet. Click on the **Project** icon to create a new project.



ezMaster Create New Project

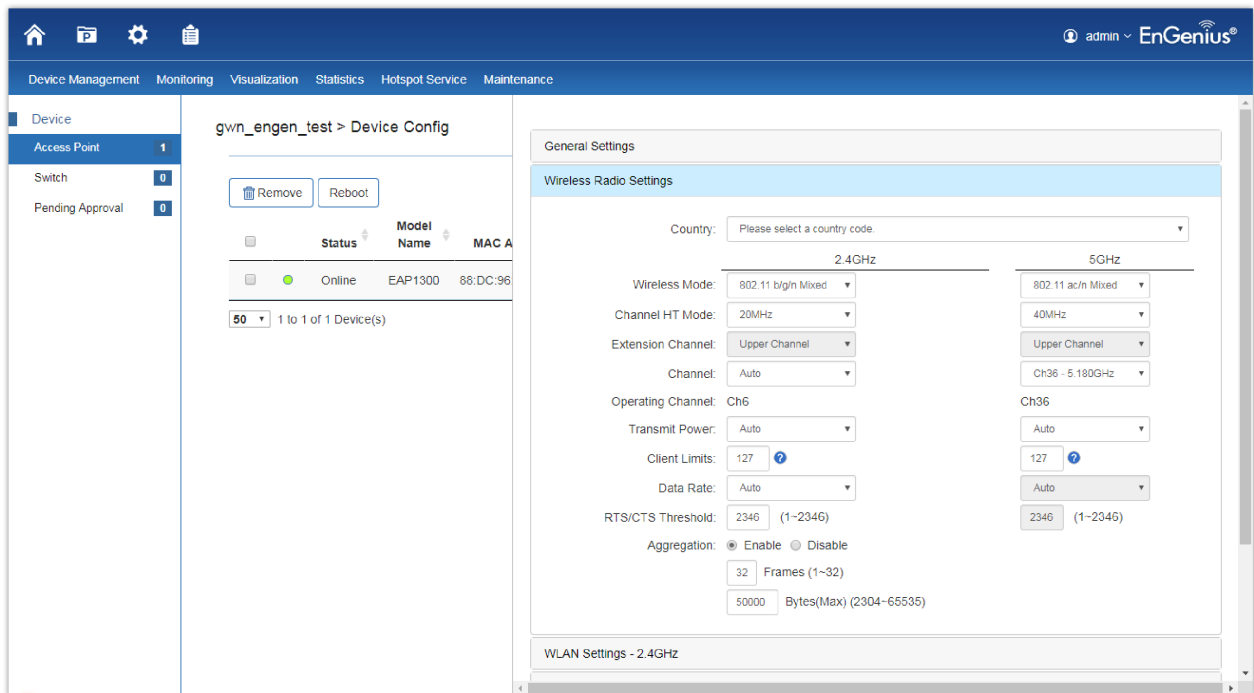
3. Device Configuration

Once the AP is online (green), to configure your AP, click on the **Device Name** link of your AP to bring up the configuration menu.



ezMaster Device Configuration

4. Set Wireless Radio Settings.

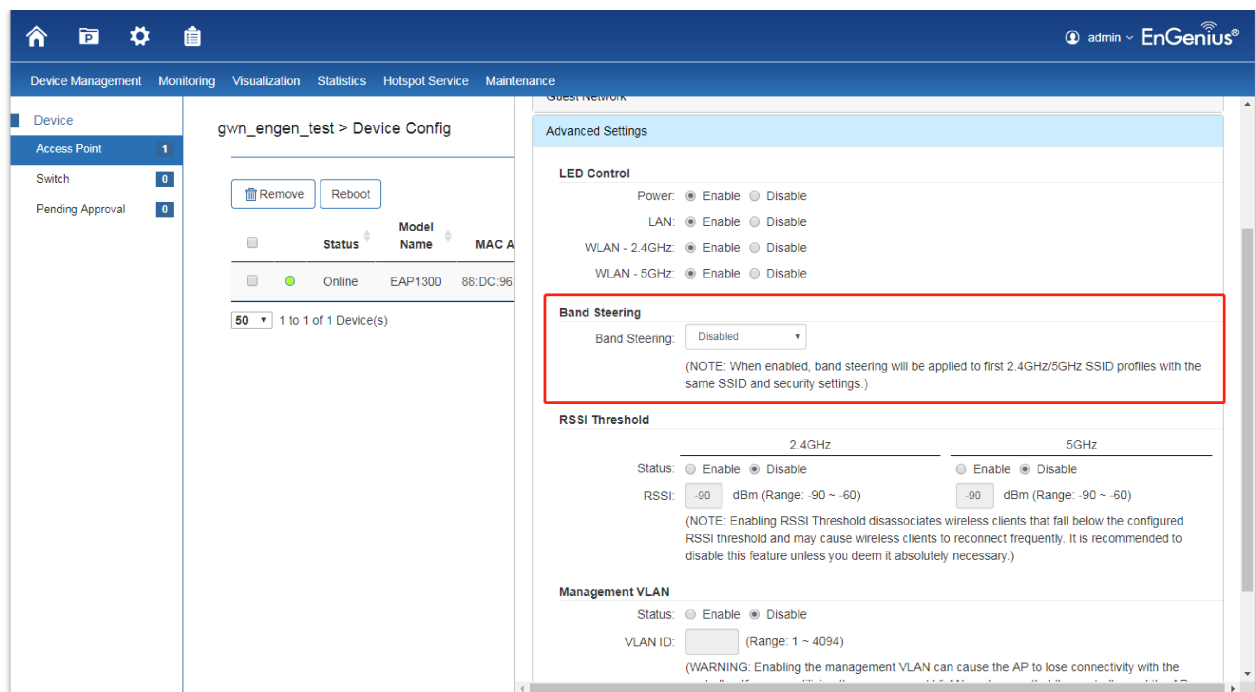


ezMaster Wireless Radio Settings

Band Steering

When "Band steering" is enabled, when the wireless client first associates with the AP, the AP will detect whether or not the wireless client is dual-band capable, and if it is, it will force the client to connect to the less congested 5GHz network to relieve congestion and overcrowding on the mainstream 2.4GHz frequency. It does this by actively blocking the client's attempts to associate with the 2.4GHz network.

