


# Aruba Instant in AirWave 7.7



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This document describes the Aruba Instant access point and Virtual Controller system as well as the procedure to integrate this system with AirWave. This section contains the following points:

- "Overview of Aruba Instant" on page 5
- "Instant Management with AirWave" on page 5
- "Using Aruba Instant with AirWave" on page 6
- "AMP Pages with Instant-Specific Features" on page 6
- "Supported Firmware" on page 7

## Overview of Aruba Instant

Aruba Instant (Instant) is a system of access points (IAP-92AP, IAP-93, IAP-105, AP-130, AP-134, and AP-135) per Layer 2 subnet. Aruba Instant IAPs are controlled by a single IAP that serves a dual role as a primary Virtual Controller, eliminating the need for dedicated controller hardware. This system can be deployed through a simplified setup process appropriate for smaller organizations, or for multiple geographically dispersed locations without an on-site administrator.

Only the first IAP/Virtual Controller you add to the network must be configured; the subsequent IAPs will all inherit the necessary configuration information from the Virtual Controller. Aruba Instant continually monitors the network to determine the IAP that should function as the Virtual Controller at any time, and the Virtual Controller will move from IAP to IAP as necessary without impacting network performance.

The Virtual Controller technology in Aruba Instant is capable of IAP auto discovery, 802.1X authentication, role-based and device-based policy enforcement, rogue detection, and Adaptive Radio Management (ARM).

## Instant Management with AirWave

Unlike other WLAN management products, AirWave eliminates the need to configure and troubleshoot individual APs or dispatch IT personnel on-site. With AirWave, IT can centrally configure, monitor, and troubleshoot Aruba Instant WLANs, upload new software images, track devices, generate reports, and perform other vital management tasks, all from a remote location.

### Intrusion Detection System

AirWave automatically detects rogue IAPs irrespective of their location in the network. It prevents authorized IAPs from being detected as rogue IAPs, and tracks and correlates the IDS events to provide a comprehensive picture of your network's security.

### Firmware Image Management

AirWave pushes firmware to the Aruba Instant Virtual Controller, and the Virtual Controller pushes the firmware to the rest of its IAPs. When using AirWave to manage IAPs, you can upgrade the firmware by loading the firmware onto AirWave, and then scheduling an upgrade from AirWave.

If you have a mixed deployment with multiple Instant products, AirWave allows you to upload firmware for each of the device types.



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If you are using Aruba Activate to set up your devices, then firmware updates will be available from the Activate server. Refer to the documentation that accompanies Aruba Activate for more information.

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## Using Aruba Instant with AirWave

AirWave can be used to provision and manage a multi-site deployment of Instant networks. For example, if you have 100 retail offices that require Instant to provide WLAN connectivity at each office, AirWave can be used to provision all the 100 offices from a central site. AirWave also provides the administrator with the ability to monitor these geographically dispersed Instant networks using an AirWave server (depending on the scalability recommendations for AirWave).

With a distributed deployment where multiple locations have an Aruba Instant Virtual Controller and IAPs, AirWave serves as a centralized management console. AirWave provides all functionality for normal WLAN deployments, including long-term trend reporting, PCI compliance, configuration auditing, role-based administration, location services, RF visualization, and many other features.

Integrating Instant systems into AirWave is unique from the setup of any other device class due to the following considerations:

- **Discovery:** AirWave does not discover Instant devices via scanning (SNMP or HTTP) the network. Each Instant deployment will automatically check-in to the AirWave configured within the IAP's user interface. The first Virtual Controller for an organization will automatically appear as a new device in AirWave. Subsequent IAPs are discovered via the Virtual Controller, just like standard controller/thin AP deployments.
- **Auto-provisioning:** The first authorized Virtual Controller requires manual authorization into AirWave via shared secret to ensure security. Along with the shared secret, the Virtual Controller sends an Organization String which automatically initializes and organizes the IAPs in AirWave. Unlike the traditional infrastructure of a physical controller and thin APs, Instant automates many tedious steps of developing a complex hierarchical structure of folders, config groups, templates, admin users, and admin roles for Instant.
- **Communication via HTTPS:** Because Instant devices may be deployed behind NAT-enabled firewalls, Virtual Controllers push data to AirWave via HTTPS. AMP initiates no connections to Instant devices via SNMP, TFTP, SSH, and the like. This enables quick remote setup without having to modify firewall rules.
- **Virtual controller listed as separate device:** The Virtual Controller is listed as an additional device, even though it is part of the existing set of IAPs. If you have 10 physical IAPs, AirWave will list 10 Instant IAPs and one Instant Virtual Controller. An asterisk icon (\*) beside the device name indicates that a device is acting as a Virtual Controller. You can also identify the IAP acting as the Virtual Controller by the identical LAN MAC addresses on the **APs/Devices > List** page, Device Inventory reports, and any other AirWave pages that list your network devices.



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A device that is added as a virtual controller does not count as a license for AirWave.

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Refer to the Aruba Instant data sheet for full operational and regulatory specifications, hardware capabilities, antenna plots, and radio details.

## AMP Pages with Instant-Specific Features

The following is a summary of AMP pages affected by Aruba Instant support:

- **APs/Devices > New:** When an Aruba Instant device appears in the **APs/Devices > New** page, an admin user can mouse over the value on the Type column to display the device's Shared Secret with AMP.
- **APs/Devices > List:** The Virtual Controller is listed as an additional device, even though it is part of the existing set of IAPs. An asterisk icon (\*) beside a device name indicates that the device is acting as a Virtual Controller. You can also identify the IAP acting as the Virtual Controller by the identical LAN MAC addresses on the **APs/Devices > List** page, Device Inventory reports, and any other AirWave pages that list your network devices.
- **Clients > Client Detail:** Once IAPs are serving clients, the IAPs can use user-agent strings to extract operating systems and device descriptions of its clients, and then populate the Device Description and Device OS fields in **Clients > Client Detail**.

- **APs/Devices > Audit:** Aruba Instant configuration fetching can be performed in **APs/Devices > Audit**. When template configuration is used to manage devices, the running configuration is stored on the IAP and verified by the template.
- **APs/Devices > Monitor > Radio Statistics:** The Radio Statistics page for Aruba Instant devices displays Clients, Usage, Radio Channel, Radio Noise, Radio Power, Radio Errors, and Channel Utilization.
- **Groups > Instant Config:** This feature is available if **Enable Instant GUI Config** is enabled on the **Groups > Basic** page. This feature allows you to use AirWave as a management console with the same UI as the IAP device.
- **RAPIDS:** Because Aruba Instant does not support mitigation or high-level rogue reporting, it does not synchronize classification. All rogue devices are reported and stored in AMP for evaluation based on high-level rule sets. Instant currently does not match wireless BSSIDs to local MAC addresses within an IAP's ARP table, and does not currently support IDS event notification.
- **Reports:** Aruba Instant Virtual Controllers appear as a separate device in the Device Inventory Report and most other reports that list devices.




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AMP does not provide a Device Uptime report for Aruba Instant devices.

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## Supported Firmware

Aruba Instant APs running software versions 6.1.3.1-3.0.0.x and prior are also supported, including the management of configuration settings and software upgrades. The following table shows when each new version of IAP was initially supported in AirWave.

**Table 1:** *Instant support in AirWave*

IAP Version	Support Introduced In	Support for Instant Config
6.2.1.0-3.4.0.0	AirWave 7.7.2	Partial*
6.2.0.0-3.3.0.0	AirWave 7.6.4	Partial*
6.2.0.0-3.2.0.0	AirWave 7.6.1	Yes
6.1.3.4-3.1.0.0	AirWave 7.5.6	No
6.1.3.1-3.0.0.0	AirWave 7.5.0	No

\*Instant Config is fully supported on Instant 3.2. New features introduced in IAP 3.3 and 3.4 are not currently supported.





## Overview

You can set up Aruba Instant in one of the following ways:

- Manually. See ["Setting up Aruba Instant Manually"](#) on page 9.
- Automatically (through DHCP). See ["Setting up Aruba Instant Automatically"](#) on page 11.
- Using Aruba Activate. Refer to the documentation that accompanies Aruba Activate for detailed information.



If you are using Aruba Activate to set up your devices, the devices will automatically move to the appropriate group if "Autoconfigure New Virtual Controllers" is enabled. If the group is template based, then the device will be configured via templates. If Instant Config is enabled on the group, then Instant Config will be used to configure the devices. In addition, autoconfiguration will wipe out any existing configuration on the device, including the factory defaults. The device will be configured based on the group policy.

The automatic setup is most suited for a multi-site Instant deployment. Both options are summarized here, but refer to the Aruba Instant documentation for more information on setting up the hardware and configuring the network.

