

# AP Performance Optimization and RF Troubleshooting

—The Lunchtime Network Curse: Using Full-Link Telemetry to Precisely Locate Non-Wi-Fi Interference

# 1 Introduction

In campus network operations, one of the most frustrating issues for engineers is periodic, "mysterious" lag spikes. For example, every day at lunchtime when someone heats up food in the breakroom, the surrounding Wi-Fi disconnects; or when wireless screen sharing starts in a conference room, video calls frequently experience screen tearing. These phenomena are typically caused by non-Wi-Fi interference sources such as microwave ovens and wireless video transmitters. Since these devices do not follow the 802.11 protocol, conventional scanning tools cannot identify them. They "devour" effective Wi-Fi bandwidth in an instant by raising the ambient noise floor.

This guide will teach you how to use deep telemetry data from the Asterfusion OpenWIFI Controller across Client View, Key Events, and Device View to precisely locate the invisible killers operating in the 2.4 GHz and 5 GHz bands.



Figure 1 AP WiFi-Scan

## 2 Core Troubleshooting Logic: Noise Floor and Signal-to-Noise Ratio (SNR)

The physical essence of Wi-Fi transmission quality lies in the signal-to-noise ratio: **SNR = RSSI**

## (Signal Strength) – Noise (Ambient Noise Floor).

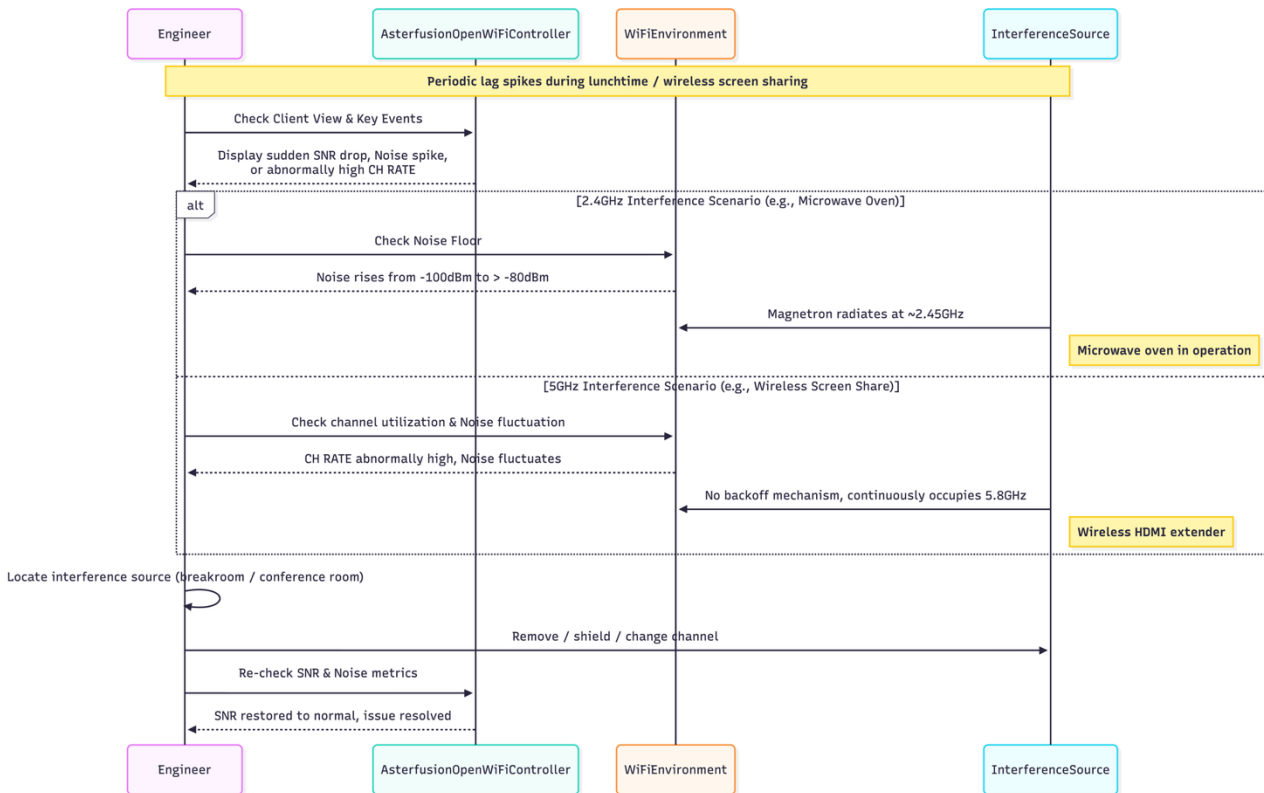


Figure 2 Check Logic

**2.4 GHz Interference Scenario (e.g., Microwave Oven):** The magnetron radiation frequency (around 2.45 GHz) instantly raises the ambient noise floor from a normal level of -100 dBm to -80 dBm or even higher. Even if the terminal signal (RSSI) is -50 dBm, the SNR plummets due to the surge in noise floor, resulting in transmission failure.

**5 GHz Interference Scenario (e.g., Proprietary Protocol Wireless Screen Sharing):** Many wireless HDMI extenders lack a backoff mechanism and continuously occupy the 5.8 GHz band (e.g., channel 149) to transmit high-bitrate video streams. On the controller, this manifests as abnormally high channel utilization (CH RATE) in that band, with the noise floor fluctuating accordingly.

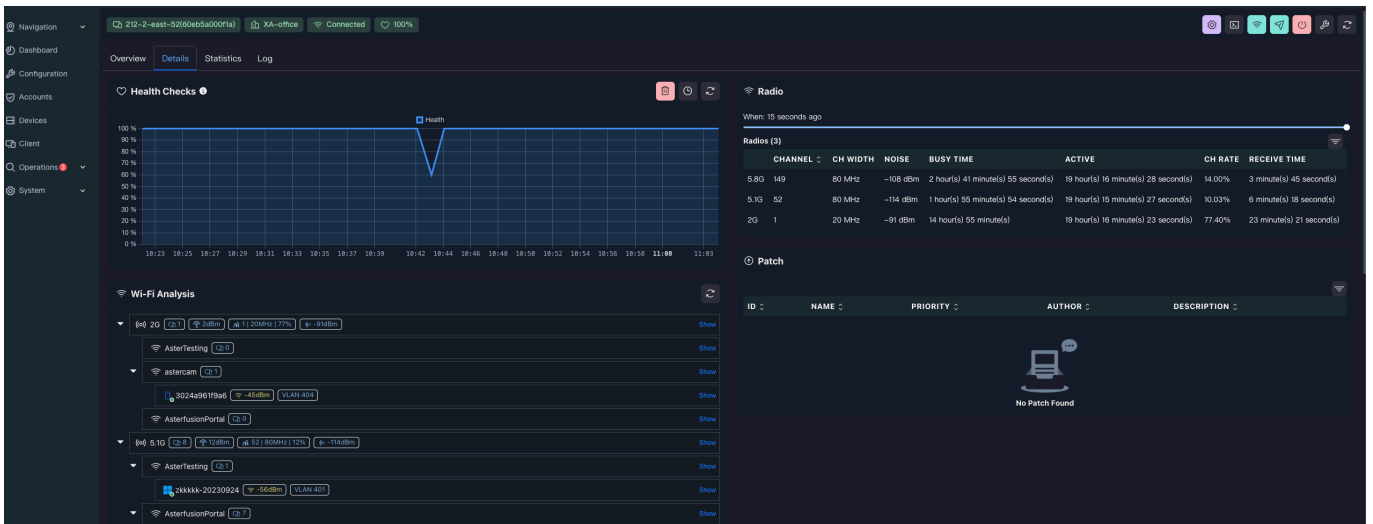


Figure 3 Channel Utilization

## 3 Controller Practical Operation: Three-Dimensional Cross-Validation

### ● Dimension One

#### Terminal SNR Trend Tracking (Pinpointing Interference Timing)

When a user reports lag, navigate to the [Client] menu on the controller, locate the corresponding terminal (e.g., Xiaomi-14-Pro), and view its SNR Trend curve.

