



Cambium-SpectraLink Configuration Guide

System Release 1.4



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Abbreviations and Terms

Terms	Description
AP	Access Point
CLI	Command line Interface
IP	Internet Protocol
MAC	Media Access Control (Hardware Address)
RFID	Radio Frequency Identification
RTLS	Real Time Location System
Tag	AeroScout Tag
UDP	User Datagram Protocol
WLAN	Wireless Local Area Network

Revision History

Date	Version #	Author(s)
5/1/2022	1.0	Marc Hemann

Introduction

Mobile workers are estimated to make up 80% of the global workforce. Spectralink empowers mobile workers by providing mobile devices allowing for improved communication, collaboration, engagement, productivity, and safety across an organization. Spectralink's Voice Interoperability for Enterprise Wireless (VIEW) Certification Program is designed to ensure interoperability and high performance between Spectralink Wireless Telephones and WLAN infrastructure products.

Cambium Networks Wi-Fi 6 access points and Enterprise Management Systems provide the network bandwidth and infrastructure necessary for Spectralink. Cambium Networks Wi-Fi products, in accordance with Spectralink's VIEW certification program, provide a single, unified wireless network throughout the customer's facility. Spectralink's solutions leverage the Wi-Fi network to enable customers to provide mobile devices to their mobile workers which allows for improved access to office resources and increased productivity.

Cambium Networks empowers millions of people with wireless connectivity worldwide. Our wireless portfolio is used by commercial and government network operators as well as broadband service providers to connect people, places, and things. With a single network architecture spanning fixed wireless and Wi-Fi, Cambium Networks enables operators to achieve maximum performance with minimal spectrum. End-to-end cloud management transforms networks into dynamic environments that evolve to meet changing needs with minimal physical human intervention. Cambium Networks empowers a growing ecosystem of partners who design and deliver gigabit wireless solutions that just work.

Cambium Networks provides industry-leading solutions used in many areas such as:

- Education
- Enterprise
- Federal Government
- Healthcare
- Hospitality
- Industrial
- Oil and Gas
- Public Wi-Fi
- Retail
- Service Providers
- Smart Cities

Solution Overview

Spectralink devices use Cambium Wi-Fi networks as core infrastructure. All mobile wireless solutions require Wi-Fi infrastructure devices to connect to and interoperate with office network resources. Spectralink provides mobile devices allowing access to back office systems to improve communication, collaboration, productivity, and safety.

Cambium Networks Enterprise Wi-Fi Access Points

Cambium Networks XV access points, cnMaestro X, and XMS-Cloud management systems deliver Enterprise grade Wi-Fi with Single Pane of Glass visibility to manage 802.11 Wi-Fi. Edge intelligent 802.11 access points are RF aware, provides seamless roaming and make intelligent decisions at the most impacted access point. Edge intelligent networks support more devices and more content, at higher bit rates.

Cambium Networks Wi-Fi 6 access points, the XV3-8 and XV2-2 deliver all the features available in the 802.11ax specification such as:

- Multi-user OFDMA – more efficient for small to large packet sizes.
- 8x8 MU-MIMO – offer targeted beam steering and 2x capacity.
- Spectrum reuse – allows multiple networks to overlap.
- Target Wait Time – schedules sleep and wake uptime.
- Preamble 3dB and longer OFDM symbol – extend the outdoor range.
- 1024 QAM and 2.4 GHz band operation.

XV3-8-Indoor Wi-Fi 6 Access Point

The XV3-8 features a total of five radios to deliver a next-generation network with edge services with high capacity and high density. Three data radios can be configured as two 5 GHz 4x4 plus one 2.4 GHz 4x4, or the two 5 GHz radios can be combined into a single 5 GHz 8x8 radio with the maximum power and performance of the 802.11ax standard. A dedicated network scanning radio provides continuous network monitoring to enhance security protocols, detailed network reports, and automatic RF optimizations. Add the Bluetooth Smart 4.1 IoT radio for BLE-based location services and you get a multi-radio, high-capacity Wi-Fi 6 AP designed for the most demanding networks in the enterprise, healthcare, education, retail, and public places.

XV2-2-Indoor Wi-Fi 6 Access Point

The XV2-2 is a dual-radio Wi-Fi 6 access point designed to deliver next-generation networks with edge services at a value-based price. While delivering all the features available in the 802.11ax specification, the XV2-2 is fully backward compatible with existing Wi-Fi technology and enables interoperability and high performance of Spectralink Wireless Telephones.

cnMaestro X Management System

cnMaestro X is a simple, yet sophisticated cloud-first, next-generation network management solution for Cambium Networks wireless and wired solutions. The system can run in the cloud, or onsite, in your existing VM environment. cnMaestro X offers single-pane-of-glass management to deliver secure, end-to-

