Alcatel-Lucent and OmniVista 3600 Air Manager 7.7

Alcatel·Lucent

Best Practices Guide

This document provides best practices for leveraging OV3600 to monitor and manage your Alcatel-Lucent infrastructure. Alcatel-Lucent wireless infrastructure provides a wealth of functionality such as firewall, VPN, remote AP, IDS, IPS, and ARM, as well as an abundance of statistical information.

Follow the simple guidelines in this document to garner the full benefit of your Alcatel-Lucent infrastructure.

This overview chapter contains the following topics:

- "Understanding Alcatel-Lucent Topology" on page 5
- "Prerequisites for Integrating Alcatel-Lucent Infrastructure " on page 5

Understanding Alcatel-Lucent Topology

Figure 1 depicts a typical master-local deployment for OmniVista 3600 Air Manager:

Figure 1 *Typical Alcatel-Lucent Deployment*
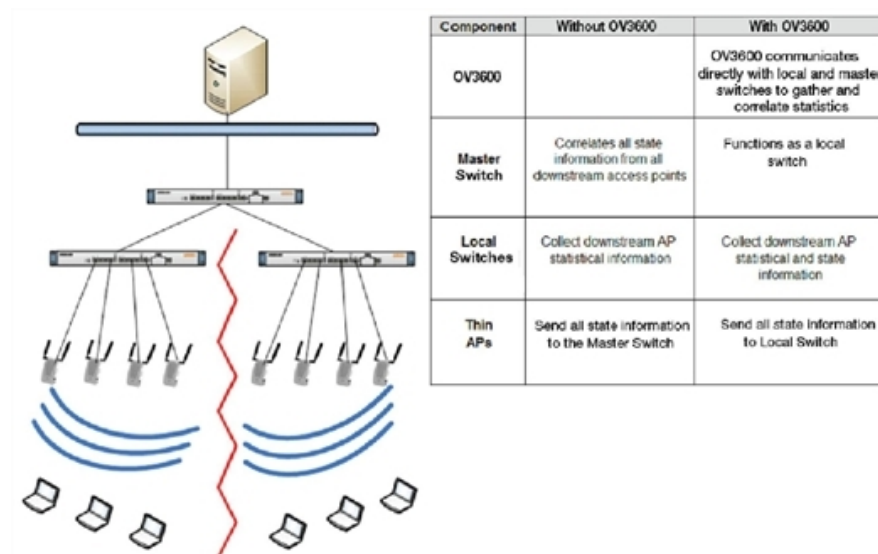
> There should never be a local switch managed by an OV3600 server whose master switch is also not under management.

Prerequisites for Integrating Alcatel-Lucent Infrastructure

You will need the following information to monitor and manage your Alcatel-Lucent infrastructure:

- SNMP community string (monitoring and discovery)
- Telnet/SSH credentials (configuration only)
- **Enable** password (configuration only)

> Without proper Telnet/SSH credentials OV3600 will not be able to acquire license and serial information from switches.

- SNMPv3 credentials are required for WMS Offload:
  - Username
  - Auth password
  - Privacy password
  - Auth protocol

This section explains how to optimally configure OV3600 to globally manage your global Alcatel-Lucent infrastructure. Refer to the following topics:

- "Disabling Rate Limiting in OV3600 Setup > General" on page 7
- "Entering Credentials in Device Setup > Communication" on page 8
- "Setting Up Recommended Timeout and Retries" on page 9
- "Setting Up Time Synchronization" on page 9
- "Enabling Support for Channel Utilization And Statistics" on page 9

Disabling Rate Limiting in OV3600 Setup > General

The SNMP Rate Limiting for Monitored Devices option adds a small delay between each SNMP GET request, thus the actual polling intervals will be longer than what is configured. For example, setting a 10-minute polling interval will result in an actual 12-minute polling interval. Disabling rate limiting is recommended in most cases.

To disable rate limiting in OV3600, follow these steps:

1. Navigate to **OV3600 Setup > General**.
2. Locate the **Performance** section on this page.
3. In the **SNMP Rate Limiting for Monitored Devices** field, select **No**, as shown in Figure 2.
4. Select **Save**.

Figure 2 *SNMP Rate Limiting in **OV3600 Setup > General***

Entering Credentials in Device Setup > Communication

OV3600 requires several credentials to properly interface with Alcatel-Lucent devices. To enter these credentials, follow these steps:

1. Navigate to **Device Setup > Communication**.
2. In the **Default Credentials** section, select the **Edit** link next to Alcatel-Lucent. The page illustrated in Figure 3 appears.
3. Enter the **SNMP Community String**.

> **NOTE**
>
> Be sure to note the community string because it must match the SNMP trap community string, which is configured later in this document.

Figure 3 *Credentials in Device Setup > Communication*

4. Enter the required fields for configuration and basic monitoring:
   - Telnet/SSH Username
   - Telnet/SSH Password
   - enable Password
5. Enter the required fields for WMS Offload:
   - SNMPv3 Username
   - Auth Password
   - SNMPv3 Auth Protocol
   - Privacy Password
   - SNMPv3 Privacy Protocol

6. Click **Save** when you are finished.

Setting Up Recommended Timeout and Retries

To set recommended timeout and retries settings, follow these steps:

1. In the **Device Setup > Communication** page, locate the **SNMP Setting** section.

2. Change the **SNMP Timeout** setting to a value or either **3**, **4**, or **5**. This is the number of seconds that OV3600 will wait for a response from a device after sending an SNMP request, so a smaller number is more ideal.

3. Change the **SNMP Retries** value to **10**. This value represents the number of times OV3600 tries to poll a device when it does not receive a response within the SNMP Timeout Period or the Group's Missed SNMP Poll Threshold setting (1-100).

Figure 4 *Timeout settings in **Device Setup > Communication***

SNMP Settings	
SNMP Timeout (3-60 sec):	3
SNMP Retries (1-40):	10

4. Click **Save** when you are done.

Setting Up Time Synchronization

You can set the clock on a switch manually or by configuring the switch to use a Network Time Protocol (NTP) server to synchronize its system clock with a central time source.

Manually Setting the Clock on a switch

You can use either the WebUI or CLI to manually set the time on the switch's clock.

1. Navigate to the **Configuration > Management > Clock** page.

2. Under **switch Date/Time**, set the date and time for the clock.

3. Under **Time Zone**, enter the name of the time zone and the offset from Greenwich Mean Time (GMT).

4. To adjust the clock for daylight savings time, click **Enabled** under Summer Time. Additional fields appear that allow you to set the offset from UTC and the start and end recurrences.

5. Click **Apply**.

Enabling Support for Channel Utilization And Statistics

In order to enable support for channel utilization statistics, you must have the following:

● OV3600 7.2 or later

● AOS-W 6.0.1 or later

NOTE

AOS-W 6.0.1 can report RF utilization metrics, while AOS-W 6.1 is necessary to also obtain classified interferer information.

- Access points - Alcatel-Lucent OAW-AP92, OAW-AP93, OAW-AP105, OAW-AP124, OAW-AP125, OAW-AP134, OAW-AP135
- switches - Alcatel-Lucent 600 Series, 3000 Series, 6000 Series, or 7200 Series

OV3600 Setup

Follow these steps in OV3600:

1. Navigate to **OV3600 Setup > General**.
2. In the **Additional OV3600 Services** section, set **Enable AMON Data Collection** to **Yes**, and set **Prefer AMON vs SNMP Polling** to **Yes**.

Figure 5 *AMON Data Collection setting in **OV3600 Setup > General***

3. Click **Save** when you are done.

switch Setup (Master And Local)

CAUTION

Enabling these commands on AOS-W versions prior to 6.0.1.0 can result in performance issues on the switch. If you are running previous firmware versions such as AOS-W 6.0.0.0, you should upgrade to AOS-W 6.0.1 (to obtain RF utilization metrics) or 6.1 (to obtain RF utilization *and* classified interferer information) before you enter this command.

Use SSH to access the switch's command-line interface, enter **enable** mode, and issue the following commands:

```
(switch-Name) # configure terminal
Enter Configuration commands, one per line. End with CNTL/Z
(switch-Name) (config) # mgmt-server type ov3600 primary-server <OV3600-IP>
(switch-Name) (config) # write mem
```

CAUTION

You can add up to four `<AMP-IP>` addresses.

It is prudent to establish one or more Alcatel-Lucent Groups within OV3600. During the discovery process you will move new discovered switches into this group.

This section contains the following topics:

- "Basic Monitoring Configuration" on page 13
- "Advanced Configuration " on page 14

Basic Monitoring Configuration

1. Navigate to **Groups > List**.
2. Select **Add**.
3. Enter a **Name** that represents the Alcatel-Lucent device infrastructure from a security, geographical, or departmental perspective and select **Add**.
4. You will be redirected to the **Groups > Basic** page for the Group you just created. On this page you will need to verify and/or change the following Alcatel-Lucent-specific settings.

    a. Find the **SNMP Polling Periods** section of the page, as illustrated in Figure 6.

    b. Verify that the **Override Polling Period for Other Services** option is set to **Yes.**

    c. Verify that **Client Data Polling Period** is set to 10 minutes. Do not configure this interval lower than 5 minutes.

> **NOTE**
> Enabling the SNMP Rate Limiting for Monitored Devices option in the previous chapter adds a small delay between each SNMP Get request, thus the actual polling interval is 12 minutes for 10 minute polling interval.

    d. Verify that the **Device-to-Device Link Polling Period** option is set to **30 minutes**.

    e. Verify that the **Rogue AP and Device Location Data Polling Period** option is set to **30 minutes**.

Figure 6 *SNMP Polling Periods section of **Groups > Basic***

5. Locate the Aruba/Alcatel-Lucent section of this page, as illustrated in Figure 7.
6. Configure the proper **SNMP Version** for monitoring the Alcatel-Lucent infrastructure.