- Normal Baseline: Review the historical data. When the noise floor is stable at -108dBm and SNR is as high as 61dB, network performance is excellent.

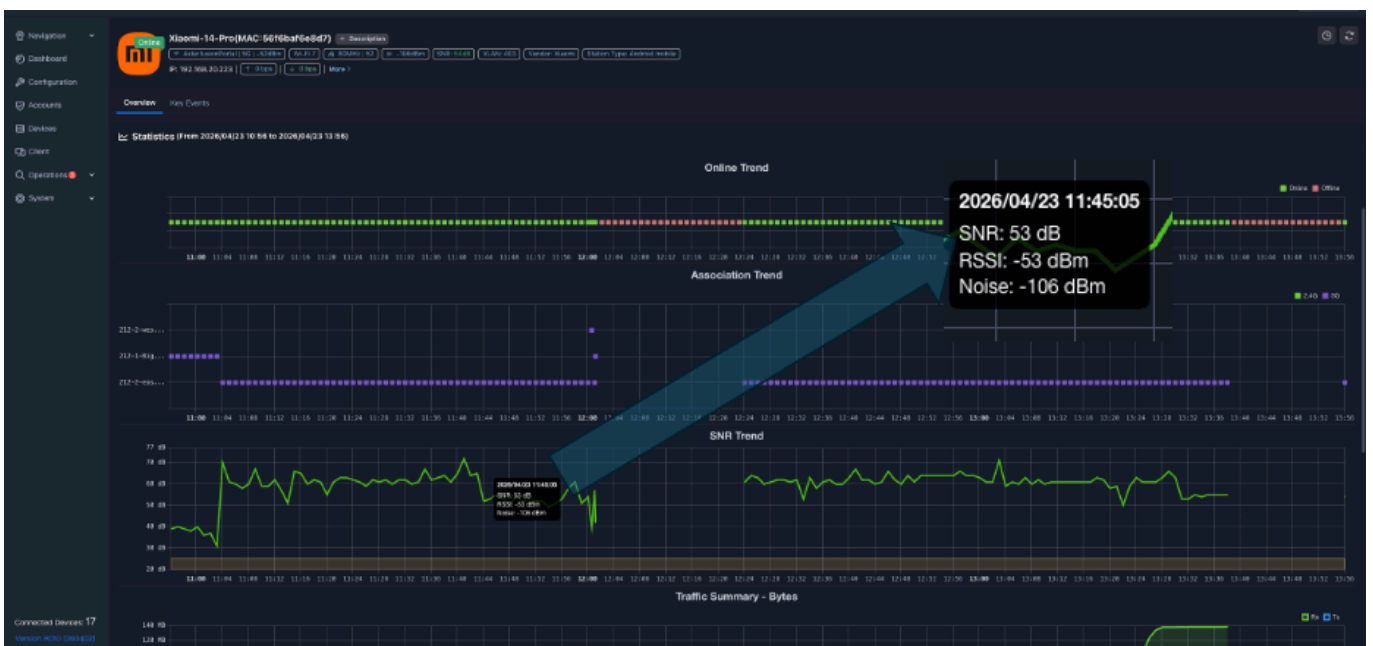


Figure 4 Client View

- Anomaly Identification: If during the lag period the curve shows that RSSI remains steady (e.g., at -47dBm), but Noise suddenly rises to -80dBm, causing SNR to contract sharply, it can be determined that physical-layer RF interference exists on site.

## ● Dimension Two

### Key Events Log (Validating Roaming and Addressing)

View the terminal's behavior when interference occurs through [Key Events].

- Logic Validation: If the terminal remains Associated - Success during the lag period and fully completes DHCP Ack to obtain an IP address, it indicates that the L2/L3 link logic is normal, and the lag is entirely caused by physical-layer contention on the air interface.

