

# Aruba IAP 解决方案

hao liu

# • IAP Introduction

# • WLAN Configuration demo

- VLAN
- DHCP
- Authentication
- Firewall
- AirGroup
- ARM
- Roaming
- MESH
- VPN
- IPS/IDS
- IoT

# • Operation & Troubleshooting

# 无线网络架构

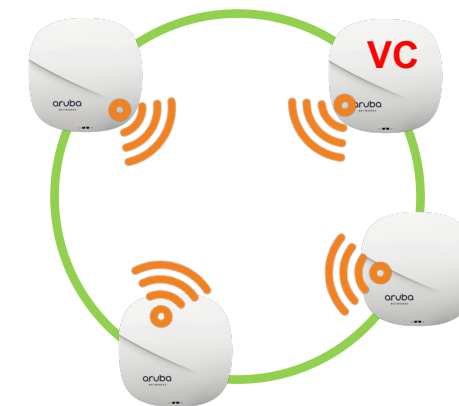
SMB市场



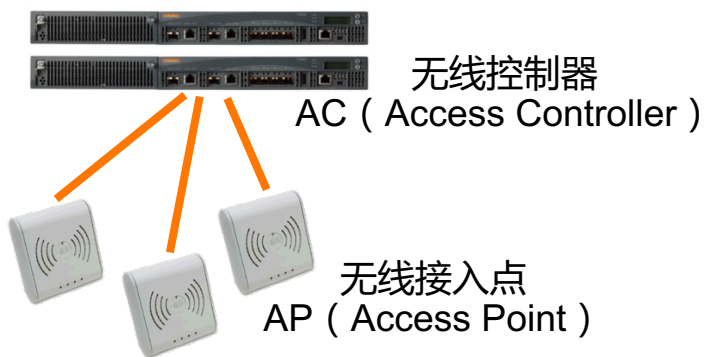
企业市场



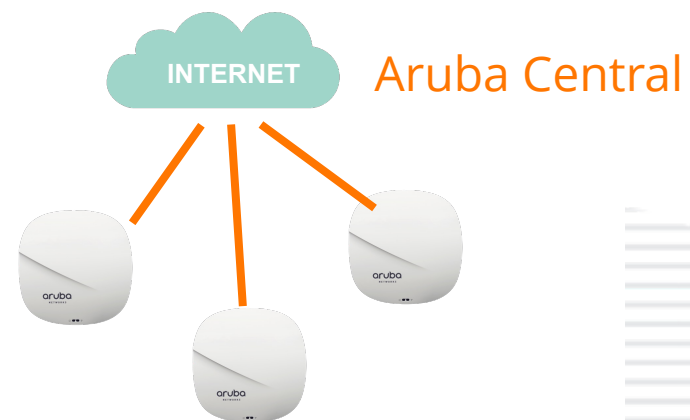
独立工作 ( Standalone )



虚拟控制器  
( Virtual Controller/Mesh/Wired )



