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1. Introduction

This technical guide was written for network administrators who wish to configure tiered AP management. AP grouping allows different levels of administrators to manage APs that are separated into different AP groups. When APs are added into Wide Area AP Management, they must be configured to belong to a map. The default map is named Overview which cannot be deleted. You may create new maps prior to adding APs. Different Administrator Groups may be assigned to each AP group realizing tiered AP management illustrated in the figure below. Network managers may restrict each administrator group by assigning different read/write permissions for their corresponding AP group.

![Concept Diagram - Tiered Management with AP Grouping](image)

A more in-depth “School District 1” example of the relationships among APs, Maps, AP Groups and Administrator Groups is displayed in the following tables.

<table>
<thead>
<tr>
<th>AP Group</th>
<th>Map</th>
<th>Template</th>
</tr>
</thead>
<tbody>
<tr>
<td>APG1</td>
<td>Custom Map1</td>
<td>1,2,3,4,5</td>
</tr>
<tr>
<td>APG2</td>
<td>Custom Map2</td>
<td>6,7,8,9,10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Admin Group</th>
<th>APG1</th>
<th>APG2</th>
</tr>
</thead>
<tbody>
<tr>
<td>School1</td>
<td>Read/Write</td>
<td>No permission</td>
</tr>
<tr>
<td>School2</td>
<td>No permission</td>
<td>Read/Write</td>
</tr>
<tr>
<td>District1</td>
<td>Read/Write</td>
<td>Read/Write</td>
</tr>
</tbody>
</table>

The above network management infrastructure will be used as an example scenario throughout this Technical Guide.
**2. Setup Flow for Administrators**

a) **Create Maps**

Follow the following procedures to setup your custom Maps:

**Step 1. Apply for a Google Maps Registration key using your controller’s WAN IP Address.**

The steps required to configure your map with AP information are described in the subsequent sections.

Before adding a new map in Wide-Area AP Management, it’s necessary to sign up for a Google account or if the Google account is already available, this step can be skipped; this account will be used to apply for a Google Maps JavaScript API key. Please follow the instructions from Google at [https://developers.google.com/maps/documentation/javascript/](https://developers.google.com/maps/documentation/javascript/). Enter the key into the field of “Google Maps Registration Key” under the Map Configuration page to use the Map feature.

Click “GET A KEY”. A Pop-up will display steps to create the key.

Click “CONTINUE” and be redirected to the following page.

Select “Create a new project” or an existing project and click “Continue”.
Enter any Name and fill in your Controller’s WAN IP address. This will ensure the created API key can only be used by your Controller’s WAN IP address.

Click Create to generate your Google Maps JavaScript API Key.

Copy the API key from the browser, paste key into the “Google Maps Registration Key” under the Map Configuration page and click Apply.

Note: Google Maps Registration Key only needs to be entered once. All existing and newly created Maps will have the same Key automatically configured.
Step 2. **Add a new Map by clicking the Add button under Map List in Map Configuration page.**

Main > Devices > Wide Area AP Management > AP Grouping > Map Configurations

An editing page will open for configuration, please fill in a **Map Name** for this map and its geographical location as defined by **Longitude** and **Latitude** and remember to fill in the **Google Maps Registration Key** if haven’t done so already. Finally choose the **Zoom Level** and **Map Type** and click the **Apply** button.

**New Map Configuration**

**Longitude** and **Latitude** values range from +180 to -180, -90 to +90 respectively.

**Zoom Level** ranges from Levels 1 to 20. Level 1 being the global view and Level 20 being the closest view.

There are two **Map types**; Normal and Satellite. Normal shows the basic labels such as roads, buildings and labels whereas Satellite displays the terrain of your map with a choice to toggle Labels on and off. After configuring a map, proceed to add APs at Wide Area AP Management.
b) **Add APs to Map**

**Main > Devices > Wide Area AP Management > AP List**

When adding APs into Wide Area AP Management (WAPM), APs must be configured to a Map. APs are automatically configured to the default Map, Overview, when discovered or added as shown in the following two figures. Additional maps can only be selected after they are created.

