



ecCLOUD Controller

User Manual

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# User Manual

## ecCLOUD Controller

Cloud-Based Wired and Wireless Device Network Controller

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# How to Use This Guide

This guide includes detailed information on the Edgecore ecCLOUD Controller, including how to create Clouds and Sites, and how to manage your APs and other devices. To manage your network devices effectively and ensure trouble-free operation, you should first read the relevant sections in this guide so that you are familiar with all features.

## Who Should Read This Guide?

This guide is for network administrators who are responsible for operating and maintaining network equipment. The guide assumes a basic working knowledge of LANs (Local Area Networks), the Internet Protocol (IP), and Simple Network Management Protocol (SNMP).

## How This Guide is Organized

The organization of this guide is based on the ecCLOUD Controller web management interface. An introduction and initial configuration information is also provided.

The guide includes these sections:

- Section I **“Getting Started”** — Includes an introduction to the ecCLOUD Controller and initial access steps.
- Section II **“Cloud Configuration”** — Includes all management options available through the ecCLOUD Controller web site.

## Conventions

The following conventions are used throughout this guide to show information:



**Note:** Emphasizes important information or calls your attention to related features or instructions.

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**Caution:** Alerts you to a potential hazard that could cause loss of data, or damage the system or equipment.

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**Warning:** Alerts you to a potential hazard that could cause personal injury.

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**Revision History** This section summarizes the changes in each revision of this guide.

### February 2025 Revision

This is the tenth revision of this guide. It includes the following change:

- Added support for EAP112-L, EAP112-H, and EAP105, see ["Edgecore APs" on page 27](#)
- Added restricted access to cloud management portal by IP ACL, see ["Changing the Cloud Properties" on page 49](#)
- Updated Site Configuration - Wi-Fi 6 to Site Configuration - Wi-Fi 6 & Newer to include WIFI-7 models, see ["Wireless SSID Configuration" on page 161](#) and [Figure 168](#)
- Added support to 320 MHz channel bandwidth for Radio Mode "802.11 be", see ["Physical Radio Settings" on page 174](#) and ["Physical Radio Settings" on page 233](#)
- Added support for Hotspot RADIUS DAE Configuration, see ["Dynamic Authorization" on page 193](#) and [Figure 193](#)
- Added support for MQTT in iBeacon, see [Publish MQTT" on page 205](#) and [Figure 206](#)
- Added support for HaLow Open Mesh Mode, see ["Mesh Radio" on page 232](#)
- Updated LinkPath to classify links with RSSI below -70dBm as "No Link," see ["Expected RSSI" on page 253](#) and ["Expected RSSI with rain" on page 254](#)

### July 2024 Revision

This is the ninth revision of this guide. It includes the following change:

- Added Smart NVR Add-on with support for IP Cameras, see ["Using the Smart NVR Add-On" on page 88](#)

### June 2024 Revision

This is the eighth revision of this guide. It includes the following changes:

- Updated the Captive Portal and SSID configuration descriptions to include Microsoft 365 Authentication, see ["SSID Configuration" on page 82](#) and [Figure 76](#)
- Added visibility for network topology update time, see ["Locations and Maps" on page 99](#) and [Figure 98](#)
- Added Microsoft 365 Authentication support, see ["Microsoft 365 Authentication" on page 171](#) and [Figure 172](#)

- Updated System Settings for WiFi 6 Sites to include SNMP Trap Server, see ["SNMP" on page 200](#) and [Figure 200](#)

### **March 2024 Revision**

This is the seventh revision of this guide. It includes the following changes:

- Added Report Management feature, see ["Report Management" on page 70](#)
- Added Aprecomm's Virtual Wireless Expert Add-on, see ["Using the Aprecomm Add-On" on page 84](#)
- Updated the LinqPath Tool to include Distance Steps and corresponding Expected MCS & Data Rate, see ["Using the LinqPath Tool" on page 252](#) and [Figure 249](#)

### **December 2023 Revision**

This is the sixth revision of this guide. It includes the following changes:

- Updated Supported Models, see ["The following devices are supported by ecCLOUD:" on page 27](#)
- Updated [Figure 20](#), see ["Device Configuration Changes" on page 41](#)
- Modified Cloud Management Add-ons, see ["Add-Ons" on page 74](#)
- Modified Target Options in Firewall Settings, see WiFi-5 ["Firewall Settings" on page 139](#) and WiFi-6 ["Firewall Settings" on page 186](#)
- Added SSID Isolation Support, see ["Wireless SSID Configuration" on page 161](#)
- Added Dynamic PSK Keys Support, see ["Security Settings" on page 163](#)
- Added Mgmt Log and SysLog Level Capability, see ["System Settings" on page 196](#)
- Added SNMPv3 User Support for WiFi-6, see ["SNMPv3 User" on page 205](#)
- Added Site SD-WAN Settings, see ["Site SD-WAN Configuration" on page 216](#)
- Added 6 GHz Band Support, see ["WiFi 6 and Newer Device Configuration" on page 228](#)
- Added Device SD-WAN Settings, see ["SD-WAN Device Configuration" on page 286](#)

### **August 2023 Revision**

This is the fifth revision of this guide. It includes the following changes:

- Added OpenRoaming, see ["Adding an SSID" on page 162](#) and ["OpenRoaming" on page 206](#)

- Added RF Isolation, see ["Radio Settings"](#) on page 173
- Modified Broadcast Rate, see ["Radio Settings"](#) on page 173
- Added Site Grouping, see ["Site Grouping"](#) on page 62
- Added ["Always Follow Cloud Configuration"](#) on page 65

### March 2023 Revision

This is the fourth revision of this guide. It includes the following changes:

- Added Airtime Fairness, see ["Global Settings"](#) on page 174
- Added 802.11v, see ["Adding an SSID"](#) on page 162
- Added BLE Tx Power, see ["iBeacon"](#) on page 204
- Added BLE Scan, see ["iBeacon"](#) on page 237
- Updated Channel Bandwidth, see ["Physical Radio Settings"](#) on page 174 and ["Physical Radio Settings"](#) on page 233
- Updated BSS Coloring, see ["Physical Radio Settings"](#) on page 174 and ["Physical Radio Settings"](#) on page 233
- Updated Minimum Allowed Signal, see ["Adding an SSID"](#) on page 120 and ["Adding an SSID"](#) on page 162
- Added Terragraph device configuration, see ["Terragraph Device Configuration"](#) on page 257
- Added Site Terragraph VLAN settings, see ["VLAN Settings"](#) on page 214

### November 2022 Revision

This is the third revision of this guide. It includes the following changes:

- Added batch upload information, see ["Creating Your First Cloud"](#) on page 29 and ["Add Devices"](#) on page 100
- Updated Cloud menu, see ["Managing Your Devices"](#) on page 54
- Updated WiFi 5/WiFi 6 configuration, see ["WiFi Configuration"](#) on page 103
- Renamed chapter ["Site WiFi 5 Configuration"](#) on page 118
- Added Multicast/Broadcast Rate, see ["Adding an SSID"](#) on page 120
- Added OSEN, see ["Adding an SSID"](#) on page 120

- Added AuthPort External RADIUS, see ["Radio Settings"](#) on page 128
- Added Disabled W52 Channel, see ["Radio Settings"](#) on page 128
- Added IPv6 settings, see ["Internet Settings"](#) on page 132
- Added Uplink 802.1P, see ["VLAN Settings"](#) on page 135
- Added Enable RSTP, see ["Local Network Settings"](#) on page 137
- Added DNS Entries, see ["Local Network Settings"](#) on page 137
- Added ARP Inspection, see ["ARP Inspection"](#) on page 141
- Added DHCP Snooping, see ["DHCP Snooping"](#) on page 142
- Added AuthPort Remote Splash Page with External RADIUS, see ["Hotspot Settings"](#) on page 142
- Added DNS Entries and DNS Mapping, see ["Hotspot Settings"](#) on page 142
- Added Generate NAS ID, see ["RADIUS Server"](#) on page 146
- Added HTTPS Login, see ["Captive Portal"](#) on page 147
- Modified Cloud and Radio LEDs, see ["System Settings"](#) on page 149
- Added MSP Mode, see ["System Settings"](#) on page 149
- Added SNMP IPv6 Write Community and SNMP Location, see ["SNMP"](#) on page 154
- Added IGMP Snooping, see ["IGMP Snooping"](#) on page 157
- Added LLDP, see ["LLDP"](#) on page 158
- Added iBeacon, see ["iBeacon"](#) on page 158
- Added SNMPv3 User, see ["SNMPv3 User"](#) on page 159
- Added chapter ["Site WiFi 6 Configuration"](#) on page 160
- Added chapter ["Site Terragraph Configuration"](#) on page 210
- Renamed chapter ["WiFi 5 Device Configuration"](#) on page 219
- Added chapter ["WiFi 6 and Newer Device Configuration"](#) on page 228

### **May 2021 Revision**

This is the second revision of this guide. It includes the following changes:

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## How to Use This Guide

- Added support for EAP101 and EAP102.
- Added section "[QR Code Onboarding](#)" on page 35.

### December 2020 Revision

This is the first revision of this guide.

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# Section I

## Getting Started

This section provides an overview of the ecCLOUD Controller software and describes the initial steps required to start using the service.

This section includes these chapters:

- [“Introduction” on page 26](#)

# 1

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## Introduction

This chapter includes the following sections:

- “ecCLOUD Controller Login” on page 27
- “Creating Your First Cloud” on page 29
- “QR Code Onboarding” on page 35
- “Understanding Configuration Inheritance” on page 37
- “Understanding Device Registration” on page 39
- “Device Configuration Changes” on page 41
- “Configuration Errors and Failures” on page 42

The Edgecore ecCLOUD Controller is a cloud-based network service available from anywhere through a web-browser interface.

The ecCLOUD Controller software is highly scalable and able to manage an unlimited number of networks and devices. Combining both network management and wireless controller features, it enables Edgecore access points (APs) and switches to automatically connect and be managed as one network.

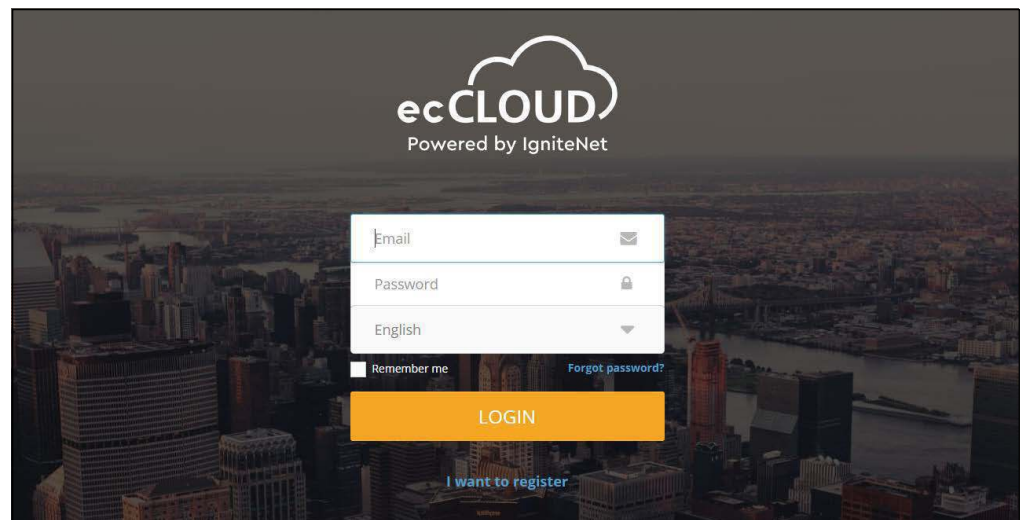
The following devices are supported by ecCLOUD:

- **Edgecore APs:** EAP101, EAP102, EAP104, EAP104 Lite, EAP112-L, EAP112-H, EAP105, ECW5211-L, ECW5410-L, ECWO5211-L, OAP100, OAP100e, OAP101, OAP101 6E, SP-W2-AC1200 (L), SP-W2M-AC1200, SP-W2M-AC1200-POE, SS-W2-AC2600
- **Edgecore Switches:** ECS2100-10P, ECS2100-10T, ECS2100-28P, ECS2100-28PP, ECS2100-28T, ECS2100-52T, ECS4100-12PH, ECS4100-12T, ECS4100-28P, ECS4100-28T, ECS4100-52P, ECS4100-52T, ECS4120-28Fv2, ECS4120-28Fv2-L, ECS4120-28T, ECS4120-52T, ECS4125-10P, ECS4150-28P
- **MLTGs:** MLTG-360, MLTG-CN, MLTG-CN LR
- **SD-WAN:** SDW102

## ecCLOUD Controller Login

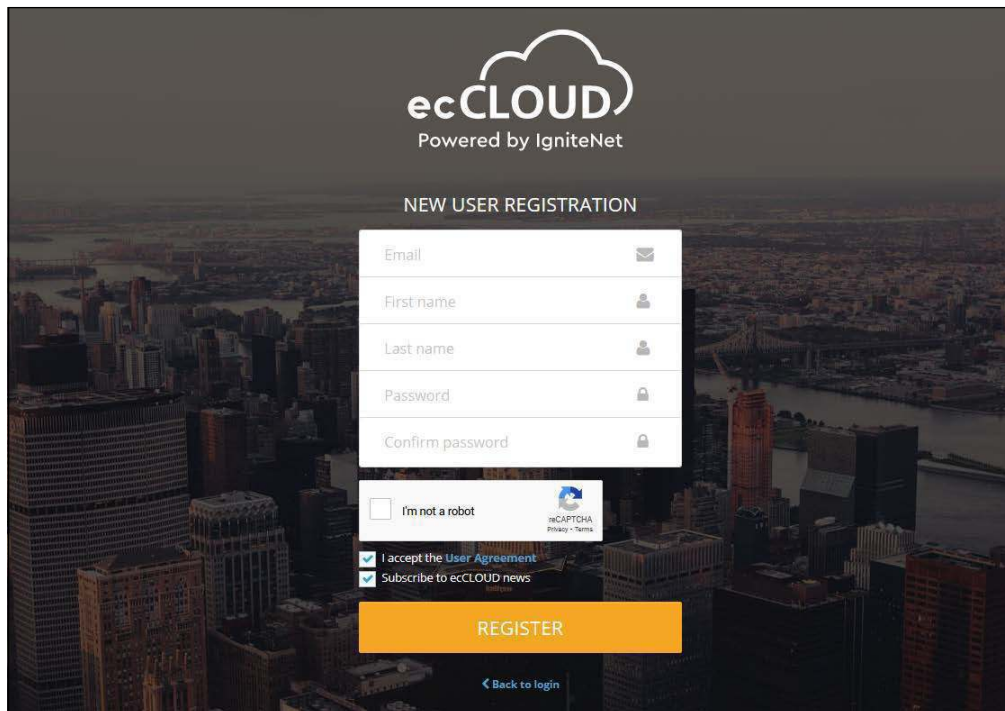
From a web browser, go to [cloud.ignitenet.com](https://cloud.ignitenet.com) to register an account and start creating your own cloud networks and sites.

Figure 1: ecCLOUD Controller Login



Click “I want to register” to create a new account.

Figure 2: New User Registration



Enter your email address and specify a first and last name. Set a password to protect access to your account, click “I am not a robot,” and then click REGISTER.

**i** **Note:** You must have a valid email address in order to create your user profile.

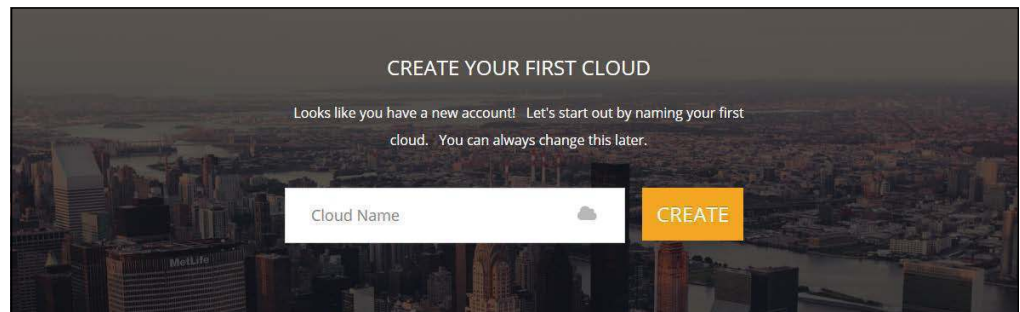
The ecCLOUD Controller sends a verification email to the account email address. When you receive the email, click on the provided link to activate your account.

## Creating Your First Cloud

The ecCLOUD Controller uses a cloud-like account – it houses a group of sites, which are logical groupings of your managed devices. Each cloud will have its own set of users and configuration settings. As an end-user, you can join as many clouds as you want, with different roles on each cloud.

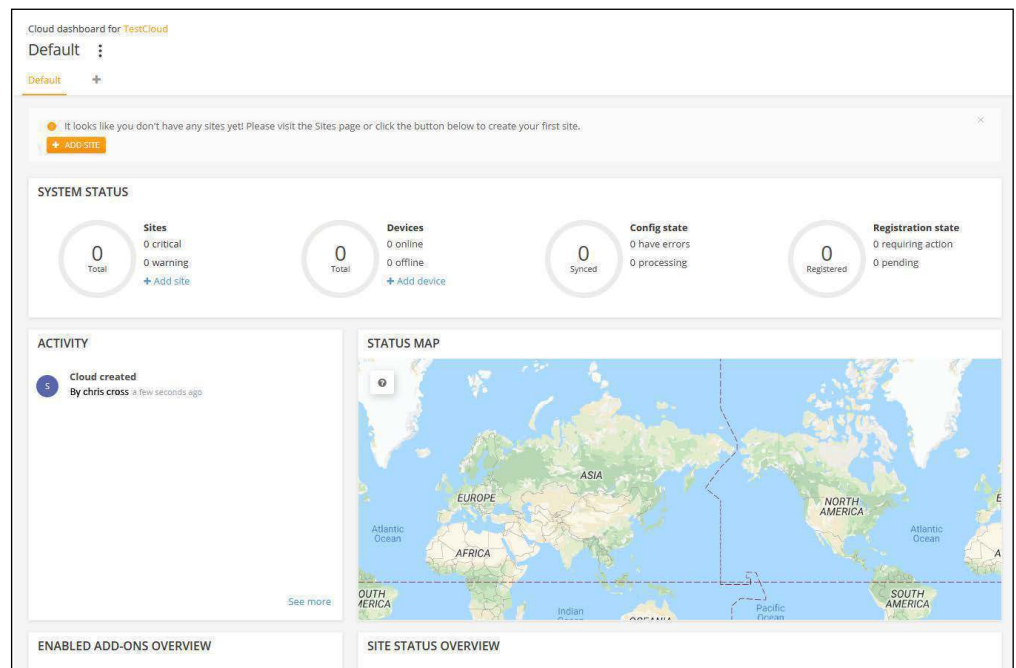
Once you are registered as a user on the ecCLOUD Controller, you are given the option to create a cloud when you first log in.

Figure 3: Creating a Cloud on First Login



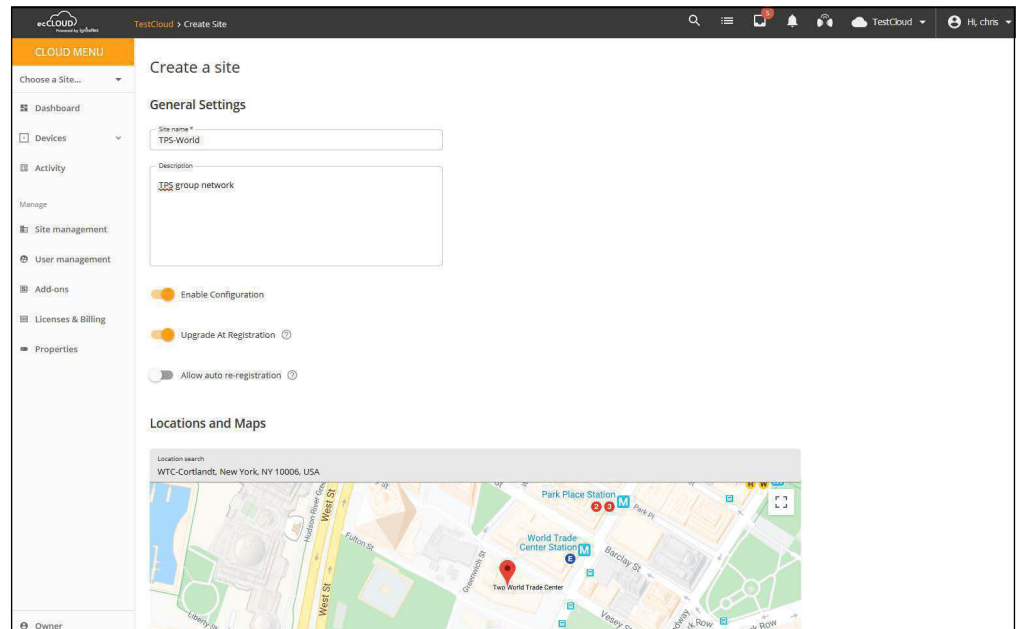
After entering a name for your first cloud, click CREATE to display the Cloud Dashboard.

Figure 4: Create Your First Cloud



Click ADD SITE and enter information for your first site.

Figure 5: Defining Your First Site



Set the following properties for devices at your site:

- **Enable Configuration:** This setting has the following options:
  - ON: Enables you to remotely configure your devices. (default)
  - OFF: Your devices need to be configured locally. However, you can still remotely monitor your devices and you will still receive alerts when a device goes offline.
- **Upgrade At Registration:** Enable this setting if you want your devices to be automatically upgraded to the latest firmware after registration. It is recommended that you keep this setting on.
- **Allow auto re-registration:** When this setting is enabled, your devices will automatically re-register when they are reset to defaults. If this setting is disabled, a user must log in to the cloud and manually chose the action to take when a device attempts to re-register.

After configuring all the site information, click CREATE to create the site.

After setting the regulatory country and local logins, click “Save” to save your configuration.

Figure 6: Saving the Site Configuration



When you first save the site configuration, you are prompted to add devices (wireless, switches, MeshLinqs, GLinqs) to your new site. Click “ADD DEVICES” to continue.

Figure 7: Add Devices Prompt



Alternatively, you can click Devices-Wireless or Switches on the main menu to access the device management view.

You are now ready to start adding Edgecore APs or switches to your cloud network.

Figure 8: Device Management View



Click on ADD DEVICE to access the “Register new Devices” page.

Fill in the serial number, MAC address and name, and then click SAVE.

Alternatively, you can use the QR code on a device (see [“QR Code Onboarding”](#))

on page 35), or use a barcode scanner. Or, you can upload information for a batch of devices in a file.

Turn “Enable barcode scanning mode” ON to quickly scan barcodes and enter the serial number and MAC addresses of your devices. Once entered, turn off the barcode scanning mode and enter the names of the devices manually. Click the SAVE button when you are ready to add your new devices to the site.

Turn on the “Always follow cloud configuration” feature to ignore any local configuration changes received from a device. For more information, see “Always Follow Cloud Configuration” on page 65.

For a batch upload, prepare a list of devices in a CSV (comma-separated values) file. A CSV file is a plain text file in which information is separated by commas. For each device, the serial number, MAC address and name should be entered on one line, as in the following format.

```
<Serial Number 1>,<MAC 1>,<Device Name 1>  
<Serial Number 2>,<MAC 2>,<Device Name 2>
```

Click the UPLOAD button to upload your CSV file.

For more information on registration, see “Understanding Device Registration” on page 39.

Figure 9: Adding Devices

Register new devices

A new device can be added to a site by inputting (or scanning) the serial number and MAC address of the device. [Learn more](#)

You can find the serial number and MAC address on the product box or on the back of the product itself.

Add the following devices to the following site:

Inherit site-level settings  
Enable this if you want to manage the devices in this site like a single unit with a common configuration. [Learn more](#)

Enable barcode scanning mode ?

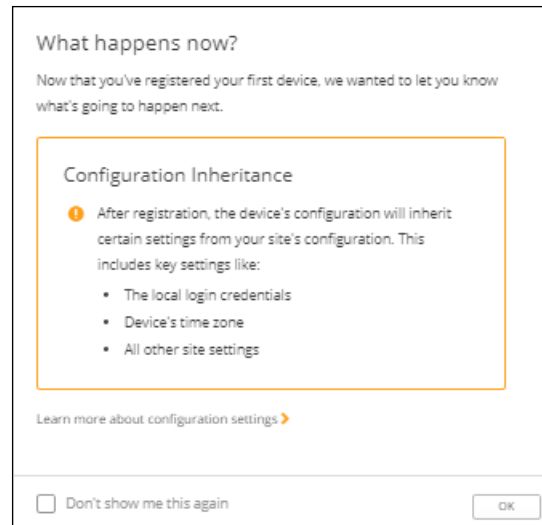
Always follow cloud configuration ?

Batch Upload File

You can register up to 48 devices.

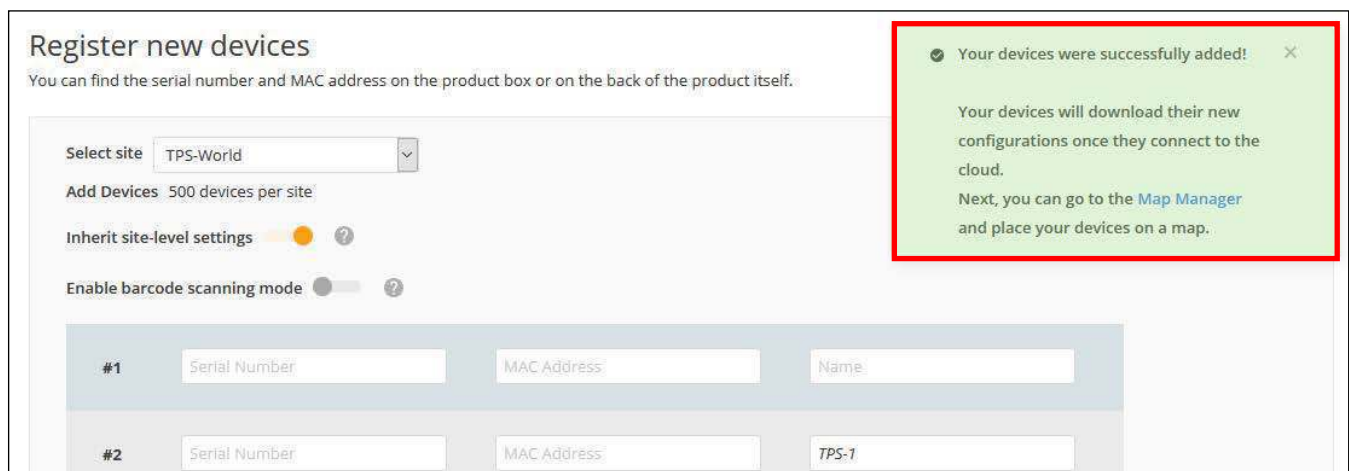
When the controller adds a device, the following pop-up window is displayed warning you that the device will inherit settings from the ecCLOUD controller site configuration. For more information on inheritance, see [“Understanding Configuration Inheritance”](#) on page 37.

Figure 10: Adding Devices Warning Message



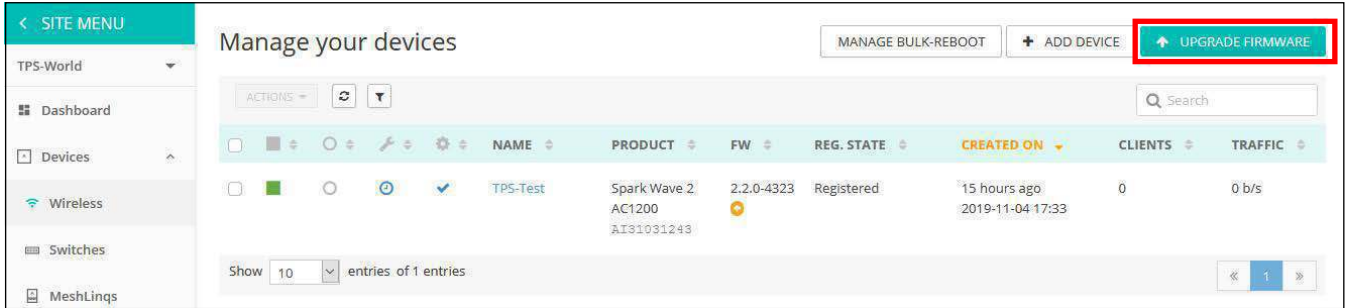
Further, at the top of the “Register new devices” page a message appears indicating that devices have been successfully added. Click on the blue link “Map Manager” in the message to place your device on a map. See [“Placing a Device on a Map”](#) on page 35.

Figure 11: Adding Devices Successful Message



Additionally, with the first device added to the site the “Upgrade Firmware” button appears above the device list. Refer to “Schedule Maintenance Tasks” on page 113.

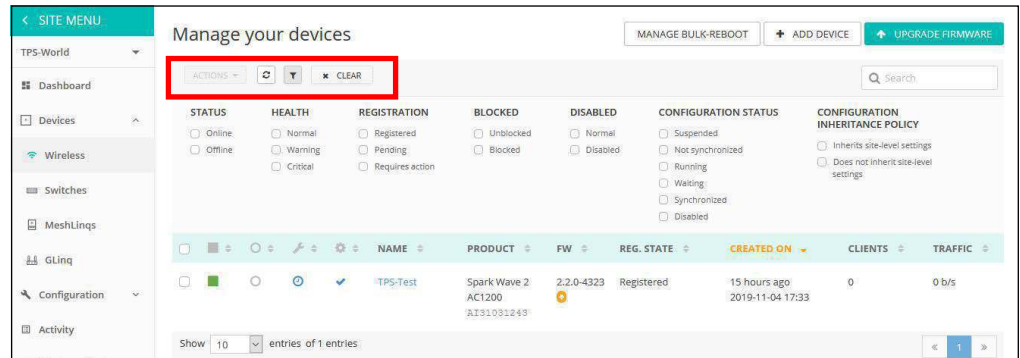
Figure 12: Firmware Upgrade Button



Clicking the filter (funnel shape) button in the upper left of the device manager view enables devices in the list to be filtered based on various properties. Chose the properties from the selection lists under Status, Health, Registration, Blocked, Disabled, Configuration Status, and Configuration Inheritance Policy.

Click the “Clear” button to reset all the filters.

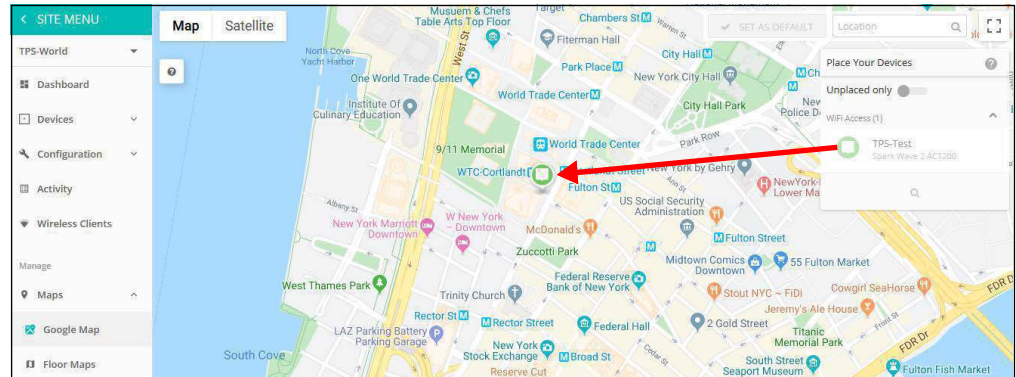
Figure 13: Filtering the Device View



## Placing a Device on a Map

Clicking on the Map Manager link in the adding-devices successful message displays the map view page. Use the mouse to click-drag devices to installation locations on the map.

Figure 14: Placing a Device on a Map



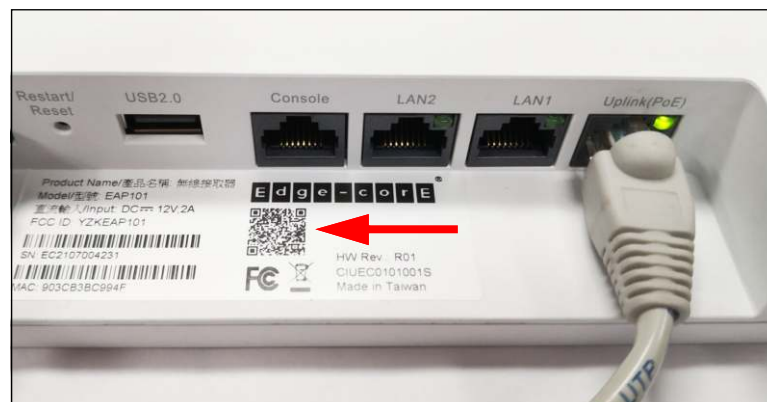
## QR Code Onboarding

For quick set up and registration of your AP with the ecCLOUD controller, you can scan the QR code on the AP using a phone.

Follow these steps:

1. Power on the AP.
2. Connect the AP to the Internet. Connect your network or Internet access device to the AP's RJ-45 Uplink port.
3. Use the camera (iPhone) or a barcode app (Android) on your phone to scan the AP's QR code. The QR code is printed on a label on the AP.

Figure 15: Scanning the AP QR Code



4. When a message pops up, tap “yes” to join the Wi-Fi network. (iPhone requires you to go to Settings > Wi-Fi for the message to pop up.)

The web browser should open and redirect to the Setup Wizard page.

**i** **Note:** If the phone cannot connect to the Wi-Fi network, type the SSID (network name) and password manually. The SSID name is the AP serial number (for example, EC0123456789), and the password is the AP MAC address (for example, 903CB3BC1234).

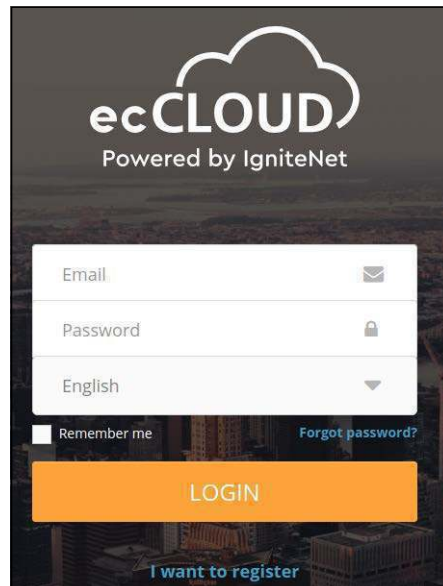
5. Select to manage the AP using the ecCLOUD controller, or to manage the AP in stand-alone mode.

- a. Stand-Alone Mode: Use the default wireless network setting or customize the network name and password. Tap “Done” to finish the setup wizard.

Wait about two minutes for the AP configuration to update, and then connect to the wireless network name configured in the Setup Wizard. The browser is then redirected to the login page of the AP.

- b. Cloud-Managed Mode: Tap “Done” to finish the Setup Wizard and the browser is redirected to the ecCLOUD login page.

Figure 16: ecCLOUD Login Page



If you already have an ecCLOUD account, log in and select a site for the AP. The AP is automatically registered for cloud management. After you tap “Save,” wait about two minutes for the cloud controller to configure the AP.

Figure 17: ecCLOUD Device Registration

The screenshot shows a 'Register Device' form with the following elements:

- A dropdown menu for 'Default Site'.
- A toggle switch for 'Inherit site-level settings'.
- A text input field for 'Serial Number \*' with the value '000003'.
- A text input field for 'MAC \*' with the value '00:00:00:00:00:03'.
- A text input field for 'Device Name \*' with the value 'Test Device'.
- A blue 'SAVE' button at the bottom.

If you do not have an ecCLOUD account, tap “I want to register” and set up an account. Create a cloud and site before confirming the regulatory country. After tapping “Next,” the AP is then automatically registered for cloud management.

After you tap “Save,” wait about two minutes for the cloud controller to configure the AP.

## Understanding Configuration Inheritance

When a new device is added to the Cloud, the device’s “Site-level configuration inheritance” behavior must also be selected. This “Inheritance Policy” determines how the Cloud configures a device. Cloud Configuration is very flexible, it allows Device-level configuration overrides to be setup when there is a need to inherit only a subset of site-level settings.

The Site-level Inheritance Policy is set when you first register a device, but this can also be changed later at any time.

There are two Inheritance Policy options for devices:

- **Inherit site-level settings** — Select this Inheritance Policy if you want to manage devices at a site like a single unit with a common configuration. This is normally the best way to configure Wi-Fi access devices. You would typically choose this Inheritance Policy for a hotel, business, or other similar application where enterprise Wi-Fi is deployed.

Even though devices inherit most of their settings from the Site-level, you can always override any Site-level settings at the Device-level by making changes on the Device-level configuration pages.


- **Don’t inherit site-level settings** — Select this Inheritance Policy if you do not want a device to inherit any settings from the Site level.

You would normally choose this Inheritance Policy if a device is used for infrastructure, backhaul, or needs to be configured independently from the other devices at a site. This is the typical choice for MetroLing point-to-point links.

When Site-level inheritance is enabled for a device, the device's final configuration will include the following:

- Settings inherited from the Site-level device configuration.
- Settings initially inherited from the Site-level configuration that have been since been modified as a Device-level "override."
- Settings unique to the Device-level configuration. That is, device-specific settings that are not configurable at the Site level.

---

 **Note:** Device-level overrides can be reset to the Site-level configuration by clicking the "Use Site Settings" button on the page where a setting has been changed.

---

Note that some Device-level override settings, specifically those for SSIDs, local logins, and VLANs, cause all other settings for that entity to be overridden. For example, changing one setting for a Site-level configured SSID at the Device level results in all settings for that SSID being treated as an override. That is, any future changes to the SSID at the Site level will not be reflected in the Device-level configuration.

## Understanding Device Registration

New devices can easily be added to a site by entering (or scanning) the serial numbers and MAC addresses of the devices into the “Add device” form on the Cloud.

Figure 18: Registering New Devices

The screenshot shows a web form titled "Register new devices". At the top, there is a text box with instructions: "A new device can be added to a site by inputting (or scanning) the serial number and MAC address of the device. Learn more" and "You can find the serial number and MAC address on the product box or on the back of the product itself." Below this is a dropdown menu labeled "Choose a Site...". There are three toggle switches: "Inherit site-level settings" (checked), "Enable barcode scanning mode" (unchecked), and "Always follow cloud configuration" (unchecked). A "Batch Upload File" section contains three input fields: "Serial Number", "MAC Address", and "Name" (with a value of "0"). A "+ UPLOAD" button is to the right. At the bottom, there are "RESET" and "SAVE" buttons. A note at the bottom left states "You can register up to 48 devices."

**Note:** A device’s serial number and MAC address can be found on its product box, or on the main dashboard page of the local web configuration UI.

This is the typical process that occurs after a device is registered:

1. Once a device is added to a site, it goes into the “Pending Registration” state. At this point, the Cloud is waiting for the device to call in for the first time to fetch the credentials it will use for future communication with the Cloud.
2. After the device makes its initial connection to the Cloud and completes registration, the Cloud checks to see if the device’s site has the “auto firmware upgrade” setting enabled. If so, it checks the device’s firmware to see if it needs to be upgraded, and if so, it creates an auto firmware upgrade task for the device.
3. After the device is upgraded (or if firmware upgrade is skipped), the device will send up its current configuration to the Cloud. This generates a “Received

Config” task, the details of which can be viewed on the device’s Activity page. The Cloud must collect the device’s initial configuration, as well as firmware version, before it can push any new configurations down to the device.

4. Next, the cloud will merge any Site-level configuration settings (assuming inheritance is enabled) with the device’s configuration, and create a “Change Config” task to push the new settings down to the device. If Site-inheritance is enabled, the device’s running configuration will be completely replaced with the configuration seen on the device’s Configuration page on the Cloud. Any configuration settings changed through the local UI prior to registration (excluding certain wireless client settings) will be wiped once the cloud sends down the device’s new configuration.

After the initial configuration task is completed, the device is finished with all registration-related activities and will commence normal operation. A device’s “Activity” page can be used at any time to see the point at which the device is in the initial registration and/or configuration process.

In summary, there are four possible registration states for a device:

- **Unregistered:** There is no record of the device in the Cloud database when a device is unregistered.
- **Pending Registration:** The Cloud user has added the device record to a site by serial number and MAC, and the Cloud is waiting for the device to make an initial connection. At this point, the device has not yet made any contact with the Cloud. If you see a device in this state for a long time, check its Internet connection or your upstream firewall settings.
- **Registered:** The device has made initial contact with the Cloud, completed the registration process, and received its credentials which it will use in any further communication with the Cloud. The “registered” state is the normal operating state of a device on the cloud.
- **Re-registration:** This means the device was previously registered, but is attempting to register again. The system creates an alert for this situation as it requires the user to login to their Cloud account and choose which actions they want to take - such as to allow the device to connect again, and what to do with the device's new configuration.



**Note:** You can enable “auto” re-registration from the site properties page so that no manual intervention is required to resolve re-registration alerts.

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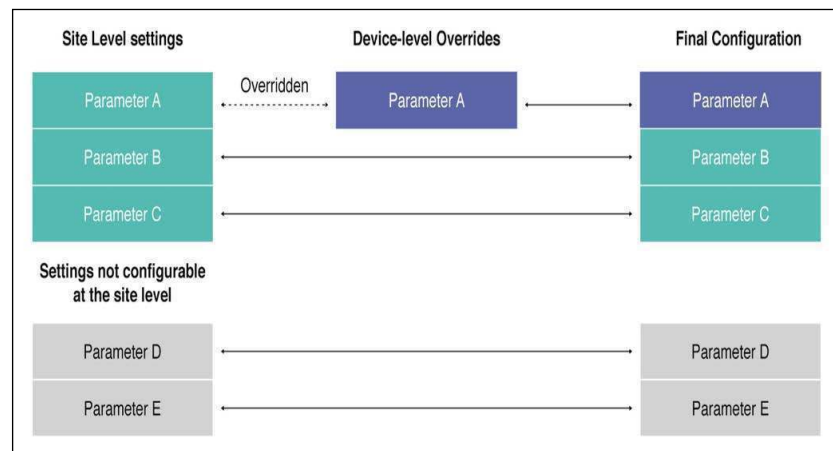
## Device Configuration Changes

Any time a device’s Device-level or Site-level configuration is changed, the Cloud must determine which settings should actually be changed and pushed down to a device.

When “Site-level configuration inheritance” is enabled for a device, the final configuration will be made of merging two different sets of configurations:

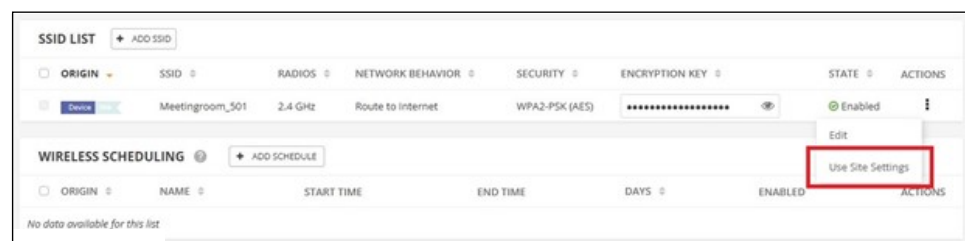
- The common Site-level configuration settings for that product type, and
- The device’s individual configuration, which includes settings not configurable at the site level, such as advanced radio settings, features unique to a single product, and more importantly, any Device-level configuration overrides.

Figure 19: Device Configuration Overrides



Device-level configuration setting overrides can be created by changing a setting at the Device-level configuration that’s currently being inherited from the site level. These overrides can always be reverted at any time by clicking the “Use Site Settings” button.

Figure 20: Reverting Device-Level Overrides



After a user changes the configuration for a device, the following will happen:

1. A “Change Config” task will be created detailing exactly which settings are being changed on the device. This task can be tracked on the device’s Activity page.
2. The Cloud will push the new configuration down to the device and wait for a configuration ACK from the device to acknowledge that the new configuration was successful.
3. If the ACK is received, the task is marked as complete. If the device loses connectivity after applying the new set of configuration settings, the device will revert to the previous configuration, and send a failure notification to the Cloud. This will result in an “out of sync” error.

---

## Configuration Errors and Failures

There are two major errors that may be encountered during the configuration process:

- **Configuration out of sync error:** This error occurs when the device reverts a configuration pushed down from the Cloud because it cannot connect to the Cloud again after the change. This is what “out of sync” means; the device’s running configuration does not match the configuration on the Cloud.
- **Resolution:** This error can be resolved by changing any incorrect settings in your device’s configuration on the Cloud, and clicking the “Resync” button to send them back down. For example, a device is currently operating in Client mode, but is configured to use AP mode from the device’s Configuration page on the Cloud. After a configuration push, the device will no longer be able to access the Internet or Cloud. The device’s operating mode must be changed to Client from the Cloud configuration.

### Configuration Suspended Error

Device configuration suspension means that no configurations will be pushed to the device from the Cloud, and no configurations received by the device will be processed by the Cloud.

A device’s configuration may become suspended in two cases:

- **Device was downgraded:** As of 2/1/2019, if you downgraded your Cloud-connected device to an older firmware without resetting to defaults, your device’s configuration will automatically be suspended. The reason for this is that the device’s configuration may contain keys or other values that are not supported, or are incompatible with the older firmware version. This situation could lead to system errors and undefined behavior.

**Resolution:** Reset your device to defaults and allow it to connect to the Cloud again through re-registration.

- **A system error has occurred:** Sometimes (very rarely), a system error will occur when the Cloud does not understand how to process one or more keys in the configuration sent to it by the device.

**Resolution:** Most times, the system error can be cleared out by resetting the device to defaults, and choosing the “Use the device’s running config” at re-registration.



**Note:** This will clear out any “bad” cloud-level configuration keys, but will also clear out any device-level overrides you may have created.

---

If that does not work, wait for support and development teams to investigate the cause of the system error. Once resolved, an email will be sent out to all Cloud account owners and admins notifying them that the device’s configuration has been unsuspended.

# Section II

## Cloud Configuration

This section provides details on creating and managing clouds and sites, as well as configuring access point settings.

This section includes these chapters:

- “Cloud Management” on page 45
- “General Site Configuration” on page 95
- “Site WiFi 5 Configuration” on page 118
- “Site WiFi 6 Configuration” on page 160
- “Site Terragraph Configuration” on page 210
- “Site SD-WAN Configuration” on page 216
- “WiFi 5 Device Configuration” on page 219
- “WiFi 6 and Newer Device Configuration” on page 228
- “MetroLinq Device Configuration” on page 239
- “Terragraph Device Configuration” on page 257
- “Switch Device Configuration” on page 267
- “SD-WAN Device Configuration” on page 286

# 2

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## Cloud Management

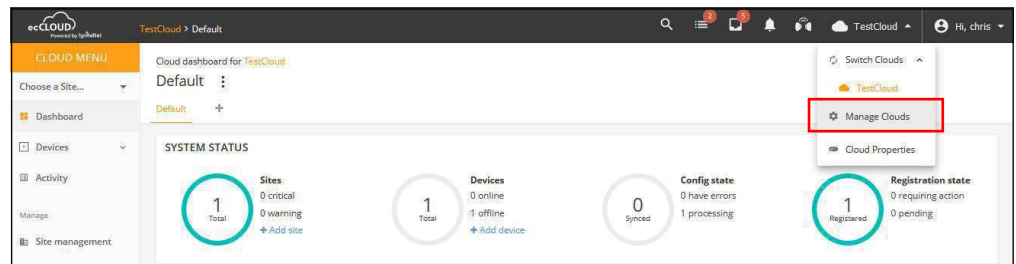
This chapter includes the following sections:

- “Managing Your Clouds” on page 46
- “Displaying the Cloud Dashboard” on page 51
- “Creating a Custom Cloud Dashboard” on page 52
- “Managing Your Devices” on page 54
- “Manage Your Sites” on page 59
- “User Management” on page 60
- “Site Grouping” on page 62
- “Always Follow Cloud Configuration” on page 65
- “Managing Licenses and Billing” on page 69
- “Report Management” on page 70
- “Add-Ons” on page 74
- “Using the AuthPort Add-On” on page 75
- “Using the Aprecomm Add-On” on page 84
- “Using the Smart NVR Add-On” on page 88

## Managing Your Clouds

Select “Manage Clouds” from the Cloud pull-down menu in the upper right of the screen to get to the cloud management page.

Figure 21: Cloud Menu



### Create a New Cloud (from an existing account)

To add a new cloud to an existing account, follow these steps:

1. Select Manage Clouds in the upper right of the screen (once logged in) to open the Cloud Memberships page.
2. Click Add Cloud.

Figure 22: Displaying Cloud Membership



3. Fill in the cloud name and other descriptive information.
4. Click Save.

Figure 23: Adding Cloud Information

[← BACK TO ALL CLOUDS](#)

## Cloud Properties

### Cloud Information

Cloud name \*

Description

Beta features [?](#)

### Billing Information

Billing name

Email \*

Company

Address 1

Address 2

City

State / Province / Region

ZIP

Country ▼

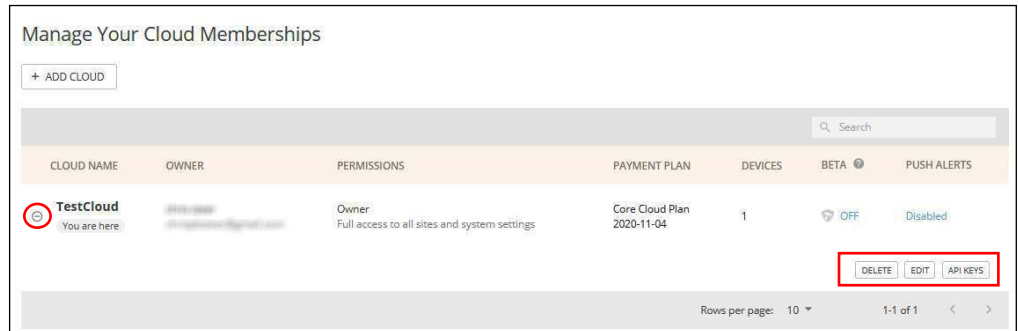
VAT ID

Invoice language ▼

[CANCEL](#) [✓ SAVE](#)

**Editing Cloud Information** Click on the expand icon to show the DELETE and EDIT buttons.

**Figure 24: Showing Cloud Actions**



### Changing the Cloud Properties

In the cloud management list with the selected cloud expanded, click on the EDIT button in the lower right of the list to display the cloud information properties. Make your changes to the cloud properties and then click the SAVE button.

To restrict cloud access, Login IP ACL allows administrators to define specific IPv4 or IPv6 addresses that are permitted to connect to the cloud management portal.

Figure 25: Changing Cloud Properties

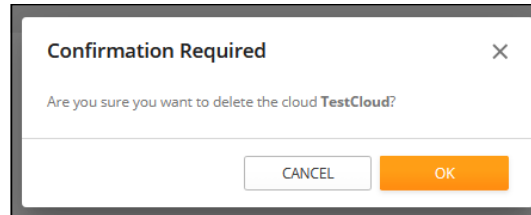
The screenshot shows a 'Cloud Properties' form with the following sections:

- Cloud Information**: Includes a text input for 'Cloud name\*', a larger text area for 'Description', and a toggle switch for 'Beta features' with a help icon.
- Management IP List**: Shows the current IP address '2a02:a31a:e096:d100:79d8:2005:f4cb:94f0' and a text input for 'Management IP'.
- Billing Information**: Includes text inputs for 'Billing name', 'Email\*', 'Company', 'Address 1', 'Address 2', 'City', 'State / Province / Region', and 'ZIP'. It also features a dropdown for 'Country\*' with a 'Country is required' error message, a 'VAT ID' input, and an 'Invoice language' dropdown.

At the bottom of the form are two buttons: 'CANCEL' and 'SAVE' (highlighted in orange).

**Deleting a Cloud** In the cloud management list with the selected cloud expanded, click on the DELETE button in the lower right of the list to delete the cloud. Click OK in the confirmation window to complete deleting the cloud.

**Figure 26: Delete Cloud Confirmation**

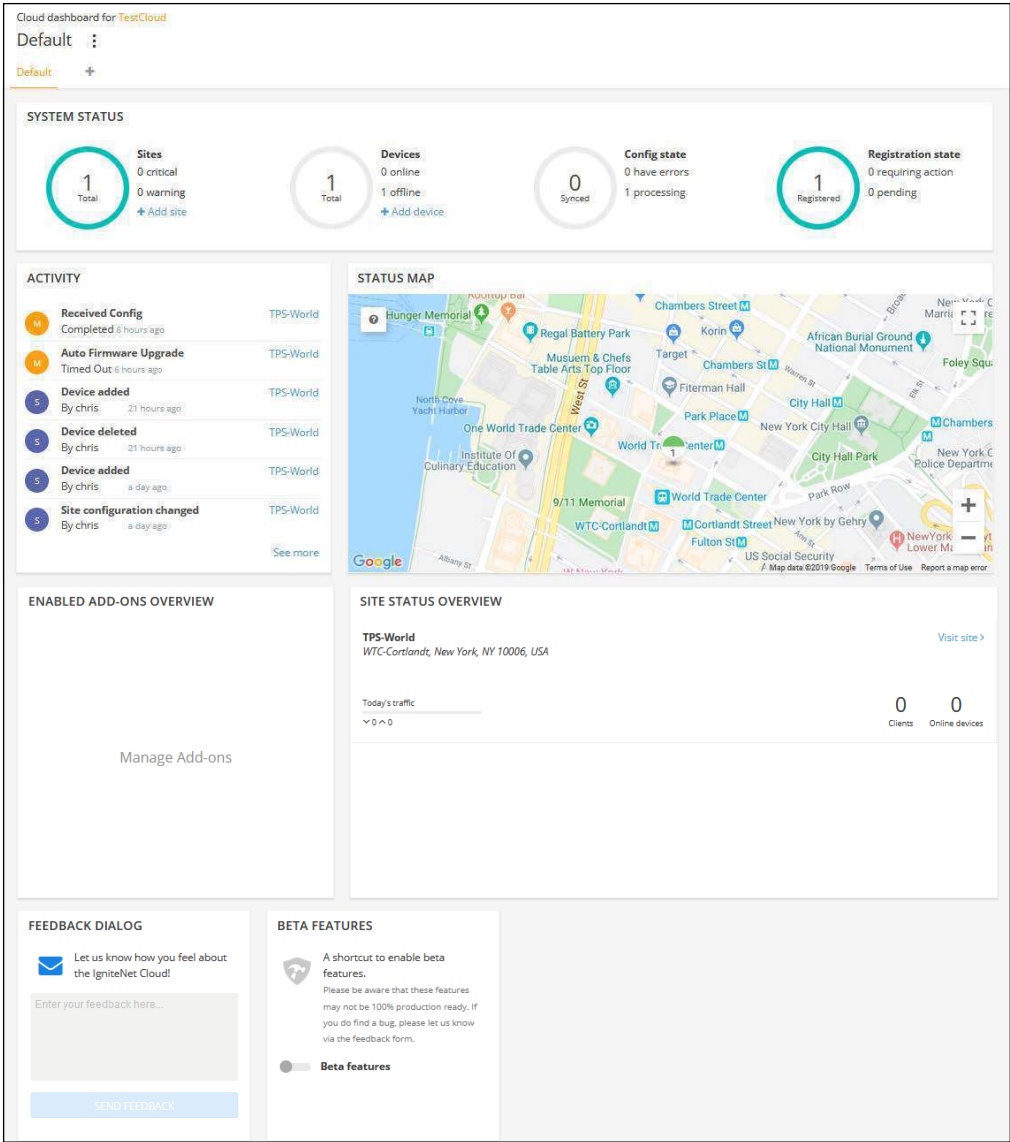


**Caution:** Deleting a cloud is a permanent action and will result in the deletion of all related records, such as APs, clients, sites, system activity logs, and device configurations stored for that cloud.

## Displaying the Cloud Dashboard

The cloud dashboard provides an overview of system status for configured devices, recent activity information, a cloud status map, and a site status overview.

Figure 27: The Cloud Dashboard



The following items are displayed on the cloud dashboard:

- **System Status** — The four circles represent (from left to right): the number of sites, the number of devices (with online/offline counts), the number of devices with synced configurations, and the number of devices registered.

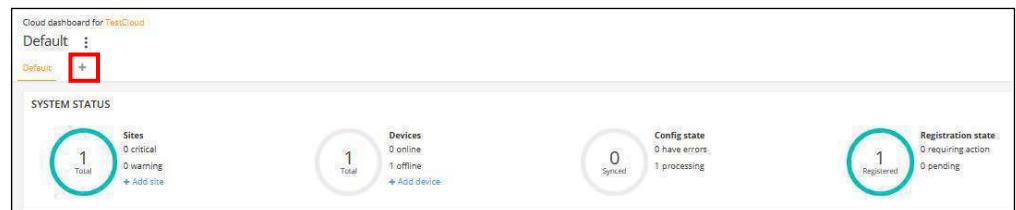
**Note:** Placing the mouse cursor over the four circles shows additional information.

- **Activity** — Provides a short summary of the most recent device, network and system alerts, and maintenance notifications such as the device being unreachable or rebooted. Clicking on each entry provides further details.
- **Cloud Map** — Displays the geographical location of the cloud sites and the devices located at each site. Hovering over a device displays a pop up with further device details.
- **Enabled Add-Ons Overview** — A summary of the currently enabled Add-ons. Clicking in the box opens the Site Add-ons management view.
- **Site Status Overview** — Lists a summary of site statistics, including the day's traffic, the number of clients, and the number of online devices.
- **Feedback Dialog** — Enables you to send your comments and suggestions directly to Edgecore.
- **Beta Features** — Enables new cloud controller features that are in beta release stage.

## Creating a Custom Cloud Dashboard

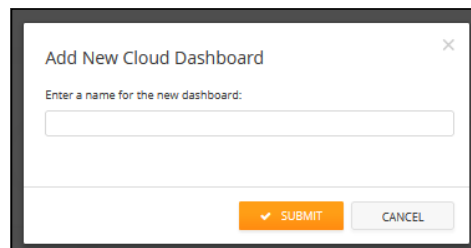
In the default cloud dashboard, click the plus sign next to the default tab at the top to create a custom dashboard suitable for your requirements.

Figure 28: Adding a Custom Cloud Dashboard



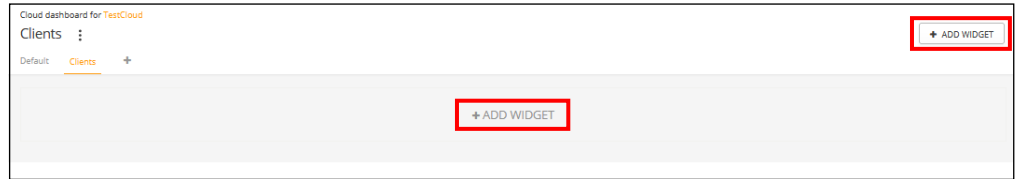
Enter a name for the new custom dashboard and click SUBMIT.

Figure 29: Naming a Custom Cloud Dashboard



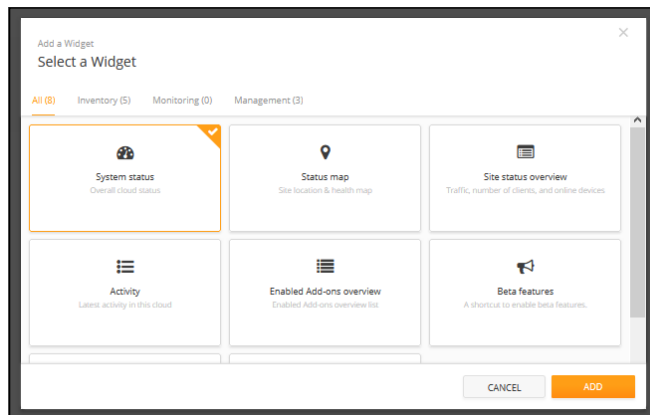
A new tab will appear next to the default dashboard tab with the custom dashboard's name. Click on one of the "+ Add Widget" buttons to add the desired item for the new dashboard.

Figure 30: Adding a Widget to a Custom Cloud Dashboard



Once a widget is selected click the "ADD" button.

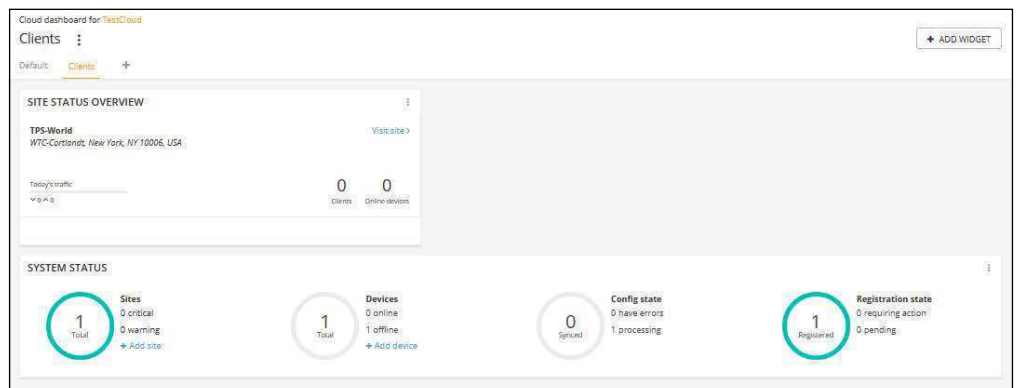
Figure 31: Selecting a Widget for a Custom Cloud Dashboard



Afterwards the widget will appear on the new custom dashboard. The widget size can be adjusted by dragging the edges of the widget box. Further, it can be renamed or removed by clicking the three dot icon in the upper right of the box.

Click the "Add Widget" button again to add additional widgets to the custom dashboard.

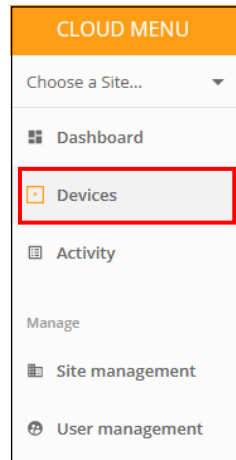
Figure 32: Customized Widgets Added to a Custom Cloud Dashboard



## Managing Your Devices

Clicking the Devices section on the Cloud menu displays all the cloud devices for all sites.

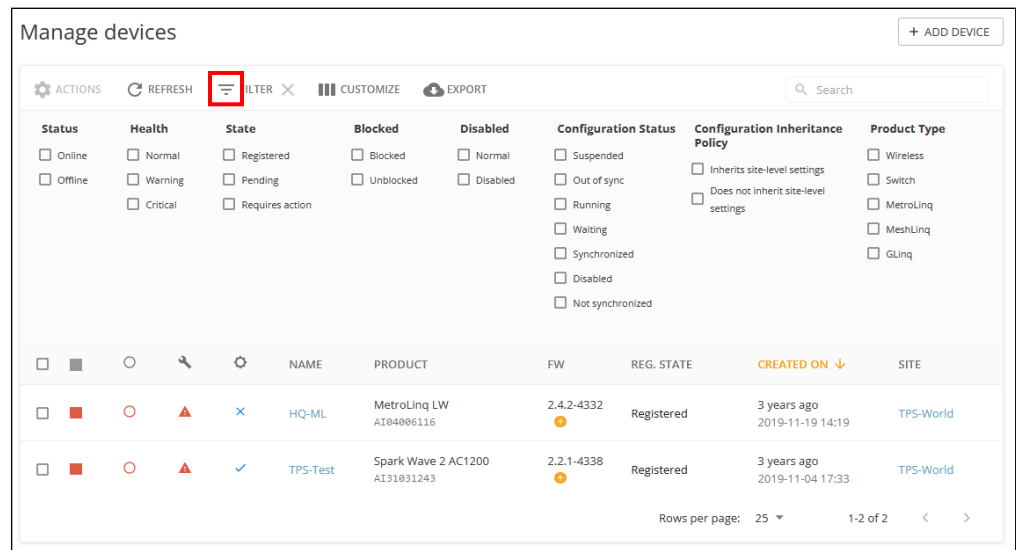
Figure 33: Cloud Menu Devices



### Filtering the Device List

Click the filter (funnel) icon button in the upper left of the window to open the filtering options for the device list (Status, Health, State, Blocked, Disabled, Configuration Status, Configuration Inheritance Policy, or Product Type). The displayed devices can also be sorted by clicking on the ascending or descending arrows at the top of each column.

Figure 34: Manage Your Devices



## Configuring Inheritance Policy

The Site-level Inheritance Policy is set when you first register a device, but this can also be changed later at any time. For more information, see [“Understanding Configuration Inheritance”](#) on page 37.

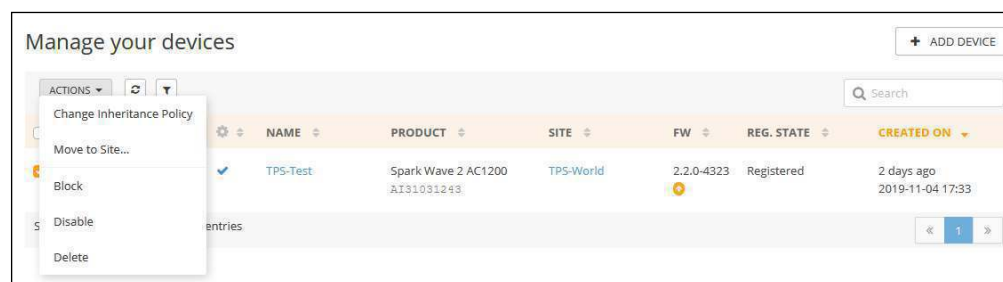
In the Cloud Devices list, the column with the gear icon indicates the devices that have the Configuration Inheritance Policy enabled. The Configuration Inheritance Policy field can be filtered and the policy for devices changed from the “Actions” list.

Figure 35: Configuration Inheritance Policy Indication



Select devices by clicking the checkmark square in the first column. The “Actions” button becomes available in the column header. Click the Actions button to display a menu of actions that can be applied to the selected devices.

Figure 36: Manage Your Devices Actions Menu

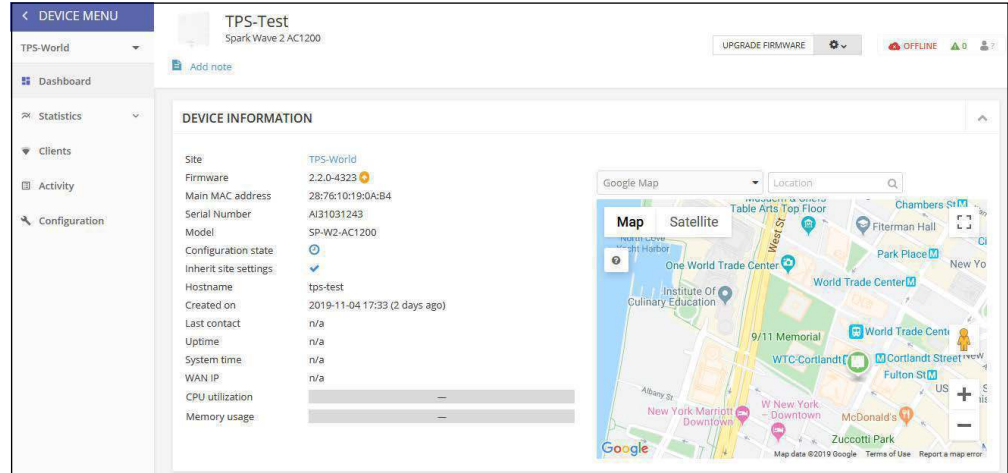


The following items are displayed on the Actions menu:

- **Change Inheritance Policy** — The selected devices will change their inheritance policy, either to “Do not inherit site-level configuration,” or to “Inherit site-level configuration,” depending on the current setting.
- **Move to Site** — Moves the selected devices to another site. The devices will inherit site-level configuration from the selected site.
- **Block** — Blocks the selected devices from communicating with the cloud.
- **Disable** — Blocks (prevents communication with the cloud) and hides the devices from all dashboards. The devices are no longer available, but the device history is preserved.
- **Delete** — Permanently removes the selected devices from the cloud.

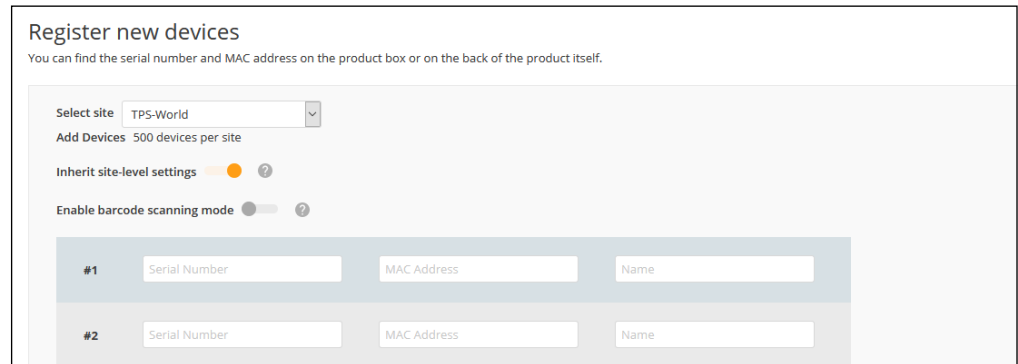
**Viewing Device Information** Click a device name link in the Name column to access the detailed device information.

**Figure 37: Accessing Device Details**



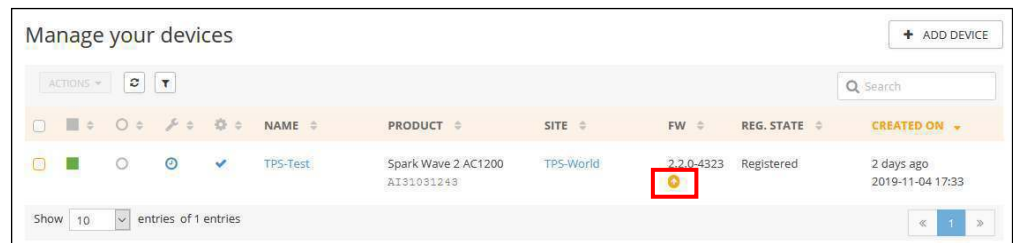
**Adding Devices** Click the Add Devices button to display the “Register new devices” page and add new devices to the cloud.

**Figure 38: Adding Devices to Your Cloud**



**Upgrading Device Firmware** Click the upgrade icon in the FW column when new firmware is available for a device. The automated firmware upgrade page opens.

**Figure 39: Firmware Upgrade Indication**



Follow the selections for the firmware type and upgrade schedules, and then click the Create button to initiate the upgrade.

Figure 40: Device Firmware Upgrade

### New Firmware Upgrade Task

Select Product Line: All

Select Model: All

Upgrade to version: Latest

Give this task a name: Upgrade Firmware (version Latest)

When do you want to start upgrade?  
 Now  
 Later

How do you want the upgrade performed?  
 All at the same time  
 One at a time (10 minutes)

Which devices do you want to upgrade?  
 All out-of-date compatible devices  
 Let me choose  
 Only TPS-Test

Reset to device defaults?

Number of selected devices: 1

Device Name	Product	Current FW	New FW	MAC
<input checked="" type="checkbox"/> TPS-Test	Spark Wave 2 AC1200	2.2.0-4323	2.2.1-4338	28:76:10:19:0A:B4

Show 10 entries of 1 entries

## Displaying System Activity

Click Activity on the Cloud menu to display all logged system alerts, maintenance tasks, and logged events. Click the filtering button on the left to specify a date range selection. The displayed messages can also be sorted by clicking on the ascending or descending arrows at the top of the Date column.

Figure 41: Showing All System Activity

DATE	TYPE	STATUS	AFFECTED	DETAILS
2 days ago 2019-11-04 10:30	Cloud created	Event	Global	User chris created this cloud
2 days ago 2019-11-04 10:50	Site created	Event	TPS-World	User chris created site TPS-World
2 days ago 2019-11-04 10:56	Site configuration changed	Event	TPS-World	User chris changed site configuration. Configuration Change Details: General: Locale Settings, Local Logins WiFi Access: Ethernet, Firewall, Hotspot, Internet, Mgmt VLAN, LAN, Advanced Radio Settings, Wireless 5 GHz, Wireless 2.4 GHz, System, ContentShield, Services, Wireless common.frequency_glinq&#x2F;r24, System, Services, Internet, Coaxial, Wireless MetroLinq: Wireless 5 GHz, Wireless 2.4 GHz, Services, System

Use the buttons at the top of the page to filter by the available categories: Alerts, Maintenance, or System logs.

Figure 42: Filtering by Activity Category

DATE	STATUS	TYPE	AFFECTED	DETAILS
1 day ago 2019-11-05 08:48	Completed 2019-11-05 08:49	Received Config (Device)	TPS-Test	Configuration was successfully updated on the cloud. Configurations received from device: Ignite, DHCP, Dropbear, Ethernet, Firewall, Hotspot, Language, mDNS, SNMP, Network, System, Telnet, UPnP, Users, Wifi Schedule, Wireless.
1 day ago 2019-11-05 08:48	Timed Out 2019-11-05 09:18	Auto Firmware Upgrade	TPS-Test	Task timed out while running. Version 2.2.1-4338 Previous version 2.2.0-4323

## Manage Your Sites

From a Cloud menu, click on the Site Management.

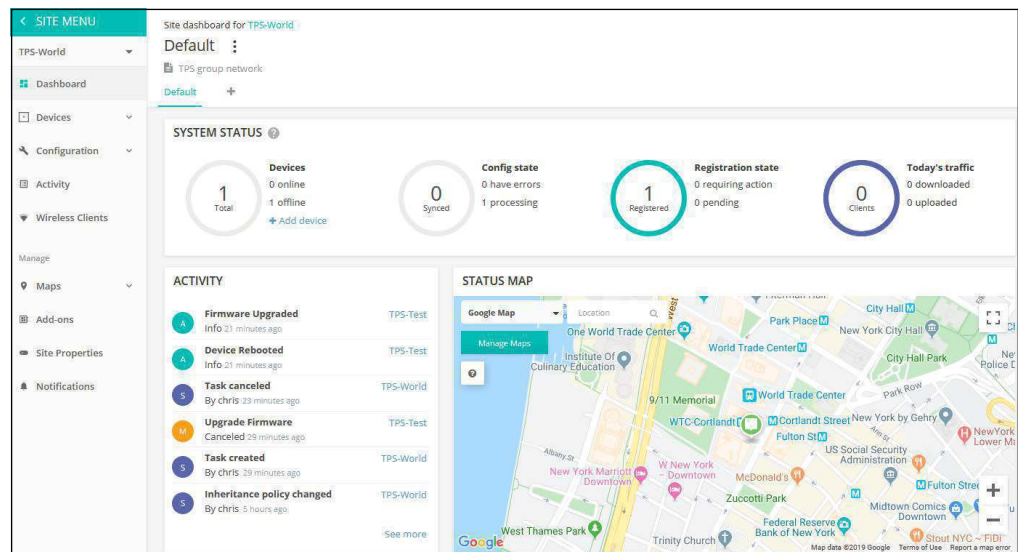
Figure 43: Site Management Page



In the Manage Sites window a list of all created sites is shown with each site name, creation date, user list, and location. Click the edit button to edit a site’s properties, or the delete button to delete a site once all devices are removed from it. Click the Add Site button to open the site creation page.

Clicking on a site name opens the site’s dashboard.

Figure 44: Site Dashboard



See [“General Site Configuration” on page 95](#) for further detailed site management and configuration information.

## User Management

The user who originally creates a cloud is the cloud's owner. The owner can then invite any number of users to have Owner, Administrator, or Regular User access to the cloud and its sites.

Note the following access rights for users:

- **Owner** — Cloud Owners have full write permissions and access to all sites and devices within the clouds they administer.
- **Administrator** — Cloud Administrators have nearly full write permissions and access to all sites and devices within the clouds they administer. They, however, cannot manage billing and licensing settings by default only the cloud owner can do this. The cloud owner can grant this permission to an Administrator if required.
- **Regular User** — Site-level users that are bound to the sites that the owner specifies. They can further be classified as Managers (with full write access), or Guests (with read-only access) within their specified sites.

From the Cloud menu, click “User management.”

Figure 45: Manage Users



The Manage Users page allows you to invite new users, remove users, or edit a user’s access permissions.

Click INVITE USER to open the invitation page. Fill in the user’s email address and select the role for the user; Owner, Administrator, or a Regular User. For administrators, two additional permissions can be selected. Click INVITE to send an email message request to the new user to join the site.

Figure 46: Invite a New User

← BACK TO ALL USERS

### Invite a user

**Email**

**Role**

Owner  
Cloud owners have complete control of all settings in their cloud.

Administrator  
Cloud administrators have nearly full write permissions and access to all sites and devices within the clouds they administer. They, however, cannot manage billing and licensing settings by default - only the cloud owner can do this. You can grant additional permissions to administrators using the checkboxes below.

**Additional permissions**

Manage licenses and billing ⓘ

Manage VPC settings ⓘ

Regular User  
Site-level users are bound to the sites that you specify below. They can further be classified as managers (with full write access), or guests (with only read-only access) within their specified sites.

**Message**

CANCEL INVITE

The “Additional permissions” field is optional and contains the following items:

- **Manage licenses and billing** — Provides full access to Licenses & Billing pages for the cloud.
- **Manage VPC settings** — Allows access to Virtual Private Cloud (VPC) settings used for custom clouds. Custom clouds remove the Edgecore branding from a cloud and allow all the pages to have a custom name, logo, etc.

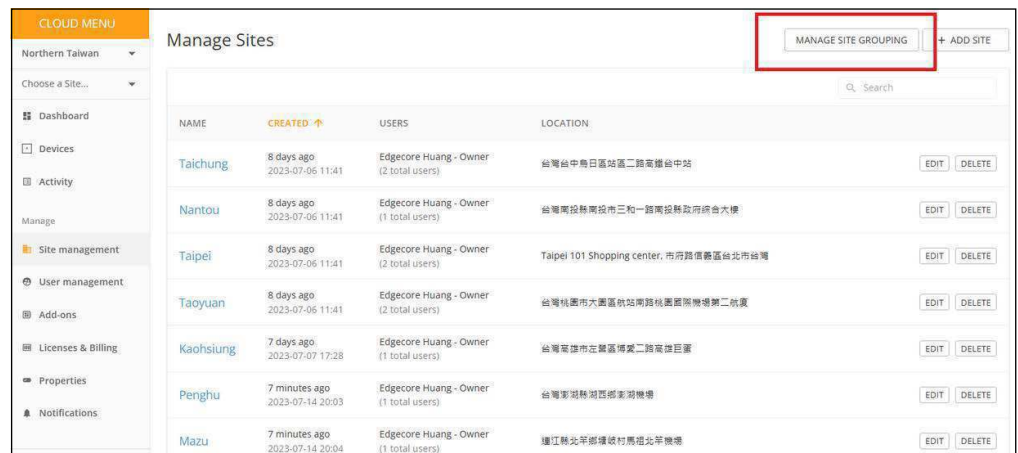
## Site Grouping

When you need to manage multiple sites within the same cloud, you can use Site Grouping to aggregate information from various sites on one page, avoiding the need to constantly switch between sites. Site Grouping essentially enables you to create a logical collection of related sites.

Note that only Cloud Owners and Cloud Administrators have permission to use Site Grouping.

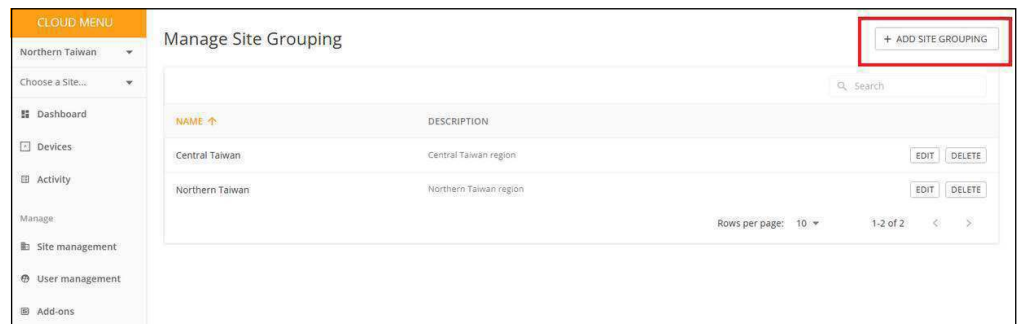
To create a site group, go to the Site Management page and click “Manage Site Grouping.”

Figure 47: Accessing Site Grouping



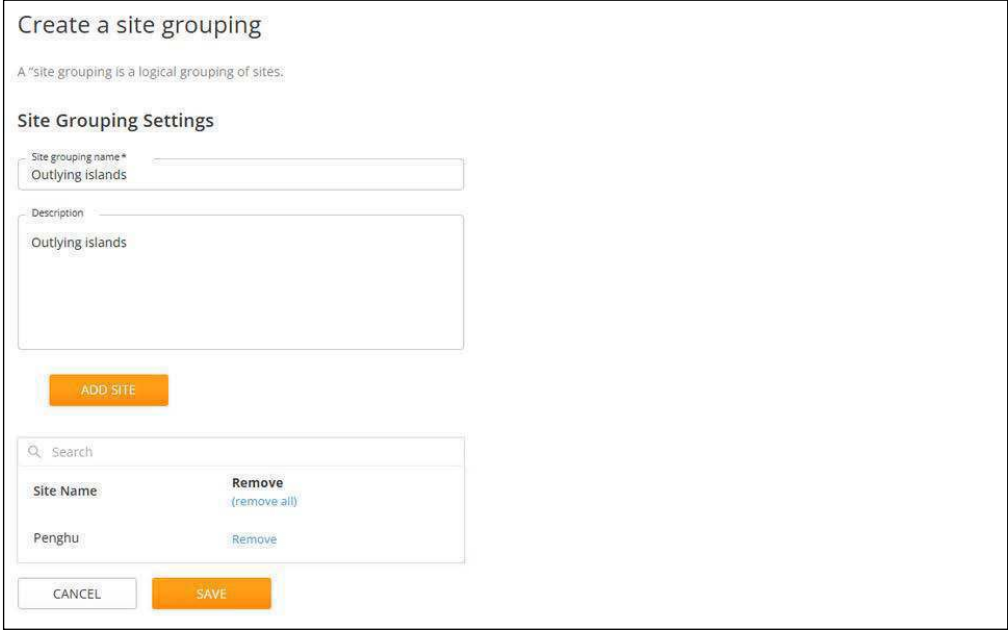
On the Site Grouping page, click “Add Site Grouping.”

Figure 48: Site Grouping Page



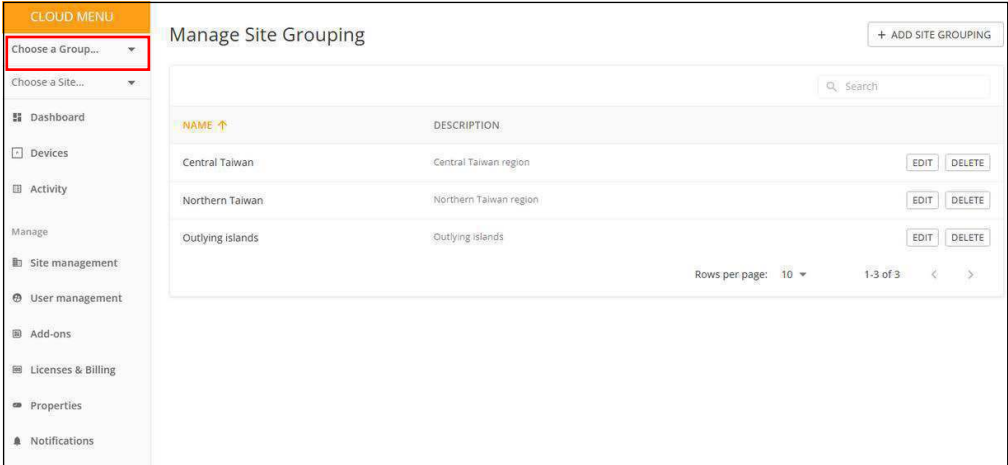
Enter a name and description for the site group. Click “Add Site” to add available sites to the group from a list. Click Save to create the group.

Figure 49: Creating a Site Group



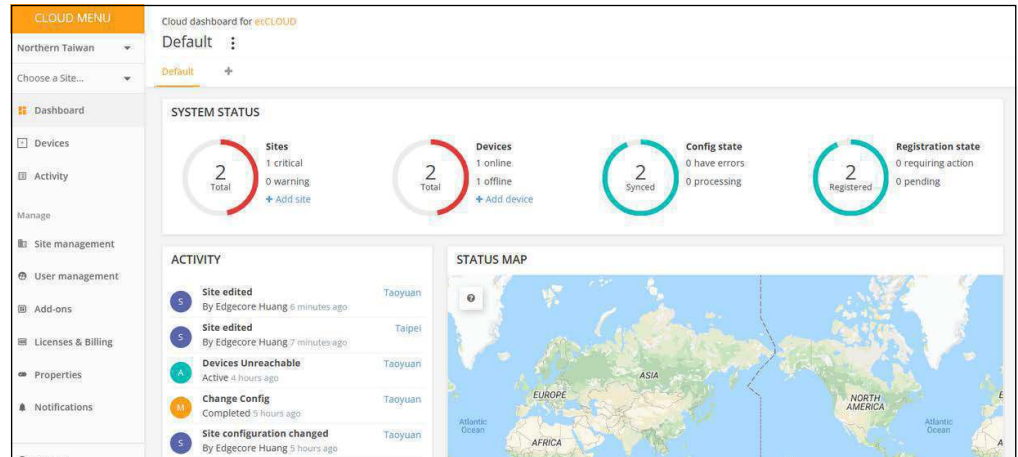
From the Manage Site Grouping page you can edit or delete groups, and switch quickly between groups using the “Choose a Group” menu at the top-left of the page.

Figure 50: Managing Site Groups



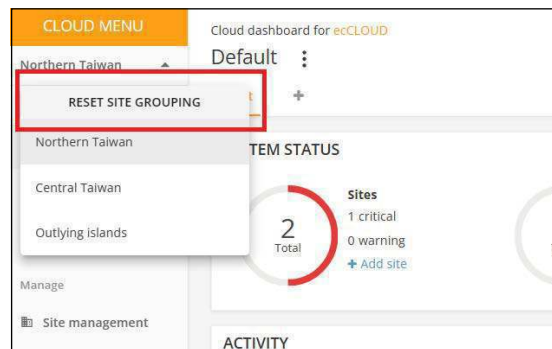
Selecting a Site Group refreshes the page and you can see aggregated information from sites in the group.

Figure 51: Viewing Site Group Information



To reset Site Grouping to the global view, click "Reset Site Grouping" on the Site Grouping drop down list.

Figure 52: Resetting Site Grouping



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## Always Follow Cloud Configuration

In addition to site inheritance and device-level changes, ecCLOUD supports two-way synchronization of cloud and device configuration. When a user modifies a device configuration locally through its web interface, the changes are pushed back to the ecCLOUD configuration.

To prevent the ecCLOUD configuration from being modified by local device changes, ecCLOUD provides an “Always follow cloud configuration” feature that ignores any local configuration changes received from a device. This feature is completely independent of the type of device or its firmware version.

---

**i** **Note:** You cannot initiate a firmware upgrade on a device with “Always follow cloud configuration” enabled. First disable this feature before performing a firmware upgrade.

---

When there is a mismatched configuration between the cloud and the device, ecCLOUD notifies the cloud administrator with the message “The configuration between cloud and device is not matched” and the “Configuration status” is marked as “Configuration is not matched.”

The cloud administrator then has the option to manually push the ecCLOUD configuration to the device, or to enable “Auto follow cloud config” to automatically resolve the mismatched configuration.

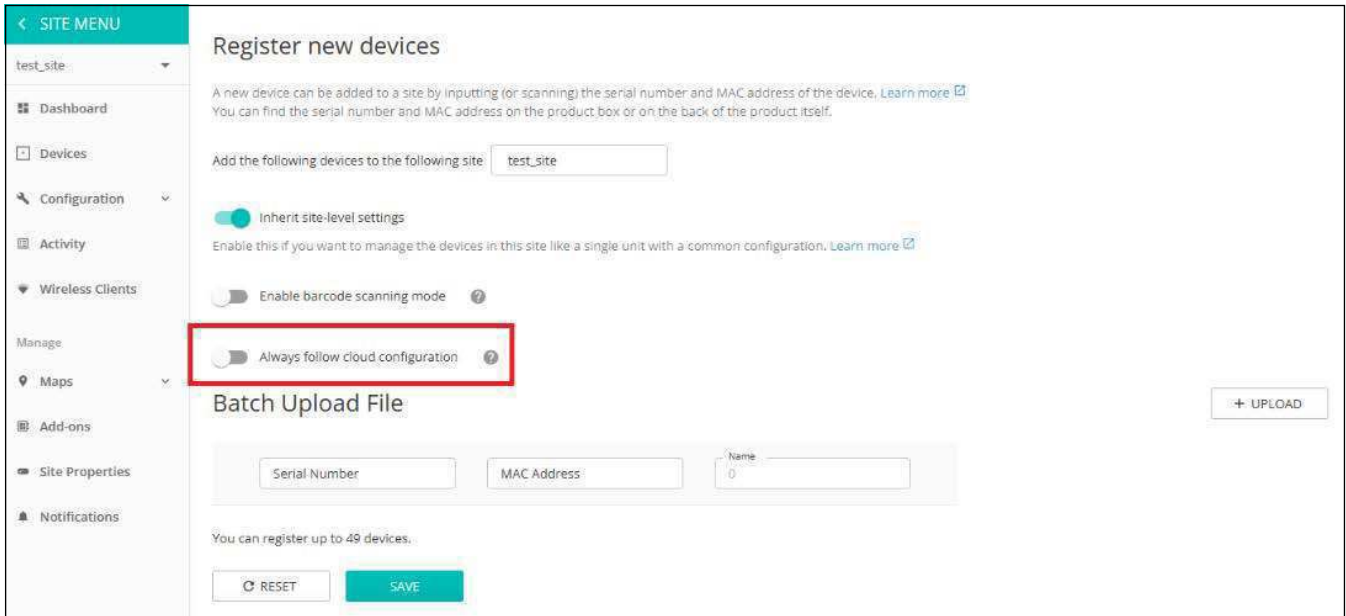
When registering new devices you can enable “Always follow cloud configuration.”

---

**i** **Note:** “Always follow cloud configuration” is automatically disabled when a device is added by QR code onboarding.

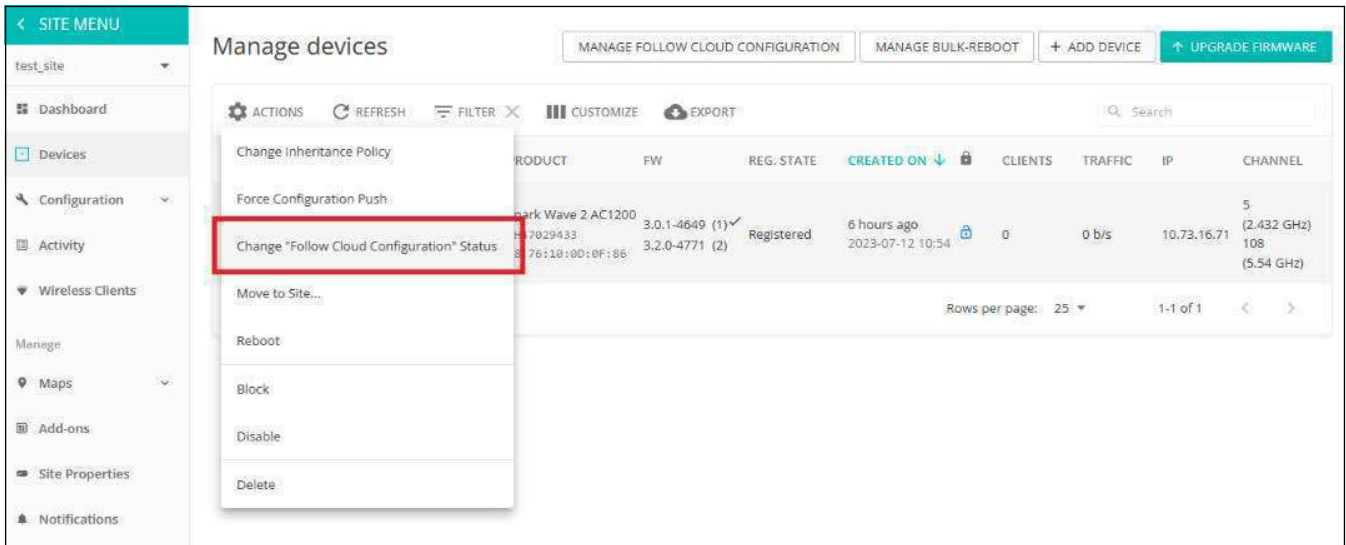
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Figure 53: Enabling Always Follow Cloud Configuration During Device Registration



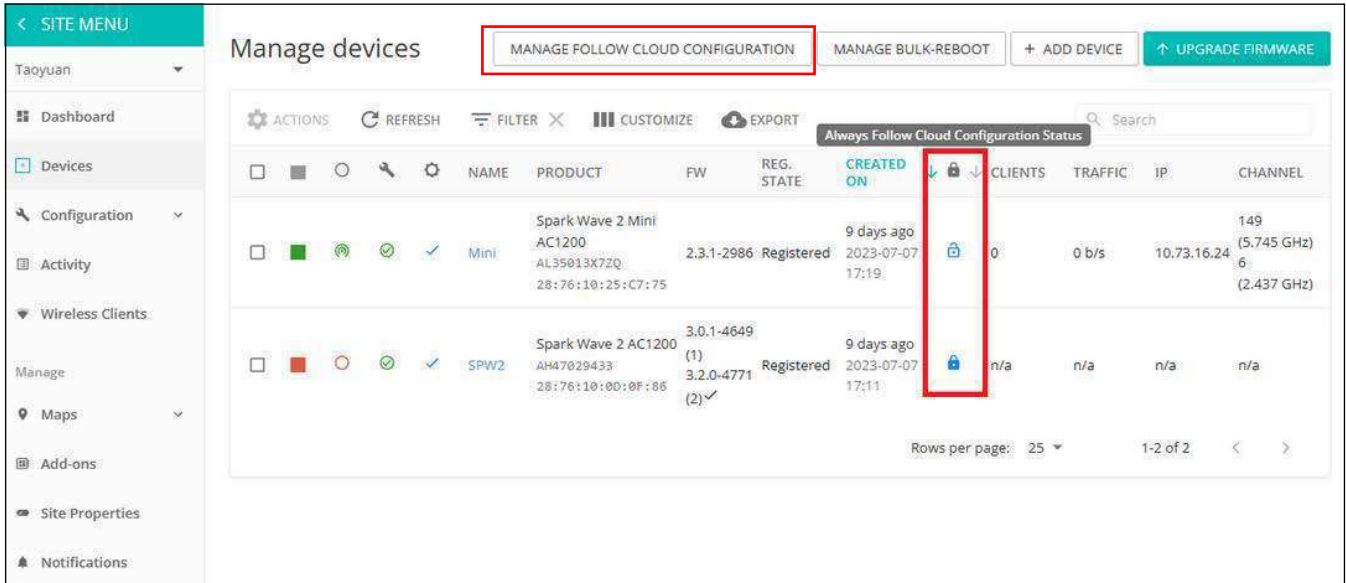
You can also enable or disable “Always follow cloud configuration” for multiple devices from the Site-level Devices page.

Figure 54: Enabling Always Follow Cloud Configuration on the Devices Page



You can check the status of “Always follow cloud configuration” for devices from the Site-level Devices page, as well as enable/disable the feature using the “MANAGE FOLLOW CLOUD CONFIGURATION” button.

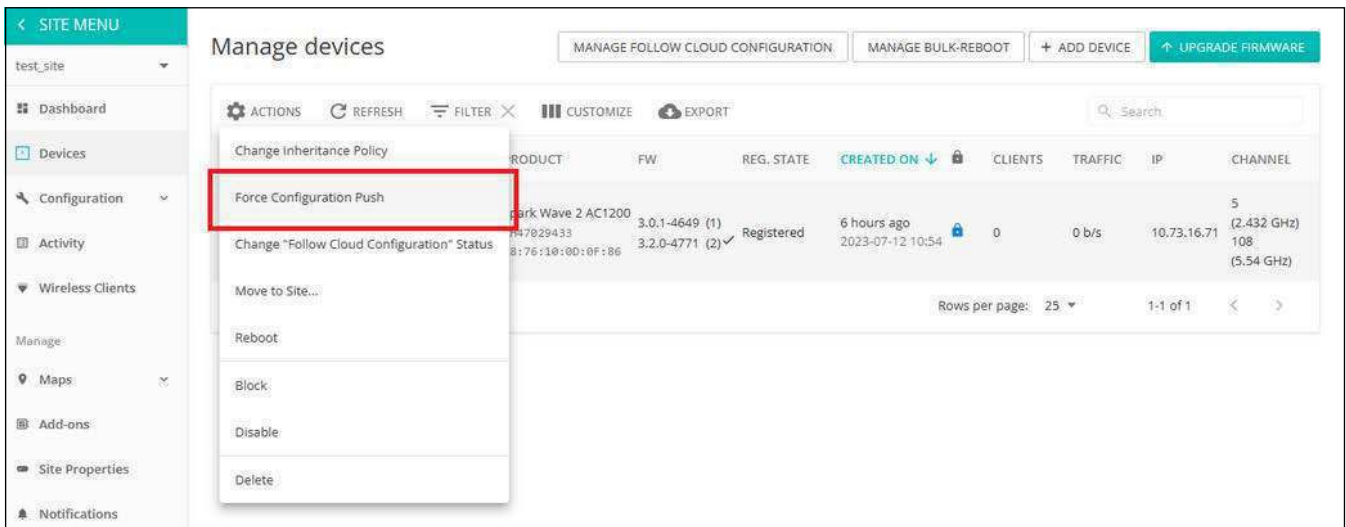
Figure 55: Managing Follow Cloud Configuration



Once “Always follow cloud configuration” is enabled, ecCLOUD will still receive configuration changes from devices, but it does not update the configuration in the cloud. In this situation, ecCLOUD marks the configuration state as “Configuration is not matched.”

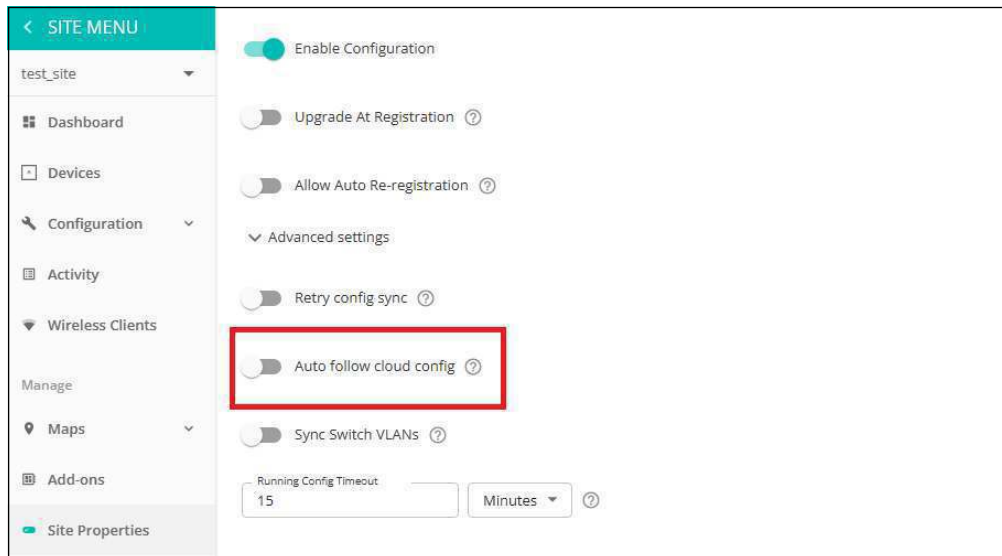
To synchronize cloud and device configurations, you can click “SYNC NOW” in the device-level configuration, or push the configuration from the Site-level Devices page.

Figure 56: Using Force Configuration Push



Alternatively, you can enable “Auto follow cloud config” on the Site Properties page to push a configuration to devices automatically.

Figure 57: Using Auto Follow Cloud Config

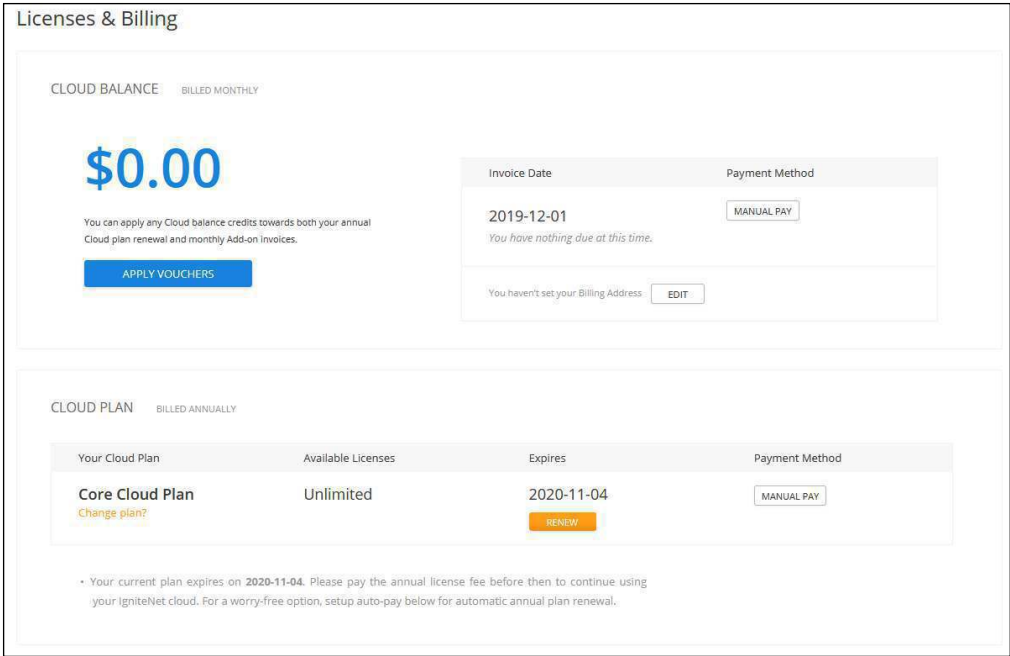


**i** **Note:** Do not enable MSP Mode and “Always follow cloud configuration” at the same time. This will cause the device configuration not to be updated to ecCLOUD properly.

## Managing Licenses and Billing

From the Cloud menu, click Licenses & Billing to manage your ecCLOUD payment plan.

Figure 58: Managing Licenses and Billing



From the Licensing and Billing page you can:

- Apply voucher codes to add credit to your existing cloud plan renewal and Add-on invoices.
- Upgrade the your cloud plan from a Trial Plan to a Core Cloud plan or a Virtual Private Cloud plan. Upgrades are enabled through credit card billing either a single manual payment or with automatic renewal payments. You can also apply Edgecore vouchers as payment for the upgrade.
- View Enabled Add-ons and Invoice History records.

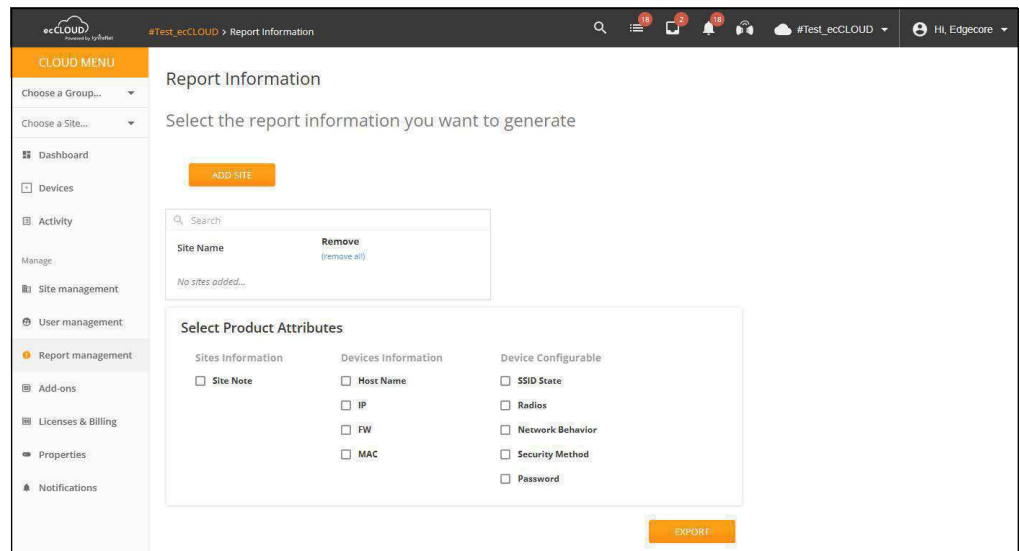
## Report Management

The Report Management feature in ecCLOUD provides a convenient way for Cloud Owners and Administrators to generate and download custom reports containing information of the sites within the network.

**Generate a Report** To generate a custom report, follow these steps:

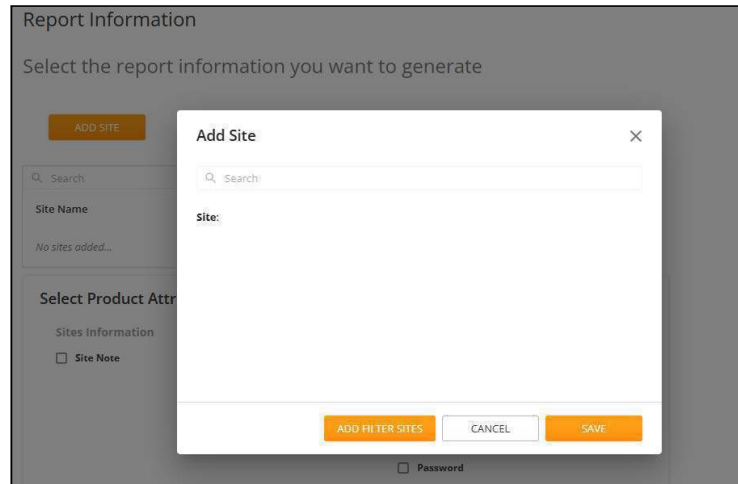
1. Navigate to 'Report Management' in the Cloud menu.

**Figure 59: Report Information**



2. Click 'Add Site' to include sites in the report. Use the search bar to find specific sites or 'Add Filter Sites' to include all sites that meet certain criteria. Click 'Save' to confirm.

Figure 60: Add Sites



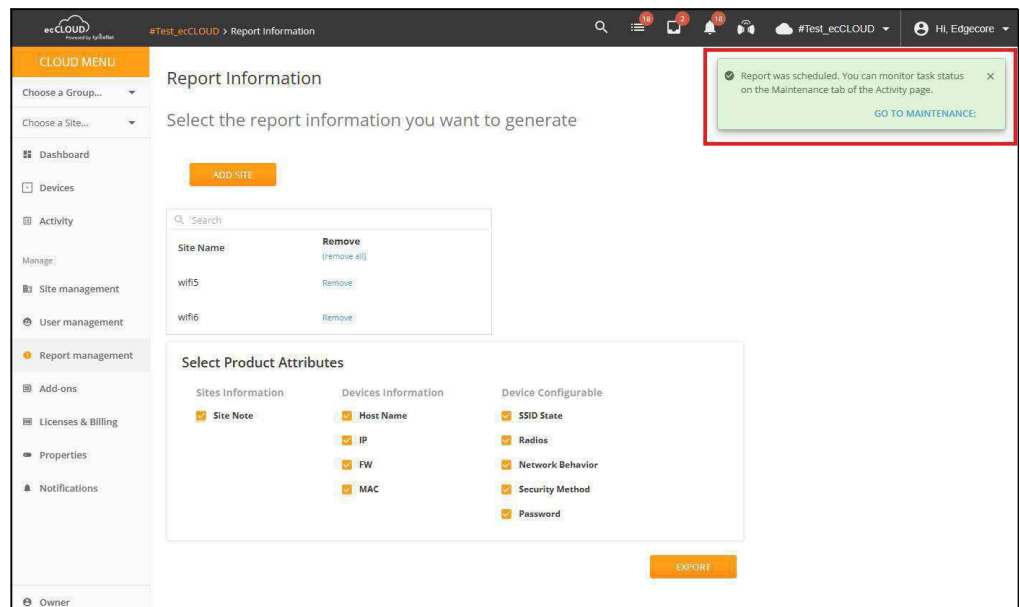
3. Select which attributes you wish to include in the report from the 'Select Product Attributes' section.

Figure 61: Select Site Attributes



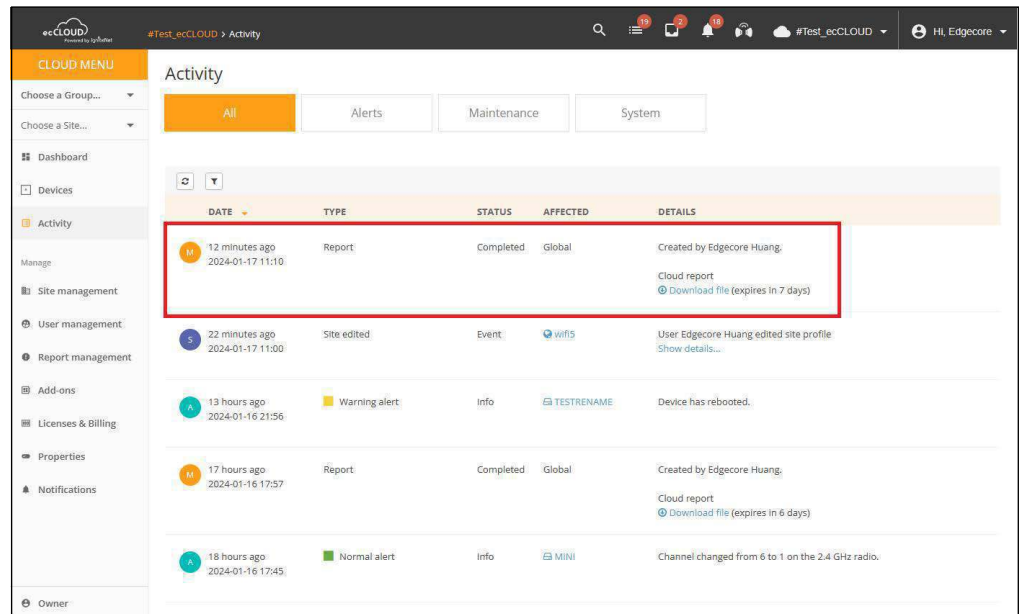
4. Click 'Export' to generate the report. A green notification will appear in the top right corner as confirmation of the action.

Figure 62: Schedule Report Export



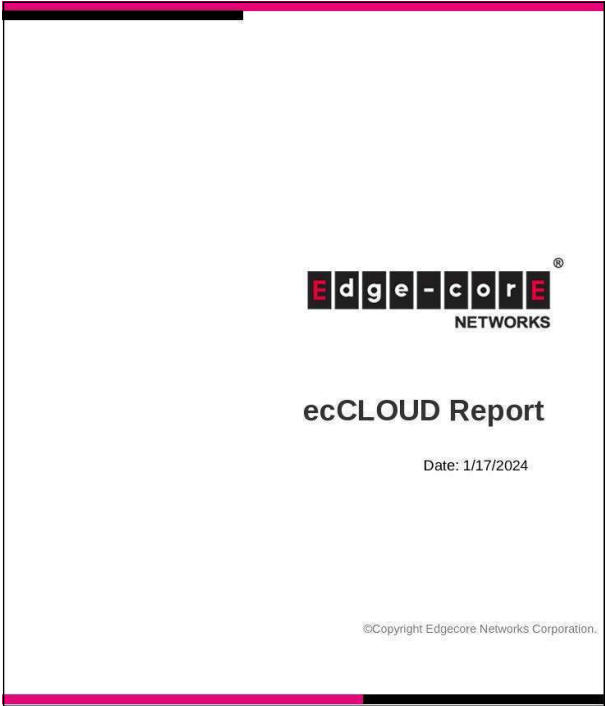
5. Monitor the status of the report creation in the 'Activity' section. A completed task will indicate the report is ready for download. Note that the file will expire after 7 days.

Figure 63: Activity Section with Report



6. Download the report by clicking on the 'Download file' link. The report will be saved locally to your device.

Figure 64: Report File



## Add-Ons

This chapter describes add-ons that can be used for the following categories:

- Enhanced Guest Wi-Fi & External Captive Portal Services
- Security and Family Services
- ecCLOUD Extensions
- Additional Hardware Support

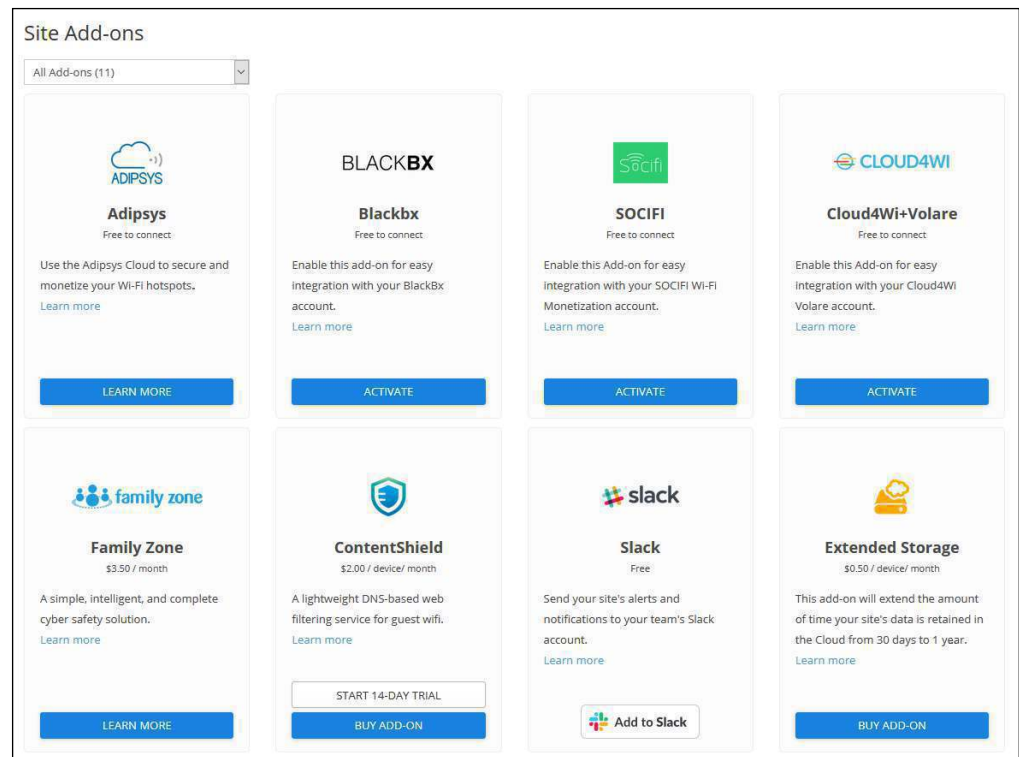
### Using Add-ons

From the Add-ons Menu, available at both Cloud and Site levels, click on selection icon, click on “Learn More,” and then click on the “Activate” button to use the selected service.

Certain add-ons are accessible exclusively at the Cloud level, as their features impact the entire cloud deployment. Examples include:

- Wedge Security Service
- Smart Indoor Location

Figure 65: Add-ons Menu



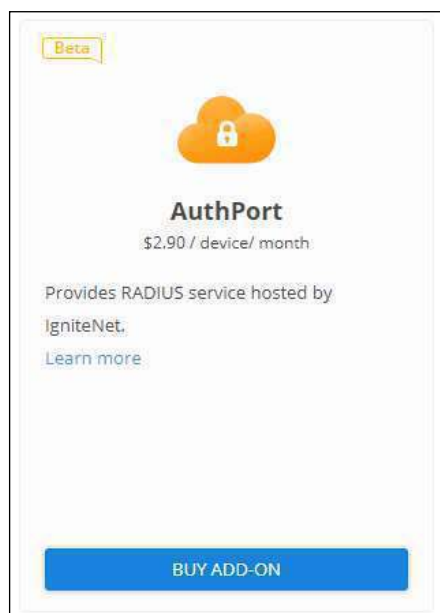
## Using the AuthPort Add-On

The AuthPort Add-on enables the built-in authentication server of ecCLOUD, supporting authentication, authorization, and accounting (AAA) functions for wireless clients. With AuthPort enabled, you can create accounts based on different service plans, which defines the time and data quota for each account. When the wireless client associates to the network, the client can login with the created account to obtain Internet access.

**i** **Note:** Currently, AuthPort is only supported on the following models: ECW5211-L, ECWO5211-L, OAP100, ECW5410-L, SP-W2-AC1200 (L), SS-W2-AC2600, EAP101, EAP102, EAP104.

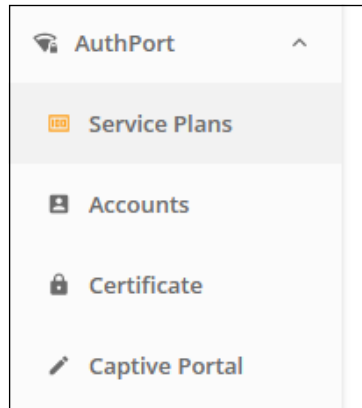
You can purchase this add-on by navigating to the “Add-ons” menu item from either the Cloud or Site-level menus, and pressing the “BUY ADD-ON” button on the AuthPort add-on.

**Figure 66: AuthPort Add-On**



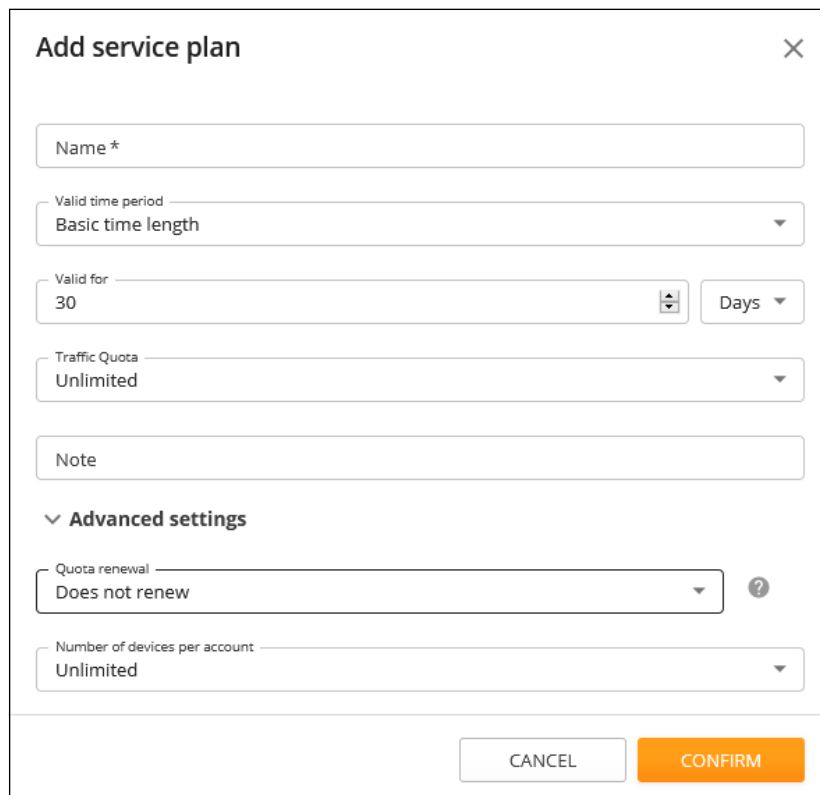
After enabling the AuthPort add-on, the AuthPort configuration menu will appear on the Cloud menu. You can configure a Service Plan, Accounts, Certificate, and Captive Portals respectively.

Figure 67: The AuthPort Menu



**Service Plans** A service plan defines the usage limitations for an account. Before creating an account, you must define the service plan first.

Figure 68: Adding a Service Plan

A screenshot of the 'Add service plan' form. The form has a title 'Add service plan' and a close button (X) in the top right corner. It contains several input fields and dropdown menus: 'Name \*' (text input), 'Valid time period' (dropdown menu with 'Basic time length' selected), 'Valid for' (text input with '30' and a dropdown menu with 'Days' selected), 'Traffic Quota' (dropdown menu with 'Unlimited' selected), 'Note' (text input), 'Advanced settings' (section header with a downward arrow), 'Quota renewal' (dropdown menu with 'Does not renew' selected and a help icon), and 'Number of devices per account' (dropdown menu with 'Unlimited' selected). At the bottom right, there are two buttons: 'CANCEL' and 'CONFIRM'.

The following list shows the configurable items for a service plan.

- **Name** — The name of the service plan.

- **Valid time period** — The account is available only in the defined valid time period. The time period is defined by the activation and expiration times.
- **Activation time** — The client must log in to the account before the activation time. If not, the account will expire and cannot be used.
- **Expiration time** — The account will expire and cannot be used after the expiration time.
- **Traffic quota** — The quota limitation for the account. If the client uses more traffic than the quota limitation, the account will be “out of quota” and cannot be used for login.
- **Note** — Any additional information for the plan.
- **Quota renewal** — Configure the time for the account to renew the traffic quota. The quota can be renewed daily, weekly, or monthly.
- **Number of devices per account** — The number of devices that can use the same account to login at the same time.

On the Service Plans page, you can see a list of overviews for all existing plans. You can also add new plans, edit existing plans, or delete plans from this page.

Figure 69: Service Plans Overview

NAME	PLAN DESCRIPTION	NOTE
10GB	Activation: Upon account creation Expiration: a month after account activation Number of devices: 10 Traffic quota: 10GB Traffic quota renewal: Weekly on Monday at 17:20	[EDIT] [DELETE]
3days	Activation: Before 2020-07-10 Expiration: 3 days after account activation Number of devices: 1 Traffic quota: Unlimited Traffic quota renewal: Does not renew	[EDIT] [DELETE]
1GB-6days	Activation: Before 2020-07-10 Expiration: 6 days after account activation Traffic quota: 1GB Traffic quota renewal: Daily at 13:30	[EDIT] [DELETE]
does not expires	Activation: Upon account creation Expiration: Does not expire Traffic quota: Unlimited Traffic quota renewal: Does not renew	[EDIT] [DELETE]

**Accounts** Accounts for wireless clients can be generated based on the service plans. Accounts can be created one by one or in a batch. When creating a single account, the username and the password of the account are configured manually. When creating accounts in a batch, the usernames and passwords are randomly generated.

Figure 70: Creating a Single Account

The 'Create an account' dialog box includes the following fields and options:

- Username \*
- Password \*
- Plan \*: 5 day plan
- Activation: Upon account creation
- Quota renewal: Does not renew
- Number of devices: Unlimited
- Quota: Unlimited
- Expiration: 5 days after account activation
- Multiplier: 1
- Total**
- Expiration: 5 days after account activation
- Notes
- CANCEL and CONFIRM buttons

Figure 71: Creating Accounts in a Batch

The 'Generate accounts' dialog box includes the following fields and options:

- Plan \*: 5 day plan
- Activation: Upon account creation
- Quota renewal: Does not renew
- Number of devices: Unlimited
- Quota: Unlimited
- Expiration: 5 days after account activation
- Multiplier: 1
- Total**
- Expiration: 5 days after account activation
- Number of accounts: 1
- Notes
- Export generated accounts to a file
- CANCEL and CONFIRM buttons

Both methods of creating accounts have a “multiplier” that can be configured to allow the account to include several units of the quota based on the service plan. For example, if an account is created based on a service plan with a 10 GB quota, you can set it to be three times the basic quota, making it have a 30 GB quota.

Figure 72: Account List

ACTIONS	REFRESH	EXPORT	SEARCH	
USERNAME	PLAN	TRAFFIC QUOTA	EXPIRATION TIME	NOTE
test1	2GB	26MB used total 2GB	Expires in 2 months 2020-09-13 10:48	[EDIT] [DELETE]
test2	3TB	516MB used total 3TB	Expires in 22 days 2020-08-07 02:08	[EDIT] [DELETE]
test3	Unlimit	Unlimited data 267MB used	Does not expire	[EDIT] [DELETE]
test4	30Day	Unlimited data 0B used	Expires in 22 days 2020-08-06 21:17	[EDIT] [DELETE]
test5	300MB	741KB used total 300MB	Expires in 3 months 2020-10-13 13:45	[EDIT] [DELETE]
test6	1Day	Unlimited data 50MB used	Expired 6 days ago 2020-07-09 13:40	[EDIT] [DELETE]

Once created, the accounts appear in the accounts list. In the accounts list, you can check the account status, corresponding plan, expiration time, and traffic quota information. Also, information of recent client device logins with the account can be examined here.

Figure 73: Account Details

AAA	333333	Unlimited data 117MB used	Expires in 10 days 2020-07-25 16:13	1234	[EDIT] [DELETE]				
MAC	SSID	Access Point	Site	IP Address	OS	Freq Band	RSSI	Session Down/Up	Session Duration
48:fd:a3:f4:4d:ff	.authport1	ECW5211-L-31	authport site	192.168.2.113	Generic Android	5 (2432 MHz)	-53	42 kB / 26 kB	32 minutes

For each created account, the administrator can also edit its properties, including the password, corresponding service plan, and the multiplier for the total quota. In addition, the administrator can export selected accounts to a CSV format file and distribute the accounts to the wireless clients.

**AuthPort Certificate** When AuthPort authentication is enabled, clients will see a captive portal page after connecting to the SSID. The administrator can upload a security certificate and configure the domain name for the captive portal page.

**Figure 74: AuthPort Certificate**

The screenshot shows a web interface for configuring an AuthPort Certificate. On the left is a 'CLOUD MENU' sidebar with options: Choose a Site..., Dashboard, Devices, Activity, Manage, Site management, User management, Add-ons, Licenses & Billing, Properties, AuthPort, Service Plans, Accounts, Certificate (highlighted), and Captive Portal. The main content area is titled 'AuthPort Certificate' and contains two large text input fields labeled 'Certificate' and 'Private Key'. Below these fields is a 'DNS' input field. At the bottom of the form are two buttons: 'CLEAR FORM' and 'SAVE'.

If a certificate is not configured, wireless clients will be redirected to the captive portal with an unencrypted HTTP connection. For security concerns, it is strongly recommended to prepare a valid certificate and upload it so that the captive portal will be under HTTPS protection. Note that the certificate and private key should be in PEM format. Just copy and paste the content of the certificate file and the private key file to the corresponding fields.

As for the DNS (domain name service), the administrator can configure a domain name that wireless clients will see for the captive portal page. If the DNS is not configured, clients will see the IP address of the AP in the URL of the captive portal page.

To prevent a security warning in the web browser, make sure the certificate is signed by a trusted authority. Also, make sure the configured domain name is the same as the “common name” (CN) field defined in the certificate.

**Captive Portal** AuthPort provides an editor for captive portal page customization. You can define multiple captive portal templates and apply a different template to different AuthPort-enabled SSIDs.

