



USER GUIDE

Home Mesh Router

Release 1.0.0



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About This User Guide

This section describes the following topics:

- [Intended audience](#)
- [Purpose](#)
- [Related documents](#)
- [Hardware platforms](#)

This User Guide describes the features supported by Home Mesh Routers, and provides detailed instructions for setting up and configuring Home Mesh Router.

Intended audience

This guide is intended for use by the system designer, system installer, and system administrator.

Purpose

Cambium Network's Home Mesh Router documents are intended to instruct and assist personnel in the operation, installation, and maintenance of Cambium's equipment and ancillary devices. It is recommended that all personnel engaged in such activities be properly trained.

Cambium disclaims all liability whatsoever, implied or expressed, for any risk of damage, loss, or reduction in system performance arising directly or indirectly out of the failure of the customer, or anyone acting on the customer's behalf, to abide by the instructions, system parameters, or recommendations made in this document.

Related documents

Table 1 provides details of related documents for Home Mesh Router.

Table 1: Related documents

Document Name	Location
Home Mesh Router Product Details	https://www.cambiumnetworks.com/products/wifi/#residential
Home Mesh Router User Guide (This document)	https://support.cambiumnetworks.com/files
Home Mesh Router Release Notes	https://support.cambiumnetworks.com/files
cnMaestro Cloud User Guide	https://docs.cloud.cambiumnetworks.com/help/5.0.0/index.htm
Software Resources	https://support.cambiumnetworks.com/files
Community	http://community.cambiumnetworks.com/
Support	https://www.cambiumnetworks.com/support/contact-support/
Warranty	https://www.cambiumnetworks.com/support/warranty/
Feedback	support@cambiumnetworks.com

Hardware platforms

Table 2 lists the existing hardware platforms in Home Mesh Routers:

Table 2: Existing hardware platforms

Hardware Platform	Description
RV22	Dual-Band Wi-Fi 6 5 GHz (3x3:2); 2.4 GHz (2x2:2) Home Mesh Router

Introduction

Cambium Home Mesh Router is designed to deliver high performance Wi-Fi and mesh. The router uses the high efficiency 802.11ax technology for maximum compatibility with consumer devices, low latency, and high throughput. The Home Mesh Routers are developed for an optimal complete home coverage with simultaneous dual-band 2.4 GHz and 5 GHz operation. It also provides longer range, higher efficiency, and lesser interference when compared to earlier Wi-Fi technologies. The routers are designed to communicate together and create a mesh network to cover the entire area, thereby avoiding Wi-Fi black spots.

The Home Mesh Routers can be configured using cnMaestro Cloud and the cnMaestro Subscriber application. However, it always requires cnMaestro Cloud.

The cnMaestro Subscriber application is a user-friendly way for the end customers to configure important entities, such as the Wi-Fi name, password, and a guest Wi-Fi. In addition, they can perform other actions, such as grouping client devices in the home into Profiles (for example, My Kids), set web content filter rules, and schedule on/off time. They can trigger an instant Family Time to get everyone together for mealtime. And they can also run speed tests anytime to test the network.

Features supported by Home Mesh Routers

The following are the key features supported by Home Mesh Routers:

- **Speed test**—Measure the speed of the routers with the speed test option available in cnMaestro Cloud and the cnMaestro Subscriber application. To correlate speed test results, a router speed test is automatically triggered when the consumer runs the speed test from the cnMaestro Subscriber application or cnMaestro Cloud.
- **Access Control List (ACL)**—Create simple rules to block or allow certain traffic between the WAN, LAN, and router.
- **Firewall (DoS attacks)**—Protect your customers from Denial of Service (DoS) attacks by enabling the router against IP spoof, smurf attack, and ICMP fragmentation attack.
- **Event logging**—Log every event that occurs in the router for better troubleshooting of issues.
- **SNMP v2c and v3 support**—Supports SNMP v2c and v3 versions for raising alarms against thresholds.
- **Web content filter**—Easily control the category of web content allowed or blocked for the clients assigned to the profile.
- **Family Time**—Create a group huddle time within the family by switching off Wi-Fi at scheduled times. You can also pause internet connectivity during meal time.
- **Bedtime Schedule**—Configure a weekly schedule for internet access to devices within a profile.
- **Schedule LED**—Schedule to switch off the LEDs during bedtime.
- **Optimize Wi-Fi**—The router scans all the channels, measures utilization, and decides if a channel change is required. A good Wi-Fi signal strength and low noise create a high SNR for each subscriber client device. This supports multiple HD video streams, web browsing, and security cameras on the same system.

- **Profiles**—Create a group of clients with similar functions or requirements. For example, group all IOT clients in the same profile and configure to never disable them. Create a kids profile and schedule internet access time, content filtering to only those devices. This profile enables parental control and scheduled internet access features for the clients assigned to the profile.

Table 3 lists the features supported by cnMaestro Cloud and the cnMaestro Subscriber application.

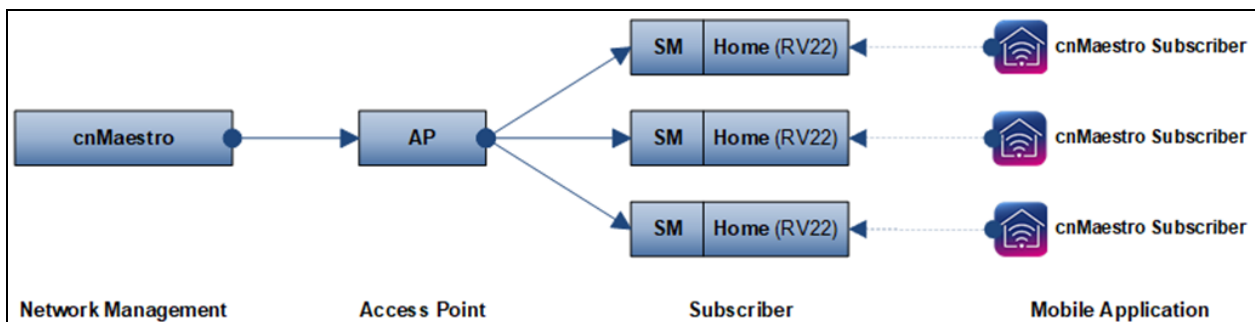
Table 3: Feature support matrix

Feature	Supported on cnMaestro Cloud	Supported on cnMaestro Subscriber application
Speed test	✓	✓
Access Control List (ACL)	✓	
Firewall (DoS attacks)	✓	
Event logging	✓	
SNMP v2c and v3 support	✓	
Web content filter		✓
Family Time		✓
Bedtime Schedule		✓
Schedule LED (LED Control)		✓
Optimize Wi-Fi		✓
Profiles		✓

Basic architecture of the router

The basic architecture of the Home Mesh Router is as shown below.

Figure 1: Basic architecture of the router

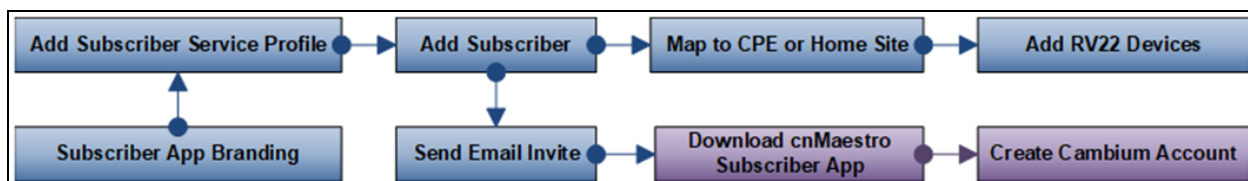


The cnMaestro Subscriber application allows home customers to manage RV22 devices using their mobile phones. In Figure 1, the Subscriber is demarcated by the SM CPE. Alternatively, it could be mapped to a PON ONU, or to no explicit backhaul. In the latter case, the Subscriber would be attached to a new cnMaestro Home Site.

Workflow for creating and managing Subscribers

The workflow for creating and onboarding Subscribers, so that customers can use the mobile application, has a cnMaestro (blue) and a customer (purple) component, as shown below.

Figure 2: Subscriber workflow



A Subscriber is configured in cnMaestro Cloud, and an invite is sent to the customer's email address, which will enable home Wi-Fi management using the mobile application. The customer must download the cnMaestro Subscriber application from the Apple App store or Google Play Store. The site in the application, which maps to the Subscriber, can be customized and branded.

Table 4: Features for managing the routers

Feature	Details
Onboarding	Supported using Cambium ID or Serial Number (MSN).
Dashboard	Dashboards tailored for Home Site and RV22 Home Mesh.
Configuration	Available through RV22 Home Mesh AP Groups.
Details	Overview and network information display.
Notifications	Alarms, AP Events, and Wi-Fi Events aggregated at System, Managed Account, Network, Site, and Device levels.
Performance	WAN Throughput, Wireless Throughput (downlink/uplink), Clients by Band, Noise Floor, Interference, and Airtime (2.4/5 GHz) performance graphs.
Statistics	System, Managed Service, and Network statistics available.
Software Update	Software update provided at System, Managed Account, Network, Site, and Device levels.
Maps	Location of Home Sites and Devices.
Clients	Both Wired and Wireless Clients supported at Site and Device levels.
Tools	Status, Debug, Network Connectivity, Wi-Fi Analyzer, Speed Test, and Packet Capture tools available.
Reports	Data Reports downloaded from the System, Managed Service, Network, and Site levels.

Hardware Overview

The Home Mesh Router package contains the following contents:

- One RV22 Wi-Fi 6 Home Mesh Router
- One power adapter
- One RJ45 cable of approximate 1.5m length

Figure 3: RV22 front and top views



Figure 4: RV22 back view

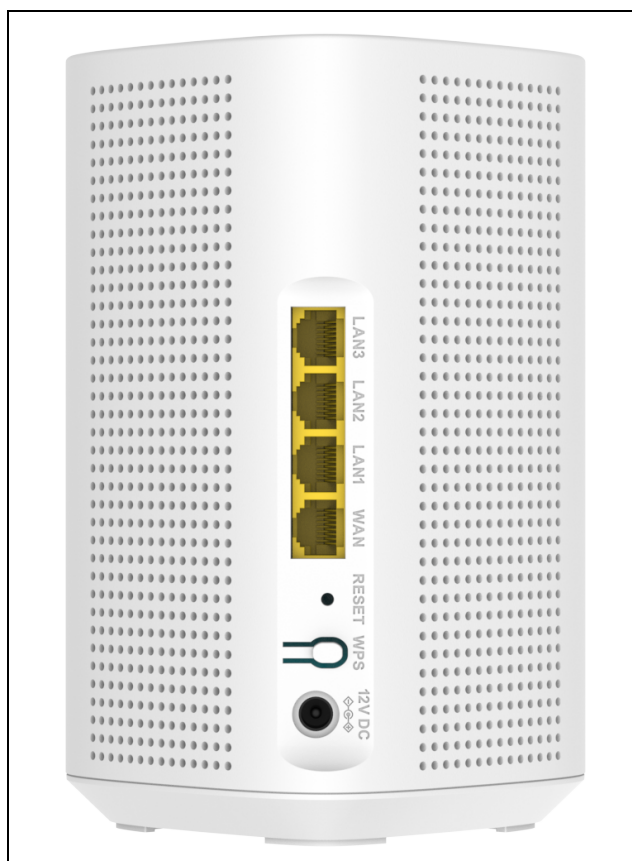


Table 5 lists the LED status indicators of the RV22 Home Mesh Router.

