AirWave 8.2.11.1

aruba

a Hewlett Packard Enterprise company

Getting Started Guide

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Chapter 1 Initial Setup

Initial setup consists of creating folders and groups, discovering and adding devices, and defining credentials for devices that communicate with AirWave. Refer to the following sections for help with the tasks:

- "How Do I Add Devices?" on page 6
- "Discovering New Devices" on page 8
- "How are Folders and Groups Organized?" on page 13
- "How Do I Define New Users and Roles?" on page 14
- "How Do I Define Credentials for Devices that Communicate with AirWave?" on page 15
- "I Have a Mismatch. What Do I Do?" on page 17

How Do I Add Devices?

In many cases, you will add devices after the devices have been discovered. Refer to "Discovering New Devices" on page 8 for more information. In other cases, your deployment may require that you manually add devices to AirWave. You can add devices manually by uploading a CSV file or from the **Device Setup > Add** page.

NOTE

Aruba Instant devices are automatically discovered. Refer to the *Aruba Instant in AirWave 8.2.11.1 Deployment Guide* for more information on Instant devices in AirWave.

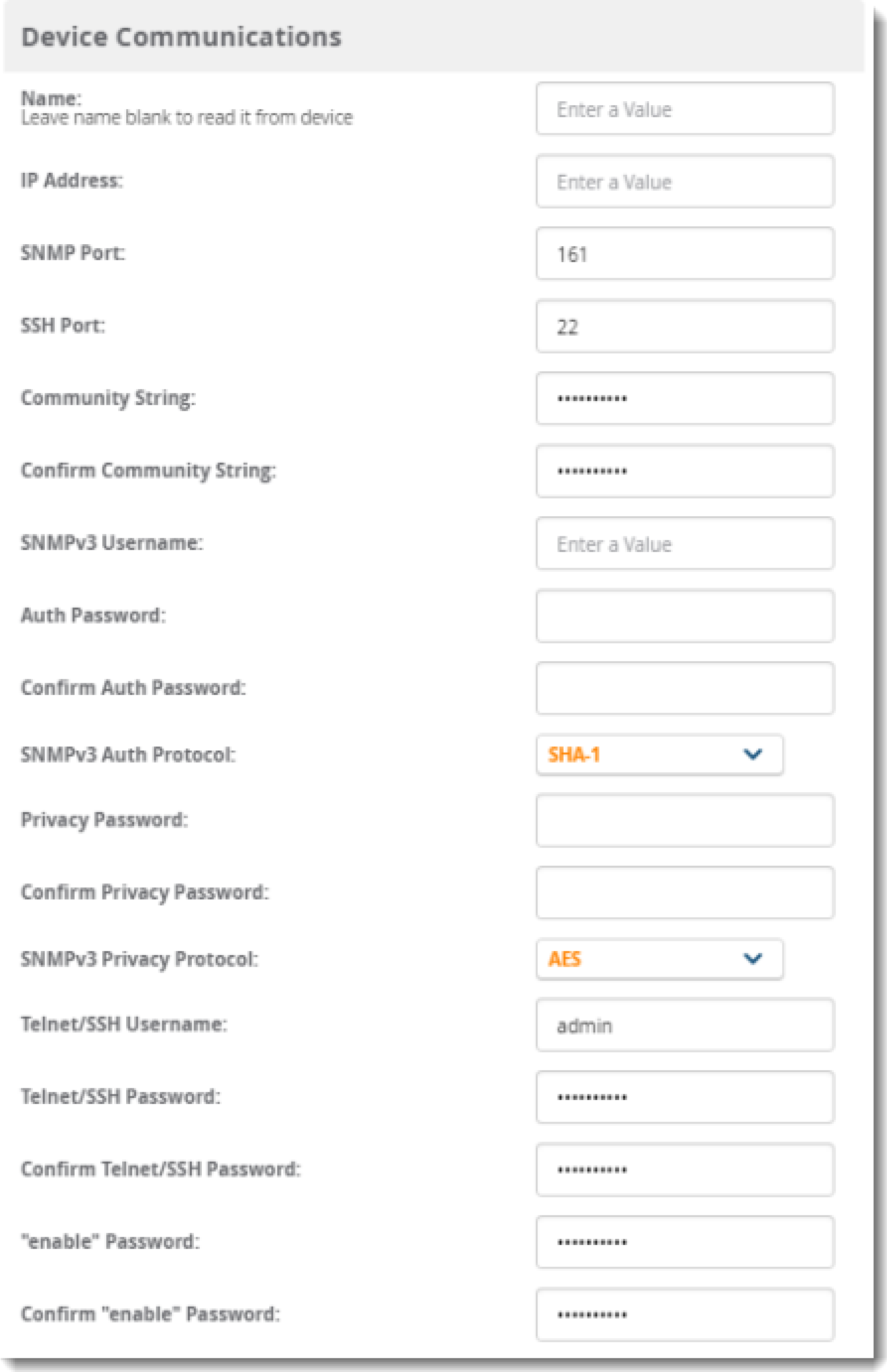
Adding Devices with the Device Setup > Add Page

Manually adding devices from the **Device Setup > Add** page to AirWave is an option for adding all device types. You only need to select device vendor information from the drop-down list, and AirWave automatically finds and adds specific make and model information into its database.

To manually add devices to AirWave:

1. Navigate to **Device Setup > Add**, then select the vendor and model of the device from the drop-down menu.
2. Click **Add**. The Device Setup > Add page displays Device Communications and Location configuration options.
3. Enter the **Device Communications** settings for the new device.

Figure 1: *Device Communications Settings*



Device Communications

Name: Leave name blank to read it from device	Enter a Value
IP Address:	Enter a Value
SNMP Port:	161
SSH Port:	22
Community String:	•••••••••••
Confirm Community String:	•••••••••••
SNMPv3 Username:	Enter a Value
Auth Password:	
Confirm Auth Password:	
SNMPv3 Auth Protocol:	SHA-1
Privacy Password:	
Confirm Privacy Password:	
SNMPv3 Privacy Protocol:	AES
Telnet/SSH Username:	admin
Telnet/SSH Password:	•••••••••••
Confirm Telnet/SSH Password:	•••••••••••
"enable" Password:	•••••••••••
Confirm "enable" Password:	•••••••••••

4. In the Location section, select the group and folder for the device from the drop-down menus.
5. At the bottom of the page, select **Monitor Only + Firmware Upgrades** or **Manage read/write**, depending on whether you want to overwrite the **Group** settings for the device being added.

NOTE

If you select **Manage read/write**, AirWave overwrites existing device settings with the **Groups** settings. Place newly discovered devices in **Monitor read/only** mode to enable auditing of actual settings instead of Group Policy settings.

6. Click **Add** at the bottom of the page.

Discovering New Devices

In addition to manually adding devices, devices connected to your network can automatically be discovered and added. AirWave performs device discovery using the following methods. These methods are described in greater detail in the *AirWave 8.2.11.1 User Guide*.

- **SNMP/HTTP Discovery Scanning** – This is the primary method for discovering devices. Refer to "Configuring and Running a Scan Set" on page 8 for information about how to utilize this feature.
- **Cisco Discovery Protocol (CDP)** – CDP uses the polling interval configured for each individual Cisco switch or router on the **Groups > List** page. For device discovery, AirWave requires read-only access to a router or switch for all subnets that contain wired or wireless devices in order to discover a Cisco device's CDP neighbors. The CDP Neighbor Data Polling Period is specified on the **Groups > Basic** page for a specific group.

NOTE

Aruba Instant devices are automatically discovered. Refer to the *Aruba Instant in AirWave 8.2.11.1 Deployment Guide* for more information on Aruba Instant devices in AirWave.

Configuring and Running a Scan Set

Configuring a scan set consists of defining the network segments that will be scanned along with the credentials used for governing the scanning of a given network. Perform the following tasks to configure a scan set.

1. Add networks for SNMP/HTTP scanning.
   a. Navigate to the **Device Setup > Discover** page and locate the Networks section.
   b. Click **Add**. A New Networks form opens.
   c. Enter a name for the network, the IP network range or first IP address on the network to be scanned, and the subnet mask for the network to be scanned. Note that the largest subnet that AirWave supports is 255.255.0.0.
   d. Click **Add** . Repeat steps 1a - 1d to add all the networks on which to enable device scanning.
2. Add credentials for scanning.
   a. Navigate to the **Device Setup > Discover** page and scroll down to the Credentials section.
   b. Click **Add**. The New Scan Credentials form opens.
   c. Enter a name for the credential in the field (for example, Default). This field supports alphanumeric characters (both upper and lower case), blank spaces, hyphens, and underscore characters.
   d. Select the type of scan to be completed.
      - SNMPv1 and SNMPv2 differ between their supported traps, supported MIBs, and network query elements used in device scanning.
      - HTTP is not as robust as SNMP in processing network events, but HTTP might be sufficient, simpler, or preferable in certain scenarios.
   e. If you selected SNMP, then define the community string to be used during scanning. If you selected HTTP, then enter a user name and password for the scan credentials.
   f. Click **Add**. Repeat steps 2a - 2f to add credentials on which to enable device scanning.
3. Define a scan set.
   a. Navigate to the **Device Setup > Discover** page and select the **Add New Scan Set** button.
   b. Select the Network(s) to be scanned and the Credential(s) to use. AirWave defines a unique scan for each Network/Credential combination.
   c. In the Automatic Authorization section, select whether to override the global setting in **AMP Setup > General** and have New Devices be automatically authorized into the New Device List, the same Group/Folder as the discovering devices, the same Group/Folder as the closest IP neighbor, or a specified auto-authorization group and folder. Be sure to note this location.

d. Select **Add** when you are finished, and repeat these steps for each scan set that you want to create.

NOTE

Discovered devices use the default credentials configured on the **Device Setup > Communication** page for each vendor-specific device. Refer to "How Do I Define Credentials for Devices that Communicate with AirWave?" on page 15 for more information.

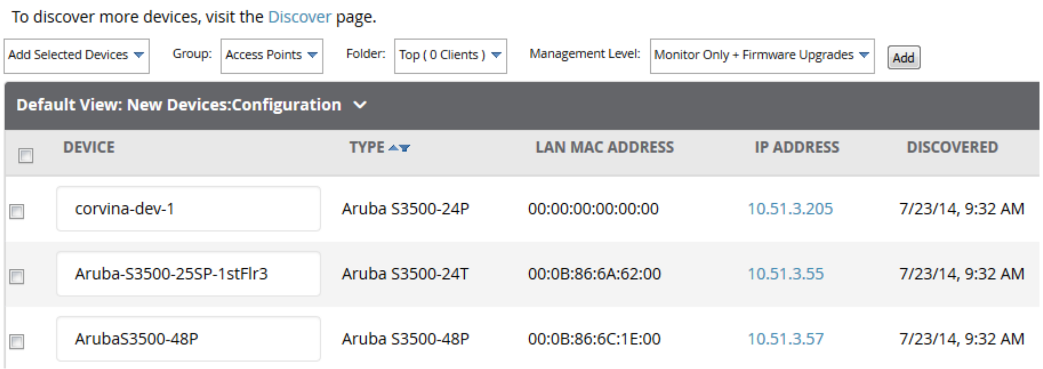
4. Running a scan set.
   a. Navigate to the **Device Setup > Discover** page and select the check boxes for each scan to run.
   b. Click **Scan**.
   c. View the **Start** and **Stop** columns to see the status of the scan. Refresh the browser until both the Start and Stop columns display date and time information. Newly discovered devices will be displayed on the **Devices > New** page. These devices can now be added to your network.