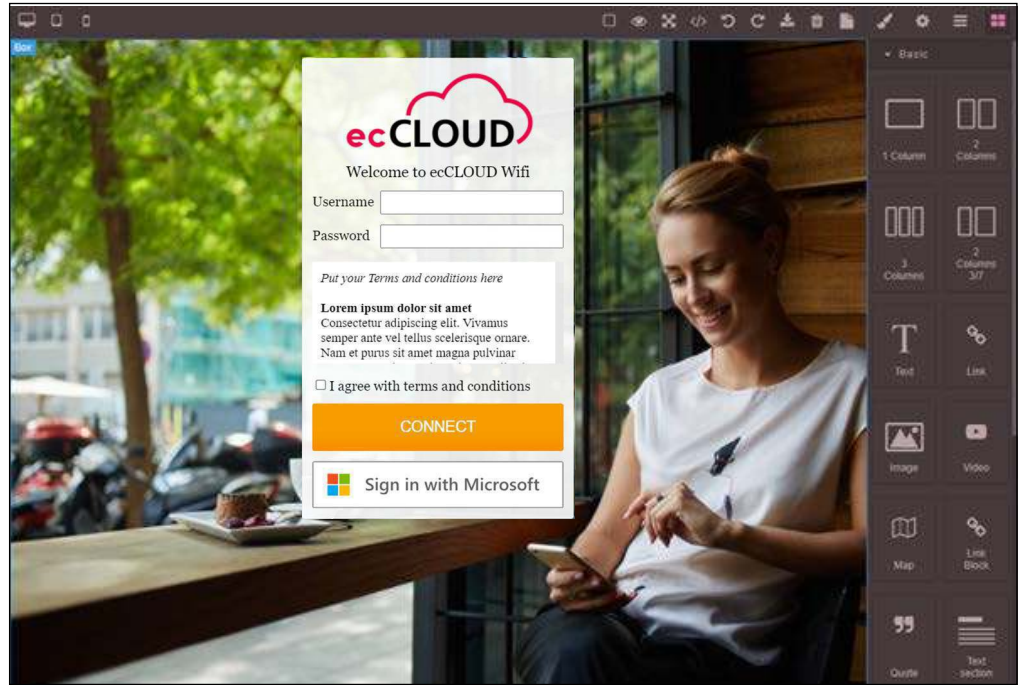
When you create a captive portal and access the editor for the first time, you will be asked to select a theme for your portal. You can select a theme that is appropriate for your service and start editing the page content.

**Figure 75: AuthPort Captive Portal Themes**



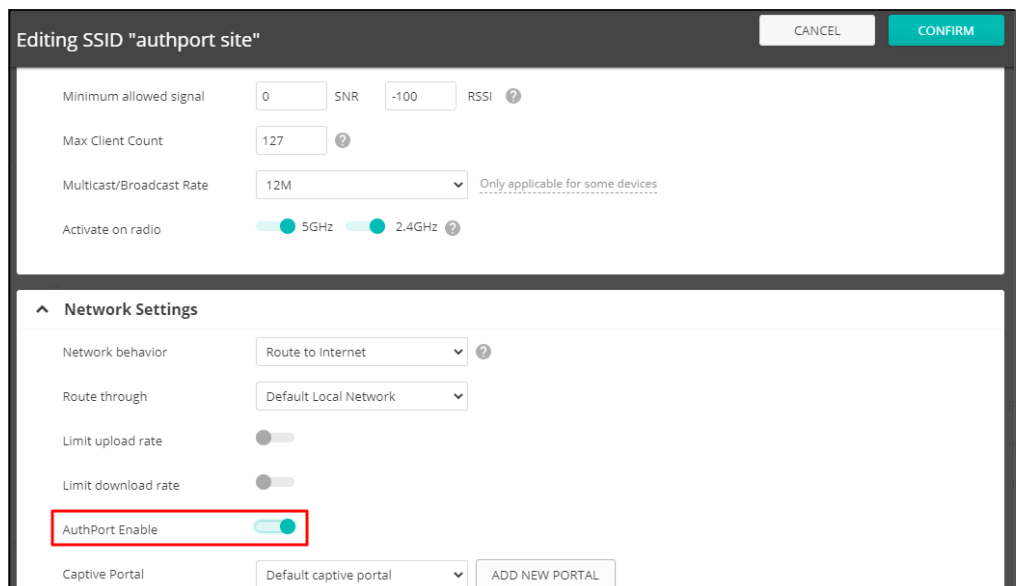
After selecting a template, you will enter the captive portal editor. The editor layout consists of three main parts; a tool bar, an options/attributes panel, and a preview frame. The tool bar is at the top of the editor. On the right-hand side is where the options or attributes can be configured. The preview frame allows you to drag-and-drop page objects and check your portal design in real-time.

Figure 76: AuthPort Captive Portal Editor



**SSID Configuration** AuthPort supports per-SSID configuration for enabling authentication. For example, if you have two SSIDs where one is for staff and the other is for customers, you can enable AuthPort authentication only on the customer SSID. When staff members associate to the staff SSID, they can immediately obtain Internet access. When customers associate to the customer SSID, they are brought to the captive portal page where login credentials are requested.

Figure 77: AuthPort SSID Configuration



AuthPort authentication not only works with a captive portal, but it also can be integrated with EAP authentication. When the security method is Open, WPA-PSK, or WPA2-PSK, and if AuthPort Enable is “on” for the SSID, wireless clients are redirected to the captive portal page after association. Clients can use the AuthPort-created account or use their Microsoft 365 credentials to login and obtain Internet access.

When the security method is WPA-EAP or WPA2-EAP, and if AuthPort Enable is “on” for the SSID, the cloud will become the RADIUS server for the EAP authentication. Wireless clients can use the AuthPort-created accounts as the credentials for wireless connection and complete the transparent login.

## Using the Aprecomm Add-On

The Aprecomm add-on service, through its Virtual Wireless Expert (VWE), equips ISPs with a unified tool for real-time network visibility and insights, simplifying troubleshooting and enhancing customer support. ecCLOUD users can activate a no-cost Freemium service or purchase a premium license for an extended feature set.

Figure 78: Aprecomm Add-On

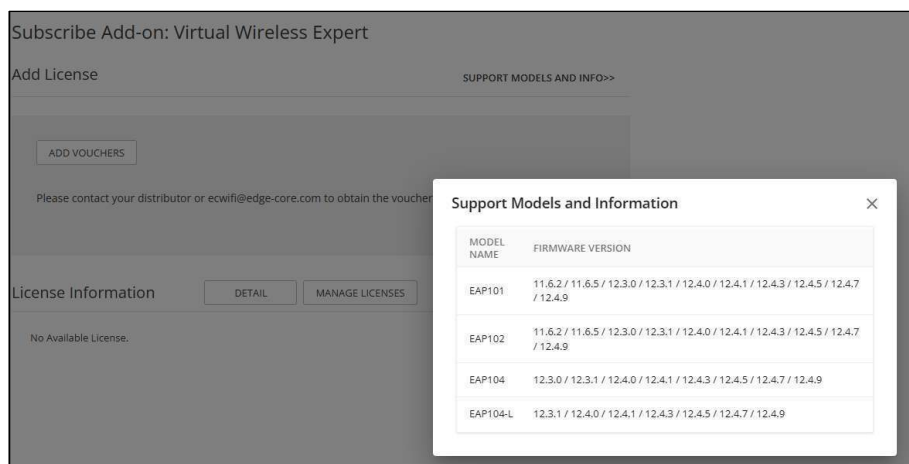


### Supported Devices and Firmware Versions

To view information on supported Edgecore Wi-Fi APs, follow these steps:

1. In the 'Add-ons' menu at the Cloud, Site or Device level, click 'Subscribe / Redeem'.
2. Select 'Support Models and Info' to view supported model names and firmware details.

Figure 79: Supported Devices and Firmware Versions



**Activating Freemium** The freemium version can be activated globally at the cloud level or individually at the site level.

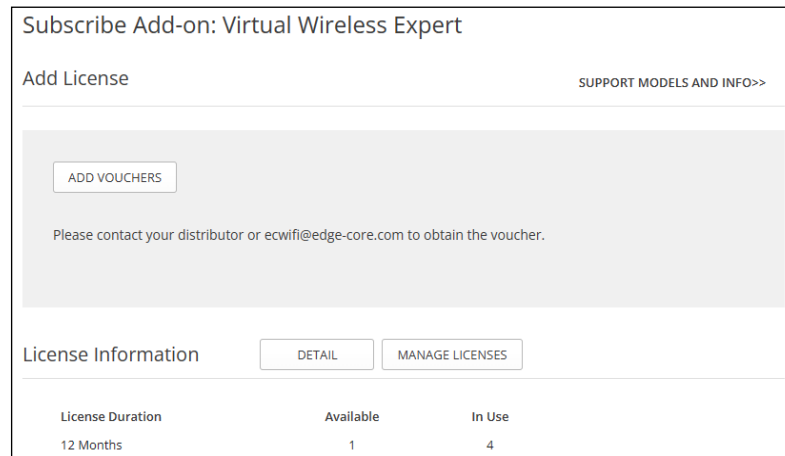
1. In the Cloud or Site menu, click 'Add-ons' and then 'Activate' under Aprecomm's Virtual Wireless Expert.
2. After confirming the activation, it automatically installs the Aprecomm package on devices running compatible firmware.

**Note:** The cloud agent on the device periodically queries ecCLOUD for new packages to install, including Aprecomm's package. A device reboot may expedite the process.

**Purchasing Licenses** To enhance visibility and insights beyond the Freemium offer, follow these steps to purchase and apply Aprecomm VWE licenses:

1. Purchase voucher codes from your distributor or email [ecwifi@edge-core.com](mailto:ecwifi@edge-core.com).
2. Add licenses on ecCLOUD by selecting 'Subscribe / Redeem' under 'Add-ons' in the cloud menu. Click 'Add Vouchers' and enter the provided voucher code.

**Figure 80: Add VWE Licenses**



3. Activate the license in the cloud menu under 'Add-ons' by selecting 'Subscribe / Redeem'.
4. Click 'Manage Licenses' to list the supported devices.
5. Select the desired devices.
6. Click 'Actions' and 'Apply License'.

Figure 81: Apply VWE Licenses

Manage Licenses: Virtual Wireless Expert

ACTIONS REFRESH CUSTOMIZE EXPORT

	NAME	PRODUCT	FW	CREATED ON	SITE
<input type="checkbox"/>	5B-13	EAP101 EC21866002065	12.4.9-1293 (1) 12.4.9-1299 (2) ✓	2 years ago 2022-05-20 15:07	Taipei Office 2
<input type="checkbox"/>	5B-14	EAP101 EC21866002091	12.4.9-1293 (1) 12.4.9-1299 (2) ✓	2 years ago 2022-05-20 15:07	Taipei Office 2
<input type="checkbox"/>	5A-501	EAP101 EC21866001882	12.4.9-1293 (1) 12.4.9-1299 (2) ✓	2 years ago 2022-05-20 15:07	Taipei Office 2
<input type="checkbox"/>	5A-10	EAP101 EC21866001763	12.4.9-1293 (1) 12.4.9-1299 (2) ✓	a year ago 2022-10-06 17:03	Taipei Office 2
<input type="checkbox"/>	EAP102	EAP102 EC21266003799	11.2.0-796 ⚠	2 years ago 2022-06-30 12:03	Beaverworks
<input checked="" type="checkbox"/>	4F	EAP101 EC21870004186	12.4.9-1299 (1) ✓ 12.4.9-1293 (2)	6 months ago 2023-07-10 17:27	Taipei Office 2
<input type="checkbox"/>		EAP101	12.4.5-1118 (1)	3 months ago	

7. Filter the available licenses by the number of available days and apply as needed.

Figure 82: VWE Licenses per Number of Days

License Application

Selected Devices: 1

Devices with Applied License: 0

Apply License: Available > Days\* 30 SUBMIT

There is 1 available license.

⚠ The licenses will be applied to those devices without licenses.  
 ⚠ If the number of available licenses is less than the selected devices, you can apply the license first, and repeat this steps to choose other valid licenses for other devices

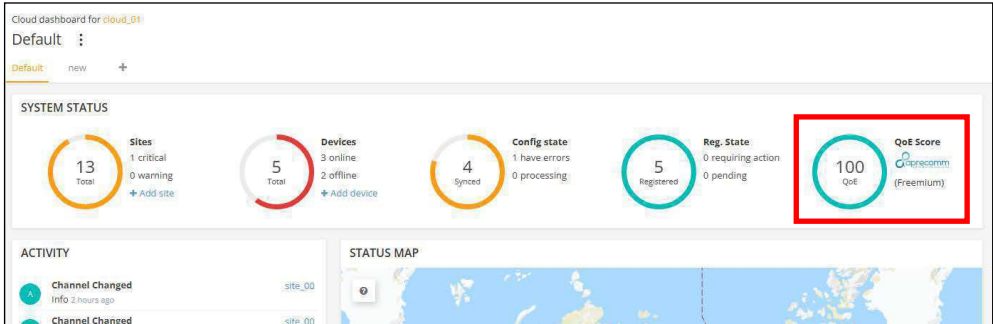
CANCEL APPLY

8. After applying the license, it automatically installs the Aprecomm package on the selected devices.

**Note:** The cloud agent on the device periodically queries ecCLOUD for new packages to install, including Aprecomm’s and associated license. A device reboot may expedite the process.

**Accessing the VWE Dashboard** In the Freemium plan, the QoE score by Aprecomm can be viewed in the dashboard at the Cloud, Site, or Device level.

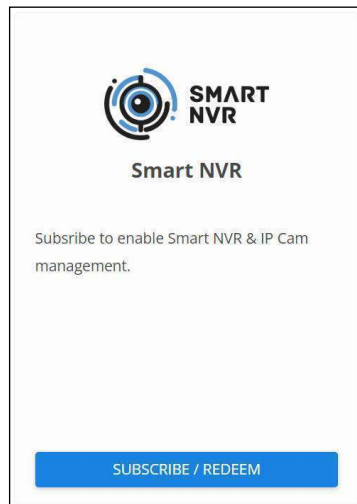
**Figure 83: Aprecomm QoE Score**



## Using the Smart NVR Add-On

The Smart NVR add-on integrates network video recording capabilities within the ecCLOUD platform, allowing users to manage IP cameras across multiple sites. This add-on supports the onboarding of Smart NVR devices and provides features for configuring, managing, and viewing live footage and recordings from IP cameras. ecCLOUD users benefit from automated IP camera scanning, cloud-based configuration, and real-time alerts for system status and camera connectivity.

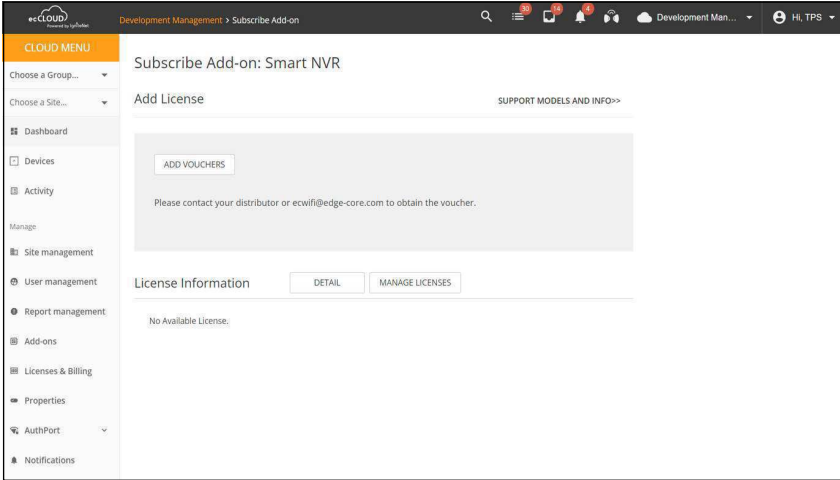
Figure 84: Smart NVR Add-On



**Purchasing Licenses** Follow these steps to purchase and apply Smart NVR licenses:

1. Purchase voucher codes from your distributor or contact [ecwifi@edge-core.com](mailto:ecwifi@edge-core.com).
2. Add licenses on ecCLOUD by selecting 'Subscribe / Redeem' under 'Add-ons' in the cloud menu. Click 'Add Vouchers' and enter the provided voucher code.

Figure 85: Adding Smart NVR Licenses

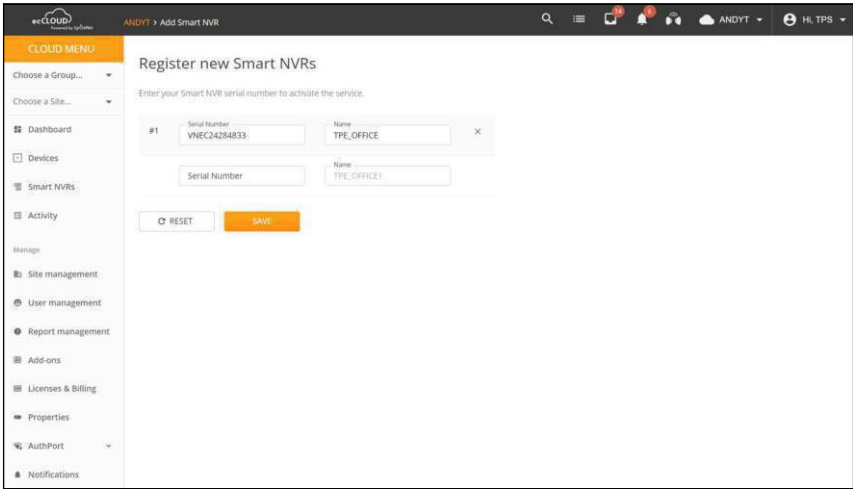


Once the voucher is successfully redeemed, the Smart NVR option will appear in the Cloud Menu.

**Adding Smart NVR Devices**

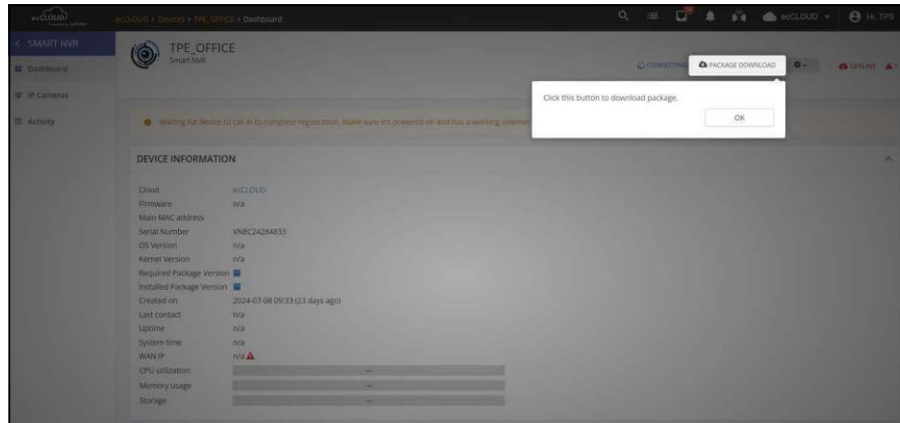
The currently supported Smart NVR device is a VM-based service. To add a new device, you will need the device's serial number. Please contact your distributor or Edgecore sales to obtain the serial number.

Figure 86: Adding a Smart NVR Device



1. Navigate to the Smart NVR management page and click 'Add Device'.
2. Enter the device's serial number and assign an easily identifiable name.

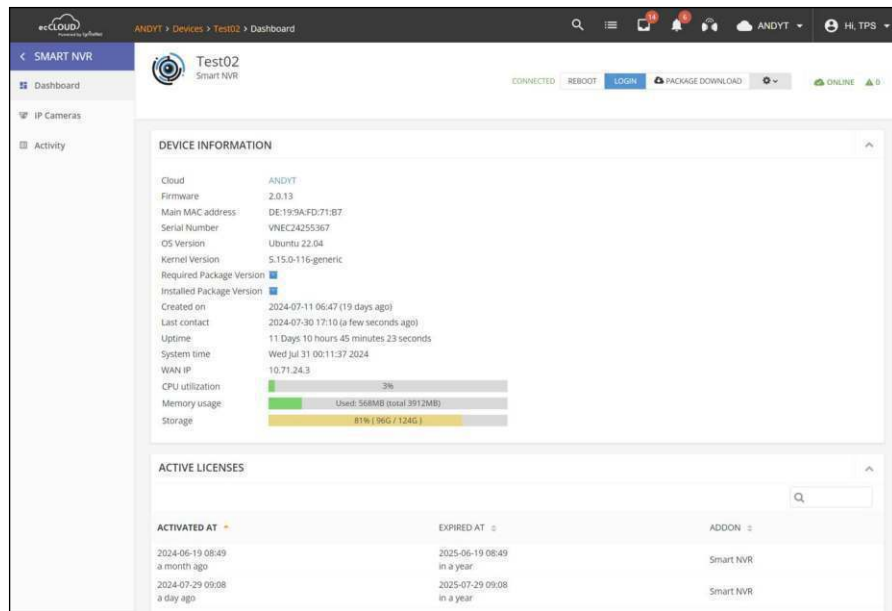
Figure 87: Installing and Registering a Smart NVR



After the device is added to the cloud account, users must download the required software package and install it on the Smart NVR device. To do this, follow these steps:

1. Access the Smart NVR's dashboard by clicking on the device name.
2. Click 'Package Download' to obtain and install the necessary software package, and register the device on the cloud account.

Figure 88: Smart NVR Dashboard



The Smart NVR dashboard provides a comprehensive overview of device status, system performance, and active licenses, offering users easy access to essential management features and real-time data.

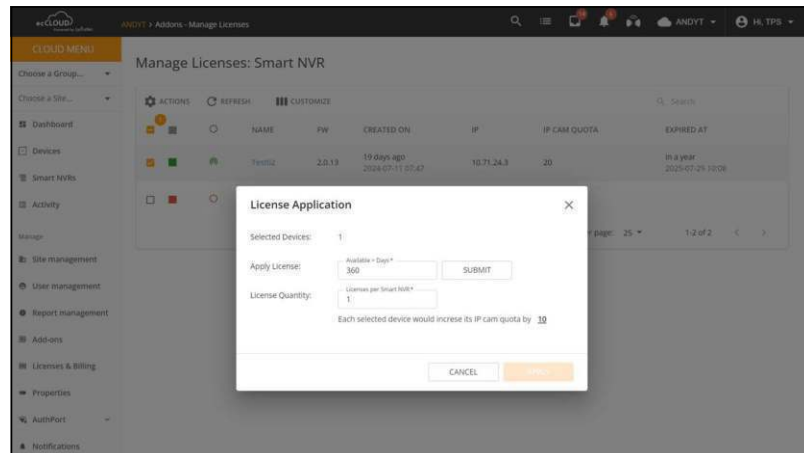
- Device Information Section:
  - **Cloud** — The name of the cloud managing the selected Smart NVR.
  - **Firmware** — The current firmware version installed on the Smart NVR.
  - **Main MAC Address** — The MAC address of the Smart NVR.
  - **Serial Number** — The Serial Number of the Smart NVR.
  - **OS Version** — The version of the operating system running on the Smart NVR.
  - **Kernel Version** — The kernel version of the Smart NVR's operating system.
  - **Required Package Version** — Hover over the icon to view the required package version for the Smart NVR.
  - **Installed Package Version** — Hover over this icon to see the currently installed package version on the Smart NVR.
  - **Created on** — The date and time when this device was added to the cloud.
  - **Last contact** — The most recent time the device reported its status to the cloud.
  - **Uptime** — The duration the Smart NVR has been running.
  - **System time** — The current system time set on the Smart NVR.
  - **WAN IP** — The WAN IP address assigned to the Smart NVR.
  - **CPU utilization** — The current CPU usage percentage of the Smart NVR.
  - **Memory usage** — The amount of memory currently being used by the Smart NVR.
  - **Storage** — The current status of the Smart NVR's storage, reflecting the operational capacity of the system.
- Active Licenses Section:
  - **Active Licenses** — Details of the licenses currently active on this Smart NVR.
- Live Action Section:
  - **Reboot** — Reboots the Smart NVR system.

- **Restart All Services** — Reboot all micro services running on the Smart NVR.
- **Login** — Allows the user to log in to the Smart NVR system for IP Camera live view and historical data access.
- **Package Download** — Download the Smart NVR package for installation or update.

### Manage Licenses and IP Camera Quotas

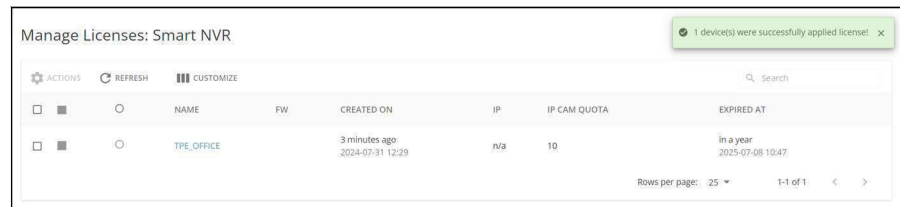
Once you have configured the Smart NVR device, you can add IP cameras. Each Smart NVR license has a quota of ten IP cameras.

Figure 89: Applying Smart NVR Licenses



1. Navigate to 'Add-ons' and select the Smart NVR Add-on.
2. Click 'Manage Licenses', select one or more Smart NVR devices, and choose 'Apply license' from the Actions menu.
3. Specify the number of days and the quantity of licenses needed based on the number of IP cameras to connect.

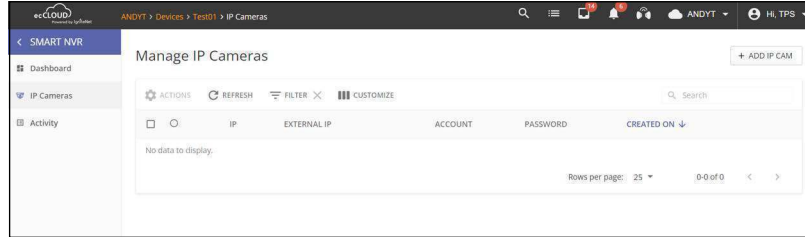
Figure 90: Available Quotas for IP Cameras per Smart NVR device



4. Confirm the available quota of IP cameras on each Smart NVR.

**Add IP Cameras** To add an IP camera to the Smart NVR, users can scan the IP camera through their Edgecore Access Point.

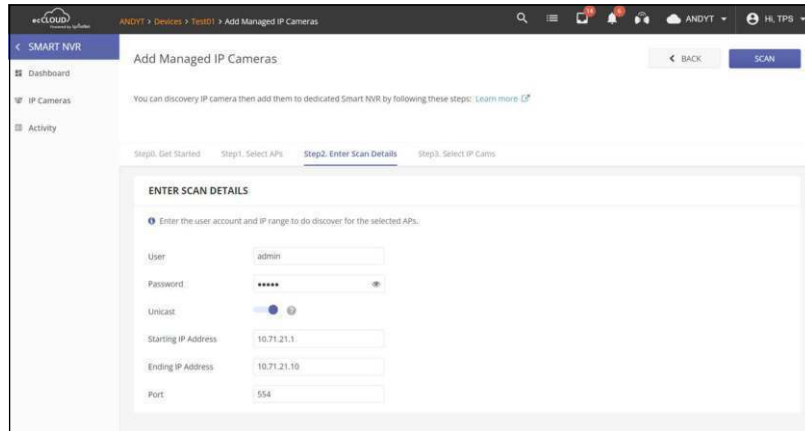
**Figure 91: Add IP Cameras**



Navigate to the Smart NVR device, click 'IP Cameras' and follow these steps:

1. Select the Access Point(s): Choose the APs for the scanning task. These devices will locate the IP cameras on the network.

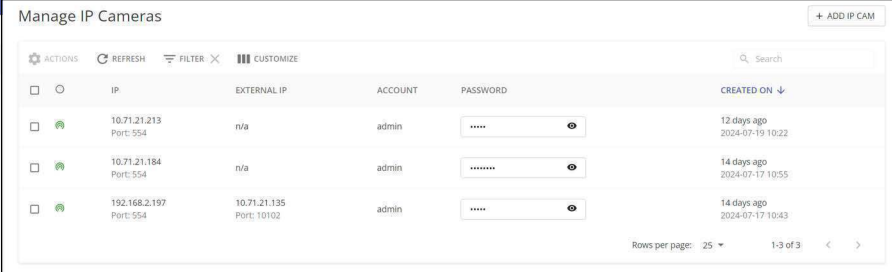
**Figure 92: IP Cameras Scan Details**



2. Configure the ONVIF scanning task:
  - Enter the login credentials of the IP cameras.
  - The AP automatically configures the Port Forwarding settings, allowing the Smart NVR to communicate with the IP cameras.
3. Multicast scan and additional Unicast scan:
  - Multicast Scan: By default, the scan uses Multicast to detect IP cameras connected to the AP's network.
  - Unicast Scan: Optionally, users can specify an IP range and port for Unicast scanning. This allows for locating IP cameras that may not be detected through Multicast.

4. Click 'Scan' to begin. Monitor the progress through the progress bar, indicating completed and in-progress APs. The scanning process may take some time.
5. Review and Select the cameras you wish to add to the Smart NVR. Click the 'Done' button to import the selected IP camera information into the Smart NVR.

Figure 93: Status and Details of IP Cameras



ACTIONS	REFRESH	FILTER	CUSTOMIZE	SEARCH
IP	EXTERNAL IP	ACCOUNT	PASSWORD	CREATED ON
<input type="checkbox"/>	10.71.21.213 Port: 554	n/a	admin	12 days ago 2024-07-19 10:22
<input type="checkbox"/>	10.71.21.184 Port: 554	n/a	admin	14 days ago 2024-07-17 10:55
<input type="checkbox"/>	192.168.2.197 Port: 554	10.71.21.135 Port: 10102	admin	14 days ago 2024-07-17 10:43

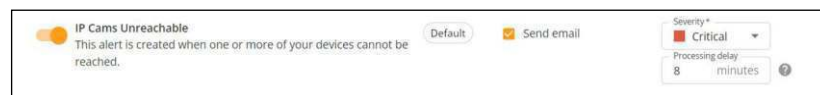
**Note:** ONVIF scanning results are stored in the cloud for 7 days. If an AP is deleted during an ONVIF scan task, the scan task for the deleted AP will be canceled. Deleting an AP will not remove IP cameras from the network, but these cameras may go offline if port forwarding rules were configured on the AP. If you add, edit, or delete profiles in an IP camera, you must re-scan and re-add the camera to the Smart NVR to update the profile information.

### Configure Notifications

To receive email alerts for unreachable IP cameras:

1. Navigate to 'Notifications' in the cloud menu.

Figure 94: Enable Notifications for Unreachable IP Cameras



2. In the Alerts section, enable or disable email alerts for unreachable IP Cameras.
3. Users can define the severity and set the interval between health checks (minimum 5 minutes, default 8 minutes).

# 3

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## General Site Configuration

This chapter describes site configuration, including parameters that apply to all site devices or to the overall site.

- [“Overview of Sites” on page 96](#)
- [“Creating a Site” on page 97](#)
- [“Displaying the Site Dashboard” on page 105](#)
- [“Creating a Custom Site Dashboard” on page 106](#)
- [“Monitoring Wireless APs and Clients” on page 109](#)
- [“Schedule Maintenance Tasks” on page 113](#)
- [“Site Notifications” on page 114](#)

## Overview of Sites

A site is a logical grouping of devices that may or may not share common configuration settings. It is customary to group devices located at the same site.

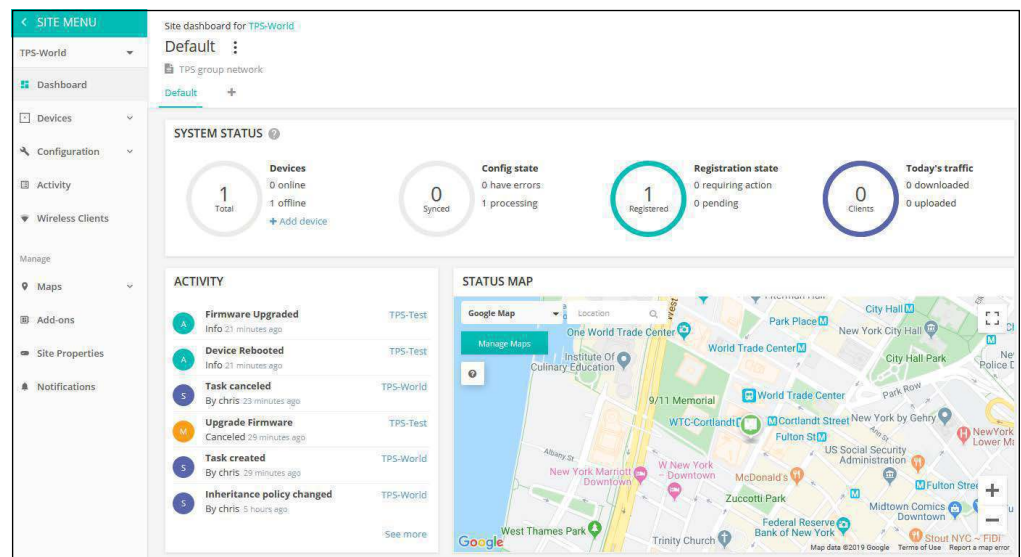
For example, if you are installing 50 APs for a hotel chain, each hotel location would be represented by a different site on the ecCLOUD controller. Each site can have a geographical location associated with it, a set of floor maps, and even preferred language and time zone settings.



**Note:** The number of devices in a site is limited to under 500.

The number of sites you can add to a cloud is dependent on your cloud plan; for a Core Cloud plan the limit is 500, for a Virtual Private Cloud plan the limit is 5000.

Figure 95: Default Site Dashboard

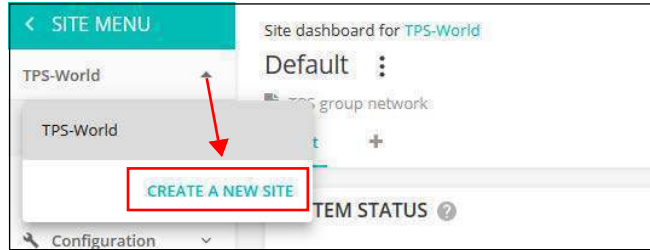


## Creating a Site

When creating your first cloud, you are also prompted to create your first site and add devices. See [“Creating Your First Cloud” on page 29](#) for details.

To create additional sites from the Site menu, click on the pull-down list of sites at the top of the menu. At the bottom of the list, click “Create a New Site.”

**Figure 96: Creating a New Site**



After opening the “Create a Site” page, fill in the properties for your new site and select the geographic location using the map.



**Note:** Items marked with an asterisk are mandatory.

Figure 97: Entering Basic Site Properties

The screenshot shows a web interface for creating a site. It is divided into two main sections: 'General Settings' and 'Locations and Maps'.  
**General Settings:**  
- 'Site name \*': A text input field.  
- 'Description': A larger text area.  
- 'Enable Configuration': A radio button that is selected (orange dot).  
- 'Upgrade At Registration': A radio button that is selected (orange dot).  
- 'Allow auto re-registration': A radio button that is not selected (grey dot).  
**Locations and Maps:**  
- 'Location search': A search bar.  
- A map showing a red pin on the coast of West Africa (Ghana/Guinea region).  
- Latitude and Longitude input fields, both currently empty.  
- 'CANCEL' and 'CREATE' buttons at the bottom.

### General Settings

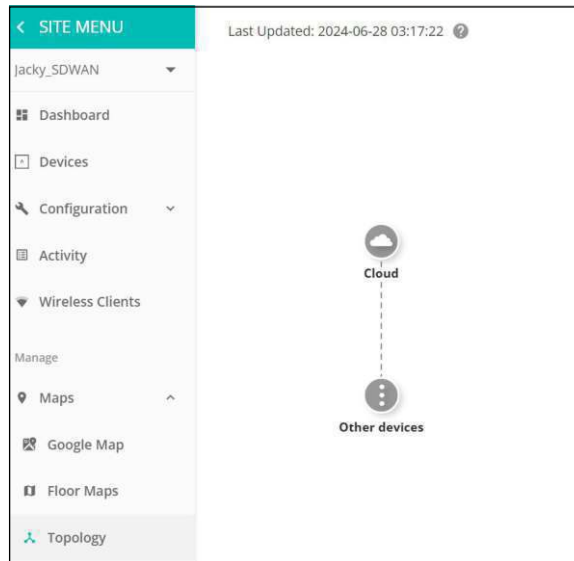
- **Site Name** – The name of your site. You should choose something short but meaningful. For example, use “ParkSide Atlanta” for a site that represents the Atlanta installment of a fictional ParkSide hotel chain.
- **Description** – Add any notes about your site here.
- **Enable Configuration:** This setting has the following options:
  - **ON:** Enables you to remotely configure your devices. (default)
  - **OFF:** Your devices need to be configured locally. However, you can still remotely monitor your devices and you will still receive alerts when a device goes offline.
- **Upgrade At Registration:** Enable this setting if you want your devices to be automatically upgraded to the latest firmware after registration. It is recommended that you keep this setting on.

- Allow auto re-registration: When this setting is enabled, your devices will automatically re-register when they are reset to defaults. If this setting is disabled, a user must log in to the cloud and manually chose the action to take when a device attempts to re-register.

### Locations and Maps

**Location** – The location set here will determine which map is displayed on your site’s dashboard by default, as well as which regulatory country will be used for wireless configuration purposes.

Figure 98: Topology Map with Timespamp



**Topology Map** – ecCLOUD automatically draws an interactive network topology based on network communication. The page displays the "Last Updated" timestamp, indicating the most recent update time. The minimum update interval is 1 hour.

**Site Configuration** After configuring all the site information, click CREATE to create the site. You are then prompted to configure the new site’s general settings, including the regulatory country and local logins.

Figure 99: Setting the Regulatory Country

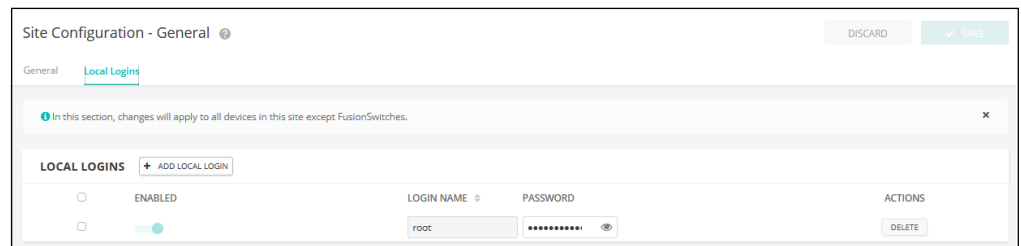


The Regulatory Country setting is typically pre-configured from the site’s Location and Maps setting. The Local Logins also have one account configured by default using a randomly-generated password. You can modify the password and configure additional local accounts as needed.



**Note:** The Local Logins default account from the ecCLOUD Site-level configuration will overwrite the default account previously configured on the local user interface of a device. Once the Site-level configuration has been pushed to devices, you must use Local Login accounts configured in the ecCLOUD Site-level configuration.

Figure 100: Setting Local Logins



After setting the regulatory country and local logins, click “Save” to save your configuration.

### Add Devices

When you first save the site configuration, you are prompted to add devices (wireless, switches, MeshLinqs, GLinqs) to your new site. Click “ADD DEVICES” to continue.

Figure 101: Add Devices Prompt



On the “Register new Devices” page, fill in the serial number, MAC address and name, and then click SAVE. Alternatively, you can use a barcode scanner by toggling the “Enable barcode scanning mode” to ON. You can then quickly enter the serial number and MAC addresses of your devices. Once entered, turn off the barcode scanning mode and enter the names of the devices manually. Click the SAVE button when you are ready to add your new devices to the site.

You also have the option of a batch upload. First, prepare a list of devices in a CSV (comma-separated values) file. A CSV file is a plain text file in which information is

separated by commas. For each device, the serial number, MAC address and name should be entered on one line, as in the following format.

```
<Serial Number 1>,<MAC 1>,<Device Name 1>  
<Serial Number 2>,<MAC 2>,<Device Name 2>
```

Click the UPLOAD button to upload your CSV file.

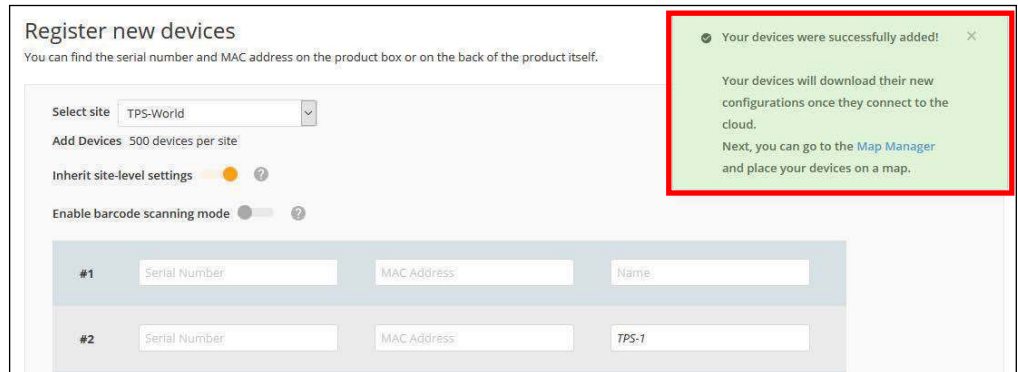
Figure 102: Registering New Devices

When the controller adds a device the following pop-up window is displayed warning you that the device will inherit settings from the ecCLOUD site configuration. Click OK.

Figure 103: Adding Devices Warning Message

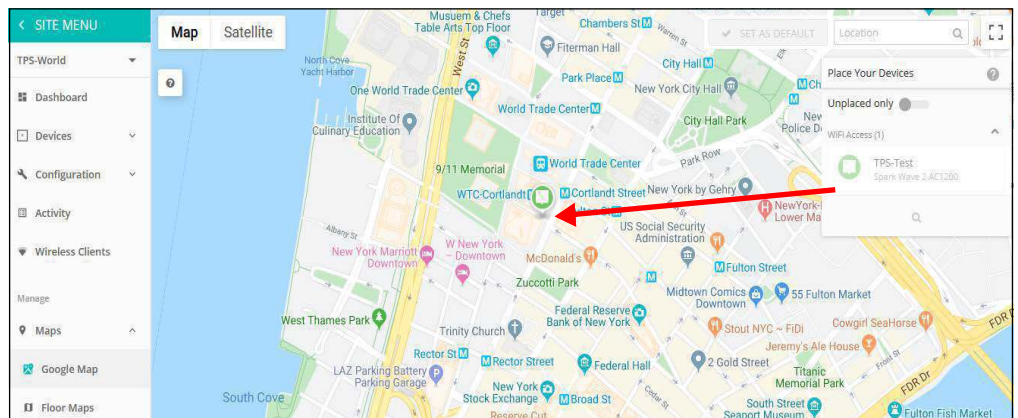
When devices have been successfully added, a message appears at the top of the "Register new devices" page. Click on the blue link "Map Manager" in the message to place your device on a map.

Figure 104: Adding Devices Successful Message



**Place Devices on a Google Map** On the Google Map page, use the mouse to click-drag devices to installation locations on the map.

Figure 105: Placing a Device on a Map



**Set Floor Maps** Floor maps provide a graphic view of your site, indicating the location and coverage area for each AP. Floor maps help you visualize where the APs and clients are in relationship to the building.

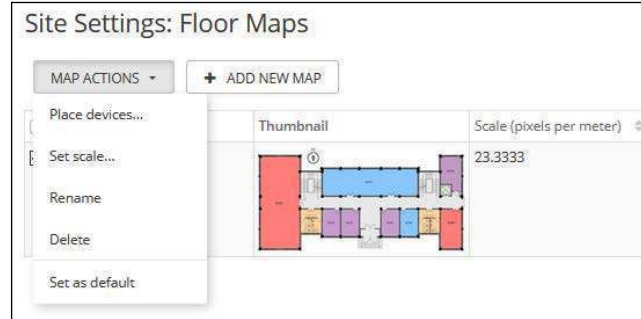
You can upload one or more custom images to create a background for the floor plan by clicking "Add New Map."

Figure 106: Adding a Floor Map



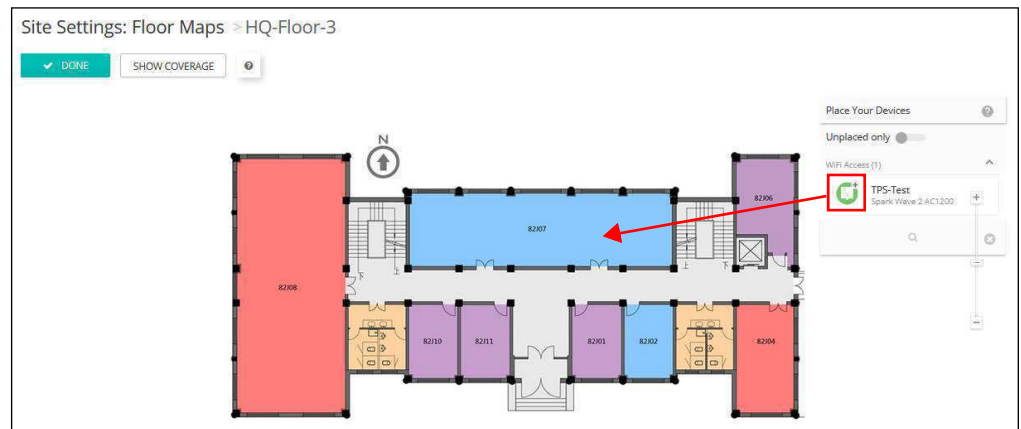
Use the “Place devices” feature from the Action icons or pull-down menu to set the location of wireless devices on the floor map image.

Figure 107: Configuring a Floor Map



Place devices by dragging an AP from the list on the right side of the page, which contains unplaced devices, to its location on the image. Position the cursor over a device to display information about the device. Click “Show Coverage” to display the area covered by the placed devices.

Figure 108: Placing Devices on Floor Maps

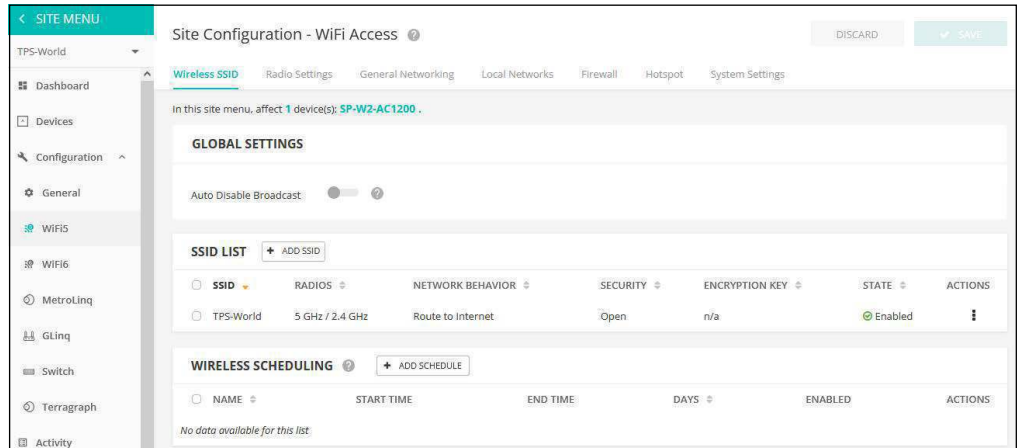


**WiFi Configuration** From the Site menu, select “Configuration” and then “WiFi5” or “WiFi6” to configure wireless settings that are inherited by all the site’s AP devices and any new devices that are added to the site.

**Note:** The WiFi5 or WiFi6 configuration does not apply to devices that have their inheritance policy set to “Do not inherit site-level configuration.”

Refer to “Site WiFi 5 Configuration” on page 118 for more detailed descriptions of wireless device configuration.

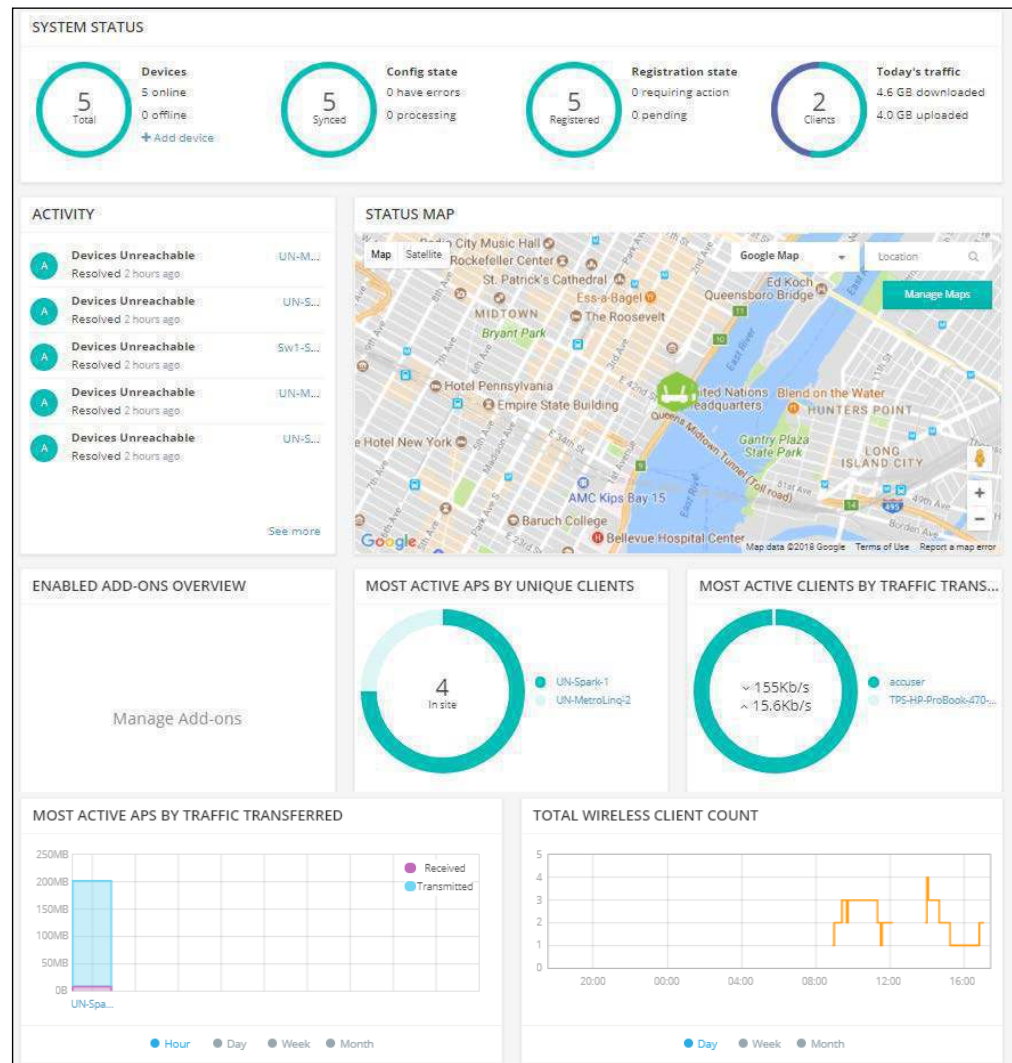
Figure 109: WiFi5 Configuration



## Displaying the Site Dashboard

The site dashboard provides status information for configured devices, client activity, most active clients, most active clients and application, gateway interface, site maps, and site activity.

Figure 110: Site Dashboard



The following items are displayed on the site dashboard:

- **System Status** — The four circles represent (from left to right): the number of devices (with online/offline counts), the number of devices with synced configurations, and the number of devices registered, and the day's client traffic.



**Note:** Placing the mouse cursor over the four circles shows additional information.

- **Activity** — Provides a short summary of the most recent device, network and system alerts, and maintenance notifications such as the device being unreachable or rebooted. Clicking on each entry provides further details.
- **Status Map** — Displays the geographical location of this site and the site’s devices. Placing the mouse cursor over a device displays a pop up with further device detail.
- **Enabled Add-Ons Overview** — A summary of the currently enabled Add-ons. Clicking in the box opens the Site Add-ons management view.
- **Most Active APs by Unique Clients** — This area shows the APs with single clients showing the most network activity i.e. download and upload traffic transferred. Click on one the APs to go to the APs detailed Dashboard view. Click on the buttons at the bottom to change the measurement window to either 10 minutes, 1 hour, 1 day, or 1 week.
- **Most Active Clients by Traffic Transferred** — This area shows the clients with the most network activity i.e. download and upload traffic transferred in the last 10 minutes. Click on one the clients to go to the clients detailed information view.
- **Most Active APs by Traffic Transferred** — This graph shows the APs with the most network activity i.e. download and upload traffic transferred. Click on the buttons at the bottom to change the measurement window to either 1 hour, 1 day, 1 week or 1 month.
- **Total Wireless Client Count**— This graph shows total clients attached to the cloud within the measurement window. Click on the buttons at the bottom to change the measurement window to either 1 day, 1 week or 1 month.

## Creating a Custom Site Dashboard

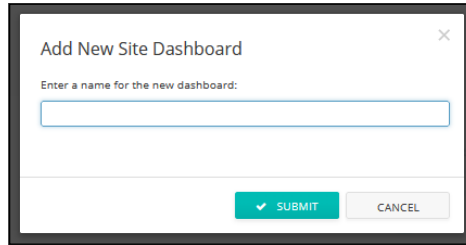
In the default site dashboard, click the plus sign next to the default tab at the top to create a custom dashboard suitable for your requirements.

Figure 111: Adding a Custom Site Dashboard



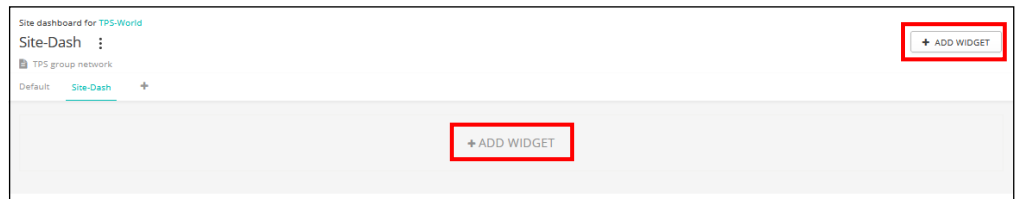
Enter a name for the new custom dashboard and click SUBMIT.

Figure 112: Naming a Custom Site Dashboard



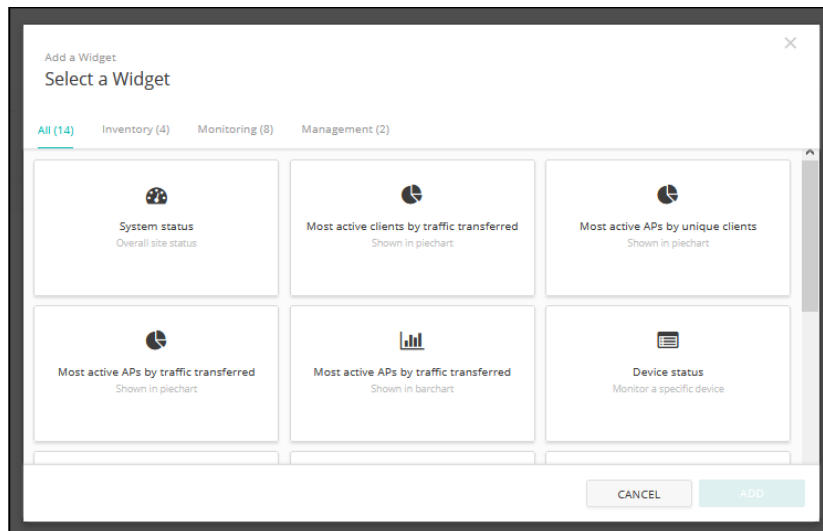
A new tab will appear next to the default dashboard tab with the custom dashboard's name. Click on one of the "+ Add Widget" buttons to add the desired item for the new dashboard.

Figure 113: Adding a Widget to a Custom Site Dashboard



Once a widget is selected click the "ADD" button.

Figure 114: Selecting a Widget for a Custom Site Dashboard



For some widgets, custom setup controls are available and these are presented in a new window. Select the desired settings for the widget and then click the “Save” button.

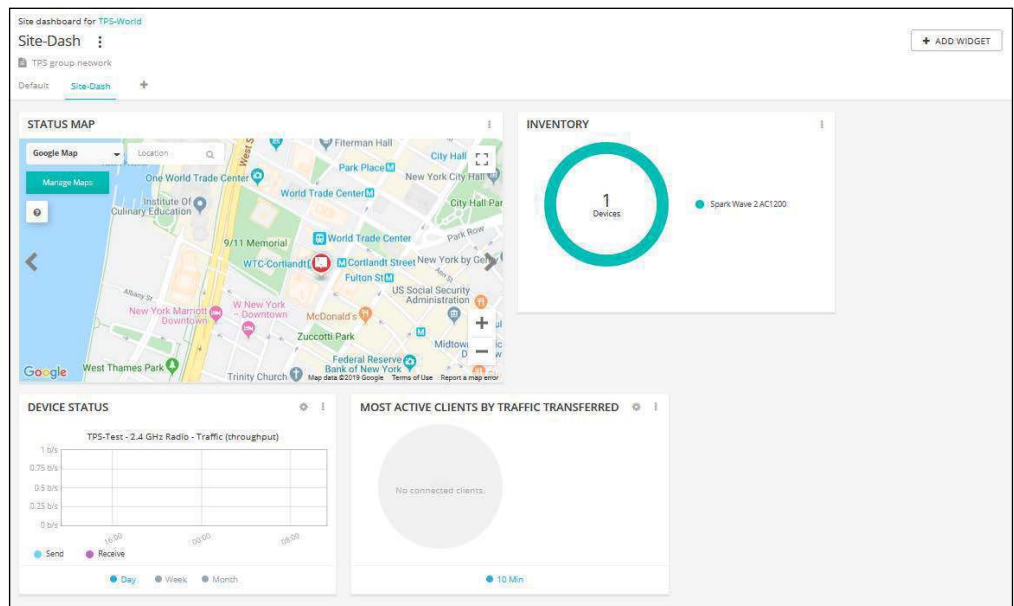
Figure 115: Customizing a New Site Dashboard Widget



Once selected and configured, the widget appears on the new custom dashboard. The widget size can be adjusted by dragging the edges of the widget box. Additionally, widgets can be renamed or removed by clicking the three dot icon in the upper right of the box and the widget settings can be adjusted by clicking the gear icon.

Click the “Add Widget” button again to add additional widgets to the custom dashboard.

Figure 116: Customized Site Dashboard

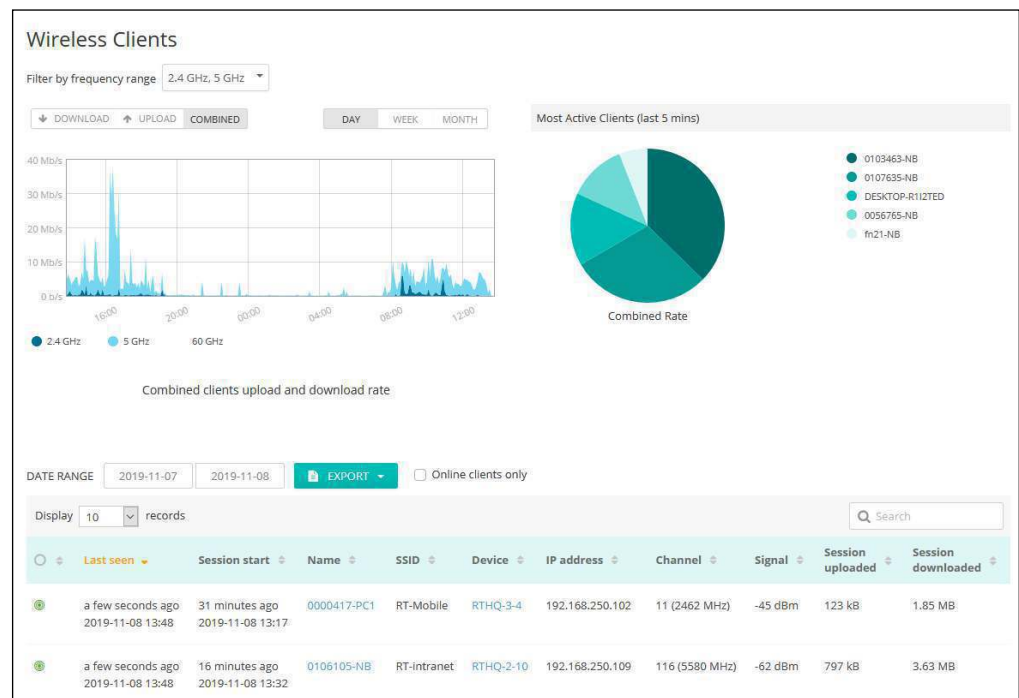


## Monitoring Wireless APs and Clients

The Wireless Clients page displays a list of wireless clients including their individual client information, associated AP, and network activity. Network activity is shown as combined throughput, most active clients, and sessions logs.

Wireless client data on the page can be filtered by band selection (2.4 GHz, 5 GHz, and 60 GHz) and the data traffic can be viewed based on traffic direction (download or upload) or time range (day, week, month, or by date).

Figure 117: Wireless Clients Page



The following items are displayed on the Wireless Clients page:

- **Filter by frequency range** — Shows or hides data on the page for the 2.4 GHz, 5 GHz, or 60 GHz frequency bands.
- **Download/Upload/Combined** — Selects the traffic throughput to display in the chart; downloaded, uploaded, or both (combined).
- **Day/Week/Month** — Selects the time range for the traffic throughput chart.
- **Most Active Clients** — Shows the most active clients (combined rate) over the last five minutes. To show more detailed information, click on a specific client in the pie chart to open the Client Information page.
- **Date Range** — Sets the date range to display for wireless client data in the session logs.

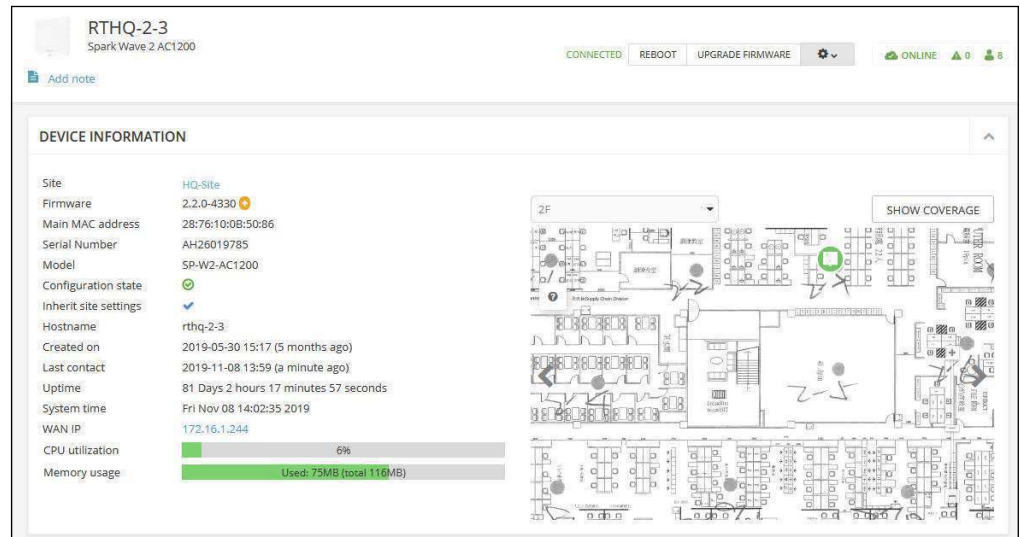
- **Export** — Exports the wireless client information to a CSV excel sheet available from the Activity menu under maintenance.
- **Online clients only** — Restricts the displayed session logs to wireless clients that are currently online.

### Session Logs

To sort the session logs, click on the ascending or descending arrows for each column heading.

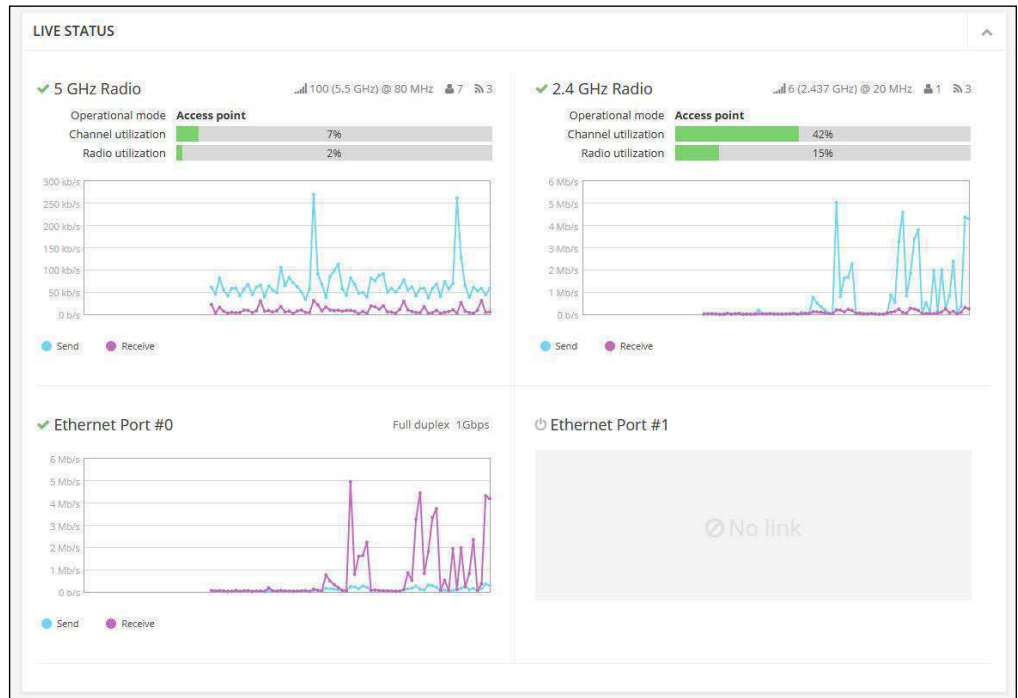
Click on any name in the Device column to open the Device information page for details on a specific AP. The first section of the Device information page includes details about the AP, including a location map.

Figure 118: Wireless AP Information



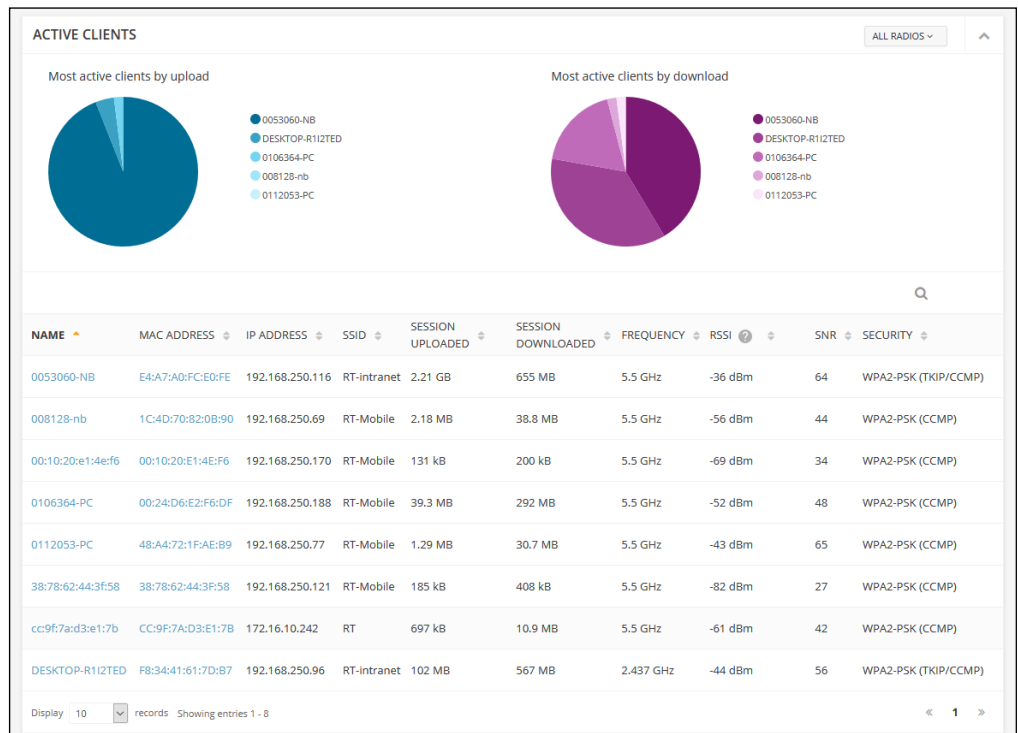
The second section of the Device information page shows throughput and utilization data for radio and Ethernet interfaces on the AP.

Figure 119: Wireless AP Live Status



The third section of the Device information page shows details on wireless clients associated to the AP.

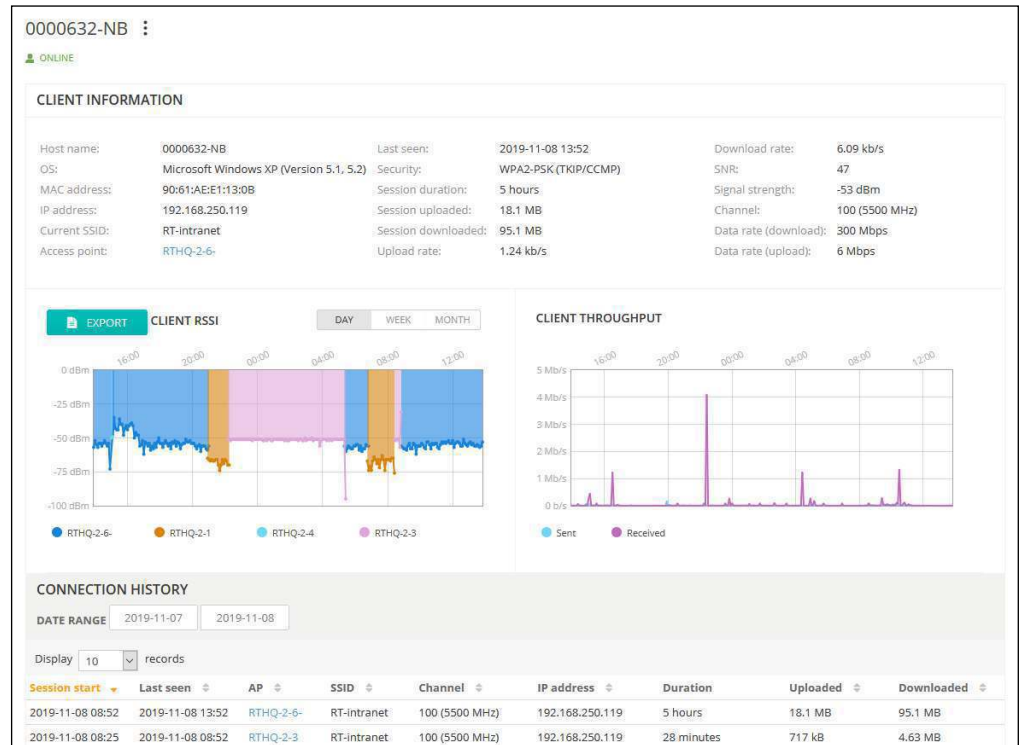
Figure 120: Wireless AP Active Clients



From the wireless client session logs or AP's active client list, click on any of the clients in the Name field to open the Client Information page for details on a specific client.

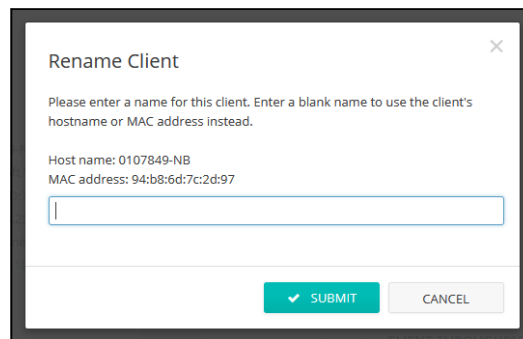
The client information page shows detailed information on the client, signal strength and throughput data, and a list of the client's connection history.

Figure 121: Client Information Page



To rename a client, on the client's information page click on the three-dot icon next to the client name at the top of the page.

Figure 122: Renaming a Wireless Client

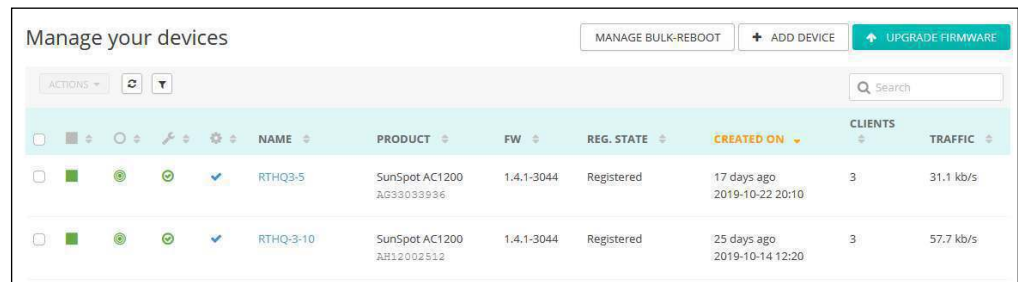


To reset a client to its original name, enter a blank in the rename dialog box and click the Submit button.

## Schedule Maintenance Tasks

From the Site menu, click on Devices and then Wireless (or other device type). The “Manage your devices” page will display. Use this page to manage a bulk reboot or upgrade firmware.

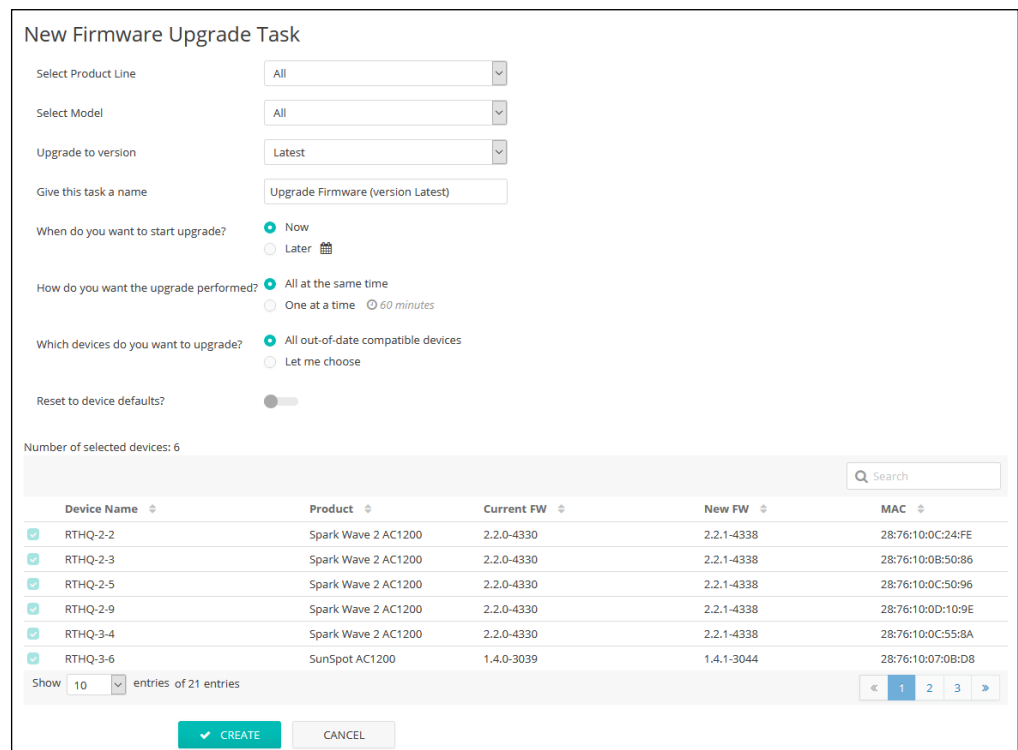
Figure 123: Maintenance Tasks Page



**Upgrade Firmware** Click the Upgrade Firmware button to access New Firmware Upgrade Task page.

Select the product line, model number, or leave as “All” to upgrade all devices. You have the option to schedule when upgrades start and which devices will be upgraded. When configuration is complete, give the task a name and click Create.

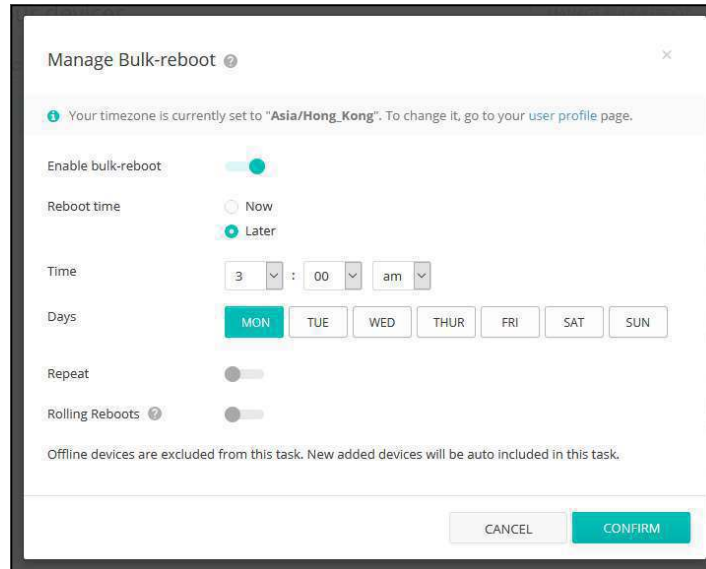
Figure 124: New Firmware Upgrade Task Page



**Bulk Reboot** Click the Manage Bulk-Reboot button to access Bulk-Reboot page. This page enables you to reboot all devices at a site, either at the same time or in a rolling manner. You can also specify a bulk-reboot to repeat at certain times and dates.

The Rolling Reboots option means that devices are rebooted one after the other rather than all at the same time. In the case that a reboot times out for a device, all other reboots after will be canceled.

**Figure 125: Manage Bulk-Reboot Page**



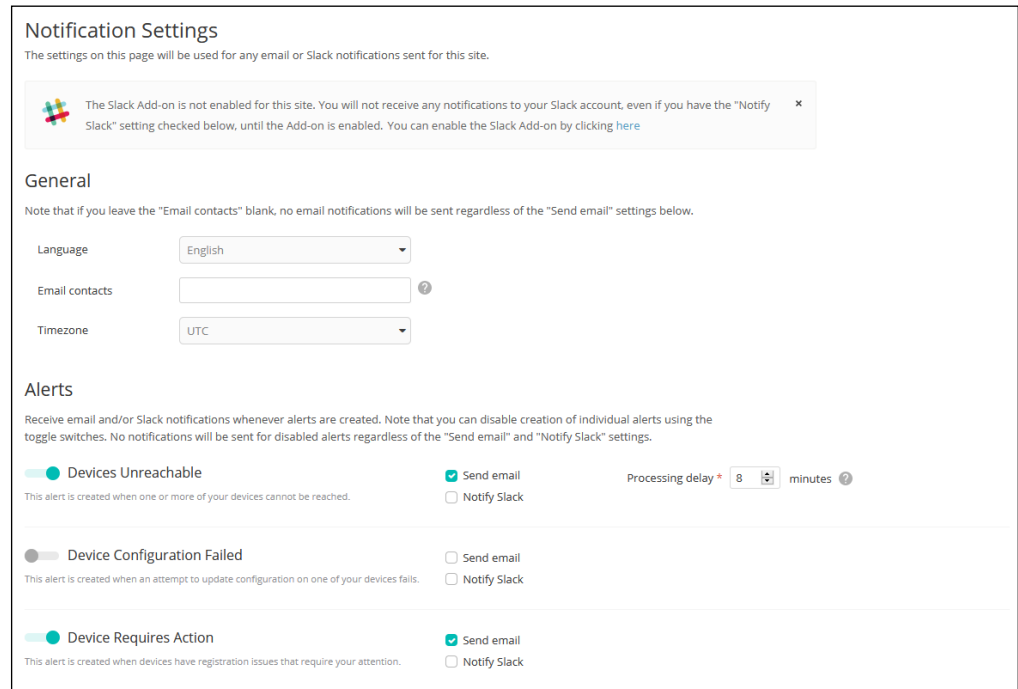
## Site Notifications

Click “Notifications” on the Site menu to access the notification settings for the selected site. The settings are used for any email or Slack notifications sent for this site.

**Note:** If the Slack Add-on is not enabled for a site, you will not receive any notifications to your Slack account, even if you have the “Notify Slack” setting enabled. Select “Add-ons” from the Cloud or Site menu to install the Slack Add-on. See “Add-Ons” on page 74 for more information.

You can disable the creation of individual alerts using the toggle switches on the Notification Settings page. No notifications will be sent for disabled alerts regardless of the “Send email” and “Notify Slack” settings.

Figure 126: Site Notification Settings



The following items are displayed on the Notification Settings page:

- **Language** — The language used for the alert emails.
- **Email Contacts** — This is the list of email addresses that will receive alerts when your devices go offline or require action. Separate multiple email addresses with spaces.

Note that if you leave the “Email contacts” blank, no email notifications will be sent regardless of the Alert “Send email” settings.

- **Timezone** — Sets the time zone that will be used when sending alert-related emails.

### Alerts

- **Devices Unreachable** — This alert is created when one or more of your devices cannot be reached.
- **Processing delay** — An alert for unreachable (offline) devices is created when at least one of your site’s devices does not contact the cloud in the given time period. For site-wide outages, this delay allows the system to create a single alert email for a group of offline/unreachable devices. (Default: 8 minutes)
- **Device Configuration Failed** — This alert is created when an attempt to update configuration on one of your devices fails.

- **Device Requires Action** — This alert is created when devices have registration issues that require your attention.
- **Device Re-registered** — This alert is created when devices automatically re-registers with cloud controller.
- **Device Rebooted** — This alert is created when one or more of your devices reboots.
- **MetroLinq 60 GHz Link is Down** — This alert is created when the 60 GHz link goes down on a MetroLinq (and the 5 GHz failover link is activated if enabled).
- **Time not in sync.** — This alert is created when the time on device not in sync with the cloud.
- **Channel Changed** — This alert is created when a radio on one of your devices switches to a different channel (as a result of a DFS event or otherwise).
- **Streaming Failure** — This alert is created when an attempt to start playing an audio stream on one of your devices fails.
- **Maintenance Task Failure** — This alert is created when a scheduled maintenance task fails on one of your devices.
- **File Sync Error** — This alert is created when an attempt to sync files (e.g. custom Hotspot terms and logo) on one of your devices fails.
- **Firmware Downgraded** — This indicates either manual firmware downgrade or bootbank failure.
- **Firmware Upgraded** — Notifies only about upgrades via device UI. Cloud upgrades are registered as tasks.

#### *Maintenance Tasks*

- **Change Config** — Receive notifications when the Cloud pushes configuration to one or more of your devices.
- **Received Config** — Receive notifications when a device pushes its config to the Cloud.
- **Upgrade Firmware** — Receive notifications when the Cloud upgrades firmware on one or more of your devices.
- **Auto Firmware Upgrade** — Receive notifications when the Cloud performs automatic firmware upgrades on your devices.
- **Rolling Firmware Upgrade** — Receive notifications when the Cloud performs rolling firmware upgrades on your devices.

- **Troubleshooting** — Receive notifications when Troubleshooting files requested by the Cloud from your devices become available.
- **Packet Capture** — Receive notifications when packet capture files requested by the Cloud from your devices become available.
- **Report** — Receive notifications when reports requested by the Cloud from your devices become available.
- **Reboot** — Receive notifications when the Cloud reboots one or more of your devices.

# 4

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## Site WiFi 5 Configuration

This chapter describes configuration settings for WiFi 5 access point devices. It includes the following sections:

- [“Wireless SSID Configuration” on page 119](#)
- [“Radio Settings” on page 128](#)
- [“General Networking Settings” on page 131](#)
- [“Local Network Settings” on page 137](#)
- [“Firewall Settings” on page 139](#)
- [“Hotspot Settings” on page 142](#)
- [“System Settings” on page 149](#)

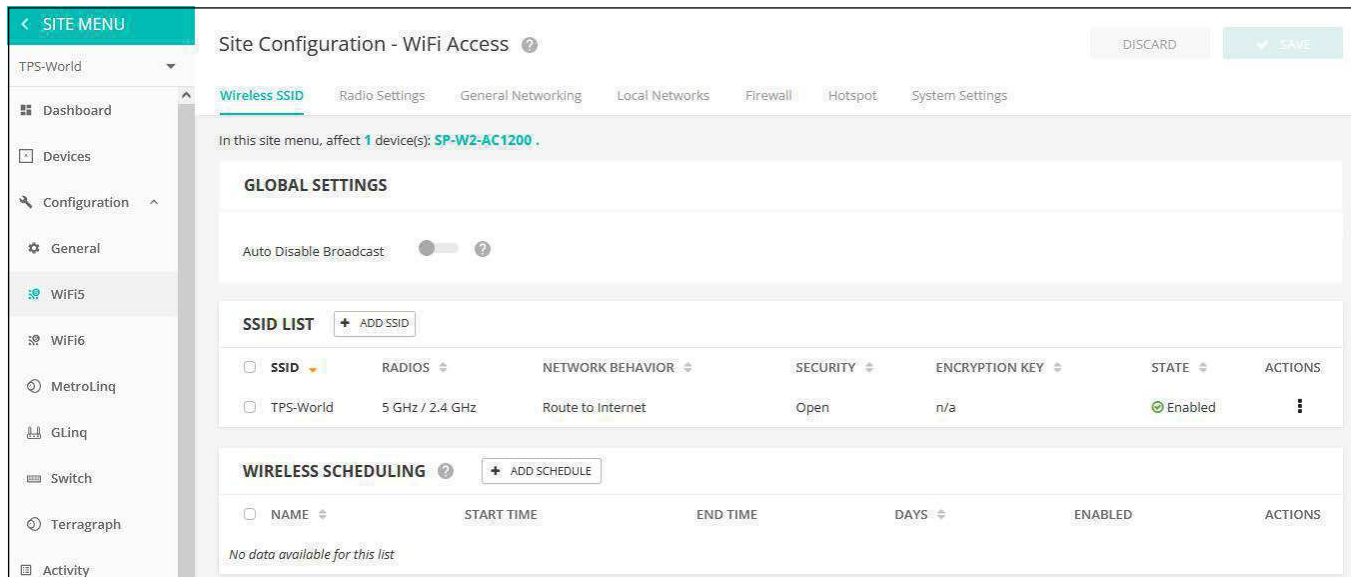
## Wireless SSID Configuration

From the Site menu, open “Configuration” and then “WiFi5” to display the configuration options that apply to all Edgecore Wi-Fi 5 access points in the same site.

The Edgecore Wi-Fi 5 access points can operate in several radio modes, 802.11a/a+n/ac+a+n (5 GHz) or 802.11b+g/b+g+n (2.4 GHz). Supported modes depend on the access point model. Note that the dual-band access points can operate at 2.4 GHz and 5 GHz at the same time.

Each radio supports eight Service Set Identification (SSID) or virtual access point (VAP) interfaces. Each VAP functions as a separate access point, and can be configured with its own SSID and security settings. However, most radio signal parameters apply to all VAP interfaces. Traffic to specific VAPs can be segregated based on user groups or application traffic. Wireless clients associate with each VAP in the same way as they would with separate physical access points. Edgecore AP devices support up to a total of 128 wireless clients across all SSID interfaces per radio.

Figure 127: Site WiFi5 Configuration



The Wireless SSID tab on the WiFi5 configuration page includes these items:

- **Global Settings** — Configuration that applies to all SSID interfaces.
  - **Auto Disable Broadcast** — Automatically disables SSID broadcasts when a Wi-Fi device cannot connect to the cloud. (Default: Disabled)
- **SSID List** — The list of configured SSID interfaces for the Wi-Fi devices in this site. Note that each SSID applies to both the 2.4 GHz and 5 GHz radios unless

otherwise configured. You can configure a maximum of eight SSIDs. Click the “Add SSID” button to create an SSID interface.

- **Wireless Scheduling** — A list of configured schedules for turning AP radios on and off at specified times. The scheduling rules apply to all 2.4 GHz and 5 GHz interfaces on all site APs. Click the “Add Schedule” button to create a wireless schedule.

**Adding an SSID** Click the Add SSID button on the WiFi Access configuration page and enter SSID, network, and security settings as displayed below.

Figure 128: Radio Settings (New SSID)

The screenshot shows the 'Add SSID' configuration page with three main sections: General Settings, Network Settings, and Security Settings. The General Settings section includes options for enabling the SSID, setting the SSID name, broadcasting the SSID, client isolation, blocking multicast forwarding, minimum allowed signal (SNR and RSSI), max client count, multicast/broadcast rates for 5GHz and 2.4GHz, and activating the radio for 5GHz and 2.4GHz. The Network Settings section includes network behavior (Route to Internet), route through (Default Local Network), and limit upload/download rates. The Security Settings section includes OSEN (disabled), method (Open), RADIUS MAC Auth (disabled), and Access Control List (disabled).

The following items are displayed on the Add SSID page:

*General Settings*

- **Enable SSID** — Enables or disables the SSID interface.
- **SSID** — The name of the basic service set provided by the VAP interface. Clients that want to connect to the network through the access point must set their SSID to the same as that of the access point's VAP interface. (Range: 1-32 characters)
- **Broadcast SSID** — The SSID can be broadcast at regular intervals so that wireless stations searching for a network connection can discover it. This allows wireless clients to dynamically discover and roam between WLANs. This feature also makes it easier for hackers to break into your home network. Because SSIDs are not encrypted, it is easy to scan WLANs looking for SSID broadcast messages coming from an AP. (Default: On)
- **Client Isolation** — When enabled, wireless clients can talk to the LAN, and reach the Internet if such connection is available, but they cannot communicate with one another. (Default Off)
- **Block Multicast Forwarding** — Stops multicast traffic from being forwarded to wireless clients connected to the SSID. (Default Off)
- **Minimum allowed Signal** — Only allows clients to associate to this SSID if their signal strength (RSSI) is equal or greater than the specified value. Setting the value to -100 disables this feature. Clients already connected are checked periodically.

This forces clients to associate with an AP that has a better signal strength (also called assisted roaming). Suggested value is -70 to -80 depending on access point density and coverage.

Enter an RSSI (Received Signal Strength Indicator) in decibels from -1 to -100db. Note that the closer it is to zero, the stronger the signal. (Default: -70)

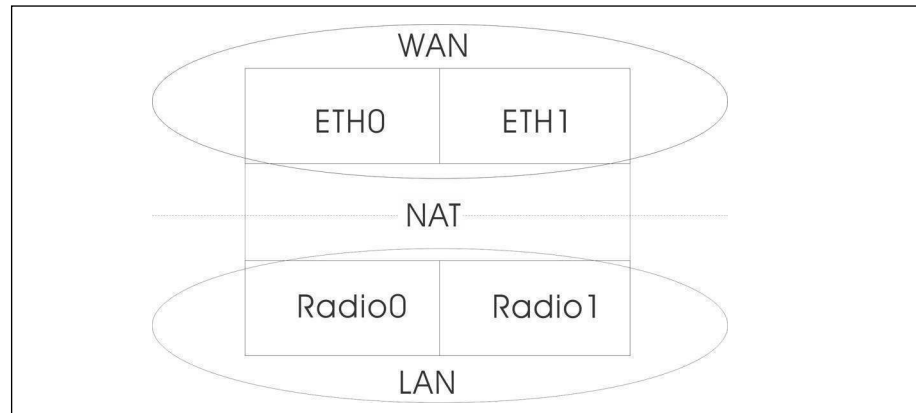
- **Max Client Count** — Sets the maximum number of wireless clients that can be connected to this SSID at the same time. (Default: 127; Range: 0 to 127)
- **Multicast/Broadcast Rate** — Allows a limit to be placed on the wireless bandwidth consumed by multicast and broadcast packets.
  - **Radio 5 Ghz** — Options: 6M, 9M, 12M, 18M, 24M, 36M, 48M, 54M; Default: 6M
  - **Radio 2.4 Ghz** — Options: 5.5M, 6M, 9M, 11M, 12M, 18M, 24M, 36M, 48M, 54M; Default: 5.5M
- **Activate on radio** — Selects the radios on which this SSID should be created. If an SSID is activated on both radios for a device (meaning that the SSID will be mirrored), you can edit its record from either configuration tab, and the changes will be made on both the 2.4 GHz and 5 GHz SSID records. (Default: 5GHz and 2.4GHz enabled)

Network Settings

- **Network Behavior** — One of the following connection methods must be specified. (Default: Route to Internet)
- **Bridge to Internet (AP Bridge Mode)** — Configures an interface as attached to the WAN (that is, the Internet).

In the following figure, Ethernet port 0 and Ethernet port 1 are both attached to the WAN. Traffic from these interfaces is directly bridged into the Internet. Any of the Ethernet or radio interfaces can be configured this way.

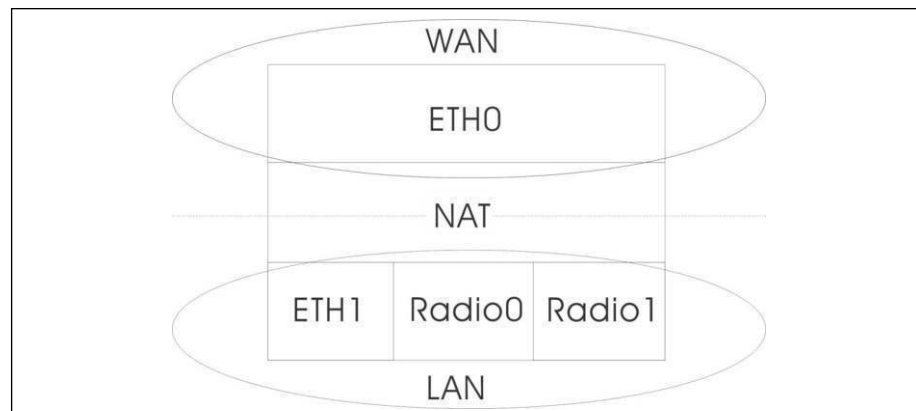
Figure 129: Bridge to Internet



- **Route to Internet (AP Router Mode)** — Configures an interface as a member of the LAN.

In the following figure, Ethernet port 1, Wireless LAN 0 (5 GHz radio), and Wireless LAN 1 (2.4 GHz radio) are all included in the LAN. Traffic from these interfaces is routed across the access point through Ethernet port 0 to the Internet.

Figure 130: Route to Internet



- **Route through** — The network to be routed. The default is “Default local network” as displayed under LAN Settings – Local Network.
- **Add to Guest Network** — This interface can only support the guest network.
- **Hotspot Controlled** — This interface can only support hotspot services.
  - **Walled garden** — Enter a list of domains and/or IP addresses in CIDR notation that the hotspot user can access before being authenticated by the captive portal. Wildcard domains can be specified in the format of *domain.com* (allow domain and all of its subdomains), or *.domain.com* (only allow subdomains).
- **VLAN Tag Traffic** — Tags any packets passing from this SSID interface to the associated Ethernet port as configured under “[VLAN Settings](#)” on [page 135](#). When enabled, select a configured VLAN ID from the list.



**Note:** ecCLOUD supports VLAN synchronization between APs and switches. When VLAN tagging is enabled for an SSID, the configured VLAN ID is automatically “pushed” by ecCLOUD to the attached switch port. This enables the VLAN-tagged traffic from the AP to be accepted by the switch port and avoids any loss of connectivity.

- **Limit upload rate** — Enables rate limiting of traffic from the SSID interface as it is passed to the wired network. You can set a maximum rate in Kbytes per second. (Range: 256-10048576 Kbytes per second; Default: OFF)
- **Limit download rate** — Enables rate limiting of traffic from the wired network as it is passed to the SSID interface. You can set a maximum rate in Kbytes per second. (Range: 256-10048576 Kbytes per second; Default: OFF)

#### Security Settings

- **OSEN** — Enable this option for OSU Server-Only Authenticated L2 Encryption Network.
- **Method** — Sets the wireless security method for each SSID, including association mode, encryption, and authentication. (Default: Open)
  - **Open** — The SSID interface broadcasts a beacon signal including the configured SSID. Wireless clients with an SSID setting of “any” can read the SSID from the beacon and automatically set their SSID to allow immediate connection.
  - **WPA-PSK** — For enterprise deployment, WPA requires a RADIUS authentication server to be configured on the wired network. However, for small office networks that may not have the resources to configure and maintain a RADIUS server, WPA provides a simple operating mode that

uses just a pre-shared password for network access. The Pre-Shared Key mode uses a common password for user authentication that is manually entered on the access point and all wireless clients. The PSK mode uses the same TKIP packet encryption and key management as WPA in the enterprise, providing a robust and manageable alternative for small networks.

- **Encryption** — Data encryption uses one of the following methods:
  - **AES** — AES-CCMP is used as the multicast encryption cipher. AES-CCMP is the standard encryption cipher required for WPA2. (This is the default setting.)
  - **TKIP + AES** — The encryption method used by the client is discovered by the access point.
- **Key** — WPA is used to encrypt data transmitted between wireless clients and the SSID interface. WPA uses static shared keys (fixed-length hexadecimal or alphanumeric strings) that are manually distributed to all clients that want to use the network.

String length must be 8 to 63 ASCII characters (letters and numbers). No special characters are allowed.

- **Dynamic Keys** — Enables the use of dynamic PSK keys that are periodically generated and updated by a RADIUS authentication server. The RADIUS server IP address, UDP port, and secret text string must be specified.

Dynamic keys are supported only for WPA2-PSK security.

- **WPA2-PSK** — Clients using WPA2 with a Pre-shared Key are accepted for authentication.

WPA was introduced as an interim solution for the vulnerability of WEP pending the ratification of the IEEE 802.11i wireless security standard. In effect, the WPA security features are a subset of the 802.11i standard. WPA2 includes the now ratified 802.11i standard, but also offers backward compatibility with WPA. Therefore, WPA2 includes the same 802.1X and PSK modes of operation and support for TKIP encryption.

Refer to WPA-PSK for a description of encryption methods and the key.

- **WPA-EAP** — WPA employs a combination of several technologies to provide an enhanced security solution for 802.11 wireless networks. A RADIUS server is used for authentication, and can also be used for accounting.

Refer to WPA-PSK for a description of encryption methods.

*RADIUS Settings*

A RADIUS server must be specified for the access point to implement IEEE 802.1X network access control and Wi-Fi Protected Access (WPA) wireless security.

In addition, you can configure a RADIUS Accounting server to receive user-session accounting information from the access point. RADIUS Accounting can be used to provide valuable information on user activity in the network.



**Note:** This guide assumes that you have already configured RADIUS servers to support the access point. Configuration of RADIUS server software is beyond the scope of this guide, refer to the documentation provided with the RADIUS server software.

- **802.11r** — Enables 802.11r fast roaming on the SSID interface. This feature is only supported on AC Wave 2 devices (Sunspot Wave2, Spark Wave2) running 2.2.0+ firmware. (Default: Disabled)
- **Mobility Domain** — The ID number that identifies the 802.11r domain in which the AP operates. (Range: 1-65535)
- **Encryption Key** — The pre-shared key for fast roaming. This key must be exactly 16 characters long and only contain characters A-Z, a-z, 0-9, space, and ~!@\$%^\*()\_+ -=[]{}|:;<>?/,./
- **Transition over the DS** — Enables support for fast transitions over a wireless distribution system (WDS) network.
- **MAC NASID list** — Enter one MAC address and NAS ID per line. Example: 00:12:34:56:78:9a a00123456789
- **Radius MAC Auth** — Use RADIUS authentication. When this setting is enabled, the AP will send the MAC address of the client device to the specified RADIUS server for authentication. The server verifies the MAC is a valid user, and then replies to the AP with the dynamic VLAN ID (if configured) and other resources for the client device.

Note: On your RADIUS server, both the user ID and password will need to be set to the WiFi MAC of the client device and must be formatted without punctuation.

This feature is supported with “Open Security” in v1.1.1 firmware, and all other security methods (besides WEP) in v1.1.2 firmware.

- **Use RADIUS Auth** — For WPA-EAP and WPA2-EAP security, a RADIUS server must be specified.

- **RADIUS Auth Server** — Specifies the IP address or host name of the RADIUS authentication server.
- **RADIUS Auth Port** — The UDP port number used by the RADIUS server for authentication messages. (Range: 1024-65535; Default: 1812)
- **RADIUS Auth Secret** — A shared text string used to encrypt messages between the access point and the RADIUS server. Be sure that the same text string is specified on the RADIUS authentication server. Do not use blank spaces in the string. (Maximum length: 255 characters)
- **NAS ID** — The RADIUS NAS identifier for the SSID interface. A NAS ID can be used instead of an IP address to identify a client to a server.
- **Backup RADIUS Auth** — Configures a secondary RADIUS server to act as a backup should the primary server become unavailable.
- **Use RADIUS Accounting** — Use RADIUS accounting to enable accounting of requested services for billing or security purposes.
- **RADIUS Acct Server** — Specifies the IP address or host name of the RADIUS accounting server.
- **Radius Acct Port** — The UDP port number used by the RADIUS server for accounting messages. (Range: 1024-65535; Default: 1813)
- **RADIUS Acct Secret** — A shared text string used to encrypt messages between the access point and the RADIUS server. Be sure that the same text string is specified on the RADIUS accounting server. Do not use blank spaces in the string. (Maximum length: 255 characters)
- **WPA2-EAP** — WPA was introduced as an interim solution for the vulnerability of WEP pending the ratification of the IEEE 802.11i wireless security standard. In effect, the WPA security features are a subset of the 802.11i standard. WPA2 includes the now ratified 802.11i standard, but also offers backward compatibility with WPA. Therefore, WPA2 includes the same 802.1X and PSK modes of operation and support for TKIP encryption.  
  
A RADIUS server is used for authentication, and can also be used to accounting.  
  
Refer to WPA-PSK for a description of encryption methods.  
  
Refer to WPA-EAP for information on configuring the RADIUS server.
- **Access Control List** — Wireless clients can be authenticated for network access by checking their MAC address against the local database configured on the access point. (Default: OFF)

- **Dynamic Authorization** — The Dynamic Authorization Extensions (DAE) to RADIUS enable a server to disconnect or change the authorization of clients that are already connected to the network.
  - **DAE Port** — The UDP port number to use for DAE messages. (Default: 3799)
  - **DAE Client** — The IPv4 address of the RADIUS server.
  - **DAE Secret** — The shared text string used to encrypt DAE messages between the access point and the RADIUS server.

## Setting Wireless Schedules

Configuring wireless schedules enables the AP radios to be turned on and off at specified times. The scheduling rules apply to all 2.4 GHz and 5 GHz interfaces on all site APs. Click the “Add Schedule” button to create a wireless schedule.

Figure 131: Adding a Wireless Schedule

The following items are displayed on the Add schedule page:

- **Enabled** — Makes the defined schedule active. (Default: Enabled)
- **Name** — A text string to identify the schedule.
- **Start time** — The time that you want the radios to be turned on.
- **End Time** — The time that you want the radios to be turned off.
- **Days** — The selected days of the week on which to apply the schedule.

## Radio Settings

On the “WiFi Access” page, click the “Radio Settings” tab to configure 5 GHz and 2.4 GHz radio settings. Note that settings apply to all configured SSID interfaces.

Figure 132: WiFi 5 Radio Settings

The following items are displayed on the Radio Settings tab. Note that configuration options apply to both the 5 GHz and 2.4 GHz radios unless otherwise indicated.

### Global Settings

- **Band Steering** — When enabled, clients that support 2.4 GHz and 5 GHz are first connected to the 5 GHz radio. This feature helps balance the client load over the two radio bands. Note that both radios must have configured SSIDs that match for this feature to fully operate. (Default: Disabled)
- **External Radius Enabled** — This is an AuthPort add-on feature (see [“Using the AuthPort Add-On” on page 75](#)). When using the AuthPort add-on, you can configure settings for an external RADIUS server.

### Physical Radio Settings

- **Channel Bandwidth** — The basic Wi-Fi channel bandwidth is 20 MHz, but by bonding channels together to create 40 MHz or 80 MHz channels, higher data transmission rate can be achieved. However, selecting larger channel bandwidths reduces the number a radio channels available.
  - **5 GHz Radio** — Options include 20, 40, and 80 MHz. (Default: 80 MHz)
  - **2.4 GHz Radio** — Options include 20 and 40 MHz. (Default: 40 MHz)
- **Channel** — The radio channel that the access point uses to communicate with wireless clients. The available channels are dependent on the radio, Channel Bandwidth, and Regulatory Country settings. You can also click the “Edit Channel List” button to select specific available channels to use for each radio interface.

Selecting Auto enables the access point to automatically select an unoccupied radio channel. (Default: Auto)

Figure 133: 5 GHz Radio Channels

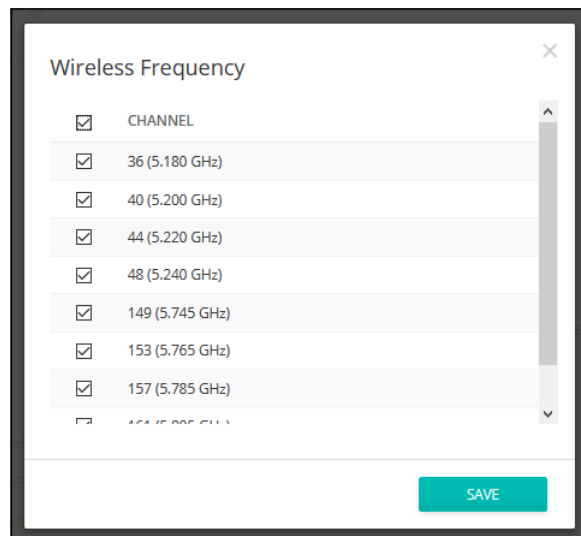
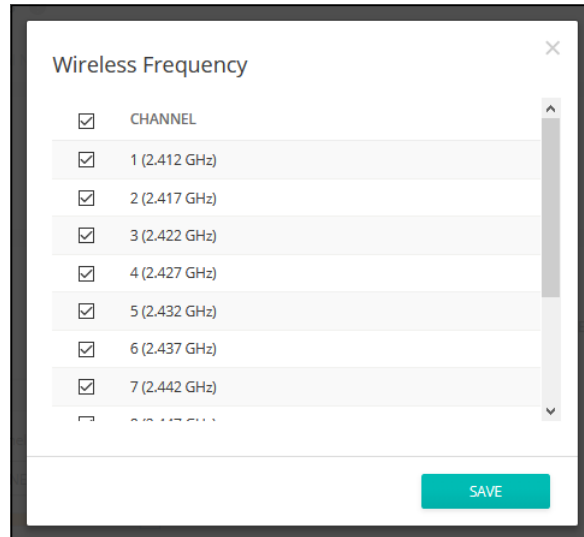


Figure 134: 2.4 GHz Radio Channels



- **Disabled W52 Channel** — Applies only to the 5 GHz radio. This feature is designed for Spark AC Wave2 Mini APs with software version v2.3.1 or newer. When enabled, this feature disables channels 36-48 automatically.
- **Max Tx Power** — Adjusts the maximum power of the radio signals transmitted from the access point. The higher the transmission power, the farther the transmission range. Power selection is not just a trade-off between coverage area and maximum supported clients. You also have to ensure that high-power signals do not interfere with the operation of other radio devices in the service area. (The range of power settings and defaults are dependent on the AP model and the Regulatory Country setting.)
- **Beacon Interval** — The rate at which beacon signals are transmitted from the access point. The beacon signals allow wireless clients to maintain contact with the access point. They also carry power-management and other information. (Range: 100-1024 TUs; Default: 100 TUs)
- **20/40MHz Coexist** — Applies only to the 2.4 GHz radio. This option allows 802.11n 20 MHz and 40 MHz channel bandwidths to operate together in the same network. (Default: On)

### Advanced Radio Settings

- **Max Client Count** — Sets the max number of clients that are allowed to connect to this radio. To disable this feature, set the value to 0. (Range: 0-64; Default: 0)
- **Probe Req. Data Push** — Enable Client Probe Request Data Push for this radio. When enabled, the radio will push client probe request data in JSON format to your specified URL.

## General Networking Settings

On the “WiFi Access” page, click the “General Networking” tab to configure Internet, Ethernet ports, and VLAN settings for all devices in a site. Some items on this page only display the current setting, they cannot be configured. These settings can only be overridden at the device-level configuration.

Figure 135: General Networking Settings

**INTERNET**

Only the Internet IP Address Mode and Mgmt VLAN settings can be changed here. The rest of these settings can only be overridden on a per-device basis at device-level config.

**GENERAL SETTINGS**

Internet Source: WAN Port

VLAN tag traffic:

IP Address Mode: DHCP

MTU Size: 1500

Fallback IP: 192.168.1.20

Fallback Netmask: 255.255.255.0

**MGMT VLAN**

Mgmt VLAN:

**IPV6 SETTINGS**

IP Address Mode: DHCP

Client ID:

**ETHERNET**

Some settings can only be overridden on a per-device basis at device-level config.

**ETHERNET SETTINGS FOR WAN PORT**

This port is the internet source for devices in this site

Auto negotiation:

**ETHERNET SETTINGS FOR LAN PORT(S)**

Network behavior: Bridge to Internet

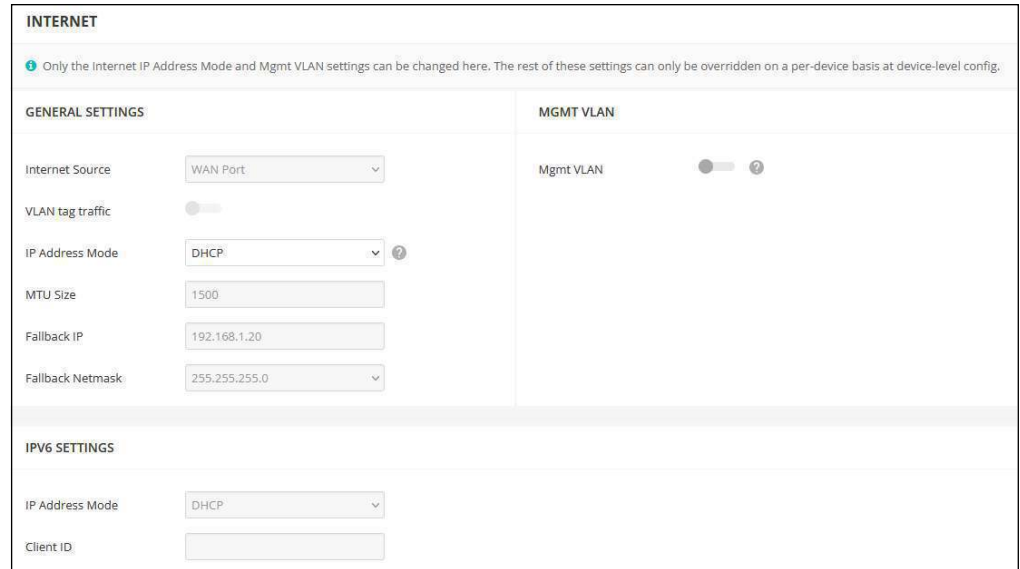
Auto negotiation:

**VLAN** [+ ADD NEW VLAN](#)

VLAN ID	TAGGED PORTS	PPPOE PROFILE	UPLINK 802.1P	UNTAGGED INTERFACES	ACTIONS
33	WAN Port, LAN Port(s)	Disabled	Video	<a href="#">Configure SSIDs</a>	<a href="#">⋮</a>

**Internet Settings** Note that only the Internet IP Address Mode and Management VLAN settings can be changed on this page. These rest of these settings can only be overridden on a per-device basis at device-level configuration.

**Figure 136: Internet Settings**



The following items are displayed on this page section:

### General Settings

- **Internet Source** — The interface on devices used to access the Internet.
- **VLAN tag traffic** — Enable to activate tagging on this interface and choose a tagging ID value between 2 and 4094, inclusive.
- **IP Address Mode** — The method used to provide an IP address for the Internet access port. (Options: DHCP, Use Device’s Settings; Default: DHCP)
  - **DHCP** — Enables DHCP on the Internet Source interface.
  - **Use Device’s Settings** — Select this option if you plan on assigning static IPs to your devices prior to registration. Also choose this option if you are mixing static IP and DHCP-based modes. By default, all devices will use DHCP unless configured otherwise.
- **MTU Size** — Sets the size of the maximum transmission unit (MTU) for packets sent on this network.
- **Fallback IP** — This IP address is used if you cannot connect to the device IP address.
- **Fallback Netmask** — The network mask associated with the fallback IP address.

## MGMT VLAN Settings

Figure 137: Management VLAN Settings

- **Mgmt VLAN** — Select this option to enable a management VLAN on site devices. Once you enable this option, you will no longer be able to access devices on any of the built-in the local networks (like 192.168.2.1 for example). You will only be able to access devices from the specified VLAN network. If a device’s IP mode is set to DHCP, it will also request a new IP address in the subnet range assigned to the VLAN network.
- **Mgmt VLAN ID**— Specifies the ID of the management VLAN.
- **IP Address Mode** — The method used to provide an IP address for a device over the Management VLAN. (Options: DHCP, Static IP; Default: DHCP)
  - **DHCP** — Enables DHCP on the management VLAN.
  - **Static IP** — Sets a static IP to access site devices over the management VLAN. Configure an IP address, subnet mask, and default gateway address.
- **Fallback IP** — The IP address to use to connect to a device over the management VLAN if the DHCP-assigned address cannot be reached.
- **Fallback Netmask** — The network mask associated with the fallback IP address.

## IPv6 Settings

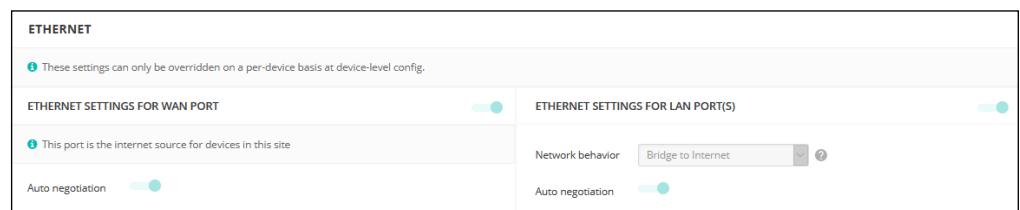
Figure 138: IPv6 Settings

The following items are displayed on this section of the page:

- **IP Address Mode** — The method used to provide an IPv6 address for the Internet access port. (Default: DHCP; Options: DHCP, Static IP)
  - **DHCP** — If you configure DHCP, the Client Id must be specified.
    - **Client Id** — Manually enter the client ID for the DHCP client.
  - **Static IP** — To configure a static IPv6 address for the Internet access port, the following items must be specified.
    - **IP Address** — Specifies an IPv6 address for the access point. An IPv6 address must be configured according to RFC 2373 using 8 colon separated 16-bit hexadecimal values. One double colon may be used in the address to indicate the appropriate number of zeros required to fill the undefined fields.
    - **Default Gateway** — The IPv6 address of the default gateway, which is used if the requested destination address is not on the local subnet.
    - **DNS** — The IPv6 address of Domain Name Servers on the network. A DNS maps numerical IPv6 addresses to domain names and can be used to identify network hosts by familiar names instead of the IPv6 addresses. If you have a DNS server located on the local network, type the IPv6 address in the text field provided.

**Ethernet Settings** This page section shows basic Ethernet settings for site APs. These settings can only be overridden on a per-device basis at device-level configuration.

Figure 139: Ethernet Settings



The following items are displayed on this page section:

### Ethernet Settings for WAN Port

By default, the WAN port interface is set as the Internet source and the following message is displayed: “This port is the Internet source for devices in this site.”

If more than one interface is connected to the Internet, only the last configured interface is used.

- **Auto-negotiation** — Enables or disables auto-negotiation for the WAN port interface.

### Ethernet Settings for LAN Port(s)

- **Network Behavior** — Shows the network connection method (that is, the manner in which the LAN ports are used).

- **Auto-negotiation** — Enables or disables auto-negotiation for a given port interface.

1000BASE-T does not support forced mode. Auto-negotiation should always be used to establish a connection over any 1000BASE-T port.

When auto-negotiation is enabled, the access point will negotiate the best settings for a link based on advertised capabilities.

**VLAN Settings** The access point can employ VLAN tagging to control access to network resources and increase security. VLANs separate traffic passing between the access point, associated clients, and the wired network. You can create up to 12 VLAN tagged networks.

VLANs (virtual local area networks) are turned off by default. If turned on they will automatically tag any packets passed to Ethernet ports from the relevant VAP (virtual access point). Note also that specific VAPs can enable or disable VLAN tagging (see [“Adding an SSID” on page 120](#)).

Note the following points about the access point’s VLAN support:

- If an Ethernet LAN port on the access point is assigned a VLAN ID, any traffic entering that port must be also tagged with the same VLAN ID.
- Wireless clients associated to the access point can be assigned to a VLAN. Wireless clients are assigned to the VLAN for the VAP interface with which they are associated. The access point only allows traffic tagged with correct VLAN IDs to be forwarded to associated clients on each VAP interface.
- When VLAN support is enabled on the access point, traffic passed to the wired network is tagged with the appropriate VLAN ID. When an Ethernet port on the access point is configured as a VLAN member, traffic received from the wired network must also be tagged with the same VLAN ID. Received traffic that has an unknown VLAN ID or no VLAN tag is dropped.
- When VLAN support is disabled, the access point does not tag traffic passed to the wired network and ignores the VLAN tags on any received frames.



**Note:** Before enabling VLAN tagging on the access point, be sure to configure the attached network switch port to support tagged VLAN frames for the VLAN IDs configured on the access point. Otherwise, connectivity to the access point will be lost when you enable the VLAN feature.

Figure 140: VLAN Settings

VLAN ID	TAGGED PORTS	PPPOE PROFILE	UPLINK 802.1P	UNTAGGED INTERFACES	ACTIONS
33	WAN Port LAN Port(s)	Disabled	Video	Configure SSIDs	

The following items are displayed on this page section:

- **VLAN ID** — The identifier assigned to the VLAN. (Range: 2-4094)
- **Tagged Ports** — The Ethernet ports assigned to the VLAN. Options include WAN port or LAN port(s).
- **PPPoE Profile** — Indicates if PPPoE is enabled or disabled for the VLAN.
- **Uplink 802.1P** — Indicates the IEEE 802.1p priority setting for traffic on this VLAN.
- **Untagged Interfaces** — Click the “Configure SSIDs” link to open the Wireless SSID tab. Then edit or create an SSID interface to be a member of the specified VLAN (see “Adding an SSID” on page 120).
- **Actions** — Click and select to edit or delete a configured VLAN.

### Adding a VLAN

Click the “Add New VLAN” button to create a VLAN.

Figure 141: Adding a VLAN

**Add New VLAN** [CANCEL] [CONFIRM]

**General Settings**

VLAN ID:

Ports:  WAN Port  LAN Port(s)

**PPPoE Profile**

Enable:

**Uplink 802.1p**

Uplink 802.1p:

The following items are displayed on this page section:

- **VLAN ID** — The VLAN identifier to be assigned. (Range: 2-4094)

- **Ports** — The Ethernet ports assigned to the VLAN. Options include WAN port or LAN port(s).
- **PPPoE Profile** — The Point-to-Point Protocol over Ethernet (PPPoE) is a common WAN protocol that provides a secure “tunnel” connection between a service provider and the local network.
  - **User Name** — The name to use for the service provider connection.
  - **Password** — The password to use for the service provider connection.
  - **IP Address** — The IP address to use for the service provider connection.
- **Uplink 802.1P** — Sets the IEEE 802.1p priority for traffic on this VLAN. Priorities range from “Best Effort” (lowest) to “Network Control” (highest).

## Local Network Settings

The Local Network tab configures settings for the default LAN network, guest network, and other custom networks.

Figure 142: Local Network Settings

**LAN**
+ ADD CUSTOM LAN

---

**DEFAULT LOCAL NETWORK**

BUILT-IN ●

IP Address	<input type="text" value="192.168.2.1"/>	DHCP Server	<input checked="" type="checkbox"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>	DHCP Start	<input type="text" value="100"/>
MTU Size	<input type="text" value="1500"/>	DHCP Limit	<input type="text" value="150"/> ?
Enable STP	<input type="checkbox"/>	Lease Time	<input type="text" value="12hr"/> ▼
Enable UPnP	<input type="checkbox"/>	DNS Servers (DHCP Option 6)	<input type="text" value="Enter one IP address per line up to three addresses."/>
Enable RSTP	<input type="checkbox"/>	DNS Entries	<input type="text" value=""/> ?
Smart Isolation	<input type="text" value="Disable (full access)"/> ▼		
Interface Members	<span style="color: green;">●</span> TPS-World (5 GHz) <span style="color: green;">●</span> TPS-World (2.4 GHz)		

---

**GUEST NETWORK**

BUILT-IN ●

IP Address	<input type="text" value="192.168.3.1"/>	DHCP Server	<input checked="" type="checkbox"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>	DHCP Start	<input type="text" value="100"/>
MTU Size	<input type="text" value="1500"/>	DHCP Limit	<input type="text" value="150"/> ?
Enable STP	<input type="checkbox"/>	Lease Time	<input type="text" value="12hr"/> ▼
Enable UPnP	<input type="checkbox"/>	DNS Servers (DHCP Option 6)	<input type="text" value="Enter one IP address per line up to three addresses."/>
Enable RSTP	<input type="checkbox"/>	DNS Entries	<input type="text" value=""/> ?
Smart Isolation	<input type="text" value="Internet access only"/> ▼		

1Doc: Protocolo 1.94312025 P... 2025 137 2426/4726

The following items are displayed on this page:

- **Add Custom LAN** — Click this button to create a additional networks with their own custom settings. You can create up to 10 custom LANs.
- **IP Address** — Specifies the IP address for the local network or guest network. Valid IP addresses consist of four decimal numbers, 0 to 255, separated by periods. (Default: 192.168.2.1)
- **Subnet Mask** — Indicates the local subnet mask. (Default: 255.255.255.0)
- **MTU Size** — Sets the size of the maximum transmission unit (MTU) for packets sent on this network. (Default: 1500)
- **Enable STP** — Enables or disables processing of Spanning Tree Protocol messages. (Default: Disabled)
- **Enable UPnP** — Enables or disables Universal Plug-and-Play broadcast messages. (Default: Disabled)
- **Enable RSTP** — Enables or disables processing of Rapid Spanning Tree Protocol messages. (Default: Disabled)
- **Smart Isolation** — Enables network traffic to be restricted to the specified network:
  - **Disable (full access)** — There is no traffic isolation. Clients can access the Internet and other devices on the local LAN. This is the option to choose if you trust the clients that will be connecting to your network.
  - **Internet access only** — Traffic from this network can only be routed to and from the Internet. This is the option to choose for hotspot users or users connecting to a guest network.
  - **LAN access only** — Traffic from this network is restricted to local LAN devices only.
  - **Internet-only (strict)** — This is the same as "Internet access only," but with the additional restriction that users cannot access resources or devices on any private network (192.168.0.0, 172.16.0.0, 10.0.0.0, etc.). This is useful if an AP is "double NAT'ed" and the network upstream from your AP's gateway is another private network.
- **Interface Members** — The interfaces attached to the local area network.
- **DHCP Server** — Enables/disables DHCP on this network. (Default: Enabled)
  - **DHCP Start** — First address in the address pool. (Range: 1-256; Default: x.x.x.100)

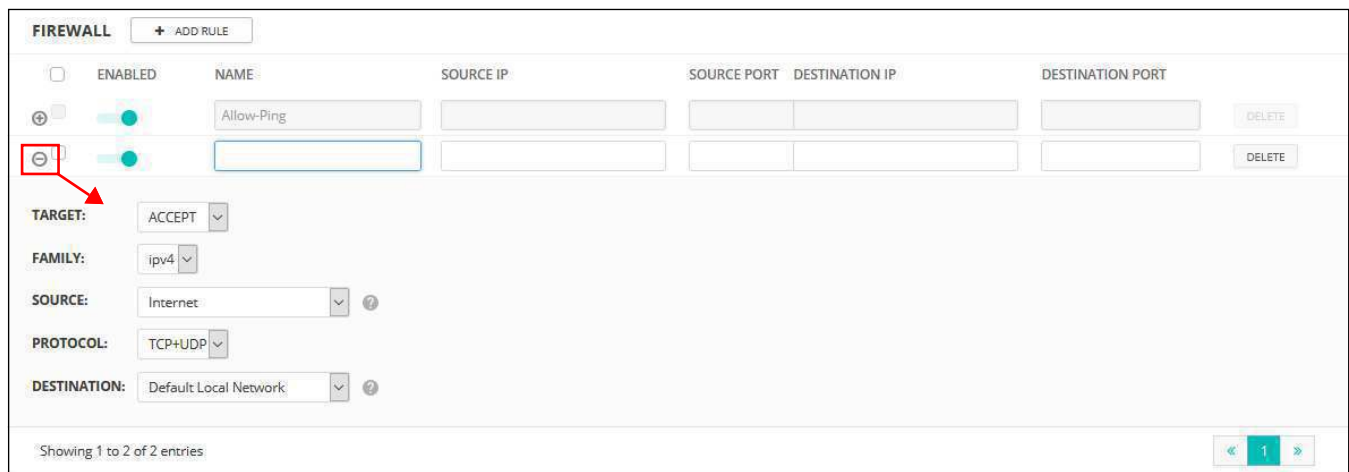
- **DHCP Limit** — Maximum number of addresses in the address pool. (Range: 1-254; Default: 150)
- **Lease Time** — The time period for which assigned IP addresses are valid.
- **DNS Servers** — List up to three DNS server IP addresses, one per line.
- **DNS Entries** — Only applicable for Spark AC Wave2 Mini APs. Allows clients to access the web interface through the specified domain from a local network.

## Firewall Settings

Firewall filtering restricts connection parameters to limit the risk of intrusion. The firewall settings allow you to define a sequential list of rules that filter traffic based on source and destination IP addresses and ports. Ingress packets are tested against the filter rules one by one. As soon as a packet matches a rule, the configured action is implemented.

One rule, "Allow-Ping," is pre-configured to allow Ping packets from the Internet. You can enable or disable this rule, but it cannot be modified or deleted. Click the "Add Rule" button to add a new firewall rule.

Figure 143: Firewall Settings



The following items are displayed on this page:

- **Enabled** — Enables the configured firewall rule.
- **Name** — User defined name for the filtering rule. (Range: 1-30 characters)
- **Source IP** — An IPv4 address in CIDR notation. Includes an IP address followed by a slash (/) and a decimal number to define the network mask.
- **Source Port** — The source protocol port. (Range: 1-65535)

- **Destination IP** — The destination IPv4 address.
- **Destination Port** — The destination protocol port. (Range: 1-65535)
- **Target** — The action to take when the configured rule matches a packet. (Options: Accept, Reject, Drop)
- **Family** — Specifies IPv4 or IPv6 traffic, or both. (Options: IPv4, IPv6, Any)
- **Source** — The source interface. (Options: Any, Default Local Network, Internet, Guest Network, Hotspot Network)
- **Protocol** — Defines the protocol type of packets. (Options: Any, TCP+UDP, TCP, UDP, ICMP)
- **Destination** — The destination interface. (Options: Any, Default Local Network, Internet, Guest Network, Hotspot Network)

**Port Forwarding** Port Forwarding can be used to map an inbound protocol type (TCP/UDP) and port to an “internal” IP address and port. The internal (local) IP addresses are the IP addresses assigned to local devices at the edge of a network, and the external IP address is the IP address assigned to the AP interface. This allows remote users to access different servers on your local network using your single public IP address.