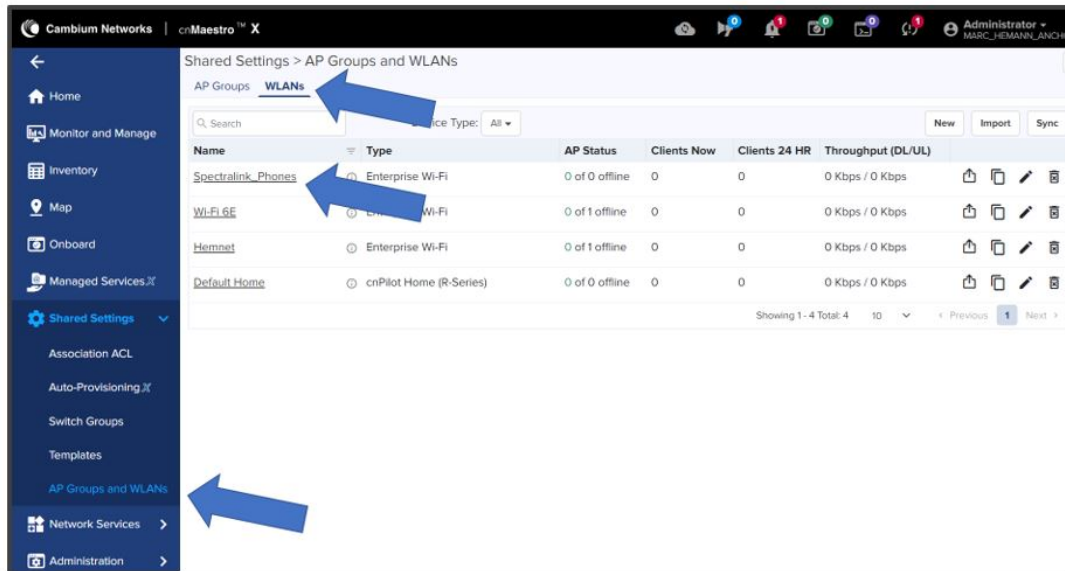
end network and wireless lifecycle management with zero-touch provisioning, monitoring, and troubleshooting capabilities. Advance features include an MSP Dashboard, Restful APIs, Webhooks, application visibility, support for Software Defined Radios, support for 1,024 Enterprise Wi-Fi PSKs, and Advanced Captive Portal capabilities including paid gateways. The powerful set of tools simplifies operations, troubleshooting, and ongoing maintenance.

Configuration – Cambium and Spectralink

Configuring the Cambium Access Points in cnMaestro X

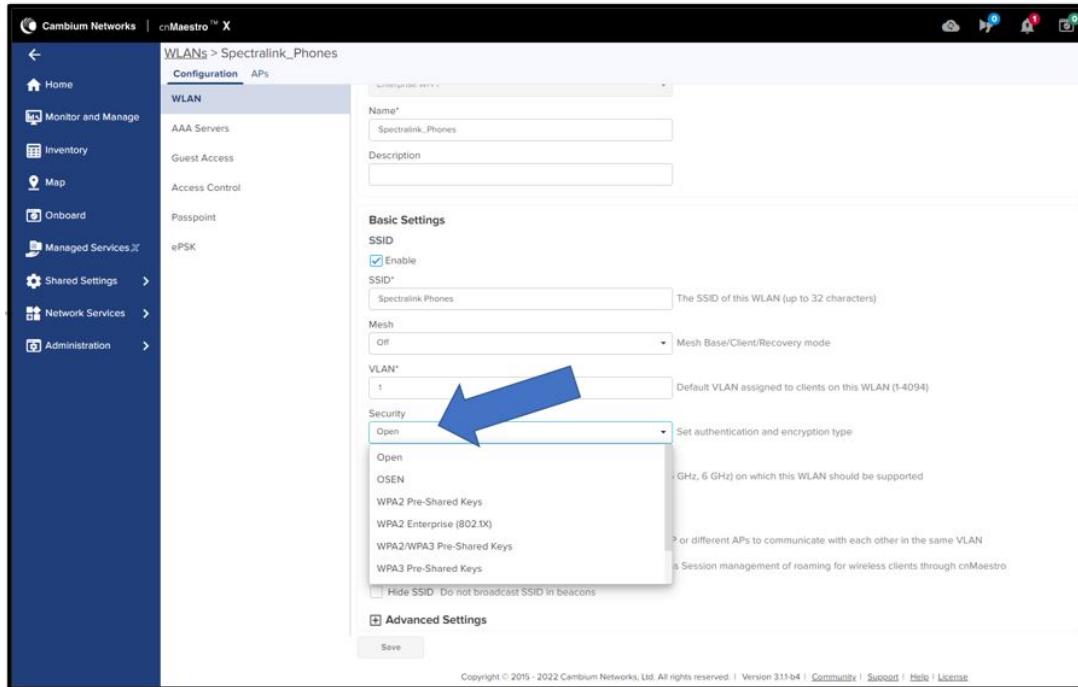
Configure WLANs / SSIDs

1. On the cnMaestro X **Home page**, go to **Shared Settings > AP Groups and WLANs > WLANs**.
2. Open an existing **WLAN**.