Add Newly Discovered Devices to a Group

1. Select the **New Devices** link in the header. This opens the location where all newly-discovered devices are displayed. This location is normally **Devices > New**, though you might have specified a different location while defining a scan set.

   The information on the page includes the related controller (when known/applicable), the device type (including vendor and model), the LAN MAC Address, the IP address, and the date/time of discovery. See Figure 2.

Figure 2: ***Devices > New*** *page*



To discover more devices, visit the Discover page.

Add Selected Devices ▾ Group: Access Points ▾ Folder: Top (0 Clients) ▾ Management Level: Monitor Only + Firmware Upgrades ▾ Add

Default View: New Devices:Configuration ▾

□	DEVICE	TYPE ▴▾	LAN MAC ADDRESS	IP ADDRESS	DISCOVERED
□	corvina-dev-1	Aruba S3500-24P	00:00:00:00:00:00	10.51.3.205	7/23/14, 9:32 AM
□	Aruba-S3500-25SP-1stFlr3	Aruba S3500-24T	00:0B:86:6A:62:00	10.51.3.55	7/23/14, 9:32 AM
□	ArubaS3500-48P	Aruba S3500-48P	00:0B:86:6C:1E:00	10.51.3.57	7/23/14, 9:32 AM

2. Select the check box beside the device(s) you want to add.
3. Use the drop-down lists to select the **Group**, **Folder**, and **Aruba AP Group** to which the devices will be added. The default group appears at the top of the Group list.

NOTE

Devices cannot be added to a Global Group because groups designated as "Global Groups" cannot contain access points.

4. Select either **Monitor Only** or **Manage Read/Write** as the mode in which the new device(s) will operate.
   - In Monitor Only + Firmware Upgrades mode, AirWave updates the firmware, compares the current configuration with the policy, and displays any discrepancies on the **Devices > Audit** page. AirWave does not change the configuration of the device.
   - In Manage Read/Write mode, AirWave compares the device's current configuration settings with the Group configuration settings and automatically updates the new device's configuration to match the Group policy.

CAUTION

Put devices in **Monitory Only + Firmware Upgrades** mode when they are added to a newly established device group.

This avoids overwriting any important existing configuration settings.

5. Click **Add**. You can go to the **Devices > List** page and select the folder that contains the newly added devices. This enables you to verify that the devices have been properly assigned.

Auditing Device Configuration

When you have added a newly discovered device successfully to a Group in **Monitor** mode, the next step is to verify device configuration status. Determine whether any changes will be applied to that device when you convert it to **Managed Read/Write** mode.

AirWave uses SNMP or Telnet/SSH to read a device's configuration. SNMP is used for Cisco controllers. AirWave uses Telnet or SSH to read device configurations from Aruba devices, and wired routers and switches.

Perform these steps to verify the device configuration status:

1. Browse to the **Devices > List** page.
2. Locate the device in the list and check the information in the **Configuration** column.
3. If the device is in **Monitor** mode, the **lock** symbol appears in the **Configuration** column, indicating that the device is locked and will not be configured by AirWave.
4. Verify the additional information in the **Configuration** column for that device.
   - A status of **Good** indicates that all of the device's current settings match the group policy settings and that no changes will be applied when the device is shifted to **Manage** mode.
   - A status of **Mismatched** indicates that at least one of the device's current configuration settings does not match the group policy and will be changed when the device is shifted to **Manage** mode.
5. If the device configuration is **Mismatched**, select the **Mismatched** link to go to the **Devices > Audit** page. This page lists detailed information for all existing configuration parameters and settings for an individual device.

   The group configuration settings are displayed on the right side of the page. If the device is moved from **Monitor** to **Manage** mode, the settings on the right side of the page overwrite the settings on the left.
6. Review the list of changes to be applied to the device to determine whether the changes are appropriate. If not, you need to change the Group settings or reassign the device to another Group.

Adding Multiple Devices from a File

You can add devices in bulk from a file to AirWave. Here you also have the option of specifying vendor name only, and AirWave will automatically determine the correct type while bringing up the device. If the .csv file includes make and model information, AirWave will add the information provided in the file. It will not override what you have specified in this file in any way.

The CSV list must contain the following columns:

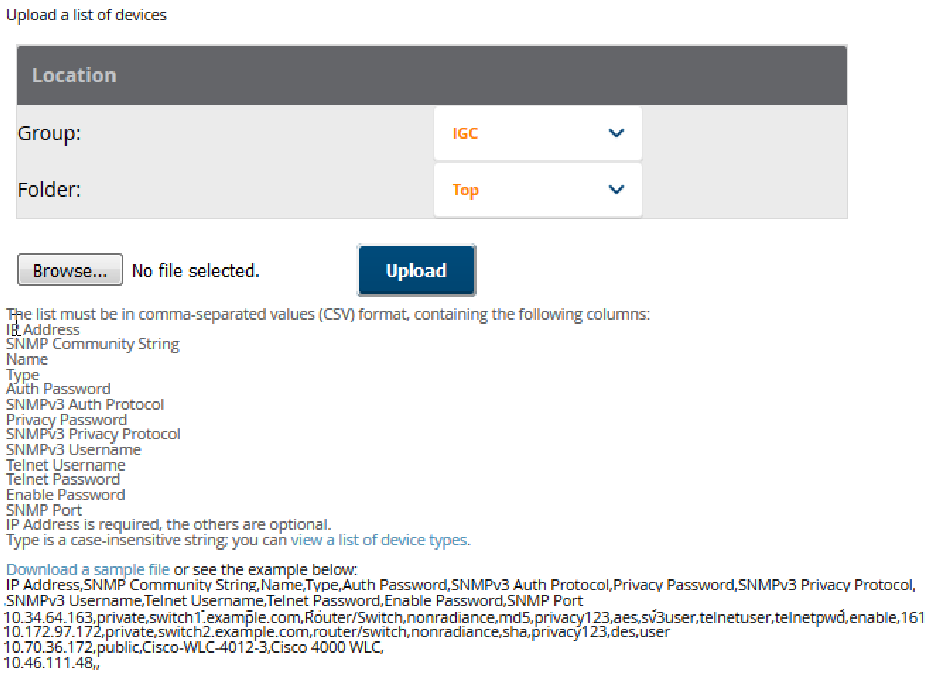
- IP Address
- SNMP community string
- Name
- Type
- Authentication password
- SNMPv3 auth protocol
- Privacy password
- SNMPv3 privacy protocol
- SNMPv3 user name
- Telnet user name

- Telnet password
- Enable password
- SNMP port

You can download and customize a file.

1. To import a CSV file, go to the **Device Setup > Add** page.
2. Click the **Import Devices via CSV** link. The **Upload a list of devices** page displays. See Figure 3.

Figure 3: *Device Setup > Add > Import Devices via CSV Page Illustration*



Upload a list of devices

Group: IGC

Folder: Top

No file selected.

The list must be in comma-separated values (CSV) format, containing the following columns:
IP Address
SNMP Community String
Name
Type
Auth Password
SNMPv3 Auth Protocol
Privacy Password
SNMPv3 Privacy Protocol
SNMPv3 Username
Telnet Username
Telnet Password
Enable Password
SNMP Port
IP Address is required, the others are optional.
Type is a case-insensitive string; you can view a list of device types.

Download a sample file or see the example below:

```
IP Address,SNMP Community String,Name,Type,Auth Password,SNMPv3 Auth Protocol,Privacy Password,SNMPv3 Privacy Protocol,
SNMPv3 Username,Telnet Username,Telnet Password,Enable Password,SNMP Port
10.34.64.163,private,switch1.example.com,Router/Switch,nonradiance,md5,privacy123,aes,sv3user,telnetuser,telnetpwd,enable,161
10.172.97.172,private,switch2.example.com,router/switch,nonradiance,sha,privacy123,des,user
10.70.36.172,public,Cisco-WLC-4012-3,Cisco 4000 WLC,
10.46.111.48,,
```

3. Select a group and folder into which to import the list of devices.
4. Click **Choose File** and select the CSV list file on your computer.
5. Click **Upload** to add the list of devices to AirWave.

Adding Universal Devices

AirWave gets basic monitoring information from every device including switches, routers and APs whether or not the devices are supported. Entering SNMP credentials is optional. If no SNMP credentials are entered, AirWave will provide ICMP monitoring of universal devices. This allows you to monitor key elements of the wired network infrastructure, including upstream switches, RADIUS servers and other devices. While AirWave can manage most leading brands and models of wireless infrastructure, universal device support also enables basic monitoring of many of the less commonly used devices.

Perform the same steps to add universal devices to AirWave. See "Adding Devices with the Device Setup > Add Page" on page 6.

AirWave collects basic information about universal devices including name, contact, uptime and location. After you add a universal device, you can view a list of its interfaces on **Devices > Manage**.

Select the **pencil** icon next to an interface, to select to be non-monitored or monitored as an interface. AirWave collects this information and displays it on the **Devices > Monitor** page in the **Interface** section. AirWave supports MIB-II interfaces and polls in/out byte counts for up to two interfaces. AirWave also monitors sysUptime.

Adding an Aruba Controller

Aruba controllers and switches can be discovered during a scan or can be added manually. The steps are similar to those described in "Adding Devices with the Device Setup > Add Page" on page 6; however, additional steps are described to ensure that the controller or switch is configured properly for monitoring.

1. Select the Aruba Device type and select **Add**.
2. Enter the **Name** and the **IP Address** for the device.
3. Enter the **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.

4. Enter the required fields for configuration and basic monitoring:
   - Telnet/SSH user name
   - Telnet/SSH password
   - Enable password
5. Assign the device to the correct Group and to a Folder. AirWave 7.7 and later does not allow you to add new switches to groups that contain controllers.
6. Ensure that the **Monitor Only** option is selected.
7. Select **Add**. The Confirmation page displays.
8. Select **Apply Changes Now**.
9. Navigate to the **Devices > New** page.
10. Select the Aruba device you just added from the list of new devices.
11. Ensure **Monitor Only** option is selected.
12. Select **Add**.

Adding as a Management Server

Use the following commands in ArubaOS 6.3.1 and later releases. To get the commands for earlier versions of ArubaOS, refer to the ArubaOS *Command-Line Interface Reference Guide* for that version.

CAUTION

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

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

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

(Controller-Name) (config) # mgmt-server type amp primary-server <AMP-IP>
(Controller-Name) (config) # mgmt-server profile <profile-name>

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

NOTE

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

In order to send UCC, Clarity, Traffic Analysis, and APs/Device data to AirWave, you must enable the following flags in the management server profile (AMP-profile) on the controller:

- uccmonitoring-enable

- inline-ap-stats
- inline-auth-stats
- inline-dhcp-stats
- inline-dns-stats
- location-enable
- misc-enable
- monitored-info-enable
- sessions-enable
- stats-enable
- tag-enable

Adding as a Trap Host

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

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

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

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

NOTE

AirWave supports SNMP v2 traps. For SNMPv3, Airwave support SNMPv3 informs only; SNMPv3 traps are not supported.

How are Folders and Groups Organized?

Folders and Groups are useful ways of organizing your devices. Folders are used for monitoring; groups are used for configuration. Group configuration applies to controllers and switches. Configuration for APs is done through the **Devices > Manage** or **Devices > List** pages.