Remote users accessing services such as web or FTP at your local site through your public IP address, are redirected (mapped) to other local server IP addresses and TCP/UDP port numbers. For example, if you set Protocol/External Port to TCP/80 (HTTP or web) and the Destination IP/Destination Port to 192.168.3.9/80, then all HTTP requests from outside users are forwarded to 192.168.3.9 on port 80. Therefore, by just using your external IP address provided by your ISP, Internet users can access the services they need at the local addresses to which you redirect them.

The more common TCP service port numbers include: HTTP: 80, FTP: 21, Telnet: 23, and POP3: 110.

Figure 144: Port Forwarding



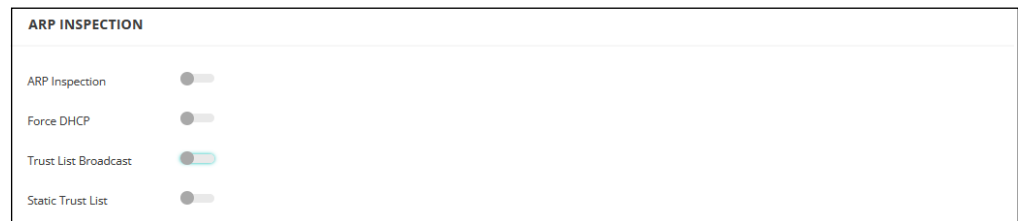
The following items are displayed on this page:

- **Enabled** — Enables port forwarding.
- **Name** — User-defined name. (Range: 1-30 characters)

- **Protocol** — Set the protocol type to which port forwarding is applied. (Options: TCP, UDP, TCP+UDP)
- **External Port** — The Internet traffic TCP/UDP port number. (Range: 1-65535)
- **Destination IP** — The destination IP address on the local network.
- **Destination Port** — The destination protocol port. (Range: 1-65535)

**ARP Inspection** ARP Inspection is a security feature that validates the MAC Address bindings for Address Resolution Protocol packets. It provides protection against ARP traffic with invalid MAC-to-IP address bindings, which forms the basis for certain “man-in-the middle” attacks. This is accomplished by intercepting all ARP requests and responses and verifying each of these packets before the local ARP cache is updated or the packet is forwarded to the appropriate destination. Invalid ARP packets are dropped.

**Figure 145: ARP Inspection**



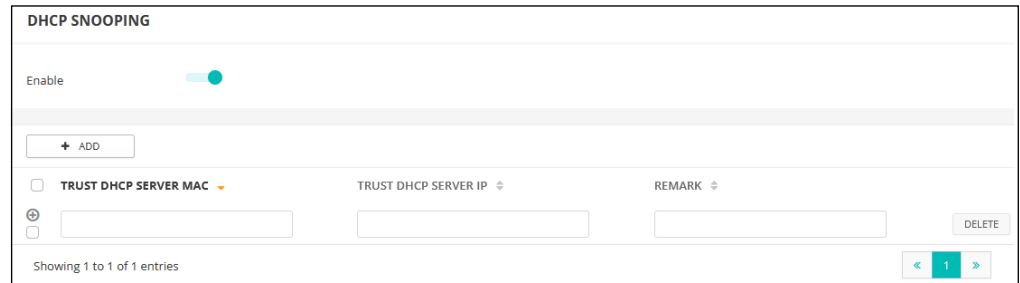
The following items are displayed on this page:

- **ARP Inspection** — When enabled, ARP packets are validated against ARP spoofing.
- **Force DHCP** — Allows an AP to only learn MAC/IP pair information through DHCP packets. Since devices configured with static IP address do not send DHCP traffic, any clients with static IP addresses will be blocked by APs unless their MAC/IP pair is listed and enabled in the Static Trust List.
- **Trust List Broadcast** — Lets other APs learn the trusted MAC/IP pairs to issue ARP requests.
- **Static Trust List** — Adds the MAC or MAC/IP pairs of devices that are trusted to issue ARP requests. Other network nodes can still send their ARP requests, but if their IP appears in the static list with a different MAC, their ARP requests will be dropped.

**DHCP Snooping** DHCP snooping is used to validate and filter DHCP messages received by APs. When DHCP snooping is enabled, DHCP messages received from a device not listed in the DHCP snooping table are dropped.

You can add known and trusted DHCP servers to the table by specifying their MAC and IP addresses.

Figure 146: DHCP Snooping



The following items are displayed on this page:

- **Enable** — Enables DHCP Snooping.
- **Trust DHCP Server MAC** — The MAC address of a known and trusted DHCP server.
- **Trust DHCP Server IP** — The IP address of a known and trusted DHCP server.
- **Remark** — A comment relating to the DHCP server configured.

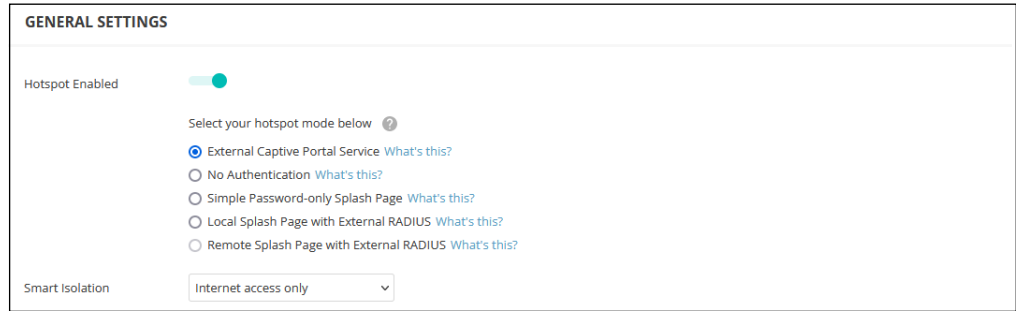
## Hotspot Settings

The Hotspot settings page can configure Internet access for the general public in places such as coffee shops, libraries, and hospitals. Specific access rights may also be defined through a RADIUS server.

When setting up a hotspot service, you must also navigate to the wireless SSID configuration page and select “Hotspot-Controlled” as the network behavior on an SSID interface. (See [“Wireless SSID Configuration”](#) on page 119.)

**General Settings** The General Settings section on the Hotspot page configures the basic hotspot mode.

Figure 147: Hotspot General Settings



The following items are displayed on this page section:

- **Hotspot Enabled** — Enables or disables the hotspot service.

Select the hotspot mode below. (Hotspot Mode will be statically set to “External Portal” for all firmware greater than 1.1.4. Please upgrade to firmware greater than 1.1.4 in order to take advantage of this setting.)

- **External Captive Portal Service** — This option will show the hotspot guest an externally hosted captive portal splash page and may prompt them to login, depending on how you have configured your service settings. Choose this option if you have signed up with a third-party captive portal service provider, such as Cloud4Wi or HotSpotSystem.
- **No Authentication** — This option shows the hotspot guest your customized, locally hosted captive portal splash page, and will not require the guest to login before accessing the Internet. If you fill out the (optional) terms of service text, the guest will be required to accept these before they can access the Internet.
- **Simple Password-only Splash Page** — This option will show the hotspot guest your customized, locally hosted captive portal splash page, and will require them to enter a simple password to login and access the Internet. If you fill out the (optional) terms of service text, the guest will be required to accept these before they can access the Internet.
- **Local Splash Page with External RADIUS** — This option shows the hotspot guest your customized, locally hosted captive portal splash page, and will require them to enter a valid RADIUS user name and password to login and access the Internet. If you fill out the (optional) terms of service text, the guest will be required to accept these before they can access the Internet.
- **Remote Splash Page with External RADIUS** — This is an AuthPort add-on feature (see [“Using the AuthPort Add-On” on page 75](#)). The hotspot will be redirected to an external splash page and authenticate with an external RADIUS server.

- **Smart Isolation** — Enables network traffic to be restricted to the specified network:
  - **Disable (full access)** — There is no traffic isolation. Clients can access the Internet and other devices on the local LAN. This is the option to choose if you trust the clients that will be connecting to your network.
  - **Internet access only** — Traffic from this network can only be routed to and from the Internet. This is the option to choose for hotspot users or users connecting to a guest network.
  - **LAN access only** — Traffic from this network is restricted to local LAN devices only.
  - **Internet-only (strict)** — This is the same as “Internet access only,” but with the additional restriction that users cannot access resources or devices on any private network (192.168.0.0, 172.16.0.0, 10.0.0.0, etc.). This is useful if an AP is “double NAT’ed” and the network upstream from your AP’s gateway is another private network.

**Network Settings** The Network Settings section on the Hotspot page configures local network settings for the hotspot service.

**Figure 148: Hotspot Network Settings**

NETWORK SETTINGS			
IP Address	<input type="text" value="192.168.182.1"/>	DNS 1	<input type="text" value="192.168.182.1"/>
Netmask	<input type="text" value="255.255.255.0"/>	DNS 2	<input type="text"/>
DHCP Gateway	<input type="text"/>	DNS Domain Name	<input type="text"/>
DHCP Gateway Port	<input type="text"/>	DNS Entries	<input type="text"/> ?
		DNS Mapping	<div style="border: 1px solid #ccc; height: 80px;"></div>

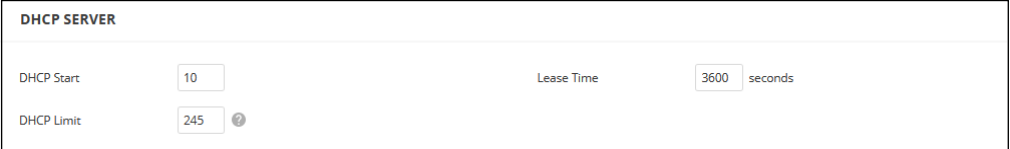
The following items are displayed on this page section:

- **IP Address** — Specifies the IP address for the hotspot. Valid IPv4 addresses consist of four decimal numbers, 0 to 255, separated by periods. (Default: 192.168.182.1)
- **Netmask** — Network mask for the associated IP subnet. This mask identifies the host address bits used for routing to specific subnets.
- **DHCP Gateway** — The gateway used to access the DHCP server.

- **DHCP Gateway Port** — The UDP/TCP port used to access the DHCP server.
- **DNS 1** — The IP address of the primary Domain Name Server on the network. A DNS maps numerical IP addresses to domain names and can be used to identify network hosts by familiar names instead of the IP addresses.
- **DNS 2** — The secondary DNS server available to DHCP clients.
- **DNS Domain Name** — The domain name used to resolve incomplete host names via the Domain Name System. (Range: 1-32 characters)
- **DNS Entries** — Only applicable for Spark AC Wave2 Mini APs. Allows clients to access the web interface through the specified domain from a local network.
- **DNS Mapping** — Configures DNS mapping for user-specified IP and domain name.

**DHCP Server** The DHCP Server section on the Hotspot page configures DHCP address pool settings for the hotspot service.

**Figure 149: Hotspot DHCP Server Settings**



The screenshot shows a configuration panel titled "DHCP SERVER". It contains three input fields: "DHCP Start" with the value "10", "DHCP Limit" with the value "245" and a help icon, and "Lease Time" with the value "3600" and the unit "seconds".

The following items are displayed on this page section:

- **Start** — Starting number of (last numeric field) in address pool. (Range: 1-254; Default: 10)
- **Limit** — Ending number of (last numeric field) in address pool. (Range: 1-245; Default: 245)
- **Lease Time** — The duration that an IP address is assigned to a DHCP client. (Range: 600-43200 seconds; Default: 3600 seconds)

**RADIUS Server** The RADIUS Server section on the Hotspot page configures RADIUS server settings for the hotspot service.

**Figure 150: Hotspot RADIUS Server Settings**

The following items are displayed on this page section:

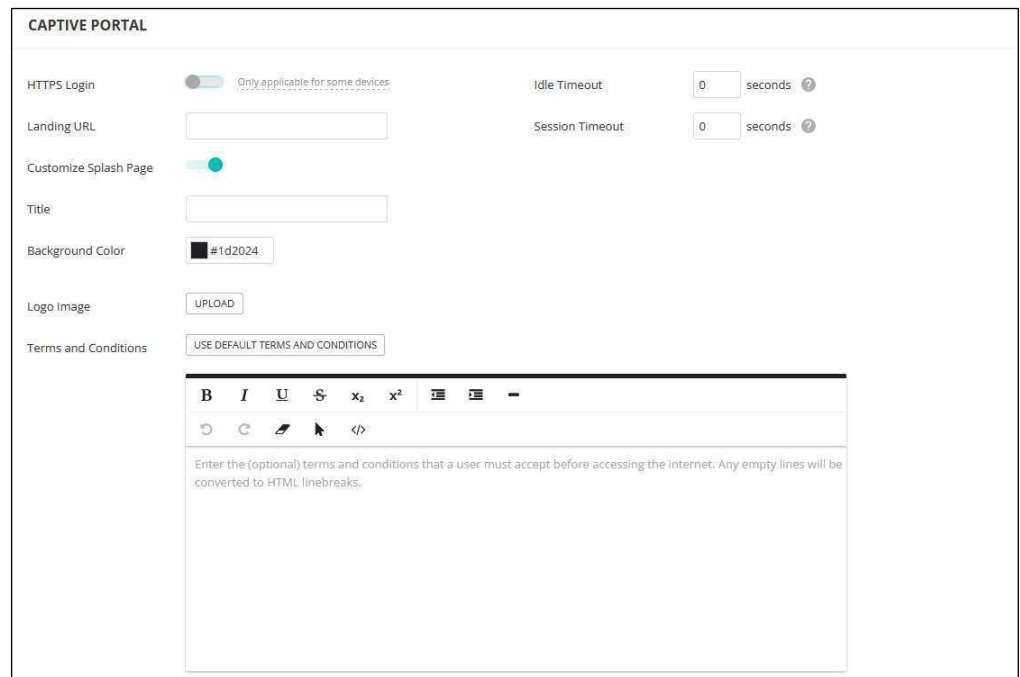
- **Enable RADIUS Auth** — Enables RADIUS authentication for clients attempting to access the captive portal.
- **RADIUS Server Address** — IP address or host name of the primary RADIUS server.
- **Backup RADIUS server address** — IP address or host name of the secondary RADIUS server.
- **RADIUS server shared secret** — A shared text string used to encrypt messages between the access point and the RADIUS server. Be sure that the same text string is specified on the RADIUS server. Do not use blank spaces in the string. (Range: 1-255 characters).
- **RADIUS server auth port** — RADIUS server UDP port used for authentication messages. (Range: 1-65535, Default: 1812)
- **RADIUS server acct port** — RADIUS server UDP port used for accounting messages. (Range: 1-65535, Default: 1813)
- **Enable RadSec** — An authentication and authorization protocol for transporting RADIUS datagrams over TCP and TLS. RadSec replaces UDP used in the initial RADIUS design, providing a reliable transport protocol and more extensive security for the packet payload.
- **Auth method** — Selects the encryption method to use for messages between the AP and the RADIUS server; CHAP, PAP, or MS-CHAPv2. The encryption method must match that used by the RADIUS server. (Default: CHAP)
- **Local ID** — Local RADIUS server identifier.

- **Local Name** — Local RADIUS server name
- **Generate NAS ID** — This option will generate a unique NAS ID for each device in this site.
- **NAS ID** — Local RADIUS server operation identifier.

**Captive Portal** The Captive Portal section on the Hotspot page configures portal details for the hotspot service.

A captive portal forces a hotspot client to access a welcome web page before gaining further access to the Internet. The welcome page may require authentication and/or payment.

**Figure 151: Hotspot Captive Portal Settings**



Depending on the hotspot mode selected, the following items are displayed on this page section:

*Common to all Modes*

- **Landing URL** — Indicates the URL to which the user is directed after logging in to the captive portal.
- **Idle Timeout** — The maximum a connection can remain inactive before it is closed. (Range: 0-86400 seconds)
- **Session Timeout** — The maximum time a client can stay logged in to the hotspot. (Range: 0-86400 seconds)

*Common to all Modes Except External Captive Portal Service and Remote Splash Page with External RADIUS*

- **HTTPS Login** — Enables HTTPS for the captive portal.

*Common to all Modes Except External Captive Portal Service*

- **Customize Splash Page** — When enabled, fill in the information that is used to create the local captive portal welcome page.
  - **Title** — Enter the text you want to display as the title on the page.
  - **Background Color** — Click the button to select a color for the page background.
  - **Logo Image** — Click the “Upload” button to send an image file. Files are limited to a size of 1MB and the image must have a maximum height and width of 1000 pixels.
  - **Terms and Conditions** — Enter text in the window that define the captive portal terms and conditions, and then use the controls to format the text. Alternatively, click the “Use Default Terms and Conditions” button to import a generic text that you can then edit.

*External Captive Portal Service Mode*

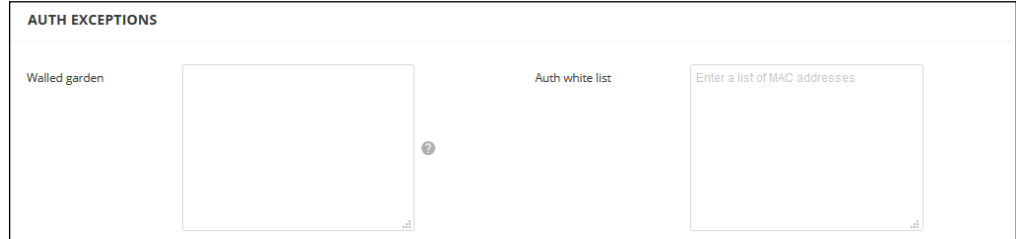
- **Captive portal URL** — Host name of Internet service portal for the hotspot.
- **Captive portal secret** — The password used for logging into the hotspot.
- **Swap Octets** — Swap the values of the reported “input octets” and “output octets.”

*Simple Password-only Splash Page Mode*

- **Splash Page Password** — The password required for users to log in and access the Internet.

**Authentication Exceptions** The Auth Exceptions section on the Hotspot page configures a “walled garden” and white list for the hotspot service.

**Figure 152: Hotspot Authentication Exceptions**



The following items are displayed on this page section:

- **Walled garden** — Enter a list of domains or IP addresses in CIDR notation that hotspot users can access before being authenticated by the captive portal. Wildcard domains can be specified in the format of *domain.com* (allow domain and all sub-domains), or *.domain.com* (only allow sub-domains).
- **Auth white list** — A list of MAC addresses that are allowed to bypass the captive portal to access the Internet.

---

## System Settings

The System Settings page allows you to control remote management access to APs and configure NTP time servers, Telnet, Web, and SNMP management interfaces are enabled and open to access from the Internet. To provide more security, specific services can be disabled and management access prevented from the Internet.

**General Settings** The General Settings section on the System Settings page can be used to configure the cloud status LED, reset button, and time zone.

Figure 153: General System Settings



The following items are displayed on this page:

- **Enable cloud status LED** — For some devices (SkyFire, SunSpot, Spark, and Spark Wave 2 Mini), the LED is green when the AP is successfully connected to ecCLOUD and is operating normally.
- **Enable radio LEDs** — Only supported on ECW5211, ECWO5211, OAP100, and Spark Wave 2/SunSpot Wave 2 running 3.0.0+ firmware. The LEDs are on when a radio is enabled and operating normally.
- **Enable reset button** — Enables or disables the hardware reset button. Note that the reset button cannot be disabled at the site level.
- **Timezone** — To display a time corresponding to your local time, choose one of the predefined time zones from the pull-down list.
- **Number of boot retries** — The maximum number of bootup retries before switching to the next boot bank. (Range: 1-254; Default: 3)
- **Enable prelogin PPPoE form** — Turn this setting on in order to show a PPPoE username/password input form before the local web UI login form whenever the Internet does not appear to be accessible. This will allow end users to enter their PPPoE credentials without having to log in to the device UI.
- **MSP Mode** — Enables the Managed Service Provider (MSP) mode that prevents end-users from accessing and modifying most device settings from user-defined user accounts. Management access from “root” and “admin” accounts still provide full access to all device settings. (Default: Disabled)

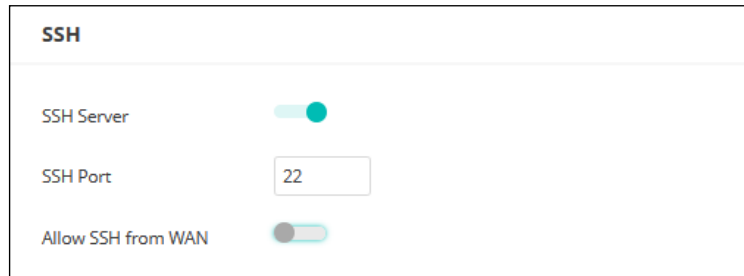
With MSP mode enabled, service providers have the option of making specific wireless SSID settings available for user configuration by enabling the “Local Configurable” setting.

**i** **Note:** Do not enable MSP Mode and “Always follow cloud configuration” (page 65) at the same time. This will cause the device configuration not to be updated to ecCLOUD properly.

**SSH** The Secure Shell (SSH) acts as a secure replacement for Telnet. The SSH protocol uses generated public keys to encrypt all data transfers passing between the access point and SSH-enabled management station clients and ensures that data traveling over the network arrives unaltered. Clients can then securely use the local user name and password for access authentication.

Note that SSH client software needs to be installed on the management station to access the access point for management via the SSH protocol.

**Figure 154: SSH Server Settings**

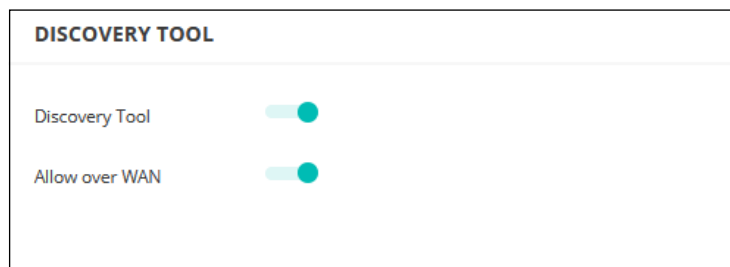


The following items are displayed on this page:

- **SSH Server** — Enables or disables SSH access to the access point. (Default: Enabled)
- **SSH Port** — Sets the TCP port number for the SSH server on the access point. (Range: 1-65535; Default: 22)
- **Allow SSH from WAN** — Allows SSH management access from the WAN.

**Discovery Tool** The Edgecore Discovery agent allows the AP to be discovered by other devices on the local network or over the Internet.

**Figure 155: Discovery Tool Settings**

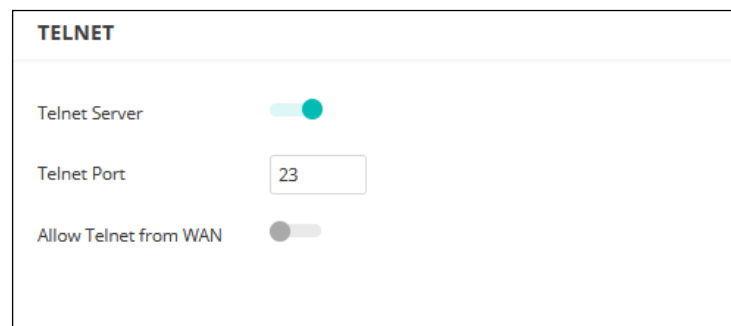


The following items are displayed on this page:

- **Discovery Tool** — Enables or disables the discovery tool. (Default: Enabled)
- **Allow over WAN** — Allows discovery tool access from the WAN.

**Telnet** Telnet is a remote management tool that can be used to configure the access point from anywhere in the network. However, note that Telnet is not secure from hostile attacks. Telnet provides access to a Linux-based interface which is used for device analysis and debugging.

**Figure 156: Telnet Server Settings**



The following items are displayed on this page:

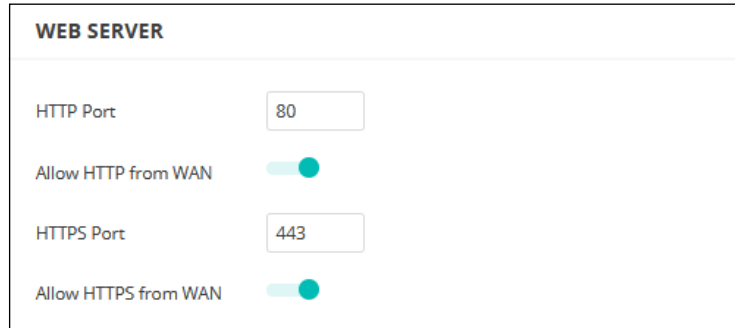
- **Telnet Server** — Enables or disables Telnet access to the access point. (Default: Enabled)
- **Telnet Port** — Sets the TCP port number for the Telnet server on the access point. (Range: 1-65535; Default: 23)
- **Allow Telnet from WAN** — Allows Telnet management access from the WAN.

**Web Server** A Web browser provides the primary method of managing the access point. Both HTTP and HTTPS service can be accessed independently. If you enable HTTPS, you must indicate this in the URL: `https://device:port_number]`

When you start HTTPS, the connection is established in this way:

- The client authenticates the server using the server's digital certificate.
- The client and server negotiate a set of security protocols to use for the connection.
- The client and server generate session keys for encrypting and decrypting data.
- The client and server establish a secure encrypted connection.
- A padlock icon should appear in the status bar for most browsers.

Figure 157: Web Server Settings



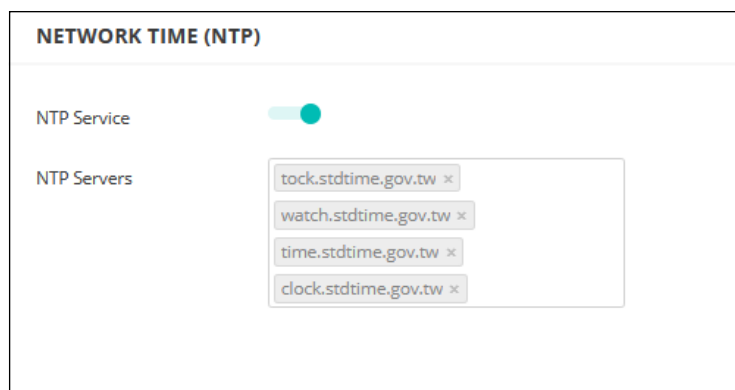
The following items are displayed on this page:

- **HTTP Port** — The TCP port to be used by the HTTP Web browser interface. (Range: 1-65535; Default: 80)
- **Allow HTTP from WAN** — Allows HTTP management access from the WAN.
- **HTTPS Port** — The TCP port to be used by the HTTPS Web browser interface. (Range: 1-65535; Default: 443)
- **Allow HTTPS from WAN** — Allows HTTPS management access from the WAN.

**Network Time** Network Time Protocol (NTP) allows the access point to set its internal clock based on periodic updates from a time server (SNTP or NTP). Maintaining an accurate time on the access point enables the system log to record meaningful dates and times for event entries. If the clock is not set, the access point will only record the time from the factory default set at the last bootup.

The access point acts as an NTP client, periodically sending time synchronization requests to specified time servers. The access point will attempt to poll each server in the configured sequence to receive a time update.

Figure 158: NTP Settings



The following items are displayed on this page:

- **NTP Service** — Enables or disables sending of requests for time updates. (Default: Enabled)
- **NTP Servers** — Sets the host names for time servers. The switch attempts to update the time from the first server, if this fails it attempts an update from the next server in the sequence. To configure additional servers, type in an entry in the blank field at the bottom of the list.

**SNMP** Simple Network Management Protocol (SNMP) is a communication protocol designed specifically for managing devices on a network. It is typically used to configure these devices for proper operation in a network environment, as well as to monitor them to evaluate performance or detect potential problems.

Figure 159: SNMP Settings

SNMP	
SNMP Server	<input checked="" type="checkbox"/>
Contact	<input type="text" value="www.ignitenet.com"/>
Community String	<input type="text" value="public"/>
IPv6 Write Community	<input type="text" value="private6"/>
Location	<input type="text"/>
Allow SNMP over WAN	<input checked="" type="checkbox"/>

The following items are displayed on this page:

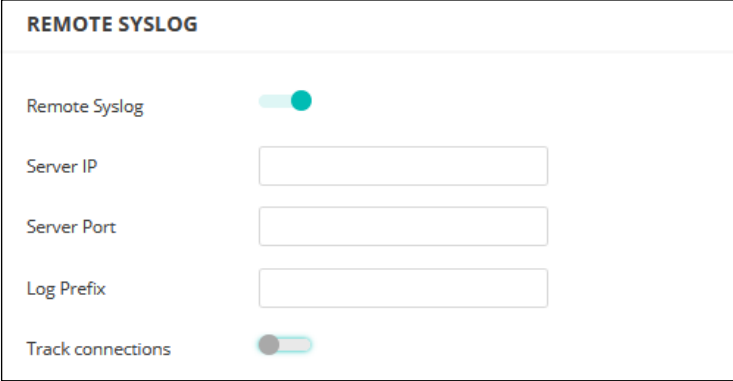
- **SNMP Server** — Enables or disables SNMP on the access point. (Default: Enabled)
- **Contact** — Administrator responsible for the access point.
- **Community String** — A community string that acts like a password and permits access to the SNMP protocol. (Range: 1-32 characters, case sensitive; Default: public)  

The default string “public” provides read-only access to the access point’s Management Information (MIB) database.
- **IPv6 Write Community** — A community string for IPv6 access to the access point’s Management Information (MIB) database. (Range: 1-32 characters, case sensitive; Default: private6)

- **Location** — Sets the SNMP system location string. (Maximum length: 255 characters)
- **Allow SNMP from WAN** — Allows SNMP management access from the WAN.

**Remote Syslog** Use this feature to send log messages to a Syslog server.

Figure 160: Remote Log Settings



The screenshot shows a configuration page titled "REMOTE SYSLOG". It includes the following elements:

- Remote Syslog**: A toggle switch that is currently turned on (green).
- Server IP**: An empty text input field.
- Server Port**: An empty text input field.
- Log Prefix**: An empty text input field.
- Track connections**: A toggle switch that is currently turned off (grey).

The following items are displayed on this page:

- **Remote Syslog** — Enables/disables the logging of debug or error messages to the remote logging process. (Default: Disabled)
- **Server IP** — Specifies the IP address of a remote server which will be sent syslog messages.
- **Server Port** — Specifies the UDP port number used by the remote server. (Range: 1-65535)
- **Log Prefix** — Sets the prefix for the log file sent to the specified server. The file suffix "log" is used.
- **Track connections** — Sends wireless client connection log messages to the Syslog server.

**Ping Watchdog** Use this feature to send ping probe packets to a defined IP address to confirm connectivity.

Figure 161: Ping Watchdog Settings

**PING WATCHDOG**

Ping Watchdog

IP Address

Failover IP Address  ?

Interval (min)  ?

Failure count  ?

The following items are displayed on this page:

- **Ping Watchdog** — Enable the sending of ping probe packets to a defined IP address to confirm connectivity. (Default: Disabled)
- **IP Address** — The primary IP address to ping.
- **Failover IP Address** — The (optional) failover IP address to ping if a ping probe to the primary IP fails. Note that if the failover IP can successfully be pinged, the fail counter will reset to zero again.
- **Interval (min)** — How often, in minutes, a ping check should be made.
- **Failure count** — The number of consecutive pings that must fail before the device is rebooted.

**BLE Settings** Use this feature to enable devices to push records of Bluetooth Low Energy (BLE) probe requests to a specified URL.

BLE settings are available only on devices with BLE support.

Figure 162: BLE Settings

**BLE SETTINGS** ?

BLE Probe Req. Data Push

Push URL

The following items are displayed on this page:

- **BLE Probe Req. Data Push** — Enable BLE Probe Request Data Push for site APs. When enabled, APs will push BLE probe request data in JSON format to the specified URL.
- **Push URL** — The URL to which to send data.

**Multicast DNS** Use this feature to enable Multicast DNS support on APs. Multicast DNS can be used on small networks that do not have a DNS server to resolve host names to multicast IP addresses.

Multicast DNS settings are available only on devices with mDNS support.

**Figure 163: Multicast DNS Settings**



The following items are displayed on this page:

- **MDNS** — Enables or disables multicast DNS support. (Default: Enabled)

**IGMP Snooping** APs can use IGMP (Internet Group Management Protocol) to check for any clients that want to receive a specific multicast service. APs can then propagate service requests up to any neighboring multicast switch/router to ensure that clients will continue to receive the multicast service.

**Figure 164: IGMP Snooping Settings**



The following items are displayed on this page:

- **Enable** — Enables the IGMP Snooping service. (Default: Disabled)

**LLDP** Link Layer Discovery Protocol (LLDP) is used to discover basic information about neighboring devices in a network. LLDP is a Layer 2 protocol that uses periodic broadcasts to advertise information about the sending device.

Figure 165: LLDP Settings



The screenshot shows the LLDP configuration page. At the top, the title "LLDP" is displayed. Below it, there is a section with three settings: "Enable" with a toggle switch turned on (green), "Tx Interval (seconds)" with a text input field containing "30", and "Tx Hold (number of time(s))" with a text input field containing "4".

The following items are displayed on this page:

- **Enable** — Enables the sending of LLDP advertisements about the AP to neighboring devices in the network. (Default: Disabled)
- **Tx Interval (seconds)** — Sets the periodic transmit interval for LLDP advertisements. (Range: 5-32768 seconds; Default: 30 seconds)
- **Tx Hold (number of time(s))** — Configures a time-to-live (TTL) value sent in the LLDP advertisements as shown in the formula below. (Range: 2-10; Default: 4)

The time-to-live tells the receiving LLDP agent how long to retain all information pertaining to the sending device if it does not transmit updates in a timely manner.

The TTL in seconds is based on the following rule:  
minimum value ((Tx Interval \* Tx Hold), or 65535)  
Therefore, the default TTL is  $4 * 30 = 120$  seconds.

**iBeacon** The AP supports the iBeacon standard based on Bluetooth Low Energy (BLE). Devices with BLE Beacons can provide location-based services to BLE clients, such as phones, that can recognize the beacon advertisements, extract the provided information, and then take actions based on the content.

Figure 166: iBeacon Settings



The screenshot shows the iBeacon configuration page. At the top, the title "IBEACON" is displayed. Below it, there is a section with five settings: "Enable" with a toggle switch turned on (green), "UUID" with a text input field containing "e2c56db5-dffb-48d2-b060-d0f5a7109e0", "Major" with a text input field containing "21395", "Minor" with a text input field containing "100", and "Tx Power" with a slider set to 5 dbm and a dropdown menu showing "5 dbm".

The following items are displayed on this page:

- **Enable** — Enables iBeacon support on the AP. (Default: Enabled)
- **UUID** — The iBeacon Universally Unique Identifier that advertises the beacon service. The UUID contains 32 hexadecimal digits in five groups, separated by hyphens.
- **Major** — The iBeacon value that is used to identify a beacon group. (Range: 0-65535)
- **Minor** — The iBeacon value that is used to identify individual beacons within a group. (Range: 0-65535)

**SNMPv3 User** SNMP protocol version 3 provides secure access by account authentication and data encryption. An SNMP v3 user can be defined by clicking the Add button.

**Figure 167: SNMPv3 User Settings**

SNMP V3 USER							+ ADD
<input type="checkbox"/>	NAME	ACCESS AUTH	AUTH TYPE	AUTH PWD	ENCRYPTION TYPE	ENCRYPTION PWD	
<input type="checkbox"/>		Write	MD5		DES		DELETE

The following items are displayed on this page:

- **Name** — The user name used to access the SNMP service.
- **Access Auth** — Select the access permission as “Read Only” or “Write.”
- **Auth Type** — Select the hash algorithm for authentication.
- **Auth Pwd** — Configure the password for authentication.
- **Encryption Type** — Select the encryption algorithm for data packets.
- **Encryption Pwd** — Configure the password for data encryption.

# 5

## Site WiFi 6 Configuration

This chapter describes configuration settings for WiFi 6 access point devices. It includes the following sections:

- “Wireless SSID Configuration” on page 161
- “Radio Settings” on page 173
- “General Networking Settings” on page 177
- “Local Network Settings” on page 184
- “Firewall Settings” on page 186
- “Hotspot Settings” on page 189
- “System Settings” on page 196
- “OpenRoaming” on page 206

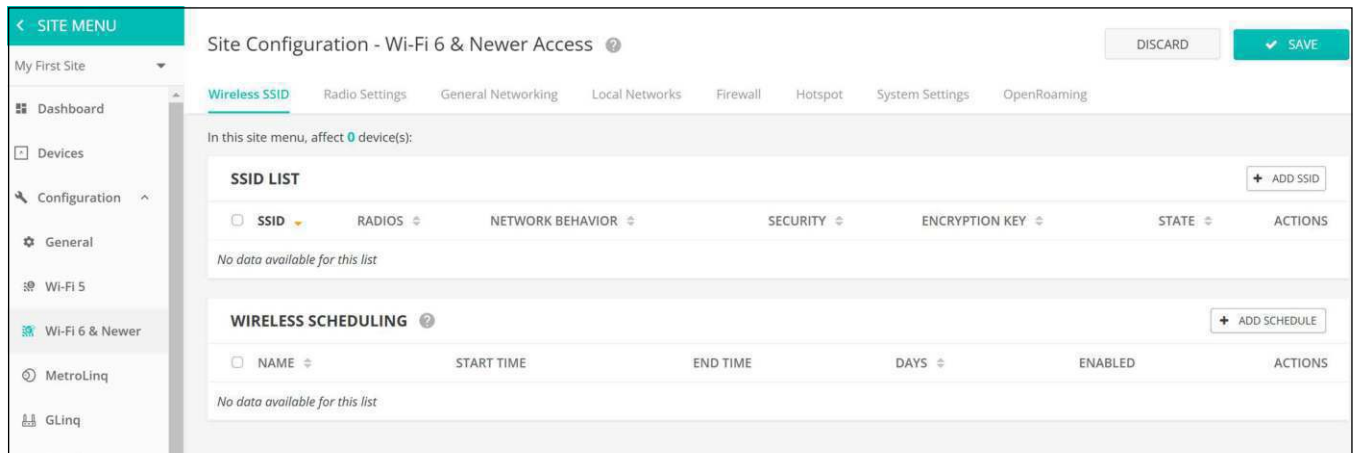
## Wireless SSID Configuration

From the Site menu, open “Configuration” and then “WiFi6 & Newer” to display the configuration options that apply to all Edgecore Wi-Fi 6 access points in the same site.

The Edgecore Wi-Fi 6 access points can operate in several radio modes, 802.11a/a+n/ac+a+n/ax (5 GHz) or 802.11b+g+n/ax (2.4 GHz). Supported modes depend on the access point model. Note that the dual-band access points can operate at 2.4 GHz and 5 GHz at the same time.

Each radio supports eight Service Set Identification (SSID) or virtual access point (VAP) interfaces. Each VAP functions as a separate access point, and can be configured with its own SSID and security settings. However, most radio signal parameters apply to all VAP interfaces. Traffic to specific VAPs can be segregated based on user groups or application traffic. Wireless clients associate with each VAP in the same way as they would with separate physical access points. Edgecore AP devices support up to a total of 128 wireless clients across all SSID interfaces per radio.

Figure 168: Site WiFi6 Configuration



The Wireless SSID tab on the WiFi6 configuration page includes these items:

- **SSID List** — The list of configured SSID interfaces for the Wi-Fi devices in this site. Note that each SSID applies to both the 2.4 GHz, 5 GHz, and 6 GHz radios unless otherwise configured. You can configure a maximum of eight SSIDs. Click the “Add SSID” button to create an SSID interface.
- **Wireless Scheduling** — A list of configured schedules for turning AP radios on and off at specified times. The scheduling rules apply to all 2.4 GHz, 5 GHz and 6 GHz interfaces on all site APs. Click the “Add Schedule” button to create a wireless schedule.

**Adding an SSID** Click the Add SSID button on the WiFi6 Access configuration page and enter SSID, network, and security settings as displayed below.

**Figure 169: Radio Settings (New SSID)**

The screenshot shows the 'Add SSID' configuration page with three main sections: General Settings, Security Settings, and Network Settings. The General Settings section includes: 'Enable SSID' (checked), 'SSID' (empty text field), 'Broadcast SSID' (checked), 'Client isolation' (unchecked), 'Multicast-to-Unicast Conversion' (checked), 'Max Client Count' (127), 'Minimum allowed signal' (-70 RSSI), and 'Activate on radio' (checked for 5GHz and 2.4GHz). The Security Settings section includes: 'Method' (Open), 'OWE' (unchecked), 'RADIUS MAC Auth' (unchecked), 'Access Control List' (unchecked), '802.11k' (unchecked), and '802.11v' (unchecked). The Network Settings section includes: 'Network behavior' (Route to Internet), 'Route through' (Default Local Network), 'Limit upload rate' (unchecked), 'Limit download rate' (unchecked), 'OpenRoaming' (checked), and 'Choose Profile' (Select profile --). There are CANCEL and CONFIRM buttons at the top right.

The following items are displayed on the Add SSID page:

*General Settings*

- **Enable SSID** — Enables or disables the SSID interface.
- **SSID** — The name of the basic service set provided by the VAP interface. Clients that want to connect to the network through the access point must set their SSID to the same as that of the access point's VAP interface. (Range: 1-32 characters)

- **Broadcast SSID** — The SSID can be broadcast at regular intervals so that wireless stations searching for a network connection can discover it. This allows wireless clients to dynamically discover and roam between WLANs. This feature also makes it easier for hackers to break into your home network. Because SSIDs are not encrypted, it is easy to scan WLANs looking for SSID broadcast messages coming from an AP. (Default: On)
- **SSID Isolation** — When enabled, wireless clients connected to different SSIDs on the same radio cards are isolated from each other. (Default Off)
- **Client Isolation** — When enabled, wireless clients can talk to the LAN, and reach the Internet if such connection is available, but they cannot communicate with one another. (Default Off)
- **Multicast-to-Unicast Conversion** — When enabled, the AP forwards multicast traffic only to those clients that request multicast traffic, instead of broadcasting traffic to all clients. This feature is automatically enabled when client isolation is disabled, and disabled when client isolation is enabled. The feature cannot be configured manually. (Default On)
- **Max Client Count** — Sets the maximum number of wireless clients that can be connected to this SSID at the same time. (Default: 127; Range: 0 to 127)
- **Minimum allowed Signal** — Only allows clients to associate to this SSID if their signal strength (RSSI) is equal or greater than the specified value. Setting the value to -100 disables this feature. Clients already connected are checked periodically.

This forces clients to associate with an AP that has a better signal strength (also called assisted roaming). Suggested value is -70 to -80 depending on access point density and coverage.

Enter an RSSI (Received Signal Strength Indicator) in decibels from -1 to -100db. Note that the closer it is to zero, the stronger the signal. (Default: -70)

- **Activate on radio** — Selects the radios on which this SSID should be created. If an SSID is activated on both radios for a device (meaning that the SSID will be mirrored), you can edit its record from either configuration tab, and the changes will be made on both the 2.4 GHz and 5 GHz SSID records. (Default: 6GHz, 5GHz, and 2.4GHz enabled)

#### Security Settings

**Method** — Sets the wireless security method for each SSID, including association mode, encryption, and authentication. (Default: Open)



**Note:** The OAP101-6E 6GHz radio supports only WPA3 Personal, WPA3 Enterprise, WPA3 Enterprise 192-bit, and OWE. (Default: WPA3 Personal)

- **Open** — The SSID interface broadcasts a beacon signal including the configured SSID. Wireless clients with an SSID setting of “any” can read the SSID from the beacon and automatically set their SSID to allow immediate connection.
- **WPA-PSK** — For enterprise deployment, WPA requires a RADIUS authentication server to be configured on the wired network. However, for small office networks that may not have the resources to configure and maintain a RADIUS server, WPA provides a simple operating mode that uses just a pre-shared password for network access. The Pre-Shared Key mode uses a common password for user authentication that is manually entered on the access point and all wireless clients. The PSK mode uses the same TKIP packet encryption and key management as WPA in the enterprise, providing a robust and manageable alternative for small networks.
  - **Encryption** — Data encryption uses one of the following methods:
    - **AES** — AES-CCMP is used as the multicast encryption cipher. AES-CCMP is the standard encryption cipher required for WPA2. (This is the default setting.)
    - **TKIP + AES** — The encryption method used by the client is discovered by the access point.
  - **Key** — WPA is used to encrypt data transmitted between wireless clients and the SSID interface. WPA uses static shared keys (fixed-length hexadecimal or alphanumeric strings) that are manually distributed to all clients that want to use the network.

String length must be 8 to 63 ASCII characters (letters and numbers). No special characters are allowed.
  - **Dynamic Keys** — Enables the use of dynamic PSK keys that are periodically generated and updated by a RADIUS authentication server. The RADIUS server IP address, UDP port, and secret text string must be specified.

Dynamic keys are supported only for WPA2-PSK security.
  - **Multiple Keys** — Enables the entry of multiple keys, one per line. Entering a key with a specific MAC address limits the key for use by a single client. Entering a key without a MAC address enables the key to be used by all clients.

Multiple keys are supported for WPA-PSK, WPA2-PSK, and WPA3 Personal Transition security.
- **WPA2-PSK** — Clients using WPA2 with a Pre-shared Key are accepted for authentication.

WPA was introduced as an interim solution for the vulnerability of WEP pending the ratification of the IEEE 802.11i wireless security standard. In effect, the WPA security features are a subset of the 802.11i standard. WPA2 includes the now ratified 802.11i standard, but also offers backward compatibility with WPA. Therefore, WPA2 includes the same 802.1X and PSK modes of operation and support for TKIP encryption.

Refer to WPA-PSK for a description of encryption methods and the key.

- **WPA-EAP** — WPA employs a combination of several technologies to provide an enhanced security solution for 802.11 wireless networks. A RADIUS server is used for authentication, and can also be used for accounting.

Refer to WPA-PSK for a description of encryption methods.

### *RADIUS Settings*

A RADIUS server must be specified for the access point to implement IEEE 802.1X network access control and Wi-Fi Protected Access (WPA) wireless security.

In addition, you can configure a RADIUS Accounting server to receive user-session accounting information from the access point. RADIUS Accounting can be used to provide valuable information on user activity in the network.



**Note:** This guide assumes that you have already configured RADIUS servers to support the access point. Configuration of RADIUS server software is beyond the scope of this guide, refer to the documentation provided with the RADIUS server software.

- **Radius MAC Auth** — Use RADIUS authentication. When this setting is enabled, the AP will send the MAC address of the client device to the specified RADIUS server for authentication. The server verifies the MAC is a valid user, and then replies to the AP with the dynamic VLAN ID (if configured) and other resources for the client device.

Note: On your RADIUS server, both the user ID and password will need to be set to the WiFi MAC of the client device and must be formatted without punctuation.

This feature is supported with “Open Security” in v1.1.1 firmware, and all other security methods (besides WEP) in v1.1.2 firmware.

- **Use RADIUS Auth** — For WPA-EAP and WPA2-EAP security, a RADIUS server must be specified.

- **RADIUS Auth Server** — Specifies the IP address or host name of the RADIUS authentication server.
- **RADIUS Auth Port** — The UDP port number used by the RADIUS server for authentication messages. (Range: 1024-65535; Default: 1812)
- **RADIUS Auth Secret** — A shared text string used to encrypt messages between the access point and the RADIUS server. Be sure that the same text string is specified on the RADIUS authentication server. Do not use blank spaces in the string. (Maximum length: 255 characters)
- **Backup RADIUS Auth** — Configures a secondary RADIUS server to act as a backup should the primary server become unavailable.
- **Use RADIUS Accounting** — Use RADIUS accounting to enable accounting of requested services for billing or security purposes.
- **RADIUS Acct Server** — Specifies the IP address or host name of the RADIUS accounting server.
- **Radius Acct Port** — The UDP port number used by the RADIUS server for accounting messages. (Range: 1024-65535; Default: 1813)
- **RADIUS Acct Secret** — A shared text string used to encrypt messages between the access point and the RADIUS server. Be sure that the same text string is specified on the RADIUS accounting server. Do not use blank spaces in the string. (Maximum length: 255 characters)
- **WPA2-EAP** — WPA was introduced as an interim solution for the vulnerability of WEP pending the ratification of the IEEE 802.11i wireless security standard. In effect, the WPA security features are a subset of the 802.11i standard. WPA2 includes the now ratified 802.11i standard, but also offers backward compatibility with WPA. Therefore, WPA2 includes the same 802.1X and PSK modes of operation and support for TKIP encryption.

A RADIUS server is used for authentication, and can also be used to accounting.

Refer to WPA-PSK for a description of encryption methods.

Refer to WPA-EAP for information on configuring the RADIUS server.

- **WPA3 Personal** — Clients using WPA3 with Simultaneous Authentication of Equals (SAE) are accepted for authentication.

WPA3 provides more robust password-based authentication called Simultaneous Authentication of Equals (SAE), which replaces Pre-Share Key (PSK) in WPA2-Personal. This technology prevents offline dictionary attacks so that data traffic can be transmitted securely.

- **WPA3 Personal Transition** — Clients using WPA3 with SAE or clients using WPA2 with PSK are accepted for authentication. The AP negotiates the supported authentication and encryption with each client before allowing access to the network.
- **WPA3 Enterprise** — An enhanced version of WPA2-EAP security that uses more robust encryption. Clients must support one of the stronger WPA3 encryption options and use Protected Management Frames (PMF) to be able to access the network. The use of IEEE 802.1X network access control and a RADIUS server is required.

Refer to RADIUS Settings above for information on RADIUS configuration.

- **WPA3 Enterprise Transition** — Allows WPA3 and WPA2 clients to access the network. Encryption options and the use of Protected Management Frames (PMF) are negotiated with each client before allowing access to the network.

Refer to RADIUS Settings above for information on RADIUS configuration.

- **WPA3 Enterprise 192-bit** — WPA3 Enterprise security uses a standard 128-bit encryption. For a network handling more sensitive data, there is an option to use 192-bit encryption for additional protection.

Refer to RADIUS Settings above for information on RADIUS configuration.

- **PMF** — Protected Management Frames (PMF) provide WPA2/WPA3 security for unicast and multicast management frames between the AP and clients. The “Optional” setting allows clients that do not support PMF to access the network. The “Mandatory” setting allows only clients that support PMF to access the network. (Default: Optional)
- **802.11k** — Provides clients with information on neighbor APs when roaming. As a client is about to roam from an AP, it sends a request for a “Neighbor Report” that includes a list of available APs and associated information. The client can then quickly identify the best AP to which it can roam without having to scan all channels. (Default: Disabled)
- **802.11v** — Provides information to associated clients that facilitates the overall improvement of the wireless network. Also helps clients to improve battery life by setting the idle period. (Default: Disabled)
- **802.11r** — Provides a method for fast transition roaming between APs. Before clients roam to a new AP, the initial handshake and encryption calculations are performed in advance, which results in a fast hand off without the need for re-authentication. (Default: Disabled)
- **OWE** — Opportunistic Wireless Encryption (OWE) is the WPA3 open network security that allows users of public Wi-Fi networks to gain secure access without using a password. OWE provides individual encryption of data

communications between the AP and each client, but does not provide authentication of user identities.

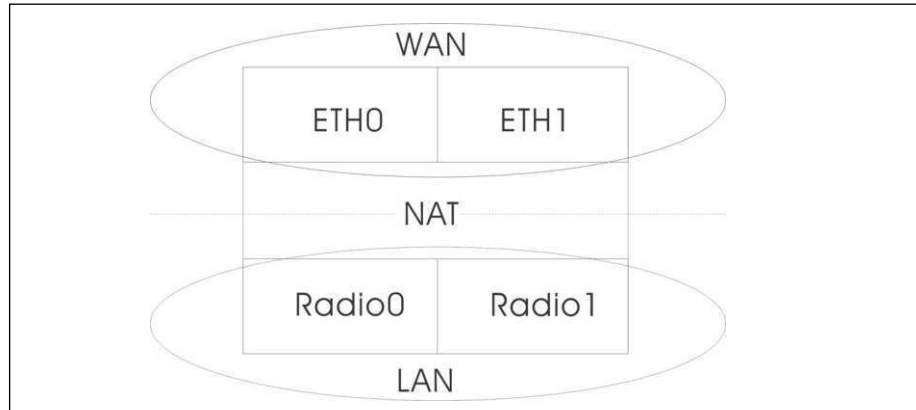
- **Access Control List** — Wireless clients can be authenticated for network access by checking their MAC address against the local database configured on the access point. (Default: OFF)
  - **Policy** — The MAC list can be configured to either allow or deny network access to specified clients. (Default: Allow all MACs on list)
  - **Filtered MACs** — List of client MAC addresses.
- **Dynamic Authorization** — The Dynamic Authorization Extensions (DAE) to RADIUS enable a server to disconnect or change the authorization of clients that are already connected to the network.
  - **DAE Port** — The UDP port number to use for DAE messages. (Default: 3799)
  - **DAE Client** — The IPv4 address of the RADIUS server.
  - **DAE Secret** — The shared text string used to encrypt DAE messages between the access point and the RADIUS server.

#### *Network Settings*

- **Network Behavior** — One of the following connection methods must be specified. (Default: Route to Internet)
  - **Bridge to Internet (AP Bridge Mode)** — Configures an interface as attached to the WAN (that is, the Internet).

In the following figure, Ethernet port 0 and Ethernet port 1 are both attached to the WAN. Traffic from these interfaces is directly bridged into the Internet. Any of the Ethernet or radio interfaces can be configured this way.

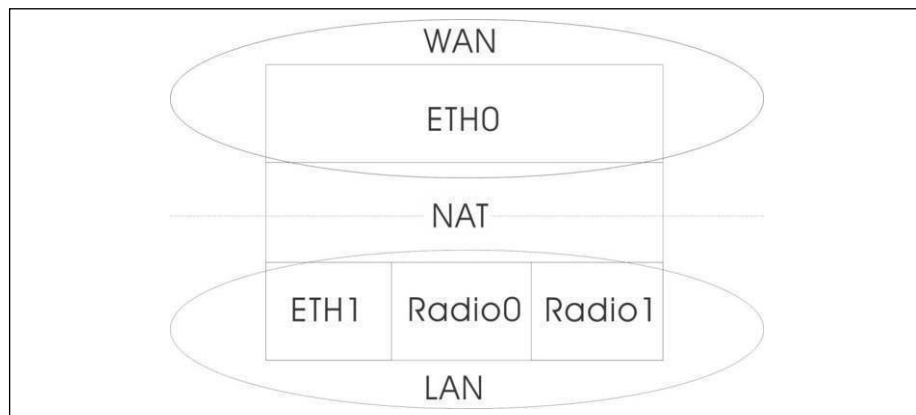
Figure 170: Bridge to Internet



- **Route to Internet (AP Router Mode)** — Configures an interface as a member of the LAN.

In the following figure, Ethernet port 1, Wireless LAN 0 (5 GHz radio), and Wireless LAN 1 (2.4 GHz radio) are all included in the LAN. Traffic from these interfaces is routed across the access point through Ethernet port 0 to the Internet.

Figure 171: Route to Internet



- **Route through** — The network to be routed. The default is “Default local network” as displayed under LAN Settings – Local Network.
- **Add to Guest Network** — This interface can only support the guest network.
- **Hotspot Controlled** — This interface can only support hotspot services.
- **Walled garden** — Enter a list of domains and/or IP addresses in CIDR notation that the hotspot user can access before being authenticated by the captive portal. Wildcard domains can be specified in the format of *domain.com* (allow domain and all of its subdomains), or *.domain.com* (only allow subdomains).

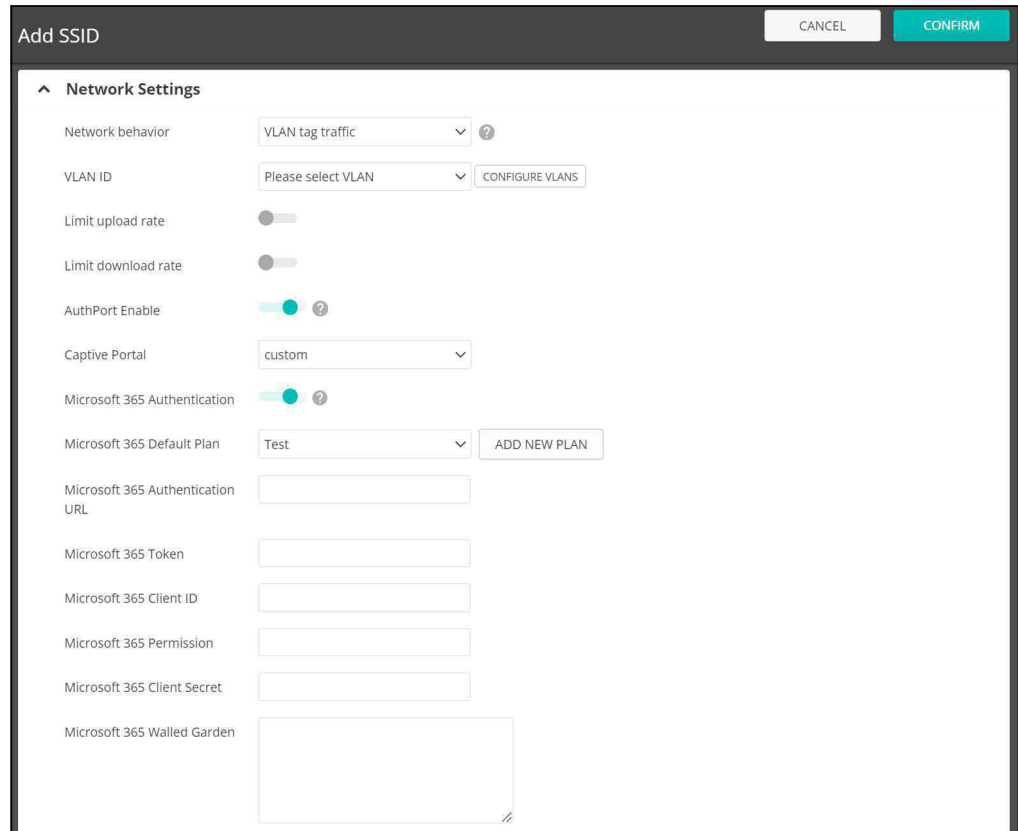
- **VLAN Tag Traffic** — Tags any packets passing from this SSID interface to the associated Ethernet port as configured under “[VLAN Settings](#)” on [page 182](#). When enabled, select a configured VLAN ID from the list.
- **Dynamic VLAN** — The RADIUS server provides the access point with the user VLAN information. The access point assigns the associated user to the related VLAN.



**Note:** ecCLOUD supports VLAN synchronization between APs and switches. When VLAN tagging is enabled for an SSID, the configured VLAN ID is automatically “pushed” by ecCLOUD to the attached switch port. This enables the VLAN-tagged traffic from the AP to be accepted by the switch port and avoids any loss of connectivity.

- **Limit upload rate** — Enables rate limiting of traffic from the SSID interface as it is passed to the wired network. You can set a maximum rate in Kbytes per second. (Range: 256-10048576 Kbytes per second; Default: OFF)
- **Limit download rate** — Enables rate limiting of traffic from the wired network as it is passed to the SSID interface. You can set a maximum rate in Kbytes per second. (Range: 256-10048576 Kbytes per second; Default: OFF)
- **OpenRoaming** — Available when WPA2-EAP security is selected, OpenRoaming (Hotspot 2.0) provides a standard for public-access Wi-Fi networks to support seamless roaming between wireless networks. An OpenRoaming AP advertises its public Wi-Fi capabilities and services so that clients can decide if they want to connect to the network. (Default: Disabled)
  - **Choose Profile** — Selects a configured profile to apply to the wireless network.
  - **Configure OpenRoaming** — Click to access the OpenRoaming profile settings page. See “[OpenRoaming](#)” on [page 206](#) for profile configuration.
- **AuthPort Enable** — When this option is enabled, Wi-Fi users are asked to authenticate against a configurable ecCLOUD hosted account database before they are granted Internet access. The AuthPort add-on must be enabled for this option to be activated (see “[Using the AuthPort Add-On](#)” on [page 75](#)).

Figure 172: Enabling Microsoft 365 Authentication



- **Captive Portal** — Choose a captive portal that includes the Microsoft login button (see [“Captive Portal”](#) on page 81).
- **Microsoft 365 Authentication** — Administrators can enable Microsoft 365 Authentication.
- **Microsoft 365 Default Plan** — Associates the billing plan consumed when the client is associated and authenticated. Choose an existing plan from the list or add a new plan.
- **Microsoft 365 Authentication URL** — Sets the endpoint for the Microsoft 365 authentication server.
- **Microsoft 365 Token** — Sets token for Microsoft 365 authorization.
- **Microsoft 365 Client ID** — The Application (client) ID assigned to your app by the Microsoft Entra admin center – App registrations experience.
- **Microsoft 365 Permission** — Specifies reading and writing permissions to the Microsoft 365 authorization server.
- **Microsoft 365 Client Secret** — Sets the client secret for Microsoft 365 authorization.

- **Microsoft 365 Walled Garden** — Specifies the walled garden during the Microsoft 365 login flow.
- **Proxy ARP** — When Proxy ARP is enabled, the AP maintains its own ARP lookup table and replies to ARP requests on behalf of downstream stations, avoiding network inefficiencies. This feature is automatically enabled when client isolation is disabled, and disabled when client isolation is enabled. The feature cannot be configured manually. Proxy ARP is supported when the network behavior is “Bridge to Internet” or “VLAN Tag Traffic.”

## Setting Wireless Schedules

Configuring wireless schedules enables the AP radios to be turned on and off at specified times. The scheduling rules apply to all 2.4 GHz, 5 GHz, and 6 GHz interfaces on all site APs. Click the “Add Schedule” button to create a wireless schedule.

Figure 173: Adding a Wireless Schedule

The screenshot shows the 'Add schedule' configuration page. At the top right are 'CANCEL' and 'CONFIRM' buttons. The main section is titled 'Schedule Settings' and contains a note about the site's timezone being set to UTC. Below the note are several configuration options: an 'Enabled' toggle switch (currently turned on), a text input field for 'Name', 'Start time' pickers (12:00 am), 'End time' pickers (06:00 am), and a 'Days' section with radio buttons for each day of the week (Mon, Tue, Wed, Thur, Fri, Sat, Sun), where 'Mon' is selected.

The following items are displayed on the Add schedule page:

- **Enabled** — Makes the defined schedule active. (Default: Enabled)
- **Name** — A text string to identify the schedule.
- **Start time** — The time that you want the radios to be turned on.
- **End Time** — The time that you want the radios to be turned off.
- **Days** — The selected days of the week on which to apply the schedule.

## Radio Settings

On the “WiFi Access” page, click the “Radio Settings” tab to configure 6 GHz, 5 GHz, and 2.4 GHz radio settings. Note that settings apply to all configured SSID interfaces.

Figure 174: WiFi 6 Radio Settings

**GLOBAL SETTINGS**

Band Steering

Airtime Fairness  ?

RF Isolation  ?

**WIRELESS 5 GHZ**

**PHYSICAL RADIO SETTINGS**

802.11 Mode: 802.11ax

Channel Bandwidth: 80MHz

Channel: Auto (all channels)  
[EDIT CHANNEL LIST](#)

Idle Timeout: 300

Max Tx Power:  20 dBm (100 mW)

Beacon Interval: 100

BSS Coloring: 64

Interference Detection: 0

Broadcast Rate: 6M

Target Wake Time:

OFDMA:

**ADVANCED RADIO SETTINGS**

Probe Req. Data Push:  ?

**WIRELESS 2.4 GHZ**

**PHYSICAL RADIO SETTINGS**

802.11 Mode: 802.11ax

Channel Bandwidth: 40MHz

Channel: Auto (all channels)  
[EDIT CHANNEL LIST](#)

Idle Timeout: 300

Max Tx Power:  22 dBm (158 mW)

Beacon Interval: 100

BSS Coloring: 64

Interference Detection: 0

Broadcast Rate: 5.5M

Target Wake Time:

OFDMA:

**ADVANCED RADIO SETTINGS**

Probe Req. Data Push:  ?

The following items are displayed on the Radio Settings tab. Note that configuration options apply to both the 5 GHz and 2.4 GHz radios unless otherwise indicated.

### Global Settings

- **Band Steering** — When enabled, clients that support 2.4 GHz, 5 GHz, and 6 GHz are first connected to the 6 GHz radio. This feature helps balance the client load over the two radio bands. Note that both radios must have configured SSIDs that match for this feature to fully operate. (Default: Disabled)
- **Airtime Fairness** — Enabling this feature improves the overall performance of the wireless network. (Default: Disabled)
- **RF Isolation** — When enabled, clients are isolated between different radio cards.

### Physical Radio Settings

- **802.11 Mode** — Defines the radio operation mode.
  - **Radio 6 GHz** — Default: 11ax; Options: 11ax, 11be
  - **Radio 5 GHz** — Default: 11ax; Options: 11a, 11a+n, 11ac+a+n, 11ax, 11be
  - **Radio 2.4 GHz** — Default: 11ax; Options: 11ax, 11be
- **Channel Bandwidth** — The basic Wi-Fi channel bandwidth is 20 MHz, but by bonding channels together to create 40 MHz, 80 MHz, 160 MHz, and 320 MHz channels, higher data transmission rate can be achieved. However, selecting larger channel bandwidths reduces the number a radio channels available. The available channel bandwidth is dependent on the 802.11 Mode.  
(Default: 20 MHz on 2.4 GHz Radio, 80 MHz on 5 GHz and 6 GHz Radio;  
Options: 20 MHz, 40 MHz, 80 MHz, 160 MHz, and 320 MHz)
  - **20MHz** — For 802.11b+g+n and 802.11ax
  - **40MHz** — For 802.11b+g+n, 802.11a, 802.11a+n, 802.11ac+a+n and 802.11ax
  - **80MHz** — For 802.11ac+a+n and 802.11ax
  - **160MHz** — (Supported on EAP104 5 GHz radio, OAP101 5 GHz radio, and OAP101-6E 5 GHz and 6GHz radios) For 802.11ac+a+n and 802.11ax
  - **320MHz** — (Supported on EAP105) For 802.11be

- **Channel** — The radio channel that the access point uses to communicate with wireless clients. The available channels are dependent on the radio, Channel Bandwidth, and Regulatory Country settings. You can also click the “Edit Channel List” button to select specific available channels to use for each radio interface.

Selecting Auto enables the access point to automatically select an unoccupied radio channel. (Default: Auto)

Figure 175: 5 GHz Radio Channels

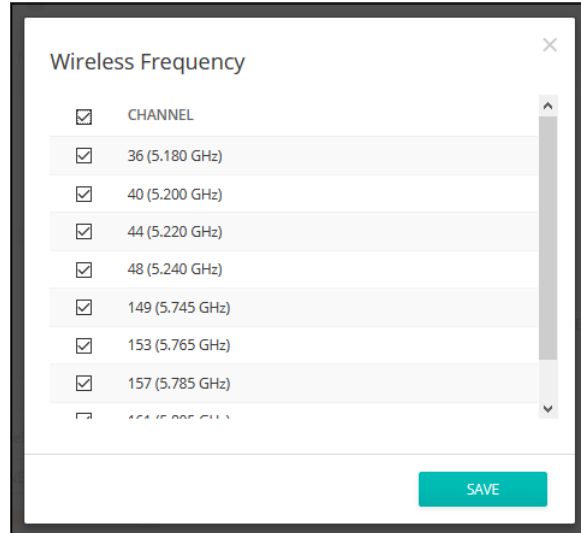
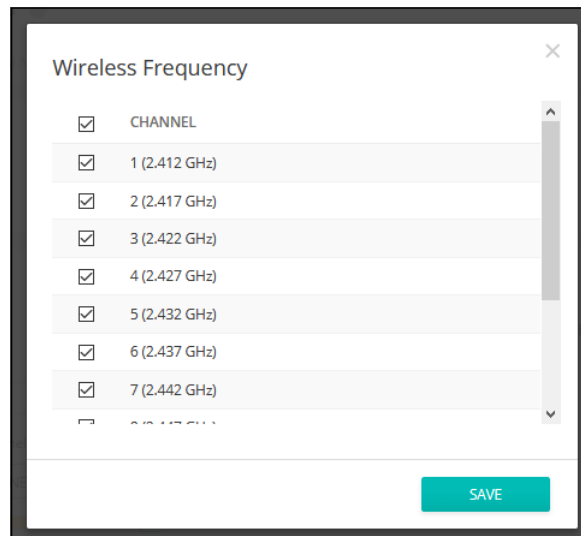


Figure 176: 2.4 GHz Radio Channels



- **Idle Timeout** — The maximum a connection can remain inactive before it is closed. (Default: 300 seconds)
- **Max Tx Power** — Adjusts the maximum power of the radio signals transmitted from the access point. The higher the transmission power, the farther the

transmission range. Power selection is not just a trade-off between coverage area and maximum supported clients. You also have to ensure that high-power signals do not interfere with the operation of other radio devices in the service area. (The range of power settings and defaults are dependent on the AP model and the Regulatory Country setting.)

- **Beacon Interval** — The rate at which beacon signals are transmitted from the access point. The beacon signals allow wireless clients to maintain contact with the access point. They also carry power-management and other information. (Range: 100-1024 TUs; Default: 100 TUs)
- **BSS coloring** — In 802.11ax (Wi-Fi 6) mode, BSS coloring allows nearby APs operating at the same frequency to identify traffic belonging to their own Basic Service Set (BSS). The BSS coloring enables Wi-Fi 6 networks to operate more efficiently in high-density environments where neighboring AP and client transmissions overlap. Assign a color value (a number from 1 to 63) to identify the radio BSS, or enter value 64 to allow the AP to randomly select a color value. (Range: 1-63, 64 random, Default: 64)
- **Broadcast Rate** — Allows a limit to be placed on the wireless bandwidth consumed by broadcast packets.
  - **Radio 6 GHz** — Options: 6M, 9M, 12M, 18M, 24M, 36M, 48M, 54M; Default: 6M
  - **Radio 5 GHz** — Options: 6M, 9M, 12M, 18M, 24M, 36M, 48M, 54M; Default: 6M
  - **Radio 2.4 GHz** — Options: 5.5M, 6M, 9M, 11M, 12M, 18M, 24M, 36M, 48M, 54M; Default: 5.5M
- **Target Wake Time** — In 802.11ax (Wi-Fi 6) mode, the AP can allow clients to request a specific Target-Wakeup Time (TWT) to transmit or receive frames, rather than rely on periodic beacons. This feature enables client devices to have much longer sleep states and results in significant power savings. In addition, the AP can control and schedule client TWTs to both manage contention in the network and accommodate delay-sensitive traffic. (Default: Disabled)
- **OFDMA** — The 802.11ax (Wi-Fi 6) mode supports Orthogonal Frequency Division Multiple Access (OFDMA) and this cannot be disabled.

### Advanced Radio Settings

- **Probe Req. Data Push** — Enable Client Probe Request Data Push for this radio. When enabled, the radio will push client probe request data in JSON format to your specified URL.

## General Networking Settings

On the “WiFi Access” page, click the “General Networking” tab to configure Internet, Ethernet ports, and VLAN settings for all devices in a site. Some items on this page only display the current setting, they cannot be configured. These settings can only be overridden at the device-level configuration.

Figure 177: General Networking Settings

**INTERNET**

Only the Internet IP Address Mode and Mgmt.VLAN settings can be changed here. The rest of these settings can only be overridden on a per-device basis at device-level config.

GENERAL SETTINGS	MGMT VLAN
Internet Source: <input type="text" value="WAN Port"/>	Mgmt VLAN: <input checked="" type="checkbox"/>
VLAN tag traffic: <input type="checkbox"/>	
IP Address Mode: <input type="text" value="DHCP"/>	
MTU Size: <input type="text" value="1500"/>	
Fallback IP: <input type="text" value="192.168.1.20"/>	
Fallback Netmask: <input type="text" value="255.255.255.0"/>	

**DHCP RELAY**

DHCP Relay:

DHCP Relay Server:

DHCP Relay Port:

Backup DHCP Relay:

Remote ID:

**IPV6 SETTINGS**

IP Address Mode:

Client ID:

**ETHERNET**

Some settings can only be overridden on a per-device basis at device-level config.

ETHERNET SETTINGS FOR WAN PORT	ETHERNET SETTINGS FOR LAN PORT(S)
This port is the internet source for this device.	Network behavior: <input type="text" value="Bridge to Internet"/>

**ADVANCED ETHERNET SETTINGS**

PoE Out:

**VLAN** + ADD NEW VLAN

VLAN ID	TAGGED PORTS	UNTAGGED INTERFACES	ACTIONS
No data available for this list			

**Internet Settings** Note that only the Internet IP Address Mode and Management VLAN settings can be changed on this page. These rest of these settings can only be overridden on a per-device basis at device-level configuration.

**Figure 178: Internet Settings**

The following items are displayed on this page section:

### General Settings

- **Internet Source** — The interface on devices used to access the Internet.
- **VLAN tag traffic** — Enable to activate tagging on this interface and choose a tagging ID value between 2 and 4094, inclusive.
- **IP Address Mode** — The method used to provide an IP address for the Internet access port. (Options: DHCP, Use Device’s Settings; Default: DHCP)
  - **DHCP** — Enables DHCP on the Internet Source interface.
  - **Use Device’s Settings** — Select this option if you plan on assigning static IPs to your devices prior to registration. Also choose this option if you are mixing static IP and DHCP-based modes. By default, all devices will use DHCP unless configured otherwise.
- **MTU Size** — Sets the size of the maximum transmission unit (MTU) for packets sent on this network.

- **Fallback IP** — This IP address is used if you cannot connect to the device IP address.
- **Fallback Netmask** — The network mask associated with the fallback IP address.

## MGMT VLAN Settings

Figure 179: Management VLAN Settings

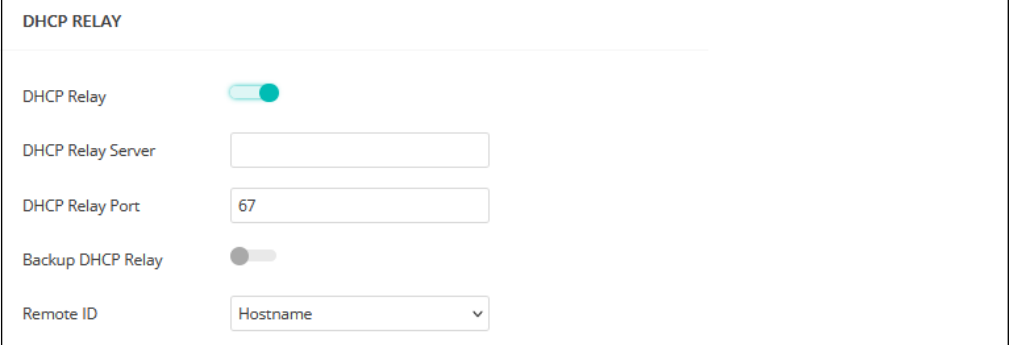
The screenshot displays the 'MGMT VLAN' configuration page. At the top, the title 'MGMT VLAN' is shown. Below it, there is a toggle switch for 'Mgmt VLAN' which is currently turned on (indicated by a green circle). To the right of the toggle is a question mark icon. Below the toggle, there are five configuration fields: 'Mgmt VLAN ID' with a text input containing '100' and a question mark icon; 'IP Address Mode' with a dropdown menu set to 'DHCP'; 'Fallback IP' with a text input containing '192.168.1.20'; and 'Fallback Netmask' with a dropdown menu set to '255.255.255.0'.

- **Mgmt VLAN** — Select this option to enable a management VLAN on site devices. Once you enable this option, you will no longer be able to access devices on any of the built-in the local networks (like 192.168.2.1 for example). You will only be able to access devices from the specified VLAN network. If a device's IP mode is set to DHCP, it will also request a new IP address in the subnet range assigned to the VLAN network.
- **Mgmt VLAN ID**— Specifies the ID of the management VLAN.
- **IP Address Mode** — The method used to provide an IP address for a device over the Management VLAN. (Options: DHCP, Static IP; Default: DHCP)
  - **DHCP** — Enables DHCP on the management VLAN.
  - **Static IP** — Sets a static IP to access site devices over the management VLAN. Configure an IP address, subnet mask, and default gateway address.
- **Fallback IP** — The IP address to use to connect to a device over the management VLAN if the DHCP-assigned address cannot be reached.
- **Fallback Netmask** — The network mask associated with the fallback IP address.

## DHCP Relay Settings

When DHCP relay is enabled, APs act as an agent for all clients and sends all broadcast DHCP requests directly to a specified DHCP server. The DHCP server IP address and port must be configured, and optionally a backup server.

Figure 180: DHCP Relay



The screenshot shows the DHCP Relay configuration page. It includes a title 'DHCP RELAY', a 'DHCP Relay' toggle switch that is turned on, a 'DHCP Relay Server' text input field, a 'DHCP Relay Port' text input field containing the value '67', a 'Backup DHCP Relay' toggle switch that is turned off, and a 'Remote ID' dropdown menu currently set to 'Hostname'.

The following items are displayed on this page:

- **DHCP Relay** — Enables the DHCP relay feature on the AP.
- **DHCP Relay Server** — Specifies the IP address of the DHCP server.
- **DHCP Relay Port** — Specifies the port of the DHCP server.
- **Backup DHCP Relay** — Optionally specifies a backup DHCP server IP address and port to use if there is no response from the primary server.
- **Remote ID** — Use the hostname as the remote ID, or manually configure a text string as the remote ID.

## IPv6 Settings

Figure 181: IPv6 Settings



The screenshot shows the IPv6 Settings configuration page. It includes a title 'IPv6 SETTINGS', an 'IP Address Mode' dropdown menu set to 'DHCP', and a 'Client ID' text input field.

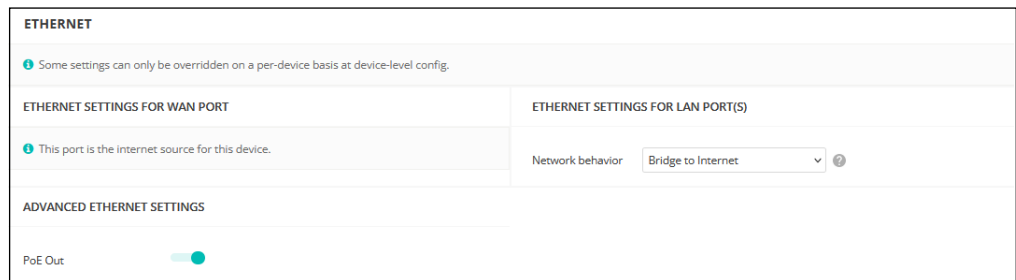
The following items are displayed on this section of the page:

- **IP Address Mode** — The method used to provide an IPv6 address for the Internet access port. (Default: DHCP; Options: DHCP, Static IP)
  - **DHCP** — If you configure DHCP, the Client ID must be specified.
    - **Client ID** — Manually enter the client ID for the DHCP client.

- **Static IP** — To configure a static IPv6 address for the Internet access port, the following items must be specified.
  - **IP Address** — Specifies an IPv6 address for the access point. An IPv6 address must be configured according to RFC 2373 using 8 colon separated 16-bit hexadecimal values. One double colon may be used in the address to indicate the appropriate number of zeros required to fill the undefined fields.
  - **Default Gateway** — The IPv6 address of the default gateway, which is used if the requested destination address is not on the local subnet.
  - **DNS** — The IPv6 address of Domain Name Servers on the network. A DNS maps numerical IPv6 addresses to domain names and can be used to identify network hosts by familiar names instead of the IPv6 addresses. If you have a DNS server located on the local network, type the IPv6 address in the text field provided.

**Ethernet Settings** This page section shows basic Ethernet settings for site APs. These settings can only be overridden on a per-device basis at device-level configuration.

**Figure 182: Ethernet Settings**



The following items are displayed on this page section:

### Ethernet Settings for WAN Port

By default, the WAN port interface is set as the Internet source and the following message is displayed: “This port is the Internet source for devices in this site.”

If more than one interface is connected to the Internet, only the last configured interface is used.

### Ethernet Settings for LAN Port(s)

- **Network Behavior** — Shows the network connection method (that is, the manner in which the LAN ports are used).

### Advanced Ethernet Settings

- **PoE Out** — Enables the PoE Out feature when the PoE source is detected as 802.3at, otherwise the PoE Out feature is disabled. When set to “Off,” PoE Out is always disabled.

**VLAN Settings** The access point can employ VLAN tagging to control access to network resources and increase security. VLANs separate traffic passing between the access point, associated clients, and the wired network. You can create up to 12 VLAN tagged networks.

VLANs (virtual local area networks) are turned off by default. If turned on they will automatically tag any packets passed to Ethernet ports from the relevant VAP (virtual access point). Note also that specific VAPs can enable or disable VLAN tagging (see “Adding an SSID” on page 162).

Note the following points about the access point’s VLAN support:

- If an Ethernet LAN port on the access point is assigned a VLAN ID, any traffic entering that port must be also tagged with the same VLAN ID.
- Wireless clients associated to the access point can be assigned to a VLAN. Wireless clients are assigned to the VLAN for the VAP interface with which they are associated. The access point only allows traffic tagged with correct VLAN IDs to be forwarded to associated clients on each VAP interface.
- When VLAN support is enabled on the access point, traffic passed to the wired network is tagged with the appropriate VLAN ID. When an Ethernet port on the access point is configured as a VLAN member, traffic received from the wired network must also be tagged with the same VLAN ID. Received traffic that has an unknown VLAN ID or no VLAN tag is dropped.
- When VLAN support is disabled, the access point does not tag traffic passed to the wired network and ignores the VLAN tags on any received frames.



**Note:** Before enabling VLAN tagging on the access point, be sure to configure the attached network switch port to support tagged VLAN frames for the VLAN IDs configured on the access point. Otherwise, connectivity to the access point will be lost when you enable the VLAN feature.

**Figure 183: VLAN Settings**



The following items are displayed on this page section:

- **VLAN ID** — The identifier assigned to the VLAN. (Range: 2-4094)
- **Tagged Ports** — The Ethernet ports assigned to the VLAN. Options include WAN port or LAN port(s).
- **Untagged Interfaces** — Click the “Configure SSIDs” link to open the Wireless SSID tab. Then edit or create an SSID interface to be a member of the specified VLAN (see “Adding an SSID” on page 162).
- **Actions** — Click and select to edit or delete a configured VLAN.

### Adding a VLAN

Click the “Add New VLAN” button to create a VLAN.

Figure 184: Adding a VLAN

The screenshot shows a web interface for adding a new VLAN. At the top, there's a dark header with the title "Add New VLAN" and two buttons: "CANCEL" and "CONFIRM". Below the header is a "General Settings" section. It contains a "VLAN ID" field with an input box. Underneath, there's a "Ports" section with two radio buttons: "WAN Port" and "LAN Port(s)".

The following items are displayed on this page section:

- **VLAN ID** — The VLAN identifier to be assigned. (Range: 2-4094)
- **Ports** — The Ethernet ports assigned to the VLAN. Options include WAN port or LAN port(s).

## Local Network Settings

The Local Network tab configures settings for the default LAN network, guest network, and other custom networks.

Figure 185: Local Network Settings

The screenshot displays the 'Local Network Settings' interface. At the top, there is a 'LAN' tab and a '+ ADD CUSTOM LAN' button. Below this, the 'DEFAULT LOCAL NETWORK' section is active, indicated by a 'BUILT-IN' label and a toggle switch. This section contains two columns of settings. The left column includes: IP Address (192.168.2.1), Subnet Mask (255.255.255.0), MTU Size (1500), Enable STP (disabled), Enable UPnP (disabled), and Smart Isolation (Disable (full access)). The right column includes: DHCP Server (enabled), DHCP Start (100), DHCP Limit (150), Lease Time (12hr), and DNS Servers (DHCP Option 6) with a text input field. Below this, the 'GUEST NETWORK' section is also active, with a 'BUILT-IN' label and a toggle switch. It contains identical settings to the Default Local Network section, but with an IP Address of 192.168.3.1.

The following items are displayed on this page:

- **Add Custom LAN** — Click this button to create a additional networks with their own custom settings. You can create up to 10 custom LANs.
- **IP Address** — Specifies the IP address for the local network or guest network. Valid IP addresses consist of four decimal numbers, 0 to 255, separated by periods. (Default: 192.168.2.1)
- **Subnet Mask** — Indicates the local subnet mask. (Default: 255.255.255.0)
- **MTU Size** — Sets the size of the maximum transmission unit (MTU) for packets sent on this network. (Default: 1500)
- **Enable STP** — Enables or disables processing of Spanning Tree Protocol messages. (Default: Disabled)

- **Enable UPnP** — Enables or disables Universal Plug-and-Play broadcast messages. (Default: Disabled)
- **Smart Isolation** — Enables network traffic to be restricted to the specified network:
  - **Disable (full access)** — There is no traffic isolation. Clients can access the Internet and other devices on the local LAN. This is the option to choose if you trust the clients that will be connecting to your network.
  - **Internet access only** — Traffic from this network can only be routed to and from the Internet. This is the option to choose for hotspot users or users connecting to a guest network.
  - **LAN access only** — Traffic from this network is restricted to local LAN devices only.
  - **Internet-only (strict)** — This is the same as "Internet access only," but with the additional restriction that users cannot access resources or devices on any private network (192.168.0.0, 172.16.0.0, 10.0.0.0, etc.). This is useful if an AP is "double NAT'ed" and the network upstream from your AP's gateway is another private network.
- **Interface Members** — The interfaces attached to the local area network.
- **DHCP Server** — Enables/disables DHCP on this network. (Default: Enabled)
  - **DHCP Start** — First address in the address pool. (Range: 1-256; Default: x.x.x.100)
  - **DHCP Limit** — Maximum number of addresses in the address pool. (Range: 1-254; Default: 150)
  - **Lease Time** — The time period for which assigned IP addresses are valid.
  - **DNS Servers** — List up to three DNS server IP addresses, one per line.

## Firewall Settings

Firewall filtering restricts connection parameters to limit the risk of intrusion. The firewall settings allow you to define a sequential list of rules that filter traffic based on source and destination IP addresses and ports. Ingress packets are tested against the filter rules one by one. As soon as a packet matches a rule, the configured action is implemented.

One rule, "Allow-Ping," is pre-configured to allow Ping packets from the Internet. You can enable or disable this rule, but it cannot be modified or deleted. Click the "Add Rule" button to add a new firewall rule.

Figure 186: Firewall Settings



The following items are displayed on this page:

- **Enabled** — Enables the configured firewall rule.
- **Name** — User defined name for the filtering rule. (Range: 1-30 characters)
- **Source IP** — An IPv4 address in CIDR notation. Includes an IP address followed by a slash (/) and a decimal number to define the network mask.
- **Source Port** — The source protocol port. (Range: 1-65535)
- **Destination IP** — The destination IPv4 address.
- **Destination Port** — The destination protocol port. (Range: 1-65535)
- **Target** — The action to take when the configured rule matches a packet. (Options: Accept, Reject, Drop)
- **Family** — Specifies IPv4 or IPv6 traffic, or both. (Options: IPv4, IPv6, Any)

- **Source** — The source interface. (Options: Any, Default Local Network, Internet, Guest Network, Hotspot Network)
- **Protocol** — Defines the protocol type of packets. (Options: Any, TCP+UDP, TCP, UDP, ICMP)
- **Destination** — The destination interface. (Options: Any, Default Local Network, Internet, Guest Network, Hotspot Network)

**Port Forwarding** Port Forwarding can be used to map an inbound protocol type (TCP/UDP) and port to an “internal” IP address and port. The internal (local) IP addresses are the IP addresses assigned to local devices at the edge of a network, and the external IP address is the IP address assigned to the AP interface. This allows remote users to access different servers on your local network using your single public IP address.

Remote users accessing services such as web or FTP at your local site through your public IP address, are redirected (mapped) to other local server IP addresses and TCP/UDP port numbers. For example, if you set Protocol/External Port to TCP/80 (HTTP or web) and the Destination IP/Destination Port to 192.168.3.9/80, then all HTTP requests from outside users are forwarded to 192.168.3.9 on port 80. Therefore, by just using your external IP address provided by your ISP, Internet users can access the services they need at the local addresses to which you redirect them.

The more common TCP service port numbers include: HTTP: 80, FTP: 21, Telnet: 23, and POP3: 110.

**Figure 187: Port Forwarding**

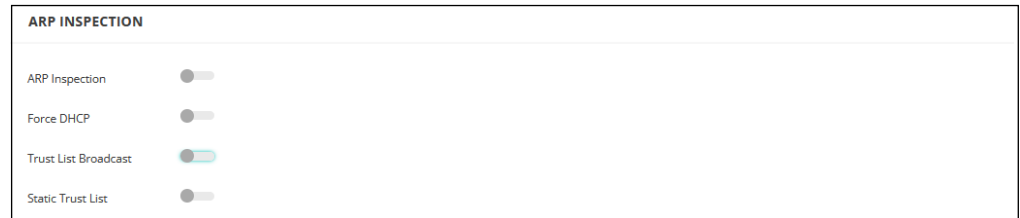


The following items are displayed on this page:

- **Enabled** — Enables port forwarding.
- **Name** — User-defined name. (Range: 1-30 characters)
- **Protocol** — Set the protocol type to which port forwarding is applied. (Options: TCP, UDP, TCP+UDP)
- **External Port** — The Internet traffic TCP/UDP port number. (Range: 1-65535)
- **Destination IP** — The destination IP address on the local network.
- **Destination Port** — The destination protocol port. (Range: 1-65535)

**ARP Inspection** ARP Inspection is a security feature that validates the MAC Address bindings for Address Resolution Protocol packets. It provides protection against ARP traffic with invalid MAC-to-IP address bindings, which forms the basis for certain “man-in-the-middle” attacks. This is accomplished by intercepting all ARP requests and responses and verifying each of these packets before the local ARP cache is updated or the packet is forwarded to the appropriate destination. Invalid ARP packets are dropped.

**Figure 188: ARP Inspection**



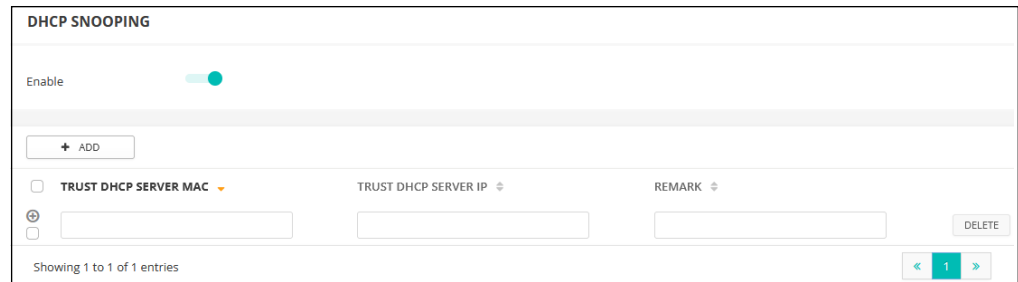
The following items are displayed on this page:

- **ARP Inspection** — When enabled, ARP packets are validated against ARP spoofing.
- **Force DHCP** — Allows an AP to only learn MAC/IP pair information through DHCP packets. Since devices configured with static IP address do not send DHCP traffic, any clients with static IP addresses will be blocked by APs unless their MAC/IP pair is listed and enabled in the Static Trust List.
- **Trust List Broadcast** — Lets other APs learn the trusted MAC/IP pairs to issue ARP requests.
- **Static Trust List** — Adds the MAC or MAC/IP pairs of devices that are trusted to issue ARP requests. Other network nodes can still send their ARP requests, but if their IP appears in the static list with a different MAC, their ARP requests will be dropped.

**DHCP Snooping** DHCP snooping is used to validate and filter DHCP messages received by APs. When DHCP snooping is enabled, DHCP messages received from a device not listed in the DHCP snooping table are dropped.

You can add known and trusted DHCP servers to the table by specifying their MAC and IP addresses.

**Figure 189: DHCP Snooping**



The following items are displayed on this page:

- **Enable** — Enables DHCP Snooping.
- **Trust DHCP Server MAC** — The MAC address of a known and trusted DHCP server.
- **Trust DHCP Server IP** — The IP address of a known and trusted DHCP server.
- **Remark** — A comment relating to the DHCP server configured.

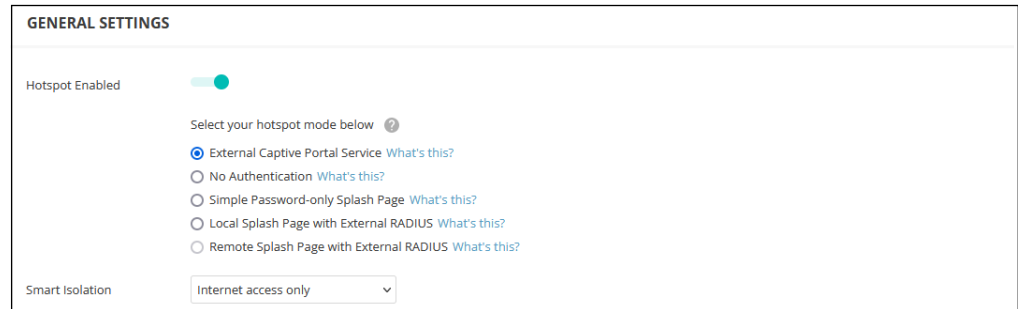
## Hotspot Settings

The Hotspot settings page can configure Internet access for the general public in places such as coffee shops, libraries, and hospitals. Specific access rights may also be defined through a RADIUS server.

When setting up a hotspot service, you must also navigate to the wireless SSID configuration page and select “Hotspot-Controlled” as the network behavior on an SSID interface. (See [“Wireless SSID Configuration”](#) on page 161.)

**General Settings** The General Settings section on the Hotspot page configures the basic hotspot mode.

Figure 190: Hotspot General Settings



The following items are displayed on this page section:

- **Hotspot Enabled** — Enables or disables the hotspot service.

Select the hotspot mode below. (Hotspot Mode will be statically set to “External Portal” for all firmware greater than 1.1.4. Please upgrade to firmware greater than 1.1.4 in order to take advantage of this setting.)

- **External Captive Portal Service** — This option will show the hotspot guest an externally hosted captive portal splash page and may prompt them to login, depending on how you have configured your service settings. Choose this option if you have signed up with a third-party captive portal service provider, such as Cloud4Wi or HotSpotSystem.
- **No Authentication** — This option shows the hotspot guest your customized, locally hosted captive portal splash page, and will not require the guest to login before accessing the Internet. If you fill out the (optional) terms of service text, the guest will be required to accept these before they can access the Internet.
- **Simple Password-only Splash Page** — This option will show the hotspot guest your customized, locally hosted captive portal splash page, and will require them to enter a simple password to login and access the Internet. If you fill out the (optional) terms of service text, the guest will be required to accept these before they can access the Internet.
- **Local Splash Page with External RADIUS** — This option shows the hotspot guest your customized, locally hosted captive portal splash page, and will require them to enter a valid RADIUS user name and password to login and access the Internet. If you fill out the (optional) terms of service text, the guest will be required to accept these before they can access the Internet.
- **Remote Splash Page with External RADIUS** — This is an AuthPort add-on feature (see [“Using the AuthPort Add-On” on page 75](#)). The hotspot will be redirected to an external splash page and authenticate with an external RADIUS server.

- **Smart Isolation** — Enables network traffic to be restricted to the specified network:
  - **Disable (full access)** — There is no traffic isolation. Clients can access the Internet and other devices on the local LAN. This is the option to choose if you trust the clients that will be connecting to your network.
  - **Internet access only** — Traffic from this network can only be routed to and from the Internet. This is the option to choose for hotspot users or users connecting to a guest network.
  - **LAN access only** — Traffic from this network is restricted to local LAN devices only.
  - **Internet-only (strict)** — This is the same as “Internet access only,” but with the additional restriction that users cannot access resources or devices on any private network (192.168.0.0, 172.16.0.0, 10.0.0.0, etc.). This is useful if an AP is “double NAT’ed” and the network upstream from your AP’s gateway is another private network.

**Network Settings** The Network Settings section on the Hotspot page configures local network settings for the hotspot service.

**Figure 191: Hotspot Network Settings**

NETWORK SETTINGS			
IP Address	192.168.182.1	DNS 1	192.168.182.1
Netmask	255.255.255.0	DNS 2	
DHCP Gateway		DNS Domain Name	
DHCP Gateway Port			

The following items are displayed on this page section:

- **IP Address** — Specifies the IP address for the hotspot. Valid IPv4 addresses consist of four decimal numbers, 0 to 255, separated by periods. (Default: 192.168.182.1)
- **Netmask** — Network mask for the associated IP subnet. This mask identifies the host address bits used for routing to specific subnets.
- **DHCP Gateway** — The gateway used to access the DHCP server.
- **DHCP Gateway Port** — The UDP/TCP port used to access the DHCP server.
- **DNS 1** — The IP address of the primary Domain Name Server on the network. A DNS maps numerical IP addresses to domain names and can be used to identify network hosts by familiar names instead of the IP addresses.

- **DNS 2** — The secondary DNS server available to DHCP clients.
- **DNS Domain Name** — The domain name used to resolve incomplete host names via the Domain Name System. (Range: 1-32 characters)

**DHCP Server** The DHCP Server section on the Hotspot page configures DHCP address pool settings for the hotspot service.

**Figure 192: Hotspot DHCP Server Settings**

DHCP SERVER			
DHCP Start	<input type="text" value="10"/>	Lease Time	<input type="text" value="3600"/> seconds
DHCP Limit	<input type="text" value="245"/>		

The following items are displayed on this page section:

- **DHCP Start** — Starting number of (last numeric field) in address pool. (Range: 1-254; Default: 10)
- **DHCP Limit** — Ending number of (last numeric field) in address pool. (Range: 1-245; Default: 245)
- **Lease Time** — The duration that an IP address is assigned to a DHCP client. (Range: 600-43200 seconds; Default: 3600 seconds)

**RADIUS Server** The RADIUS Server section on the Hotspot page configures RADIUS server settings for the hotspot service.

**Figure 193: Hotspot RADIUS Server Settings**

RADIUS SERVER			
Enable RADIUS Auth	<input checked="" type="checkbox"/>	Enable RadSec	<input checked="" type="checkbox"/>
RADIUS Server Address	<input type="text" value="127.0.0.1"/>	Enable MAC Auth	<input type="checkbox"/>
Backup RADIUS server address	<input type="text" value="Enter RADIUS server IP address"/>	Auth method	<input type="text" value="CHAP"/>
RADIUS server shared secret	<input type="password" value="*****"/>	Local ID	<input type="text" value="0"/>
RADIUS server auth port	<input type="text" value="1812"/>	Local name	<input type="text"/>
RADIUS Accounting	<input checked="" type="checkbox"/>	Generate NAS ID	<input type="checkbox"/>
RADIUS server acct port	<input type="text" value="1813"/>	NAS ID	<input type="text"/>
Dynamic Authorization	<input checked="" type="checkbox"/>		
DAE Port	<input type="text"/>		
DAE Client	<input type="text"/>		
DAE Secret	<input type="password"/>		

The following items are displayed on this page section:

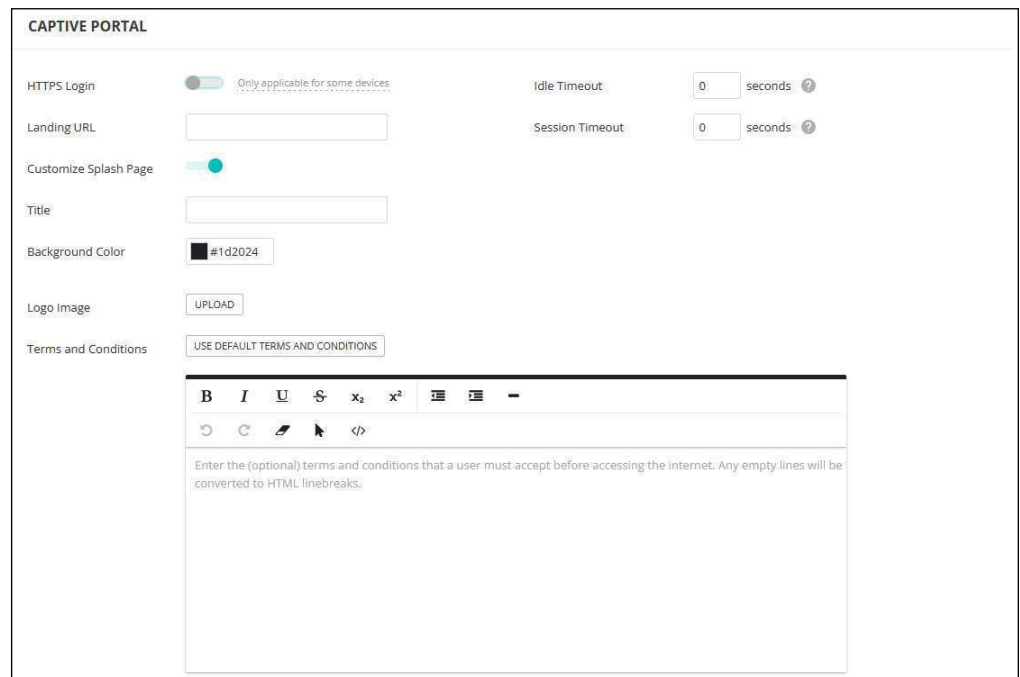
- **Enable RADIUS Auth** — Enables RADIUS authentication for clients attempting to access the captive portal.
- **RADIUS Server Address** — IP address or host name of the primary RADIUS server.
- **Backup RADIUS server address** — IP address or host name of the secondary RADIUS server.
- **RADIUS server shared secret** — A shared text string used to encrypt messages between the access point and the RADIUS server. Be sure that the same text string is specified on the RADIUS server. Do not use blank spaces in the string. (Range: 1-255 characters).
- **RADIUS server auth port** — RADIUS server UDP port used for authentication messages. (Range: 1-65535, Default: 1812)
- **RADIUS server acct port** — RADIUS server UDP port used for accounting messages. (Range: 1-65535, Default: 1813)
- **Dynamic Authorization** — Enables Radius Dynamic Authorization Extensions, allowing administrators to dynamically disconnect online users or change authorization levels.
  - **DAE Port** — UDP port used for Dynamic Authorization requests between the RADIUS server and the access point.
  - **DAE Client** — IP address of the AP that is authorized to send Disconnect and Change of Authorization requests to the RADIUS server.
  - **DAE Secret** — Shared secret used for secure communication between the RADIUS server and the access point.
- **Enable RadSec** — An authentication and authorization protocol for transporting RADIUS datagrams over TCP and TLS. RadSec replaces UDP used in the initial RADIUS design, providing a reliable transport protocol and more extensive security for the packet payload.
- **Auth method** — Selects the encryption method to use for messages between the AP and the RADIUS server; CHAP, PAP, or MS-CHAPv2. The encryption method must match that used by the RADIUS server. (Default: CHAP)
- **Local ID** — Local RADIUS server identifier.
- **Local Name** — Local RADIUS server name
- **Generate NAS ID** — This option will generate a unique NAS ID for each device in this site.

- **NAS ID** — Local RADIUS server operation identifier.

**Captive Portal** The Captive Portal section on the Hotspot page configures portal details for the hotspot service.

A captive portal forces a hotspot client to access a welcome web page before gaining further access to the Internet. The welcome page may require authentication and/or payment.

**Figure 194: Hotspot Captive Portal Settings**



Depending on the hotspot mode selected, the following items are displayed on this page section:

*Common to all Modes*

- **Landing URL** — Indicates the URL to which the user is directed after logging in to the captive portal.
- **Idle Timeout** — The maximum a connection can remain inactive before it is closed. (Range: 0-86400 seconds)
- **Session Timeout** — The maximum time a client can stay logged in to the hotspot. (Range: 0-86400 seconds)

*Common to all Modes Except External Captive Portal Service and Remote Splash Page with External RADIUS*

- **HTTPS Login** — Enables HTTPS for the captive portal.

*Common to all Modes Except External Captive Portal Service*

- **Customize Splash Page** — When enabled, fill in the information that is used to create the local captive portal welcome page.
  - **Title** — Enter the text you want to display as the title on the page.
  - **Background Color** — Click the button to select a color for the page background.
  - **Logo Image** — Click the “Upload” button to send an image file. Files are limited to a size of 1MB and the image must have a maximum height and width of 1000 pixels.
  - **Terms and Conditions** — Enter text in the window that define the captive portal terms and conditions, and then use the controls to format the text. Alternatively, click the “Use Default Terms and Conditions” button to import a generic text that you can then edit.

*External Captive Portal Service Mode*

- **Captive portal URL** — Host name of Internet service portal for the hotspot.
- **Captive portal secret** — The password used for logging into the hotspot.
- **Swap Octets** — Swap the values of the reported “input octets” and “output octets.”

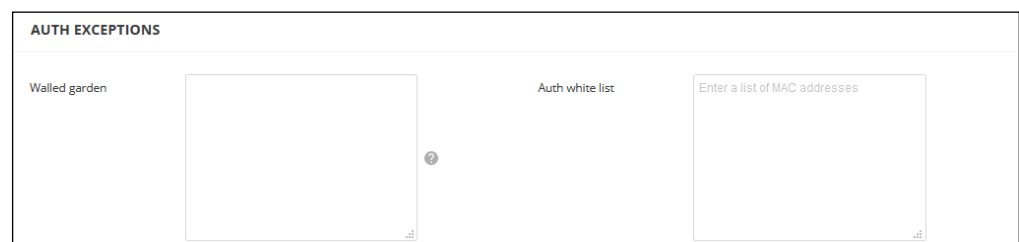
*Simple Password-only Splash Page Mode*

- **Splash Page Password** — The password required for users to log in and access the Internet.

## Authentication Exceptions

The Auth Exceptions section on the Hotspot page configures a “walled garden” and white list for the hotspot service.

**Figure 195: Hotspot Authentication Exceptions**



The following items are displayed on this page section:

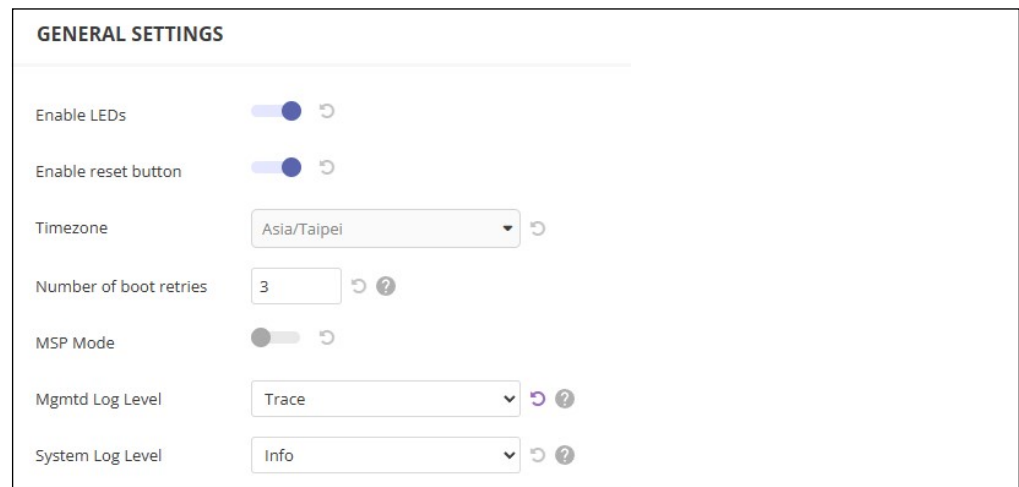
- **Walled garden** — Enter a list of domains or IP addresses in CIDR notation that hotspot users can access before being authenticated by the captive portal. Wildcard domains can be specified in the format of *domain.com* (allow domain and all sub-domains), or *.domain.com* (only allow sub-domains).
- **Auth white list** — A list of MAC addresses that are allowed to bypass the captive portal to access the Internet.

## System Settings

The System Settings page allows you to control remote management access to APs and configure NTP time servers, Telnet, Web, and SNMP management interfaces are enabled and open to access from the Internet. To provide more security, specific services can be disabled and management access prevented from the Internet.

**General Settings** The General Settings section on the System Settings page can be used to configure the cloud status LED, reset button, and time zone.

Figure 196: General System Settings



The following items are displayed on this page:

- **Enable LEDs** — Only supported on ECW5211, ECWO5211, OAP100, and Spark Wave 2/SunSpot Wave 2 running 3.0.0+ firmware. The LEDs are on when a radio is enabled and operating normally.

- **Enable reset button** — Enables or disables the hardware reset button. Note that the reset button cannot be disabled at the site level.
- **Timezone** — To display a time corresponding to your local time, choose one of the predefined time zones from the pull-down list.
- **Number of boot retries** — The maximum number of bootup retries before switching to the next boot bank. (Range: 1-254; Default: 3)
- **MSP Mode** — Enables the Managed Service Provider (MSP) mode that prevents end-users from accessing and modifying most device settings from user-defined user accounts. Management access from “root” and “admin” accounts still provide full access to all device settings. (Default: Disabled)

With MSP mode enabled, service providers have the option of making specific wireless SSID settings available for user configuration by enabling the “Local Configurable” setting.



**Note:** Do not enable MSP Mode and “Always follow cloud configuration” (page 65) at the same time. This will cause the device configuration not to be updated to ecCLOUD properly.

- **MgmtD Log Level** — Use the menu to select the severity of the system log level for the ecCLOUD daemon (mgmtd). Logs with the severity level you select and all logs of greater severity print. For example, if you select Debug, the logged messages include Debug, Informational, Warning, and Error. The default severity level is Informational(2). The severity can be one of the following levels:

**Table 1: Management Daemon Logging Levels**

Level	Severity Name	Description
4	Trace	Granular details about the system's interactions, state changes, and network communications
3	Debug	Debugging messages
2	Info	Informational messages only
1	Warn	Warning conditions (e.g., return false, unexpected return)
0	Error	Error conditions (e.g., invalid input, default used)

- **Syslog Level** — Use the menu to select the severity of the logs to print to the console. The default severity level is Informational(6). The severity can be one of the following levels:

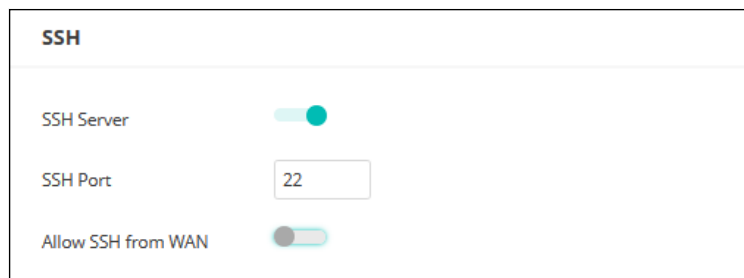
Table 2: System Logging Levels

Level	Severity Name	Description
7	Debug	Debugging messages
6	Info	Informational messages only
5	Notice	Normal but significant condition, such as cold start
4	Warn	Warning conditions (e.g., return false, unexpected return)
3	Error	Error conditions (e.g., invalid input, default used)
2	Critical	Critical conditions (e.g., memory allocation, or free memory error - resource exhausted)
1	Alert	Immediate action needed
0	Emergency	System unusable

**SSH** The Secure Shell (SSH) acts as a secure replacement for Telnet. The SSH protocol uses generated public keys to encrypt all data transfers passing between the access point and SSH-enabled management station clients and ensures that data traveling over the network arrives unaltered. Clients can then securely use the local user name and password for access authentication.

Note that SSH client software needs to be installed on the management station to access the access point for management via the SSH protocol.

Figure 197: SSH Server Settings



The following items are displayed on this page:

- **SSH Server** — Enables or disables SSH access to the access point. (Default: Enabled)
- **SSH Port** — Sets the TCP port number for the SSH server on the access point. (Range: 1-65535; Default: 22)
- **Allow SSH from WAN** — Allows SSH management access from the WAN.

**Discovery Tool** The Edgecore Discovery agent allows the AP to be discovered by other devices on the local network or over the Internet.

**Figure 198: Discovery Tool Settings**



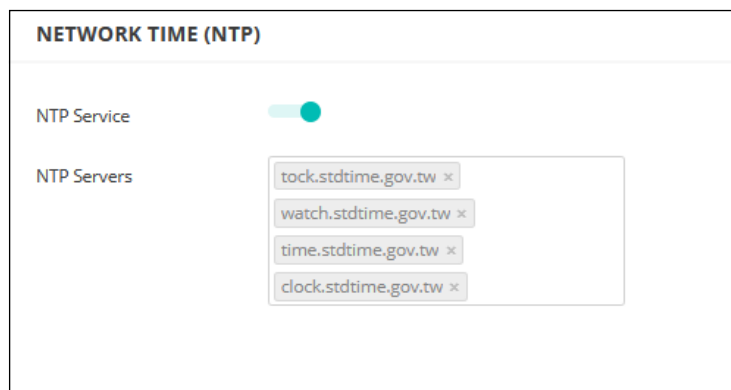
The following items are displayed on this page:

- **Discovery Tool** — Enables or disables the discovery tool. (Default: Enabled)
- **Allow over WAN** — Allows discovery tool access from the WAN.

**Network Time** Network Time Protocol (NTP) allows the access point to set its internal clock based on periodic updates from a time server (SNTP or NTP). Maintaining an accurate time on the access point enables the system log to record meaningful dates and times for event entries. If the clock is not set, the access point will only record the time from the factory default set at the last bootup.

The access point acts as an NTP client, periodically sending time synchronization requests to specified time servers. The access point will attempt to poll each server in the configured sequence to receive a time update.

**Figure 199: NTP Settings**



The following items are displayed on this page:

- **NTP Service** — Enables or disables sending of requests for time updates. (Default: Enabled)
- **NTP Servers** — Sets the host names for time servers. The switch attempts to update the time from the first server, if this fails it attempts an update from the

next server in the sequence. To configure additional servers, type in an entry in the blank field at the bottom of the list.

**SNMP** Simple Network Management Protocol (SNMP) is a communication protocol designed specifically for managing devices on a network. It is typically used to configure these devices for proper operation in a network environment, as well as to monitor them to evaluate performance or detect potential problems.

Figure 200: SNMP Settings

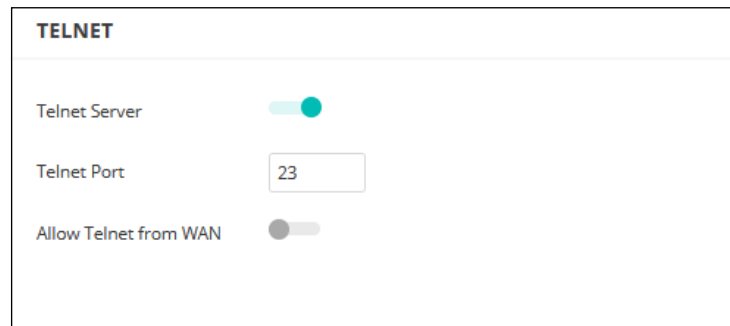
The following items are displayed on this page:

- **SNMP Server** — Enables or disables SNMP on the access points. (Default: Enabled)
- **Write Community** — A community string that acts like a password and permits access to the SNMP protocol. (Range: 1-32 characters, case sensitive; Default: public)  
The default string “public” provides read-only access to the access point’s Management Information (MIB) database.
- **IPv6 Write Community** — A community string for IPv6 access to the access point’s Management Information (MIB) database. (Range: 1-32 characters, case sensitive; Default: private6)
- **Read Community** — A community string for read-only access to the access point’s Management Information (MIB) database. (Range: 1-32 characters, case sensitive; Default: public)
- **IPv6 Read Community** — A community string for IPv6 read-only access to the access point’s Management Information (MIB) database. (Range: 1-32 characters, case sensitive; Default: public6)

- **Trap** — Enables the sending of SNMP trap messages to a specified server. The access point sends the following trap messages: cold start, warm start, link up, and link down. (Default: Disabled)
  - **Server IP** — The IP address of the SNMP trap server that will receive the trap messages.

**Telnet** Telnet is a remote management tool that can be used to configure the access point from anywhere in the network. However, note that Telnet is not secure from hostile attacks. Telnet provides access to a Linux-based interface which is used for device analysis and debugging.

**Figure 201: Telnet Server Settings**



The following items are displayed on this page:

- **Telnet Server** — Enables or disables Telnet access to the access point. (Default: Enabled)
- **Telnet Port** — Sets the TCP port number for the Telnet server on the access point. (Range: 1-65535; Default: 23)
- **Allow Telnet from WAN** — Allows Telnet management access from the WAN.

**Web Server** A Web browser provides the primary method of managing the access point. Both HTTP and HTTPS service can be accessed independently. If you enable HTTPS, you must indicate this in the URL: https://device:port\_number]

When you start HTTPS, the connection is established in this way:

- The client authenticates the server using the server’s digital certificate.
- The client and server negotiate a set of security protocols to use for the connection.
- The client and server generate session keys for encrypting and decrypting data.
- The client and server establish a secure encrypted connection.
- A padlock icon should appear in the status bar for most browsers.

Figure 202: Web Server Settings

WEB SERVER	
HTTP Port	<input type="text" value="80"/>
Allow HTTP from WAN	<input checked="" type="checkbox"/>
HTTPS Port	<input type="text" value="443"/>
Allow HTTPS from WAN	<input checked="" type="checkbox"/>

The following items are displayed on this page:

- **HTTP Port** — The TCP port to be used by the HTTP Web browser interface. (Range: 1-65535; Default: 80)
- **Allow HTTP from WAN** — Allows HTTP management access from the WAN.
- **HTTPS Port** — The TCP port to be used by the HTTPS Web browser interface. (Range: 1-65535; Default: 443)
- **Allow HTTPS from WAN** — Allows HTTPS management access from the WAN.

**Remote Syslog** Use this feature to send log messages to a Syslog server.

Figure 203: Remote Log Settings

REMOTE SYSLOG	
Remote Syslog	<input checked="" type="checkbox"/>
Server IP	<input type="text"/>
Server Port	<input type="text"/>
Log Prefix	<input type="text"/>
Track connections	<input type="checkbox"/>

The following items are displayed on this page:

- **Remote Syslog** — Enables/disables the logging of debug or error messages to the remote logging process. (Default: Disabled)
- **Server IP** — Specifies the IP address of a remote server which will be sent syslog messages.

- **Server Port** — Specifies the UDP port number used by the remote server. (Range: 1-65535)
- **Log Prefix** — Sets the prefix for the log file sent to the specified server. The file suffix “log” is used.
- **Track connections** — Sends wireless client connection log messages to the Syslog server.

**Multicast DNS** Use this feature to enable Multicast DNS support on APs. Multicast DNS can be used on small networks that do not have a DNS server to resolve host names to multicast IP addresses.

Multicast DNS settings are available only on devices with mDNS support.

**Figure 204: Multicast DNS Settings**



The following items are displayed on this page:

- **MDNS** — Enables or disables multicast DNS support. (Default: Enabled)

**LLDP** Link Layer Discovery Protocol (LLDP) is used to discover basic information about neighboring devices in a network. LLDP is a Layer 2 protocol that uses periodic broadcasts to advertise information about the sending device.

**Figure 205: LLDP Settings**



The following items are displayed on this page:

- **Enable** — Enables the sending of LLDP advertisements about the AP to neighboring devices in the network. (Default: Disabled)
- **Tx Interval (seconds)** — Sets the periodic transmit interval for LLDP advertisements. (Range: 5-32768 seconds; Default: 30 seconds)

- **Tx Hold (number of time(s))** — Configures a time-to-live (TTL) value sent in the LLDP advertisements as shown in the formula below. (Range: 2-10; Default: 4)

The time-to-live tells the receiving LLDP agent how long to retain all information pertaining to the sending device if it does not transmit updates in a timely manner.

The TTL in seconds is based on the following rule:  
minimum value ((Tx Interval \* Tx Hold), or 65535)  
Therefore, the default TTL is  $4 * 30 = 120$  seconds.

**iBeacon** The AP supports the iBeacon standard based on Bluetooth Low Energy (BLE). Devices with BLE Beacons can provide location-based services to BLE clients, such as phones, that can recognize the beacon advertisements, extract the provided information, and then take actions based on the content.

Figure 206: iBeacon Settings

The following items are displayed on this page:

- **Enable** — Enables iBeacon support on the AP. (Default: Enabled)
- **UUID** — The iBeacon Universally Unique Identifier that advertises the beacon service. The UUID contains 32 hexadecimal digits in five groups, separated by hyphens.
- **Major** — The iBeacon value that is used to identify a beacon group. (Range: 0-65535)

- **Minor** — The iBeacon value that is used to identify individual beacons within a group. (Range: 0-65535)
- **Tx Power** — Sets the BLE radio transmit power (supported only on EAP101 and EAP104). (Range: 5 dBm to -20 dBm; Default: 5 dBm)
- **BLE Probe Request Data Push** — Enables BLE probe request detection and sends collected data to the cloud.
- **Publish MQTT** — Sends iBeacon data to a Message Queuing Telemetry Transport broker for integration with external systems.
  - **Topic** — The MQTT topic where iBeacon data is published.
  - **Host** — The IP address or hostname of the MQTT broker. (Default: 127.0.0.1)
  - **Port** — The TCP port used for MQTT communication. (Default: 1883)
  - **Client ID** — The identifier for this AP when connecting to the MQTT broker.
  - **User Name / Password** — Optional authentication credentials for the MQTT broker.

**SNMPv3 User** SNMP protocol version 3 provides secure access by account authentication and data encryption. An SNMP v3 user can be defined by clicking the Add button.

**Figure 207: SNMPv3 User Settings**

SNMP V3 USER							+ ADD
<input type="checkbox"/>	NAME	ACCESS AUTH	AUTH TYPE	AUTH PWD	ENCRYPTION TYPE	ENCRYPTION PWD	
<input type="checkbox"/>		Write	MD5		DES		DELETE

The following items are displayed on this page:

- **Name** — The user name used to access the SNMP service.
- **Access Auth** — Select the access permission as “Read Only” or “Write.”
- **Auth Type** — Select the hash algorithm for authentication.
- **Auth Pwd** — Configure the password for authentication.
- **Encryption Type** — Select the encryption algorithm for data packets.
- **Encryption Pwd** — Configure the password for data encryption.

## OpenRoaming

OpenRoaming provides a standard for public-access Wi-Fi networks to support seamless roaming between wireless networks. An OpenRoaming network advertises its public Wi-Fi capabilities and services so that clients can decide if they want to connect to the network.

Up to 32 OpenRoaming profiles can be configured and applied to specific wireless networks (see “OpenRoaming” under “Adding an SSID” on page 162). Click “Add Custom Openroaming” to configure a profile.

Figure 208: OpenRoaming Profile

The screenshot shows the configuration page for an OpenRoaming profile named "TEST1". At the top, there is a header "OPENROAMING" with a help icon and a button "+ ADD CUSTOM OPENROAMING". Below the header, the profile name "TEST1" is displayed. The main configuration area includes several sections:

- Internet Access:** A toggle switch is currently turned off.
- Access Network Type:** A dropdown menu showing "Private network: Home and Ente".
- HESSID:** A text input field containing "ff:ff:ff:ff:ff:ff".
- Venue Group:** A dropdown menu showing "Unspecified".
- Venue Type:** A dropdown menu showing "Unspecified".
- Network Auth Type:** A dropdown menu showing "Acceptance of terms and conditio".
- IPv4 Address Type:** A dropdown menu showing "Address type not available".
- IPv6 Address Type:** A dropdown menu showing "Address type not available".
- Operating Class:** A text input field containing "5173".

Below these settings are several sections for adding rules, each with a "+ ADD RULE" button:

- VENUE NAME INFORMATION
- NAI REALM LIST
- OPERATOR FRIENDLY NAME
- CELLULAR NETWORK INFORMATION LIST(PLMN)
- DOMAIN NAME LIST
- ROAMING CONSORTIUM LIST

At the bottom of the configuration area, there are two buttons: "RENAME" and "DELETE".

The following items are displayed on this page:

- **Internet Access** — Enable if this network provides access to the Internet.

- **Access Network Type** — Select one from the predefined list.
  - **Private network** — Home and enterprise networks that unauthorized users cannot access.
  - **Private network with guest access** — A private network that provides for guest access. A typical example would be an enterprise network that offers guest access.
  - **Chargeable public network** — A network that is available to all users, but requires a fee.
  - **Free Public Network** — A network that is available to all users without any fees.
  - **Personal device network** — A network for peripheral connectivity in an ad-hoc mode. For example, a camera that connects to a printer.
  - **Emergency services only network** — A network that is dedicated for access to emergency services only.
  - **Test or experimental** — A network for tests or experimental work.
  - **Wildcard** — When selected, the AP will reply to clients regardless of the network type requested by the client query.
- **HESSID** — The Homogenous Extended Service Set Identifier (HESSID) for the OpenRoaming network. When configured, the HESSID (a MAC address) uniquely identifies all APs belonging to the same network.
- **Venue Group** — Identifies the general class of the venue. Select from the predefined list.
- **Venue Type** — Identifies the specific type of venue within each group.
- **Network Auth Type** — Specifies the authentication required for the network. Select an option from the predefined list. (Default: “Acceptance of terms and conditions”)
- **IPv4 Address Type** — Specifies the IPv4 address type available from the network.
- **IPv6 Address Type** — Specifies the IPv6 address type available from the network
- **Operating Class** — A standard index (based on IEEE Std 802.11-2012 Annex E) that specifies the AP supported operating channels.

- **Venue Name Information** — Configures a list of up to 10 venue names.
  - **Language** — Select a language from the list. (Default: English)
  - **Name** — The name of the network venue. Multiple names can be added to the list.
  - **URL** — Specifies a URL that provides additional venue information to users.
- **NAI Realm List** — (Optional) The network access identifier (NAI) realm list identifies those service provider or other networks that are accessible through the AP. By discovering which authentication realms are supported by a network, a mobile device can selectively authenticate to its preferred network. Up to 10 identifiers can be configured.
- **Operator Friendly Name** — The name of the network operator and the specified language. Up to 10 names can be configured.
- **Cellular Network Information List (PLMN)** — (Optional) Identifies the 3GPP cellular networks available through the AP. Specifically, this field identifies the Public Land Mobile Network (PLMN) ID, comprised of the Mobile Country Code (MCC) and Mobile Network Code (MNC) of the mobile operator. Up to 10 PLMN IDs can be configured. Input the pair of MCC, MNC.  
For example: 400, 00  
MCC: Three decimal digits (000-999)  
MNC: Two (00-99) or three decimal digits (000-999)
- **Domain Name List** — Lists one or up to 10 domain names for the entity operating the AP. This is critical for OpenRoaming network selection policy, as it identifies the operator of the network. It indicates to the mobile device whether they are at a home hotspot or a visited hotspot.
- **Roaming Consortium List** — (Optional) A roaming consortium is a group of service providers (SP) with which a user's credentials can be used for authentication. Each roaming consortium is identified by an organization identifier (OI) that is assigned by the IEEE. An OI is often 24 bits in length, but can also be 36 bits. Up to 10 identifiers can be configured.



