Designing for Location

Aerohive Location Awareness Deployment Guide

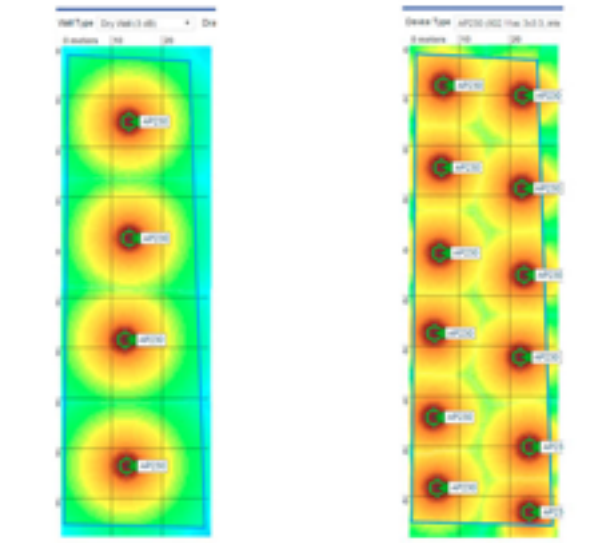
Aerohive Networks - June 25, 2016

Introduction

When deploying a network for location accuracy, there are many elements to consider which are not part of network design for connectivity. Aerohive's Real-Time Location services is flexible enough to deliver results from networks designed from the ground up to be location-ready, as well as existing networks which have been augmented to support location. This deployment guide will walk you through best practices for designing both "greenfield" location-aware installations as well as augmenting existing designs.

Physical Deployment Attributes

In a location-ready design, it is important to ensure proper access point placement, position and density. Access points should be placed not only at the central regions of the building, but also the perimeter so that clients are always within the perimeter of access points. As clients move outside the perimeter of access points, location accuracy degrades. Additionally, access points should be spaced such that 3 access points are within 70 feet from any point you wish to use location tracking. It is preferred that access points are arranged such that observations can be made from each of the 4 quadrants extending from a client's position.



NOT RECOMMENDED RECOMMENDED

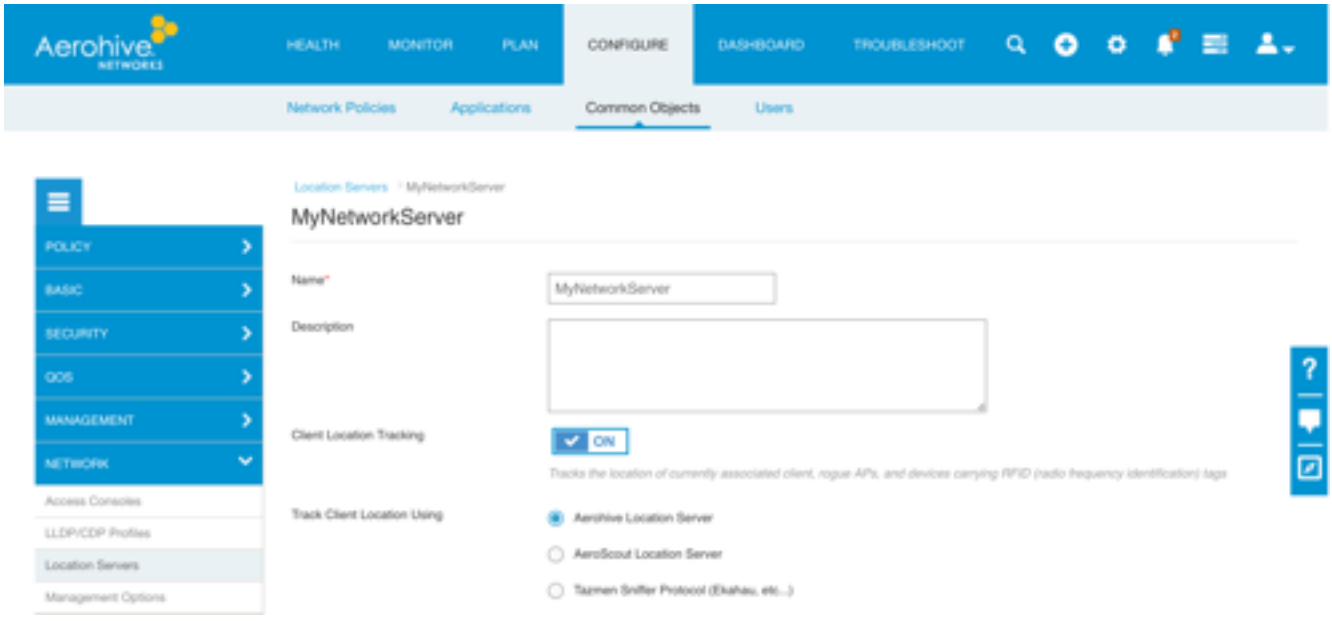
A point is “location-ready” when all of the following conditions are met:

- At least 4 access points are deployed on that floor.
- At least one access point is found within each of the 4 quadrants surrounding the point in question
- At least 1 access points are seen within each of 3 quadrants within 70 feet of the point in question

When upgrading an existing installation which is designed for network, it is possible to configure the new access points to be in sensor mode, which will cause the access points to be used exclusively for positioning. In this manner, additional APs may be placed in the building without requiring channel re-mapping or power changes.