Groups should be comprised of similar devices that will utilize a consistent configuration. Controllers and switches though, must reside in separate groups.

Folders are used to filter devices by location. For example, you are monitoring a campus with several dormitories that use Aruba controllers and thin AP devices. The controllers might be part of one collection, and the thin APs might be part of another. Both of those collections can reside in a folders named Dorm1, Dorm2, and so on. In addition, folders can be nested, so that both Dorm1 and Dorm2 can reside under a top folder named Campus.

Groups

Enterprise APs, controllers, routers, and switches have hundreds of variable settings that must be configured precisely to achieve optimal performance and network security. Configuring all settings on each device individually is time consuming and error prone. AirWave addresses this challenge by automating the processes of device configuration and compliance auditing. At the core of this approach is the concept of Device Groups, with the following functions and benefits:

- AirWave allows certain settings to be managed at the Group level, while others are managed at an individual device level.
- AirWave defines a Group as a subset of the devices on the wireless LAN, ranging in size from one device to hundreds of devices that share certain common configuration settings.

- Groups can be defined based on geography (such as 5th Floor APs), usage or security policies (such as Guest Access APs), function (such as Manufacturing APs), or any other appropriate variable.
- Devices within a group can originate from the same vendor or hardware model and might share certain basic configuration settings.
- Controllers and switches cannot reside in the same group.

Typical group configuration variables include:

- Basic settings - SSID, SNMP polling interval, and so forth
- Security settings - VLANs, WEP, 802.1X, ACLs, and so forth
- Radio settings - data rates, fragmentation threshold, RTS threshold, DTIM, preamble, and so forth.

When configuration changes are applied at a group level, they are assigned automatically to every device within that group. These changes must be applied to every device while in **Managed** mode.

NOTE

When you first configure AirWave, only a group named Access Points is available. You can add groups by navigating to the **Groups > List** page and selecting the **Add New Group** button. You can also select the **Duplicate** button for a current group (normally the very last column in the **Groups > List** page). Selecting this button creates a copy of the specified group and opens immediately to the **Groups > Basic** page. Refer to the *AirWave 8.2.11.1 User Guide* for more information.

Controller Groups and Switch Groups

AirWave can configure Aruba controllers and switches globally or from the Groups page, based on the Use Global Aruba Configuration setting in **AMP Setup > General**.

The **Groups > Switch Config** page provides configuration support for Mobility Access Switches (MAS). With switches and controllers now residing under separate groups, users will no longer encounter mismatches on their switches because of controller configurations.

If Group-based configuration is enabled in AirWave, then the **Switch Config** and **Controller Config** pages will display by default when a new group is created to support switch and controller configurations.

Folders

The devices on the **Devices > List** page are arranged in collections called folders. Folders provide a logical organization of devices unrelated to the configuration groups of the devices. Using folders, you can quickly view basic statistics about devices. You must use folders if you want to limit the APs and devices that AirWave users can see.

NOTE

The amount and type of information that a user can see is based on user role.

Folder views are persistent in AirWave. For example, if you created a folder named "Store1", you can select that folder and then select the **Down** link in the header section of the page (top), to view only the down devices in the Store1 folder.

If you want to see every down device, select the **Expand folders to show all Devices** link. When the folders are expanded, you see all of the devices on AirWave that satisfy the criteria of the page. You also see a column that lists the folder containing the APs.

How Do I Define New Users and Roles?

AirWave installs with only one AirWave user: admin. Admin users are authorized to perform the following functions:

- Define additional users with varying levels of privilege, including managing read/write or monitoring.

- Limit the viewable devices as well as the level of access a user has to the devices.

Each general user that you add must have a user name, a password, and a role.

NOTE

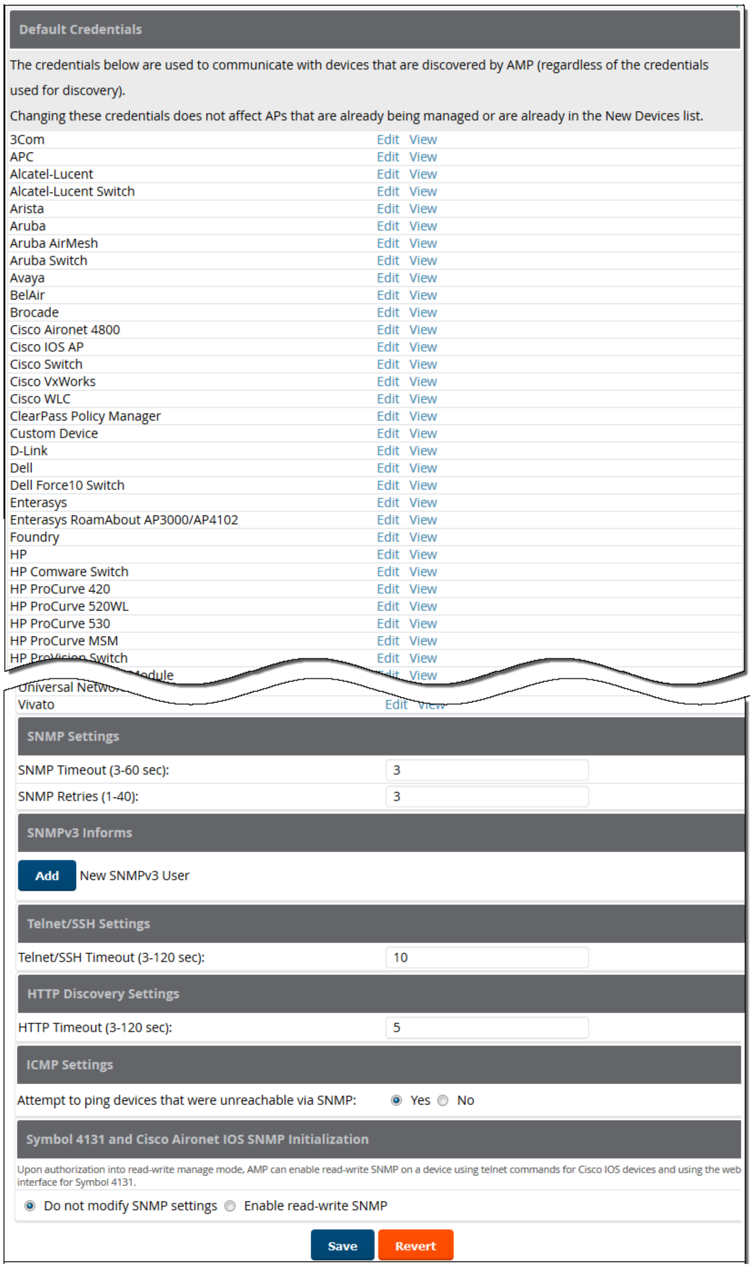
User name and password are not required if you configure AirWave to use RADIUS, TACACS, or LDAP authentication. In addition, you do not need to add individual users to the AirWave server if you use RADIUS, TACACS, or LDAP authentication. Refer to the following sections in the *AirWave 8.2.11.1 User Guide*: Configuring RADIUS Authentication and Authorization, Configuring TACACS+ Authentication, and Configuring LDAP Authentication and Authorization.

User roles determine the level of access that a user has to folders. For example, you can create non-administrative users, such as help desk or IT staff, who support a subset of accounts or sites within a single AirWave deployment. These non-admin users can be set up to monitor data and users for devices within their assigned folders. Roles also determine a user's access to VisualRF and RAPIDS.

How Do I Define Credentials for Devices that Communicate with AirWave?

On the **Device Setup > Communication** page, you can configure AirWave to communicate with your vendor-specific devices, and you can set SNMP polling information. The configuration defines the default credentials for future devices; it does not impact existing devices. See Figure 4.

Figure 4: *Device Setup > Communication Page (Partial View)*



Default Credentials

The credentials below are used to communicate with devices that are discovered by AMP (regardless of the credentials used for discovery).

Changing these credentials does not affect APs that are already being managed or are already in the New Devices list.

3Com	Edit View
APC	Edit View
Alcatel-Lucent	Edit View
Alcatel-Lucent Switch	Edit View
Arista	Edit View
Aruba	Edit View
Aruba AirMesh	Edit View
Aruba Switch	Edit View
Avaya	Edit View
BelAir	Edit View
Brocade	Edit View
Cisco Aironet 4800	Edit View
Cisco IOS AP	Edit View
Cisco Switch	Edit View
Cisco VxWorks	Edit View
Cisco WLC	Edit View
ClearPass Policy Manager	Edit View
Custom Device	Edit View
D-Link	Edit View
Dell	Edit View
Dell Force10 Switch	Edit View
Enterasys	Edit View
Enterasys RoamAbout AP3000/AP4102	Edit View
Foundry	Edit View
HP	Edit View
HP Comware Switch	Edit View
HP ProCurve 420	Edit View
HP ProCurve 520WL	Edit View
HP ProCurve 530	Edit View
HP ProCurve MSM	Edit View
HP ProVision Switch	Edit View
Module	View
Universal Netwo	
Vivato	Edit View

SNMP Settings

SNMP Timeout (3-60 sec): 3

SNMP Retries (1-40): 3

SNMPv3 Informs

Add New SNMPv3 User

Telnet/SSH Settings

Telnet/SSH Timeout (3-120 sec): 10

HTTP Discovery Settings

HTTP Timeout (3-120 sec): 5

ICMP Settings

Attempt to ping devices that were unreachable via SNMP: ● Yes ○ No

Symbol 4131 and Cisco Aironet IOS SNMP Initialization

Upon authorization into read-write manage mode, AMP can enable read-write SNMP on a device using telnet commands for Cisco IOS devices and using the web interface for Symbol 4131.

● Do not modify SNMP settings ○ Enable read-write SNMP

Perform the following steps to define the default credentials and SNMP settings for your wireless network.

1. Configure default credentials.
   a. Navigate to the **Device Setup > Communication** page and enter the credentials for each device model on your network. These credentials represent the default credentials that are assigned to all newly discovered APs.

NOTE

Community strings and shared secrets must have read-write access in order for AirWave to configure the devices. Without read-write access, AirWave can monitor the devices only; it cannot apply any configuration changes.

2. Specify SNMP Settings.
   a. Specify an **SNMP Timeout** value. This is the number of seconds that AirWave will wait for a response from a device after sending an SNMP request, so a smaller number is more ideal.

b. Enter a value for **SNMP Retries**. This value represents the number of times AirWave attempts 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. As a best practice, we recommend a value of 10.

3. Configure SNMPv3 Informs.

   a. Locate the SNMPv3 Informs section and select the **Add** button to configure all SNMPv3 users that are configured on the controller. The SNMP Inform receiver in AirWave will restart when users are changed or added to the controller.

4. Specify Telnet/SSH, HTTP Discovery, and ICMP settings.

   a. Specify the Telnet/SSH Timeout value. This value represents the number of seconds when performing Telnet and SSH commands.

   b. Specify the HTTP Timeout value. This value represents the number of seconds used when running an HTTP discovery scan.

   c. In the ICMP Settings section, specify whether to ping devices that were unreachable via SNMP.

NOTE

This value should be set to "**No**" if ICMP is disabled on your network.

5. Specify read/write settings for Symbol 4131 and Cisco Aironet SNMP Initialization.

   - If you select **Do Not Modify SNMP Settings**, then AirWave will not modify any SNMP settings. If SNMP is not already initialized on the Symbol, Nomadix, and Cisco IOS APs, AirWave is not able to manage them.
   - If you select **Enable read-write SNMP**, then AirWave can manage networks with Symbol, Nomadix, Cisco IOS AP that do not have SNMP initialized.