For each remote location, an on-site installer is required to physically mount the IAPs, connect to the Aruba Instant SSID, configure the WLAN, configure the names of the IAPs, and enter the information in the first IAP's user interface that will enable communication with AMP.

An AMP administrator sends an Organization String and Shared Secret key along with the AMP IP address to the on-site installer. The AMP administrator later validates the first Virtual Controller's Organization String and its Shared Secret when it appears in the **APs/Devices > New** list. The administrator also enables user roles to administer the Aruba Instant systems, makes any other changes in AMP as necessary.



The first Instant network that is added to AMP includes the 'golden' configuration that is used as a template to provision other Instant networks at other locations as the locations are brought online. It is recommended that the 'golden' configuration is validated and pre-tested in a non-production environment prior to applying it to a production network. Users have the option to add additional devices into managed mode automatically by setting the **Automatically Authorized Virtual Controller Mode** option to **Manage Read/Write** on the **AMP Setup > General** page. Refer to the *AirWave 7.7 User Guide* for more information. It is also important to note that any changes that are made to the template variables will have to be manually applied to each deployed device.

## Setting up Aruba Instant Manually

When setting up Aruba Instant manually, you will be requested to provide an Organization string, the AMP IP address, and a Shared Key. The steps to create this information are described in the following sections:

- ["Creating your Organization String"](#) on page 9
- ["The Shared Key"](#) on page 10
- ["Entering the Organization String and AirWave Information into the IAP"](#) on page 10

### Creating your Organization String

The Organization String is a set of colon-separated strings created by the AMP administrator to accurately represent the deployment of each Aruba Instant system. This string is entered into the Aruba Instant UI by the on-site installer.

The format of the Organization String is Org:subfolder1:subfolder2... and so on, up to 31 characters long. Org, the top-level string, is generally the name of your organization and is used to automatically generate the following (if not already present) in AMP:

- AMP Role: Org Admin (initially disabled)
- AMP User: Org Admin (assigned to the role Org Admin)
- Folder: Org (under the Top folder in AMP)
- Configuration Group: Org

Additional strings in the Organization String are used to create a hierarchy of subfolders under the folder named Org:

- subfolder1 would be a folder under the Org folder
- subfolder2 would be a folder under subfolder1

To create your Organization String, consider the plan of how your Aruba Instant IAPs are to be physically distributed. As a best practice, the Organization String should mirror your company's geographical or internal reporting structure. For example, if you plan to deploy Aruba Instant in four stores in two different cities for Acme Corporation, your Organization Strings might look like these:

- Acme:New York:Times Square Store
- Acme:New York:Queens Store
- Acme:San Francisco:Sunset Store
- Acme:San Francisco:SOMA Store

## The Shared Key

The Shared key is used by the administrator to manually authorize the first Virtual Controller for an organization that appears in the **APs/Devices > New** page in AMP. Any string is acceptable, but this string must be the same for all devices in your organization.




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Always ensure the protection of your organization's shared secret. Knowledge of this shared secret, the organization string, and communication protocol could allow a rogue device to masquerade as an Aruba Instant device.

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At this point, the admin in our example should send the Organization String, Shared Secret key, and AMP IP address to the on-site installers setting up Aruba Instant hardware inside the storefronts.

## Entering the Organization String and AirWave Information into the IAP

For the initial IAP/Virtual Controller set up in each location, the on-site installer logs in to the first IAP's web interface via the Aruba Instant configuration SSID, and navigates to **Settings > AirWave**. The installer then enters the correct Organization String, the AMP IP address, and the Shared Secret key, as shown in [Figure 1](#). Perform the following steps to set up AMP in Instant.

1. Log into your IAP.
2. Click on either the **Set up Now** at the bottom of the UI or on the **Settings** tab in the top right corner. This opens the **Settings** menu.
3. Locate the AirWave section on the **Admin** tab.

**Figure 1** *Aruba Instant > Settings page*

Settings [Help](#)

General Admin RTLS SNMP OpenDNS Uplink Enterprise Domains Walled Garden Syslog L3 Mobility

Local

Authentication: Internal

Username: admin

Password: •••••

Retype: •••••

AirWave

Organization: AirWave

AirWave IP: 10.15.76.165

AirWave backup IP: 10.15.76.166

Shared key: ••••••••

Retype: ••••••••

[Hide advanced options](#) OK Cancel

4. Enter the Organization string, the AirWave IP address, and the Shared key.
5. Click **OK** when you are finished.

## Setting up Aruba Instant Automatically

Instant can be configured automatically using DHCP options 60 and 43.

The Aruba Instant Virtual Controller initiates a DHCP request with the DHCP option 60 string 'Aruba Instant.' If the DHCP server is configured to recognize this option 60 string, it will return an option 43 string containing the organization, AMP IP, and pre-shared key (Organization is optional). The three pieces of information should be specified using comma separators without any spaces. For example,

```
option 43 text "TME-Instant,10.169.240.8,aruba123"
```

The AMP information in the option 43 will be used to connect to AMP, if AMP is not otherwise configured manually on the Virtual Controller.

The organization string can be hierarchical and define sub-folders for different stores. This supports an architecture that is required to manage multiple branches or stores where individual stores can be managed by local administrators.

DHCP server options:

```
ip dhcp pool IAP-Pool
  default-router 10.169.241.1
  option 60 text "ArubaInstantAP"
  option 43 text "Acme:Store1,10.169.240.8,aruba123"
  network 10.169.241.0 255.255.255.0
  authoritative
!
ip dhcp pool IAP-Pool2
  default-router 10.169.242.1
  option 60 text "ArubaInstantAP"
  option 43 text "Acme:Store2,10.169.240.8,aruba123"
  network 10.169.242.0 255.255.255.0
```

authoritative

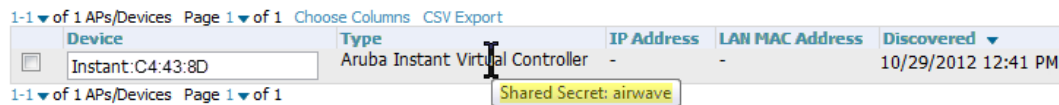
In the example configuration shown above, the following group and folder structure is created on AMP:

- A group called Acme is created.
- A top-level folder called Acme is created.
- Two sub-folders called Store1 and Store2 are created which will contain the IAPs.

## Verifying the Shared Secret

After the role is enabled, the Aruba Instant device will appear in the **APs/Devices > New** page, the admin user should mouse over the value under the **Type** column to verify the device's Shared Secret with AMP, as shown in [Figure 2](#).

**Figure 2** Mouse over the **Type** column to view the Shared Secret



Device	Type	IP Address	LAN MAC Address	Discovered
Instant:C4:43:8D	Aruba Instant Virtual Controller	-	-	10/29/2012 12:41 PM

If the incoming Shared Secret matches the one you created, select **Add**, then **Save and Apply** in the confirmation page.

With an Organization specified, you do not have to select any Group or Folder from the drop-down menus on the **APs/Devices > New** page. In fact, if you do change the Group/Folder drop-down menus, all Organization-specified Virtual Controllers will ignore these values and will use the folder/group values from the Organization String instead. If you select **Add** for some non-Aruba Instant devices as well as some Organization-specified Virtual Controllers, the drop-down menus will apply to the non-IAPs but not the Virtual Controllers. If you have any Virtual Controllers with no Organization specified the first time they communicate with AirWave then they will be placed in the Folder/Group drop-box values you have selected.



## Completing the Setup

After the setup is completed, determine whether the devices in your groups will be managed using template-based configuration or using Instant Config, and then refer to the following sections.

- [Using Template Configuration on page 13](#)
- [Using Instant Config on page 21](#)

Template configuration allows you manage IAP devices with minimal administrative intervention by applying a group-based template configuration to all devices that are added to the group.



Be sure that the default configuration is validated and has been pre-tested in a non-production environment prior to applying it to a production network.

Additional information about creating templates for Aruba Instant is available in the *AirWave 7.7 User Guide*.

### Adding the First Instant Device to AirWave

After the first Instant device receives the AirWave server information from the DHCP server, or after AirWave server information is manually configured, the Instant device appears as a new device in AirWave. As shown, this virtual controller is added in **Monitor Only** mode.

**Figure 3** A new Instant device in AirWave

The screenshot shows the AirWave interface with the 'APs/Devices' tab selected. A red box highlights the 'New Devices: 3' status. Below the navigation tabs, a table lists discovered devices. The first device, 'Instant-08:50:A0', is highlighted with a red box. Below the table, the 'Monitor Only + Firmware Upgrades' radio button is selected.