Figure 7 *Group SNMP Version for Monitoring*

7. Click **Save and Apply** when you are done.

Advanced Configuration

Refer to the *OmniVista 3600 Air Manager 7.7 Configuration Guide* for detailed instructions.

OV3600 utilizes the Alcatel-Lucent topology to efficiently discover downstream infrastructure. This section guides you through the process of discovering and managing your Alcatel-Lucent device infrastructure.

Refer to the following earlier sections in this document before attempting discovery:

- "Configuring OV3600 for Alcatel-Lucent Infrastructure" on page 7
- "Configuring an Alcatel-Lucent Group in OV3600" on page 13

The following topics in this chapter walk through the basic procedure for discovering and managing Alcatel-Lucent infrastructure:

- "Discovering or Adding Master switches" on page 15
- "Local switch Discovery" on page 17
- "Thin AP Discovery" on page 17

NOTE
Always add one switch and its affiliated Thin APs into management or monitoring mode in a serial fashion, one at a time. Adding new devices is a very CPU intensive process for OV3600 and can quickly overwhelm all of the processing power of the server if hundreds of Thin APs are added (migrated from New to Managed or Monitoring) simultaneously.

Discovering or Adding Master switches

Scan networks containing Alcatel-Lucent master switches from **Device Setup > Discover.**

- or -

Manually enter the master switch by following these steps in the **Device Setup > Add** page:

1. Select the **Alcatel-Lucent** OmniSwitch type and select **Add**. The page illustrated on Figure 8 appears.
2. Enter the **Name** and the **IP Address** for the switch.
3. Enter **SNMP Community String**, which is required field for device discovery.

NOTE
Be sure to note the community string because it must match the SNMP trap community string, which is configured later in this document.

Figure 8 *Alcatel-Lucent Credentials in* **Device Setup > Add**

Configure default credentials on the Communication page.

Device Communications	
Name: Leave name blank to read it from device	
IP Address:	
SNMP Port:	161
SSH Port:	22
Community String:	••••••••••
Confirm Community String:	••••••••••
SNMPv3 Username:	snmpv3user
Auth Password:	••••••••••
Confirm Auth Password:	••••••••••
SNMPv3 Auth Protocol:	SHA-1 ▼
Privacy Password:	•••••••
Confirm Privacy Password:	•••••••
SNMPv3 Privacy Protocol:	DES ▼
Telnet/SSH Username:	admin
Telnet/SSH Password:	••••••••••
Confirm Telnet/SSH Password:	••••••••••
"enable" Password:	••••••••••
Confirm "enable" Password:	••••••••••

Location	
Group:	Access Points ▼
Folder:	Top ▼

◉ **Monitor Only** (no changes will be made to device)
◯ **Manage read/write** (group settings will be applied to device)

[Add] [Cancel]

4. Enter the required fields for configuration and basic monitoring:
   - Telnet/SSH Username
   - Telnet/SSH password
   - enable password

5. Enter the required fields for WMS Offload
   - SNMPv3 Auth Protocol
   - SNMPv3 Privacy Protocol
   - SNMPv3 Username
   - Auth Password
   - Privacy Password

NOTE

The protocols for SNMPv3 Auth and SNMPv3 Privacy should be SHA-1 and DES in order for WMS Offload to work.

CAUTION

If you are using SNMPv3, and the switch's date/time is incorrect, the SNMP agent will not respond to SNMP requests from the OV3600 SNMP manager. This will result in the switch and all of its downstream access points showing as Down in OV3600.

6. Assign the switch to a Group and Folder.

7. Ensure that the **Monitor Only** option is selected.

> **NOTE**
> If you select Manage read/write, AMP will push the group setting configuration, and existing device configurations will be deleted/overwritten.

8. Select **Add**.

9. Navigate to the **APs/Devices > New** page.

10. Select the Alcatel-Lucent master switch you just added from the list of new devices.

11. Ensure **Monitor Only** option is selected.

12. Select **Add**.

Local switch Discovery

Local switches are added to OV3600 via the master switch, by a discovery scan, or manually added in **Device Setup > Add**. After waiting for the Thin AP Polling Period interval or executing a Poll Now command from the **APs/Devices > Monitor** page, the local switches will appear on the **APs/Devices > New** page.

Add the local switch to the Group defined previously. Within OV3600, local switches can be split away from the master switch's Group.

> **NOTE**
> Local switch Discovery/monitoring may not work as expected if OV3600 is unable to communicate directly with the target device. Be sure and update any ACL/Firewall rules to allow OV3600 to communicate with your network equipment.

Thin AP Discovery

Thin APs are discovered via the local switch. After waiting for the Thin AP Polling Period or executing a Poll Now command from the **APs/Devices > Monitor** page, thin APs will appear on the **APs/Devices > New** page.

Add the thin APs to the Group defined previously. Within OV3600, thin APs can be split away from the switch's Group. You can split thin APs into multiple Groups if required.

This section describes strategies for integrating OV3600 and Alcatel-Lucent devices and contains the following topics:

Integration Goals

The following table summarizes the types of integration goals and strategies for meeting them in certain architectural contexts:

Table 1: *Integration Goals in All Masters or Master/Local Architectures*

Integration Goals	All Masters Architecture	Master/Local Architecture
Rogue And Client Info		enable stats
Rogue containment only	ssh access to switches	ssh access to switches
Rogue And Client containment	WMS Offload	WMS Offload
Reduce Master switch Load		WMS Offload debugging off
IDS And Auth Tracking	Define OV3600 as a trap host	Define OV3600 as a trap host
Track Tag Location	enable RTLS WMS Offload	enable RTLS WMS Offload
Channel Utilization	enable AMON	enable AMON
Spectrum	enable AMON	enable AMON
Policy Enforcement Firewall (PEF) visibility	enable AMON	enable AMON
Health Information	enable ARM	enable ARM

Key integration points to consider include the following:

- IDS Tracking does not require WMS Offload in an all-master or master/local environment.
- IDS Tracking does require enable stats in a master/local environment.
- WMS Offload will hide the Security Summary tab on master switch's web interface.
- WMS Offload encompasses enable stats or enable stats is a subset of WMS Offload.

- Unless you enable stats on the local switches in a master/local environment, the local switches do not populate their MIBs with any information about clients or rogue devices discovered/associated with their APs. Instead the information is sent upstream to master switch.

Example Use Cases

The following are example use cases of integration strategies:

When to Use Enable Stats

You want to pilot OV3600, and you do not want to make major configuration changes to their infrastructure or manage configuration from OV3600.

> **NOTE**
>
> Enable Stats still pushes a small subset of commands to the switches via SSH.

When to Use WMS Offload

- You have older Alcatel-Lucent infrastructure in a master/local environment and their master switch is fully taxed. Offloading WMS will increase the capacity of the master switch by offloading statistic gathering requirements and device classification coordination to OV3600.
- You want to use OV3600 to distribute client and rogue device classification amongst multiple master switches in a master/local environment or in an All-Masters environment.
- See the following topics:

When to Use RTLS

- A hospital wants to achieve very precise location accuracy (5 -15 feet) for their medical devices which are associating to the WLAN.
- You want to locate items utilizing WiFi Tags.

> **NOTE**
>
> RTLS can negatively impact your OV3600 server's performance.

When to Define OV3600 as a Trap Host

- You want to track IDS events within the OV3600 UI.

- You are in the process of converting their older third-party WLAN devices to Alcatel-Lucent devices and want a unified IDS dashboard for all WLAN infrastructure.
- You want to relate Auth failures to a client device, AP, Group of APs, and switch. OV3600 provides this unique correlation capability.

See "Define OV3600 as a Trap Host using the AOS-W CLI" on page 23.

When to Use Channel Utilization

- You have a minimum version of AOS-W 6.1.0.0 and OAW-AP105 or OAW-AP135.

Prerequisites for Integration

If you have not discovered the Alcatel-Lucent infrastructure or configured credentials, refer to the previous chapters of this book:

- "Configuring OV3600 for Alcatel-Lucent Infrastructure" on page 7
- "Configuring an Alcatel-Lucent Group in OV3600" on page 13
- "Discovering Alcatel-Lucent Infrastructure" on page 15

Enable Stats Utilizing OV3600

To enable stats on the Alcatel-Lucent switches, follow these steps:
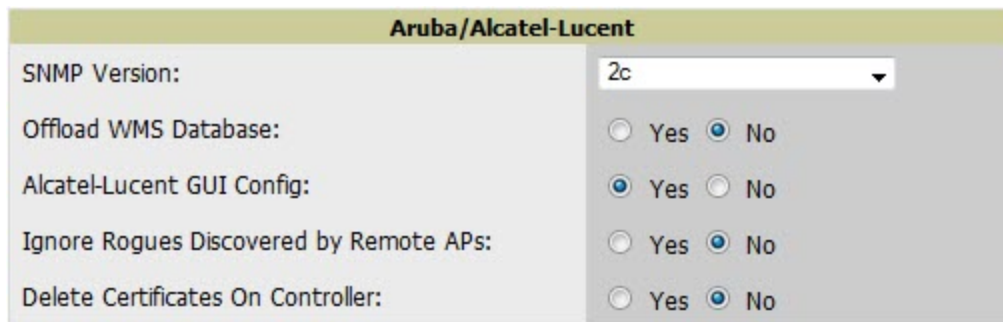
1. Navigate to **OV3600 Setup > General** and locate the **Device Configuration** section.
2. Set the **Allow WMS Offload Configuration in Monitor-Only Mode** field to **Yes**, as shown in Figure 9:

Figure 9 *WMS Offload Configuration in **OV3600 Setup > General***

3. Navigate to **Groups > Basic** for the group that contains your Alcatel-Lucent switches.
4. Locate the Alcatel-Lucent section on the page.
5. Set the **Offload WMS Database** field to **No,** as shown in Figure 10:

Figure 10 *Offload WMS Database field in **Groups > Basic***

Aruba/Alcatel-Lucent	
SNMP Version:	2c ▼
Offload WMS Database:	○ Yes ◉ No
Alcatel-Lucent GUI Config:	◉ Yes ○ No
Ignore Rogues Discovered by Remote APs:	○ Yes ◉ No
Delete Certificates On Controller:	○ Yes ◉ No

6. Select **Save and Apply**.

7. Select **Save**.

This will push a set of commands via SSH to all Alcatel-Lucent local switches. OV3600 must have read/write access to the switches in order to push these commands.

