

Setting Up an Edgecore EAP112 OpenMesh Network with HaLow Backbone

Objective: To configure a mesh network using three Edgecore EAP112 devices. One device will act as the Root AP (connected to the internet via Ethernet), and the other two will act as Mesh APs, connecting wirelessly to the Root AP via the HaLow (IEEE 802.11ah, Sub-1GHz) radio to form a mesh backbone. All devices will also provide standard Wi-Fi access on the 2.4GHz and 5GHz bands.

Hardware:

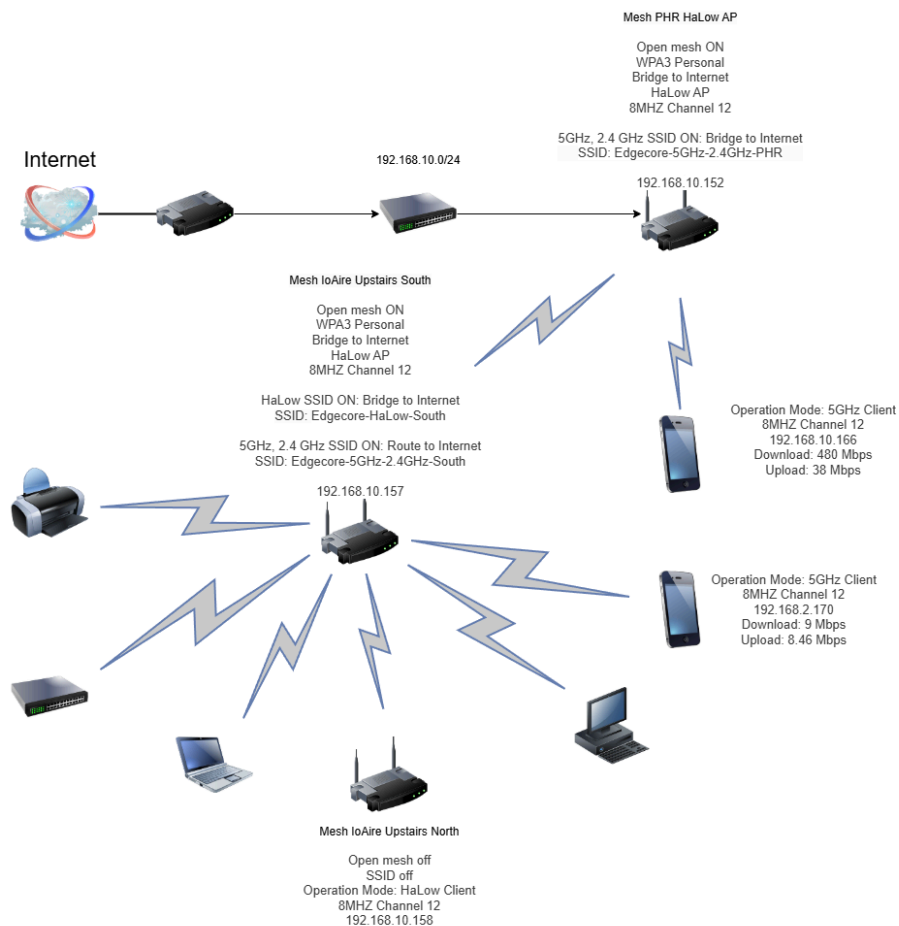
- Two or more Edgecore EAP112 routes
- Internet Connection
- Ethernet Cables

Prerequisites:

- All Edgecore EAP112 devices must be initially connected via their upstream Ethernet port to the internet and successfully registered on the ecCloud management platform.

Network Topology Overview:

- **Device 1 (Root AP):** Connected directly to the main internet router/modem via its upstream Ethernet port. It serves as the gateway for the mesh network. (e.g., Mesh PHR HaLow AP)
- **Device 2 (Mesh AP):** Placed remotely. They connect *wirelessly* to Device 1 using the HaLow mesh link. They do *not* have their upstream Ethernet ports connected after the initial setup. (e.g., Mesh IoAire Upstairs South)
- **Client Devices:** Connect to any of the three EAP112 devices via the HaLow, 2.4GHz or 5GHz Wi-Fi SSIDs.(e.g., Mesh IoAire Upstairs North as HaLow client, mobile phones as 5GHz Clients)



Configuration Steps:

1. Initial Setup & Registration:

- Power on all three EAP112 devices.
- Connect the upstream Ethernet port of *each* EAP112 to your network switch or router that provides internet access.
- Ensure all three devices appear online and are registered in your ecCloud account.