Device	Aruba AP Group	Type	IP Address	LAN MAC Address	Discovered
<input checked="" type="checkbox"/> Instant-08:50:A0	-	Aruba Instant Virtual Controller	-	-	6/25/2013 2:53 AM
<input type="checkbox"/> Aruba-14:33:C0	-	Aruba S3500-24P	10.15.76.113	00:1A:1E:14:33:C0	6/5/2013 2:08 AM
<input type="checkbox"/> ethersphere-1322-m3	-	Aruba Device	10.100.64.12	-	5/31/2013 6:58 PM

1. Click **Add** to add the device. A Group and Folder do not have to be selected. The Instant device will automatically get added to the new group that was created.
2. Select **Apply Changes Now** to add the Instant device to the group.

### Updating the Instant Template

As stated previously, the first Instant network that is added to AMP automatically includes the default configuration that is used as the template to provision other Instant networks. You can view and, if necessary, edit this template directly on the **Groups > Templates** configuration page.



The **Groups > Templates** page is not available if Instant Config is enabled.



Be sure that the default configuration is validated and has been pre-tested in a non-production environment prior to applying it to a production network. Any changes that are made to this configuration will follow the same process each time and will be applied to other Instant networks.

**Figure 4** *The Instant template editor*

```
version 6.1.3.0-3.0.0
virtual-controller-country IN
virtual-controller-key $guid%
%if ip address%
virtual-controller-ip $ip_address%
%endif%
%if organization%
organization $organization%
%endif%
ams-ip $manager_ip_address%
ams-key $password%
$server_cert_checksum%
$ca_cert_checksum%
$cert_psk%
bid 3
name $hostname%
clock timezone none 00 00
rf-band all

allow-new-aps
$allowed_aps%

arm
wide-bands 5ghz
```

If you want to add additional variables to the template, the Allowed Variables section just to the right of the Instant template editor shows you the set of variables that can be added.

**Figure 5** *Sample Allowed Variables*

The following variables may be used in the template. The value of each variable is configured on the APs/Devices Manage page for each device in the group. Each variable must be surrounded by percent signs: %hostname%. The %if...% statements must be terminated by %endif% and cannot be nested.

**Available Variables:**

allowed_aps	guid
ams_identity	hostname
ca_cert_checksum	ip_address
cert_psk	ip_address_a
clock_timezone	ip_address_a_b
custom_variable_1	ip_address_a_b_c
custom_variable_10	manager_ip_address
custom_variable_2	organization
custom_variable_3	password
custom_variable_4	radius_server_ip
custom_variable_5	rf_band
custom_variable_6	server_cert_checksum
custom_variable_7	syslog_server
custom_variable_8	
custom_variable_9	

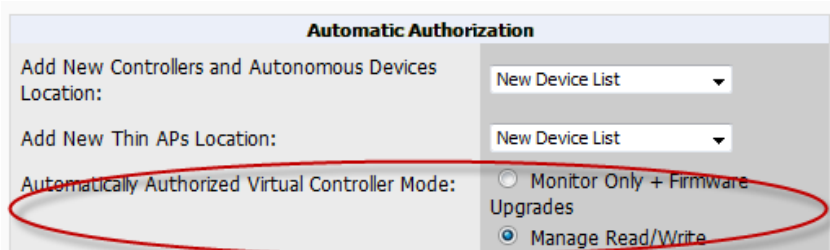
Refer to the *AirWave 7.7 User Guide* or detailed information about templates and variables.

## Adding Additional Instant APs to AirWave

After the first Instant device has been provisioned and set up in AirWave, additional Instant networks in other locations can be added and provisioned automatically. To do this, set the **Automatically Authorized Virtual Controller Mode**

option to **Manage Read/Write** on the **AMP Setup > General** page.

**Figure 6** *Setting devices to Manage Read/Write mode*



The screenshot shows the 'Automatic Authorization' configuration page. It includes fields for 'Add New Controllers and Autonomous Devices Location:' and 'Add New Thin APs Location:', both with a 'New Device List' dropdown. The 'Automatically Authorized Virtual Controller Mode:' section is circled in red and contains two radio button options: 'Monitor Only + Firmware Upgrades' and 'Manage Read/Write'. The 'Manage Read/Write' option is selected.

When the second Instant contacts AMP using the DHCP server options as described previously, and that second Instant device has the same Shared key, it shows up on AMP. Because the devices are in **Manage Read/Write** mode, there is no need for manual intervention to provision these new Instant networks. The new networks will automatically be placed into the same group (if this is the desired configuration), but a new folder will be created to contain these devices.



---

Keep Aruba Instant devices in Monitor Only mode to audit the device and to ensure that configurations are not automatically pushed. This practice is consistent with the rest of AMP.

---

The golden template configuration from the first Instant network is used to provision the second Instant network in the new folder. When provisioning is complete, the status of the device will change from **Verifying** to **Good**.

## Adding Multiple Devices from a CSV File

You can add devices in bulk from a CSV file to AMP. Here you also have the option of specifying vendor name only, and AMP will automatically determine the correct type while bringing up the device. If your CSV file includes make and model information, AMP will add the information provided in the CSV file as it did before. 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
- Auth Password
- SNMPv3 Auth Protocol
- Privacy Password
- SNMPv3 Privacy Protocol
- SNMPv3 Username
- Telnet Username
- Telnet Password
- Enable Password
- SNMP Port

You can download a CSV file and customize it as you like.

1. To import a CSV file, go to the **Device Setup > Add** page.
2. Select the **Import Devices via CSV** link. The **Upload a list of devices** page displays. See [Figure 7](#).

**Figure 7** *Device Setup > Add > Import Devices via CSV Page Illustration*

Upload a list of devices

Location	
Group:	Access Points ▼
Folder:	Top ▼

The list must be in comma-separated values (CSV) format, containing the following columns:

1. IP Address
2. SNMP Community String
3. Name
4. Type
5. Auth Password
6. SNMPv3 Auth Protocol
7. Privacy Password
8. SNMPv3 Privacy Protocol
9. SNMPv3 Username
10. Telnet Username
11. Telnet Password
12. Enable Password
13. 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 Au
10.34.64.163,private,switch1.example.com,Router/Switch,nonradiance
10.172.97.172,private,switch2.example.com,router/switch,nonradiance
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. Select **Choose File** and select the CSV list file on your computer.
5. Select **Upload** to add the list of devices into AMP.

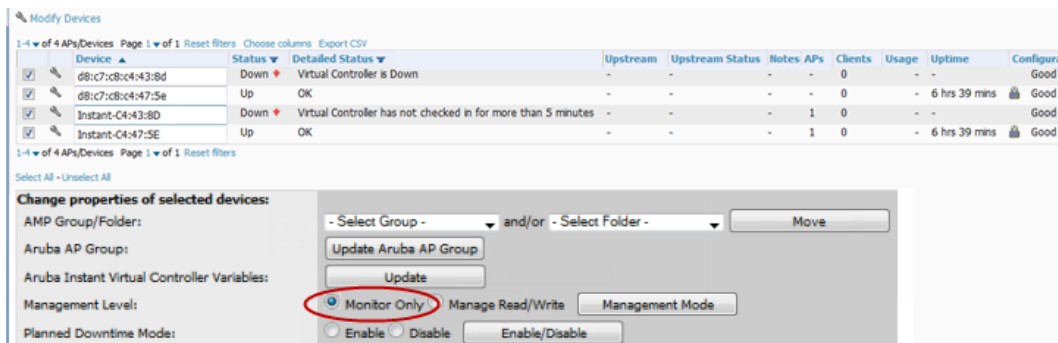
## Changing the Mode to Monitor Only for New Instant Devices

A best practice for using Instant in AirWave is to change the mode for new devices to Monitor Only. This ensures that the configuration for the new devices does not get unintentionally overwritten and is a consistent behavior and practice throughout AirWave.

1. Navigate to **AP/Devices > List** page.
2. Filter the devices by the folder name using the Folder drop down menu on the top portion of the page.
3. Select the **Modify Devices** (wrench) icon, and select all devices.
4. Select the **Monitor Only** radio button.
5. Click the **Management Mode** button. This opens the Confirm Changes page. You can apply the changes now or schedule the change to be applied later.