Table 5: LED status indicators

Router Mode	LED Color	Description
Standalone	Solid Red	On boot
	Solid Purple	Device is up and operational
	Solid Blue	Device is up and connected to cnMaestro
Mesh	Purple and Red toggling alternatively	When Mesh client is looking for Mesh base
	Purple—On for 3 seconds and off for 3 seconds	When connected to Mesh base, Link signal is less than -75dBm, and not connected to cnMaestro
	Blue—On for 3 seconds and off for 3 seconds	When connected to Mesh base, Link signal is less than -75dBm, and connected to cnMaestro
	Solid Blue	When connected to Mesh base, Link signal is meeting RSSI requirements, and connected to cnMaestro
	Solid Purple	When connected to Mesh base, Link signal is meeting RSSI requirements, and not connected to cnMaestro

Adding a logo to the RV22 Home Mesh Router

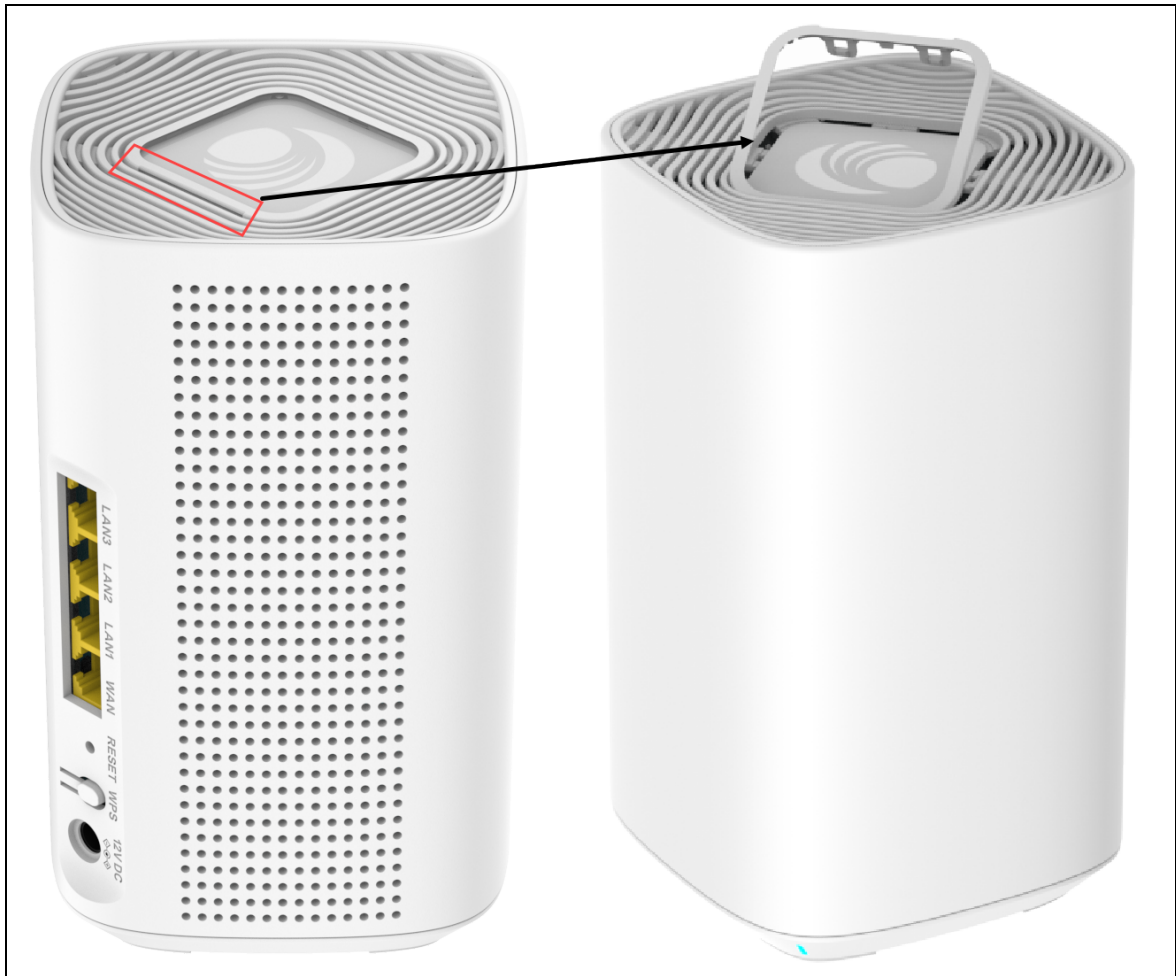
You can customize the RV22 Home Mesh Router by adding the required logo to the router.

To add a custom logo to the router:

1. Find the latch slot at the top of the router.

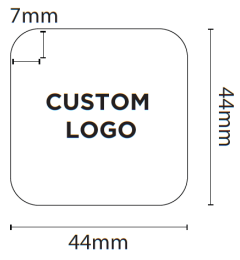
Use a flat-head screwdriver to remove the clear plastic window.

Figure 5: Opening the top latch



2. Insert the logo in the space provided and close the window.

Recommended size for the logo: 44 mm x 44 mm



Configuring Home Mesh Router

Before shipping the Home Mesh Routers to the subscribers, they must be configured with AP groups, Wi-Fi profiles, and associated with the corresponding subscriber.

Configuring the routers involves the following steps:

1. [Configuring WLAN profiles \(SSIDs\)](#)
2. [Configuring AP groups](#)
3. [Onboarding the Home Mesh Router to cnMaestro](#)
 - a. [Subscriber application branding](#)
 - b. [Adding a subscriber service profile](#)
 - c. [Adding a subscriber](#)
 - d. [Claiming the Home Mesh Router](#)

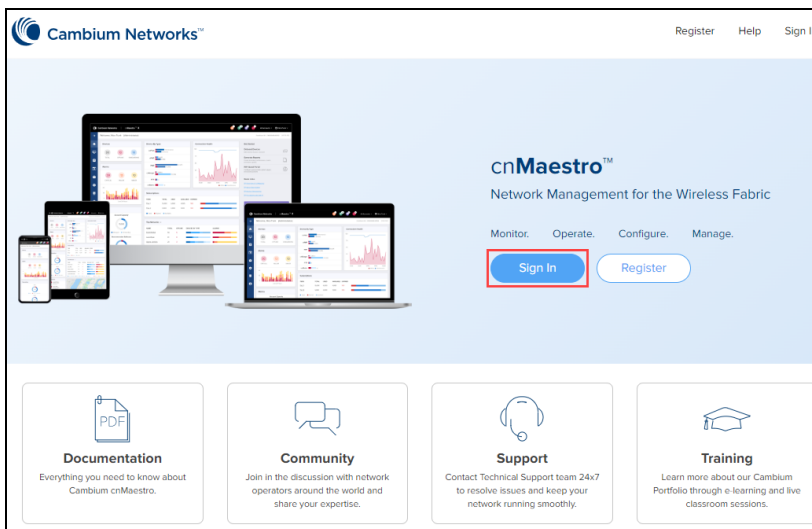
Configuring the WLAN Profiles (SSIDs)

WLANs allow you to configure home and guest access SSIDs for the Home Mesh Router. This WLAN profile (Wi-Fi profile) is associated with an AP group that contains configuration, which is applied on the Home Mesh Routers. When applied on the routers, these SSIDs act as default SSIDs on all routers associated with the AP group.

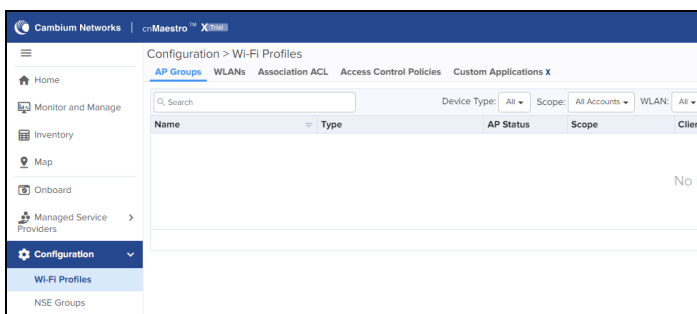
To configure a Wi-Fi profile, complete the following steps:

1. Sign in to cnMaestro.

The home page appears.



2. Click **Configuration > Wi-Fi Profiles**.



3. Click the **WLANs** tab.

4. Click **Add**.

In the **Add WLAN** window configure the WLAN parameters as described in [Table 6](#).

Table 6: WLAN parameters

Parameter	Description
Basic Information	
Type	Type of device for which the WLAN profile is configured. Select RV22 Home Mesh from the drop-down list.
Name	Name of the WLAN profile.
Scope	Specifies the availability of the WLAN profile across managed accounts. The following values are supported: <ul style="list-style-type: none"> • Base Infrastructure—The WLAN profile is available only for the global account. It is not shared with other managed accounts. • Shared—The WLAN profile is shared across all managed accounts. It can be mapped to devices in the managed account, but it cannot be modified. To modify the configuration, it must be copied into the managed account and then updated. • Managed Account—The WLAN profile is available only for that specific managed account. <p>Note: When the scope is configured for a WLAN profile, it cannot be modified.</p>
Description	Brief description for the WLAN profile.
SSIDs—Home Access	
Configure the default SSID that is used to connect devices wirelessly. Only one home SSID can be configured.	
SSID	Unique name of the SSID for this WLAN.

Parameter	Description
	Supports a maximum of 32 characters.
Security	<p>Security method used for encryption.</p> <p>The following security methods are supported:</p> <ul style="list-style-type: none"> • Open • WPA Pre-Shared Key • WPA2 Pre-Shared Keys • WPA/WPA2 Pre-shared Keys
Password	Security passphrase or key used to connect to this SSID.
SSIDs—Guest Access	
Configure the guest SSID to allow any guest devices to access the wireless network.	
Enable Guest Access	<p>Determines whether the guest access is enabled.</p> <p>Select the check box to enable guesst access.</p>
SSID	<p>Unique name of the guest SSID for this WLAN.</p> <p>Supports a maximum of 32 characters.</p>
Password	Security passphrase or key used to connect to this guest SSID.
Band Steering	<p>Determines whether the band steering is enabled for the wireless clients.</p> <p>When enabled, APs steer wireless clients to connect to the 5 GHz band.</p>

5. Click **Save**.

Configuring AP groups

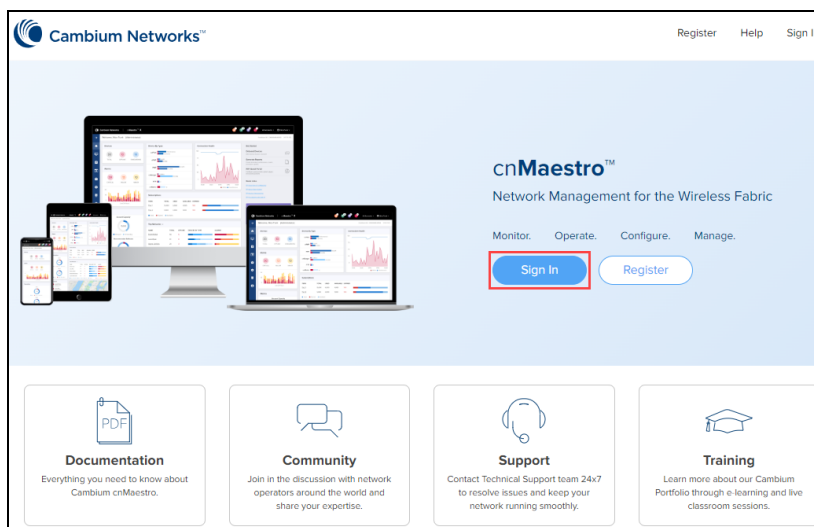
AP groups allow applying the same configuration to multiple Home Mesh Routers. AP groups contain configuration, such as automatic syncing of configuration, administrator password, event logging, radio configuration, the default WAN configuration, and DNS mode.

The following configuration are part of the AP group:

- **Basic**
- **Management**
 - Administrator Access
 - Time server
 - Event logging
 - SNMP
- **Radio**
- **Network**
 - WAN configuration
 - LAN configuration
- **Security**
 - DoS Protection
 - Access Control List (ACL)

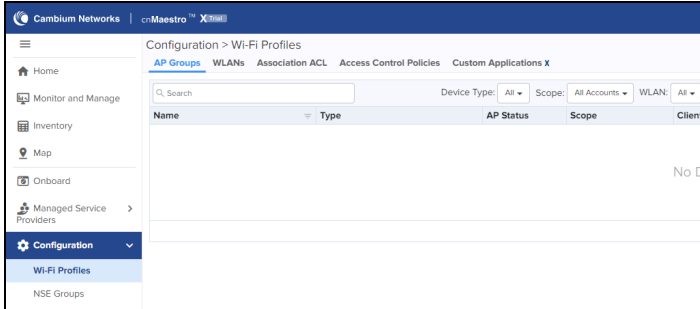
To configure an AP group, complete the following steps:

1. Sign in to cnMaestro.



2. Click **Configuration > Wi-Fi Profiles**.

The **AP Groups** tab is displayed, by default.