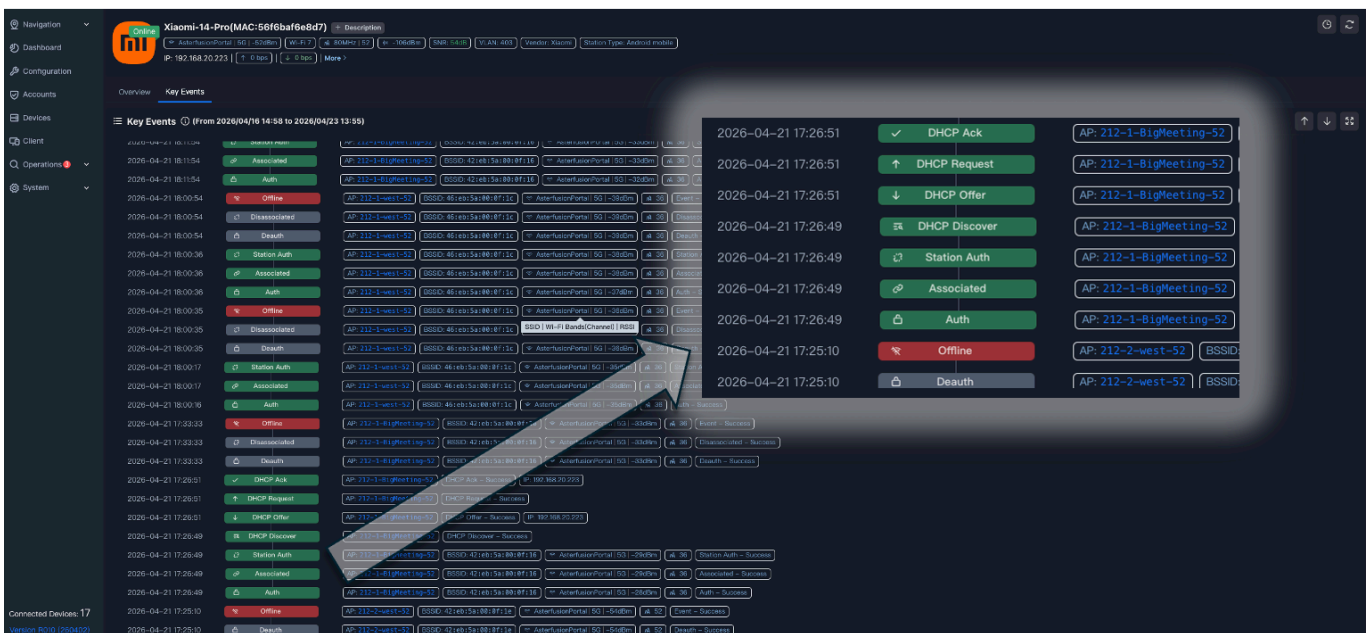


Figure 5 Client Key Event

- Path Restoration: Examine the Roaming records to confirm that the terminal experienced performance degradation under a specific AP (e.g., 212-1-BigMeeting-52), thereby narrowing down the physical troubleshooting scope.



Figure 5 Client Key Event

## ● Dimension Three

### AP-side RF Metric Analysis (Identifying the Affected Band)

Drill down to the target AP's [Details] page and use the Radio metrics table to determine which band is "hit":

- **Abnormal Noise Floor Comparison (NOISE):** Observe the noise floor differences across different bands. In a normal environment, the noise floor is typically around -95dBm. If during measurement you find that the noise floor on a particular band (e.g., 2.4GHz Channel 1) is significantly elevated, reaching -87dBm or even exceeding -80dBm, it indicates that the band is suffering from severe physical-layer RF interference.