**Figure 8** *Changing the mode to Monitor Only*



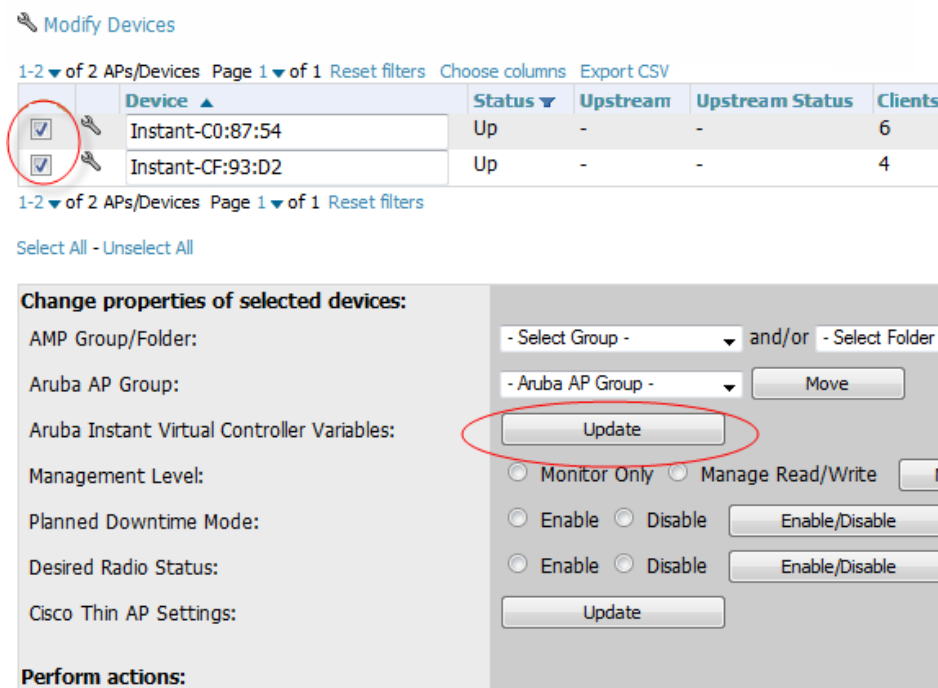
## Editing Variables

AirWave includes support for editing variables on virtual controllers that have different values. Some common variables include Name, LAN IP Address, Syslog Server, Timezone, Radius Servers, and RF Band Selection. AirWave also supports additional generic variables that you can customize (such as adding a new WLAN). The defaults for all VC variables can be changed from the Template page.

Perform the following steps to begin editing variables on virtual controllers.

1. On the **APs/Devices > List** page, select **Modify Devices** (wrench icon), and then select the check box beside the virtual controllers that you want to edit.

**Figure 9** *Select the VCs to update*



2. Click the **Update** button next to the Aruba Instant Virtual Controller Variables field. This opens the Variable Edit page.

Refer to the following sections for information on using the Variable Edit page:

- "Editing Individual Virtual Controller Values" on page 18
- "Bulk Editing of Multiple Virtual Controllers" on page 18

- "Using Custom Variables" on page 19
- "Applying Changes" on page 20

## Editing Individual Virtual Controller Values

After you click **Update** in the Modify Devices form, the Variable Edit screen displays. This screen includes two sections. The lower section includes editable fields. Enter values or select options directly in these fields to make changes on individual controllers. In the example below, the VC names are changed from Instant-C0:87:54 and Instant-CF:93:D2 to Store-00001 and Store-00002 respectively.

**Figure 10** *Change the Individual VC Names*

The screenshot shows the Variable Edit screen. At the top, there is a dropdown menu set to 'custom\_variable\_10', an empty text input field, and an 'Apply' button. To the right of the 'Apply' button is the text 'Please select one or more'. Below this is a table with two columns: 'hostname' and 'clock\_timezone'. The table has two rows. The first row has a checkbox, the hostname 'Store-00001', and the clock\_timezone 'none 00 00'. The second row has a checkbox, the hostname 'Store-00002', and the clock\_timezone 'none 00 00'. Below the table are 'Save' and 'Cancel' buttons.

	hostname	clock_timezone
<input type="checkbox"/>	Store-00001	none 00 00
<input type="checkbox"/>	Store-00002	none 00 00

## Bulk Editing of Multiple Virtual Controllers

The upper section of the Variable Edit page includes a drop down menu of variables that can be used to apply bulk changes to all VCs that you select in the lower section.

Perform the following steps to apply bulk edits.

1. In the edit screen, select the check box beside the virtual controller(s) that will be edited. (See [Figure 11](#).)
2. Select the variable that you want to change from the drop down list in the upper section.
3. Enter or select the new value. In the example below, clock\_timezone is changed to Pacific time for both VCs.
4. Click **Apply** when you are finished making each change. The selected virtual controllers will display the updated information. Follow these same steps for each variable that you want to edit.



The **Apply** button remains disabled until a virtual controller is selected (via its check box).

**Figure 11** *Change the Timezone variable*

clock\_timezone 2 Pacific-Time UTC-08 3 Apply 4 Please select one or more \

1-2 ▼ of 2 Virtual Controllers Page 1 ▼ of 1 Choose columns Choose columns for roles

	hostname ▲	clock_timezone	ip_address
<input checked="" type="checkbox"/>	Store-00001	none 00 00 ▼	
<input checked="" type="checkbox"/>	Store-00002	none 00 00 ▼	

1-2 ▼ of 2 Virtual Controllers Page 1 ▼ of 1

Select All - Unselect All

Save Cancel

## Using Custom Variables

The Variable Edit page includes additional generic fields, labeled as **custom\_variable\_1** through **custom\_variable\_10**. The custom\_variable\_1 field can be used to add multiple lines of text rather than a single entry (as indicated by the larger note field on the UI.) This is useful, for example, if you want to add a new WLAN configuration to a VC. Other variables can be used to enter additional, single support commands.

The process for creating custom variables is the same as that used in editing available variables. To create a custom variable on a single VC, use the horizontal scroll bar (if necessary) to locate the variable you want to edit, and type directly into that field. To add the same custom variable to all virtual controllers, select the check box beside the VCs you want to edit, select the variable from the drop-down menu at the top of the edit page, enter the variable information, and then click **Apply**.



Your template must support or contain the commands and/or configuration that you add using the custom variables in order for any changes to be pushed to your devices.

In the image below, a new WLAN config is added to Store-00001 with the following configuration:

```
wlan access-rule 0ttt
rule any any match any any permit
wlan ssid-profile 0ttt
type employee
ssid 0ttt
wpa-passphrase 8d072cdea5bcec1eaae3cb597975951fbd7d7124120e3217
opmode wpa2-psk-aes
max-authentication-failures 0
rf-band all
captive-portal disable
dtim-period 1
inactivity-timeout 1000
broadcast-filter none
dmo-channel-utilization-threshold 90
```

**Figure 12** *Entering a custom variable (cropped)*

clock\_timezone ▼ Pacific-Time UTC-08 ▼ Apply Please select one or more VCs to apply this setting.

1-2 ▼ of 2 Virtual Controllers Page 1 ▼ of 1 Choose columns

hostname ▲	clock_timezone	ip_address	custom_variable_1
<input checked="" type="checkbox"/> Store-0001	Pacific-Time UTC-08 ▼		wlan access-rule 0ttt 0ttt rule any any match
<input checked="" type="checkbox"/> Store-0002	Pacific-Time UTC-08 ▼		

## Applying Changes

Select **Save** when you are done updating variables.



All changes will be lost if you do not click **Save**.

The **Confirm Changes** page opens, displaying your recent edits. At this point, you can apply changes immediately, you can schedule to apply the changes at a later time, or you can cancel.

**Figure 13** *Confirm Changes page*

Confirm changes:

**Controller "Instant-C0:87:54"**

Extra Device Commands #1 (empty string) ➔ wlan access-rule 0ttt  
rule any any match any any any permit  
wlan ssid-profile 0ttt  
type employee  
essid 0ttt  
wpa-passphrase 8d072cdea5bcec1eaae3cb597975951fbd7d7124120e3217  
opmode wpa2-psk-aes  
max-authentication-failures 0  
rf-band all  
captive-portal disable  
dtim-period 1  
inactivity-timeout 1000  
broadcast-filter none  
dmo-channel-utilization-threshold 90

Name	Instant-C0:87:54 ➔	Store-00001
Timezone	none 00 00 ➔	Pacific-Time UTC-08

**Controller "Instant-CF:93:D2"**

Name	Instant-CF:93:D2 ➔	Store-00002
Timezone	none 00 00 ➔	Pacific-Time UTC-08

Apply Changes Now Cancel

**Scheduling Options**

Specify numeric dates with optional 24-hour times (like **7/4/2003** or **2003-07-04** for July 4th, 2003, or **7/4/2003 13:00** for July 4th, 2003 at 1:00 PM.), or specify relative times (like **tomorrow at noon** or **next tuesday at 4am**). Other input formats may be accepted.

Current Local Time: November 14, 2012 6:21 am CST

Desired Start Date/Time:

Schedule

Selecting **Cancel** returns you to the Variable Edit page, where your latest edits will still be visible. Click **Cancel** again to return to the **APs/Devices > List** page with no changes saved or applied.

