RUCKUS One Online Help (index.html)

Search

Radio Settings

The default radio settings of the venue can be adjusted to meet the administrator's needs. Additionally, the external antenna settings, load balancing, and client admission control can also be modified.

Complete the following steps to customize the radio settings of a venue.

1. On the navigation bar, click Venues.
   The Venues page is displayed.

2. Click the check box for a specific venue and click Edit. Alternatively, click on a specific venue name then click the Configure button.

3. Select the Wi-Fi Configuration tab.
   By default, the Radio tab and Wi-Fi Radio sub-tab are displayed. The Wi-Fi Radio sub-tab provides several options for configuration, all of which can be accessed by clicking the menu option on the left, or by scrolling down the screen. You can customize the services of your preference and click Save. Refer to the following instructions to configure each of the available radio services:
   - *Configuring the Wi-Fi Radios*
   - *Configuring Load Balancing*
   - *Configuring Client Admission Control*
   - *Configuring the Antenna*

Configuring the Wi-Fi Radios

Note:

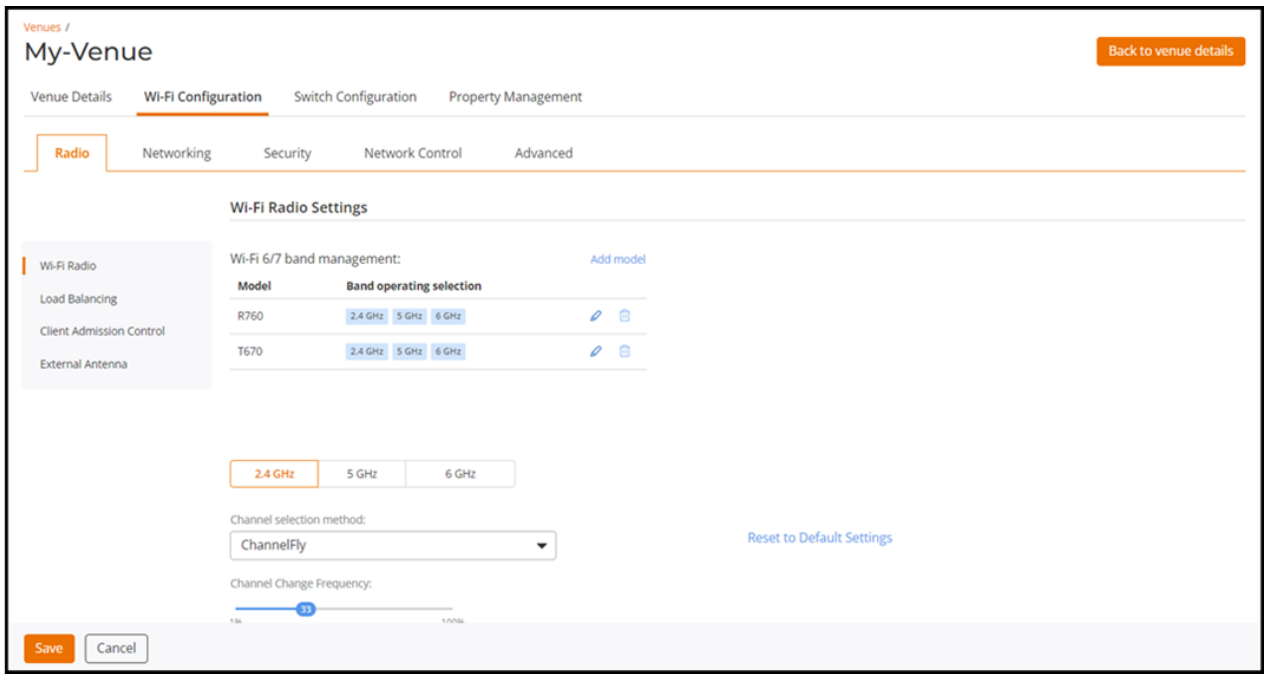
- The 2.4 GHz, 5 GHz, and 6 GHz radio settings, although similar, must be configured separately.
- RUCKUS One allows for per-radio customization on access points. You can choose to use the venue settings for each radio or configure them individually.

1. For Wi-Fi 6/7 band management, click Add Model. In the Wi-Fi Band Management sidebar, select the Model using the drop-down menu and Band Management (Dual-band or Tri-band). Dual-band is for 2.4 and 5 GHz bands, and tri-band is for 2.4, 5, and 6 GHz bands. For more information, refer to *Switchable Radio Frequency Support (GUID-3E0112D7-A87A-49BE-874A-75EB6A5B3481.html)*.

   Note: Only AP models that support band management are included in the drop-down menu and can be configured (such as R670, T670, and R760 APs).

   A warning message "Modifying the band operation mode will reboot the AP and the Mesh connection will also be disconnected when rebooting" is displayed. Click Add to add the AP model.