3. Click **Add**.
4. In the **Add New** window > **Basic** tab, select **RV22 Home Mesh** in the **Type** drop-down list and configure the following parameters:

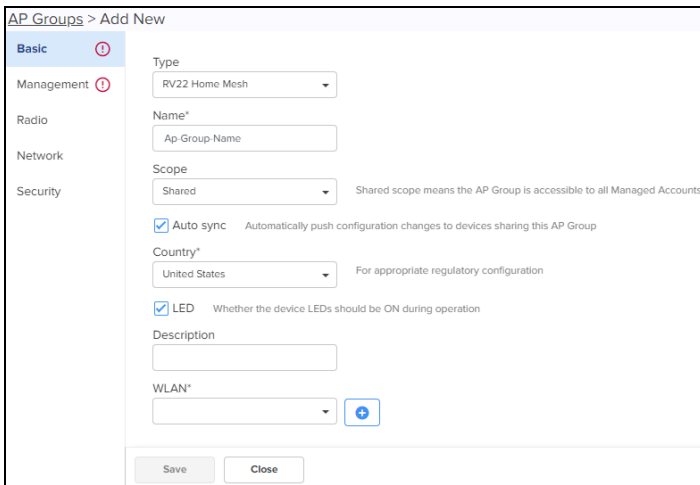



Table 7: Basic parameters

Parameter	Description
Type	Type of device for which the AP group is configured. Select RV22 Home Mesh from the drop-down list.
Name	Hostname of the device. Supports a maximum of 64 characters
Scope	Specifies the availability of the AP group across managed accounts. The following values are supported: <ul style="list-style-type: none"> • Base Infrastructure—AP group is available only for the global account. It is not shared with other managed accounts.

Parameter	Description
	<ul style="list-style-type: none"> Shared—AP group is shared across all managed accounts. It can be mapped to devices in the managed account, but it cannot be modified. To modify the configuration, it must be copied into the managed account and then updated. Managed Account—AP group is available only for that specific managed account. <p>Note: Once the scope has been configured on a AP group, it cannot be modified.</p>
Auto sync	<p>Specifies whether configuration is applied to the router automatically after saving.</p> <p>Select the check box to enable auto sync.</p>
Country	<p>Country of operation of the device.</p> <p>To be set by the administrator only.</p> <p>The allowed operating channels and the respective transmit power levels depend on the country of operation. The list of countries supported depends on the SKU of the device (FCC and ROW).</p> <p>Note: Radios remain disabled unless this parameter is configured.</p>
LED	<p>When enabled, turns on the device LEDs during operation.</p>
Description	<p>Brief description for the AP group.</p>
WLAN	<p>WLAN profile to be associated with this AP group.</p> <p>WLAN profile contains SSID details of the wireless network.</p> <p>Select the WLAN from the drop-down list. If no WLAN is configured, create one by clicking the add () icon. For more information, See Configuring WLAN profiles (SSIDs).</p>

5. Click the **Management** tab on the left pane and configure the following parameters:

The screenshot shows the 'Management' tab of the 'Add New' configuration page. The 'Administrator Access' section contains the following elements:

- Admin Password:** A text input field with a password icon and a note: 'Configure password for authentication of GUI and CLI sessions (max 32 characters)'.
- Remote Management Access:** A checkbox with the description 'Enable remote access through WAN interface'.
- SSH:** A checkbox with the description 'Enable SSH access to the device CLI'.
- HTTP:** A checkbox with the description 'Enable HTTP access to the device GUI'.
- HTTP Port:** A text input field containing '80' with a note: 'Port for HTTP access to the device GUI (1-65535)'.
- HTTPS:** A checkbox with the description 'Enable HTTPS access to the device GUI'.
- HTTPS Port:** A text input field containing '443' with a note: 'Port for HTTPS access to the device GUI (1-65535)'.
- Disable Hardware Reset Button:** A checkbox with the description 'When enabled the physical hardware reset button will not let the user to do factory reset the device'.

Below the 'Administrator Access' section are three expandable sections: 'Time Settings', 'Event Logging', and 'SNMP'. At the bottom are 'Save' and 'Close' buttons.

Table 8: Management parameters

Parameter	Description
Administrator Access-related parameters	
Admin Password	Password for authentication of the router.
Disable Hardware Reset Button	Determines whether the reset button on the router is required to prevent a factory reset operation of the router. Select the check box to prevent the user from performing the factory reset operation.
Time Settings-related parameters	
Time zone	Time zone of the location where the router is installed. Select an appropriate time zone from the drop-down list.
NTP Server 1	Hostname or IPv4 address of the Network Time Protocol (NTP) server.
NTP Server 2	Hostname or IPv4 address of a second NTP server.
Event Logging-related parameters	
Syslog Server	Hostname, IPv4 address of the Syslog server and the respective port number. Default port number: 514
Syslog Severity	The severity level of event that must be forwarded to the server. The supported severity levels (0-7) are based on RFC standards.
SNMP-related parameters	
Enable	Determines whether SNMPv2c or SNMPv3 support on the router is enabled. Select the check box to enable SNMP support.
Trap Receiver IP	IPv4 address of the SNMP server to receive the SNMP traps.

Parameter	Description
	This parameter is applicable to both SNMP v2c and v3 versions.
Version	Specifies the SNMP version configured for the router. The following options are available: <ul style="list-style-type: none"> • v2c • v3
SNMPv2c-related parameters	
SNMPv2c RO community	The SNMP v2c read-only community string used as a password when obtaining information from the router.
SNMPv2c RW community	The SNMP v2c read-write community string as a password when writing information to the router.
SNMPv3-related parameters	
SNMPv3 Username	Username for the SNMPv3 server. Supports a maximum of 32 characters.
Enable Authentication	Indicates whether authentication is enabled for SNMP communication. Select the check box to enable authentication.
Authentication Protocol	Specifies the authentication protocol. The following options are available: <ul style="list-style-type: none"> • MD5 • SHA Cambium uses SHA-1 authentication protocol.
Authentication Password	Password used for authentication. Supports 8 to 32 characters.
Enable Encryption	Indicates whether encryption is enabled for SNMP communication. Select the check box to enable encryption.
Encryption Type	Specifies the encryption type. The following options are available: <ul style="list-style-type: none"> • AES • DES
Encryption Password	Password used for encryption. Supports 8 to 32 characters.

6. Click the **Radio** tab on the left pane and configure the preferred radios (2.4 GHz or 5 GHz or both).

By default, both the radios are enabled. You can disable only the 2.4 GHz radio.

Configure the following parameters (described in Table 9), which are similar across 2.4 and 5 GHz radio tabs:

Table 9: Radio parameters

Parameter	Description
Enable	Enables the operation of radio.
Channel	This parameter cannot be modified. This is configured as Auto , by default.
Auto Channel Frequency Coordination	Enable to prevent router from self-interference with upline wireless network infrastructure.
Channel Width	Select the following channel widths for the operation: <ul style="list-style-type: none"> For 2.4 GHz—20 MHz and 40 MHz channel width are supported. Default: 20 MHz For 5 GHz—20 MHz, 40 MHz, 80 MHz, and 160 MHz channel width are supported. Default: 80 MHz
Transmit Power	Transmit power of the router in percentage (%). The following options are available: <ul style="list-style-type: none"> Auto 20 40 60 80 100

7. Click the **Network** tab on the left pane and configure the WAN mode and IP address assignment parameters.

The screenshot shows the 'Add New' configuration page for AP Groups. The left sidebar has the 'Network' tab selected. The main content area is divided into 'WAN Configuration' and 'LAN Configuration'. In the 'WAN Configuration' section, 'AP Mode' is set to 'Router' and 'WAN Mode' is set to 'DHCP'. In the 'LAN Configuration' section, 'IPv4' is expanded and 'Auto' is selected. The 'Local IP Address*' is 192.168.1.1, 'Local Subnet' is 255.255.255.0, 'Address Range Start*' is 192.168.1.2, and 'Address Range End*' is 192.168.1.254. There are 'Save' and 'Close' buttons at the bottom.

- i. The **AP Mode** is pre-configured as **Router** and cannot be modified.
- ii. In the **WAN Configuration** section, select the **WAN Mode** and configure the corresponding parameters.

This mode selects the mode of IP address assignment for the WAN interface. The following WAN modes are supported:

- **DHCP**—This mode is selected by default.
- **PPPoE**—Configure the PPPoE parameters as described in [Table 10](#).

The screenshot shows the 'Add New' configuration page for AP Groups with the 'Network' tab selected. In the 'WAN Configuration' section, 'WAN Mode' is set to 'PPPoE'. The 'Service Name' is 'Home-RV22-PPPoE', 'Username' is 'home-rv22-test', and 'Password' is masked. There is a 'Show' button for the password. The 'Passthrough' checkbox is unchecked. 'PPP Connection Trigger' is set to 'Auto Connect'. 'Idle Timeout' is 300 seconds. 'MTU' is 1492. There are 'Save' and 'Close' buttons at the bottom.

Table 10: WAN Mode: PPPoE parameters

Parameter	Description
PPPoE-related parameters	

Table 10: WAN Mode: PPPoE parameters

Parameter	Description
Service Name	Name of the PPPoE service name. Supports a maximum of 32 characters.
Username	Username of the PPPoE service required for authentication.
Password	Password of the PPPoE service required for authentication.
Passthrough	Indicates whether the clients must directly establish connection with the service provider. Select the check box to enable passthrough.
PPP Connection Trigger	Indicates the connection method for the router for keeping the connection intact. The following options are supported: <ul style="list-style-type: none"> • Auto Connect • On Demand
Idle Timeout	This parameter is mandatory when you select On Demand type of PPP Connection Trigger . Specifies the duration (in seconds) after which PPPoE keep-alive packets must be sent to keep the connection intact. Default: 300
MTU	Maximum size (in bytes) of each packet sent in a single transmission between connected devices. Default: 1492

- **Static**—Configure the Static parameters as described in [Table 11](#).

The screenshot shows the configuration page for a new AP group. The 'Network' tab is selected in the left sidebar. Under 'WAN Configuration', the 'Static' radio button is selected. The 'IPv4' section is expanded, showing the following fields:

- IP Address*: 192.168.10.10
- Subnet Mask*: 255.255.255.0
- Gateway*: 192.168.10.254
- Primary DNS*: 8.8.8.8
- Secondary DNS*: 1.1.1.1
- MTU: 1492

Table 11: WAN Mode: Static parameters

Parameter	Description
Static-related parameters	
IP Address	IPv4 address assigned to the router.
Subnet Mask	Subnet mask assigned to the router's IPv4 address.
Gateway	IPv4 address of the gateway used for communication.
Primary DNS	IPv4 address of the primary DNS server.
Secondary DNS	IPv4 address of the secondary DNS server.
MTU	Maximum size (in bytes) of each packet sent in a single transmission between connected devices. Default: 1492



Note

If you select **PPPoE** or **Static** mode, you must preconfigure the settings in the router before shipping the routers to customers. Complete the following steps before shipping the Home Mesh Router to the customers:

- i. Onboard the Home Mesh Router using the standard WAN mode as **DHCP**.
- ii. After the Home Mesh Router is onboarded, set the WAN mode to **PPPoE** or **Static**.
- iii. Configure the username and password credentials.

The configuration and the credentials are applied on the Home Mesh Router.

- iv. Disconnect the Home Mesh Router and ship it to the customer.

When the customer connects the router to the PPPoE authenticated network, the Home Mesh Router uses the PPPoE credentials to authenticate.

- iii. In the **LAN Configuration** section, configure the mode of IP address assignment for connecting devices to **Auto** or **Manual**.

If you select **Manual** mode of assignment, configure the following parameters:

Table 12: LAN Configuration parameters for Manual mode

Parameter	Description
IPv4-related parameters	

Table 12: LAN Configuration parameters for Manual mode

Parameter	Description
Local IP Address	Local IPv4 address assigned to the router.
Local Subnet	Subnet mask assigned to the router's IPv4 address.
Address Range Start	Starting IPv4 address in the address pool.
Address Range End	Ending IPv4 address in the address pool.
Domain Name	The domain name.
DNS Mode	DNS mode used for IP address resolution. Following are the supported options: <ul style="list-style-type: none"> • Auto • Manual • Proxy

- Click the **Security** tab on the left pane and configure protection against different types of attacks, such as Smurf attack and ICMP fragment.

Select the check box corresponding to the DoS protection options.