Enabling the Location Server

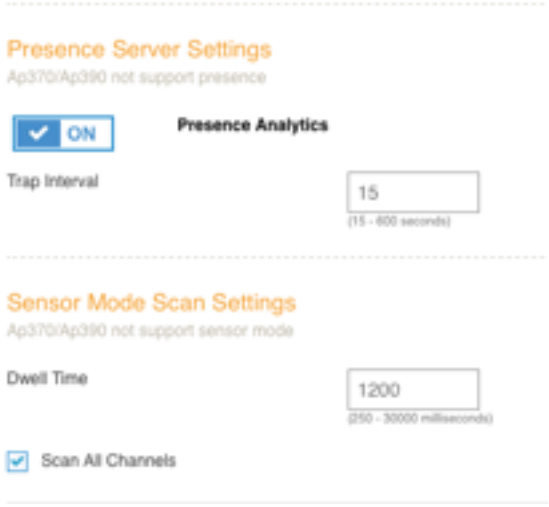
To enable the Location Server on Hive Manager, select one of your active network policies. In the advanced configuration options, select the *Network* grouping. Inside the Location Server tab, click the “+’ icon to add a new Location Server. Name this server, and select ‘Aerohive Location Server’.



Enabling Presence Analytics

Presence Analytics allows the access points to scan the air for clients which are not currently associated to the base station. The easiest way to enable Presence Analytics on Aerohive access points is to navigating to Configure -> Common Objects -> Radio Profiles, and selecting a radio profile you use on your network.

Near the bottom of the page, you will see a section on Presence Server. Presence Analytics must be turned on in order to collect presence data.



Note that the **Trap Interval** is how frequently the access point will execute a scan and upload the data to HiveManager. **Dwell Time** is how long the access point will wait on a particular channel, listening for probe requests. When making modifications to these settings, it is important to consider that the longer an access point waits on a channel listening, the longer a scan will take to complete. Further, while the radio is listening for probe requests, it is unable to broadcast and serve WiFi. Longer dwell times or shorter trap intervals may negatively affect WiFi throughput on access points which are both serving WiFi and listening off channel for unassociated clients.

Enabling Streaming Services

The Aerohive presence webhooks enable steaming presence and location data to your server in near-realtime. We will make a POST call to your web server with fresh information about the physical clients in your network every 60 seconds.

Configuring Hive Manager to Send Presence Analytics Data

HiveManager may be configured to send data to your server either through the user interface, or by using the webhooks configuration API.

Setting up Streaming using HiveManager:

In order to receive streaming presence data, you must configure HiveManager to communicate with your sever. Log into HiveManager, and click the 'settings' icon. In the left navigation bar, click on 'API Data Management'. After clicking the '+' icon, you should see a screen like this: !(New Data Feed)

The Post URL should match exactly where you expect the data to arrive on your server. "Access Token" is a secret value which your server should check accompanies each POST to ensure no one is attempting to forge requests.

Using the Webhooks Configuration APIs (beta)

Make a POST request to /xapi/beta/configuration/webhooks with the following headers:

Header	Value
X-AH-API-CLIENT-SECRET	(your client secret)
X-AH-API-CLIENT-ID	(your client ID)
X-AH-API-CLIENT-REDIRECT-URI	(your redirect URL)
Authorization	Bearer (+ your access token)
Content-Type	application/json

The JSON body of the POST request must contain the following:

```
{
  "application": "string",
  "ownerId": 0,
  "secret": "string",
  "url": "string"
}
```

Application is the name of the application receiving the data.

Secret is a string value (may be random) which you should verify on all incoming data to ensure that it's really from HiveManager and not forged.
URL is the exact address where we should send the data to your server.

Sample Data:


```
{
"ownerId" : "1082983976",
"apMac" : "3a1e6d8c785c",
"observations" : [ {
"clientMac" : "dcac3da506b4",
"ipv4" : "191.45.252.67",
"ipv6" : null,
"seenTime" : "2015-10-09T07:00:00.000+0000",
"seenEpoch" : 1264988544,
"ssid" : "Retail World",
"rssi" : -50,
"manufacturer" : "Apple",
"os" : "ios",
"lat" : 45,
"lng" : 122,
"unc" : 5,
"x" : 0,
"y" : 0
}, {
"clientMac" : "dcac3da506b4",
"ipv4" : "191.45.252.67",
"ipv6" : null,
"seenTime" : "2015-10-09T07:00:00.000+0000",
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"lng" : 122,
"unc" : 5,
"x" : 0,
"y" : 0
} ]
}
```