Note: For Band Steering to take effect, both 2.4GHz and 5GHz SSIDs must have the same SSID and security settings. Wireless clients must be in both 2.4GHz and 5GHz wireless coverage zone when authenticating with the AP for the Band Steering algorithm to take effect.

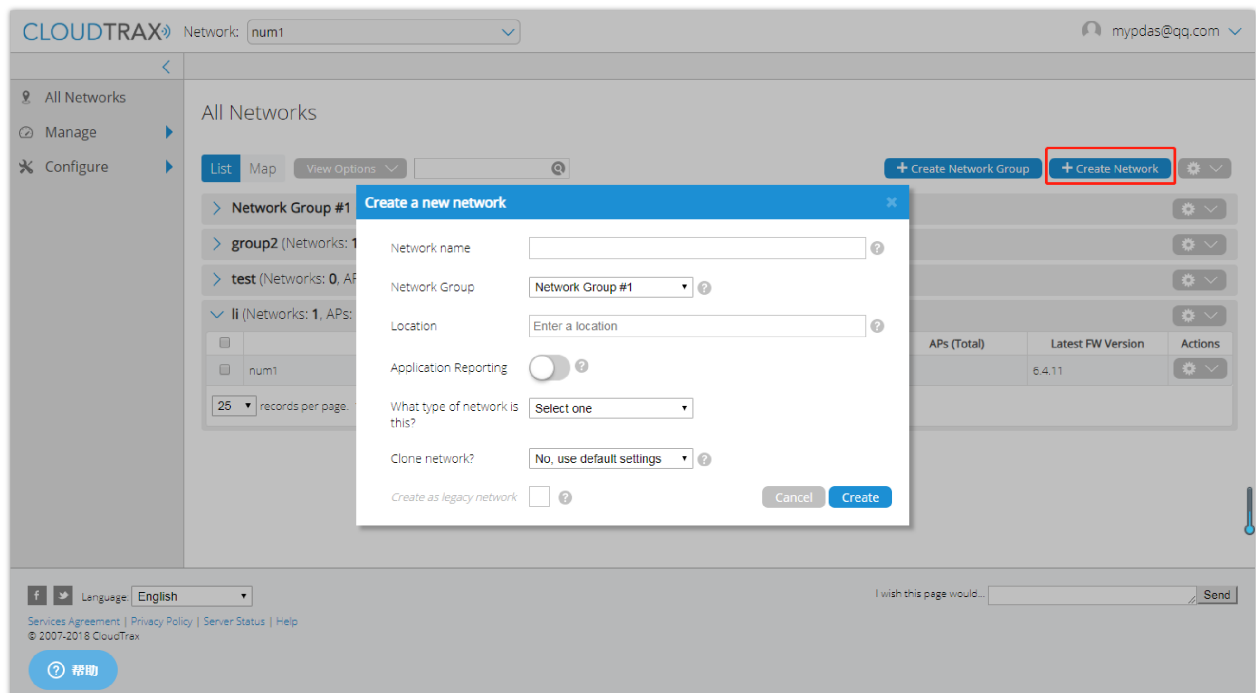


ezMaster Band Steering

CLOUDTRAX

Wireless Configuration

1. Create a new network. Fill in below information.



CloudTrax Create New Network

- **Network name:** This is the name you want to give this specific network. You will use this name to make changes to the network, display reports, etc.
- **Network Group:** This determines which user accounts will administrate this network.
- **Location:** Enter a street address for the first access point. To add access points, you will be shown a map that you click on to place access points. By entering an address here, you will be centered on the correct location for your network.
- **Application Reporting:** This will set whether the Application Reporting function is enabled by default on this network, which will provide more in depth reporting on the sort of traffic on your network.
- **Network Type:** This gives us an idea how you are using CloudTrax so we can find more ways to improve.

- o **Clone Network?:** If you wish to carry over your network settings from an already existing CloudTrax network under your same account, you can choose to clone that networks' settings here.

2. Add access points to your network

Navigate to the **Manage → Access Points** screen. There are three options to add access points to your network: click the "Add New" button to add access points one at a time by clicking on a map, or use the down arrow to the right of that to add access points in bulk.

The screenshot shows the CloudTrax 'Access Points' management page for network 'num1'. The sidebar on the left has 'Manage' selected, with 'Access Points' highlighted. The main content area includes a traffic graph for 'Clients' and a table of access points. A red box highlights the '+ Add New' button with a dropdown arrow in the top right of the table area.

Status	Name	Mac/IP	Clients	Usage	2.4G	5G	Last Checkin	Up time	Hops	Outages	Actions
	gwn	ac:b6:74:4d:5c:20 LAN IP / 192.168.1.67 Mesh IP / 5.77.92.32	0	0B (10B, 10B)	1	40	10 minutes ago	28d 14h 11m	0	4PM 4AM Now	

CloudTrax Create New Network

3. Configure your network

Each CloudTrax device can broadcast four unique SSIDs that users can connect to. Each of these SSIDs are controlled independently in CloudTrax. Typically users have a mix of public SSIDs – with splash pages, bandwidth throttling, DNS filtering and client isolation – and private SSIDs, with WPA Enterprise authentication and access to LAN resources and other clients. When we created your network, we set the first SSID to be public and the second SSID to be private, but you can adjust these any way you wish.

