

Introduction to **OW-400-A2**

CERIO
Amplify your Wireless Network



eXtreme Power AC1200 Dual Band +17dBi
+Heater Outdoor Access Point (800mW)

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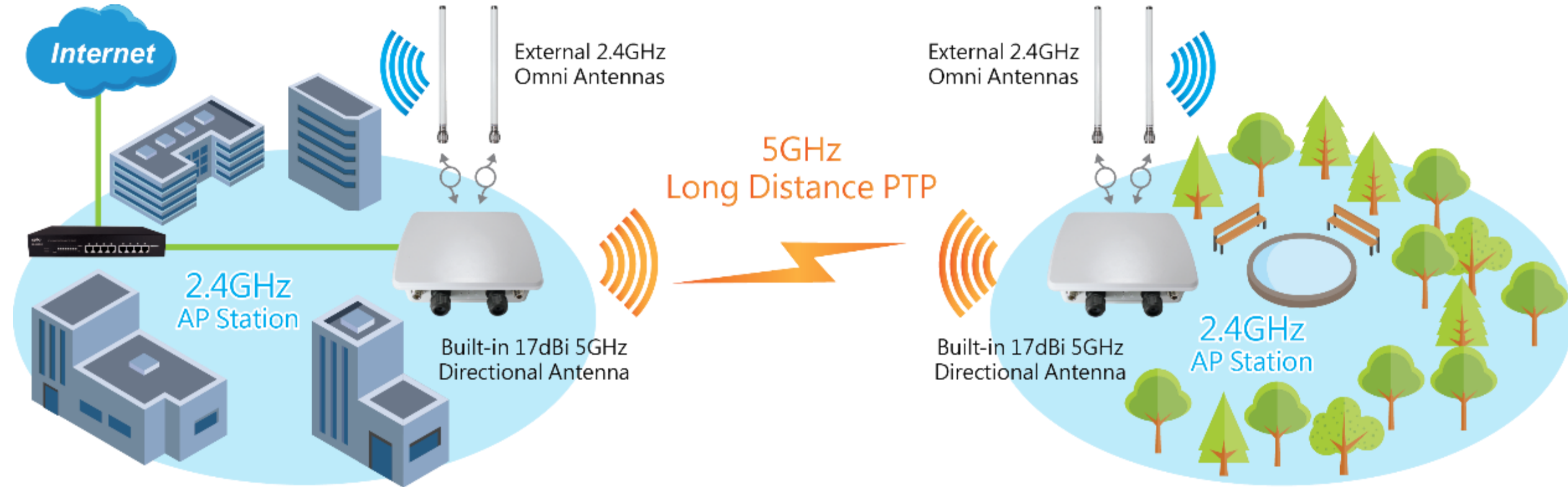
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- 800mW AC1200 Dual Band Outdoor Access Point
- 2.4GHz Data Rate of up to 300Mbps (TxRx)
- 5GHz Data Rate of up to 867Mbps (TxRx) for 80MHz channel bandwidth
- Supports IEEE 802.3af/at Power over Ethernet
- Built-in 17dBi 5GHz Directional Panel Antenna
- 4 N-Type Connectors for external antennas
- Supports 5 Operation Modes (CenOS 5.0)
- Integrates a long-range power amplifier and high sensitivity receiver to deliver unmatched reliability and performance at large coverage application



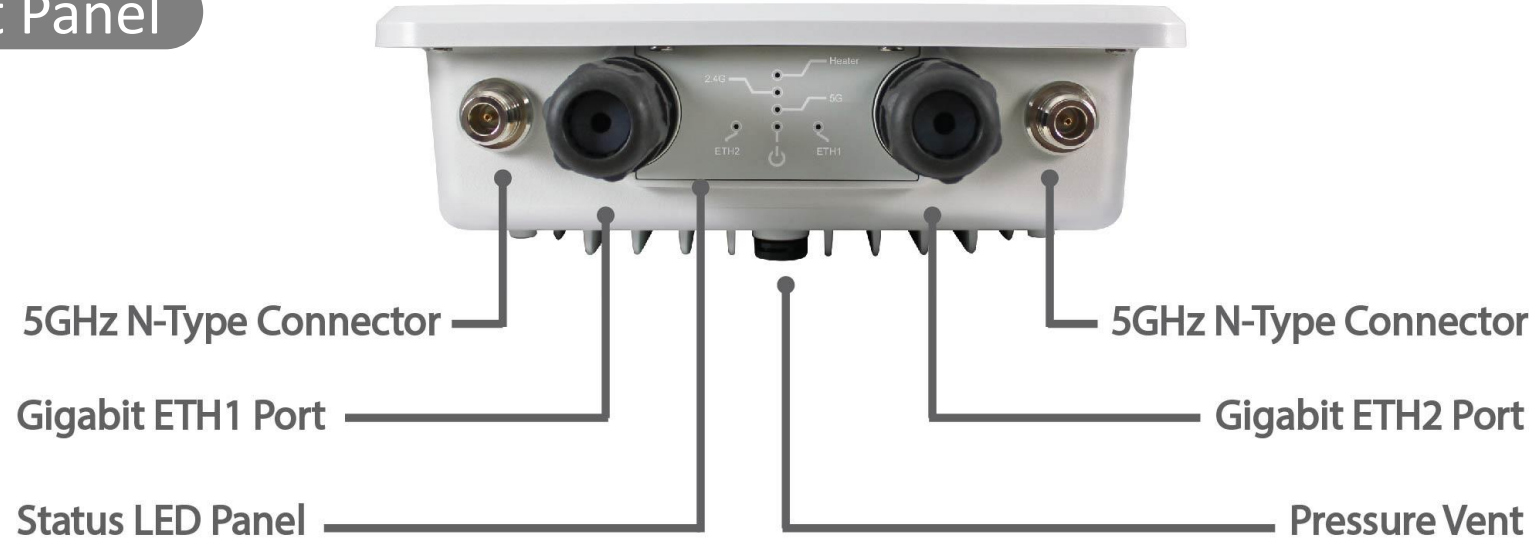
- Supports up to 100 concurrent users
 - Approximately 60-65 Clients on the 5Ghz band
 - Approximately 35-40 Clients on the 2.4GHz band
- Supports 802.11ac/11n/11an/11a wireless standards
- Operation modes include: AP with WDS Mode and Captive Portal, Router AP Mode, Control Access Point Mode, Client Bridge Mode, and WISP/ CPE Mode
- Built-in 802.1x RADIUS Server authentication
- Supports Band Steering technology
- Incorporates 802.11r/k Fast Roaming Protocol
- Software includes LED Control
- Supports PoE Bridge function