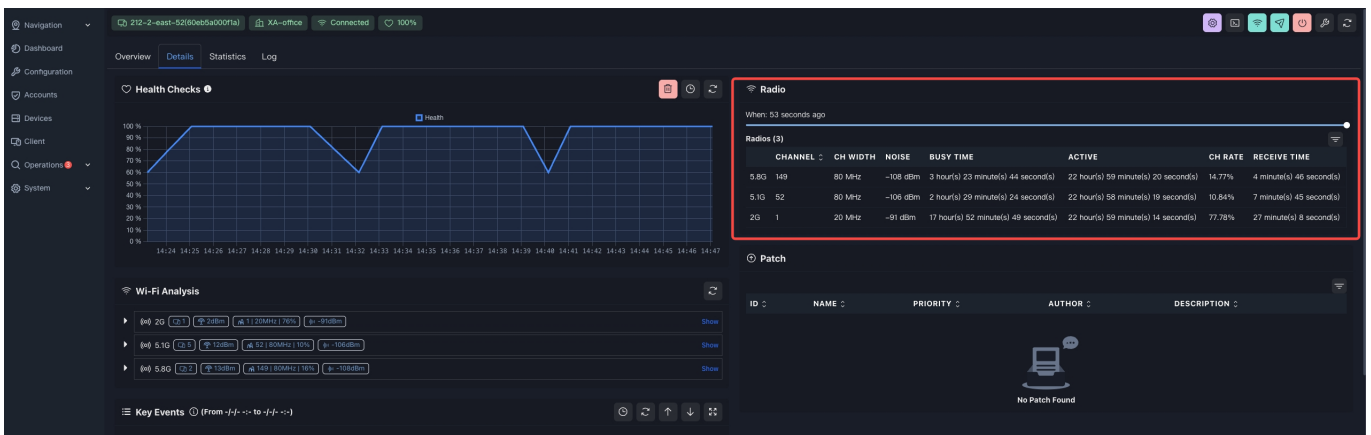


Figure 6 Radio Detail

- **Channel Utilization Spike (CH RATE):** Examine channel utilization alongside the noise floor. For example, if channel utilization on the 2.4GHz band has skyrocketed to 77.25%, even when few clients are associated and no heavy traffic downloads are occurring, it means that precious airtime resources are being heavily consumed by environmental interference. Similarly, if you observe the same "dual-high" phenomenon (high noise floor + abnormally high utilization) on the 5GHz band (e.g., conference room Channel 149), it points to non-Wi-Fi interference sources such as wireless screen sharing devices in the conference room.

## 4 Optimization Recommendations: "Physical Steering" and Avoidance in Dual-Band Same-SSID Deployments

In real-world enterprise deployments where both 2.4GHz and 5GHz share the same SSID (dual-band same-SSID), to encourage client NICs to actively flee from 2.4GHz interference and connect to 5GHz, it is recommended to implement the following physical-layer tuning strategies via the Asterfusion OpenWiFi Controller:

### Strategy 1: Asymmetric Power Steering (Creating a 5G Signal Advantage)

Client NICs are inherently inclined to associate with the band that offers a higher received signal strength (RSSI). It is recommended to significantly reduce the 2.4GHz transmit power (e.g., down to 10dBm) in the controller's radio configuration, while maintaining or increasing the 5GHz band power (e.g., to 18dBm). By artificially creating a signal disparity at the physical layer, dual-band clients are "tricked" into prioritizing 5GHz association.