2. General Mesh Configuration (Apply to ALL mesh devices):

- Navigate to the Mesh settings section for each device in ecCloud.
- **Enable OpenMesh:** Turn this feature ON.
- **Mesh ID:** Assign the *same* Mesh ID to all three devices. This allows them to identify each other as part of the same mesh network.
- **Network Behavior (Mesh Setting):** Set this to `Bridge to Internet` for *all mesh* devices (Root AP and Mesh APs).
- cloud.ignitenet.com/site/281474976786088/device/281474977164523/config#radio

The screenshot shows the ecCloud web interface. The breadcrumb trail is: Iron Eagle > Child Site > Devices > Mesh IoAire Upstairs South > Configuration. The page title is 'Mesh IoAire Upstairs South' with a status of 'ONLINE' and 'Near east'. The left sidebar shows a 'DEVICE MENU' with options: Dashboard, Statistics, Clients, Activity, and Configuration (selected). The main content area is titled 'MESH SETTINGS' and contains the following configuration items:

Open Mesh	<input checked="" type="checkbox"/>
Mesh Id	<input type="text" value="openmesh"/>
Security Method	<input type="text" value="WPA3 Personal"/>
Mesh Key	<input type="text" value="12345678"/>
Network Behavior	<input type="text" value="Bridge to Internet"/>
Mesh Radio	<input type="text" value="HaLow (Sub 1 GHz)"/>

3. HaLow (Sub-1GHz / 802.11ah) Radio Configuration (Apply to ALL mesh devices):

- Navigate to the Wireless Radio settings for the 802.11ah (Sub-1GHz / HaLow) interface on each device: **Device menu -> Configuration -> Radio Settings -> Wireless HaLow (Sub 1GHz)**
- **Enable Radio:** Ensure the HaLow radio is enabled.
- **Channel Bandwidth:** Set to `8 MHz`.
- **Channel:** Set to `Channel 12`.
 - **Important Note:** *Do not use Channel 44.* There is a known bug where enabling Mesh + Channel 44 causes the HaLow radio to fail. Use Channel 12 until a firmware update addresses this issue.
- **Wireless networks:**
 - Enable SSID and set the SSID and key.
 - Set Network behavior to `Bridge to Internet` for *all mesh* devices. This ensures the mesh backbone operates in bridge mode.
 - Method: WPA3 Personal

WIRELESS HALOW (SUB 1GHz)	
GENERAL RADIO SETTINGS	
Enable Radio	<input checked="" type="checkbox"/>
Operation Mode	Access Point (Auto-WDS)
PHYSICAL RADIO SETTINGS	
Channel Bandwidth	8MHz
Channel	12 (0.908 GHz)
Beacon Interval	100
WIRELESS NETWORKS	
Enable SSID	<input checked="" type="checkbox"/>
SSID	Edgecore-HaLow
Idle Timeout	300
Method	WPA3 Personal
Key	uergx5pw
Network behavior	Bridge to Internet

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4. Standard Wi-Fi (2.4GHz / 5GHz) Configuration (Apply to ALL mesh devices):

- o Navigate to the **Wireless SSID** settings for the 2.4GHz and 5GHz interfaces on each device.
- o **Enable Radios:** Ensure these radios are enabled if you want to provide standard Wi-Fi access.
- o **Configure SSIDs:** Set up your desired SSIDs, security (WPA2/WPA3), and passwords for client access.
- o **Network Settings**
 - Network Settings can be set as any type, `bridge to internet` is recommended

^ General Settings

Note: Changing any single SSID setting here will cause the whole SSID to no longer inherit

Enable SSID	<input checked="" type="checkbox"/>
SSID	Edgecore-5GHz-2.4GHz-South
Broadcast SSID	<input checked="" type="checkbox"/>
Client isolation	<input type="checkbox"/>
Multicast-to-Unicast Conversion	<input checked="" type="checkbox"/>
Max Client Count	127 ?
Minimum allowed signal	-100 RSSI ?
Activate on radio	<input checked="" type="checkbox"/> 5GHz <input checked="" type="checkbox"/> 2.4GHz ?
OS Blacklist	<input type="checkbox"/> Android <input type="checkbox"/> IOS / MacOS <input type="checkbox"/> Windows
U-APSD	<input checked="" type="checkbox"/> ?

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5. Final Physical Setup:

- o Disconnect the Ethernet cables from the upstream ports of **Mesh AP (Device 2 and other mesh nodes)**. They should now obtain their internet connection wirelessly via the HaLow mesh link to Device 1.
- o Ensure **Device 1 (Root AP)** remains connected to the internet via its upstream Ethernet port.

Verification:

- Check the status of all three devices in ecCloud. Device 2 and other mesh nodes should show as online.

- Connect client devices (EAP 112 in HaLow client mode, laptops, phones) to the HaLow, 2.4GHz/5GHz SSIDs broadcast by Device 2 and other mesh nodes. Verify they can access the internet.
- Observe the mesh link status and performance metrics available in ecCloud.

Summary of Critical Settings:

- **Mesh Enabled:** ON (All Devices)
- **Same Mesh ID:** (All Devices)
- **Mesh Network Behavior:** Bridge to Internet (All Devices)
- **HaLow Radio Network Behavior:** Bridge to Internet (All Devices)
- **HaLow Channel:** Channel 12 (Avoid Channel 44)
- **HaLow Bandwidth:** 8 MHz