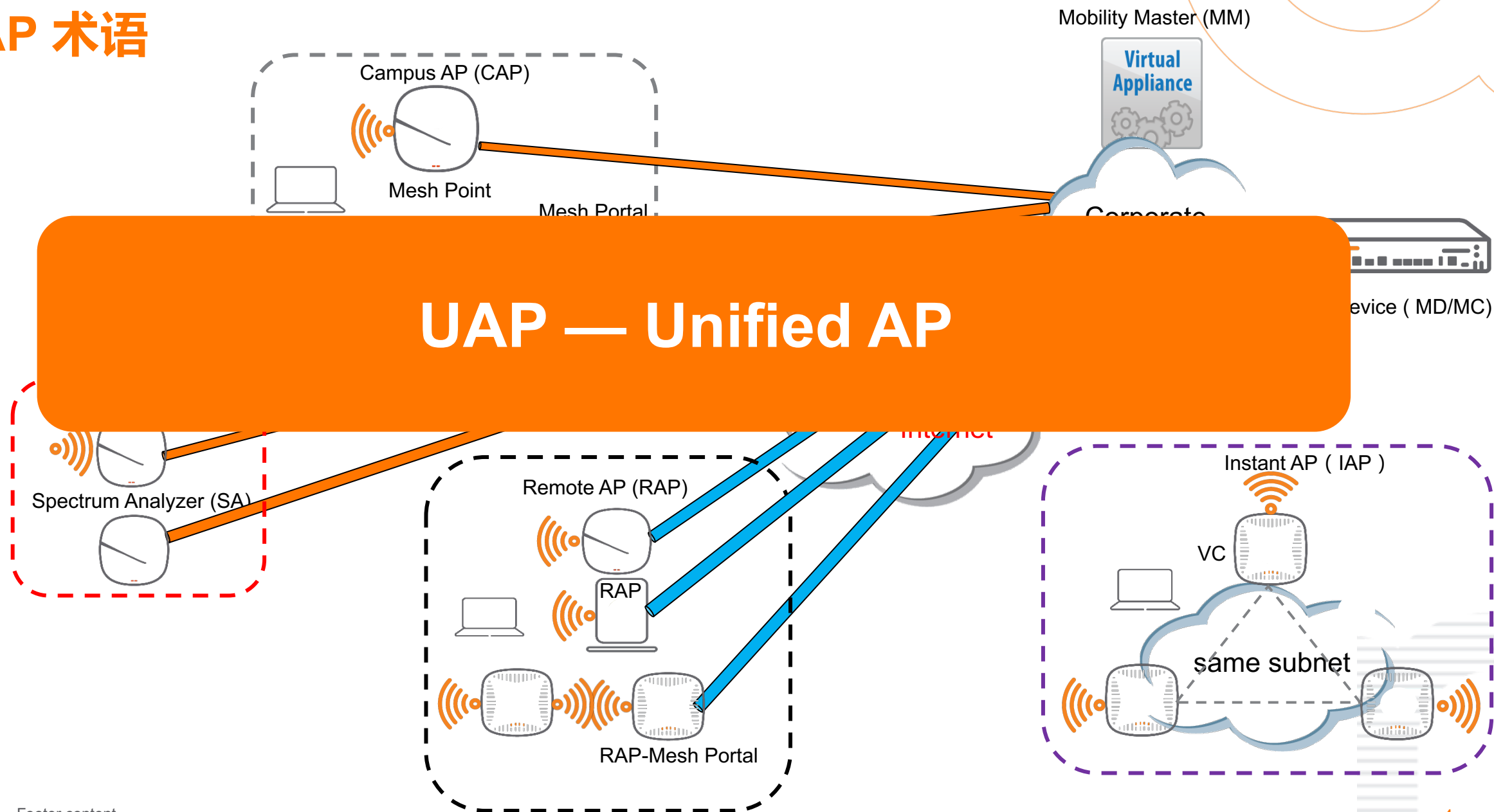
控制器架构



云架构



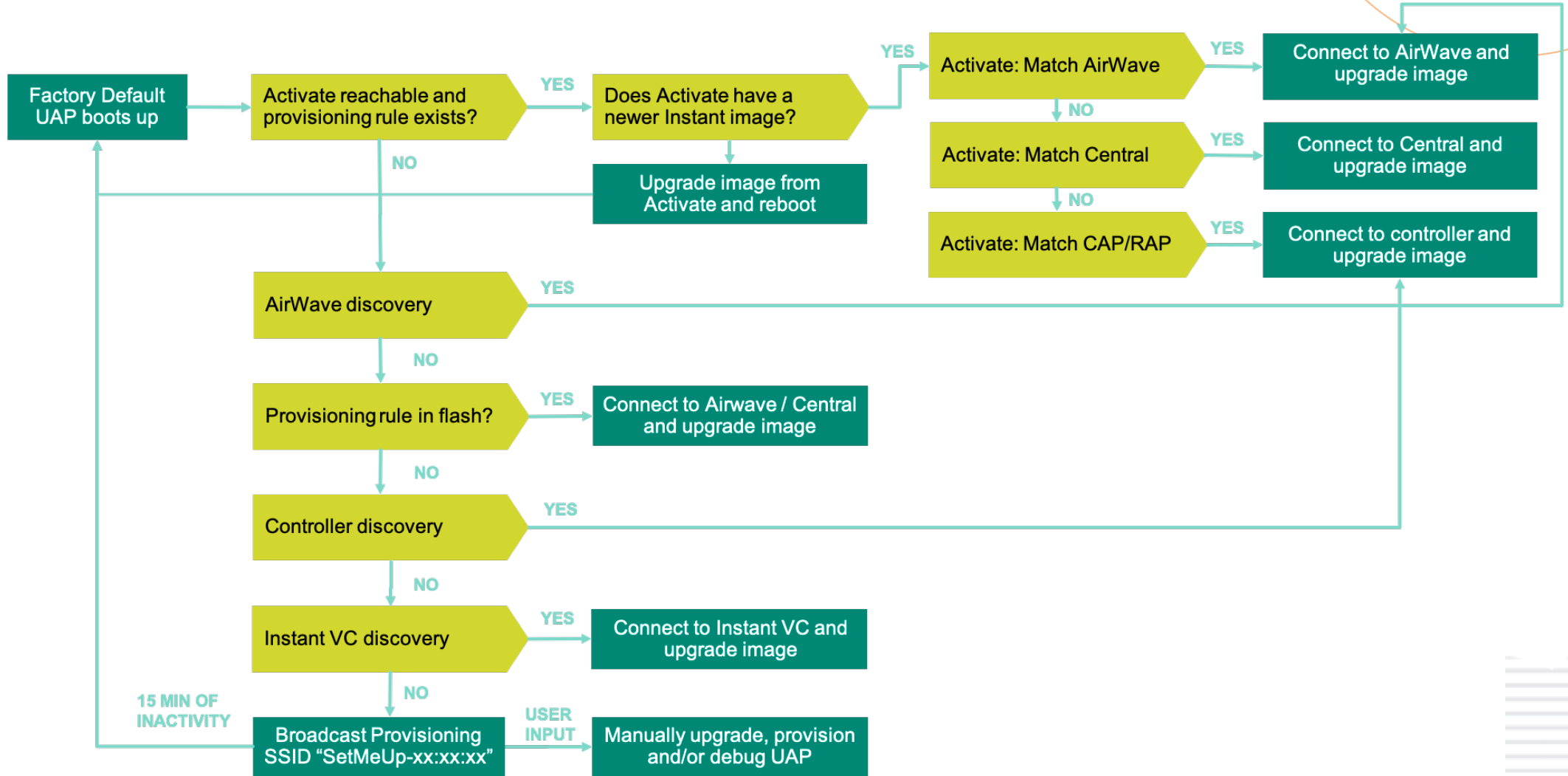
# AP 术语



## UAP — Unified AP



# UAP Discovery Process





# IAP Clusters

## Radio Features

- Adaptive Radio Management
- Client Match
- Spectrum analysis

## Firewall

- Stateful firewall / User based roles / WLAN based rules
- Extended actions / Voice ACLs / AppRF (Layer 7)

## Services

- WLAN 802.1X, MAC auth, captive portal
- OS fingerprinting
- Cloud based content filtering (OpenDNS, Brightcloud)
- Webcc
- IoT
- WiFi Calling