3. Set Security

No security – Select the **Open** option.



- Set Security
 - WPA2-PSK Security
 - Select the Pre-Shared Key option.
 - Enter a passphrase in the Passphrase field. This will be the same passphrase used on the Spectralink phones.

WLANs > Spectralink_Phones

Configuration APs

WLAN

AAA Servers

Guest Access

Access Control

Passpoint

ePSK

Name*

Spectralink_Phones

Description

Basic Settings

SSID

☒ Enable

SSID*

Spectralink_Phones

The SSID of this WLAN (up to 32 characters)

Mesh

Off

Mesh Base/Client/Recovery mode

VLAN*

1

Default VLAN assigned to clients on this WLAN (1-4094)

Security

WPA2 Pre-Shared Keys

Set authentication and encryption type

Passphrase*

.....

Show

WPA2 Pre-shared security passphrase or key

Band

☒ 2.4 GHz ☒ 5 GHz ☒ 6 GHz

Define radio types (2.4 GHz, 5 GHz, 6 GHz) on which this WLAN should be supported

Client Isolation

Disable

When selected, it allows wireless clients connected to the same AP or different APs to communicate with each other in the same VLAN

- WPA2-Enterprise Security
 - Select **WPA2 Enterprise (802.1x)** option.
 - Click **Save** to save the configuration.

WLANs > Spectralink_Phones

Configuration APs

WLAN

AAA Servers

Guest Access

Access Control

Passpoint

ePSK

Basic Settings

SSID

☒ Enable

SSID*

Spectralink_Phones

The SSID of this WLAN (up to 32 characters)

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Client Isolation

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☐ cnMaestro Managed Roaming Enable centralized Guest Access Session management of roaming for wireless clients through cnMaestro

☐ Hide SSID Do not broadcast SSID in beacons

Advanced Settings

Save

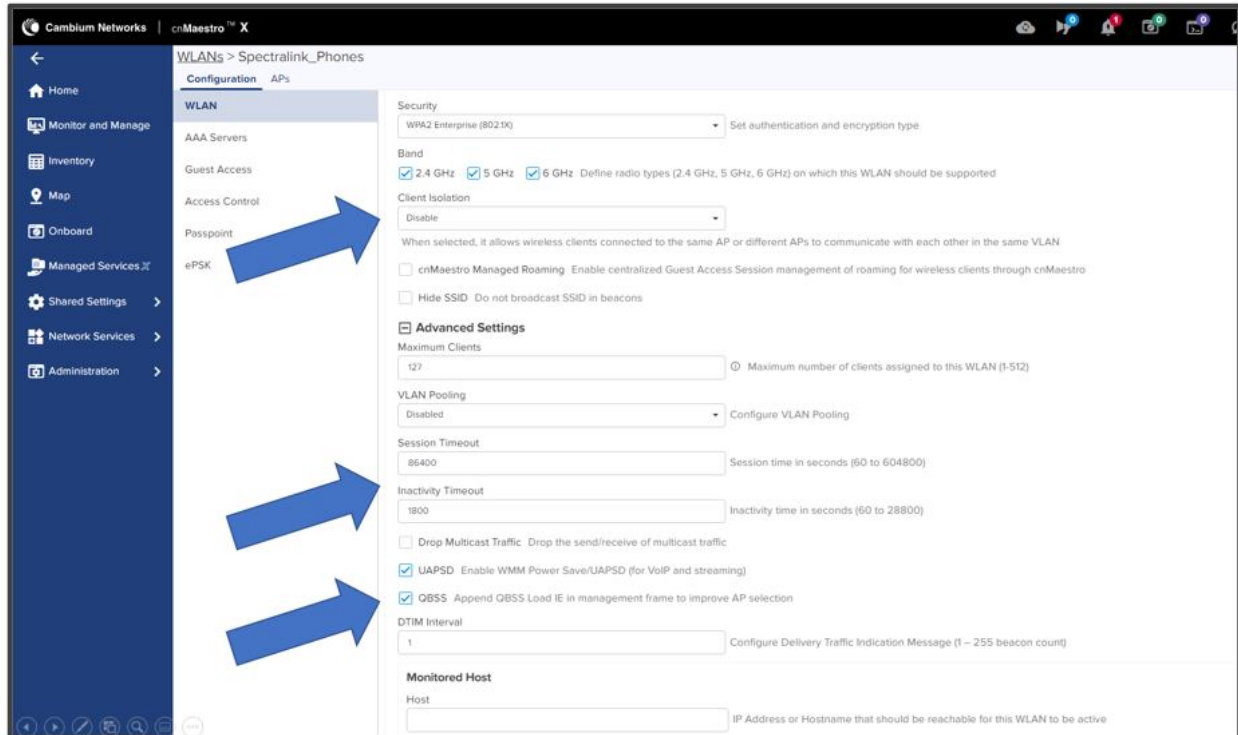
- Configure RADIUS server settings
 - Go to the **AAA Servers** page.
 - Enter the **IP address** or **Hostname** of the **RADIUS server** and **RADIUS secret**.
 - Click **Save** to save the configuration.

