

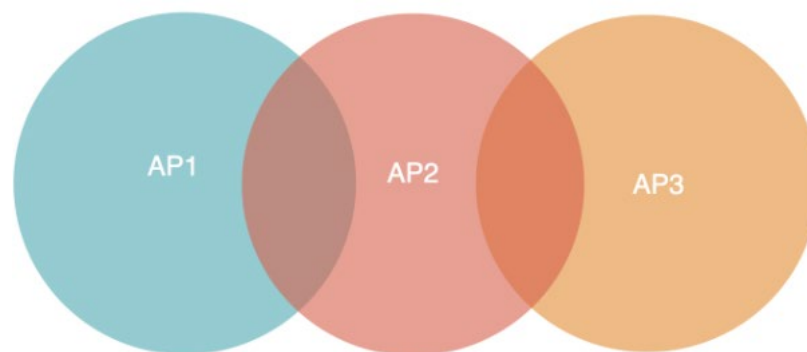
Cisco Wireless Phone 9821

Wireless LAN Deployment Guide

(Abbreviated version)

Cisco Wireless Phone 9821 supports IEEE 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac, and 802.11ax (20M/40M/80M bandwidth) and works in 2.4 GHz, 5 GHz, and 6 GHz channels.

Each Access Point (AP) provides a wireless coverage area, commonly referred to as a cell, as illustrated in the following figure. These overlapping APs collectively establish a roaming zone. Cisco Wireless Phone 9821 maintains connectivity by associating with an AP and performing seamless handovers between adjacent APs as the user moves throughout the facility.



The figure above illustrates the recommended coverage and overlap for neighboring Access Points (APs). Within a roaming zone, all APs must operate within the same regulatory domain and utilize non-overlapping channels. Design the cell edge at -67 dBm to ensure a 15% to 20% overlap with adjacent AP cells.

In addition to signal strength, maintain Channel Utilization (CU) below 40% on both the connected and neighboring APs. High channel utilization can lead to increased latency, packet loss, and transmission failures.

This overlapping coverage is essential to ensure seamless roaming for the Cisco Wireless Phone 9821. The 9821 supports both Fast Transition (FT) and legacy roaming; however, we strongly recommend configuring FT on the APs to optimize roaming performance.

In summary, Cisco Wireless Phone 9821 provides optimal performance when the connected Access Point (AP) maintains a signal strength of at least -67 dBm, an SNR of 25 dB or higher, and channel utilization below 40%. Under these conditions, the 9821 can perform seamless roaming between adjacent APs, ensuring that active voice calls and meetings remain uninterrupted, provided the APs share the same regulatory domain and maintain adequate coverage overlap.



When configuring network infrastructure, administrators should avoid using Dynamic Frequency Selection (DFS) channels. For optimal signal propagation, avoid installing Access Points (APs) near glass or metal surfaces, and ensure they are not obstructed by heavy metal ductwork or concrete pillars.

For tri-radio APs (2.4 GHz, 5 GHz, and 6 GHz), configure the maximum transmit power to follow a tiered approach: 2.4 GHz < 5 GHz < 6 GHz, maintaining a 3–5 dB gap between each band. For example, a recommended transmit power settings might include 3 dBm (2.4 GHz), 8 dBm (5 GHz), and 13 dBm (6 GHz).

Cisco Wireless Phone 9821 has been tested for interoperability with most current Cisco Catalyst and Meraki infrastructure devices. While the phone is primarily designed for indoor use, please note that while basic connectivity may be supported with third-party APs, interoperability regarding seamless roaming and enhanced features cannot be guaranteed.

Supported Wi-Fi authentication and encryption algorithms

Cisco Wireless Phone 9821 supports the following Wi-Fi authentication and encryption algorithms:

- Open and OWE
- WPA2 -PSK
- WPA3 - SAE
- EAP-PEAP (including GTC and MSCHAPv2)
- EAP-FAST
- EAP-TLS (including MIC, LSC and user installed certificates)
- CCMP
- GCMP (including Suite-B and Suite-B-192b)

Note: CCMP256 encryption cipher is not supported.

Configurable Wi-Fi profiles

Cisco Wireless Phone 9821 supports four independent profiles. Each profile allows for the configuration of specific parameters, including the SSID, security mode, and preferred frequency band.