## IDS / IPS

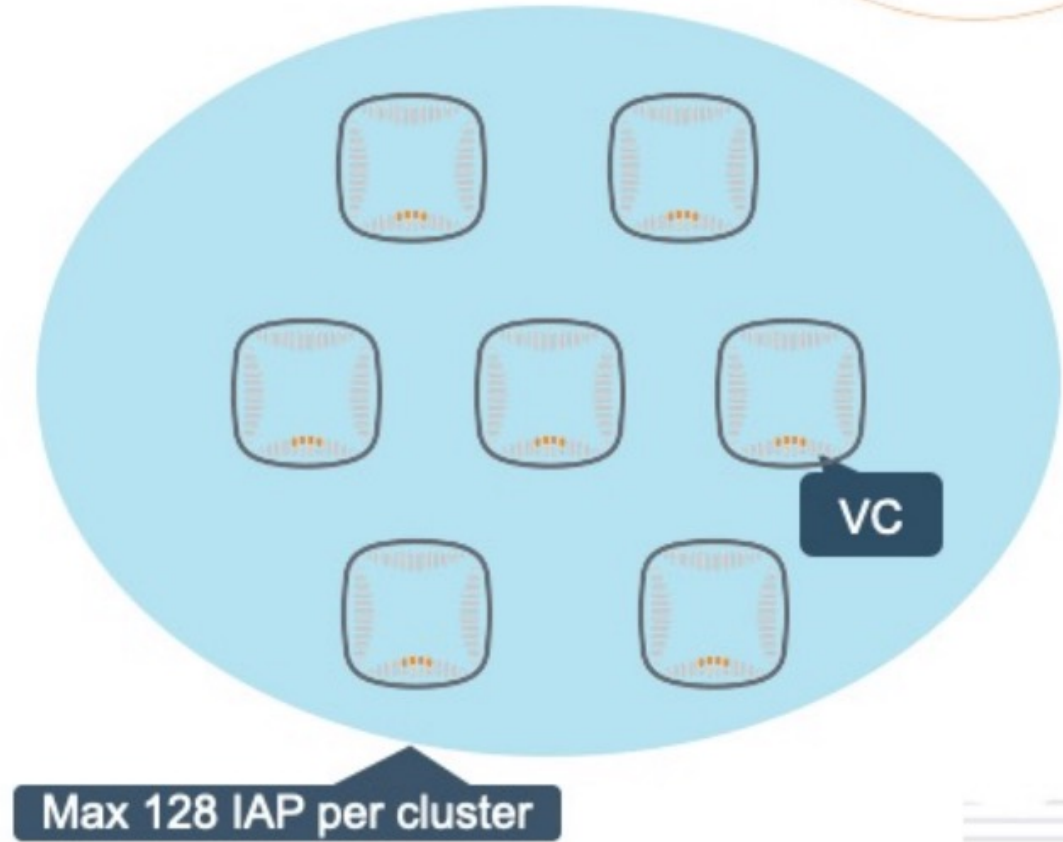
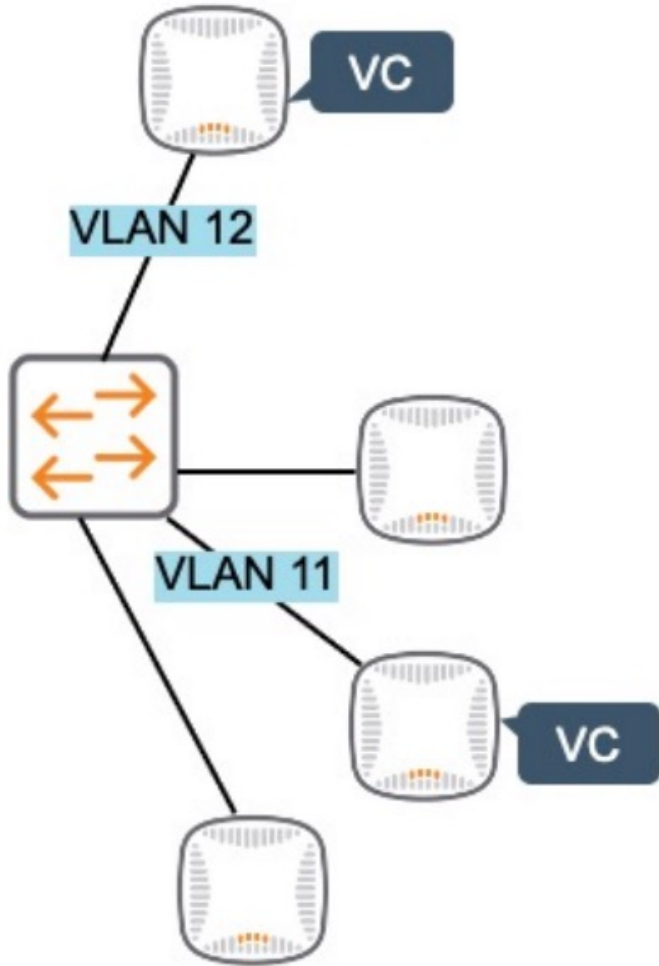
- Rogue AP detection and classification

## Management

- AirWave integration
- Aruba Central cloud-based management
- Activate automates deployments