   Wi-Fi Radio Sub-tab



2. Select a radio from the following options:
   - 2.4 GHz
   - 5 GHz

- 6 GHz

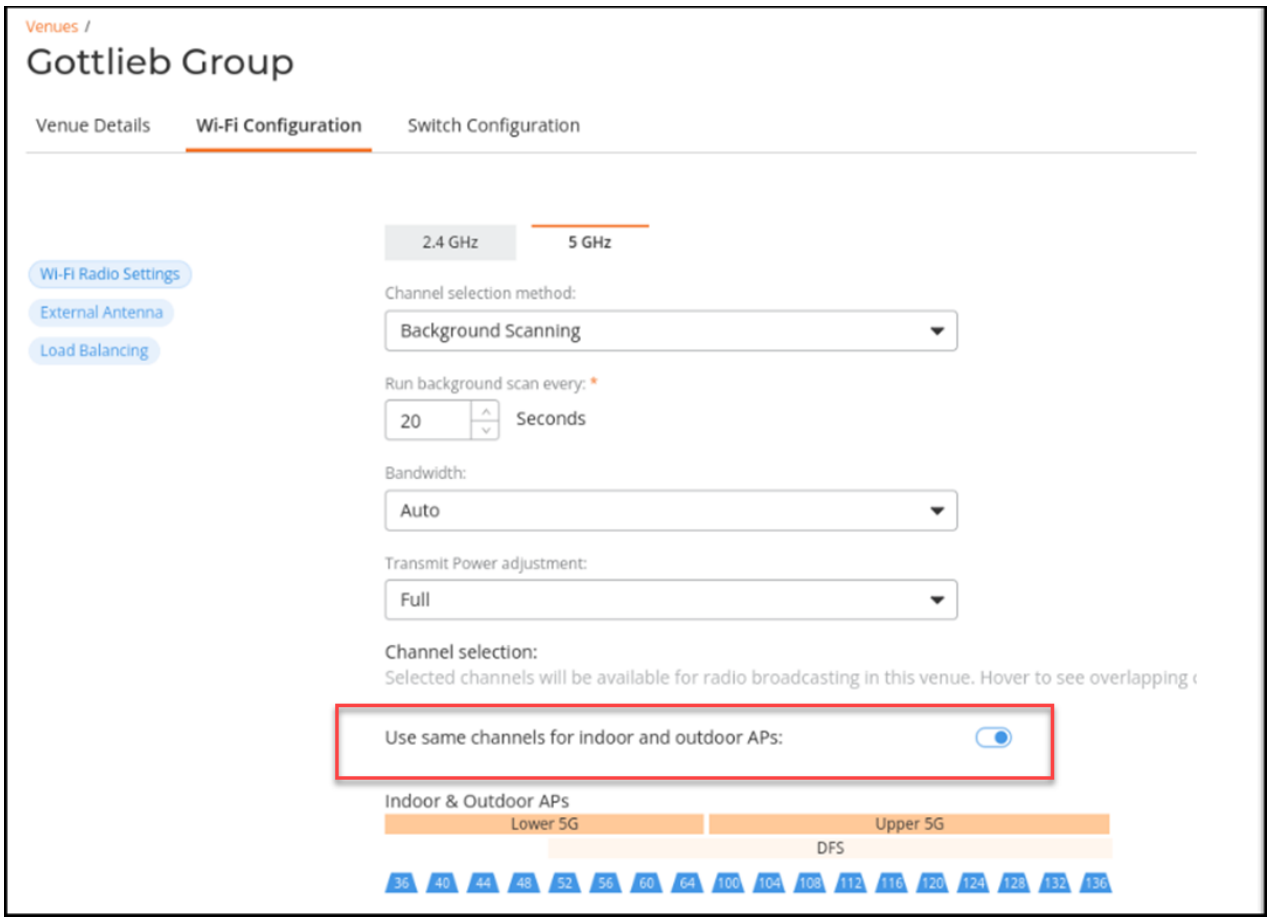
3. Configure the following settings for the 2.4 GHz and 5 GHz bands:
   - Channel Selection Method: Select either Background Scanning,ChannelFly, or Manual channel selection.
   - Channel Change Frequency: This option is displayed only if you select the Channel Selection Method as ChannelFly. Adjust the frequency between 1-100. By default, 33 is selected.
   - Run background scan every [ ] seconds: If you selected Background Scanning, interval at which RUCKUS One will run the scan ranges from 1 through 65535 seconds. For 2.4 GHz and 5 GHz, the default is 20 seconds.
   - Bandwidth: Select Auto, 20 MHz, or 40 MHz channel width for the 2.4 GHz radio, or Auto, 20 MHz, 40 MHz, 80 MHz, or 160 MHz channel width for the 5 GHz radio.
   - Transmit Power Adjustment: Select the transmit power adjustments from the drop-down list. The default is Full.
   - Channel Selection: A blue icon above the channel number indicates that the channel is enabled for the radio. If there are channels that you do not want the radio to use, disable them by clicking their respective icons. When a channel is disabled, its blue icon changes to gray.

     Note: For the 5 GHz, Lower 5 GHz, and Upper 5 GHz bands, you must configure a different set of channels for indoor APs and outdoor APs.