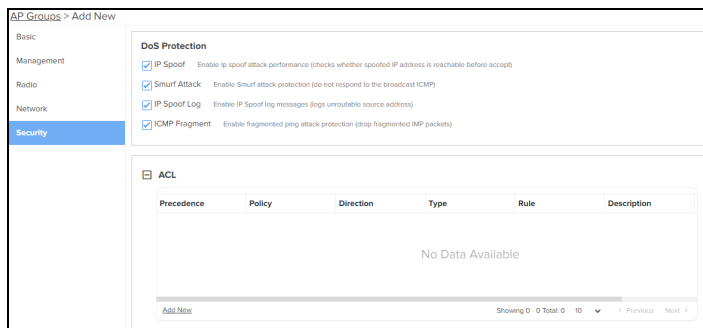


Table 13: Security parameters: DoS Protection

Parameter	Description
IP Spoof	Enable protection against IP spoof attacks. When enabled, the router checks whether the spoofed IP address is reachable before accepting.
Smurf Attack	Enable protection against Smurf attacks. When enabled, the router does not respond to the broadcast ICMP.
IP Spoof Log	Enable logging of IP spoof addresses. When enabled, the router logs the unroutable source IP address.
ICMP Fragment	Enable protection against ICMP fragmented ping attack.

Table 13: Security parameters: DoS Protection

Parameter	Description
	When enabled, the router drops the fragmented ICMP packets.

9. Click **Add New** in the **ACL** section and configure the parameters as described in [Table 14](#).

Table 14: Security parameters: Access Control List (ACL)

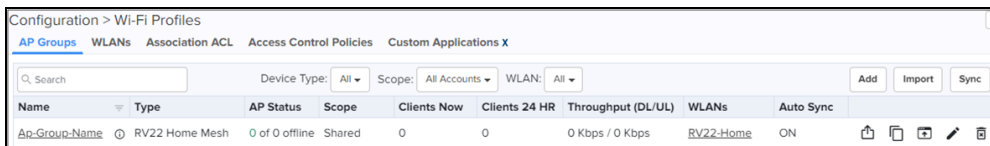
Parameter	Description
Precedence	Specifies the priority of the rule configured. Select the precedence from the drop-down list.
Policy	Indicates the action to be taken for the policy. The following are the supported actions: <ul style="list-style-type: none"> • Accept • Drop • Reject
Direction	Direction to which the policy must be applied. The following are the supported options: <ul style="list-style-type: none"> • WAN to LAN • LAN to WAN • WAN to Router • Router to WAN
Type	Type of traffic to which the policy must be applied. The following are the supported options: <ul style="list-style-type: none"> • IP • IPv6 • MAC

Table 14: Security parameters: Access Control List (ACL)

Parameter	Description
	<ul style="list-style-type: none"> • Protocol • Protocolv6 <p>Additional parameters are enabled when you select the type.</p>
Source IP/Mask Destination IP/Mask	<p>This field is applicable when you select the Type as IP, IPv6, Protocol, or Protocolv6.</p> <p>Specifies the source IPv4 or IPv6 address and the destination IPv4 or IPv6 address for the policy.</p> <p>You can configure Any if there is no specific IP address to apply the policy to any source IP address.</p>
Source MAC/Mask Destination MAC/Mask	<p>This field is applicable when you select the Type as MAC.</p> <p>Specifies the source MAC address and the destination MAC address for the policy.</p> <p>You can configure Any if there is no specific MAC address to apply the policy to any source IP address.</p>
Protocol	<p>Type of protocol for which the policy must be applied.</p> <p>The following are the supported options:</p> <ul style="list-style-type: none"> • TCP • UDP • ICMP • Any <p>Additional parameters are enabled when you select the protocol.</p>
Source Port	<p>This field is applicable when you select the Protocol as TCP, UDP, or Any.</p> <p>Specifies the source port number for the policy.</p>
Destination Port	<p>This field is applicable when you select the Protocol as TCP, UDP, or Any.</p> <p>Specifies the source port number for the policy.</p>
Description	Description for the rule.

10. Click **Save**.

The AP group is successfully created with the configured parameters.



Onboarding the Home Mesh Router to cnMaestro

After creating a WLAN profile and an AP group, you must now create a subscriber profile and associate it with the subscriber. Finally, you must onboard the router(s) to the corresponding subscriber.

Adding a subscriber and onboarding the router involves the following steps:

1. [Subscriber application branding](#)
2. [Adding a subscriber service profile](#)
3. [Adding a subscriber](#)
4. [Claiming the Home Mesh Router](#)

cnMaestro Subscriber application branding


Customize the cnMaestro Subscriber application with your company name, brand logo, and other details, such as support contact information and timings. This branding can be associated with individual subscriber service profiles.

To add brand details to the cnMaestro Subscriber application, complete the following steps:

1. Navigate to the **Manage Service Providers > Managed Subscribers > Subscriber Service Profiles** tab.

The **Subscriber Service Profiles** page appears.

2. Click **Subscriber App Branding**.

3. Click the add () icon.

The **Subscriber App Branding** window appears. Configure the parameters as described in [Table 15](#)

Table 15: cnMaestro Subscriber application branding parameters

Parameter	Description
Name	Name of the application branding.
Scope	<p>Specifies the availability of the subscriber across managed accounts.</p> <p>The following values are supported:</p> <ul style="list-style-type: none"> • Base Infrastructure—Subscriber is available only for the global account. It is not shared with other managed accounts. • Shared—Subscriber is shared across all managed accounts. It can be mapped to devices in the managed account, but it cannot be modified. To modify the configuration, it must be copied into the managed account and then updated. • Managed Account—Subscriber is available only for that specific managed account. <p>Note: When the scope is configured for a subscriber, it cannot be modified.</p>
Logo	<p>Brand logo that is displayed in the cnMaestro Subscriber application.</p> <p>Maximum size of the image supported is 1 MB.</p> <p>Only JPEG, JPG, PNG, and SVG file formats are supported.</p>
Support Email	Email address of your customer support team that is displayed in the application.

Parameter	Description
Support Phone Number	Phone number of your customer support team that is displayed in the application.
Support Hours	<p>Timings for contacting the customer support team.</p> <ul style="list-style-type: none"> Select the Weekdays check box and configure the week days on when the customer support team is available. You can also configure the time using the time picker tool. Select the Weekends check box and configure the weekend days on when the customer support team is available. You can also configure the time using the time picker tool.

You can preview your branding updates by scrolling through the images in the preview window on the right.

4. Click **Save**.

Managing subscribers (end-customer)

To enable a subscriber to manage the router using the Android or iOS application, you must add a subscriber profile in cnMaestro and send an invitation to the subscriber.

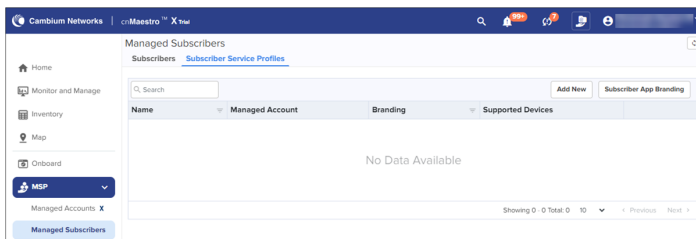
This process involves the following actions:

1. [Adding a subscriber service profile](#)
2. [Adding a subscriber](#)
3. [Claiming the Home Mesh Router](#)

Adding a subscriber service profile

1. Navigate to the **Manage Service Providers > Managed Subscribers > Subscriber Service Profiles** tab.

The **Subscriber Service Profiles** page appears.




2. Click **Add New**.

The **Add Subscriber Service Profile** window appears.

3. Select the Home Mesh Router configuration to which you want to associate with the subscriber service profile and configure the parameters as described in [Table 16](#).

Table 16: Subscriber Service Profile parameters

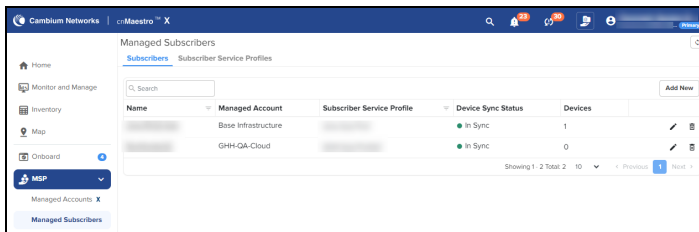
Parameter	Description
Name	Name of the subscriber service profile.
Scope	<p>Specifies the availability of the subscriber service profile across managed accounts.</p> <p>The following values are supported:</p> <ul style="list-style-type: none"> • Base Infrastructure—Subscriber service profile is available only for the global account. It is not shared with other managed accounts. • Shared—Subscriber service profile is shared across all managed accounts. It can be mapped to devices in the managed account, but it cannot be modified. To modify the configuration, it must be copied into the managed account and then updated. • Managed Account—Subscriber service profile is available only for that specific managed account. <p>Note: When the scope is configured for a subscriber service profile, it cannot be modified.</p>
Description	Brief description for the subscriber service profile.
Download (Mbps)	Download speed (in Mbps) configured for the profile.
Upload (Mbps)	Upload speed (in Mbps) configured for the profile.
Type	<p>Displays the device type as RV22 Home Mesh.</p> <p>This field cannot be modified.</p>
Device Configuration	Specifies the Wi-Fi AP group (created for Home Mesh Router) that must be associated with the service profile.

Parameter	Description
	Select the group from the drop-down list.
Subscriber App Branding	<p>Specifies the cnMaestro Subscriber application branding that must be used in this profile.</p> <p>All routers sent to subscribers in this service profile contain the selected branding logo and information.</p> <p>Select the required branding from the drop-down list.</p> <p>If no branding is present, create one by clicking the add () icon. See cnMaestro Subscriber application branding for more information.</p>

- Click **Save**.

Adding a subscriber

- Click the **Subscribers** tab on the **Managed Subscribers** page.



- Click **Add New**.

The **Add Subscriber** window appears.

- In the **Add Subscriber** window, configure the details of the subscriber in the **Basic Information** section, as described in [Table 17](#).

Table 17: Subscriber > Basic tab parameters

Parameter	Description
Full Name	Name of the subscriber.
Scope	<p>Specifies the availability of the subscriber across managed accounts.</p> <p>The following values are supported:</p> <ul style="list-style-type: none"> • Base Infrastructure—Subscriber is available only for the global account. It is not shared with other managed accounts. • Shared—Subscriber is shared across all managed accounts. It can be mapped to devices in the managed account, but it cannot be modified. To modify the configuration, it must be copied into the managed account and then updated. • Managed Account—Subscriber is available only for that specific managed account. <p>Note: When the scope is configured for a subscriber service profile, it cannot be modified.</p>
Email ID	Email address of the subscriber.
Phone Number	Phone number of the subscriber.
Customer ID	Unique ID for the subscriber.
Address	Address of the subscriber where the routers will be installed.

8. Click **Next**.

The **Service Configuration** tab is displayed.

The screenshot shows a window titled "Add Subscriber" with a close button in the top right corner. On the left, there are two tabs: "Basic Information" and "Service Configuration", with "Service Configuration" selected. The main area contains the following fields and controls:

- "Service Profile*" dropdown menu.
- "Download (Mbps)*" and "Upload (Mbps)*" input fields.
- "AP Group" input field.
- A checkbox labeled "Home Wi-Fi Devices Setting Override" which is currently checked.
- "Previous" and "Save" buttons at the bottom.

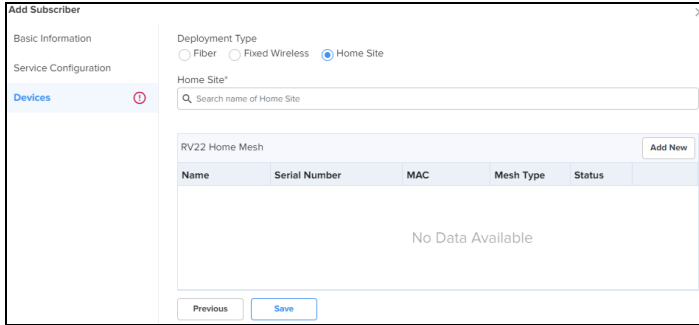
9. Select the subscriber service profile to be associated with this subscriber from the **Service Profile** drop-down list.

10. Click **Save**.

A new tab, **Devices** appears, where you can link (or claim) the Home Mesh Router to the subscriber. See [Claiming the Home Mesh Router](#).

The Subscriber application invitation email is sent to the subscriber with the link to join the account.