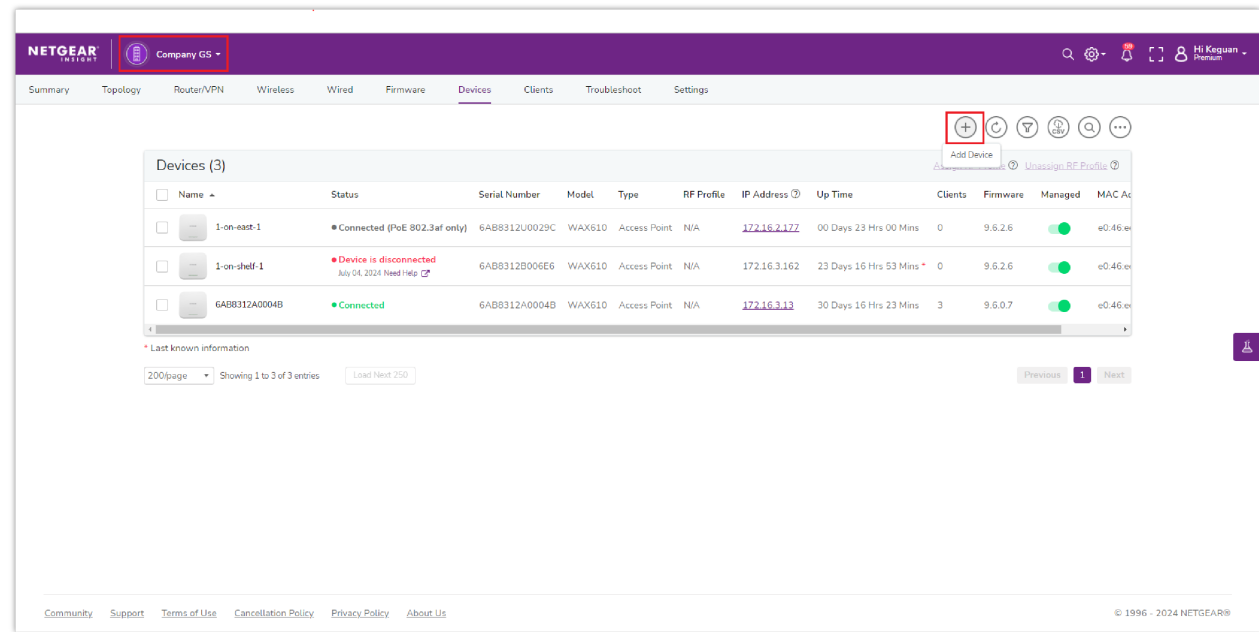
The screenshot shows the 'SSID 1' configuration page in CloudTrax. The 'SSID 1' option is selected in the sidebar. The main area shows configuration for 'SSID 1: openmesh+'. A red box highlights the 'Band' dropdown menu, which is set to 'Both - Combined SSID'. Other visible settings include 'Authentication type' set to 'WPA Pre-shared key' and 'WPA password'.

CloudTrax Create New Network

NETGEAR INSIGHT

Wireless Configuration

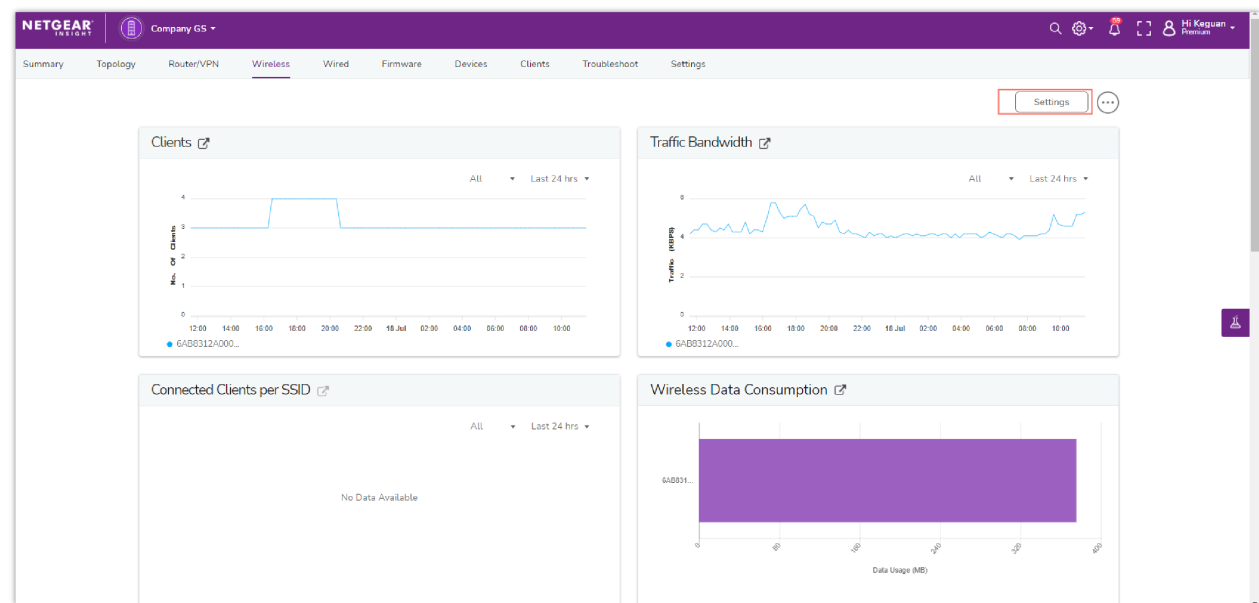
1. Ensure that you have added a location and that the AP has been added to that location.



Netgear Add Location and Device

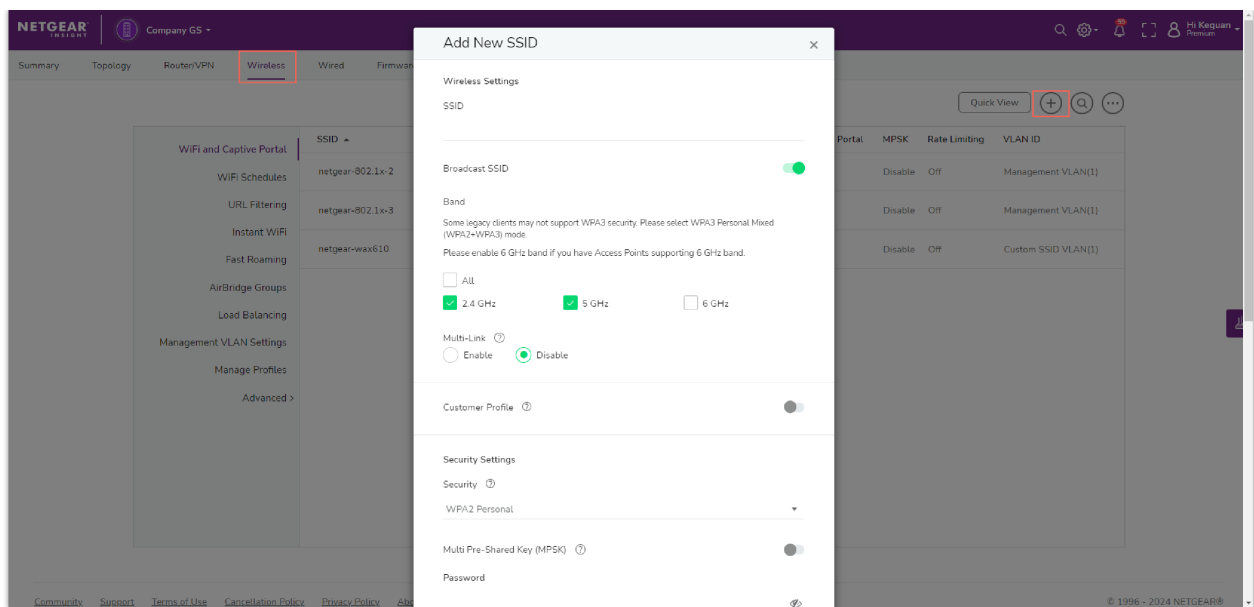
2. To configure WLAN settings, please complete the following steps:

- Enter the Wireless Setting settings page.



Netgear Wireless Home Page

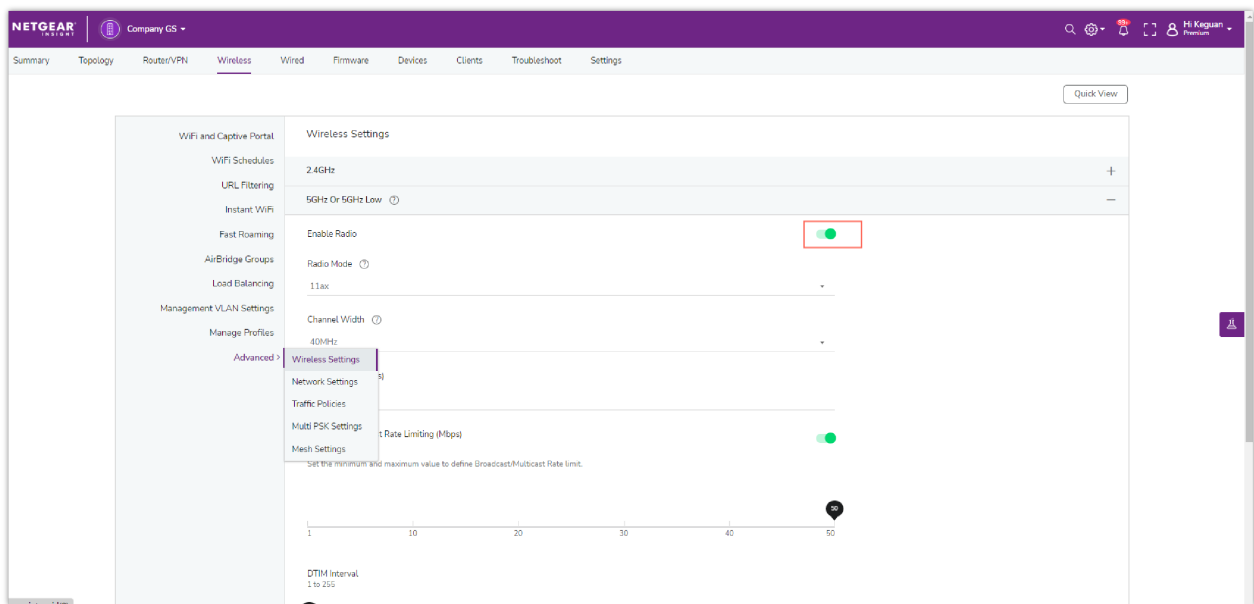
- Click the "+" icon to open the page for adding SSIDs.
- SSID: Enter or edit Wireless name.
- Band: Choose 2.4GHz/5GHz.
- Security Settings: Configure security mode and password.
- Network Settings: Addressing and traffic, Vlan ID, and other configurations.