     Note: For 6 GHz bands, the channel range for both indoor and outdoor Access Points (APs) can be configured individually to distinguish indoor and outdoor channel ranges, considering the diverse channel availability across different counties. APs located within the venue can adopt these indoor or outdoor channel configurations based on their model's capabilities, provided they are set to use the venue's settings.

4. (Optional) Toggle Use same channel for indoor and outdoor APs to ON. This option is available depending on the country code; different countries have specific regulations regarding which channels can be used for indoor and outdoor APs.

   Allowing Outdoor APs to Use Indoor Channels



When this feature is enabled, outdoor APs can use the indoor channels.

5. To enable the Automated Frequency Coordination (AFC) feature, select the 6 GHz option and then toggle the Enable Indoor AFC switch to ON. For outdoor APs, AFC is enabled automatically.

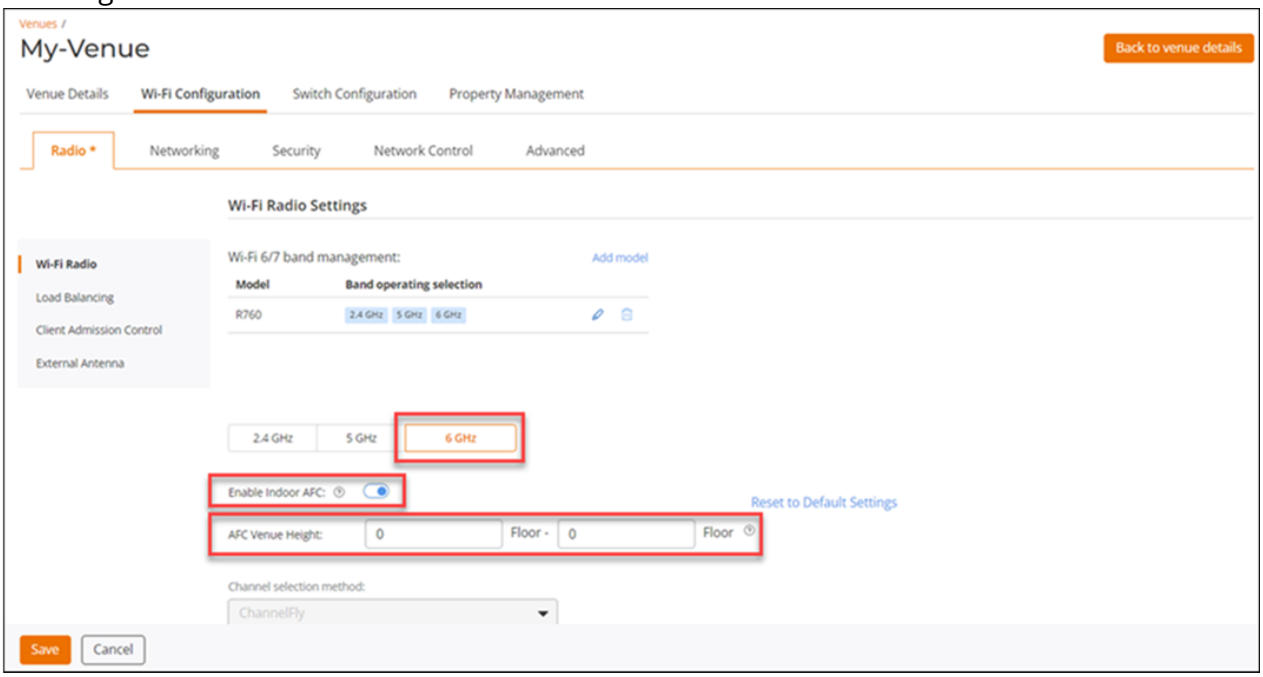
   Note:

   - The AFC feature is disabled by default for existing venues upgraded from an earlier version (for example, 6.2.x). Conversely, the AFC feature is enabled by default for new venues created in version R7.0.
   - The AFC feature is available to the venues only if the country of the selected zone allows AFC or RUCKUS obtains the AFC certificate from a competent government authority, such as the US Federal Communications Commission (FCC). For any other locations, the Enable Indoor AFC option is grayed out.

In the 6 GHz band (ranging from 5.925 to 6.425 GHz and from 6.525 to 6.875 GHz) that houses various radio services, Wi-Fi access points (APs) use the AFC system to share radio waves without causing interference, improving the overall network performance. The AFC system manages and allocates frequencies dynamically, utilizing a database of 6 GHz operators (including geolocation, frequencies, power levels, antenna coverage) which keeps track of the frequencies that are already in use in a specific area. By checking the AFC database, Wi-Fi APs can avoid using frequencies that are already occupied, preventing signal disruptions.
When you enable the AFC feature on RUCKUS One, a standard power (SP) AP (tri-radio, outdoor

AP), before transmitting, consults with a local AFC system to validate frequency operation and starts operating only after the usage request is approved. However, an AP operating in Low Power Indoor (LPI) mode is allowed to transmit without the need for approval from the AFC system. For more information, refer to the *RUCKUS AFC User Guide*.