I Have a Mismatch. What Do I Do?

AirWave has a configuration policy and a mismatch is a device that does not match the configuration that AirWave wants. Mismatches can occur for a variety of reasons. For example, you might have some policies that are defined on a Local Controller that override policies on the Master Controller. In this case, AirWave recognizes policies defined on a global level (on the Master Controller).

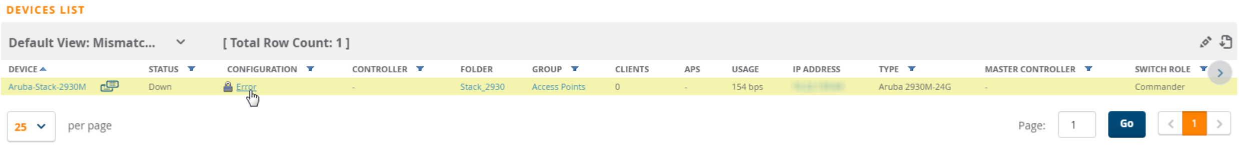
Auditing to Resolve Mismatches

Updating your configuration and then performing an audit on a device can resolve most mismatches.

Follow these steps to audit the device configuration:

1. Make a configuration change on the device.
2. Navigatie to **Devices > List** page, then select the device that shows a configuration mismatch. You will go to the view of mismatched devices.
3. Locate the device in the Device List table, then click the configuration link.

Figure 5: *Accessing the Device Configuration Page*



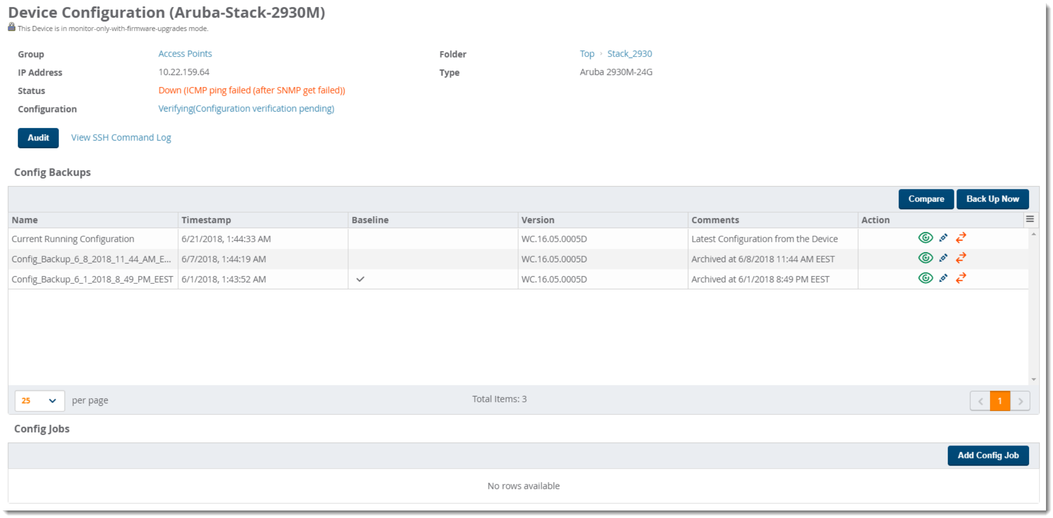
DEVICES LIST

Default View: Mismatc... [Total Row Count: 1]

DEVICE	STATUS	CONFIGURATION	CONTROLLER	FOLDER	GROUP	CLIENTS	APS	USAGE	IP ADDRESS	TYPE	MASTER CONTROLLER	SWITCH ROLE
Aruba-Stack-2930M	Down	Error	-	Stack_2930	Access Points	0	-	154 bps	[redacted]	Aruba 2930M-24G	-	Commander

4. From the Device Configuration page, click **Audit** to view the current and desired configuration settings. While running the audit, AirWave will display "pending" for configuration status.

Figure 6: *Pending Audit*



Device Configuration (Aruba-Stack-2930M)

This Device is in monitor-only-with-firmware-upgrades mode.

Group	Access Points	Folder	Top › Stack_2930
IP Address	10.22.159.64	Type	Aruba 2930M-24G
Status	Down (ICMP ping failed (after SNMP get failed))		
Configuration	Verifying(Configuration verification pending)		

Config Backups

Name	Timestamp	Baseline	Version	Comments	Action
Current Running Configuration	6/21/2018, 1:44:33 AM		WC.16.05.0005D	Latest Configuration from the Device	
Config_Backup_6_8_2018_11_44_AM_E...	6/7/2018, 1:44:19 AM		WC.16.05.0005D	Archived at 6/8/2018 11:44 AM EEST	
Config_Backup_6_1_2018_8_49_PM_EEST	6/1/2018, 1:43:52 AM	✓	WC.16.05.0005D	Archived at 6/1/2018 8:49 PM EEST	

Config Jobs

No rows available

5. Review the audit:
   a. If you determine that certain configuration options require change, make those changes within AirWave so that they match the desired configuration setting, and then click **Save and Apply** before Auditing again.
   b. If you determine that some mismatch configurations can be ignored, click **Customize** to select the items that can be ignored during the upcoming audit.
6. Click **Audit**. The configuration state changes from Mismatched to Verifying. Note that this process can take several minutes to complete.

After the audit is complete, the configuration state should change from Verifying to Good.

Importing Group Settings to Resolve Mismatches

Some mismatches can occur because the controller's group settings do not match the desired configuration. In this case, importing group settings can resolve the mismatch.

1. Click the **Audit** to view the current and desired configuration settings.
2. Click **Import**.

After the import is completed, the device settings on AirWave will match the desired configuration on the controller.

Importing Device Specific Settings

You can import device specific settings to resolve a mismatch.

1. Navigate to the device's **Manage** page.
2. Click **Import Settings**.

Chapter 2
Common Configuration Options

This section describes common configuration options for triggers, reports, and alerts that you might use on a daily basis. Refer to the following sections for additional information:

- "How Do I Acknowledge Alerts?" on page 19
- "Trigger Conditions" on page 20
- "Notification Options" on page 20
- "Alert Visibility" on page 20
- "Which Triggers Are Most Important?" on page 20
- "All Triggers" on page 21
- "Which Reports Should I Use?" on page 21

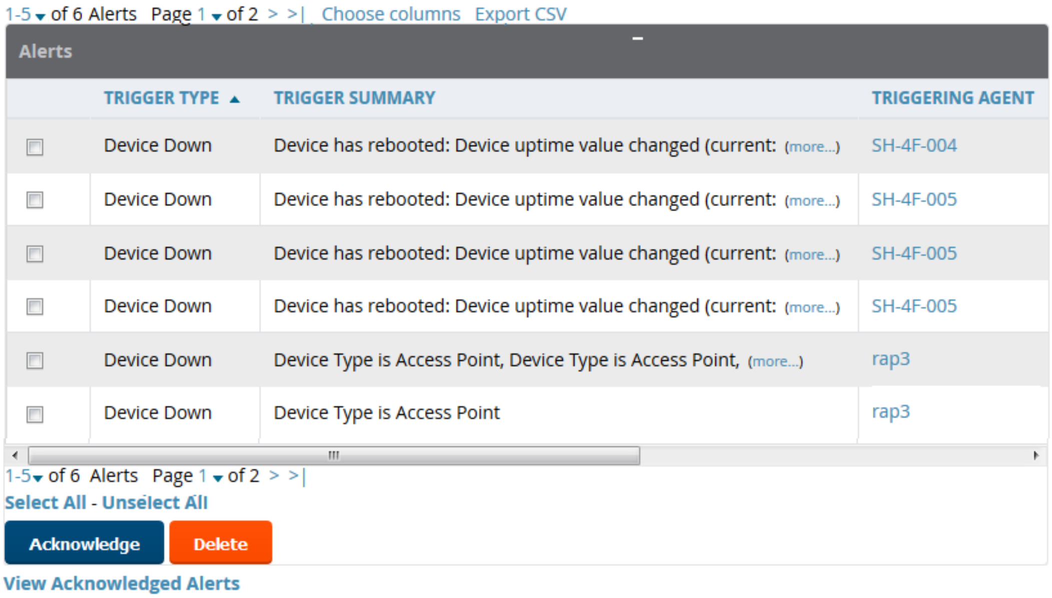
How Do I Acknowledge Alerts?

AirWave can send out customizable alerts on over 35 types of events. You can control the alerting behavior by creating triggers on the **System >Triggers** page.

Workflow

Normally AirWave will not alert on an event if there is an existing, unacknowledged alert for the same event (for example, a radio with > 80% utilization). To tell AirWave that you are ready for it to start alerting on that event again, the alert needs to be either acknowledged or deleted on the **System >Alerts** page.

Figure 7: *Alerts List*



1-5 of 6 Alerts Page 1 of 2 > >| Choose columns Export CSV

Alerts

	TRIGGER TYPE ▲	TRIGGER SUMMARY	TRIGGERING AGENT
☐	Device Down	Device has rebooted: Device uptime value changed (current: (more...)	SH-4F-004
☐	Device Down	Device has rebooted: Device uptime value changed (current: (more...)	SH-4F-005
☐	Device Down	Device has rebooted: Device uptime value changed (current: (more...)	SH-4F-005
☐	Device Down	Device has rebooted: Device uptime value changed (current: (more...)	SH-4F-005
☐	Device Down	Device Type is Access Point, Device Type is Access Point, (more...)	rap3
☐	Device Down	Device Type is Access Point	rap3

1-5 of 6 Alerts Page 1 of 2 > >|

Select All - Unselect All

Auto-Acknowledgement of Device Down Alerts

Device Down alerts can be automatically acknowledged when the device comes back up. To enable auto-acknowledgement of Device Down alerts, create a Device Up alert with the Auto Acknowledge setting enabled in one of these ways:

- Up - When a device comes up, its Device Down alerts are acknowledged.

- Up and Down - Like above, and in addition if the device goes down, it's Device Up alerts are acknowledged.

Alert Suppression

It's important to understand the "Suppress Until Acknowledged" setting for triggers.

- If suppression is set to No, then AirWave will send out an alert every time it detects the symptom. For example, if an AP were down, we would send an alert every time we poll for Thin AP Status, typically every 5 minutes.
- If suppression is set to Yes, then AirWave will not send another alert until one of these things happens:
  - A user acknowledges or deletes the alert.
  - The alert is automatically acknowledged or purged by nightly maintenance. The thresholds for automatically acknowledging and purging are configurable on the AMP Setup page.

Trigger Conditions

You can fine-tune when AirWave sends alerts by setting trigger conditions. For many types of triggers, you can use multiple conditions. When you configure multiple trigger conditions, you decide whether all trigger conditions must match, or just a few.

Notification Options

AirWave includes the following notification options:

- Alerts are always logged on the **System > Alerts** page.
- Email - Alerts can be sent to multiple email addresses.
- SNMP Traps to External NMS - Traps can be sent to external systems. Add external NMS servers on the **AMP Setup > NMS** page.

Alert Visibility

There are two options for alert visibility:

- By Role - only users with the same role as the trigger creator will see the alerts.
- By Triggering Agent - If an AirWave user is allowed to see the AP/rogue/client that the alert is about, then he can see the alert. If he is not allowed to see the AP/rogue/client, then he also cannot see the alert.