Instant Config provides an alternate method for configuring and managing Instant 3.2 or newer devices. (See Note below.) After Instant devices are added to a group, this feature is available when you select **Enable Instant GUI Config** option on the **Groups > Basic** page. When this feature is enabled, the **Groups > Templates**, **APs/Devices > Manage**, and **APs/Devices > Audit** pages are unavailable. Instead, all IAP management is performed from the **Instant Config** pages in AirWave.



Instant Config is fully compatible with devices running Instant version 3.2. Prior versions are not supported. Newer versions (3.3 and 3.4) only include support for those features that are available in 3.2. New features introduced in 3.3 and 3.4 are not currently supported. In addition, Instant devices running different firmware versions cannot reside in the same group. Each group can only include devices with the same firmware version.

Refer to the following sections for more information:

- "Enabling Instant Config" on page 21
- "Buttons and Icons in Instant Config" on page 22
- "Importing Devices for Instant Config" on page 23
- "The Instant Config UI" on page 24
- "Where to Get Additional Information" on page 27

## Enabling Instant Config

The **Groups > Instant Config** pages are not available by default. Perform the following steps to enable this feature.

1. On the **Groups > List** page, click the **Add** button to create a new group.
2. Provide a name for the group, and then click **Add**.
3. On the **Groups > Basic** page, scroll down to the Group Display Options section. Ensure that the **Show Device Settings** for option includes Instant devices. Instant Config is only available for groups that include Instant devices. The following image specifies to include only selected Instant devices.

**Figure 14** *Include Instant devices*

**Group Display Options**

Show Device Settings for: Selected device types

Select Device Types:

- ☐ 3Com
- ☐ Alcatel-Lucent
- ☒ Alcatel-Lucent Instant
- ☐ Alcatel-Lucent Switch
- ☐ Aruba
- ☐ Aruba AirMesh
- ☒ Aruba Instant
- ☐ Aruba Switch
- ☐ Aruba

4. Save and apply changes. Upon completion, you are directed to the **Groups > Monitor** page. Navigate back to the **Groups > Basic** page.
5. In the Aruba Instant section, specify **Yes** for the **Enable Instant GUI Config** option.

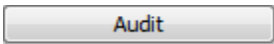




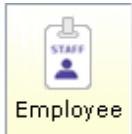




**Figure 15** *Enable Instant Config*

6. Save and apply changes.



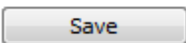
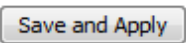

## Buttons and Icons in Instant Config

The table below includes buttons and icons that are available on the Instant Config pages. Many of these are unique to this feature.

**Table 2:** *Instant Config buttons and icons*

Function	Image	Description
Audit		On the <b>AirWave &gt; Config Archive</b> page for a device, select this to audit a device's configuration.
Auditing or applying configuration		Indicates that the devices is undergoing an audit or that a new configuration is being applied.
Cancel		Cancels the current edit or task.
Delete		Deletes a network.
Down		Indicates that a device is down.
Employee Usage		Indicates that the network is used for Employee data.
Filter (Funnel icon)		Filters a list by values of the selected column. To reset all filters in all columns, click the Reset filters link at the bottom of the table.
Guest Usage		Indicates that the network is used for Guest data. This is normally used when captive portal is enforced.
Mismatched		Indicates a mismatched device configuration.
Multi-Edit		Used with text entry fields to perform an edit across multiple devices. This option is only available when the Instant Config focus is the Group. It is not available when viewing devices or

**Table 2:** *Instant Config buttons and icons (Continued)*

Function	Image	Description
		networks.
Note		Drag a note from the menu bar onto the configuration page. Notes that are placed on configuration pages can be used to indicate why you changed an option or setting.
Policy Error		Indicates that AMP is unable to push or compare configurations because the policy version does not match the firmware version
Save		Saves the information on the current page in the AMP database.
Save & Apply		Saves changes to AMP's database and applies all changes. <b>NOTE:</b> Instant Config does not currently allow users to apply individual edits. When you click the <b>Save and Apply</b> button, changes made on other pages that have not been canceled will also be applied.
Voice Usage		Indicates that the network is used for voice traffic. This is normally used when all traffic has to be prioritized.

## Importing Devices for Instant Config

The section "[Enabling Instant Config](#)" on [page 21](#) describes how to set up an Instant Config group. Devices that are added to this group can be managed using Instant Config.



When importing Instant devices in bulk to a new group, AirWave randomly selects the first device that it encounters and uses that as the "golden" configuration. This configuration will then be used across all other Instant networks. A best practice is to select a device that can be used as the golden and add that to the group before any others. New devices that are added after this will include the configuration from that golden device.

### Add Newly Discovered Devices to a Group

Perform the following steps to add a newly discovered device to a group.

1. Select the **New Devices** link in the header (top of the page). This opens the location where all newly discovered devices are displayed. This is normally **APs/Devices > New**, though you may have specified a different location while defining a scan set.

The information on this 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. Refer to the following image.

Figure 16 *APs/Devices > New* page

Home Groups **APs/Devices** Clients Reports System Device Setup AMP Setup RAPIDS VisualRF

List **New** Up Down Mismatched Ignored

To discover more devices, visit the [Discover](#) page.

1-10 ▼ of 67 APs/Devices Page 1 ▼ of 7 > | Reset filters Choose columns Choose columns for roles Export CSV

	Device	Aruba AP Group ▼	Controller ▼	Type ▼	IP Address	LAN MAC Address	Discov
<input type="checkbox"/>	00:24:6c:c0:62:53	default	Aruba3600-138	Aruba AP 105	10.51.84.29	00:24:6C:C0:62:53	6/10/20
<input type="checkbox"/>	00:24:6c:c7:db:39	default	aruba-118	Aruba AP 92	10.6.132.161	00:24:6C:C7:DB:39	6/3/201
<input type="checkbox"/>	6c:f3:7f:c9:8e:c5	default	aruba-118	Aruba AP 105	10.6.132.170	6C:F3:7F:C9:8E:C5	6/2/201
<input type="checkbox"/>	Apsim-AP_040_004	apsim-apgroup	Aruba3600	Aruba AP 105	172.16.0.65	00:03:04:00:00:58	5/24/20
<input type="checkbox"/>	Apsim-AP_040_001	apsim-apgroup	Aruba3600	Aruba AP 105	172.16.0.62	00:03:04:00:00:52	5/24/20
<input type="checkbox"/>	Apsim-AP_020_009	apsim-apgroup	Aruba3600	Aruba AP 105	172.16.0.50	00:03:04:00:00:3A	5/24/20
<input type="checkbox"/>	Apsim-AP_000_011	apsim-apgroup	Aruba3600	Aruba AP 105	172.16.0.32	00:03:04:00:00:16	5/24/20
<input type="checkbox"/>	Apsim-AP_020_000	apsim-apgroup	Aruba3600	Aruba AP 105	172.16.0.41	00:03:04:00:00:28	5/24/20
<input type="checkbox"/>	Apsim-AP_040_008	apsim-apgroup	Aruba3600	Aruba AP 105	172.16.0.69	00:03:04:00:00:60	5/24/20
<input type="checkbox"/>	Apsim-AP_030_009	apsim-apgroup	Aruba3600	Aruba AP 105	172.16.0.60	00:03:04:00:00:4E	5/24/20

1-10 ▼ of 67 APs/Devices Page 1 ▼ of 7 > | Reset filters

Select All - Unselect All

View Ignored Devices

Group: Access Points ▼

Folder: Top ▼

☒ Monitor Only

☐ Manage Read/Write

Add

Ignore Delete

Replace Hardware

2. Select the check box beside the device or devices that you want to add.
3. Use the drop down menus to select the **Group** and **Folder** to which the devices will be added. The default group appears at the top of the Group list.



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

4. Select **Add** when you are done. At this point, you can go to the **APs/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.