> **NOTE**
>
> This process will not reboot your switches.

> **CAUTION**
>
> If you don't follow the above steps, local switches will not be configured to populate statistics. This decreases OV3600's capability to trend client signal information and to properly locate devices. See "AOS-W CLI" on page 37 for information on how to utilize the AOS-W CLI to enable stats on Alcatel-Lucent infrastructure.

If your credentials are invalid or the changes are not applied to the switch, error messages will display on the switch's **APs/Devices > Monitor** page under the **Recent Events** section. If the change fails, OV3600 does not audit these setting (display mismatches) and you will need to apply to the switch by hand. See "AOS-W CLI" on page 37 for detailed instructions.

These are the commands pushed by OV3600 while enabling WMS Offload. Do not enter these commands:

```
configure terminal
no mobility-manager <Active WMS IP Address>
wms
general collect-stats enable
stats-update-interval 120
show wms general
write mem
```

WMS Offload with OV3600

To offload WMS on the Alcatel-Lucent switches using OV3600

1. In **OV3600 Setup > General**, locate the **Device Configuration** section and enable or disable **Allow WMS Offload Configuration in Monitor-Only Mode.**

2. Select **Save and Apply**. This will push a set of commands via SSH to all Alcatel-Lucent master switches. If the switch does not have an SNMPv3 user that matches the OV3600 database it will automatically create a new SNMPv3 user. OV3600 must have read/write access to the switches in order to push these commands

3. Navigate to **Groups > Basic** and locate the **Alcatel-Lucent** section.

4. Set the **Offload WMS Database** field to **Yes**.

This process will not reboot your switches. See "AOS-W and OV3600 CLI Commands " on page 37 on how to utilize the AOS-W CLI to enable stats for WMS Offload.

The SNMPv3 user's Auth Password and Privacy Password must be the same.

Do not enter these commands; these are pushed by OV3600 while enabling WMS Offload.

```
configure terminal
mobility-manager <OV3600 IP> user <OV3600 SNMPv3 User Name> <OV3600 Auth/Priv PW>
stats-update-interval 120
write mem
```

OV3600 will configure SNMPv2 traps with the **mobile manager** command.

Define OV3600 as a Trap Host using the AOS-W CLI

To ensure the OV3600 server is defined a trap host, access the command line interface of each switch (master and local), enter enable mode, and issue the following commands:

```
(switch-Name) # configure terminal
Enter Configuration commands, one per line. End with CNTL/Z

(switch-Name) (config) # snmp-server host <OV3600 IP ADDR> version 2c <SNMP Community String of
switch>
```

Ensure the SNMP community matches those that were configured in "Configuring OV3600 for Alcatel-Lucent Infrastructure" on page 7.

```
(switch-Name) (config) # snmp-server trap source <switch-IP>
(switch-Name) (config) # write mem
```

OV3600 supports SNMP v2 traps and SNMP v3 informs in AOS-W 3.4 and higher. SNMP v3 traps are not supported.

Ensuring That IDS And Auth Traps Display in OV3600

Validate your AOS-W configuration by exiting the configure terminal mode and issue the following command:

```
(switch-Name) # show snmp trap-list
```

If any of the traps in the output of this command do not appear to be enabled enter **configure terminal** mode and issue the following command:

```
(switch-Name) (config) # snmp-server trap enable <TRAPS FROM LIST ABOVE>
```

See "AOS-W CLI" on page 37 for the full command that can be copied and pasted directly into the AOS-WCLI.

```
(switch-Name) (config) # write mem
```

Ensure the source IP of the traps match the IP that OV3600 utilizes to manage the switch, as shown in Figure 11. Navigate to **APs/Devices > Monitor** to validate the IP address in the **Device Info** section.

Figure 11 *Verify IP Address on **APs/Devices > Monitor** Page*

```
                                           Device Info
Status: Up (OK)
Configuration: Mismatched (The settings on the device do not match the desired configuration policy.)
Firmware:        6.2.1.0                  Licenses
Upstream Device: 13-core1                 Upstream Port:        ge-1/0/18.0
Controller Role: Master
Type:            Aruba 7220               Last Contacted:       5/14/2013 4:13 PM  Uptime:   56 days 16 hrs 58 mins
LAN MAC Address: 00:1A:1E:00:0E:28        Serial:               BB0000118
Location:        13-1 Rack 28             Contact:              -
IP Address:      10.11.0.11               APs:                  29        Clients:  115         Usage:   3.77 Mbps
VPN Sessions:    0                        VPN Usage:            -
Quick Links:     Open controller web UI...▼    Run command...  ▼
Notes:
```

Verify that there is a SNMPv2 community string that matches the SNMP Trap community string on the switch.

```
(switch-Name) # show snmp community
SNMP COMMUNITIES
---------------
COMMUNITY ACCESS     VERSION
--------- ------     -------
public    READ_ONLY V1, V2c


(switch-Name) # #show snmp trap-host


SNMP TRAP HOSTS
---------------
HOST            VERSION     SECURITY NAME PORT    TYPE TIMEOUT RETRY
----            -------     ------------- ----    ---- ------- -----
10.2.32.4       SNMPv2c     public        162     Trap N/A     N/A
```

Verify that firewall port **162** (default) is **open** between OV3600 and the switch.

Validate that traps are making it into OV3600 by issuing the following commands from OV3600 command line.

```
[root@OV3600 ~]# qlog enable snmp_traps


[root@OV3600 ~]# tail -f /var/log/ov3600_diag/snmp_traps


1241627740.392536 handle_trap|2009-05-06 09:35:40 UDP: [10.2.32.65]->[10.51.5.118]:-32737 sends
trap: DISMAN-EVENT-MIB::sysUpTimeInstance = Timeticks: (127227800) 14 days, 17:24:38.00 SNMPv2-
MIB::snmpTrapOID.0 = OID: SNMPv2-SMI::enterprises.14823.2.3.1.11.1.2.1106 SNMPv2-SMI::enterpris
es.14823.2.3.1.11.1.1.60 = Hex-STRING: 07 D9 05 06 09 16 0F 00 2D 08 00   SNMPv2-SMI::enterpri
ses.14823.2.3.1.11.1.1.5.0 = Hex-STRING: 00 1A 1E 6F 82 D0 SNMPv2-SMI::enterprises.14823.2.3.1.
11.1.1.6.0 = STRING: Alcatel-Lucent-apSNMPv2-SMI::enterprises.14823.2.3.1.11.1.1.1.0 = Hex-STRI
NG: 00 1A 1E C0 2B 32 SNMPv2-SMI::enterprises.14823.2.3.1.11.1.1.56.0 = INTEGER: 2    SNMPv2-SM
I::enterprises.14823.2.3.1.11.1.1.17.0 = STRING: Alcatel-Lucent-124-c0:2b:32 SNMPv2-SMI::enterp
rises.14823.2.3.1.11.1.1.18.0 = INTEGER: 11   SNMPv2-SMI::enterprises.14823.2.3.1.11.1.1.58.0 =
STRING: http://10.51.5.118/screens/wmsi/reports.html?mode=ap&bssid=00:1a:1e:6f:82:d0
```

NOTE

You will see many IDS and Auth Traps from this command. OV3600 only processes a small subset of these traps which display within OV3600. The traps that OV3600 does process are listed above.

We recommend that you disable qlogging after testing. Leaving it turned on can negatively impact OV3600 performance:

```
[root@OV3600 ~]# qlog enable snmp_traps
```

Understanding WMS Offload Impact on Alcatel-Lucent Infrastructure

When offloading WMS, it is important to understand what functionality is migrated to OV3600 and what functionality is deprecated.

The following AOS-W tabs and sections are deprecated after offloading WMS:

- **Plan** - The tab where floor plans are stored and heatmaps are generated. Prior to offloading WMS, ensure that you have exported floor plans from AOS-W and imported them into OV3600. All functionality within the Plan Tab is incorporated with the VisualRF module in OV3600.

- **Dashboard > Security Summary** - The **Security Summary** section (Figure 12) disappears after offloading WMS. The data is still being processed by the master switch, but the summary information is not available. You must use OV3600 to view data for APs, clients and events in detail and summary from.

  - OV3600 displays information on Rogue APs in the **RAPIDS > Overview** pages.

  - Information on Suspected Rogue, Interfering and known interfering APs is available in OV3600 on each **APs/Devices > Manage** page.

  - IDS events data and reports appear on OV3600's **Reports > Generated > IDS Events** page.