# 6

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## Site Terragraph Configuration

This chapter describes configuration settings for MetroLinq Terragraph units at the Site level. It includes the following sections:

- [“MetroLinq Terragraph Configuration” on page 211](#)
- [“VLAN Settings” on page 214](#)

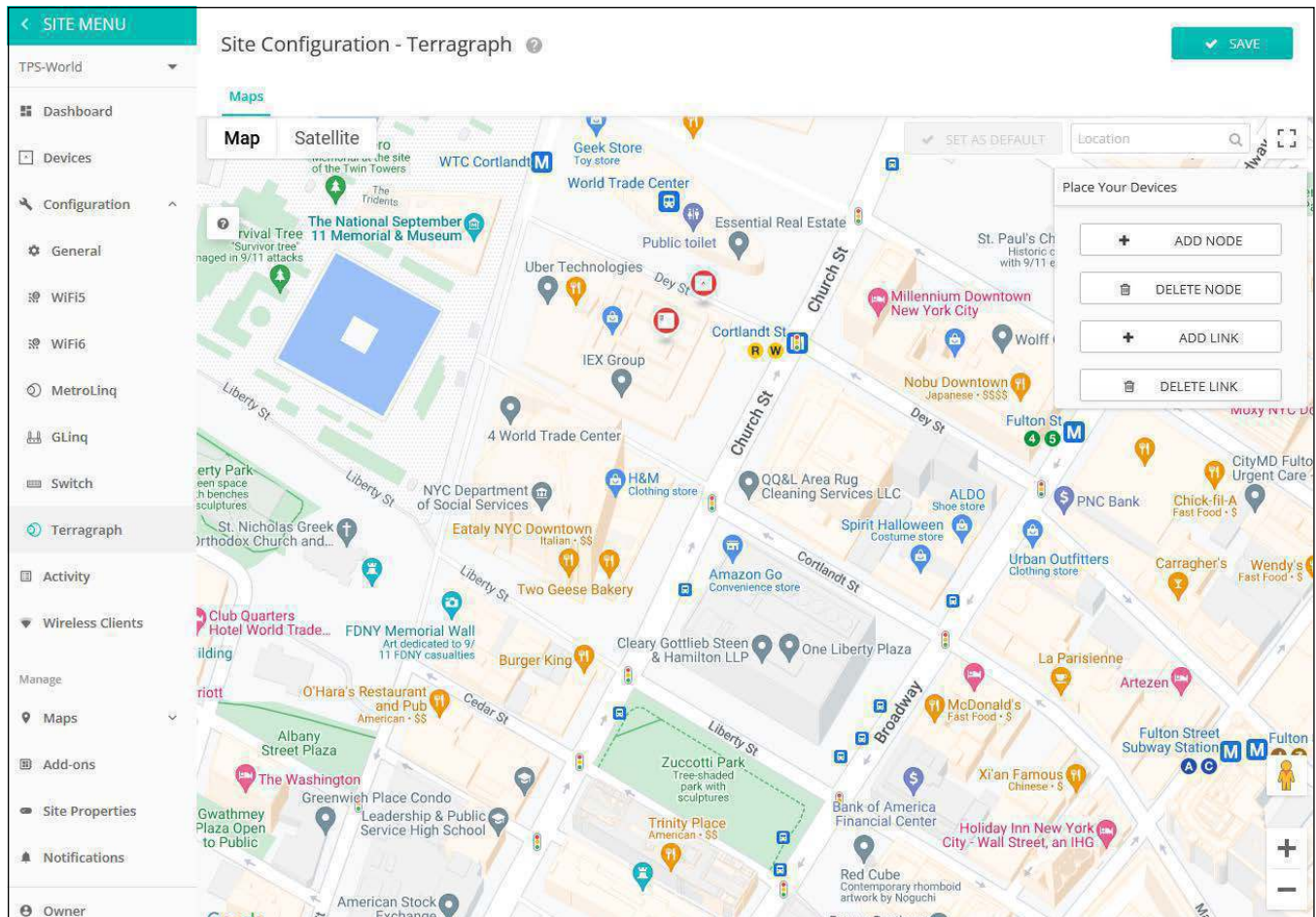
## MetroInq Terragraph Configuration

The network connectivity and topology for MetroInq Terragraph units can be defined on the PoP node when the local controller is enabled. After defining the topology, the PoP will find the nodes and set up links automatically.

**Note:** When configuring MetroInq Terragraph units, be sure to follow these points:

1. After resetting a PoP node to defaults, you should delete all nodes and links, and then re-add them to the Site Configuration page.
2. Be sure to delete all related links and nodes before you delete or move a device to another site.

Figure 209: Site Terragraph Configuration



The Terragraph site configuration page includes these items:

- **Add Node** — Fill in correspond type and Radio MAC to add Node.

Figure 210: Add Terragraph Node

- **Name** — The name of the node. It is defined automatically based on the node type, but can be modified afterward.
- **MAC** — The system MAC address of the node. For a DN, the system MAC address can be found on the device’s label or on the Dashboard tab. For a CN, use the radio MAC as the node MAC.
- **Type** — Set the node as Distribution Node (DN) or Client Node (CN).
- **Radio A/B/C/D** — The MAC addresses of the radios.
- **Pop** — Only one of the MLTG-360 devices can be the PoP node in a topology.

Note that POP DN can only be named as “POP.”

- **Delete Node** — Delete the node from the topology. You need to delete all related links before deleting a node.

Figure 211: Delete Terragraph Node

- **Name** — The name of the node.
- **MAC** — The system MAC address of the node.

- **Add Link** — Select two nodes and corresponding radio MACs to establish a link.

Figure 212: Add Terragraph Link

The screenshot shows a dialog box titled "Add Link" with a "CANCEL" button and a "CONFIRM" button. The main content area is titled "Add Link" and contains five rows of dropdown menus. The first row is "Node A", the second is "MAC A", the third is "Node B", the fourth is "MAC B", and the fifth is "Channel". The "Node A" and "Node B" dropdowns are highlighted with a red border and have a red error message below them: "Link can't be added." The "Channel" dropdown is set to "1".

- **Node A** — Selects the node A name.
- **MAC A** — Selects the node A radio MAC address.
- **Node B** — Selects the node B name.
- **MAC B** — Selects the node B radio MAC address.
- **Channel** — Select the working channel. Channels 1 to 4 are available.
- **Delete Link** — Select a specific node pair to delete a link.

Figure 213: Delete Terragraph Link

The screenshot shows a dialog box titled "Delete Link" with a "CANCEL" button and a "CONFIRM" button. The main content area is titled "Delete Link" and contains four rows of dropdown menus. The first row is "Node A", the second is "MAC A", the third is "Node B", and the fourth is "MAC B". The "Node A" dropdown is highlighted with a red border and has a red error message below it: "Link can't be deleted." The other dropdowns are empty.

- **Node A** — Selects the node A name.
- **MAC A** — Selects the node A radio MAC address.
- **Node B** — Selects the node B name.
- **MAC B** — Selects the node B radio MAC address.

## VLAN Settings

QinQ tagging adds a second VLAN tag to the Ethernet frame, which then contains the original VLAN tag and additional information, such as the service provider VLAN. This allows network operators to extend VLANs across multiple switches and service provider networks, creating a more scalable and flexible network architecture.

After configuring the VLANs, data traffic from the LAN side of a CN device will be encapsulated with configured S-VLAN and C-VLAN headers, and then be forwarded to the uplink of the POP node.

This feature is available for MLTG devices with firmware 1.5.0 and above.

**Figure 214: Site Terragraph VLAN Settings**

NAME	S-VLAN ID	C-VLAN ID
CN	0	0

The following items are displayed on this page:

- **Name** — A name that identifies the VLAN configuration.
- **S-VLAN ID** — The Service VLAN, which is a VLAN that is used to differentiate traffic from different customers or services in a service provider network.
- **C-VLAN ID** — The Customer VLAN, which is a VLAN that is used to differentiate traffic from different customers in a service provider network.



# 7

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## Site SD-WAN Configuration

This chapter describes the configuration settings for SD-WAN devices at the site level. It includes the following section:

- [“VPN Group Configuration” on page 217](#)

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## VPN Group Configuration

From the Site menu, open “Configuration” and then “SDWAN” to display the configuration options that apply to all SD-WAN devices in the same site.

**VPN Group** The VPN Group tab on the SD-WAN configuration page includes these items:

- **General Settings**

- **Name** — Define a name for the new VPN group.
- **Subnet IP** — Specify the virtual IP address for the VPN tunnel. It does not overlap with WAN IPs or LAN subnets of devices within the group.
- **Subnet Mask** — Select the subnet mask of the virtual tunnel IP.
- **Protocol** — Select TCP (default and recommended) or UDP for the VPN tunnel.
- **Port** — The port used by Hub devices in the VPN group. Ensure no conflicts with ports in use on the Hub device.
- **Autonomous Data Tunnel** — Enable or disable autonomous tunneling to allow independent data tunnel creation without manual intervention.

Figure 215: Add New VPN Group

The screenshot shows the 'Add New VPN Group' configuration interface. It has a dark header with 'Add VPN Group' and 'CANCEL' and 'CONFIRM' buttons. The main content is divided into two sections: 'General Settings' and 'VPN Group Devices'.  
**General Settings:**  
- Name: Text input field.  
- Subnet IP: Text input field.  
- Subnet Mask: Dropdown menu with '255.255.255.0 (/24)' selected.  
- Protocol: Dropdown menu with 'TCP' selected.  
- Port: Text input field with '1194'.  
- Autonomous Data Tunnel: Toggle switch (off).  
**VPN Group Devices:**  
- VPN Device List: A table with '+' and '-' buttons.  
- Group Devices: Dropdown menu with 'Please select...'.  
- SN: Text input field.  
- Role: Dropdown menu with 'Hub' selected.  
- WAN1 VPN Service Type: Dropdown menu with 'Customized' selected.  
- WAN1 VPN Service IP: Text input field.  
- WAN2 VPN Service Type: Dropdown menu with 'Customized' selected.  
- WAN2 VPN Service IP: Text input field.

### ■ VPN Group Devices

- **Group Devices** — Add devices to the VPN Device List by selecting from the available list.
- **SN** — Serial Number of this site device.
- **Role** — Devices in the VPN Group are assigned one of the following roles:
  - **Hub** — The central node that acts as a VPN server. For Hubs behind NAT, set a WAN VPN Service Type as 'Customized' with the WAN IP of the NAT router. Only one Hub is permitted per VPN Group.
  - **Spoke** — Device acting as VPN client, where Internet access is local to the site device.
  - **To Server** — Device acting as a VPN client, where Internet traffic is routed to the Hub through the VPN tunnel.
- **WAN1/WAN2 VPN Configuration** — For Hub devices, specify service type between Customized and Domain Name., domain name, and public IP for WAN1 and WAN2. If 'Customized' is selected, manually input the service IP for the corresponding WAN. If 'Domain Name' is selected, manually input the service domain.

# 8

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## WiFi 5 Device Configuration

This chapter describes configuration settings for access points at the Device level. It includes the following sections:

- [“Accessing Device-Level Configuration” on page 220](#)
- [“Device Radio Settings” on page 222](#)

## Accessing Device-Level Configuration

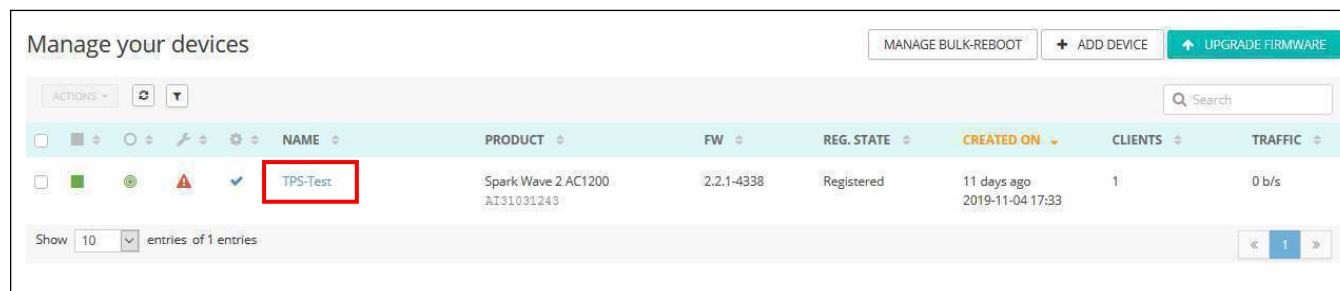
When a device’s “Inheritance Policy” is enabled, the device is configured from the Site level. However, a device can be individually configured at the Device level and the settings will override the Site-level configuration.

**Note:** Individual device overrides can be reset to the Site-level configuration by clicking the “Use Site Settings” button on the page where a setting has been changed.

In addition, wireless devices include settings not configurable at the Site level, such as advanced radio settings and features unique to a specific product. These settings can only be configured at the Device level.

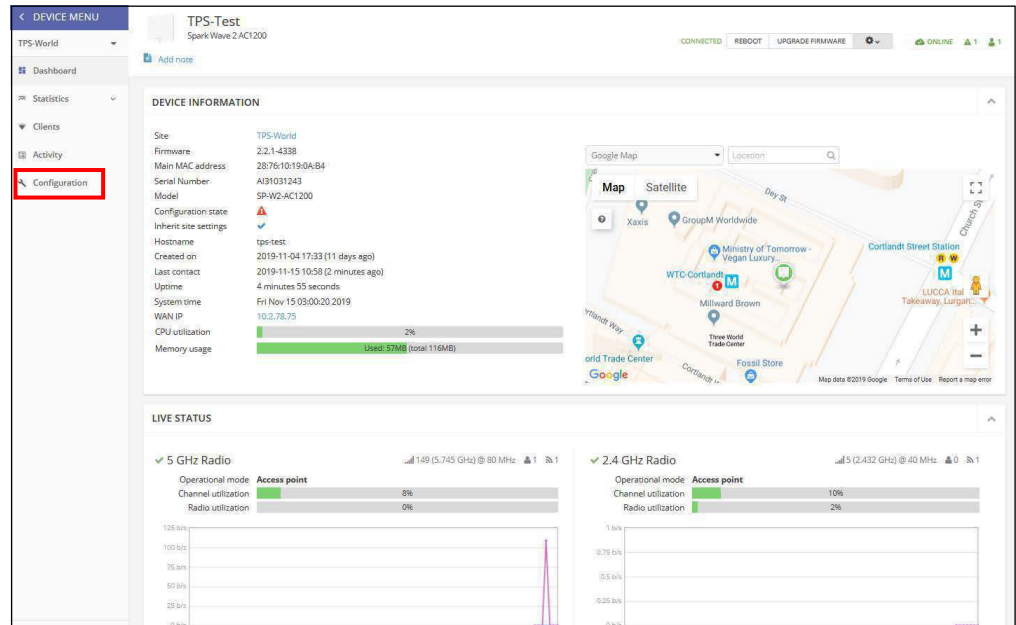
To access configuration for a device, click on the device name from the Site-level list of devices (also available from the Cloud-level list of devices).

Figure 216: Accessing Device-Level Configuration



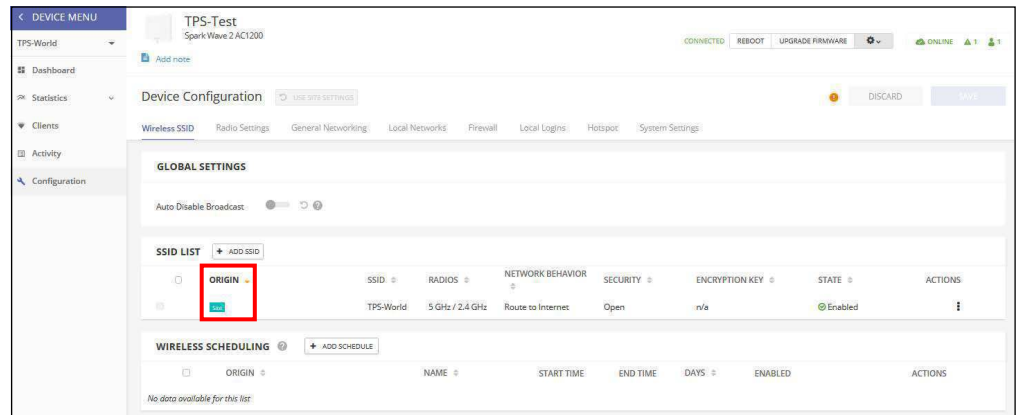
From the Device dashboard, click on “Configuration” on the Device menu to access a device’s configuration.

Figure 217: Device-Level Dashboard



The Device Configuration page includes tabbed sections similar to the Site Configuration page.

Figure 218: Device Configuration



Device-level configuration for SSIDs are indicated in the “Origin” column of the SSID list; either “Site” or “Device” is displayed. Most other configuration items at the Device level are identical to those at the Site level.

This chapter only covers the device configuration that is different from the Site-level configuration, as documented in “Site WiFi 5 Configuration” on page 118.

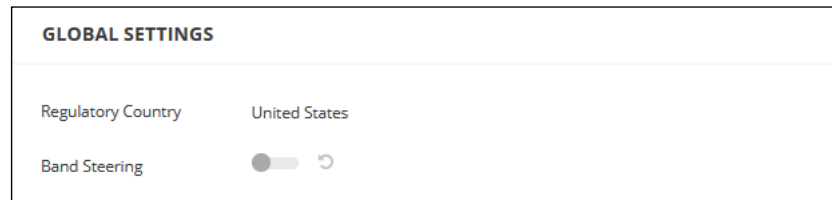
## Device Radio Settings

Click the “Radio Settings” tab to configure 5 GHz and 2.4 GHz radio settings. Note that settings apply to all configured SSID interfaces.

The following items are displayed on the Radio Settings tab. Configuration options apply to both the 5 GHz and 2.4 GHz radios unless otherwise indicated.

### Global Settings

Figure 219: Device Global Radio Settings



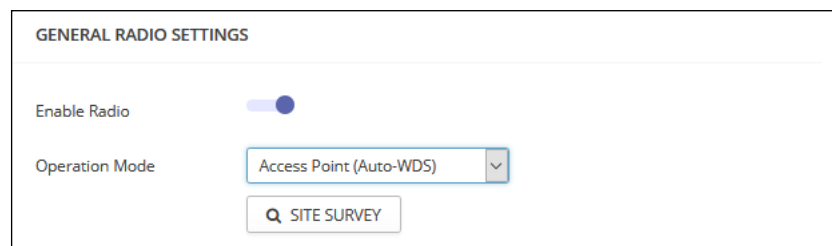
- **Regulatory Country** — The wireless device regulatory setting. This setting is displayed but not configurable at the Device level.

The AP’s country code must be correctly set to be sure that the radios operate according to permitted local regulations. That is, setting the country code restricts operation of the AP to the radio channels and transmit power levels permitted for wireless networks in the specified country.

- **Band Steering** — When enabled, clients that support 2.4 GHz and 5 GHz are first connected to the 5 GHz radio. This feature helps balance the client load over the two radio bands. Note that both radios must have configured SSIDs that match for this feature to fully operate. (Default: Disabled)

### General Radio Settings

Figure 220: Device General Radio Settings



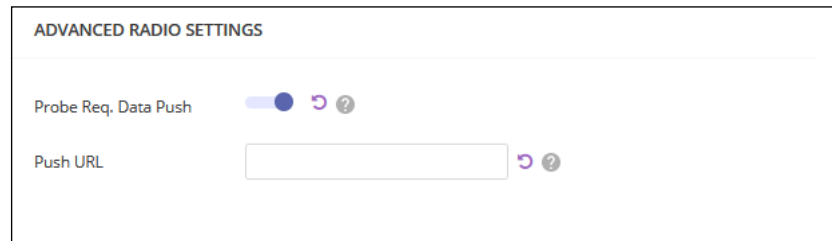
- **Enable Radio** — Enables or disables the wireless service on this interface.

- **Operation Mode** — Selects the mode in which the AP radio will function.
  - **Access Point (Auto-WDS)** — The AP operates as an access point in WDS mode, which accepts connections from APs in Client WDS mode. (This is the default setting.)

In this mode, the AP provides services to clients as a normal access point. WDS is used to automatically search for and connect to other AP nodes using the same SSID and security settings.
  - **Client** — The AP can provide a wireless connection to another AP. In this mode, it can pass information from or to locally wired hosts, but does not provide services to any wireless clients.
  - **Client WDS** — The AP operates as a client station in WDS mode, which can connect to other access points in Auto-WDS mode. Connection to another AP can be made automatically by other access points operating in Auto-WDS mode.
- **Site Survey** — Click the button to scan for other Wi-Fi devices in the device location.

## Advanced Radio Settings

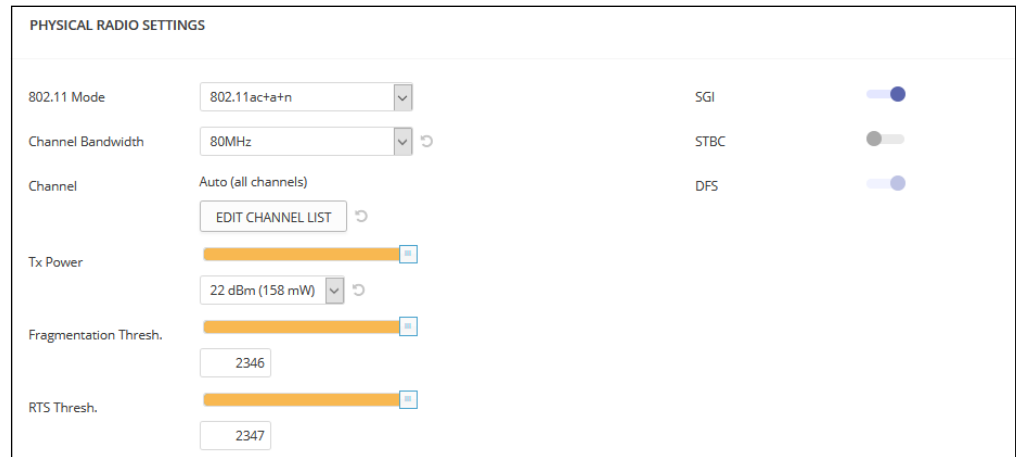
Figure 221: Device Advanced Radio Settings



- **Probe Req. Data Push** — Enable Client Probe Request Data Push for this radio. When enabled, the radio will push client probe request data in JSON format to your specified URL.
- **Push URL** — The web address where probe request data from this radio will be pushed.

## Physical Radio Settings

Figure 222: Device Physical Radio Settings



- **802.11 Mode** — Defines the radio operation mode.
  - **5 GHz Radio** — Options: 802.11a, 802.11a+n, 11ac+a+n; Default: 802.11ac+a+n
  - **2.4 GHz Radio** — Fixed: 802.11b+g+n
- **Channel Bandwidth** — The basic Wi-Fi channel bandwidth is 20 MHz, but by bonding channels together to create 40 MHz or 80 MHz channels, higher data transmission rate can be achieved. However, selecting larger channel bandwidths reduces the number a radio channels available.
  - **5 GHz Radio** — Options include 20, 40, and 80 MHz. (Default: 80 MHz)
  - **2.4 GHz Radio** — Options include 20 and 40 MHz. (Default: 40 MHz)
- **Channel** — The radio channel that the access point uses to communicate with wireless clients. The available channels are dependent on the radio, Channel Bandwidth, and Regulatory Country settings. You can also click the “Edit Channel List” button to select specific available channels to use for each radio interface.

Selecting Auto enables the access point to automatically select an unoccupied radio channel. (Default: Auto)

Figure 223: 5 GHz Radio Channels

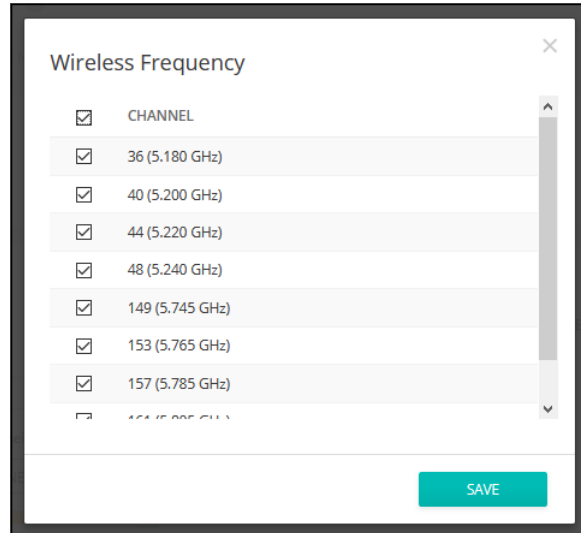
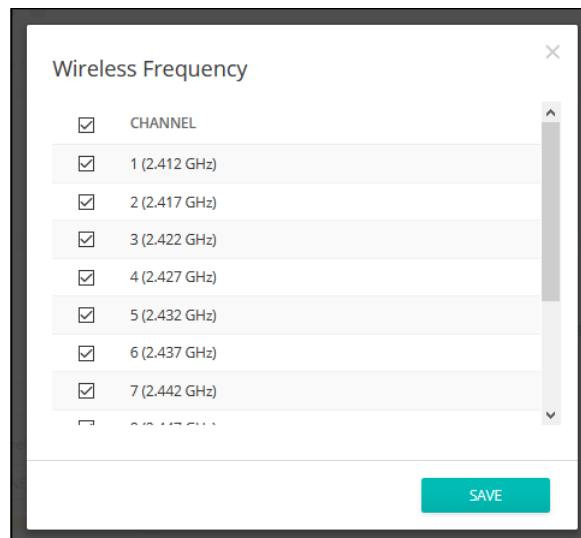


Figure 224: 2.4 GHz Radio Channels



- **Tx Power** — Adjusts the maximum power of the radio signals transmitted from the access point. The higher the transmission power, the farther the transmission range. Power selection is not just a trade off between coverage area and maximum supported clients. You also have to ensure that high-power signals do not interfere with the operation of other radio devices in the service area. (The range of power settings and defaults are dependent on the AP model and the Regulatory Country setting.)
- **Fragmentation Thresh.** — Sets the maximum frame size above which packets are fragmented. This reduces the time required to transmit the frame, and

therefore reduces the probability that it will be corrupted (at the cost of more data overhead). (Range: 256-2346 bytes; Default: 2346 bytes)

- **RTS Thresh.** — Sets the packet size threshold at which a Request to Send (RTS) frame must be sent to a receiving station prior to the sending station starting communications. The access point sends CTS frames to a receiving station to negotiate the sending of a data frame. After receiving an RTS frame, the access point sends a CTS (clear to send) frame to notify the sending station that it can start sending data.

If the RTS threshold is set to 1, the access point always sends RTS signals. If set to 2347, the access point never sends RTS signals. If set to any other value, and the packet size equals or exceeds the RTS threshold, the RTS/CTS (Request to Send / Clear to Send) mechanism will be enabled.

The access points contending for the medium may not be aware of each other. The RTS/CTS mechanism can solve this “Hidden Node Problem.” (Range: 1-2347 bytes; Default: 2347 bytes)

- **SGI** — The 802.11n draft specifies two guard intervals: 400ns (short) and 800ns (long). Support of the 400ns Short Guard Interval is optional for transmit and receive. The purpose of a guard interval is to introduce immunity to propagation delays, echoes, and reflections to which digital data is normally very sensitive. Enabling the SGI sets it to 400ns. (Default: Enabled)
- **STBC** — Space-time Block Coding sends multiple copies of the same data over a number of antennas, using the various received versions to improve the reliability of data transfer. The transmitted signal may traverse a difficult environment with scattering, reflection, and refraction which may then be further corrupted by thermal noise in the receiver, so some of the received copies will be better than others. This redundancy results in a higher chance of being able to use one or more of the received copies to correctly decode the received signal. (Default: Disabled)
- **DFS** — This field is available only if the selected radio mode operates in the 5 GHz frequency.

For radios in the 5 GHz band, When DFS support is on and the regulatory domain requires radar detection on the channel, the Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) features of 802.11h are activated. The default is Off.

DFS is a mechanism that requires wireless devices to share spectrum and avoid cochannel operation with radar systems in the 5 GHz band. DFS requirements vary based on the regulatory domain, which is determined by the country code setting of the AP. (Default: Enabled)

- **20/40MHz Coexist** — Applies only to the 2.4 GHz radio. This option allows 802.11n 20 MHz and 40 MHz channel bandwidths to operate together in the same network. (Default: On)



# 9

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## WiFi 6 and Newer Device Configuration

This chapter describes configuration settings for WiFi 6 access points at the Device level. It includes the following sections:

- [“Accessing Device-Level Configuration” on page 229](#)
- [“Device Radio Settings” on page 230](#)
- [“System Settings” on page 237](#)

## Accessing Device-Level Configuration

When a device’s “Inheritance Policy” is enabled, the device is configured from the Site level. However, a device can be individually configured at the Device level and the settings will override the Site-level configuration.



**Note:** Individual device overrides can be reset to the Site-level configuration by clicking the “Use Site Settings” button on the page where a setting has been changed.

In addition, wireless devices include settings not configurable at the Site level, such as advanced radio settings and features unique to a specific product. These settings can only be configured at the Device level.

To access configuration for a device, click on the device name from the Site-level list of devices (also available from the Cloud-level list of devices).

Figure 225: Accessing Device-Level Configuration

	NAME	PRODUCT	FW	REG. STATE	CREATED ON	CLIENTS	TRAFFIC	IP	CHANNEL
	MA1F-AP4	AP101	11.6.3-1315 (1) 12.0.0-673 (2)	Registered	5 months ago 2022-05-05 14:25	1	356 kb/s	120.105.6.75	149 (5.745 GHz) 6 (2.437 GHz)

From the Device dashboard, click on “Configuration” on the Device menu to access a device’s configuration.

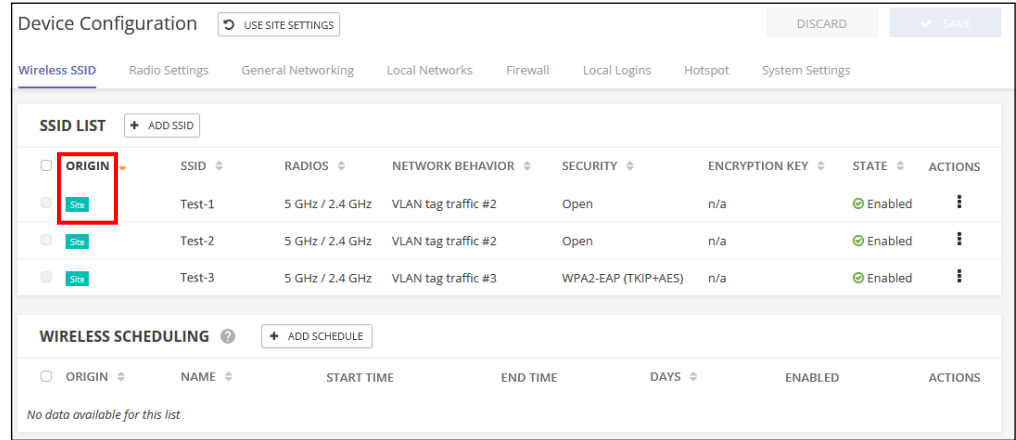
Figure 226: Device-Level Dashboard

The dashboard displays the following information for device MA1F-AP4 (EAP101):

- Site:** TPS-World
- Firmware:** 12.0.0-673
- Main MAC address:** 98:19:2C:F9:D5:30
- Serial Number:** EC2205002364
- Model:** EAP101
- Configuration state:** Online
- Inherit site settings:** Enabled
- Bootbank:** 2
- Hostname:** ma1fap4
- Created on:** 2022-05-05 14:25 (5 months ago)
- Last contact:** 2022-10-18 16:32 (2 minutes ago)
- Uptime:** 32 Days 5 hours 30 minutes 54 seconds
- System time:** Tue Oct 18 16:34:11 2022
- WAN IP:** 120.105.6.75
- CPU utilization:** 4%
- Memory usage:** Used: 205MB (total 891MB)

The Device Configuration page includes tabbed sections similar to the Site Configuration page.

Figure 227: Device Configuration



Device-level configuration for SSIDs are indicated in the “Origin” column of the SSID list; either “Site” or “Device” is displayed. Most other configuration items at the Device level are identical to those at the Site level.

This chapter only covers the device configuration that is different from the Site-level configuration, as documented in “Site WiFi 6 Configuration” on page 160.

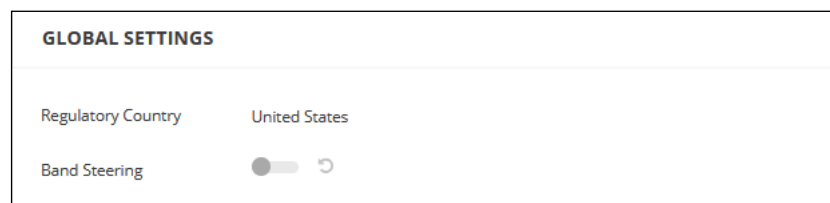
## Device Radio Settings

Click the “Radio Settings” tab to configure 6 GHz, 5 GHz, and 2.4 GHz radio settings. Note that settings apply to all configured SSID interfaces.

The following items are displayed on the Radio Settings tab. Configuration options apply to the 6 GHz, 5 GHz, and 2.4 GHz radios unless otherwise indicated.

### Global Settings

Figure 228: Device Global Radio Settings



- **Regulatory Country** — The wireless device regulatory setting. This setting is displayed but not configurable at the Device level.

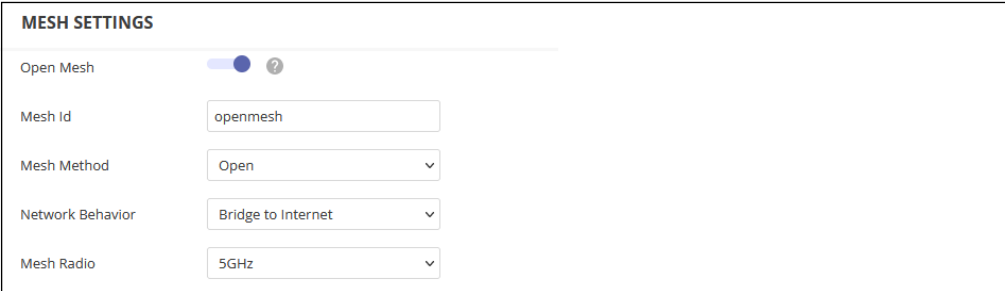
The AP's country code must be correctly set to be sure that the radios operate according to permitted local regulations. That is, setting the country code restricts operation of the AP to the radio channels and transmit power levels permitted for wireless networks in the specified country.

- **Band Steering** — When enabled, clients that support 2.4 GHz, 5 GHz and 6 GHz are first connected to the 6 GHz radio. This feature helps balance the client load over the two radio bands. Note that both radios must have configured SSIDs that match for this feature to fully operate. (Default: Disabled)

## Mesh Settings

Open Mesh is a network of interconnected node APs, of which only one has a wired connection to the network (and the Internet). The other AP nodes provide wireless links to each other and some support connections to wireless clients. The mesh network not only extends wireless connectivity over a greater distance, but also provides backup links should one node in the network fail.

Figure 229: Device Mesh Settings



The screenshot shows the 'MESH SETTINGS' configuration page. At the top, there is a title 'MESH SETTINGS'. Below the title, there is a toggle switch for 'Open Mesh' which is currently turned on. Underneath the toggle, there are four configuration options, each with a text input field or a dropdown menu: 'Mesh Id' with the value 'openmesh', 'Mesh Method' with the value 'Open', 'Network Behavior' with the value 'Bridge to Internet', and 'Mesh Radio' with the value '5GHz'.

- **Open Mesh** — Enables Open Mesh support on the SSID interface.
- **Mesh ID** — Name of the mesh network.
- **Mesh Method** — Security applied on Open Mesh links.
  - **Open** — None.
  - **WPA3-Personal** — Uses WPA3 with Simultaneous Authentication of Equals (SAE) on mesh links to other APs.
- **Network Behavior** — One of the following connection methods must be specified. (Default: Route to Internet)
  - **Bridge to Internet** — Configures an interface as attached to the WAN. Traffic from this interface is directly bridged into the Internet. (See [Figure 170, "Bridge to Internet", on page 169.](#))
  - **Route to Internet** — Configures an interface as a member of the LAN. Traffic from this interface is routed across the access point and out through

an interface which is bridged to the Internet. (See [Figure 171, “Route to Internet”, on page 169.](#))

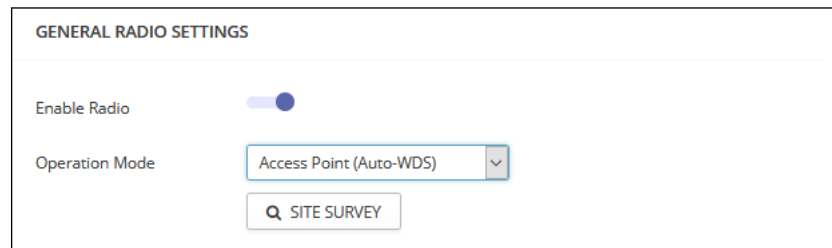
- **Network Name** — The network to be routed. The default is “Default local network” as displayed under LAN Settings – Local Network.
- **Mesh Radio** — When setting up an AP to be a node in a mesh network, select one radio interface: 2.4 GHz, 5 GHz, 6 GHz, or HaLow (sub-1 GHz). Configure it to operate on a specific channel (do not select Auto). Set up other AP nodes to operate on the same radio interface, channel, and with the same SSID.



**Note:** HaLow Open Mesh Mode is available on EAP112 with firmware version 12.5.0 or later.

## General Radio Settings

Figure 230: Device General Radio Settings



- **Enable Radio** — Enables or disables the wireless service on this interface.
- **Operation Mode** — Selects the mode in which the AP radio will function.
  - **Access Point (Auto-WDS)** — The AP operates as an access point in WDS mode, which accepts connections from APs in Client WDS mode. (This is the default setting.)

In this mode, the AP provides services to clients as a normal access point. WDS is used to automatically search for and connect to other AP nodes using the same SSID and security settings.
  - **Client** — The AP can provide a wireless connection to another AP. In this mode, it can pass information from or to locally wired hosts, but does not provide services to any wireless clients.
- **Site Survey** — Click the button to scan for other Wi-Fi devices in the device location.

## Advanced Radio Settings

Figure 231: Device Advanced Radio Settings

- **Probe Req. Data Push** — Enable Client Probe Request Data Push for this radio. When enabled, the radio will push client probe request data in JSON format to your specified URL.
- **Push URL** — The web address where probe request data from this radio will be pushed.

## Physical Radio Settings

Figure 232: Device Physical Radio Settings

- **802.11 Mode** — Defines the radio operation mode.
  - **Radio 6 GHz** — Default: 11ax; Options: 11ax, 11be
  - **Radio 5 GHz** — Default: 11ax; Options: 11a, 11a+n, 11ac+a+n, 11ax, 11be
  - **Radio 2.4 GHz** — Default: 11ax; Options: 11ax, 11be

- **Channel Bandwidth** — The basic Wi-Fi channel bandwidth is 20 MHz, but by bonding channels together to create 40 MHz, 80 MHz, 160 MHz, and 320 MHz channels, higher data transmission rate can be achieved. However, selecting larger channel bandwidths reduces the number a radio channels available. The available channel bandwidth is dependent on the 802.11 Mode.  
(Default: 20 MHz on 2.4 GHz Radio, 80 MHz on 5 GHz and 6 GHz Radio;  
Options: 20 MHz, 40 MHz, 80 MHz, 160 MHz, and 320 MHz)
  - **20MHz** — For 802.11b+g+n and 802.11ax
  - **40MHz** — For 802.11b+g+n, 802.11a, 802.11a+n, 802.11ac+a+n and 802.11ax
  - **80MHz** — For 802.11ac+a+n and 802.11ax
  - **160MHz** — (Supported on EAP104 5 GHz radio, OAP101 5 GHz radio, and OAP101-6E 5 GHz and 6GHz radios) For 802.11ac+a+n and 802.11ax
  - **320MHz** — (Supported on EAP105) For 802.11be
- **Channel** — The radio channel that the access point uses to communicate with wireless clients. The available channels are dependent on the radio, Channel Bandwidth, and Regulatory Country settings. You can also click the “Edit Channel List” button to select specific available channels to use for each radio interface.  
  
Selecting Auto enables the access point to automatically select an unoccupied radio channel. (Default: Auto)

Figure 233: 5 GHz Radio Channels

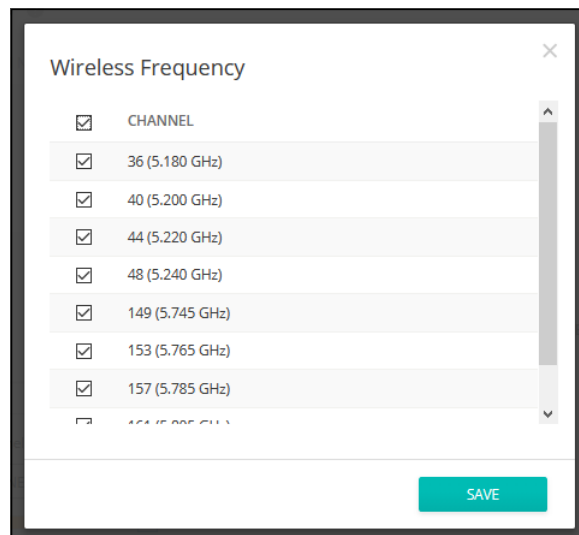
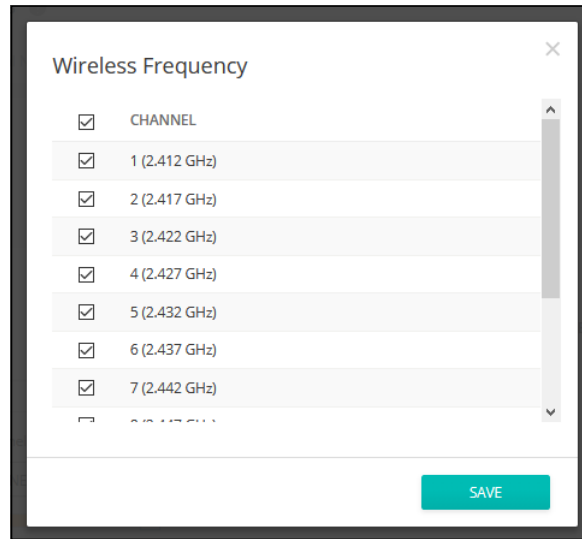


Figure 234: 2.4 GHz Radio Channels



- **WME Configuration** — Wireless Multimedia Extensions (WME), also known as Wi-Fi Multimedia (WMM), is a Wi-Fi Alliance interoperability certification, based on the IEEE 802.11e standard. It provides basic Quality of service (QoS) features for IEEE 802.11 networks. Access priority can be configured for four “Access Category”(AC) types using the following parameters:
  - **CW Min (Minimum Contention Window)** – The initial upper limit of the random backoff wait time before wireless medium access can be attempted. The initial wait time is a random value between zero and the CWMin value. Specify the CWMin value in the range 0-15 microseconds. Note that the CWMin value must be equal or less than the CWMax value.
  - **CW Max (Maximum Contention Window)** – The maximum upper limit of the random backoff wait time before wireless medium access can be attempted. The contention window is doubled after each detected collision up to the CWMax value. Specify the CWMax value in the range 0-15 microseconds. Note that the CWMax value must be greater or equal to the CWMin value.
  - **AIFS (Arbitration Inter-Frame Space)** – The minimum amount of wait time before the next data transmission attempt. Specify the AIFS value in the range 0-15 microseconds.
  - **TXOP Limit (Transmit Opportunity Limit)** – The maximum time an AC transmit queue has access to the wireless medium. When an AC queue is granted a transmit opportunity, it can transmit data for a time up to the TXOP Limit. This data bursting greatly improves the efficiency for high data-rate traffic. Specify a value in the range 0-8192 microseconds.

- **Idle Timeout (sec)** — The AP disconnects a client when there is no activity for the configured amount of time. (Default: 300 seconds; Range: 60-60000 seconds)
- **Beacon Interval** — The rate at which beacon signals are transmitted from the access point. The beacon signals allow wireless clients to maintain contact with the access point. They also carry power-management and other information. (Range: 100-1024 TUs; Default: 100 TUs)
- **Target Wake Time** — In 802.11ax (Wi-Fi 6) mode, the AP can allow clients to request a specific Target-Wakeup Time (TWT) to transmit or receive frames, rather than rely on periodic beacons. This feature enables client devices to have much longer sleep states and results in significant power savings. In addition, the AP can control and schedule client TWTs to both manage contention in the network and accommodate delay-sensitive traffic. (Default: Disabled)
- **BSS coloring** — In 802.11ax (Wi-Fi 6) mode, BSS coloring allows nearby APs operating at the same frequency to identify traffic belonging to their own Basic Service Set (BSS). The BSS coloring enables Wi-Fi 6 networks to operate more efficiently in high-density environments where neighboring AP and client transmissions overlap. Assign a color value (a number from 1 to 63) to identify the radio BSS, or enter value 64 to allow the AP to randomly select a color value. (Range: 1-63, 64 random, Default: 64)
- **Multicast/Broadcast Rate** — Allows a limit to be placed on the wireless bandwidth consumed by multicast and broadcast packets.
  - **Radio 6 GHz** — Options: 6M, 9M, 12M, 18M, 24M, 36M, 48M, 54M; Default: 6M
  - **Radio 5 GHz** — Options: 6M, 9M, 12M, 18M, 24M, 36M, 48M, 54M; Default: 6M
  - **Radio 2.4 GHz** — Options: 5.5M, 6M, 9M, 11M, 12M, 18M, 24M, 36M, 48M, 54M; Default: 5.5M
- **Tx Power** — Adjusts the maximum power of the radio signals transmitted from the access point. The higher the transmission power, the farther the transmission range. Power selection is not just a trade off between coverage area and maximum supported clients. You also have to ensure that high-power signals do not interfere with the operation of other radio devices in the service area. (The range of power settings and defaults are dependent on the AP model and the Regulatory Country setting.)
- **OFDMA** — The 802.11ax (Wi-Fi 6) mode supports Orthogonal Frequency Division Multiple Access (OFDMA) and this cannot be disabled.
- **DFS** — This field is available only if the selected radio mode operates in the 5 GHz frequency.

For radios in the 5 GHz band, When DFS support is on and the regulatory domain requires radar detection on the channel, the Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) features of 802.11h are activated. The default is Off.

DFS is a mechanism that requires wireless devices to share spectrum and avoid cochannel operation with radar systems in the 5 GHz band. DFS requirements vary based on the regulatory domain, which is determined by the country code setting of the AP. (Default: Enabled)

## System Settings

Click the “System Settings” tab to configure Device-level features.

**iBeacon** The AP supports the iBeacon standard based on Bluetooth Low Energy (BLE). Devices with BLE Beacons can provide location-based services to BLE clients, such as phones, that can recognize the beacon advertisements, extract the provided information, and then take actions based on the content.

**Figure 235: Device iBeacon Settings**



The following items are displayed on this page:

- **Enable** — Enables iBeacon support on the AP. (Default: Enabled)
- **BLE Scan** — (EAP101 and EAP104 only) Scans for all BLE devices, including these four types: EddyStone-UUID, EddyStone-URL, EddyStone-TLM, and ibeacon.
- **UUID** — The iBeacon Universally Unique Identifier that advertises the beacon service. The UUID contains 32 hexadecimal digits in five groups, separated by hyphens.
- **Major** — The iBeacon value that is used to identify a beacon group. (Range: 0-65535)

- **Minor** — The iBeacon value that is used to identify individual beacons within a group. (Range: 0-65535)
- **Tx Power** — Sets the BLE radio transmit power (supported only on EAP101 and EAP104). (Range: 5 dBm to -20 dBm; Default: 5 dBm)

# 10

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## MetroLinq Device Configuration

This chapter describes configuration settings for MetroLinq units at the Device level. It includes the following sections:

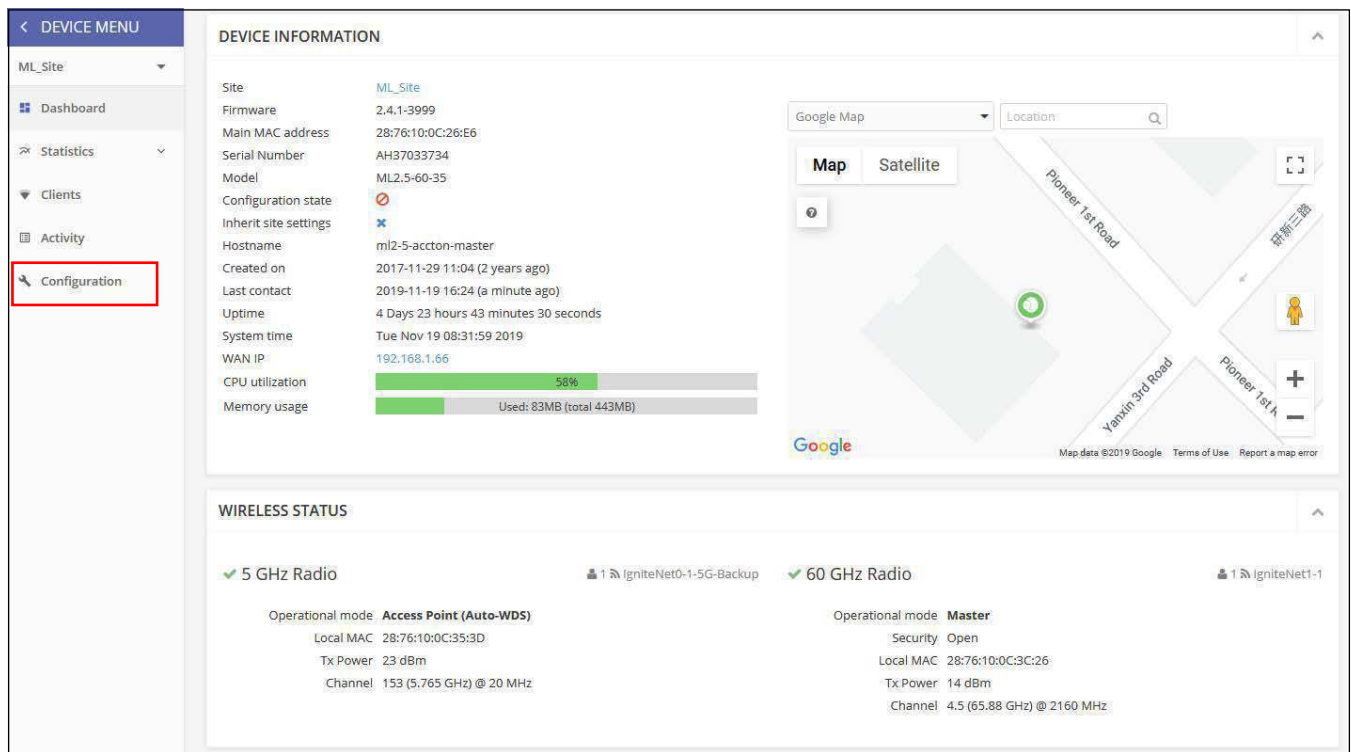
- “MetroLinq Configuration” on page 240
- “Wireless SSID” on page 240
- “Radio Settings” on page 241
- “QoS Settings” on page 250
- “Traffic Control” on page 251
- “Using the LinqPath Tool” on page 252

## MetroLinq Configuration

MetroLinq devices that support 2.4 GHz and 5 GHz bands can inherit configuration settings from the Site level for these radio interfaces. The 60 GHz radio settings cannot be inherited from the Site level and must be configured at the Device level.

This section covers Device-level configuration for MetroLinq devices, including specific settings not available at the Site level. For general Device-level settings, see “WiFi 5 Device Configuration” on page 219.

Figure 236: MetroLinq Device Dashboard



## Wireless SSID

The MetroLinq devices support a 60 GHz radio, and often include 5 GHz and 2.4 GHz radios. SSIDs can only be configured for the 5 GHz and 2.4 GHz radios from the Wireless SSID page. The 60 GHz radio supports only one SSID and it must be configured on the Radio Settings page.

In cases where the 5 GHz radio is configured as a backup to the 60 GHz radio, the SSID must also be configured on the Radio Settings page.

For details on configuring Wi-Fi access SSIDs, see [“Wireless SSID Configuration”](#) on page 119.

Figure 237: MetroLinq Device Dashboard

ORIGIN	SSID	RADIO	DATA VLAN	SECURITY	ENCRYPTION KEY	STATE	ACTIONS
Device	IgniteNet3-1 (60GHZ SSID)	60 GHz	n/a	Off	n/a	Enabled	⋮
Device	IgniteNet-2.4G	2.4 GHz	Off	Off	n/a	Enabled	⋮

## Radio Settings

Click the “Radio Settings” tab to configure 60 GHz, 5 GHz, and 2.4 GHz radio settings.

Figure 238: MetroLinq Device 5 GHz Radio Settings

**GLOBAL SETTINGS**

Country: United States

---

**WIRELESS 5 GHZ**

**GENERAL RADIO SETTINGS**

Enable Radio:

Operation Mode: Access Point (Auto-WDS) [?]

[SITE SURVEY]

---

**PHYSICAL RADIO SETTINGS**

Channel Bandwidth: 20MHz

Channel: Auto (all channels) [EDIT CHANNEL LIST]

Tx Power: 20 dBm (100 mW)

Multicast Enhancement:

**Global Settings** The following items are displayed on this page section:

- **Country** — The MetroLinq device regulatory setting.

The MetroLinq's country code must be correctly set to be sure that the radios operate according to permitted local regulations. That is, setting the country code restricts operation of the MetroLinq to the radio channels and transmit power levels permitted for wireless networks in the specified country.

## Wireless 5 GHz General Radio Settings

- **Enable Radio** — Enables or disables the wireless service on the 5 GHz interface. Note that the 5 GHz radio can be configured to operate as a backup link for the 60 GHz radio.
- **Operation Mode** — Selects the mode in which the 5 GHz radio will function.
  - **Access Point (Auto-WDS)** — The 5 GHz radio operates as an access point in WDS mode, which accepts connections from APs in Client WDS mode. (This is the default setting.)

In this mode, the 5 GHz radio provides services to clients as a normal access point. WDS is used to automatically search for and connect to other AP nodes using the same SSID and security settings.
  - **Client WDS** — Sets the 5 GHz radio to only operate as the backup wireless bridge client in a point-to-point wireless link between two MetroLinq units.
- **Site Survey** — Click the button to scan for other Wi-Fi devices at the device location.

## Client Mode Settings (when Client WDS mode selected)

- **SSID** — Input a unique name for the service set identifier of the 5 GHz interface. MetroLinq units at each end of a point-to-point backup link must be set to the same SSID. (Range: 1—32 characters)
- **Lock to BSSID** — Enter the MAC address of the Master unit in the link to lock the Client radio to only that unit.
- **Encryption** — Sets the wireless security method for the 5 GHz interface. When disabled, there is no security on the wireless link. When enabled, MetroLinq units in the point-to-point backup link use WPA2 security with a pre-shared key for authentication and encryption. (Default: Disabled)
  - **Encryption Cipher** — Sets the encryption cipher to use for the WPA2 pre-shared key.
    - **CCMP (AES)** — AES-CCMP is the standard encryption cipher required for WPA2. (This is the default setting.)
    - **Auto: TKIP + CCMP (AES)** — The encryption method used is discovered during association with the link partner.

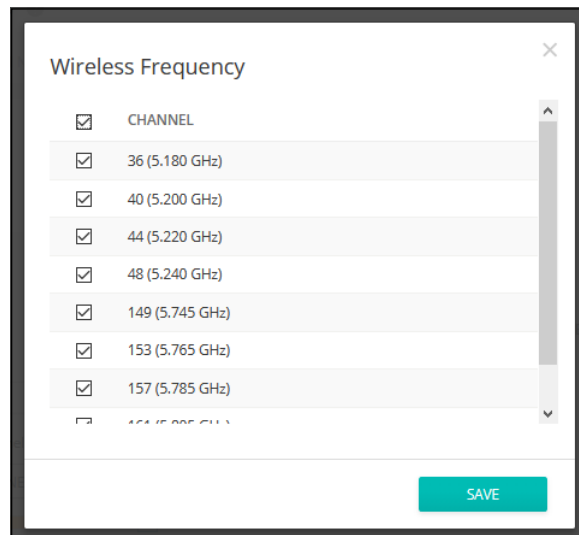
- **Key** — Sets the WPA2 pre-shared key to use for encryption.

### Physical Radio Settings

- **Channel Bandwidth** — The basic Wi-Fi channel bandwidth is 20 MHz, but by bonding channels together to create 40 MHz or 80 MHz channels, higher data transmission rate can be achieved. However, selecting larger channel bandwidths reduces the number a radio channels available. (Options: 20, 40, and 80 MHz; Default: 80 MHz)
- **Channel** — The radio channel that the access point uses to communicate with wireless clients. The available channels are dependent on the radio, Channel Bandwidth, and Regulatory Country settings. You can also click the “Edit Channel List” button to select specific available channels to use.

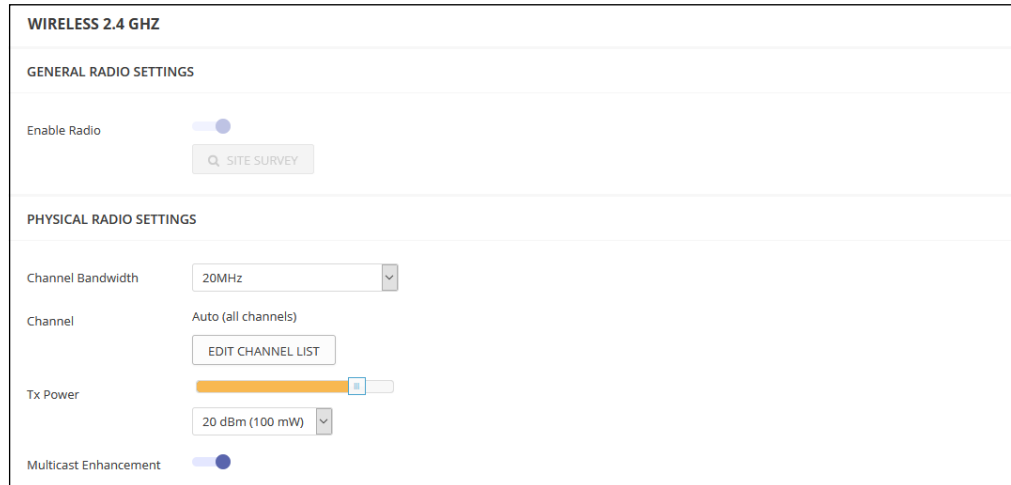
Selecting Auto enables the access point to automatically select an unoccupied radio channel. (Default: Auto)

Figure 239: 5 GHz Radio Channels



- **Tx Power** — Adjusts the maximum power of the radio signals transmitted from the access point. The higher the transmission power, the farther the transmission range. Power selection is not just a trade off between coverage area and maximum supported clients. You also have to ensure that high-power signals do not interfere with the operation of other radio devices in the service area. (The range of power settings and defaults are dependent on the AP model and the Regulatory Country setting.)
- **Multicast Enhancement** — This feature translates multicast packets to unicast packets before forwarding to clients, which results in more stable and faster transmissions. If poor multicast streaming is experienced by wireless clients, enable this feature to improve performance. (Not available when the 5 GHz radio is set to Client WDS mode.)

Wireless 2.4 GHz Figure 240: MetroLinq Device 2.4 GHz Radio Settings

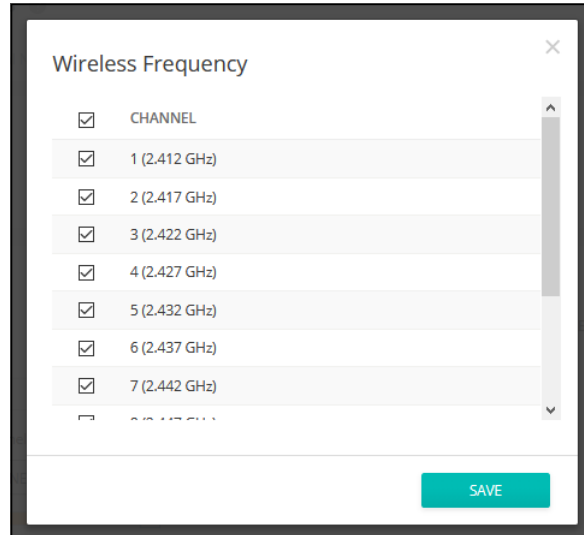


The following items are displayed on this page section:

- **Enable Radio** — Enables or disables the wireless service on the 2.4 GHz interface.
- **Site Survey** — Click the button to scan for other Wi-Fi devices at the device location.
- **Channel Bandwidth** — The basic Wi-Fi channel bandwidth is 20 MHz, but by bonding channels together to create 40 MHz or 80 MHz channels, higher data transmission rate can be achieved. However, selecting larger channel bandwidths reduces the number a radio channels available. (Options: 20 and 40 MHz; Default: 20 MHz)
- **Channel** — The radio channel that the access point uses to communicate with wireless clients. The available channels are dependent on the radio, Channel Bandwidth, and Regulatory Country settings. You can also click the “Edit Channel List” button to select specific available channels to use.

Selecting Auto enables the access point to automatically select an unoccupied radio channel. (Default: Auto)

Figure 241: 2.4 GHz Radio Channels



- **Tx Power** — Adjusts the maximum power of the radio signals transmitted from the access point. The higher the transmission power, the farther the transmission range. Power selection is not just a trade off between coverage area and maximum supported clients. You also have to ensure that high-power signals do not interfere with the operation of other radio devices in the service area. (The range of power settings and defaults are dependent on the AP model and the Regulatory Country setting.)
- **Multicast Enhancement** — This feature translates multicast packets to unicast packets before forwarding to clients, which results in more stable and faster transmissions. If poor multicast streaming is experienced by wireless clients, enable this feature to improve performance.

Wireless 60 GHz Figure 242: MetroLinq Device 60 GHz Radio Settings

**WIRELESS 60 GHZ**

GENERAL RADIO SETTINGS	CLIENT MODE SETTINGS
Enable Radio: <input checked="" type="checkbox"/>	SSID: IgniteNet1-1
Operation Mode: Client	Lock to BSSID: <input type="text"/>
5 GHz backup: <input type="checkbox"/>	Encryption: <input checked="" type="checkbox"/>
<input type="button" value="SITE SURVEY"/>	Key: <input type="password"/>

**BACKUP SSID (5 GHZ)**

SSID: IgniteNet0-1-5G-Backup
Broadcast SSID: <input checked="" type="checkbox"/>
Encryption: <input checked="" type="checkbox"/>

**PHYSICAL RADIO SETTINGS**

MCS Rate: Auto
Channel Bandwidth: 2160MHz
Channel: 1 (58.320 GHz)
Tx Power: 14 dBm (25 mW)
AMPDU: <input checked="" type="checkbox"/>
IGMP Snooping: <input type="checkbox"/>
Radio beamwidth: 120 degrees
DBSC: <input type="checkbox"/>

### General Radio Settings

The following items are displayed on this page section:

- **Enable Radio** — Enables the wireless service on the 60 GHz interface.
- **Operation Mode** — Selects the mode in which the 60 GHz interface will function.
  - **Master** — Sets the 60 GHz interface as the Master in a point-to-point or point-to-multi-point wireless link between two or more MetroLinq units. MetroLinq wireless links require one unit set as Master and the other(s) set to Client. Links to non-Edgecore devices are not supported.
  - **Client** — Sets the 60 GHz interface as a client in a point-to-point wireless link between two MetroLinq units.
- **5 GHz backup** — Configures the 5 GHz interface to function as a backup to the 60 GHz radio link. Should the 60 GHz link fail, the 5 GHz link is enabled

to maintain connectivity. The 5 GHz backup can only be configured when the 60 GHz interface is set to Master mode. (Default: Disabled)

### Wireless Networks (60 GHz radio set to Master mode)

- **SSID** —Input a unique name for the service set identifier of the 60 GHz interface. MetroLinq units at each end of a point-to-point link must be set to the same SSID. (Range: 1—32 characters)
- **Encryption** — Sets the wireless security method for the 60 GHz interface. When disabled, there is no security on the wireless link. When enabled, MetroLinq units in the point-to-point link use WPA2 security with a pre-shared key for authentication and encryption. (Default: Disabled)
  - **Key** — Sets the WPA2 pre-shared key to use for encryption.

### Client Mode Settings (60 GHz radio set to Client mode)

- **SSID** —Input a unique name for the service set identifier of the 60 GHz interface. MetroLinq units at each end of a point-to-point link must be set to the same SSID. (Range: 1—32 characters)
- **Lock to BSSID** — Enter the MAC address of the Master unit in the link to lock the Client radio to only that unit.
- **Encryption** — Sets the wireless security method for the 60 GHz interface. When disabled, there is no security on the wireless link. When enabled, MetroLinq units in the point-to-point link use WPA2 security with a pre-shared key for authentication and encryption. (Default: Disabled)
  - **Key** — Sets the WPA2 pre-shared key to use for encryption.

### Backup SSID (5 GHz)

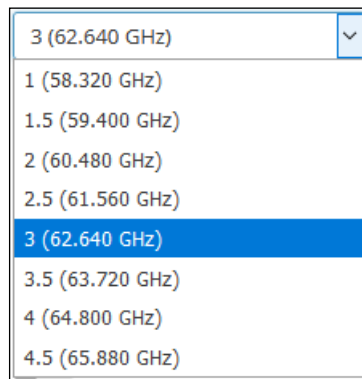
- **SSID** —Input a unique name for the service set identifier of the backup 5 GHz interface. MetroLinq units at each end of a point-to-point link must be set to the same 5 GHz backup SSID. (Range: 1—32 characters)
- **Broadcast SSID** — Enables or disables sending the configured SSID in beacon messages. (Default: Enabled)
- **Encryption** — Sets the wireless security method for the 60 GHz interface. When disabled, there is no security on the wireless link. When enabled, MetroLinq units in the point-to-point link use WPA2 security with a pre-shared key for authentication and encryption. (Default: Disabled)
  - **Encryption Cipher** — Sets the encryption cipher to use for the WPA2 pre-shared key.
    - **CCMP (AES)** — AES-CCMP is the standard encryption cipher required for WPA2. (This is the default setting.)

- **Auto: TKIP + CCMP (AES)** — The encryption method used is discovered during association with the link partner.
- **Key** — Sets the WPA2 pre-shared key to use for encryption.

### Physical Radio Settings

- **MCS Rate** — The modulation and coding scheme used to set the data rate at which the MetroLinq transmits packets on the 60 GHz interface. A setting of “Auto” sets the rate depending on the signal strength.
- **Channel Bandwidth** — For the 60 GHz radio, a channel bandwidth of 2160 MHz or 1080 MHz can be selected. (Default: 2160 MHz)
- **Channel** — The radio channel that the MetroLinq uses to communicate on the 60 GHz interface. The available channels are dependent on the radio, Channel Bandwidth, and Regulatory Country settings.

Figure 243: 60 GHz Radio Channels

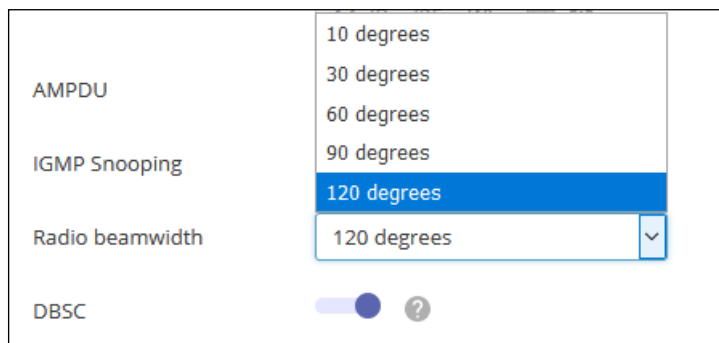


- **Tx Power** — Adjusts the maximum power of the radio signals transmitted on the 60 GHz interface. The higher the transmission power, the farther the transmission range and higher the data rate. (The range of power settings and defaults are dependent on the AP model and the Regulatory Country setting.)
- **AMPDU** — Enables or disables the use of Aggregated MAC Protocol Data Units. Physical layer (PHY) data rate improvements do not increase real throughput beyond a point because of 802.11 protocol overheads. The main media access control feature that provides a performance improvement is aggregation. Aggregation of MAC protocol data units (MPDUs) is referred to as MPDU aggregation or (A-MPDU). (Default: Enabled)
- **Client Isolation** — When enabled, wireless clients can talk to the LAN, and reach the Internet if such connection is available, but they cannot communicate with one another. (Default Off)
- **IGMP Snooping** — Enables IGMP snooping to manage and filter multicast streams over the 60 GHz interface.

- **RSSI based failover** —When enabled and the Received Signal Strength Indicator (RSSI) of the 60 GHz link falls below the “RSSI failover limit,” the link will failover to the 5 GHz backup link. (Default:-65, Range: -95 to -25)

### Settings for MetroLinq 60 LW, 2.5-60-18-BF, 10G Tri-Band Omni

Figure 244: MetroLinq Radio Beamwidth



- **Radio beamwidth** — Sets the sector antenna beamwidth for the MetroLinq 60 LW, 2.5-60-18-BF, and 10G Tri-Band Omni. The narrower the beamwidth, the more directional the signal, and higher the antenna gain. (Options: 10, 30, 60, 90, 120 degrees; Default: 120 degrees)
- **DBSC** — Enable Directional Beam Scan and Connect (DBSC) to address the limitation where phased array antennas only use a quasi-omni single directional beam to perform a wide area scanning. The lower gain of a quasi-omni beam limits the maximum distance at which connections can be established and traffic maintained. Enabling DBSC resolves the lower gain issue by using directed beams when scanning. (Default: Disabled)

## QoS Settings

The QoS (Quality of Service) Settings tab enables specific VLANs to be assigned as high priority traffic, where the data packets are tagged as high priority and are transmitted before other packets.

The MetroLinq interfaces have three priority queues; one for control messages, one for high priority traffic, and one for all other traffic. Packets tagged with an IEEE 802.1p priority of 4 to 7, or IP/TOS priority of 4 to 7, are classified as high priority and placed into the high priority queue by default.

On the QoS Settings page, you can also configure up to five VLANs as high priority traffic. That is, any data frame with one of the VLAN IDs will be classified as high priority and put in the high priority queue.

Figure 245: MetroLinq QoS Settings

QOS SETTINGS	
VLAN id #1	<input type="text" value="0"/> ?
VLAN id #2	<input type="text" value="0"/> ?
VLAN id #3	<input type="text" value="0"/> ?
VLAN id #4	<input type="text" value="0"/> ?
VLAN id #5	<input type="text" value="0"/> ?
IPTV Video Stream	<input checked="" type="checkbox"/>

The following items are displayed on this page:

- **VLAN id #1-#5** — Configures a VLAN ID as high priority traffic. All five VLANs have the same equal priority. (Range: 1-4094, 0 means disabled)
- **IPTV Video Stream** — When enabled, causes all multicast frames to be classified as high priority, improving performance for IPTV streams. (Default: Disabled)

## Traffic Control

Use the Traffic Control settings to limit the uplink and downlink bandwidth for specified devices. First create Traffic Profiles that specify the uplink and downlink bandwidth limits, and then bind the profiles to specific device MAC addresses.

Click the “Add Profile” button to add a new profile. Give the profile a name and specify the bandwidth limits.

To bind a profile to a MAC address, click the “Add Control” button, enter a device MAC address, and then select the profile name from the pull-down list.

Figure 246: MetroLinq Traffic Control Settings

The following items are displayed on this page:

- **Traffic Control Enable** — Enables the configured traffic control settings. (Default: Disabled)
- **Traffic Profile** — Configure the required profiles.
  - **Profile** — Specify a name that describes the profile.
  - **Download (Mbps)** — Sets the maximum downlink rate to a value between 0 and 1000 Mbps. (Default: 0)
  - **Upload (Mbps)** — Sets the maximum uplink rate to a value between 0 and 1000 Mbps. (Default: 0)

- **Traffic Control** — Binds the Traffic Profiles to MAC addresses.
  - **MAC** — Device MAC address.
  - **Profile** — Configured profile name.

## Using the LinqPath Tool

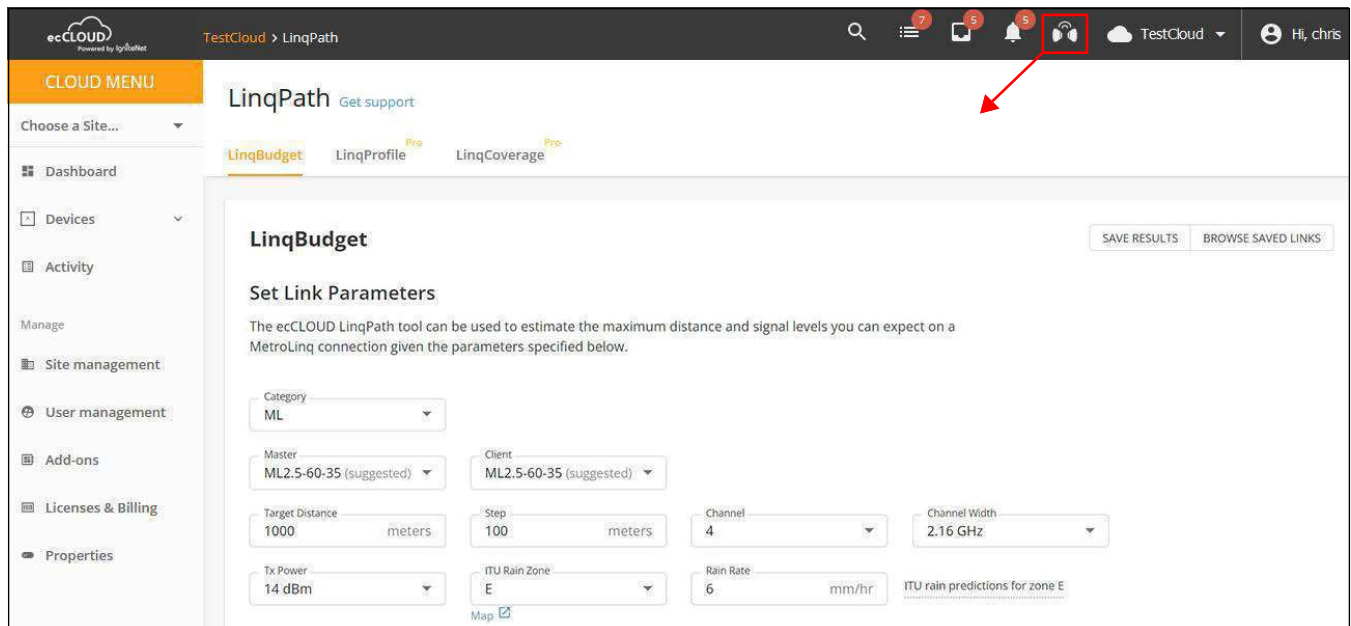
The Edgecore LinqPath™ tool can be used to estimate the maximum distance and signal levels you can expect on a MetroLinq connection given the specified parameters. Statistical rain fade calculations are included using the ITU rain model.

The LinqPath™ tool is available with a free ecCLOUD account. You can access LinqPath by clicking the icon in the top navigation menu.

Specify the planned link details in the LinqBudget section, and then view the results and RSSI graph to be sure it meets your required link performance.

You can save your LinqPath calculations using the “Save Results” button. Up to 10 link results can be saved in your LinqPath history.

Figure 247: MetroLinq LinqPath Settings

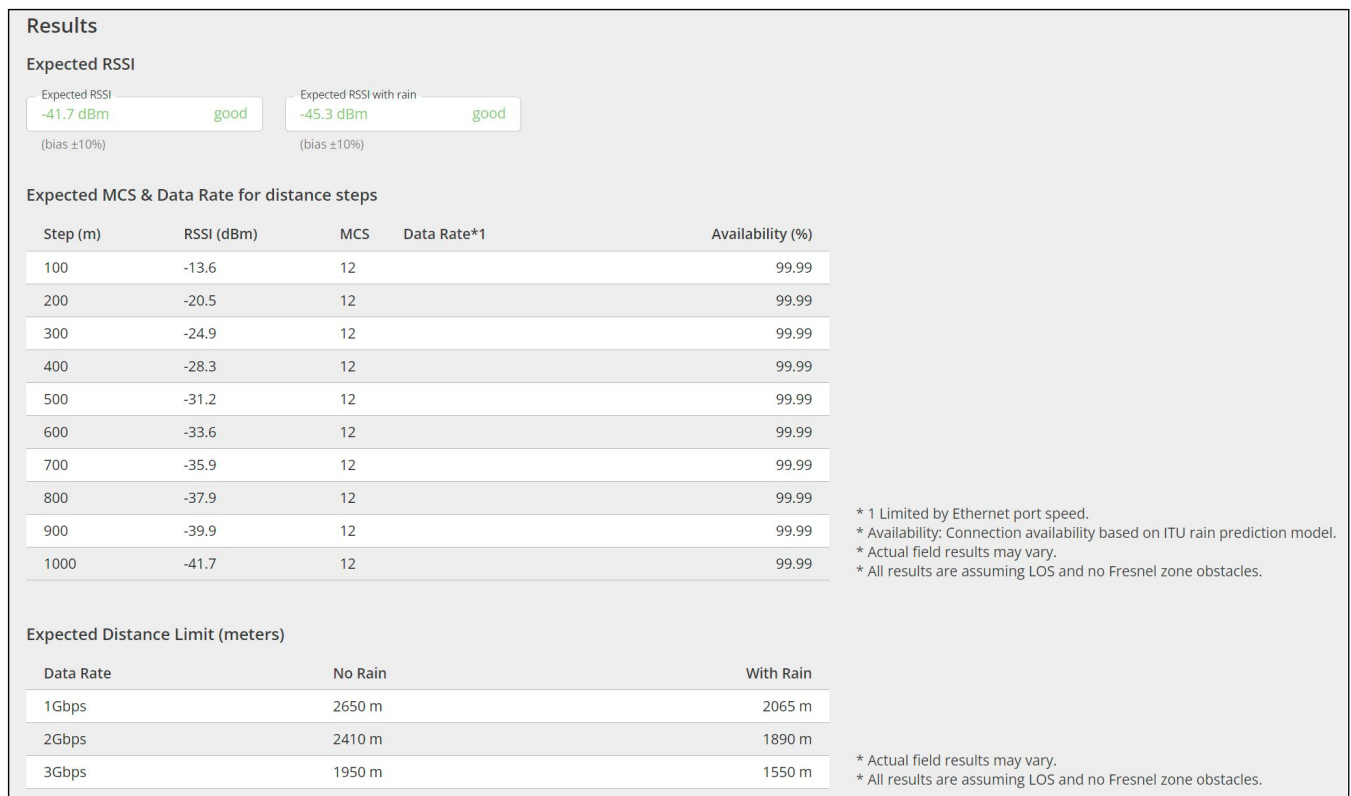


The following items are displayed on this page section:

- **Master** — The MetroLinq model that will be used as the PTP or PTMP master.
- **Client** — The MetroLinq model that will be used as the PTP or PTMP client.

- **Target Distance** — The intended distance of the link.
- **Step** — Distance intervals for assessing expected link performance at various distances up to the target distance. (Default: 10% of Target Distance)
- **Channel** — The radio channel that the link will operate on.
- **Channel Width** — The configured radio channel width.
- **Tx Power** — The transmit power that will be configured for the MetroLinq 60 GHz radio.
- **ITU Rain Zone** — The ITU rain zone in which the link will operate. A map highlighting the various rain regions are provided by the LinqPath tool.
- **Rain Rate** — The predicted ITU rain rate (mm per hour) for the specified zone.

Figure 248: MetroLinq LinqBudget Results



The following items are displayed on this page section:

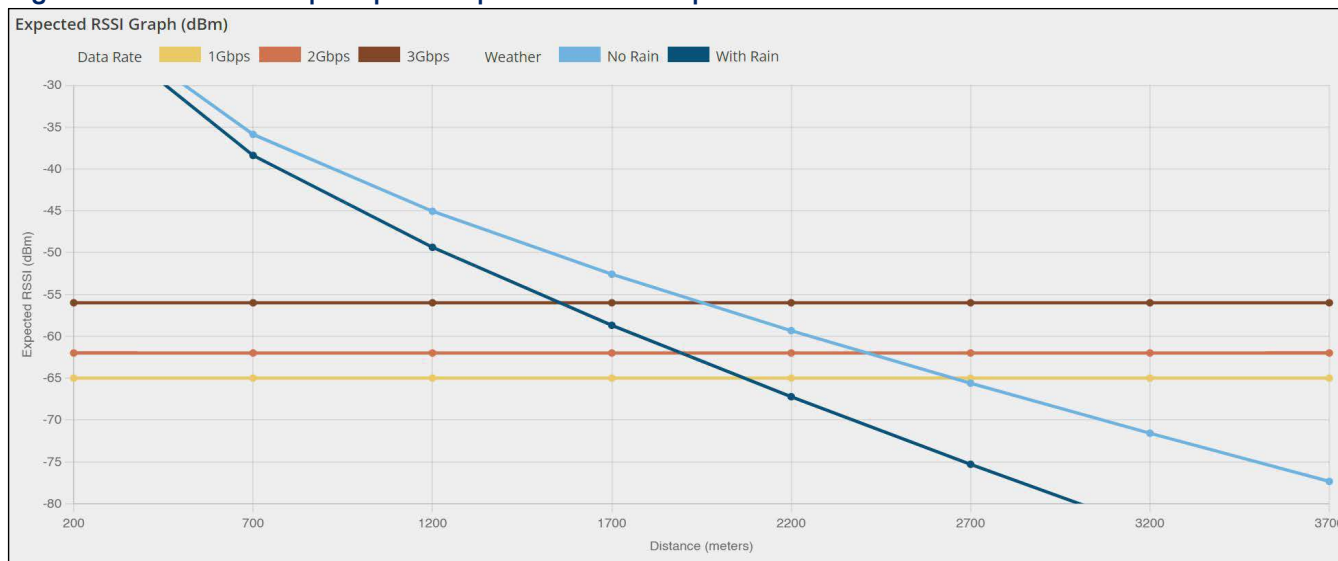
- **Expected RSSI** — Shows the expected RSSI of the link based on the distance provided in the Target Distance input box. Links with RSSI below -70 dBm are classified as “No link.”

- **Expected RSSI with rain** — Shows the expected RSSI of the link when it is raining based on the distance provided in the Target Distance input box. Links with RSSI below -70 dBm are classified as “No link.”
- **Expected MCS & Data Rate for distance steps** (Only supports MLTG products) — Shows the expected RSSI, MCS values and corresponding Data Rates at each step interval up to the set target distance.
  - **Data Rate** — Expected data rate, limited by Ethernet port speed.
  - **Availability** — Connection availability based on the ITU rain prediction model.
- **Expected Distance Limit** — Shows the expected maximum distance at which a link with the selected MetroLinq models can achieve 3 Gbps, 2 Gbps, and 1 Gbps throughput. The “With Rain” values include the statistical rain fade considerations calculated using the ITU Rain Zone and Rain Rate settings.

### RSSI vs. Distance Graph

LinqPath also produces a graph of the Expected RSSI versus distance. The purple “No Rain” line indicates the expected RSSI without rain. The blue “With Rain” line indicates the expected RSSI that should be exceeded by the percentage of time selected in the “60 GHz Rain Reliability” drop-down menu. The 1 Gbps, 2 Gbps, and 3 Gbps lines show the RSSI levels at which each data rate can be achieved.

Figure 249: MetroLinq LinqPath Expected RSSI Graph







# 11

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## Terragraph Device Configuration

This chapter describes configuration settings for Terragraph MLTG-CN units at the Device level. It includes the following sections:

- [“Terragraph Configuration” on page 258](#)
- [“General Networking Settings” on page 259](#)
- [“Radio Settings” on page 261](#)
- [“System Settings” on page 263](#)

## Terragraph Configuration

This section covers Device-level configuration for Terragraph MLTG-CN devices, including specific settings not available at the Site level.

Figure 250: Terragraph Device Dashboard

The screenshot displays the Terragraph Device Dashboard for an LR-RTK device. The interface includes a left-hand navigation menu with 'Configuration' highlighted in a red box. The main content area is divided into several sections:

- Header:** Shows the device name 'LR-RTK', model 'Edgecore MetroLinq MLTG-CN\_LR', and status 'CONNECTING'. There are buttons for 'UPGRADE FIRMWARE' and 'OFFLINE'.
- DEVICES INFORMATION:** A table listing device details:

Site/Sites	ML_Site
Firmware	1.4.2-00266-4c6b042
Main MAC address	14:44:8F:E5:78:93
Serial Number	EC2223002535
Model	MLTG-CN_LR
Configuration state	Warning icon
Inherit site settings	Warning icon
Bootbank	0
Created on	2022-09-06 15:14 (7 months ago)
Last contact	2023-01-05 15:40 (3 months ago)
Uptime	n/a
LAN IP	192.168.1.121
MANAGEMENT IP	n/a
CPU utilization	Progress bar
Memory usage	Progress bar
- Map:** A Google Map showing the device location. A message reads: 'Your Google map is empty! Go to the Map Manager to place your devices.'
- WIRELESS STATUS:** A section for '60 GHz Radio' with various settings:
  - Operation Mode -
  - Security -
  - Local MAC -
  - Remote MAC -
  - Datarate -
  - Tx Power -
  - Channel -
  - Sector position -

## General Networking Settings

Click the “General Networking” tab to configure management port and LAN port settings.

Figure 251: Terragraph Device General Networking

The screenshot shows the configuration interface for a Terragraph device. It is organized into three main sections:

- POE PORT:**
  - POE Port Role: Bridged with LAN Port (dropdown menu)
- MANAGEMENT PORT SETTINGS:**
  - IP Address Mode: DHCP (dropdown menu)
  - Fallback IP: 192.168.1.20 (text input)
  - Fallback Netmask: 255.255.255.0 (dropdown menu)
- LAN PORT SETTINGS:**
  - IP Address Mode: Static IP (dropdown menu)
  - IP Address: 192.168.1.121 (text input)
  - Subnet Mask: 255.255.255.0 (dropdown menu)
  - Default Gateway: 192.168.1.1 (text input)
  - DNS Entries: 8.8.8.8, 2001:4860:4860::8888 (text input)
  - Mgmt VLAN:  (toggle switch)

The following items are displayed on this page:

### PoE Port

- **POE Port Role** — Selects the function of the Uplink Port (PoE port). This port functions as a dedicated management port by default. The role can be changed to “Bridged with LAN port” so that the port functions as a LAN port.

### Management Port Settings

- **IP Address Mode** — Sets the method used to provide an IP address for the Internet access port. (Default: DHCP; Options: DHCP, static IP)
- **Fallback IP** — The IPv4 address used when a DHCP server is unavailable. (Default: 192.168.1.20)
- **Fallback Netmask** — The subnet mask used for the Fallback IP address. (Default: 255.255.255.0)

### LAN Port Settings

- **IP Address Mode** — Configures the LAN interface to be in static IP mode or DHCP mode. In DHCP mode, a DHCP request is broadcast to the Layer 2 network when the network behavior is set to Layer 2 Bridge. When the network behavior is set to VXLAN, a DHCP request is sent to the core network via the VXLAN tunnel.
- **IP Address** — The static IP address when the IP Address Mode is “Static IP.”
- **Subnet Mask** — The subnet mask when the IP Address Mode is “Static IP.”
- **Default Gateway** — The IPv4 address of the default gateway, which is used if the requested destination address is not on the local subnet.
- **DNS Entries** — Allows clients to access the web interface through the specified domain from a local network.
- **Mgmt VLAN** — Select this option to enable a management VLAN on site devices. Once you enable this option, you will no longer be able to access devices on any of the built-in the local networks (for example, 192.168.2.1). You will only be able to access devices from the specified VLAN network. If a device’s IP mode is set to DHCP, it will also request a new IP address in the subnet range assigned to the VLAN network.

## Radio Settings

Click the “Radio Settings” tab to configure the operation mode and security.

**Figure 252: Terragraph Device Radio Settings**

The following items are displayed on this page:

### Operation Mode

- **Mode** — For firmware versions before 1.4.2:
  - **Client Mode (Terragraph Mode)** — Allows a connection to a Terragraph DN device. In this mode, the client passively waits for a DN device to connect.
  - **Client Mode (Point-to-point Mode)** — Allows a connection to a Base Station Mode CN device. In this mode, the client passively waits for a Base Station Mode CN to connect.
  - **Base Station Mode** — Allows links to be created to client mode (Point-to-point Mode) CN devices. For MLTG-CN units, up to 15 links can be created. For MLTG-CN LR units, only one link can be created.
- **Mode** — For firmware versions after 1.5.0:
  - **Client Mode** — Allows connections to DN or Base Station Mode CN devices. In this mode, the client passively waits for a connection.

- **Base Station Mode** — Allows links to be created to client mode (Point-to-point Mode) CN devices. For MLTG-CN units, up to 15 links can be created. For MLTG-CN LR units, only one link can be created.

#### *Channel*

- **Channel** — In Base Station Mode, you can select the working channel (1 to 4) for a link.

#### *Security*

- **Security** — The security method used for the link. In the current version, only WPA2-PSK is supported.

#### *Password*

- **Password** — Configures the password for WPA2-PSK.

#### *Radio Configuration*

In Base Station Mode, click “ADD RULE” and enter the 60GHz radio MAC address of the another MLTG-CN device. Alternatively, click “SCAN” to find and select MAC addresses of other MLTG-CN devices.

## System Settings

Click the “System Settings” tab to configure general settings, NTP, SNMP, and syslog.

**Figure 253: Terragraph Device System Settings**

The following items are displayed on this page:

### General Settings

- **Timezone** — To display a time corresponding to your local time, choose one of the predefined time zones from the pull-down list.
- **Number of boot retries for switching bootbank** — The maximum number of bootup retries before switching to the next boot bank. (Range: 1-254; Default: 5)
- **Number of boot retries for factory reset** — The maximum number of bootup retries before reset device to default. (Range: 1-254; Default: 3)

### Network Time (NTP)

Network Time Protocol (NTP) allows the device to set its internal clock based on periodic updates from a time server. The device acts as an NTP client, periodically sending time synchronization requests to specified time servers. The device will attempt to poll each server in the configured sequence to receive a time update.

- **NTP Servers** — Enter IP addresses of NTP servers.

### SNMP

The Simple Network Management Protocol (SNMP) is designed specifically for managing devices on a network. It is typically used to configure devices for proper operation in a network environment, as well as to monitor them to evaluate performance or detect potential problems.

- **SNMP Server** — Enables or disables SNMP.
- **Write Community** — A text string that acts like a password and permits access through SNMP protocol version 2. This community string verifies the access of IPv4 users.
- **IPv6 Write Community** — A text string that acts like a password and permits access through SNMP protocol version 2. This community string verifies the access of IPv6 users.

### Remote Syslog

The device allows you to control the logging of error messages, including the type of events that are recorded and configure logging to a remote System Log (syslog) server or other management stations.

- **Server Size** — Specifies the available memory used for logging of error messages. (Default: 64 KiB)
- **Server IP** — Specifies the IPv4 or IPv6 address of a remote server which will be sent syslog messages.
- **Server Port** — Specifies the UDP port number used by the remote server. (Range: 1-65535; Default: 514)
- **Log Level** — Use the menu to select the severity of the logs to print to the console. Logs with the severity level you select and all logs of greater severity print. For example, if you select Error, the logged messages include Error, Critical, Alert, and Emergency. The default severity level is Debug(7). The severity can be one of the following levels:

Table 3: Logging Levels

Level	Severity Name	Description
7	Debug	Debugging messages
6	Informational	Informational messages only
5	Notice	Normal but significant condition, such as cold start
4	Warning	Warning conditions (e.g., return false, unexpected return)
3	Error	Error conditions (e.g., invalid input, default used)

\* There are only Level 2, 5 and 6 error messages for the current firmware release.

Table 3: Logging Levels (Continued)

Level	Severity Name	Description
2	Critical	Critical conditions (e.g., memory allocation, or free memory error - resource exhausted)
1	Alert	Immediate action needed
0	Emergency	System unusable

\* There are only Level 2, 5 and 6 error messages for the current firmware release.

#### SNMP V3 User

SNMP protocol version 3 provides secure access by account authentication and data encryption. The SNMP v3 user list can be defined with the following items.

- **Name** — The user name used to access the SNMP service.
- **Access Auth.** — Select the access permission as “Read Only” or “Write.”
- **Auth. Type** — Select the hash algorithm for authentication.
- **Auth. Pwd.** — Configure the password for authentication.
- **Encryption Type** — Select the encryption algorithm for data packets.
- **Encryption Pwd** — Configure the password for data encryption.



This chapter describes configuration settings for switches at the Device level. It includes the following sections:

- “Switch Configuration” on page 268
- “Port Configuration” on page 269
- “VLAN Configuration” on page 271
- “Configuring Name Servers” on page 273
- “Configuring Static IP Routes” on page 273
- “Configuring Port Rate Limiting (QoS)” on page 274
- “STP Configuration” on page 275
- “Port Security Configuration” on page 275
- “Configuring 802.1X Port Authentication” on page 276
- “ACL Configuration” on page 278
- “Configuring Switch Services” on page 280
- “Configuring Port Mirroring” on page 281
- “Configuring Local Logins” on page 282
- “Configuring System Settings” on page 282
- “Configuring Login Authentication” on page 283

## Switch Configuration

Edgecore switch devices can only inherit Site Port Security settings from the Site level. Other settings must be configured at the Device level.

This section covers Device-level configuration for switch devices. ecCLOUD supports switch management for the following Edgecore models.

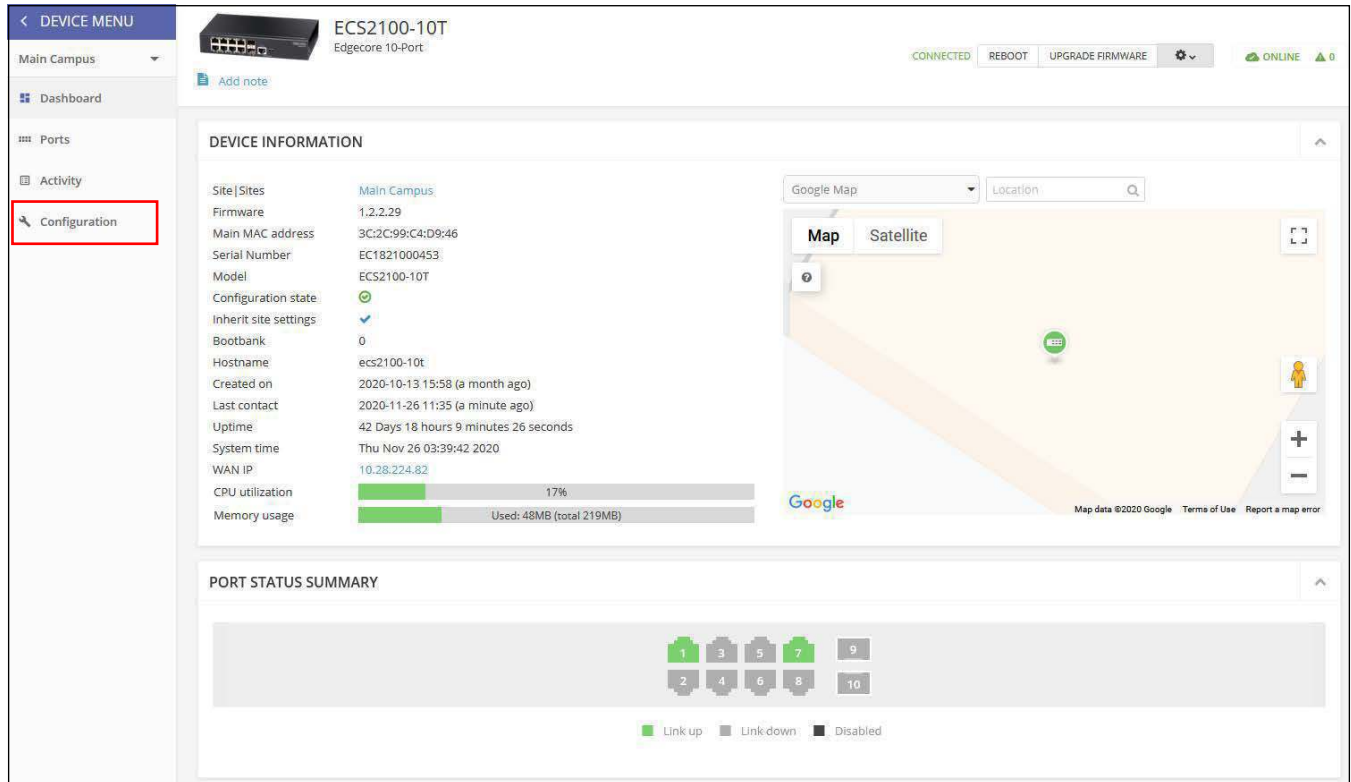
ECS2100-10P, ECS2100-10T, ECS2100-28P, ECS2100-28T, ECS2100-28PP, ECS2100-52T

ECS4100-12T, ECS4100-12PH, ECS4100-28P, ECS4100-28T, ECS4100-52P

ECS4120-28Fv2, ECS4120-28Fv2-I, ECS4120-28T, ECS4120-52T

**Note:** This chapter provides an example of switch configuration available from ecCLOUD. For complete feature support and configuration, refer to the *Web Management Guide* and *CLI Reference Guide* for the specific switch model, which can be obtained from [www.edgecore.com](http://www.edgecore.com).

Figure 254: Switch Device Dashboard

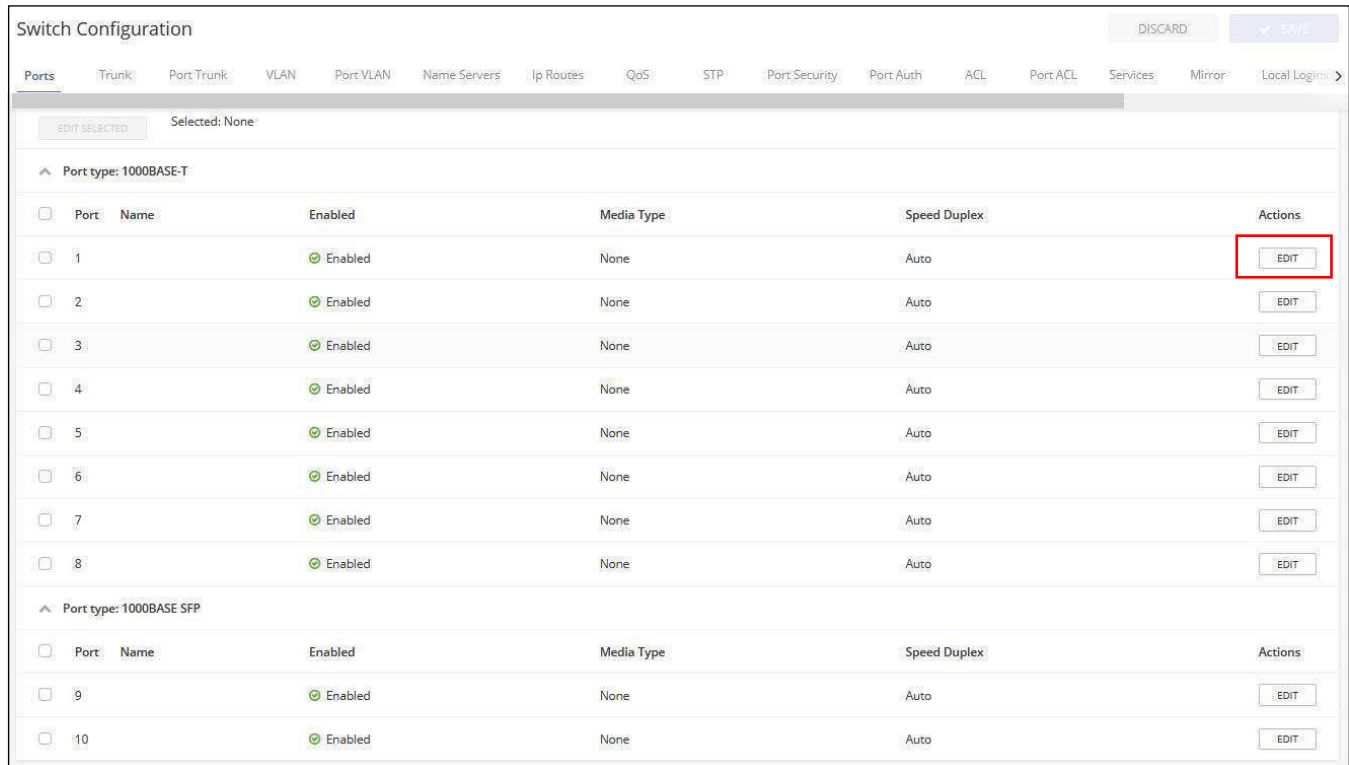


## Port Configuration

The switch configuration Ports tab provides access to basic port settings.

Click the EDIT button to enable/disable a port interface, set auto-negotiation and the interface capabilities to advertise, or manually fix the speed, duplex mode, and flow control.

Figure 255: Switch Ports



**Trunk Configuration** Trunks are multiple links between devices that work as one virtual, aggregate link. A port trunk offers a dramatic increase in bandwidth for network segments where bottlenecks exist, as well as providing a fault-tolerant link between two devices.

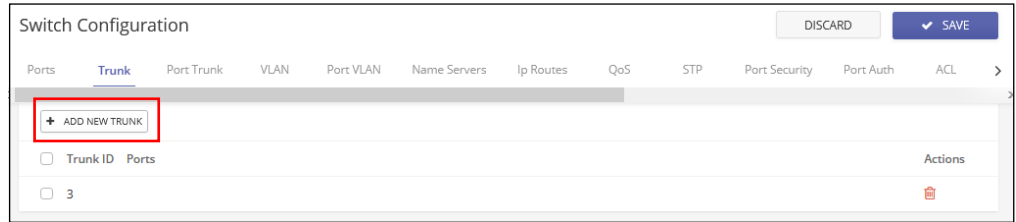
When setting up a static trunk between switches, take note of the following points:

- Finish configuring trunks before you connect the corresponding network cables between switches to avoid creating a loop.
- The ports at both ends of a connection must be configured as trunk ports.
- When configuring static trunks on switches of different types, they must be compatible with the Cisco EtherChannel standard.

- The ports at both ends of a trunk must be configured in an identical manner, including speed, duplex mode, flow control, VLAN assignments, and CoS settings.

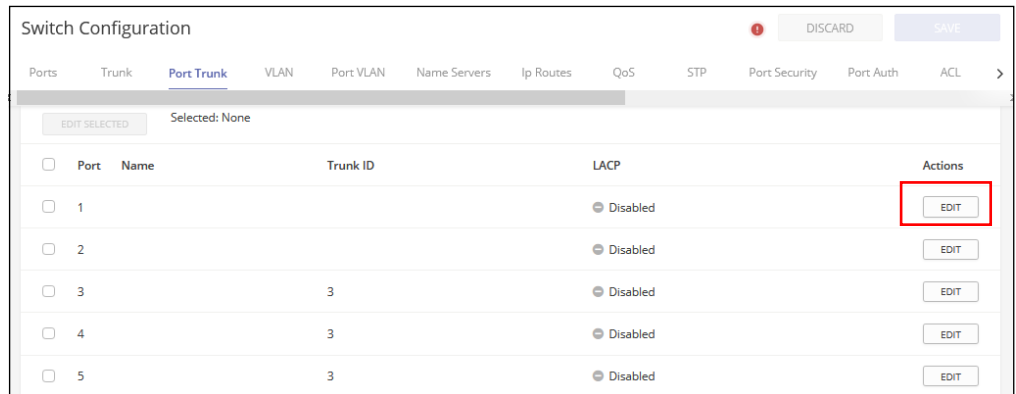
Click the Trunk tab and then the ADD NEW TRUNK button to create a trunk identifier.

Figure 256: Configuring a Trunk



Click the Port Trunk tab to add member ports to a static trunk. Click the EDIT button to assign a trunk ID to a port.

Figure 257: Configuring Trunk Ports



**LACP Trunks** The Link Aggregation Control Protocol (LACP) enables dynamic trunks to be created between two switches. LACP-configured ports automatically negotiate a trunked link with LACP-configured ports on another device. You can configure any number of ports on a switch as LACP, as long as they are not already configured as part of a static trunk. If ports on another device are also configured as LACP, the switch and the other device will negotiate a trunk link between them.

When setting up LACP trunks, take note of the following points:

- To avoid creating a loop in the network, be sure you enable LACP before connecting the ports, and also disconnect the ports before disabling LACP.
- If the target switch has also enabled LACP on the connected ports, the trunk will be activated automatically.

- A trunk formed with another switch using LACP will automatically be assigned the next available trunk ID.
- If more than the maximum number of ports attached to the same target switch have LACP enabled, the additional ports are placed in standby mode, and will only be enabled if one of the active links fails.
- All ports on both ends of an LACP trunk must be configured for full duplex, and auto-negotiation.

**Figure 258: Configuring LACP Trunks**

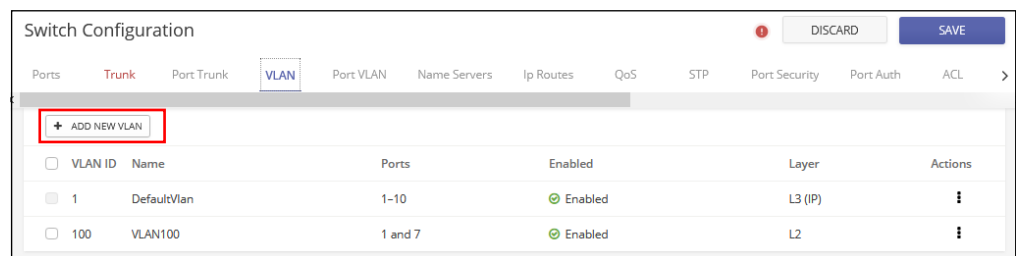


## VLAN Configuration

Click the VLAN tab to create or remove VLAN groups, or set the administrative status. To propagate information about VLAN groups used on this switch to external network devices, you must specify a VLAN ID for each of these groups.

Click the ADD NEW VLAN button to create a new VLAN ID. You can also define a VLAN as an Layer 3 interface, which must be configured before you can assign an IP address to a VLAN.

**Figure 259: Configuring VLANs**



### Adding VLAN Port Members

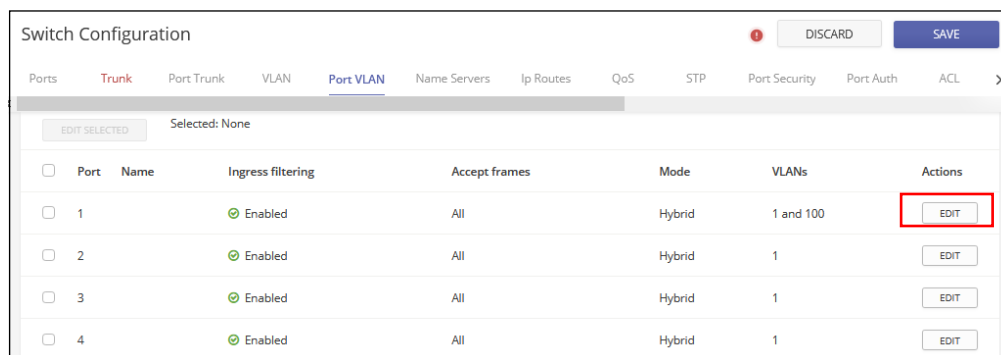
When creating and enabling VLANs for a switch, you must assign each port to the VLAN group(s) in which it will participate. By default, all ports are assigned to VLAN 1 as untagged ports. Add a port as a tagged port if you want it to carry traffic for one or more VLANs, and any intermediate network devices or the host at the other end of the connection supports VLANs. Then assign ports on the other VLAN-aware network devices along the path that will carry this traffic to the same VLAN(s). However, if you want a port on this switch to participate in one or more VLANs, but

none of the intermediate network devices nor the host at the other end of the connection supports VLANs, then you should add this port to the VLAN as an untagged port.

**Note:** ecCLOUD supports VLAN synchronization between APs and switches. When VLAN tagging is enabled for an SSID, the configured VLAN ID is automatically "pushed" by ecCLOUD to the attached switch port. This enables the VLAN-tagged traffic from the AP to be accepted by the switch port and avoids any loss of connectivity.

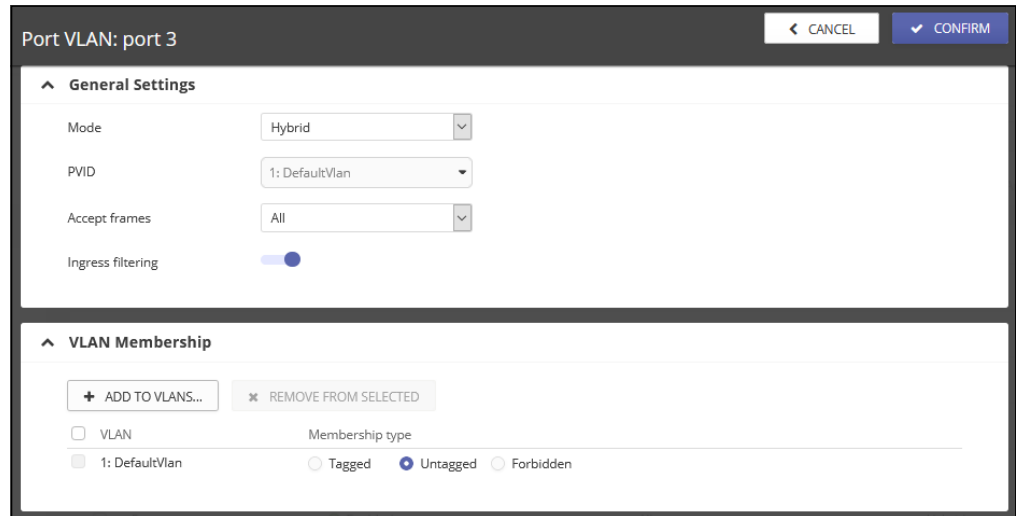
Click the Port VLAN tab to show port VLAN membership.

Figure 260: Configuring VLAN Port Members



Click the EDIT button to configure the VLAN behavior for a specific port, including the mode of operation (Hybrid or 1Q Trunk), the default VLAN identifier (PVID), accepted frame types, and ingress filtering. Assign ports as tagged if they are connected to 802.1Q VLAN compliant devices, or untagged they are not connected to any VLAN-aware devices. Or, configure a port as forbidden to prevent the switch from adding it to a VLAN.

Figure 261: Configuring VLAN Port Settings

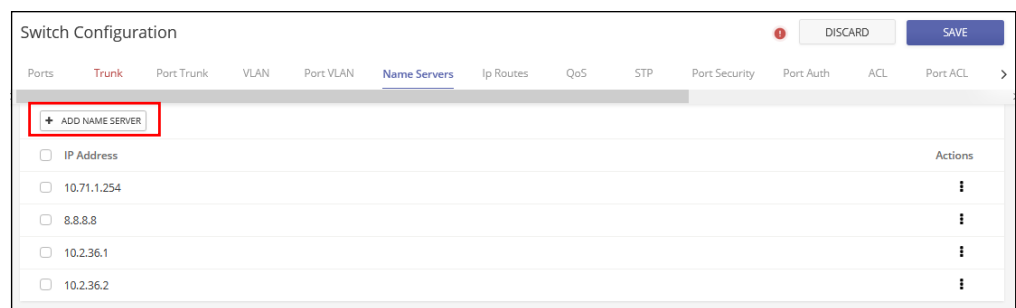


## Configuring Name Servers

Click the Name Servers tab to configure a list of name servers to be used for dynamic DNS lookup. When more than one name server is specified, the servers are queried in the specified sequence until a response is received, or the end of the list is reached with no response.

Click the ADD NAME SERVER button and specify the IPv4 or IPv6 address of a domain name server to use for name-to-address resolution.

Figure 262: Configuring Name Servers



## Configuring Static IP Routes

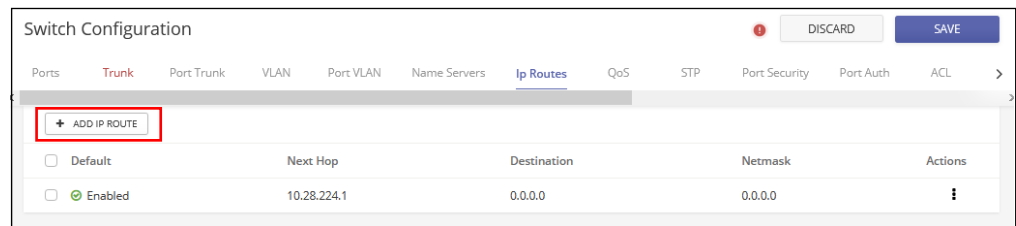
Edgecore switches support IP routing and routing path management via static routing definitions. When IP routing is functioning, a switch acts as a wire-speed router, passing traffic between VLANs with different IP interfaces, and routing traffic to external IP networks. However, when a switch is first booted, default routing can

only forward traffic between local IP interfaces. As with all traditional routers, static routing needs to be manually configured.

Static routes may be required to force the use of a specific route to a subnet. Static routes do not automatically change in response to changes in network topology, so you should only configure a small number of stable routes to ensure network accessibility.

To enter static routes in the routing table, click the IP Routes tab and then the ADD IP ROUTE button. Specify the destination IP Address and net mask, and the IP address of the next router hop used for the route.

Figure 263: Configuring IP Routes



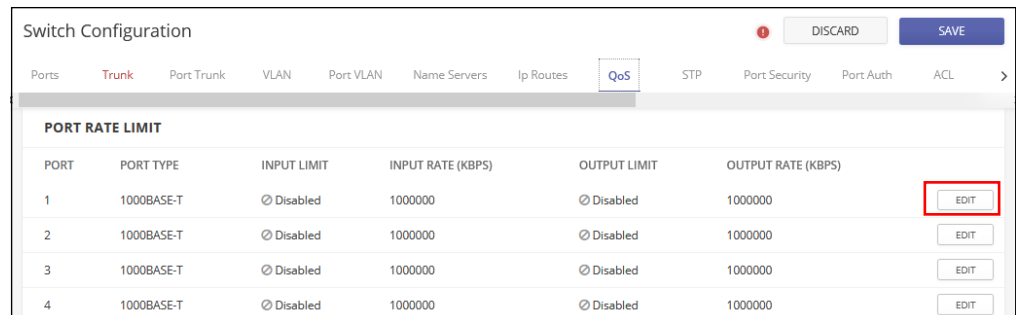
## Configuring Port Rate Limiting (QoS)

Click the QoS tab to apply rate limiting to ingress or egress ports. This function allows a network manager to control the maximum rate for traffic received or transmitted on a port interface. Rate limiting is configured on interfaces at the edge of a network to limit traffic into or out of the network.

Rate limiting can be applied to individual ports or trunks. When an interface is configured with this feature, the traffic rate will be monitored by the switch hardware to verify conformity. Non-conforming traffic is dropped, conforming traffic is forwarded without any changes.

Click the EDIT button for a port interface to enable input or output rate limiting and set the required rate limit.

Figure 264: Configuring Port Rate Limiting



## STP Configuration

The Spanning Tree Protocol (STP) can be used to detect and disable network loops, and to provide backup links between switches, bridges or routers. This allows the switch to interact with other bridging devices (that is, an STP-compliant switch, bridge or router) in your network to ensure that only one route exists between any two stations on the network, and provide backup links which automatically take over when a primary link goes down.

Edgecore switches support three types of spanning tree protocol:

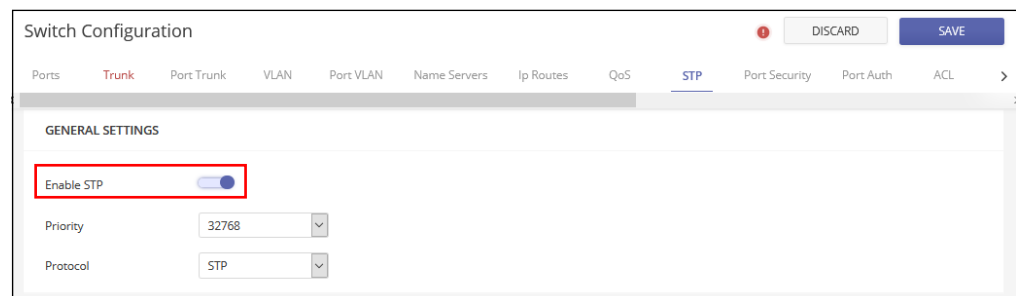
- **STP** — Spanning Tree Protocol (IEEE 802.1D). (When this option is selected, the switch will use RSTP set to STP forced-compatibility mode.)
- **RSTP** — Rapid Spanning Tree (IEEE 802.1w).
- **MSTP** — Multiple Spanning Tree (IEEE 802.1s).

Click the STP tab and enable STP. Select the protocol and configure the bridge priority, which is used in selecting the spanning tree root device (the network device with the highest priority becomes the STP root device).



**Note:** For more information on STP configuration, refer to the *Web Management Guide* and *CLI Reference Guide* for the specific switch model, which can be obtained from [www.edgecore.com](http://www.edgecore.com).

**Figure 265: Configuring STP**



## Port Security Configuration

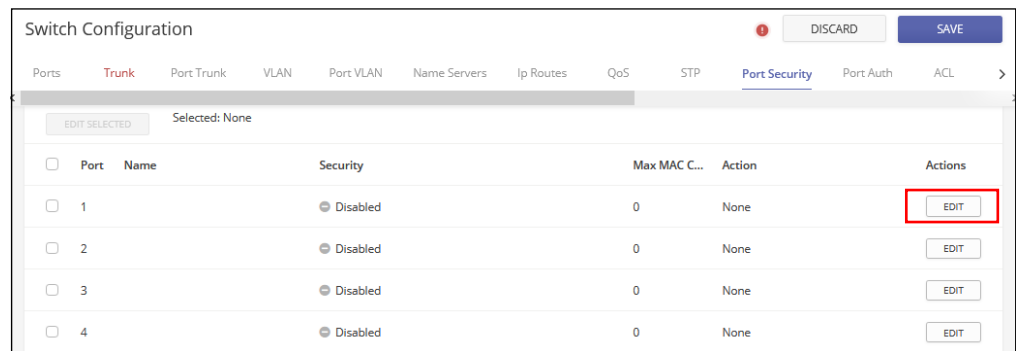
You can use Port Security to configure the maximum number of device MAC addresses that can be learned by a switch port, stored in the address table, and authorized to access the network.

When port security is enabled on a port, the switch stops learning new MAC addresses on the specified port when it has reached a configured maximum

number. Only incoming traffic with source addresses already stored in the address table will be authorized to access the network through that port. If a device with an unauthorized MAC address attempts to use the switch port, the intrusion will be detected and the switch can automatically take action by disabling the port and sending a trap message.

Click the Port Security tab and then the EDIT button for ports you want to configure. Enable security for the port, set the action to take when an invalid address is detected on a port, and set the maximum number of MAC addresses allowed on the port.

Figure 266: Configuring Port Security



## Configuring 802.1X Port Authentication

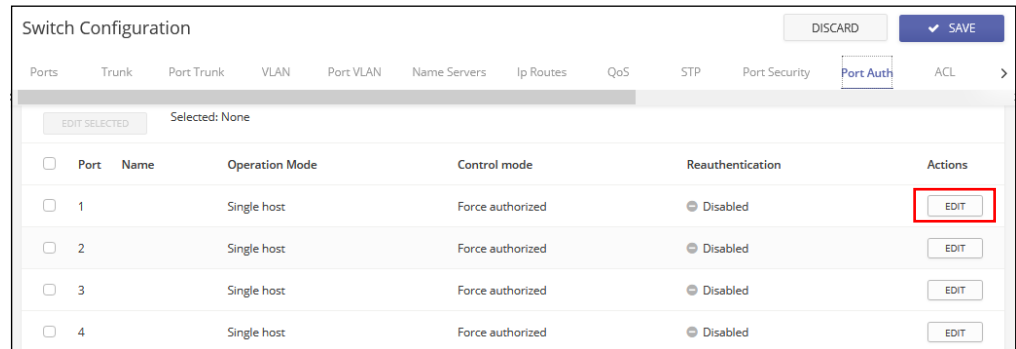
The IEEE 802.1X (802.1X or dot1X) standard defines a port-based access control procedure that prevents unauthorized access to a network by requiring users to first submit credentials for authentication. Access to all switch ports in a network can be centrally controlled from a server, which means that authorized users can use the same credentials for authentication from any point within the network.

Click the Port Auth tab to configure 802.1X port settings for the switch as the local authenticator. When 802.1X is enabled, you need to configure the parameters for the authentication process that runs between the client and the switch (that is, the authenticator), as well as the client identity lookup process that runs between the switch and authentication server.

For information on authentication server configuration, see [“Configuring Login Authentication” on page 283](#).

Click the EDIT button for a port to configure the port authentication details.

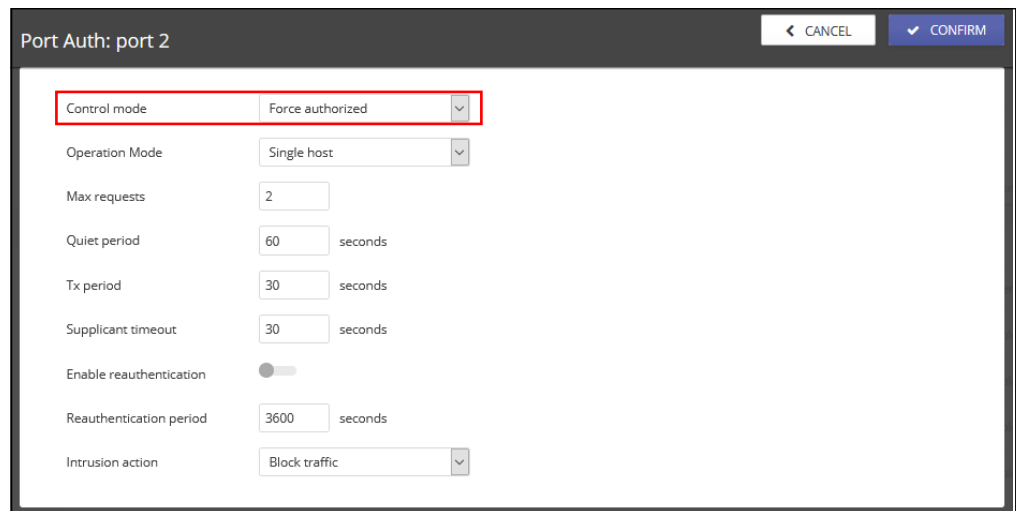
Figure 267: Configuring Port Authentication



When the switch functions as a local authenticator between supplicant devices attached to a switch port and the authentication server, you need to configure the parameters for the exchange of EAP messages between the authenticator and clients on the Authenticator configuration page.

On the port authentication details page, set the port Control Mode to “Auto” to enable authentication.

Figure 268: Configuring Port Authentication



**Note:** For more information on port authentication configuration, refer to the *Web Management Guide* and *CLI Reference Guide* for the specific switch model, which can be obtained from [www.edgecore.com](http://www.edgecore.com).

## ACL Configuration

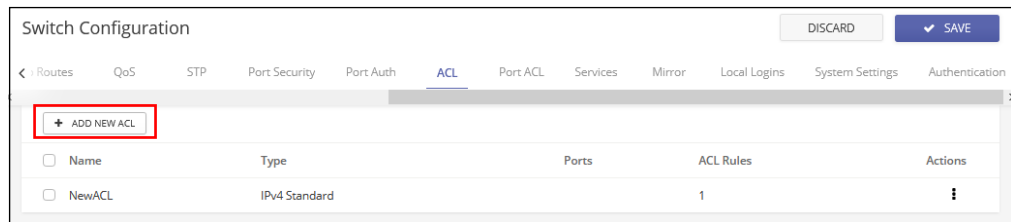
Access Control Lists (ACL) provide ingress packet filtering for IPv4/IPv6 frames (based on address, protocol, Layer 4 protocol port number or TCP control code), IPv6 frames (based on address, DSCP traffic class), or any frames (based on MAC address or Ethernet type). To filter incoming packets, first create an access list, add the required rules, and then bind the list to a specific port.

An ACL is a sequential list of permit or deny conditions that apply to IP addresses, MAC addresses, or other more specific criteria. The switch tests ingress packets against the conditions in an ACL one by one. A packet will be accepted as soon as it matches a permit rule, or dropped as soon as it matches a deny rule. If no rules match, the packet is accepted.

To configure an ACL, click the ACL tab and then the ADD NEW ACL button. Select the type of ACL you want to configure:

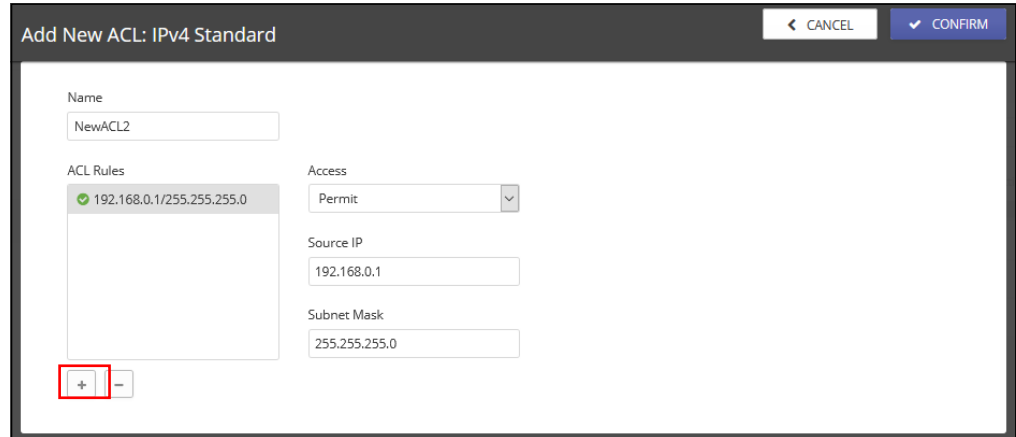
- **IPv4 Standard** — Configures an ACL based on source IPv4 addresses.
- **IPv4 Extended** — Configures an ACL based on source and destination IPv4 addresses, TCP/UDP port number, protocol type, and TCP control code.
- **IPv6 Standard** — Configures an ACL based on source IPv6 addresses.
- **IPv6 Extended** — Configures an ACL based on source and destination IPv6 addresses, DSCP traffic class, or next header type.
- **MAC** — Configures an ACL based on hardware addresses, packet format, and Ethernet type.
- **ARP** — Configures an ACL based on ARP messages addresses.

Figure 269: Configuring ACLs



On the Add New ACL page, give the ACL a name and then click the “+” button to configure rules to add to the ACL.

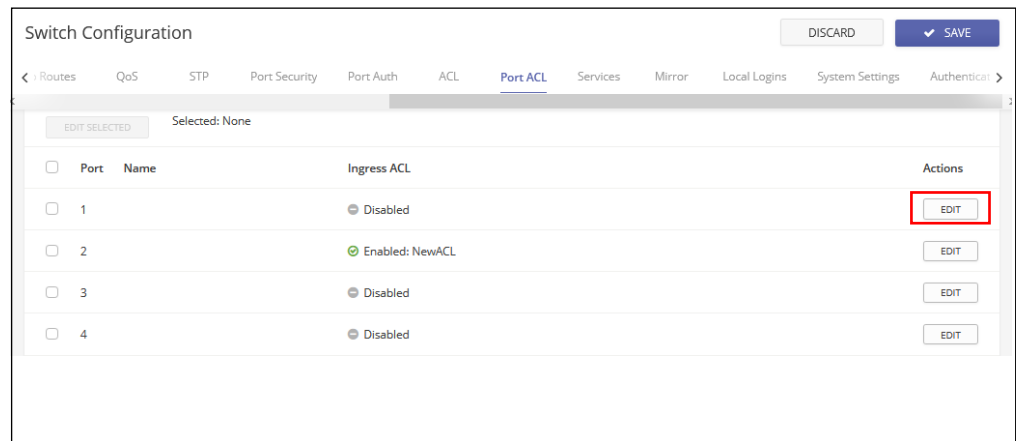
Figure 270: Adding a New ACL



**Binding Ports to an ACL** After configuring ACLs, click the Port ACL tab to bind the ports that need to filter ingress traffic to the appropriate ACLs.