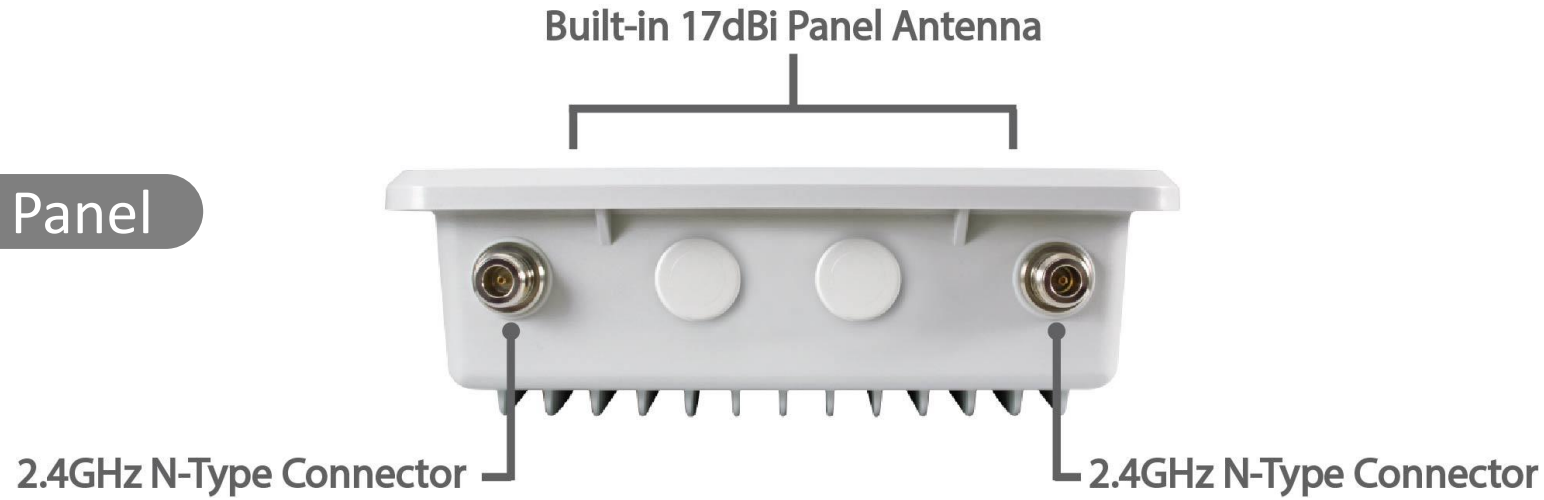
OW-400-A2's 11ac dual-band design is perfect for long distance PTP connections over the 5GHz frequency band, while simultaneously operating as an AP station over the 2.4GHz frequency band.

Hardware Overview

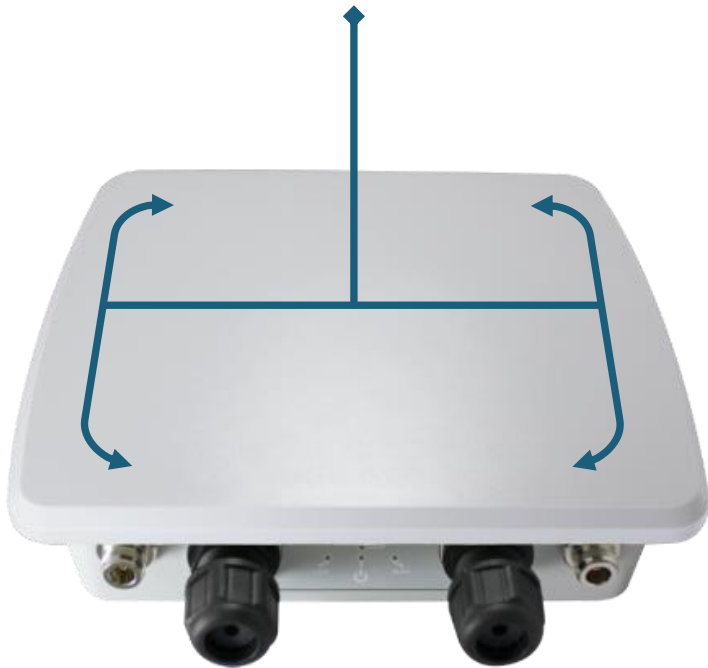
Front Panel



Back Panel



Integrated 17 dBi Directional Antenna



External 25 dBi Directional Antenna



General Setup

| | |
|----------------|--|
| MAC Address | 8c:4d:ea:04:f4:78 |
| Country | Taiwan |
| Band Mode | 802.11ac |
| Auto Channel | <input checked="" type="radio"/> Enable <input type="radio"/> Disable |
| Channel | |
| Tx Power | Level 9 |
| Antenna Switch | <input checked="" type="radio"/> Internal <input type="radio"/> External |
| Slot Time | 9 Distance |
| ACK Timeout | 30 |

Administrators can choose between using the **built-in 5GHz directional antenna** or the external **N-Type connectors** by logging into the software user interface.

The integrated pressure vent allows the IP67 enclosure to breathe safely.

Pressure Vent

This auto-adjusting technology **equalizes pressure** inside the device and **reduces condensation** from building up inside.

The overall result of the Pressure Vent is that product performance and durability are increased. This effectively gives users peace of mind when deploying out OW-400-A2



Versatile Mounting

Wall Mount Supported



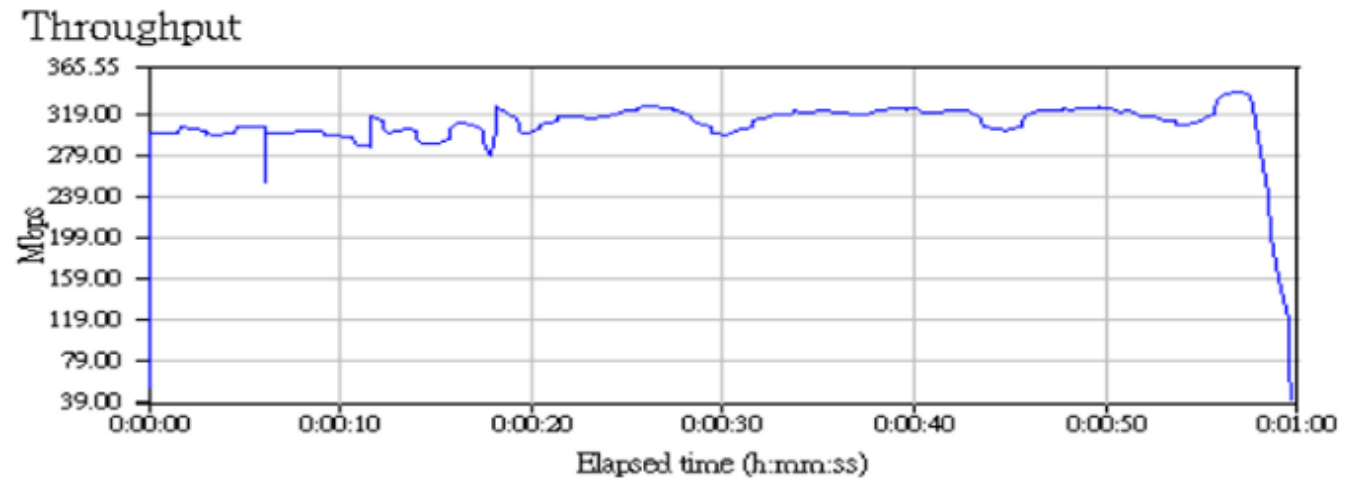
Pole Mount Supported



Proven Test Results



OW-400-A2's high performance design maintained a high bandwidth of **309Mbps** during a **3.7KM outdoor point-to-point test** (5GHz) using a built-in 17 dBi antenna.