Figure 12 *Security Summary on the Master switch*
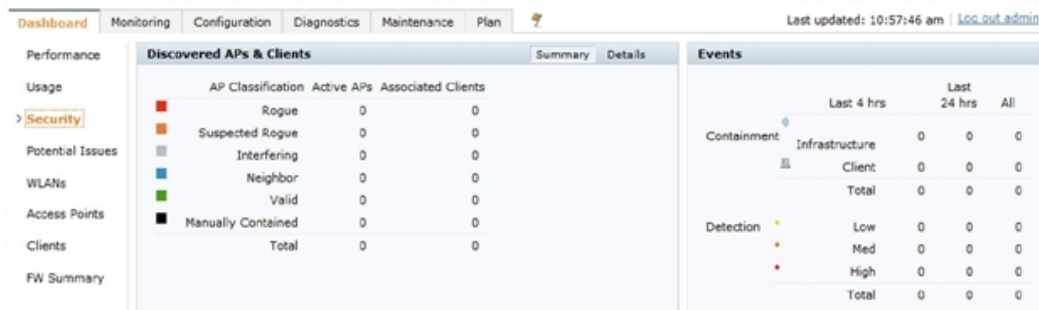
See "Rogue Device Classification" on page 33 for more information on security, IDS, WIPS, WIDS, classification, and RAPIDS.

This section discusses Alcatel-Lucent specific capabilities in OV3600 and contains the following topics:

- "Alcatel-Lucent Traps for RADIUS Auth and IDS Tracking" on page 27
- "Remote AP Monitoring" on page 28
- "ARM and Channel Utilization Information" on page 28
- "Viewing switch License Information" on page 32
- "Rogue Device Classification" on page 33
- "Rules-Based Controller Classification" on page 35

Alcatel-Lucent Traps for RADIUS Auth and IDS Tracking

The authentication failure traps are received by the OV3600 server and correlated to the proper switch, AP, and user. See Figure 13 showing all authentication failures related to a switch.

You can view RADIUS authentication issues by selecting the RADIUS Authentication Issues link in the Alert Summary table.

Figure 13 *RADIUS Authentication Traps in OV3600*

The IDS traps are received by the OV3600 server and correlated to the proper switch, AP, and user. See Figure 14 showing all IDS traps related to a switch. You can view IDS events by selecting the IDS Events link in the Alert Summary table.

Figure 14 *IDS Events in OV3600*

Remote AP Monitoring

To monitor remote APs, follow these steps:

1. From the **APs/Devices > List** page, filter on the **Remote Device** column to find remote devices.

2. To view detailed information on the remote device, select the device name. The page illustrated in Figure 15 appears.

Figure 15 *Remote AP Detail Page*

3. You can also see if there are users plugged into the wired interfaces in the Connected Clients list below the Clients and Usage graphs.

> **NOTE**
>
> This feature is only available when the remote APs are in split tunnel and tunnel modes.

ARM and Channel Utilization Information

ARM statistics and Channel utilization are very powerful tools for diagnosing capacity and other issues in your WLAN.

1. Navigate to an **APs/Devices > Monitor** page for any of the following: Alcatel-Lucent OAW-AP105, OAW-AP92, OAW-AP93, OAW-AP124, OAW-AP125, OAW-AP134, or OAW-AP135.

2. In the **Radios** table, select a radio link under the **Name** column for a radio.

3. The graphs default to Client and Usage. Select the drop down icon for each to change these to Radio Channel and Channel Utilization.

Figure 16 *ARM and Channel Utilization Graphs*
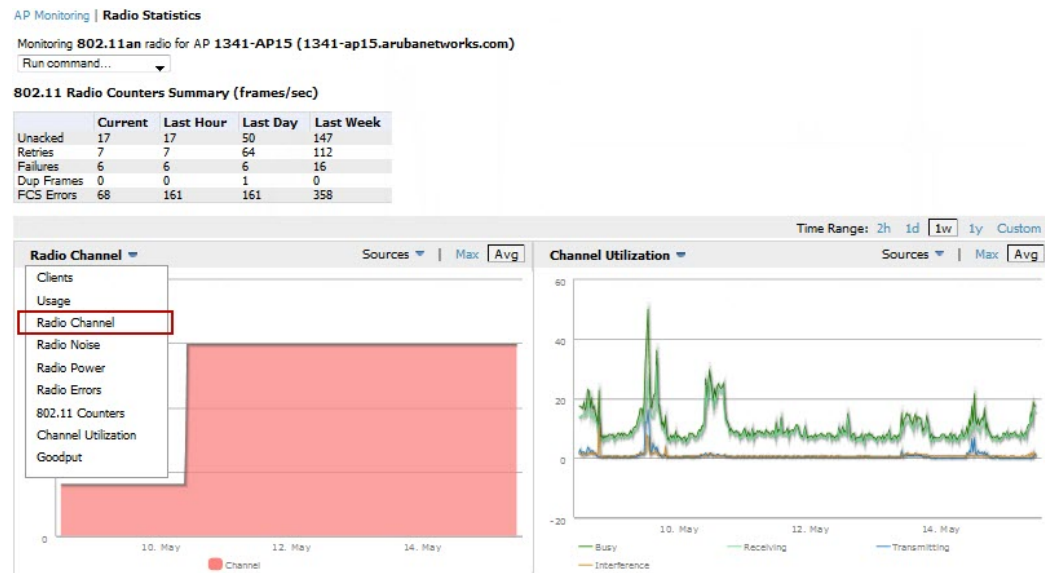
See the *OmniVista 3600 Air Manager 7.7 User Guide* for more information on the data that displays in the **Radio Statistics** page for these devices.

VisualRF and Channel Utilization

To view how channel utilization is impacting an area within a building, follow these steps:

1. Navigate to a floor plan by clicking on the thumbnail on a device's **APs/Devices > Monitor** page or navigating to **VisualRF > Floor Plans** page.

2. Select the **Overlays** menu.

3. Select the **Ch. Utilization** overlay.

4. Select **Current** or **Maximum** (over last 24 hours).
   - If Maximum is selected, then use the drop down menu to select total (default), receive (RX), transmit (TX), or interference (Int.).

5. Select to view information for the current floor, the floor above, and/or the floor below.

6. Select a frequency of 5 GHz and/or 2.4 GHz.

Figure 17 *Channel Utilization in VisualRF (Interference/2.4 GHz)*
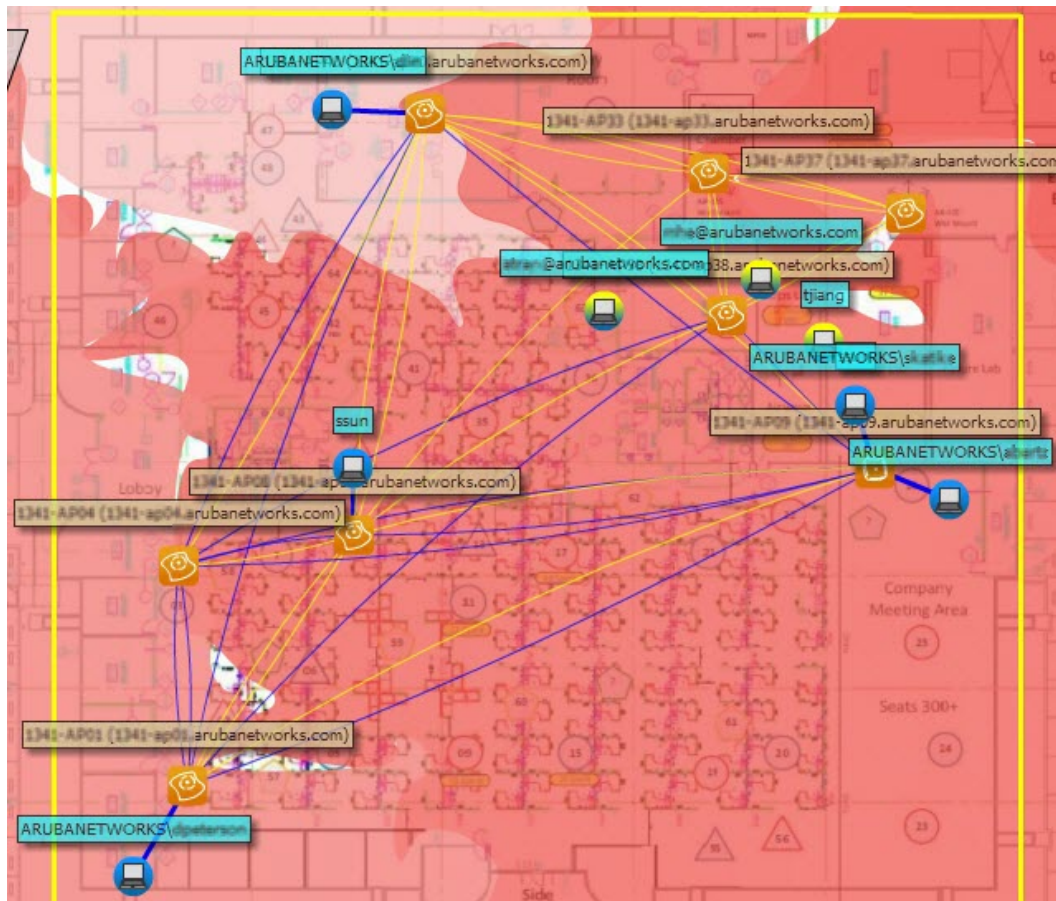
Configuring Channel Utilization Triggers

1. Navigate to **System > Triggers** and select **Add**.

2. Select **Channel Utilization** from the **Type** drop-down menu as seen on Figure 18:

Figure 18 *Channel Utilization Trigger*

3. Enter the duration evaluation period.

4. Click the **Add New Trigger Condition** button.

5. Create a trigger condition for **Radio Type** and select the frequency to evaluate.

6. Select total, receive, transmit, or interference trigger condition.

7. Set up any restrictions or notifications. (Refer to the *OmniVista 3600 Air Manager 7.7 User Guide* for more details.)

8. When you are finished, click **Add**.

Viewing Channel Utilization Alerts

You can view Channel Utilization alerts from the APs/Devices > Monitor page and on the System > Alerts page.