Enabling the AFC Feature



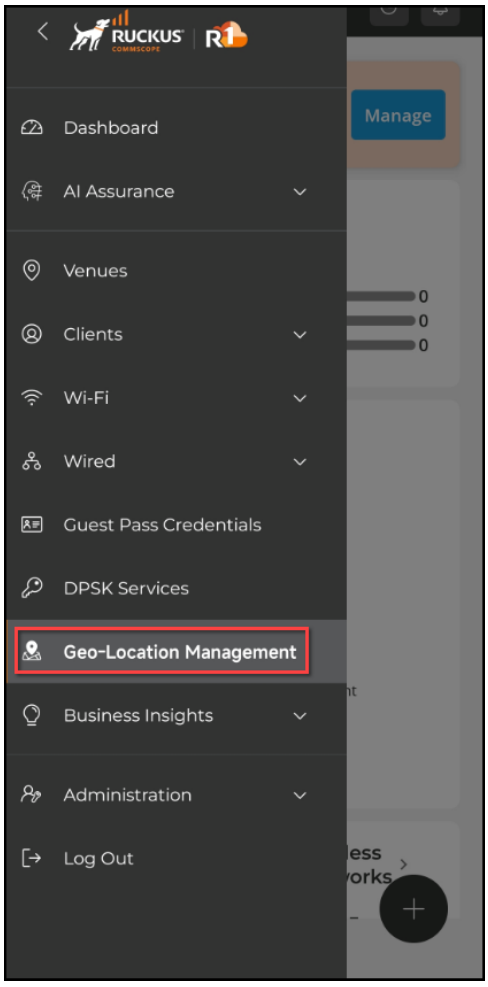
a. After enabling the AFC feature, you must configure the AFC Venue Height. Enter the floor numbers in the corresponding fields.
The US FCC mandates the AFC geolocation to determine the permissibility of transitioning to substitution-permutation in specific channels. The identification of the geographic location of a device is based on various data collected from different areas of the same place. Therefore, after enabling the AFC feature and configuring the AFC venue height, set the GPS coordinates using the RUCKUS One mobile app. The RUCKUS One mobile app is available for download from Apple App Store and Google Play Store. Scan the following QR code to download the RUCKUS One mobile app on your mobile device.

Android Devices	iOS Devices

Android Devices	iOS Devices

b. Log in to the RUCKUS One mobile app and select the Geo-Location Management menu option.

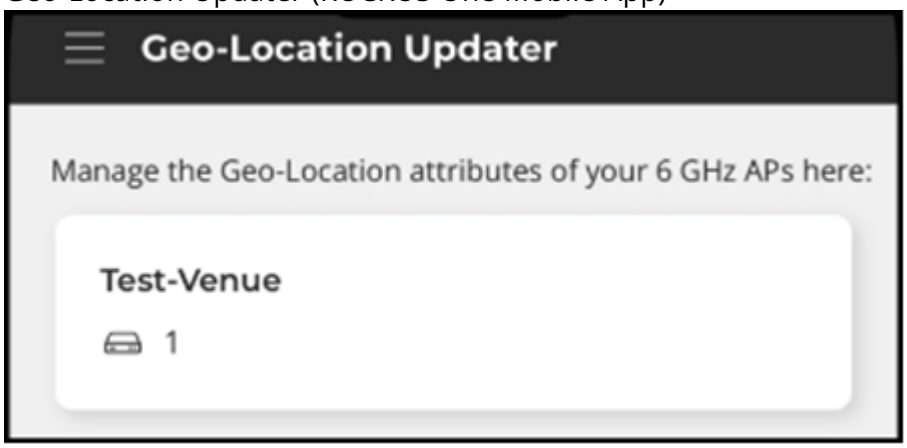
Geo-Location Management (RUCKUS One Mobile App)



Note: RUCKUS Wi-Fi 6E APs do not have an embedded GPS; their location must be set using the RUCKUS One mobile app. If the AFC geolocation for Wi-Fi 6E/7 APs is configured using the RUCKUS One mobile app, it takes precedence over the GPS location detected by the AP. After powering up, the AP might take up to 30 minutes to scan all its neighbors and use the neighbor list to calculate the AFC geolocation.

c. From the Geo-Location Updater screen, select a Venue.

Geo-Location Updater (RUCKUS One Mobile App)

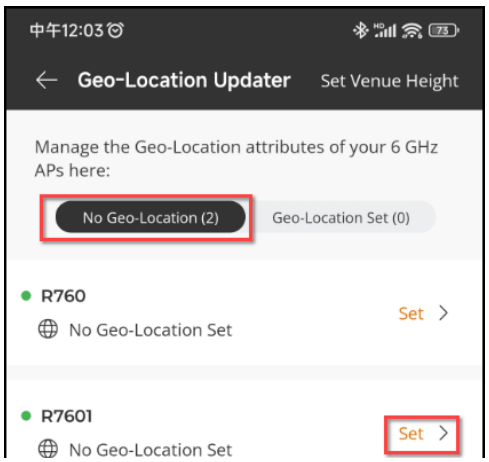


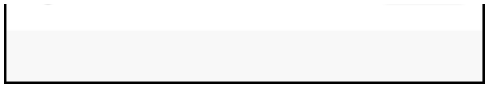
d. Place the mobile phone close to the AP and ensure your device can receive signals from the AP.

e. Log into the RUCKUS One mobile app again with your account and register the geolocation to your AP.

f. Select the Geo-Location Management menu
APs in the selected venue, without the geolocation coordinates, are listed in the No Geo-Location tab.