| Test Setup | | Throughput | Transaction Rate | Response Time | Raw Data Totals | Endpoint Configuration | | | | |
|------------------|-----------------|------------|--------------------------|-------------------------|-----------------|------------------------|----------------|---------------------|--------------------|--|
| Group | Pair Group Name | Run Status | Timing Records Completed | 95% Confidence Interval | Average (Mbps) | Minimum (Mbps) | Maximum (Mbps) | Measured Time (sec) | Relative Precision | |
| All Pairs | | | 231 | | 309.579 | 12.081 | 54.091 | | | |
| | Pair 1 No Group | Finished | 32 | -1.822 : +1.822 | 43.024 | 37.471 | 53.691 | 59.502 | 4.234 | |
| | Pair 2 No Group | Finished | 32 | -1.848 : +1.848 | 42.901 | 37.506 | 53.945 | 59.672 | 4.307 | |
| | Pair 3 No Group | Finished | 32 | -1.762 : +1.762 | 42.930 | 36.866 | 52.840 | 59.632 | 4.104 | |
| | Pair 4 No Group | Finished | 32 | -1.838 : +1.838 | 43.024 | 36.281 | 53.512 | 59.501 | 4.271 | |
| | Pair 5 No Group | Finished | 23 | -7.460 : +7.460 | 31.379 | 12.081 | 41.429 | 58.638 | 23.775 | |
| | Pair 6 No Group | Finished | 31 | -1.738 : +1.738 | 42.753 | 37.700 | 54.091 | 58.008 | 4.066 | |
| | Pair 7 No Group | Finished | 26 | -6.571 : +6.571 | 35.246 | 13.514 | 46.350 | 59.014 | 18.643 | |
| | Pair 8 No Group | Finished | 23 | -7.493 : +7.493 | 31.504 | 12.208 | 41.929 | 58.405 | 23.784 | |

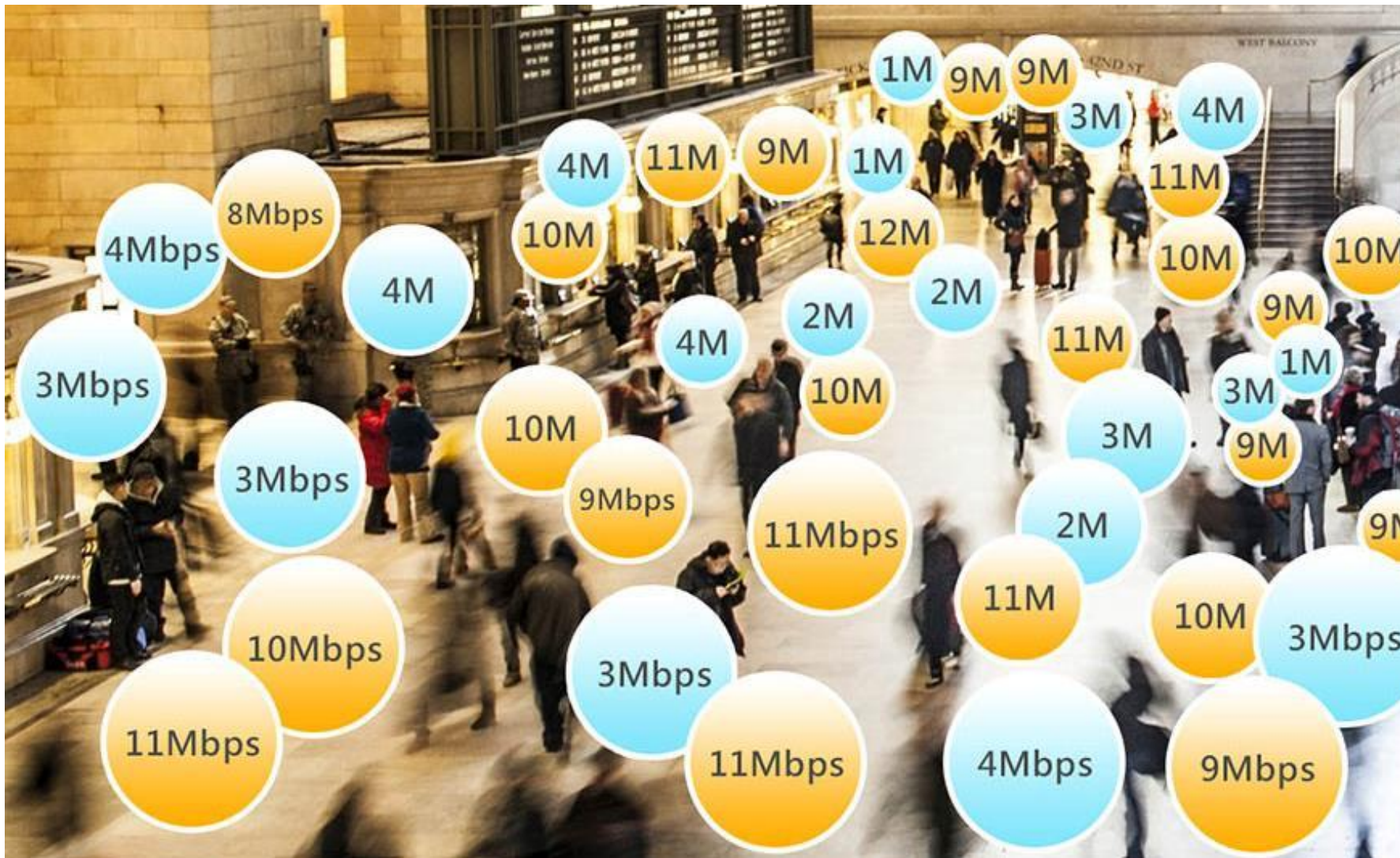
High Durability Design — CERIO

OW-400-A2 utilizes an integrated heater in its circuit board design. This heater uses **sensor technology** to automatically activate when device temperatures drop below 0° Celsius.

Along with the **built-in heater**, OW-400-A2's **IP67** housing design makes this device perfect for rugged outdoor environments such as extreme cold or rainy installations.



Powerful Performance



OW-400-A2 Dual Band AP

Supports:
100 Concurrent Users
Band Steering Technology

Captive Portal Authentication

Captive Portal Authentication conveniently allows wireless clients to access the network through a customized web login portal.