Which Triggers Are Most Important?

Enable the following triggers every time you install a new AirWave server:

- **Device Down**. Configure a separate trigger for controllers, access points, and routers or switches because they have different severity levels. Use the trigger condition to specify the device type.
- **Device Up**. Configure this trigger by setting the **Auto Acknowledge Up/Down Alerts** option to **Up and Down**, thereby acknowledging Device Down alerts when the device returns online.
- **Channel Utilization**. Configure this trigger to receive notifications of high utilization or high interference. An interference percentage of 30-40% makes a good starting point. For example, add a trigger condition by setting the **Time Busy (%)** option to **>= 80** and the **Interference (%)** option to **>= 30**.
- **Rogue Device Classified**. Configure this trigger to alert you when AirWave detects devices classified as rogue or greater.

- **Connected Clients**. Configure this trigger with the device MAC address, so that, when the device is missing, AirWave sends an alert whenever the device is seen on the network. For some customers, disabling alert suppression makes sense when enabling this trigger.
- **Client RADIUS Authentication Issues**. Configure this trigger to identify devices that fail continuously to authenticate and avoid performance issues with the authentication server. For example, add a trigger condition to receive an alert after 10 counts.

All Triggers

You can configure all triggers from the **System > Triggers** page. AirWave 8.2.11.1 includes the following triggers:

- **Devices**
  - Device Down
  - Device Up
  - Configuration Mismatch
  - AP Usage
  - Device Resources
  - Device Event
  - Device Uplink Status
  - AP Uplink Speed
  - Controller Cluster Trigger
- **Interfaces/Radios**
  - Radio Down
  - Radio Up
  - 802.11 Frame Counters
  - 802.11 QoS Counters
  - Interface Usage
  - Interface Errors
  - Channel Utilization
  - Radio Noise Floor
  - Channel Change
- **Discovery**
  - New Devices Discovered
- **Clients**
  - New Clients
  - Connected Clients
  - Client Count
  - Client Usage
  - New VPN User
  - Connected VPN Users
  - VPN Session Usage
  - Inactive Tag
  - IPv4 Link-Local Addresses
  - Client Goodput
  - Client Speed
  - Disconnected VPN Users
  - Disconnected Clients
  - **RADIUS Authentication Issues**
  - Client RADIUS Authentication Issues
  - Device RADIUS Authentication Issues
  - Total RADIUS Authentication Issues
- **RADIUS Accounting Issues**
  - Client RADIUS Accounting Issues
  - Device RADIUS Accounting Issues
  - Total RADIUS Accounting Issues
- **IDS Events**
  - Device IDS Events
  - Rogue Device Classified
  - Client on Rogue AP
- **AMP Health**
  - Disk Usage
  - System Resources
  - VisualRF Down
- **Clarity**
  - Authentication Time
  - DHCP Response Time
- **GRE Tunnels**
  - Tunnel Up
  - Tunnel Down
  - Tunnel Group
  - Tunnel Duplicate Id
  - Tunnel Duplicate Ip

Which Reports Should I Use?

AirWave includes a powerful, industry leading reporting feature, with customizable reports on devices, clients, the wireless and wired network, and security. This section describes some of the best practices in using reports.

This section includes the following topics:

- "Creating Report Definitions" on page 22
- "Report Types" on page 22

- "Recommended Reports" on page 28

Creating Report Definitions

You can use the following features when defining reports.

Scheduling

When AirWave is first installed, every type of report is pre-configured to run every night, reporting on the previous day. This is great for giving new customers a look into many of the reporting features, but over time it becomes a lot of data. It's a good idea to figure out what types of reports are most important for each customer and run those as often as it makes sense. Weekly and monthly reports are good for minimizing inbox clutter.

Sharing

- Email: Reports can be emailed in html, pdf, or csv format. Multiple addresses can be separated by spaces, commas, or semicolons.
- External server: Reports can be sent via FTP or SCP to an external server.

Access to Generated Reports

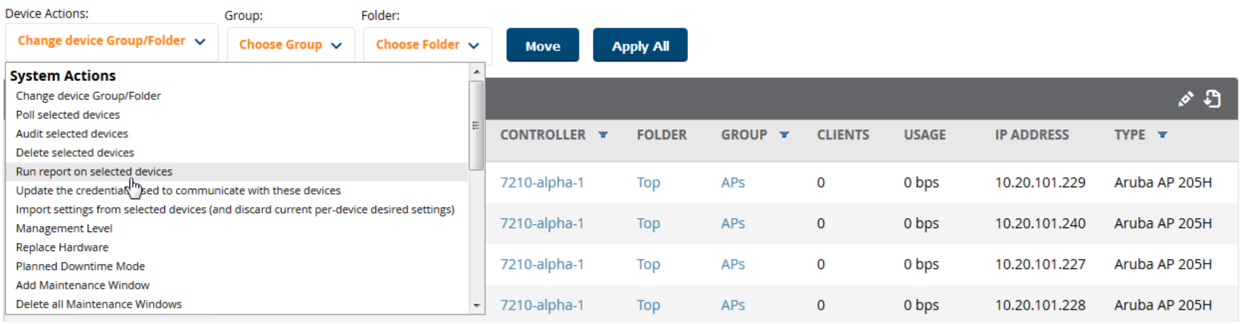
When a report is defined you can choose between two visibility options:

- By Role: Only AirWave users who have the same user role will be able to see the report. Users from other roles have no access.
- By Subject: If a user's role allows her to view all of the devices/users/rogues in the report, she will be able to access to the report. If the report contains information about any devices/users/rogues that she is not allowed to see, she will not be able to see the report at all.

Creating a Report Using the Modify Devices Feature

Usually, an AirWave user will create a new report definition by going to the **Reports > Definitions** page and clicking the **Add** button. It's also possible to create a report starting from any device list. Just click the modify icon () on right side of the table title bar, choose the devices on which you want to report, then click **Run Report**.

Figure 8: *Modify Devices*



Device Actions: Change device Group/Folder

Group: Choose Group

Folder: Choose Folder

Move
Apply All
System Actions
Change device Group/Folder
Poll selected devices
Audit selected devices
Delete selected devices
Run report on selected devices
Update the credentials used to communicate with these devices
Import settings from selected devices (and discard current per-device desired settings)
Management Level
Replace Hardware
Planned Downtime Mode
Add Maintenance Window
Delete all Maintenance Windows

CONTROLLER	FOLDER	GROUP	CLIENTS	USAGE	IP ADDRESS	TYPE
7210-alpha-1	Top	APs	0	0 bps	10.20.101.229	Aruba AP 205H
7210-alpha-1	Top	APs	0	0 bps	10.20.101.240	Aruba AP 205H
7210-alpha-1	Top	APs	0	0 bps	10.20.101.227	Aruba AP 205H
7210-alpha-1	Top	APs	0	0 bps	10.20.101.228	Aruba AP 205H

Report Types

AirWave has multiple predefined reports that contain one or more sections of data, (also called widgets). The most commonly used reports are the Aruba License, Device Summary, Inventory, Client Details, Traffic Analysis, and RF Health reports . You can also create a custom report by combining individual widgets from multiple report types.

Traffic Analysis Report Widgets

- Top Applications Summary
- Top Destinations Summary

- Top 10 Applications By Device Types
- Top 10 Applications By User Roles
- Top 10 Applications By SSIDs
- Top 3 Applications For Top 10 Users
- User Detail

Aruba License Report Widgets

- License Info

Capacity Planning Report Widgets

- Summary
- Interface Usage
- Interfaces Vs. Percent of Time Above Threshold
- Raw Capacity Data

Client Inventory Report Widgets

- AOS Device Type Summary
- Device Type Summary
- Device Manufacturer and Model Summary
- Device Manufacturer Summary
- Device Model Summary
- OS Summary
- Device OS Detail Summary
- Network Vendor Summary
- Network Chipset Summary
- Network Driver Summary
- EAP Supplicant Summary
- Asset Group Summary
- Asset Category Summary
- Last SSID Summary
- Last Aruba Role Summary
- Last Connection Mode Summary
- Last Auth. Type Summary
- Clients

Client Session Report Widgets

- Session Data by OS (List)
- Session Data by OS (Charts)
- Session Data by OS Detail (List)
- Session Data by OS Detail (Charts)
- Session Data by Model (List)
- Session Data by Model (Charts)
- Session Data by Manufacturer (List)
- Session Data by Manufacturer (Charts)

- Session Data by Device Type (List)
- Session Data by Device Type (Charts)
- Session Data by AOS Device Type (List)
- Session Data by AOS Device Type (Charts)
- Session Data by Network Interface Vendor (List)
- Session Data by Network Interface Vendor (Charts)
- Session Data by Network Chipset (List)
- Session Data by Network Chipset (Charts)
- Session Data by Network Driver (List)
- Session Data by Network Driver (Charts)
- Session Data by EAP Supplicant (List)
- Session Data by EAP Supplicant (Charts)
- Session Data by Asset Group (List)
- Session Data by Asset Group (Charts)
- Session Data by Asset Category (List)
- Session Data by Asset Category (Charts)
- Session Data by Connection Mode (List)
- Session Data by Connection Mode (Charts)
- Session Data by SSID (List)
- Session Data by SSID (Charts)
- Session Data by Role (List)
- Session Data by Role (Charts)
- Session Data by VLAN (List)
- Session Data by VLAN (Charts)
- Session Data by Cipher (List)
- Session Data by Cipher (Charts)
- Top Clients by Total MB Used
- Top Clients by Total MB Used by Folder
- Summary
- Sessions
- Session Data by Client

Configuration Audit Report Widgets

- Detail

Device Summary Report Widgets

- Most Utilized Folders by Maximum Concurrent Clients
- Most Utilized Folders by Usage
- Most Utilized by Maximum Concurrent Clients
- Most Utilized by Usage
- Least Utilized by Maximum Concurrent Clients
- Least Utilized by Usage
- Devices

Device Uptime Report Widgets

- Avg Uptime by Device
- Avg Uptime by Any AP
- Avg Uptime by Any Controller
- Avg Uptime by Any Switch
- Avg Uptime by Group
- Avg Uptime by Folder
- Device Downtime Detail
- Uptime by Device

IDS Events Report Widgets

- Top IDS Events by Device
- Top IDS Events by Controller
- Raw IDS Data

Inventory Report Widgets

- Vendor Summary
- Firmware Version Summary
- Model/Firmware Version Summary
- Bootloader Version Summary
- Model/Bootloader Version Summary
- Type Summary
- Model Summary
- Aruba AP Interfaces Summary
- Devices

Match Event Report Widgets

- By Folder
- By AP
- By Client
- Details
- Device Type Summary
- Reasons for Match Summary
- Connection Mode Summary

Memory and CPU Utilization Report Widgets

- Top CPU Utilization by Device
- Top Memory Usage by Device
- CPU Utilization Details
- Memory Usage Details

Network Usage Report Widgets

- Usage
- Client Count

- Usage and Client Count by Folder
- Usage by SSID
- Total Usage

New Clients Report Widgets

- Detail

New Rogue Devices Report Widgets

- Devices by RAPIDS Classification
- Devices by Controller Classification
- Top Rogue Devices by Discovering APs
- Top Rogue Devices by Signal Strength
- Devices by LAN MAC Address Vendor
- Devices by Radio MAC Address Vendor
- Summary
- Devices Discovered Wirelessly and on the LAN
- Devices Discovered Only Wirelessly
- Devices Discovered on the LAN Only
- All Rogue Devices
- Discovery Events