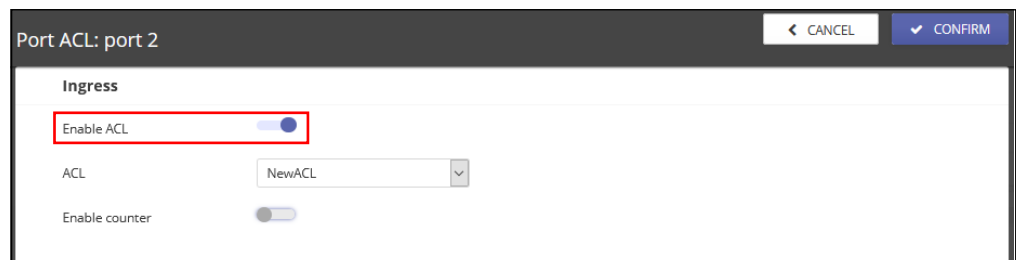
Click the EDIT button to configure an ACL for a port.

Figure 271: Port ACL Bindings



On the Port ACL edit page, select the configured ACL name, enable the ACL, and optionally enable counters to collect ACL statistics.

Figure 272: Binding Ports to ACLs





**Note:** For more information on ACL configuration, refer to the *Web Management Guide* and *CLI Reference Guide* for the specific switch model, which can be obtained from [www.edgecore.com](http://www.edgecore.com).

## Configuring Switch Services

Click the Services tab to configure Telnet and web server access to the switch, and to configure network time.

Enable the Telnet server for accessing the switch CLI over a Telnet connection.

Enable the HTTP web server for access to switch management using a web browser interface.

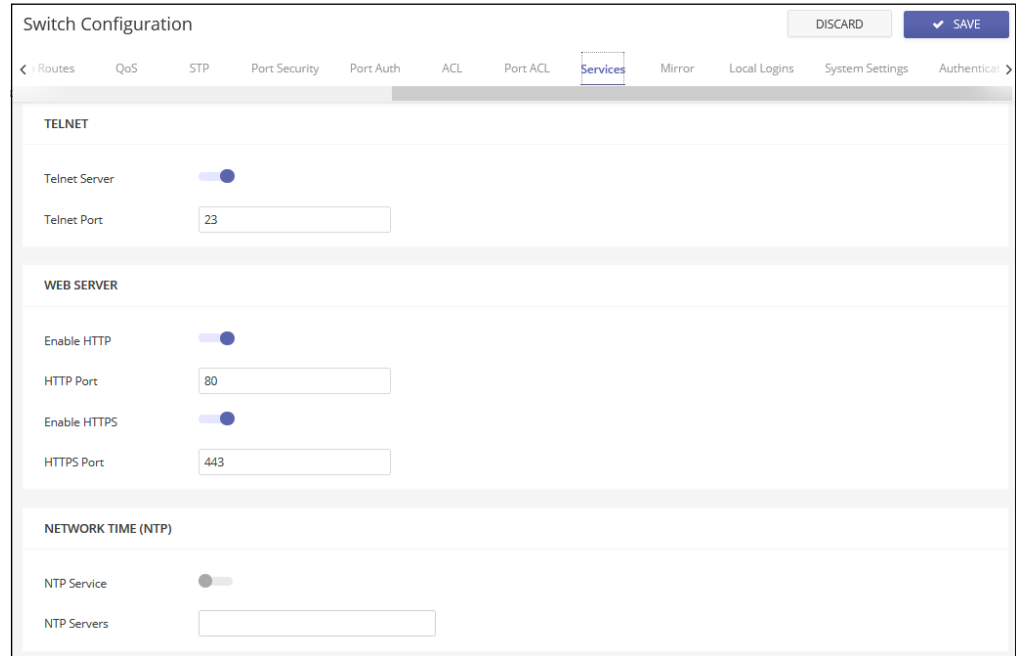
You can also enable HTTPS over the Secure Socket Layer (SSL), providing secure access (an encrypted connection) to the switch's web interface.

Both the HTTP and HTTPS service can be enabled independently on the switch. However, you cannot configure both services to use the same TCP port.

The Network Time Protocol (NTP) allows a switch to set its internal clock based on periodic updates from a time server. Maintaining an accurate time on a switch enables the system log to record meaningful dates and times for event entries.

To configure NTP, enter the IPv4 address for up to three time servers and then enable the NTP service. The switch will poll all the time servers configured, the responses received are filtered and compared to determine the most reliable and accurate time update for the switch.

Figure 273: Switch Services

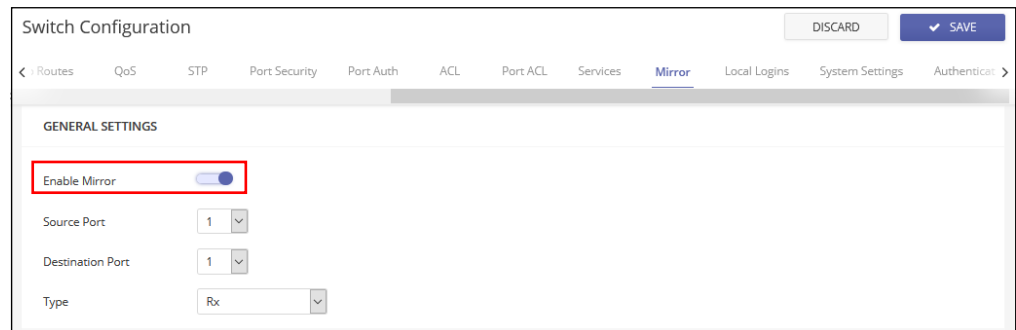


## Configuring Port Mirroring

Use the Mirror tab to mirror traffic from any source port to a target port for real-time analysis. You can then attach a logic analyzer or RMON probe to the target port and study the traffic crossing the source port in a completely unobtrusive manner.

Enable mirroring, select the source and destination ports, and the type of traffic to mirror; received, transmitted, or both.

Figure 274: Port Mirroring



## Configuring Local Logins

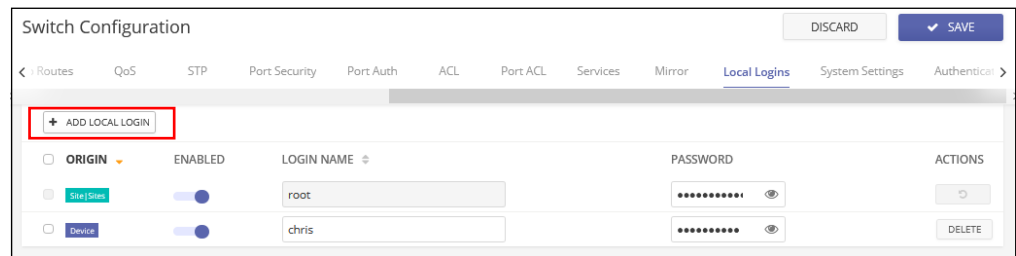
Use the Local Logins tab to control management access to the switch based on manually configured user names and passwords.

The Local Logins have one account configured by default using a randomly-generated password. You can modify the password and configure additional local accounts as needed.



**Note:** The Local Logins default account is from the ecCLOUD Site-level configuration and it will overwrite the default account previously configured on the local user interface of a device. Once the Site-level configuration has been pushed to devices, you must use Local Login accounts configured at the ecCLOUD Device-level configuration.

Figure 275: Local Login Configuration



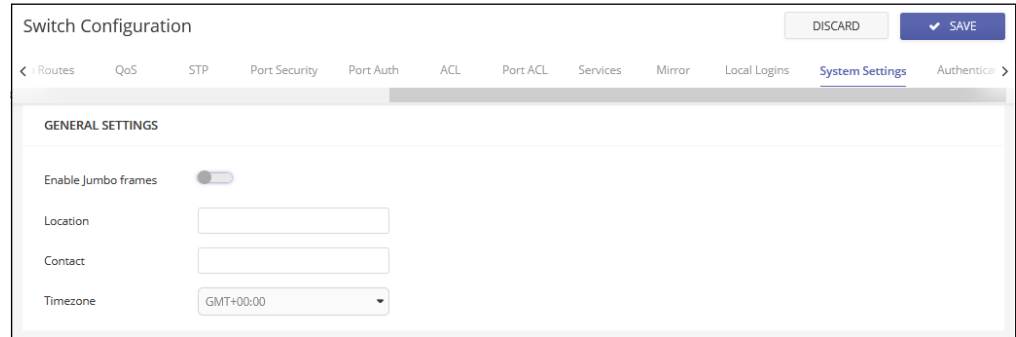
## Configuring System Settings

Use the System Settings tab to identify the system by displaying information such as the device location and contact information. You can also enable jumbo frames and configure the local timezone.

Edgecore switches include support for layer 2 jumbo frames. A switch provides more efficient throughput for large sequential data transfers by supporting jumbo frames up to 10240 bytes for Gigabit Ethernet and 10 Gigabit Ethernet ports or trunks. Compared to standard Ethernet frames that run only up to 1.5 KB, using jumbo frames significantly reduces the per-packet overhead required to process protocol encapsulation fields.

You should also set the time zone of your switch location. NTP uses Coordinated Universal Time (or UTC, formerly Greenwich Mean Time, or GMT) based on the time at the Earth's prime meridian, zero degrees longitude, which passes through Greenwich, England. To display a time corresponding to your local time, you must indicate the number of hours and minutes your time zone is east (before) or west (after) of UTC. You can choose one of the predefined time zone definitions.

Figure 276: System Settings



## Configuring Login Authentication

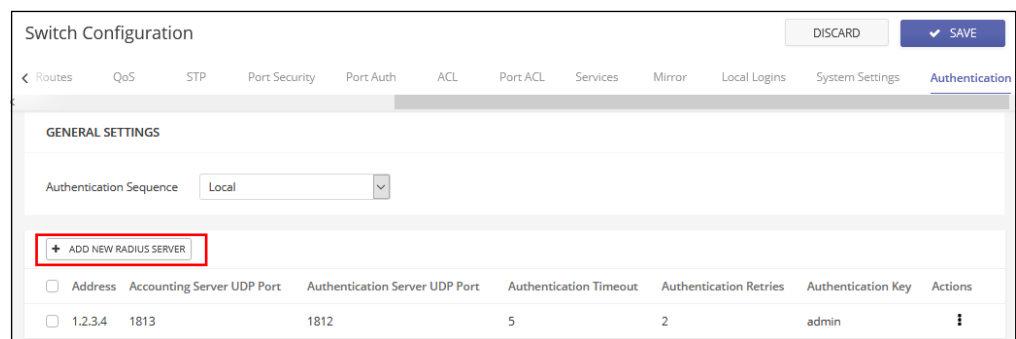
Use the Authentication tab to specify local or remote authentication. Local and remote login authentication control management access via the console port, web browser, or Telnet.

Local authentication restricts management access based on user names and passwords. Remote authentication uses a remote access authentication server based on RADIUS or TACACS+ protocols to verify management access.

By default, management access is always checked against the local authentication database. If a remote authentication server is used, you must specify the authentication sequence. Then specify the corresponding parameters for the remote authentication servers.

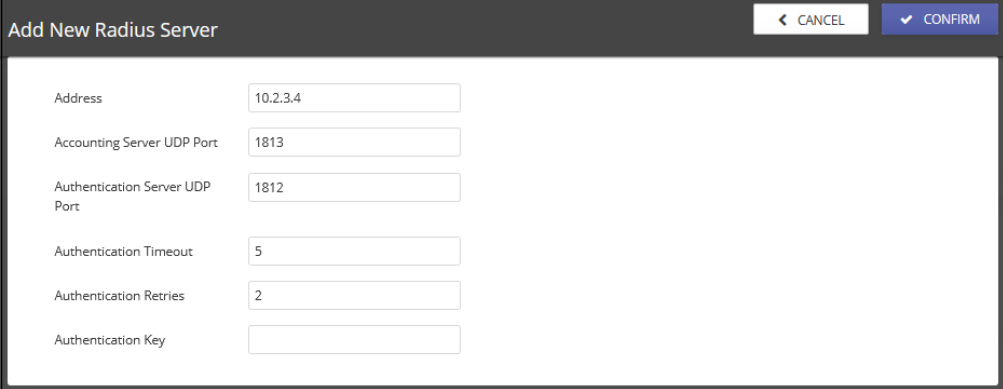
You can specify up to three authentication methods for any user to indicate the authentication sequence. For example, if you select (1) RADIUS, (2) TACACS and (3) Local, the user name and password on the RADIUS server is verified first. If the RADIUS server is not available, then authentication is attempted using the TACACS+ server, and finally the local user name and password is checked.

Figure 277: Login Authentication



To add authentication servers, click the ADD NEW RADIUS SERVER button and configure the IP address and other server details.

Figure 278: Adding Authentication Servers



The screenshot shows a configuration dialog box titled "Add New Radius Server". It features a dark header bar with a left-pointing arrow and the text "CANCEL" on the left, and a right-pointing arrow and the text "CONFIRM" on the right. The main content area is white and contains several labeled input fields:

- Address:** 10.2.3.4
- Accounting Server UDP Port:** 1813
- Authentication Server UDP Port:** 1812
- Authentication Timeout:** 5
- Authentication Retries:** 2
- Authentication Key:** (empty field)



# 13

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## SD-WAN Device Configuration

This chapter describes configuration settings for SD-WAN at the Device level. It includes the following sections:

- “SD-WAN Device Configuration” on page 286
- “WAN” on page 288
- “LAN” on page 293
- “Static Route” on page 295
- “Dynamic Route” on page 295
- “Access Control” on page 296
- “Virtual Server” on page 298
- “System Settings” on page 299

## Accessing SD-WAN Device-Level Configuration

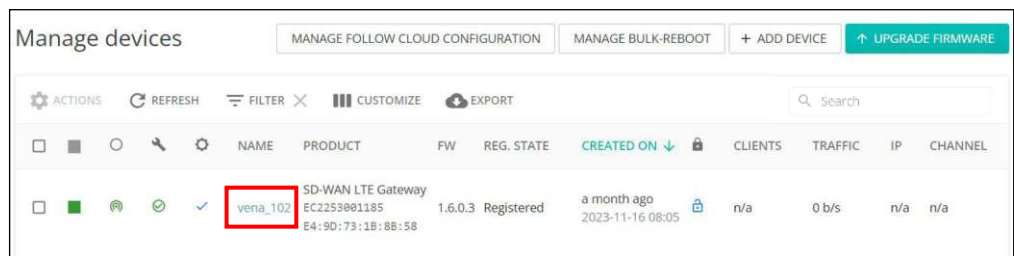
When a device’s “Inheritance Policy” is enabled, the device is configured from the Site level. However, a device can be individually configured at the Device level and the settings will override the Site-level configuration.

**Note:** Individual device overrides can be reset to the Site-level configuration by clicking the “Use Site Settings” button on the page where a setting has been changed.

In addition, SD-WAN Devices include settings not configurable at the Site level, such as advanced settings and features unique to a specific product. These settings can only be configured at the Device level.

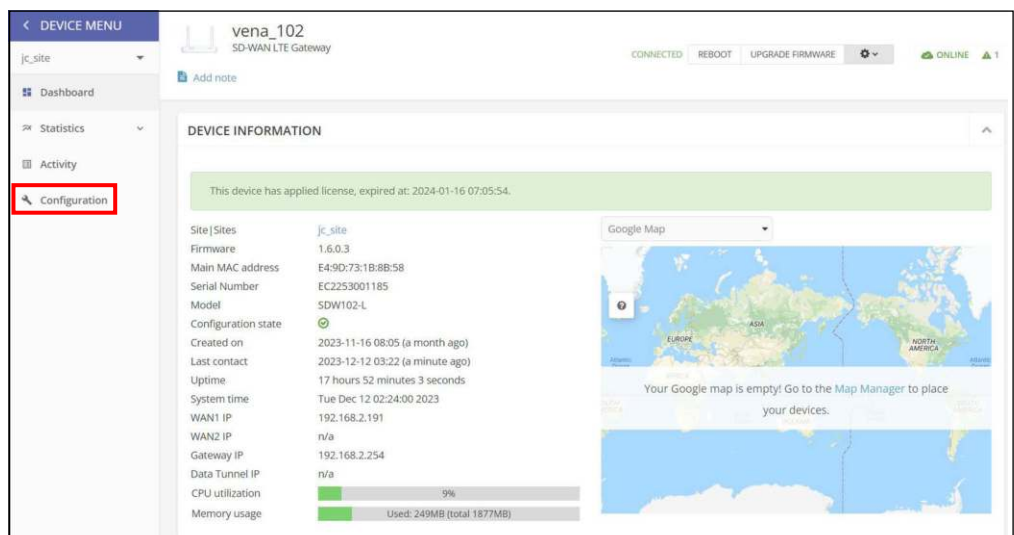
To access configuration for a device, click on the device name from the Site-level list of devices (also available from the Cloud-level list of devices).

**Figure 279: Accessing Device-Level Configuration**



From the Device dashboard, click on “Configuration” on the Device menu to access a device’s configuration.

**Figure 280: Device-Level Dashboard**



This chapter only covers the device configuration that is different from the Site-level configuration, as documented in “Site SD-WAN Configuration” on page 216.

## WAN

Click the “WAN” tab to configure settings. The following items are displayed on the WAN tab.

### WAN

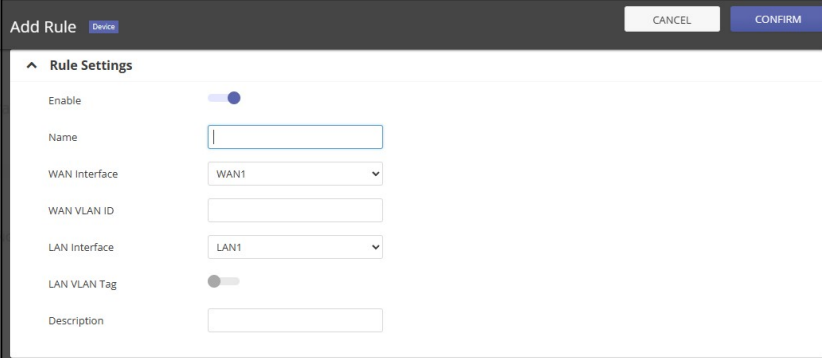
Figure 281: Device WAN Configuration



- **WAN Provisioning** — Configure the settings of WAN1 and WAN2. Each interface can be configured independently.
- **Type** — The method used to provide an IP address for the WAN Interface. (Default: DHCP. Other options: Static IP, PPPoE)
- **IP Address** — Enter the IP address here.
- **Netmask** — Specify the subnet mask associated with the WAN1 IP address.
- **Gateway** — Define the gateway IP address for WAN1 to route traffic outside the local network.
- **DNS 1** — Enter the primary DNS server IP address.
- **DNS 2** — Enter the secondary DNS server IP address.
- **NAT** — Enable or disable the NAT function.

## WAN VLAN Passthrough

Figure 282: Create a New WAN VLAN Passthrough Rule




Add rules to allow traffic to traverse from the WAN to specified LAN interfaces. In the WAN VLAN Passthrough table, each entry can be enabled or disabled and comprises:

- **Name** — Define a name for the passthrough rule.
- **WAN Interface** — Designated WAN interface for the rule.
- **WAN VLAN ID** — VLAN ID tagged for the WAN, specifying which VLAN's traffic is to pass through.
- **LAN Interface** — Target LAN interface for the VLAN traffic.
- **LAN VLAN Tag** — VLAN ID assigned to the LAN interface, when VLAN tagging is enabled.
- **Description** — A brief note describing the rule.

## WAN Internet Prefer

Figure 283: Select the Preferred WAN Interface for Internet Connectivity



- **Prefer WAN** — Select the WAN interface (WAN1 or WAN2) to be given priority for Internet traffic. If 'Disable' is selected, no preference is given, and the device will manage WAN selection based on availability or other load balancing setting.

## SLA

Figure 284: SLA Configuration

The screenshot shows the SLA configuration interface with the following settings:

- Enable:** A toggle switch is turned on (blue).
- Test IP:** A text input field contains the value "8.8.8.8".
- Monitor Interval:** A text input field contains "5.0" with the unit "seconds" displayed to the right.
- Max Latency:** A text input field contains "700" with the unit "milli seconds" displayed to the right.
- Max Jitter:** A text input field contains "700000" with the unit "micro seconds" displayed to the right.
- WAN Load Balance:** A toggle switch is turned off (grey).

- **Test IP** — Enter the IP address used to test the link quality.
- **Monitor Interval** — Set the time interval, in seconds, for how frequently the link quality is assessed.
- **Max Latency** — Maximum acceptable latency of qualified service level in milliseconds. The device changes the default route if this threshold is exceeded.
- **Max Jitter** — Maximum acceptable jitter of qualified service level in microseconds. The device changes the default route if this threshold is exceeded.
- **WAN Load Balance** — Enable or disable load balancing across WAN interfaces for Internet access.

## Traffic Steering

Allows for the management of network traffic direction based on specific rules.

- **Name** — Enter a name for the rule.
- **Mode** — Defines the steering behavior (Available, Mandatory, Load Balance).
- **IP Address (Source > Destination)** — Source and destination IP addresses of targeted packets.
- **Application/Protocol (Source > Destination)** — Choose a predefined application or set custom parameters for traffic matching or select customize and specify the protocol to use.

- **Interface Preferred/Backup** — The link (interface) which rule-matching target packets are forward to and when the preferred interface is unavailable.
- **Actions** — Edit or delete this traffic steering rule configuration.

**Figure 285: Add Traffic Steering Filtering Rule**

Add a new steering rule to control how traffic is directed through the network:

- **Source IP** — Enter the source IP or network IP.
- **Source Netmask** — Define the network netmask for the source IP.
- **Destination IP** — Specify the destination IP or network IP.
- **Destination Netmask** — Define the network mask for the destination IP.
- **Application** — Automatically set IP Protocol number, default destination IP port of filter rule for common application.
  - Customized applications require manually specify the source and destination ports, and the IP protocol rule number.
  - GRE protocol, IP protocol number: 47
  - ESP protocol, IP protocol number: 50
  - IGMP protocol IGMP protocol, IP protocol number: 2
  - SNMP protocol, UDP destination port: 21
  - SSH protocol, TCP destination port: 22
  - Telnet protocol, TCP destination port: 23
  - Web HTTP protocol, TCP destination port: 80

- Web HTTPS protocol, TCP destination port: 443
  - Email POP3 protocol, TCP destination port: 110
  - Email SMTP protocol, TCP destination port: 25
  - Email IMAP protocol, TCP destination port: 143
  - Video RTP protocol, UDP destination port: 5004, 5005
  - Video RTSP protocol, TCP/UDP destination port: 554
  - Video RSVP protocol, TCP/UDP destination port: 3455
  - VPN L2TP protocol, UDP destination port: 1701
  - VPN PPTP protocol, TCP destination port: 1723
  - VPN ISAKMP protocol, UDP destination port: 500
  - VPN IPsec protocol, UDP destination port: 4500
  - VoIP H.323 protocol, TCP destination port: 1720
  - VoIP SIP protocol, TCP destination port: 5060
- **Ingress Interface** — Choose the ingress interface from options such as WAN1, WAN2, TUN, LAN, or specific VPN tunnels.

Figure 286: Configure Action to Filter-Matching Packets

The screenshot shows a configuration form with the following fields and values:

- Name: [Empty text box]
- Mode: Available (dropdown menu)
- Multipath Default: Disabled (toggle switch)
- Prefer Interface: WAN1 (dropdown menu)
- Prefer Gateway: [Empty text box]
- Backup Interface: [Empty dropdown menu]

- **Actions** — Edit or delete this traffic steering rule configurations.
  - **Name** — Name the filtering rule.
  - **Mode** — Set the Traffic Steering behavior:
    - **Available** — Traffic defaults to the preferred interface and falls back to the backup interface if needed.

- **Mandatory** — Traffic is strictly sent through the preferred interface or dropped if unavailable.
- **Load Balance** — Distributes traffic between the preferred and backup interfaces based on current load and availability.
- **Multipath Default** — Enable or Disable traffic multipath capability. (Default is Disabled)
- **Prefer Interface** — Select the primary interface to forward packets matching the rule.
- **Prefer Gateway** — Define the IP Address of the primary gateway.
- **Backup Interface** — Select an alternative interface to forward packets matching the rule if the preferred interface is unavailable.
- **Backup Gateway** — (Optional) Define an alternative gateway for use if the preferred gateway is unavailable.

## LAN

Click the “LAN” tab to configure the Default LAN settings, DHCP Server settings, and define additional LAN subnets.

### Default LAN

Figure 287: Default LAN and DHCP Server Configuration

The screenshot displays the configuration page for the Default LAN. At the top left, there is a 'LAN' tab and an '+ ADD LAN' button. Below this, the 'DEFAULT LAN' section contains several configuration options:

- IP Address:** A text input field containing '192.168.100.1'.
- Subnet Mask:** A dropdown menu showing '255.255.255.0 (/24)'.
- DPI:** A toggle switch that is currently turned off.
- DHCP Server:** A toggle switch that is currently turned on.
- DHCP Start:** A text input field containing '192.168.100.100'.
- DHCP Limit:** A text input field containing '192.168.100.200'.
- Lease Time:** A text input field containing '86400'.
- DNS 1:** A text input field containing '8.8.8.8'.
- DNS 2:** An empty text input field.

- **IP Address** — Enter the IP address for the default LAN interface.
- **Subnet Mask** — Select the netmask for the default LAN.
- **DHCP Server** — Toggle this to enable or disable the DHCP (Dynamic Host Configuration Protocol) server.
- **DHCP Start and End** — Define the range of IP addresses in the DHCP pool, starting with the lowest assignable address and ending with the highest.

- **Lease Time** — The duration, in seconds, that an IP address is assigned to a DHCP client.
- **DNS1** — The IP address of the primary Domain Name Server for network name resolution.
- **DNS2** — The IP address of a secondary Domain Name Server for network name resolution.

### Additional LAN Subnet

Click “Add LAN” and configure additional LAN Subnets:

- **Name** — Define a name for the new subnet.
- **IP Address** — Set the LAN IP address for the subnet.
- **Subnet Mask** — Select the netmask of LAN IP address.
- **Port** — Select the local physical network interface for the subnet.
- **VLAN Tag** — Enable or disable VLAN Tagging for traffic segmentation.
  - **VLAN ID** — Set the VLAN ID within the range of 1 to 3999.
- **Remote Accessible** — The subnet can be other edge for VPN Group or P2P tunnel port to access.
- **DHCP Server** — Toggle this to enable or disable the DHCP (Dynamic Host Configuration Protocol) server.
- **DHCP Start and End** — Define the range of IP addresses in the DHCP pool, starting with the lowest assignable address and ending with the highest.
- **Lease Time** — The duration, in seconds, that an IP address is assigned to a DHCP client.
- **DNS1** — The IP address of the primary Domain Name Server for network name resolution.
- **DNS2** — The IP address of a secondary Domain Name Server for network name resolution.

## Static Route

Click the “Static Route” tab to configure the list of static routes.

**Figure 288: Static Route Configuration**

IP ADDRESS	NETMASK	GATEWAY	INTERFACE	METRIC
<input type="text"/>	255.255.255.0 (24)	<input type="text"/>	WAN1	0

Showing 1 to 1 of 1 entries

- **Destination IP** — Enter the destination IP address. Valid IP addresses consist of four decimal numbers, ranging from 0 to 255, separated by periods.
- **Netmask** — Select the netmask that corresponds to the destination IP address. (Default: 255.255.255.0)
- **Gateway** — The IP address of the gateway router, which will be used to route traffic to destinations not on the local network.
- **Interface** — The point of interconnection between a device and a private or public network. Options include physical interfaces such as WANs or LANs, and virtual interfaces like multi-subnets.
- **Metric** — Assign a metric value to the route, which is used to determine its precedence within the routing table. A lower metric value gives the route a higher priority.

## Dynamic Route

Click the “Dynamic Route” tab to manage the OSPF (Open Shortest Path First) and BGP (Border Gateway Protocol) protocols, as well as to configure dynamic routes.

**Figure 289: Dynamic Settings Configuration**

**DYNAMIC SETTINGS**

OSPF

OSPF Auto

BGP

BGP Auto

ASN

- **OSPF** — Enable or disable the OSPF protocol.

- **OSPF Auto** — When enabled, OSPF configuration is automated to include the default LAN, multi-subnets marked as 'Remote Accessible', VPN group subnets, and P2P tunnel IP subnets.
- **BGP** — Enable or disable the BGP protocol.
- **BGP Auto** — Automatically configures BGP settings, including default LAN, multi-subnets marked as 'Remote Accessible,' VPN group subnets, P2P tunnel IP subnets, and BGP Neighbors.
- **BGP ASN** — Enter the BGP Autonomous System Number (ASN) to identify the device in BGP routing networks.

**Figure 290: Add New Dynamic Route**

CLASSIFICATION	PROTOCOL	IP ADDRESS	NETMASK	AREA/ASN	
<input type="checkbox"/> OSPF	Network	10.0.0.1	255.255.255.0 (/24)	1	DELETE

Showing 1 to 1 of 1 entries

- **Classification** — Select the protocol classification for the new route, whether OSPF or BGP.
- **Protocol** — Choose the type of protocol item to configure, such as BGP Network, OSPF Network, or BGP Neighbor.
- **IP Address** — Specify the network IP for BGP or OSPF Networks, or the neighbor IP for BGP Neighbor configurations.
- **Netmask** — Select the netmask for the BGP or OSPF Network, or for the BGP Neighbor.
- **Area/ASN** — Enter the OSPF Area number or the BGP ASN, as applicable to the chosen protocol.

## Access Control

Navigate to the "Access Control" tab to configure endpoint security settings.

**Figure 291: Define the Default Filter Policy**

DEFAULT FILTER POLICY

Action Type:

ACL RULES

NAME	APPLICATION MODE	ADDRESS	PROTOCOL	ACTION TYPE	DIRECTION	ACTIONS
No data available for this list						

Showing 0 to 0 of 0 entries

- **Default Filter Policy** — Set the default Access Control to either deny or permit network traffic.

### ACL Rules

- **Name** — Define a name for the rule.
- **Application Mode** — Choose between the protocol "Transport Protocol" (dependent on the protocol mode) and Application Layer Protocol (based on the application-to-layer protocol) to define the rule's active mode.
- **Address (Source > Destination)** — Define the source and destination IPs of traffic to match the rule.
- **Protocol/Port (Source > Destination)** — Define the source and destination ports of traffic to match the rule.
- **Action Type** — Select if the rule should deny or permit the traffic.
- **Direction** — Select between 'Outbound' (only outbound traffic) and 'ANY' (both inbound and outbound traffic) as the protection direction.
- **Actions** — Modify or delete the selected ACL rule.

**Figure 292: Configuration of a New Access Control Rule**

The screenshot shows the 'Add Rule' configuration window. At the top right, there are 'CANCEL' and 'CONFIRM' buttons. The main area is titled 'Rule Settings' and contains the following fields:

- Name:** An empty text input field.
- Source IP:** An empty text input field.
- Source Netmask:** A text input field containing '255.255.255.255'.
- Destination IP:** An empty text input field.
- Destination Netmask:** A text input field containing '255.255.255.255'.
- Application Mode:** A dropdown menu with 'Transport Protocol' selected.
- Application Name:** A dropdown menu with '- CUSTOMIZED -' selected.
- Protocol:** A dropdown menu with 'None' selected.
- Action Type:** A dropdown menu with 'Deny' selected.
- Direction:** A dropdown menu with 'Any' selected.

- **Name** — Define a name for the rule name.
- **Source IP** — Specify the original source IP value.
- **Source Netmask** — Set the source IP subnet mask.
- **Destination IP** — Set the destination IP value.
- **Destination Netmask** — Set the destination IP subnet mask.

- **Application Mode** — Select the dependent the protocol mode (Transport Protocol) or the application mode (Application-to Layer Protocol) to set the active mode.
- **Application Name** — Set public application protocol the system will use relating and it can use multi applications.
- **Protocol** — Selecting UDP, TCP, or UDP/TCP and enter valid port numbers ranging from 1 to 65535 for both the source and destination ports. If IP Protocol is chosen, only the IP address is required.
- **Action Type** — Select whether the rule should deny or permit traffic..
- **Direction** — Select the protection direction as either 'Outbound' (only outbound) or 'ANY' (both inbound and outbound). When using the 'Application Layer Protocol', Direction is set to ANY.

## Virtual Server

A Virtual Server allows remote computers to connect to specific computers or services within a private Local Area Network (LAN). It can do so using two primary mechanisms: Virtual Server (also known as Port-Forwarding) and 1-to-1 NAT (Network Address Translation) mapping.

The Virtual Server Section lists all configured virtual servers.

**Figure 293: New Virtual Server Settings**

Click "Add Virtual Server" and configure the settings of a new virtual server:

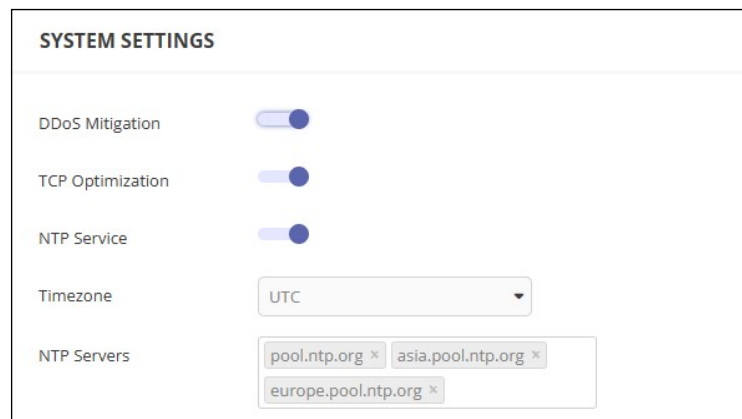
- **Name** — Enter a name for the virtual server entry.
- **Classification** — Choose the type of virtual server to deploy:

- **Virtual Server** — Redirects communication requests from one address and port number to another while traversing a network gateway. Useful for accessing services on a host within a protected network by remapping the destination address and port number to an internal host via a WAN interface.
- **1to1 NAT** — Maps one external IP address (typically public) to one internal IP address within LAN subnets. Overrides the Outbound NAT configuration for traffic from the private IP address to the Internet and vice versa.
- **Public IP Alias Inbound Interface** — Select the outbound WAN interface (WAN1 or WAN2) associated with the public IP alias.
- **Public IP Alias** — Specify the external (public) IP address for mapping.
- **Private IP** — Define the internal IP address to forward the packets.
- **Protocol** — Select the protocols for the virtual server (UDP or TCP).
- **Public Port** — Set the original destination port for packets via the WAN interface.
- **Private Port** — Define the internal port to redirected packets.
- **Description** — Add a brief comment to identify this virtual server setup.

## System Settings

Access the "System Settings" tab to manage SD-WAN features at the device level.

**Figure 294: SD-WAN Device System Settings**



The following items are displayed on this page:

- **DDoS Mitigation** — Enable the Distributed Denial of Service (DDoS) mitigation mechanism within the Routing/System Control domain.

- **TCP Optimization** — Activate TCP Optimization to enhance the performance of TCP (Transmission Control Protocol) traffic across the network.
- **NTP Service** — Enable the Network Time Protocol (NTP) service to send time updates request to maintain accurate system time.
- **Time Zone** — Select the appropriate time zone from the dropdown list to ensure the device displays the local time accurately.
- **NTP Servers** — Configure the hostnames for NTP servers. The Bsta server initially attempts to synchronize the time with the first server. If unsuccessful, it sequentially attempts to synchronize with the next server in the list.



# Accton

Making Partnership Work



## 2023 ESG REPORT

Accton Group  
Corporate Sustainability Report

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# About the Report

## The Accton Technology 2023 Corporate Sustainability Report was prepared in accordance with the GRI Standards 2021

Accton Technology has published its Corporate Social Responsibility Report (CSR Report) since 2017 to fulfill our corporate vision of sustainable development. The CSR Report was renamed as the Corporate Sustainability Report in 2021, aiming to disclose operational outcomes beyond financial performance to the public. This report encompasses three major dimensions: corporate governance, environmental aspects, and social and human rights considerations. This Report is published in both Chinese and English versions and made publicly available on the official Company website. This approach aims to ensure that various stakeholders understand Accton's unwavering commitment to sustainable development goals.

### Compilation Principles

Building upon the 20 sustainability issues of stakeholder concern identified in 2022, this Report specifies material issues based on their impact on the economy, environment, and society. These selected issues will be addressed with relevant content accordingly. This report was prepared according to the GRI Standards 2021 released by the Global Reporting Initiative (GRI) to present the corporate sustainability actions taken by the Company in 2023 as per the requirements of the Type 1 moderate-level assurance of the AA1000 Assurance Standard v3 (AA1000ASv3) and the Accountability principle. The content of this Report follows the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) to disclose climate-related risks and opportunities. Additionally, the index tables of the Global Reporting Initiative (GRI) and Sustainability Accounting Standards Board (SASB) indicators are provided in the appendix section.

### Reporting Cycle

Accton annually discloses sustainability information for the previous year and compiles it into a corporate sustainability report. In line with environmental conservation efforts and the promotion of paperless practices, these reports are published in electronic format on Accton's official website. Furthermore, Accton publishes the latest sustainability achievements and progress through its ESG website from time to time. The issuance details of this Report are as follows:

Issue Date: June 2024  
Last Issue Date: June 2023  
Next Issue Date: Scheduled for June 2025

## Reporting Period and Scope of the Report

This report discloses the measures and comprehensive outcomes of actions taken by Accton in various aspects of corporate sustainability from January 1, 2023, to December 31, 2023. It also highlights sustainability measures related to the official operation of Accton Vietnam during this period. The organizational scale, structure, ownership, and supply chain have not undergone any significant changes.

The operational scope covered in this Report includes:

- Accton Technology Corporation: Hsinchu headquarters, Hsinchu Plant 2, Zhunan Plant
- Accton Technology Corporation: Taipei/Hsinchu/Taichung offices, Tainan Science Park
- Edgecore Networks Corporation, hereinafter known as "Edgecore"
- Joy Technology (Shenzhen) Co., Ltd., hereinafter known as "JoyTech"
- Vietnam Accton Technology Company Limited, hereinafter known as "Vietnam Accton"

The boundary of this Report does not entirely match the affiliated entities listed in Accton Technology's 2023 annual report (accessible at: <https://www.accton.com/esg-documents/>). This discrepancy is due to the Report's primary focus on Accton Technology as the main reporting entity. To ensure comprehensive and transparent information disclosure, the operational activities of the brand sales subsidiary Edgecore Networks Corporation, as well as the production manufacturing subsidiaries JoyTech and Vietnam Accton, have been included in this Report. Other related entities in the financial report have relatively minor or insignificant impact on the operational activities of Accton Technology and therefore, are not included within the boundary of this Report.

### Assurance of the Report

This Report has been verified by SGS Taiwan, Ltd., in accordance with the GRI 2021 Standards and adopts the AA1000 ASv3 Type 1 Moderate Assurance level. The SGS assurance statement is attached in the appendix of this report.

### Contact Information

If you have any suggestions regarding this Report, please feel free to contact us through the following channels. For ease of reference, we have also published this

### Accton Technology Corporation / ESG Office

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Tel +886-3-5770270  
CSR Email csr@accton.com  
Corporate website www.accton.com  
Corporate website <https://www.accton.com/esg-home/>



# Sustainable Management

## Corporate sustainability vision and commitment

Connect people and communities around the globe with our technology.

"Distance is never a problem as long as we are determined." Accton has striven to achieve the goal of corporate sustainability through the Company's core network technologies and partnerships. With the corporate strategy of "solidarity, innovation, cloud convergence, and environmental protection" at the core of our operations, we have persisted in the development of high-quality, reliable, sustainable, and resilient network infrastructure and remain committed to becoming a critical driving force for promoting global ICT access and equality. Connecting the community and the world through partnerships has always been Accton's vision of corporate sustainability.



"Making Partnership Work" demonstrates Accton's commitment to our valued partners. Insistence of our corporate philosophy of integrity and honesty is also our fundamental belief in establishing a long-term partnership, thereby creating the best interests for all our partners.

Our most crucial partners are our employees. Providing everyone with a good job is an indispensable element of corporate sustainability and the foundation for safeguarding labor rights and safety, promoting gender equality, and creating an equal employment environment for different groups. Enabling everyone to obtain better remuneration and benefits is our promise to ourselves and our employees.

Our clients and suppliers play vital roles as partners in our ongoing improvement and growth. Through consistent development and innovation, we've enhanced productivity while reducing the correlation between productivity and energy usage. Over time, we've established a sustainable supply chain strategy with our suppliers, aimed at crafting environmentally responsible products for our clients. This commitment aligns with our vision and underscores our dedication to sustainability.

"Making Partnership Work" is not merely a slogan but the spirit of pursuing corporate sustainability. Our internal and external business philosophy can correspond to Accton's business motto of "trust, passion, courage, collaboration, and perfection." With a passion for the vision, the courage to realize our commitment, and the mutual trust and collaboration with our partners, we can perfectly achieve our established goals, and the motto is our belief in striving toward sustainable management.

## Our sustainability commitment and organizational history

The ESG Committee is the highest corporate social responsibility organization within the Accton Group. It is responsible for coordinating and setting the Company's corporate social responsibility and sustainable development directions. Senior Vice President Mr. Jackal Lee serves as the chair of the Committee and the top-level managers of relevant functional units serve as the members of various committees, including the Corporate Governance Committee, Operating Performance and Customer Relations Committee, Innovative Technology Committee, Green Manufacturing Committee, Supply Chain Management Committee, Environment Committee, Information Security Committee, and Employee Safety and Health Committee. The Corporate Sustainability Committee includes subsidiaries Edgecore Networks Corporation and JoyTech, which are involved in the boundaries of the Report.

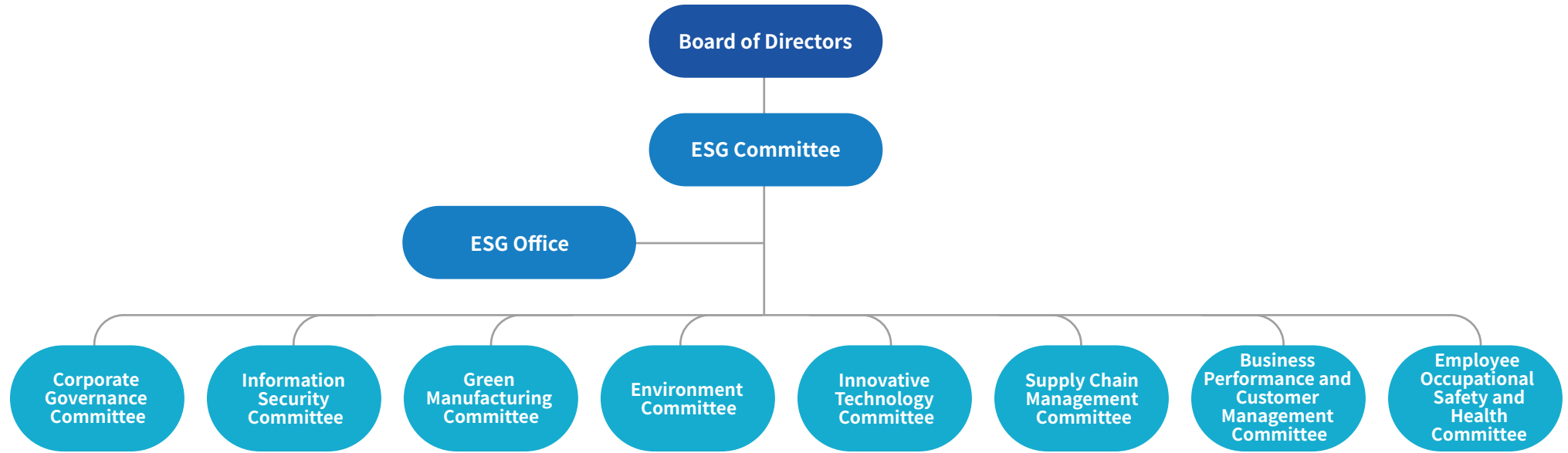
Furthermore, we have formally established the ESG Office, which has validated its implementation strategy and the current status of tasks and goals, set the direction and method of engagement with stakeholders regarding sustainability issues, and regularly reported on the progress of its implementation to the ESG Committee. To enhance the tracking and promotion of initiatives overseen by the ESG Office, at the end of 2023, we hired a full-time specialist dedicated to these tasks.

The ESG Committee was responsible for planning and implementing the project for this Corporate Sustainability Report, while the ESG Office was responsible for preparing and composing this report in detail. This Corporate Sustainability Report is scheduled to be presented to the Board of Directors by the chair of the ESG Committee in May 2024, outlining the execution results and future plans before publication.

ESG Committee	Governance		Environment		Social
	Corporate Governance Committee Information Security Committee Business Performance and Customer Management Committee	Innovative Technology Committee	Environment Committee Green Manufacturing Committee	Supply Chain Management Committee	Employee Occupational Safety and Health Committee
Goals	Ensure excellent performance and client satisfaction Reinforce corporate governance and adhere to the principle of integrity	Pursue sustainable innovative technology	Cherish natural resources and support environmental sustainability	Conduct responsible supply chain management	Develop human capital and improve employee care
Stakeholders	Shareholders Government agencies Suppliers				
	Clients Employees				



◆ ESG Committee and ESG Office Organizational Chart



## Accton Sustainable Development Policy and Commitment

**Comply with laws and regulations:**The Company complies with related labor, environmental protection, and safety and health regulations of the local government.

**Support for human rights policies and guidelines:** In accordance with the United Nations Guiding Principles on Business and Human Rights (UNGPs), the United Nations Universal Declaration of Human Rights (UDHR), the International Labor Standards (ILO), the Ten Principles of the United Nations Global Compact (UNGC), ILO Declaration on Fundamental Principles and Rights at Work, OECD Guidelines for Multinational Enterprises, The Code of Conduct for Responsible Business Alliances (RBA) and other human rights norms, we provide humane treatment and prohibit illegal discrimination and harassment, including but not limited to the prohibition of child labor, no violence against employees, no gender-based violence, no sexual harassment, no sexual abuse, no corporal punishment, no abuse, no mental or physical coercion, no bullying, no public humiliation, and no verbal abuse against employees.

**Ensure freedom of employment:** The Company ensures that all labor services are provided voluntarily and do not involve oppressive or forced labor.

**Ensure reasonable salary, benefits and labor hours:** The Company strictly abides by related regulations of the local government for labor salary and benefits. We also openly and clearly communicate our company's management practices to employees.

**Protect intellectual property rights:** Employees must protect and respect the intellectual property rights of the Company and others. The use of technology, professional skills, and related documents and data must be conducted in a manner that protects intellectual property rights.

**Transparency:** The Company must establish related internal and external communication channels. For internal communication, the Company should encourage direct communication and exchange of ideas between employees and the management; for external communication, the Company welcomes all exchange of information through dedicated emails.

**Uphold ethical management:** The Company shall adopt the highest ethical standards for the Company's operations and the management of employee ethics. The Company prohibits any form of bribery, corruption, fraud, or other unlawful behavior.

**Operate and promote social engagement:** The Company actively evaluates the positive and negative impacts of its operations on vulnerable groups. It comprehensively considers and meticulously plans diverse social initiatives to enhance positive impacts, mitigate negative impacts, or avoid them altogether. Additionally, the Company encourages employees and business partners to jointly promote and participate in relevant actions.

**Responsible mineral sourcing:** In recent years, there have been minerals from mines in conflict areas in the Republic of the Congo, including niobium, tantalum, iron ore, cassiterite, wolframite, and gold. These minerals are converted into tantalum (Ta), tin (Sn), tungsten (W), and gold (Au), resulting in social, environmental, and human rights deterioration. The Company will continue to adopt a conflict-free mineral procurement policy for 3TG, cobalt, mica, and other minerals produced in high-risk areas identified by the OECD and perform due diligence actively. Our due diligence method is in alignment with the OECD's approach and the corresponding due diligence framework, and we support the RBA's strategies for and approaches to conflict minerals and have adopted the Conflict Minerals Reporting Template released by RMI to investigate whether our suppliers comply with the above policies as required. For more information on the RBA, please visit: <http://www.responsiblemineralsinitiative.org/>

**Risk Management:** Through the implementation of robust risk management measures, the Company has fortified its operations with effective prevention and control mechanisms. We have adeptly identified potential opportunities and seamlessly integrated them into the daily operational framework to realize efficient risk management and control. This steadfast commitment not only amplifies our enterprise value but also underscores its dedication to the interests of all stakeholders.

**Green Products:** In order to reduce the impact on the environment and ecology and fulfill the corporate sustainable responsibility for the environment, low-carbon management, packaging reduction, energy conservation and hazardous substance control are included in product design. We also continue to develop the concept of green design and abide by the environmental laws and regulations of various countries, constantly optimizing to design products in line with sustainability principles.

### Corporate Sustainability Policy and Commitment:

<https://www.accton.com/csr-policy/>

For the Corporate Sustainability Report and relevant documents, please refer to:

<https://www.accton.com/esg-documents/>



# Sustainability Performance

In 2023, Accton continued its commitment to corporate sustainable development, receiving widespread recognition across social, environmental, and economic aspects.

## ESG Performance

- ✓ Once again, Accton was included as a constituent stock in the "FTSE4Good TIP Taiwan ESG Index" in 2023.
- ✓ Listed among "World's Best Companies 2023" by TIME Magazine. The selection, conducted in collaboration with renowned research firm Statista, encompassed criteria such as employee satisfaction, revenue growth, and corporate sustainability. Among 5,000 global companies evaluated, only 750 made the list.

## Social

- ✓ Received the SGS 2023 ESG Awards - Talent Development Award.
- ✓ Listed among "World's Best Employers 2023" by Forbes Magazine.
- ✓ Recognized with the "National Excellent Health Workplace Evaluation - Nutrition and Health Award" by the Health Promotion Administration, MOHW
- ✓ Awarded the "2023 Happy Enterprise Silver Award" by 1111 Job Bank
- ✓ Accton Arts Foundation was honored with the Bronze Award of the Ministry of Culture's Arts & Business Awards.
- ✓ In 2023, Accton Group (including the Accton Arts Foundation) continued its commitment to social responsibility by contributing a total of NT\$13,980,000 to various social engagement activities. This contribution encompassed cash donations, material donations, and volunteer services.



▲ Accton Arts Foundation was awarded the Bronze Award of the Ministry of Culture's Arts & Business Awards, with the foundation's CEO, Protocol Director, and Project Administrator, Mr. Chen, accepting the award.

## Environmental

- ✓ Received the "Subsidy Program for Carbon Reduction and Smart Upgrade Led by Large-Scale Manufacturers" launched by the Ministry of Economic Affairs. Furthermore, Accton has established the "Accton Academy of Sustainability" in collaboration with ten supply chain partners to curb carbon emissions, with a shared goal of achieving decarbonization and net-zero carbon emissions by 2050.
- ✓ The Zhunan Plant was recognized with the "Ministry of Environment and Miaoli County Private Enterprise and Group Green Procurement - Outstanding Achievement Award."
- ✓ Participated in the Carbon Disclosure Project (CDP) and received a B grade score.
- ✓ The overall electricity intensity in 2023 decreased by 20.8% compared to the baseline year of 2021.
- ✓ The waste wooden pallet reduction project in 2023 achieved a 65% reduction in overall waste, extending the life cycle of wooden pallets through reduction measures both within and outside Accton's factory plant.

## Economic

- ✓ Included as a constituent stock in the "FTSE TWSE Taiwan 50 Index".
- ✓ Grand opening and commencement of production at Vietnam Accton's plant
- ✓ The topping-out ceremony for the Accton Zhubei Plant AI Smart Park project was held, with operations expected to commence in 2024.
- ✓ Developed a new product, an 800G switch, to meet the market demands for AI and high-performance computing applications.



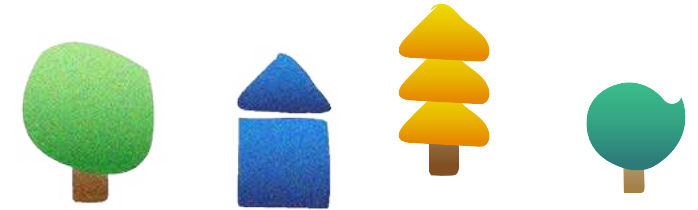
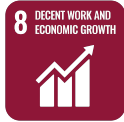
▲ The Zhunan Plant was recognized with the "Ministry of Environment and Miaoli County Private Enterprise and Group Green Procurement - Outstanding Achievement Award."



▲ Grand opening and commencement of production at Vietnam Accton 's plant.



Consolidated revenue, gross profit, and net profit growth chart for Accton over five consecutive years.



◆ **Accton consolidated revenue**

(in NT\$ '000)

	2019	2020	2021	2022	2023
Revenue	55,401,047	54,462,872	59,598,681	77,205,223	84,188,426
Gross profit	10,998,762	11,554,062	11,344,596	16,518,262	19,262,801
Net profit	6,039,983	6,402,66	5,440,726	9,632,608	11,501,097
Net profit after tax	4,950,495	5,048,353	4,705,059	8,165,812	8,920,165
Gross profit margin	19.85%	21.21%	19.03%	21.40%	22.88%
Net profit margin	8.94%	9.27%	7.89%	10.58%	10.60%

**Corporate governance**

- ✓ Obtained ISO 22301 Business Continuity Management System certification in 2023
- ✓ Established a permanent organization, the "Risk Management Office"
- ✓ Corporate governance evaluation: 21%-35%
- ✓ Clearly defined and promoted the implementation of the "Ethical Corporate Management Best Practice Principles," completed relevant training, and provided comprehensive training to establish ethical and integrity concepts for all employees, starting from the basics. The coverage rate of training for new employees reached 100%

For more information on Accton's ESG highlights, please visit <https://www.accton.com/esg-spotlight/>





## Response to the United Nations Sustainable Development Goals (SDGs)


Responding to the 17 UN SDGs, Accton has identified and compiled our actions into seven goals with the descriptions as follows:

Response to SDGs	Action Plan	Implementation results	Corresponding Chapters/ Sections
	<ul style="list-style-type: none"> <li>Accton firmly believes that employees are the most valuable asset of the Company. We embrace a preventive medicine framework structured around the three stages and five levels. Through organizing health check-ups, health management, and health promotion activities, we ensure comprehensive care for the physical, mental, and emotional well-being of our employees.</li> </ul>	<ul style="list-style-type: none"> <li>★ <b>Maternity Health Protection Plan</b> Implemented health protection program for female employees of childbearing age, during pregnancy, and in the postpartum period. In 2021, we were honored with the "Maternal Health Friendly Award" by the Health Promotion Administration of the Ministry of Health and Welfare for our outstanding workplace practices. (SDG 3.4)</li> <li>★ <b>Cardiovascular Disease Monitoring (Overloading Protection Program)</b> Evaluated the risk of cardiovascular disease and abnormal workloads based on annual employee health examination data. High-risk groups were identified for subsequent protective measures. In 2023, 12 individuals requiring physician interviews and consultations were identified according to regulations, achieving a completion rate of 100%. We were honored with the Health Management Award in 2019.</li> <li>★ <b>New Hire Physical Examination / Special Physical and Health Examinations</b> Provided physical examinations for new employees, special health examinations for employees engaged in hazardous tasks, and general health examinations. Follow-up assessments by nurses and occupational specialists were conducted to ensure the health and rights of employees.</li> <li>★ <b>Employee Injury and Illness Care</b> Checked on every employee on sick leave by phone and email to provide health education for their early recovery; analyze and plan health management and health promotion activities as per the International Statistical Classification of Diseases and Related Health Problems 10th Revision; checked upon a total of 2,229 employees. We were honored with the Health Care Award in 2020. (SDG 3.4)</li> <li>★ <b>My New Dietary Proposition</b> Healthy dietary habits are crucial for preventing chronic diseases. In 2023, we launched the "My Dietary New Proposition" series of activities, focusing on nutrition to create a healthy eating environment. We were honored with the "Excellent Workplace Certification" by the Health Promotion Administration of the Ministry of Health and Welfare, and received the "Nutrition Health Award." This series of activities included four key courses to provide comprehensive dietary education and support, empowering employees to adopt healthier lifestyles. Related achievements:                      (1)Established a workplace nutrition-friendly environment: Subsidized 1,440 servings of light meals.                      (2)Conducted online dietary education interactive games - "Magic Nutrition Academy": Achieved a total of 966 participant interactions, with a 17.3% overall increase in nutritional knowledge from pre- to post-test.                      (3)Organized healthy spring roll factory tours: 180 employees from three factory plants participated.                      (4)Management of high triglyceride populations: The average triglyceride level of 24 individuals decreased by 22.73%.</li> <li>★ <b>Cancer Screening Subsidies</b> Given that cancer has been the leading cause of death for 41 consecutive years according to the Ministry of Health and Welfare, the Company organized cancer screenings and provided a 50% subsidy for employees at high risk based on age and gender. Screenings included colonoscopies, thyroid ultrasounds, breast ultrasounds, and low-dose computed tomography. Encouraging early screening for early intervention and treatment. In 2023, a total of 327 individuals participated, with employees exhibiting abnormal test results included in special health management groups and regularly monitored for follow-up visits.</li> <li>★ <b>Influenza Vaccination Drive</b> Starting in October, during the peak season for influenza, we provided on-site influenza vaccinations to enhance employee resistance and increase vaccination willingness. A total of 225 employees were vaccinated, with a satisfaction rate of 94%.</li> </ul>	<p>4.4 Safeguarding Employee Health</p>





Response to SDGs	Action Plan	Implementation results	Corresponding Chapters/Sections
	<ul style="list-style-type: none"> <li>The Taiwan Welfare Association focuses on "active aging," catering to the physical and psychological needs of the elderly, and fostering a dignified third phase of life.</li> </ul>	<ul style="list-style-type: none"> <li>★ <b>Trendy Seniors On Air" Podcast Channel</b> In collaboration with the Chiayi City Government, we trained a team of 16 seniors to produce podcasts, showcasing the value of the elderly and enhancing social cohesion. In 2023, 27 podcast episodes were released, accumulating 1,169 downloads.</li> <li>★ <b>Promote Concept of Self-Support Care</b> By collaborating with Changtai Senior Academy. We recorded 66 episodes of podcast programs, totaling 15,050 downloads, along with 29 YouTube videos, accumulating 125,004 views. Additionally, we conducted 3 physical seminars with a total of 179 participants.</li> <li>★ <b>Elderly Care</b> Supported at-home mobile bath services with a donation of NT\$120,000; donated medical equipment to nursing centers, providing caregivers with peace of mind.</li> </ul>	5. Social Charity
	<ul style="list-style-type: none"> <li>Through educational project collaboration, we accompany education professionals to enhance their teaching capacity and develop child-centered educational environments.</li> <li>Through long-term investment in both hardware and service resources, we aim to ignite the interest of rural children in reading, thereby enhancing their cognitive and emotional development.</li> </ul>	<ul style="list-style-type: none"> <li>★ <b>Education Empowerment</b> Provided practical support to frontline educators. In 2023, we supported a total of 4 project cooperation initiatives, including:                             <ol style="list-style-type: none"> <li>(1) Donated 76 sets of Sustainable Development Goals (SDGs) educational tools developed by the Taiwan Youth Creative Action Association (DFC), allowing frontline teachers to promote sustainability issues on campus. Two online workshops were held, with a total of 56 teachers participating.</li> <li>(2) Collaborated with the Yingguang Education Association on the "Long-Term In-School Companion Program," accompanying 4 rural schools to identify development strengths and revitalize teaching sites.</li> <li>(3) Supported the "Partner Development Program" for two consecutive years for children's libraries in Taitung, improving the overall low salary situation of frontline teachers and supervisors, with an actual number of 32 individuals receiving salary adjustments.</li> <li>(4) Supported the "Wan 8 Program" by the Change Formula Association, providing reasonable working conditions for student counselors to alleviate the care pressure at children's placement institutions.</li> </ol> </li> <li>★ <b>Encouraging Reading Among Rural Pre-School Children</b> Through long-term investment in both hardware and service resources, we aim to ignite the interest of rural children in reading, thereby enhancing their cognitive and emotional development. Initiatives include:                             <ol style="list-style-type: none"> <li>(1) Establishing reading corners in rural waiting areas, providing 2,180 children's books to 19 rural medical units.</li> <li>(2) Collaborating with Dong Hwa University's Social Participation Center, donating 200 books on various topics to kindergartens. We also collaborated with early childhood education and educational potential development departments to promote language-themed courses for early childhood educators.</li> <li>(3) Collaborating with the Ruro Platform to promote reading and writing in rural primary schools. Engaged instructors led four-week reading and writing classes in two rural primary schools in Hsinchu, while also providing training courses for rural teachers.</li> <li>(4) Remote intergenerational reading: In collaboration with the ROR Taiwan, Taipei Medical University physicians, and the Chiayi City Health Bureau, under the guidance of physicians, seniors in Chiayi City engage in remote reading sessions with children from Penghu kindergartens via video conferencing. Increasing preschoolers' verbal participation stimulates the elderly's brains and prevents dementia. Eight remote reading events were held, with a total of 50 elderly participants from Chiayi City.</li> </ol> </li> </ul>	5. Social Charity



Response to SDGs	Action Plan	Implementation results	Corresponding Chapters/ Sections
	<ul style="list-style-type: none"> <li>Promoting Menstrual Education for a Friendly and Gender Equal Society</li> </ul>	<ul style="list-style-type: none"> <li>★ <b>Teacher Training</b> Continuing the collaboration project with the With Red Foundation from 2022, we held a workshop for primary school teachers in Hsinchu in 2023. This workshop enhanced menstrual education capabilities for 32 primary school teachers from 22 schools in Hsinchu, indirectly benefiting 15,570 students</li> <li>★ <b>Demonstration Teaching</b> Conducted menstrual education demonstration teaching in five primary schools in Hsinchu, impacting 194 students with knowledge related to menstruation.</li> <li>★ <b>Donation of Teaching Materials</b> Donated 30 sets of menstrual education kits and 750 menstrual education books to schools participating in the workshops and demonstration teaching, addressing the lack of menstrual education materials in current education.</li> </ul>	5. Social Charity
	<ul style="list-style-type: none"> <li>Taking a sustainable operational perspective, we adopt a "facilitator" role, integrating resources to promote cultural and artistic education</li> </ul>	<ul style="list-style-type: none"> <li>★ <b>Establishment of an Artistic Talent Database</b> We cultivate talent across every aspect of the cultural and arts ecosystem, including arts administration, volunteer partners in arts education promotion, artists, and creators.</li> <li>★ <b>Artistic Talent Cultivation Program</b> We provide resources such as funding for creation and materials, exhibition spaces, promotional resources, audio-visual documentation, and talent in arts administration to assist creators in enhancing their competencies. In 2023, we supported a total of 14 individuals from the artistic field, originating from 6 countries, to conduct 12 exhibitions exploring contemporary social issues, attracting a cumulative total of 43,112 visitors.</li> <li>★ <b>Promotion of Cultural and Artistic Community Development</b> At the behest of the Hsinchu City Government Cultural Affairs Bureau, we revitalized historical building spaces at the Railway Art Village to promote both the cultivation of artistic talent and arts education. We selected 6-8 Taiwanese and international artists for residency and creation. In 2023, the Railway Art Village was open for 305 days, welcoming a total of 31,822 visitors. We organized 25 exhibitions and 40 workshops (including hosting, co-hosting, and moderating), with a total of 1,124 participants.</li> </ul>	5. Social Charity
	<ul style="list-style-type: none"> <li>Recruitment, hiring, development, and compensation of employees are based solely on their work capabilities, without any differentiation based on gender.</li> </ul>	<ul style="list-style-type: none"> <li>★ At Accton, male and female employees each comprise 50% of the workforce. Female supervisors make up 24.8% of all supervisory roles.</li> <li>★ At Edgecore, male employees constitute 66.2% of the workforce, while female employees account for 33.8%. Female supervisors make up 30.4% of all supervisory roles at Edgecore.</li> <li>★ At JoyTech, male employees constitute 62.7% of the workforce, while female employees account for 37.3%. Female supervisors make up 33% of all supervisory roles at JoyTech.</li> <li>★ At Vietnam Accton, male and female employees each constitute 50% of the workforce. Female supervisors represent 55.0% of all supervisory roles.</li> <li>★ The gender pay gap at Accton is no greater than 0.3%. (SDG5.5)</li> </ul>	4.1 Talent Attraction and Retention

Response to SDGs	Action Plan	Implementation results	Corresponding Chapters/ Sections
	<ul style="list-style-type: none"> <li>Safeguarding workers' rights, strengthening risk assessment, implementing education and training, expanding audit scope, and promoting workplace safety.</li> <li>Enhancing subcontractor management efficiency and supervising construction safety discipline.</li> </ul>	<ul style="list-style-type: none"> <li>★ <b>Strengthen Safe and Secure Working Environment (SDG8.8)</b> Compared to 2022, in 2023 the frequency of disabling injuries decreased by 15.4%, while the severity of disabling injuries increased by 35.3%. There were 0 major occupational accidents.</li> <li>★ <b>Conducted Workplace Risk Identification</b> Adopting graded management, prevention or reduction of hazards and risks. In 2023, a total of 1,555 risk identifications and assessments were conducted.</li> <li>★ <b>Optimizing Emergency Response Training (SDG8.8)</b> In 2023, emergency response drills involving a total of 10,331 people were conducted, using an electronic evacuation roll call system, which effectively shortened the roll call time.</li> <li>★ <b>Inclusion of Migrant Worker Dormitories in Regular Safety Audits (SDG8.8)</b> Our OSH Department audits migrant worker dormitories monthly, examining six major aspects including "building safety," "electrical safety," "fire evacuation," "food hygiene," "environmental cleanliness," and "epidemic prevention measures." Additionally, we demonstrate a spirit of partnership by providing guidance to improve migrant worker dormitory management companies continuously.</li> <li>★ <b>Improving Subcontractor Construction Management Efficiency</b> Introduced an electronic subcontractor management system. Subcontractors executed a total of 586 projects within the factory premises, achieving a 100% rate for on-site surveys and hazard notification during operations.</li> </ul>	<p>4.3 Safeguarding Employee Safety</p>
	<ul style="list-style-type: none"> <li>Develop high-quality, reliable, sustainable, and resilient network infrastructure, promoting global "ICT accessibility equality."</li> </ul>	<ul style="list-style-type: none"> <li>★ Actively promote open network platforms as a pioneer in Taiwan's network product industry.</li> <li>★ We serve as a founding member of open network promotion organizations such as OCP, TIP, DENT, and SONiC, contributing to accelerating innovation in core network infrastructure design, reducing network construction costs, and increasing network coverage through the popularization of network technology, promoting affordable quality networks for everyone. (SDG9.1)</li> </ul>	<p>Sustainability Performance</p>
	<ul style="list-style-type: none"> <li>Significantly reduce waste generation through prevention, reduction, recycling, and reuse.</li> </ul>	<ul style="list-style-type: none"> <li>★ Waste recycling and reuse: The recycling rate increased from 74.57% in 2022 to 81.66% in 2023.</li> <li>★ There were zero major environmental law violation incidents reported.</li> <li>★ Optimization of steel plate cleaning processes: In 2023, after optimization, the use of organic solvents decreased by 30% compared to the original usage.</li> <li>★ Introduction of wood pallet waste reduction plan in 2022, implementing internal and external reuse reduction measures, achieving a 65% reduction in overall waste by 2023.</li> </ul>	<p>3.3 Environmental Management</p>

Response to SDGs	Action Plan	Implementation results	Corresponding Chapters/ Sections
	<ul style="list-style-type: none"> <li>Formulated the "Accton Group Quality Manual" (QMC-QA), and the "Product Hazardous Substance Criteria Management Procedure" (QPC-CE05) as well as other QMS documents as guidelines for implementing the green product system.</li> <li>Collect customer hazardous substance requirements and international regulations, and manage material hazardous substances through the Accton eGreen system.</li> </ul>	<ul style="list-style-type: none"> <li>★ Green Product System: Regular internal and external audits of the IECQ QC080000 hazardous substance management system are conducted. The main production bases continue to pass the IECO QC080000 annual certification.</li> <li>★ Through raw material/process hazardous substance reduction and control, investigations of 2,242 product models were completed in 2023, with all models meeting 100% of international hazardous substance regulations/directives and customer requirements.</li> </ul>	<p>3.4 Green Product Management</p>
	<ul style="list-style-type: none"> <li>Select and purchase environmentally sustainable products to contribute to environmental protection efforts.</li> </ul>	<p>★ <b>Implementation of green procurement, prioritizing procurement of sustainable and eco-friendly products.</b></p> <p>Our Zhunan Plant adheres to the government's green procurement policy, prioritize the purchase of products recognized by the Ministry of Environment's eco labels, including packaging materials, office supplies, office equipment, and electrical appliances, etc. The Accton Zhunan Plant was recognized with the "Miaoli County Private Enterprise and Group Green Procurement - Outstanding Achievement Award," and was recognized by the Ministry of Environment in 2023</p>	<p>2.3 Responsible Supply Chain</p>
	<ul style="list-style-type: none"> <li>Mitigate the impact of climate change by regularly conducting greenhouse gas inventory and continuously implementing energy-saving measures.</li> </ul>	<ul style="list-style-type: none"> <li>★ Completed organizational greenhouse gas inventories for Accton's Hsinchu Headquarter/Plant 2/Zhunan Plant, JoyTech, and Vietnam Accton.</li> <li>★ Participated in the Carbon Disclosure Project (CDP) and included in the B List.</li> <li>★ Energy-saving and Carbon Reduction Measures: Installation of inverters for air conditioning/exhaust equipment, reduction of toilet exhaust operation time, and continuous replacement with LED energy-saving lighting equipment</li> <li>★ Refinement of extreme weather response mechanisms (typhoon warning and response readiness), incorporated into the Company's Business Continuity Plan. (SDG13.3)</li> </ul>	<p>2.1.3 Business Continuity Management</p> <p>2.1.4 Climate Risk Management</p> <p>3.2 Energy Saving and Carbon Reduction</p>

## Participation in External Associations to Promote Internet Accessibility

Accton is dedicated to leveraging technology to bridge the gap between urban and rural regions, fostering connections between communities worldwide. This commitment to enhancing global ICT accessibility is demonstrated through active engagement in industry associations and technical alliances both domestically and internationally, fostering enduring relationships with vendors across the supply chain. In 2013, Accton joined the Open Compute Project (OCP) initiated by Meta and contributed multiple hardware platform designs through its brand, Edgecore Networks, becoming one of the pioneers in building an open network architecture. Accton Group participates in the following external organizations:

### ◆ Accton Technology Corp

	Association Name	Method of Participation
1	Taiwan Association of Information and Communication Standards	Member
2	Peripheral Component Interconnect Special Interest Group (PCI-SIG)	Member
3	Taiwan Thermal Management Association	Member
4	Japan VCCI Council	Member
5	Wi-Fi Alliance	Member
6	Optical Internetworking Forum	Member
7	National Quality & Sustainable Excellence Alliance	Member
8	PCI Industrial Computer Manufacturers Group (PICMG)	Member

## ◆ Edgecore Networks

	Association name	Method of participation
1	Open Compute Project (OCP) Platinum Member	1.First contributor in the Project with 17 designs certified by the Project. 2.Providing innovative hardware solutions for telecom companies. 3.Supports all OCP network software
2	Telecom Infra Project (TIP)	1.First contributor for the design of the mobile base station cell site gateways 2.Developed the Cassini - a 100G optical switch 3.Designed and manufactured 400G cell site gateways that meet the TIP Bronze Certification standards.
3	Distributed Enterprise (DENT) Linux Linux Edge Network Switch Operating System Project	1.Founding member 2.Contributed to Edge - Enterprise solutions
4	SONiC (Software for Open Networking in the Cloud)	1.One of the top five contributors in the association 2.Provide technical contributions to most SONiC platforms
5	WI-FI Alliance	Member
6	Taipei Computer Association member	Member
7	Taiwan External Trade Development Council	Member

# Materiality Analysis

## • Material Topic Identification Process

### I. Collection and Identification of Sustainability Issues

- Based on international sustainability (GRI guidelines, TCFD, SDGs UN SDGs, RBA Code of Conduct, SASB), customer requirements, domestic and international regulations, and recommendations from rating agencies. This information is compiled into a comprehensive list of sustainability issues.
- Convene meetings to review sustainability issues, and confirm whether adjustments are needed.

### II. Material Topic Decision-Making Process 1. Impact and Quantification Assessment

- The ESG Office team confirms the assessment processes of material topics
- A meeting for the assessment of material topics is convened. Through surveys and questionnaires, the various ESG committees evaluate the potential positive and negative impacts of each topic. Each issue is scored based on the likelihood of occurrence and the extent of impact.
- An Impact Significance Matrix plotting "Likelihood of Occurrence vs. Impact Degree" is created, with a priority consideration given to the evaluation of negative impacts.

### II. Material Topic Decision-Making Process 2. Order by Degree of Impact

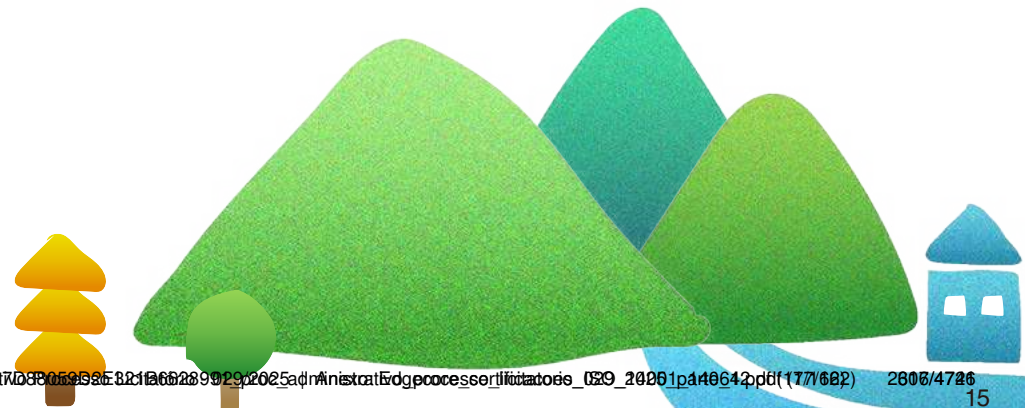
- Compile the results of the impact degree and rank them by score.
- To prevent material topics from being biased towards a single aspect, sustainability issues are divided into three dimensions: economic, environmental, and social. Those topics scoring highest within each dimension are provisionally listed as material.
- This process is discussed by the ESG Office team. In addition to score ranking, considerations include operational importance and domestic and international regulations.

### III. Stakeholder Level of Concern Survey

- Collect stakeholder level of concern regarding various sustainability issues via questionnaires.
- After analyzing the survey results, rank the concern scores for each issue.
- Create a matrix diagram of "Impact Degree vs. Level of Concern".
- Feedback from stakeholders is also reported to various departments for understanding and response.

### IV. Confirmation of Material Topics and Information Disclosure

- Integrate the assessment results of impact degree and make reference to the results of the stakeholder concern level questionnaire to finally confirm the material topics.
- In the sustainability report, disclose each material topic and explain changes compared to the previous year. Also disclose descriptions of positive and negative impacts and assessments of substantive potential impacts.
- The report is reviewed by the chair of the ESG Committee and approved by the Board of Directors, and announced in June.



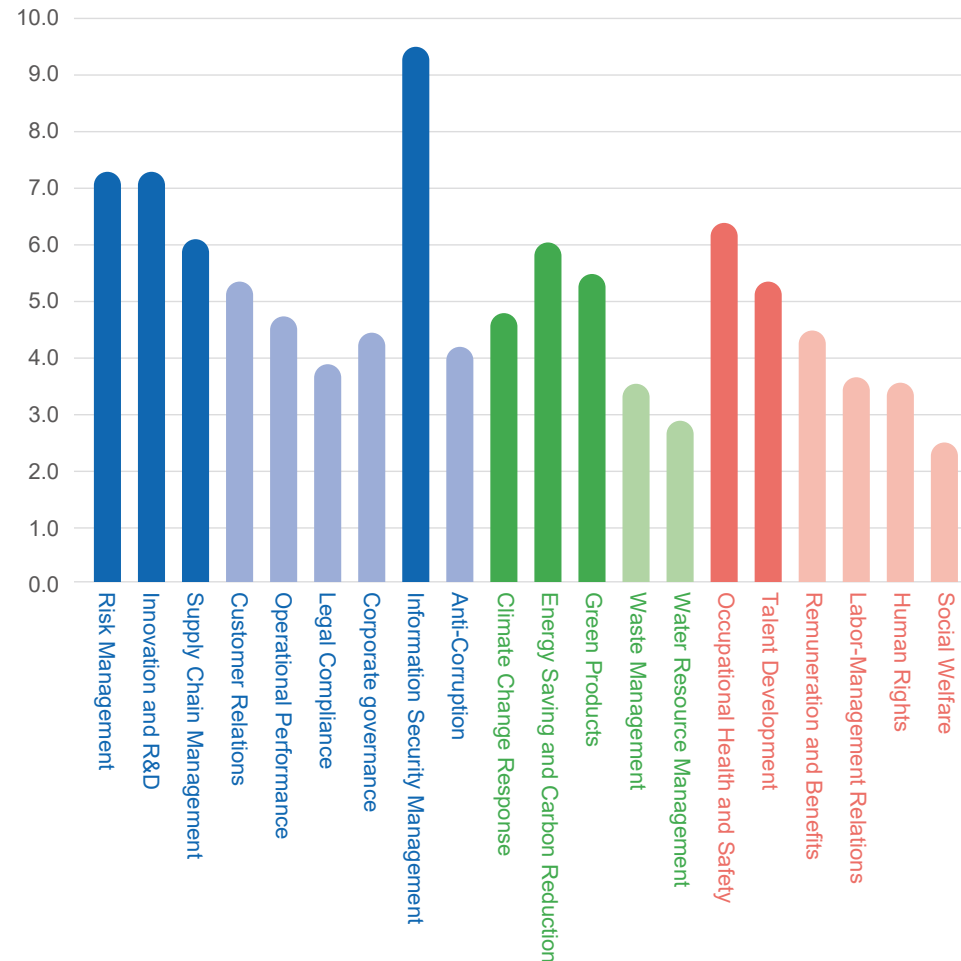




## 2. Order by Significance of Impact

The ESG Office team compiles the significance scoring results, orders them by positive and negative significance, and prioritizes those with higher negative "Significance Degree" scores. This includes a comprehensive consideration of regulatory trends and operational importance, filtering sustainability issues according to the three main categories: economic, environmental, and social. For 2023, a total of 9 material topics were selected.

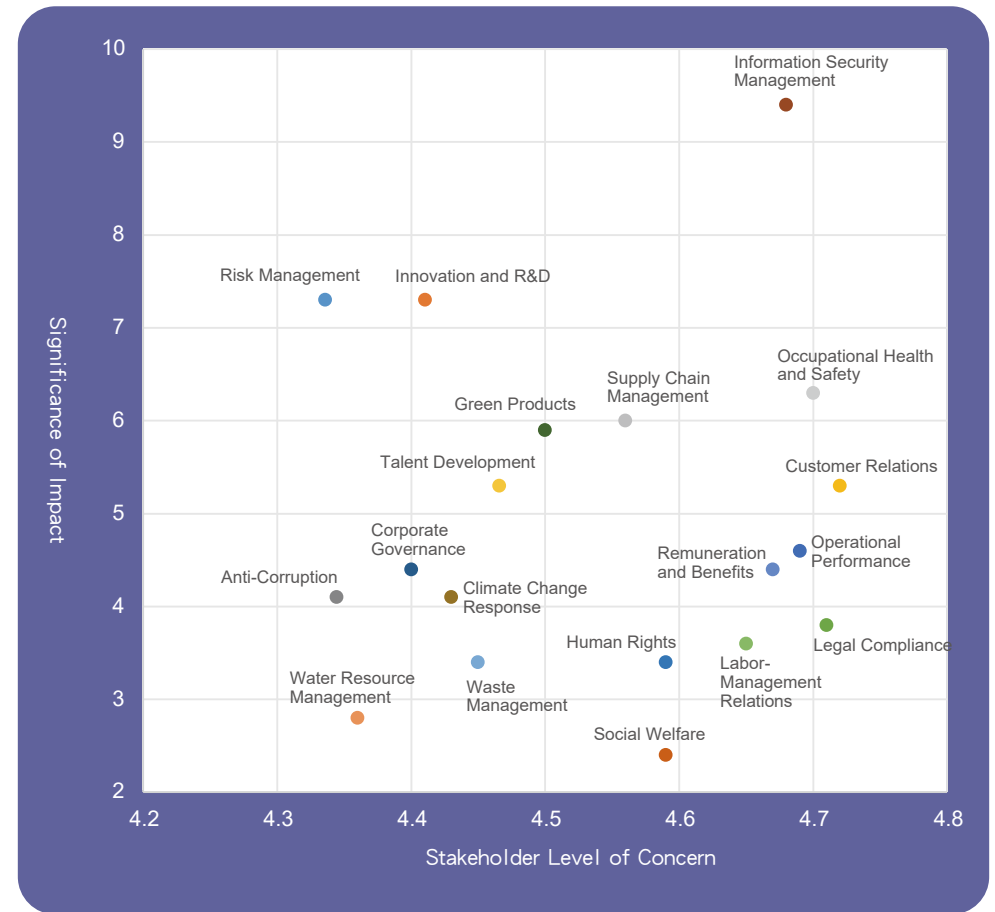
### ◆ Material Topics and Impact Significance Scoring



## 3. Stakeholder Level of Concern

We conducted a sustainability issue survey targeting our key stakeholders to continually gauge their interest in various sustainability topics. The survey was designed with a scoring system ranging from 5 (highest concern) to 1 (least concern). In 2023, we collected 485 responses, and the average scores for interest in the 20 sustainability issues ranged from 4.36 to 4.72, indicating no significant issues of no concern. The highest-scoring issue was Information Systems Security Management, while the lowest was Water Resource Management.

### ◆ Stakeholder Concern and Impact Assessment Scatter Plot



### III. 2023 Material Topics and Change Comparison

After synthesizing the internal impact significance assessments and considering the results of the stakeholder concern survey, we confirmed 9 material topics for 2023 (as indicated below).

Compared to 2022, the material topics for 2023 have been updated to include "Information Systems Security Management," "Climate Change Response," and "Energy Saving and Carbon Reduction," while "Green Production" has been removed. Changes to the material topics are described below.

#### ◆ 2023 Material Topics and Change Comparison

	Governance	Environmental	Social
2023 Material Topics	Information Systems Security Management <b>NEW</b> Risk Management Supply Chain Management Innovation and R&D	Climate Change Response <b>NEW</b> Energy Saving and Carbon Reductio <b>NEW</b> Green Products	Occupational Health and Safety Talent Development
2022 Material Topics	Risk Management Supply Chain Management Innovation and R&D	Green Production (Note) Green Products	Occupational Health and Safety Talent Development

Note: Green Production includes two sustainability issues, namely "Waste Management" and "Water Resource Management."

#### 1.Addition of "Information Systems Security Management"

Accton, as a player in the network communications industry, has identified information systems security management as a material topic due to escalating information system risks and the constant evolution of cyberattack methodologies, which pose substantial risks to both business operations and customer privacy.

#### 2.Addition of "Climate Change Response" and "Energy Saving and Carbon Reduction"

In light of the accelerating global climate risks, enterprises are compelled to take more proactive actions in energy saving and carbon reduction to curb the ongoing rise in global temperatures. Accton has adopted the Task Force on Climate-related Financial Disclosures (TCFD) in 2022 to analyze the Company's potential climate risks and opportunities. Following this analysis, Accton has established ambitious targets of reducing carbon emissions by 50% by 2030 and achieving net-zero carbon emissions by 2050. In 2023, Accton further established the "Accton Academy of Sustainability" in collaboration with ten supply chain partners, aiming to progressively implement decarbonization growth and achieve net-zero carbon emissions targets. Therefore, "Climate Change Response" and "Energy Saving and Carbon Reduction" has been elevated to material topics this year, reflecting Accton's determination to reduce carbon emissions and aiding in monitoring the progress towards its carbon reduction goals.

#### 3.The previous material topic of "Green Production" has been decomposed into "Water Resource Management" and "Waste Management."

Previously, "Green Production" encompassed both "Water Resource Management" and "Waste Management" as part of its sustainability focus. With this reclassification, although "Water Resource Management" and "Waste Management" are not classified as material topics for 2023, Accton will continue to assess their impact and disclose relevant information. This ongoing disclosure will be included in the "3.3 Environmental Management" section of this Report.





#### 4. Descriptions of Positive and Negative Impacts and Assessments of Actual/Potential Impacts

Note: (■) Actual Impact; (□) Potential Impact

Material Topic	Aspect	Positive Impact	Negative Impact
Risk Management	Economy	Systematic identification and control of various risks, with pre-established scenarios and countermeasures for high-risk situations, regular review of countermeasure effectiveness, and identification of remaining potential issues. (□)	The increasing diversity of business risks, such as geopolitical and economic trade issues in 2024, could rapidly alter risk profiles, challenging the Company if an adequate risk management mechanism is not in place. (□)
Information Security Management		Promote information security policies and initiate training and integration of ISO standards to foster a comprehensive awareness of information security, ensuring the protection of stakeholders' rights without infringement. (■)	Risks of phishing emails or hacker intrusions affecting customer privacy data and overall corporate reputation. (□)
Supply Chain Management		Implementation of RBA management processes, regular auditing of suppliers, promotion of localized supply chains to enhance supply flexibility, shorten new product development time, reduce unnecessary costs, and decrease carbon emissions within the supply chain, thus building a sustainable supply chain management system. (■)	The CSR behaviors of suppliers also indirectly impact Accton's intangible reputation or pose a potential risk. (□)
Innovation and R&D		Encourage innovation and the foster a culture of creativity has led to an increase in the total number of global patent applications by Accton over the past three years. Enforcement of intellectual property policies and management systems protects Accton's intellectual properties while respecting the rights of others. (■)	Diverse customer expectations for products and the challenge of aligning these with goals for low-carbon design pose challenges to innovation and development. (■)
Climate Change Response	Environment	Identify climate risks and opportunities, assess financial impact, and develop response strategies and action plans. (■)	Assessed scenarios of extreme weather events like torrential rain and floods. However, due to the complex interlinked systems of climate risk, if the damage from weather disasters exceeds natural thresholds, the extent of their impact can be difficult to predict. (□)
Energy Saving and Carbon Reduction		Formulate environmental management policies and promote carbon reduction initiatives. Conduct annual carbon inventory to assess carbon reduction targets and progress, and initiate the implementation of product carbon footprint and platform systems, while also initiating supply chain carbon reduction initiatives. (■)	With Accton's recent operational growth, the addition of new plants and production equipment may pose challenges in achieving greenhouse gas reductions. (■)
Green Products		Progressively develop low-carbon, high-efficiency technologies or products to meet customer demands while also considering environmental protection. (■)	Energy-efficient and low-energy products are increasingly favored. If products fail to keep up with market trends or customer expectations in energy consumption performance or energy-saving design, sales may decline, leading to reduced revenue. (□)
Occupational Health and Safety	People	Enforce occupational health and safety management to ensure that employees possess safety and health concepts, fostering a secure work environment. (■)	With the expansion of the scope of internal and external management and the impact range during the addition of new plants and equipment, a more meticulous risk assessment and awareness building for the occupational health and safety of all employees are required. (■)
Talent Development		Continue to promote talent development programs and provide diverse and equal learning opportunities, without differentiation based on nationality, race, gender, etc. (■)	Online learning can enhance learning motivation and improve talent development effectiveness. However, if employees leak or misuse confidential technical materials related to research and development, it may compromise the Company's competitiveness. (□)



### IV. Identification of Material Topic Impact Boundaries and Responses

Based on these nine material topics, we identify the impact on key stakeholders and formulate six specific topics and three self-defined topics in accordance with GRI guidelines. For each material topic, data is collected and information is disclosed according to reporting requirements and underlying management policies.

The table below illustrates the importance and significance of each material topic to Accton,

impact boundaries, and details of management policies, short-medium-long-term indicators for each corresponding chapter. For complete information, please refer to the response chapters of the report.

As the Board of Directors represents the highest level of corporate governance and also serves as the superior unit of the ESG Committee, this report has undergone review by the chairperson of the ESG Committee and is published after approval by the board of directors.

Material Topic	Operational Significance	Internal Boundaries	External Boundaries					GRI Standards	Corresponding Chapters/Sections
		Employees	Suppliers	Clients	Investors	Government agencies			
<b>Governance</b>									
<b>Risk Management</b>	Comprehensively identify risks and opportunities relevant to Accton, including operational continuity management, product safety, information security, and climate risks. To address the dynamic market environment and regulatory trends, we have established a permanent organization, the "Risk Management Office," to establish management mechanisms for responding to these challenges.	●	●	●	●	●	General Disclosures 201 Economic Performance	2.1 Risk Management	
<b>Information Security Management</b>	To mitigate information security risks and bolster corporate digital resilience, we ensure customer privacy and transaction security, aiming to prevent operational losses and reputation risks resulting from cyber attacks.	●	●	●	●	●	Customized topic	2.1.1 Information Security Management	
<b>Supply Chain Management</b>	We rely on suppliers to provide localized, timely, and stable services to enhance supply chain flexibility and shorten new product development lead time. Collaborating with supplier partners, we aim to reduce supply chain carbon emissions and achieve decarbonized growth together.	●	●	●	●	●	204 Procurement Practices 308 Supplier Environmental Assessment 414 Supplier Social Assessment	2.3 Responsible Supply Chain	
<b>Innovation and R&amp;D</b>	Invest in innovative research and development to grasp new-generation network technologies, proactively deploy to maintain a leading market position, and enhance organizational competitiveness.	●	●	●	●	●	Customized topic	2.2 Innovation and R&D	
<b>Environmental</b>									
<b>Climate Change Response</b>	Accton identifies climate risks to address both the risks and opportunities brought about by climate change.	●	●	●	●	●	201 Economic Performance	3.1 Climate Change Response 2.1.4 Climate Risk Management	
<b>Energy Saving and Carbon Reduction</b>	Accton has set carbon reduction goals and is promoting a series of environmental management measures such as greenhouse gas emission management, energy, etc. The Company continues to improve and implement environmental sustainability.	●	●	●	●	●	302 Energy 305 Emissions	3.2 Energy Saving and Carbon Reduction 3.3 Environmental Management	
<b>Green Products</b>	In product design, we conduct low-carbon management and hazardous substance control, continuously developing green design concepts and adhering to environmental regulations in various countries where we operate, continuously optimizing product designs to meet environmental sustainability requirements.	●	●	●	●	●	Customized topic	3.4 Green Product Management	
<b>Social</b>									
<b>Occupational Health and Safety</b>	Accton ensures occupational health and safety for workers through policies and management mechanisms.	●	●	●	●	●	403 Occupational Health and Safety	4.3 Safeguarding Employee Safety 4.4 Safeguarding Employee Health	
<b>Talent Development</b>	Talent forms the core foundation of corporate competitiveness. Accton offers diverse courses, establishes an internal instructor system to pass on workers' knowledge and skills, promotes departmental collaboration, and collectively enhances corporate competitiveness.	●	●	●	●	●	404 Training and Education	4.2 Talent Learning and Development	



**Employees**

**Significance: Our employees are our most valued assets, and excellent talent is a crucial component of sustainable business operations. Therefore, we are committed to providing our employees with a high-quality work environment to attract and retain excellent talent.**

Communication Method/ Frequency	Issues of Concern	Accton's Response and Results
<ul style="list-style-type: none"> <li>Labor-management meeting (quarterly)</li> <li>Occupational Safety and Health Committee (quarterly)</li> <li>Employee Welfare Committee (quarterly)</li> <li>Labor Pension Reserve Committee (quarterly)</li> <li>Employee briefing session (from time to time)</li> <li>Hold management meetings and departmental meetings (monthly, from time to time)</li> <li>Accton Portal (from time to time)</li> <li>Accton Whisper physical mailbox</li> <li>Accton Whisper e-mail (from time to time)</li> <li>Sexual harassment complaint hotline and email</li> <li>Care for employees' injury or illness</li> </ul>	<ul style="list-style-type: none"> <li>Information Security Management</li> <li>Occupational Health and Safety</li> <li>Social Welfare</li> <li>Remuneration and Benefits</li> </ul>	<ul style="list-style-type: none"> <li>We have established various communication channels and mechanisms, including physical mailboxes, HR email, complaint hotlines, Line@ for policy dissemination, and employee feedback channels. We encourage colleagues to provide suggestions on operational or management measures, allowing the voices and expectations of frontline employees to be directly conveyed to senior executives, serving as references for continuous improvement and corporate governance. In 2023, a total of 8 feedback items were received from all employees, with a 100% closure rate. The main topics included: (1) Environmental facilities in the workplace, (2) Equipment used for work, (3) Education training and self-growth, (4) Welfare systems and activities, (5) Healthcare, (6) Internal communication channels, (7) Meals, and (8) Initiatives related to promoting Diversity, Equity, and Inclusion (DEI).</li> <li>We provide information system security education and training to new employees to establish literacy and awareness regarding information security issues. Information on important security measures is regularly conveyed through letters, internal websites such as Accton Portal, and other means.</li> <li>To create a healthy and safe workplace environment for employees, we provide education and training for new and existing colleagues, and conduct contingency drills, with the following outcomes:             <ol style="list-style-type: none"> <li>Following the concept of preventive medicine in three stages and five levels, we provide comprehensive health check-up items that are superior to what is required according to regulations. We organize health promotion activities to enhance employee engagement while educating them.</li> <li>Safety education and training cover various topics including general safety and health, hazard awareness, safe equipment operation, kitchen gas safety, and industrial instrument operation. A total of 8,122 training sessions were completed, including annual safety training for contractors. All employees of Accton and contractors have passed safety and health training.</li> <li>In 2023, 10,331 contingency drills were conducted, covering scenarios such as chemical spills, civil defense training, emergency response organization training, fire evacuation drills, and confined space rescue drills.</li> <li>We conducted CPR and Automated External Defibrillator (AED) training for all employees to acquaint them with first aid skills to assist colleagues or family members in need.</li> </ol> </li> <li>Additionally, Accton E-Charity provides information on social welfare groups and public welfare activities from time to time, offering employees direct support and participation channels.</li> <li>We comply with labor laws and international human rights norms, fostering good labor relations. The number of cases involving unethical conduct is reviewed monthly.</li> <li>At the quarterly Employee Welfare Committee meetings, updates on previous quarter's tracked items and activity information are provided to committee members, who then disseminate them to various departments, ensuring that employees fully understand welfare measures and related activities.</li> </ul>
<p>Email: <a href="mailto:hr@accton.com">hr@accton.com</a></p>		

**Suppliers**

**Significance: The supply chain plays a crucial role in Accton's sustainable development. Accton is committed to collaborating with its supply chain partners to promote corporate social responsibility in areas such as economy and governance, environmental protection, and social inclusion. This collaboration aims to enhance ESG competitiveness and pave the way for a sustainable future.**

Communication Method/ Frequency	Issues of Concern	Accton's Response and Results
<ul style="list-style-type: none"> <li>Supplier conference (annually)</li> <li>Supplier audits: As per the annual list of suppliers to be audited (from time to time)</li> <li>Telephone/e-mail (daily)</li> </ul>	<ul style="list-style-type: none"> <li>Supply Chain Management</li> <li>Green Product Management</li> <li>Legal Compliance</li> <li>Anti-Corruption</li> </ul>	<ul style="list-style-type: none"> <li>In 2023, a total of 193 suppliers completed conflict mineral management and due diligence risk identification and assessment.</li> <li>Through the eGreen material hazardous substance management system, compliance with international regulatory requirements is ensured.</li> <li>Established the "WIC-CE05002 Product Hazardous Substance Management Specification" for suppliers to adhere to, exceeding international mandatory legal requirements and covering the international material declaration standard IEC 62474.</li> <li>To comply with RoHS/REACH hazardous substance requirements, a total of 420 new material reviews and 5,563 component recognitions were completed in 2023, and we requested suppliers to provide inspection reports.</li> <li>Through raw material/process hazardous substance reduction and control, investigations of 2,242 product models were completed in 2023, with all models meeting 100% of international hazardous substance regulations/directives.</li> <li>Supplier signed integrity commitments with a total of 855 suppliers in 2023, including 100% of suppliers in the EMEA region.</li> </ul>
<p>Email: <a href="mailto:supplier@accton.com">supplier@accton.com</a></p>		



### Government Agencies

**Significance: Understanding government policy trends and complying with regulations are fundamental to business operations. Responding promptly with relevant information as required by competent authorities also helps build trust.**

Communication Method/Frequency	Issues of Concern	Accton's Response and Results
<ul style="list-style-type: none"> <li>Official document correspondence and visit (from time to time)</li> <li>MOPS (from time to time)</li> <li>Company website (from time to time)</li> <li>Press releases (from time to time)</li> <li>Industry Value Chain Information Platform (from time to time)</li> </ul>	<ul style="list-style-type: none"> <li>Risk Management</li> <li>Information Security Management</li> <li>Corporate Governance</li> <li>Legal Compliance</li> </ul>	<ul style="list-style-type: none"> <li>In accordance with regulatory requirements, we promptly respond to relevant messages and execute necessary measures. In 2023, we established a Risk Management Office to address regulatory demands.</li> <li>We ensure compliance with relevant regulations and the ISO 27001 Information Security Management System, continuously enhancing information security education and training to cultivate a culture of information security awareness among all employees.</li> <li>We regularly release updates to provide stakeholders with an understanding of the overall status of the Company.</li> </ul>
<p> Email: IR@accton.com</p>		

### Shareholders/Investors

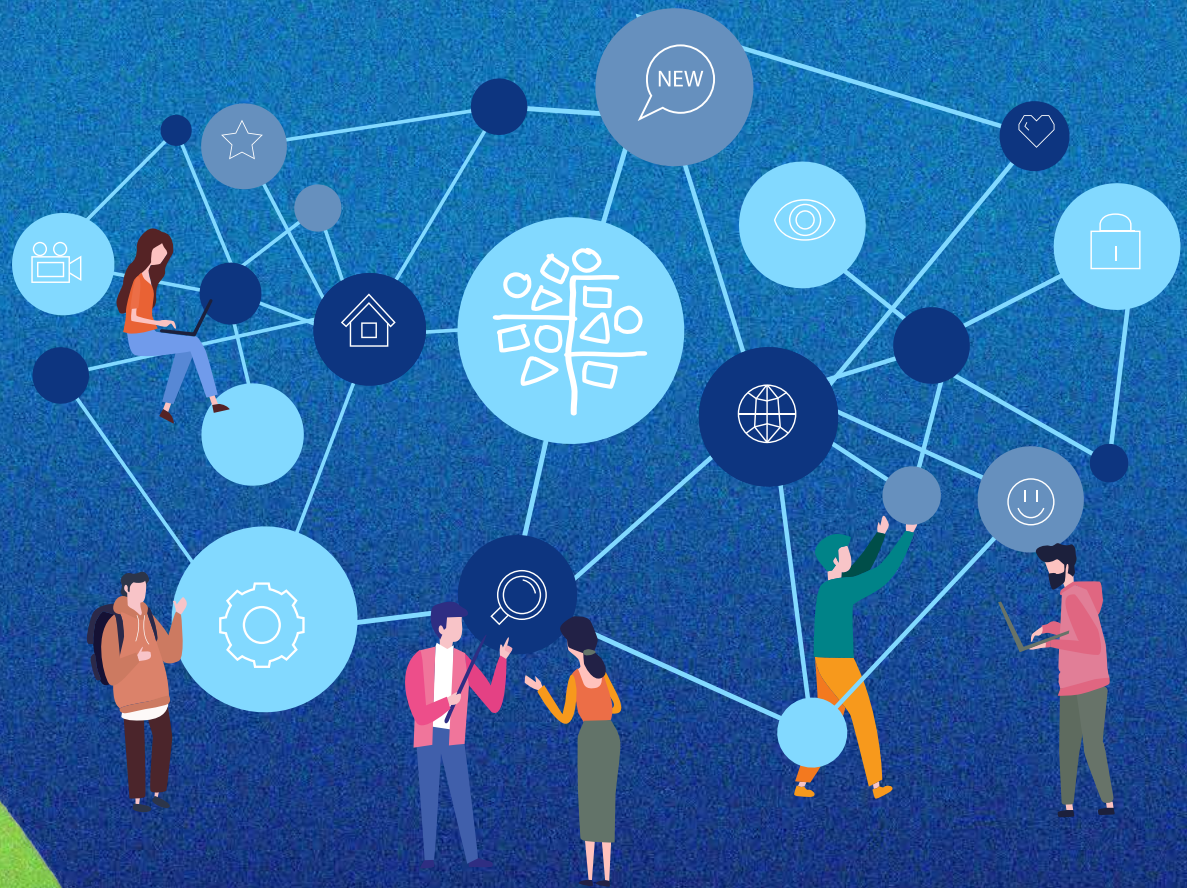
**Significance: Shareholders and investors are supporters of corporate operations, providing accurate and transparent information on the Company's business status and sustainable actions to safeguard shareholder interests.**

Communication Method/Frequency	Issues of Concern	Accton's Response and Results
<ul style="list-style-type: none"> <li>The Company's ESG Website and ESG Report (annually)</li> <li>Annual general shareholders' meeting (annually)</li> <li>Investor conference (annually)</li> <li>Annual financial report (monthly and quarterly)</li> <li>Investor questionnaire survey (from time to time)</li> </ul>	<ul style="list-style-type: none"> <li>Operational Performance</li> <li>Legal Compliance</li> <li>Corporate Governance</li> <li>Risk Management</li> <li>Anti-Corruption</li> <li>Supply Chain Management</li> </ul>	<ul style="list-style-type: none"> <li>Release the latest information promptly for shareholders and investors to be informed of the Company's situation as a whole.</li> <li>Collaborated with the Financial Supervisory Commission (FSC) to complete the corporate governance evaluation.</li> <li>Promptly respond to investors' concerns.</li> </ul>
<p> Financial Information: IR@accton.com</p> <p> Non-financial Information: csr@accton.com</p>		

In 2023, relevant contact windows were established for various stakeholders, as indicated in the table above. To enhance communication between stakeholders and the highest governance unit of the company, starting from 2022, the highest governance unit has appointed a proxy, namely the Chief Corporate Governance Officer. The Chief Corporate Governance Officer consolidates important ESG topics related to stakeholders and reports them to the highest governance unit. The highest governance unit then deliberates each issue to ensure comprehensive communication with stakeholders.

# 1 About Accton

- 1.1 Company Profile
- 1.2 Operating Performance
- 1.3 Products and Services
- 1.4 Exceeding Customer Expectations
- 1.5 Corporate Governance
- 1.6 Ethical Management



# 1.1 Company Profile

## Accton Technology Corporation

<b>Date Established</b>	Feb 9, 1988
<b>Headquarters</b>	Taiwan Hsinchu Science Park
<b>IPO</b>	Publicly listed on the TWSE in 1995      Stock Code: 2345
<b>Market Capitalization</b>	NT\$ 8,800,000,000

## Accton Technology Group in 2023



**Global Employees**  
5,716



**Consolidated Revenue**  
NT\$84.188 billion  
(+ 9.05% YoY)



**Total Shipments**  
7.14 million units



**Paid-in Capital**  
NT\$5,603,563,970

## ◆ Accton Technology Headquarters



With 35 years of experience in the design and development of network products, Accton's professional international team is committed to developing advanced, economic, and reliable products. As a leader in the design of open hardware platforms for data centers, metro Ethernet, telecommunication networks, school/enterprise networks, and software-defined wide area networks (SD-WAN), the Accton Group satisfies client needs around the world for next-generation designs through close long-term partnerships.

From end-users to hyperscale data centers, and telecom network operators, our product portfolio encompasses data center switches, metropolitan and enterprise-grade switches, server switches, smart network interface cards, 5G cell site gateways, telecom core routers, edge computing servers, enterprise wireless access, broadband access and gateways, smart sensors, and more. We continue to provide efficient and complete services to the world's top clients and strive to bridge the gap between urban and rural areas, thereby connecting all communities around the world.

As Accton Technology expands into the Accton Group with multiple affiliate companies, our strong sense of mission and social responsibility ensure that the Group actively participates in activities that give back to society. We have instilled environmental protection awareness in all our designs and manufacturing processes.





## Accton Technology - Design, R&D, Manufacturing, Sales

### An industry leader in advanced technology for hyperscale data centers, AI, and edge computing.

Accton Technology is dedicated to the comprehensive research, design, and manufacturing of Ethernet and wireless equipment. With a diverse and complete product portfolio, outstanding communication technology research capabilities, and close partnerships throughout the global networking industry supply chain, Accton provides diversified network communication equipment and solutions to major network, information, and telecommunications operators. Accton is a primary OEM/ODM partner for leading global brands, renowned for its innovative technology and manufacturing quality. The rise in Internet use has propelled the success of the Company.



Company Introduction Video:  
<https://youtu.be/kOoGbnKC2Mk>

## Brand Sales - Edgecore Networks

Edgecore Networks is a subsidiary of Accton Technology, established in 2010, responsible for the global brand business. As a trailblazer in the field of open networking, Edgecore offers wired and wireless network solutions and professional services to data centers, service providers, and enterprise customers through global partners and system integrators.

Edgecore offers a full range of open 1G-800G switches, core routers, access routers, terminal network equipment, packet forwarders, and wireless network products, and supports NOS and SDN software to meet various environmental needs. Edgecore has service bases in the United States, Singapore, and India. For more information, please refer to [www.edge-core.com](http://www.edge-core.com)

## Industry Chain - JoyTech

JoyTech is the production base of Accton Technology in Shenzhen, China, established in 2005. It has 16 SMT production lines and 22 back-end assembly testing and packaging production lines. JoyTech employs more than 1,800 employees. Through lean management and total quality management (TQM), we provide stable production capacity and excellent quality. JoyTech has successfully obtained TL 9000, ISO 9001, ISO 14001:2015, ISO 45001:2018, ISO 50001:2018, IECQ QC080000:2017, and RBA third-party verification. JoyTech enjoys widespread recognition from international industry partners and has been repeatedly honored with prestigious local government awards for outstanding quality management.

## Industry Chain - Vietnam Accton

Vietnam Accton serves as the production base for Accton Technology in Vĩnh Phúc Province, Vietnam. Established in 2023, it operates with six SMT production lines and five back-end assembly and packaging production lines, employing over 400 employees. Vietnam Accton has successfully obtained ISO 9001, TL 9000, QC 080000, ISO 14001, ISO 45001, ANSI/ESD S20.20 through third-party verification.





## 1.2 Operating Performance

In 2023, the consolidated revenue of Accton Group amounted to NT\$84,188,426,000, representing a year-on-year increase of approximately 9.05% compared to the same period in 2022. Accton Technology and its subsidiary, Edgecore Networks, accounted for 77% of the consolidated revenue in 2023.

Please refer to Accton Technology's 2023 Report for affiliated enterprises (<https://www.accton.com/esg-documents/>), the boundary of which was different from this Report. In this Report, Accton Technology is the reporting entity. Regarding the operating activities of Accton Technology, the part related to brand sales must be included in the operating activities of Edgecore, while the part related to manufacturing must be included in the operating activities of JoyTech. Other affiliated enterprises in the financial report are not included within the scope of this report because they do not significantly impact the operating activities of Accton Technology.

### ◆ Accton consolidated revenue

(in NT\$ '000)

	2019	2020	2021	2022	2023
Revenue	55,401,047	54,462,872	59,598,681	77,205,223	84,188,426
Gross profit	10,998,762	11,554,062	11,344,596	16,518,262	19,262,801
Net profit	6,039,983	6,402,66	5,440,726	9,632,608	11,501,097
Net profit after tax	4,950,495	5,048,353	4,705,059	8,165,812	8,920,165
Gross profit margin	19.85%	21.21%	19.03%	21.40%	22.88%
Net profit margin	8.94%	9.27%	7.89%	10.58%	10.60%

### Major Product Sales and Sales Regions

The Company's main products include high-speed Ethernet switches, network access equipment (network appliances such as SmartNIC), and wireless network products/broadband Internet.

Product Category	2020	2021	2022	2023
Network Switches	71%	63%	59%	68%
Network Appliances	14%	19%	27%	23%
Network Access Switches	10%	12%	9%	6%
Wireless Network Equipment	2%	4%	4%	1%
Other Network Equipment	3%	2%	1%	2%
Total	100%	100%	100%	100%

Exports constituted 99% of overall product sales, and the main sales regions were the Americas, Asia Pacific, and Europe. For the distribution of main product sales regions in the most recent three years, please refer to the "Statistics of Main Sales Regions in 2023."

### ◆ Statistics of Main Sales Regions in 2023

	2020	2021	2022	2023
Americas	69%	60%	66%	71%
Europe	20%	21%	18%	12%
Asia Pacific	9%	18%	15%	16%
Taiwan	2%	1%	1%	1%
Other Countries	0%	0%	0%	0%
Total	100%	100%	100%	100%

### ◆ Government Subsidies

Government Subsidies Item	Nature of Subsidies	Subsidy Amount (NT\$ thousand)
Executive Yuan Employment Subsidy	Employment Subsidy	360
Subsidy from the Industrial Development Administration	Subsidy from the Taiwan Industry Innovation Platform	16,300
Economic Development Bureau, Tainan City Government	Subsidy from the Tainan Special Project	841
Subsidy from the Industry and Information Bureau	Stable growth and technological transformation	7,965
Public Employment Service Center	Spring festival employment and return to work subsidy	2,438
Subsidy from the Social Security Bureau	Employment stabilization and expansion, and maternity	1,882

Exchange rate: Exchange rate of CNY to NTD on December 31, 2023: NT\$4.327

### ◆ Payment of Income Tax by Region

Unit: NT\$ thousand

Income tax	2021	2022	2023
Taiwan	921,446	1,944,593	2,487,114
China	82,978	143,261	290,554
Other regions	21,668	22,257	34,628
<b>Total</b>	<b>1,026,092</b>	<b>2,110,111</b>	<b>2,812,296</b>

### ◆ Employee Benefits by Region

Unit: NT\$ thousand

Employee benefits	2021	2022	2023
Taiwan	3,905,666	4,892,483	5,558,098
China	1,024,053	1,152,166	1,050,615
Other regions	234,815	286,229	398,824
<b>Total</b>	<b>5,164,535</b>	<b>6,330,878</b>	<b>7,007,537</b>

### ◆ Dividends Distribution over the Years

Unit: NT\$ thousand

	2021	2022	2023
Cash dividends	3,359,576	4,201,117	5,603,834

Note: The profit distribution for FY2023 is expected to be resolved at the annual general shareholder's meeting scheduled for June 13, 2024.

The Company's ownership structure is mainly composed of foreign investors, individual investments, juristic persons, and financial institutions, with government agencies holding a 6.69% stake, which is below 7%.

Shareholder Structure	Government agencies
Number of investors	103
Shareholdings	37,484,384
Shareholding ratio (%)	6.69





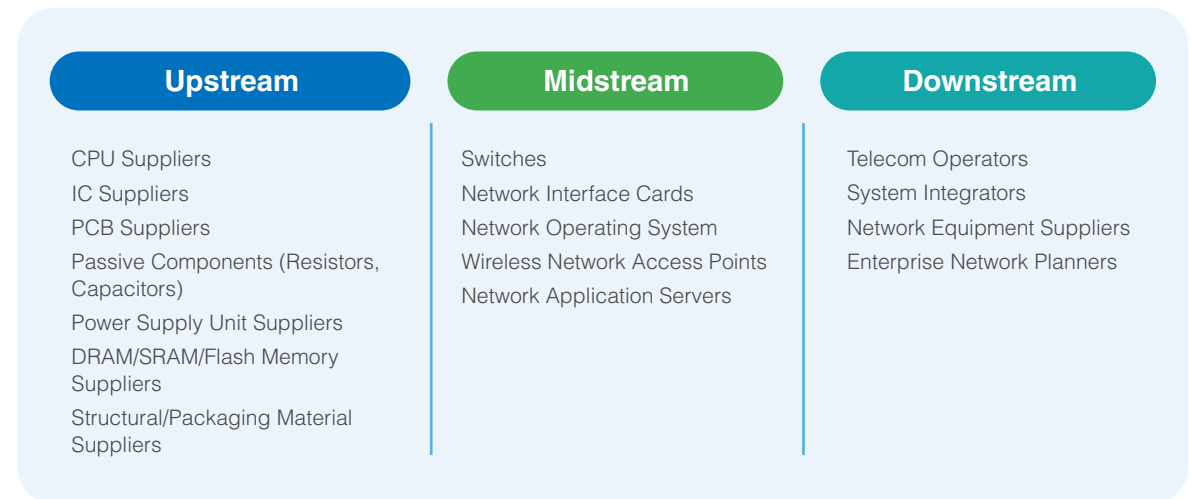
## Accton Group develops, designs, manufactures, and sells the following high-quality products:

- Hyperscale Data Center Switches
- Coherent Optical Packet Transponders
- Hyper Cloud Appliances
- Ethernet BOF (Bunch of Flash) Storage Systems
- Smart Network Interface Cards (Smart NIC)
- Core Routers for Telecom Facilities
- IoT Systems including end hardware, sensors, application software, and hybrid cloud platforms
- Enterprise Network Wired and Wireless Equipment including switches and wireless access points
- Computer Network Systems including hardware, system software, network application software, and network workstations
- Customer Premises Communication Equipment (CPE) including hardware, system software, and application software
- 5G CPEs and enterprise small cell base stations
- Wireless Local Area Network (WLAN)
- Wireless Subscriber Loop Systems
- Millimeter-Wave Base Stations, Bridges, and CPEs
- SD-WAN Gateways, Virtual/Universal Customer Premises Equipment (vCPE/uCPE)
- Optoelectronic Communication Subsystems including fiber optic networks, optoelectronic communication modules, and optical repeaters
- Software-Defined Wide Area Networks (SD-WANs)
- Edge Computing Servers

## Industry Upstream, Midstream, and Downstream Relationships

Accton integrates upstream wired and wireless local area network chip manufacturers, leveraging its own R&D capabilities to provide integrated network platforms and systems that offer optimized network software and hardware to end users.

Accton broadens its range of materials and suppliers to ensure a steady supply of raw materials and maintains strong relationships with leading chip manufacturers. This strategy allows Accton to effectively manage component sources and information, seize market opportunities, and enhance existing collaborations in business, technical R&D, and manufacturing supply chains.



# 1.4 Exceeding Customer Expectations

The scope primarily covers Accton and its subsidiary, Edgecore, as Accton and Edgecore are responsible for business sales. JoyTech and the Vietnam Accton are involved in manufacturing, so there were no customer satisfaction surveys conducted.

Item	2023 Goals	2023 Results	Short-Term Goals (2024-2025)	Medium-Long-Term Goals (2025-2030)
<b>Accton</b>	<ul style="list-style-type: none"> <li>Customer Feedback Score: 85</li> <li>Maintain a flexible supply chain system and continue investing in innovative technologies</li> </ul>	<ul style="list-style-type: none"> <li>Customer Feedback Score: 83</li> <li>Continue strengthening inventory control system. To reduce production risks for customers, enhance supply chain resilience, we established a manufacturing plant in Vietnam in 2023 to ensure sustainable business value.</li> </ul>	<ul style="list-style-type: none"> <li>Achieve a customer satisfaction score of 85 or above</li> <li>Introduce a Cloud Outpost System to integrate the group's information flow</li> <li>Enhance supply chain production flexibility to mitigate the risk of over-concentration of production capacity</li> </ul>	<ul style="list-style-type: none"> <li>Achieve a customer satisfaction score of 85 or above</li> <li>Enhance product technology and invest in innovative technologies to create greater value for customers</li> <li>Continue global market deployment to provide customers with better products and services</li> </ul>
<b>Edgecore</b>	<ul style="list-style-type: none"> <li>Achieve a customer satisfaction score of 86 or above</li> </ul>	<ul style="list-style-type: none"> <li>Achieve a customer satisfaction score of 86 or above</li> <li>Improve customer feedback mechanism</li> <li>Enhance customer service training</li> </ul>	<ul style="list-style-type: none"> <li>Achieve a customer satisfaction score of 86-89</li> <li>Optimize processes through data analysis</li> <li>Predict maintenance needs and establish RMA spare parts inventory</li> <li>Strengthen maintenance technology training</li> </ul>	<ul style="list-style-type: none"> <li>Achieve a customer satisfaction score of 90 or above</li> <li>Customer knowledge sharing platform</li> <li>Continue improving customer service processes</li> </ul>

## I. Accton Technology - Customer Relationship Management

In 2023, Accton conducted satisfaction surveys with 10 key customers, receiving feedback from 8, with a satisfaction rate of 83%. Customers highly commended our supply chain flexibility and R&D capabilities. We will continue to focus on enhancing product technology in various fields, especially in green energy-saving areas, to create higher value for customers.

Ensuring sustainable business and creating higher value for customers has been a key focus for Accton in recent years. The interplay of key factors such as the tense US-China trade relations, the COVID-19 pandemic, and the Russia-Ukraine conflict led Accton to establish a new manufacturing plant in Vietnam on March 30, 2023, to mitigate production risks for customers. This new factory is part of Accton's strategy in Asia and the global market deployment, marking an important milestone for Accton Group and the beginning of a new cross-regional layout model. In the future, we will continue to increase supply chain production flexibility and continue global market deployment to provide better products and services to customers.

## II. Edgecore - Customer Satisfaction

Improving customer satisfaction has always been our mission, ensuring customer needs are met through regular satisfaction surveys. Over the past five years, we have evaluated various aspects, such as products, technical support, delivery, sales service, RMA processes, and website functions to comprehensively assess customer satisfaction and improve shortcomings.

### ◆ Edgecore's Customer Satisfaction Scores Over the Past Five Years

Year	2018	2019	2020	2021	2022	2023
<b>Average Score</b>	82.6	82.4	86.4	86	86	86

### Historical Customer Satisfaction Trends:

Performance in products, delivery, and sales staff services was outstanding, while the RMA process and website functionality still have room for improvement. Therefore, we will continue to improve customer satisfaction strategies by proactively communicating, providing innovative solutions, enhancing products and services, ensuring timely updates on RMA progress, and strengthening the environmental characteristics of products with a focus on sustainability. Our goal is to achieve a score of 90 or above.

We believe that by focusing on listening to customers and continuously optimizing with their needs at the core, we can surely earn higher recognition and support from customers. Thank you to the customers and partners who participated in this survey. Your valuable feedback is crucial to our continued growth. Let us work together to continuously improve customer satisfaction and create better opportunities for collaboration.

### III. Participating in International Online Shows and Hosting Online Seminars

Through the brand Edgecore Networks, Accton participates in many renowned overseas IT and telecom exhibitions, directly introducing and showcasing the latest solutions to customers and distributors.

#### Physical Exhibitions:

- 2023/1/25-27 : JANOG51, Yamanashi, Japan
- 2023/2/27-3/2 : MWC Barcelona, Spain
- 2023/10/9-11 : Fyuz Summit, Madrid, Spain
- 2023/10/9-12 : WISAPALOOZA, Las Vegas, Spain
- 2023/10/17-19 : OCP Global Summit, San Jose, USA
- 2023/11/15-17 : US Broadband Summit, Washington DC, USA



▲ International Exhibitions: Fyuz 2023 in Madrid, Spain

### Online Seminars:

2023/7/27 : Comprehensive Networking Solutions for the Telecom and Service Provider Market from Edgecore Networks

2023/9/6 : Optimizing Your Business with Cloud Data Center Solution from Edgecore Networks

2023/9/27 : SONiC-based solution for Optical Tranponder Use Case from Edgecore and PalC Networks



▲ Online Seminar: SONiC-based solution for Optical Tranponder Use Case from Edgecore and PalC Networks

## IV. Maintenance and Repair Services: Continuous Improvement, Fast Delivery

### Edgecore

Edgecore Networks provides comprehensive technical support services, specifically covering:

#### 1. Open Networking Switch, Legacy Switch, WiFi

Hardware diagnostics, firmware updates, RMA application and return services, hardware failure analysis, and other hardware support.

#### 2. Software/NOS Developer Hardware Support Services:

Providing hardware information required for device development, such as BSP (Board Support Package), ECN (Engineering Change Notification), specification documentation, technical support for hardware diagnostics and debug tools, source code data for platform drivers, hardware integration verification testing, and early product hardware issue feedback consultation to achieve early hardware driver development and performance optimization.

#### 3. EC SONiC Software:

- For SONiC Software Users: Technical support, SONiC software evaluation, SONiC operation and usage training, SONiC version update services, and SLA services.
- For SONiC Software Developers: SONiC sub-license services, tailored SONiC development, SONiC version upgrade services, and SONiC integration verification testing (software diagnostic).

Edgecore operates a professional global support team that uses a comprehensive ticket system to provide pre-sales and after-sales services, ensuring the success of customers' businesses.

## ◆ Product Technical Services

Item	2022 Results	2023 Goals	2023 Results	Mid to Long-term Goals
Average time for first response: (hours).	27.5	< 48	27.3	< 24
Average customer waiting days	14.0	< 15	17.1	< 14
Average days to resolve issues	18.6	< 22	20.3	< 20

### Overall performance:

Remained stable at 27.3 ~ 27.5 hours.

Increased from 14 days to 17.1 days.

Increased from 18.6 days to 20.3 days.

### Trend Analysis:

The average time for first response remained unchanged, indicating a relatively stable response speed.

The increase in average customer waiting days and average days to resolve issues suggests potential obstacles in the overall problem resolution process.

### Short-Term Plan:

- Improve Customer Feedback Mechanism: Establish or improve the customer feedback system to collect customer opinions and complaints more promptly, analyze feedback data regularly, and respond quickly to customer needs.
- Quickly Resolve Common Issues: Analyze common issues from the past year and develop quick response solutions. Enhance the knowledge management system with more self-troubleshooting solutions.
- Enhance Customer Service Training: Improve the technical problem-solving capabilities and service efficiency of the customer service team.

### Medium-Long-Term Strategy:

- Customer Knowledge Sharing Platform: Establish a platform for customers to share their experiences and solutions.
- Optimize Processes Through Data Analysis: Leverage data analysis tools to optimize technical service processes, establish a data analysis team to continuously monitor and improve technical support processes, and enhance efficiency.
- Continuously Improve Customer Service Processes: Continue to optimize customer service processes to increase overall satisfaction.

◆ **Product Repair**

Item	2022 Results	2023 Goals	2023 Results	Mid to Long-term Goals
Repair Turnaround Time: (TAT)	42	< 45	45.66	< 40

**Edgecore Product Repair Department:**

We understand that product reliability and after-sales service are critical factors for customers choosing Edgecore. To fully safeguard customer interests, Edgecore provides comprehensive product warranty and RMA policies, along with efficient service processes, to offer dedicated after-sales support. By implementing short-term plans and medium- to long-term strategies, we actively respond to challenges. The intent of these measures is to improve customer satisfaction and ensure that our services exceed customer expectations.

Since 2021, Edgecore's Product Repair Department has been committed to providing efficient and high-quality services. However, in 2023, we faced some challenges, particularly with a decline in our repair turnaround time (TAT) performance. Overall Performance and Trends Over in the Past 3 Years:

2021: Accepted 2,037 RMA applications, with average repair TAT of 41 days.

2022: Accepted 2,315 RMA applications, with average repair TAT of 42 days.

2023: Accepted 2,000 RMA applications, with average repair TAT of 46 days.

**Short-Term Plan:**

We have always been committed to exceeding customer expectations, particularly in product repair services. Despite facing supply chain challenges in 2022 and 2023, we have developed the following short-term plans to improve repair efficiency for 2024.

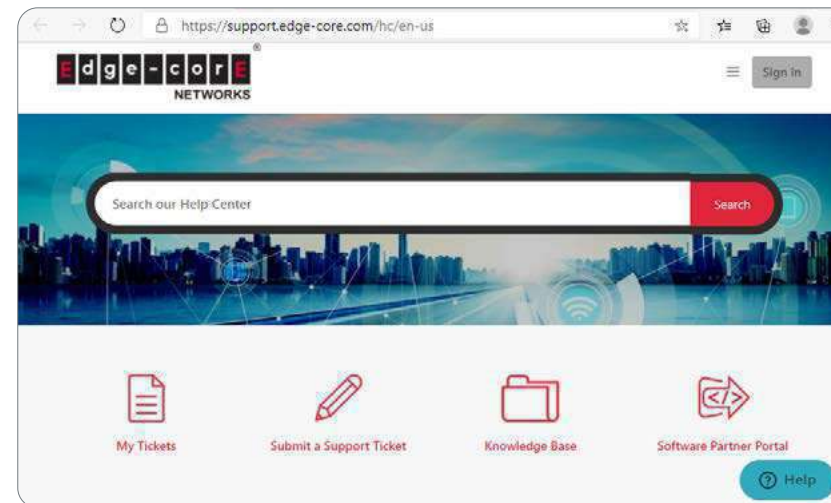
**Regional Spare Parts:** Establish RMA spare parts inventories to provide timely RMA parts for specific customers and regions, aiming to reduce wait times. The goal is to shorten the average repair turnaround time from 46 days to 45 days (short-term goal). In addition to providing RMA spare parts for specific regions, we continuously optimize the RMA order processing to achieve our medium- to long-term goals.

**Medium-Long-Term Strategy:**

- To realize the long-term goal of reducing the average repair turnaround time to less than 40 days, we have initiated the following medium- to long-term plans.
- Predictive Maintenance and Timely RMA Spare Parts: Establish a data analysis team to use big data techniques to analyze past repair data, predict future repair needs, and prepare the necessary spare parts and resources in advance, thereby reducing repair turnaround time.
- Strengthen Technical Training: Enhance global product repair technical training in the mid-term to ensure consistent technical proficiency across different regions, further improving repair efficiency.

◆ **For more information, please visit the Edgecore online customer service website**

<https://support.edge-core.com/hc/en-us>

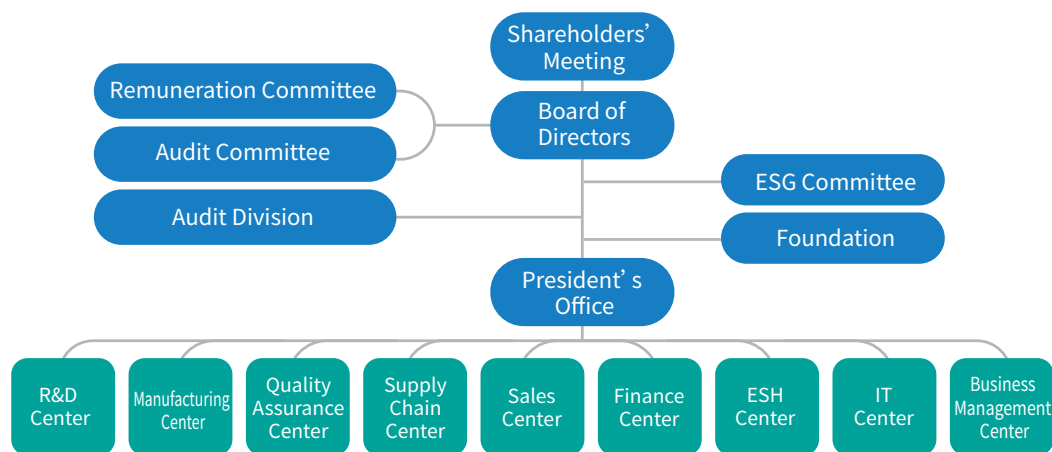




# 1.5 Corporate Governance



## I. Corporate Governance Structure



Accton has established a Board of Directors as the highest governance unit, including an Audit Committee and a Remuneration Committee.