Local Account Login



Facebook Login



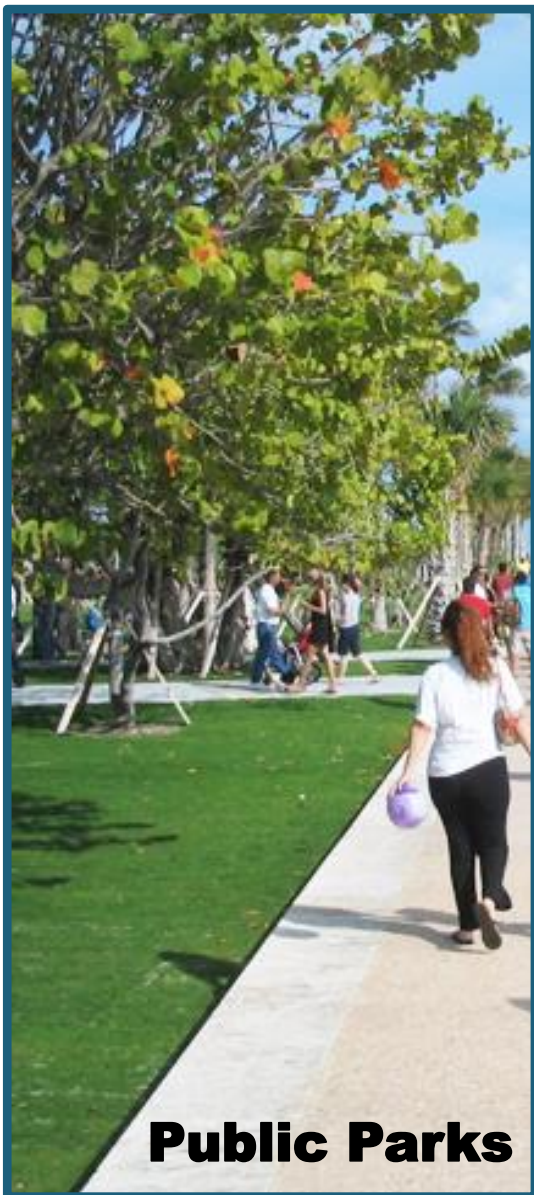
Administrators can deploy a customized Captive Portal with the following login methods

1. Guest Login
2. Local Account Login
3. OAuth2.0 Login (Facebook/Google/etc.)

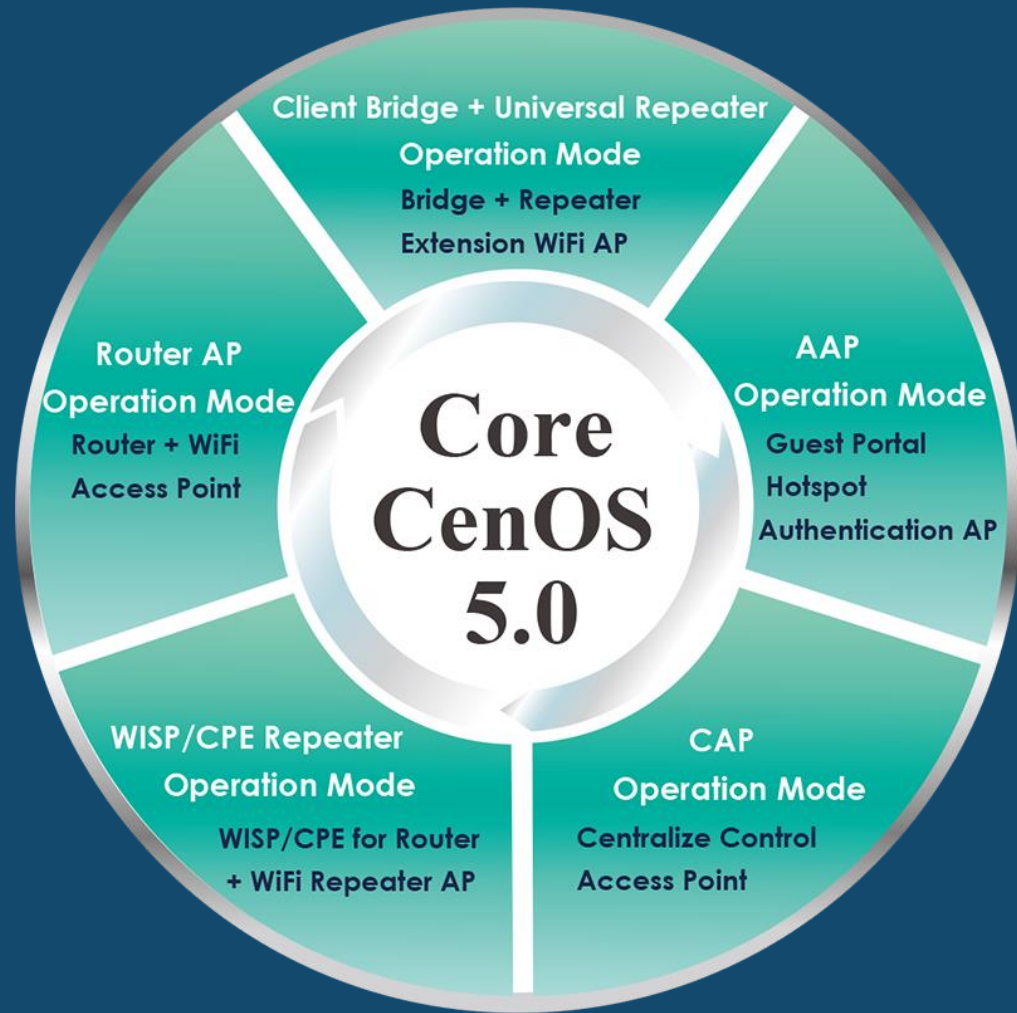


*Router Mode does **NOT support** Captive Portal Login*

Ideal Deployment



Software Overview



Only Cerio's special model supports CAP / Router mode

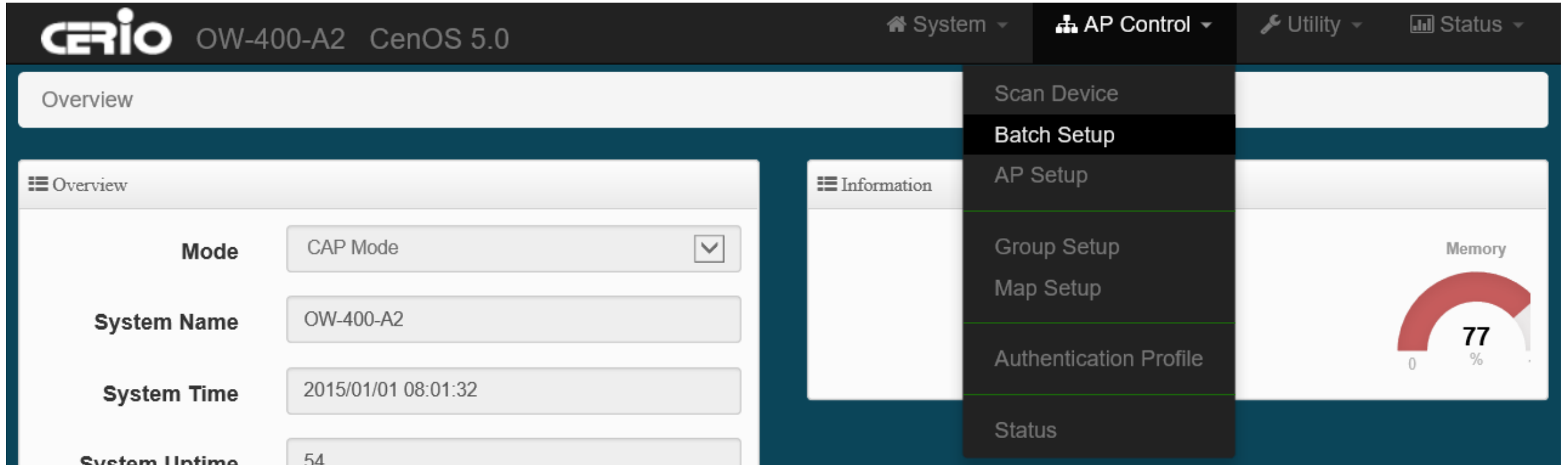
OW-400-A2 supports five different Operation Modes: Control Access Point, Access Point Mode with WDS and Captive Portal Authentication, Client Bridge + Repeater Mode, WISP/CPE Repeater AP Mode, and finally Router Mode

The screenshot shows the CERIO web interface for the OW-400-A2 device running CenOS 5.0. The top navigation bar includes the CERIO logo, device name, OS version, and menu items for System, Wireless, Utility, and Status. The main content area is titled 'System Mode' and contains a dropdown menu. The dropdown menu is open, showing the following options: CAP Mode, Access Point Mode (highlighted in blue), ClientBridge Mode, WISP Mode, and Router Mode. At the bottom of the interface, there are two buttons: 'Save & Reboot' (green) and 'Cancel' (white).