11. Click **Devices**.



12. Select one of the following options in the **Deployment Type** field:
 - **Fiber**—Select the Optical Network Unit (ONU) device that you want to associate with the subscriber’s router by searching in the **ONU** search box.
 - **Fixed Wireless**—Select the Subscriber Module (SM) device that you want to associate with the subscriber’s router by searching in the **SM** search box.
 - **Home Site**—Select the home site that you want to associate with the subscriber’s router by searching in the **Home Site** search box. For more information on creating a site, see *cnMaestro Cloud User Guide*.

13. Before linking the Home Mesh Router to the subscriber, click **Save**.

Claiming the Home Mesh Router

After adding a subscriber profile and a subscriber, you must now associate the Home Mesh Router to the subscriber by claiming the router in cnMaestro.

To claim the router, complete the following steps:

1. Navigate to the **Manage Service Providers > Managed Subscribers > Subscribers** tab.
The **Subscribers** page appears.
2. In the list of subscribers, click the subscriber name for which you want to associate the Home Mesh Router.
3. Click the **Devices** tab.
4. In the **RV22 Home Mesh** section, click **Add New**.
The **Link Subscriber** window appears.

5. In the **Link Subscriber** window, link the Home Mesh Router to the subscriber by any of the following methods:

- To claim a new router that is not onboarded to cnMaestro, select the **Claim new and assign** option and enter the serial number of the device to be claimed.

You can claim multiple routers by adding multiple serial numbers separated by commas.

- To claim a router that is already onboarded to cnMaestro, select the **Search for inventory and assign** option.

Enter the details of the router you want to claim.


6. Click **Assign**.

The assigned router appears in the **Devices** section.

RV22 Home Mesh					Add New
Name	Serial Number	MAC	Mesh Type	Status	
RV22-Sravs-Home			Base	● Onboarded	🔍



Note

Click the unlink () icon to unlink the router from the subscriber.

Downloading the cnMaestro Subscriber application

Home Mesh Routers can also be managed using the cnMaestro Subscriber application, available for Apple iOS and Android mobile operating systems.

You can download and install the cnMaestro Subscriber application from the following locations:

- For [Apple iOS](#)
- For [Android](#)

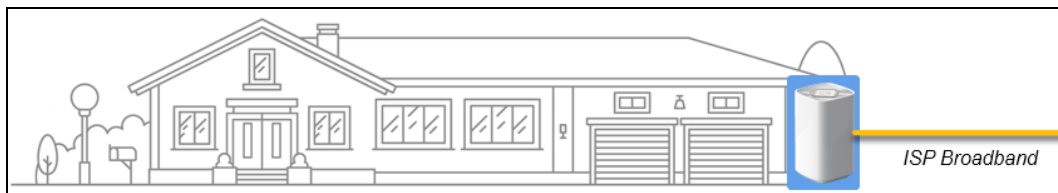
Setting up the Home Mesh Router

Home Mesh Routers can be deployed in one of the following modes:

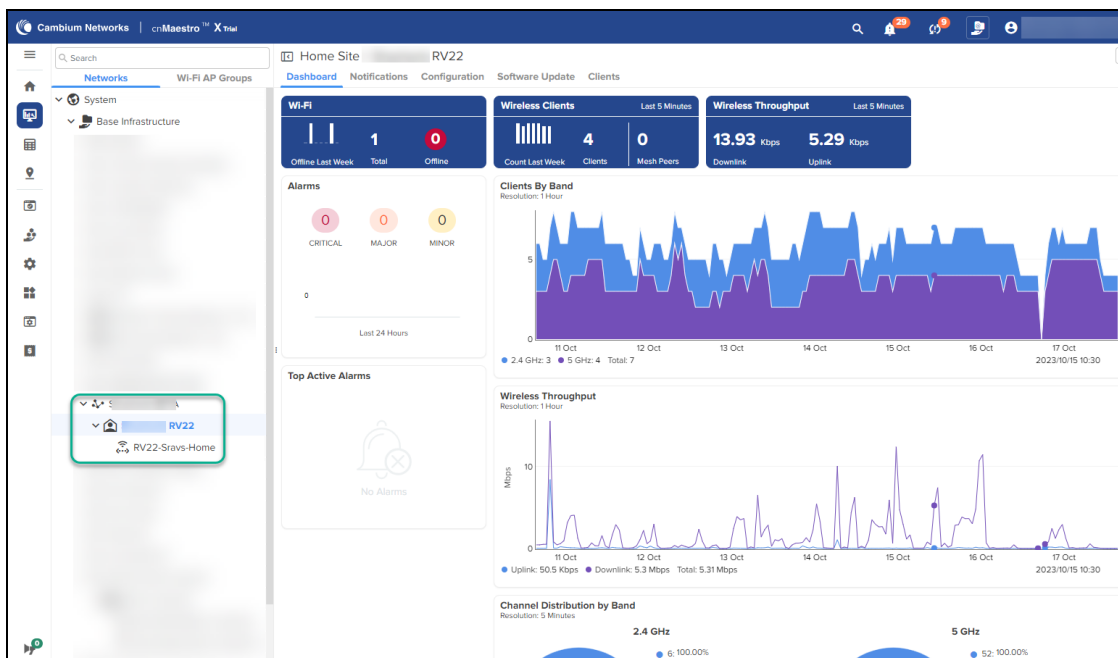
- [Standalone mode](#)
- [Mesh mode](#)

Setting up the Home Mesh Router—Standalone mode

In standalone mode of deployment, there is only one Home Mesh Router deployed. A sample scenario is shown in the following figure:



A sample cnMaestro dashboard for the standalone mode of deployment is shown in the following figure:



Setting up the Home Mesh Router—Mesh mode

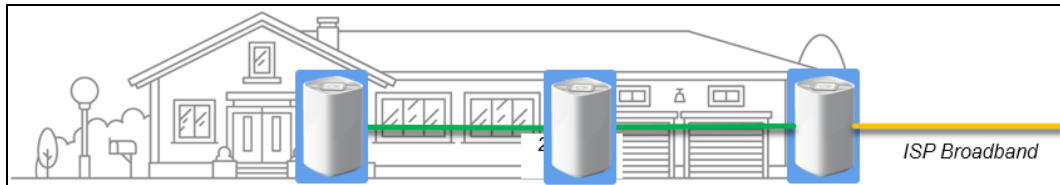
To configure a mesh, onboard the routers to a site—Claim the routers on cnMaestro in the subscriber workflow.

The AP group mapped to the subscriber is applied to all the routers to sync the configuration. Based on the physical connections of the device, the mesh base and node roles are assigned to the devices in the site.

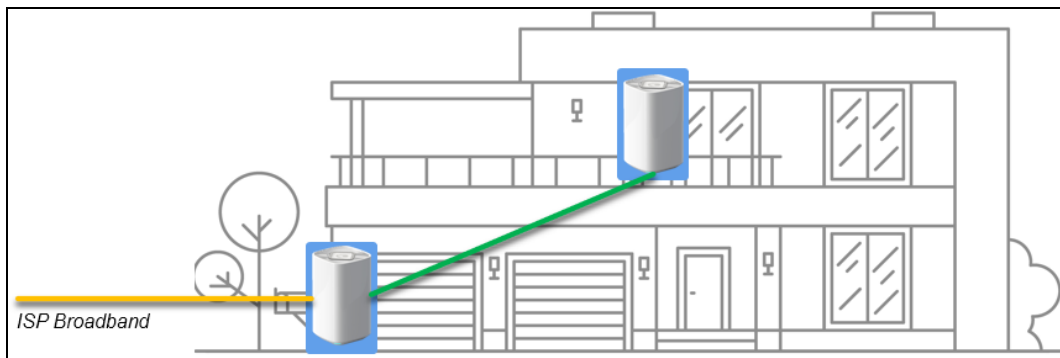
Following are some of the mesh configuration scenarios and the corresponding dashboards and hierarchy in cnMaestro:

- [Linear mesh \(1-1-1\)](#)
- [Multi-mesh \(1-1\)](#)
- [Multi-mesh \(1-2\)](#)

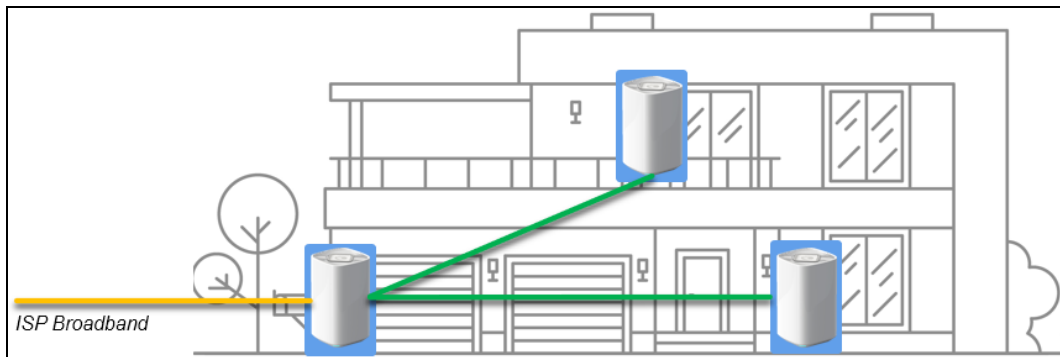
Linear mesh (1-1-1)



Multi-mesh (1-1)



Multi-mesh (1-2)



Viewing router system information and network traffic status

When the customer configures the Home Mesh Router and connects to the internet, you can check the connection of the router in cnMaestro. You can also check the details of the clients that are connected.

To view router system information and the connection status, navigate to **Monitor and Manage** > *<Home-Mesh-Router-name>* > **Details** tab.

The **Details** page displays information in the following tabs:

- **Overview**

This page displays information in the following sections:

- **System**—Displays information, such as router name, MAC address, health of the router (online, offline), software version, and location.
- **Radio**—Displays radio details, such as the running bands, RF quality, count of clients connected to each radio, and the average throughput.
- **Configuration Update**—Displays the history of configuration updates to the router.
- **Software Update**—Displays the currently running software version and a history of software updates that were performed and the status.

The screenshot shows the 'Details' page for an RV22 Home Mesh router. The page is divided into several sections:

- System:** A table listing key information:

Name	RV22-Mesh-Base-Foyer
Product Name	RV22 Home Mesh
MAC Address	[Redacted]
Health	Online (2d 23h 16m)
Uptime	2d 23h 16m
IPv4 Address	192.168.20.54
Software Version	1.0.0-b21
Serial Number	[Redacted]
Hardware	RV22 Wi-Fi 6 Home MESH Router 2x2 dual band
DA Version	4.107
Last Reboot	Sat Oct 14 2023 17:07 (Device reboot due to Power Cycle)
Location	
Onboard Date	27 Sep 2023, 04:07 PM
Description	
Available Memory	50%
CPU Utilization	20%
- Radio Details:** A table comparing Radio 1 and Radio 2:

Radio	Radio 1	Radio 2
Band	2.4 GHz	5 GHz
State	ON	ON
Channel	1	40
Channel Width	20 MHz	80 MHz
Power	14 dBm	15 dBm
MAC Address	[Redacted]	[Redacted]
RF Quality	Average	Average
WLANs	1	1
Mesh	OFF	BASE
Clients	1	1
UL Throughput	0.12 Kbps	16.26 Kbps
DL Throughput	0.25 Kbps	59.63 Kbps
- Configuration Update History:** A table showing recent updates:

Date	Status	AP Group
17 Oct 2023, 02:27 PM	Success	RV22 Biju Home Profile
17 Oct 2023, 02:27 PM	Success	RV22 Biju Home Profile
17 Oct 2023, 03:04 PM	Success	RV22 Biju Home Profile
- Software Update History:** A table showing software version updates:

Date	Status	Version
12 Oct 2023, 12:10 PM	Success	1.0.0-b20_1012_1
12 Oct 2023, 03:01 PM	Success	1.0.0-b20_1012_1
13 Oct 2023, 01:56 PM	Success	1.0.0-b21

- **Network Info**

This tab displays information in the following sections:

- **WAN**—Displays collective statistics about total number of transmitted and received data packets, data bytes, packets dropped, maximum and average speeds
- **IPv4 Routes**—Displays the IPv4 routes configured for the router.
- **DNS Server(s)**—Displays the details of the DNS servers.
- **LAN**—Displays details of the LAN interfaces, their status, total number of transmitted and received data packets and size (in bytes), packet errors and drops.
- **DHCP Server**—Displays details of the DHCP servers, start and end IP address in the range used for allocation, and the lease time.