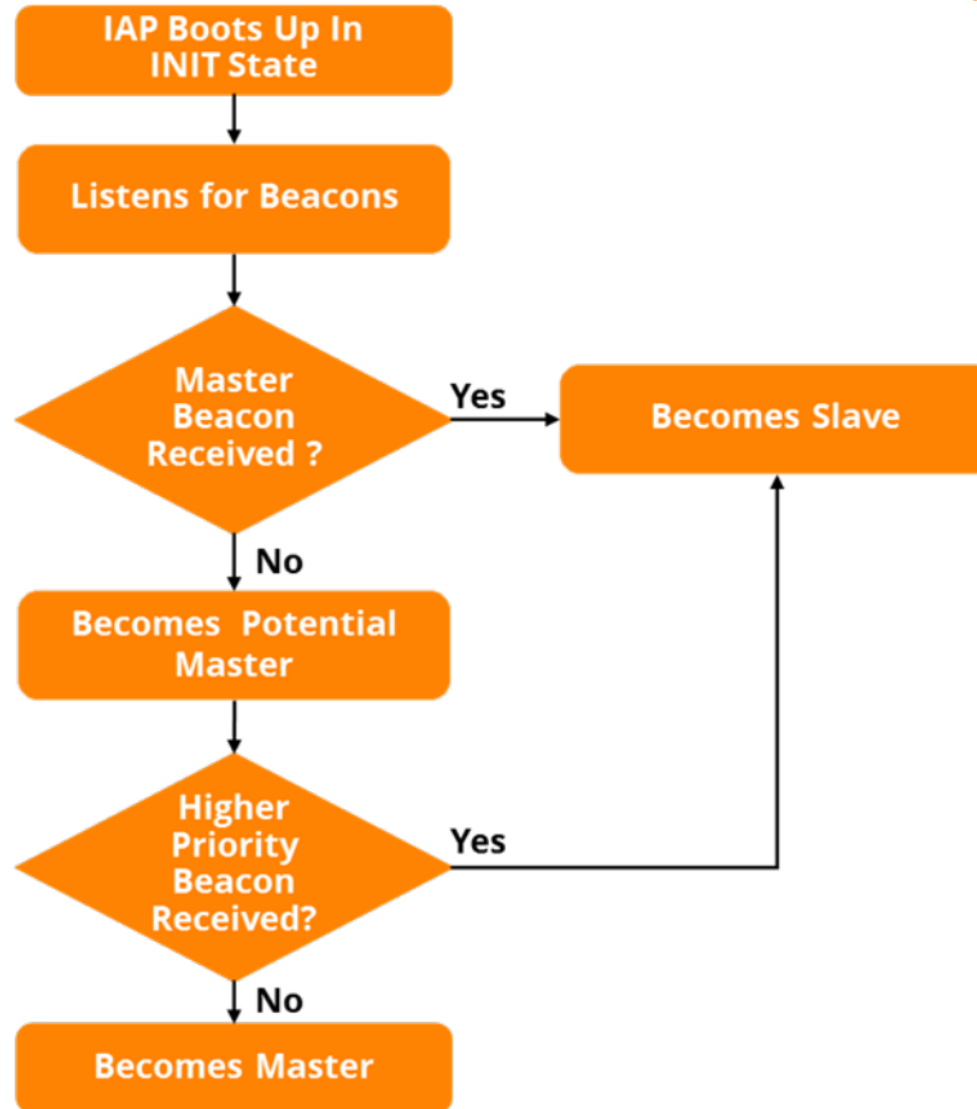
# Aruba Instant VC Cluster



# Master Election Process

IAPs are capable of operation in one of 4 possible states:

- Initial
- Slave
- Potential Master
- Master





# Conductor Election Protocol

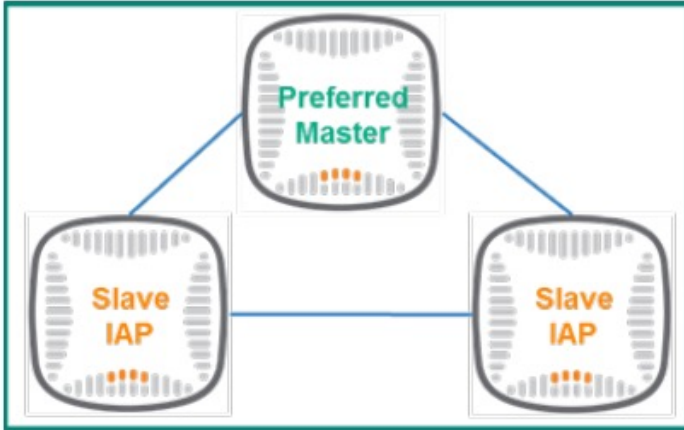
Election beacons  
are broadcast and  
unicast L2 frames

An IAP is elected as a  
conductor by

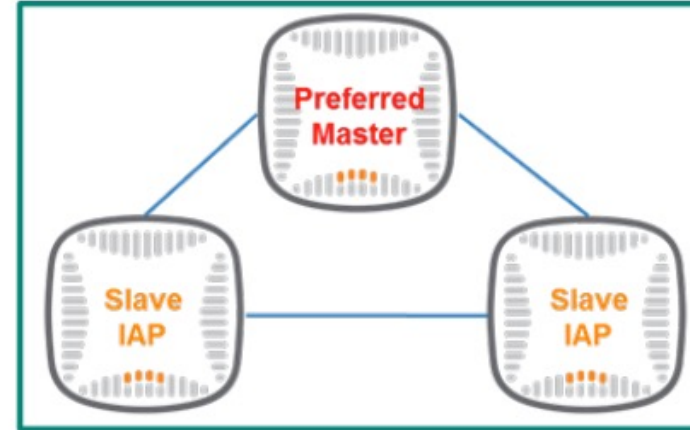
- Enforced
- Random Intervals
- Versus Policy