Channel Utilization Alerts on the APs/Devices > Monitor Page

1. Navigate to **APs/Devices > Monitor** page for a selected device.

2. Scroll down to the Alert Summary page and select AMP Alerts.

Figure 19 *Channel Utilization alerts*

AMP Alerts for ITC in group Ethersphere-lms3 in folder Top > Sunnyvale HQ | Return to AP/Device Monitor page

Alert Type ▲		Last 2 Hours	Last 24 Hours	Total
Channel Utilization Interference (%) >= 50% and Time Busy (%) >= 70% for 5 minutes		0	0	1

1-1 ▼ of 1 Alerts Page 1 ▼ of 1   Choose columns   Choose columns for roles   Export CSV

	Trigger Type	Trigger Summary	Triggering Agent	Severity	Time ▼
☐	Channel Utilization	Interference (%) >= 50% and Time Busy (%) >= 70% for 5 minutes	ITC (radio 802.11an)	Warning	5/14/2013 8:54 AM

1-1 ▼ of 1 Alerts Page 1 ▼ of 1

Select All - Unselect All

[Acknowledge]   [Delete]

Channel Utilization Alerts on the System > Alerts Page

1. Navigate to the **System > Alerts** page.

2. Sort the **Trigger Type** column and find **Channel Utilization** alerts.

Figure 20 *Channel Utilization alerts on the System > Alerts page*

Alerts

1-20 ▼ of 35 Alerts   Page 1 ▼ of 2 > >| Choose columns   Choose columns for roles   Export CSV

	Trigger Type ▲	Trigger Summary	Triggering Agent	Time	S
☐	Channel Utilization	Interference (%) >= 50% and Time Busy (%) >= 70% for 5 (more...)	13-AP3 (radio 802.11bgn)	5/14/2013 1:45 PM	W
☐	Channel Utilization	Interference (%) >= 50% and Time Busy (%) >= 70% for 5 (more...)	IT(radio 802.11an)	5/14/2013 8:54 AM	W
☐	Channel Utilization	Interference (%) >= 50% and Time Busy (%) >= 70% for 5 (more...)	APtca.9ba.598a (radio 802.11bgn)	5/13/2013 11:26 PM	W
☐	Channel Utilization	Interference (%) >= 50% and Time Busy (%) >= 70% for 5 (more...)	13-ac.arubanetworks.com (radio 802.11ac)	5/15/2013 10:47 AM	W
☐	Device Down	Minutes Down Threshold >= 15 minutes	Aru50-RN-Ram	5/13/2013 11:21 PM	N

View Channel Utilization in RF Health Reports

1. Navigate to **Reports > Generated**.

2. Find and select an RF Health report.

3. Scroll down to view most and least utilized 2.4 and 5 channel usage information.

Figure 21 *Channel Utilization in an RF Health Report (partial view)*

Most Utilized by Channel Usage (5 GHz)

Rank ▲	Device	Channel Busy (%)	Interference (%)	Clients	Usage (bps)	Location	Controller	Folder	G
1	RTLS4	60.63	15.35	0	0.00	-	RTLS	Top > AB	A
2	RTLS3	59.45	11.02	0	0.00	-	RTLS	Top > AB	A
3	2188-ac.arubanetworks.com	56.30	25.98	1	0.00	-	ethersphere-1322-porfidio.arubanetworks.com	Top	1
4	1260-ac.arubanetworks.com	42.13	2.76	5	381.00	-	ethersphere-1322-porfidio.arubanetworks.com	Top	1
5	AP225-SW (ap225-sw.arubanetworks.com)	40.55	7.87	5	13252.00	-	ethersphere-1322-porfidio.arubanetworks.com	Top	1
6	1263-ac.arubanetworks.com	36.22	5.12	4	6.00	-	ethersphere-1322-porfidio.arubanetworks.com	Top	1
7	AP225-TE (ap225-te.arubanetworks.com)	32.28	7.87	5	0.00	-	ethersphere-1322-porfidio.arubanetworks.com	Top	1
8	2218-ac.arubanetworks.com	31.89	4.33	4	0.00	-	ethersphere-1322-porfidio.arubanetworks.com	Top	1
9	1362-ac.arubanetworks.com	30.71	3.94	8	43.00	-	ethersphere-1322-porfidio.arubanetworks.com	Top	1
10	1142-ac.arubanetworks.com	30.31	10.63	8	15930.00	-	ethersphere-1322-porfidio.arubanetworks.com	Top	1

Most Utilized by Channel Usage (2.4 GHz)

Rank ▲	Device	Channel Busy (%)	Interference (%)	Clients	Usage (bps)	Location	Controller	Folde
1	RTLS2	96.46	19.29	1	0.00	-	RTLS	Top >
2	RTLS3	87.80	16.93	0	0.00	-	RTLS	Top >
3	RTLS	87.40	17.72	0	0.00	-	RTLS	Top
4	1341-AP22 (1341-ap22.arubanetworks.com)	86.22	17.32	1	688.00	-	Chuckwagon (chuckwagon.arubanetworks.com)	Top >
5	1341-AP21 (1341-ap21.arubanetworks.com)	85.04	16.54	0	463.00	-	Chuckwagon (chuckwagon.arubanetworks.com)	Top >
6	AP70ca.9b2a.598a	85.04	85.04	0	0.00	default location	aruba-flex-7500	Top
7	1341-AP38 (1341-ap38.arubanetworks.com)	83.07	14.96	0	0.00	-	Chuckwagon (chuckwagon.arubanetworks.com)	Top >
8	1341-AP19 (1341-ap19.arubanetworks.com)	82.28	16.93	1	1375.00	-	Chuckwagon (chuckwagon.arubanetworks.com)	Top >
9	1341-AP20 (1341-ap20.arubanetworks.com)	81.10	13.39	0	129.00	-	Chuckwagon (chuckwagon.arubanetworks.com)	Top >
10	RTLS4	79.53	13.78	0	0.00	-	RTLS	Top >

Viewing switch License Information

Follow these steps to view your switch's license information in OV3600:

1. Navigate to the **APs/Devices > Monitor** page of a switch.

2. Select the **Licenses** link in the **Device Info** section. A pop-up window appears listing all licenses.

Figure 22 *License Popup from **APs/Devices > Monitor** page a switch*

License Table for apollo.com:

Service Type ▲	Installed	Expires	Flag	Key
Access Points: 128	4/21/2011 7:21 PM		E	AITUcWKj-mSKz4X9i-1LNPyyMR-iEeuecZf-X+9Gmfr/-XgA
Access Points: 64			E	built-in
Next Generation Policy Enforcement Firewall Module: 128	5/31/2011 8:26 AM		E	nlbcg/3R-FUWPSOg6-/N25gjU/-4VAC9jIJ-gLnXncgz-+V0
Next Generation Policy Enforcement Firewall Module: 16	4/21/2011 7:21 PM		E	p2jhTQzm-7yKbipTQ-QXJKLNvB-vJFb4HHC-uqWkDwnc-gDY
Next Generation Policy Enforcement Firewall Module: 2048	5/30/2011 8:37 PM	Expired		Q4he6HDa-RNBoIJ15-h8MAoYhP-UBFlEu2n-pkrApkX6-eWc
Policy Enforcement Firewall for VPN users	4/21/2011 7:21 PM		E	7dWBfc7U-qRuAsC8e-dkZiXpGR-nK8JHbjU-2YvRrJAi-ZrM
Wireless Intrusion Protection Module: 128	4/21/2011 7:21 PM		E	Ba19CgJy-2nHLUk+z-ZAejSfY+-X65ZfMat-P+qp4gYw-tw8

7 Licenses

Rogue Device Classification

Complete this section if you have completed WMS Offload procedure above. After offloading WMS, OV3600 maintains the primary ARM, WIPS, and WIDS state classification for all devices discovered over-the-air.

Table 2: *WIPS/WIDS to OV3600 switchClassification Matrix*

OV3600 switch Classification	AOS-W (WIPS/WIDS)
Unclassified (default state)	Unknown
Valid	Valid
Suspected Valid	Suspected Valid
Suspected Neighbor	Interfering
Neighbor	Known Interfering
Suspected Rogue	Suspected Rogue
Rogue	Rogue
Contained Rogue	DOS

To check and reclassify rogue devices, follow these steps:

1. Navigate to the **RAPIDS > Detail** page for a rogue device, as shown in the following figure.
2. Select the proper classification from the **RAPIDS Classification Override** drop-down menu.

Figure 23 *Rogue Detail Page Illustration*

⚠ **CAUTION**

Changing the switch's classification within the OV3600 UI will push a reclassification message to all switches managed by the OV3600 server that are in Groups with Offloading the WMS database set to **Yes**. To reset the switch classification of a rogue device on OV3600, change the switch classification on the OV3600 UI to unclassified.

switch classification can also be updated from **RAPIDS > List** via the **Modify Devices** link.

All rogue devices will be set to a default switch classification of unclassified when WMS is first offloaded except for devices classified as valid. Rogue devices classified in AOS-W as valid will also be classified within OV3600 as valid for their switch classification as well. As APs report subsequent classification information about rogues, this classification will be reflected within OV3600 UI and propagated to switches that OV3600 manages. The device classification reflected in the switch's UI and in the OV3600 UI will probably not match, because the switch/APs do not reclassify rogue devices frequently.

To update a group of devices' switch classification to match the AOS-W device classification, navigate to **RAPIDS > List** and utilize the **Modify Devices** checkbox combined with the multiple sorting a filtering features.