## The Instant Config UI

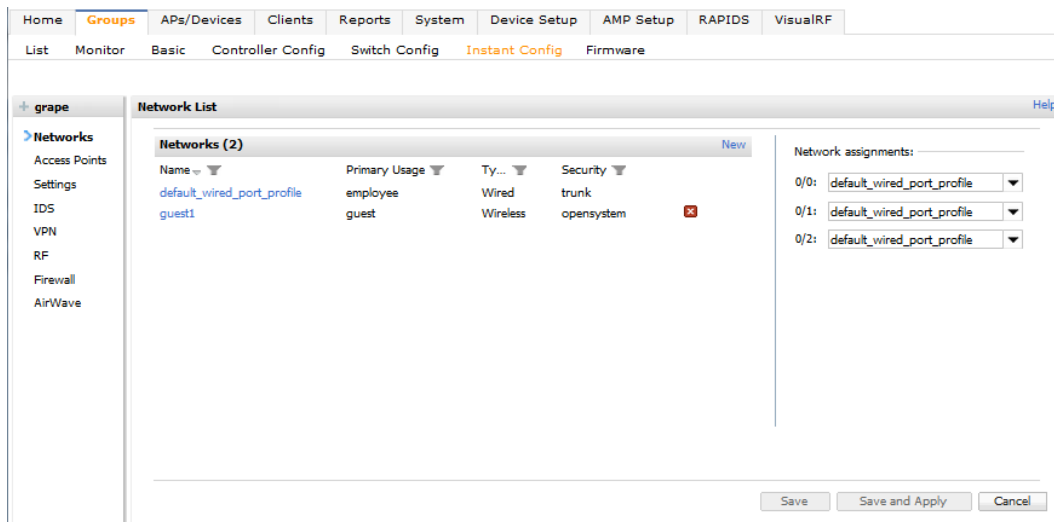
The **Groups > Instant Config** feature allows network administrators to configure Instant access points on the network remotely through AMP. The flow of pages within the Instant Config UI closely resemble the pages available in Aruba Instant.



When performing Instant configurations within AMP, be sure to have a copy of the *Aruba Instant User Guide* available.



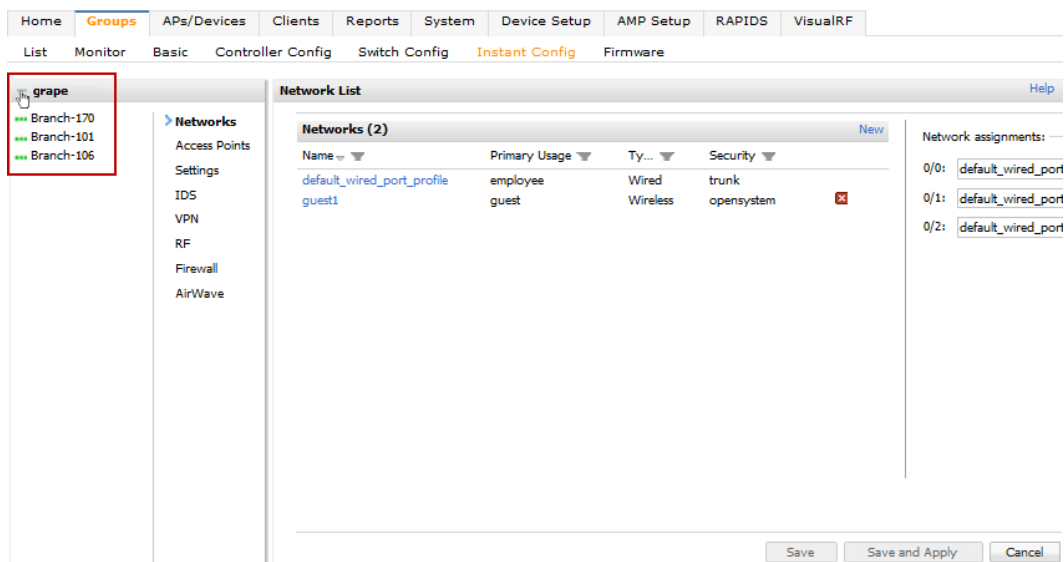
**Figure 17** *Groups > Instant Config*



## Group Focus

The Instant Config page opens in the Group focus. The following image shows a group named "grape." Click the group name to view the available devices.

**Figure 18** *Group focus*

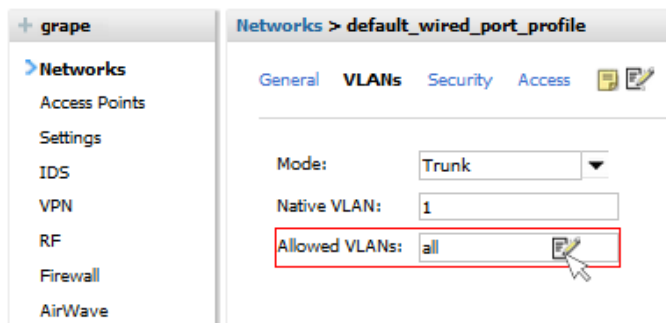


Group focus is used to changes settings and apply those changes to all devices within the group. For text-entry settings, Instant Config includes a unique multi-edit feature that allows you to apply custom settings to multiple devices from a single form.

## Multi-Edit

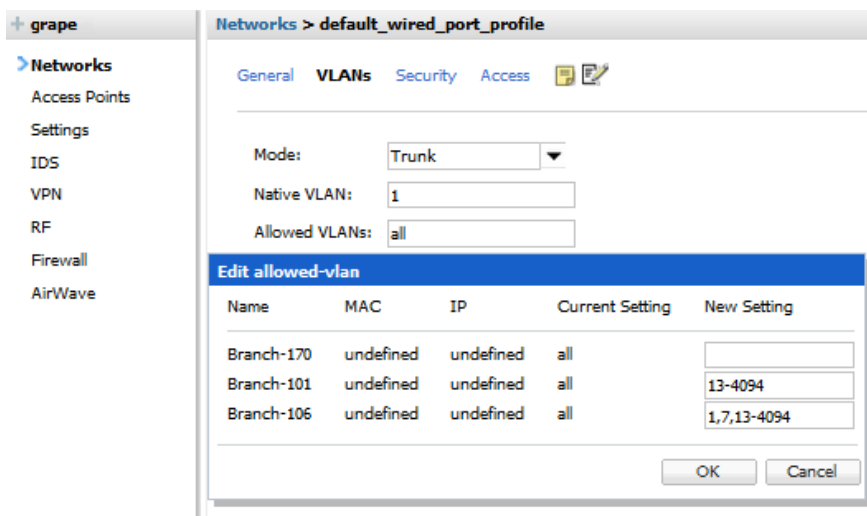
1. In Group focus, click on the multi-edit icon (✎), and drag it to a text-entry field.

**Figure 19** *Using Multi-Edit*



2. Fields that can be edited will be outlined in red when you drag the multi-edit icon. Unclick your mouse to open the multi-edit form. In the image below, the Allowed VLANs option is updated for each device.

**Figure 20** *Multi-edit form*

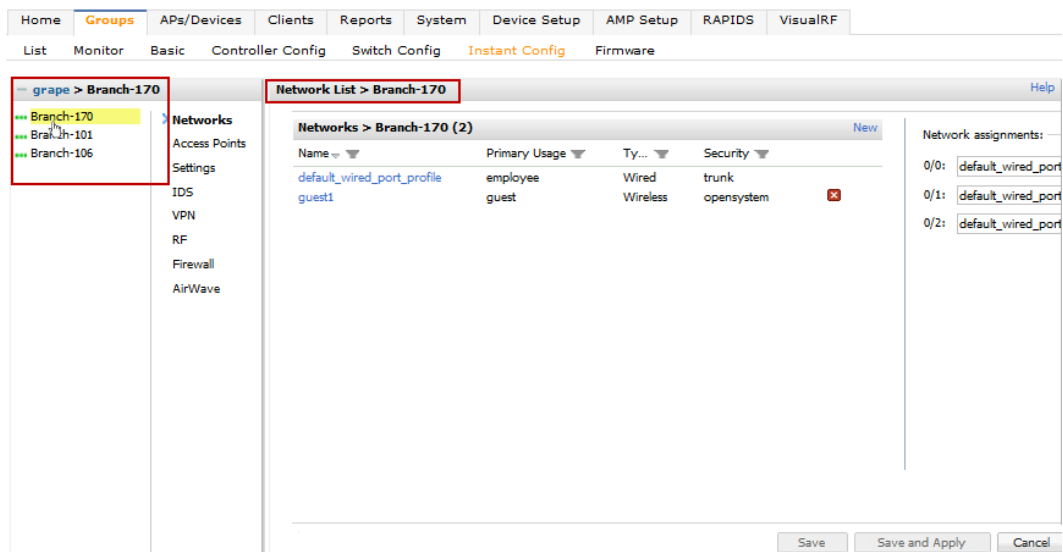


## Virtual Controller Focus

Virtual Controller focus is used to change settings for selected devices. From this page, you can add and configure wired and wireless networks. Select a device from the Group list to change to Device focus. Navigation at the top of the page indicates the currently selected device. The selected device is also highlighted in the list of Devices.

In the following image, Branch-170 device is selected. You can see that the device currently has two networks configured: one wireless and one wired.