The Board of Directors is the superior unit of the ESG Committee. The Board provides advice and guidance on the operation of the ESG Committee, and major proposals must be submitted to the Board for deliberation and approval.

## II. Corporate Governance Goals

Accton's corporate governance emphasizes transparency, foresight, functionality, and internationalization, aiming to maximize the interests of all shareholders.

The decision-making for goals related to business development and strategic vision lies primarily with the Board of Directors, including business plans, profit distribution, approval of important charters and contracts, budget and final accounts review, appointment and dismissal of the President and Vice President(s), and approval of real estate transactions and business investments.

## III. Board of Directors

The Chairman of the Board of Directors, serving as the highest-level manager of the company's operational organization, is appointed from among the directors.

### 1. Maintaining a Majority of Independent Director Seats to Establish an Impartial, Objective, and Detached Internal Control System

The Company adheres to a policy of having a majority of independent directors and has established the "Regulations Governing the Election of Directors" in accordance with legal regulations. All director appointments are made in compliance with these procedures. The nomination and selection process for director candidates, qualifications of independent directors, restrictions on concurrent positions, and other matters to be observed are all handled in accordance with relevant provisions of Company Act and relevant securities regulations.

The Company places significant emphasis on the independence of its board members, not only by increasing the number of independent director seats but also by adhering to relevant regulations regarding the independence assessment and evaluation of independent directors.

The directors of the Company are individuals with extensive industry experience, high academic standing, and outstanding performance in other professional fields.

### 2. Diversification Policy in Composition of Board Members

To achieve the aforementioned goals and enhance effectiveness, the Company has established a "Policy for Diversified Composition of Board Members," following the guidelines of the "Corporate Governance Best Practice Principles." The composition of the Board of Directors should consider diversity and formulate appropriate diversification policies based on the Company's operations, business model, and development needs. These policies should encompass but are not limited to the following two major aspects:

- (1) Basic Conditions and Values: Gender, age, nationality, and culture.
- (2) Professional Knowledge and Skills: Professional backgrounds (such as law, accounting, industry, finance, marketing, or technology), professional skills, and industry experience.

The Company had seven directors in 2023, including four independent directors, accounting for approximately three-fifths of all director seats, or about 57%. These directors were individuals with diverse backgrounds, extensive professional knowledge, experience, exceptional insights, and uphold high ethical standards.



The independent directors had diverse expertise: two were from Taiwan, with backgrounds in finance, accounting, operations, risk management, administration, operations, and decision-making; one was from India, specializing in industry, operations, and international affairs; and one was from Japan, with expertise in management, leadership, and international affairs.

The 12th Board of Directors exceeded the Financial Supervisory Commission's requirement of three independent directors by appointing Shu-Chieh Huang, Fa-Yauh Lee, Kobayashi Eizo, and Ankur Singla, totaling four independent directors. This move aimed to solidify the professionalization and transparency of corporate governance, with a focus on the interests of all shareholders.

### In 2023, five board meetings were convened, during which proposals and reports covering :

environmental issues (2), social matters (3), and business management (49) were deliberated. All proposals were submitted to the Board of Directors and passed.

Case \ Category	Environmental	Social	Governance
Proposal	0	3	29
Report	2	0	20
Total	2	3	49

### 3. Non-Compete and Conflict of Interest Recusal

- 3.1 To prevent any potential conflicts of interest that may affect the interests of all shareholders, no member of the Board of Directors serves as a director or is a shareholder of any competing company.
- 3.2 Our Company's Rules of Procedure for Board of Directors Meetings stipulates that if a director or a juristic person that the director represents is an interested party in relation to an agenda item, and the relationship could potentially compromise the Company's interest, the director shall state the significant aspects of the interested party relationship. At the respective meeting, such director may not partake in the discussion or voting on that agenda item and shall recuse themselves. Further, the director is prohibited from exercising the voting rights of another director in proxy.

### 4. Continuing Education

The rapid advancements in technology necessitate the continuous improvement of directors' skills in industry dynamics and professional management. To this end, the Company organizes training programs related to business management and industry trends, including:

May 2023: Trends in Smart Manufacturing and Application of Digital Technology in Business Management

November 2023: Enhancing Digital Resilience and Developing Cybersecurity Governance Strategies for Public Companies

## IV. Remuneration Committee

The 5th term Remuneration Committee (2021/07/08-2024/07/07) comprises independent directors Fa-Yauh Lee, Shu-Chieh Huang, and Chih-Ping Chang. The Committee convened two meetings in 2023.

### Duties and Responsibilities:

- 1. Establishment and regular review of the policies, rules, standards, and structure of performance evaluations and remuneration for directors and managerial officers.
- 2. Ensure that salary and performance are consistent, and that transparency and fairness are upheld to protect the rights and interests of shareholders.

## V. Audit Committee

The 2nd term Audit Committee consists of Independent Directors Shu-Chieh Huang, Fa-Yauh Lee, Kobayashi Eizo, and Ankur Singla. The Committee convened five meetings in 2023.

### Duties and Responsibilities:

- 1. Fair presentation of the Company's financial reports.
- 2. Appointment or dismissal of the attesting CPAs, and evaluation of their independence and performance.
- 3. Effective implementation of the Company's internal control system.
- 4. Ensure the Company's compliance with relevant regulations and rules.
- 5. Manage the Company's existing or potential risks.

## VI. Corporate Sustainability Committee (ESG Committee)

A Corporate Sustainability Committee is set up under the Board of Directors and manages the organization's economic, environmental, and human rights impacts.

The Vice President, Jackal Lee, serves as the Chairman of the "Corporate Sustainability Committee." The Committee includes senior management executives of various departments. The Sustainability Committee has an office, whose members are composed of employees from different departments to handle the Committee's substantive work.

The "Corporate Sustainability Committee" annually reports the execution status of significant matters to the highest governing body, the Board of Directors. If there are special matters that need to be reported, they can be presented as proposals during board meetings for discussion and approval.

In 2023, the committee reported its overall operational status and carbon inventory status to the Board of Directors as planned. The board provided guidance and suggestions on the execution status and outcomes of the corporate sustainability operations.

Annual ESG topics and reports are also submitted to the Board of Directors for review and approval.

## VII. Performance Evaluation

### The Company has completed the performance evaluation report of the Board of Directors and Functional Committees.

To enhance corporate governance and the functions of the Board of Directors and its functional committees, the Company conducts performance evaluations in accordance with the "Regulations Governing Board of Directors Performance Evaluation."

Evaluation Period: January 1, 2023, to December 31, 2023.

The Board of Directors and the Functional Committees of the Company conduct performance evaluation annually and appoint an external professional independent institution or a team of external experts and scholars to conduct the evaluation at least once every three years. The annual performance evaluation adheres to established evaluation procedures and indicators, with the report being finalized prior to the end of the first quarter of the subsequent year.

The self-evaluation is conducted using a questionnaire divided into five levels: 1: Very Poor (Strongly Disagree); 2: Poor (Disagree); 3: Fair (Neutral); 4: Good (Agree); 5: Excellent (Strongly Agree). The self-evaluation results are scored out of 100 points. The weighted average is calculated to determine the final score: Scores between 100-90 are rated as "Excellent" Scores between 89-80 are rated as "Good" Scores below 79 are rated as "Needs Improvement"

## Evaluation Results

### 1. Board Performance Evaluation

Evaluators: Meen-Ron Lin, Chairperson Heng-Yi Du, Director Kuo-Hsiu Huang, Director Shu-Chieh Huang, Independent Director Fa-Yauh Lee, Independent Director Kobayashi Eizo, Independent Director Ankur Singla, Independent Director, for a total of seven evaluators.

Evaluation Items	Number of Questions	Total Score	Self-Evaluation Score	Difference	Weight (%)	Final Score
A. Participation in Company Operations	12	420	366	-54	26.7%	23.2
B. Enhancing Board Decision-Making Quality	12	420	369	-51	26.7%	23.4
C. Board Composition and Structure	7	245	228	-17	15.6%	14.5
D. Selection of Directors and Continuing Education	7	245	213	-32	15.6%	13.5
E. Internal Control	7	245	226	-19	15.6%	14.3
<b>Total</b>	<b>45</b>	<b>1575</b>	<b>1402</b>	<b>-173</b>	<b>100.0%</b>	<b>89.0</b>

**Rating: Good**

### 2. Board Member Evaluation

Evaluators: Meen-Ron Lin, Chairperson Heng-Yi Du, Director Kuo-Hsiu Huang, Director Shu-Chieh Huang, Independent Director Fa-Yauh Lee, Independent Director Kobayashi Eizo, Independent Director Ankur Singla, Independent Director, for a total of seven evaluators.

Evaluation Items	Number of Questions	Total Score	Self-Evaluation Score	Difference	Weight (%)	Final Score
A. Grasp of Company Goals and Missions	3	105	94	-11	13.0%	11.7
B. Awareness of Director Responsibilities	3	105	101	-4	13.0%	12.5
C. Participation in Company Operations	8	280	251	-29	34.8%	31.2
D. Management and Communication of Internal Relationships	3	105	93	-12	13.0%	11.6
E. Director's Professionalism and Continuing Education	3	105	93	-12	13.0%	11.6
F. Internal Control	3	105	96	-9	13.0%	11.9
<b>Total</b>	<b>23</b>	<b>805</b>	<b>728</b>	<b>-77</b>	<b>100.0%</b>	<b>90.4</b>

**Rating: Excellent**

### 3. Audit Committee Performance Evaluation

Evaluators: Shu-Chieh Huang, Independent Director, Fa-Yauh Lee, Independent Director, Kobayashi Eizo, Independent Director, Ankur Singla, Independent Director, for a total of four evaluators.

Evaluation Items	Number of Questions	Total Score	Self-Evaluation Score	Difference	Weight (%)	Final Score
A. Participation in Company Operations	4	80	71	-9	18.2%	16.1
B. Awareness of Audit Committee Responsibilities	5	100	88	-12	22.7%	20.0
C. Enhancing Audit Committee Decision-Making Quality	7	140	125	-15	31.8%	28.4
D. Audit Committee Composition and Member Selection	3	60	54	-6	13.6%	12.3
E. Internal Control	3	60	53	-7	13.6%	12.0
<b>Total</b>	<b>22</b>	<b>440</b>	<b>391</b>	<b>-49</b>	<b>100.0%</b>	<b>88.9</b>

**Rating: Good**

### 4. Remuneration Committee Performance Evaluation

Evaluators: Shu-Chieh Huang, Independent Director, Fa-Yauh Lee, Independent Director, Chih-Ping Chang, Director, for a total of 3 evaluators.

Evaluation Items	Number of Questions	Total Score	Self-Evaluation Score	Difference	Weight (%)	Final Score
A. Participation in Company Operations	4	60	58	-2	26.7%	25.8
B. Awareness of Remuneration Committee Responsibilities	4	60	54	-6	26.7%	24.0
C. Enhancing Remuneration Committee Decision-Making Quality	5	75	66	-9	33.3%	29.3
D. Remuneration Committee Composition and Member Selection	2	30	29	-1	13.3%	12.9
<b>Total</b>	<b>15</b>	<b>225</b>	<b>207</b>	<b>-18</b>	<b>100.0%</b>	<b>92.0</b>

**Rating: Excellent**

### Overall Rating

**The overall performance evaluation rating is: Excellent.**

This year's evaluation highlighted a larger discrepancy in the participation in Company operations and the quality of decision-making by the board. This is mainly attributed to the higher number of external board members, who may not have immediate access to the Company's future strategies and development directions. Increased interaction between the management team and board members is recommended to enhance the quality of the board's decision-making.

Overall, the board's operations are functioning well. The Company will continue to strengthen governance based on the results of this performance self-evaluation to further improve corporate governance effectiveness.

### VIII. Corporate Governance Evaluation

The Financial Supervisory Commission's "Blueprint for Strengthening Corporate Governance in Taiwan" includes measures for conducting "Corporate Governance Evaluations" for all listed companies. These evaluations have proven effective in advancing corporate governance practices, aligning rapidly with international standards, and helping investors and companies understand the implementation effectiveness of corporate governance through comprehensive market evaluations.

To continuously deepen corporate governance, enhance sustainable corporate development, and foster a healthy sustainable development ecosystem to strengthen the international competitiveness of the capital market, the FSC launched the "Corporate Governance 3.0 - Sustainable Development Roadmap" in 2020. This initiative encourages companies to promote governance by incorporating corporate governance evaluation indicators.

- On April 28, 2023, the Taiwan Stock Exchange and Taipei Exchange announced the results of the "10th Corporate Governance Evaluation System." Accton ranked in the top 21% to 35% among 1,700 listed companies.



# 1.6 Ethical Corporate Management

## I. Supply Chain Management

In terms of sustainable supply chain management, Accton demands all its suppliers to operate their business in accordance with the Responsible Business Alliance (RBA). This commitment includes respect for labor rights, health and safety, environment, business ethics, and management systems. Suppliers must also fully comply with the laws and regulations of the country/region in which they operate. Concurrently, Accton requires its suppliers to implement the same standards for their next-level suppliers

## II. Top-Down Approach in the Formulation and Implementation of Ethics and Integrity Policies

The Company has established the "Ethical Corporate Management Best Practice Principles" that were approved by the Board of Directors and disclosed on the Market Observation Post System (MOPS).

The Board of Directors and management strive to implement management policies rooted on integrity and have demonstrated this in the Company's internal management.

The "Ethical Corporate Management Best Practice Principles" and "Supplier Code of Conduct" explicitly forbid bribery, acceptance of bribery, provision of illegal political donations, inappropriate charity donations or sponsorship, providing or accepting unreasonable presents, hospitality or other improper benefits, infringement of trade secrets, trademark rights, patent rights, copyrights, and other intellectual property rights. They also prohibit engaging in unfair competitive practices and causing direct or indirect damage to the rights or interests, health, or safety of consumers or other stakeholders during research and development, procurement, manufacturing, provision, or sale of products and services. The Company has adopted preventive measures and implemented training to uphold the Ethical Management Policy.

## III. Clear Regulations and Multi-Pronged Communication Approach to Drive Communication and Training of "Ethical Business Principles"

The Company delineated clear regulations in the "Employee Professional Ethical Guidelines" and "Ethical Corporate Management Best Practice Principles," which are implemented and published on the Company's internal website for employees to peruse at any time. We also employ training and various other methods to increase employees' awareness of the Company's core values and compliance system. Additionally, we require employees to uphold the critical responsibilities of maintaining high moral standards, the Company's reputation, and compliance with regulations.

## 1. Education Training and Engagement

Establishment of the concept of full-staff integrity from the foundation, and the coverage rate of education and training of new recruits has reached 100%

## 2. Education and Training | Employees and Suppliers Taiwan HQ

### New Employees

The Human Resources unit is responsible for planning and organizing all training programs of the Company. The training and awareness campaigns for integrity and honesty are implemented during orientation training for new employees to ensure that all employees understand the relevant regulations.

Employee Level	Number of Employees to be Trained	Actually Completed	Percentage
Management	5	5	100%
Indirect Non-Management	236	236	100%
Direct Employees	257	257	100%

Note 1: The trainees included full-time and contractual personnel in Accton's Hsinchu HQ, Plant 2, Zhunan Plant, Edgecore, and offices.

Note 2: Management refers to employees who are responsible for leading subordinates such as section chiefs and managers.

### Current Employees

The integrity and anti-corruption training courses for Accton and Edgecore are primarily based on "Responsible Business Alliance (RBA)" training. The content primarily focuses on promoting social responsibilities and achieving market success. Participants and agents must abide by the highest moral standards, uphold ethical management principles, and comply with the "Professional Ethical Management Procedures"

Employee Level	Course Name	Course Type	Number of Employees to be Trained	Actually Completed	Percentage
Management	RBA Training	Physical and online	8	8	100%
Indirect Non-Management	RBA Training	Physical and online	321	321	100%
Direct Employees	RBA Training	Physical and online	257	257	100%

Note 1: Management refers to employees who are responsible for leading subordinates such as section chiefs and managers.

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### New Employees

The Human Resources unit is responsible for planning and organizing all education and training activities within the Company. Integrity and anti-corruption education and promotion are incorporated into the onboarding training for new employees to ensure that all employees are made fully aware of and understand the relevant regulations.

Employee Level	Number of Employees to be Trained	Actually Completed	Percentage
Management	2	2	100%
Indirect Non-Management	11	11	100%
Direct Employees	344	344	100%

Note 1: Targets of training include both regular employees and contractors.

Note 2: Management refers to employees who are responsible for leading subordinates such as section chiefs and managers.

### Current Employees

Accton and Edgecon conducted the annual Responsible Business Alliance (RBA) training in December 2023. The training primarily focused on promoting the fulfillment of social responsibility. To achieve market success, participants and their representatives must adhere to the highest ethical standards, uphold the principles of integrity management, and comply with the "Professional Ethical Management Procedures."

Employee Level	Course Name	Course Type	Number of Employees to be Trained	Actually Completed	Percentage
Management	RBA Training	Physical and online	95	95	100%
Indirect Non-Management	RBA Training	Physical and online	275	275	100%
Direct Employees	RBA Training	Physical and online	787	787	100%

Note 1: Management refers to employees who are responsible for leading subordinates such as section chiefs and managers.

## Vietnam Accton

In 2023, Vietnam Accton subsidiary was established and commenced operations. During the onboarding education and training of new personnel, the policy of integrity management was promoted. We planned to add a chapter on integrity and ethical education and conduct related training in 2024.

## IV. Establishment of Diverse Communication Modes, Demonstrating the Resolve to Operate with Integrity and Acknowledging Partners

### Communication | Suppliers

To ensure suppliers understand and comply with the Company's integrity policy, the Company requires new suppliers to sign an Integrity Commitment Statement during the procurement process. This statement confirms their commitment not to engage in illegal practices.

### Communication | Internal and External Communication Channels

The Company has established the "Employee Ethical Conduct Management Procedures" and "Complaint and Report Management Measures." These documents define the ethical standards for employee conduct, encourage the reporting of any illegal or unethical behavior, and outline protections against retaliation. Employees can report to relevant supervisory units via email or a dedicated whistleblowing hotline, which are publicly listed on the internal legal audit information area and the company's website. Upon receiving a report, the relevant units notify the company's audit department to investigate and handle the matter according to the "Complaint and Report Management Measures."

The Company treats all substantiated unethical conduct or violation of professional ethics with the utmost seriousness. Violators face severe disciplinary actions and appropriate legal actions.



1. The Company has established the "Ethical Corporate Management Best Practice Principles" and the "Supplier Code of Conduct" to ensure that supply chain partners comply with the Company's business integrity regulations.

When signing a contract with a business partner, the Company shall obtain thorough information about the integrity of the counterpart's ethical management status and include ethical management requirements in the contracts. In case of a violation, the partnership will be terminated immediately, ensuring the procurement of the most reasonable quotations and the best services and quality.

The Company has established an effective accounting system and internal control system to implement ethical management. Internal auditors prioritize high-risk operations in the annual audit plan based on risk assessment, thereby strengthening preventive measures, and report the actual implementation status of the audit plan to the Board of Directors. The CPA reviews the implementation of the Company's internal control system annually.

The results of the internal audit and the audit by the CPA this year did not reveal any significant violations of ethical management regulations.

2. Employee training is planned by the human resources unit, while integrity training and signing of the integrity statements by supply chain partners are managed by the procurement unit.
3. The aforementioned educational materials, training resources, and advocacy documents are available in Chinese, Vietnamese, and English, the primary language of our international colleagues, to ensure effective communication of information to all employees.
4. In 2023, there were no complaints or reports related to business integrity that met the criteria for "confirmed corruption incidents." There were no dismissals or disciplinary actions due to corruption, and no contracts with business partners were terminated due to corrupt practices.

Based on risk control principles, all reported incidents are evaluated for potential risks and preventive measures are initiated to "immediately address negative risks upon discovery and prevent recurrence," while continuously promoting integrity awareness.

## V. Legal Compliance

According to the audit plan approved by the Board of Directors, legal compliance audits were conducted, with no major violations found.

1. The Company requires its internal organizations and colleagues to comply with the laws, regulations, and the Company's policies. The Company requires them to self-assess their compliance through the annual Control Self-Assessment, and they are subjected to audits by the internal audit unit.
2. The main targets for audits on compliance with laws and regulations in the Company's annual internal audit plan include human resources, accounting, and occupational safety and health. According to the results of the annual audit plan, there were no major violations in 2023. Procedural recommendations not involving violations were addressed and improvements were tracked and completed within the planned timeframe.

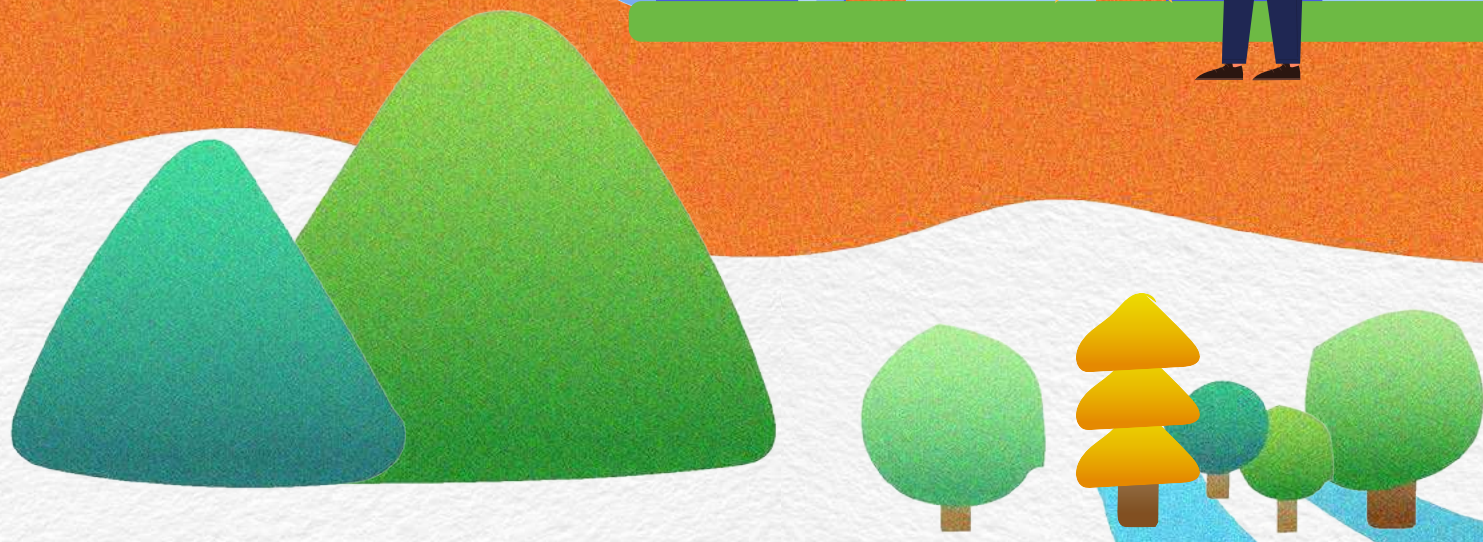
## VI. Stakeholder Engagement

In accordance with the provisions of listed companies, the Company will convene annual shareholders' meetings to engage directly with stakeholders. The Company's spokesperson serves as the main contact window for communication between the governance unit and the stakeholders. The spokesperson is also responsible for formally disclosing information to the public.



# 2 Corporate Governance

- 2.1 Risk Management
- 2.2 Innovation and R&D
- 2.3 Responsible Supply Chain



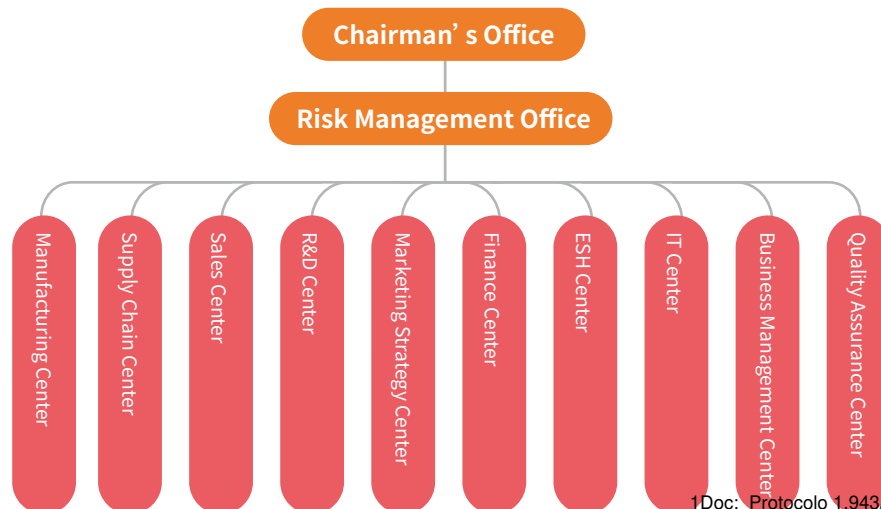
## 2.1 Risk Management

The increasing frequency of extreme climate events, geopolitical instability, key component shortages, and recurrent infectious disease outbreaks are posing significant uncertainty to future corporate operations. In alignment with our commitment to sustainable operations, since 2015, we have implemented the "Emergency Response Management Procedures" to prepare for and respond to emergencies, aiming to mitigate their impact on personnel, property, and the environment.

To further strengthen our commitment to sustainability, we proactively engaged in risk management. In 2023, we partnered with professional organizations to enhance our risk management framework. This initiative involved establishing a comprehensive risk management system, including forming a risk management organization, developing risk management procedures, and utilizing a thorough risk factor database to identify risks. Each relevant department manages these risks according to their respective responsibilities.

### I. Risk Management Organization

The Board of Directors serves as the highest decision-making body for risk management, approving policies and frameworks in line with business strategies and environmental changes to ensure effective risk management. In 2023, Accton established a Risk Management Office to assist in coordinating and implementing the risk management framework. This office is responsible for reviewing and controlling the risk assessments and response actions of various plans and projects initiated by each responsible department.



## II. Risk Management Procedures

Accton's risk management procedures include risk identification, risk analysis, risk measurement, risk response, and risk monitoring and review. The complete procedures are scheduled to be submitted to the Board of Directors for review in August 2024. The approaches for each stage are described as follows:

### 1. Regular Risk Identification

- The Risk Management Office, according to the risk management schedule, notifies the members of the Risk Management Team to initiate the risk identification process and provides the annual risk assessment questionnaire.
- Analyzing potential risks: Upon receiving the initiation notification, the risk management personnel, together with relevant personnel from various operational units, analyze internal and external information such as internal loss events, sustainability reports, annual reports, external environmental changes, market trends, industry competition, regulatory changes, stakeholders' concerns, and other material risk events. This analysis identifies internal and external risks that could impact sustainable operations and the achievement of performance goals.
- Executing Risk Scenario Identification: Based on pertinent information from the "Risk Knowledge Base" and the analysis results, risk management personnel identify the annual risk items and fill in the corresponding annual risk scenarios in the "Risk Assessment Questionnaire." The completed questionnaire is then submitted to the Risk Management Team members for review. Should members of the Risk Management Team deem changes to be necessary, the questionnaire is returned to the risk management personnel for modification. If no changes are needed, the risk management personnel proceed with risk analysis and assessment.

### 2. Ad Hoc Risk Identification

#### Reporting Sudden or Irregular Material Risk Events:

1. If the Risk Management Office detects a potential event that could significantly impact operational activities during the non-regular risk identification period, and if it meets the criteria for initiating ad hoc risk identification (refer to the "Criteria for Initiating Ad Hoc Risk Identification"), the office should notify the Risk Management Team members to assist in completing the "Ad Hoc Risk Identification Application Form." This form is used to apply for ad hoc risk identification and, once completed, is submitted to the Risk Management Office for review by the Risk Management Team leader.
2. If Risk Management Team members detect a potential event that could significantly impact operational activities during the non-regular risk identification period, and if it meets the criteria for initiating ad hoc risk identification (refer to the "Criteria for Initiating Ad Hoc Risk Identification"), they must first complete the "Ad Hoc Risk Identification Application Form." This form is used to apply for ad hoc risk identification and is then submitted to the Risk Management Office for review by the Risk Management Team leader.

3. If Risk Management Team members detect a potential event that could significantly impact operational activities during the non-regular risk identification period, and if it meets the criteria for initiating ad hoc risk identification (refer to the "Criteria for Initiating Ad Hoc Risk Identification"), they must first complete the "Ad Hoc Risk Identification Application Form." This form is used to apply for ad hoc risk identification and is then submitted to the Risk Management Office for review by the Risk Management Team leader.

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2. If Risk Management Team members detect a potential event that could significantly impact operational activities during the non-regular risk identification period, and if it meets the criteria for initiating ad hoc risk identification (refer to the "Criteria for Initiating Ad Hoc Risk Identification"), they must first complete the "Ad Hoc Risk Identification Application Form." This form is used to apply for ad hoc risk identification and is then submitted to the Risk Management Office for review by the Risk Management Team leader.
3. If the responsible risk management personnel detect a potential event during the non-regular risk identification period that could significantly impact operational activities and meets the criteria for initiating ad hoc risk identification (refer to the "Criteria for Initiating Ad Hoc Risk Identification"), they must first complete the "Ad Hoc Risk Identification Application Form." This form is used to apply for ad hoc risk identification. After obtaining approval from the Risk Management Team members, it is then submitted to the Risk Management Office for review by the Risk Management Team leader.

### 3. Risk Analysis and Assessment

- The Risk Management Team members and risk management personnel perform risk analysis and assessment on the identified annual risk scenarios based on the regular Risk Assessment Standards. The results of the analysis and assessment are recorded in the "Risk Assessment Questionnaire."  
1. Conducting Risk Analysis:

Risk management personnel, along with relevant personnel from various operational units, assess the severity and frequency of impacts of the annual risk scenarios based on the "Risk Assessment Standards."

#### 2. Conducting Risk Assessment:

Risk management personnel, together with relevant personnel from various operational units, prioritize risks based on the results of the risk analysis, the vulnerability of existing controls, and the risk appetite and risk levels approved by the Risk Management Committee. This prioritization determines which risks need to be addressed first and serves as a reference for subsequent response measures.

- Reviewing Risk Assessment Results: Completed "Risk Assessment Questionnaires" are submitted by risk management personnel to Risk Management Team members for review. If modifications are deemed necessary, the questionnaires are returned for re-assessment and re-execution of the risk analysis and assessment. If no changes are needed, the risk response process can proceed.

### 4. Risk Responses

- Formulating Risk Response Strategies and Action Plans: Based on the results of risk analysis and assessment, and considering available resources, risk management personnel draft response strategies and action plans, which are then recorded in the "Risk Assessment Questionnaire." Formulating Action Plans: Action plans should be clear and feasible, clearly defining areas for improvement, responsible units/personnel, expected completion dates, required resources, etc. These plans are reviewed by Risk Management Team members. If the Team deems adjustments necessary, the plans are returned for revision. If no changes are necessary, the plans are submitted to the Risk Management Office for further review.
- Approving Risk Assessment Questionnaires: The Risk Management Office reviews the results of the "Risk Assessment Questionnaires" from each responsible unit. If modifications are required, the process returns to "Formulating Risk Response Strategies and Action Plans." If no changes are needed, the questionnaires are submitted to the Risk Management Team leader for review. If the leader requires changes, the process returns to "Formulating Risk Response Strategies and Action Plans." If no changes are needed, the Risk Management Office checks for any new risk items and updates the "Risk Knowledge Base" if necessary.
- Compiling the Risk Mapping: Based on the confirmed and reviewed results of the "Risk Assessment Questionnaires," the Risk Management Office prepares the annual "Risk Map," which is subsequently submitted to the Risk Management Team leader for review.
- Risk Calibration: The Risk Management Committee, together with the Risk Management Team leader, the Risk Management Office, and Risk Management Team members, hold a risk calibration meeting. During the meeting, Risk Management Team members report on the execution of risk management activities. The Risk Management Committee and the Risk Management Team leader perform risk calibration. If the calibrated risk map requires adjustments, the Risk Management Office consolidates the feedback and provides the calibrated results to the Risk Management Team members and risk management personnel for updating the "Risk Assessment Questionnaire" . After the updated "Risk Assessment Questionnaire" is reviewed and approved by the Risk Management Team members, risk management personnel can proceed with risk monitoring activities. If not approved, it is returned to the risk management personnel for further updates. The Risk Management Office will adjust the "Risk Map" based on the updated "Risk Assessment Questionnaire" and submit it to the Risk Management Team leader for review. Upon approval, the Risk Management Office can carry out risk reporting and disclosure activities.

## 5. Risk Monitoring

### 5.1 Execution Procedures

1. Risk Management Team members are responsible for continuously monitoring risks during daily operational activities to ensure effective execution of risk management and related control procedures within their units. They must ensure compliance with the Accton's risk management policies and related procedures. Additionally, they need to monitor the execution of risk management activities and periodically compile and report the results and related information to the Risk Management Office.
2. Risk management personnel assigned by the Risk Management Team members of their respective units will carry out risk response strategies and action plans, ensuring the proper operation of the risk management system within their units. They are also responsible for preparing reports on the execution of risk management activities within their units, which are then submitted to their respective Risk Management Team members for review.

## 6. Risk Reporting and Disclosures

### 6.1 Risk Management Report

- Compilation, Preparation, and Confirmation of the "Annual Risk Management Report": The Risk Management Office compiles the annual risk management results and prepares the "Annual Risk Management Report" accordingly. The "Annual Risk Management Report" prepared by the Risk Management Office must be confirmed by the Risk Management Team members. If modifications are deemed necessary, the Risk Management Office will be notified to make adjustments. If no changes are required, the Risk Management Office submits the report to the Risk Management Team leader for review. If the leader does not accept it, the report is returned to the Risk Management Office for further modification.

### 6.2 Annual Risk Reporting Conference and Risk Management Committee Meeting

- Annual Risk Reporting Conference: The Risk Management Office presents the "Annual Risk Management Report" to the Risk Management Team leader. Upon the leader's confirmation of the report's content, the Risk Management Office adjusts the report based on the meeting outcomes and coordinates with the Risk Management Committee for further review.
- Risk Management Committee Meeting: In this meeting, the Risk Management Team leader reports on the execution of risk management activities to the Risk Management Committee. Additionally, the committee reviews and confirms the "Annual Risk Management Report."

### ◆ Risk Management Flowchart





### III. Risk Identification and Assessment

Adopting a comprehensive risk factor database, risks are identified and discussed through internal cross-departmental evaluations. The primary risks are categorized into five main types:

#### 1. Strategic Deployment Risks

- (1) Technological innovation and industry trends;
- (2) Market demand changes;
- (3) Technological R&D progress and competitive landscape;
- (4) Policy or regulatory changes;
- (5) Global political and economic developments

#### 2. Operational Management Risks

- (1) Customer or supplier performance contract;
- (2) Intellectual property protection and utilization;
- (3) Talent recruitment and development management;
- (4) Information security;
- (5) Corporate overall image

#### 3. Financial Operations Risks

- (1) Fluctuations in exchange rates, interest rates, taxes, and inflation;
- (2) Strategic investments;
- (3) Financial management

#### 4. Hazard Event Risks

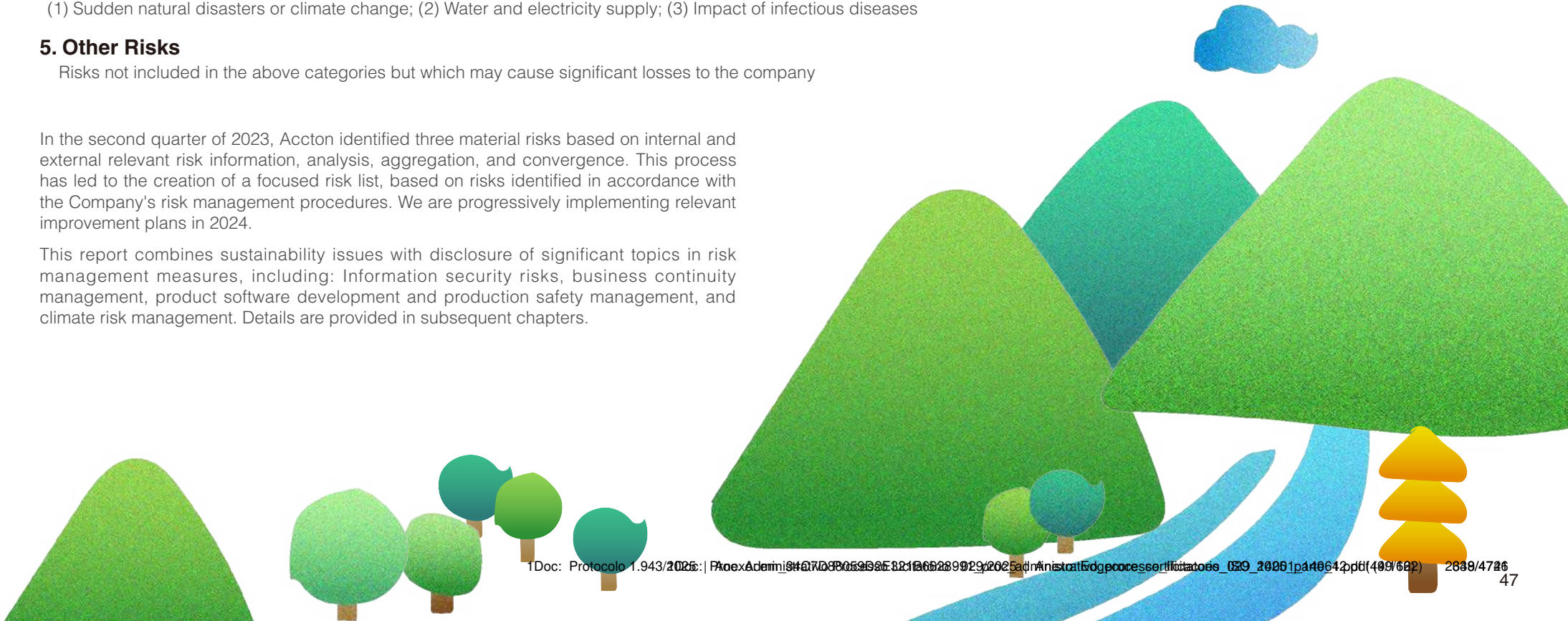
- (1) Sudden natural disasters or climate change;
- (2) Water and electricity supply;
- (3) Impact of infectious diseases

#### 5. Other Risks

Risks not included in the above categories but which may cause significant losses to the company

In the second quarter of 2023, Accton identified three material risks based on internal and external relevant risk information, analysis, aggregation, and convergence. This process has led to the creation of a focused risk list, based on risks identified in accordance with the Company's risk management procedures. We are progressively implementing relevant improvement plans in 2024.

This report combines sustainability issues with disclosure of significant topics in risk management measures, including: Information security risks, business continuity management, product software development and production safety management, and climate risk management. Details are provided in subsequent chapters.



## 2.1.1 Information Security Management



**Boundary: Accton Hsinchu HQ, Hsinchu Plant 2, Zhunan Plant, Edgecore, JoyTech, Vietnam Accton**

### I. Implementing Information Security Risk Assessments and Enhancing Information Security Management

Accton has implemented a Plan-Do-Check-Act (PDCA) cycle in its information security management system. Additionally, the "Information Security Incident Reporting Procedures" has been integrated into Accton's internal risk management system. Quarterly management review meetings are held regularly or when material changes occur in the information operations environment. These meetings independently review information security policies, objectives, procedures, and control measures to prevent potential information security threats and improve information security protection levels, thereby maintaining a consistently high level of service commitment.

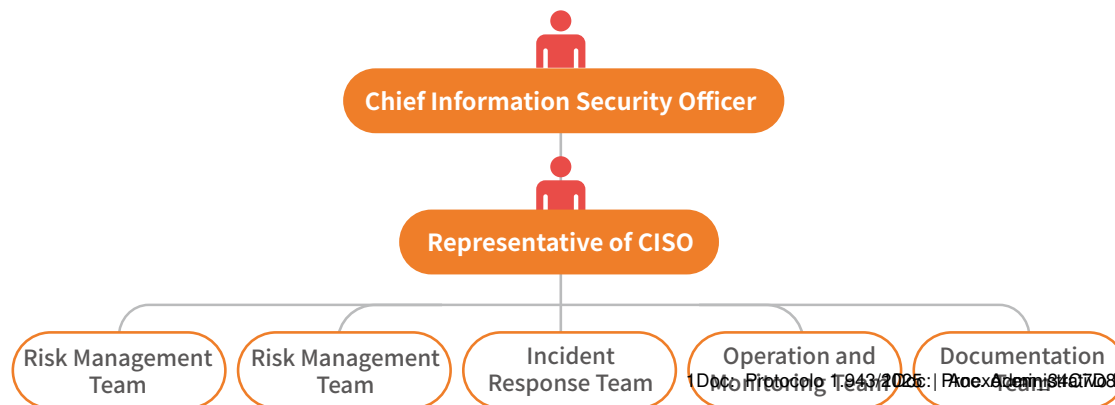
### II. Reducing Information Security Risks and Strengthening Corporate Digital Resilience

Accton established its Information Security Promotion Committee in 2016 and obtained ISO27001:2013 international standard certification. In 2023, Accton completed the verification of the continued effectiveness of its information security policies and controls to ensure the normal operation of the information security management system, thereby reducing information security risks.

In 2020, Accton established a dedicated information security management organization, the Information Security Department, responsible for network security issues, activities, and threat intelligence within the Group.

The department is tasked with the implementation, planning, monitoring, and management of operations to proactively detect, investigate, and respond to security threats faced by Accton.

#### ◆ Organizational chart of the Information Security Promotion Committee



## III. Information Security Risk Management Plan, Training, and Advocacy

Accton's Information Security Department is tasked with developing and enforcing information security strategies and control measures. These strategies and measures are designed to manage all information security risks effectively. Our information security risk management plan encompasses standard ISO27001 security controls, incident response, and communication plans, ensuring timely and precise reporting of major security incidents. In 2023, we experienced zero information security incidents affecting operations due to hacker attacks or virus infections.

The primary goal of Accton's information security risk management plan is to safeguard the confidentiality, integrity, and availability of the information we own or manage. Key technical projects include annual third-party red team exercises, penetration testing, security configuration management, extensive compliance monitoring, and testing our disaster recovery capabilities through simulations and scenario drills.

## IV. Operational and Privacy Security

In our daily business operations, Accton is committed to data security and safeguarding the personal information entrusted to us by customers, suppliers, partners, and employees. In 2023, there were zero complaints from third parties or regulatory authorities against Accton for violating customer personal data protection or customer data loss that led to judicial actions.

Our operational security infrastructure continuously manages risks in multiple areas, including:

1. Ensuring the integrity of our product intellectual property.
2. Preventing intrusions and broader backdoor attacks on Company system users.
3. Protecting the production service environment managed by the Company and ensuring the software, firmware, and hardware produced are trustworthy and reliable.
4. Ensuring the availability of critical information systems.
5. Requiring all employees to complete annual cybersecurity awareness training (please see below) and requiring all new employees to complete privacy and trade secrets protection training.
6. Conducting annual regular reviews of the privacy and security controls of major suppliers as part of the supplier compliance process to ensure they meet our basic standards.

## V. Information Security Policies

- All personnel (including full-time employees or outsourced personnel such as on-site vendors, part-time staff, and consultants) have the responsibility and obligation to protect the information assets related to their respective business areas, ensuring the confidentiality, accuracy, and availability of the group's critical information assets.
- Employee job functions should be appropriately segregated, and only the necessary permissions and information required to complete the job should be granted.
- Personnel recruitment should include necessary evaluations and the signing of applicable operational norms. Employees must also engage in information security education and training to recognize that upholding information security is a responsibility for every employee, to be integrated into their daily tasks.
- A business continuity management mechanism should be established and regularly tested to ensure its applicability.
- The Group's information security measures adhere to legal regulations and the Group's information security policies. All established or modified information security standards or procedures must comply with and follow the mechanisms of the information security management system.

## VI. Information Security Goals:

- Compliance with regulatory requirements, competent regulatory authority mandates, and customer contract or professional duty requirements.
- Protection and preservation of customer data to prevent improper or unlawful situations.
- Ensuring the continuity and timeliness of services provided.
- Ensuring the accuracy and integrity of the provided data.
- Providing appropriate responses and handling when information security incidents occur, compromising the rights and interests of related parties (stakeholders).

Information Security Training		Number of Participants	Training Hours
Accton new employees	Information Security Policy and Awareness Training	330	0.5
JoyTech new employees		987	2
Accton current employees	Information Security Awareness and Trade Secret Protection Training	1,862	0.5
JoyTech current employees		1,200	2
Accton IT personnel	Professional Skills Training	77	1
Accton IT Supervisor Training	In-service supervisors completed the annual information security in-person training course, which included important topics such as the current state of information security threats to industrial control systems and practical defense measures.	154	1
Information Security Drill		Time	Participants
Accton Social Engineering Drills	In 2023, we conducted 4 social engineering phishing email drills, involving over 12,000 participants.	Jan-23	2,457
		Apr-23	2,562
		Jul-23	2,648
		Oct-23	2,743
JoyTech Social Engineering Drills		Jan-23	580
		Apr-23	580
		Jul-23	573
		Oct-23	560

Note: Accton's information security measures also cover its subsidiaries, Edgecore Networks and Accton Vietnam, so their specific goals and data are not separately described.



## 2.1.2 Product Software Development and Production Safety Management

### Security Measures for Product Software Development and Production

#### I. Security of Information Systems

All computer and network systems used in product development and production must be under strict security management to ensure that only personnel with appropriate authority can operate them, so as to prevent intrusion, destruction and theft by external malicious parties. Primarily, this is the responsibility of the Information Management Department.

#### II. Security in Software Development

##### 1. Security of the Software Development Process

###### 1.1 Version Management

Revisions and distributions of software source code are strictly managed using modern source code management systems, such as Git, which can track all development branches and historical versions. The source code is stored in a well-managed computer system. Each change is stored in the source management system as a new version. The scope of the change is limited to a single feature and the new version must be properly described. In this way, the history of software development can be completely tracked, preventing unauthorized tampering.

###### 1.2 Automated Testing and Release

A corresponding test program is also developed in the software development process. After the completion of a development phase, the automated testing program is activated to perform tests under an automated testing environment. After the testing is completed, a code name is given to the new version, and it is stored in the production system. Every release is subject to comprehensive testing, and the testing process and results can be tracked to ensure quality.

##### 2. Quality Assurance of Software Source Code

If there are lapses in software writing quality, it becomes vulnerable to attacks by malicious entities during execution, potentially leading to product dysfunction, data theft or alteration, or even being used as a tool for further attacks. In addition to testing measures, the quality of source code writing should also be safeguarded.

###### 2.1 Source Code Programming Standard

We established a unified source code programming standard to define unified formatting and naming, typography, etc., and good coding practices. This includes avoiding common error-prone coding methods. These standards facilitate peer reviews among employees and help prevent frequent mistakes and vulnerabilities in the software.

#### 2.2 Compilation

When compiling code, a stricter verification method should be adopted to address and correct all compilation warnings. These checks often help prevent potential program vulnerabilities.

#### 2.3 Static Analysis of the Source Code

We deploy static analysis tools to check the quality of the source code. These tools collect common program development mistakes and poor writing habits from the past, analyze the source code, and provide change suggestions.

#### 3. Quality Control of Software from Other Parties

Software development often involves using third-party source code, from operating systems to functional modules. Sometimes the third-party software forms the core, and our side only performs partial customization. Therefore, it is essential to maintain close cooperation with upstream teams, regularly receive updates on security issues and new releases, and update appropriately to ensure quality and security.

Common software security information is available on public websites and is tracked and resolved by volunteer teams, with the National Vulnerability Database (NVD), maintained by the U.S. National Institute of Standards and Technology, being one of the most notable. It is crucial to regularly check the public security vulnerability information for the software in use, along with the corresponding remedial measures, and to address them promptly to avoid threats.

#### 4. System Testing

Software provided to end users must pass system testing verification. System testing is conducted by an independent testing department, assessing the product's specification requirements from a user perspective, compatibility with other products, saturation capacity, resilience under error inputs and malicious attacks, and performance under simulated real network conditions over extended periods. Issues discovered during testing are categorized by severity and managed through an issue tracking system. After comprehensive testing, a test report is issued. The release of a new software version is contingent upon the number of serious issues being below a predefined standard. The acceptance criteria for each product are jointly determined by the product development and testing departments.

#### III. Security in Software Production and Distribution

The object code of a software release must have a corresponding source code version, which can be traced back at any time. The object code is assigned with a version number that conforms to a version specification, which is stored in the production system, with a signature calculated from the full content of the object code stored. The signature can be used to recheck at production or external distribution to ensure that the object code has not been tampered with.

## 2.1.3 Business Continuity Management

### Accton has officially obtained the ISO 22301 Business Continuity Management System (BCMS) certification



#### Boundary: Hsinchu HQ, Zhunan Plant

To enhance Accton's resilience in facing various operational disruptions, improve response capabilities, and expedite response times, we proactively plan response measures and recovery plans to mitigate the risk of supply chain disruptions. This proactive approach aims to ensure timely responses and rapid recovery in the event of operational interruptions, thereby minimizing the extent of damages and safeguarding the interests of key stakeholders. Since May 2022, Accton has initiated the implementation of the ISO 22301 Business Continuity Management System across various functional departments within the Company. These departments encompass sales, supply chain (procurement, production management, warehousing, import/export), research and development, manufacturing, quality assurance, information technology, occupational health and safety, finance, facilities/general affairs, human resources, media relations, and legal affairs. Over the course of approximately one year, these units have collaborated to build and integrate the ISO 22301 Business Continuity Management System. Regarding the process of implementing and establishing the ISO 22301 Business Continuity Management System at Accton, please refer to the 2022 Accton Group Corporate Sustainability Report, Section "2.1.5 Business Continuity Management" (p.46-48). (<https://www.accton.com.tw/wp-content/uploads/2023/06/Accton-2022ESG-20230628.pdf>)

Following system implementation in 2022, we proceeded with the actual documentation execution in the first half of 2023. This documentation exercise included the Business Continuity Management Manual, along with related procedures and specifications. Based on the established "Accton Business Continuity Management Policy," procedural documents, and performance indicators, the system has operated effectively for a year. In June 2023, we successfully passed an external audit conducted by the third-party verification firm SGS. Consequently, by the end of September of the same year, we officially obtained the ISO 22301 Business Continuity Management System certification.

#### Business Continuity Management Policy

1. We are committed to the philosophy of "Making Partnership Work", setting operational sustainability goals in accordance with the company's environment and stakeholder expectations, and committing to provide sustainable services to our partners.
2. In order to ensure the effective operation of the BCM system, we flexibly deploy resources to meet system-related requirements and dynamically evaluate and continuously improve it in response to international situations and risks.
3. Our goal is to enhance resilience against operational shocks, prioritize the interests of our customers and stakeholders, and move towards sustainable development and management.



▲ Accton's ISO22301 Certificate



## 2.1.4 Climate Risk Management

Climate change-induced extreme weather and disasters, such as floods, wildfires, droughts, and windstorms, inevitably impact operations, production, and economic activities, posing significant risks to corporate sustainability. Therefore, enterprises must actively mitigate greenhouse gas emissions and initiate low-carbon transitions to move towards net-zero carbon emissions.

Since 2021, Accton has been following the framework of the Task Force on Climate-related Financial Disclosures (TCFD) to compile climate risks and opportunities in the high-tech electronics and network communications equipment manufacturing sector, and to establish measurement metrics and management objectives.

The Board of Directors is the highest governing body overseeing climate risks at Accton. The Sustainable Development Committee reports to the Board of Directors on operational performance related to climate change at board meetings. The ESG Committee is the highest executive body for managing climate change at Accton. Each year, it identifies climate change risks and opportunities, formulates response strategies, and sets targets for material financial and strategic risks and opportunities. The committee meets regularly to track the progress of these targets and the current status of management performance.

For the complete details and implementation of TCFD in 2023, please refer to section "[3.1 Climate Change Response](#)."



## 2.2 Innovation and R&D



Boundary: Accton Hsinchu HQ, Hsinchu Plant 2, Zhunan Plant, Edgecore, JoyTech, Vietnam Accton

GRI103

### I. Innovation and R&D

In order to ensure the competitiveness of the products, to maintain the healthy growth of the Company's continuous operations, and meet the strong expectations of investors and colleagues, Accton has never slowed its pace in innovative research and development. Taking 2021, 2022, and 2023 as examples, the proportion of investment in product research and development each year is more than 3.5% of the current annual revenue. The Company focuses on a stable practice in the field of communications and the continuous design and development of a marketable and forward-looking product portfolio, and bringing equipment and services in line with the future development of the world.

Meanwhile, the Company has also set up measures and management systems related to intellectual property, implementing the protection of intellectual property rights to protect the technology and knowledge of every output and to enhance the added value of products.

◆ In addition, the Company's short-term and medium-term goals in terms of intellectual rights and innovative technologies are as follows:

2023 Goals	2023 Results	Short-Term Goals (2024-2025)	Medium and Long-Term Goals (2026-2028)
<ul style="list-style-type: none"> <li>Review R&amp;D achievements and patent portfolio</li> <li>Ensure R&amp;D investment exceeds 3% of revenue</li> </ul>	<ul style="list-style-type: none"> <li>Accumulate 1,224 patent applications</li> <li>Invest 4% of revenue in R&amp;D</li> <li>Mass production and maintenance of 400Gbps products</li> <li>Develop 800Gbps products</li> </ul>	<ul style="list-style-type: none"> <li>Inventory innovation results and transform them into proposals</li> <li>Ensure R&amp;D investment exceeds 3.5% of revenue</li> </ul>	<ul style="list-style-type: none"> <li>Carry out the patent portfolio of related technologies in line with the Company's product development direction</li> <li>Ensure R&amp;D investment exceeds 3.5% of revenue</li> </ul>

### 1. Key Technology Developments and Achievements

In 2022 and 2023, the primary indicators and achievements were the realization of 400Gbps and 800Gbps products, and the development of immersion cooling products to reduce cooling energy consumption.

Autonomous development in CPLD/FPGA programming, automated testing, and controlling product functionality and test completeness. Self-development in optical transceivers, mastering optical and transmission technologies to provide better customer service. Strengthening R&D, material management, and production capabilities across market, technology, production, and supply chain aspects, overcoming related challenges.

### 2. Product Network Security

Accton is committed to addressing current network security issues, focusing on information security at the operational level and system security at the product level. Network cybersecurity issues can directly impact customers' business operations, such as disrupting Internet services or failing to protect personal information and privacy, which could also directly or indirectly affect the company's operations significantly.

Accton addresses product network security by promptly notifying customers of public and disclosed common vulnerabilities and exposures (CVEs), providing relevant firmware solutions to mitigate impact. Security testing agencies conduct security confirmation, using third-party vulnerability scanning tools for assessment and patching before releasing new firmware versions. Accton also implements mechanisms and procedures to ensure firmware security, such as verifying the root of trust security (originating firmware location or geographical location for firmware re-download), providing secure chip usage, secure boot processes, and checking for malicious software intervention from external control centers.

When products leave Accton's controlled environment, such as delivery to clients, Accton offers appropriate features to ensure data security. For example, "secure erasure of solid-state drive data" according to international security standards, completely erasing the operating system and related data to protect end-user privacy and personal information comprehensively.

### 3. Low Carbon Product Development

In response to the impact of extreme climate change and to ensure sustainable development, Accton has been tirelessly working on the development of green/low-carbon products. In addition to conducting organizational carbon audits from 2019 to 2021, Accton further initiated a carbon footprint inventory and reduction plan for the upstream and downstream of the product chain in the second half of 2021, embarking on a continuous journey towards carbon neutrality. By the end of 2023, two carbon footprint verification projects had been completed.

Through the product carbon footprint inventory, Accton introduces creative approaches in thermal design and material selection to improve the carbon footprint value of products, thereby maintaining our competitiveness.

## II. Intellectual Property

Accton firmly adheres to the principle of continuous innovation and improvement, leveraging the momentum of technology research and development to product development and enhancement. The aim is to continuously provide high-performance, highly stable products and to launch forward-looking products that meet industry needs. The results of product R&D are converted into intellectual property for protection, thereby increasing product value, enhancing our competitiveness, and generating profit for the Company. To effectively manage patents, Accton regularly reviews the application status of patents, understands their practical benefits, and eliminates outdated or non-beneficial patents to maximize the return on patent investments.

### 1. Patent Application and Management

Accton's patent application strategy aims to protect products, create product value, and increase company competitiveness. Based on this strategy, Accton has established patent incentive and management measures to encourage R&D staff to actively innovate and improve during the product development process. These measures also regulate the management of patent assets and the confidentiality of patent information.

To promote a culture of innovation and select technologies that can effectively benefit Company operations, Accton has established an ideation and proposal mechanism before the patent proposal process according to Regulations Governing Patent Incentives and Management. Unlike the patent proposal mechanism, which requires assessing the patentability of the application content, the ideation and proposal process involves simply disclosing a concept and undergoing a review process focused on product benefits to evaluate the technical content. This streamlined procedure, complemented with proposal bonuses, aims to motivate R&D staff to continually think of product improvement solutions. New employees are also educated on the fundamentals of intellectual property rights and the steps for submitting idea proposals, promoting a culture of ongoing innovation and stimulating R&D output.

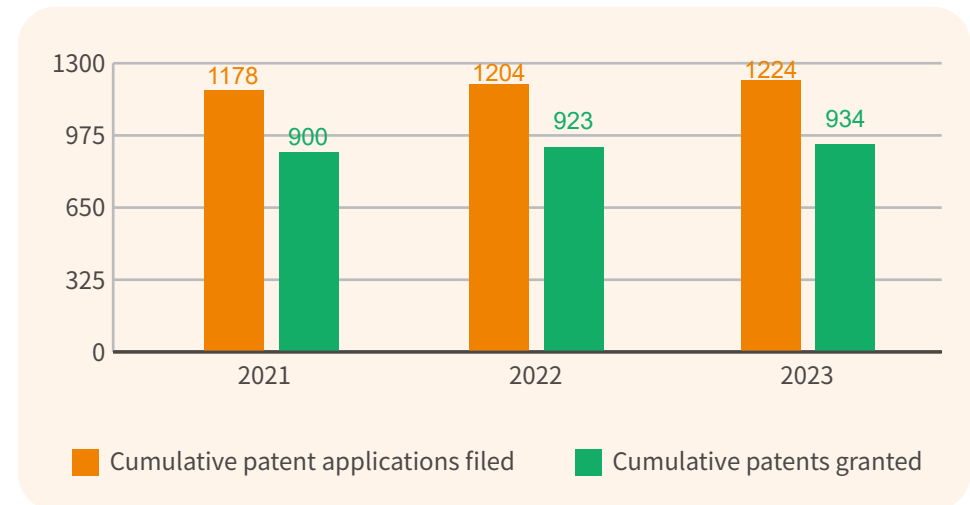
Once an idea proposal passes the review, it can proceed to the patent proposal process. This includes evaluating the patentability of the proposal and conducting a prior art search to identify existing related patents, thus assessing the necessity of product design modifications to avoid infringement. This step aims to reduce the risk associated with future product sales. Innovations deemed unsuitable for public disclosure are managed as trade secrets to ensure effective protection of the Company's intellectual property.

In addition to the innovation idea and patent proposal process, Accton regularly investigates the application status of patented technologies to manage patent benefits and control costs. The Company reviews the maintenance of patents, phasing out obsolete patents and those with low application opportunities, thus maintaining an economically efficient patent portfolio and ensuring patent quality.

To facilitate the aforementioned proposals and management activities, Accton has independently developed an intellectual property management system. This system encompasses ideation and proposals, patent applications, and a management platform for collaboration across related departments, enabling accurate and efficient execution of management tasks. This system supports the Company's ongoing efforts in the operation and management of intellectual property.

As of the end of 2023, Accton has accumulated a total of 1,224 patent applications worldwide and has been granted 934 patents globally.

### ◆ Status of patent applications over the most recent 3 years





## 2. Patent Infringement Risk Prevention

In addition to protecting its own intellectual property, Accton respects the intellectual property rights of others. During the patent proposal process, Accton proactively investigates the risk of infringement associated with proposed technologies. Furthermore, to support the needs of the R&D units during product development, Accton conducts patent infringement investigations on both self-developed technologies and those provided by suppliers, analyzing the risks of infringement. When concerns on infringement risks are identified, Accton mitigates these risks through design modifications or by obtaining non-infringement guarantees. This proactive approach aims to prevent potential issues early on, thereby mitigating the impact of patent litigation on the company's operations.

## 3. Trademark Application and Management

Accton values its corporate image and reputation. To actively enhance the value of our corporate brand, Accton continues to increase the competitiveness of products and also seeks to protect and enhance the value of the Company and product brands by way of applying for trademarks. We also manage our trademark rights effectively to maximize the benefits of our trademarks.

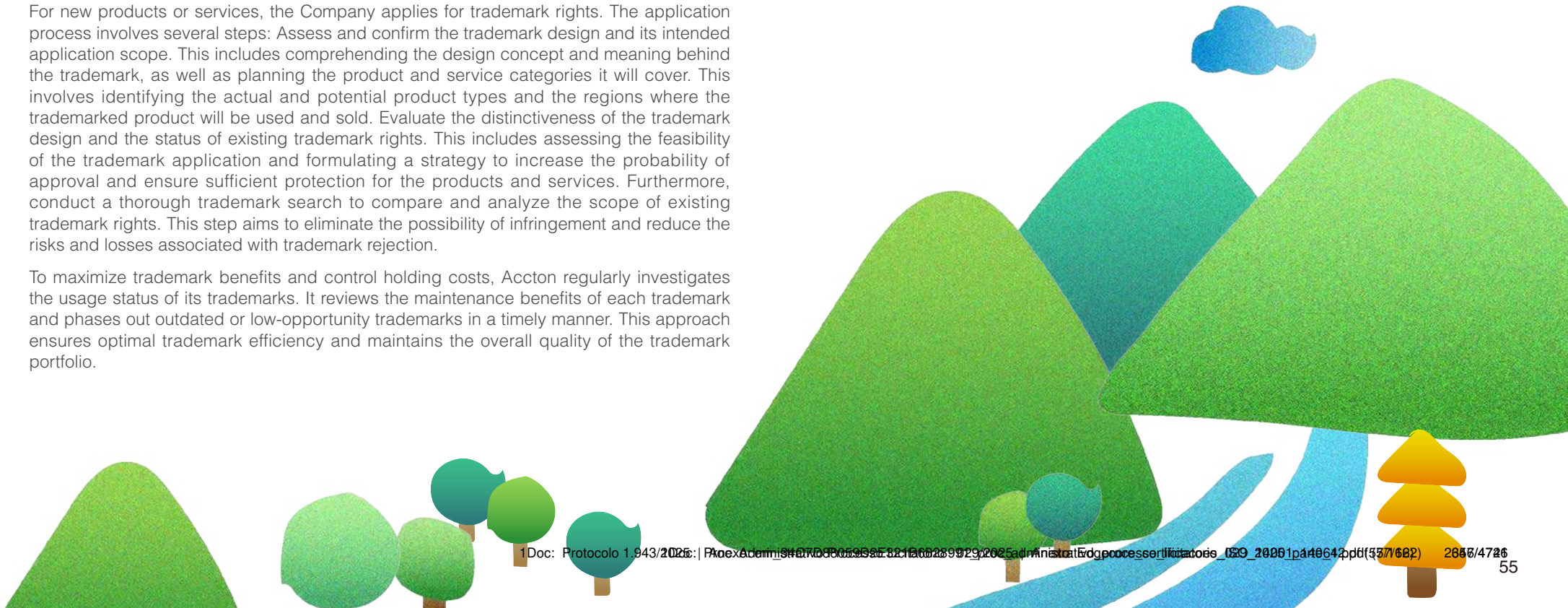
For new products or services, the Company applies for trademark rights. The application process involves several steps: Assess and confirm the trademark design and its intended application scope. This includes comprehending the design concept and meaning behind the trademark, as well as planning the product and service categories it will cover. This involves identifying the actual and potential product types and the regions where the trademarked product will be used and sold. Evaluate the distinctiveness of the trademark design and the status of existing trademark rights. This includes assessing the feasibility of the trademark application and formulating a strategy to increase the probability of approval and ensure sufficient protection for the products and services. Furthermore, conduct a thorough trademark search to compare and analyze the scope of existing trademark rights. This step aims to eliminate the possibility of infringement and reduce the risks and losses associated with trademark rejection.

To maximize trademark benefits and control holding costs, Accton regularly investigates the usage status of its trademarks. It reviews the maintenance benefits of each trademark and phases out outdated or low-opportunity trademarks in a timely manner. This approach ensures optimal trademark efficiency and maintains the overall quality of the trademark portfolio.

## 4. Protection of Trade Secrets

Accton requires R&D staff to regularly document significant discoveries and results in their daily work. These key findings or inventions are meticulously recorded in R&D logs or idea systems to preserve critical R&D outcomes and technical knowledge.

Trade secrets are valuable assets to the Company, and protecting them is essential for maintaining the Company's technical advantage and ensuring its continuous development. For the protection of trade secrets, Accton implements both software and hardware measures. These measures control the access, download, use, and transmission of internal business information. Additionally, the Company ensures that confidential information received from customers or suppliers is adequately protected, respecting their intellectual property rights.







**Vision**

The members of Accton's supply chain are crucial partners for the Company's sustainable growth. These partners are expected to excel in quality, cost efficiency, delivery time, service, management, innovation, and technology. Additionally, Accton aims to collaborate with its supply chain partners to implement ESG-focused corporate social responsibilities, including economic and governance practices, environmental protection, and social inclusion. This collaboration aims to enhance sustainable competitiveness and create a sustainable future.

**Strategy**

Identify and manage economic, environmental and social risks in the supply chain and enhance the sustainability of the supply chain.

Strengthen responsible mineral management, ensuring no use of minerals from unqualified smelters in illegal conflict mining areas, and establish responsible procurement practices.

Promote a green supply chain, encourage suppliers to reduce the environmental impact in both operations and products, and gradually establish supplier organization for greenhouse gas emissions and product carbon footprint inventory.

## II. Sustainable Supply Chain Management Framework

Accton divides its sustainable supply chain management into three main axes: sustainability rules, risk identification, and management mechanism. After setting the fundamental sustainability rules for supply chain members to comply with, Accton identifies high risk factors and supplier industries with risk identification tools, and further refines supply chain management with various management mechanisms.

### 1. Supply Chain Management Rules

In terms of sustainable supply chain management, Accton requires all its suppliers to conduct their business in accordance with the Responsible Business Alliance (RBA) and commit to the respect of labor rights, health and safety, environment, business ethics and management systems, and fully comply with the laws and regulations of the country/region in which they operate. Concurrently, Accton requires its suppliers to implement the same standards for their next-level suppliers.

In addition, in terms of ethical corporate management, Accton has also required all suppliers to sign an "Integrity Commitment Letter" since 2020, mandating them not to offer any bribes or provide other improper benefits to Accton's staff for the purpose of transaction or performance of contracts, or directly or indirectly to benefit Accton's staff or their related parties.

In terms of product manufacturing, Accton has established the "QPC-CE05 Product Hazardous Substance Control Procedures" for green products supplied by suppliers. This procedure includes guidelines on prohibited and restricted substances and a responsible minerals management policy. For more details, please refer to the relevant sections.



#### Supplier "Operation Management and Commitment Letter"

To be a supplier of Accton, the supplier shall undertake to conduct its business in full compliance with all applicable local laws and regulations. The supplier should further sign this letter to undertake and confirm that it is committed to complying with Accton's Supplier Code of Conduct. This code has been developed on the basis of Responsible Business Alliance (RBA) and in accordance with its five aspects to ensure that suppliers, as members of the supply chain, are able to provide a safe working environment, respect and dignity for their employees, and should undertake environmental responsibility and observe business ethics in their operations, as well as implementing Accton's required standards.

## 2. Supply Chain Management Mechanism

### 2.1 Supplier Selection and Classification

Accton differentiates and labels suppliers based on their characteristics to facilitate effective management. To ensure efficient supplier management, Accton has established a principle for supplier selection. Beyond the fundamental evaluations of quality, cost, delivery time, service, management, innovation, and technical capability, Accton also incorporates procurement management principles rooted in green supply chain practices and ESG-related sustainable risk considerations. The following are the basic principles for evaluating all suppliers, including new ones:

- Accton's suppliers are required to sign the Integrity Commitment Letter and adhere to Accton's Supplier Code of Conduct.
- Accton's material suppliers must fully comply with relevant local laws and regulations and establish their risk control mechanisms.
- Accton's suppliers must implement a management system for the environment, employee health and safety, and non-hazardous substances.
- Accton's material suppliers must comply with the "Technical Standard for Environmental Control of Hazardous Substances."
- Suppliers must provide appropriate self-declaration or supporting documentation and update it regularly in line with Accton's Restricted Substance Management Plan for Components.
- Suppliers must cooperate with Accton's responsible mineral management policy and complete due diligence.

### 2.2 Key Supplier Identification

To realize effective supplier management, Accton has identified "key suppliers" as the basis for key management. The key principles for identifying key suppliers based on product, process, and sales characteristics in 2023 include the following points:

- Top 75% of the annual procurement amount of direct materials
- Key components
- The only source of supply or irreplaceable

In accordance with these principles, Accton has incorporated the "Accton CSR Code of Conduct," "Accton Supplier Code of Conduct," and the "Supplier Operation and Management Commitment Letter" into the supplier qualification evaluation process and considers them in procurement decision-making to promote continuous improvement. In 2023, 37 new key suppliers were required to respond to the Responsible Business Alliance (RBA) survey.

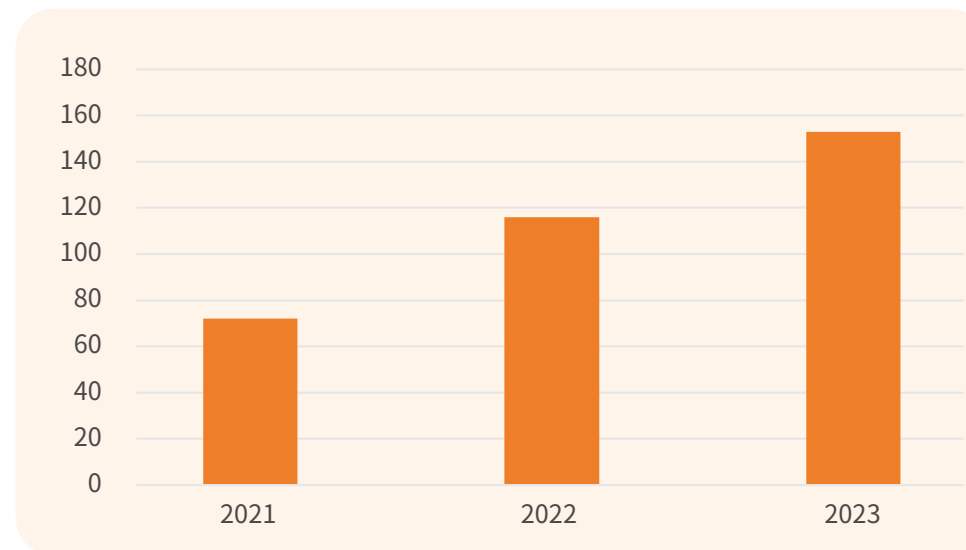
### 2.3 Accton Supply Chain ESG Sustainability Risk Audit

#### Supplier "Human Rights, Environment, Safety, Health, and Management System" Audit Enhancement Plan

Accton has integrated the "RBA Code of Conduct" into its supply chain to monitor the implementation of labor rights, health and safety, environmental protection, business ethics, and management systems by suppliers. The Company encourages suppliers to develop materials and processes that reduce environmental impact or achieve energy-saving and carbon reduction through process utilities. Environmental issues, including climate change and biodiversity, are given increased attention and management.

To this end, over the years, we have harmonized Accton's supplier audit forms based on RBA requirements, conducting reviews and evaluations of suppliers on corporate social responsibility and ESG sustainability aspects. This audit tool includes stricter scoring methods and more rigorous requirements than in the past. From 2021 to 2023, our objective was to conduct surveys on the RBA Code of Conduct for the top 200 production raw material suppliers by transaction value (i.e., key suppliers). The number of suppliers completing the survey during this period were as follows: 72 suppliers in 2021, increasing to 116 suppliers in 2022, and reaching 153 suppliers in 2023.

#### ◆ Number of Suppliers Completing the Survey from 2021 to 2023



## 2.4 Risk Assessment Process

Accton regards supply chain risk management as a key component of its competitive advantage. Within the industry Accton operates, common risk factors can be briefly categorized across economic, environmental, and social dimensions based on industry characteristics.

### Risk Assessment

Accton conducts risk assessments across three dimensions: economic, environmental, and social. The factors considered in these risk assessments include:

Economic	Environmental	Social
<ul style="list-style-type: none"> <li>Quality, cost, delivery time, service, innovation, management, and technical capability</li> <li>Business ethics</li> <li>Integrity management</li> <li>Sole or critical supply source</li> <li>Supplier automation capability</li> </ul>	<ul style="list-style-type: none"> <li>Compliance with environmental regulations</li> <li>Environmental management systems</li> <li>Climate change</li> <li>Water resource management</li> <li>Waste and air pollution management</li> </ul>	<ul style="list-style-type: none"> <li>Employee health and safety</li> <li>Human rights</li> <li>Labor practices</li> <li>Responsible minerals management</li> <li>Labor working hours</li> </ul>

Based on the aforementioned factors, Accton analyzed the 2023 market conditions and the industries of its suppliers to identify the primary high-risk sustainability factors and high-risk supplier industry categories for the supply chain in 2023. The results are presented in the table below:

High-Risk Supplier Industry Categories	Economic Risk Factors	Environmental Risk Factors	Social Risk Factors
IC	<ul style="list-style-type: none"> <li>Sole supply source</li> <li>Supplier automation capability</li> <li>Integrity management</li> </ul>	<ul style="list-style-type: none"> <li>Compliance with environmental regulations</li> <li>Water resource management</li> <li>Climate change</li> </ul>	<ul style="list-style-type: none"> <li>Employee health and safety</li> <li>Labor working hours</li> <li>COVID-19</li> </ul>
		PCBs/cables/enclosures	PCBs/power supplies/cables/enclosures

In 2023, Accton harmonized its supplier audit forms based on RBA requirements to review and evaluate suppliers on environmental and social risk factors. No non-compliant suppliers were identified during these assessments.

## III. Launch of the Zero Carbon Chain Project

On April 21, 2023, Accton held a supplier sharing conference for the Zero Carbon Chain Project, specifically choosing the day before Earth Day to emphasize the importance of this initiative. The theme of the conference was "Zero Carbon Chain," aimed at building consensus with supplier partners to jointly develop ESG sustainability and carbon reduction action plans. The event underscored the significance of future carbon reduction and ESG sustainability actions in Accton's overall supply chain management.

### 1. Carbon Reduction Goals

Accton aims to reduce carbon emissions by 50% by 2030 through internal process optimization and product design. In collaboration with supply chain partners, the Zero Carbon Chain Project will be pragmatically advanced, working towards the goal of net zero carbon emissions by 2050. A critical strategy for 2026 includes joint decarbonization growth with upstream and downstream partners.

The implementation steps begin with energy management and continuous energy-saving and carbon reduction mechanisms, progressing through process design, product improvements across the supply chain, and the establishment and procurement of global renewable energy sources.

In September 2023, Accton, in collaboration with 10 supply chain partners, received the "Low Carbon and Smart Manufacturing Upgrade Transformation Subsidy Program" from the Ministry of Economic Affairs Industrial Development Bureau. This initiative, following the "Supply Chain One Leading Ten" model, collectively works towards achieving energy-saving and carbon reduction goals. This Project Has Established Three Major Goals:

- Accton aims to achieve a relative reduction of 20% in carbon emissions while expanding its production capacity.
- Precise carbon footprint calculations, including calculating the carbon footprint from raw material processing by collaborative manufacturers to in-factory processes. This is to prepare for potential future carbon tariff reporting requirements for product exports.
- Suppliers are encouraged to adopt carbon emissions reduction measures and to amplify these effects further.

For this project, Accton collaborates with key suppliers to promote green product design and optimize local supply chains. Additionally, Accton has established the "Accton Academy of Sustainability" to integrate resources, provide educational training, offer energy-saving and carbon reduction tools, and share industry energy-saving experiences. This capacity-building initiative aims to assist supply chain and industry partners in reducing carbon emissions and expanding sustainable impact.

### 2. 2023 Project Outcomes

- Continuous optimization of process equipment, anticipated to complete new machine improvements by the first quarter of 2024.
- Assisted 10 suppliers in setting up energy measurement equipment to obtain actual electricity usage data and establish improvement baselines.
- In November 2023, the Accton Academy of Sustainability launched training courses for senior executives to help partners complete and present their "Carbon Reduction Roadmap," clearly defining their carbon reduction timelines and goals based on their company conditions and future plans.
- Assisted supplier partners in optimizing processes, improving yield, and reducing waste production to

### 3. Future Plans

- Process Electricity Carbon Reduction Management: Accton will first introduce a real-time electricity information monitoring system and use data management to adjust production schedules, ultimately achieving continuous optimization of low-carbon production lines.
- Upstream and Downstream Collaboration on Product Carbon Footprint: Initially, reduce energy consumption during the product testing phase for downstream customers. Establish a carbon footprint management platform and collaborate with upstream suppliers on carbon reduction projects to achieve estimated carbon reductions. The carbon footprint management platform aims to introduce a carbon pricing management mechanism in future procurement.
- Continued Expansion of Impactful Carbon Reduction Initiatives: Implement Accton's sustainable supply chain management mechanism, aiming to obtain ISO 20400 Sustainable Procurement Guidelines certification. Share various carbon reduction experiences with partners in the Zero Carbon Chain Project. Continue offering Accton's sustainability courses, inviting suppliers to participate and actively promoting energy-saving and carbon reduction concepts and practical methods to expand sustainable impact.

### IV. Environmental Management

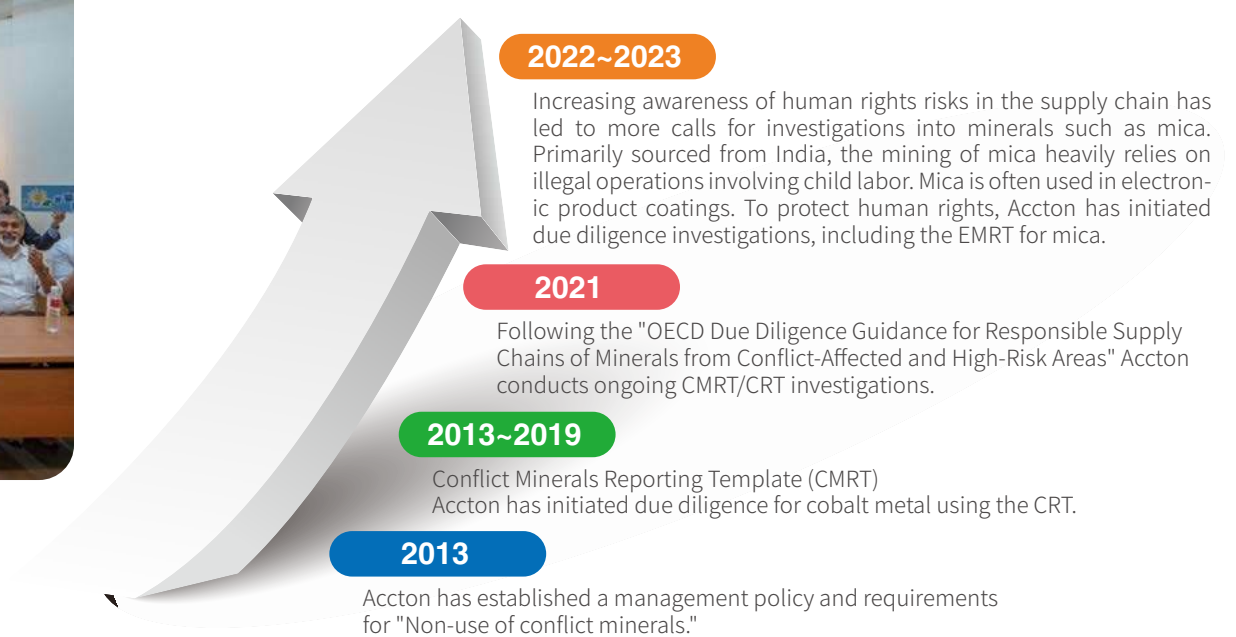
Accton Group is committed to implementing Hazardous Substance Free (HSF) management. Our Hsinchu HQ, Zhunan Plant in Taiwan, JoyTech plant in Shenzhen, China, and the recently established factory in Vietnam have all continuously passed the annual certification of the IECQ QC080000 system. All products comply with international environmental regulations (e.g., EU RoHS, REACH directives), aiming to achieve the goal of using environmentally friendly materials through green supply chain management. This allows Accton to produce and provide customers with low-pollution green products that reduce associated harm to humans and the environment.

Accton Group reviews and updates the "QPC-CE05 Product Hazardous Substance Management Procedure" based on international regulations, customer requirements, and green regulatory trends. This procedure fully covers the "IEC 62474 Material Declaration Standards." In 2023, a total of 203 suppliers responded with hazardous substance-related reports, involving 2,242 BOMs. All materials used comply with international standards and customer requirements.

### V. Conflict Minerals

#### Supplier Management

#### ◆ 1. Accton Group's Responsible Conflict Minerals Development History



## ◆ 2. 100% Non-Use of Conflict Minerals in Accton Group Components



**100%**

Completion of CMRT/EMRT surveys with 193 suppliers.



**100%**

Completion of at least one quarterly audit and implementation of corrective measures.



**100%**

Compliance with customer investigation requirements.

Respecting international human rights and corporate social responsibility, Accton Group avoids using minerals from areas affected by armed conflict and human rights abuses. Through regular due diligence as part of the Responsible Minerals Initiative (RMI), suppliers are required to source raw materials that do not originate from Conflict-Affected and High-Risk Areas (CAHRAs). This is to prevent indirect human rights violations and ensure compliance with national and international laws. For details, please view:

<https://www.accton.com/esg-home/topics/governance/conflict-minerals/>

Accton Group values the thoughts and opinions of its suppliers and ensures the protection of their legitimate rights and interests. Suppliers can maintain good interaction and provide feedback through the stakeholder section on the company website

[\(https://www.accton.com/interested/\)](https://www.accton.com/interested/)

## ◆ 3. Accton's Responsible Conflict Minerals Management Process

### 1 Establishment of Conflict

- Accton has published its responsible procurement policy on the company website.
- New qualified suppliers are required to sign a "Product Procurement Agreement," guaranteeing that the goods supplied to Accton Group do not contain gold (Au), tantalum (Ta), tin (Sn), tungsten (W), cobalt(Co), mica, or other metal substances that directly or indirectly fund or assist high-risk areas identified by the OECD. Suppliers must implement due diligence on the origin and chain of custody of these materials and provide Accton with their due diligence measures upon request.

### 2 Risk Identification and Assessment

- Accton identifies the scope of suppliers and conducts investigations using the CMRT/EMRT templates.
- Review the surveys completed by suppliers and compile findings into the Accton Group's Conflict Minerals Report (CMRT/EMRT).

### 3 Due Diligence

- Accton only accepts metals from smelters and refiners that are certified through the Responsible Minerals Assurance Process (RMAP) and confirmed by the RMI.

### 4 Investigation and Review

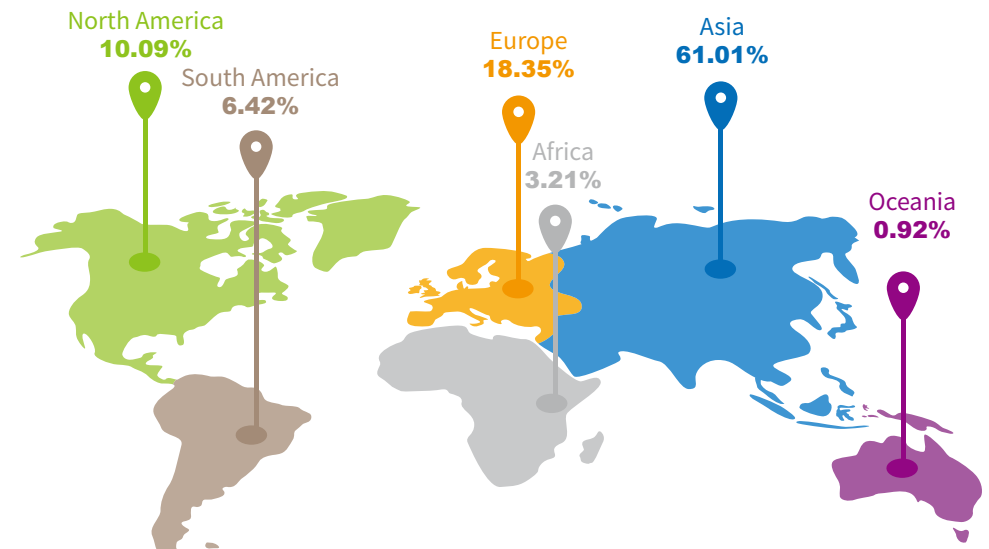
- At least once per quarter, Accton audits the list of completed investigations against the compliance list on the RMI website.

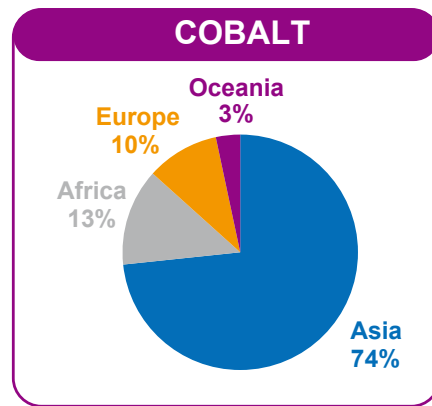
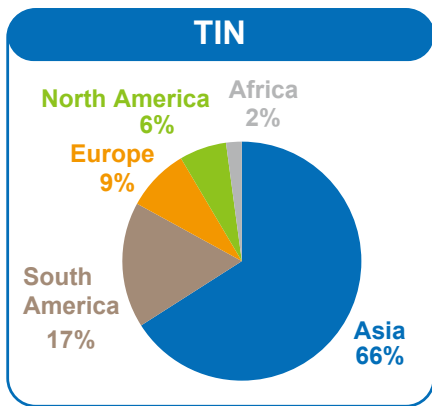
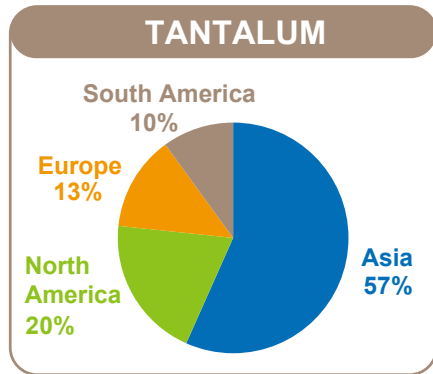
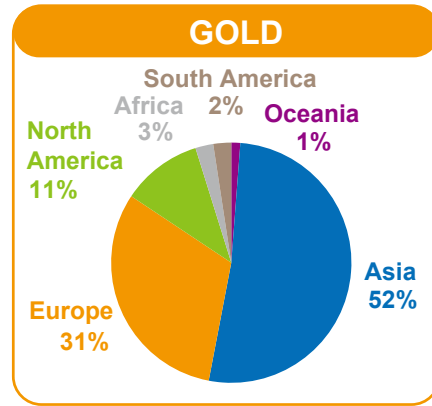
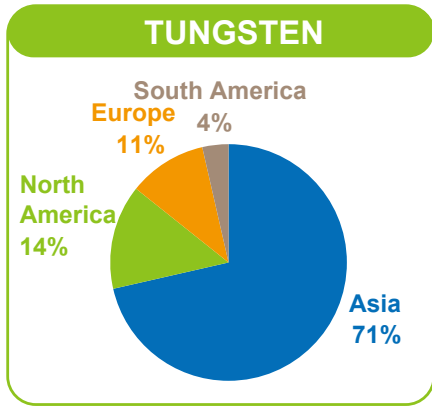
### 5 Open disclosures

- Accton updates its due diligence reports at least once annually, publishes these reports on the company website, and provides the investigation results upon customer request.

## ◆ 4. Distribution and Proportion of Qualified Smelters:

To ensure responsibility for conflict minerals at the source, Accton annually conducts risk assessments to screen suppliers that need further investigation. This process utilizes the CMRT and EMRT templates from the Responsible Minerals Initiative (RMI) and the latest compliant smelter lists published by the RMI to identify overall risks. According to the 2023 survey results, Accton's supply chain used a total of 218 qualified smelters. The distribution of these smelters is primarily in Asia, followed by Europe.





## VI. Zhunan Plant Recognized with Green Procurement Excellence Awards

Accton Technology is committed to achieving sustainable development goals and integrating sustainability actions into its business operations. In 2023, Accton's Zhunan plant actively aligned with the government's green procurement policy, earning recognition from the Ministry of Environment and receiving the "Outstanding Achievement in Green Procurement by Private Enterprises and Groups in Miaoli County - Special Distinction Award."

We profoundly recognize that Earth's resources are limited and aim to achieve environmental protection benefits through concrete green consumption practices. When procuring packaging materials, office supplies, office equipment, and electrical appliances, the Zhunan plant selects products with environmental labels or certifications recognized by the Ministry of Environment, such as FSC, PEFC, Energy Star, Water-saving Label, and Energy-saving Label. This approach reduces energy and resource consumption, fulfilling our corporate responsibility for environmental protection and promoting the development of green industries through green procurement actions.

Receiving this award affirms our environmental efforts. In the future, we will more actively implement environmental protection and management policies, balancing environmental and economic development, fulfilling our corporate social responsibility, and contributing to a sustainable future for the planet and its inhabitants.



# 3 Environmental Sustainability

- 3.1 Climate Change Response
- 3.2 Energy Saving and Carbon Reduction
- 3.3 Environmental Management
- 3.4 Green Product Management

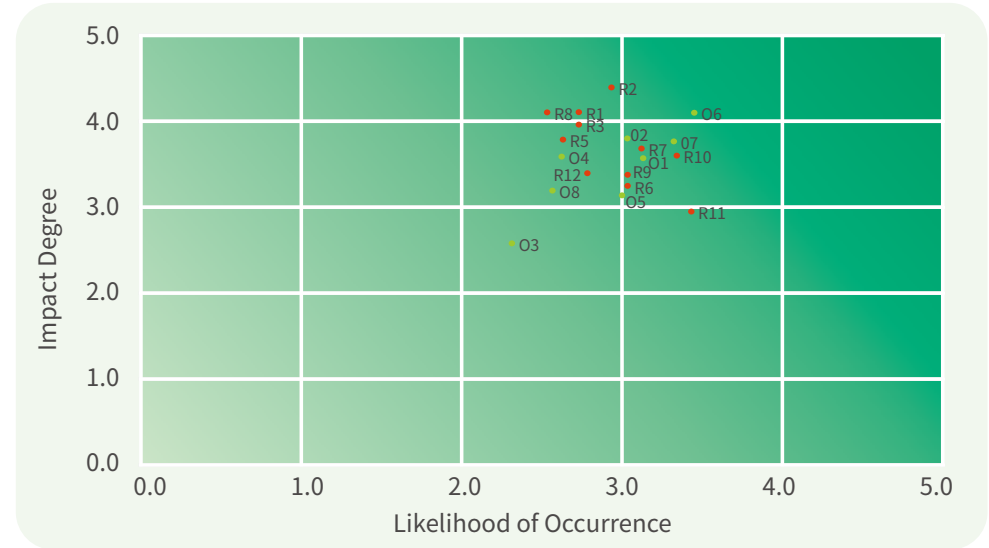


# 3.1 Climate Change Response

## I. 2023 Accton Climate Risk and Opportunities

### Risk and Opportunity Matrix

- A compilation of the climate risks and opportunities for high-tech electronics and network communication equipment manufacturing, based on feedback from senior management surveys assessing the likelihood and impact of industry-related risks and opportunities. The resulting Accton risk and opportunity matrix is plotted accordingly.
- Initially, risks are sorted by risk score. Then, considering Accton's current operational status and industry characteristics, these risks and opportunities are filtered and ranked in sequence to determine material climate-related risks and opportunities.



Major Risks/ Opportunities	Category	Climate Scenario	Time	Financial Impact Type	Financial Impact	Response Strategies
<b>R2 (Policy and Regulations) Enhanced Emission Reporting Obligations</b>	Transition Risk	SSP1	Medium-term	Cost increase	Estimated annual expenditure of approximately NT\$2.5 million (for guidance, audit, verification, reporting, and manpower investment)	<ol style="list-style-type: none"> <li>1. Promote ISO 14064-1 GHG inventory at global operational sites</li> <li>2. Engage a professional third party to verify ISO 14064-1 GHG emissions.</li> <li>3. Assign the ESH department to identify regulations at operation locations and conduct inventory and reporting.</li> <li>4. The ESG Committee is responsible for climate change risk management, climate change adaptation, formulating response strategies, setting reduction targets, planning and implementing climate mitigation actions, and reporting to the Board of Directors annually.</li> </ol>
<b>R4 (Technological Risk) Products and Services Supplanted by Low-Carbon Technologies</b>	Transition Risk	SSP1	Long-term	Decrease in revenue	Anticipating the low-carbon trend in the market due to climate change, failure to timely respond may lead to a decline in product sales, affecting revenue. Given the multitude of factors involved, the Company will further evaluate the implications.	<ol style="list-style-type: none"> <li>1. Continuously increase investment in research and development of key networking equipment (such as network switches, network application equipment, network access equipment, etc.) with low energy consumption and high transmission efficiency technologies.</li> <li>2. Collaborate with major customers:                             <ol style="list-style-type: none"> <li>(1) Develop low energy consumption specifications, low-carbon, and high-efficiency applications.</li> <li>(2) Promote carbon reduction and net-zero emissions: green manufacturing processes, green factories, introduction of renewable energy, and energy-saving projects to reduce customer Scope 3 emissions.</li> </ol> </li> <li>3. Develop patents related to low-carbon, high-efficiency, and carbon-reduction applications.</li> <li>4. Participate in international initiatives.</li> </ol>



Major Risks/ Opportunities	Category	Climate Scenario	Time	Financial Impact Type	Financial Impact	Response Strategies
<b>R11 (Acute Physical Risk) Increased Severity of Extreme Weather Events</b>	Physical Risk	SSP5	Medium-term	Decrease in revenue	It is anticipated that climate change will lead to an increase in the frequency and intensity of extreme weather events, causing potential financial impact on Accton Technology due to operational disruptions, equivalent to approximately 1 to 5 days of revenue.	<ol style="list-style-type: none"> <li>1. Implement ISO 22301 Business Continuity Management System and obtain third-party certification.</li> <li>2. Operate a risk management system.</li> <li>3. Conduct climate scenario stress tests at operational sites.</li> <li>4. Promote damage prevention programs at high-risk sites.</li> <li>5. Increase production sites in different countries.</li> </ol>
<b>O6 (Products and Services) Develop or Expand Low-Carbon Products and Services</b>	Opportunity	SSP1	Long-term	Increase in revenue	As the market shifts towards a low-carbon economy due to climate change, Accton anticipates new business opportunities from expanding or developing climate-friendly products and services. This could potentially increase revenue by approximately NT\$4-6 billion by 2030.	<ol style="list-style-type: none"> <li>1. Continuously collect and track industry trends in energy saving and low-carbon development.</li> <li>2. Increase R&amp;D investments</li> <li>3. Proactively communicate and collaborate with customers.</li> <li>4. Develop patents related to low-carbon, high-efficiency, and carbon-reduction applications.</li> </ol>
<b>O7 (Products and Services) Capitalize on Carbon Reduction Opportunities</b>	Opportunity	SSP1	Long-term	Increase in revenue	Consolidate internal resources and provide products and services for carbon reduction or low-carbon applications through R&D and innovation. Empower both new and existing clients in achieving their carbon reduction commitments and goals. Consequently, thus increasing sales of new products and services and boosting corporate revenue. Increase in corporate revenue.	<ol style="list-style-type: none"> <li>1. Leverage Accton's expertise and experience in energy-saving technologies and processes.</li> <li>2. Integrate IoT and AI computing technology.</li> <li>3. Offer innovative services and penetrate niche markets.</li> </ol>
<b>O2 (Resource Efficiency) Towards More Efficient Buildings</b>	Opportunity	SSP1	Medium-term	Cost reduction	Compared to traditional facilities, it is estimated that electricity expenses can be reduced by 10-15%.	<ol style="list-style-type: none"> <li>1. Implement green building designs for the new Zhubei plant.</li> <li>2. Conduct sunlight and ventilation simulations prior to design.</li> <li>3. Procure high-efficiency facility systems.</li> </ol>

\*IPCC AR6 adopts Shared Socioeconomic Pathways (SSPs) to estimate future GHG emission scenarios, including five pathways: very low emissions (SSP1-1.9), low emissions(SSP1-2.6), intermediate emissions (SSP2-4.5), high emissions (SSP3-7.0), and very high emissions (SSP5-8.5).

**Risk Patterns :**

**R2 (Policy and Regulations) Enhanced Emission Reporting Obligations :**

1. The Financial Supervisory Commission (FSC) promotes transparency in carbon inventory disclosure for TWSE/TPEX-listed companies, mandating three stages of mandatory disclosure based on industry and capital thresholds.
2. Accton's market capitalization is between NT\$5 billion and NT\$10 billion, and therefore subject to the second phase of FSC regulations. The primary manufacturing center in Taiwan, located in Zhunan Township, emits approximately 11,000 tons of greenhouse gases annually. According to FSC's schedule, Accton will be included in mandatory inventory reporting by 2025.
3. To comply, Accton must establish a GHG inventory mechanism based on ISO 14064-1. Related investments include external advisory guidance, third-party verification, internal manpower allocation, and relevant departmental inputs, leading to increased operational costs.





## II. 2023 Accton TCFD Implementation

### ◆ Task Force on Climate-Related Financial Disclosures (TCFD) – Governance

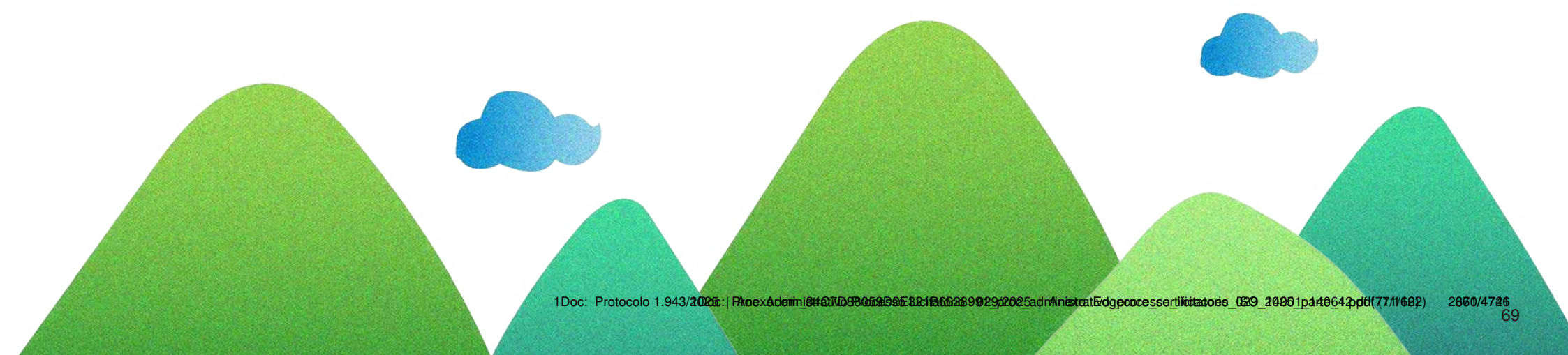
TCFD Four Core Pillars			Current Management Practices at Accton Technology
Governance	Climate Related Risks and Opportunities Governance	Board of Directors Oversee Climate Related Topics	<ol style="list-style-type: none"> <li>The Board of Directors is the highest supervisory body for climate change at Accton Technology. The ESG Committee regularly reports on climate change management and performance during board meetings.</li> <li>The Board of Directors oversees climate change-related management operations at Accton. Their responsibilities include reviewing climate-related strategies, annual targets, action plans, annual budgets, and major financial expenditures. They also track the achievement of the previous year's targets and management performance.</li> <li>The Board provides guidance and directions for adjustments and improvements based on the performance and target achievement reports presented by the ESG Committee.</li> </ol>
		Management's Assessment and Handling of Climate-Related Issues	<ol style="list-style-type: none"> <li>The ESG Committee is the highest executive unit for managing climate change at Accton, and chaired by a senior vice president, with the ESG Office acting as the secretary. The ESG Committee annually identifies climate change risks and opportunities, formulates response strategies, and sets targets for material financial and strategic risks and opportunities. The Green Manufacturing Committee under the ESG Committee is responsible for implementing climate change-related action plans and tracking KPI performance.</li> <li>The Green Manufacturing and Environment Committee reports the status of target achievement, current KPI status, and action plan performance to the ESG Committee.</li> <li>Accton Technology Climate Governance Structure: Board of Directors (climate-related topics supervision, major decision-making) → ESG Committee (climate-related goal setting, strategy development, action plan planning and implementation, and tracking and management).</li> </ol>
Strategy			<ol style="list-style-type: none"> <li>Accton's Definition of Short-, Medium- and Long-term and Major Climate-related Risks and Opportunities:               <ol style="list-style-type: none"> <li>Short term (1-3 years): (physical) Increase in severity of extreme weather events</li> <li>Medium term (3-6 years): (Transition) Enhanced reporting obligations for emissions, (Transition) Increased price of greenhouse gas emissions, (Transition) Products and services are supplanted by low-carbon technology, (Transition) increased raw material costs, (Physical) increased severity of extreme weather events, (Transition) increased stakeholder concerns and negative feedback</li> <li>Long term (7-10 years): (Transition) Products and services are supplanted by low-carbon technologies, (Transition) raw material costs increase, (Physical) the severity of extreme weather events increases</li> </ol> </li> <li>Accton identifies material climate-related financial risks and opportunities through four steps: (Compilation) Gather potential climate-related risks and opportunities in the technology and network communications industry. → (Convergence) Assess risks and opportunities based on product and service types, changes in operational climates, regulatory trends in operating and sales markets, major customer climate change strategies, etc. → (Materiality Analysis): Senior management determines risk scores based on the likelihood of climate-related risk and opportunity events occurring and their impact on Accton Technology. → (Strategic Response) Develop strategies to address these risks, (including major investments or expenditures).</li> </ol>



TCFD Four Core Pillars		Current Management Practices at Accton Technology
Strategy		<p>1. For material climate-related risks and opportunities, the ESG Committee analyzes the causes and degrees of impact on the organization and proposes response strategies and formulates corresponding action plans. They also assess the resources and costs required by the organization. Once the ESG Committee confirms the direction, it reports to the Board. Any business action plans involving significant resource allocation and expenditures must be approved by the Board before implementation.</p> <p>A. In response to future greenhouse gas emission costs and rising carbon prices, the first step in Accton's carbon management strategy defined by the ESG Committee is to set short-to-medium-term reduction targets and long-term net-zero emission goals. The priority is given to organizational reduction initiatives, followed by offsetting remaining emissions through the purchase of green energy certificates and other decarbonization measures.</p> <p>B. To address the risk of products and services being supplanted by low-carbon technologies, and to enhance customer trust and strengthen partnerships, Accton proactively responds to customer expectations for low-carbon products. Without compromising the product specifications and quality requirements, we work with customers on projects to reduce the burn-in time of products during the manufacturing stage, which greatly reduces the electricity required for product manufacturing.</p> <p>2. The climate scenarios considered by Accton Technology include the 1.5°C and 2°C scenarios in which the world is moving towards net-zero and low carbon transition, and the 4°C scenario in which the world is still focusing on accelerating economic growth, using fossil fuels without restrictions, and passively facing the continuous increase in atmospheric CO<sub>2</sub> concentration caused by climate change</p> <p>3. Our carbon reduction strategy prioritizes carbon reduction in the R&amp;D, design and manufacturing stages.</p> <p>R&amp;D design: After a carbon footprint inventory of products, it was found that the carbon emissions of network communications products during the use phase account for about 90% of the carbon emissions during its entire life cycle. Therefore, we will continue to work with our customers to start from product R&amp;D. This includes the use of high-efficiency chips, low-energy consuming power supplies, new heat dissipation designs, increasing the proportion of recycled materials, and using a product carbon footprint calculation system to understand the improvement of the carbon emissions of each product.</p> <p>Manufacturing Phase:</p> <p>1. Factory construction has commenced incorporating green building design principles, including insulation and natural ventilation design for the building. 2. Facility Systems: Implementation of new high-efficiency plant facilities, including chiller systems, HVAC systems, air compression systems, and energy-saving lighting systems. 3. Installation of photovoltaic solar power systems to increase the proportion of renewable energy usage. 4. Implementation of rainwater harvesting systems to reduce the consumption of raw water. 5. Process Improvement: Collaborate with clients to optimize process parameters while maintaining product reliability, thereby reducing carbon emissions from processes.</p>
Risk Management	Identification, Assessment, and Management of Climate Related Risks	<p>1. Accton Climate-Related Risk Management Process:</p> <p>A. Climate-related risk/opportunity events ① Likelihood of occurrence (1 to 5, from low to high) and the ② impact level on Accton (1 to 5, from low to high).</p> <p>B. ① Likelihood of Occurrence * ② Impact Level = Materiality Score</p> <p>C. Materiality scores are ranked from high to low.</p> <p>D. Materiality rankings are discussed, adjusted, and determined by senior executives, identifying material risks and opportunities for Accton</p> <p>2. Accton has identified transition risks arising from "Taiwan's Pathway to Net-Zero Emissions in 2050" announced in 2022. The primary regulatory transition risk faced by Accton involves the FSC mandating TWSE/TPEX-listed companies to disclose their carbon inventory results in three phases based on specific industry sectors and capital thresholds. Accton, with a market capitalization ranging from NT\$5 billion to 10 billion, falls under the second phase of this regulation. By 2025, the Company is required to disclose the results of the greenhouse gas inventory from the previous year in its annual report, covering all global operations directly controlled by Accton.</p> <p>3. Climate-related topics are a primary focus for Accton, overseen by the ESG Committee. The ESG Committee consistently evaluates, assesses, analyzes, and manages risks tied to climate change. They convene quarterly to monitor progress toward objectives and review the status of management effectiveness, reporting their findings to the Board of Directors.</p> <p>4. After identifying material climate-related risks, the ESG Committee evaluates the timing of these risks and their potential financial impacts on Accton. Based on the nature and severity of the risks, the Committee proposes appropriate response strategies. These strategies prioritize mitigation first, followed by control, transferring the risk, and</p>



TCFD Four Core Pillars		Current Management Practices at Accton Technology
Indicators and Targets	Evaluate and manage climate-related risks and opportunities through specific indicators and targets	<ol style="list-style-type: none"> <li>1. Accton's main carbon reduction targets are to reduce carbon emissions by 50% by 2030 and achieve net-zero emissions by 2050.</li> <li>2. In addition to monitoring greenhouse gas emissions, Accton tracks climate change-related performance using other indicators such as energy consumption, electricity intensity, municipal water use, waste output, and recycling rates.</li> <li>3. Accton prioritizes climate change management and fosters innovation among its staff. We have introduced the "Production Nobel Prize" to financially reward employees whose proposals for improving production efficiency or energy conservation are approved.</li> <li>4. Accton is currently formulating an internal carbon pricing strategy, intending to assign carbon emissions to various processes and products based on working hour allocation. The plan is to establish an internal carbon price using shadow pricing within the next two years, which will be an essential tool for managing greenhouse gas emissions.</li> </ol>
		<ol style="list-style-type: none"> <li>5. Since 2018, Accton has been conducting greenhouse gas inventories according to ISO 14064-1 and the guidelines provided by the Ministry of Environment. The initial scope of these inventories commenced with Accton HQ and JoyTech, expanding by 2021 to include Accton HQ, Plant 2, the Zhunan Factory, Edgecore, Shenzhen JoyTech, and various offices, incorporating Scope 3 (Categories 3 to 6).</li> <li>6. 2023 Greenhouse Gas Inventory Emissions:               <ul style="list-style-type: none"> <li>A.Scope 1: 722 tCO<sub>2</sub>e</li> <li>B.Scope 2: 43,475 tCO<sub>2</sub>e</li> <li>C.Scope 3: 39,703 tCO<sub>2</sub>e (Category 3 - 6)</li> </ul> </li> </ol>





## 3.2 Energy Saving and Carbon Reduction

### I. Greenhouse Gas Emissions Statistics

Accton is actively responding to international carbon reduction trends by setting 2021 as the baseline year, with goals to reduce carbon emissions by 50% by 2030 and achieve net-zero carbon emissions by 2050. The first phase of carbon reduction involves a comprehensive greenhouse gas inventory.

The boundaries primarily include: Direct greenhouse gas emissions and removals (Category 1) and indirect greenhouse gas emissions from imported energy (Category 2). Other indirect greenhouse gas emission sources (Categories 3 to 6) are considered based on the significance principle by evaluating data sources and quality. Starting from 2022, the calculation scope was expanded to include: 3.1 Emissions from upstream cargo transportation and distribution; 3.3 Emissions from employee commuting; 3.5 Emissions from business travel; 4.1 Emissions from purchased goods; 4.3 emissions from solid and liquid waste disposal.

In 2023, the carbon emissions in Categories 1 and 2 were higher compared to 2022, primarily due to the capacity expansion at Vietnam Accton's and Zhunan plants.

The verification process referenced the ISO 14064-1:2018 standard and the Ministry of Environment's greenhouse gas inventory and registration guidelines.

Unit: tCO<sub>2</sub>e/year

Plant	2020		2021			2022				2023			
	Category 1	Category 2	Category 1	Category 2	Category 4	Category 1	Category 2	Category 3	Category 4	Category 1	Category 2	Category 3	Category 4
Accton HQ (Taiwan 1)	255	3,836	252	3,556	700	251	2,899	795	535	286	3,006	847	580
Accton RMA	n/a	341	126	306	44	9	307	48	42	9	304	47	42
Zhunan Plant (Taiwan 2)	120	3,252	2,215	7,721	1,401	548	11,234	2,219	1,553	372	13,329	36,286	1,791
Offices across Taiwan	n/a	431	19	305	-	22	378	-	66	24	405	-	72
Edgecore (Taipei/Taichung/Tainan)	n/a	n/a	18	465	-	6	206	-	36	6	211	-	38
Joy Technology (JoyTech)	40	23,790	49	27,979	-	33	23,208	-	-	25	24,074	-	-
Vietnam Accton	-	-	-	-	-	-	-	-	-	0	2,147	-	-
<b>Subtotal</b>	<b>415</b>	<b>31,650</b>	<b>2,679</b>	<b>40,332</b>	<b>2,145</b>	<b>869</b>	<b>38,232</b>	<b>3,062</b>	<b>2,232</b>	<b>722</b>	<b>43,475</b>	<b>37,180</b>	<b>2,523</b>

\* Note 1: The emission factor for Taiwan is based on Taipower's 2022 emission factor of 0.495 kg CO<sub>2</sub>e/kWh. The emission factor for JoyTech is based on China Southern Power Grid's 2023 electricity emission factor of 0.9489 kg CO<sub>2</sub>e/MWh. The emission factor for Vietnam Accton is based on the grid's emission factor of 0.7221 kg CO<sub>2</sub>e/kWh.

\* Note 2: Accton HQ (Taiwan 2), Accton RMA, and Zhunan Plant engaged in third party verification.

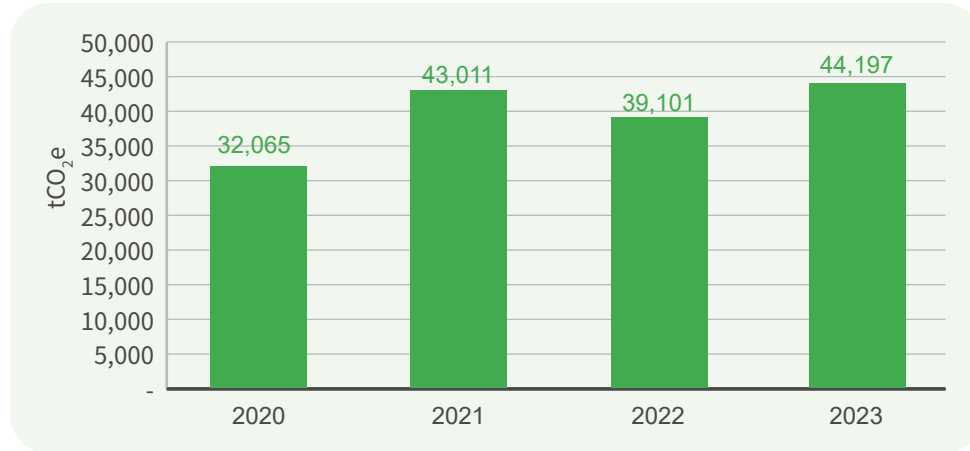
\* Note 3: The scope for Hsinchu HQ covers Accton HQ and Edgecore's Hsinchu office.

\* Note 4: The carbon emission data for Accton and Edgecore offices (Taipei/Taichung/Tainan offices) as well as Vietnam Accton were self-inventoried.

\* Note 5: JoyTech was verified by a third party commissioned by the Shenzhen Municipal Government.

### ◆ Historical Greenhouse Gas Emissions (Categories 1+2)

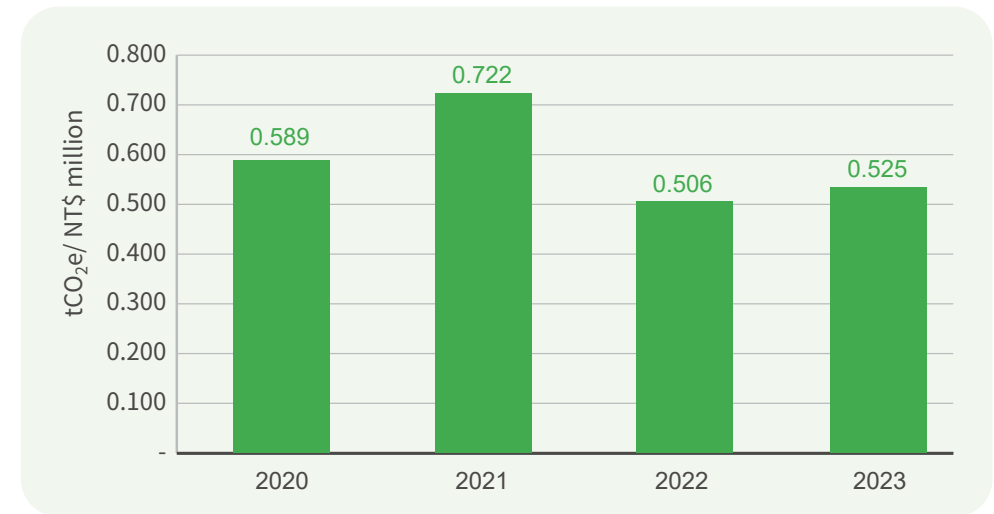
#### Greenhouse Gas Emissions



## II. Greenhouse Gas Emission Intensity

In response to international trends, greenhouse gas emission intensity has been added as a management indicator. The table below indicates the relationship between Category 1 and Category 2 data and revenue. Starting from 2022, Categories 3 to 6 data are disclosed according to the significance principle of ISO 14064, revealing related upstream and downstream carbon emissions data.

#### Greenhouse Gas Emission Intensity

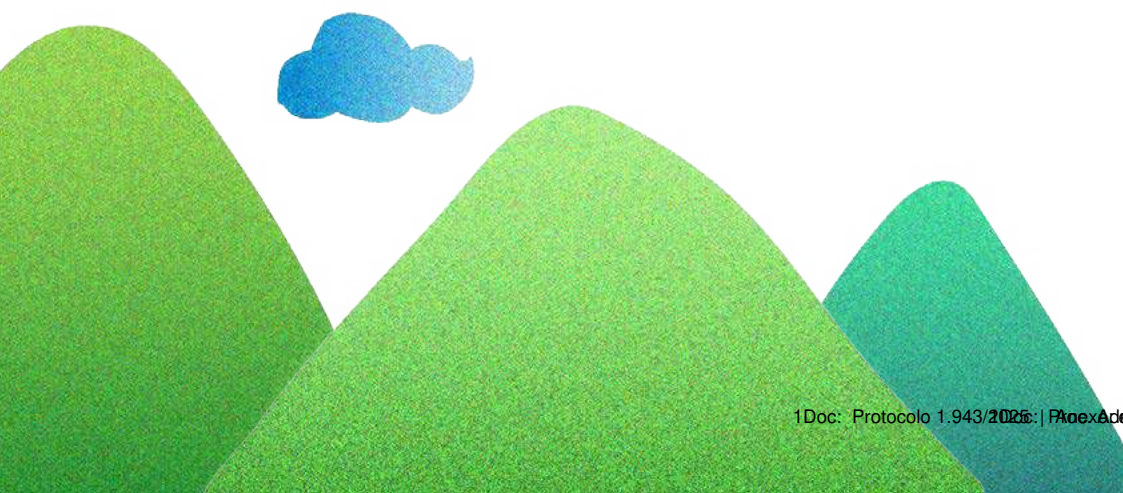


Unit: tCO<sub>2</sub>e/ NT\$ million

Year	2020	2021	2022	2023
<b>Greenhouse Gas Emission Intensity</b>	0.589	0.722	0.506	0.525

Note: Greenhouse Gas Emission Intensity = Greenhouse Gas Emissions (tCO<sub>2</sub>e) / Total Revenue (NT\$ million)

Accton scored a D on the International Carbon Disclosure Project (CDP) questionnaire in 2021, improved to a B in 2022, and maintained a B in 2023.



### III. Energy-Saving Achievements

Since operational electricity consumption is the primary source of the Company's carbon emissions, the following improvement measures have been implemented starting in 2023:

- Accton conducts detailed energy consumption inventory by segregating electricity usage based on the purpose within the plant. Sub-meters have been installed for each area, and the electricity usage data is uploaded to the cloud. This allows for accurate monitoring of electricity consumption and measurement of energy-saving performance.
- Accton has optimized production by analyzing the electricity usage of production machines. By closely monitoring the energy consumption patterns, the Company can identify potential anomalies and detect abnormal energy usage hotspots. Once these hotspots are identified, necessary improvements are made.
- Accton has improved its equipment by evaluating and adjusting the testing methods of high and low-temperature testing equipment within the plant. These adjustments aim to reduce energy consumption during the heating and cooling processes, thereby enhancing overall energy efficiency.



### ◆ Energy Saving Achievements

Plant	Energy Saving Measures	Implementation
Hsinchu HQ	Cleaning of Chiller Condensers	<p><b>Energy Savings Calculation</b></p> <p>In 2022, the total power consumption of the chiller equipment was 830,005 kWh.</p> <p>Condenser Approach Temperature (°C) = Condenser Temperature (°C) – Cooling Water Outlet Temperature (°C)</p> <p>Before improvement: The chiller equipment condenser was dirty, resulting in poor heat exchange with an approach temperature of about 5°C .</p> <p>After improvement: The approach temperature was reduced to 3°C . Lowering the condenser temperature by 1°C reduces power consumption by approximately 2%.</p> <p>Electricity Savings (kWh/year) = 830,005kWh/year × 4% (energy savings rate from reducing approach temperature by 1°C) = 33,200kWh/year</p> <p>Formula: 830,005*4%*8/12 = 22,133.467kWh (Time period: May to December 2023)</p> <p>Total electricity savings: 22,133.467kWh</p>
Hsinchu HQ	Changing to High-Efficiency Cooling Water Pumps	<p><b>Energy Savings Calculation</b></p> <p>Energy consumption before improvement: Horsepower (HP) x0.746 (kW/HP) x Quantity (units) x Usage time(hours/year)/ Motor efficiency before improvement (%)</p> <p>20HP*0.746*2*3,240/0.85=113,743</p> <p>Energy consumption after improvement: Horsepower (HP) x0.746 (kW/HP) x Quantity (units) x Usage time(hours/year)/ Motor efficiency after improvement (%)</p> <p>20HP*0.746*2*3,240/0.93=96,681</p> <p>113,743-96,681=17,061 kWh</p> <p>17,061*7/12=9,952.25 kWh (Time period: June to December 2023)</p> <p>Total electricity savings: 9,952.25kWh</p>
Hsinchu HQ	Adjusting Chiller Outlet Water Temperature from 7°C to 8.5 °C	<p><b>Energy Savings Calculation</b></p> <p>Energy Savings= Chiller Power Consumption × (Chiller Water Temperature After Improvement – Chiller Water Temperature Before Improvement) × 2% /°C (Each 1°C increase can reduce the chiller power consumption by approximately 2%) × Non-Summer Operation Time</p> <p>830,003*(8.5-7)*0.02*0.75=18,675</p> <p>18,675*11/12=17,118.75 kWh (Time period: February to December 2023)</p> <p>Total electricity savings: 17,118.75kWh</p>

## 3.3 Environmental Management



**Boundary: Includes manufacturing plants: Accton HQ (Plant 1) and Plant 2 in Hsinchu, Zhunan Plant in Miaoli, offices in Taipei, Taichung, and Tainan, and subsidiaries Edgecore, JoyTech in Shenzhen, China, and Vietnam Accton manufacturing plant. Vietnam Accton manufacturing facility commenced operations in 2023; therefore, there is no relevant data prior to 2022.**

### I. Environmental Safety and Health Policy

Accton remains deeply committed to the stewardship of Earth's resources and sustainable development, integrating an environmental safety and health management system throughout our entire management framework. We assess the interrelations between processes, products, and the environment, and identify potential safety risks in our manufacturing activities. To prevent accidents and establish emergency response systems, we commit to maintain and continually improve our environmental safety and health practices, ensuring a safe and healthy workplace to achieve sustainable corporate growth. To effectively drive and manage these initiatives, we pledge to:

1. Comply with domestic occupational safety and health regulations, and effectively implement and continuously improve our safety and health management systems.
2. Actively promote resource recycling and industrial waste reduction.
3. Enhance education for employees and manage suppliers and contractors with rigorous environmental safety and health training and awareness.
4. Proactively eliminate unsafe acts and conditions to prevent accidents.
5. Maintain employee health and achieve zero accidents.

### II. Strategy

To achieve environmental protection and sustainable business operations, we actively set management goals for the use and pollution control of various energy resources and continually improve these processes. Implement environmental management to reduce pollution, enhance resource recycling and waste reduction benefits, balance economic and environmental considerations, and fulfill our corporate social responsibilities. To actualize energy conservation and environmental protection, Accton actively implements various energy-saving initiatives in manufacturing facilities and offices, conducting periodic internal audits and third-party verifications to ensure compliance with ISO 14001, ISO 14064, ISO 50001, and relevant environmental regulations.

Environmental and energy management certifications:  
<https://www.accton.com/esg-documents/>

### III. Management Objectives

Goals	Short-Term Goals 2022-2023	2023 Goals	2023 Results	Mid to Long-term Goals 2024~2026
No instances of penalties related to environmental pollution.	0	0	0	0
Waste Recycling Rate (%)	>78	78	82	>80
Electricity Use Intensity (EUI) (MJ/Revenue)	Reduce by 1% (Combined reduction target for 2022 and 2023, with 2021 as the baseline year)	3.30 (2021 as base year, reduce by 1%)	2.64 (20.8% lower than 2021)	Reduce by 25% (Combined reduction target for 2024 and 2026, with 2021 as the baseline year)

Waste Recycling Rate: Weight of Recycled Material / Total Weight of Waste

Electricity Use Intensity (EUI): Total Electricity Usage (MJ) / Total revenue in NT\$ thousands







◆ **2023 Statistics on Waste Treatment Method**

Unit: metric tons

Plant	Incineration	Recycling	Thermal Treatment	Total
Hsinchu HQ	28.3	48.7	-	77.0
Plant 2	9.2	68.8	-	78.0
Zhunan Plant	152.556	1,915.36	-	2,067.8
Edgecore	1.6	0.7	-	2.4
Offices	-	-	-	-
Joy Technology (JoyTech)	292.0	178.7	-	470.7
Vietnam Accton	-	-	-	-
<b>Total</b>	<b>483.7</b>	<b>2,212.3</b>	<b>-</b>	<b>2,695.9</b>

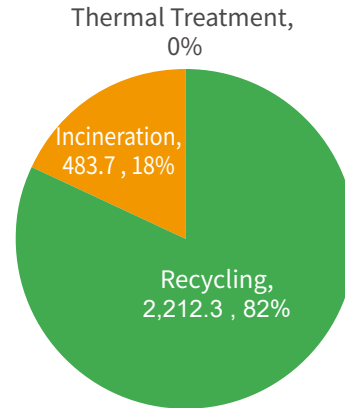
Note 1: Taipei, Taichung, and Tainan office waste is included in the centralized waste disposal of the building, with no related weight records.

Accton continues to promote waste recycling and reuse. The goal is to increase the waste recycling rate to 80% by 2024. Starting from a recycling rate of 78.3% in 2020, through strict waste classification and increasing reuse channels, the recycling rate has been gradually improved, reaching 81.64% in 2023, achieving the expected target one year in advance.

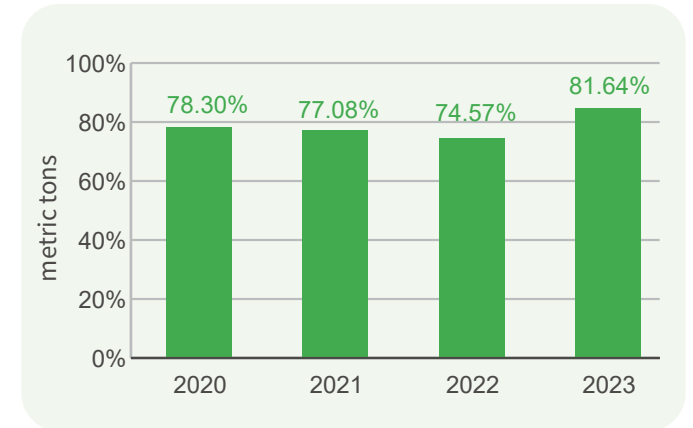
Unit: metric tons

Year	2020	2021	2022	2023
<b>Total Waste Output</b>	1,617	1,543	2,152	2,785
<b>Total Resource Recycling</b>	1,266	1,190	1,605	2,273
<b>Recycling and Reuse Rate</b>	78.30%	77.08%	74.57%	81.64%

◆ **2023 Waste Treatment Methods**



◆ **Waste Recycling Rate**



◆ **Weight of Hazardous Waste**

Plant	Hsinchu HQ	Hsinchu Plant 2	Zhunan Plant	Joy Technology (JoyTech)	Vietnam Accton
<b>Weight (metric tons)</b>	0	0	3.83	2.5	0.012
<b>Recycling Rate</b>	-	-	0	0	0

Due to the inability to fractionate and recycle solvent-type hazardous waste, incineration and thermal treatment methods are adopted.