RV22 Home Mesh > RV22-Mesh-Base-Foyer

Dashboard Notifications Configuration **Details** Performance Software Update Tools Clients WLANs

Overview **Network Info**

IPv4 Address	IPv6 Address	MAC	Link Status	Tx Bytes	Rx Bytes	Tx Avg (Kbps)	Tx Max (Kbps)	Tx Min (Kbps)	Rx Max (Kbps)	Rx Avg (Kbps)	R
192.168.20.54			UP	3837701583	22853270234	116	105862	0	145606	696	0

Destination	Mask	Gateway	Flags	Metric	Interface
0.0.0.0	0.0.0.0	192.168.20.1	UG	0	eth1.2
192.168.11.0	255.255.255.0	0.0.0.0	U	0	br0
192.168.20.0	255.255.255.0	0.0.0.0	U	0	eth1.2
239.0.0.0	255.0.0.0	0.0.0.0	U	0	br0

IP Address	Resolve Status
192.168.20.1	success

Interface Name	Link Status	Tx Bytes	Rx Bytes	Rx Errors	Tx Errors	Tx Drops	Rx Drops	Rx Packets	Tx Packets	Speed	Dupl
lan1	DOWN	0	0	0	0	0	0	0	0		
lan2	DOWN	0	0	0	0	0	0	0	0		
lan3	DOWN	0	0	0	0	0	0	0	0		

Type	Start Address	End Address	Network Mask	Lease Time	Prefix Length	MAC Address	IP Address
v4	192.168.11.2	192.168.11.254	255.255.255.0	3600	-		192.168.11.1

Viewing, editing, and blocking connected clients

cnMaestro allows you to view details of clients (both wired and wireless) connected to the router and edit the name of clients. You can also block certain clients that you do not want to be connected to your wireless networks.

This topic contains the following sections:

- [Viewing connected clients](#)
- [Editing client host name](#)
- [Blocking clients](#)

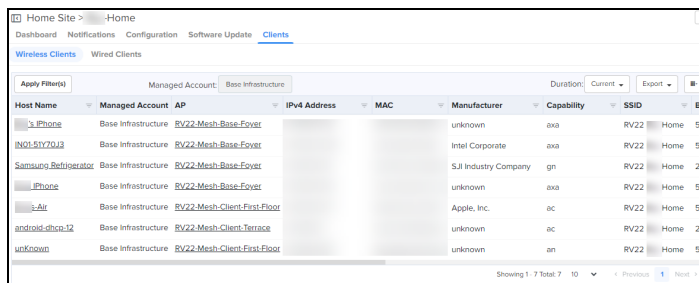
Viewing connected clients

To view the list of connected clients, both wired and wireless, navigate to **Monitor and Manage** > <Home-Mesh-Router-name> > **Clients** tab.

The **Details** tab displays information in the following two tabs:

- **Wireless Clients**

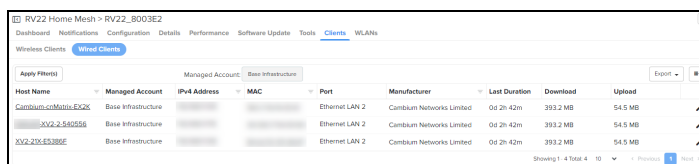
This page displays information about the wireless clients connected to the router, such as the host name, MAC address, IPv4 address assigned, the router it is connected to, and the status of connection with the router (online, offline).



Host Name	Managed Account	AP	IPv4 Address	MAC	Manufacturer	Capability	SSID	Bar
iPhone	Base Infrastructure	RV22-Mesh-Base-Foyer			unknown	axa	RV22 Home	5 C
INOS170J3	Base Infrastructure	RV22-Mesh-Base-Foyer			Intel Corporate	axa	RV22 Home	5 C
Samsung Refrigerator	Base Infrastructure	RV22-Mesh-Base-Foyer			S.J Industry Company	gn	RV22 Home	2.4
iPhone	Base Infrastructure	RV22-Mesh-Base-Foyer			unknown	axa	RV22 Home	5 C
Air	Base Infrastructure	RV22-Mesh-Client-First-Floor			Apple, Inc.	ac	RV22 Home	5 C
android-iphone12	Base Infrastructure	RV22-Mesh-Client-Terrace			unknown	ac	RV22 Home	2.4
unknown	Base Infrastructure	RV22-Mesh-Client-First-Floor			unknown	an	RV22 Home	5 C


- **Wired Clients**

This page displays information about the wired clients connected to the router, such as the host name, MAC address, IPv4 address assigned, port number to which it is connected, the manufacturer of device connected, last connected duration, and the download and upload data size (in MB).



Host Name	Managed Account	IPv4 Address	MAC	Port	Manufacturer	Last Duration	Download	Upload
Cambricon.com/Mini-EX26	Base Infrastructure			Ethernet LAN 2	Cambricon Networks Limited	0d 2h 42m	393.2 MB	54.5 MB
XYZ-2-560556	Base Infrastructure			Ethernet LAN 2	Cambricon Networks Limited	0d 2h 42m	393.2 MB	54.5 MB
XYZ-206-633866	Base Infrastructure			Ethernet LAN 2	Cambricon Networks Limited	0d 2h 42m	393.2 MB	54.5 MB

Editing client host name

To edit the host name of a connected client, click the edit client name () icon corresponding to the client.

Enter the name in the **Host Name** field and click **Save**.



Dialog box titled "Edit Client Name" with a close button (X) in the top right corner. The dialog contains a label "Host Name*" above a text input field. The input field contains the text "IN01-CMQ7HW3". Below the input field are two buttons: "Save" and "Cancel".

Blocking clients

To block a connected client, click the block () icon corresponding to the client.

Monitoring and Troubleshooting

You can monitor and perform troubleshooting tasks on the Home Mesh Router using cnMaestro. This topic covers the following sections

- [Monitoring the Home Mesh Router](#)
- [Troubleshooting the Home Mesh Router](#)
- [Upgrading the Home Mesh Router firmware](#)

Monitoring the Home Mesh Router

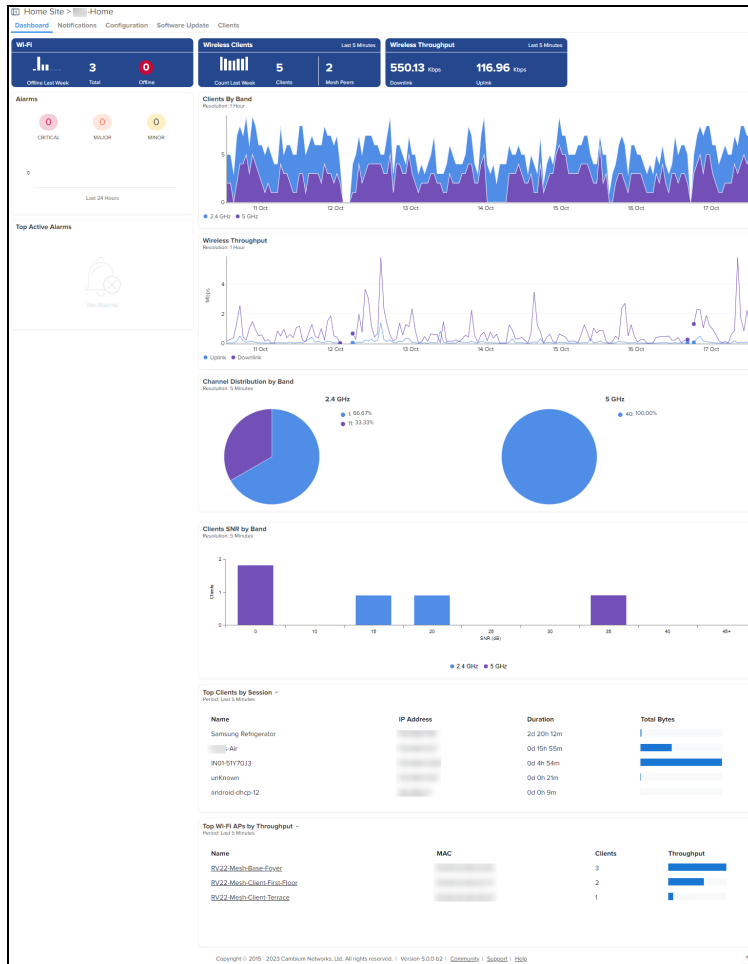
After the device is onboarded to cnMaestro, based on the deployment type, the router will be displayed under the site that is configured.

cnMaestro provides the following pages to monitor and view details of the router and the deployment.

- [Home Site Dashboard](#)
- [Notifications](#)
- [Software Update](#)
- [Performance](#)

Home Site Dashboard

To view the site dashboard, access the **Dashboard** page under **Monitor and Manage** > *<Home-site-name>* > **Dashboard**.



Notifications

The Notifications page displays current alarms, previous alarms, Wi-Fi-related events, and other device-related events.

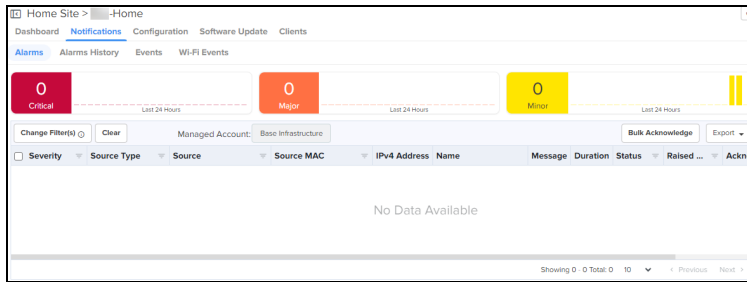
cnMaestro displays the following types of notifications:

- [Alarms](#)
- [Alarms History](#)
- [Events](#)
- [Wi-Fi Events](#)

Alarms

The Alarms page displays the number of critical, major, and minor events observed for the Home Mesh Router. You can also view the details of the events, such as severity level, name of the event, time and action taken.

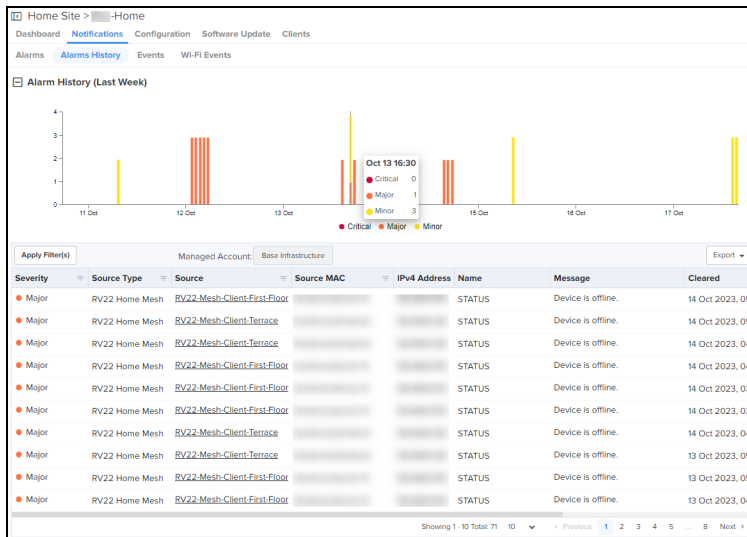
To view the alarms raised, access the **Alarms** page under **Monitor and Manage** > *<Home-site-name>* > **Notifications** > **Alarms**.



Alarms History

The Alarms History page displays the number of critical, major, and minor events observed in the previous week.

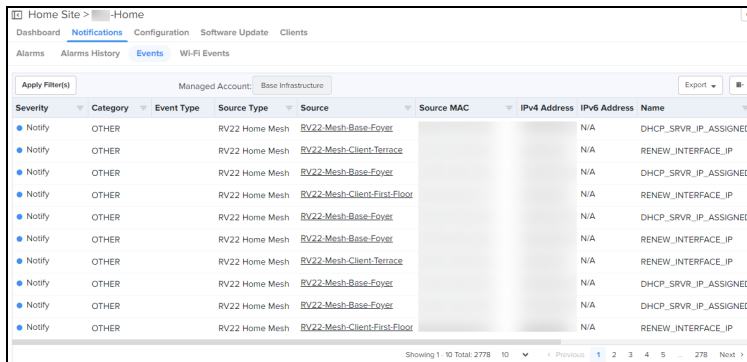
To view the alarms history displayed as a graphical representation, access the **Alarms History** page under **Monitor and Manage > <Home-site-name> > Notifications > Alarms History**.