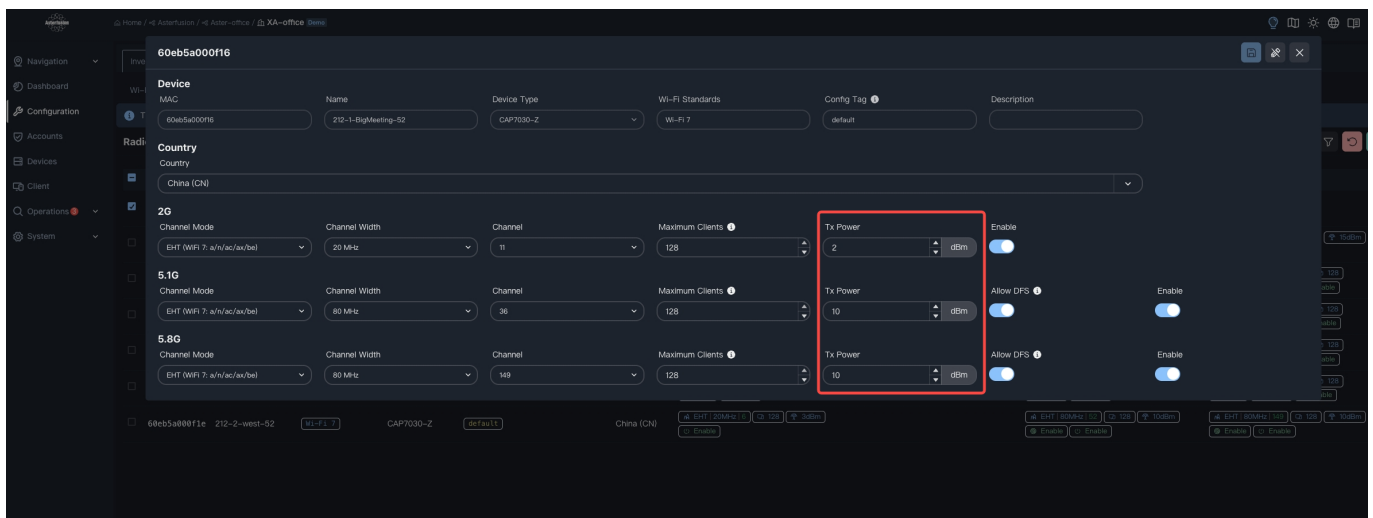


Figure 7 Tx-Power config

### Strategy 2: 2.4GHz Basic Rate Trimming (Reducing 2.4G Coverage Radius)

This is an advanced technique for dual-band same-SSID scenarios. Navigate to the SSID advanced settings and disable low basic rates on 2.4GHz (e.g., 1Mbps, 2Mbps, 5.5Mbps, etc.). This physically reduces the effective coverage radius of 2.4GHz, cutting off connections from distant, weak-signal clients to the 2.4GHz band. It forces clients that have been "sticking" to 2.4GHz to disconnect and attempt to associate with the higher-speed 5GHz band.