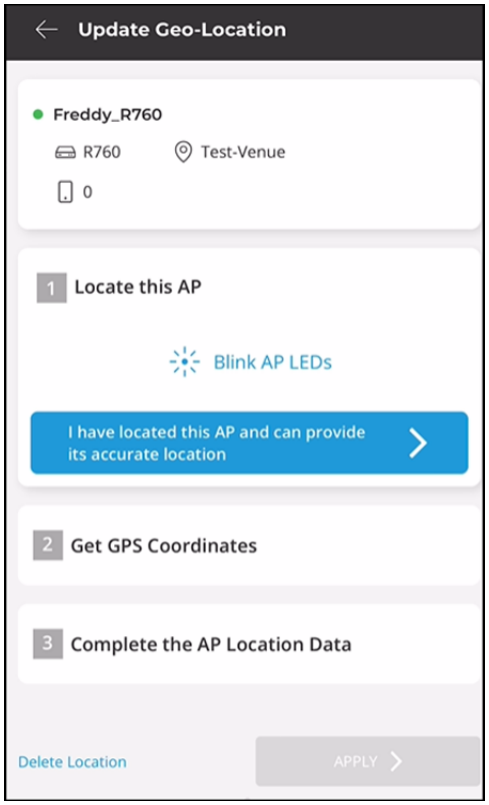
APs Without Geolocation Coordinates (RUCKUS One Mobile App)





g. To set the geolocation, click Set next to an AP.
The AP details screen is displayed.

AP Details Page (RUCKUS One Mobile App)

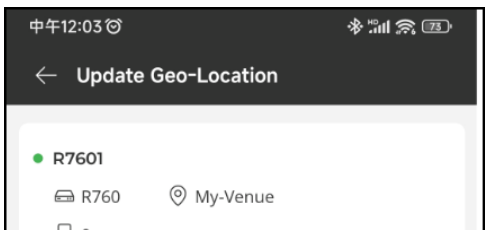


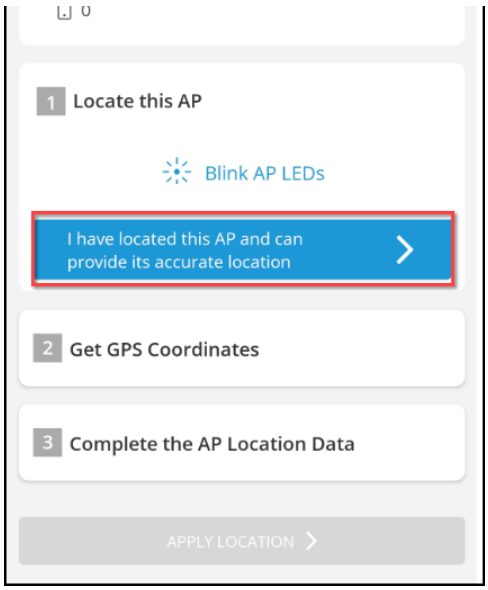
h. Complete the following steps to locate and get GPS coordinates.

1) In the Step 1 (Locate this AP) tile, click Blink AP LEDs. The LED light in the respective AP starts blinking. This is to help you identify the device for which you would need to set the geolocation.

2) After identifying the AP, click I have located this AP and can provide its accurate location. A check mark appears and the wizard proceeds to the next Step (Get GPS Coordinates) tile.

Locating the AP (RUCKUS One Mobile App)

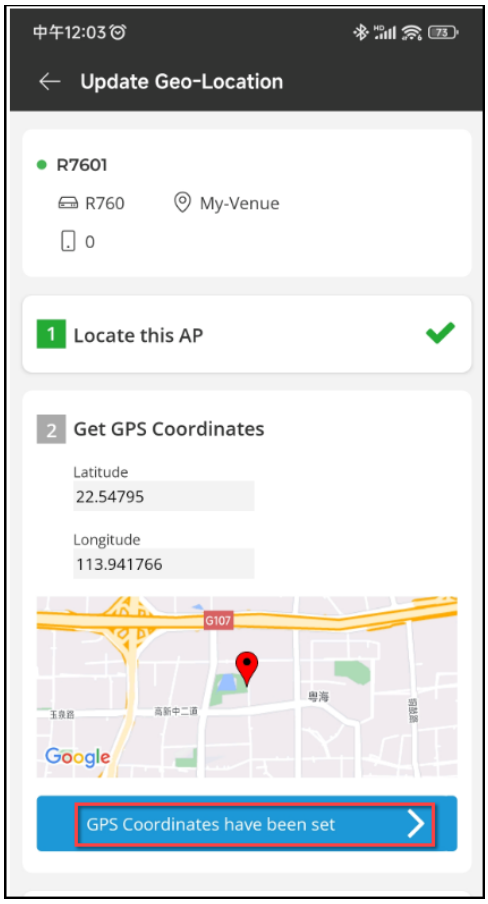




3) Move your mobile device as close as practicable to the AP. You can view the GPS location in the Google map displayed in the Step 2 (Get GPS Coordinates) tile.