The screenshot shows the 'AAA Servers' configuration page in the Cambium Networks cnMaestro X interface. The left sidebar has a blue arrow pointing to the 'AAA Servers' menu item. The main content area has a blue arrow pointing to the '1. Host' field, which contains the IP address '10.100.100.10'. Other fields include 'Secret', 'Port*', and 'Realm'.

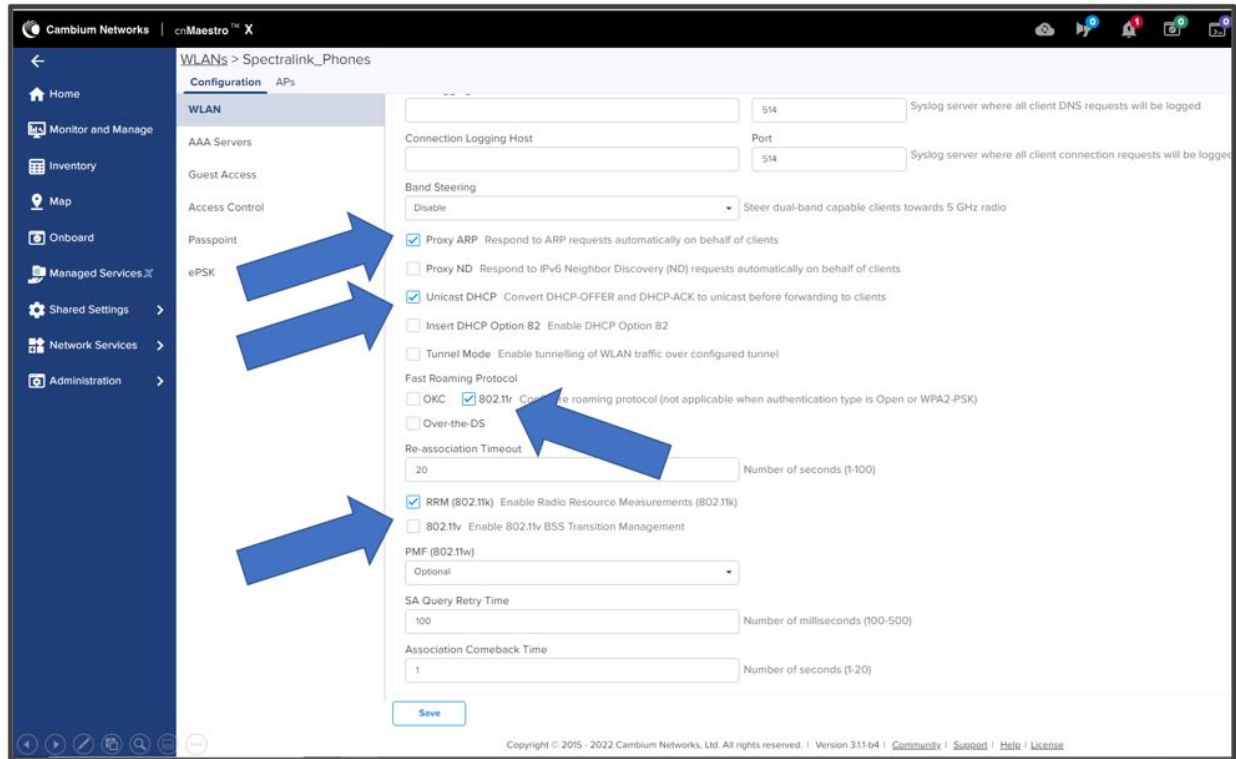
- **Advanced WLAN/SSID settings**
 - Go to the **WLAN** page and expand the **Advanced Settings** section

The screenshot shows the 'WLAN' configuration page in the Cambium Networks cnMaestro X interface. The left sidebar has a blue arrow pointing to the 'WLAN' menu item. The main content area has a blue arrow pointing to the 'Basic Settings' section, which includes fields for 'SSID', 'Mesh', 'VLAN*', 'Security', and 'Band'.

- Set Client Isolation to Disable
- Set Session Timeout to 86400
- Set Inactivity Timeout to 1800
- Enable QBSS load element
- Enable U-APSD
- Set DTIM Interval to 1