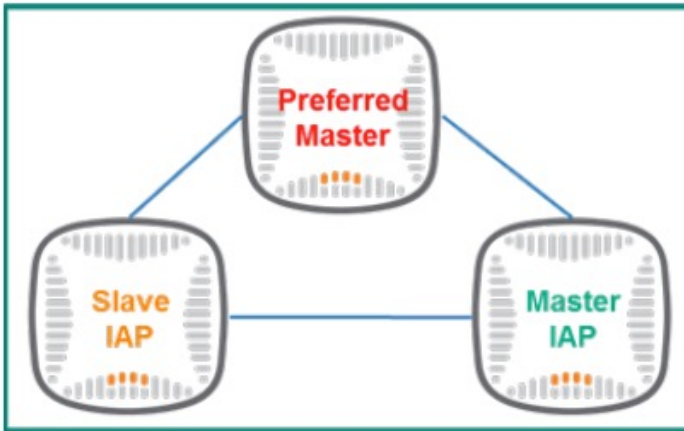
# Preferred Master



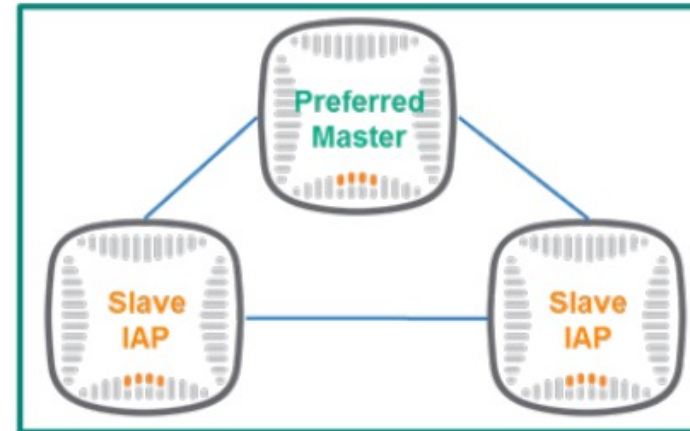
Preferred Master Designated



Preferred Master Fails



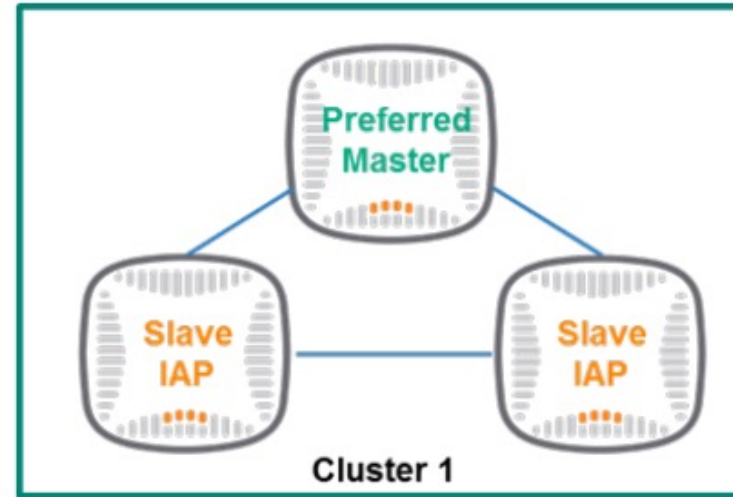
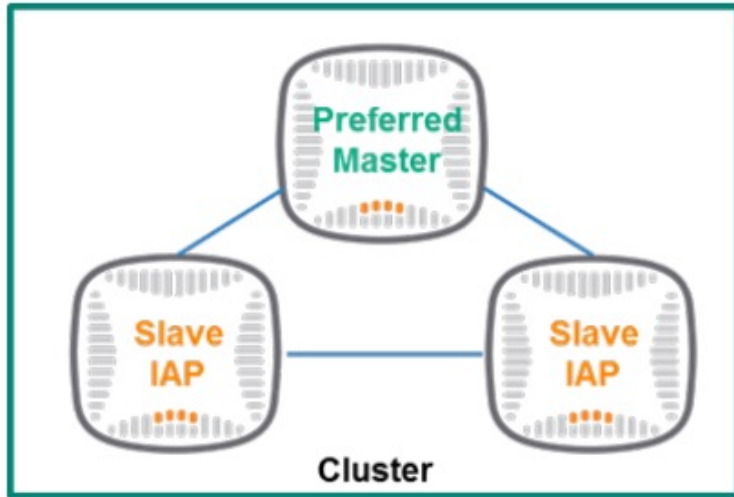
New Master Elected



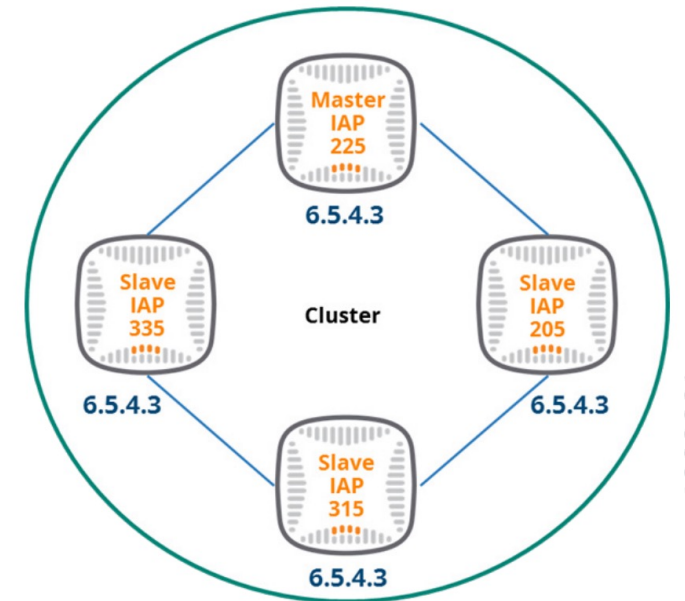
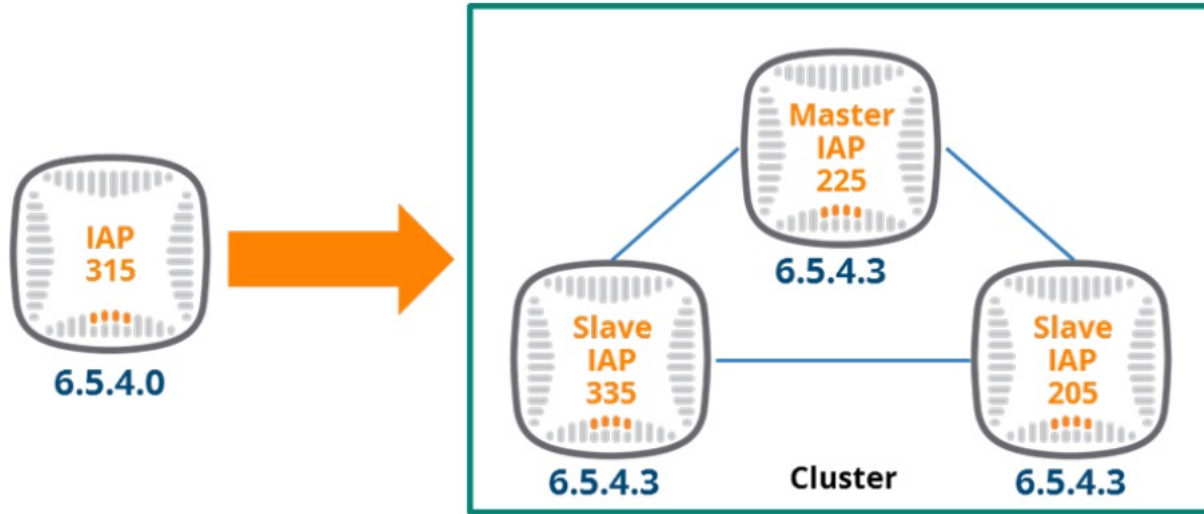
Preferred Master Restored