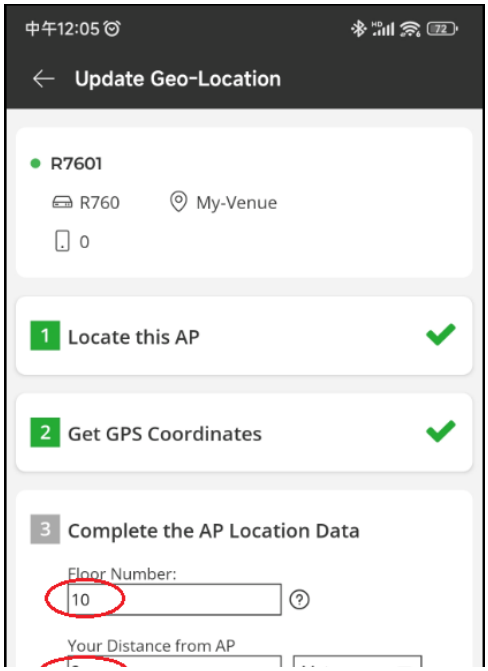
4) After verifying the location on the Google map, click GPS coordinates have been set. A check mark appears and the wizard proceeds to the Step 3 (Complete the AP Location Data) tile.

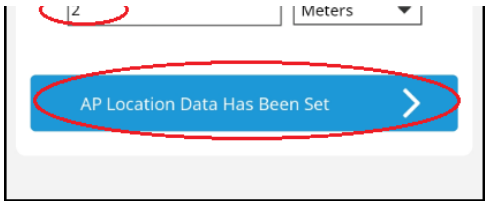
Getting GPS Coordinates (RUCKUS One Mobile App)



5) In the Step 3 (Complete the AP Location Data) tile, enter the Floor Number, enter Your Distance from AP, and select the distance unit of measure.

AP Location - Floor Number and Your Distance (RUCKUS One Mobile App)

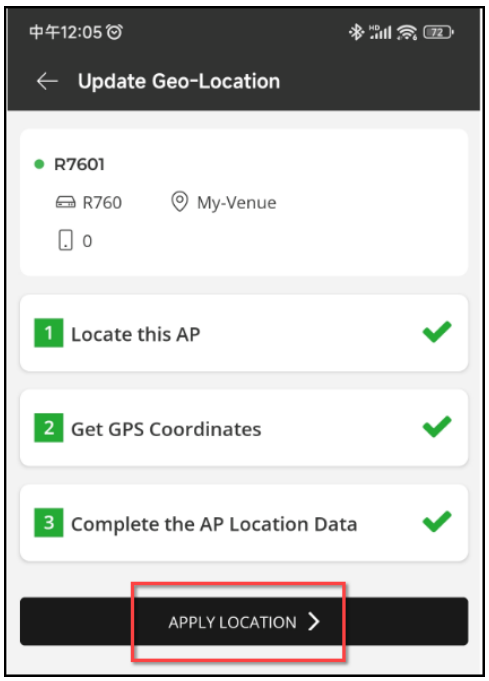




n. Click AP Location Data Has Been Set. A check mark appears and the Apply Location button becomes active.

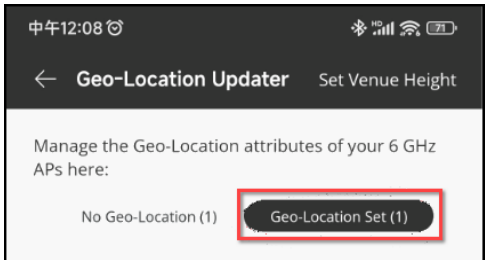
o. Click APPLY LOCATION.
The geolocation settings are applied to the AP.

Applying Location Settings (RUCKUS One Mobile App)



p. Ensure that the geolocation setting has been applied to your AP successfully. The AP will be moved to the Geo-Location Set tab and the status of the AP will be set to Manual.

Geo-Location Status Change to Manual (RUCKUS One Mobile App)



6. Complete the following fields to configure 6 GHz band.
   - Channel selection method: By default, ChannelFly is selected.
   - Channel Change Frequency: This option is displayed only if you select the Channel Selection Method as ChannelFly. Adjust the frequency between 1-100. By default, 33 is selected.
   - Run background scan every [ ] seconds: If you selected Background Scanning, interval at which RUCKUS One will run the scan. The interval ranges from 1 through 65535 seconds. For 2.4 GHz and 5 GHz, the default is 20 seconds. For 6 GHz, the default is 10 seconds.
   - Bandwidth: Select Auto, 20 MHz, 40 MHz, 80 MHz, 160 MHz, or 320 MHz channel width from the drop-down list.
   - Transmit Power Adjustment: Select the transmit power adjustments from the drop-down list. The default is Full.
   - BSS Min Rate: Select HE MCS 0, HE MCS 1, HE MCS 2, or HE MCS 3 from the drop-down list.
   - Mgmt Tx Rate: Select 6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, or 24 Mbps from the drop-down list.
   - Channel Selection: A blue icon containing the channel number indicates that the channel is enabled for the radio. If there are channels that you do not want the radio to use, disable them by clicking their respective icons. When a channel is disabled, its blue icon changes to gray.