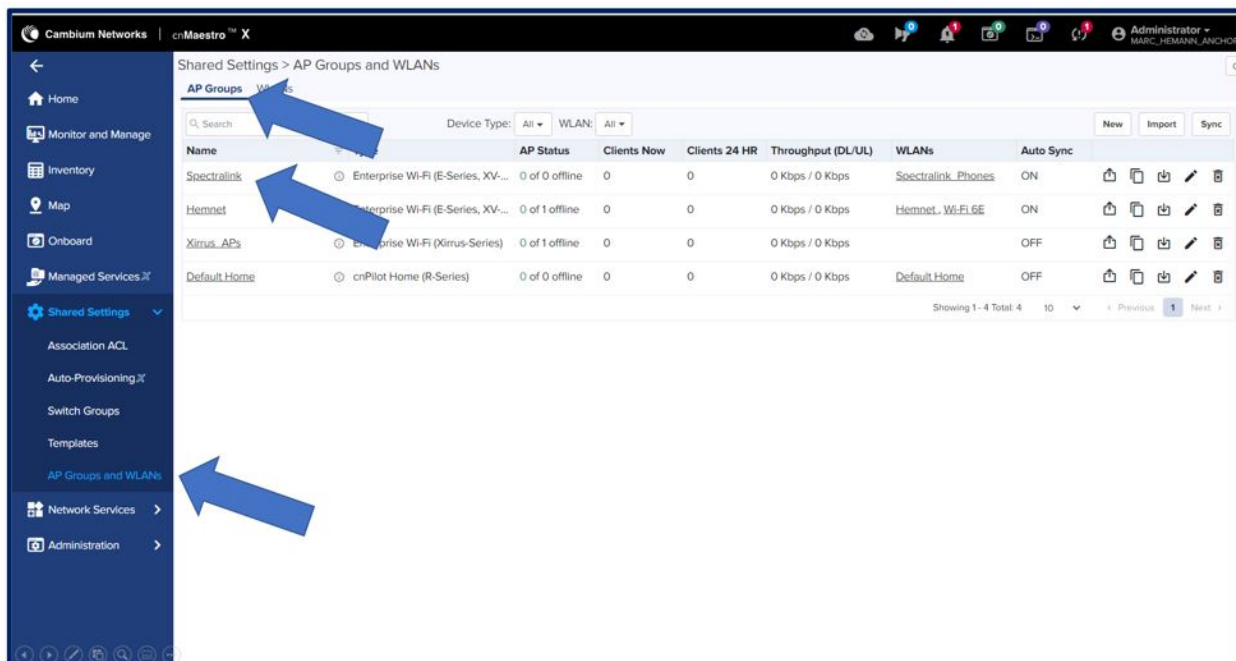


- Enable **Proxy ARP** and **Unicast DHCP**
- Enable **802.11k** and **802.11r**
- **DO NOT** enable **802.11v**