**Figure 21** *Device focus*

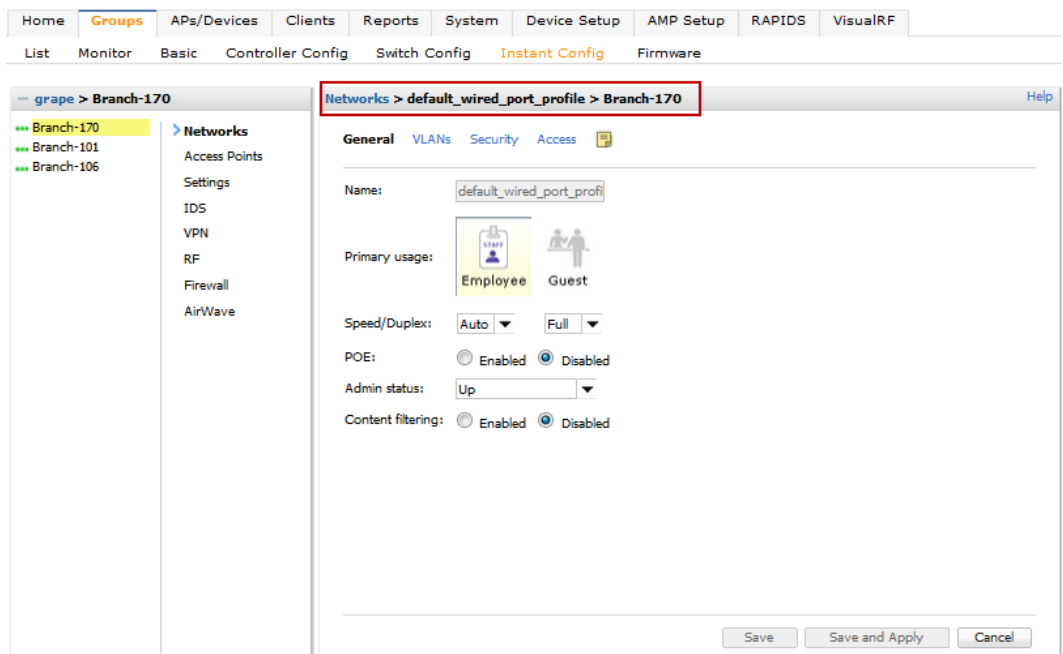


## Network Focus

Network focus is used to configure settings for the networks available on each device, for example, the authentication mode, access point radio settings, VPN settings, etc. From this page, you can also add and delete wired and wireless networks.

The following image shows the General settings for the "default\_wired\_port\_profile" network on the Branch-170 device.

**Figure 22** *Network focus*



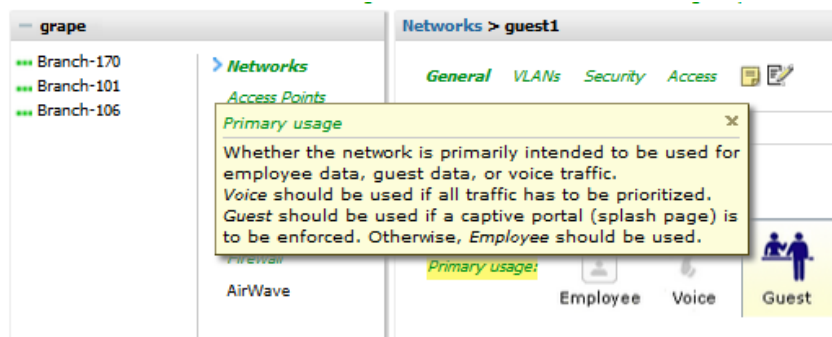
## Where to Get Additional Information

### Field-Level Help

The Instant Config pages include field-level help. Click the Help link ( [Help](#) ) in the upper-right portion of the page to turn on field-level help. Once enabled, the field labels switch to green italics font. Mouse over each field to view the

field-level help.

**Figure 23** *Field-level help*



## Additional Documentation

Refer to the following documentation for additional information

- *Aruba Instant 6.2.0.0.3.2 User Guide*
- *Aruba Instant 6.2.0.0.3.2 Quick Start Guide*
- *Aruba Instant 6.2.0.0.3.2 Release Notes*
- *AirWave 7.7 Release Notes*

The following additional tasks can be completed in AirWave. These include configuration and monitoring tasks.

- ["Resolving Mismatches" on page 29](#)
- ["Enabling the IAP Role" on page 31](#)
- ["Monitoring Devices" on page 32](#)
- ["Run Commands" on page 32](#)

## Resolving Mismatches

After adding a device, the new device will appear in AirWave as two devices: the first is the Virtual Controller for that Instant network, and the second is the access point itself. In some cases, the Instant device shows up as having Mismatched configuration. This occurs when the AirWave information was received from Instant via the DHCP server (i.e, was not manually configured). The method for resolving mismatches varies based on whether Instant Config is enabled.

- ["Resolving Mismatches when Instant Config is Disabled" on page 29](#)
- ["Resolving Mismatches when Instant Config is Enabled" on page 30](#)

### Resolving Mismatches when Instant Config is Disabled

When Instant Config is disabled, configuration for IAP devices is done via the Instant UI. In this case, AirWave is used to monitor the devices, and when necessary, to update the Instant template and variables within the template.

Clicking on the mismatched device opens the audit page of the device, showing the reason for the mismatch. The configuration shows the desired configuration versus the current Instant configuration. As shown in the following image, the AirWave IP address, shared secret, and organization string has to be provisioned on the Instant device.

**Figure 24** *APs/Devices > Audit page*

List Monitor Manage **Audit** Compliance New Up Down Mismatched Ignored

Device Configuration of **Instant-C4:43:8D** in group **TME-Instant** in folder **Top** > **TME-Instant** > **Store1**  
This Device is in monitor-only mode.  
Configuration read from device at 1/13/2012 9:47 AM

Template: Aruba Instant Virtual Controller - 6.1.2.3-2.0.0.3\_31389  
Configuration: Mismatched

Audit: the device's current configuration.

[Refresh this page](#)

Controller Settings	
Template:	allow-new-aps
	allowed-ap d8:c7:c8:c4:43:8d
Desired	ams-ip 10.169.240.8
Desired	ams-key 5d4f50485e4f5048dded7c804bc32e2222cfff541975d4ae
	enet-vlan guest
	mgmt-user admin 5d4f50485e4f50482daf2c017496eb3e
	name Instant-C4:43:8D
Desired	organization "TME-Instant:Store1"
	rf-band all
	syslog-level warn ap-debug
	syslog-level warn network
	syslog-level warn security
	syslog-level warn system
	syslog-level warn user
	syslog-level warn user-debug
	syslog-level warn wireless
	version 6.1.2.0-2.0.0
	virtual-controller-country US
	virtual-controller-key 000c283001c93f1a41ff2a53516b6955dac5f7e22b063891c8

Perform the following steps to resolve the mismatch.

1. Navigate to the **AP/Devices > Manage** page for that Instant device.



The **APs/Devices > Manage** page is not available when Instant Config is enabled.

2. Change the **Management Mode** option to **Manage Read/Write**.
3. Click on **Save and Apply** at the bottom on the page.
4. When the **Confirm changes** page opens, click on **Apply Changes Now** for the changes take effect.

Upon completion, the configuration will be synced to the Instant network. The status of the device will initially display as 'Verifying' during this process. The status will change to 'Good' after the provisioning is successful.



This is the same process for any configuration change sync that is done in future.

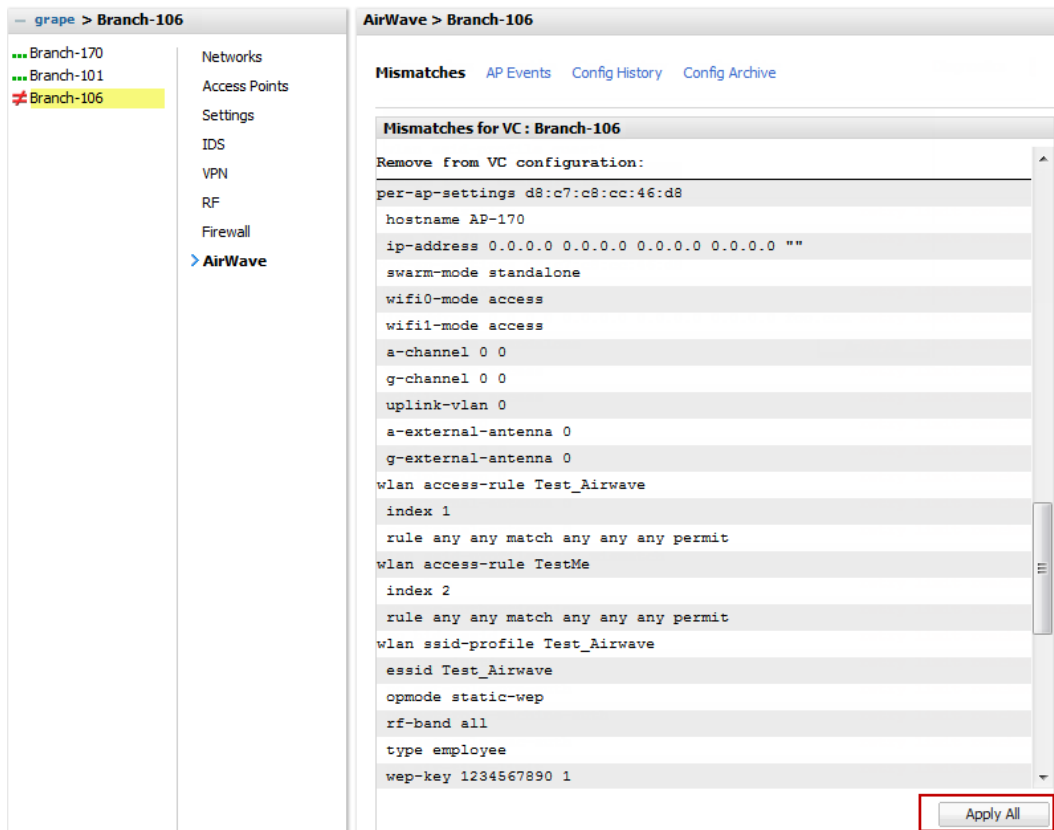
## Resolving Mismatches when Instant Config is Enabled