*Notice: Router Mode does **NOT support** Client Authentication*

Control Access Point — CERIO

Control Access Point (CAP) Mode's converts the device into a centralized AP management controller. When OW-400-A2 is in CAP Mode, it can centrally manage up to 128 AP devices.



The screenshot displays the CERIO web interface for device OW-400-A2 running CenOS 5.0. The top navigation bar includes 'System', 'AP Control', 'Utility', and 'Status' menus. The 'AP Control' menu is expanded, showing options: 'Scan Device', 'Batch Setup', 'AP Setup', 'Group Setup', 'Map Setup', 'Authentication Profile', and 'Status'. The main content area is divided into two panels: 'Overview' and 'Information'. The 'Overview' panel shows system details:

| Field | Value |
|---------------|---------------------|
| Mode | CAP Mode |
| System Name | OW-400-A2 |
| System Time | 2015/01/01 08:01:32 |
| System Uptime | 54 |

The 'Information' panel is currently empty. On the right side, a 'Memory' gauge shows a usage of 77%.

Scan AP Device

Filter Device

VLAN#

Default Password

Sort

Update IP Address & Netmask

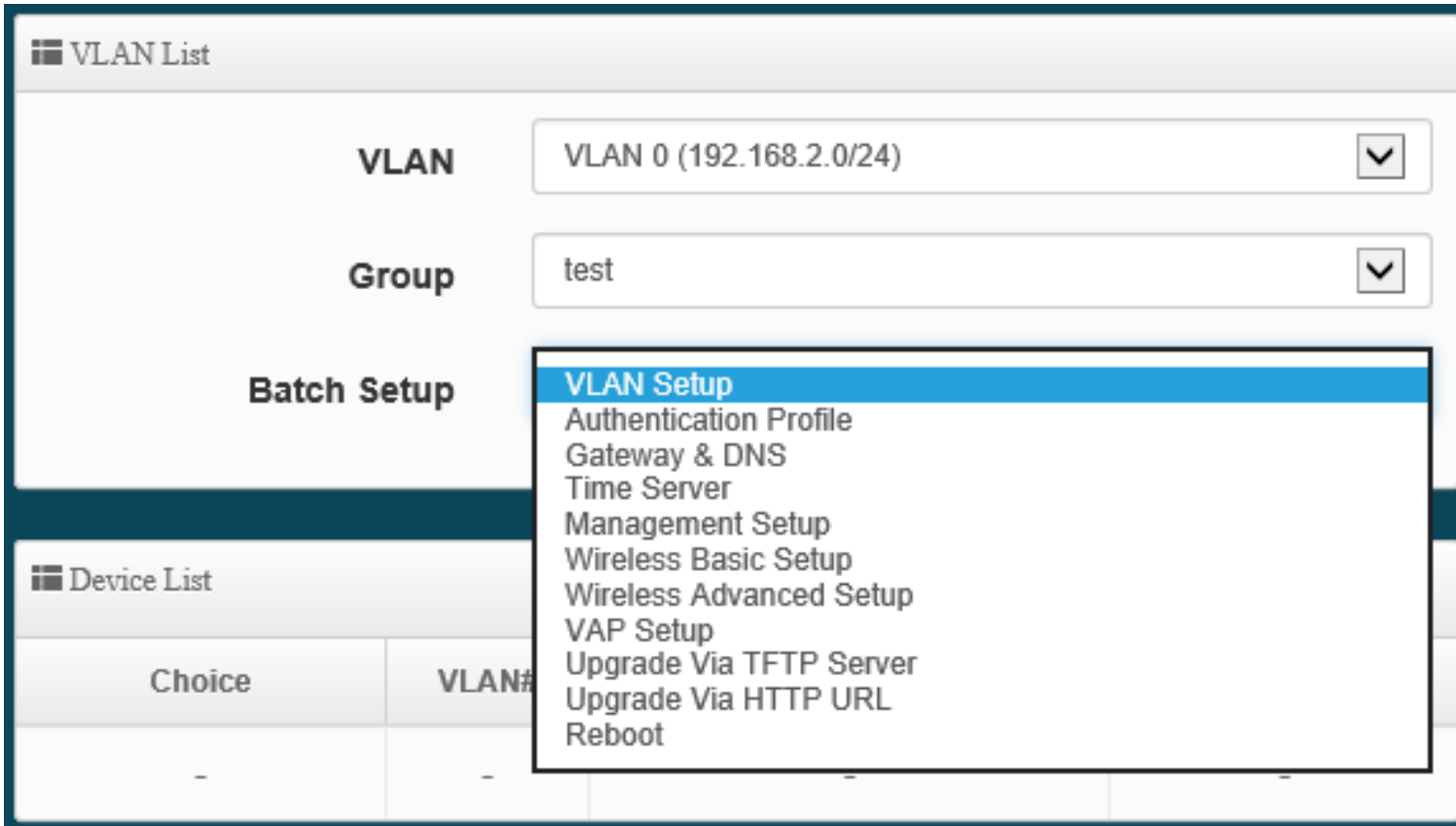
Control Port

VLAN TAG

IP Address

Netmask

CAP Mode allows administrators to scan for AP devices within their virtual LAN and import them into the management database. Once imported, administrators can make quick changes such as changing IP addresses for organization and easy management



The screenshot shows the 'Batch Setup' interface in CERIO. It features a 'VLAN List' section with two dropdown menus: 'VLAN' set to 'VLAN 0 (192.168.2.0/24)' and 'Group' set to 'test'. Below these is a 'Batch Setup' dropdown menu that is open, showing a list of configuration options: 'VLAN Setup' (highlighted), 'Authentication Profile', 'Gateway & DNS', 'Time Server', 'Management Setup', 'Wireless Basic Setup', 'Wireless Advanced Setup', 'VAP Setup', 'Upgrade Via TFTP Server', 'Upgrade Via HTTP URL', and 'Reboot'. At the bottom, a 'Device List' table is partially visible with columns for 'Choice' and 'VLAN#', showing a single row with dashes.

| Choice | VLAN# |
|--------|-------|
| - | - |

CAP Mode's control function supports centralized configuration of managed APs. This allows administrators to make convenient batch changes to the network of AP devices from one centralized location. This main function of CAP mode can save time and cost by reducing servicing and installation time.