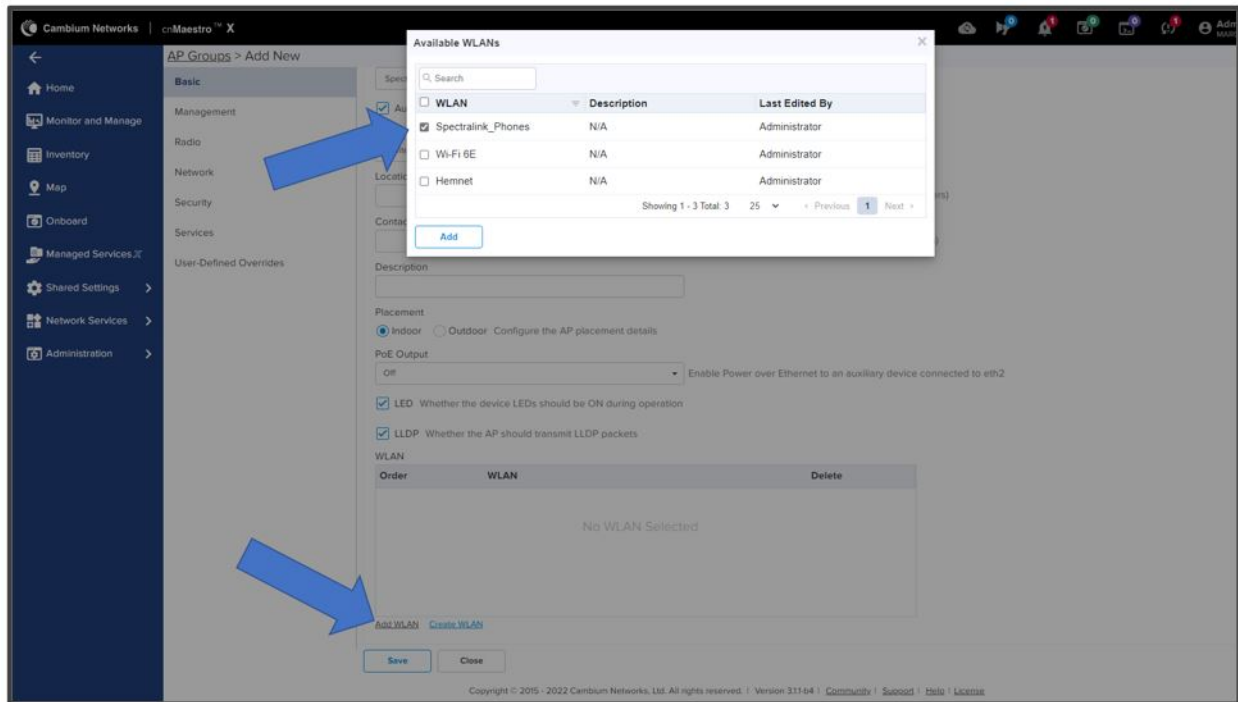


Configure Radios

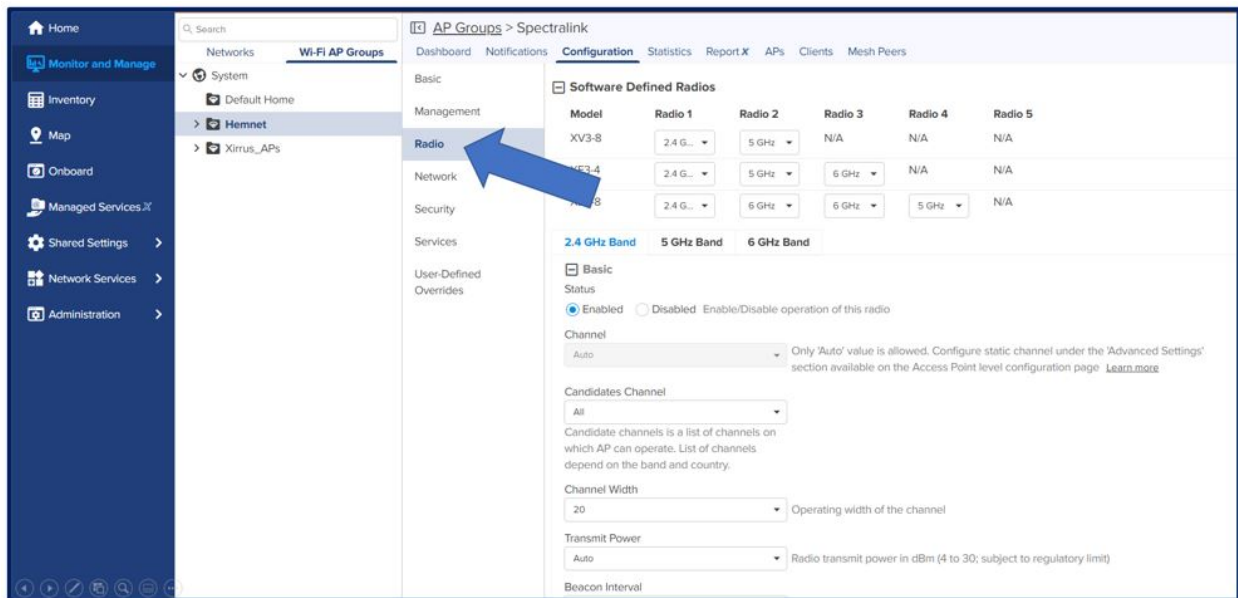
- On the cnMaestro X Home page, go to **Shared Settings > AP Groups and WLANs > AP Groups**.
- Open an existing **AP Group**.



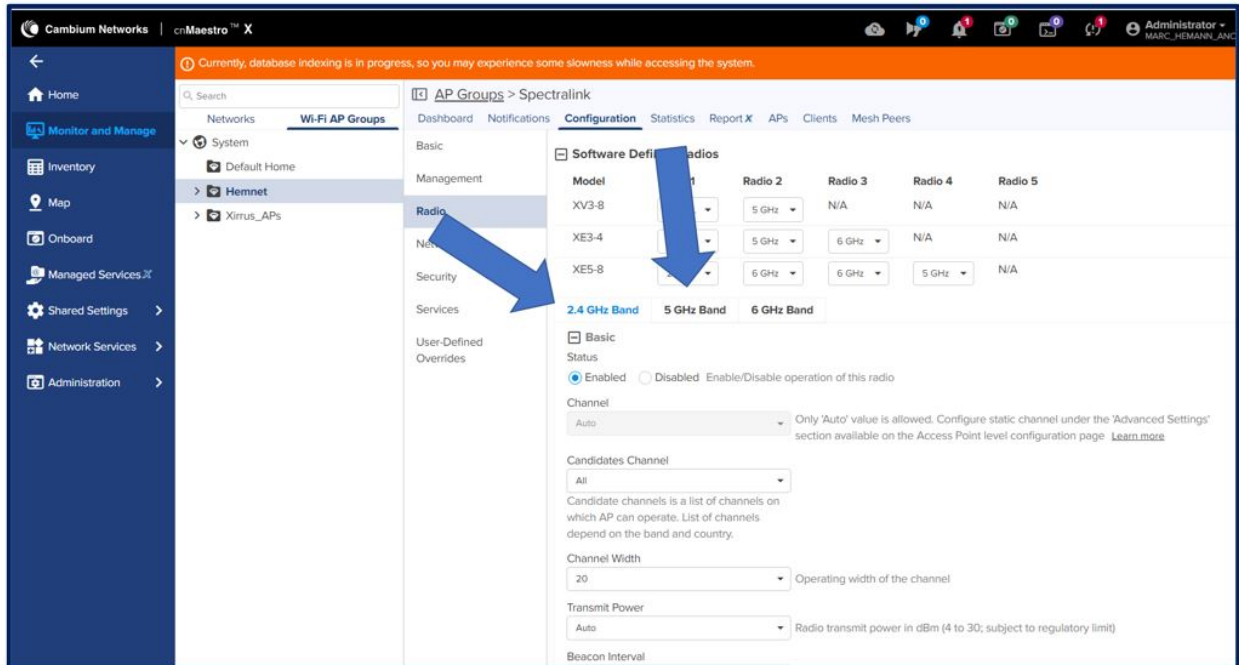
- Scroll to the **WLAN** section and click **Add WLAN**. Select the WLAN configured in the previous steps and click **Add**.