◆ **Disclosure of Product Lifecycle Management: Including the Weight of Scrapped Products and Electronic Waste and the Recycling Percentage**

Plant	Hsinchu HQ	Hsinchu Plant 2	Zhunan Plant	Total
<b>Weight (metric tons)</b>	0.7422	5.0724	27.935	33.7496
<b>Recycling Rate (%)</b>	100	100	100	100

4.1 Environmental Protection and Public Welfare Go Hand in Hand

After recyclable waste are sorted by category, including tin cans, plastic bottles, glass bottles, paper, etc., are cleaned up in cooperation with charitable organizations (Tzu Chi). In 2023, the overall waste recycling rate reached 81.64%. Food waste and waste cooking oil are commissioned for co-processing and reuse, effectively reducing environmental impact, recycling resources, and supporting charitable activities of public welfare organizations.

**5. Energy and Water Resource Consumption**

5.1 Energy Consumption

The energy used by Accton includes fossil fuels (such as natural gas, diesel, gasoline, liquefied petroleum gas, etc.) and purchased electricity. Fossil fuels are mainly used for emergency generators, lawnmowers, forklifts, official vehicles, and employee cafeterias. Purchased electricity is the largest source of greenhouse gas emissions at Accton's main production sites.

The energy consumption in 2023 was higher than in 2022, due to the expansion of Vietnam Accton and the increase in production capacity at the Zhunan Plant.

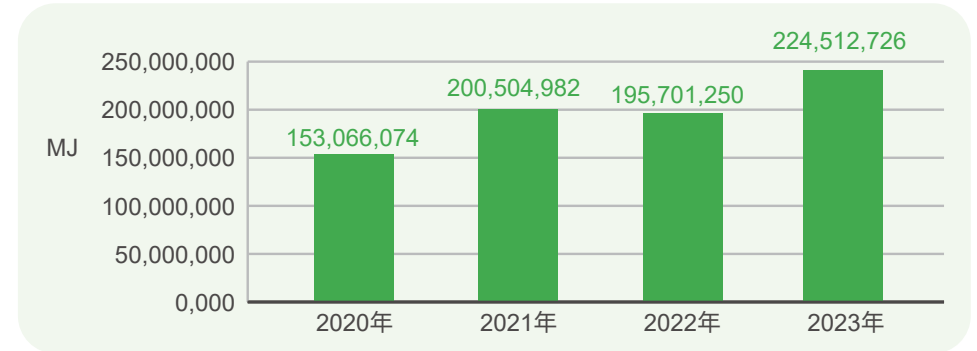
Unit: MJ

Year	2020	2021	2022	2023	2023 Ratio (%)
Purchased Electricity	151,163,420	198,625,661	193,668,973	222,256,466	99.00
Gasoline	881,903	783,769	892,079	819,262	0.36
Diesel	901,771	999,436	1,033,497	1,285,628	0.57
Liquefied Petroleum Gas	118,979	96,117	106,701	151,370	0.07
<b>Total</b>	<b>153,066,074</b>	<b>200,504,982</b>	<b>195,701,250</b>	<b>224,512,726</b>	<b>100%</b>

Note 1: Data Source: Energy calorific value coefficient data source is the Greenhouse Gas Emissions Factors Management Table Version 6.0.4, gasoline 7,800 kcal/L, diesel 8,400 kcal/L, liquefied petroleum gas 6,635 kcal/m<sup>3</sup>

Note 2: Taichung office electricity is included in management fees and not calculated separately.

◆ Energy Consumption Statistics



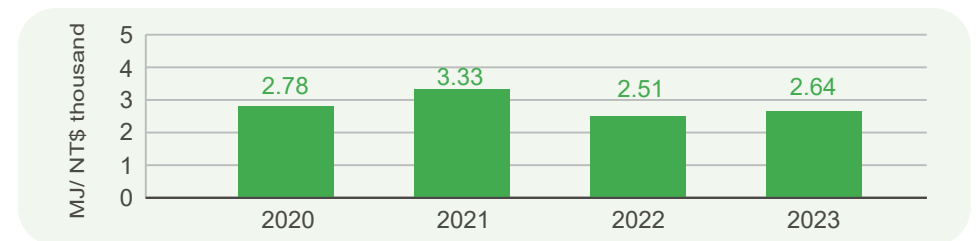
5.2 Electricity Use Intensity (EUI)

Electricity Use Intensity Reduction Targets:

Since 99% of energy consumption is electricity, energy intensity is expressed as electricity intensity. In 2023, the electricity intensity of Accton's main locations, including Hsinchu HQ, Plant 2, Zhunan Plant, Edgecore, Shenzhen JoyTech, and Vietnam Accton, increased by 7.9% compared to 2022. This increase was due to the expansion of Vietnam Accton and increased production capacity at Zhunan Plant.

Electricity Use Intensity Statistics:

◆ Electricity Use Intensity (EUI)



Note: Electricity Use Intensity (EUI): Total Electricity Usage (MJ) / Total revenue in NT\$ thousands

Unit: MJ/ NT\$ thousand

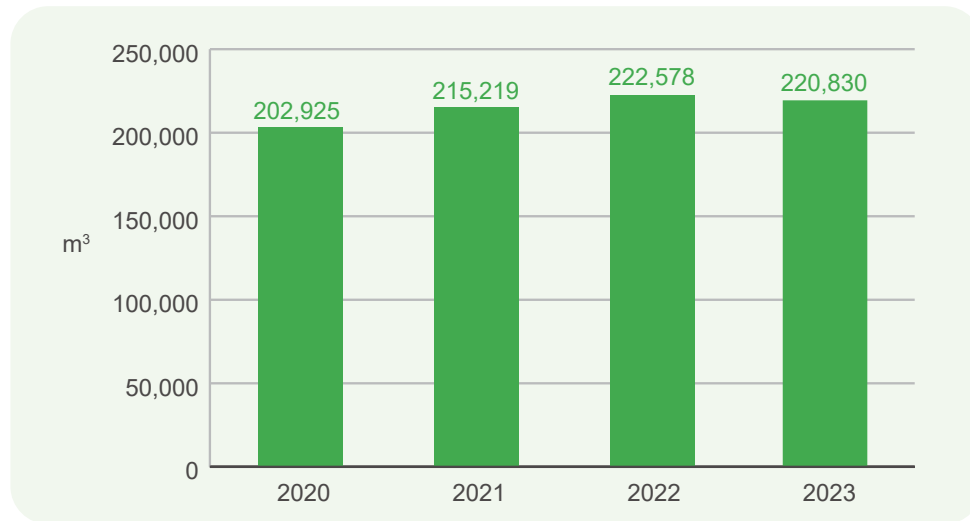
Year	2020	2021	2022	2023
<b>Total</b>	<b>2.78</b>	<b>3.33</b>	<b>2.51</b>	<b>2.64</b>



### 5.3 Tap Water Usage (Total Water Withdrawal)

Although production capacity increased in 2023, water usage remained comparable to 2022 levels.

#### ◆ Tap Water Usage



Unit: m<sup>3</sup>

Year	2020	2021	2022	2023
Total	202,925	215,219	222,578	220,830

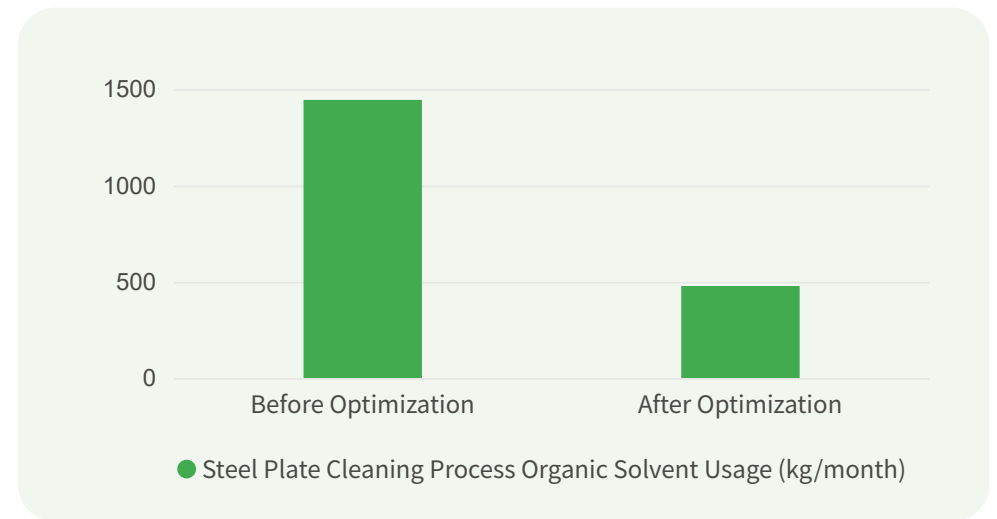
Note 1: Taipei and Taichung office water consumption is included in the building's total water usage.

### 5.4 Waste Improvement

Accton is committed to responsible consumption and production. In mid-2022, Accton launched a steel plate cleaning process optimization project. Through continuous testing, this project successfully replaced organic solvent-based cleaning agents with water-based cleaning agents.

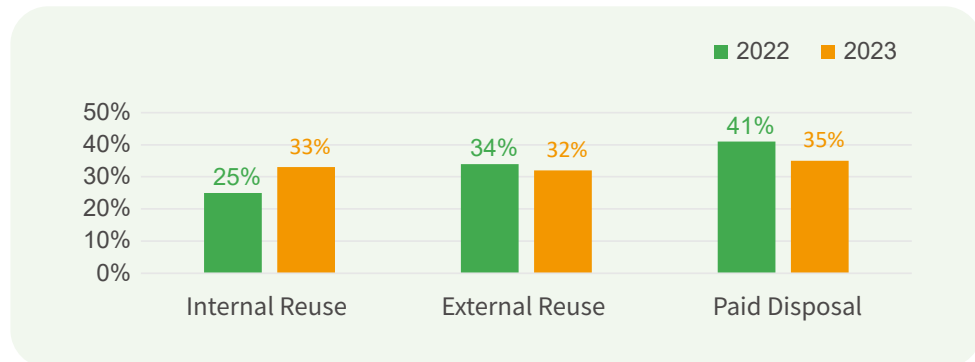
By reviewing the 2023 chemical procurement volume, the use of organic solvents in the steel plate cleaning process has been reduced to 30% of the original amount after optimization, while maintaining product quality, achieving environmental protection, and reducing fire risks.

#### ◆ Organic Solvent Usage



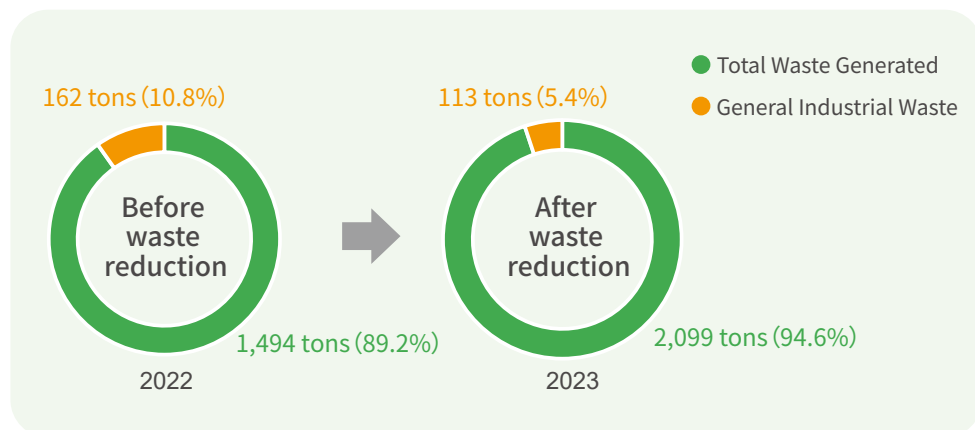
Accton supports sustainable consumption and production models. Since 2022, Accton has implemented a waste wooden pallet reduction project, effectively extending the lifecycle of wooden pallets through internal and external reuse measures. Unusable waste wooden pallets are outsourced to be made into fuel rods for energy recovery, achieving waste reduction.

In 2023, in our continuation of the 2022 waste wooden pallet reduction project, we have carried out internal and external reuse measures. Overall reduction reached 65%, a 6% improvement over 2022. The internal reuse ratio increased by 8% compared to 2022, and the paid waste disposal decreased by 6%, achieving waste reduction and lower waste disposal costs.



Starting in 2023, Accton also implemented a general industrial waste reduction project. This involves commissioning a waste management company to reprocess part of the high calorific value general industrial waste into fuel rods for energy recovery.

In 2023, the ratio of general industrial waste processed compared to the total factory waste significantly decreased from 10.8% in 2022 to 5.4%, reducing the proportion of waste directly incinerated.



## 3.4 Green Product Management

### I. Commitment to Environmental Sustainability

To align with global trends and the urgent demand for low-carbon products from major industry players, Accton focuses on enhancing product competitiveness and raising environmental sustainability awareness. This involves conducting organizational carbon footprint assessments and emphasizing low-carbon product development. Starting in the second half of 2021, Accton initiated the assessment and verification of product carbon footprints. By the end of 2022-2023, Accton had successfully certified the first two products under ISO 14067 for carbon footprints and plans to systematically extend these assessments across all product lines to carry out carbon emissions reduction planning.

From 2024 onwards, Accton plans to continue utilizing the methodologies established in 2022-2023, combined with IT system enhancements, to automate the carbon footprint assessment process.

The goals for product carbon footprint management are structured as follows:

#### **Boundary: Accton (including Plant 1, Plant 2, and Zhunan Plant) and subsidiaries Edgecore and JoyTech**

2022 - 2023 Goals	2022 - 2023 Results	Short-Term Goals (2024-2025)	Medium and Long-term Goals (2026-2027)
Complete ISO 14067 carbon footprint certification for two products.	Complete ISO 14067 carbon footprint certification for two products.	Implement automated carbon footprint inventory. Initiate energy efficiency improvements in products.	Fully automate the carbon footprint assessment process.

In the B2C (Business to Customer) calculation process, the usage phase of a product typically results in the highest carbon footprint. Therefore, Accton plans to continuously improve product energy efficiency to reduce carbon emissions. Once the automated product carbon footprint assessment system is fully implemented, it is expected to enable early calculation and consideration of new projects, making this indicator a key focus in product development.

## II. Product Hazardous Substance Free (HSF) Management

**Accton Group's HSF policy is committed to green design and reducing the environmental impact of products to achieve a goal of zero hazardous substances.**

Accton Group actively promotes HSF management. Facilities including the Hsinchu headquarters and Zhunan Plant in Taiwan, JoyTech in Shenzhen, China, and the new Vietnam Accton plant have all continuously passed the IECQ QC080000 system annual certification. Supplier management is governed by the "WIC-CE05002 Product Hazardous Substance Management Standards," which exceeds international mandatory regulations and covers the international material declaration standard IEC 62474<sup>Note</sup>. This standard is rigorously applied in the management of hazardous substances throughout the production process and the supply chain, ensuring a green product supply chain. Through the eGreen hazardous substance management system, Accton ensures compliance with international regulations (RoHS, REACH, EU Battery Directive, CA Pro 65, U.S. EPA TSCA, PFAS, etc.), customer requirements, and anticipated green regulatory trends. Accton actively collaborates with customers to promote HSF and substitution projects, aiming to mitigate environmental and ecological impacts, fulfill corporate environmental sustainability responsibilities, and meet stakeholder expectations to ensure user health and safety and reduce potential environmental pollution risks.

Note: IEC 62474 is an International Electrotechnical Commission (IEC) standard for the electrical and electronics industry. It uses supply chain material declarations to track material composition information in electrical and electronic products, enhancing data exchange efficiency globally and within the supply chain.

## III. Hazardous Substance Free (HSF) Short-, Medium-, and Long-term Goals



### 2023 Goals and Results

✓ Achieved

- Details and achievements of HSF risk management across all phases of product development are documented in "Risk Management Goals and Results for Hazardous Substance Free (HSF) Across Product Phases"



### Medium- and Long-term Goals (2025-2027)

- Enhance the automation of the eGreen system to improve the efficiency of hazardous substance assessments.

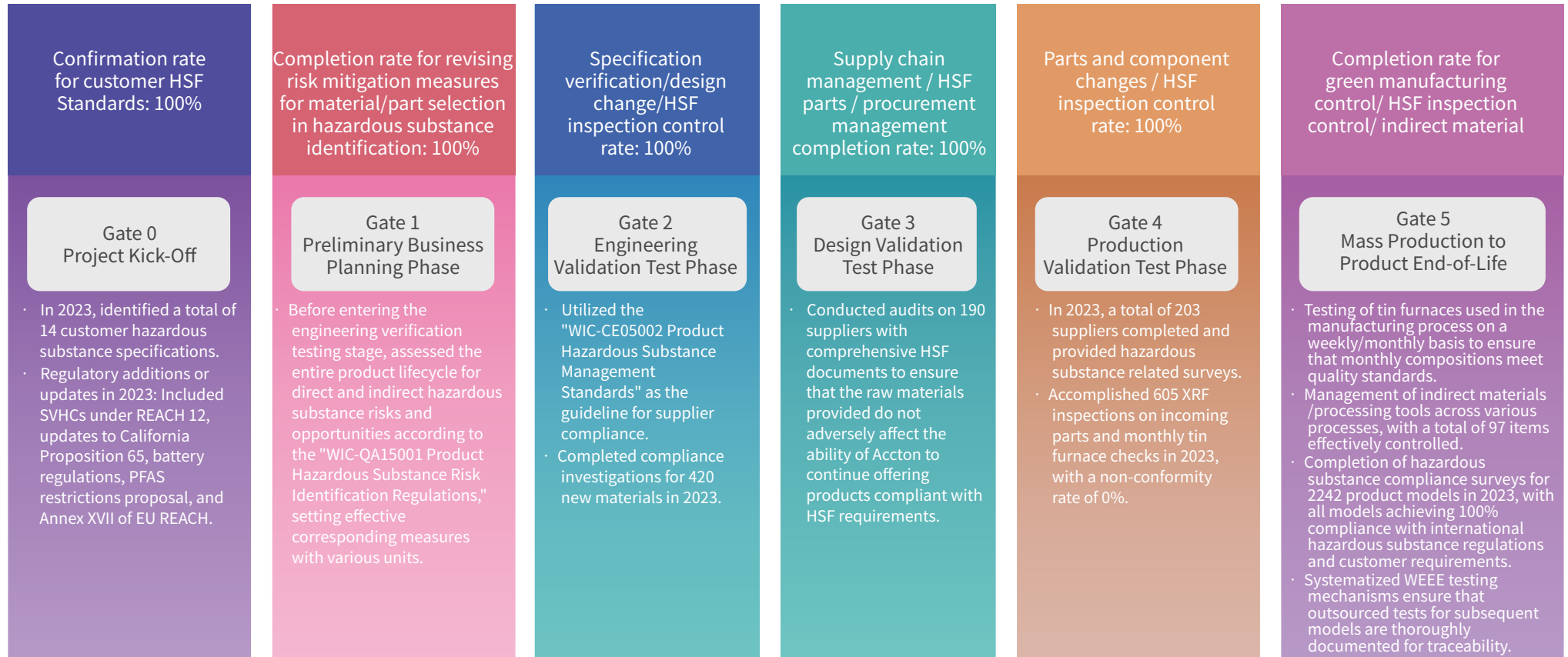


### Short-term Goals (2024 - 2025)

- Refine the control of hazardous substances within TCO and EPEAT standards.
- Reduce or eliminate harmful substances such as heavy metals (exceeding standards such as RoHS/REACH).



## IV.Risk Management Goals and Results for Hazardous Substance Free (HSF) Across Product Phases



### Note: Related ISO Standards and Forms

- Hazardous Substance Free Regulatory Control List: FMC-CE05000-10 HSF specification check and identification summary table
- New Supplier Selection and Assessment: FMC-SC02000-02 Vendor Assessment Audit Form
- Annual Evaluation of Qualified Suppliers: FMC-SC02004-01 Supplier Audit Checklist
- HSF Parts Management: FMC-CE05000-03 Accton HSF Products Declaration, FMC-CE05000-04 REACH(SVHC) substance Declaration of Compliance, and FMC-CE05000-02 Accton Green Parts Checking List
- IQA XRF Testing: WIC-CEQC01015 LF/LT Inspection Operation Standard
- Production Process Control: WIC-MT01005 Small Tin Furnace Operation Specification
- Indirect Material/Tool Management: FMC-CE05000-07 Indirect Materials Management Summary Table

## V. Sustainable Risk Management Effectiveness for Product Hazardous Substance Free (HSF)

### Latest HSF Regulatory Trends Response

In February 2023, ECHA published a PFAS restriction proposal, anticipating most PFAS substances will be banned starting 2026 or 2027.

Measures: Notifications alert relevant units to be vigilant in material specifications; identify and assess replacement of components containing PFAS or TSCA restricted substances.

### International Regulations and Customer Standards Compliance

Products are 100% compliant with international green standards and customer requirements, with no violations recorded.

Fully adheres to the RBA Code of Conduct and completes 100% of conflict mineral due diligence inquiries to customers.

### RoHS Risk Assessment Report

Produced product compliance assessment reports and risk management according to the harmonized standard of EU EN IEC 63000:2018.



### Proactive TSCA Replacement Mechanism:

Upon identifying TSCA restricted substances in components, despite the ban being extended to October 31, 2024, Accton initiated a ban management process to control the risk of non-compliance with hazardous substance regulations.

### Hazardous Substance Reduction Program

Actively assisted clients in reducing the use of SVHC substances at the source and in reviewing the compliance of non-halogenated components.

### Vietnam Accton has successfully obtained IECQ QC 080000:2017 certification

Expanded the scope of hazardous substance management processes, with Vietnam Accton's factory plant also successfully obtaining its first certification under IECQ QC 080000:2017.



# 4 Friendly Work Environment

- 4.1 Talent Attraction and Retention
- 4.2 Talent Learning and Development
- 4.3 Safeguarding Employee Safety
- 4.4 Safeguarding Employee Health





## 4.1 Talent Attraction and Retention



Boundary: Accton, Edgecore, JoyTech, Vietnam Accton

### Why Is it Important?

Upon employee recruitment, employment, and development, Accton, Edgecore, JoyTech, and Vietnam Accton adopts the competency of employees as the basis and the recruitment procedures are in accordance with the statutory standards. All employees from different ethnic groups, religions, colors, nationalities, ages, genders, sexual orientation, marital status and political affiliation shall be subject to fair and impartial operating procedures and shall be treated equally. Accton encourages talent to bring their role into full play and upholds its care for employees and their families as the most important responsibility. We hope to provide a worry-free working environment to help employees devote themselves to their work and increase the Company's competitiveness, creating a solid foundation for sustainable development.

### Management Objectives

At Accton, Edgecore, JoyTech, and Vietnam Accton, we consider our employees to be our most vital asset. We recognize that talent is essential for a company's long-term success. Consequently, we are dedicated to providing high-quality employment opportunities, which include competitive salaries and benefits, opportunities for comprehensive advancement through professional development, and a secure workplace. Moreover, we are committed to fostering a workplace environment that encourages continuous learning and enjoyment, helping us attract and retain skilled employees.

### Policies

In addition to ensuring employees are well-suited to their roles, taking care of employees and their families is a key responsibility for the company. Accton, Edgecore, JoyTech, and Vietnam Accton provide a worry-free work environment that allows employees to concentrate on their work and enjoy their lives, thereby enhancing the company's competitiveness and laying the foundation for sustainable corporate operation and development.

### Goals

We provide diverse communication mechanisms, create happy and friendly workplaces, provide competitive benefits systems to attract and retain key talent, and follow international human rights standards to establish good labor relations. Comply with international human rights standards and establish good labor relations.

### Performance and Adjustments

1. Accton, Edgecore, JoyTech, and Vietnam Accton convene monthly meetings of managers and departments whenever necessary and respond to 100% of employee feedback.
2. Accton's employee turnover rate is 9.6%, Edgecore's turnover rate is 7.6%, JoyTech's turnover rate is 35.2%, and Vietnam Accton's turnover rate is 173.1%.
3. Accton's reinstatement rate after parental leave was 77.8%; Edgecore's was 50%. In 2022, no employees at JoyTech applied for reinstatement after parental leave without pay, so there is no retention rate data available. Due to local regulations, Vietnam Accton has not implemented a parental leave without pay system and currently follows the local government laws.
4. Monthly audits indicate no cases of ethics violations, the annual RBA labor ethics risk assessment is below 5, and the RBA labor ethics training completion rate has reached 100%.

### Evaluation Mechanisms

1. Accton, Edgecore, JoyTech, and Vietnam Accton convene management and department meetings from time to time to facilitate communication between employees and the company, promote labor cooperation, and enhance work efficiency.
2. On the Portal platform, a communication channel called "Employee Exchange" has been established, along with an open comment space, encouraging colleagues to offer suggestions regarding operational or management measures. This allows the voices and expectations of frontline employees to be directly conveyed to senior management, serving as a reference for continuous improvement and corporate governance.
3. We also established an employee complaint hotline: (03) 577- 0270, extension 3119, an email for employee complaints at [hr885@accton.com](mailto:hr885@accton.com), a company internal physical mailbox, Accton Helper Line@ account, and a QR Code to provide employees with diverse channels for communication. Vietnam Accton provides several channels for employee grievances, including an employee complaints email: [AcctonVnHr@accton.com.vn](mailto:AcctonVnHr@accton.com.vn), the Accton Helper Line APP, and an employee union email address: [CongdoanATVN@accton.com.vn](mailto:CongdoanATVN@accton.com.vn). Establishment of physical complaint points: Employee Care Office, Union Office, thereby providing employees with diverse channels for voicing concerns.
4. Accton, Edgecore, JoyTech, and Vietnam Accton organize family days, club activities, Accton Talk seminars, and related subsidized activities each year to help employees realize work and life balance.
5. Accton and JoyTech ensure compliance with international human rights standards: Accton and JoyTech maintain an annual RBA labor ethics risk rating of less than 5. We regularly review the number of violations of ethical standards and take corrective actions. (Refer to [1.6 Ethical Management](#))

**Brief description of goals and track records:**

2023 Goals	2023 Results	Short-Term Goals (2024-2025)	Medium-Long-Term Goals (2026-2028)
<p><b>Provide diverse communication mechanisms and complaint channels to promote harmonious labor relations</b></p>	<ol style="list-style-type: none"> <li>Accton, Edgecore, JoyTech, and Vietnam Accton convene monthly meetings of managers and departments whenever necessary.</li> <li>100% completion rate of Accton and Edgecore's labor-management meetings.</li> <li>Provided employees with a complaint hotline, internal physical complaints mailbox, Accton Helper Line@, QR Code, union email, and union office to provide diverse channels for communication.</li> <li>The feedback closure rate for all employees at Accton and Edgecore is 100%.</li> </ol>	<ol style="list-style-type: none"> <li>Ensures smooth communication channels and promote harmonious labor-management relations.</li> <li>100% completion rate for Accton and Edgecore's labor-management meetings.</li> <li>100% response rate and case closure for employee feedback.</li> </ol>	<ol style="list-style-type: none"> <li>100% completion rate for Accton and Edgecore's labor-management meetings.</li> <li>The feedback closure rate for all employee-related opinions is 100%.</li> <li>Establish harmonious labor relations and comprehensive communication channels to prevent labor disputes and illegal infringement in the workplace.</li> </ol>
<p><b>Build a happy and friendly work environment and provide competitive salary and benefits to attract and retain key talent</b></p>	<ol style="list-style-type: none"> <li>The employee turnover rate at Accton was 9.6%.</li> <li>The employee turnover rate at Edgecore was 7.6%.</li> <li>The employee turnover rate at JoyTech was 35.2%.</li> <li>The employee turnover rate at Vietnam Accton was 173.1%.</li> <li>Accton's reinstatement rate after parental leave was 77.5%; Edgecore's was 50%. As no JoyTech employees applied for parental leave without pay in 2022, there is no retention rate data available. Due to local regulations, Vietnam Accton has not implemented a parental leave without pay system and currently follows the local government laws.</li> <li>Vietnam Accton supports pregnant employees; those who are 7 months pregnant or more receive one hour of paid maternity leave daily until childbirth and are offered 6 months of maternity leave (including time off for prenatal appointments); and provide one hour of paid nursing leave daily upon return to work until the child is one year old.</li> <li>Vietnam Accton provides a monthly childcare allowance of 100,000 VND for female employees with children under 6 years old.</li> <li>Vietnam Accton encourages learning among employees' children and offers a scholarship of 500,000 VND for outstanding students.</li> <li>Vietnam Accton has an emergency assistance mechanism to support employees with severe illnesses or facing life hardships, and provides humanitarian aid to those externally affected by natural disasters who are left destitute.</li> <li>There is a cozy "Employee Care Room" within the factory plant, where professional staff provide a private, confidential, warm, and relaxing environment for employees to express and address their emotions.</li> </ol>	<ol style="list-style-type: none"> <li>The employee turnover rate at Accton was 16%.</li> <li>Edgecore turnover rate of 10%.</li> <li>The employee turnover rate at JoyTech was 37%.</li> <li>The employee turnover rate at Vietnam Accton was 15%.</li> <li>Accton, Edgecore, JoyTech, and Vietnam Accton organize family days, club activities, Accton Talk seminars, and related subsidized activities each year to make employees feel supported and help them learn, love, and have fun at work to increase employees' solidarity.</li> <li>Accton and Edgecore reinstatement rate after parental leave of 88%.</li> <li>JoyTech reinstatement rate after parental leave of 100%.</li> </ol>	<ol style="list-style-type: none"> <li>The employee turnover rate at Accton was 14%.</li> <li>Edgecore turnover rate of 8%.</li> <li>The employee turnover rate at JoyTech was 30%.</li> <li>The employee turnover rate at Vietnam Accton was 10%.</li> <li>Organize employee activities and subsidized activities to strengthen organizational culture and increase employees' solidarity.</li> <li>Attain an overall 90% reinstatement rate after parental leave.</li> </ol>
<p><b>We strictly follow international human rights standards to establish good labor-management relations.</b></p>	<ol style="list-style-type: none"> <li>Number of violations of ethical standards reviewed each month.</li> <li>Accton and JoyTech maintain an annual RBA labor ethics risk rating of less than 5.</li> <li>100% RBA labor ethical training completion rate for Accton and JoyTech.</li> </ol>	<ol style="list-style-type: none"> <li>Ensure compliance with international human rights standards.</li> <li>The annual RBA labor ethics risk assessment for Accton, JoyTech, and Vietnam Accton is maintained at below 5.</li> <li>Regular audits confirm there are no cases of ethical violations.</li> <li>100% RBA labor ethical training completion rate for Accton,</li> </ol>	<p>Regularly review labor regulations and international human rights standards, create harmonious labor relations, and fulfill corporate social responsibilities.</p>

## I. Labor Resource Structure

Employees are Accton's most valuable asset. Accton has always firmly believed that talent is the most important aspect for sustainability of a company. We are therefore committed to providing employees with high-quality jobs, including offering a competitive salary and benefits, comprehensive advancement with professional development pathways, and a safe workplace. We also establish a workplace environment suitable for continuous learning and fun to attract and retain top talent.

By the end of 2023, Accton employed 3,369 people and 1,649 non-employee workers (such as dispatch, resident staff, cleaners, security, and contractors, who are not included in subsequent manpower statistics), with 98.3% on indefinite contracts and 1.7% on fixed contracts; Edgecore's employee count at the end of 2023 was 157.

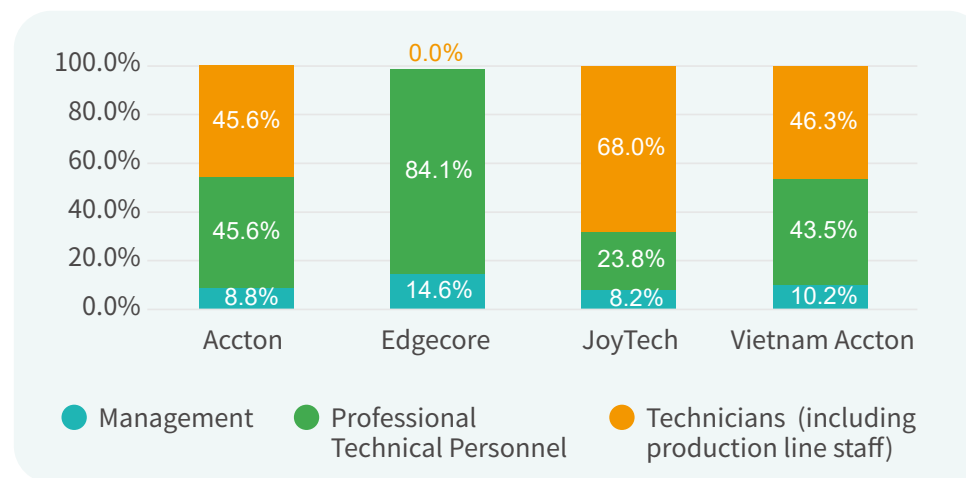
In terms of employment contracts, 98.7% are on indefinite contracts for regular employees and 1.3% on fixed contracts. JoyTech had 1,157 employees, with 67 non-employee workers (such as dispatch, onsite staff, cleaners, security, and contractors, not included in subsequent manpower statistics), where 28.6% are on indefinite contracts and 71.4% on fixed contracts (indefinite contract: according to legal provisions, upon completing 10 years of service or signing a labor contract for the third time; fixed contract explained: according to legal provisions, new employees sign fixed labor contracts based on the stipulated probation period). Vietnam Accton employed a total of 322 employees and 23 non-employee workers (such as resident staff, security, and contractors, not included in subsequent manpower statistics), with 0% on indefinite contracts and 100% on fixed contracts (indefinite contract: according to legal provisions, upon completing 10 years of service or signing a labor contract for the third time; fixed contract explained: according to legal provisions, new employees sign fixed labor contracts based on the stipulated probation period).

When classified according to the type of employees, Accton's professional technical personnel and managerial personnel account for 54.4% of all full-time employees, while technicians (including production line assistants) make up 45.6%, indicating a predominance of professional and managerial personnel. At Edgecore, which does not have production lines, managerial positions constitute 14.6% of the regular workforce, while professional technical personnel make up 84.1%. At JoyTech, professional technical personnel and managerial personnel represent 32% of the regular employees, and technicians (including production line assistants) make up 68%, showing that JoyTech primarily focuses on production and manufacturing. In Vietnam Accton, professional technical personnel and managerial personnel account for 53.7% of Vietnam Accton's regular employees, and technicians (including production line assistants) make up 46.3%, indicating a predominance of professional and managerial personnel in Vietnam Accton.

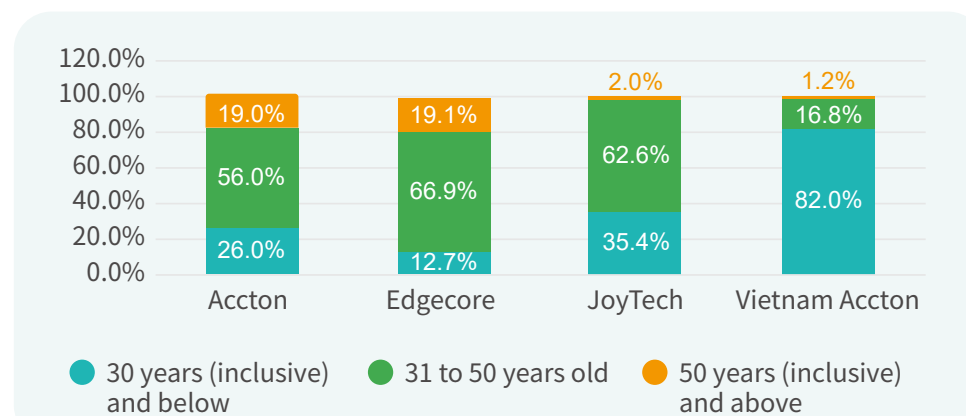
Looking at the age distribution of employees, Accton's workforce includes 26% of regular employees aged 30 (inclusive) and under, 56% aged 31 to 50, and 19% aged 50 (inclusive) and above, indicating a workforce skewed towards the younger and middle-aged generations. Similarly, Edgecore's age structure also leans towards the younger and

middle-aged generations, with 12.7% of regular employees under 30 (inclusive) years old, 66.9% between 31 and 50, and 19.1% aged 50 (inclusive) and above. JoyTech's workforce is notably younger, with 35.4% of regular employees under 30 (inclusive) years old, 62.6% between 31 and 50, and only 2% aged 50 (inclusive) and above. In contrast, Vietnam Accton shows a significant tilt towards youth, with 82% of regular employees under 30 years old (inclusive), 16.8% between 31 and 50, and just 1.2% aged 50 (inclusive) and above, highlighting a predominantly younger workforce in Vietnam.

### ◆ Employee Category Ratio



### ◆ Age Ratio



## 1. Recruitment of Local Employees and Management Talent

The Company aims to fulfill social obligations and create job opportunities for local residents. As of the end of 2023, 71.6% of Accton's full-time employees and 96.2% of Edgecore's full-time employees were local hires. In addition, 100% of JoyTech and Vietnam Accton's full-time employees were local hires.

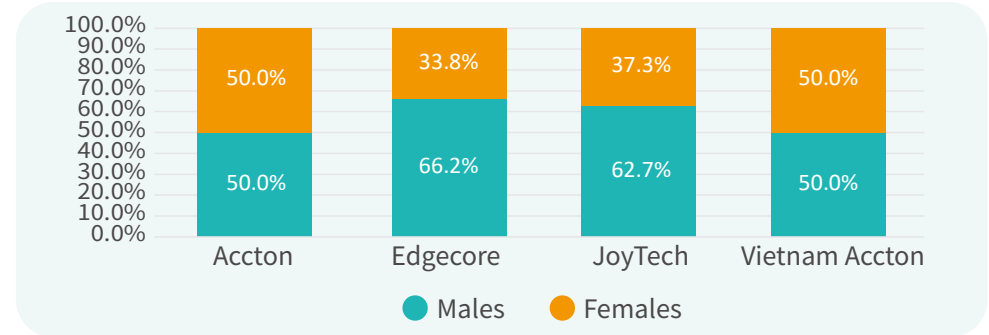
## 2. Distribution of Female Workers

When recruiting, employing, and developing employees, Accton, Edgecore, JoyTech, and Vietnam Accton all base decisions on employees' work capabilities. Gender-wise, Accton has an equal distribution of 50% male and 50% female full-time employees. At Edgecore, 66.2% of full-time employees are male, and 33.8% are female. This distribution is due to Edgecore's focus on technology and R&D, which predominantly attracts male candidates in the job market. JoyTech, which is production and manufacturing technology-oriented, has 62.7% male and 37.3% female full-time employees, while Vietnam Accton has a balanced 50% male and 50% female full-time employee ratio. Additionally, due to the nature of the tech industry and job market factors, Accton's management and professional technical personnel are predominantly male, with 75.2% of management roles and 64.9% of professional technical roles occupied by men. Conversely, technicians (including production line assistants) are predominantly female, accounting for 69.8% of this category. Edgecore's male management accounts for 69.6% of this category and professional technical roles account for 65.2%. At JoyTech, men occupy 67% of management roles and 66.7% of technician roles (including production line assistants), while women hold 50.5% of professional technical roles.

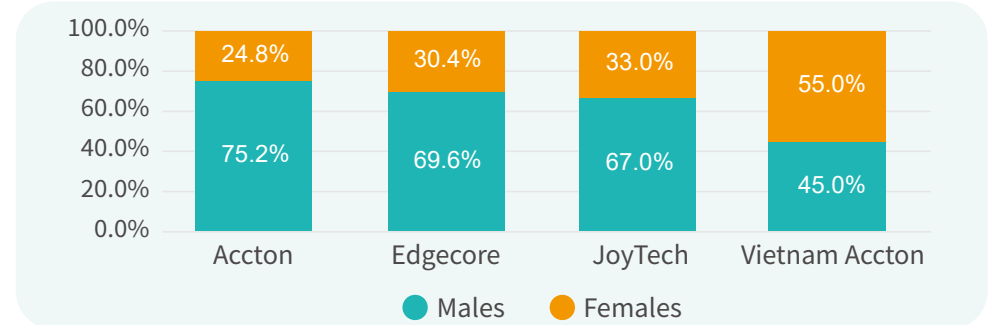
Accton employs meritocracy, treats people equally, and supports gender equality in the workplace. Under the fair promotion system, in 2023, the proportion of females in various management levels was highest at the grassroots level in Accton and Vietnam Accton, at 35.9% and 54.5%, respectively. Edgecore and JoyTech had the highest proportion of females at the middle management level, at 33.3% and 39.3%, respectively. This demonstrates that with the promotion of workplace equality, excellent work capabilities, and comprehensive promotion channels, female employees are encouraged to pursue career and personal growth opportunities.

Proportion of Female Employees at Different Levels of Management Positions	Accton	Edgecore	Joy Technology (JoyTech)	Vietnam Accton
Front-line management positions	35.9%	0.0%	29.9%	54.5%
Mid-level management positions	14.3%	33.3%	39.3%	0.0%
Senior-level management positions	20.3%	28.6%	0.0%	0.0%

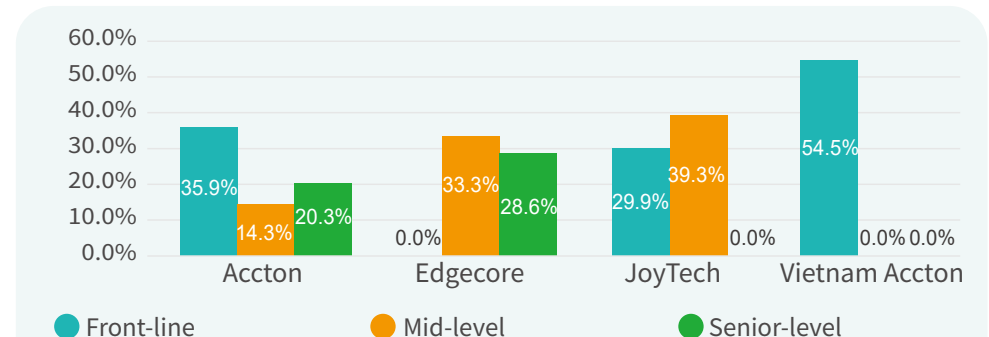
### ◆ Gender Ratio



### ◆ Gender Ratio of Management Employees



### ◆ Proportion of Female Employees at Different Levels of Management Positions





### 3. Diverse Talent Composition and Inclusion

We actively recruit talent in response to global talent requirements and the need to increase innovation and R&D capacity. Accton, Edgecore, JoyTech, and Vietnam Accton have adopted merit-based recruitment and identification of the corporate culture as the core values for talent recruitment. We aim to build professional teams composed of diverse talents, fostering an environment of equal development, respect, and inclusion to enhance team cohesion and provide better products and services. In 2023, Accton employed a total of 956 foreign employees, accounting for 28.4% of full-time employees. Edgecore employed 6 foreign employees, representing 3.8% of full-time employees. JoyTech and Vietnam Accton fully localized their workforce, employing only local hires. The diverse nationalities of our talent pool include employees from the United States, Mexico, the United Kingdom, China, Japan, South Korea, India, the Philippines, Indonesia, Malaysia, Germany, Hong Kong, and Vietnam. Through the recruitment of international talent, we aim to enhance our professional and international capabilities.

### 4. Continued Employment of Persons with Disabilities

Accton and Edgecore have been committed to providing jobs for people with physical and mental disabilities. Accton has employed a total of 15 persons with mild and moderate physical and mental disabilities, and 4 persons with severe or above physical and mental disabilities. Edgecore employed 1 person with severe mental and physical disabilities, achieving a 71.4% increase in the employment rate for persons with disabilities compared to 2022. Due to the nature of Accton's industry and work, the number of applicants with disabilities remains insufficient, and the weighted employment ratio for the year did not reach 1% of the total workforce. Consequently, the Company has paid the required compensation fee as stipulated by law. Accton continues to actively match relevant job vacancies and build an equal, diverse, and inclusive environment, while Edgecore fulfills its full employment obligations.

#### ◆ Relevant charts/data information:

Region	Category	Category	Males		Females		Number of Employees	Proportion of Total Employees (%)
			Number of People	Percentage in the Category (%)	Number of People	Percentage in the Category (%)		
Accton	Employment Contract	Full-time Employee - Indefinite Contract	1,647	49.7	1,666	50.3	3,313	98.3
		Full-time Employee - Fixed-term Contract	38	67.9	18	32.1	56	1.7
		Non-employed Workers	1,471	89.2	178	10.8	1,649	32.9
	Employment Type	Full-time	1,669	49.8	1,684	50.2	3,353	99.5
		Part-time	16	94.1	1	5.9	17	0.5
	Age Distribution	30 years (inclusive) and below	374	43.5	486	56.5	860	26.0
		31-50 years	1,064	56.4	822	43.6	1,886	56.0
		50 years (inclusive) and above	247	39.6	377	60.4	624	19.0
	Employee Category	Management	224	75.2	74	24.8	298	8.8
		Non-management roles	Professional Technical Personnel	998	64.9	539	35.1	1,537
Technicians (including production line assistants)			463	30.2	1,072	69.8	1,535	45.6



Region	Category	Category	Males		Females		Number of Employees	Proportion of Total Employees (%)	
			Number of People	Percentage in the Category (%)	Number of People	Percentage in the Category (%)			
Edgecore	Employment Contract	Full-time Employee - Indefinite Contract		102	65.8	53	34.2	155	98.7
		Full-time Employee - Fixed-term Contract		2	100.0	0	0.0	2	1.3
		Non-employed Workers		0	0.0	0	0.0	0	0.0
	Employment Type	Full-time		100	65.4	53	34.6	153	97.5
		Part-time		2	0.0	0	0.0	2	1.3
	Age Distribution	30 years (inclusive) and below		14	70.0	6	30.0	20	12.7
		31-50 years		69	65.7	36	34.3	105	66.9
		50 years (inclusive) and above		19	63.3	11	36.7	30	19.1
	Employee Category	Management		16	69.6	7	30.4	23	14.6
		Non-management roles	Professional Technical Personnel	86	65.2	46	34.8	132	84.1
Technicians (including production line assistants)			0	0.0	0	0.0	0	0.0	
Joy Technology (JoyTech)	Employment Contract	Full-time Employee - Indefinite Contract		198	59.8	133	40.2	331	28.6
		Full-time Employee - Fixed-term Contract		527	63.8	299	36.2	826	71.4
		Non-employed Workers		44	0.0	23	0.0	67	5.8
	Employment Type	Full-time		725	62.7	432	37.3	1,157	100.0
		Part-time		0	0.0	0	0.0	0	0.0
	Age Distribution	30 years (inclusive) and below		281	68.5	129	31.5	410	35.4
		31-50 years		428	59.1	296	40.9	724	62.6
		50 years (inclusive) and above		16	69.6	7	30.4	23	2.0
	Employee Category	Management		64	67.0	31	33.0	95	8.2
		Non-management roles	Professional Technical Personnel	136	49.5	139	50.5	275	23.8
Technicians (including production line assistants)			525	66.7	262	33.3	787	68.0	



Region	Category	Category	Males		Females		Number of Employees	Proportion of Total Employees (%)	
			Number of People	Percentage in the Category (%)	Number of People	Percentage in the Category (%)			
Vietnam Accton	Employment Contract	Full-time Employee - Indefinite Contract	0	NA	0	NA	0	0.0	
		Full-time Employee - Fixed-term Contract	161	50.0	161	50.0	322	100.0	
		Non-employed Workers	7	0.0	16	0.0	23	7.1	
	Employment Type	Full-time	161	50.0	161	50.0	322	100.0	
		Part-time	0	0.0	0	0.0	0	0.0	
	Age Distribution	30 years (inclusive) and below	137	51.9	127	48.1	264	82.0	
		31-50 years	24	44.4	30	55.6	54	16.8	
		50 years (inclusive) and above	0	0.0	4	100.0	4	1.2	
	Employee Category	Management	15	45.0	18	55.0	33	10.2	
		Non-management roles	Professional Technical Personnel	67	47.9	73	52.1	140	43.5
			Technicians (including production line assistants)	79	53.0	70	47.0	149	46.3

Note 1: Full-time employees with indefinite contract: Employees signing an indefinite term contract.

Note 2: Full-time employees with a fixed-term contract: Employees signing a fixed-term contract, such employees with a short-term contract, interns, and student participants.

Note 3: Non-employed workers: Dispatched personnel, resident personnel, flexible labor, cleaning personnel, security personnel, and contractors' onsite personnel.

Note 4: Full-time employees: Employees with regular work hours.

Note 5: Part-time employees: Employees on an hourly salary system with work hours lower than regular work hours, such as employees from indirect units.

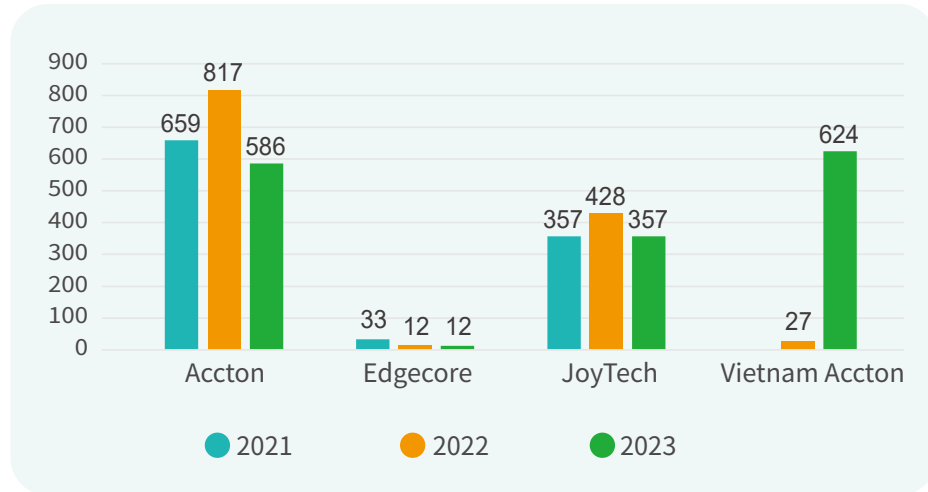
Note 6: Definitions of management roles: Employees who are responsible for leading subordinates, such as section chiefs or assistant managers or above.

Note 7: Definitions of technicians (including production line assistants): Personnel directly related to production activities such as technicians, quality management personnel, and warehouse management personnel.

Note 8: Definitions of professional technical personnel: Management specialists or engineers directly related to production activities such as quality management specialists, product management specialists, R&D engineers, sales specialists, and human resources specialists.



◆ Number of New Employees



2. Diverse Recruitment Channels

To attract outstanding talent in a competitive market, Accton actively employs diverse recruitment channels, including official websites, job banks, campus recruitment, various job fairs, social media, internal referrals, and corporate internships.

3. Campus Recruitment Internship Briefing Events

Accton, Edgecore, and Vietnam Accton have actively participated in campus recruitment and internship briefing events in recent years. These activities aim to share the Company's core values and corporate culture with young students, assist them in exploring future careers, and attract outstanding talent through face-to-face interactions. In 2023, we participated in 8 campus recruitment events and partnered with the Hsinchu County Government for the "Digital Innovation Youth Training Program," involving 14 students. This program not only establishes brand image and marketing but also provides diverse internship experiences and reserves outstanding talent. Outstanding interns are given priority for conversion to full-time positions, creating a win-win situation. In 2023, Accton had 53 interns, with 18 converted to full-time positions, achieving a conversion rate of 34%. Edgecore had 2 interns continuing their internship programs. Vietnam Accton participated in 1 campus recruitment event, with 7 interns continuing their internship programs. JoyTech has no relevant information because the local government has not promoted the student internship system.

◆ Relevant charts/data information:

Ratio of New Employees																					
Age/ Gender/ Item		Number of Full-time Employees	New employees						30 years (inclusive) and below				31 to 50 years old				50 years (inclusive) and above				
			2023	Year New Hire Rate (%)	Number of New Employees	Male	Ratio (%)	Female	Ratio (%)	Male		Female		Male		Female		Male		Female	
										Number of People	Ratio (%)	Number of People	Ratio (%)	Number of People	Ratio (%)	Number of People	Ratio (%)	Number of People	Ratio (%)	Number of People	Ratio (%)
Region	Accton	3,369	17.8	586	325	9.6	261	7.7	172	5.1	149	4.4	139	4.1	106	3.1	14	0.4	6	0.2	
	Edgecore	157	7.6	12	8	5.1	4	2.5	4	2.5	0	0.0	4	2.5	4	2.5	0	0.0	0	0.0	
	Joy Technology (JoyTech)	1,157	30.1	357	245	21.2	112	9.7	171	14.8	74	6.4	74	6.4	38	3.3	0	0.0	0	0.0	
	Vietnam Accton	322	357.6	624	283	87.9	341	105.9	231	71.7	258	80.1	52	16.1	78	24.2	0	0.0	5	1.6	

Note 1: The annual new hire rate does not include workers not hired by the Company: dispatched personnel, resident personnel, flexible labor, cleaning personnel, security personnel, and contractors' onsite personnel.

Note 2: The annual new hire rate is the total number of new hires/annual average number of employees (including dispatched personnel, resident personnel, flexible labor, cleaning personnel, security personnel, and contractors' onsite personnel) at the end of the current year. (Unit: person/year)

Note 3: Male (female) new hire rate: Number of new male (female) full-time employees in the current year/number of full-time employees at the end of the current year.





◆ Relevant charts/data information :

Ratio of Separated Employees																				
Age/ Gender/ Item		Number of Full-time Employees	Separated Employees						30 years (inclusive) and below				31 to 50 years old				50 years (inclusive) and above			
			Annual Turnover Rate (%)	Total Separated Employees	Male	Ratio (%)	Female	Ratio (%)	Male		Female		Male		Female		Male		Female	
		2023							Number of People	Ratio (%)	Number of People	Ratio (%)	Number of People	Ratio (%)	Number of People	Ratio (%)	Number of People	Ratio (%)	Number of People	Ratio (%)
Region	Accton	3,369	9.6	318	131	3.9	187	5.6	45	1.3	64	1.9	77	2.3	120	3.6	9	0.3	3	0.1
	Edgecore	157	7.6	12	6	3.8	6	3.8	2	1.3	0	0.0	4	2.5	6	3.8	0	0	0	0.0
	Joy Technology (JoyTech)	1,157	35.2	418	286	24.5	135	11.7	195	16.9	82	7.1	86	7.4	50	4.3	2	0.2	3	0.3
	Vietnam Accton	322	173.1	302	122	37.9	180	55.9	94	29.2	131	40.7	28	8.7	48	14.9	0	0	1	1.3

Note 1: The annual turnover rate does not include workers not hired by the Company: dispatched personnel, resident personnel, flexible labor, cleaning personnel, security personnel, and contractors' onsite personnel.

Note 2: Employee turnover statistical data does not cover the following factors: death, retirement, lawful dismissal, layoffs, expiry of the internship, expiry of employment contract, transition from contractual to permanent positions, or internal transfers within the Group.

Note 3: The annual turnover rate is the total employee turnover/annual average number of employees [(number of workers in service in December of the previous year + number of employees in service at the end of the current year)/2].

Note 4: Male (female) turnover rate: Number of male (female) full-time employee turnover in the current year/number of full-time employees at the end of the current year.



Employee Turnover Rate				
Region	Year	Number of People	Separated Employees	Annual New Hire Rate (%)
Accton	2023	3,369	318	9.6
	2022	3,225	430	13.9
	2021	2,955	415	14.3
	2020	2,867	316	11.7
	2019	2,541	505	24.5
Edgecore	2023	157	12	7.6
	2022	159	16	9.6
	2021	174	67	34.6
	2020	213	13	7.1
	2019	154	25	16.9
Joy Technology (JoyTech)	2023	1,157	418	35.2
	2022	1,218	446	36.3
	2021	1,236	542	40.8
	2020	1,421	656	41.1
	2019	1,770	658	37
Vietnam Accton	2023	322	302	173.1
	2022	27	0	0

### III. Benefits for Full-Time Employees

#### 1. Comprehensive Insurance Plans

Employees are Accton, Edgecore, JoyTech, and Vietnam Accton's key to sustainable development. Taking care of employees and providing them with a caring work environment and life are our basic tenets. During their employment, Accton and Edgecore ensure that employees and their families are protected in cases of hospitalization due to illness or injury, and provide financial security in the event of death or disability. This coverage includes six types of insurance: term life insurance, accident insurance, accidental injury medical insurance, hospitalization medical insurance, cancer medical insurance (including initial cancer diagnosis insurance and cancer death insurance), and occupational accident insurance. In addition to coverage for spouses and children, parents are also included under favorable conditions for employees to insure their loved ones. Employees or their spouses can renew their insurance up to the age of 70. If both spouses are employees, each is insured separately under their employee status. Children can be insured up to the age of 25 if unmarried, and can be insured for accident insurance from the age of 15. Parents can be insured up to the age of 85. JoyTech provides five types of social insurance, including retirement pension insurance, medical insurance, work injury insurance, unemployment insurance, and maternity insurance. It also provides employees with commercial critical illness insurance and group employer's liability insurance as supplementary insurance policies. The Company aims to provide employees with financial support in the event of an accident.

Vietnam Accton provides statutory pensions, medical insurance, work injury insurance, maternity insurance, unemployment insurance, and sick leave insurance for employees to take care of sick children.

#### 2. Love in Accton - Childbirth Benefits

Employees are crucial for the Company's sustainable development. We must help employees bring their role into full play and uphold the care for employees and their families as the most important responsibility. Accton and Edgecore launched the "marriage allowance" to encourage employees to start families. Company employees that marry each other are entitled to NT\$3,000 of allowance per month per person, totaling NT\$6,000 for each couple. The program is designed to express Accton and Edgecore's positive support for family values.

To support female employees, the Company has dedicated parking spaces for pregnant mothers and appointed professional nurses to provide health consultation and health education to pregnant employees before, during, and after childbirth. We provide pregnant employees with gifts and encourage them to report their pregnancies. We also provide employees with postpartum care as well as the right to unpaid parental leave in accordance with regulations. Vietnam Accton supports pregnant employees; those who are 7 months (inclusive) pregnant or more receive one hour of paid maternity leave daily until childbirth and are offered 6 months of maternity leave (including time off for prenatal appointments); and provide one hour of paid nursing leave daily upon return to work until the child is one year old.

### 3. First Accton Kindergarten

In 1997, Accton pioneered the establishment of a kindergarten and daycare center in the Hsinchu Science Park to create a secure, friendly, and happy work environment and to alleviate the burden of commuting for employees. The daycare center accepts children aged two months to six years.

The daycare center accepts babies under two years old and provides meticulous physical care while also addressing "education" and "nurturing" needs to support development at each stage. The center focuses on developing self-care skills and good habits in infants and toddlers.

The kindergarten uses a child-centered teaching model, focusing on providing a comfortable and conducive learning environment, activity content, and emotional management. Based on children's interests, group discussions determine themes, which are then extended to parent-child activities to showcase learning outcomes. The goal is to enhance the relationship between parents and children, improve mutual understanding and trust, help children develop various skills and interests, and boost their social abilities and sense of self-awareness.

Vietnam Accton offers a childcare allowance of 100,000 VND per household for female employees with children under six years old.



### 4. Leave Policies Superior to Statutory Requirements

Since 2022, Accton and Edgecore have provided employees with two days of flexible leave per quarter, exceeding statutory requirements to help achieve a good work-life balance.

Accton and Edgecore are committed to creating a thoughtful and people-oriented organizational culture. If an employee requires long-term leave due to a major injury or illness, the employee may apply for a one-year leave with pay. To support employees' medical treatment, we also provide transportation to and from medical appointments. We understand employees' feelings and needs and we aim to provide them the strongest support and heartwarming care. Additionally, to fulfill corporate social responsibility and encourage community involvement, the Company offers two days (16 hours) of volunteer leave, allowing employees to participate in corporate social activities and demonstrate care for society through concrete actions.

### 5. Diverse Benefits and Subsidies

Accton and Edgecore employees enjoy general benefits such as labor insurance, health insurance, and pension benefits. Additionally, the Company provides extra benefits including group insurance for employees, accident insurance for family members, and major injury and burn insurance. Other benefits include annual holiday bonuses, profit-sharing, employee stock options for long-term employees, emergency aid, marriage and childbirth allowances, hospitalization subsidies, lunch allowances, free dinners, employee dormitories, sexual harassment prevention, health checkups superior to regulatory requirements, health lectures, and various measures to manage employee health.

For Vietnam Accton employees, in addition to social insurance, medical insurance, and pension benefits, free meals (three meals a day and snacks), free health check-ups are provided for new and regular employees, on-site services by certified medical staff (nurses), sexual harassment prevention, and an employee care room to address both physical and mental well-being.

Accton has established an Employee Welfare Committee in accordance with the law, which is committed to balancing employees' work and life, caring for their physical and mental health, financial support for families and living conditions, and offering diverse learning opportunities. We set up annual plans and budgets every year for children's scholarships, bereavement subsidies, gift coupons for festivals and birthdays, movie tickets, group travel subsidies and travel activities for employees, family days, club activities, volunteer activities, ball games or physical endurance competitions, special merchant discounts, private movie screenings, employee care actions, and ESG sustainability activities. In 2023, Accton held a special 35th Anniversary Group Sports Day, with over 3,000 employees and their families participating. The event featured five major athletic competitions, bonus point competitions, parent-child races, fun obstacle courses, a children's play area, and DIY experiences. Each team demonstrated excellent teamwork demonstrating the corporate DNA of bravery, passion, perfection, trust, and collaboration, striving to achieve the best results for their team. Accton hopes that comprehensive welfare measures will help employees relax and maintain a balanced life.

Vietnam Accton has also established a union according to law, aiming to maximize its functions and regularly hold meetings to actively promote labor-management harmony. The union sets an annual budget, planning items such as scholarships for outstanding employees' offspring, holiday bonuses or gifts, funeral subsidies, hospitalization subsidies, maternity allowances, wedding gifts, club activities, sports competitions, club subsidies, emergency aid, and more. These activities aim to foster a sense of learning, recognition, belonging, and happiness among employees and their families, seamlessly integrating these feelings into the Vietnam Accton community.





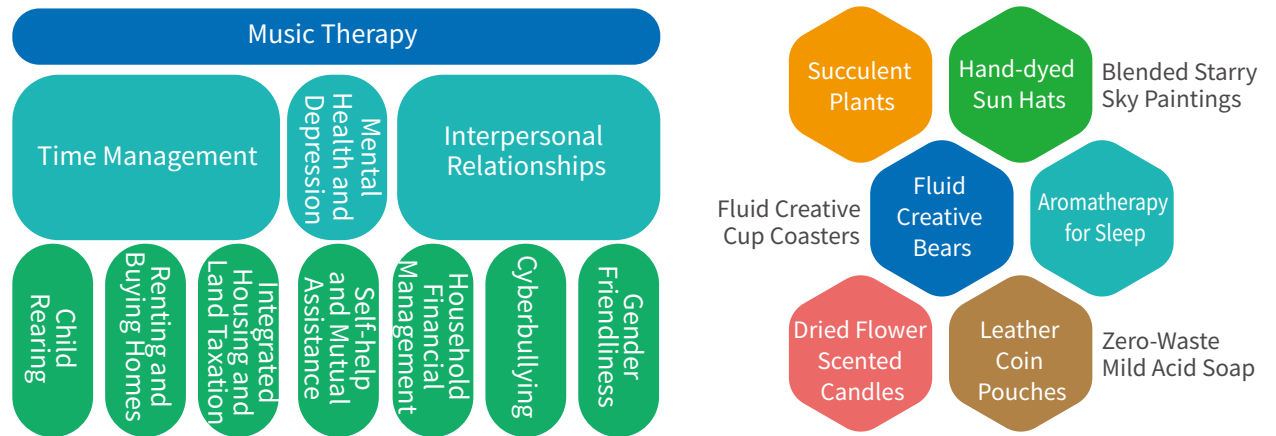
## IV. Employee Care

### 1. Multifaceted Life and Mental Health Stress Relief Lectures and Handcraft Courses

Accton prioritizes the mental and physical well-being of its employees and their families. In 2023, we maintained our commitment by offering a range of lectures and courses focused on life skills and stress relief for mental health. These initiatives aim to provide employees with diverse learning opportunities, improve their psychological well-being, and bolster their ability to prevent problems before they arise.

The themes covered in 2023 included time management, workplace gender friendliness, interpersonal communication, legal knowledge, family finances, taxes, renting and buying homes, and emotional and mental stress adjustment. Additionally, hands-on courses were offered on topics such as horticultural therapy, zero-waste handmade soap, aromatherapy, painting, and indigo dyeing.

By offering both online lectures and in-person courses, we aim to help employees achieve a better work-life balance while also allowing them to share newly acquired knowledge with their families, thereby fostering better family relationships. A total of 35 sessions were held, with 2,279 participants and 68.5 total class hours.



### 2. Employee Care Bulletins

Accton has combined various care themes to create bulletins on topics such as personal growth, current events, health and nutrition, finance, law, light reading, heartwarming quotes, and movie quotes. These bulletins are posted in restrooms, bulletin boards, break rooms, and dining areas, allowing employees to gain new knowledge or relax their minds through brief and engaging content. A total of 42 bilingual (Chinese and English) care bulletins were published, and over 88% of employees reported that these bulletins were very helpful to their mental and physical health. Employees shared that they felt encouraged, had their spirits lifted, could temporarily relieve work stress, and gained inspiration for both work and life. They expressed affirmation of the Company's warmth and care.



### 3. Accton J!YO! Mental Health Relief YouTube Channel

In addition to in-person lectures, the second half of 2023 saw the establishment of the "Accton J!YO! Mental Health Relief" YouTube channel. Each quarter, the channel features different themed content such as interpersonal relationships, parenting, current events, and emotions. Prior to each episode, employees are invited to submit their questions or thoughts on the topic via an online survey. Psychologists or expert scholars are occasionally invited to join and address these questions. This channel helps employees who cannot attend online lectures or courses due to work commitments gain new knowledge. The channel accumulated a total of 389 views.



## V. Diversity, Equity, and Inclusion (DEI)

### SDGs Goal 10 | Reduce inequality within and among countries

#### 1. The Warmth of Coffee - Seeing Infinite Possibilities: Visually Impaired Coffee Train

Accton places great value on professionalism and strives to create diverse, inclusive, and equal opportunities. In March 2023, Accton hired two professional visually impaired baristas to lead a series of inclusive coffee experiences. All proceeds from the coffee sales, after covering costs, are directed to the "Accton Coffee Train" charity fund.

Respect and empathy are fundamental qualities that everyone should cultivate. Accton believes that through firsthand experiences and understanding, employees can naturally integrate a sense of diversity, equity, and inclusion into the workplace. This involves abandoning prejudices and stereotypes, and learning to accept, appreciate, and respect each other. By opening their hearts and minds, employees can engage with different groups and increase their awareness of equality and destigmatization. Through their professional abilities, they can demonstrate the diverse employment opportunities available for people with disabilities.

#### 2. Hand-Brewed Coffee Charity Sale

Starting in March, a weekly hand-brewed coffee charity sale was launched in the Taipei office and the Hsinchu headquarters, offering various flavors of coffee for employees to enjoy conveniently. While waiting for their coffee, employees voluntarily assist the baristas by refilling hot water, organizing the workspace, designing coffee cup positioning models, and creating promotional materials, demonstrating empathy and mutual assistance.

#### 3. Hand-Brewed Coffee Course

In August, the "Coffee for You - Learning to Become a Coffee Expert" hand-brewed coffee course was launched, taught by visually impaired baristas. They shared their practical experiences and guided employees step by step into the world of coffee. The first step of the course involved blindfolded coffee brewing, encouraging participants to amplify their other senses and understand the challenges faced by visually impaired baristas. Through each session, employees not only gained coffee-making skills but also learned empathy and acceptance, supporting a diverse and inclusive workplace. The course had two sessions with a total of 103 participants.

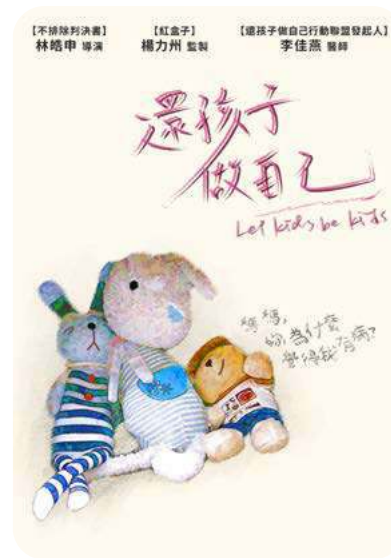


## VI. ESG Sustainable Actions

### SDGs Goal 4 | Quality Education

#### 1. Diversity and Equality - Weirdo Film Forum

To foster a diverse and equitable workplace, Accton collaborated with the GX Foundation for the "Weirdo Film Series" in the second half of 2023. Four documentaries were selected, and the protagonists were invited to engage in conversations with employees. The themes included "Fatbulous Me" discussing body equality, "Dear Period" on menstrual equality, "Let Kids Be Kids" and "Kites That Cannot Fly Freely" on children's rights, aiming to provide employees with different perspectives and insights. The goal was to help employees learn to appreciate others' values, reduce stigmatization, and lower discrimination, with a total of 175 participants.



#### 2. SDGs Knowledge King Challenge

In 2015, the United Nations announced the "2030 Sustainable Development Goals" (SDGs), including 17 goals to address issues like poverty eradication, climate change mitigation, and gender equality. These goals guide global efforts towards sustainability. Accton organized the "SDGs Knowledge King Challenge," allowing employees from the northern, central, southern regions, and production centers to participate through online quizzes, gradually building sustainability awareness. The event saw a total participation of 650 employees.

**2023 Accton Cup SDGs The King of Knowledge Challenge 知識王挑戰賽**

由於氣候變遷、經濟成長、社會平權、貧富差距等議題如重兵壓境，2015年，聯合國宣布了「2030 永續發展目標」(Sustainable Development Goals, SDGs)，包含消除貧窮、減緩氣候變遷、促進性別平權等17項 SDGs 目標，指引全球共同努力、邁向永續。

身為地球保衛隊一員的你，這17個改變世界的方法，你了解幾個呢？趕快來挑戰看看！

In 2015, due to challenging issues such as climate change, economic growth, social equality, and wealth disparity, the United Nations announced the "2030 Sustainable Development Goals" (SDGs), which include eradicating poverty, mitigating climate change, and promoting gender equality. These 17 SDGs goals guide the world to work together towards sustainability.

As a member of the Earth, how many of these 17 world-changing approaches do you know? Let's have a challenge.

**挑戰期間 / 方式 Challenge Period / Method**

- 即日起-6/7 (三) -From now until June 7th (Wed.)
- 填寫線上測驗卷(總共20題，每題5分) -Fill in the online quiz (20 questions in total, 5 points for each question).

**抽獎資格 Eligibility for lucky draw**

總分 80分以上 就有機會抽中 Those who score 80 points or above will have a chance to win a Summer Super Chill Sustainable Gift Pack.

### 3. SDGs Accton Reading Initiative

To instill the concept of sustainability from an early age, Accton encourages employees to guide their children in co-reading sessions, fostering sustainability awareness through books. In September, Accton launched the "SDGs Accton Reading Initiative," preparing 17 picture books on SDGs themes, including gender equality, hunger and poverty eradication, reducing inequalities, climate action, good health and well-being, responsible consumption and production, etc., totaling 236 books. Employees were encouraged to share their reading insights, with 482 book borrowings recorded.

JoyTech legally established a labor union and created the "1+1 Emergency Assistance Fund" to promptly aid employees in need. The union also regularly organizes employee activities, club events, and provides year-end bonuses, meal subsidies, employee dormitories, annual health check-ups, and other welfare measures. These efforts aim to provide a sense of belonging and happiness to employees, linking various resources to strengthen corporate culture and stabilize employee relations.



### VII. Workplace Equality

Accton and Edgecore are dedicated to fostering a harmonious balance between work and family life. Alongside adhering to statutory maternity and paternity leave rights, we provide comprehensive leave management systems, enabling employees to utilize flexible leave policies for family care and apply for unpaid leave during major illnesses or other extended absences. This approach not only aids in attracting and retaining top-tier talent but also elevates employee morale and productivity.

Implemented in accordance with the "Act of Gender Equality in Employment," Accton and Edgecore offer an unpaid parental leave system applicable to both male and female employees. The application criteria include:

- (1) The employee must have completed at least six months of employment with the Company.
- (2) The youngest child must be under three years old.
- (3) Each application for unpaid parental leave must be for a minimum of no less than six months, with a maximum duration of two years per application.

Throughout the unpaid leave period, the Company proactively supports employees and manages matters related to their reinstatement to work, ensuring a seamless transition back to their original positions.

For instance, in 2023, Accton had 33 employees apply for unpaid parental leave, with 22 employees scheduled to return to work during the year. Of these, 18 returned on schedule, resulting in a reinstatement rate of 81.8%. Edgecore had 2 employees apply for unpaid parental leave in 2023, retention rate data is not yet available as their scheduled reinstatement dates had not yet arrived.

The retention rate refers to the proportion of employees who have worked for at least one year after reinstatement from unpaid parental leave. In 2023, Accton's retention rate stood at 77.8%, representing an increase from the 75% retention rate observed in 2022.

With regard to JoyTech, although the Chinese government has not promoted the parental leave without pay system, the Company is committed to promoting work and family life balance to create a friendly work environment. Therefore, the unpaid parental leave rules specified in its internal regulations allow both male and female employees to apply for leave. The eligibility rules include the following:

- (1) Having served for at least one year at the Company.
- (2) Having at least Grade B in the performance evaluation in the current year.
- (3) Each parental leave application is capped at 1 year.

In 2023, no staff in JoyTech applied for unpaid parental leave, and there was also no information on the reinstatement rate since no one had applied for unpaid parental leave in 2022.

Due to local regulations, Vietnam Accton has not implemented a parental leave without pay system and currently follows the local government laws.

**◆ Relevant charts/data information:**

Accton - Number of reinstated employees, reinstatement rate, and retention rate after parental leave by gender			
2023	Males	Females	Subtotal
Number of employees eligible for unpaid parental leave	120	87	207
Number of applicants for unpaid parental leave in the current year	4	29	33
Number of employees expected to be reinstated from unpaid parental leave in the current year (A)	3	19	22
Number of employees reinstated from unpaid parental leave in the current year (B)	2	16	18
Reinstatement rate (B/A) (%)	66.7	84.2	81.8
Number of employees reinstated from unpaid parental leave in the previous year (C)	4	14	18
Number of employees reinstated from unpaid parental leave in the previous year who have continuously worked for more than one year (D)	3	11	14
Retention rate (D/C) (%)	75.0	78.6	77.8

Edgecore - Number of reinstated employees, reinstatement rate, and retention rate after parental leave by gender			
2023	Males	Females	Subtotal
Number of employees eligible for unpaid parental leave	12	10	22
Number of applicants for unpaid parental leave in the current year	0	2	2
Number of employees expected to be reinstated from unpaid parental leave in the current year (A)	0	0	0
Number of employees reinstated from unpaid parental leave in the current year (B)	0	0	0
Reinstatement rate (B/A) (%)	NA	NA	NA
Number of employees reinstated from unpaid parental leave in the previous year (C)	0	2	2
Number of employees reinstated from unpaid parental leave in the previous year who have continuously worked for more than one year (D)	0	1	1
Retention rate (D/C) (%)	0.0%	50.0%	50.0%

JoyTech - Number of reinstated employees, reinstatement rate, and retention rate after parental leave by gender			
2023	Males	Females	Subtotal
Number of employees eligible for unpaid parental leave	46	78	124
Number of applicants for unpaid parental leave in the current year	0	0	0
Number of employees expected to be reinstated from unpaid parental leave in the current year (A)	0	0	0
Number of employees reinstated from unpaid parental leave in the current year (B)	0	0	0
Reinstatement rate (B/A) (%)	NA	NA	NA
Number of employees reinstated from unpaid parental leave in the previous year (C)	0	0	0
Number of employees reinstated from unpaid parental leave in the previous year who have continuously worked for more than one year (D)	0	0	0
Retention rate (D/C) (%)	NA	NA	NA

Note 1: The number of employees eligible for unpaid parental leave is those who have applied for maternity or paternity leave in the reporting period from January 1, 2021 to December 31, 2023.

Note 2: Reinstatement rate: Number of employees reinstated from unpaid parental leave in the current year/ Number of employees expected to be reinstated from unpaid parental leave in the current year \*100%

Note 3: Retention rate: Number of employees reinstated from unpaid parental leave who have continuously worked for more than one year/number of employees reinstated from parental leave \*100%.

## VIII. Minimum Notice Periods Regarding Operational Changes

### Protection of Labor Rights

Since their inception, Accton and Edgecore have empowered talent to fully utilize their roles and have prioritized care for employees and their families as their utmost responsibility. Our aim is to cultivate a worry-free working environment that enables employees to dedicate themselves to their work and enhances the Company's competitiveness. In addition to the active implementation of thoughtful management and various benefit measures, the Company learns about employees' ideas and needs at all times through various channels for the purpose of achieving sufficient communication, solving problems effectively, and promoting harmonious relations between employer and employees.

When significant operational changes occur in the Company that may affect employees' rights and various labor conditions, we comply with Article 16 of the Labor Standards Act. These changes may include:

1. Where the Company suspends or transfers operations
2. Where the Company sustains losses or reduction in business operations.
3. Where work is suspended for more than one month due to force majeure factors.
4. Where the Company changes the nature of its business and it is necessary to reduce the number of workers but has no suitable work for workers.
5. Where an employee is verified as unable to perform tasks required for his/her job.

Notices given based on work experience

1. Where a worker has worked continuously for more than 3 months but less than 1 year, the notice shall be given 10 days in advance.
2. Where a worker has worked continuously for more than 1 year but less than 3 years, the notice shall be given 20 days in advance.
3. Where a worker has worked continuously for more than 3 years, the notice shall be given 30 days in advance.

JoyTech provides a 30-day notice in accordance with Article 26 and Article 27 of the Labor Law of the People's Republic of China.

Accton and Edgecore strive to foster a harmonious atmosphere of mutual trust between labor and management. Various communication channels are utilized regularly to understand employees' satisfaction with management and welfare policies, enhancing conceptual communication and consensus building.

For Accton and Edgecore, a communication channel called "Employee Exchange" has been established on the Accton Portal, along with an open comment space, encouraging colleagues to offer suggestions regarding operational or management measures. This allows the voices and expectations of frontline employees to be directly conveyed to senior management, serving as a reference for continuous improvement and corporate governance.

Employees can also use the employee complaint hotline: (03) 577-0270, EXT 3119, and an email [hr885@accton.com](mailto:hr885@accton.com) and Accton Helper Line@ for employees to provide feedback.

JoyTech set up different communication channels including a QR code, a complaint mailbox, and telephone hotline to encourage employees to provide recommendations which are used for the Company's continuous improvements and exchange of ideas.

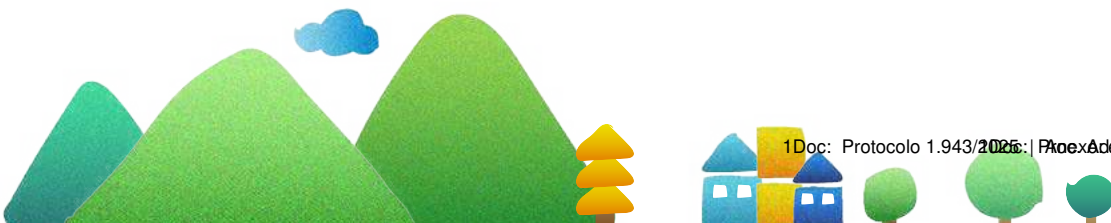
Vietnam Accton also provides an employee complaint email: [AcctonVnHr@accton.com.vn](mailto:AcctonVnHr@accton.com.vn), the Accton Line Helper APP, the union email: [CongdoanATVN@accton.com.vn](mailto:CongdoanATVN@accton.com.vn), and physical complaint points such as the Employee Care Room and the union office, offering diverse avenues for employees to voice their concerns.

Accton employed 956 foreign employees who account for 28.4% of all full-time employees in Taiwan. Further breakdown shows that Filipino workers make up the majority of foreign employees, with 921 individuals representing 96.3% of the total foreign workforce. Edgecore employs six foreign employees, making up 3.8% of its full-time employees, while JoyTech and Vietnam Accton employ 100% local staff.

Following the GRI Sustainability Reporting Standards, we disclose our human rights practices and achievements for all employees, including:

1. No incidents of discrimination have occurred.
2. No violation of freedom of association and collective bargaining rights.
3. Commitment to maintaining a workplace free of violence, harassment, and intimidation, as well as respect for the privacy and dignity of employees.
4. No hiring of child labor.
5. No incident of forced or compulsory labor.

Starting from a commitment to humane care, Accton implements human rights principles in daily operations, from gender equality to migrant worker rights, providing a work environment that exceeds statutory requirements. We also promote human rights due diligence in the supply chain, adhere to international norms, and fulfill corporate sustainability commitments.



## IX. All-round Care for Migrant Workers

Ensuring human rights is Accton's responsibility. We support international human rights policies and integrate them into our operations. We treat colleagues from different countries with the same care as family, fostering an inclusive, integrated, professional, and respectful work atmosphere.

### 1. Zero Placement Policy and Human Rights Equality

Accton fully implements the “zero placement” policies, and migrant workers do not have to pay any recruitment fees, such as intermediary fees, application fees, medical examination fees, service fees, etc. Non-discrimination and prohibition of harassment to ensure the migrant workers' freedom of employment and prevention of oppression.

### 2. Homestyle Meals and Accommodations

We provide Filipino-style meals using authentic sauces to ease migrant workers' homesickness. Accommodations include 2-4 person suites to improve living quality. The Company and dormitories have prayer rooms and sports facilities, and we organize festive activities, family days, and sports competitions to enrich migrant workers' lives when off-duty.

### 3. Economic Support and COVID-19 Care

Since the outbreak of COVID-19, Accton has taken responsibility for caring for migrant workers, providing full salary during quarantine periods, covering quarantine hotel and medical expenses, and supplying daily necessities. We arrange employee care to alleviate economic worries and organize new life under the pandemic activities to encourage employees to share their feelings and experiences through words and drawings to relieve psychological stress.

### 4. Maternal Protection and Warm Care

Pregnant migrant workers receive appropriate job adjustments based on their duties and environment, prenatal and postnatal education and care services, and maternity gifts. They also enjoy maternity subsidies and parental leave rights, ensuring the best care for our employees.

## 5. Employee Care and Emergency Assistance

We have established emergency assistance measures to mitigate losses caused by natural disasters. We provide emergency relief funds to help migrant workers rebuild their homes. In 2023, there were no applications for emergency assistance.

## 6. Talent Development and Promotion

We provide equal training and promotion channels. 25 migrant workers were promoted to production line supervisors in 2023. For outstanding employees, the Company proactively recommends them for recognition. Two employees were selected as Model Employees by the Hsinchu City Government, and one received the highest honor as a National Model Worker in 2023.

## 7. Farewell Parties for Senior Migrant Workers

Accton holds farewell parties for senior migrant workers who return home after the conclusion of their employment contracts, presenting them with crystal awards, thank-you cards, bouquets, and albums documenting their life in Taiwan. Supervisors and colleagues are invited to participate, expressing gratitude for their dedication. In 2023, no senior migrant workers returned home.

## 8. Regular Communication Meetings

Monthly communication meetings with dormitory leaders are arranged to discuss issues raised by migrant workers, such as meal supply and living needs. Solutions are provided for discussed problems, and the effectiveness of these solutions is monitored.

## 9. Promoting Sports and Forming Clubs

We encourage migrant workers to enhance their physical fitness and relieve psychological stress through sports, a basketball club was established in the second half of the year. The Employee Welfare Committee assisted in planning and lighting the dormitory basketball court. A basketball tournament was held at the end of the year, promoting a sports culture and fostering camaraderie among dorm mates, building a sense of overall identity.

## 10. Lunar New Year Celebration

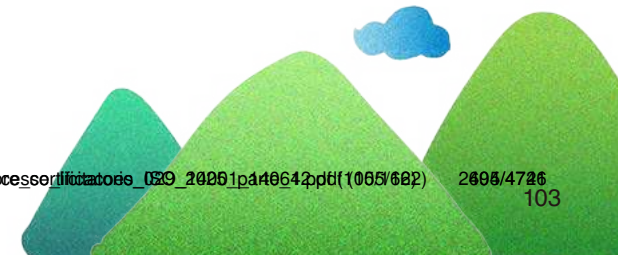
Cognizant of the challenges of migrant life in Taiwan, Accton ensures that migrant workers can celebrate Lunar New Year's Eve in their dormitories, enjoying Filipino-style special meals and experiencing Taiwanese festive atmosphere and warmth.

## X. Human Rights Protection

To Accton, human rights protection is not just a policy but an integral part of life. We will continue to minimize human rights risks in our business activities, as protecting human rights is both our responsibility and obligation.

In addition to setting up an employee complaint hotline and email, Accton arranges bilingual professionals to handle daily communication and coordination with foreign employees. In 2023, Accton had 7 labor practice grievances resolved through formal complaint mechanisms, Edgecore had 1, JoyTech had 0, and Vietnam Accton had 15 complaints, all with a 100% resolution rate.

Furthermore, to prevent internal and external workplace violence, Accton has established a workplace violence prevention plan based on the Occupational Safety and Health Act. This plan clarifies the responsibilities of each unit and includes regular assessments and evaluations of prevention measures. The Company explicitly prohibits all forms of physical, verbal, psychological violence, and sexual harassment to ensure the physical and mental health of all employees. In 2023, there were no reported instances of workplace violence complaints.



## XI. Remuneration

"Gender Equality" and "Anti-Gender Discrimination" are among the most critical social issues today. To promote economic prosperity and harmony in Taiwanese society, enhance the socioeconomic status of women, and ensure equal pay for equal work without gender-based discrimination, Accton is committed to its employees and society. We aim to create a gender-equal workplace environment, fulfill corporate social responsibility, and follow gender equality principles. This includes enhancing female professional development and eliminating gender-based pay disparities for the same work.

### 1. Ratios of Standard Entry-Level Wage by Gender Compared to Local Minimum Wage

Accton rigorously abides by laws and regulations. The standard starting salary (Note 1) of entry-level personnel is superior to the minimum wage announced by the government of Taiwan each year (Note 2). We also adhere to regulations for gender equality and equal pay for work of equal value. There is no gender-based difference in the starting salary for employees.

Gender/Region	Taiwan		Mainland China	Vietnam
	Accton	Edgecore	Joy Technology (JoyTech)	Vietnam Accton
Males	1.09 : 1	1.17 : 1	1.31 : 1	1.25 : 1
Females	1.09 : 1	1.17 : 1	1.31 : 1	1.25 : 1

Note 1: The standard starting salary is the minimum salary specified in the Company's regulations (excluding overtime pay and other position allowances)

Note 2: The minimum salary announced in Taiwan in 2023 was NT\$26,400, the minimum salary announced in Mainland China was RMB 2,360, and the minimum salary announced in Vietnam was 4,610,000 VND.

### 2. Ratio of Basic Salary and Remuneration of Women to Men

The salary of Accton's employees is determined in accordance with personal academic records, experience, professional knowledge, market conditions, and internal regulations of the Company. The proportional differences arise due to variations in employee composition within the same level, including diverse educational backgrounds, job duties, nature of work, and number of employees. However, the gender pay ratio difference does not exceed 0.3.

### ◆ Taiwan

Ratio of basic salary and remuneration of women to men		Managerial roles		Non-managerial roles		Technicians
		Accton	Edgecore	Accton	Edgecore	Accton
Basic salary (Note 1)	Females	1.00	1.00	1.00	1.00	1.00
	Males	1.12	0.96	1.28	1.28	1.01
Total Remuneration (Note 2)	Females	1.00	1.00	1.00	1.00	1.00
	Males	1.02	0.89	1.30	1.22	1.06

### ◆ Mainland China (JoyTech)

Ratio of basic salary and remuneration of women to men		Managerial roles	Non-managerial roles	Technicians
Basic salary (Note 1)	Females	1.00	1.00	1.00
	Males	1.00	1.16	1.05
Total Remuneration (Note 2)	Females	1.00	1.00	1.00
	Males	0.97	1.15	1.03

### ◆ Vietnam (Vietnam Accton)

Ratio of basic salary and remuneration of women to men		Managerial roles	Non-managerial roles	Technicians
Basic salary (Note 1)	Females	1.00	1.00	1.00
	Males	0.89	1.09	1.00
Total Remuneration (Note 2)	Females	1.00	1.00	1.00
	Males	0.87	1.26	1.00

The statistical data range is from 2023/01-2023/12 .

Note 1: The basic salary is calculated based on the "regular salary."

Note 2: The total remuneration is calculated based on the "regular salary plus bonus rewards."



### 3. Number, Average, and Median Salary of Full-Time Non-managerial Employees

Accton reported (Note 1) "3,106 employees" who were full-time non-managerial employees in 2023, in accordance with regulations of the Taiwan Stock Exchange. The average salary was "NT\$1,385 thousand" and the median salary was "NT\$982 thousand".

Reporting Year	Number of full-time Employees	Average Salary (Note 2)	Median Salary (Note 2)
Y2023	3,106	1,385	982
Y2022	2,824	1,324	934
Y2021	2,827	1,052	732

Note 1: Statistics for Taiwan only (excluding Edgecore Networks)

Note 2: NT\$1,000

### 4. Defined Benefit Plan Obligations and Other Retirement Plans

Accton has established "Employee Retirement Regulations" in accordance with the "Labor Standards Act" and "Labor Pension Act" (Note 1). We also appropriate retirement reserve to the Bank of Taiwan at regular intervals in accordance with regulations. The Supervisory Committee of Retirement Reserve Fund takes charge of management and usage of the funds.

In addition to statutory retirement fund contributions, we conduct actuarial valuations through engagements with professional actuaries annually. As of the end of 2023, the present value of the defined benefit obligation was approximately NT\$280 million, with the retirement reserve fund amounting to NT\$260 million, ensuring sufficient contributions and a net pension liability of about NT\$20 million. Contributions to the new and old systems account for about 3.7% of total salary expenses, ensuring the security of future retirement benefits for employees. The Company offers the "Employee Retirement Plan" (Note 1) superior to statutory requirements and provides employees with different retirement options to help employees arrange their retirement plans with greater flexibility.

All Accton employees enrolled under the old system are included in related calculations and payment principles specified in the "Labor Standards Act."

For employees who opted for the new labor pension system of the "Labor Pension Act" after July 1, 2005 and new employees, the Company allocates an amount equivalent to 6% of each worker's wage to the employees' pension accounts. Employees can also flexibly contribute 0% to 6% of their wages as retirement funds according to their wishes.

Note 1: The "Employee Retirement Plan" applies to Accton and Edgecore but not JoyTech.



## 4.2 Talent Learning and Development



**Boundary: Accton, Edgecore, JoyTech, Vietnam Accton**

### Brief description of targets and track records:

Region	2023 Goals	2023 Results	Short-term goal (2024-2025)	Mid to Long-term Goals (2026-2028)
Accton Edgecore	Upgrade the E-learning environment and enhance the employees' motivation to learn independently.	<ol style="list-style-type: none"> <li>1. Transitioned to a new Learning Management System (LMS) to achieve compatibility with mobile devices for accessing learning materials.</li> <li>2. Developed 104 online training courses.</li> </ol>	Assist departments in optimizing their learning training roadmap to enhance employee expertise and support corporate operational goals.	Optimize the system mechanisms, design comprehensive systems and methods, and encourage employees to learn on their own to enhance their performance and potential.
Joy Technology (JoyTech)	100% completion rate of training programs in Mainland China in the current year	Actual achievement: 98%	<ol style="list-style-type: none"> <li>1. Execute training plans based on employees' skill levels and achieve 100% of the target.</li> <li>2. Continuously improve the corporate training system and its application.</li> <li>3. Implement a hybrid blend of online and offline teaching, combining theory with practical application, to cultivate a self-learning mindset among employees and enhance their quality and capabilities.</li> </ol>	Establish a digital, smart, and agile training system to facilitate knowledge and upskilling as well as experience transmission.
Vietnam Accton	Develop systematic mechanisms and reserved training resources for comprehensive training of Vietnam Accton's supervisors.	Implement a comprehensive development and training system that gradually perfects and enforces professional skills training for specific job positions.	Optimize the training system to foster a culture of self-learning among employees and encouraged autonomous learning.	Establish a training system that allows learners to study anytime anywhere, increasing the average learning hours.

## Talent Development

Talent is a crucial resource for the Company's sustainable development. Accton's training policy is people-oriented, and we encourage our employees to become active learners. Based on the Company's growth direction, organizational needs, and individual performance requirements, we formulate annual training plans to assist employees in learning and development. Through internal and external training courses and various learning activities, we nurture outstanding employees to enhance corporate operational efficiency. Internal training is divided into six major sectors, including: (N) new recruit orientation training, (E) work efficiency, (P) professional knowledge and skills, (Q) quality management, (H) environmental safety and occupational health, (M) leadership and management; external training is provided to employees in the form of courses or seminars organized by external professional organizations, where necessary. To improve foreign language level, each employee is provided with a fixed amount of subsidy for foreign language training each year to help employees improve their performance at work and team competitiveness. In 2023, Accton was recognized with the SGS 2023 ESG Awards: Talent Development Award.



▲ The globally recognized certification authority SGS held the "SGS 2023 Annual Joint Awards Ceremony," during which Accton Technology was honored with the "SGS 2023 ESG Awards: Talent Development Award." The award was accepted on behalf of the company by Ying-Hui Chiang, the Senior VP of the Business Management Center, who represented Accton at the event.

## I. Training Framework

### 1. Learning Scope

Learning Scope (Taiwan)	Content
<b>New Staff Orientation Training</b>	Includes an introduction to the company, corporate culture, rules and regulations, corporate social responsibility, ethical management, anti-corruption, insider trading prohibition, and quality system, which help new recruits understand the company and adapt to the environment.
<b>Work Efficiency</b>	Includes courses such as business presentation design, communication, cyber security, document processing, and TTT program to enhance employees' work efficiency.
<b>Professional Expertise</b>	Includes courses to enhance domain-specific knowledge, advanced manufacturing processes, and systematic professional knowledge.
<b>Quality Management</b>	Includes general knowledge quality courses, such as protection against electrostatic discharge (ESD), problem analysis and problem-solving techniques, QC7, SPC, and PFMEA as well as special ISO courses to ensure that all processes comply with procedures, improve production yields, and meet customer requirements.
<b>Environmental Safety and Occupational Health</b>	According to regulatory requirements, new employees shall complete general safety and health training, hazard awareness training, and provide different training courses for general and special operations.
<b>Leadership Management</b>	We plan training courses necessary for supervisors based on the roles and functions that correspond to the necessary management skills of each level. Courses include system and regulations, self-management, team management, and business management.

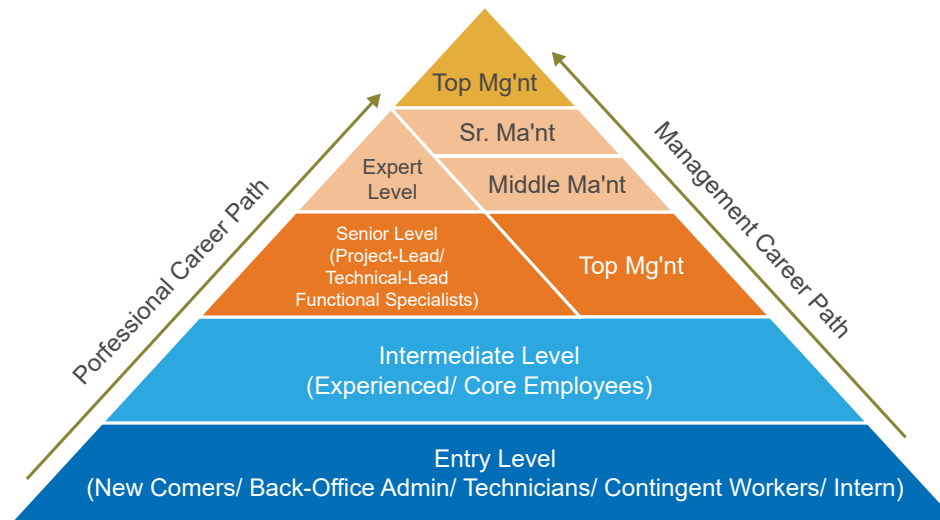
Accton has created a dedicated training classroom and provided a Learning Management System (LMS) platform for online learning. Employees are provided with a convenient learning system free from time and spatial constraints.

To monitor learning effectiveness and ensure smooth operation of overall learning activities, the training department confirms the schedule for the following month at the end of each month and regularly compiles learning reports. According to a due diligence survey, Accton Group recorded a total of 69,281 training hours in 2023, with 35,828 training instances completed, averaging approximately 13.1 hours of learning per employee.

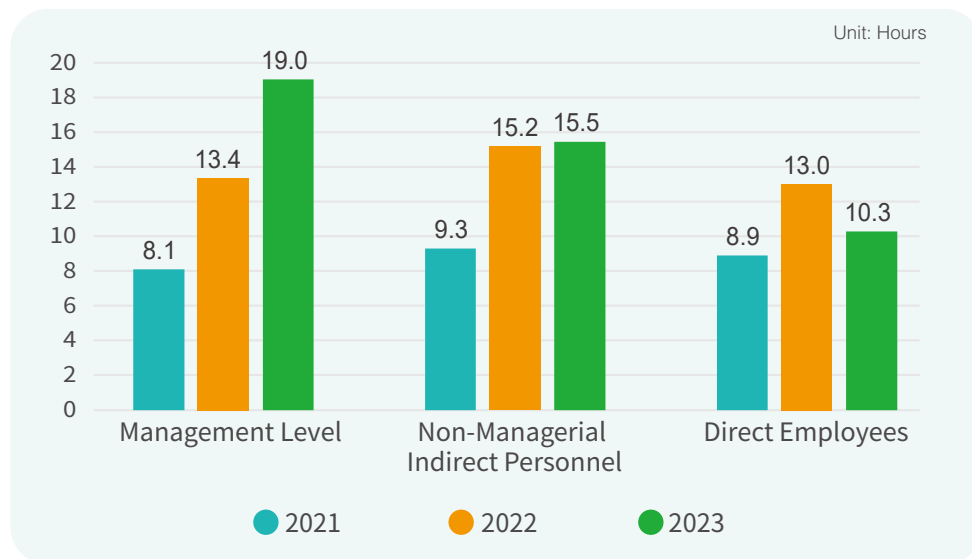


### 2. Talent Development Roadmap

Accton Group adheres to the talent pyramid concept, where employees at all levels undergo extensive training to enhance their professional capabilities. According to their proficiency levels, employees are nurtured either into professional technical roles or management positions. The Company systematically develops managerial talents and encourages professional staff to advance, allowing outstanding individuals to focus on roles suited to their strengths and fully utilize their abilities.



### ◆ Average Training Hours per Employee by Level



Note 1: Employee numbers are based on the average from January to December 2023, including full-time and contract employees, but excluding temporary workers (whose training hours are calculated separately). JoyTech follows the same basis, which applies to the data indicated below.

Note 2: Data includes Accton, Edgecore Networks, JoyTech, and Vietnam Accton.

Note 3: Calculation formula = Number of training hours per level/ number of employees per level.

Note 4: Management refers to employees who are responsible for leading subordinates, such as section leaders and managers; Indirect personnel refer to non-management personnel. Please refer to 4.1 Talent Attraction and Retention, Diverse Talent Composition and Inclusion for more details.

Note 5: All data below are the same.

In 2023, Accton implemented a digital transformation initiative. The LMS platform supports mobile learning, enabling employees to utilize fragmented time for learning. There were 104 online courses have been developed for supervisors and employees in professional knowledge.

Management at Accton leads by example, with average training hours per managerial staff continuously increasing over the past three years. Due to a reduction in general courses, the training hours for direct personnel saw a slight decrease in 2023.

Accton adopts the four levels of evaluation proposed by Donald Kirkpatrick: Reaction, Learning, Behavior, and Results. In 2023, over 70% of courses in Taiwan underwent reaction evaluations, including aspects such as instructor performance, course content design, material arrangement, administrative services, and overall course effectiveness. The average satisfaction score for course effectiveness was 94 out of 100, with JoyTech achieving a score of 95.

Accton's training programs are not confined to classrooms. Our value proposition is auto-motivate learning. We encourage each employee to actively acquire new skills through projects, work guidance, deputizing, and product development meetings. When there is a need, units are actively encouraged to invite experts to teach and discuss together and accumulate their valuable practical experience from real cases.

## II. DEI Learning Environment

Since Accton was established, we have upheld the spirit of diversity, equity, and inclusion to our employees. We strongly believe that creating a diverse and safe work environment, and respecting and including employees from different backgrounds, allows employees to develop and grow sustainably. This idea aligns with DEI principles, implemented through:

### Institutional Policies

- **Inclusive Recruitment:** Accton employs inclusive recruitment policies, ensuring a fair and equal hiring process. Our employees come from 13 countries, with 956 foreign employees, including 35 white-collar foreign workers.
- **Building a Diverse Team:** Accton has an operational presence spanning 13 locations across North America, Europe, and Asia, and establishes diverse work teams across different levels and departments. This includes diversity in terms of gender, race, culture, and other aspects.
- **Safe Work Environment:** We ensure all employees feel respected and supported, with established grievance reporting mechanisms, regular reviews, and scheduled employee communication activities to create a non-discriminatory work environment.
- **Equal Pay:** Regular checks on compensation structures are executed to ensure wage equality among employees of different genders and backgrounds in the same positions.
- **Flexible Work Arrangements:** Accton offers flexible work arrangements to meet the diverse needs of employees, such as remote work and flexible working hours.
- **Superior Leave Policies:** To help employees balance family, life, and work, Accton provides 8 additional flexible leave days annually, alongside the establishment of the first kindergarten in the Hsinchu Science Park.
- **Corporate Social Responsibility:** We actively participate in CSR programs, supporting social justice and inclusivity, including the creation of the Accton Arts Foundation and participation in public welfare activities.

For more details, please refer to "4.1 Talent Attraction and Retention."

## Training

- Empathy Concept Establishment: Accton offers empathy training courses during onboarding to instill respect and understanding in every employee.
- Training and Development: All employees receive training on diversity, inclusion, and equity to promote awareness and understanding. This training helps shift our corporate culture and fosters team collaboration. (Please refer to details below)
- Multifaceted Training Activities: Beyond learning and development, Accton organizes various training activities, including understanding depression and gender equality. (For more details, refer to "4.1 Talent Attraction and Retention.")
- Leadership Involvement: Accton's leadership actively participates in and supports DEI policies. Managers lead by example, regularly promoting these values. The CEO communicates directly with employees through videos, providing contact information to encourage open communication, embedding these values into the corporate culture.

## 1. Diverse and Equal Learning Development

Accton's employee composition is diverse. To accommodate this diversity, training materials are available in English, with online courses also featuring English narration. Internal communications, newsletters, and public information are presented in both Chinese and English. For Filipino employees, native language announcements are provided in dormitories.

Regarding gender equality, Accton offers equal job opportunities and training for all roles and necessary skills, without gender bias. Training statistics are as follows:

Average Training Hours	Biological Male	Biological Female
Accton	61%	39%
Edgecore	49%	51%
Joy Technology (JoyTech)	52%	48%
Vietnam Accton	57%	43%

Note 1: Average training hours: Total training hours / Total number of employees (rounded).

Note 2: Employee numbers are based on the average from January to December 2023, including full-time and contract employees, but excluding temporary workers. JoyTech and Vietnam Accton follow the same basis, which applies to the data indicated below.

Accton includes R&D and manufacturing, with more males proportionally in R&D roles. The majority of training in 2023 was professional knowledge, aligning training hours with employee proportions. The gender difference in training hours at Edgecore Networks is minimal. At JoyTech and Vietnam Accton, due to industry nature, males predominantly received machinery operation training.

## 2. Talent Development Strategy

To promote talent development, we have adopted the following ways and strategies to help employees grow and develop, while also improving Accton's competitiveness and business performance.

<p><b>Provide Training and Development Opportunities</b></p>	Through internal and external training courses, we offer the necessary skills and knowledge to employees. Additionally, we provide subsidies for learning, such as language and external training subsidies.
<p><b>Provide Job Rotation Opportunities</b></p>	For specific positions and units, we offer rotation opportunities to help employees gain diverse experiences and skills, enhancing job satisfaction, promoting inter-departmental cooperation, and career development.
<p><b>Giving Feedback and Guidance</b></p>	Employees need to know their performance and how to improve. Accton provides regular performance evaluations and feedback from supervisors to help employees improve and motivate them to enhance performance.
<p><b>Providing Promotion Opportunities</b></p>	We offer promotion opportunities for outstanding employees, allowing them to develop their careers within the Company.
<p><b>Establish Professional Communities</b></p>	Accton has various professional communities for employees to learn and exchange ideas. Through these communities, employees can resolve problems together, share best practices and knowledge, and improve their skills and knowledge.
<p><b>Link Performance with Learning</b></p>	By connecting performance and learning, employees can clearly understand the skills and knowledge needed in the Company. New employees must complete mandatory courses to pass their probation, and ongoing employee performance evaluations include learning status as an important criterion.

### 3. Internal Instructors

To enhance the transfer of knowledge and experience within the Company and provide a platform for professional talent, Accton has established a Train The Trainer program. The HR department has created an internal instructor system and guidelines, offering training courses for internal instructors. Additionally, various activities such as book clubs, themed luncheons, instructor outings, special events for Teachers' Day, and excellent instructor recognition and award ceremonies are organized. These activities foster a positive atmosphere for internal instructors, creating a culture of sharing and learning.

Through our continuous effort, Accton has cultivated a total of 107 internal instructors. In 2023, these instructors conducted 81 courses (including recording online courses), totaling 13,508 training hours, which accounts for approximately 34% of Accton's total training hours. The post-training satisfaction score was 94 out of 100. JoyTech has 14 certified instructors who conducted 48 sessions, totaling 12,741 training hours, accounting for about 85% of JoyTech's total training hours, with an average post-training satisfaction score of 95 out of 100.

Note 1: Training man-hours: Total number of man-hours of attendees in courses lectured by qualified internal instructors.

Note 2: Employment calculation interval: January 1, 2023 - December 31, 2023.

### Internal Instructor Training and Activity Planning

- Instructor Outings: Engage in outdoor activities such as hiking and seaside trips.



- Year-end Appreciation Events



## 4. Comprehensive Training

Accton values every talent, offering training activities regardless of age, gender, or position. The training hours and attendance for various age groups in Taiwan, Mainland China, and Vietnam in 2023 are summarized as follows:

Age Distribution	Accton		Edgecore		Joy Technology (JoyTech)		Vietnam Accton	
	Training Hours	Number of Participants	Training Hours	Number of Participants	Training Hours	Number of Participants	Training Hours	Number of Participants
29 and below	11,146	6,101	100	108	5,420	1,743	7,913	1,981
30 to 49 years old	24,696	17,732	595	545	9,274	3,177	5,341	1,129
50 and above	4,133	3,046	235	154	223	81	206.5	31
<b>Total</b>	<b>39,975</b>	<b>26,879</b>	<b>930</b>	<b>807</b>	<b>14,916</b>	<b>5,001</b>	<b>13,460</b>	<b>3,141</b>

In 2022, Accton held a series of seminars in Taiwan (Accton, Edgecore) focused on post-retirement life. These included activities such as experiencing the life of dementia patients, self-care, and caring for individuals with dementia. In 2023, we organized two seminars on financial planning, helping employees build sound financial concepts and start early financial planning. A total of 223 employees participated, accumulating 446 training hours. For more details, please refer to "4.1 Talent Attraction and Retention - Employee Care".

## III. Product Safety Training

### 1. Quality Management

To ensure that Accton's products are in line with the product safety standards of different countries and ensure the safety of users, we have established product safety standard measurement practices and completed relevant training, and have obtained corresponding certification qualifications.

- **Product Quality:** ISO 9001:2015 Quality Management System, TL 9000-H R6.3/R5.7 Telecom Quality Management System, and IECQ QC080000:2017 HSPM Hazardous Substance Process Management System.

- **Occupational Safety and Health Management:** ISO 14001:2015 Environmental Management System, ISO 45001:2018 Occupational Health and Safety Management System, and ISO 14064-1:2018 Greenhouse Gas Inventory.
- **Energy Management:** ISO 50001:2018 Energy Management System (Accton Headquarters and JoyTech).
- **Security Management:** AEO (JoyTech) and ISO 28000:2022 Security Management System (Accton Zhunan Plant, Accton Headquarters, Accton RMA Plant).
- **Business Continuity:** ISO 22301:2019 Business Continuity Management System (Accton Headquarters, Accton Zhunan Plant).

For related certificates, please refer to our official website:  
<https://www.accton.com/esg-documents/>

To further enhance quality awareness, knowledge, skills, and the application of tools, we arrange for external consultants to deliver courses on quality tools. The content includes the application, methods, and timing of five core tools (APQP, PPAP, SPC, MSA, DFMEA, PFMEA). Through case studies, presentations, and consultant guidance, participants understand the essence of these tools and learn to apply them flexibly. Post-training assessments are conducted through tests, and participants are required to submit reports such as DFMEA, guided by consultants to ensure effectiveness.

In 2023, a total of 8,514 participants attended quality management training, accumulating 9,725 training hours. Fifteen in-person courses were held on the five core tools, with 1,104 participants and a total of 6,170 training hours for both in-person and online learning.

### ◆ Course Training and Case Study Discussions



## 2. Production Line Training

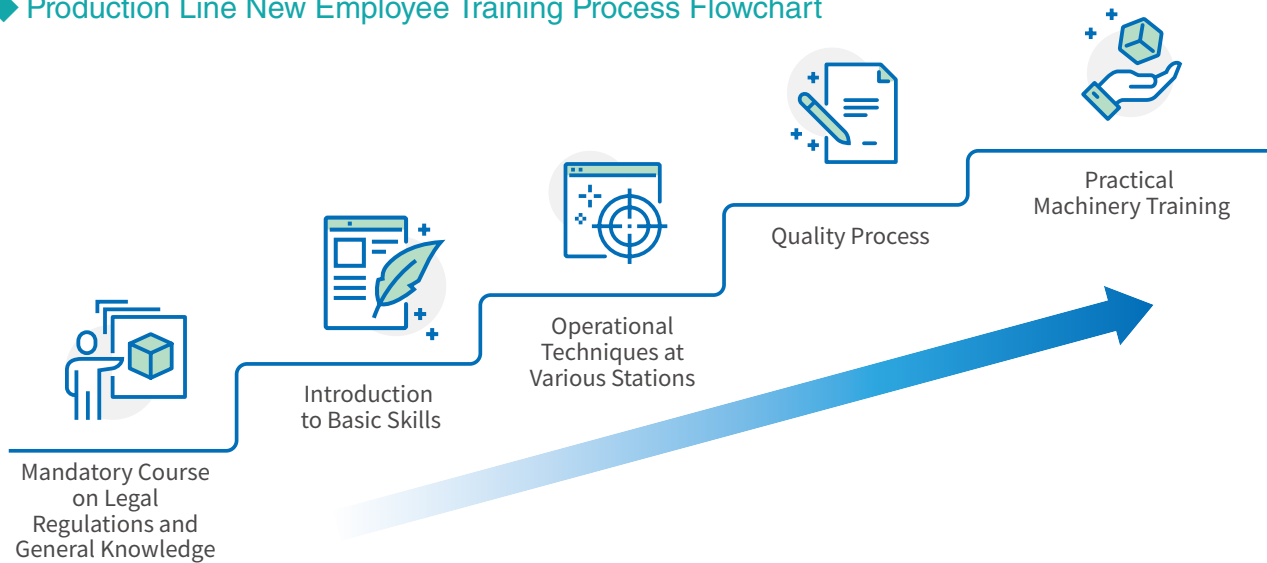
To adhere to the principle of "Do the right thing right the first time," Accton has established training classrooms within the production line. New direct employees, including full-time staff, migrant workers, and temporary workers, must undergo a mandatory general training course on their first day and several days simulation production line training courses. The course content includes both foundational theoretical learning (academic) and practical operation courses at each simulation station (technical). Each subject must meet passing standards for certification before proceeding to on-the-job training (OJT). Skilled employees guide new employees through hands-on training at the worksite, and the production line supervisor evaluates the newcomers' learning outcomes to ensure they meet Accton's quality standards before officially starting work. This ensures that quality management begins at the source to prevent quality risks during production caused by inexperienced new employees.

In 2023, a total of 902 new employees completed production line training, accumulating 28,864 training hours, including 645 temporary employees who received 20,640 training hours. JoyTech and Vietnam Accton adhere to the same principles. The supervisors teach newcomers the necessary skills for each station in the classroom, and the department leaders confirm the actual operations at the station before independent work is allowed on the production line. The training is completed within one week.

### ◆ Production Line Training



### ◆ Production Line New Employee Training Process Flowchart



## IV. Regular Performance Evaluations



**Boundary: Accton, Edgecore, JoyTech, Vietnam Accton**

### Brief description of targets and track records:

2023 Goals	2023 Results	Short-term goal (2024-2025)	Mid to Long-term Goals (2026-2028)
85% and above of employees receive the annual performance evaluation	100% of employees received the annual performance evaluation	90% and above of employees receive the annual performance evaluation	Strengthen the link between evaluation and rewards
85% and above of new employees receive the new employee evaluation	99.6% of new employees received the new employee evaluation	90% and above of new employees receive the new employee evaluation	Set up a positive feedback loop module for performance evaluation

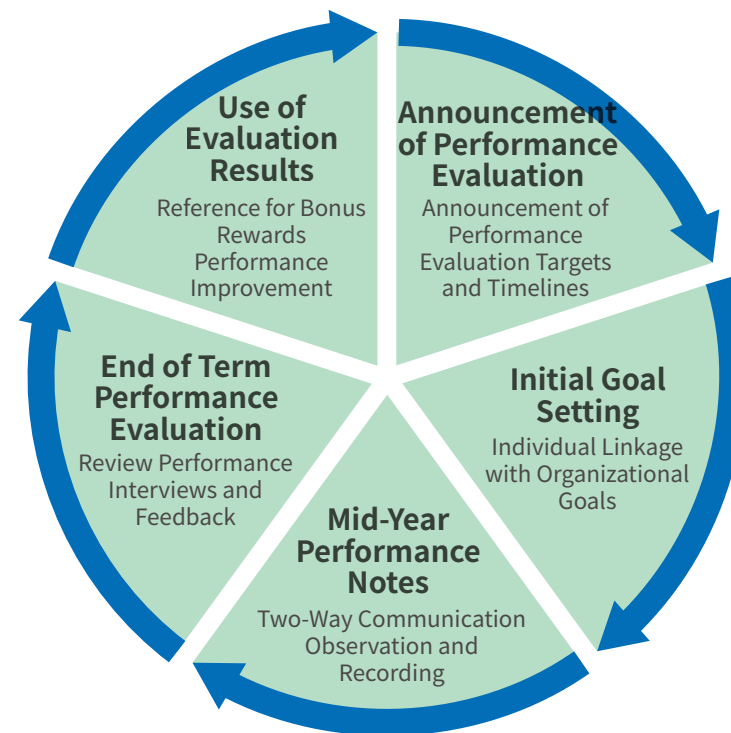
### Regular Performance Evaluation

Since the implementation of the online learning and performance platform in 2014, Accton has made significant strides to promote a regular performance evaluation system. Recognizing the importance of "regular performance evaluations" for personnel development and company growth, Accton reviews the "Performance Management and Evaluation Procedures" every two years. Considering changes in the Company's workforce structure and external trends, and drawing on feedback from internal employees and managerial staff, Accton periodically revises and adjusts operating procedures to maximize the effectiveness of the performance evaluation system. In 2023, employees in Taiwan and China comprised 94% of the Group's workforce. This section focuses on these two regions, including Accton, Edgecore, JoyTech, and Vietnam Accton.

Cybersecurity is not only a concern for suppliers, customers, and investors but also an issue of crucial concern for Accton. With the system software being updated annually, the user interface and information security of the original online platform became outdated. To ensure that every employee has a user-friendly experience and meets internal and external information security requirements, Accton upgraded the online learning and performance platform in the second half of 2022. The goal was to provide a secure environment for online learning and regular performance evaluations.

In 2023, Accton adopted a goal management approach, conducting annual performance evaluations in two phases: the first and second halves of the year. The process included:

1. Initial Phase: Setting individual goals based on organizational objectives.
2. Mid-Year Phase: Recording performance through performance notes, engaging in two-way communication with supervisors, and adjusting goals as necessary.
3. Year-End: Conducting performance interviews and evaluations.
4. Final Phase: Confirming evaluation results and subsequent actions. Continuous, periodic communication, guidance, and goal adjustments ensure that individual work directions align with Company objectives, ensuring shared success. New employees, within two weeks of joining, confirm their goals with their supervisors. They then undergo an evaluation at the end of three months.



### The evaluation mechanism is jointly managed and promoted by three parties:

1. The Human Resources Department is responsible for revising policies, ensuring the implementation of processes, and developing subsequent talent development and reward plans based on the results. In 2023, performance bonuses were issued according to evaluation results. In 2024, the "Performance Management and Evaluation Procedures" will be reviewed and revised based on the evaluation results.
2. Senior Decision-Making Group and Unit Managers execute performance management tasks according to relevant regulations. In 2023, based on evaluation results, relevant talent training and development plans, as well as employee performance improvement plans, were implemented.
3. Internal and external IT units assist in data security. In 2022, an online platform upgrade was introduced to meet internal and external information security requirements, ensuring system data security.

The performance evaluation results are linked to the performance bonus reward plan, employee promotions, and talent training development directions. Accton's reward plan is performance-oriented, serving as an incentive for retaining outstanding talent. For employees who do not meet performance standards, improvement goals are set with supervisors, and performance improvement plans are implemented. This approach not only promotes a healthy workforce cycle but also helps employees identify the root causes of poor performance, providing appropriate tools and assistance to enable them to excel and develop in suitable positions.

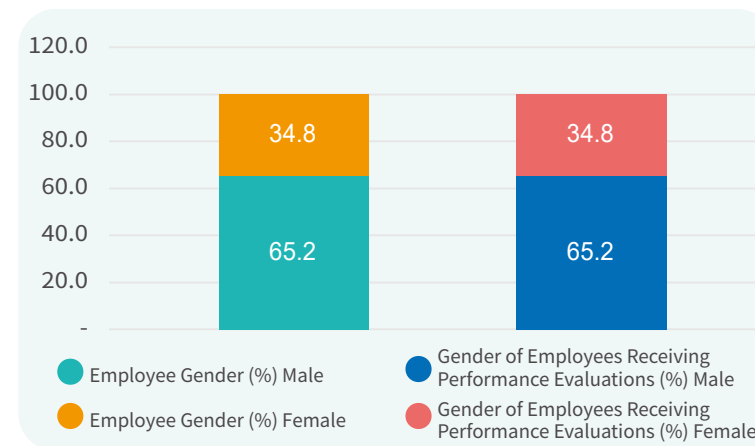
### Description of regular employee performance evaluation data for 2023:

Accton regular indirect employees, excluding senior management above the vice president level, part-time workers, employees who have been approved for employment separation (excluding Group internal transfers), and those who have not passed the new employee evaluation, are required to undergo annual performance evaluations every six months. In 2023, the total number of employees was 3,369. In the first half of 2023, there were 1,711 regular indirect employees, of which 1,568 met the aforementioned criteria and underwent performance evaluations, resulting in a participation rate of 91.6%. In the second half of 2023, there were 1,824 regular indirect employees, of which 1,580 underwent performance evaluations, resulting in a participation rate of 86.6%. Direct employees are evaluated monthly by their respective units after joining the Company, and performance bonuses are awarded based on job performance. Temporary employees undergo evaluations after four months of employment, with the results determining whether they are promoted to regular employee status. In 2023, there were 684 new temporary employees, 32 of whom were promoted to regular employees after evaluation, with a promotion rate of approximately 4.7%.

Edgecore regular indirect employees, excluding senior management above the vice president level, contract employees, employees who have approved for employment separation (excluding Gorup internal transfers), and new employees with less than three months of service, are required to undergo annual performance evaluations every six months. In 2023, the total number of employees was 312. In the first half of 2023, 152 employees met the aforementioned criteria and underwent performance evaluations, resulting in a participation rate of 100%. In the second half of 2023, 150 employees met the criteria and underwent performance evaluations, resulting in a participation rate of 100%.

JoyTech employees, except those who joined in the fourth quarter of the current year, are required to undergo annual performance evaluations every year. In 2023, the total number of employees was 1,157. Of these, 1,113 met the aforementioned criteria and underwent performance evaluations, resulting in a participation rate of 96.2%. Vietnam Accton was established in March 2023 and conducted one performance evaluation in 2023. In 2023, the total number of employees was 106. Of these, 106 met the aforementioned criteria and underwent performance evaluations, resulting in a participation rate of 100%.

### ◆ Gender Ratio for Performance Reviews in 2023



Accton's new formal employees, excluding direct personnel, managers and above, and those transferred within the Group, must undergo a probation evaluation after three months of employment. In 2023, a total of 577 new formal employees joined, of which 251 met the criteria for the probation evaluation, resulting in a participation rate of 43.5%. Edgecore Networks does not conduct probation evaluations. New employees undergo annual performance evaluations after three months of employment. In 2023, a total of 12 new employees joined. JoyTech's new employees must undergo a probation evaluation after three months of employment. In 2023, a total of 359 new employees joined, all of whom met the criteria for the probation evaluation, resulting in a participation rate of 100%. Vietnam Accton has different evaluation regulations for different job categories. Direct employees are evaluated after 6 days of employment, while indirect employees undergo a probation evaluation after three months. Those who pass the evaluation become formal employees. In 2023, a total of 419 new direct employees and 191 new indirect employees joined. Of these, 106 met the criteria for the annual performance evaluation, resulting in a participation rate of 100%.

Accton has been effectively implementing regular performance evaluations for many years. The medium to long-term goal is to strengthen the connection between evaluation results and other functions, allowing high-potential talents to shine and providing sufficient resources and opportunities for underperforming employees to get on track. Through the positive feedback loop module for performance evaluations, we aim to help both employees and the Company achieve outstanding results.



◆ Relevant charts/data information

Ratio of Regular Employees Undergoing Performance Evaluation												
Company	Job Position		Employees (persons)		Employees Who Underwent Performance Evaluation (persons)		Employee Gender (%)		"Gender Ratio of Employees Who Underwent Performance Evaluation (%)"		Annual Performance Evaluation Rate (%)	
			Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Accton	Direct Employees		-	-	-	-	-	-	-	-	-	-
	Indirect Employees	Managerial role	404	141	404	141	74.1	25.9	74.1	25.9	100.0	100.0
		Technical role	1,701	902	1,701	902	65.3	34.7	65.3	34.7	100.0	100.0
	Subtotal		2,105	1,043	2,105	1,043	66.9	33.1	66.9	33.1	100.0	100.0
Edgecore	Direct Employees		-	-	-	-	-	-	-	-	-	-
	Indirect Employees	Managerial role	28	13	29	13	68.3	31.7	69.0	31.0	103.6	100.0
		Technical role	168	93	164	93	64.4	35.6	63.8	36.2	97.6	100.0
	Subtotal		196	106	193	106	64.9	35.1	64.5	35.5	98.5	100.0
JoyTech	Direct Employees		510	256	510	256	66.6	33.4	66.6	33.4	100.0	100.0
	Indirect Employees	Managerial role	63	31	63	31	67.0	33.0	67.0	33.0	100.0	100.0
		Technical role	135	138	135	138	49.5	50.5	49.5	50.5	100.0	100.0
	Subtotal		708	425	708	425	62.5	37.5	62.5	37.5	100.0	100.0
Vietnam Accton	Direct Employees		-	-	-	-	-	-	-	-	-	-
	Indirect Employees	Managerial role	-	6	-	6	-	100	-	100	-	100.0
		Technical role	49	51	49	51	49.0	51.0	49.0	51.0	100.0	100.0
	Subtotal		49	57	49	57	46.2	53.8	46.2	53.8	100.0	100.0
<b>Total</b>			3,058	1,631	3,055	1,631	65.2	34.8	65.2	34.8	99.9	100.0

Note 1: Excludes management levels of Vice President and above, and those who have not passed the new employee evaluation, and those who do not meet the qualifications for performance evaluation.

Note 2: Direct employees in Taiwan who undergo regular evaluations by their respective units and are not included in this table.



**Ration of Regular Employees Who Underwent New Employee Evaluation**

Company	Job Position		Employees (persons)		Employees Who Underwent Performance Evaluation (persons)		Employee Gender (%)		"Gender Ratio of Employees Who Underwent Performance Evaluation (%)"		Annual Performance Evaluation Rate (%)	
			Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Accton	Direct Employees		-	-	-	-	-	-	-	-	-	-
	Indirect Employees	Managerial role	3	-	3	-	100.0	-	100.0	-	100.0	-
		Technical role	159	112	159	112	58.7	41.3	58.7	41.3	100.0	100.0
	Subtotal		162	112	162	112	59.1	40.9	59.1	40.9	100.0	100.0
Edgecore	Direct Employees		-	-	-	-	-	-	-	-	-	-
	Indirect Employees	Managerial role	-	-	-	-	-	-	-	-	-	-
		Technical role	8	4	-	-	-	-	-	-	-	-
	Subtotal		8	4	-	-	-	-	-	-	-	-
JoyTech	Direct Employees		235	112	235	112	67.7	32.3	67.7	32.3	100.0	100.0
	Indirect Employees	Managerial role	1	-	1	-	100.0	-	100.0	-	100.0	-
		Technical role	9	2	9	2	81.8	18.2	81.8	18.2	100.0	100.0
	Subtotal		245	114	245	114	68.2	31.8	68.2	31.8	100.0	100.0
Accton Vietnam	Direct Employees		193	226	183	200	46.1	53.9	47.8	52.2	94.8	88.5
	Indirect Employees	Managerial role	2	7	2	7	22.2	77.8	22.2	77.8	100.0	100.0
		Technical role	88	94	88	92	48.4	51.6	48.9	51.1	100.0	97.9
	Subtotal		283	327	273	299	46.4	53.6	47.7	52.3	96.5	91.4
<b>Total</b>			698	557	680	525	55.6	44.4	56.4	43.6	97.4	94.3

Note 1: Excludes intra-Group transferees or those who do not meet the qualifications for new employee evaluation.

Note 2: Direct employees in Taiwan who undergo regular evaluations by their respective units and are not included in this table.

Note 3: Edgecore does not conduct new employee evaluations. New employees undergo annual performance evaluations after three months of employment.



## V. Volunteering

### SDGs Goal 10 | Reduce inequality within and among countries

#### Brief description of goals and track records:

Accton continues to harness the power of its employees, promoting various volunteer initiatives and encouraging employees to engage in different volunteer services. The aim is to enable employees to exert their influence and collectively work towards the goal of diversity and inclusion.