Profile priority is fixed: Profile 1 holds the highest priority, while Profile 4 holds the lowest. When multiple profiles are enabled, the phone attempts to establish a connection by iterating through the profiles in descending order of priority.

It is recommended to avoid configuring the same SSID across multiple profiles. If the same SSID is configured in more than one profile, the phone will exclusively select the profile with the highest priority and disregard any lower-priority profiles containing the same SSID.

Battery Life

Cisco Wireless Phone 9821 is a mobile device powered by a rechargeable battery. Battery capacity naturally diminishes over repeated charge cycles; therefore, it is recommended to replace the battery approximately every two years to ensure optimal performance.

A fully charged battery provides up to 145 hours of idle time or 11.5 hours of talk time. Please note that these figures are estimates; actual battery life varies based on the wireless environment and specific usage patterns. The following factors can reduce battery life.

Network Environment

- **Weak Signal Strength:** Operating in areas with an RSSI lower than -67 dBm forces the device to increase transmit power.
- **Out-of-Range Conditions:** If the device loses connection, it will continuously scan for an AP, which significantly increases power consumption.
- **Background Traffic:** Unnecessary network traffic, such as service/port scans, probes, or monitoring packets, keeps the radio active.

Recommended Configuration Settings

To maximize battery life, we recommend the following configuration thresholds:

- **DHCP Lease Time:** 8 hours or greater.
- **AP Session Timeout:** 24 hours or greater.
- **AP Rekey Interval:** 4 hours or greater.
- **EAP Reauthentication Interval:** 8 hours or greater.
- **SIP Keepalive Interval:** 120 seconds or greater.

Usage Patterns and Features

- **Remote Management:** Frequent access via web interfaces, SSH, XAPI, or XSI applications.
- **Multicast Traffic:** Participation in multicast groups (e.g., PTT, paging) keeps the device active to process incoming streams.
- **WxC Services:** Frequent messaging from WxC services.
- **Battery-Intensive Features:** Enabling features such as Background Noise Reduction (BNR) will increase power consumption.

Bluetooth co-existence

Cisco Wireless Phone 9821 supports Bluetooth headsets, which operate in the 2.4 GHz frequency band. To minimize potential interference between Bluetooth and Wi-Fi, it is recommended to configure the phone to utilize the 5 GHz or 6 GHz bands for Wi-Fi connectivity whenever a Bluetooth headset is in use.

PFS

Disable the Image Pre-download (PFS) feature for wireless devices. This process is resource-intensive and can negatively impact battery life.

Limitation

- **Duplicate SSIDs Across Profiles:** If the same SSID is configured across multiple profiles with different radio settings (2.4, 5, or 6 GHz), the device may experience increased latency during reconnection attempts after moving out of range (OOR).
- **IGMP Support:** Cisco Wireless Phone 9821 supports IGMPv2 exclusively. Ensure that the network infrastructure is configured to be compatible with this version to maintain proper multicast functionality.

Sample WLC/AP configuration

Here is a sample WLC/AP recommended configuration for your reference.

- Enable the **802.11r (FT)** feature
- Disable the **CCKM** feature
- Disable the **Call Admission Control (CAC)** feature
- Set **Quality of Service (QoS)** to **Platinum**
- Set the **WMM Policy** to **Required**
- Enable the **Session Timeout** feature and configure the value for a long time, such as 24 hours
- Enable the **Broadcast Key Interval** feature and configure the value for a long time, such as 8 hours
- Enable the **Aironet IE** feature
- Disable the **P2P (Peer to Peer) Blocking Action** feature
- Enable the **Advertise AP name** feature
- Set **Protected Management Frame (PMF)** to **Optional** for WPA2, while mandatory for WPA3
- Set the **DTIM Period** to 2 if no multicast application
- Disable the **Client Band Select** feature
- Enable the **IGMP Snooping** feature
- Disable the **Over DS** feature
- Enable the **RNR, PSC enforcement**, and **FILS discovery** features for 6G APs
- Set **40M** or **80M** channel bandwidth for 5G and 6G APs
- Enable the **6G Clients Steering** feature
- Keep default **RRM** and **Radio** settings