Table 3: *ARM to OV3600 Classification Matrix*

OV3600	AOS-W (ARM)
Unclassified (default state)	Unknown
Valid	Valid
Contained	DOS

1. Navigate to the **Clients > Client Detail** page for the user.
2. In the Device Info section, select the proper classification from the **Classification** drop-down menu as seen in Figure 24:

Figure 24 *User Classification*
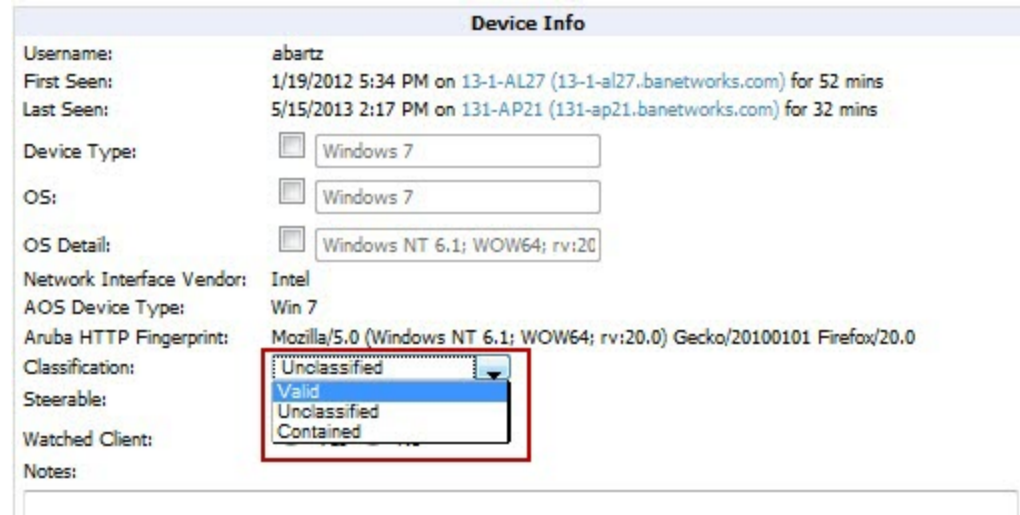
> ⚠ **CAUTION**
> Changing User Classification within the OV3600 UI will push a user reclassification message to all switches managed by the OV3600 server that are in Groups with Offloading the WMS database set to **Yes**.

All users will be set to a default classification of unclassified when WMS is first offloaded. As APs report subsequent classification information about users, this classification will be reflected within the OV3600 UI and propagated to switches that OV3600 manages. It is probable that the user's classification reflected in the switch's UI and in the OV3600 UI will not match, because the switches/APs do not reclassify users frequently.

There is no method in the OV3600 UI to update user classification on mass to match the switch's classification. Each client must be updated individually within the OV3600 UI.
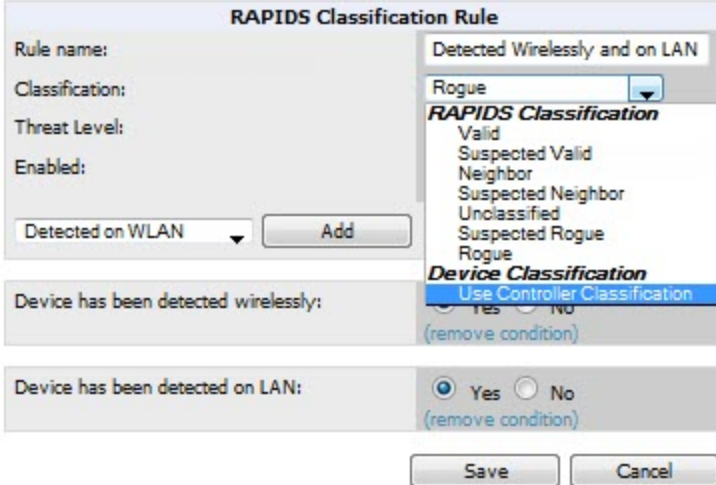
Rules-Based Controller Classification

Using RAPIDS Defaults for Controller Classification

To use the controller's classification as RAPIDS classification, follow these steps:

1. Navigate to the **RAPIDS > Rules** page and select the pencil icon beside the rule that you want to change.

2. In the **Classification** drop-down menu, select **Use Controller Classification** as seen in Figure 25.

Figure 25 *Using Controller Classification*

3. Click **Save** when you are done.

Changing RAPIDS based on switch Classification

1. Navigate to **RAPIDS > Rules** and select the desired rule.

2. In the **Classification** drop-down menu, select desired RAPIDS classification.

3. Select **Controller Classification** from the drop-down menu, as shown in Figure 26.

Figure 26 *Configure Rules for Classification*

4. Click **Add**.

5. A new Controller Classification field displays. Select the desired switch classification to use as an evaluation in RAPIDS.

6. Click **Save**.

Enable Channel Utilization Events

⚠ **CAUTION**

Enabling these commands on AOS-W versions prior to 6.1 can result in performance issues on the switch.

To enable channel utilization events utilizing the AOS-W CLI, use SSH to access a local or master switch's command-line interface, enter **enable** mode, and issue the following commands:

```
(switch-Name) # configure terminal
Enter Configuration commands, one per line. End with CNTL/Z

(switch-Name) (config) # mgmt-server type ov3600 primary-server <OV3600 IP>
(switch-Name) (config) # write mem
```

Enable Stats With the AOS-W CLI

The following commands enable collection of statistics (up to 25,000 entries) on the master switch for monitored APs and clients.

NOTE

Do not use these commands if you use the OV3600 GUI to monitor APs and Clients. Enabling these commands on AOS-W versions prior to 6.1 can result in performance issues on the switch.

Use SSH to access the master switch's command-line interface, enter **enable** mode, and issue the following commands:

```
(switch-Name) # configure terminal
Enter Configuration commands, one per line. End with CNTL/Z

(switch-Name) (config) # ids wms-general-profile collect-stats enable
(switch-Name) (config-ids-wms-general-profile) # collect-stats
(switch-Name) (config-ids-wms-general-profile) # exit
(switch-Name) (config) # write mem
```

Offload WMS Using the AOS-W or OV3600 CLI

NOTE

Do not use these commands if you use the OV3600 GUI to monitor APs and clients.

Additional commands can be used to offload WMS using the AOS-W command-line interface or the OV3600 SNMP Walk.

Refer to:

AOS-W CLI

SSH into all switches (local and master), and enter enable mode, and issue the following commands:

```
(switch-Name) # configure terminal
Enter Configuration commands, one per line. End with CNTL/Z
```

```
(switch-Name) (config) # mobility-manager <OV3600 IP> user <MMS-USER> <MMS-SNMP-PASSWORD>
(switch-Name) (config) # write mem
```

This command creates an SNMPv3 user on the switch with the authentication protocol configured to **SHA** and privacy protocol **DES**. The user and password must be at least eight characters because the Net-SNMP package in OV3600 adheres to this IETF recommendation. AOS-W automatically creates Auth and Privacy passwords from this single password. If mobility-manager is already using a preconfigured SNMPv3 user, ensure the privacy and authentication passwords are the same.

Example:

```
mobility-manager 10.2.32.1 user ov3600123 ov3600123
```

OV3600 SNMP

Log in into the OV3600 server with proper administrative access and issue the following command for all switches (master and locals):

```
[root@OV3600 ~]# snmpwalk -v3 -a SHA -l AuthPriv -u <MMS-USER> -A <MMS-SNMP-PASSWORD> -X <MMS-S
NMP-PASSWORD> <switch-IP> wlsxSystemExtGroup

WLSX-SYSTEMEXT-MIB::wlsxSysExtSwitchIp.0 = IpAddress: 10.51.5.222
WLSX-SYSTEMEXT-MIB::wlsxSysExtHostname.0 = STRING: Alcatel-Lucent-3600-2
.
..
WLSX-SYSTEMEXT-MIB::wlsxSysExtSwitchLastReload.0 = STRING: User reboot.
WLSX-SYSTEMEXT-MIB::wlsxSysExtLastStatsReset.0 = Timeticks: (0) 0:00:00.00 response
[root@OV3600 ~]#
```

Unless this SNMP walk command is issued properly on all of the switches, they will not properly populate client and rogue statistics. Ensure the user and passwords match exactly to those entered in above sections.

Example:

```
snmpwalk -v3 -a SHA -l AuthPriv -u ov3600123 -A ov3600123 -X ov3600123 10.51.3.222 wlsxSystemEx
tGroup
```

If you do not use the OV3600 WebUI to offload WMS, you must add a cronjob on the OV3600 server to ensure continued statistical population. Because the MIB walk/touch does not persist through a switch reboot, a cronjob is required to continually walk and touch the MIB.

Pushing Configs from Master to Local switches

Use the following AOS-W CLI commands to ensure that the master switch is properly pushing configuration settings from the master switch to local switches. This command ensures configuration changes made on the master switch will propagate to all local switches.

> **NOTE**
>
> Do not use these commands if you use the OV3600 GUI to monitor APs and clients.

```
(switch-Name) (config) # cfgm mms config disable
(switch-Name) (config) # write mem
```

Disable Debugging Utilizing the AOS-W CLI

If you are experiencing performance issues on the master switch, ensure that debugging is disabled. It should be disabled by default. Debugging coupled with gathering the enhanced statistics can put a strain on the switch's CPU, so it is highly recommended to disable debugging.

To disable debugging, SSH into the switch, enter enable mode, and issue the following commands:

```
(switch-Name) # show running-config | include logging level debugging
```

If there is output, then use the following commands to remove the debugging:

```
(switch-Name) # configure terminal
Enter Configuration commands, one per line. End with CNTL/Z

(switch-Name) (config) # no logging level debugging <module from above>
(switch-Name) (config) # write mem
```

Restart WMS on Local switches

To ensure local switches are populating rogue information properly, use SSH to access the command-line interface of each local switch, enter enable mode, and issue the following commands:

```
(switch-Name) # configure terminal
Enter Configuration commands, one per line. End with CNTL/Z
(switch-Name) (config) # process restart wms
```

After executing the restart wms command in AOS-W, you will need to wait until the next Rogue Poll Period on OV3600 and execute a **Poll Now** operation for each local switch on the **APs/Devices > List page** before rogue devices begin to appear in OV3600.