Netgear Create New SSID

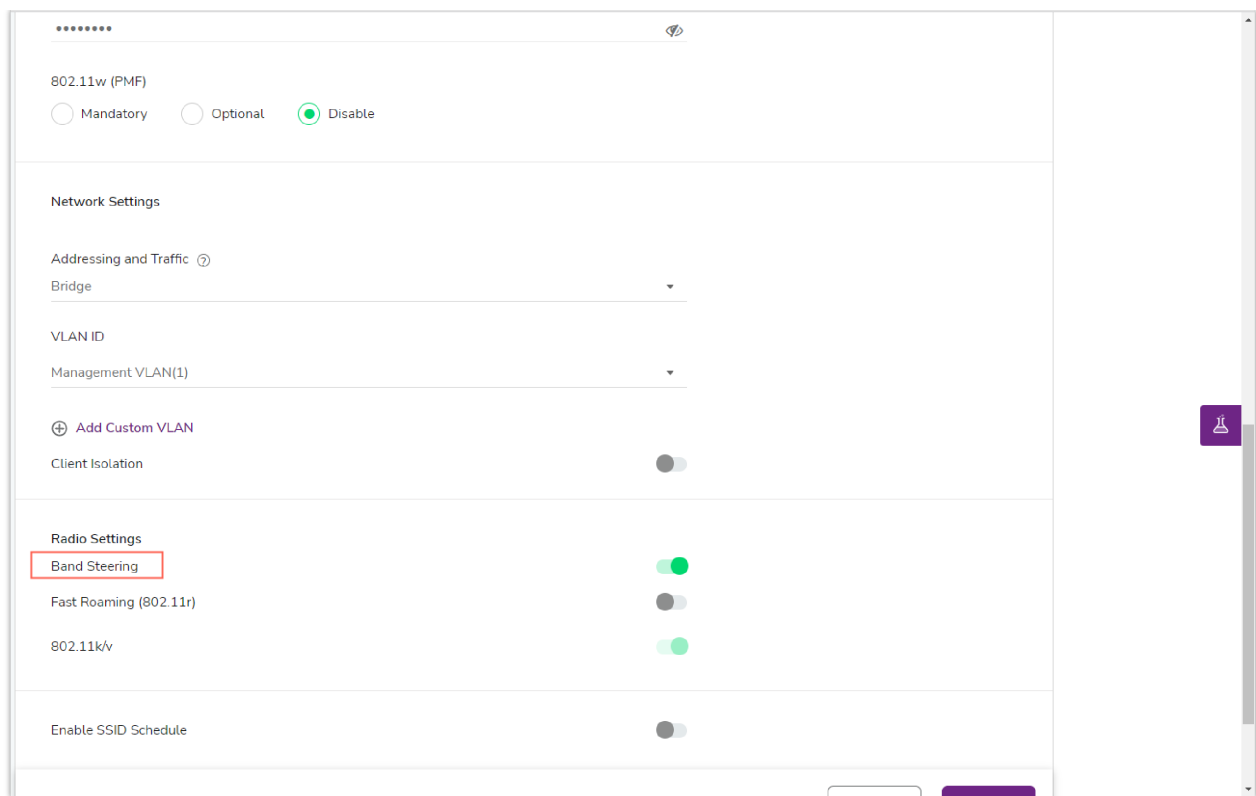
Band Steering

1. Go to **Wireless** → **Setting** → **Advanced** → **Wireless Settings**, configure 2.4GHz/5GHz globally and configure bandwidth, etc.



Netgear Wireless Settings

2. Go to Wireless Settings, find the SSID, click on the edit icon to enter the SSID configuration page, and enable Band Steering.

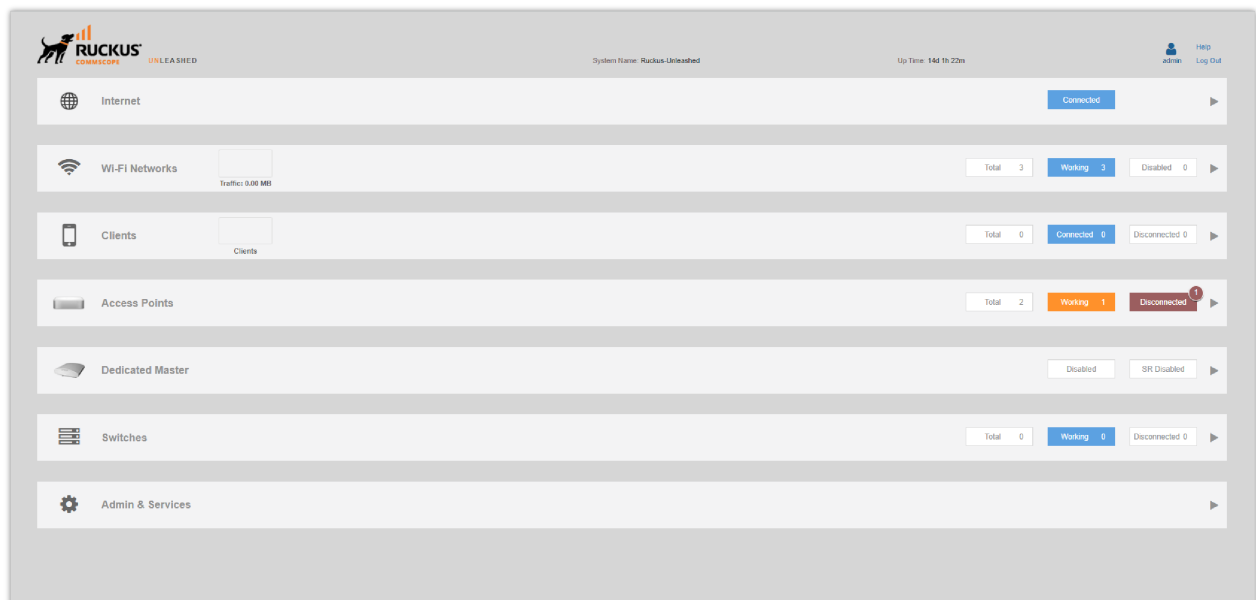


Netgear Enable Band Steering

RUCKUS UNLEASHED

Wireless Configuration

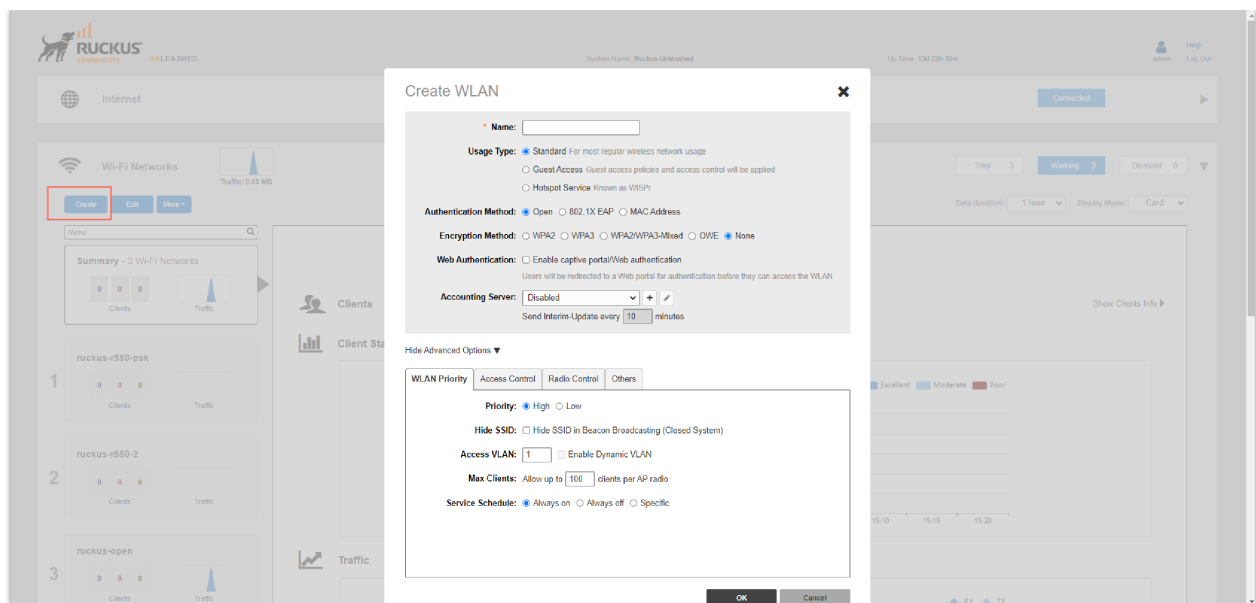
To manage APs using a virtual controller, it is necessary to first upgrade the APs to Unleashed firmware. After APs are connected to the same network, automatic networking is achieved, and web access to any AP's IP address will be redirected to the main AP's web page.