Region	2023 Goals	2023 Results	Short-term goal (2024-2025)	Mid to Long-term Goals (2026-2028)
Accton Edgecore	<ol style="list-style-type: none"> <li>Organize at least 4 volunteer activities.</li> <li>The target participation rate is 9% of the total employees, approximately 300 participants.</li> </ol>	<ol style="list-style-type: none"> <li>Organize 7 volunteer activities.</li> <li>The target participation rate is 14% of the total employees, approximately 500 participants.</li> </ol>	<ol style="list-style-type: none"> <li>Organize at least 8 volunteer activities.</li> <li>The target participation rate is 15% of the total employees, approximately 600 participants.</li> </ol>	<ol style="list-style-type: none"> <li>Organize at least 12 volunteer activities.</li> <li>The target participation rate is 800 participants.</li> </ol>
Joy Technology (JoyTech)	<ol style="list-style-type: none"> <li>Plan to conduct 3 volunteer training sessions with 15 participants, including employees and their families.</li> <li>Promote traffic safety with 25 participants.</li> <li>Organize participation in Tzu Chi Charity Foundation appreciation activities with 30 participants.</li> </ol>	<ol style="list-style-type: none"> <li>Conduct two volunteer training sessions with about 5 family members and over 80 non-employee members of the public participating.</li> <li>Promote traffic safety with a total of 35 participants, accumulating over 120 hours.</li> <li>24 employees participated in blood donation drives, contributing 9,600ml of blood.</li> <li>One employee participated in the "Bao'an District International Marathon" in Shenzhen, accumulating 9 hours.</li> <li>Hosted a "Fire Safety Knowledge Lecture" with 1 employee participating for 2 hours, serving 40 community members.</li> </ol>	<ol style="list-style-type: none"> <li>Plan to conduct 3 volunteer training sessions with 20 participants, including employees and their families.</li> <li>Promote traffic safety with 30 participants.</li> <li>Organize participation in Tzu Chi Charity Foundation appreciation activities with 30 participants.</li> </ol>	<ol style="list-style-type: none"> <li>Continue to conduct 4 volunteer training sessions.</li> <li>Continue traffic safety promotion with a cumulative total of 80 participants.</li> <li>Organize participation in Tzu Chi Charity Foundation appreciation activities with 60 participants.</li> <li>Focus on the care of underprivileged children in the Shenzhen area.</li> </ol>

## | Accton, Edgecore

### ◆ 8 Major Results in 2023:

#### 1.Encouraging employees to "voluntarily engage in public philanthropy" and give back to society.

Accton encourages employees to embrace giving, serve others, and find value and meaning in life. Employees have the option to participate in volunteer activities organized by the Accton Group or external organizations. In 2023, 14 employees contributed a total of 89 volunteer hours. Their service included assisting at elderly care centers, conducting resume clinics, participating in elementary school Christmas charity sales, and providing Mandarin tutoring for children in rural areas.

## 2. 520 Walk in Support of Those with Disabilities, Striding Towards Health

• The First Step Towards Social Inclusion Begins with Understanding  
In May, employees and their families were led to Taitung to visit and accompany Accton's long-term philanthropic partners, "Kids' Book House" and "Jinlun Friendly Workshop." In the morning, we visited the "Black Kid, Black Coffee" training center, where young people are trained before entering the workforce. We learned about the growth journey of these children, who were raised in the Book House, and how they give back to the Taitung community with their skills and expertise in a virtuous cycle. We also visited the "Kids' Book House (Qinglin Bookhouse)," Taiwan's first steel-frame adobe house, built through the combined efforts of children, the community, and the public. This house serves as a place for the Book House children to study, dine, and maintain a self-sufficient vegetable garden.

In the afternoon, members of the Jinlun Friendly Workshop with disabilities demonstrated their skills, leading employees and community residents in hands-on activities. These included making beaded bracelets with Paiwan katakata glass beads, handmade paper, and egg cakes. The meticulous teaching of our disabled friends helped participants create items for charity sales.

On the second day, we participated in the "520 Walk in Support of Those with Disabilities, Striding Towards Health" charity event organized by Jinlun Friendly Workshop. Accton employees accompanied disabled friends with mobility challenges, starting from the Dawu Multi-functional Activity Center in Taitung County. They traversed the beautiful South Link Highway and completed a 5.4-kilometer journey. With the support and encouragement of Accton's employees, the participants successfully reached the final stop - the Heart of Dawu South Link Highway Station.

"Accton with Love, Society without Barriers" Accton Technology and Accton E-Charity (www.17885.com.tw) have always shown great concern for society, continually creating a positive impact. A total of 19 employees and their families participated, contributing a total of 152 volunteer hours.



## 3. St. Anne's Home X Intelligent Ocean

• Fostering Deeper Connections through Accompaniment  
The children with multiple physical and mental disabilities at the Taipei St. Anne's Home had been unable to go outdoors due to the COVID-19 pandemic. After many years, the pandemic restrictions were finally lifted. To help employees better understand and connect with the children, Saint Anne's teachers prepared pairing lists and detailed each child's characteristics and special needs. On June 30, Accton's volunteers took the children to the National Museum of Marine Science and Technology, where they explored various exhibition halls, observed marine life up close, participated in interactive experiences, and assisted the children with meals. After lunch, employees helped the teachers by pushing the children's wheelchairs to the restrooms for diaper changes and comforting the children during the process. The volunteers engaged in simple conversations and listened attentively to the children.

After the event, the employees shared their experiences, noting that although the children's actual ages were older, their eyes and conversations reflected adorable childlike innocence and charm. Despite their physical challenges, the children's smiles were never lost. The hope is that these children will have more opportunities to see the world and that more people will come to know and understand them. This effort aims to remove the stigma of disability and create an environment of understanding, respect, equality, and inclusion. Participants: 14 employees and family members. Total volunteer hours: 98 hours.



## 4. Accton Arts Foundation: "Nice to Meet You! A Friendly and Equal Art Exhibition Experiment"

In August, the Accton Arts Foundation invited seven major social welfare organizations, namely the Luway Opportunity Center, the Sisters of Our Lady of China Catholic Charity Social Welfare Foundation, the Beunen Foundation, the Abundant Blessings Community Association of Taiwan, the Abao Education Foundation, the Saint Joseph Social Welfare Foundation, and the Ai Heng Training Center for Mental Retardation, to collaborate. Using the openness and experimental nature of art, the themed curation led the service recipients of these institutions to engage with art. Through multifaceted dialogues between artists and friends with disabilities, the exhibition opened up new ways of imagining and creating art, building a platform for both the general public and people with disabilities to participate and interact. During the exhibition, Accton's visually impaired baristas conducted charity coffee sales, supported by six Accton volunteers who helped with exhibition explanations, guiding visitors to interact with the artworks, filling out questionnaires, assisting the visually impaired baristas, and providing support for manual coffee brewing. The aim was to use art to bridge the gap between people with disabilities, artistic creation, and the audience.



## 5. Accton E-Charity's "Podcast New Wave: Trendy Seniors Invite You to Stay Young At Heart!"

Accton E-Charity, in collaboration with the Chiayi City Government Health Bureau, has pioneered the launch of a new wave of senior podcasters. Over two years, they guided Chiayi's trendy seniors to "go on air!" On September 16-17, a results exhibition was held at the "Youth Soul Lab" in Chiayi City.

In 2022, Accton E-Charity successfully launched the "Trendy Seniors on Air" podcast channel. In 2023, they aimed to evolve this group into a self-sufficient production team through professional training and division of labor, enabling them to continue sharing their life stories through new media. This initiative hopes to inspire all seniors to enjoy and create a unique and vibrant life.

The results exhibition showcased diversity and inclusion, featuring Lin Chia-Chien, an internationally certified visually impaired barista and Accton employee, who shared her coffee brewing experience and life story. Other activities included live storytelling by the seniors, sensory experiences for children, and a charity market.

To allow employees to experience this warm and inclusive event, Accton Group called on its employees to serve as volunteers, providing on-site support for the event. The volunteers assisted with tasks such as providing directions and consultations, guiding tours, managing event check-ins, leading participants, and offering general event assistance. The prompt responses, activity support, and on-the-spot feedback from Accton's volunteers ensured the event ran smoothly and successfully.

Nine employees enthusiastically supported the event, contributing a total of 46 volunteer hours. The two-day event attracted over 100 registered participants and more than 300 visitors. Thanks to the enthusiastic assistance of Accton's volunteers, the inclusive carnival was a resounding success.



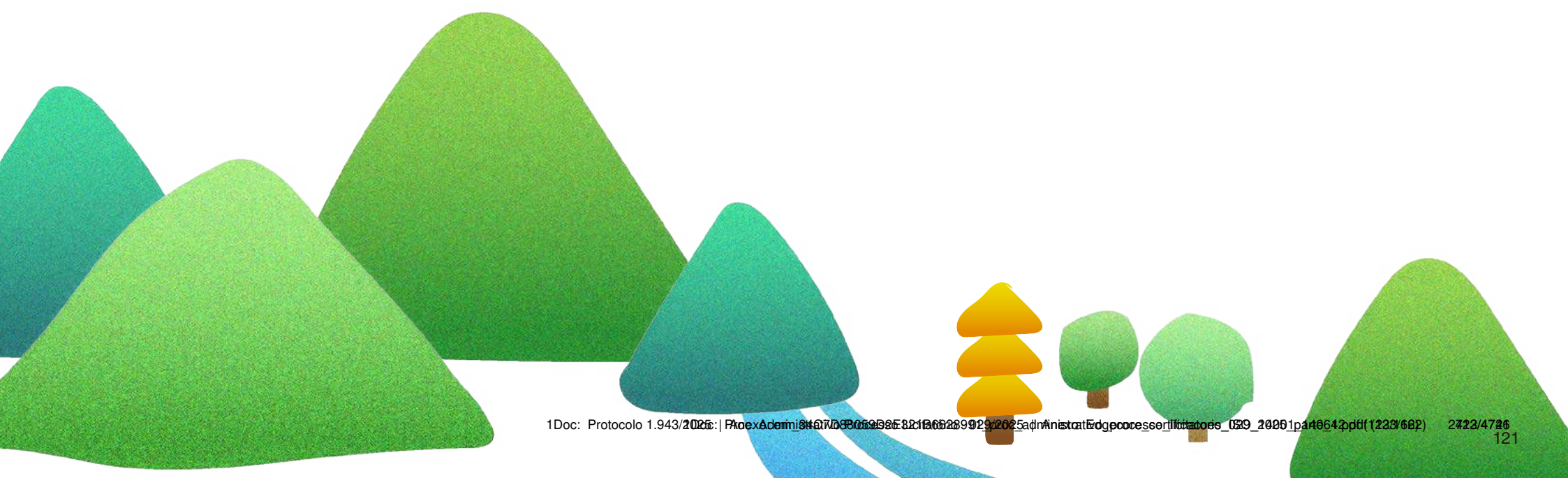




## | JoyTech

### ◆ 5 Major Results in 2023:

1. JoyTech engaged in the Shiyuan Street Volunteer Association's volunteer training program, which delved into the origins and essence of volunteering, highlighting its voluntary, unpaid, organized, and public-spirited nature. The program underscored the values of participation, mutual assistance, and dedication, encouraging employees to actively engage in activities and contribute to social development. It also reminded them to give back to society while striving in their personal and professional lives. Employees and their families participated approximately five times, while training community residents, with a total participation of 80 individuals.
2. For traffic safety advocacy, we supported the government in promoting pedestrian and electric vehicle safety to help reduce traffic accidents, while spreading a message of gratitude and social responsibility. A total of 35 employees participated, contributing over 120 hours of service.
3. Emphasizing social responsibility and the importance of blood donation as a humanitarian act and a mark of social progress, JoyTech encouraged employees to donate blood. In this activity, 24 employees donated a total of 9,600 ml of blood out of a spirit of selfless devotion.
4. To support for the Shenzhen Bao'an District International Marathon, we assisted by providing on-site supplies and maintaining order, ensuring the smooth progression of the event. Volunteers received certificates in recognition of their contributions. One employee participated, providing nine hours of volunteering service.
5. For 119 Fire Safety Promotion Day, employees conducted a "Fire Safety Awareness Lecture" in the community, sharing the fire safety knowledge they acquired at the company. The session was attended by 40 community residents. The community residents expressed their gratitude and took photos with the volunteer instructor. One employee participated, contributing two hours of service. In addition, JoyTech partnered with volunteer organizations to establish a "Safety Knowledge Promotion Team," consisting of eight members who organize awareness activities from time to time each year to give back to the community.



## 4.3 Safeguarding Employee Safety

### Occupational Safety and Health Management



**Boundary: Including manufacturing plants: Accton HQ (Plant 1) and Plant 2 in Hsinchu, Zhunan Plant in Miaoli, offices in Taipei, Taichung, and Tainan, and subsidiaries Edgecore, JoyTech in Shenzhen, China, and Vietnam Accton manufacturing plant.**

Accton values the performance of occupational safety and health management. In addition to providing a good working environment, the company is also committed to establishing a safety culture and reducing occupational health and safety risks. Based on the ISO 45001 management system, Accton has implemented a Plan-Do-Check-Action framework to establish a safety and health management system that is applicable to activities, products, and services across all its facilities.

#### I. Environmental Safety and Health Policy

1. Comply with domestic occupational safety and health regulations, and effectively implement and continuously improve our safety and health management systems. Regularly update and analyze employee health examination reports.
2. Actively promote resource recycling and industrial waste reduction.
3. Enhance education for employees and manage suppliers and contractors with rigorous environmental safety and health training and awareness.
4. Proactively eliminate unsafe acts and conditions to prevent accidents.
5. Maintain employee health and achieve zero accidents.

#### II. Strategy

Accton has established related procedures and systems in accordance with the characteristics of each unit to prevent, track, manage, and report occupational injuries and diseases and implement routine inspections and audits to ensure the health and safety of employees and the work environment. Annual internal audits and third-party inspections are conducted to ensure compliance with ISO 45001 and related safety and health regulations.

#### III. Management Goal: In 2023, Accton, Edgecore, JoyTech, and Vietnam Accton aim for zero major occupational accidents.

Management Indicators	2023 Goals	2023 Results	Short-term Goals (2022-2023)	Mid to Long-term Goals (2024-2026)
Number of Major Occupational Accidents	0	0	0	0
Disabling Injury Frequency Rate (FR)	Reduce by 5% (Compared to the previous year)	Reduce by 26%	Reduce by 5% (Compared to the previous year)	Reduce by 5% (Compared to the previous year)
Disabling Injury Severity Rate (SR)	Reduce by 5% (Compared to the previous year)	Increased by 18%	Reduce by 5% (Compared to the previous year)	Reduce by 5% (Compared to the previous year)

Due to the Disabling Frequency Rate (FR=1.324) in 2022, Accton has implemented the following safety and health measures:

**1. Case studies:** Workplace injury cases are included in the training materials for new recruits and ongoing employee training to ensure both new and seasoned employees understand the causes of accidents and the improvements made to prevent similar incidents. **2. Production line training room:** For example, when learning to drive a machine operation simulation area is set up next to the production line. Before officially operating the machine, the manufacturing department staff will use the simulated production line to familiarize themselves with the operation process and must pass the examination before they can operate the machine. This can ensure that employees not only know how but also can do, and raise safety awareness to reduce the number and severity of workplace injuries. **3. Adjustments to occupational safety and health refresher training content:** Accident cases are added to on-the-job training materials to give employees a more direct understanding of the causes of accidents and the measures taken to improve safety.

The results for 2023 show a reduction in the FR and an increase in the SR. Accton continues to improve, aiming to reduce the rate by 5% annually (based on the previous year as the baseline).



## IV. Occupational Safety and Health Management

To prevent hazards associated with operations, activities, services, or facilities from causing safety and health risks to colleagues or financial losses to the Company, Accton maintains an ISO 45001 safety and health management system. This system continuously promotes the identification of safety and health hazards, risk and opportunity assessments, and the implementation of appropriate preventative measures or necessary control methods to keep risks at an acceptable level.

### 1. Occupational Safety and Health Committee

Accton has established an Occupational Safety and Health Committee, chaired by senior executives and plant managers, and meets quarterly. Each factory plant nominates labor representatives exceeding 1/3 of the number of management representatives, complying with regulatory requirements.

The Taipei, Taichung, Tainan offices, and Edgecore hold meetings at Accton's Hsinchu headquarters to review safety inspections, environmental operation testing results, etc. JoyTech also has an Occupational Safety and Health Committee that meets quarterly.

The Occupational Safety and Health Committee convenes quarterly meetings to discuss the following matters:

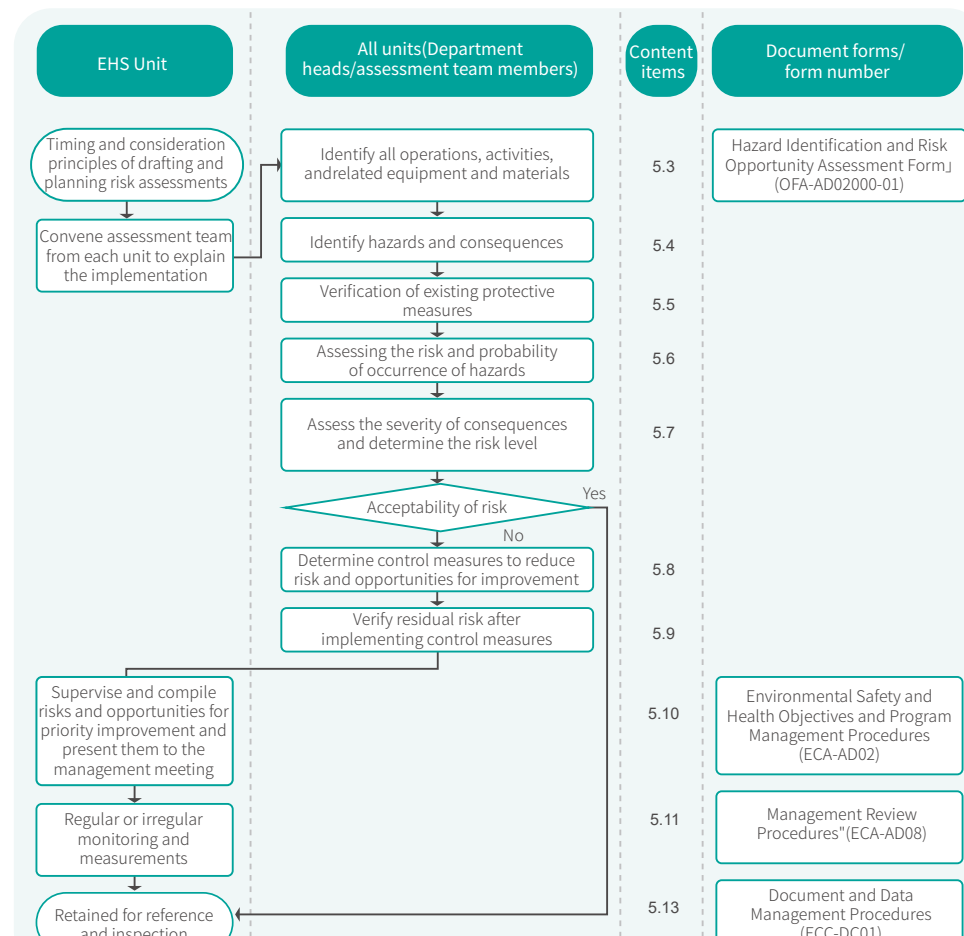
<b>A</b>	Formulation of the occupational safety and health policy and recommendations.	<b>G</b>	Business units' automatic inspections and safety and health audit matters.
<b>B</b>	Coordination and recommendations of the occupational safety and health management plan.	<b>H</b>	Preventive measures for hazards from machinery, equipment, and materials.
<b>C</b>	Safety and health training programs.	<b>I</b>	Occupational injury investigation reports.
<b>D</b>	Work environment inspection plans, inspection results, and measures adopted.	<b>J</b>	Evaluation of the performance of onsite safety and health management.
<b>E</b>	Health management, occupational disease prevention, and health promotion matters.	<b>K</b>	Managing safety and health in contracted businesses.
<b>F</b>	Safety and health proposals.	<b>L</b>	Other occupational safety and health management matters.

## 2. Hazard Identification and Risk Assessment GRI 403-2,GRI 403-7

Accton follows the ISO 45001 PDCA management spirit of continuous improvement and has established procedures for hazard identification and risk assessment to control risks to an acceptable level through regular safety and health hazard identification and risk opportunity assessment. The effectiveness of the implementation is submitted to the Occupational Safety and Health Committee for review on a quarterly basis.

Hazard Identification and Risk Assessment Process:

### ◆ Hazard Identification and Risk Opportunity Assessment Implementation Process



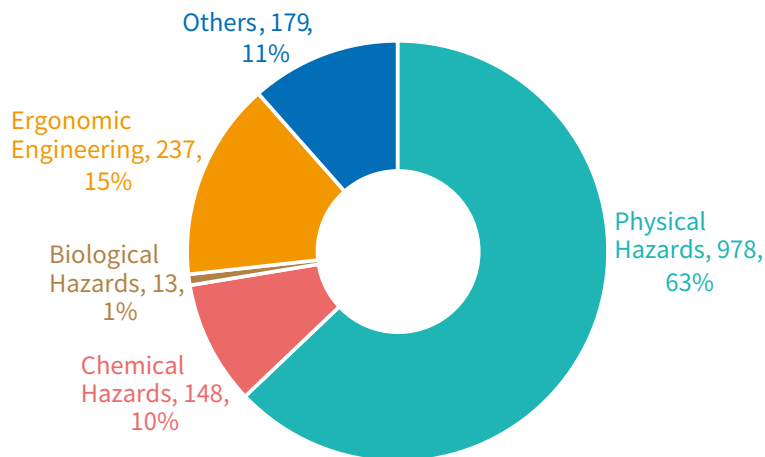
After training, occupational safety and health risk assessment personnel identify hazards and consequences annually based on operational items, determining the type of potential hazards. OSH personnel shall determine the risk level based on the severity of the hazard multiplied by the likelihood of occurrence.

Risks rated level 4 (inclusive) and above are prioritized for improvement by the responsible unit. The priority of control measures are as follows: 1. elimination, 2. replacement, 3. engineering control, 4. management, and 5. personal protective equipment.

**Risk Assessment Results:**

Accton's main sites, including the Hsinchu headquarters (Plant 1), Hsinchu Plant 2, Zhunan Plant, JoyTech, and Vietnam Accton, are all included in the hazard identification scope, covering employees and contractors controlled by Accton such as security personnel, cleaning staff, and other contractors. In 2023, physical risks were the highest proportion of assessed risks, followed by ergonomic engineering and chemical risks. Among all other categories, traffic accidents have the highest risk assessment ratio.

**◆ 2023 Hazard Identification and Risk Opportunity Assessment**



**A. Physical Hazards**

Since the production equipment is mainly automated on assembly lines, it is common to see hazards such as cutting injuries, high and low-temperature contact, and inductive electric shocks. Therefore, a three-stage approach was adopted to reduce the risks. 1. Newly purchased machine safety review: The purchased machinery and equipment should be inspected and qualified by an accredited inspection agency, and the type of certified machinery and equipment apparatus should obtain the TS safety label before use. 2. Hardware safety devices: Accton sets up suitable hardware protection for such risks, such as setting up shields, light grilles, two-hand switches, safety switches, leakage circuit breakers, grounding wires, etc. 3. Safety operation standards: Develop relevant safety procedures and regulations, conduct safety education and training, and provide various personal protective equipment for colleagues to use.

**B. Chemical Hazards**

Regular checks of chemical Safety Data Sheets (SDS), implementation of workplace environmental assessments, and risk level evaluations based on the chemical control banding (CCB) and prioritize chemical management procedures. In addition, we carry out related hazard prevention measures, such as using lower hazard chemicals instead of higher hazard chemicals, using chemicals within closed systems, enhancing overall ventilation, installing local exhaust ventilation equipment, wearing personal protective equipment like gloves and masks, and conducting hazard awareness training.

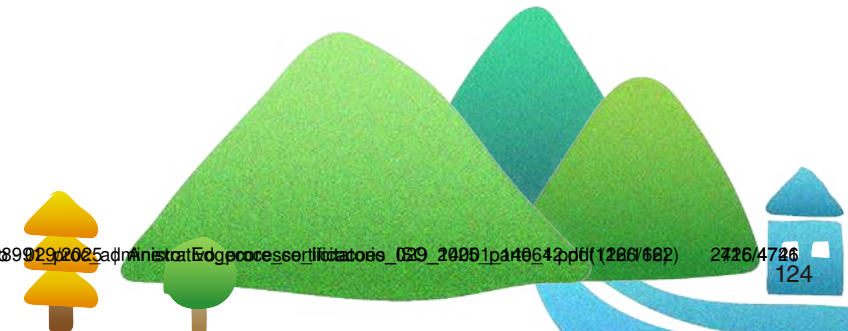
**C. Ergonomic Hazards**

Accton has developed an "Ergonomic Hazard Prevention Plan" to avoid musculoskeletal injuries caused by repetitive tasks. Accton's Occupational Safety and Health Department collects signs of ergonomic hazards through various channels such as employee notifications, health examination questionnaires, requests for pain relief patches, medical records, or workstation hazard analysis.

Upon detection, the task is analyzed to assess ergonomic risk factors. Occupational health physicians provide guidance based on the assessment results. Departments are expected to implement improvements in the intensity of efforts, working hours, postures, and frequency of tasks to reduce or eliminate hazard factors.

**D. Traffic Accident Hazards**

Accton is committed to preventing and reducing the impact of traffic accidents on employees. This involves continuously enhancing employee knowledge of traffic safety, rules, and defensive driving techniques to increase driving safety awareness.





### 3. Ongoing Promotion of Safety and Health Initiatives

Accton promotes a people-centered safety culture, manages safety risks, and constructs an inherently safe work environment. Opportunities for improvement are identified during each training session, audit, and drill, with regular monitoring of related safety and health initiatives and execution details as follows:

Item	Implementation
<b>Regulatory Identification</b>	<ul style="list-style-type: none"> <li>Accton regularly identifies regulations and tracks compliance across all facilities, with four updates to occupational safety and health-related regulations.</li> </ul>
<b>Standardized Management Procedures</b>	<ul style="list-style-type: none"> <li>Accton's standardized safety and health management procedures were reviewed and 41 documents were revised and updated.</li> </ul>
<b>Safety and Health Education Training</b>	<ul style="list-style-type: none"> <li>Courses: Including general safety and health, hazard awareness training, equipment operation safety, kitchen gas safety, industrial safety equipment operation, and annual contractor safety training for both new and current employees, with a total of 8,122 training sessions completed.</li> <li>All Accton employees and contractors passed the safety and health training.</li> </ul>
<b>Risk Identification and Assessment</b>	<ul style="list-style-type: none"> <li>Work environment risk identifications were conducted, implementing graded management and hazard reduction measures, with 1,555 risk identifications and assessments performed.</li> </ul>
<b>Newly Purchased Equipment Safety Management</b>	<ul style="list-style-type: none"> <li>Accton assessed 34 pieces of newly purchased equipment for safety reviews, with zero incidents caused by the use of new machinery.</li> </ul>
<b>Chemical Management</b>	<ul style="list-style-type: none"> <li>All chemicals entering Accton facilities must pass a safety review process. Three chemical CCB classification management assessments were completed, with 0 incidents caused by the use of new chemicals.</li> </ul>
<b>Contractor Management</b>	<ul style="list-style-type: none"> <li>Accton contractors conducted 586 operations within the facilities, with a 100% achievement rate in site inspections and hazard communication.</li> </ul>
<b>Implementation Checks</b>	<ul style="list-style-type: none"> <li>Accton's internal audits identified 89 issues, with a 94% improvement rate.</li> </ul>
<b>Emergency Response Drills</b>	<ul style="list-style-type: none"> <li>In 2023, 10,331 participants took part in emergency response drills, including chemical leak, civil defense, response team training, and fire evacuation drills.</li> </ul>
<b>Occupational Accident Prevention</b>	<ul style="list-style-type: none"> <li>In addition to risk assessment, the depth of accident investigation has been refined, and related improvements have been extended to all plants as a level to reduce the number of injury cases.</li> </ul>

### 4. Workplace Environment Monitoring

To maintain a good workplace environment, the Accton plants are regularly monitored by occupational health technicians every six months and JoyTech is monitored annually, and the monitoring results are published. The content of inspections includes (1) environmental measurements of physical factors: noise and lighting; (2) environmental measurements of chemical factors: carbon dioxide, organic solvents, tin, and metal dust. All monitoring results met statutory laws and regulations.

### 5. Exchange of Occupational Safety and Health Information

To enhance the exchange of occupational safety and health information, it is disseminated through the Company's internal website, emails, and bulletin boards periodically. Accton also actively participates in explanatory seminars organized by competent regulatory authorities to keep occupational safety and health information up-to-date. We hope to increase employees' safety awareness and participation through bilateral or multilateral communication channels and increase protection for employees' safety and health.

During safety and health education training for new employees, in addition to informing them about workplace hazard risks, it is particularly emphasized that, according to Article 18 of the Occupational Safety and Health Act and Article 25 of the Enforcement Rules of the Occupational Safety and Health Act regarding "imminent danger," employees are instructed that if they detect any immediate danger during work, they should not only report it immediately but also evacuate to a safe place on their own. Additionally, supervisors and managers may order an evacuation based on the current disaster situation to ensure the safety of all employees. Employees shall immediately report any safety concerns to their supervisors or occupational safety guards during their employment and shall not be subject to disciplinary action for reporting safety concerns.

Other workers such as security personnel, cleaning staff, and contractors agree on the implementation of safety and health management, health management regulations, emergency and incident notification, etc. through the organization of agreements, hazard notification, etc. If there is a risk of danger during the construction process, the contractor will not only request improvement on the spot, but will also provide the relevant records to the contractor and the contractor's responsible window to remind the relevant stakeholders of safety and health awareness.

### 6. Inclusion of migrant worker dormitories in regular safety audits

Accton Technology not only cares about the safety of colleagues at work but also prioritizes the safety of their accommodations. Therefore, the Occupational Safety and Health Department conducts monthly audits of migrant worker dormitories, checking six major aspects: "building safety," "electrical safety," "fire evacuation," "food hygiene," "environmental cleanliness," and "pandemic prevention measures." With the assistance of Accton's occupational safety and health professionals, the dormitory management companies are continuously guided to improve, fostering a cooperative



## V. Management Performance GRI 403-5

### 1. Five indicators of safety and health management performance

Item		2023 Goals	2023 Results	Achievement Rate (%)
Proactive Performance	Occupational safety and health training (persons)	8,168	8,122	99.4
	Participation in emergency drills (persons)	10,331	10,331	100
	Educational training for certifications (persons)	345	345	100
Reactive Performance	Number of fines (cases)	0	0	100
	Completion rate of occupational injury investigations and improvements (%)	100	100	100

### 2. Occupational Safety and Health Statistics GRI 403-9

Accton has established a "Management Procedures for Incident Investigation" applicable to employees and contractors at workplaces, company events, or business-related trips. The health management unit shall provide medical care in accordance with the "Employee Injury and Illness Management Regulations" for injuries to personnel. It shall also notify the environmental safety and health management unit to carry out accident investigation and handling operations. Where the occupational safety and health requirements are not met, improvements must be implemented in accordance with the "Management Procedures for Corrective and Preventive Measures".

During 2023, Accton/Edgecore/JoyTech/Vietnam Accton reported zero fatalities, severe incidents, or occupational diseases (with no occupational disease deaths or confirmed diagnoses of occupational diseases or work-related diseases by occupational medicine specialists in the last three years). There were also no occupational injuries among contractors.

### ◆ Occupational Injury Statistics (excluding off-site traffic accidents) include:

Injury Category	2021	2022	2023
Total Recordable Incident Rate	10	12	12
Work Hours Lost	1,432	1,256	1,520
Work Days Lost	179	157	250
Disabling Injury Frequency Rate (FR) (to three decimal places)	1.050	1.324	1.120
Disabling Injury Severity Rate (SR) (no decimals)	19	17	23
Frequency-Severity Index (FSI) (to two decimal places)	0.14	0.15	0.16

Note: Disabling Injury Frequency Rate (FR) = (number of people who suffer disabling injuries × 10<sup>6</sup>)/total work hours

Note: Disabling Injury Severity Rate (SR) = (days lost due to disabling injuries × 10<sup>6</sup>)/total work hours

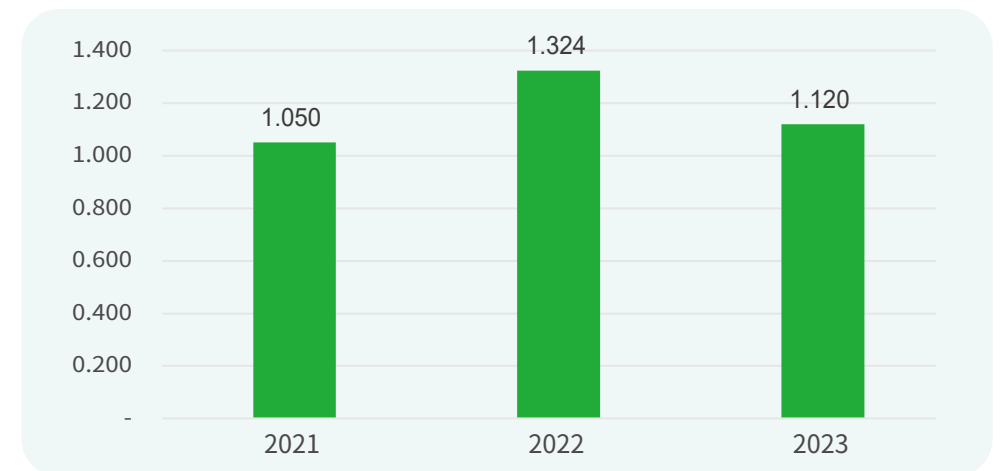
Note: Frequency-Severity Index (FSI) =  $\sqrt{[(FR \times SR)/1,000]}$

Note: Total hours worked: 8 hours \* number of working days per month \* number of employees per month, sum annual total (10,713,808 hours).

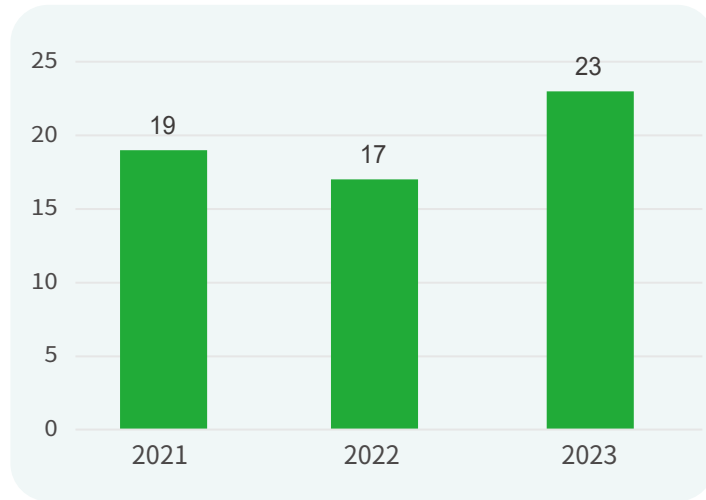
Note: Workers consist of employees and temporary workers of outsourced service providers employed at Accton sites under Accton's management, such as security personnel, cleaning staff, and contractors.

Note: For temporary staff, such as security personnel and cleaning staff, there were no work-related injuries reported in 2023.

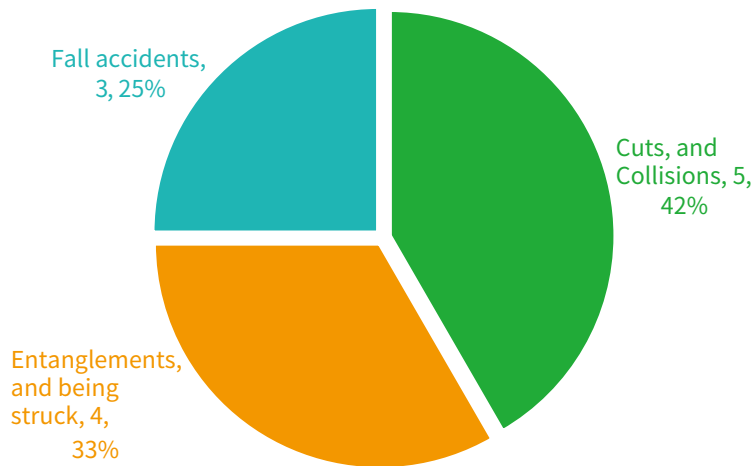
### ◆ Disabling Injury Frequency Rate (FR)



◆ **Disabling Injury Severity Rate (SR)**



◆ **Occupational Accident Category Statistics**



Cause Analysis and Improvement Measures for Accident Categories in 2023:

The increase in the SR from 17 in 2022 to 23 was primarily due to three accident categories causing relatively significant loss of work hours:

1. Injuries from mobile carts.
2. Injuries from handling goods.
3. Sprain injuries caused by not following designated pathways.

Improvement measures for the aforementioned accident types:

A. Accidents related to machinery and equipment: Injuries included cuts, collisions, entanglements, and being struck. The causes were collision injuries caused by not being aware of surrounding personnel when using hydraulic pallet trucks and racks. Dropping goods during handling. Improvement measures: 1. Add a product mobile cart operation practice station in the production line training room. This station uses physical simulations to teach employees on correct operation techniques and safety precautions before they start working on the line. 2. Mandate the use of hydraulic pallet trucks and forklifts in specific work areas, and require the wearing of safety shoes to reduce injuries caused by improper actions. 3. Implement color coding in work areas to denote safety zones and required personal protective equipment (PPE). 4. Enhance safety awareness by installing digital signboards in the employee rest areas within the plant. These signboards will display occupational safety and health regulations, emergency response procedures, correct operational methods, and safety information to improve safety awareness among plant employees.

B. Fall accidents: These primarily occur due to employees running inside the factory and not following designated pathways. Subsequent improvements: Emphasize the importance of being aware of surroundings and adhering to designated pathways to avoid unsafe behaviors.

C. Sprain accidents: Occurs when personnel do not follow the designated pathways, leading to sprains. Improvement measures: Mandate that all personnel must follow designated pathways when arriving and departing work. During morning meetings, conduct safety announcements to remind colleagues to observe safe behaviors.

**3. Occupational Safety and Health Management System**

To ensure a safe and healthy work environment for all employees, contractors, and visitors during the production process. Accton adheres to the ISO 45001 standard, implementing safety and health controls and achieving third-party certification. Continuously updated each year to ensure compliance with standards. Accton's main facilities are certified, with the occupational safety and health management system and internal and external audits covering all sites, encompassing a total of 3,369 employees and 1,649 other workers, achieving a 100% coverage rate. Accton's offices are managed under the ISO45001 System.

Plant	Hsinchu HQ	Hsinchu Plant 2	Zhunan Plant	Joy Technology (JoyTech)	Vietnam Accton
ISO45001	V	V	V	V	V

For detailed information on Accton's ISO certifications, please visit the official company website:

## 4. CPR and AED Emergency Training

Conducting CPR (Cardiopulmonary Resuscitation) and AED (Automated External Defibrillator) emergency training within the Company is crucial as it can save lives in emergency situations. The benefits include:

1. Rapid response to emergency situations: Regardless of the situation, when a sudden loss of vital signs is detected in colleagues or family members, if employees can respond quickly and use appropriate first-aid skills, they may be able to save a life.
2. Increase employee knowledge and confidence in performing first aid: By learning CPR and AED procedures, employees gain knowledge and skills on how to perform first aid. This knowledge and skill can make employees feel more confident, knowing they can assist others in need.
3. Foster a safety culture: Through first aid training, the Company demonstrates its commitment to the safety of its employees and clients. This focus contributes to fostering a safety culture where employees are more conscious of their own and their colleagues' safety and better prepared to handle emergencies.

If everyone could learn CPR and provide first aid within the critical "golden hour" after an emergency, many lives and families could be saved.

Prioritizing employee health and wellbeing, Accton has arranged for employees to participate in first aid training courses to maximize the crucial time for rescuing colleagues in the event of an accident. From 2022 to 2023, the Company has continuously invited Red Cross first aid instructors to conduct hands-on practice drills.



In 2023, based on departmental operational risks across manufacturing plants, Accton conducted emergency response drills for various scenarios, including production equipment fires, abnormal battery charging fires, and facility equipment fires. Through simulations of emergency response drills conducted for daytime, nighttime, and on public holidays, the factory plants' responsiveness is enhanced.

Additionally, with reference to past incidents of fires in waste areas, synchronized fire drills are conducted in the waste storage areas of each factory. Taking the Zhunan Plant as an example, the types of waste produced include foam, pallets, and cardboard, which are stored adjacent to the landlord's waste storage area, posing a potential risk of rapid fire spread.

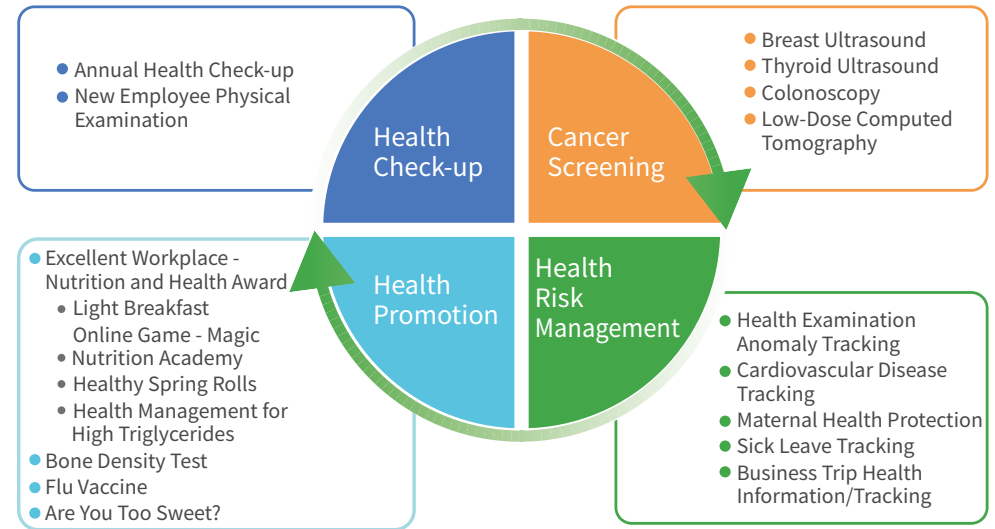
To address this, joint drills with the landlord are organized to strengthen the notification and response capabilities between the two facilities. The drills utilize the Plan-Do-Check-Act (PDCA) cycle to review and enhance inter-plant communication, equipment support, and personnel coordination, which contributes to improving the disaster response workflows and broadens the scope of disaster reduction efforts.



## 4.4 Safeguarding Employee Health

### Comprehensive Health Management

The Company has always upheld the belief that "employee health is the company's most valuable asset," leading to the establishment of a Health Management Department, staffed by occupational nurses and specialist occupational physicians. Through health promotion, management, and services, the company is committed to creating a professional workplace environment. To this end, a health management system has been set up to timely update and analyze employee health examination reports. Early detection of issues allows for timely intervention. Mechanisms are in place to maintain the confidentiality of personal health information, complying with medical personnel regulations. When collaborating with healthcare service providers, contracts specify mutual confidentiality obligations to ensure data security. In the future, the system will be enhanced to version 2.0 to realize the goal of customized health services for employees. Unique health promotion activities are designed to embody the principle of "prevention is better than cure" and are dedicated to fostering healthy lifestyle habits. The Company will continue to provide professional health support, ensuring that all employees can promote health in a vibrant environment. Comprehensive health management contributes to improving the quality of life and work efficiency of employees, and it also strengthens the commitment to employee health, earning the company a Health Management Award in 2019.



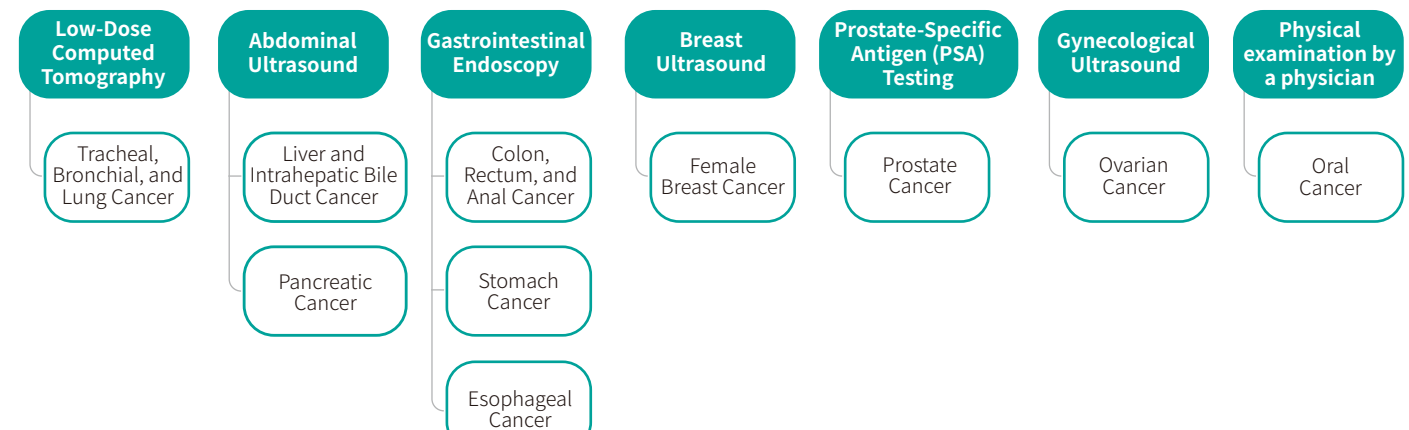
### Annual Achievements

Accton participated in an excellent health workplace program and received the Nutrition and Health Award. We will continue to provide precise health management and actively promote various health promotion activities. We hope employees will accumulate health capital from their lives and develop a healthy lifestyle.



### Health Check-ups and Cancer Screenings

In prioritizing employee well-being, we conduct annual health check-ups and cancer screenings that surpass statutory requirements. These screenings encompass cancer types with the highest mortality rates in 2022, urging employees to engage and develop consistent screening routines for early detection and treatment. For those diagnosed with cancer, we provide comprehensive case management support, including monthly treatment monitoring and the provision of timely assistance and care. Honored with a Health Care Award in 2020.



## Health Risk Management

Health risk management aims to effectively manage various risks individuals face concerning their health. The company carries out a systematic approach to track health check-up results, categorizing them into three levels: A, B, and C. Level C necessitates a re-examination within one month, Level B within three to six months, and Level A entails self-directed health management. For employees who needed re-examinations in 2023, efforts are intensified based on the grading system, with additional manpower dedicated to executing these follow-ups. Special attention is given to specific groups such as maternal protection and the prevention and management of neuro cardiovascular diseases, as well as tracking sick leave to ensure employees receive appropriate support under the impact of illnesses. For employees frequently traveling overseas for business, the Company not only provides pre-trip health information but also monitors their condition upon returning to their home country, ensuring their safety and well-being during work assignments. Additionally, the Company carefully plans the "Mom's Appreciation Gift" program, specifically designed for employees in the early stages of pregnancy, a critical period for fetal development. Comprehensive occupational risk assessments and adaptive health protection suggestions are made throughout the pregnancy. The company received the Excellent Breastfeeding Room Certification in 2023 and was awarded the Excellent Workplace - Maternal Health Friendly Award in 2021.



### Health Examination Anomaly Tracking

- The rate of follow-up health examinations increased from 25% to 44%; the rate of non-responses decreased from 67% to 53%.
- Awarded the 2019 Excellent Workplace - Health Management Award

### Cardiovascular Disease Tracking

- Provided a list of employees with medium and high workload to the Employee Care Department.
- Employees with a monthly cardiovascular risk  $\geq 10\%$  are notified by the system, alerting the employee, their supervisor, and the Human Resources Department.
- In compliance with legal standards, 12 doctor consultations were arranged, achieving a 100% completion rate.

### Maternal Health Protection

- Excellent breastfeeding facilities.
- Early pregnancy notifications come with a "Mom's Appreciation Gift" to congratulate the employee on pregnancy.
- Awarded the 2021 Excellent Workplace - Maternal Health Friendly Award.

### Sick Leave Tracking

- Necessary workplace readjustment assessments.
- Arranged doctor consultations based on employee conditions.
- Respiratory infection patients encouraged to receive flu vaccinations.
- Awarded the 2020 Excellent Workplace - Health Care Award.

### Travel Health Tracking

- Provided pre-travel health information and epidemic prevention education about the destination.
- We offer employees a travel medicine clinic and vaccination subsidies.
- Health check abnormalities: Pre-travel doctor interviews.
- 14-day post-return tracking

## Health Promotion

Accton's annual health promotion planning aims to establish itself as a role model for fostering a healthy workplace, a commitment that has consistently earned it the Nutrition Health Award, including in 2023. Further details can be found on the Health Promotion Administration's Workplace Health website. In addition to disseminating health education information through health check-ups and screening results, specific groups are encouraged to engage in various activities, such as the "My New Dietary Proposition" series, blood glucose testing, and vaccinations. Carefully curated practical gifts are provided to enhance employee participation. To ensure accessibility, relevant information is disseminated not only through Company posters, websites, and leaflets, but also through foreign manpower agencies on social media fan pages and groups, allowing foreign employees to directly access pertinent information.

**您的骨質，易脆嗎?**  
免費! 市價\$800  
骨質密度檢查 黃金標準

**雙能量X光吸收儀(DXA)**

- 40歲以上女性
- 50歲以上男性
- 有骨折病史

名額有限, 高風險及產線同仁優先錄取

報名連結

健康管理處 JESS#368P

**2023 MULTI-VACCINATION 多種疫苗**

竹南 莊耳鼻喉科 CHONG ENT CLINIC | 竹科員診 Hsinchu SCIENCE PARK CLINIC

統一報名扣款 / 自行向診所預約 / 11月自行至診所施打 / 攜帶員工證享特約價

HPV疫苗 嘉喜-9價 HUMAN PAPILLOMAVIRUS VACCINE GARDASIL 9 \$5,500	1	HPV疫苗 嘉喜-9價 HUMAN PAPILLOMAVIRUS VACCINE GARDASIL 9 \$5,000
肺炎鏈球菌疫苗 沛兒-13價 PNEUMOCOCCAL VACCINE PREVENAR 13 \$3,700	2	肺炎鏈球菌疫苗 沛兒-13價 PNEUMOCOCCAL VACCINE PREVENAR 13 \$3,500
帶狀皰疹疫苗 欣剋疹 ZOSTER VACCINE SHINGRIX \$8,200	3	帶狀皰疹疫苗 欣剋疹 ZOSTER VACCINE SHINGRIX \$8,500
減量破傷風/白喉/百日咳疫苗 TDAP \$1,600	4	
麻疹腮腺炎德國麻疹混合疫苗 MEASLES, MUMPS AND RUBELLA MMR \$550	5	
B型肝炎 HEPATITIS B \$450	6	
A型肝炎 HEPATITIS A \$1,650	7	

報名網址 REGISTRATION: 10.12.12:00 截止 CLOSED

健康管理處 AMY #3681 | HEALTH MANAGEMENT DIVISION BELLA #3682

\*健康管理處保留調整活動之相關權利\*

**SEP 流徵疫苗月 Influenza Vaccination Month**

2023口罩解封後，是否擔心「免疫債」找上門?  
Are you worried about the "immunization debt" after mask was removed?  
去年打過流徵疫苗，今年保護力不夠怎麼辦?!  
I got the flu shot last year, so what if I don't have enough protection this year?  
讓我們捲起袖口，提升免疫力!  
Let's Roll Up Our Sleeves and Improve Our Immunity!

不用煩惱可依據自身需求選擇報名地點囉!  
You can choose the location according to your needs!

**新竹 Hsinchu**  
10/4 13:30 一樓產線施打  
Arrange for vaccination at the factory in October 4th  
或 10月自行至竹科員診施打  
Vaccination at Hsinchu Science Park Clinic in October  
員工 & 眷屬優惠價 \$750  
Discounted price for staff & dependents

**竹南 Zhunan**  
10月自行至莊耳鼻喉科施打  
Vaccination at Chong Ear, Nose and Throat Clinic in October  
員工價 \$750 眷屬優惠價 \$880  
Employee Price \$750 Dependent Price \$880  
(莊耳鼻喉科優惠\$880 / 公司補助員工\$130產線)  
(Chong Ear, Nose and Throat Clinic \$880 / Company Subsidized Staff \$130 Off-site)

報名連結 Registration Link

9/13 12:00 截止 Closing

健康管理處 Health Management Division  
新竹 Hsinchu Bella #3682 | 竹南 Zhunan Amy #3681

LET'S VACCINE!  
\*健康管理處保留調整活動之相關權利\*

**你會太甜嗎?**

為何通知我?  
今年6月健康資料，顯示您的空腹血糖介於100-125MG/DL之間 (糖尿病前期)，未來有患第二型糖尿病、心血管疾病、腎臟病風險升高。為避免發展至疾病並及早發現及治療，邀請您參與空腹測血糖活動!

活動資訊  
新竹廠 08:00-10:30  
竹南廠 07:00-10:00

日期/時間 12/13(三)-12/15(五)

地點 健康管理處

流程 報到→血糖檢測→提供衛教

報名 請掃我→

還請 12/1 報名截止

注意 請至少空腹8小時，可依需求喝少量白開水或降血壓藥

新竹廠 Bella #3682 | bella\_how@accton.com  
竹南廠 Jess #3684 | jess\_liao@accton.com

## Mid- to Long-Term Goals for 2024

The Company will continue to prioritize improving employee health. By actively participating in the national healthy workplace certification and integrating professional medical opinions, we aim to develop a health management model tailored for our employees. In the future, we will strive to progressively win additional health awards, including the Vitality Award, Smoke-Free Health Award, and Healthy Aging Award. We will also continue to help cancer screening and health promotion activities, expanding the scope and timing of screenings to facilitate employee participation. During this period, we will upgrade our customized health management system to version 2.0, enhancing its functionality and providing personalized plans for employees. Additionally, we are launching a new health-themed activity, "Become a Pokémon Trainer: Move for Health," which promotes physical and mental health in a fun and engaging way. This demonstrates our commitment to employee health and aims to create a vibrant work environment.

Region	2023 Goals	2023 Results	Short-Term Goals (2024-2025)	Mid- to Long-Term Goals (2026-2028)
Taiwan Accton Group	Participated in the Health Promotion Agency's Excellent Health Workplace Certification and was honored with the "Nutrition and Health Award."	Received the "Nutrition and Health Award"	Receive the "Vitality Award"	Receive the "Smoke-Free Health Award" Receive the "Healthy Aging Award"

# 5 Social Charity

- 5.1 Accton E-Charity
- 5.2 Taiwan Public Welfare and Service Association
- 5.3 Accton Cultural and Educational Foundation
- 5.4 Accton Arts Foundation
- 5.5 Arttime Art Network



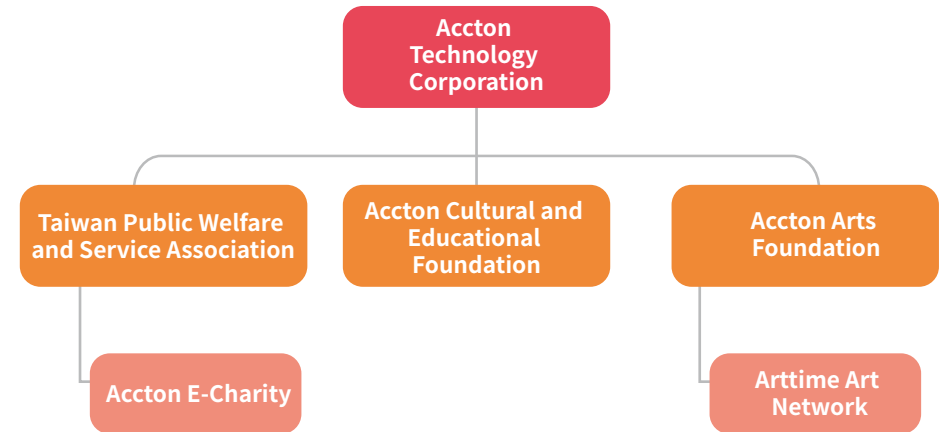
## 5. Commitment to Social Welfare

In 1999, Accton established the "Accton Cultural and Educational Foundation" to provide diverse learning opportunities with the vision of lifelong learning and growth, and the goal of improving the teaching environment, fostering diverse education, and promoting inclusive education. In 2001, drawing on its core ICT and marketing expertise, Accton created the "Accton E-Charity Portal" platform, an open and diverse digital platform designed to help non-profit organizations bridge the digital divide. Through this online platform, Accton connects people, events, and resources, enabling good deeds to be done and encouraging broader participation in charitable endeavors to help those in need. In 2003, recognizing the need to provide immediate support to those facing emergencies or hardships, the "Taiwan Public Welfare and Service Association" was established by individuals enthusiastic about public welfare and Accton employees. The association endeavors to harness goodwill and pool resources from various sectors to maximize its positive impact.

As a leading global provider of network equipment, Accton prioritizes innovation and invests in nurturing future talent through arts education, fostering creative thinking. In 2000, Accton established the "Accton Arts Foundation" and "Arttime Art Network" platform, with the aim of helping the public understand the diversity of art and encouraging sustainable and equal public participation through art as a bridge. Under this overarching vision, the Arts Foundation has undertaken four missions: Promote culture and art education, develop a database of Taiwanese art talent, drive the overall development of culture and art communities, develop cultural, creative and artistic communities, as the focus of the operation, adapt to the changes of the times and continue to provide services.

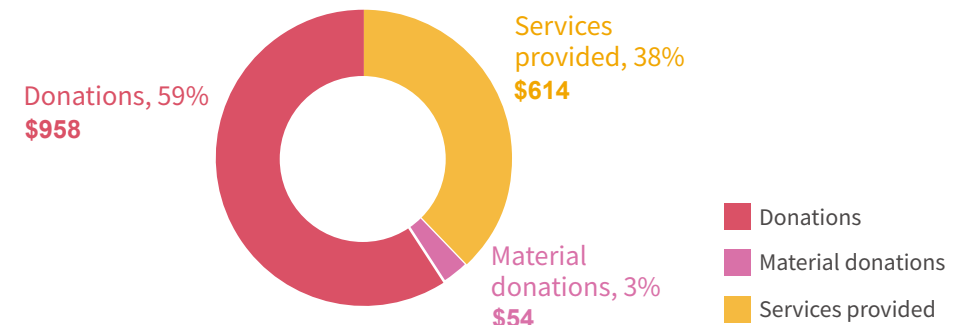
Beyond local contributions, as a global citizen, Accton's subsidiary Edgecore operates under the name Edgecore America. Since 2019, it has supported the non-profit organization MCDC (Metro Community Development Corporation) for six consecutive years. This non-profit organization provides financial education, one-on-one counseling, tax preparation services, and emergency loans to low-income households in the United States, helping them afford housing and transportation costs to secure their living and employment stability. MCDC has trained 500 professionals to provide effective treatment and home services for individuals with hoarding disorders and offers educational and social welfare resources for new immigrants in Massachusetts. From 2019 to 2023, the cumulative donation amount to this cause has been US\$288,000.

### ◆ Relationship between Accton and its foundations



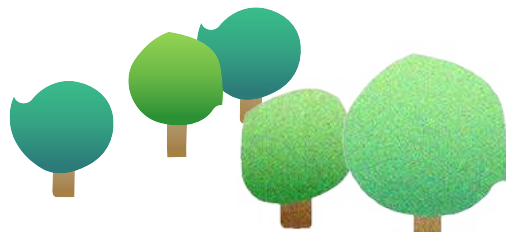
### ◆ Our social contributions Total: NT\$16.27million

(Unit: NT\$, ten thousands)



Note: Social contributions include activities related to Accton Technology, Edgecore Networks, Accton Cultural and Educational Foundation, Taiwan Public Welfare and Service Association, Accton Arts Foundation, and donations made by employees of the Accton Group.

Note: Accton has prioritized social welfare and cultural and artistic enhancement as core objectives of its main business. Therefore, from the inception of each unit, it was decided that the related operational costs, including personnel and operational venues, would be funded by Accton. The social contributions mentioned above do not include these operational costs covered by Accton.



## 5.1 Accton E-Charity

Accton leveraged core competencies in network communications to set up and operate a fundraising platform, Accton E-Charity ([www.17885.com.tw](http://www.17885.com.tw)), aimed at bridging the digital divide for non-profit organizations. This platform supports social welfare organizations across Taiwan by assisting with online fundraising, event promotion, volunteer recruitment, and the collection of resources.

### Bridging the digital divide for social welfare organizations

#### Online Fundraising on the Accton E-Charity Platform

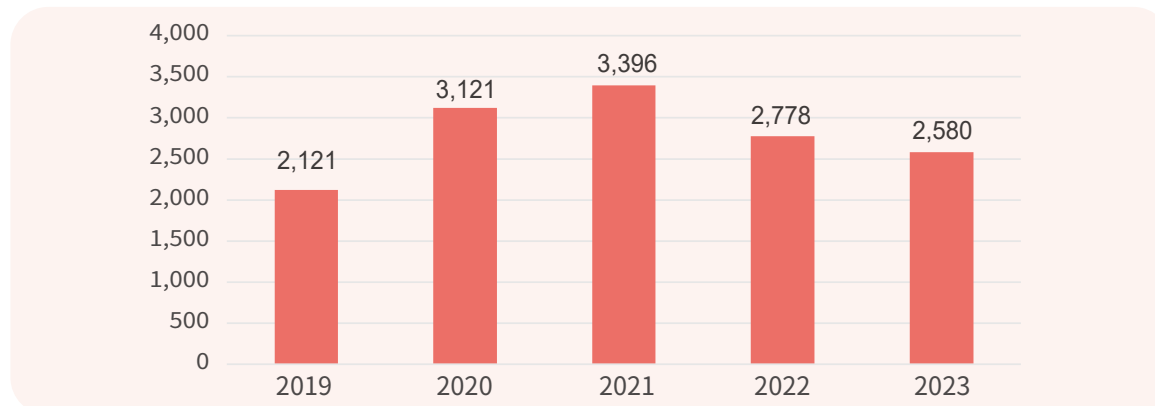
At the end of 2023, Accton E-Charity had 409 public welfare organizations as members and 300,000 individual members. By covering all operational expenses for the platform, Accton ensures that public welfare organizations can utilize the platform without financial burden. Throughout 2023, the platform served as a catalyst for 531 fundraising initiatives, collectively generating NT\$25.80 million in support of diverse causes across Taiwan. This platform not only provides more exposure for members but also enhances their connectivity, fostering horizontal communication among organizations. It pushes forward cross-sector and cross-unit projects, focusing not just on individual members but on thematic collaborations that leverage the strengths of various members, thereby enhancing visibility from multiple perspectives.

Accton prioritizes website security by assigning dedicated personnel to oversee the site's operation and monitoring. They promptly address any irregular activities to safeguard donor data effectively. The website employs HTTPS encryption to fortify the security of information transmission. Furthermore, online transactions benefit from SSL certificates, boasting an exceptional security level rated A+. Moreover, the site implements stringent security headers rated A and adheres to TLS 1.2 (or higher) encryption protocols, aligning with international standards for secure Internet transmission.



#### ◆ Amount donated to public welfare organizations across Taiwan via Accton E-Charity

(Unit: NT\$, ten thousands)



## 5.2 Taiwan Public Welfare and Service Association

Since its inception in 2003, the Taiwan Public Welfare and Service Association has primarily focused on providing emergency relief. In the past five years, in response to social changes and the emergence of new issues, as well as the rise of the social media era, a variety of new and diverse fundraising models have emerged. These changes reflect the evolving ways in which issues are presented and addressed. The association has adapted by embracing diverse fundraising methods and platforms. This adaptability allows for the early identification and prevention of various issues, enhancing the effectiveness of subsequent solutions. Besides caring for the disadvantaged, the association has defined three main areas of focus: "Educational Empowerment," "Aging with Dignity," and "Diversity and Inclusion."

Under the main focus of "Educational Empowerment," the approach is twofold: enhancing the competencies of educators and companions, and promoting reading. In the area of "Aging with Dignity," the focus starts with meeting basic physiological needs and extends to psychological care, aiming to open up a treasure trove of opportunities for seniors, thereby fostering a dignified and independent third stage of life. For "Diversity and Inclusion," different activities are designed to promote integration among various groups, enhancing community harmony and inclusion through diverse interactions.

In 2023, the Taiwan Public Welfare and Service Association's donations included emergency relief and collaboration on public welfare projects, totaling NT\$6.94 million.

#### ◆ Sources of donation for Taiwan Public Welfare and Service Association, 2022-2023

(Unit: NT\$, ten thousands)

Source	2022		2023	
	Amount	Percentage	Amount	Percentage
Accton donations	456	67%	500	72%
Public donations	227	33%	194	28%
<b>Total</b>	<b>683</b>	<b>100%</b>	<b>694</b>	<b>100%</b>



## II. Educational Empowerment



Educational institutions and frontline educators play a pivotal role in learning. The association aims to enhance the teaching capabilities of educators through collaborative educational projects, developing child-centered educational environments. These initiatives not only facilitate students' comprehension of the world around them, but also bridge the gap between theoretical knowledge and practical application in their daily lives. By nurturing problem-solving skills, these efforts prepare students to confront and surmount future challenges with confidence.

### 1. Promotion of SDGs Sustainable Teaching Aids

To encourage teachers to introduce SDGs (Sustainable Development Goals) to students and integrate them into their teaching, the Taiwan Public Welfare and Service Association sponsored 75 sets of teaching aids developed by DFC Taiwan in 2023. The aids, titled "Daily Challenges: Implementing Sustainable Ideas through DFC Learning Methods," were promoted through two online workshops, attracting 56 teachers. This initiative empowers frontline educators seamlessly introduce sustainability topics into their lessons, utilizing the SDGs teaching aids combined with DFC teaching methods, thus integrating sustainable concepts into the curriculum and fostering a culture of sustainability within campuses across the nation.

### 2. Long-Term School Companion Program

The Taiwan Public Welfare and Service Association is collaborating with Education Support for Taiwan Association on a long-term companion program for remote schools. Experienced companion teachers directly engage with schools to identify development strengths, resolve curriculum issues, and rejuvenate teachers' confidence and enthusiasm in their teaching practices through companionship engagements. In 2023, the Taiwan Public Welfare and Service Association supported four rural schools: Yongle Elementary School in Su'ao Township, Yilan County; Daxi Elementary School in Taimali Township, Taitung County; Ren He Junior High School in Taoyuan City; and Hao Shou Elementary School in Beigang Township, Yunlin County.

### 3. Taitung Kids' Book House "Partner Development Program"

To improve the working conditions of frontline childcare workers, the association has continued to support the "Partner Development Program" at the Taitung Kids' Book House for two consecutive years. In 2023, under the designated support of the Taiwan Public Welfare and Service Association, the program addressed the issue of low overall salaries for frontline teachers and supervisors. A total of 32 individuals received salary adjustments, with the majority being frontline service partners, followed by secondary and primary supervisors. The average salary increase was 11.82%. The association also provides transitional dormitories for partners who are in the process of adapting to life in Taitung. The association hopes to revolutionize conventional donation paradigms by implementing systems and benchmarks that enable frontline workers to witness the tangible outcomes of their efforts and receive equitable compensation. This progressive approach seeks to empower these workers to offer consistent and impactful support to children without the burden of financial concerns, thereby fostering a secure environment akin to a stable home for the children under their care.

### ◆ "We Support Your Raise! Recognizing the Value of Our Partners: When You Thrive, We All Do"

Listen to podcast: <https://us.rightplus.org/PD1EP71>

### 4. Change Formula Association "Wan 8 Program"

Professional companionship stands at the core of caregiving work, and the starting point for child care is how to provide these professional caregivers with ample support. In 2023, the Taiwan Public Welfare and Service Association supported the Change Formula Association's "Wan 8 Program," aiming to alleviate the caregiving pressure at child care institutions and provide social workers with fairer working conditions, while also hoping that these children have a chance to grow up well and thrive.

### 5. "OPEN Skills to All" WorldSkills Asia Abu Dhabi 2023 Interview Project

Vocational education is crucial for nurturing the country's future technical talent. However, the societal trend has long been "to prioritize academics over vocational training," resulting in a reduction of over 180,000 vocational students over the past decade, leading to a gradual decline of crucial technical talent in Taiwan.

To remove social biases and change the entrenched views on vocational education, the Taiwan Public Welfare and Service Association supported the Skills for U association to head to Abu Dhabi and document the Taiwan team participating in the WorldSkills Asia Abu Dhabi 2023. By filming and sharing the stories of these vocational champions through videos, news media, YouTube, and social media collaborations, the project aims to showcase the professionalism and spirit of technical professionals, encouraging more youth to engage in vocational education. A total of 5 videos were shot and produced, including the opening ceremony, closing ceremony, and competition highlights, attracting over 300,000 views.

- 2023 WorldSkills Asia Abu Dhabi Full Video: <https://shorturl.at/myNW5>





### III. Reading Promotion

#### 1. Rural Clinic Waiting Area Reading Corner Setup

To bridge the urban-rural educational resource gap and expand the diversity of preschool education, the Taiwan Public Welfare and Service Association collaborated with Reach Out And Read Taiwan (ROR Taiwan) on a project called "Preschool Children Reading Promotion". This initiative distributed 2,180 children's books to 19 rural medical units' waiting areas. Additionally, a reading space was set up at the Pingxi Health Center in New Taipei City, where medical staff explained and demonstrated to parents the importance and techniques of parent-child co-reading. Through parent-child co-reading sessions, this initiative aims to assist in the mental and cognitive development of young children, reduce the rate of developmental delays among rural children, and enhance emotional bonds and connections among rural families.



▲ A doctor demonstrating co-reading techniques to parents in the waiting area.

#### 2. Rural Preschool Reading Promotion Program

In rural areas, preschool education often grapples with hurdles like insufficient reading materials and frequent turnover among educators. In a joint effort with National Dong Hwa University's Social Participation Center, the association contributed 200 children's books covering diverse themes to Fengren Elementary School Kindergarten and Shoufeng Township Kindergarten in Hualien. Leveraging the resources of the university's Social Participation Center, the Department of Early Childhood Education and the Department of Education and Human Potentials Development, this initiative aims to enhance language arts curricula and enrich learning environments. By offering sustained and consistent support to preschool educators, it endeavors to establish long-term stability in these educational settings.

We hope to inspire rural children's interest and curiosity in reading through long-term investment in both physical and digital resources, and enriching books, which will enhance their vocabulary, cognitive, and emotional development.



▲ Kindergarten teachers prepare a special storytelling space for the preschool class.



▲ Children actively interact with the teachers during the story sessions.

#### 3. Rural Elementary School Reading and Writing Program

Children who enjoy reading might not necessarily enjoy writing, but those who are fond of writing definitely appreciate reading. In partnership with the Ruro platform, the association invited Atayal literature author Walis Nokan to conduct a four-week reading and writing course at Huayuan Elementary School in Wufeng Township, Hsinchu County, and Klapay Indigenous Experimental Elementary School in Hsinchu County. The program not only offers writing classes to children but also provides training for local teachers, helping them learn how to ignite students' motivation to write, regain their freedom and motivation in writing, and eventually develop a reading and teaching plan tailored to each school.



▲ Reading and writing training courses for teachers

#### ◆ Children's Works

• "The Mountain" by Huang, Grade 6 Class A  
The mountain is like a giant green hand, enveloping the entire Garden Village.

• "Rain" by Hsu, Grade 4 Class A  
Rain is like a showerhead, cleansing the world.

• "Scissors" by Dai, Grade 6 Class A  
Scissors, help me cut away the unhappiness of life.

• "Shoes" by Chen, Grade 3 Class A  
Shoes are like cars, taking me to school.

• "Basketball" by Chen, Grade 6 Class A  
A basketball is a slimming pill, you'll lose weight once you use it.



▲ Free writing classes for children

## 4. Remote Video Intergenerational Co-Reading Sessions

Remote intergenerational reading: To promote the development of reading habits among preschool children in rural areas, Taiwan Public Welfare Service Association collaborated with the ROR Taiwan, Taipei Medical University physicians, and the Chiayi City Health Bureau, under the guidance of physicians, seniors in Chiayi City engage in remote reading sessions with children from a kindergarten in Penghu via video conferencing.

The sessions adopted a dialogic reading model to enhance the verbal participation of young children. This approach not only helps preschoolers enhance their vocabulary and cognitive development through interaction and reading, but also stimulates the brains of the elderly, helping to prevent dementia and increasing their sense of achievement and well-being. The selection of picture books also integrates topics related to dementia and sustainability, achieving a triple impact of dementia prevention, intergenerational reading, and deepening sustainability awareness. A total of 8 online reading sessions were conducted, with 50 participations by elders from Chiayi City, accumulating 25 hours of service.



## IV. Aging with Dignity



### 1. Trendy Seniors On Air

In collaboration with the Chiayi City Health Bureau, the Taiwan Public Welfare and Service Association extended the "Trendy Seniors on Air" podcast program in 2023, following training and showcase events in 2022. The program continued to evolve the independence plan for the elderly by involving 16 seniors in a total of 2 general knowledge classes (4 hours) and 8 advanced classes (12 hours). The initiative transformed the elderly from mere podcast participants into a self-operating production team based on their interests and expertise. This approach ensures the continuous creation of quality programs, presenting the value and societal contribution of the elderly, and encouraging them to enjoy and create a distinctive lifestyle for seniors. In 2023, a total of 27 podcast episodes were released, accumulating 1,169 downloads.

#### Trendy Seniors On Air Channel:

- <https://reurl.cc/Z1qXzg>

#### Podcast New Wave: Trendy Seniors Invite You to Stay Young at Heart!

- Youtube video:

<https://www.youtube.com/watch?v=QMqNGtGgMlk&t=7s>

## 2. Promote Concept of Self-supporting Care

"Self-support" has recently become a prominent caregiving concept in Taiwan. However, there is a lack of systematic organization and advocacy for this care method. Therefore, the Taiwan Public Welfare and Service Association has partnered with Chang Tai Old Age Academy to promote self-supporting care through various channels such as podcasts, YouTube, TikTok, and in-person lectures. In 2023, a total of 66 podcast episodes were recorded, accumulating 15,505 downloads in total, with 8,465 unique downloads. Additionally, 29 YouTube videos were uploaded, reaching a cumulative viewership of 125,004 views. Moreover, three physical lectures were organized in Chiayi, Yunlin, and Hsinchu, with a total attendance of 179 participants.

#### Ever Healthy Channel

- <https://shorturl.at/hlOUW> (Podcast)
- <https://shorturl.at/hsvH5> (Youtube)

## 3. Elderly Care and Support

Home Bathing Mobile Van: In long-term care services, rural families often face significant economic difficulties, making it especially challenging to afford caregiving expenses. In 2023, the Taiwan Public Welfare and Service Association continued to support the Quixotic Implement Foundation by providing professional, safe, and dignified home bathing services for bedridden and mobility-impaired individuals, allocating a total of NT\$120,000. This service not only improves the psychological and physical state of the disabled but also enhances their daily quality of life and significantly relieves the pressure on caregivers, offering them solid support.

Donation of Medical Equipment to Nursing Homes: Elderly care is a key concern for the Taiwan Public Welfare and Service Association. In 2023, the association assisted the local Bethany Nursing Home in Hsinchu, providing 6 electric beds, blood pressure monitors, forehead thermometers, and other medical equipment. This support alleviates worries for caregivers and includes a large commercial refrigerator to address the lack of storage space for grocery supplies.

## V. Diversity and Inclusion



### 1. Achieving Inclusion Through Art Activities:

The association collaborated with the Tainan Luway Opportunity Center on the "Luway Art Creation: Story Factory" project. This initiative included 9 storytelling workshops tailored to the capabilities and needs of the youth with intellectual disabilities at the Luway Opportunity Center, helping them develop their personal modes of expression through collaborative story discussion and enactment. The program also conducted 12 on-site storytelling and themed art experience events at family centers, museums, and libraries around Tainan.

These activities provided individuals with intellectual disabilities new experiences of interacting with the community, fostering their confidence in public expression. Through these events, the community gained deeper understanding and interaction with individuals with intellectual disabilities, promoting social participation, cultural integration, and the practice of cultural equity.

- Luway Art Creation: Storytelling Time Facebook page: <https://www.facebook.com/luwayartcreation>

### 2. Achieving Inclusion Through Sports Activities

In 2023, the Taiwan Public Welfare and Service Association continued its cooperation with Special Olympics Chinese Taipei on the "Meet the Angels: Aligning with International Standards" project.

The program was conducted in 20 schools across Hsinchu County, Miaoli County, Nantou County, Chiayi County and City, Tainan City, Kaohsiung City, and Pingtung County. Through various inclusive courses and sports activities, the program enhanced positive interactions between regular students and special education students, increased attention to the diverse career development of individuals with disabilities, and promoted their respect and acceptance by the general public, fostering equality and social participation in a diverse society. The program has estimated the participation of at least 15,000 people.

### 3. Disability Independence

In 2023, due to the full capacity of the original site in Taoyuan District, the Taiwan Happywork Association established a new workshop in Zhongli District, which has the second highest population of disabled individuals in Taoyuan. This new site offers a professional learning environment for people with disabilities, giving them opportunities to learn independent living skills. Initially, as the Zhongli workshop lacked many essential service facilities, the Taiwan Public Welfare and Service Association helped by donating necessary equipment, facilitating 104 home management courses and community adaptation sessions. This not only improves the quality of home management training for the participants, but also enhances their overall learning opportunities.

### 4. Human Rights Pantoh Initiative

The Taiwan Public Welfare and Service Association is committed to promoting social diversity and inclusion, connecting communities to support various minority groups, and fostering dialogue through advocacy. For five consecutive years, it has supported the "Human Rights Pantoh" organized by the Chen Wen-Chen Memorial Foundation, raising public awareness of "political victims," "homeless individuals," and the philosophies of various advocacy groups, with the hope of collectively overcoming current difficulties. In 2023, the association specifically supported a series of lectures as part of the "Human Rights Pantoh" series of activities, including human rights lectures and family events hosted by the Flip Flops Theatre. Through diverse artistic expressions like film, drama, text, and speech, these events promote societal dialogues, striving to achieve the goal of a society without exclusion, focusing only on equality and freedom for all.

List of Schools Supported by Taiwan Public Welfare and Service Association for Inclusive Education

County/City	School Name
Hsinchu County	Xinhu Elementary School, Hukou Elementary School, Baoshan Elementary School
Miaoli County	Miaoli Junior High School, Chiwen Elementary School
Nantou County	Shuili Junior High School, Dacheng Junior High School, National Shuili Vocational High School of Commerce and Industry
Chiayi County	Taibao Elementary School, Alishan Junior High School and Elementary School, Jhuci Senior High School Junior High School Division, Suantou Elementary School
Chiayi City	Beiyuan Elementary School, Bo'ai Elementary School
Tainan City	Datan Elementary School, Chongming Elementary School, Hougang Elementary School
Kaohsiung City	Guangwu Elementary School, Zhao Ming Elementary School
Pingtung County	Linluo Elementary School

## 5.3 Accton Cultural and Educational Foundation

The Accton Education Foundation, established in 1999 to fulfill corporate social responsibility, contributed NT\$1.73 million in 2023 to causes that promote diverse education and improve the educational environment. The foundation aims to cultivate respect for diversity from a young age, establish positive attitudes, develop critical thinking skills, and assist in making thoughtful decisions about social actions, all directed towards achieving social equity and justice.

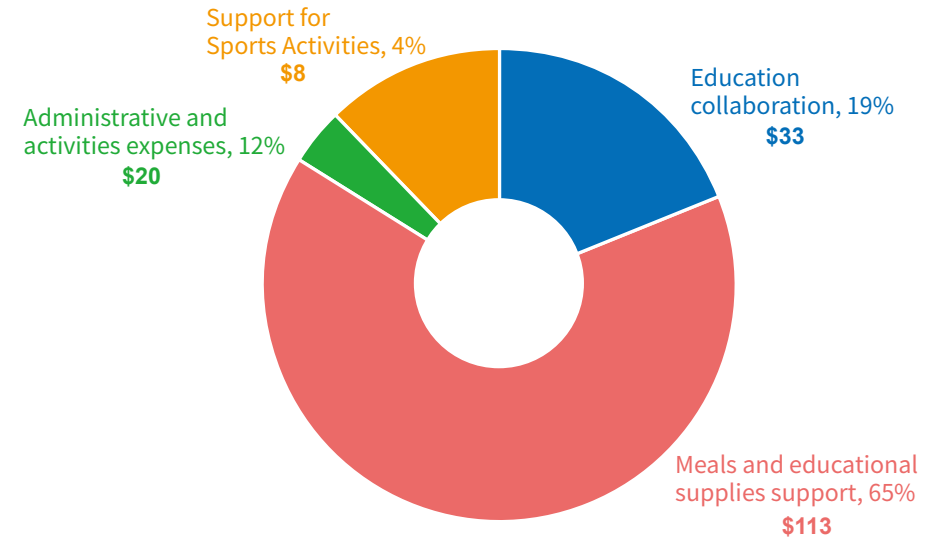
### Sources of donation for Accton Cultural and Educational Foundation, 2022-2023

(Unit: NT\$ ten thousands)

Source	2022		2023	
	Amount	Percentage	Amount	Percentage
Employee Donations	135.6	69%	120.5	69%
Accton Donations	60.0	31%	53	31%
<b>Total</b>	<b>195.6</b>	<b>100%</b>	<b>173.5</b>	<b>100%</b>

### ◆ Proportion of commitment categories for Accton Cultural and Educational Foundation in 2023

(Unit: NT\$ ten thousands)



## I. Introducing Diverse Perspectives, Respecting Differences

### Promoting Menstrual Education for a Friendly and Gender Equal Society



Continuing from the 2022 collaboration with the With Red Foundation, in 2023 the Accton Cultural and Educational Foundation hosted a menstrual education workshop for teachers in the Hsinchu area. The event trained 32 elementary school teachers from 22 schools, indirectly benefiting 15,570 students. Additionally, five Hsinchu elementary schools participated in demonstration classes, reaching 194 students with direct teaching about menstruation by 16 trained teachers.

The Accton Cultural and Educational Foundation also donated 30 sets of menstrual education teaching aids and 750 books to the schools involved in the workshop and demonstration classes, addressing the lack of educational materials on menstrual health. This initiative aims to enable teachers to continue promoting menstrual education within their schools. Furthermore, a LINE group for elementary school teachers was established to provide ongoing support, facilitating their implementation of menstrual education and addressing their teaching challenges. Through school education, students are guided from understanding their bodies to gaining knowledge about menstruation, thereby fostering a menstruation-friendly society that supports menstrual equity.

#### ◆ Feedback from attending teachers of the workshop:

- Provided concrete and actionable teaching directions and frameworks, with innovative content that greatly aids teaching in practice.
- Group discussions on real cases were helpful, especially in conservative contexts, discussing how to adapt.



▲ Menstrual Education Teachers' Courses

#### ◆ Feedback from attending students:

- After the class, I realized how amazing girls are. I think it's important to respect girls and not make fun of them because of menstruation.
- Today's class was extremely meaningful; it taught girls what they can do in the future and showed everyone how hard it is for mothers to give birth!



▲ Menstrual Education Demonstration Teaching

## II. Long-term Assistance for Disadvantaged Children, Enhancing Learning Quality

### 1. Subsidizing Meals for Disadvantaged Children to Improve Learning Focus



Since 2014, Accton has rallied its employees to sponsor a year's worth of nutritious breakfasts for over 1,200 disadvantaged schoolchildren in the Hsinchu area. In 2023, a total of 15,500 nutritious breakfasts were provided to children in 18 elementary and junior high schools. We believe that providing a nutritious breakfast can improve the children's focus in learning and give them an opportunity to change their futures.

Since 2016, employees of Accton Group have been long-term sponsors of dinner costs for after-school tutoring classes for disadvantaged children organized by the Haikou Community Association in Pingtung County.

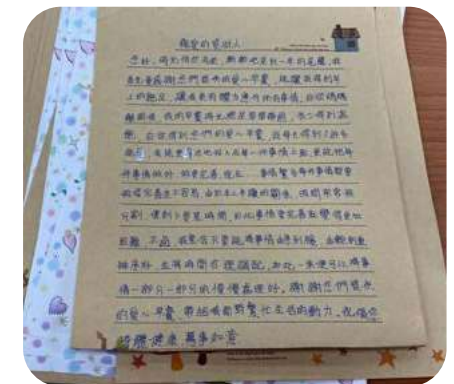
In 2023, they supported evening meals for 30 children, ensuring they have a balanced diet and are not left to eat irregularly or fill up on high-calorie snacks due to their parents' work schedules, which could lead to nutritional imbalances.

### 2. Hope Project of Education: Reversing the Cycle of Poverty

We provide long-term support for the "Accton Hope Project of Education" at the Hsinchu Family Support Center, focusing on providing necessary educational expenses for students from two junior high schools in Wufeng and Jiashi. In 2023, the project assisted 150 children in overcoming adverse economic conditions, enabling them to attend school with peace of mind. This initiative aims to provide these children with the opportunity to break the cycle of poverty through education.

### 3. Support for Sports Activities

To facilitate athletes' concentration on training and maximizing their potential, the Accton Cultural and Educational Foundation has been backing the archery team of Zai Xi Elementary School in Hsinchu City. This assistance encompasses initiatives such as employee donations, geared towards offering sustained support to gradually fulfill the team's equipment requirements. By ensuring a secure and conducive training environment for these young athletes, the foundation nurtures the unfolding of their potential beyond academic achievements through the promotion of sporting pursuits. In 2023, a total of NT\$75,000 was allocated to relieve the athletes of any concerns regarding participation in training and competitions, with the hope that these young athletes might one day reach the pinnacle of sports and bring honor to the nation.



## 5.4 Accton Arts Foundation

In 2023, the Accton Arts Foundation invested a total of NT\$5,308,563, of which NT\$4,000,000 was allocated for the operational management of the Art Site of Railway Warehouse under a service contract with the Hsinchu City Government. Drawing on its past experience, the Foundation has translated this into concrete actions, committing to four major missions: promoting cultural and arts education, establishing a database for Taiwanese artistic talent, fostering the development of arts and cultural communities, and building a creative arts community.

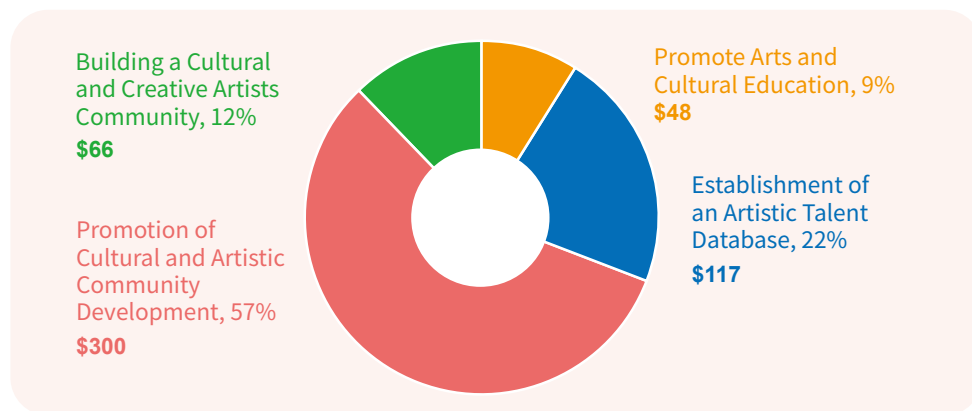
### ◆ Sources of funding for Accton Arts Foundation, 2022-2023

(Unit: NT\$ ten thousands)

Source	2022		2023	
	Amount	Percentage	Amount	Percentage
Government Grants	400	84%	400	75%
Accton Donations	76	16%	130	25%
Total	476	100%	530	100%

### ◆ Proportion of commitment categories for Accton Arts Foundation in 2023

(Unit: NT\$ ten thousands)



## I. Promote Arts and Cultural Education



In 2023, the Accton Arts Foundation focused on promoting cultural and arts education with an emphasis on "holistic education" and "equity and inclusion." Firmly believing in the transformative power of art to foster critical thinking and social inclusion, the foundation views itself as a facilitator, harnessing existing resources to create environments conducive to discussing diverse topics.

### 1. Artful Thinking Education Outreach Program

Since 2021, the foundation has been committed to "promoting cultural and art education" with a focus on fundamentally discussing "how to bring people closer to art" and challenging entrenched perceptions surrounding "art appreciation." Through various interactions, it became evident that the main barrier was not a lack of interest in art but rather a lack of effective methods for engaging with it. Consequently, after researching commonly used methods both domestically and internationally that facilitate the public in viewing art, the foundation has chosen the "Artful Thinking" concept developed by Harvard University's Graduate School of Education. This concept encompasses six fundamental thinking dispositions: [Questioning and Investigating], [Observing and Describing], [Comparing and Connecting], [Finding Complexity], [Exploring Viewpoints], and [Reasoning]. These allow the foundation to assist viewers in adopting the "SEE THINK WONDER" framework used across various disciplines, gradually developing a method to approach and appreciate art that is tailored to individual needs.

In 2022, the foundation applied the Artful Thinking approach to traditional artifacts, and in 2023, it shifted its focus back to contemporary art. This was integrated with the foundation's current exhibitions. The foundation engaged with visitors using guided methods to encourage the public to observe and experience the exhibitions using different senses, while also practicing how to formulate questions about the exhibitions, the artifacts, display methods, creative concepts, techniques, and artists involved. Practicing questioning enables visitors to transform their observations into inquiries, and then explore answers from those questions. This allows artists to first receive questions from visitors, attempt to answer them, and thereby gain an opportunity to understand visitors' direct impressions and feedback. The promotion of Artful Thinking has created a positive reciprocal learning relationship.





▲ Learning worksheet of "Encountering Artful Thinking at the Railway feat. He Looks SUPERFLAT - Wu Pu Wei Solo Exhibition"

exhibition attracted 3,394 visitors, with 192 visits by institutions. Additionally, five volunteers from Accton provided assistance at the event.



▲ Left: Service recipients from the participating institutions provide guided tours for visitors.



▲ Right: Visitors listen attentively to the service recipients as they introduce themselves and discuss their self-portraits.

## 2.Arts For Everyone Project 1.0

launched in August 2022 with support from the sister foundation Accton Cultural and Educational Foundation and the Luway Opportunity Center, not only fosters a better understanding Taiwan's institutions for individuals with disabilities, but aims to harness the openness and experimental nature of art. Through project collaboration and joint creation by artists and individuals with disabilities, the goal was to construct an exhibition space that service recipients, institutions, artists, and the general public could all participate in. This exhibition was designed not only to facilitate artistic expression but also to enhance mutual understanding among all parties involved through the shared experience of art.

Recognizing the importance of preliminary communication before collaborative involvement from various groups, the Accton Arts Foundation took the lead in engaging in dialogue by inviting different institutions to engage in both online meetings and offline workshops. The aim was to build consensus, exchange experiences, and gradually foster a supportive and cooperative community among the participants. Moreover, for the three participating institutions, the Accton Arts Foundation facilitated partnerships with three artists-in-residence who were interested in the project's themes. This allowed the artists to design participatory art activities after understanding the institutional context and environment. These activities involved collaboration with service recipients, social workers, and educare giver from the institutions, resulting in jointly created artworks.

After nearly a year of preparation, the exhibition opened on August 5, 2023. It featured contributions from eight institutions and three artists, and even included services by visually impaired baristas providing coffee on-site. The 30-day

## II. Establishment of an Artistic Talent Database

The composition of the arts ecosystem includes not only a repository of well-known artists and creators, but also arts administrators who handle various tasks behind the scenes to ensure that exhibitions and events run smoothly. It also includes volunteers who maintain artworks at the forefront of display activities and interact with audiences to promote concepts in art education. On this mission, the Accton Arts Foundation adopts a "sustainable operation" approach, combining theory and practice to empower talents at every link of the ecosystem. They encourage lifelong learning and aim to create a relatively conducive environment for the art industry.

### Artistic talent cultivation program

The Accton Arts Foundation adopts an inclusive approach by extending open calls or invitations to creators within the arts community, encouraging them to participate in art residencies and create new works. Through these initiatives, the foundation provides a range of resources to support the creators, including financial assistance for their projects, provision of materials, access to workspace, opportunities for exhibition, promotional assistance, documentation in audiovisual and textual formats, and support with arts administration. This comprehensive support is aimed at nurturing and enhancing the competencies of the creators. Furthermore, the foundation acts as a bridge between these creators and the public, fostering mutual understanding and facilitating opportunities for dialogue. In 2023, the Accton Arts Foundation supported 14 talented artists from various sectors of the arts, hailing from Taiwan, Hong Kong, Germany, Japan, the Philippines, and the UK. These individuals participated in a total of 12 exhibitions that delved into contemporary social issues and phenomena. The exhibitions collectively attracted 43,112 visitors, reflecting the impact and reach of the foundation's initiatives.



◆ Artists

	Name	Nationality
1	Peng, Wei	Taiwan
2	Wu, Pu-Wei	Taiwan
3	Tsai, Chen-Tse	Taiwan
4	Kao, An-Bo	Taiwan
5	Shyu, Hsin	Taiwan
6	Lu, Wei	Taiwan
7	Chen, Yen-Wei	Taiwan
8	2enter	Taiwan
9	Antonio Wong	Hong Kong
10	Mario Winberg	Germany
11	Sebastian Wickeroth	Germany
12	Kimiko Suzuki	Japan
13	Lyra Gracellano	Philippines
14	Richard Müller	UK

◆ Exhibition

	Time	Duration	Exhibition Name	Number of Visitors
1	2023/2/11-3/26	44 days	Spaces   Peng Wei Solo Exhibition	4552 visitors
2	2023/3/4-3/26	23 days	Unknown Unknowns   Sebastian Wickeroth & Mario Weinberg	2190 visitors
3	2023/3/31-5/21	52 days	Convergent Space   Richard Müller	5412 visitors
4	2023/4/1-5/28	58 days	He Looks SUPERFLAT   Wu Pu-Wei Solo Exhibition	6260 visitors
5	2023/6/3 - 2023/7/16	44 days	Spirit of Clay   Antonio Wong and Hsinchu Citizens' Joint Exhibition	3878 visitors
6	2023/6/3 - 2023/7/30	58 days	The Past Garden   Tsai Chen-Tse Solo Exhibition	5358 visitors
7	2023/8/12-2023/9/10	30 days	Traveling Books   Lu Wei Arts Residency Solo Exhibition	3150 visitors
8	2023/9/16-2023/10/29	44 days	Extended Postures   Chen Yen-Wei Solo Exhibition—Body Space: Hsinchu Landscape and Seniors Co-Creation Project	2914 visitors
9	2023/10/7-2023/11/12	37 days	The Necessity of Occasional Boredom   A Residency Solo Exhibition by Hsin Shyu	2922 visitors
10	2023/11/19-2023/12/31	43 days	Yōu Yōu   Kao An Bo Solo Exhibition	3780 visitors
11	2023/12/1-2023/12/17	17 days	STATION 1913   SUZUKIMI Solo Exhibition	1514 visitors
14	2023/12/23-2023/12/31	8 days	Time and Displacement   2ENTER Residency Solo Exhibition	1182 visitors



▲ Left: The opening of the solo exhibition "STATION 1913" by Japanese artist-in-residence, SUZUKIMI, along with representatives from the Accton Arts Foundation, Hsinchu City Cultural Affairs Bureau, friends from the arts world, and visiting public, posing for a commemorative group photo. Right: British artist-in-residence exploring the man-made landscapes along the riverbanks of Hsinchu City with his artwork.

### III. Promotion of Cultural and Artistic Community Development



Since 2016, the Accton Arts Foundation has been actively engaged in overseeing the Art Site of Railway Warehouse, rejuvenating the area by preserving the legacy of historic structures and fostering cultural and artistic education in the Hsinchu region. This endeavor has facilitated interactions between domestic and international resident artists and the local community, fostering a mutually beneficial relationship that enriches both culture and economy. This investment has transformed the Art Site of Railway Warehouse into a distinctive cultural and artistic hub within Hsinchu City, covering expenses such as facility upkeep, personnel salaries, utilities, and insurance.

#### Art Site of Railway Warehouse Operational Management Project

From 2016, the Accton Arts Foundation has been commissioned by the Hsinchu City Cultural Affairs Bureau to foster artistic talent and promote art education within the venue. Annually, the Art Site of Railway Warehouse selects 6 to 8 artists from Taiwan and abroad for residency programs that are combined with exhibitions, art education activities, and workshops that the public can attend for free. The Art Site of Railway Warehouse not only continues the foundation's mission to promote cultural and artistic education and maintain a talent database, but it has also transformed a former railway warehouse into a dynamic experimental space that serves a broad array of purposes and welcomes the general public. This transformation has further energized the cultural and artistic enclave behind Hsinchu Railway Station, which includes Hsinchu Park, Glass Museum of Hsinchu City, Police Dormitory on Nanda Road, and the UP Gallery. As a result, this area has become a central hub for local cultural information and talent exchange in Hsinchu City.

In 2023, the Art Site of Railway Warehouse operated for 305 days, attracting 31,822 visitors. The Accton Arts Foundation, managing the venue, collaborated with resident artists, local groups, and institutions and schools to share this public space, hosting 25 exhibitions. In addition, they organized 40 workshops, lectures, and activities, engaging 1,124 participants.



▲ Through a variety of activities and workshop designs, engagements with the local community are facilitated, creating new memories and connections with the art village. This engagement helps the public gain a deeper understanding of the space and its surrounding environment, fostering a sense of identification and belonging with the area.

### IV. Building a Cultural and Creative Artists Community



The Accton Arts Foundation has been pivotal in establishing and nurturing diverse cultural and creative communities, which support each other and stimulate innovation within the arts and culture ecosystem.

#### The Accton Arts Foundation is involved in maintaining several communities including:

- **Taiwan Art Space Alliance (TASA):** The alliance focuses on artist residency programs, cultivation of artistic talent, promotion of international cultural affairs, and advocacy for cultural space policies.
- **Hsinchu City Museum Cluster:** This group comprises various arts and cultural museums in Hsinchu City, working together to integrate resources, exchange ideas, and facilitate discussions on municipal cultural policies.
- **Living Arts International (also known as Mekong Cultural Hub, MCH) Taiwan Office:** The MCH primarily engages with cultural practitioners from Cambodia, Laos, Myanmar, Taiwan, Thailand, and Vietnam. It focuses on using arts and culture as tools to address social issues, actively involving cultural workers who are committed to societal engagement through artistic expressions. MCH's projects are dedicated to fostering regional cooperation in Asia. The organization's mission is to support a diverse array of cultural workers in realizing their visions for inclusive and sustainable regional development.

In 2023, the Accton Arts Foundation actively engaged with three communities, participating in ongoing research projects such as "Sustainable Artist Residency" with TASA, utilizing its operational experiences at the Art Site of Railway Warehouse as a key member. The Foundation actively engaged in consensus meetings organized by the Hsinchu City Museum Cluster, aiming to establish connections with local cultural communities and devise strategies for sharing resources. Furthermore, the Foundation collaborated with the MCH (Museum of Contemporary Hsinchu) to facilitate a residency for Filipino artist Lyra Teresa Abueg Garcellano, providing support in accessing local resources in Hsinchu. This collaboration not only facilitated the artist's residency but also enabled the Foundation to interact with cultural practitioners from Southeast Asia. Through these interactions, the Foundation gained valuable insights into the local and regional cultural landscapes, fostering mutual learning and reflection among all participants involved.

### Arttime Art Network

Arttime is a website that includes free posting, paid collaboration, and editor-curated content, categorized into five major categories: exhibitions, music, performances, events, and calls for submissions. The website regularly publishes a curated e-newsletter every Monday, crafted by the editorial team. Starting in 2023, Arttime has redefined its focus to serve local cultural museums and alternative art space information sharing, aiming to carve a public service roadmap distinct from mainstream art information platforms like Accupass and OPENTIX. The weekly newsletter published every Monday by Arttime focuses on local and international observances, such as International Day of Persons with Disabilities and Earth Day, shaping the context around these themes. Information on e-newsletter: As of the end of 2023, Arttime has amassed 10,467 free members, 52 fee-paying members, and 25,159 newsletter subscribers.



▲ Filipino artist Lyra Teresa Abueg Garcellano participated in the MCH professional exchange program, traveling to Hsinchu City. During her stay, she shared her experiences on MCH's website and the online media platform Coverstory.



▲ Arttime's weekly e-newsletter is released every Monday and content is themed around specific local and international observance days, such as International Day of Persons with Disabilities and Earth Day.

# 6 Appendix

- 6.1 Assurance Statement
- 6.2 GRI Index Table
- 6.3 SASB
- 6.4 Sustainability Disclosure Indicators - Communication Network Industry
- 6.5 ESG Performance Metrics



# 6.1 Assurance Statement / SGS Assurance Statement

## ◆ Errata of the 2022 ESG Report

- Chapter/Section: Sustainability Performance / Response to the United Nations Sustainable Development Goals (SDGs)/ P.11
  - SDG12 Performance: Waste recycling rate corrected to 74.57%
- Chapter/Section: Appendix / 6.4 Sustainability Disclosure Indicator - Communication and Network Industry / p.138
  - Indicator: Total energy consumption, percentage of purchased electricity and utilization rate of renewable energy; total energy consumption corrected to 195,701GJ, percentage of purchased electricity corrected to 99.0%
  - Indicator: Weight of generated hazardous waste and recycling percentage; total hazardous waste weights corrected to 6.2 metric tons

**SGS TAIWAN LTD.'S REPORT ON SUSTAINABILITY ACTIVITIES IN THE ACCTON TECHNOLOGY CORPORATION'S SUSTAINABILITY REPORT FOR 2023**

**NATURE AND SCOPE OF THE ASSURANCE**  
SGS Taiwan Ltd. (hereinafter referred to as SGS) was commissioned by Accton Technology Corporation (hereinafter referred to as Accton) to conduct an independent assurance of the Corporate Sustainability Report for 2023 (hereinafter referred to as the CSR Report). The scope of assurance is based on the SGS Sustainability Report Assurance methodology and AA1000 Assurance Standard v3 Type 1 Moderate level to assess whether the text and data in accompanying tables contained in the report presented and complies with the GRI Standards and AA1000 Accountability Principles (2018) during assurance (12March/2024-16April/2024) in Accton headquarter. The assurance process did not include the evaluation of specific performance information outside the scope, such as climate-related financial disclosures (TCFD) and sustainability accounting standards (SASB).

**INTENDED USERS OF THIS ASSURANCE STATEMENT**  
This Assurance Statement is provided with the intention of informing all Accton's Stakeholders. (Where relevant - The following stakeholder groups were consulted about the usefulness of the report and the assurance process. (List))

**RESPONSIBILITIES**  
The information in the Accton's Sustainability Report of 2023 and its presentation are the responsibility of the directors or governing body (as applicable) and management of Accton. SGS has not been involved in the preparation of any of the material included in the CSR Report.

**ASSURANCE STANDARDS, TYPE AND LEVEL OF ASSURANCE**  
The SGS ESG & Sustainability Report Assurance protocols used to conduct assurance are based upon internationally recognized assurance guidance and standards including the principles of reporting process contained within the Global Reporting Initiative Sustainability Reporting Standards (GRI Standards) GRI 1: Foundation 2021 for report quality, GRI 2 General Disclosure 2021 for organization's reporting practices and other organizational details; GRI 3: 2021 for organization's process of determining material topics, its list of material topics and how it manages each topic, and the guidance on levels of assurance contained within the AA1000 series of standards.

Assurance Standard Options	Level of Assurance
A	SGS ESG & SRA Assurance Protocols (based on GRI Principles and guidance in AA1000)
B	AA1000ASv3 Type 1 Moderate (AA1000AP Evaluation only)

**SCOPE OF ASSURANCE AND REPORTING CRITERIA**  
The scope of the assurance included evaluation of adherence to the following reporting criteria:

Reporting Criteria Options
1 GRI Standards (Reference)
2 AA1000 Accountability Principles (2018)

- AA1000 Assurance Standard v3 Type 1 evaluation of the report content and supporting management systems against the AA1000 Accountability Principles (2018) at a moderate level of scrutiny and therefore the reliability and quality of specified sustainability performance information is excluded.
- The evaluation of the report against the requirements of GRI Standards is listed in the GRI content index as material in the report and is conducted with reference to the Standards.

**ASSURANCE METHODOLOGY**  
The assurance comprised a combination of pre-assurance research, interviews with relevant employees, superintendents, Sustainability committee members and the senior management in Taiwan; documentation and record review and validation with external bodies and/or stakeholders where relevant.

**LIMITATIONS AND MITIGATION**  
Financial data drawn directly from independently audited financial accounts, Task Force on Climate-related Financial Disclosures (TCFD) and SASB related disclosures has not been checked back to source as part of this assurance process.

Some statements and data within the scope were not assured due to lack of accessible records during the timescale allowed for assurance, for example, non-key-performance information, non-material-issue-related information, or those not clearly marked in the index of the report.

**STATEMENT OF INDEPENDENCE AND COMPETENCE**  
The SGS Group of companies is the world leader in inspection, testing and assurance, operating in more than 140 countries and providing services including management systems and service certification; quality, environmental, social and ethical auditing and training; environmental, social and sustainability report assurance. SGS offers our independence from Accton, being free from bias and conflicts of interest with the organization, its subsidiaries and stakeholders.

The assurance team was assembled based on their knowledge, experience and qualifications for this assignment, and comprised auditors registered with ISO 30000, ISO 20121, ISO 50001, SAS9000, RBA, GMS, EMS, SHAS, GPMs, CFP, WFP, GHG Verification and GHG Validation Lead Auditors and experience on the SRA Assurance service provisions.

**FINDINGS AND CONCLUSIONS**

**ASSURANCE / VERIFICATION OPINION**  
On the basis of the methodology described and the assurance work performed, we are satisfied that the disclosure with inclusivity, materiality, responsiveness, and impact information in the scope of assurance is reliable, has been fairly stated and has been prepared, in all material respects, in accordance with the reporting criteria. We believe that the organization has chosen an appropriate level of assurance for this stage in their reporting.

**ADHERENCE TO AA1000 ACCOUNTABILITY PRINCIPLES (2018)**

**INCLUSIVITY**  
Accton has demonstrated a good commitment to stakeholder inclusivity and stakeholder engagement. A variety of engagement efforts such as survey and communication to employees, customers, investors, suppliers, sustainability experts, and other stakeholders are implemented to underpin the organization's understanding of stakeholder concerns. For future reporting, it is advised that in future reports, stakeholders' concerns and responses be integrated into relevant policies, operational procedures, systems, and information disclosure. For instance, the alignment between information disclosed in reports such as goals or performance and stakeholders' concerns and responses should be emphasized.

**MATERIALITY**  
Accton has established effective processes for determining issues that are material to the business. Formal review has identified stakeholders and those issues that are material to each group and the report addresses these at an appropriate level to reflect their importance and priority to these stakeholders. It is recommended to institutionalize the process of conducting significant impact analysis in the sustainability office in the future. Set consistent and clear boundaries for substantive assessments, including defining purposes, time frames, scopes, etc. Through this process, determine various substantive issues that may directly or indirectly, actually or potentially impact entities or situations (locations, periods) in the organization's operations or business activities to ensure alignment with sustainability planning direction.

**RESPONSIVENESS**  
The report includes coverage given to stakeholder engagement and channels for stakeholder feedback.

**IMPACT**  
Accton has demonstrated a process on identify and fairly represented impacts that encompass a range of environmental, social and governance topics from wide range of sources, such as activities, policies, programs, decisions and products and services, as well as any related performance. Measurement and evaluation of its impacts related to material topics were in place at target setting with combination of qualitative and quantitative measurements. Encourage the integration of identified impacts into key organizational management processes, such as the substantive assessment process, as well as organizational strategies, governance, goal setting, and operations.

**GLOBAL REPORTING INITIATIVE REPORTING STANDARDS CONCLUSIONS, FINDINGS AND RECOMMENDATIONS**  
The report, Accton's CSR Report of 2023, is reporting with reference to the GRI Universal Standards 2021 and complies with the requirements set out in section 3 of GRI 1 Foundation 2021. The significant impacts were assessed and disclosed with reference to the guidance defined in GRI 3: Material Topic 2021 and the relevant 200/300/400 series Topic Standard related to Material Topic have been disclosed. The report has properly disclosed information related to Accton's contributions to sustainability development. For future reporting, Accton is encouraged to prepare for the transition to reporting in accordance with the GRI Standards, with more comprehensive details of its management processes on the identified impacts on the economy, environment, and people, including impacts on their human rights.

**Signed:**  
For and on behalf of SGS Taiwan Ltd.

**Stephen Pao**  
Business Assurance Director  
Taipei, Taiwan  
25 June, 2024  
[www.sgs.com](http://www.sgs.com)



## 6.2 GRI Index Table

<b>Statement of Use</b>	The report of Accton Technology was compiled with reference to GRI standards. Information disclosure period: January 1, 2023, to December 31, 2023
<b>GRI 1 Used</b>	GRI 1: Foundation 2021
<b>Applicable GRI Sector Standards</b>	N/A

### Universal Standard

#### GRI 2: General Disclosures 2021

GRI Standards	Disclosure Item	Corresponding Chapters/ Sections and Explanations	Page Number
<b>The organization and its reporting practices</b>			
2-1	Organizational details	1.1 Company Profile	25
2-2	Entities included in the organization's sustainability reporting	About the Report	2
2-3	Reporting period, frequency and contact point	About the Report	2
2-4	Restatements of information	6 Appendix Errata of the 2022 ESG Report	148
2-5	External assurance	About the Report	2
<b>Activities and workers</b>			
2-6	Activities, value chain and other business relationships	1.1 Company Profile 1.3 Products and Services 2.3 Responsible Supply Chain	25-27 30-31 56-62
2-7	Employees	4.1 Talent Attraction and Retention	84-105
2-8	Workers who are not employees	4.1 Talent Attraction and Retention	86, 88-90
<b>Governance</b>			
2-9	Governance structure and composition	1.5 Corporate Governance	36-37

GRI Standards	Disclosure Item	Corresponding Chapters/ Sections and Explanations	Page Number
2-10	Nomination and selection of the highest governance body	1.5 Corporate Governance	36
2-11	Chair of the highest governance body	1.5 Corporate Governance	36
2-12	Role of the highest governance body in overseeing the management of impacts	1.5 Corporate Governance	36-37, 44
2-13	Delegation of responsibility for managing impacts	1.5 Corporate Governance	37, 44
2-14	Role of the highest governance body in sustainability reporting	1.5 Corporate Governance	2, 15, 37
2-15	Conflicts of interest	1.5 Corporate Governance	37
2-16	Communication of critical concerns	1.5 Corporate Governance	37
2-17	Collective knowledge of the highest governance body	1.5 Corporate Governance	36-37
2-18	Evaluation of the performance of the highest governance body	1.5 Corporate Governance	38-39
2-19	Remuneration policies	1.5 Corporate Governance For detailed information, please refer to: <a href="#">Remuneration Committee Charter</a>	37
2-20	Process to determine remuneration	1.5 Corporate Governance 4.1 Talent Attraction and Retention	37 104-105
<b>Strategy, policies and practices</b>			
2-22	Statement on sustainable development strategy	Message from the Chair of the ESG Committee	1
2-23	Policy commitments	Sustainable Management 1.6 Ethical Management 2.1 Risk Management 2.3 Responsible Supply Chain 3.4 Green Product Management Please refer to: <a href="#">Accton Sustainable Development Policy</a>	3 40 44-52 56 80



GRI Standards	Disclosure Item	Corresponding Chapters/ Sections and Explanations	Page Number
2-24	Embedding policy commitments	Sustainable Management	3-5
2-25	Processes to remediate negative impacts	1.6 Ethical Management 4.1 Talent Attraction and Retention	40-42 85
2-26	Mechanisms for seeking advice and raising concerns	Stakeholder Engagement 1.6 Ethical Management	21-23 40-42
2-27	Compliance with laws and regulations	1.6 Ethical Management 2.1 Risk Management 2.3 Responsible Supply Chain 3.2 Green Product Management	40-42 45 57-61 79-82
2-28	Membership associations	Sustainability Performance	14
<b>Stakeholder engagement</b>			
2-29	Approach to stakeholder engagement	Materiality Analysis Stakeholder Engagement	15-20 21-23
2-30	Collective bargaining agreements	The Company has not signed a group agreement but regularly holds labor-management meetings every quarter	85

## Material Topic

### GRI 3: Material Topics 2021

GRI Standards	Disclosure Item	Corresponding Chapters/ Sections and Explanations	Page Number
<b>GRI 3: Material Topics 2021</b>			
3-1	Process to determine material topics	Materiality Analysis	15-20
3-2	List of material topics	Materiality Analysis	17-18
3-3	Management of material topics	Materiality Analysis	20

### Topic-specific Standards

GRI Standards	Disclosure Item	Corresponding Chapters/ Sections and Explanations	Page Number
<b>Risk Management</b>			
<b>GRI 3: Material Topics 2021</b>			
3-3	Management of material topics	2.1 Risk Management	44-52
<b>GRI 201: Economic Performance</b>			
201-1	Direct economic value generated and distributed	1.2 Operating Performance	28-29
201-2	Financial implications and other risks and opportunities due to climate change	2.1.4 Climate Risk Management 3.1 Climate Change Response	52 64
201-3	Defined benefit plan obligations and other retirement plans	4.1 Talent Attraction and Retention 4.2 Talent Learning and Development	105 111
201-4	Financial assistance received from government	1.2 Operating Performance	29





GRI Standards	Disclosure Item	Corresponding Chapters/ Sections and Explanations	Page Number
<b>Supply Chain Management</b>			
<b>GRI 3: Material Topics 2021</b>			
3-3	Management of material topics	2.3 Responsible Supply Chain	56-62
<b>GRI 204: Procurement Practices</b>			
204-1	Proportion of spending on local suppliers	2.3 Responsible Supply Chain	56
<b>GRI 308: Supplier Environmental Assessment</b>			
308-1	New suppliers that were screened using environmental criteria	2.3 Responsible Supply Chain	57-59
308-2	Negative environmental impacts in the supply chain and actions taken	2.3 Responsible Supply Chain	60
<b>GRI 414: Supplier Social Assessment</b>			
414-1	New suppliers that were screened using social criteria	2.3 Responsible Supply Chain	57-59
414-2	Negative social impacts in the supply chain and actions taken	2.3 Responsible Supply Chain	58-59 60-62
<b>Climate Change Response</b>			
<b>GRI 3: Material Topics 2021</b>			
3-3	Management of material topics	3.1 Climate Change Response	64-69
<b>GRI 201: Economic Performance</b>			
201-2	Financial implications and other risks and opportunities due to climate change	2.1.4 Climate Risk Management 3.1 Climate Change Response	52 64-66

GRI Standards	Disclosure Item	Corresponding Chapters/ Sections and Explanations	Page Number
<b>Energy Saving and Carbon Reduction</b>			
<b>GRI 3: Material Topics 2021</b>			
3-3	Management of material topics	3.2 Energy Saving and Carbon Reduction	70-72
<b>GRI 302: Energy 2016</b>			
302-1	Energy consumption within the organization	3.2 Energy Saving and Carbon Reduction 3.3 Environmental Management	70-71 77
302-3	Energy intensity	3.2 Energy Saving and Carbon Reduction 3.3 Environmental Management	70 77
302-4	Reduction of energy consumption	3.2 Energy Saving and Carbon Reduction	72
<b>GRI 305: Emissions 2016</b>			
305-1	Direct (Scope 1) GHG emissions	3.2 Energy Saving and Carbon Reduction	70
305-2	Energy indirect (Scope 2) GHG emissions	3.2 Energy Saving and Carbon Reduction	70
305-3	Other indirect (Scope 3) GHG emissions	3.2 Energy Saving and Carbon Reduction	70
305-4	GHG emissions intensity	3.2 Energy Saving and Carbon Reduction	71
305-5	Reduction of GHG emissions	3.2 Energy Saving and Carbon Reduction	72
305-6	Emissions of ozone-depleting substances (ODS)	Accton's has no emissions of ozone-depleting substances (ODS)	-
305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant gas emissions	Accton has no such gas emissions	-





## 6.3 SASB

Topic	No.	Calculation Metrics	Unit of Measurement	Description and Corresponding Chapters
Product Information Security	TC-HW-230a.1	Description of approach to identifying and addressing data security risks in products.	Discussion and Analysis	Please refer to 2.1.1 Information Systems Security Management
Employee Diversity and Inclusion	TC-HW-330a.1	Percentage of gender and racial/ethnic group representation for (1) management, (2) technical staff, and (3) all other employees	%	Please refer to 4.1 Talent Attraction and Retention
Supply Chain Management	TC-HW-430a.1	Percentage of Tier 1 supplier facilities audited in the RBA Validated Audit Process (VAP) or equivalent, by (a) all facilities and (b) high-risk facilities	%	No-high risk facilities (suppliers that have implemented RBA VAP in this written survey have a compliance rate of no less than 80%)
	TC-HW-430a.2	Tier 1 suppliers' (1) non-conformance rate with the RBA Validated Audit Process (VAP) or equivalent, and (2) associated corrective action rate for (a) priority non-conformances and (b) other non-conformances	Rate	In 2023, a total of 153 key suppliers responded to Accton's RBA Standards survey. For details, please refer to 2.3 Responsible Supply Chain
Material Procurement	TC-HW-440a.1	Description of the management of risks associated with the use of critical materials	n/a	In 2023, a total of 193 suppliers completed the conflict minerals management and due diligence risk identification and assessment, with 100% compliance.





Topic	No.	Calculation Metrics	Unit of Measurement	Description and Corresponding Chapters
Product Lifecycle Management	TC-HW-410a.1	Percentage of annual revenue derived from products compliant with IEC 62474 reporting requirements	Quantitative	Accton Group reviews domestic and international regulations on restricted hazardous substances and updates the Accton Group hazardous substances management guidelines to include chemicals of concern covered by the IEC 62474 materials declaration. All set criteria are met. Refer to 3.4 Green Product Management for related management approaches.
	TC-HW-410a.2	Percentage of annual revenue from products compliant with EPEAT criteria or equivalent	Quantitative	Not applicable
	TC-HW-410a.3	Percentage of annual revenue derived from products compliant with energy efficiency certification	Quantitative	Not applicable
	TC-HW-410a.4	Weight of scrapped products and electronic waste recycled, recycling percentage	Quantitative	Weight: 33.7496 metric tons. Recycling percentage: 100%. Since Accton operates in the B2B sector, the disclosure covers the weight of scrapped products and electronic waste at the manufacturing stage. (Same as Indicator 5 of 6.5 Sustainability Disclosure Indicators - Communications and Internet Industry)

Activity Indicators	No.	Unit of Measurement	Description and Corresponding Chapters
Number of units produced by product category	TC-HW-000.A	Number	Not applicable to Accton's product type
Area of manufacturing facilities	TC-HW-000.B	Square feet (ft <sup>2</sup> )	Not applicable to Accton's product type
Percentage of production from owned facilities	TC-HW-000.C	Percentage (%)	Not applicable to Accton's product type



## 6.4 Sustainability Disclosure Indicators - Communication Network Industry

No.	Indicator	Type of Indicator	Annual Disclosure	Unit	Note
1.	Total energy consumption, percentage of purchased electricity, and renewable energy usage rate	Quantitative	Total energy consumption: 224,512.7 GJ, percentage of purchased electricity: 99%, and renewable energy usage rate: 0%	GJ (gigajoules), %	Please refer to 3.3 Environmental Management
2.	Total water withdrawal and total water consumption	Quantitative	Total water withdrawal: 220,830 Total water consumption: 202,171	m <sup>3</sup>	Please refer to 3.3 Environmental Management
3.	Weight of hazardous waste generated and recycling percentage	Quantitative	Total weight of hazardous waste: 6.342 tons, recycling percentage: 0%	Tons (t), %	Due to current waste unable to be separated for recycling, incineration and thermal treatment methods are adopted.
4.	Description of types, numbers, and rates of occupational injuries	Quantitative	Please refer to section 4.2 Safeguarding Employee Safety	%, quantity	
5.	Disclosure of product lifecycle management: including the weight of scrapped products and electronic waste, and recycling percentage (Note 1)	Quantitative	Weight: 33.7496 metric tons. Recycling percentage: 100%.	Tons (t), %	Since Accton operates in the B2B sector, the disclosure covers the weight of scrapped products and electronic waste at the manufacturing stage.
6.	Description of risk management related to the use of critical materials	Qualitative description	According to the OECD's "Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High Risk Areas", CMRT/CRT survey standards for tantalum, tungsten, and cobalt are defined as critical minerals. Management and performance related to these minerals are disclosed in section 2.3 Responsible Supply Chain, "Conflict Minerals."	Not applicable	
7.	Total monetary losses due to legal actions related to anti-competitive behavior	Quantitative	No such losses have occurred in Accton's operational history	Reporting currency	
8.	Output of main products by product type	Quantitative	Please refer to the chart below	Varies by product type	

Note 1: Includes sales of material leftovers or other recycling processes, relevant explanations should be provided.

### ◆ Indicator 8: Output of main products by product type

Unit: Thousands/Pcs (EA)

Year Production Value Main Products (or Department)	2023		
	Capacity	Production	Value
Network Switches	3,888,015	3,763,118	55,767,200
Network Appliances	3,402,597	3,232,587	14,860,702
Network Access Switches	222,926	212,010	3,847,503
Wireless Network Equipment	515,646	507,401	658,905
Others	—	—	96,210
Total	8,029,184	7,715,116	75,230,520



## 6.5 ESG Performance Metrics

Economic		Unit	2020	2021	2022	2023
Accton consolidated revenue	Revenue	(in NT\$ thousands)	54,462,872	59,598,681	77,205,223	84,188,426
	Gross profit	(in NT\$ thousands)	11,554,062	11,344,596	16,518,262	19,262,801
	Net profit	(in NT\$ thousands)	6,402,66	5,440,726	9,632,608	11,501,097
	Net profit after tax	(in NT\$ thousands)	5,048,353	4,705,059	8,165,812	8,920,165
	Gross profit margin	%	21.21%	19.03%	21.40%	22.88%
	Net profit margin	%	9.27%	7.89%	10.58%	10.60%
Corporate governance	Independent Director Seats / Total Director Seats	seats/total seats	5/9	5/8	5/8	4/7
	Corporate Governance Evaluation Ranking	Rank	21% to 35%	21% to 35%	21% to 35%	21% to 35%
Employee benefits	Employee Welfare - Total	(in NT\$ thousands)	4,763,957	5,164,535	6,330,878	7,007,537
Dividend Distribution	Cash dividends <sup>(Note)</sup>	(in NT\$ thousands)	3,636,538	3,359,576	4,201,117	5,603,834

(Note) The annual earnings distribution for 2023 is expected to be resolved at the annual general shareholder's meeting scheduled for June 13, 2024.

Environmental		Unit	2020	2021	2022	2023
Greenhouse Gas Emissions	Category 1	tCO <sub>2e</sub> / year	415	2,679	869	722
	Accton HQ		255	252	251	286
	Hshin Chu Plant 2(RMA)		n/a	126	9	9
	Zuhnan Factory		120	2,215	548	372
	Local Offices		n/a	19	22	24
	Edgecore		n/a	18	6	6
	JoyTech		40	49	33	25
	Vietnam Accton		n/a	n/a	n/a	0



Environmental		Unit	2020	2021	2022	2023
Greenhouse Gas Emissions	Category 2	tCO <sub>2e</sub> / year	31,650	40,332	38,232	43,475
	Accton HQ		3,836	3,556	2,899	3,006
	Hshin Chu Plant 2(RMA)		341	306	307	304
	Zuhnan Factory		3,252	7,721	11,234	13,329
	Local Offices		431	305	378	405
	Edgecore		n/a	465	206	211
	JoyTech		23,790	27,979	23,208	24,074
	Vietnam Accton		n/a	n/a	n/a	2,147
	Scope 1+2	tCO <sub>2e</sub> / year	32,065	43,011	39,101	44,197
	Greenhouse Gas Emission Intensity	tCO <sub>2e</sub> / NT\$ million revenue	0.589	0.722	0.506	0.525
Water Resources	Domestic Wastewater Volume (total water consumption)	m <sup>3</sup>	185,749	200,041	198,566	202,171
	Tap Water Usage (Total Water Withdrawal)	m <sup>3</sup>	202,925	215,219	222,578	220,830
Waste	Total Waste Output	metric tons	1,617	1,543	2,152	2,785
	Total Resource Recycling	metric tons	1,266	1,190	1,605	2,273
	Recycling and Reuse Rate	%	78.30%	77.08%	74.57%	81.62%
Energy Use	Purchased electricity	MJ	151,163,420	198,625,661	193,668,973	222,256,466
	Gasoline	MJ	881,903	783,769	892,079	819,262
	Diesel	MJ	901,771	999,436	1,033,497	688,522
	Liquified Petroleum Gas	MJ	118,979	96,117	106,701	151,370
	Electricity Use Intensity (EUI)	MJ/NT\$ million revenue	2.78	3.33	2.51	2.64



Social		Unit	2020	2021	2022	2023
Number of Employees	Accton	persons	2,867	2,955	3,225	3,369
	Edgecore	persons	213	174	159	157
	JoyTech	persons	1,421	1,236	1,218	1,157
	Vietnam Accton	persons	--	--	--	322
Distribution of Female Workers	Accton	%	52.50%	52.1%	52%	50%
	Edgecore	%	29.10%	33.3%	36.5%	33.80%
	JoyTech	%	37.40%	37.8%	37.4%	37.30%
	Vietnam Accton	%	--	--	--	50%
New Hire Rate	Accton	%	28.2	22.6	26.4	17.8
	Edgecore	%	38.1	17.1	7.2	7.6
	JoyTech	%	19.2	26.9	34.9	30.1
	Vietnam Accton	%	--	--	200	357.6
Employee Turnover Rate	Accton	%	11.7	14.3	13.9	9.6
	Edgecore	%	7.1	34.6	9.6	7.6
	JoyTech	%	41.1	36.3	40.8	35.2
	Vietnam Accton	%	--	--	0	173.1
Number of Full-Time Employees (Non-Managerial) and Salary	Number of full-time Employees	persons	2,506	2,827	2,824	3,106
	Average Salary	(in NT\$ thousands)	1,030	1,052	1,324	1,385
	Median Salary	(in NT\$ thousands)	665	732	934	982

(Note): Statistics for Taiwan only (excluding Edgecore Networks)



Social		Unit	2020	2021	2022	2023
Talent Development	Total Training Hours	Man-hours	92,621	39,439	61,955	39,975
Work-related injuries	Total recordable incident rate		23	10	12	12
	Disability Injury Frequency Rate (FR)		2.610	1.050	1.324	1.12
	Disability Injury Severity Rate (SR)		30	19	17	23
	Frequency-severity indicator (FSI)		0.28	0.14	0.15	0.16
Social Welfare	Amount donated to charities through Accton E-Charity	NT\$ ten thousands	3,121	3,396	2,778	2,580





**Accton**  
Making Partnership Work

## Accton Technology Corporation

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