7. (Optional) Click Reset to Default Settings to revert to default settings.

Configuring Load Balancing

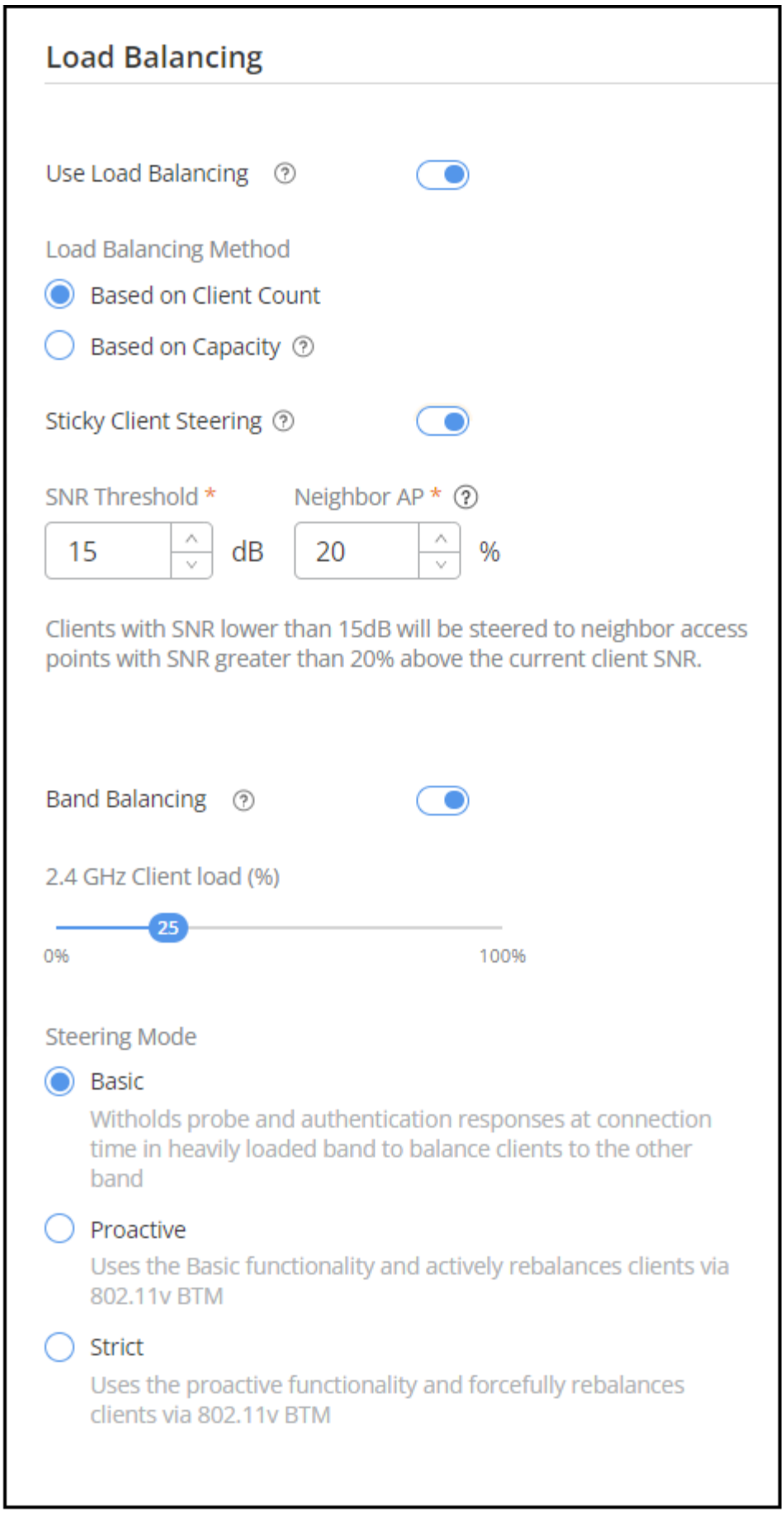
▶️

Note: Make sure Background Scanning is selected for Channel selection method on the radios for which you would like to enable Load Balancing. Also, at the Wi-Fi network level, enable Load Balancing on network configuration (More Settings > (and then)Radio > (and then)Load Control options).

1. Select the Load Balancing sub-tab and toggle the Use Load Balancing switch to ON. By default,

Load Balancing is set to OFF.