Ruckus Unleashed Home Page

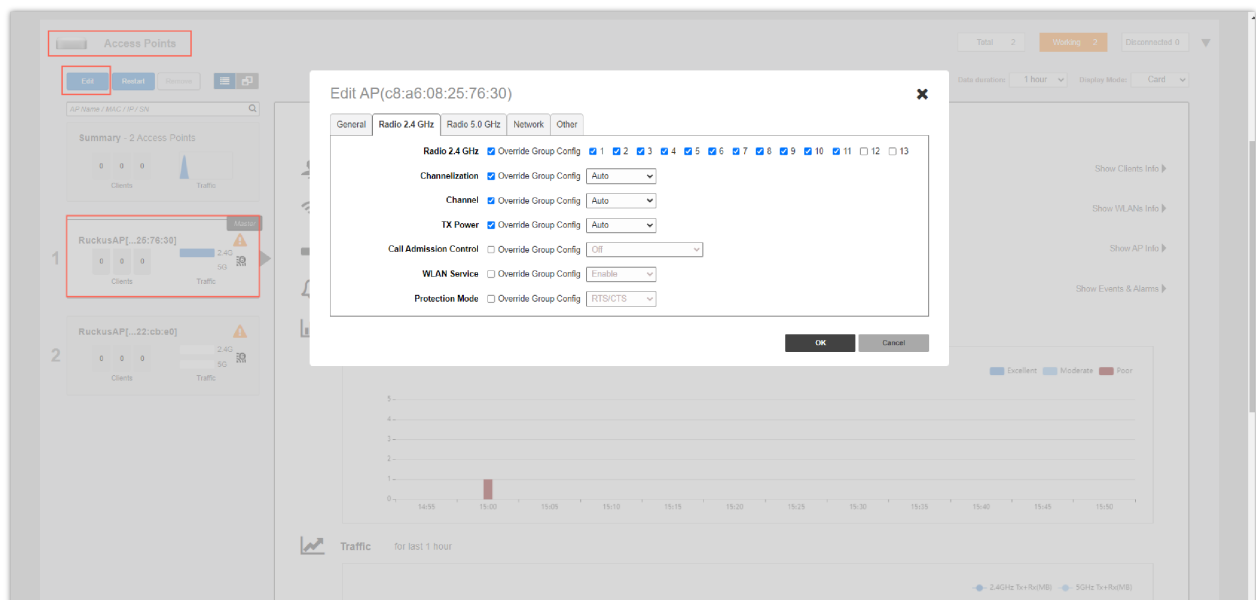
1. To configure WLAN settings, please complete the following steps:

- Click 'Create' to open the SSID addition page.
- Enter or edit Wireless name.
- Select encryption method and enter password and other information.
- Configure priority, access control, 802.11kr, DTIM and other information in the advanced settings options, and save after enabling 802.11kr.



Ruckus Unleashed Create New SSID

2. Open Access Points to modify RF configuration, and adjust AP channel, bandwidth, power, and other configurations according to your needs.



Ruckus Unleashed Modify AP RF

TP-LINK

Wireless Configuration

1. Add Wireless Networks

Select a band frequency and click + to add a WLAN group.

The screenshot shows the TP-Link web interface. At the top, there are tabs for 'Map', 'Statistics', 'Access Points', 'Clients', 'Insight', and 'Log'. The 'Access Points' tab is selected. Below the tabs, there is a search bar and a table of access points. The table has columns for AP Name, MAC Address, IP Address, Status, Model, Hardware Version, Firmware Version, Client Number, Download, Upload, and Action. Two access points are listed, both with a status of 'Disconnected'. Below the table, there is a 'Page Size' dropdown set to 10 and a pagination bar showing 'A total of 1 page(s)'. Below the table, there is a 'Wireless Settings' window. The window has tabs for 'Wireless Control', 'System', and 'Admin'. The 'Wireless Control' tab is selected. Below the tabs, there is a 'Basic Wireless Setting' tab. A red box highlights the '+ Add' button in the table.

TP Link Add Wireless Network

2. Add an SSID to the specific WLAN group, Configure the parameters in the following window.

The screenshot shows the TP-Link web interface with the 'Add 2.4GHz SSID' dialog box open. The dialog box has a 'Basic Info' tab selected. The 'SSID Name' field is highlighted with a red box. Other fields in the dialog box include 'Wireless Vlan ID' (set to 0), 'SSID Broadcast' (checked), 'Security Mode' (set to WPA-PSK), 'Version' (set to WPA2-PSK), 'Encryption' (set to AES), 'Wireless Password' (empty), 'Group Key Update Period' (set to 0), 'SSID Isolation' (unchecked), and 'Access Control Rule' (set to None). There is an 'Apply' button at the bottom of the dialog box.

TP Link Add SSID

3. Configure Advanced Wireless Parameters

The advanced wireless parameters consist of Beacon Interval, DTIM Period, RTS Threshold, Fragmentation Threshold and Airtime Fairness. Go to **Wireless Settings** → **Advanced Setting**.

The screenshot shows the TP-Link Omada Controller interface. At the top, there are tabs for Map, Statistics, Access Points, Clients, Insight, and Log. The 'Access Points' tab is selected. Below the tabs, there is a table listing access points. The table has columns for AP Name, MAC Address, IP Address, Status, Model, Hardware Version, Firmware Version, Client Number, Download, Upload, and Action. Two access points are listed: AC-84-C6-3D-E2-44 and AC-84-C6-17-BA-A6. Both are in a 'Disconnected' state. Below the table, there is a 'Wireless Settings' section. The 'Advanced Wireless Setting' tab is selected. Under this tab, there are settings for 2.4GHz and 5GHz. The 2.4GHz settings are highlighted with a red box. The settings are: Beacon Interval: 100 ms(40-100), DTIM Period: 1 (1-255), RTS Threshold: 2347 (1-2347), Fragmentation Threshold: 2346 (256-2346, works only in 11b/g mode), and Airtime Fairness: ☐ Enable. There is an 'Apply' button at the bottom of the settings section.