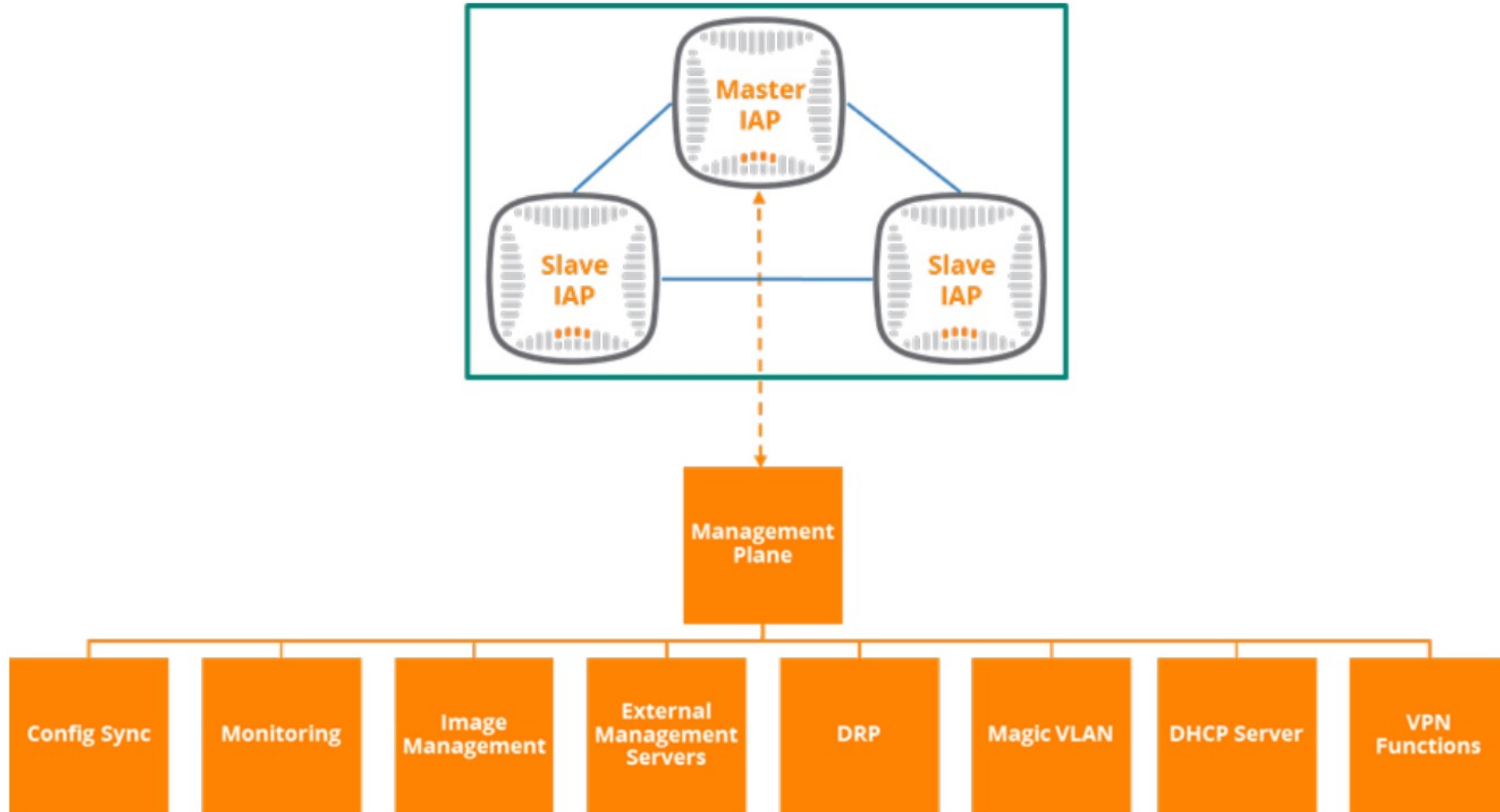
# Multiple Preferred Masters



# Multi-model AP