In Instant Config, mismatches are indicated with a red, unequal symbol (≠) beside the device name. Click on the device name, then navigate to **AirWave > Mismatches** to view the details for mismatch. Click **Apply All** at the bottom of the page to resolve the mismatches.



The **Apply All** button resolves all mismatches. You cannot select individual mismatches to resolve.

**Figure 25** Viewing mismatches in Instant Config



## Enabling the IAP Role

As shown previously, new IAP devices can be added to AMP automatically. In some cases, after a device is added, the Admin may want to enable store-specific access. In this case, the Admin might enable a specific IAP role.

1. Enable the newly created Admin User Role in **AMP Setup > Roles**, as shown in [Figure 26](#).

**Figure 26** Enable Admin User Roles in AMP Setup > Roles

2. In **Groups > Template** for the newly created group, verify the first Virtual Controller's auto-created template.



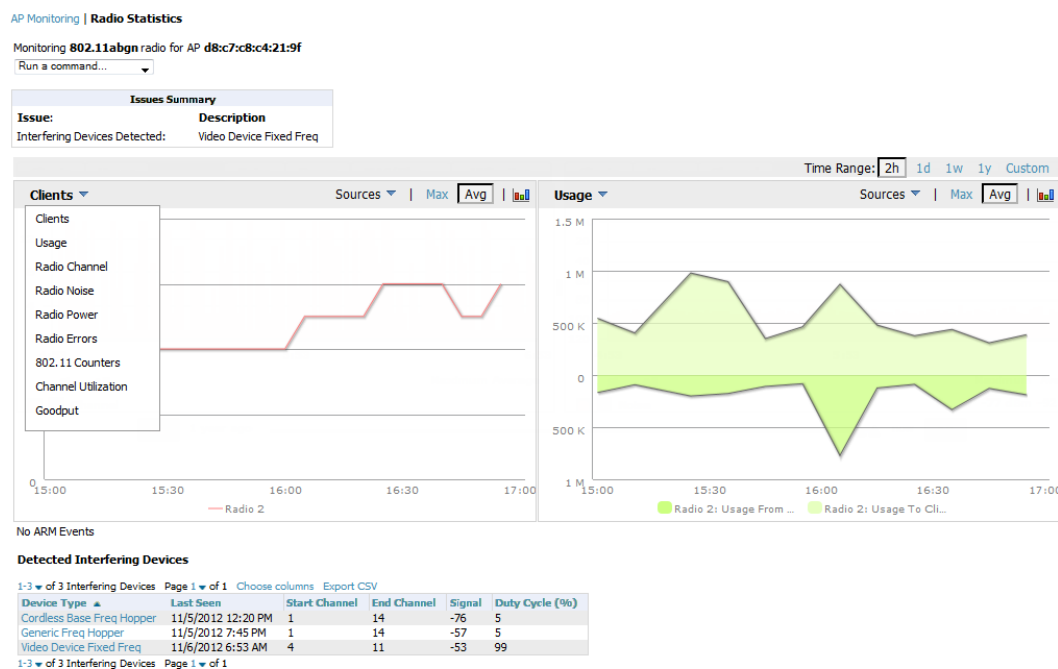
The auto-created template is most useful if the first Virtual Controller for the top-level Organization String is fully configured on-site *before* it is pointed at AMP in the Virtual Controller's UI.

3. Evaluate, approve, or ignore incoming Virtual Controllers with a different top level Organization String and/or Shared Secret in the **APs/Devices > New** list. Subsequent IAPs are auto-authorized if they have an Organization/Shared Secret key that matches the Shared Secret key of any existing authorized Virtual Controller in the top-level Organization String.
4. Set the initial Virtual Controller to **Manage Read/Write** mode and push the good configuration to the subsequent IAPs.
5. Set up AMP users to have access to specific folders, if desired.

## Monitoring Devices

Use the **APs/Devices > Monitor** page to monitor your Instant devices. AirWave provides you with detailed information for your virtual controller, APs, and radios. This information includes spectrum interferers, rogue clients, and channel utilization. The image below shows an example of radio statistics.

**Figure 27** *Monitoring Radios*



## Run Commands

If you are running a minimum of IAP 3.2, then AirWave provides a set of commands that you can run from the virtual controller and from the AP. On the virtual controller, you also have option to run commands for all APs as well as for the current virtual controller.



When you first run a command, the results can take up to a minute to appear. For subsequent commands, the results will appear after one or two seconds.



Figure 28 Run Commands

Monitoring **Instant-C4:21:9F** in group **junyei** in folder **Top > junyei**  
This Device is in monitor-only-with-firmware-upgrades mode.

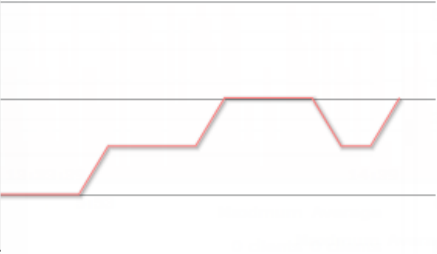
Device Info

Status: Up (OK)  
Configuration: **Mismatched** (The settings on the device do not match the desired configuration)  
Firmware: 6.1.3.4-3.1.0.0-arm\_0  
Upstream Device: - Upstream Port: -  
Controller Role: -  
Type: Aruba Instant Virtual Controller Last Contacted: 6/1/2013 2:  
LAN MAC Address: -  
IP Address: 192.168.1.102 APs: 2  
Run command for VC... Run command for all APs

Run command for VC...

VC 802.1x Certificate  
VC AMP Current State Data  
VC AMP Current Stats Data  
VC AMP Data Sent  
VC AMP Events Pending  
VC AMP Last Configuration Received  
VC AMP Single Sign-on Key  
VC About  
VC Active Configuration  
VC AirGroup Service  
VC AirGroup Status  
VC AirGroup vlan  
VC Allowed AP Table  
VC Application Services  
VC Auth-Survivability Cache  
VC DHCP Option 43 Received  
VC Global Alerts  
VC Global Statistics  
VC IDS AP List

Sources | Max Avg |





This section describes some best practices to follow when using AirWave to monitor and configure Instant devices. It also includes some known issues to take into consideration when using AirWave. This list is inclusive of the AirWave Release Notes and of the Instant Release Notes.

## Best Practices

- Keep Aruba Instant devices in Monitor Only mode to audit the device and to ensure that configurations are not automatically pushed. This practice is consistent with the rest of AirWave.
- Be sure that the default configuration is validated and has been pre-tested in a non-production environment prior to applying it to a production network. Any changes that are made to this configuration will follow the same process each time and will be applied to other Aruba Instant networks.
- If you modify a device's configuration through the Instant user interface, we recommend that you put the device in Manage Mode, and then use the **Import Settings** button from the **APs/Devices > Manage** page. When using this method instead of Instant Config, you can import settings and update the template from a single page. Import the settings and then wait approximately a minute. If you find that you need to also update the template, the **APs/Devices > Manage** page for the VC provides a link to quickly access the Template.

## Known Issues with the Aruba Instant Integration with AirWave

- If the Organization String configured on the Instant device is different than what is statically written in the template, AirWave will overwrite the configured Organization String to match the template.
- The Instant primary device sends an update message to AirWave every minute. If the send fails, then the device will continue to send a state message every two seconds. If the send fails 25 times, then Instant will determine that AirWave is down.