Port Usage Report Widgets

- Summary
- Folder Summary
- Histogram
- Most Utilized Switches
- Most Utilized Ports
- Switches
- Ports

RADIUS Issues Report Widgets

- Top 10 RADIUS Issues by Device
- Top 10 RADIUS Issues by Controller
- Top 10 RADIUS Issues by RADIUS Server
- Top 10 RADIUS Issues by Client
- RADIUS Issues

RF Health Report Widgets

- Thresholds
- Top Folders By Worst Client and Radio Statistics Combined 2.4 GHz and 5 GHz
- Radio Statistics by Folder - Combined 2.4 GHz and 5 GHz
- Top Folders By Worst Client and Radio Statistics 2.4 GHz
- Radio Statistics by Folder - 2.4 GHz
- Top Folders By Worst Client and Radio Statistics 5 GHz

- Radio Statistics by Folder - 5 GHz
- Problem 5 GHz Radios
- Problem 2.4 GHz Radios
- Most Noise (5 GHz)
- Most Noise (2.4 GHz)
- Most Interfering Devices (5 GHz)
- Most Interfering Devices (2.4 GHz)
- Most Utilized by Channel Usage (5 GHz)
- Most Utilized by Channel Usage (2.4 GHz)
- Least Utilized by Channel Usage (5 GHz)
- Least Utilized by Channel Usage (2.4 GHz)
- Most MAC/Phy Errors (5 GHz)
- Most MAC/Phy Errors (2.4 GHz)
- Most Channel Changes (5 GHz)
- Most Channel Changes (2.4 GHz)
- Most Mode Changes (5 GHz)
- Most Mode Changes (2.4 GHz)
- Most Transmit Power Changes (5 GHz)
- Most Transmit Power Changes (2.4 GHz)
- Clients with Least Goodput
- Clients with Least Speed
- Radios with Least Goodput

Rogue Clients Report Widgets

- Clients Per Classification
- Misassociations by Rogue APs
- Misassociations by Rogue Clients
- Details

Rogue Containment Audit Report Widgets

- Rogue Containment by Controller

UCC Report Widgets

- Thresholds and Filters
- UCC Data by Call Quality (List)
- UCC Data by Call Quality (Charts)
- UCC Data by Connectivity Type (List)
- UCC Data by Connectivity Type (Charts)
- UCC Data by Call Type (List)
- UCC Data by Call Type (Charts)
- UCC Data by Application Type (List)
- UCC Data by Application Type (Charts)
- UCC Data by Device Type (List)

- UCC Data by Device Type (Charts)
- Folders by Poor Call Quality
- APs by Poor Call Quality
- Clients by Poor Call Quality

VPN Session Report Widgets

- Session Data by VLAN (List)
- Session Data by VLAN (Charts)
- Session Data by VPN Type (List)
- Session Data by VPN Type (Charts)
- Session Data by Controller (List)
- Session Data by Controller (Charts)
- Session Data by HTTP Fingerprint (List)
- Session Data by HTTP Fingerprint (Charts)
- Session Data by AOS Device Type (List)
- Session Data by AOS Device Type (Charts)
- Summary
- Session Data by Users
- Sessions

Recommended Reports

Although AirWave includes a large number of report types, Aruba recommends running the following reports on a regular basis, as these reports supply helpful information for monitoring, managing and troubleshooting your network.

1. Client Session Reports
2. RF Health Reports
3. Network Usage Reports
4. Device Summary Reports
5. Traffic Analysis Reports

With AirWave, you can monitor devices on your network with the click of a button and see real-time statistics as well as historical information. Diagnostic summaries highlight anomalies and situations that can affect end-user network performance. AirWave includes monitoring views designed to aggregate critical information for the help desk, as well as the high-end monitoring functions network engineers need.

AirWave monitoring features include:

- The ability to automatically track every user and device – wireless and remote – on the network.
- Visibility into the wired infrastructure that connects wireless controllers and APs.
- Logging and displaying of radio and RADIUS errors, a frequent cause of connectivity problems.
- Rapid drill-downs from network-wide to device-level monitoring view.
- Logging audit and system events to an external syslog server.

Refer to the following sections for information on common monitoring practices that you will utilize on a daily basis.

- "Viewing Device Monitoring Statistics" on page 29
- "Monitoring Data for Wired Devices (Routers and Switches)" on page 30
- "Understanding the Devices > Monitor Pages for all Device Types" on page 31
- "Understanding the Devices > Interfaces Page" on page 32
- "Monitoring with the RF Performance Page" on page 33
- "Viewing Syslog Messages" on page 34

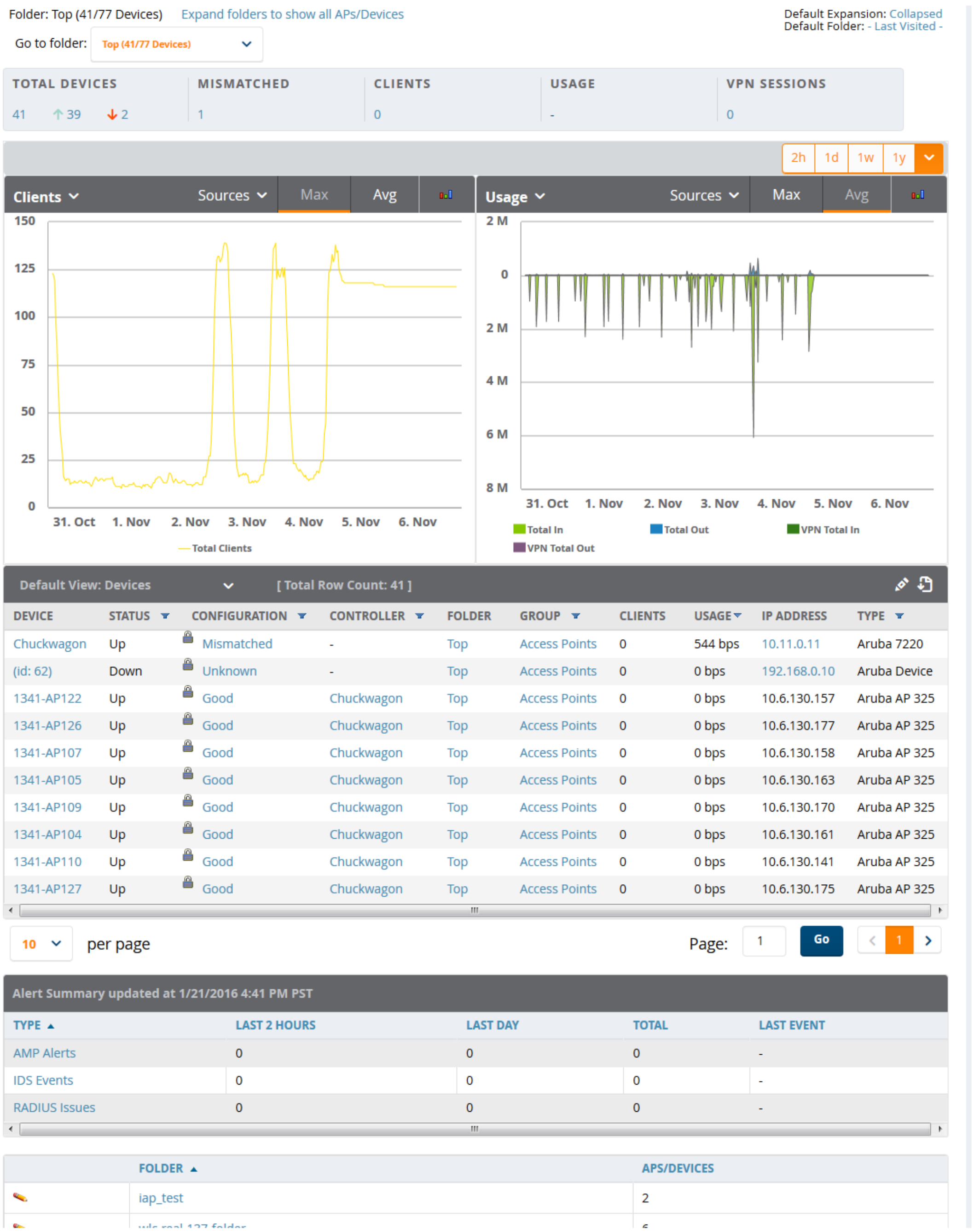
Viewing Device Monitoring Statistics

You can view device monitoring statistics in the **Devices > List** page. The **Devices > List** page displays interactive graphs of Clients and Usage and lists all devices that are managed or monitored by AirWave.

To see only the Up devices, click the **Up** link in the **Top Header Stats**. It displays the **Devices > Up** page with the same information, but only containing active devices. You can do the same with the **Down** and **Mismatched** top header stats links.

Use the **Go to folder** drop-down list at the top of the page to filter the list by folder, or click **Expand folders to show all Devices** if you are looking at a filtered device list. A lock icon in the **Configuration** column indicates that the device in that row is in **Monitor only** mode.

Figure 9: *Devices > List (partial view)*



Folder: Top (41/77 Devices) Expand folders to show all APs/Devices

Go to folder: Top (41/77 Devices)

Default Expansion: Collapsed
Default Folder: - Last Visited -

TOTAL DEVICES	MISMATCHED	CLIENTS	USAGE	VPN SESSIONS
41 ↑39 ↓2	1	0	-	0

Default View: Devices [Total Row Count: 41]

DEVICE	STATUS	CONFIGURATION	CONTROLLER	FOLDER	GROUP	CLIENTS	USAGE	IP ADDRESS	TYPE
Chuckwagon	Up	Mismatched	-	Top	Access Points	0	544 bps	10.11.0.11	Aruba 7220
(id: 62)	Down	Unknown	-	Top	Access Points	0	0 bps	192.168.0.10	Aruba Device
1341-AP122	Up	Good	Chuckwagon	Top	Access Points	0	0 bps	10.6.130.157	Aruba AP 325
1341-AP126	Up	Good	Chuckwagon	Top	Access Points	0	0 bps	10.6.130.177	Aruba AP 325
1341-AP107	Up	Good	Chuckwagon	Top	Access Points	0	0 bps	10.6.130.158	Aruba AP 325
1341-AP105	Up	Good	Chuckwagon	Top	Access Points	0	0 bps	10.6.130.163	Aruba AP 325
1341-AP109	Up	Good	Chuckwagon	Top	Access Points	0	0 bps	10.6.130.170	Aruba AP 325
1341-AP104	Up	Good	Chuckwagon	Top	Access Points	0	0 bps	10.6.130.161	Aruba AP 325
1341-AP110	Up	Good	Chuckwagon	Top	Access Points	0	0 bps	10.6.130.141	Aruba AP 325
1341-AP127	Up	Good	Chuckwagon	Top	Access Points	0	0 bps	10.6.130.175	Aruba AP 325

10 per page Page: 1 Go 1

Alert Summary updated at 1/21/2016 4:41 PM PST

TYPE	LAST 2 HOURS	LAST DAY	TOTAL	LAST EVENT
AMP Alerts	0	0	0	-
IDS Events	0	0	0	-
RADIUS Issues	0	0	0	-