Configure AOS-W CLI when not Offloading WMS

To ensure proper event correlation for IDS events when WMS is not offloaded to OV3600, access the command line interface of each switch (master and local), enter enable mode, and issue the following commands:

```
(switch-Name) # configure terminal
Enter Configuration commands, one per line. End with CNTL/Z
(switch-Name) (config) # ids management-profile
(switch-Name) (config) # ids general-profile <name>
(switch-Name) (config) # ids-events logs-and-traps
(switch-Name) (config) # write mem
```

Copy and Paste to Enable Proper Traps with the AOS-W CLI

To ensure the proper traps are configured on Alcatel-Lucent switches, copy and paste the following command in config mode:

```
snmp-server trap enable wlsxNUserAuthenticationFailed
snmp-server trap enable wlsxUserAuthenticationFailed
snmp-server trap enable wlsxNAuthServerReqTimedOut
snmp-server trap enable wlsxSignatureMatchAP
snmp-server trap enable wlsxSignatureMatchSta
snmp-server trap enable wlsxSignAPNetstumbler
snmp-server trap enable wlsxSignStaNetstumbler
snmp-server trap enable wlsxSignAPAsleap
snmp-server trap enable wlsxSignStaAsleap
snmp-server trap enable wlsxSignAPAirjack
snmp-server trap enable wlsxSignStaAirjack
snmp-server trap enable wlsxSignAPNullProbeResp
snmp-server trap enable wlsxSignStaNullProbeResp
snmp-server trap enable wlsxSignAPDeauthBcast
snmp-server trap enable wlsxSignStaDeauthBcastwlsxChannelFrameErrorRateExceeded
snmp-server trap enable wlsxChannelFrameFragmentationRateExceeded
snmp-server trap enable wlsxChannelFrameRetryRateExceeded
snmp-server trap enable wlsxNIpSpoofingDetected
```

```
snmp-server trap enable wlsxStaImpersonation
snmp-server trap enable wlsxReservedChannelViolation
snmp-server trap enable wlsxValidSSIDViolation
snmp-server trap enable wlsxStaPolicyViolation
snmp-server trap enable wlsxRepeatWEPIVViolation
snmp-server trap enable wlsxWeakWEPIVViolation
snmp-server trap enable wlsxFrameRetryRateExceeded
snmp-server trap enable wlsxFrameReceiveErrorRateExceeded
snmp-server trap enable wlsxFrameFragmentationRateExceeded
snmp-server trap enable wlsxFrameBandWidthRateExceeded
snmp-server trap enable wlsxFrameLowSpeedRateExceeded
snmp-server trap enable wlsxFrameNonUnicastRateExceeded
snmp-server trap enable wlsxChannelRateAnomaly
snmp-server trap enable wlsxNodeRateAnomalyAP
snmp-server trap enable wlsxNodeRateAnomalySta
snmp-server trap enable wlsxEAPRateAnomaly
snmp-server trap enable wlsxSignalAnomaly
snmp-server trap enable wlsxSequenceNumberAnomalyAP
snmp-server trap enable wlsxSequenceNumberAnomalySta
snmp-server trap enable wlsxApFloodAttack
snmp-server trap enable wlsxInvalidMacOUIAP
snmp-server trap enable wlsxInvalidMacOUISta
snmp-server trap enable wlsxStaRepeatWEPIVViolation
snmp-server trap enable wlsxStaWeakWEPIVViolation
snmp-server trap enable wlsxStaAssociatedToUnsecureAP
snmp-server trap enable wlsxStaUnAssociatedFromUnsecureAP
snmp-server trap enable wlsxAPImpersonation
snmp-server trap enable wlsxDisconnectStationAttackAP
snmp-server trap enable wlsxDisconnectStationAttackSta
```

> **NOTE:** You will need to issue the `write mem` command.

The following table describes the different methods through which OV3600 acquires data from Alcatel-Lucent devices on the network.

Table 4: *Methods by which OV3600 Acquires Data from Alcatel-Lucent Devices*

Data Elements	switch/Thin AP						Alcatel-Lucent Instant
	SNMP MIB	SNMP Traps	AMON	CLI/SSH	WMS Offload	RTLS	HTTPS
Configuration interface							
Device configuration/audit				X			X
User and client interfaces							
Assoc/auth/roam	X	X					X
Bandwidth	X						X
Signal quality	X					X	X
Auth failures		X					*N/A*
AP/radio interfaces							
CPU And memory utilization	<--------------------------------N/A-------------------------------------->						X
Bandwidth	X						X
Transmit Power	X						X
Channel utilization			X				X
Noise floor	X						
Frame rates	X						X
Error counters	X						X
Channel summary				X			*N/A*
ARM events		X					*N/A*
Active interferers			X				*N/A*

Data Elements	switch/Thin AP						Alcatel-Lucent Instant
Active BSSIDs/SSIDs	X						X
Security							
IDS events		X					*N/A*
Neighbors/rogues	X				X		X
Neighbor re-classification				X	X		*N/A*
Client classification					X		*N/A*
User deauthorization				X			*N/A*

WMS Offload instructs the master switch to stop correlating ARM, WIPS, and WIDS state information amongst its local switches because OV3600 will assume this responsibility. Figure 27 depicts how OV3600communicates state information with local switches.

Figure 27   *ARM/WIPS/WIDS Classification Message Workflow*
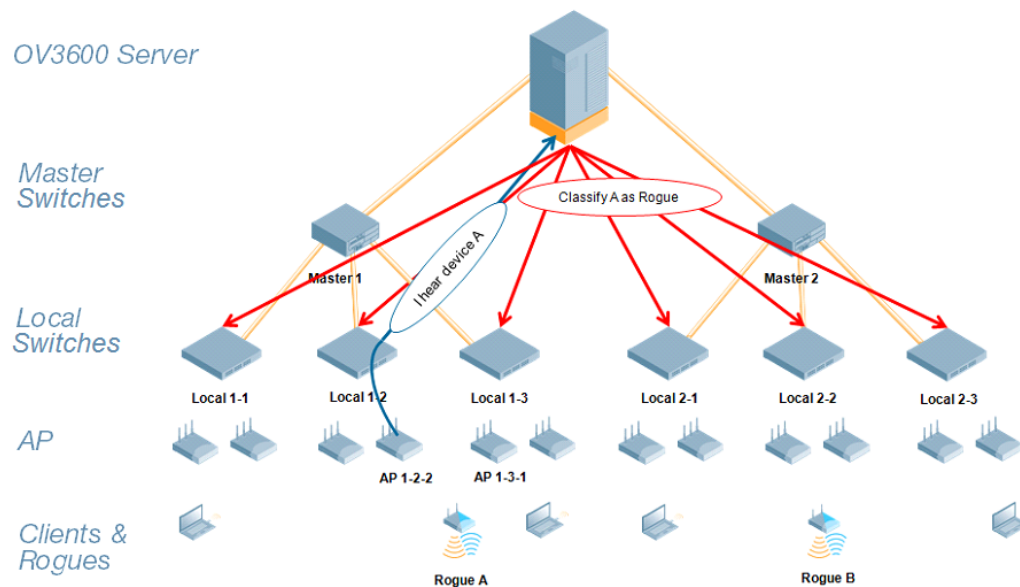
State Correlation Process

1. AP-1-3-1 hears rogue device A.

2. Local switch 1-3 evaluates devices and does initial classification and sends a classification request to OV3600.

3. OV3600 receives message and re-classifies the device if necessary and reflects this within the OV3600 GUI and via SNMP traps, if configured.

4. OV3600 sends a classification message back to all local switches managed by master switch 1, (1-1, 1-2, and 1-3).

5. OV3600 sends a classification message back to all additional local switches managed by theOV3600 server. In this example all local switches under master switch 2, (2-1, 2-2, and 2-3) would receive the classification messages.

6. If an administrative OV3600 user manually overrides the classification, then OV3600 will send a re-classification message to all applicable local switches.

7. OV3600 periodically polls each local switch's MIB to ensure state parity with the OV3600 database. If the local switch's device state does not comply with the OV3600 database, OV3600 will send a re-classification message to bring it back into compliance.

NOTE: The Rogue Detail page includes a BSSID table for each rogue that displays the desired classification and the classification on the device.

Using OV3600 as a Master Device State Manager

OV3600 offers the following benefits as a master device state manager:

- Ability to correlate state among multiple master switches. This will reduce delays in containing a rogue device or authorizing a valid device when devices roam across a large campus.
- Ability to correlate state of third party access points with ARM. This will ensure that Alcatel-Lucent infrastructure inter-operates more efficiently in a mixed infrastructure environment.
- Ability to better classify devices based on OV3600 wire-line information not currently available in AOS-W.
- OV3600 provides a near real-time event notification and classification of new devices entering air space.
- RAPIDS gains additional wire-line discovery data from Alcatel-Lucent switches.

This section describes the impact that band steering can have on location accuracy. It also explains how RTLS can be used to increase location accuracy.

Leveraging RTLS to Increase Accuracy

This section provides instructions for integrating the OV3600 and Alcatel-Lucent WLAN infrastructure with Alcatel-Lucent's RTLS feed to more accurately locate wireless clients and Wi-Fi Tags.