Cluster

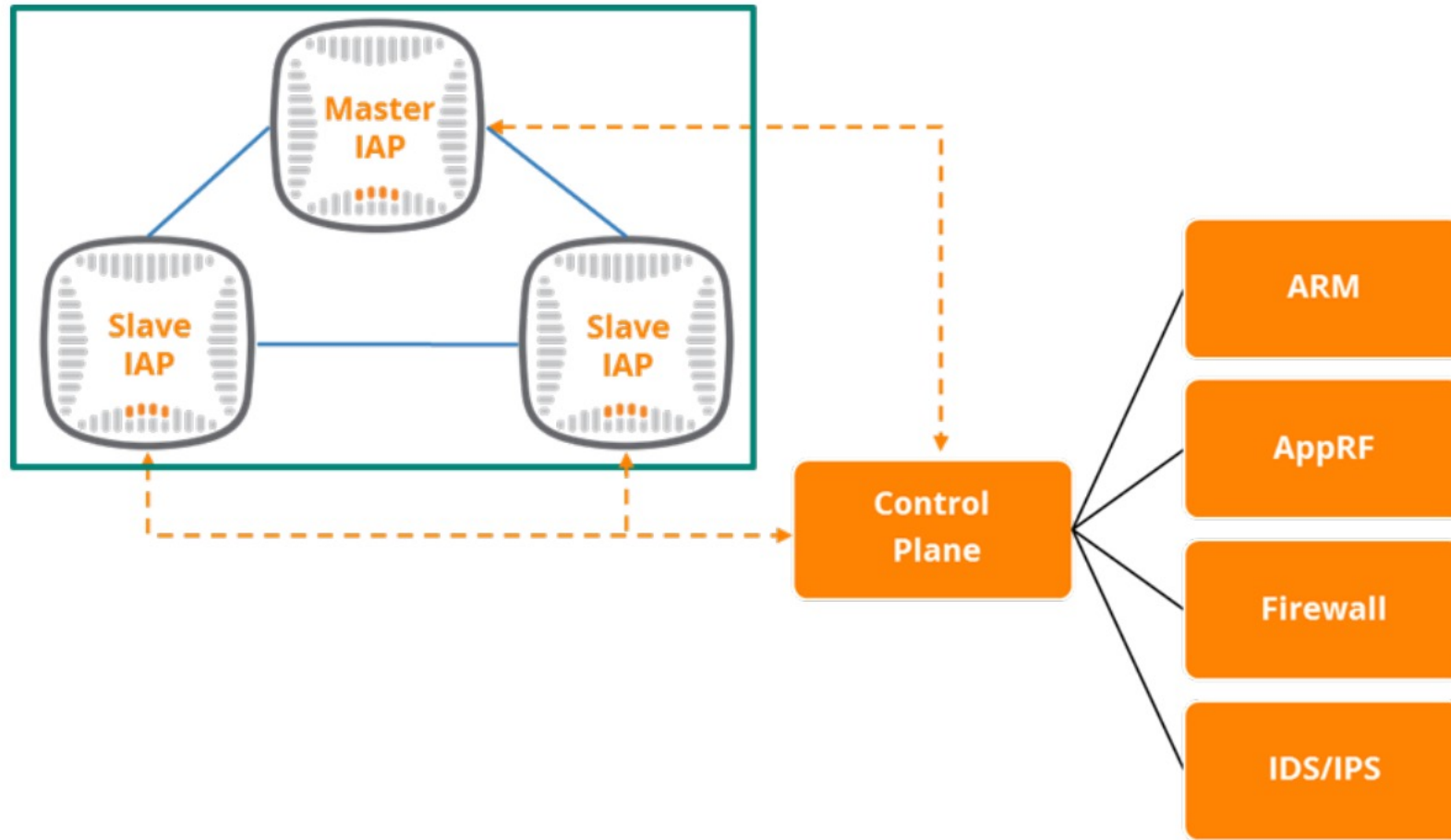


# Management Plane