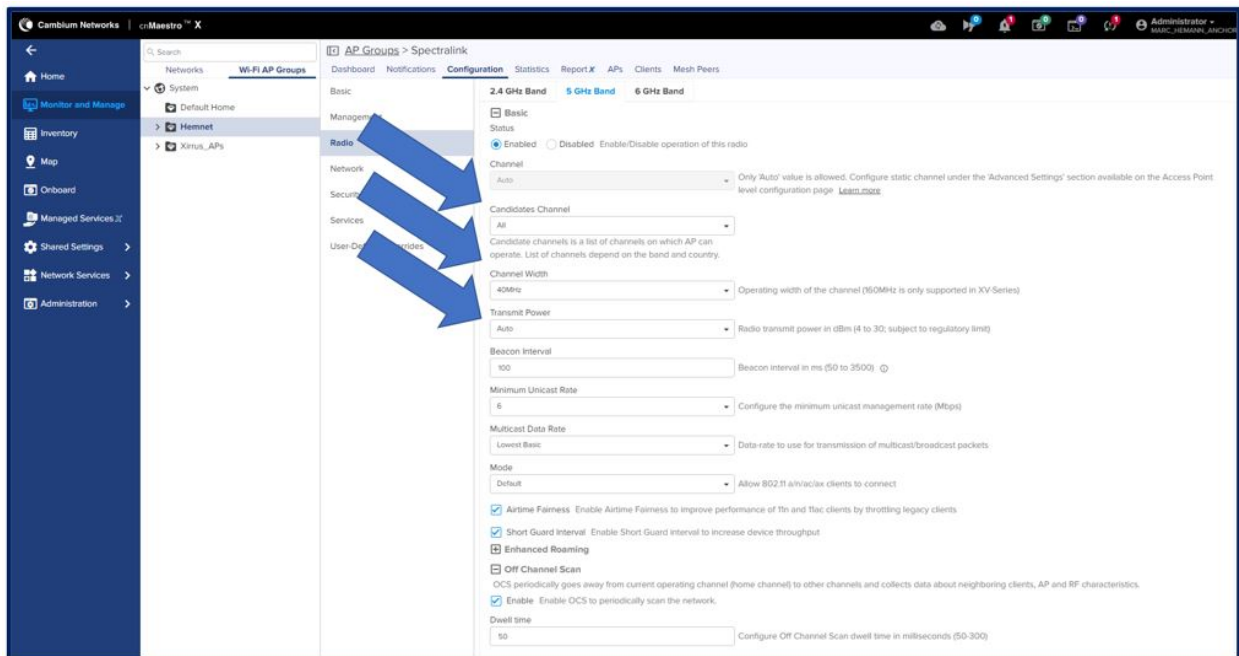
- Got to the **Radio** page



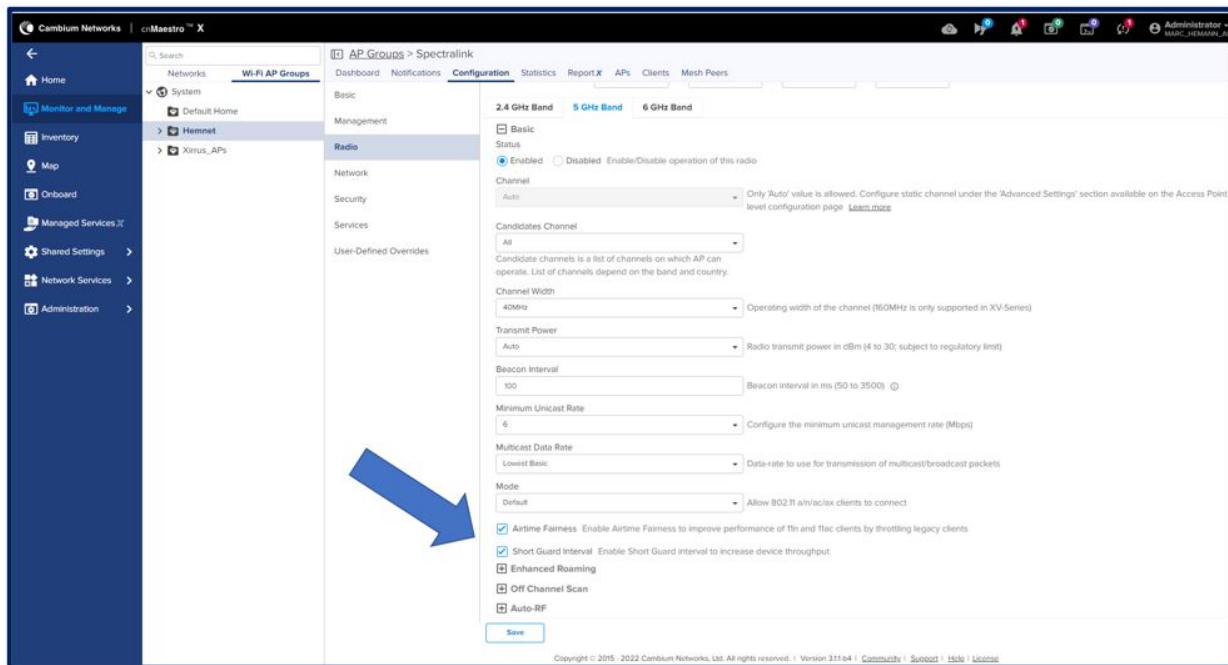
- Select **Radio** to be configured.