Load Balancing Sub-tab


Load Balancing
Use Load Balancing
Load Balancing Method
Based on Client Count
Based on Capacity
Sticky Client Steering
SNR Threshold *
15
dB
Neighbor AP *
20
%
Clients with SNR lower than 15dB will be steered to neighbor access points with SNR greater than 20% above the current client SNR.
Band Balancing
2.4 GHz Client load (%)
25
0%
100%
Steering Mode
Basic
Witholds probe and authentication responses at connection time in heavily loaded band to balance clients to the other band
Proactive
Uses the Basic functionality and actively rebalances clients via 802.11v BTM
Strict
Uses the proactive functionality and forcefully rebalances clients via 802.11v BTM

2. For Load Balancing Method, choose one of the following methods:
   - Based on Client Count (default): Distributes clients evenly across APs by considering the number of connected devices.
   - Based on Capacity: Allocates clients to APs based on their available capacity, which includes factors such as bandwidth, data rate, and the number of streams. Choosing this option will hide the Band Balancing setting from the user interface.

3. Toggle the Sticky Client Steering switch to ON and configure the following settings:
   By default, Sticky Client Steering is disabled.

   Note: You must enable the Use Load Balancing option to configure the Sticky Client Steering setting.

   a. SNR Threshold (dB): The Signal-to-Noise Ratio (SNR) threshold is a value that determines the minimum acceptable SNR for a client device to maintain a connection with an AP. Enter a threshold value ranging from 5 to 30. The default value is 15.

   b. Neighbor AP (%): The Neighbor AP threshold is a value that represents the minimum acceptable percentage of signal strength from neighboring APs compared to the current AP. Enter a threshold value ranging from 10 to 40. The default value is 20.

   Note: If you disable Load Balancing, Sticky Client Steering feature on all the APs in the venue will be deactivated.

   For more information, refer to *Sticky Client Steering (GUID-089696F6-B051-4700-9A87-26D945D5BD7C.html)*.

4. Toggle the Band Balancing switch to ON. Move the slider to configure the 2.4 GHz Client load percentage. By default, Band Balancing is enabled.
   Band Balancing typically distributes clients between different frequency bands (2.4 GHz, 5 GHz, and 6 GHz) to avoid congestion on a single band.

5. Select a Steering Mode from the following options:
   - Basic (default): Delays probe and authentication responses during connection time in a heavily loaded band to balance clients to the other band.
   - Proactive: Uses the Basic functionality and actively rebalancing clients using IEEE 802.11v BSS Transition Management (BTM).
   - Strict: Uses the Proactive functionality and forcefully rebalances clients using IEEE 802.11v BTM.

   Note: Sticky Client Steering requires the clients to support IEEE 802.11v for optimal operation. In Strict mode for non-802.11v clients, the Sticky Client Steering algorithm will send an IEEE 802.11 disassociation message to the client to force the client to scan for neighboring APs with a better potential service.

The following table specifies the client behavior on different steering modes:

Client Type	Basic	Proactive	Strict
Non-802.11v	No steering actions are taken	No steering actions are taken	The client is disconnected from the current AP if it does not move to a better AP.
802.11v	The BTM frame is sent, allowing the client (STA) to decide whether to move to a better AP.	The BTM frame is sent, allowing the client (STA) to decide whether to move to a better AP.	The BTM Disassoc-imminent option is used, notifying a client device that it must move to another AP within a specified time, or it will be disassociated from the current AP.

Configuring Client Admission Control

Disable Load Balancing and Band Balancing at the venue level to enable Client Admission Control. By default, Client Admission Control is disabled.

1. Toggle the Enable 2.4 GHz and Enable 5 GHz switches to ON.
   You can apply the Client Admission Control setting on different frequency bands separately to manage client access and performance.

2. Configure the following settings:
   - Min. client count: The minimum number of clients that must be connected to a venue ensuring Client Admission Control is enforced only when there are sufficient number of clients, avoiding unnecessary restrictions during light network load. Select a value ranging from 0 through 100.
   - Min. radio load (%): The minimum percentage of radio load (utilization) required to manage network resources effectively. Select a value ranging from 50 through 100.
   - Min. client throughput (Mbps): The minimum throughput that each client must achieve to maintain a minimum performance standard for connected clients by restricting new connections if throughput drops below the threshold. Select a value ranging from 0 through 100.

Configuring the Antenna

1. Select the Antenna sub-tab.

2. Select the AP Model from the drop-down list. Depending on the AP model, configure the following parameters:
   - E510: Toggle the Enable 2.4 GHz and Enable 5 GHz switches to ON. Specify the antenna gain for 2.5 GHz and 5 GHz as specified in the antenna data sheet and then click Save.
   - T350SE: Toggle the Enable switch to ON. Configure the 2.4 GHz Antenna gain and 5 GHz Antenna gain as specified in the antenna data sheet and then click Save.
   - T750SE: Toggle the Enable switch to ON. Specify the parameters for 2.4 GHz Antenna gain and 5 GHz Antenna gain as specified in the antenna data sheet and then click Save.
   - T670SN: Select the Antenna Type. Options include Sector and Narrow.

AP Model Enable Options