Deployment Topology
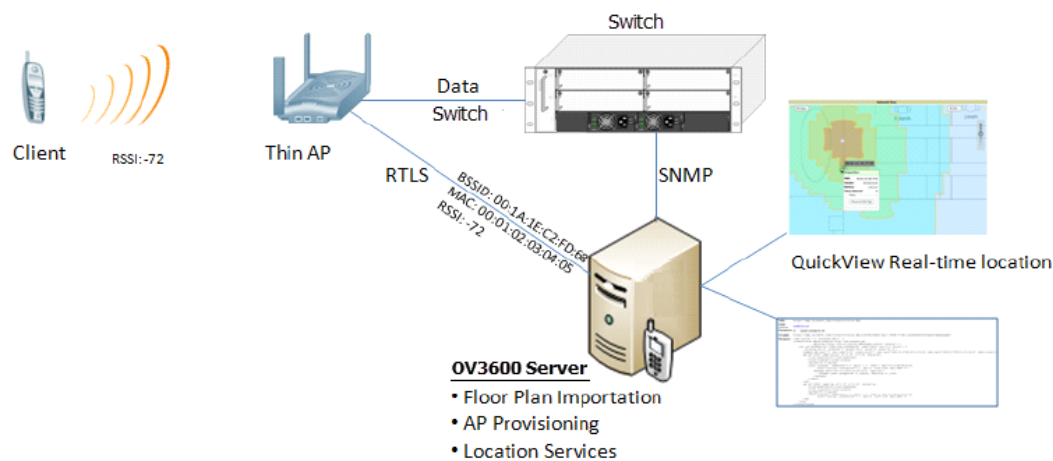
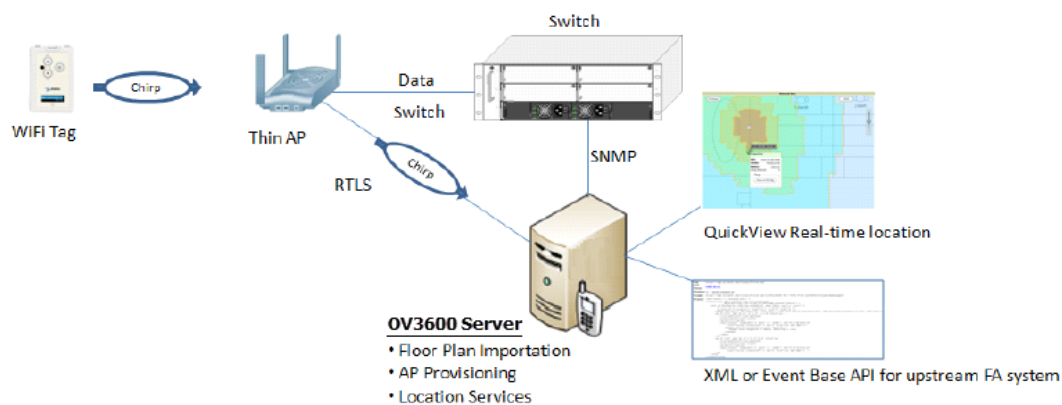**Figure 28** *Typical Client Location*

Figure 29 *Typical Tag Deployment*

Prerequisites

You will need the following information to monitor and manage your Alcatel-Lucent infrastructure.

- Ensure that the OV3600 server is already monitoring Alcatel-Lucent infrastructure.

- Ensure that the WMS Offload process is complete.
- Ensure that the firewall configuration for port 5050 (default port) supports bidirectional UDP communication between the OV3600 server's IP address and each access point's IP address.

Enable RTLS Service on the OV3600 Server

To enable RTLS service on the OV3600 server, follow these steps:

1. Navigate to **OV3600 Setup > General** and locate the **Additional OV3600 Services** section
2. Select **Yes** for the **Enable RTLS Collector** option.
3. A new section will automatically appear with the following settings:
   - **RTLS Port** - the match switch default is 5050
   - **RTLS Username** - This must match the SNMPv3 MMS username configured on the switch.
   - **RTLS Password** - This must match the SNMPv3 MMS password configured on the switch.

Figure 30 *RTLS Fields in **OV3600 Setup> General***

4. Click **Save** at the bottom of the page when you are done.

Enable RTLS on the switch

> **NOTE**
>
> RTLS can only be enabled on the master switch and it will automatically propagate to all local switches.

SSH into master switch, enter **enable** mode, and issue the following commands:

```
(switch-Name) # configure terminal
Enter Configuration commands, one per line. End with CNTL/Z

(switch-Name) (config) # ap system-profile <Thin-AP-Profile-Name>

(switch-Name) (AP system profile default) # rtls-server ip-addr <IP of OV3600 Server> port 5050
key <switch-SNMPv3-MMS-Password>

(switch-Name) (AP system profile default) # write mem
```

To validate exit configuration mode:

```
(switch-Name) # show ap monitor debug status ip-addr <AP-IP-Address>
...
RTLS configuration
-------------------
Type        Server IP   Port Frequency Active
----        ---------   ---- --------- ------
MMS         10.51.2.45  5070 120
Aeroscout   N/A         N/A  N/A
RTLS        10.51.2.45  5050 60           *
```

Troubleshooting RTLS

You can use either the WebUI or CLI to ensure the RTLS service is running on your OV3600 server.

Using the WebUI

In the OV3600 WebUI, navigate to the **System > Status** page.

Scroll down through the Services list to locate the RTLS service, as shown below.

Figure 31 *RTLS System Status*

Using the CLI

Use SSH to access the command-line interface of your OV3600 server, and issue the following commands:

```
[root@OV3600Server]# daemons | grep RTLS
   root     17859 12809 0 10:35 ?         00:00:00 Daemon::RTLS
```

Issue the **logs** and **tail rtls** commands to check the RTLS log file and verify that Tag chirps are making it to the OV3600 server.

```
[root@OV3600Server]# logs

[root@OV3600Server]# tail rtls

  payload: 00147aaf01000020001a1ec02b3200000001000000137aae0100000c001a1ec02b320000001a1e82b322
  590006ddff02
  1224534900.588245 - got 96 bytes from 10.51.1.39 on port 5050
  Mon Oct 20 13:35:00 2008: 1224534900.588338 - got 96 bytes from 10.51.1.39 on port 5050
```

```
    payload: 0014c9c90100003c001a1ec050780000000200000013c9c70100000c001a1ec050780000000d54a7a280
    540001ddff020013c9c80100000c001a1ec050780000000cdb8ae9a9000006c4ff02
    1224534900.588245 - got 96 bytes from 10.51.1.39 on port 5050
    Mon Oct 20 13:35:00 2008: 1224534900.588338 - got 96 bytes from 10.51.1.39 on port 5050
    payload: 0014c9c90100003c001a1ec050780000000200000013c9c70100000c001a1ec050780000000d54a7a280
    540001ddff020013c9c80100000c001a1ec050780000000cdb8ae9a9000006c4ff02
```

Ensure chirps are published to Airbus by snooping on RTLS tag reports.

```
[root@OV3600Server]# airbus_snoop rtls_tag_report

Snooping on rtls_tag_report:
Mon Oct 20 13:49:03 2008 (1224535743.54077)
%
    ap_mac => 00:1A:1E:C0:50:78
    battery => 0
    bssid => 00:1A:1E:85:07:80
    channel => 1
    data_rate => 2
    noise_floor => 85
    payload =>
    rssi => -64
    tag_mac => 00:14:7E:00:4C:E4
    timestamp => 303139810
    tx_power => 19
```

Verify external applications can see WiFi Tag information by exercising the Tag XML API:

```
        https://<OV3600-Server-IP>/visualrf/rfid.xml
```

You should see the following XML output:

```
  <visualrf:rfids version=1>
   <rfid battery-level=0 chirp-interval= radio-mac=00:14:7E:00:4C:E0
      vendor=>
      <radio phy=g xmit-dbm=10.0/>
      <discovering-radio ap=SC-MB-03-AP10 dBm=-91 id=811 index=1
        timestamp=2008-10-21T12:23:30-04:00/>
      <discovering-radio ap=SC-MB-03-AP06 dBm=-81 id=769 index=1
        timestamp=2008-10-21T12:23:31-04:00/>
      <discovering-radio ap=SC-MB-01-AP06 dBm=-63 id=708 index=1
        timestamp=2008-10-21T12:23:31-04:00/>
      <discovering-radio ap=SC-MB-02-AP04 dBm=-88 id=806 index=1
      timestamp=2008-10-21T12:22:34-04:00/>
   </rfid>
   <rfid battery-level=0 chirp-interval= radio-mac=00:14:7E:00:4B:5C
      vendor=>
      <radio phy=g xmit-dbm=10.0/>
      <discovering-radio ap=SC-MB-03-AP06 dBm=-74 id=769 index=1
        timestamp=2008-10-21T12:23:20-04:00/>
      <discovering-radio ap=SC-MB-01-AP06 dBm=-58 id=708 index=1
        timestamp=2008-10-21T12:23:20-04:00/>
      <discovering-radio ap=SC-MB-03-AP02 dBm=-91 id=734 index=1
        timestamp=2008-10-21T12:23:20-04:00/>
   </rfid>
   <rfid battery-level=0 chirp-interval= radio-mac=00:14:7E:00:4D:06
      vendor=>
      <radio phy=g xmit-dbm=10.0/>
      <discovering-radio ap=SC-SB-GR-AP04 dBm=-91 id=837 index=1
        timestamp=2008-10-21T12:21:08-04:00/>
      <discovering-radio ap=SC-MB-03-AP06 dBm=-79 id=769 index=1
```

```
      timestamp=2008-10-21T12:22:08-04:00/>
   <discovering-radio ap=SC-MB-01-AP06 dBm=-59 id=708 index=1
      timestamp=2008-10-21T12:23:08-04:00/>
   <discovering-radio ap=SC-MB-02-AP04 dBm=-90 id=806 index=1
      timestamp=2008-10-21T12:22:08-04:00/>
 </rfid>
</visualrf:rfids>
```

Wi-Fi Tag Setup Guidelines

● Ensure that the tags can be heard by at least three (3) access points from any given location. The recommended value is is 4 APs.

● Ensure that the tags chirp on all regulatory channels.