![Add an AP for adding a single AP](image)

Click the AP’s name after the AP has been successfully added into the AP List in WAPM. An editing page will open for configuration, please fill in or edit the following required parameters; **Device Name, SNMP Community, SNMP Write Community, Longitude and Latitude**.

Additional information that can be filled in to display more information while using our Maps feature include **Remark, Radius of Coverage, Link 1 ~ Link 3** and **Thumbnail Image**.
Radius of Coverage can be configured to show the coverage area of an AP on the Map.

Link 1 ~ Link 3 can be configured to reference additional information on that particular AP. For example, an IP address of an IP camera connected to the AP or an URL of the Venue Website where the AP is deployed.

A customizable Thumbnail Image can be uploaded to be displayed in a pop-up dialogue on the Map when an AP is selected.

Click the Apply button to save settings and return to the AP List page.

Note: Longitude and Latitude coordinates can be easily changed by dragging and moving the AP's marker on the Map to a new location and clicking the Save Modification button. Refer to Section 3a - Map Features of the Technical Guide.

APs can be changed to belong to a different map. Select the APs, click the Add to Map button, choose the desired Map and click Apply. The APs added to a map will appear as
c) **Create AP Groups**

AP Groups are created at `Main > Devices > Wide Area AP Management > AP Grouping > AP Grouping > AP Grouping Add`. Click Add to be redirected to the **AP Grouping Add** page.

**Adding an AP Group**

Fill in a unique AP Group Name such as “APG1”, select at least 1 Map and 1 Template. Selecting a Map will include all APs added to that Map and selecting a Template will allow
this AP Group access to that Template. All AP Groups can be viewed at the AP Grouping List page located at

Main > Devices > Wide Area AP Management > AP Grouping > AP Grouping

### AP Grouping

<table>
<thead>
<tr>
<th></th>
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<th>Map</th>
<th>Template</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>APG1</td>
<td>Custom Map 1</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td></td>
<td>APG2</td>
<td>Custom Map 2</td>
<td>6 7 8 9 10</td>
</tr>
</tbody>
</table>

**AP Group List**

Now that AP Groups have been configured, the network administrator can manage APs using the Map. The following section explains each Map feature in detail.

**Note:** Overview if selected in an AP Group will include ALL APs added to WAPM. Please refer to the Network Management Infrastructure in Section 1 – Introduction for the current example being used.
3. **Tiered Management using AP Grouping and Maps**

a) **Map Features**

Main > Devices > Wide Area AP Management > Map

Map is a utility showing managed APs and their WDS links on Google Maps for wireless network planning and management. Features included in Maps are explained below.

- **Goto Map**: When you have configured multiple map profiles, this function allows convenient switching between different maps.
- **Goto AP**: This function is for administrators to select an AP on the list, allowing the map to automatically shift its view to show the selected AP in the center of the map.
- **Save Modification**: This function is for saving the changes made to the map and overwriting the maps’ profile attributes. For instance if you have altered or panned the original map, clicking this button will save the changes made.
- **Show Coverage**: This button once pressed will display the signal coverage of all the APs on the map according to the coverage radius set in each AP’s profile under **AP List** page.
- **Show STP**: This button once pressed will display a green line connecting WDS linked APs.
- **Show Longitude and Latitude**: This function when pressed will display in a pop up window the longitude and latitude of the map’s current center point.
- **List AP in this Map**: Clicking this button will open a new page on your browser redirecting to the **AP List** tab page for displaying a list of APs in the Map.
- **List WDS in this Map**: Clicking this button will redirect to the **WDS List** page displaying a list of WDS links on the Map.

The following figure displays the **Overview** map of the Zhongshan Junior High School Metro...
Station area; two APs are situated inside the High School and two APs are placed around the station.

The four APs, shown with marker icons with different icons for each AP model, are corresponded to the physical coordinates configured in the AP Attributes page.

Overview Map

The Overview map shows all APs added into the Wide Area AP Management List. This Map is mainly used by the top-level administrator who oversees all APs connected to the controller.

Note: The WDS link shown after clicking the Show STP button is only visible in the corresponding AP’s Map. For Example, if the WDS linked APs belong to Custom Map 1, Show STP will not work when viewing the Overview Map.
When marker icon is clicked, a pop-up dialogue will display the **AP Status, # of Clients** and the **Thumbnail Image** from the **AP Attributes** page.