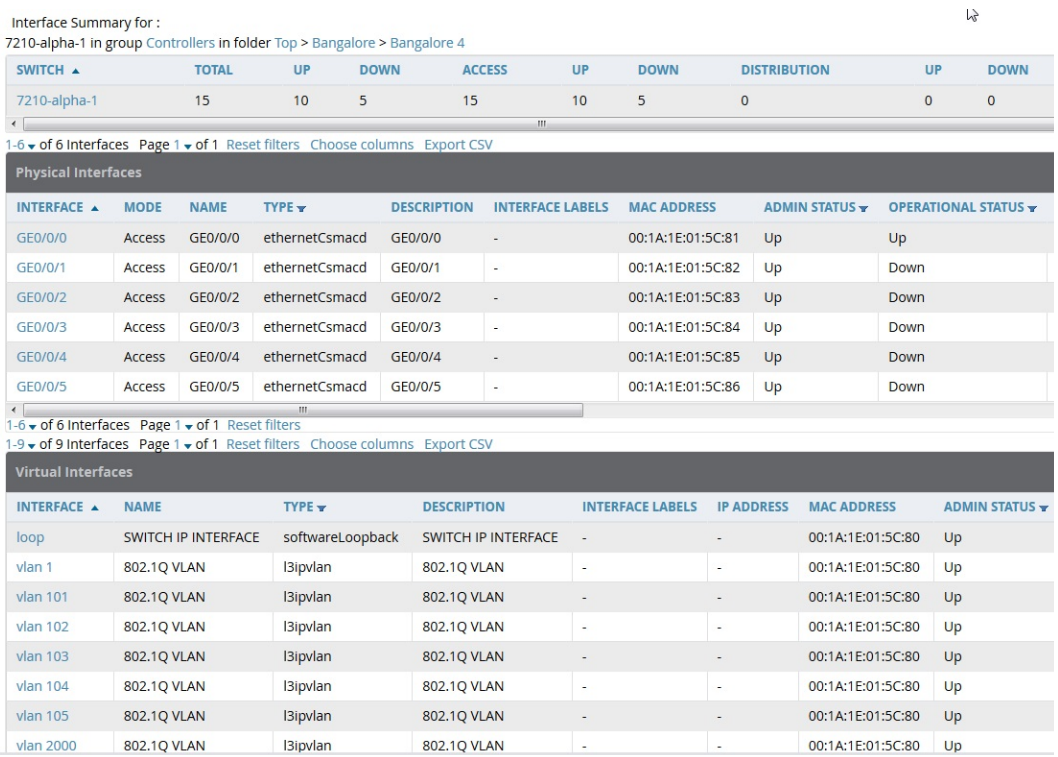
	FOLDER	APS/DEVICES
	iap_test	2
	wlc-real-127-folder	6

Monitoring Data for Wired Devices (Routers and Switches)

The monitoring page for routers and switches includes basic device information at the top. Beneath that are graphs that display the number of clients and their usage. A menu in each graph allows you to change the graph to view CPU and Memory utilization data.

All managed wired devices include an **Interfaces** subtab, as shown in Figure 10.

Figure 10: *Devices > Interfaces Page for Wired Devices (partial view)*



Interface Summary for :
7210-alpha-1 in group Controllers in folder Top > Bangalore > Bangalore 4

SWITCH ▲	TOTAL	UP	DOWN	ACCESS	UP	DOWN	DISTRIBUTION	UP	DOWN
7210-alpha-1	15	10	5	15	10	5	0	0	0

1-6 ▾ of 6 Interfaces Page 1 ▾ of 1 Reset filters Choose columns Export CSV

Physical Interfaces

INTERFACE ▲	MODE	NAME	TYPE ▾	DESCRIPTION	INTERFACE LABELS	MAC ADDRESS	ADMIN STATUS ▾	OPERATIONAL STATUS ▾
GE0/0/0	Access	GE0/0/0	ethernetCsmacd	GE0/0/0	-	00:1A:1E:01:5C:81	Up	Up
GE0/0/1	Access	GE0/0/1	ethernetCsmacd	GE0/0/1	-	00:1A:1E:01:5C:82	Up	Down
GE0/0/2	Access	GE0/0/2	ethernetCsmacd	GE0/0/2	-	00:1A:1E:01:5C:83	Up	Down
GE0/0/3	Access	GE0/0/3	ethernetCsmacd	GE0/0/3	-	00:1A:1E:01:5C:84	Up	Down
GE0/0/4	Access	GE0/0/4	ethernetCsmacd	GE0/0/4	-	00:1A:1E:01:5C:85	Up	Down
GE0/0/5	Access	GE0/0/5	ethernetCsmacd	GE0/0/5	-	00:1A:1E:01:5C:86	Up	Down

1-6 ▾ of 6 Interfaces Page 1 ▾ of 1 Reset filters
1-9 ▾ of 9 Interfaces Page 1 ▾ of 1 Reset filters Choose columns Export CSV

Virtual Interfaces

INTERFACE ▲	NAME	TYPE ▾	DESCRIPTION	INTERFACE LABELS	IP ADDRESS	MAC ADDRESS	ADMIN STATUS ▾
loop	SWITCH IP INTERFACE	softwareLoopback	SWITCH IP INTERFACE	-	-	00:1A:1E:01:5C:80	Up
vlan 1	802.1Q VLAN	l3ipvlan	802.1Q VLAN	-	-	00:1A:1E:01:5C:80	Up
vlan 101	802.1Q VLAN	l3ipvlan	802.1Q VLAN	-	-	00:1A:1E:01:5C:80	Up
vlan 102	802.1Q VLAN	l3ipvlan	802.1Q VLAN	-	-	00:1A:1E:01:5C:80	Up
vlan 103	802.1Q VLAN	l3ipvlan	802.1Q VLAN	-	-	00:1A:1E:01:5C:80	Up
vlan 104	802.1Q VLAN	l3ipvlan	802.1Q VLAN	-	-	00:1A:1E:01:5C:80	Up
vlan 105	802.1Q VLAN	l3ipvlan	802.1Q VLAN	-	-	00:1A:1E:01:5C:80	Up
vlan 2000	802.1Q VLAN	l3ipvlan	802.1Q VLAN	-	-	00:1A:1E:01:5C:80	Up

The top of the **Interfaces** page includes a summary of all interfaces. In the case of stacked switches, the master includes the interfaces of all the members, including its own. The physical and virtual interfaces are displayed in separate tables, labeled **Physical Interfaces** and **Virtual Interfaces**. VLANs are listed below the interface.

NOTE

The Interfaces page for AirMesh APs includes VLANs as part of the Virtual Interfaces. When no management interface is specified, VLAN1 will be treated as management interface. If VLAN1 does not exist, then Ethernet 0 will be treated as the management interface.

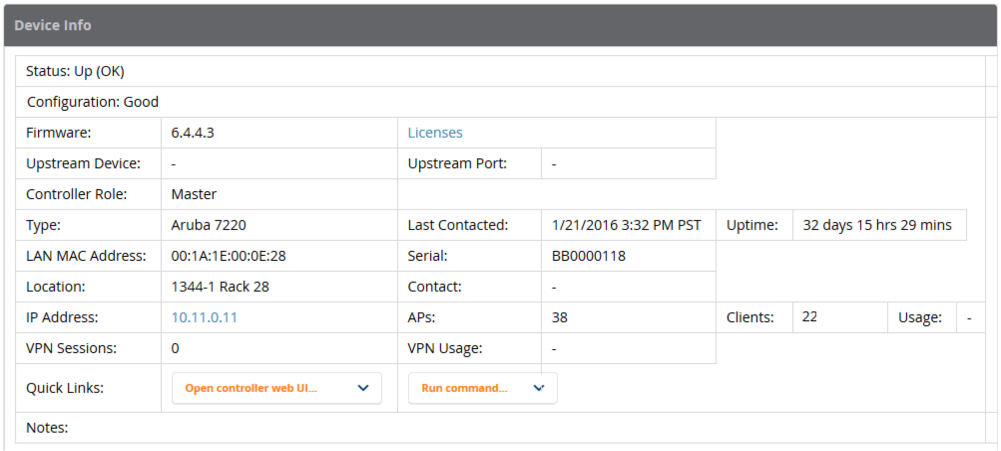
AirWave monitors **Up/Down** status and bandwidth information on all interfaces. You can edit multiple interfaces concurrently by selecting one of the two **Edit Interfaces** links. Interface labels are used to group one or more interfaces for the purpose of defining interface bandwidth triggers.

Understanding the Devices > Monitor Pages for all Device Types

You can quickly go to any device's monitoring page after you go to its specific folder or group on the **Devices > List** page by selecting its hyperlinked name in the **Device** column.

All **Monitor** pages include a section at the top displaying information such as monitoring/configuration status, serial number, total users, firmware version, and so on, as shown in Figure 11.

Figure 11: *Monitoring Page Top-level Data Common to all Device Types*

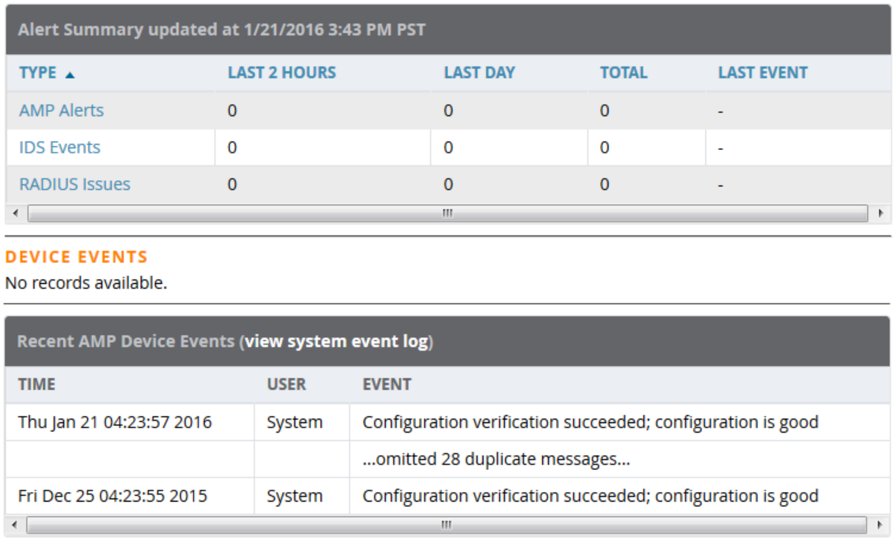


Device Info

Status: Up (OK)							
Configuration: Good							
Firmware:	6.4.4.3	Licenses					
Upstream Device:	-	Upstream Port:	-				
Controller Role:	Master						
Type:	Aruba 7220	Last Contacted:	1/21/2016 3:32 PM PST	Uptime:	32 days 15 hrs 29 mins		
LAN MAC Address:	00:1A:1E:00:0E:28	Serial:	BB0000118				
Location:	1344-1 Rack 28	Contact:	-				
IP Address:	10.11.0.11	APs:	38	Clients:	22	Usage:	-
VPN Sessions:	0	VPN Usage:	-				
Quick Links:	Open controller web UI...	Run command...					
Notes:							

The alert summary and recent events sections are the same regardless of the device type, and these sections appear toward the bottom of these pages. A link to the Audit Log is available on the bottom of this page. A portion of this page is shown in Figure 12.