Events

The Events page displays Home Mesh Router-related events, such as its status, if there was a bandwidth change, when the DHCP server IP was assigned to the connected clients.

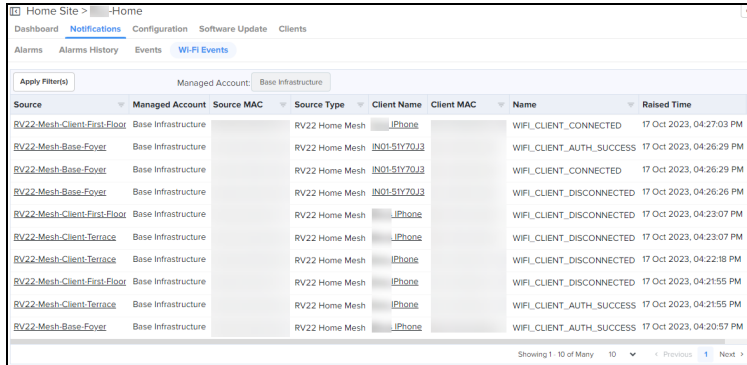
To view the events, access the **Events** page under **Monitor and Manage > <Home-site-name> > Notifications > Events**.



Wi-Fi Events

The Wi-Fi Events page displays client-related events, such as when the client connected to the network, when it was disconnected, and authentication events.

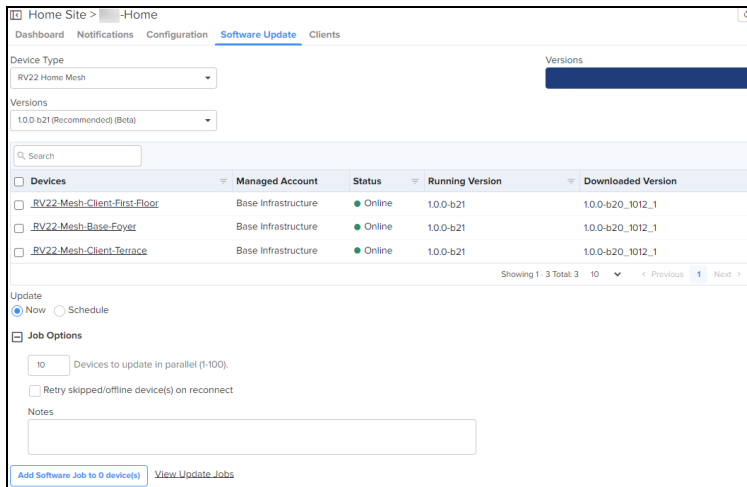
To view the Wi-Fi events, access the **Wi-Fi Events** page under **Monitor and Manage** > <Home-site-name> > **Notifications** > **Wi-Fi Events**.



Source	Managed Account	Source MAC	Source Type	Client Name	Client MAC	Name	Raised Time
RV22-Mesh-Client-First-Floor	Base Infrastructure		RV22 Home Mesh	iPhone		WIFI_CLIENT_CONNECTED	17 Oct 2023, 04:27:03 PM
RV22-Mesh-Base-Foyer	Base Infrastructure		RV22 Home Mesh	IN0151Y70J3		WIFI_CLIENT_AUTH_SUCCESS	17 Oct 2023, 04:26:29 PM
RV22-Mesh-Base-Foyer	Base Infrastructure		RV22 Home Mesh	IN0151Y70J3		WIFI_CLIENT_CONNECTED	17 Oct 2023, 04:26:29 PM
RV22-Mesh-Base-Foyer	Base Infrastructure		RV22 Home Mesh	IN0151Y70J3		WIFI_CLIENT_DISCONNECTED	17 Oct 2023, 04:26:26 PM
RV22-Mesh-Client-First-Floor	Base Infrastructure		RV22 Home Mesh	iPhone		WIFI_CLIENT_DISCONNECTED	17 Oct 2023, 04:23:07 PM
RV22-Mesh-Client-Terrace	Base Infrastructure		RV22 Home Mesh	iPhone		WIFI_CLIENT_DISCONNECTED	17 Oct 2023, 04:23:07 PM
RV22-Mesh-Client-Terrace	Base Infrastructure		RV22 Home Mesh	iPhone		WIFI_CLIENT_DISCONNECTED	17 Oct 2023, 04:22:18 PM
RV22-Mesh-Client-First-Floor	Base Infrastructure		RV22 Home Mesh	iPhone		WIFI_CLIENT_DISCONNECTED	17 Oct 2023, 04:21:55 PM
RV22-Mesh-Client-Terrace	Base Infrastructure		RV22 Home Mesh	iPhone		WIFI_CLIENT_AUTH_SUCCESS	17 Oct 2023, 04:21:55 PM
RV22-Mesh-Base-Foyer	Base Infrastructure		RV22 Home Mesh	iPhone		WIFI_CLIENT_AUTH_SUCCESS	17 Oct 2023, 04:20:57 PM

Software Update

To upgrade the router firmware, go to the **Software Update** page. See [Upgrading the Home Mesh Router firmware](#) for more information.



Devices	Managed Account	Status	Running Version	Downloaded Version
<input type="checkbox"/> RV22-Mesh-Client-First-Floor	Base Infrastructure	Online	1.0.0-b21	1.0.0-b20_1012_1
<input type="checkbox"/> RV22-Mesh-Base-Foyer	Base Infrastructure	Online	1.0.0-b21	1.0.0-b20_1012_1
<input type="checkbox"/> RV22-Mesh-Client-Terrace	Base Infrastructure	Online	1.0.0-b21	1.0.0-b20_1012_1

Performance

To view the performance of the router, access the **Wi-Fi Events** page under **Monitor and Manage** > <Home-Mesh-Router-name> > **Performance**.

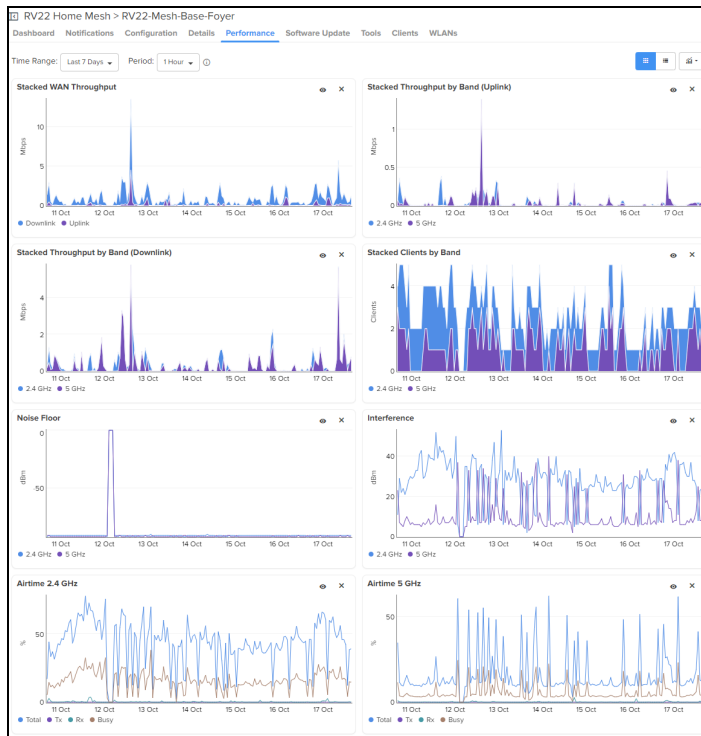
The tab displays the following graphical information:

Table 18: Performance tab graphs—Base and Node routers

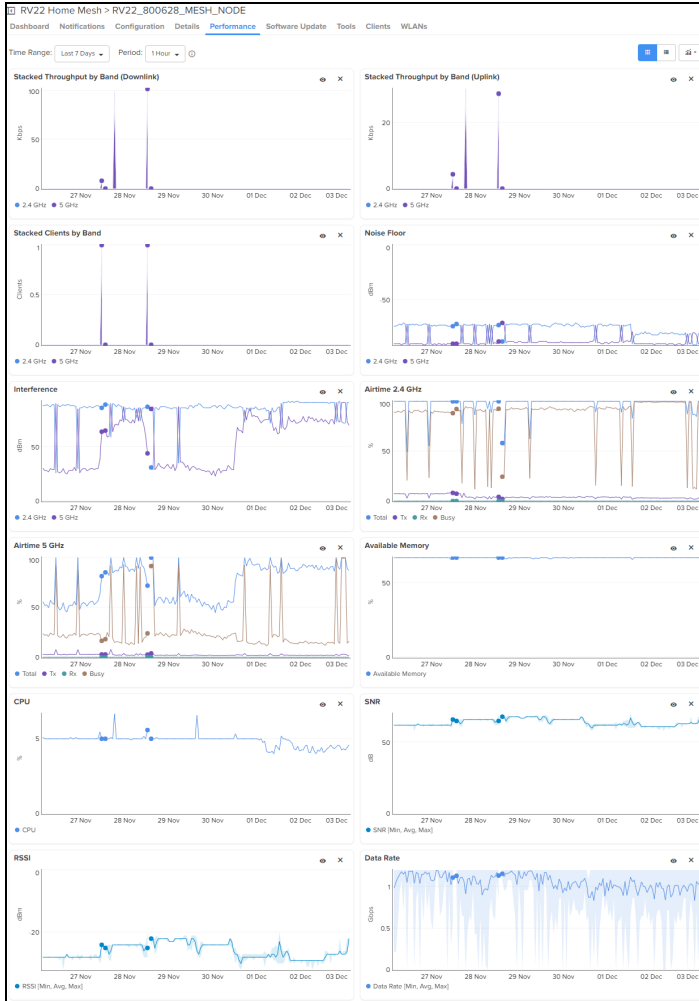
Parameter	Description	Router (Base / Node / Both)
Stacked WAN Throughput	Hourly throughput for both downlink and uplink in the WAN interface for each band of the mesh base router.	Base only
Stacked Throughput by Band (Downlink)	Downlink speed in each band.	Both
Stacked Throughput by Band (Uplink)	Uplink speed in each band.	Both
Stacked Clients by Band	Count of number of clients connected in each band.	Both
Noise Floor	Amount of background noise (in dBm) or interference created by devices in the same frequency.	Both
Interference	Interference (in dBm) caused by other wireless signals and devices interrupting the router's Wi-Fi signal.	Both
Airtime 2.4 GHz	Capacity utilization (in %) of the 2.4 GHz band for effective transmission.	Both
Airtime 5 GHz	Capacity utilization (in %) of the 5 GHz band for effective transmission.	Both
Available Memory	Amount of router memory (in %) available for use.	Both
CPU	Router CPU utilization in percentage (%).	Both
SNR	Minimum, average, and maximum SNR values (in dB) for the mesh node router.	Node only
RSSI	Received Signal Strength Indicator (RSSI) value (in dBm) for the mesh node router.	Node only
Data Rate	Minimum, average, and maximum data rates (in Mbps or Gbps) provided by the mesh node router to the client devices.	Node only

Following are sample performance graphs for base and node routers:

- Performance of the *base router* in a mesh deployment



- Performance of the *node router* in a mesh deployment



Troubleshooting the Home Mesh Router

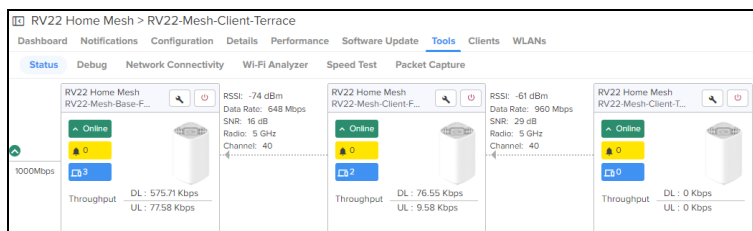
cnMaestro provides the following troubleshooting options for the router:

- [Status](#)
 - [Downloading tech support file](#)
- [Debug](#)
- [Network Connectivity](#)
- [Wi-Fi Analyzer](#)
- [Speed Test](#)
- [Packet Capture](#)


Status

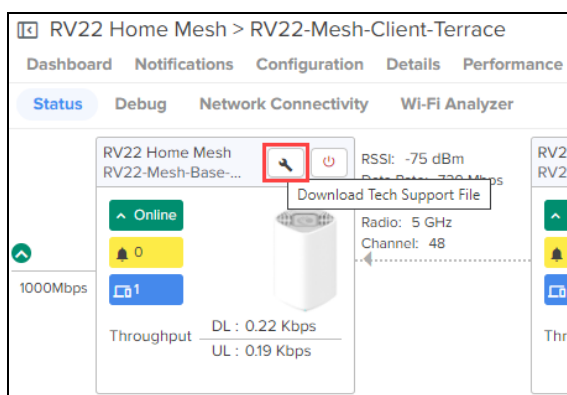
The Status page displays the status of link between the Home Mesh Router base and client devices.