VLAN Setup

Apply

VLAN

VLAN Mode Enable Disable

Access Point 0 Enable Disable

Access Point 1 Enable Disable

802.1d Spanning Tree Enable Disable

Control Port Enable Disable

IAPP

IP Setup

Apply Enable Disable

IP Mode Enable Disable

IP Address

Netmask

ETH0 VLAN Tag Setup

ETH0 Enable Disable

VLAN TAG

Administrators can enable VLAN Mode, Spanning tree, Control Port capabilities, IAPP Roaming, change IP settings and setup VLAN tag for batches of access points. These changes can be implemented differently for each VLAN, allowing for both centralized and organized control.

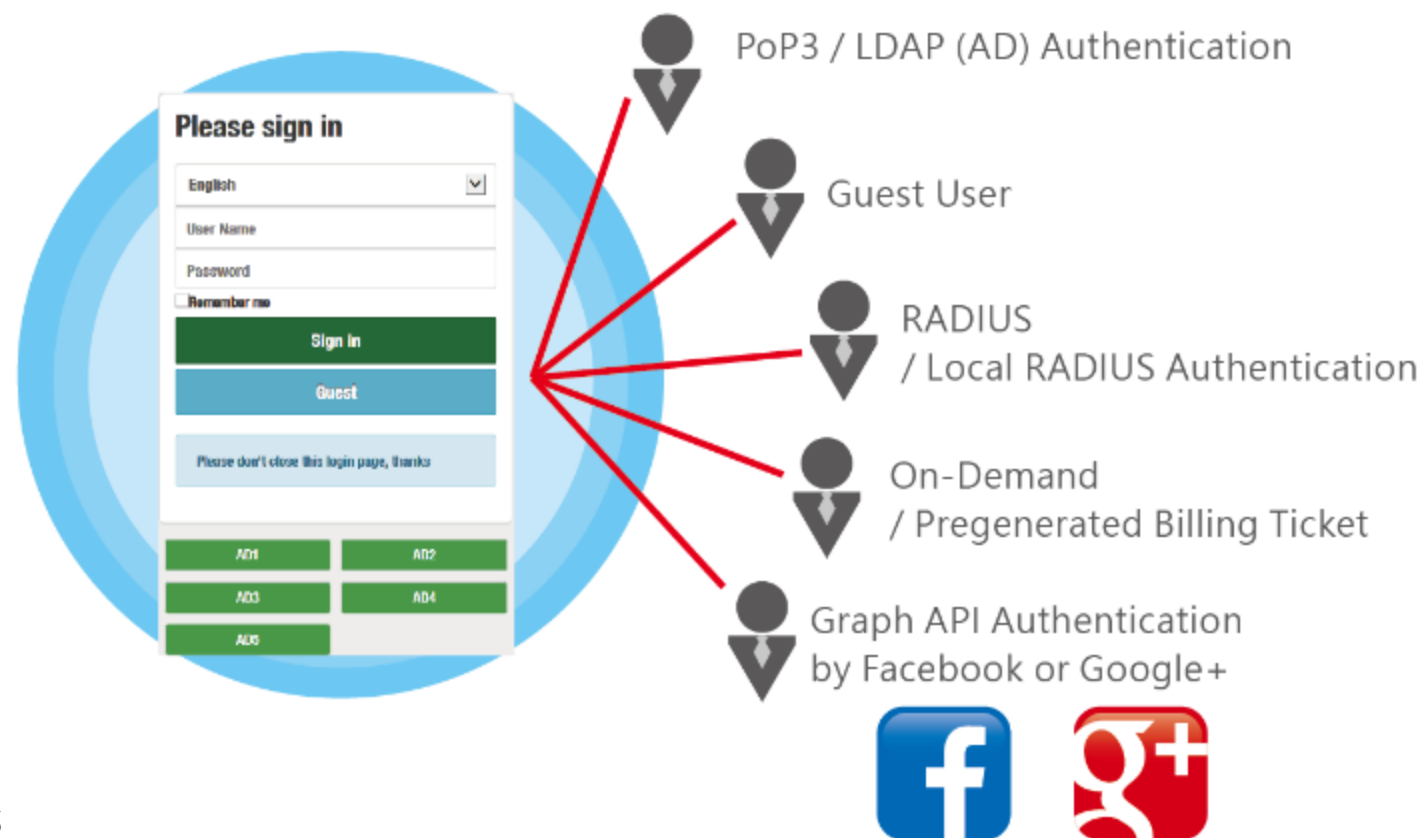
CAP Mode also supports Map Setup function for organizing your AP network. Administrators can create maps by uploading floor plan URLs and dragging APs to the correct location. Once complete, administrators can monitor AP statuses such as uptime, data rates, and connected clients

| Map List | | | | Create New Map |
|----------|---------|-------------------------|--------|----------------|
| # | Name | Description | Action | |
| 1 | 1F_plan | Location Map for man... | View | ▼ |



CenOS 5.0 supports Authentication Access Point Mode for versatile AP deployment. Administrators can choose from many authentication options to best suit their network needs.

This enables convenient access to the wireless network for public clients, as well as improved management and organization for network administrators



*Notice: Router Mode does **NOT support** Client Authentication*

CenOS 5.0 supports multiple methods of authentication for user management, security and convenience.

OAuth2.0 : Allows devices to use third-party credentials such as Facebook and Google+ for user authentication. This provides login convenience for public clients and also allows administrators to collect data through Facebook / Google analytics.

| OAuth 2.0 Provider List Create New Provider | | | |
|--|-----------------|----------|---------------------|
| # | Active | Provider | Action |
| 1 | On | Google | Edit ▾ |
| 2 | On | Facebook | Edit ▾ |



Guest Login : Provides limited Wifi connection to clients to an open network. Limitations can be put in place to manage client limits, connection time, and control bandwidth

| | | |
|-------------|---|--|
| Service | <input checked="" type="radio"/> Enable | <input type="radio"/> Disable |
| Login Type | <input checked="" type="radio"/> One Time | <input type="radio"/> Multiple Time |
| Count Limit | <input type="text" value="10"/> | |
| Login Time | <input type="text" value="10"/> | Minutes |
| QoS | <input type="radio"/> Enable | <input checked="" type="radio"/> Disable |
| Upload | <input type="text" value="512"/> | Kbps |
| Download | <input type="text" value="512"/> | Kbps |

Local User: Provides fixed authentication user accounts for controlled client login and data management. Administrators can track Local Account usage, connection time, etc. CenOS 5.0 supports up to 10 Local User accounts

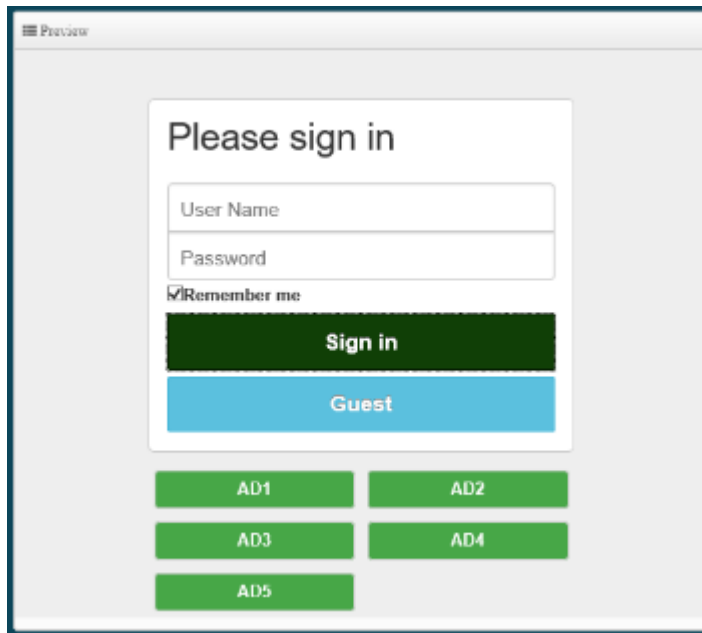
| # | Name | Action |
|---|----------------|------------------------|
| 1 | Test Account 1 | Delete |
| 2 | Test Account 2 | Delete |