- **Edit**: This button will redirect to the AP Attribute page.
- **Goto**: This button will redirect to the AP’s Web Management Interface from the controller.
- **More Info…**: This link will open a window showing **AP Link, AP Statistic, AP Status, Client List** and **WDS List**.

**AP Link** displays links and descriptions of the information provided in the **AP Attribute** page.
**AP Statistic** displays graphical information collected in real-time on the AP’s System, Network, VAP and WDS. Time ranges from 1 Hour, 1 Day, 1 Week, 1 Month and 1 Year.

**AP Status** displays a more detailed numerical representation of the AP’s System, Network, VAP and WDS statuses.
Client List shows the associated clients on the AP.

WDS List shows the WDS statuses of WDS links on that AP.

Note: AP Statistic, AP Status, Client List and WDS List information listed are collected from the remote AP via SNMP.
To correctly view these information, SNMP must be Enabled for each AP.
A **Distance Calculation** tool is located below the Map to calculate distances between two AP’s. This tool is to provide network administrators with additional information to optimize location and coverage when managing APs.

<table>
<thead>
<tr>
<th>From:</th>
<th>AP1</th>
<th>To:</th>
<th>AP2</th>
<th>Calculate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>No. 18, Lane 106, Section 3, Minquan E Rd, Songshan District, Taipei City, Taiwan 105</td>
<td>Address:</td>
<td>No. 16, Alley 3, Lane 106, Section 3, Minquan E Rd, Songshan District, Taipei City, Taiwan 105</td>
<td></td>
</tr>
</tbody>
</table>

**Distance Calculator**

AP Groups are assigned permissions by adding an Administrator Group to the Administrator Group List. Specific procedures are shown in the next step.

**b) Administrator Group Creation**

In order to achieve tiered management, **Administrator Groups** and **Administrator Accounts** must be configured with specific permissions.

Proceed to **Main > Utilities > Administrator Accounts > Administrator Group List**

Click the **Configure** button beside Access Permission in Administrator Accounts to enter the Administrator Group List.
Click Add to add a new Administrator Group and fill in the required Admin Group Name. Select permissions for each AP Group; Read only, Read/Write or Disable.

Administrator accounts created under this Admin Group will not have access to fields where permissions are set to Disabled; realizing tiered management for various network architectures such as school districts. The following example shows steps to creating an Administrator Group called **School1** where only the AP Group: **APG1** permission is set to Read/Write.
Note: Be sure to set Read/Write to the **AP Management – Wide Area AP Management & Wide Area APs** Fields as shown in the above and below figures. This configuration allows administrators accounts under School1 to access the Map Feature and manage APs under Wide Area AP Management.

Note: Be sure to Disable fields **AP Grouping – AP Grouping & Administrator Accounts** to prevent local administrators from changing account restrictions set by the top-level Administrator. The following figure shows where these two fields are located.
c) Administrator Accounts Creation

Different Administrator Accounts can manage and have access to different AP Groups. After an Administrator Group is created with access permissions to different AP Groups, Administrator Accounts can be allocated to an Administrator Group.

Go to Main > Utilities > Administrator Accounts

Click Add to add new administrator accounts.

Fill in a new Admin Username and Password and allocate the account to an Administrator Group.

The following steps show an “admin1” account allocated to Administrator Group: School1.

As shown in the Introduction, “admin1” will only be able to manage School1. Admin2 will manage School2 and etc.

New Admin Account Page

The newly created Administrator Account belonging to its Administrator Group: School1 is
School1’s network administrator is able to login using the “admin1” account. Using features such as AP Grouping and Map within the Wide Area AP Management allows local administrators to manage only APs within their own school’s area. Setting up tiered management provides these administrators freedom to manage their APs through the controller without interference from other local administrators.

4. Conclusion

In this technical guide, configurations of tiered AP management are shown step-by-step. In tiered AP management, AP grouping allows different levels of administrators to manage APs that are separated into different AP groups. Network managers may restrict each administrator group by assigning different read/write permissions for their corresponding AP group.

5. Remark

For more information, please contact our Technical Support team.