To view the status of the link between the Home Mesh base and client devices, access the **Status** page under **Monitor and Manage** > <Home-Mesh-Router-name> > **Tools**.



Downloading tech support file

To download the tech support file, on the **Status** page, click the Download Tech Support File () icon.

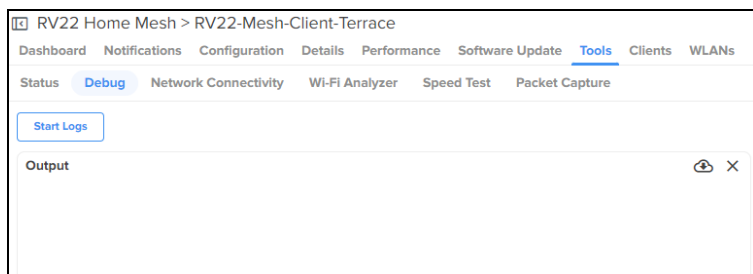


Debug

The Debug page displays log information of the Home Mesh Router. To view the debug information, complete the following steps:

1. Navigate to the **Monitor and Manage** > <Home-Mesh-Router-name> > **Tools** > **Debug** tab.
2. Click **Start Logs**.

The log information is displayed in the **Output** window.



Network Connectivity

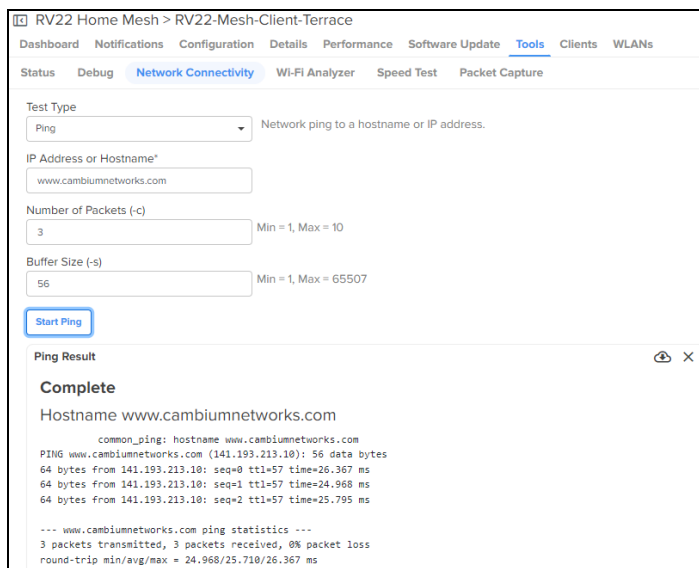
The Network Connectivity page provides network connectivity information of the Home Mesh Routers. cnMaestro supports the following tests to provide connectivity information for the Home Mesh Routers:

- Ping
- DNS Lookup
- Traceroute

To test network connectivity of the router, complete the following steps:

1. Navigate to the **Monitor and Manage > <Home-Mesh-Router-name> > Tools > Network Connectivity** tab.
2. Select the required test type from the **Test Type** drop-down list and configure the corresponding parameters required for the test.
3. Click **Start Test**.

cnMaestro initiates the test and displays the result in the **<Test Type> Result** window.



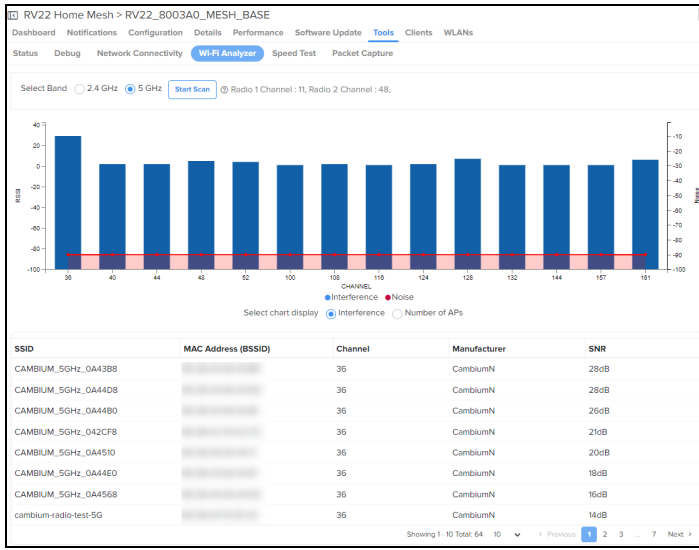
Wi-Fi Analyzer

The Wi-Fi Analyzer page displays radio traffic and signal information for the selected band. It displays the interference and noise measured for the selected band.

To view the Wi-Fi Analyzer details, complete the following steps:

1. Navigate to the **Monitor and Manage > <Home-Mesh-Router-name> > Tools > Wi-Fi Analyzer** tab.
2. Select the required band (2.4 or 5 GHz).
3. Click **Start Scan**.

cnMaestro analyzes the band and displays the result in table.



Speed Test

The Speed Test page displays the internet speed provided by the Home Mesh Router.

To know the speed of the router, complete the following steps:

1. Navigate to the **Monitor and Manage** > <Home-Mesh-Router-name> > **Tools** > **Speed Test** tab.
2. Configure the required values for testing the speed.
3. Click **Start Speed Test**.

cnMaestro checks the speed and displays both download and upload speeds in megabits per second (Mbps)

The screenshot shows the Speed Test configuration page for RV22 Home Mesh. The top navigation bar includes Dashboard, Notifications, Configuration, Details, Performance, Software Update, Tools, Clients, and WLANs. The 'Tools' tab is active, with sub-tabs for Status, Debug, Network Connectivity, Wi-Fi Analyzer, Speed Test, and Packet Capture. The 'Speed Test' sub-tab is selected. Below the navigation, there are input fields for 'Duration (Seconds)' (15), 'Parallel Streams' (3), 'Download Size (MB)' (20), and 'Upload Size (MB)' (20). Each field has a 'Min' and 'Max' value. A 'Start Speed Test' button is at the bottom.

The speed test is also available in the **Subscriber** page in the **Home Wi-Fi Devices Setting Override** section.

To avail this speed test option, complete the following steps:

1. Navigate to the **Manage Service Providers > Managed Subscribers > Subscribers** tab.
2. From the list of subscribers, click the subscriber name for which you want to configure the speed test.

The **Edit <Subscriber-name>** window is displayed.

3. Click the **Service Configuration** tab.
4. In the **Home Wi-Fi Devices Setting Override** section, click the **Speed Test** tab.

5. To schedule the speed test at a particular duration, select the **Schedule Background Testing** check box.
6. Select the start and end time for performing the speed test on the router.

Packet Capture

The Packet Capture page allows the user to capture all packets on a specified interface.

To capture packet data, complete the following steps:

1. Navigate to the **Monitor and Manage** > <Home-Mesh-Router-name> > **Tools** > **Packet Capture** tab.
2. Select the required interface and provide the source and destination IP address or MAC address.
3. Provide the number of packets to be captured.
4. Click **Start Capture**.
cnMaestro displays the information in the **Output** window.
5. To download the PCAP file, click the download (📄) icon.

The screenshot shows the 'Packet Capture' configuration page in the cnMaestro web interface. The page title is 'RV22 Home Mesh > RV22-Mesh-Client-Terrace'. The navigation menu includes Dashboard, Notifications, Configuration, Details, Performance, Software Update, Tools, Clients, and WLANs. The 'Tools' menu is expanded, showing Status, Debug, Network Connectivity, Wi-Fi Analyzer, Speed Test, and Packet Capture. The 'Packet Capture' page has the following fields:

- Interface:** A dropdown menu set to 'Ethernet' and a text input field with 'Min = 1, Max = 2'.
- Source IP/Destination IP:** Two text input fields labeled 'Source IP' and 'Destination IP'.
- Source MAC/Destination MAC:** Two text input fields labeled 'Source MAC' and 'Destination MAC'.
- Direction:** A dropdown menu set to 'Both'.
- Count:** A text input field.
- Filter:** A text input field with the example 'Ex: icmp[icmpType]=8'.

A blue 'Start Capture' button is located below the filter field. Below the form is a note: 'Note: Packet capture will be aborted after 60 seconds, if the count has not reached. Summary will not be available when aborted.' At the bottom, there is an 'Output' window with a download icon (📄) and a close button (X).

Upgrading the Home Mesh Router firmware

To upgrade the firmware of Home Mesh routers present in a home site, complete the following steps:

1. Navigate to **Monitor and Manage** > <Home-site-name> > **Software Update**.
The Software Update page appears
2. Select **RV22 Home Mesh** from the **Device Type** drop-down list.
3. Select the software version from the **Versions** drop-down list.
4. In the list of devices table, select the check boxes corresponding to the devices for which you want to upgrade the firmware.
You can also select one router to upgrade the firmware of only that router.
5. Select the **Now** option in the **Update** field to upgrade the firmware immediately.
To schedule the upgrade job, select the **Schedule** option and configure the required date and time.
6. Click **Add Software Job to** <number of devices> **device(s)**.
The upgrade is scheduled to run at the specified date and time.

To view the status of the update jobs, click **View Update Jobs**.

The screenshot shows the 'Software Update' page in a web application. At the top, there are navigation tabs: 'Dashboard', 'Notifications', 'Configuration', 'Software Update', and 'Clients'. Below the navigation, there are dropdown menus for 'Device Type' (set to 'RV22 Home Mesh') and 'Versions' (set to '1.0.0-b21 (Recommended) (Beta)'). A search bar is located below the version dropdown. The main content area features a table with the following columns: 'Devices', 'Managed Account', 'Status', 'Running Version', and 'Downloaded Version'. The table lists three devices, all with a status of 'Online' and a running version of '1.0.0-b21'. Below the table, there are 'Update' options: 'Now' (selected) and 'Schedule'. Under 'Job Options', there is a 'Devices to update in parallel (1-100)' field set to '10', a checkbox for 'Retry skipped/offline device(s) on reconnect', and a 'Notes' text area. At the bottom, there are two buttons: 'Add Software Job to 0 device(s)' and 'View Update Jobs'.

Devices	Managed Account	Status	Running Version	Downloaded Version
<input type="checkbox"/> RV22-Mesh-Client-First-Floor	Base Infrastructure	Online	1.0.0-b21	1.0.0-b20_1012_1
<input type="checkbox"/> RV22-Mesh-Base-Foyer	Base Infrastructure	Online	1.0.0-b21	1.0.0-b20_1012_1
<input type="checkbox"/> RV22-Mesh-Client-Terrace	Base Infrastructure	Online	1.0.0-b21	1.0.0-b20_1012_1

Showing 1 - 3 Total: 3 10 < Previous 1 Next >

Update
 Now Schedule

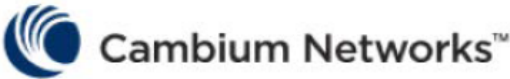
Job Options
10 Devices to update in parallel (1-100).
 Retry skipped/offline device(s) on reconnect
Notes

[Add Software Job to 0 device\(s\)](#) [View Update Jobs](#)

Cambium Networks

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Support website	https://support.cambiumnetworks.com
Support enquiries	
Technical training	https://learning.cambiumnetworks.com/learn
Main website	http://www.cambiumnetworks.com
Sales enquiries	solutions@cambiumnetworks.com
Warranty	https://www.cambiumnetworks.com/support/standard-warranty/
Telephone number list	http://www.cambiumnetworks.com/contact-us/
User Guides	http://www.cambiumnetworks.com/guides
Address	Cambium Networks Limited, Unit B2, Linhay Business Park, Eastern Road, Ashburton, Devon, TQ13 7UP United Kingdom



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