Customized Login Page

Administrators can create a customized Login Page which can become a platform for:

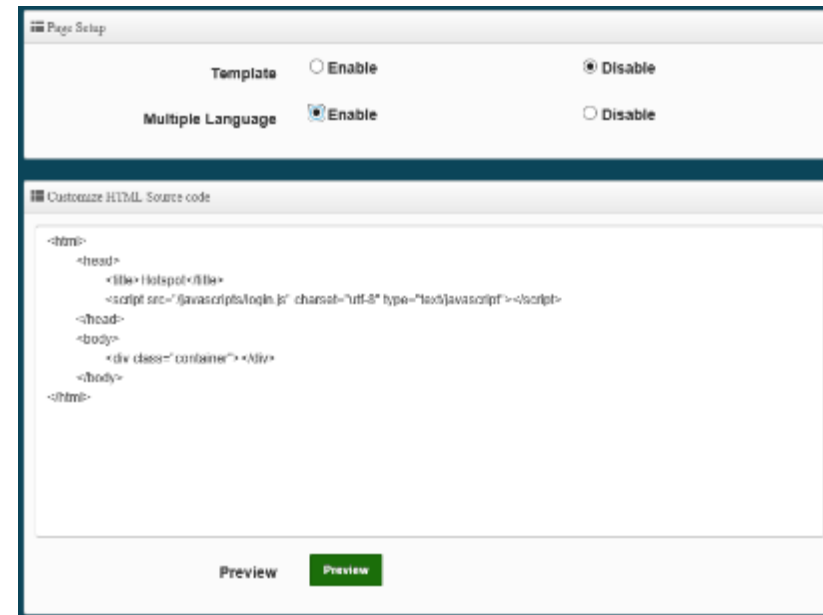
(1.) Promotions (2.) Brand Exposure (3.) Advertisements (4.) Platform for providing Information

This customized Captive Portal supports login through **1. Guest Users 2. Local Accounts 3. Facebook, Google+, etc using OAuth2.0.**



The screenshot shows a 'Preview' window of a login page. The main heading is 'Please sign in'. Below it are two input fields: 'User Name' and 'Password'. There is a checked checkbox for 'Remember me'. Below the inputs are two buttons: a dark green 'Sign in' button and a light blue 'Guest' button. At the bottom, there are five green buttons labeled 'AD1', 'AD2', 'AD3', 'AD4', and 'AD5' arranged in two rows.

Default Template



The screenshot shows a 'Page Setup' window. At the top, there are two rows of radio buttons: 'Template' with 'Enable' and 'Disable' options, and 'Multiple Language' with 'Enable' and 'Disable' options. Below this is a 'Customize HTML Source code' section with a text area containing the following HTML code:

```
<html>
<head>
<title> hotspot</title>
<script src="/javascripts/login.js" charset="utf-8" type="text/javascript"></script>
</head>
<body>
<div class="container"> <div>
</body>
</html>
```

At the bottom of the window, there are two 'Preview' buttons.

Customize through HTML Code

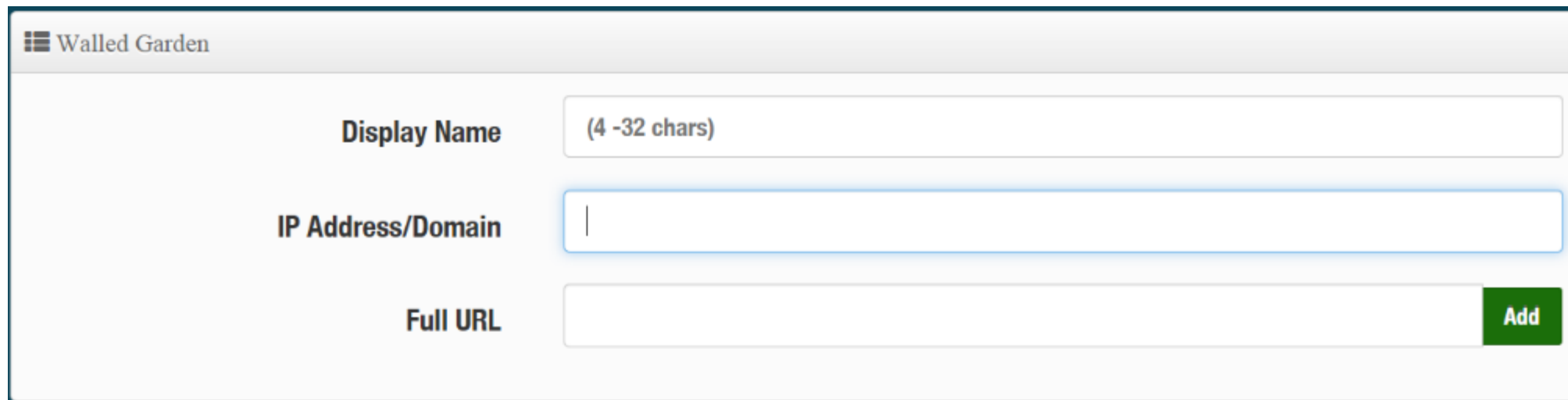
Bandwidth Control of connected clients allows administrators to control individual user upload and download speeds, as well as set a maximum limit on the total amount of bandwidth that can be used at a single time.

Bandwidth Control

| | | |
|------------|---|-------------------------------|
| Peer Users | <input checked="" type="radio"/> Enable | <input type="radio"/> Disable |
| Upload | <input type="text" value="512"/> | Kbps |
| Download | <input type="text" value="512"/> | Kbps |
| Total | <input checked="" type="radio"/> Enable | <input type="radio"/> Disable |
| Upload | <input type="text" value="1024"/> | Kbps |
| Download | <input type="text" value="1024"/> | Kbps |

Modes Walled Garden function allows administrators to create a browsing environment that controls user access and accessible information. This function is ideal for directing users to specific parts of the Web such as;

1. Paid Content
2. Self-Promotions
3. Limited Free Internet Service
4. Advertisement web pages before login and authentication



The screenshot shows a web interface titled "Walled Garden" with a hamburger menu icon. It contains three input fields for configuration:

- Display Name**: A text input field with a placeholder "(4 -32 chars)".
- IP Address/Domain**: A text input field with a vertical cursor.
- Full URL**: A text input field with a green "Add" button at the end.

Built-in 802.1x RADIUS

Supports integrated 802.1x RADIUS Server authentication for small to medium network environments. This supports a maximum of 50 built-in RADIUS Users.