TP Link Configure Advanced Wireless Parameters

Band Steering

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

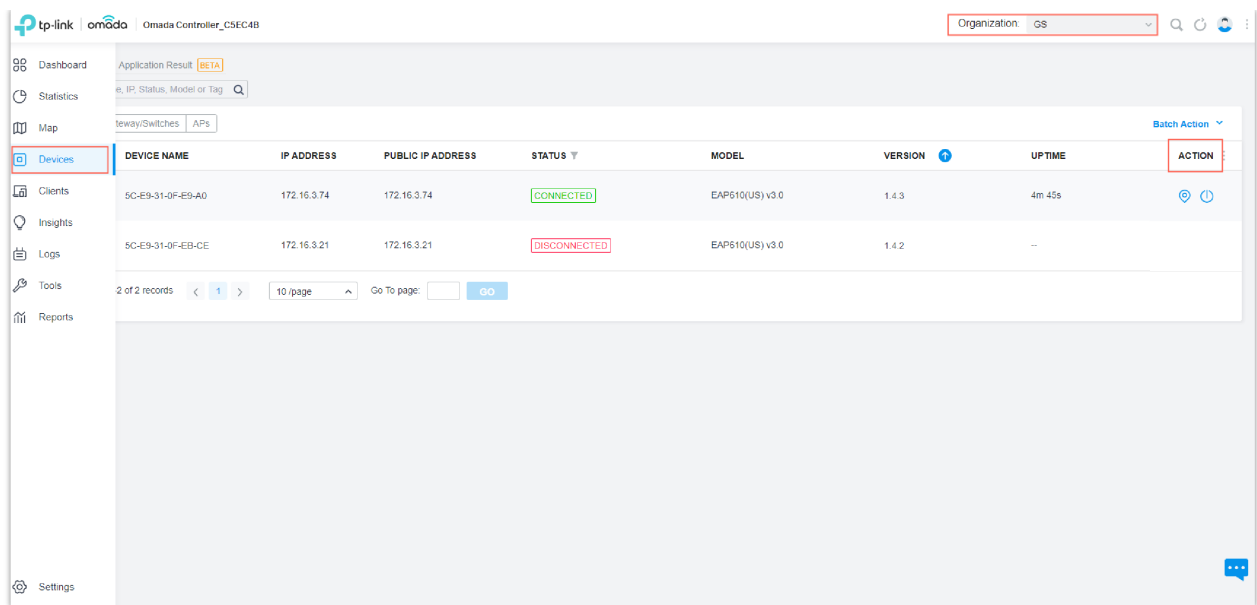
The screenshot shows the TP-Link Omada Controller interface. At the top, there are tabs for Map, Statistics, Access Points, Clients, Insight, and Log. The 'Access Points' tab is selected. Below the tabs, there is a table listing access points. The table has columns for AP Name, MAC Address, IP Address, Status, Model, Hardware Version, Firmware Version, Client Number, Download, Upload, and Action. Two access points are listed: AC-84-C6-3D-E2-44 and AC-84-C6-17-BA-A6. Both are in a 'Disconnected' state. Below the table, there is a 'Wireless Settings' section. The 'Band Steering' tab is selected. Under this tab, there are settings for Band Steering: ☐ Band Steering, Connection Threshold: 20 (2-40), Difference Threshold: 4 (1-8), and Max Failures: 10 (0-100). There is an 'Apply' button at the bottom of the settings section. A note at the bottom states: 'Note : To run the Band Steering function on a SSID, please create the SSIDs on both of the 2GHz and 5GHz band and make sure they have the same name, security mode and wireless password.'

TP Link Band Steering

OMADA CONTROLLER

Wireless Configuration

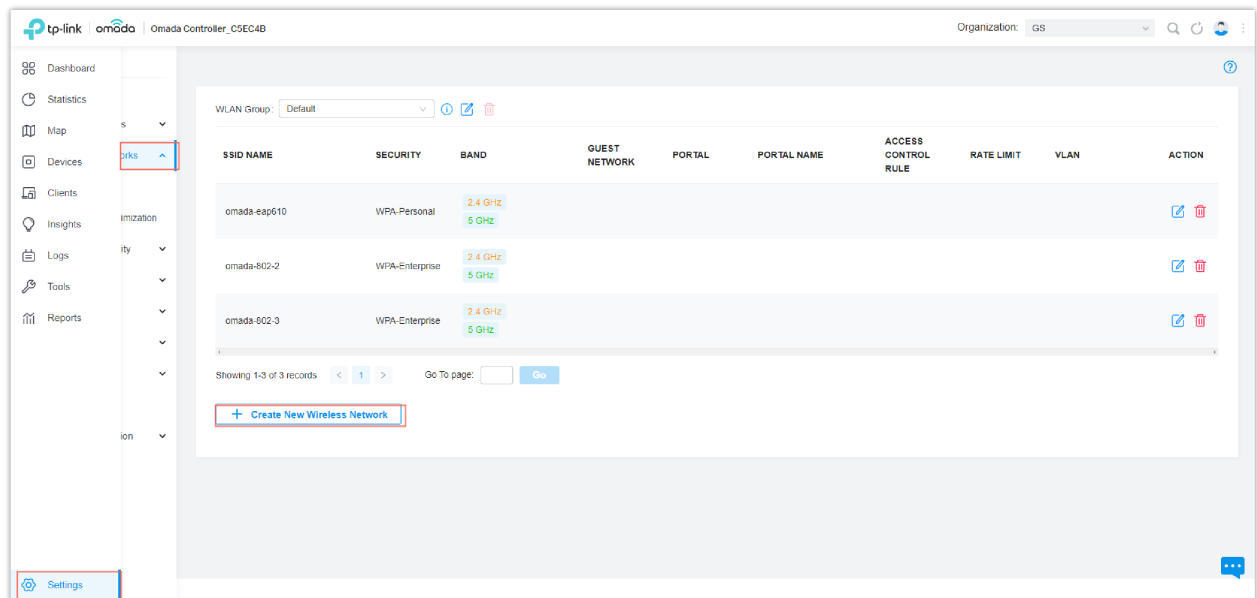
The Omada Controller app allows for the management and configuration of Omada APs. After adding a Site, go to Site-Devices and adopt the AP to the Controller.