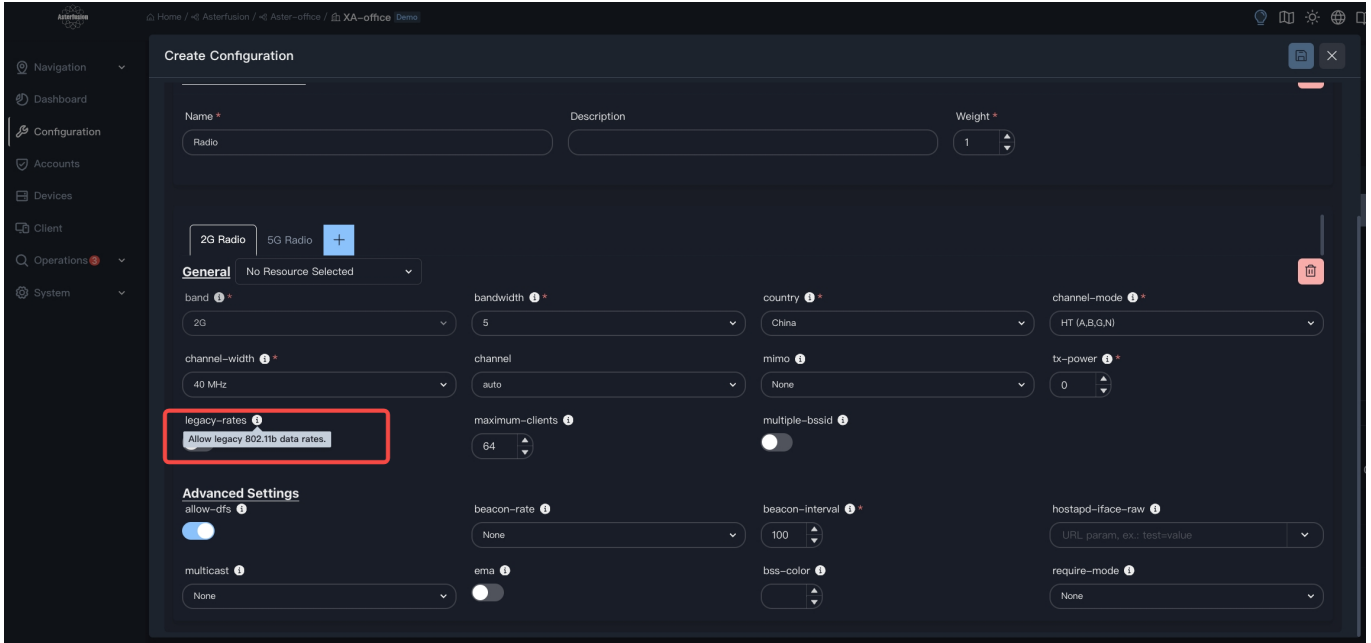


Figure 8 Disable 802.11b

### Strategy 3: Manual 5GHz Channel Avoidance

If the 5GHz band is interfered with (e.g., persistent interference from a wireless screen sharing device on 5.8GHz Channel 149), manually fix the 5GHz radio of the affected conference room AP to Channel 157 or a cleaner 5.1GHz channel (e.g., Channel 52), thereby completely shifting away from the interference source at the physical frequency band level.

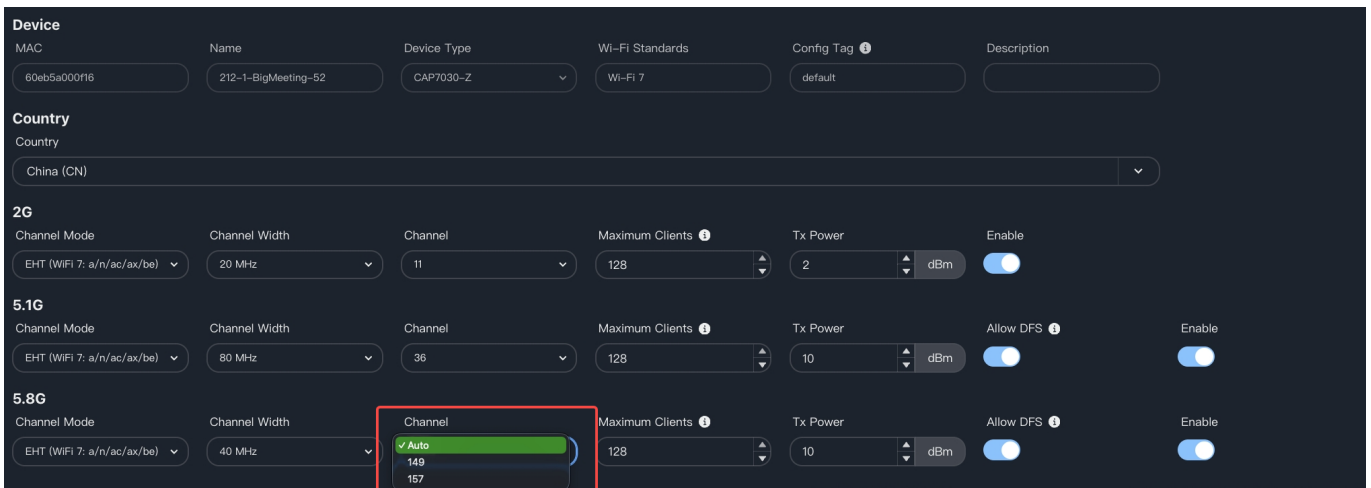


Figure 9 Select channel

## 5 Final Troubleshooting Checklist

Phase	Controller View	Normal Reference	Corrective Action
<b>L1 Physical Layer Detection</b>	[Client] -> SNR Trend	Noise Floor < -95dBm	When sudden spikes occur, investigate on-site appliances or wireless HDMI devices
<b>L2 Stability Validation</b>	[Client] -> Key Events	Status: Associated with DHCP Ack	If roaming is normal but lag persists, focus on the physical environment of the current AP
<b>L3 RF Load Assessment</b>	[Devices] -> Radio	Channel Utilization (CH RATE) < 60%	If CH RATE > 70% with high noise floor, perform manual channel avoidance
<b>Overall Strategy</b>	[Configuration]	High 5GHz association ratio under dual-band same-SSID	Lower 2.4GHz transmit power; disable 2.4GHz low basic rates