The screenshot displays the CERIO RADIUS management interface, divided into three main sections:

- Radius User:** A form for creating a new user. It includes a "User Name" field (3-32 chars) and a "Password" field (4-32 chars) with an "Add" button.
- Export/Import Users:** A section for managing user data. It features an "Export User File" button and an "Import From PC" section with a file selection field and a "Browse..." button, followed by an "Import" button.
- Radius List:** A table listing existing users. The table has columns for ID, Name, and Action.

| # | Name | Action | # | Name | Action |
|---|-------|--------|---|-------|--------|
| 1 | test1 | Delete | 2 | test2 | Delete |

Increased Security- Individual user sessions are encrypted uniquely, which prevents other users from acquiring private information

Cost Efficient – The built-in RADIUS server design removes the need to purchase additional equipment such as external servers.

OW-400-A2's Dual Band radio design supports a total of 16 Virtual LANs (VLAN) and 32 SSIDs. Each VLAN supports two SSIDs, one on the 2.4GHz frequency band and one on the 5GHz frequency band.

| # | VLAN Mode | Flag | IP Address | Netmask | Radio 0 | Radio 1 | Action |
|---|-----------|----------------------------|---------------|---------------|----------|---------|---------|
| 0 | On | Native ETH0 Access Control | 192.168.2.254 | 255.255.255.0 | 2.4G_0_0 | 5G_0_1 | Network |



Supports 16 VLANS (#0 to 15)



Each VLAN supports 2 SSIDs, one for 2.4G and one for 5G

The image shows two screenshots of a web interface for WDS configuration. The top screenshot is titled 'WDS Setup' and contains the following fields:

- WDS Setup:** Radio buttons for 'Enable' (selected) and 'Disable'.
- Authentication:** A dropdown menu currently set to 'Disable'.
- PassPhrase:** An empty text input field.

The bottom screenshot is titled 'WDS Client Setup' and displays a table for configuring WDS links on two radios:

| Radio 0(2.4G) | | Radio 1(5G) | |
|--------------------------|----------------------|--------------------------|----------------------|
| Enable | MAC Address | Enable | MAC Address |
| <input type="checkbox"/> | <input type="text"/> | <input type="checkbox"/> | <input type="text"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="checkbox"/> | <input type="text"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="checkbox"/> | <input type="text"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="checkbox"/> | <input type="text"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="checkbox"/> | <input type="text"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="checkbox"/> | <input type="text"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="checkbox"/> | <input type="text"/> |
| <input type="checkbox"/> | <input type="text"/> | <input type="checkbox"/> | <input type="text"/> |

OW-400-A2 with **CenOS 5.0** supports **WDS Setup** when operating in **Access Point Mode**

OW-400-A2's Access Point mode supports **8** WDS links per radio for a total of **16 links** per OW-400-A2

(8x WDS on the 2.4GHz frequency band)

(8x WDS on the 5GHz frequency band)

802.11r/802.11k Fast Roaming

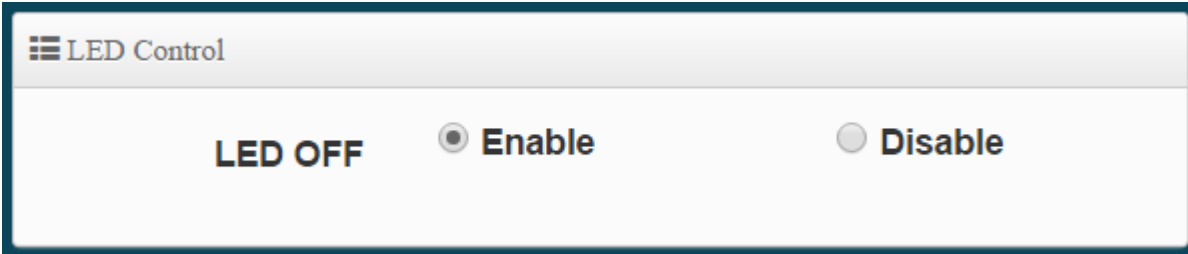
Fast Roaming **Enable** **Disable**

Fast Roaming Settings

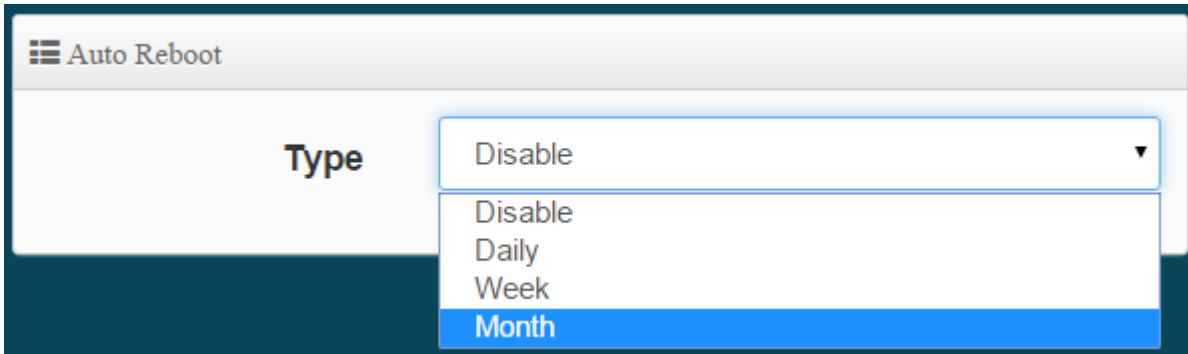
| | |
|--------------------------|---|
| Mobility Domain | <input type="text" value="a1b2"/> |
| R0 Key Lifetime | <input type="text" value="10000"/> |
| Reassoc deadline | <input type="text" value="1000"/> |
| R0/NAS Identifier | <input type="text" value="ap.example.com"/> |
| R1 Identifier | <input type="text" value="000102030405"/> |
| R1 Push | <input type="radio"/> Enable <input checked="" type="radio"/> Disable |

802.11k- Smartly provides roaming client with information regarding nearby APs and their channels, which prepares the client for easier roaming.

802.11r- Stores encryption keys on all the APs within the network. This simplifies the authentication process when clients roam to new APs, greatly reducing CPU loading and latency.



LED Control- Allows the devices LED lights to be disabled to reduce blinking irritation in sensitive environments.



Auto Reboot- Setup device auto reboot schedule to reduce CPU overloading and device crashes.



PoE Bridge- Supply power to subsequent devices such as IP Cameras and Access Points through RJ45 cabling.

What we do



Innovation & Design

Our R&D team continues to incorporate the newest wireless protocols and features to make our products perfect for enterprise deployment.



Wireless Solutions

Our Field Application Engineers and Specialists have unparalleled experience providing the perfect solution for any wireless projects (e.g. Hotels, Long Distance PTP Backhaul, Universities)



Software Development & Design

Our software provides a high featured and easily operated User Interface and also supports centralized AP Management for convenient device deployment.



Outstanding Customer Service

CERIO's customer service staff are experts on our products and possess clear and patient communication skills.

Contact Information

CERIO

CERIO Corporation

4F.-3., No.192, Sec. 2, Zhongxing Rd., Xindian Dist.,
New Taipei City 231, Taiwan (R.O.C.)

Telephone : +(886) 02-8911-6160

Fax : +(886) 02-8911-6180



www.cerio.com.tw



issales@cerio.com.tw



www.facebook.com/center.ww



www.linkedin.com/company/cerio-corporation



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