- Configure **Radio**
 - Set Channel to pre-determined network design values
 - Set Channel Width to pre-determined network design values
 - Set Transmit Power to match determined network design values



- Configure **Radio**
 - Enable **Short Guard Interval** to predetermined network design values
 - Enable **Airtime Fairness**
 - Set **Auto-RF** parameters to match pre-determined network design values
 - Click **Save**



Spectralink Products

For assistance with Spectralink product configuration, please refer to Spectralink's support website at https://support.spectralink.com/products?qt-product_finder_tabs=0&type=9.

Version Compatibility and Configuration Suggestion

Firmware version details

Spectralink phone	Please refer to Spectralink support site
Cambium Access Point	6.4.1
cnMaestro X (On-Premises)	3.1.0
cnMaestro X Cloud	Updated by Cambium

Supported AP Models

Cambium Networks XV2-2 and XV3-8.

Cambium AP configuration suggestions

- OCS scan should be disabled.

The following configuration suggestions are for VoWiFi deployments in general and not specific to Spectralink systems

WLANs

- Separate SSID for voice clients
- Separate VLAN for voice clients
- WPA2-PSK / WPA3-PSK security
- 802.11 standards can be enabled
 - OKC
 - .11r
 - .11k
 - .11v

Radio configuration

- Select a suitable band (5 GHz or 6 GHz)
- 20MHz channel width
- The minimum data rate set to 9/12
- In multi-radio AP, reserve one radio exclusively for VoWiFi clients
- It is not recommended to map the Mesh client profile and Spectralink profile to the same radio

General

- DSCP to WMM conversion – normally WMM parameters are copied from the wireless network to the wired network. If there is a need to override the DSCP settings in the AP, this would be accomplished in the CLI. In the below example, using the mapping command, we can change the DSCP value for voice traffic.

```
xv2-2-51201B(config-wlan-1)#
xv2-2-51201B(config-wlan-1)#
xv2-2-51201B(config-wlan-1)#
xv2-2-51201B(config-wlan-1)#
xv2-2-51201B(config-wlan-1)# mapping

mapping-background      : Configure comma separated dscp values followed by wmm value
mapping-best-effort     : Configure comma separated dscp values followed by wmm value
mapping-video           : Configure comma separated dscp values followed by wmm value
mapping-voice           : Configure comma separated dscp values followed by wmm value

xv2-2-51201B(config-wlan-1)# mapping-voice
mapping-voice           : Configure comma separated dscp values followed by wmm value
```

Cambium AP deployment suggestions

When mounting APs to the ceiling or walls, ensure that all the APs throughout the building are mounted at approximately the same height, and within the range of 2.5 - 3.5 meters off the ground. The physical orientation of the APs does not affect the performance, so they can be mounted in whichever way is the easiest.

Once the access points have been deployed, wireless coverage will need to be validated, which can be done by using a site survey tool such as Ekahau. For VoWi-Fi, the survey needs to confirm that there is at least an RSSI ≥ -65 dBm and a Signal Noise Ratio (SNR) of 25 or higher to three APs at any point throughout the floorplan.

Cambium Networks

Cambium Networks delivers wireless communications that work for businesses, communities, and cities worldwide. Millions of our radios are deployed to connect people, places, and things with a unified wireless fabric that spans multiple standards and frequencies of fixed wireless and Wi-Fi, all managed centrally via the cloud. Our multi-gigabit wireless fabric offers a compelling value proposition over traditional fiber and alternative wireless solutions. We work with our Cambium certified Connected Partners to deliver purpose built networks for service provider, enterprise, industrial, and government connectivity solutions in urban, suburban, and rural environments, with wireless that just works.

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Telephone number list	http://www.cambiumnetworks.com/contact-us/
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