Omada Controller Adopt APs

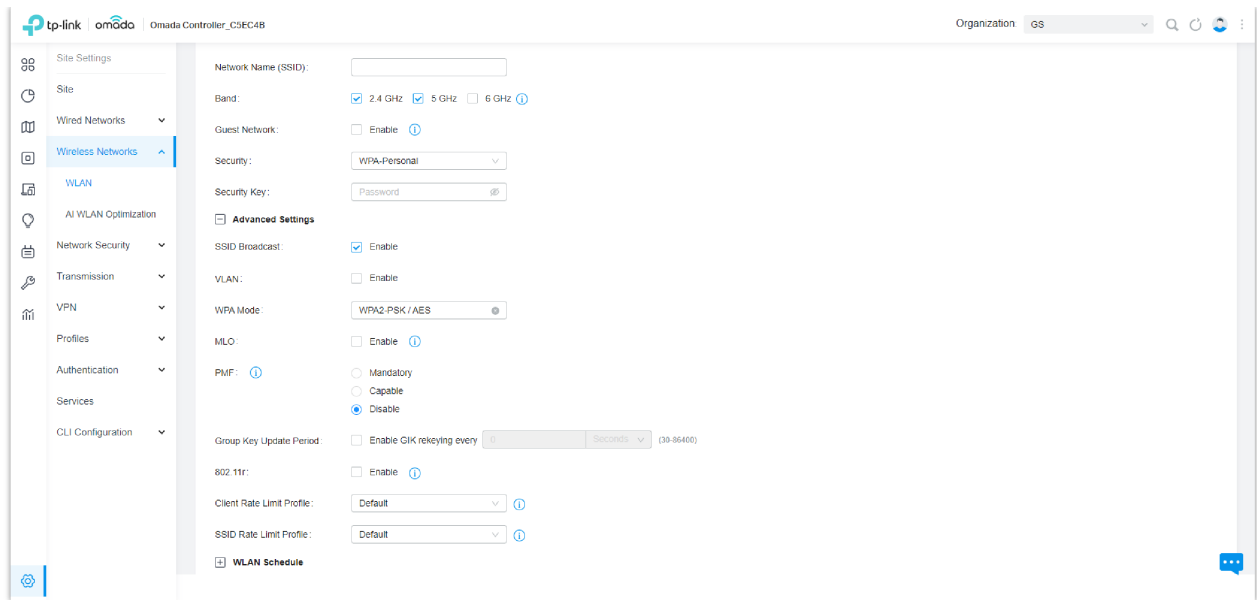
1. To configure WLAN settings, please complete the following steps:

- Click "Create New Wireless Network" to open the SSID addition page.



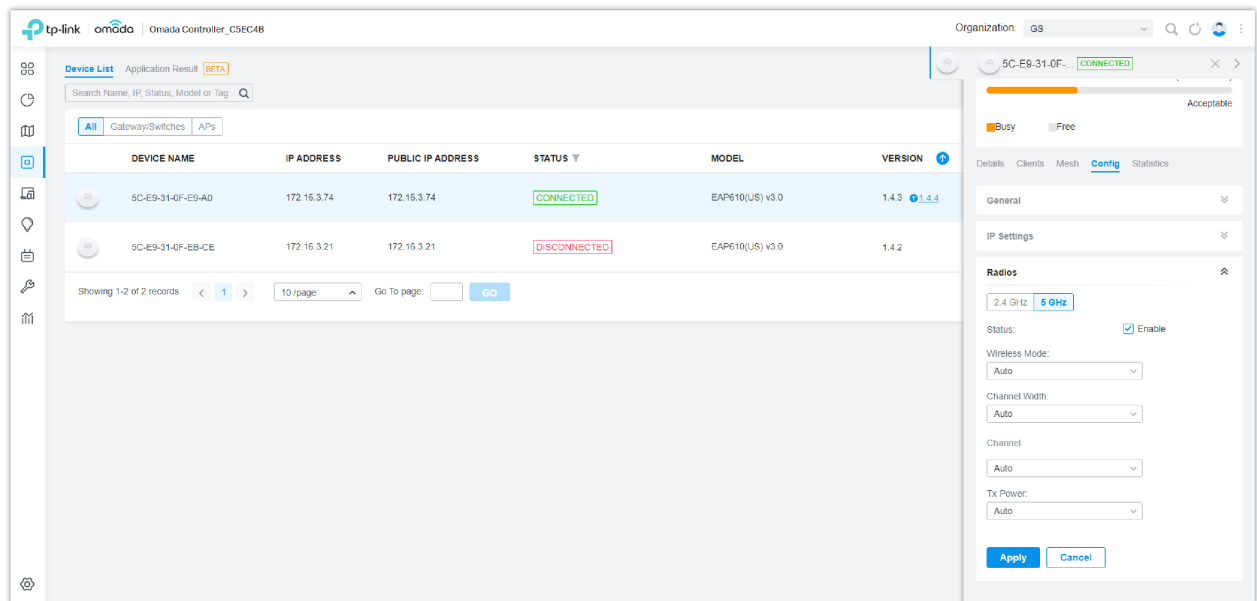
Omada Controller Create New SSID

- Enter or edit Wireless name.
- Select or modify 2.4GHz/5GHz frequency band.
- Select encryption method and enter password and other information.
- Modify SSID Broadcast, Multicast Filtering and other configurations. Save configuration after enabling 802.11r.



Omada Controller Edit Wireless Network

2. Enter Site-Devices, click on AP, and select Config-Radios. Enable 2.4GHz/5GHz and customize the channel, channel bandwidth, and transmission power.



Omada Controller Modify AP RF