Figure 12: *Monitoring Page Bottom Level Data Common to all Device Types (Partial View)*



Alert Summary updated at 1/21/2016 3:43 PM PST

TYPE ▲	LAST 2 HOURS	LAST DAY	TOTAL	LAST EVENT
AMP Alerts	0	0	0	-
IDS Events	0	0	0	-
RADIUS Issues	0	0	0	-

DEVICE EVENTS

No records available.

Recent AMP Device Events (**view system event log**)

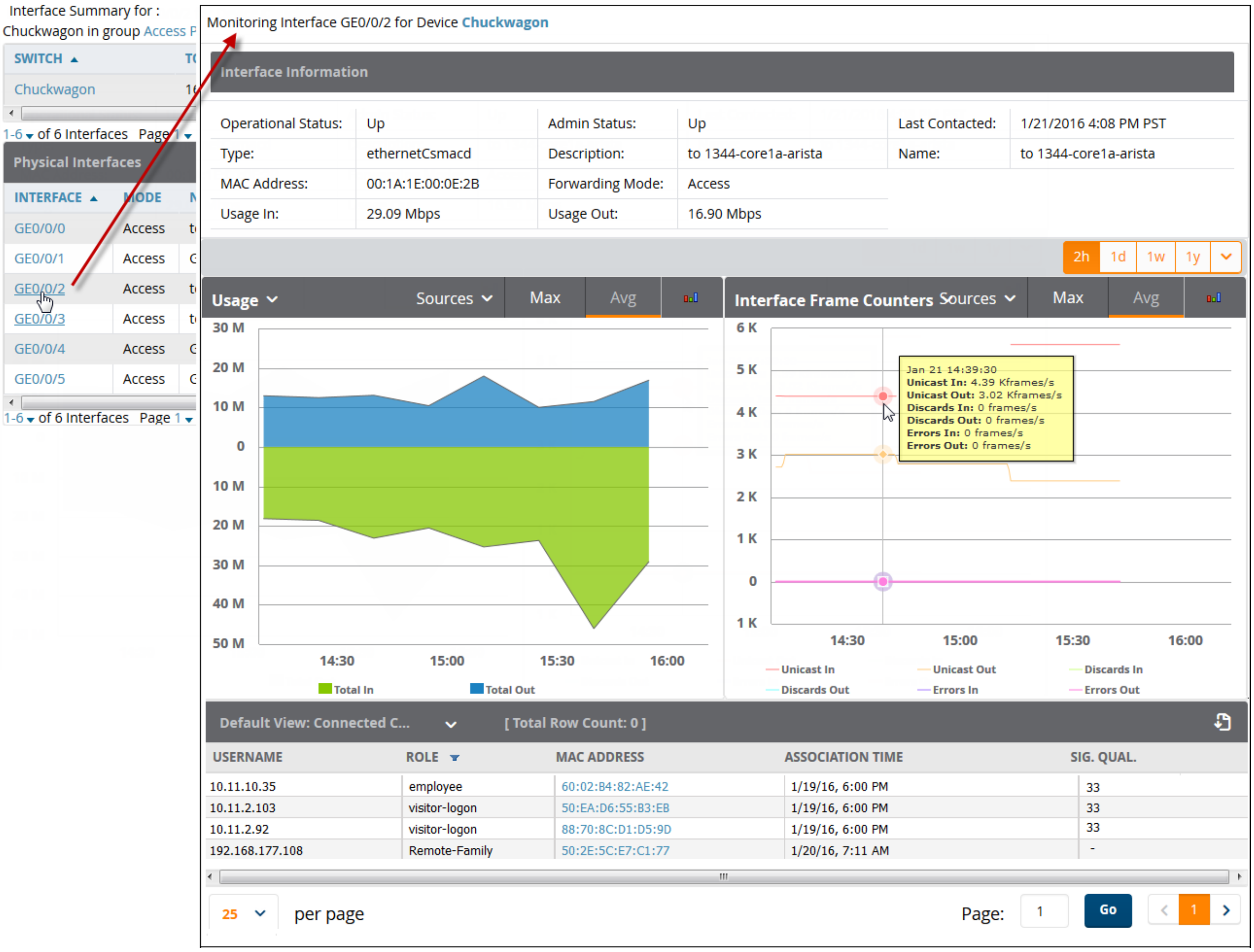
TIME	USER	EVENT
Thu Jan 21 04:23:57 2016	System	Configuration verification succeeded; configuration is good
		...omitted 28 duplicate messages...
Fri Dec 25 04:23:55 2015	System	Configuration verification succeeded; configuration is good

Monitoring pages vary according to whether the devices being monitored are wired routers/switches, controllers/WLAN switches, or thin or fat APs; whether the device is a Mesh device; and whether Spectrum is enabled. These differences are discussed in the sections that follow.

Understanding the Devices > Interfaces Page

The "Monitoring Data for Wired Devices (Routers and Switches)" on page 30 section described how to view high-level interface information for all physical and virtual interfaces on an entire router or switch. Select an interface link in the **Interface** column of the Physical or Virtual Interfaces tables on the stacked switches to go to an **Interface Monitoring** page to display data relevant to that specific interface, as shown Figure 13.

Figure 13: *Interface Monitoring Page for a Wired Device*



Interface Summary for :
Chuckwagon in group Access P

SWITCH ▲	T(
Chuckwagon	1(

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Physical Interfaces

INTERFACE ▲	MODE	N
GE0/0/0	Access	t(
GE0/0/1	Access	C
GE0/0/2	Access	t(
GE0/0/3	Access	t(
GE0/0/4	Access	C
GE0/0/5	Access	C

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Monitoring Interface GE0/0/2 for Device **Chuckwagon**

Interface Information

Operational Status:	Up	Admin Status:	Up	Last Contacted:	1/21/2016 4:08 PM PST
Type:	ethernetCsmacd	Description:	to 1344-core1a-arista	Name:	to 1344-core1a-arista
MAC Address:	00:1A:1E:00:0E:2B	Forwarding Mode:	Access		
Usage In:	29.09 Mbps	Usage Out:	16.90 Mbps		

Jan 21 14:39:30
Unicast In: 4.39 Kframes/s
Unicast Out: 3.02 Kframes/s
Discards In: 0 frames/s
Discards Out: 0 frames/s
Errors In: 0 frames/s
Errors Out: 0 frames/s

Default View: Connected C... [Total Row Count: 0]

USERNAME	ROLE	MAC ADDRESS	ASSOCIATION TIME	SIG. QUAL.
10.11.10.35	employee	60:02:B4:82:AE:42	1/19/16, 6:00 PM	33
10.11.2.103	visitor-logon	50:EA:D6:55:B3:EB	1/19/16, 6:00 PM	33
10.11.2.92	visitor-logon	88:70:8C:D1:D5:9D	1/19/16, 6:00 PM	33
192.168.177.108	Remote-Family	50:2E:5C:E7:C1:77	1/20/16, 7:11 AM	-

25 per page Page: 1 Go 1

An **Interface Monitoring** page has three sections. The **Interface Information** table at the top of the page displays specific details about the interface, the **Usage** and **Interface Frame Counters** graphs appear in the middle of the page, and the **Connected Clients** table at the bottom of the page lists the user name, role, MAC address, association time and signal quality for any connected clients.

Monitoring with the RF Performance Page

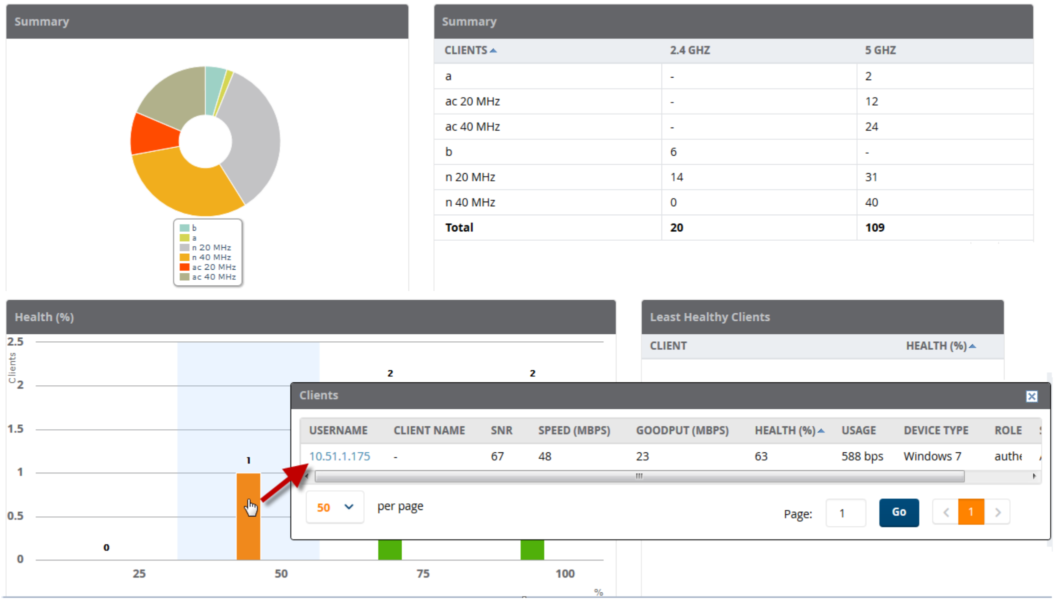
The **Home > RF Performance** page provides graphs that enable you to identify clients with poor health, Signal-to-noise (SNR) ratios, and speed rates. In the upper-right corner of this page, you can limit the information that displays by selecting a specific folder.

NOTE

The Health, SNR, and Speed graphs will only be populated with information from Aruba devices that support AMON.

Click any graph to view information for a specific client, device, or location. As shown in Figure 14, clicking on a bar in the **Health** graph opens a popup window that displays information for those clients.

Figure 14: *Drill Down to View Client Data*



Summary

CLIENTS ▲	2.4 GHZ	5 GHZ
a	-	2
ac 20 MHz	-	12
ac 40 MHz	-	24
b	6	-
n 20 MHz	14	31
n 40 MHz	0	40
Total	**20**	**109**

Least Healthy Clients

CLIENT	HEALTH (%) ▲

Clients

USERNAME	CLIENT NAME	SNR	SPEED (MBPS)	GOODPUT (MBPS)	HEALTH (%) ▲	USAGE	DEVICE TYPE	ROLE
10.51.1.175	-	67	48	23	63	588 bps	Windows 7	authe

Click any user name in the **Clients** popup window to open the **Clients > Diagnostics** page and view additional detailed information about the selected client.

Viewing Syslog Messages

AirWave allows you to specify an external syslog server for storing audit and system events. After the external server is set up, everything written to the AirWave Event Log and audit logs will be sent to a specified syslog server.

You can find the AirWave event log on the **System > Event Log** page and at /var/log/amp_events from the AirWave command line.

To set up an external server:

1. Navigate to the **AMP Setup > General** page and scroll down to the **External Logging** section.
2. Enter the IP address and port value of the syslog server.
3. Specify **Yes** for the **Include Event Log Messages** option.
4. Select an Event Log facility from the drop-down list. Typically, facility identifiers local0-local7 are available to the administrator to use as "custom" identifiers. An exception is local5. On some systems, ftpd defaults to local5.

Messages "tagged" with these identifiers can be sorted by the syslog server into separate log files. You set this up on the syslog server in the /etc/syslog.conf file.

5. Specify **Yes** for the **Include Audit Log Messages** option.
6. Select an audit log facility from the menu.
7. Send a test message to the syslog server.
8. Click **Save**.