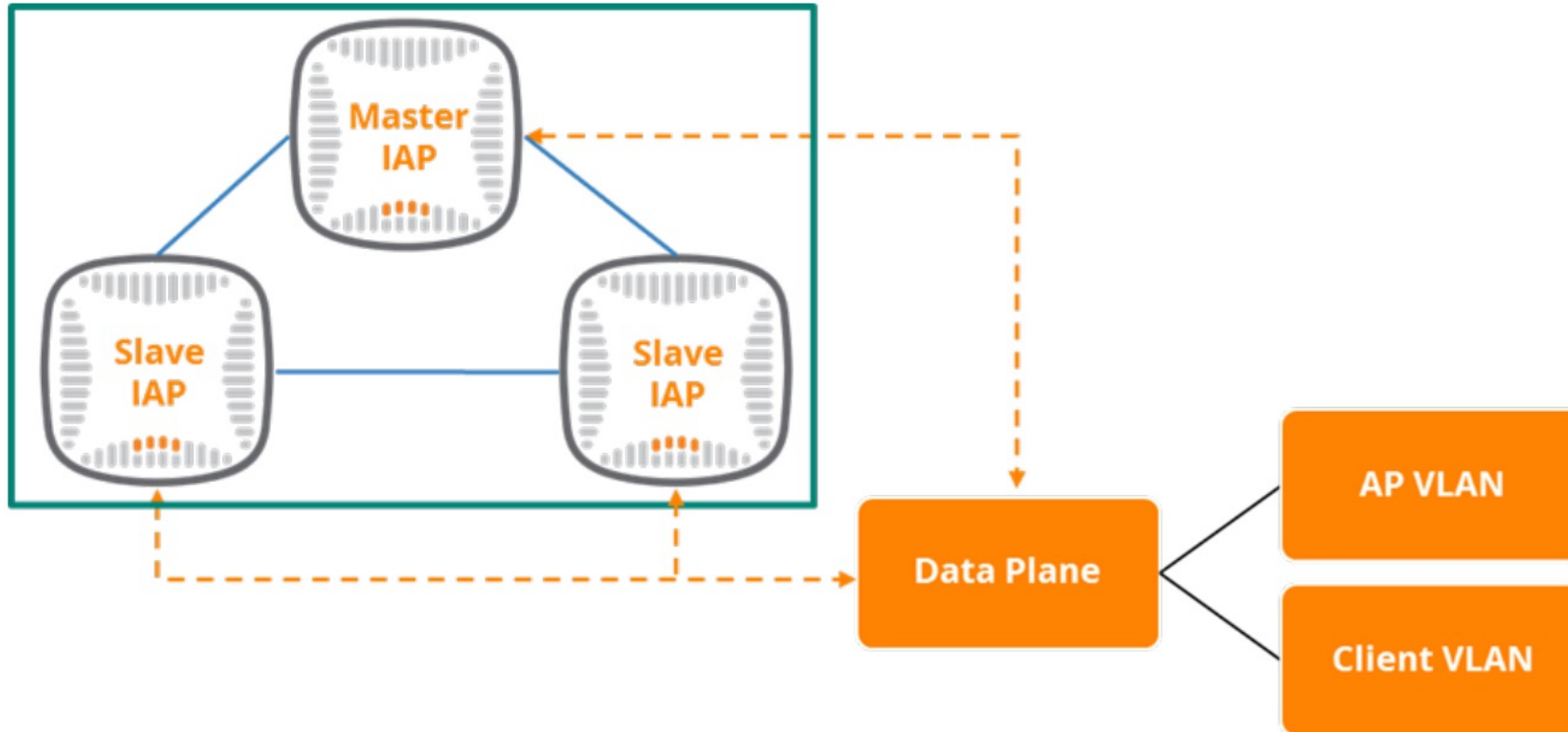




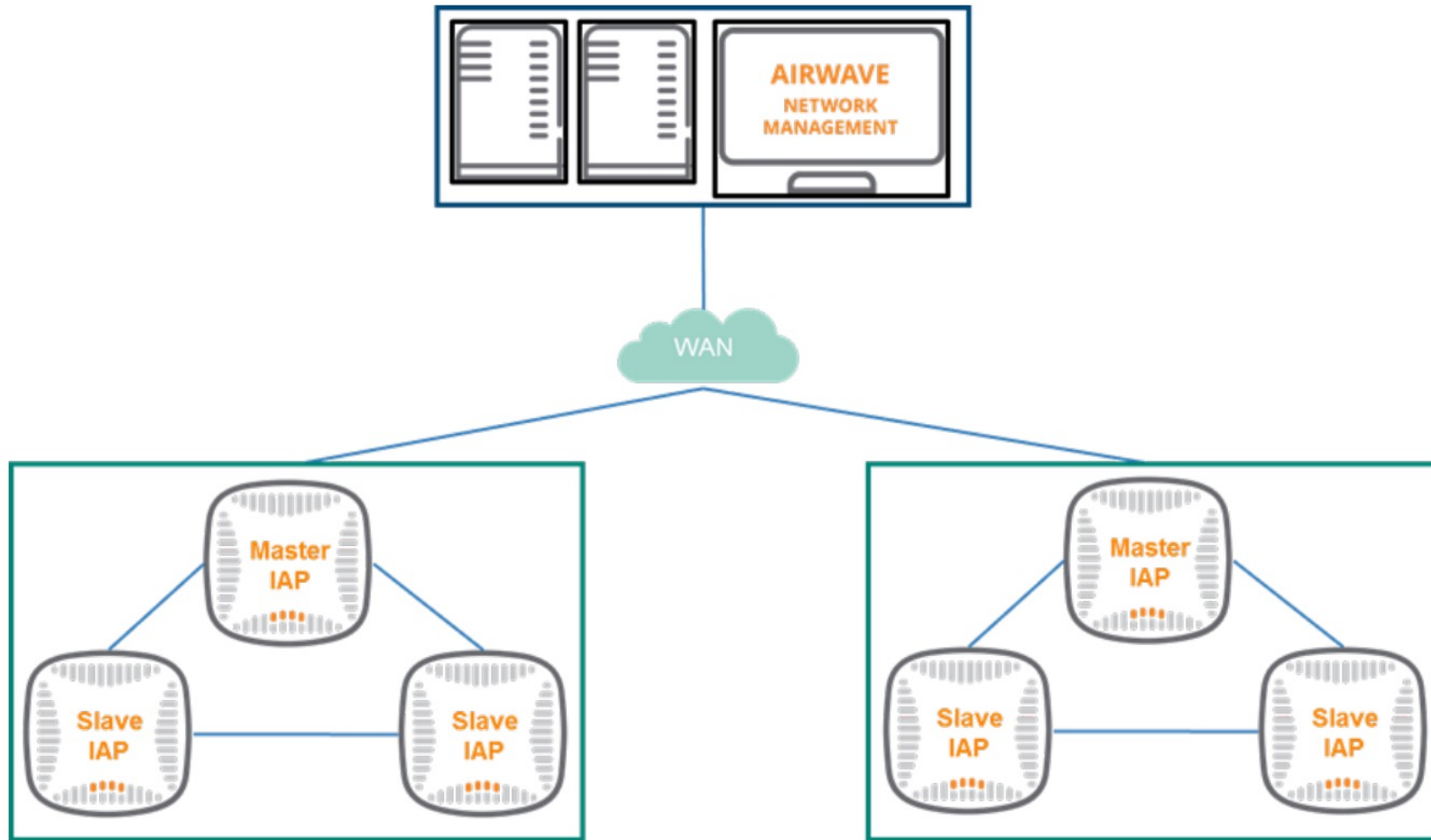
# Control Plane



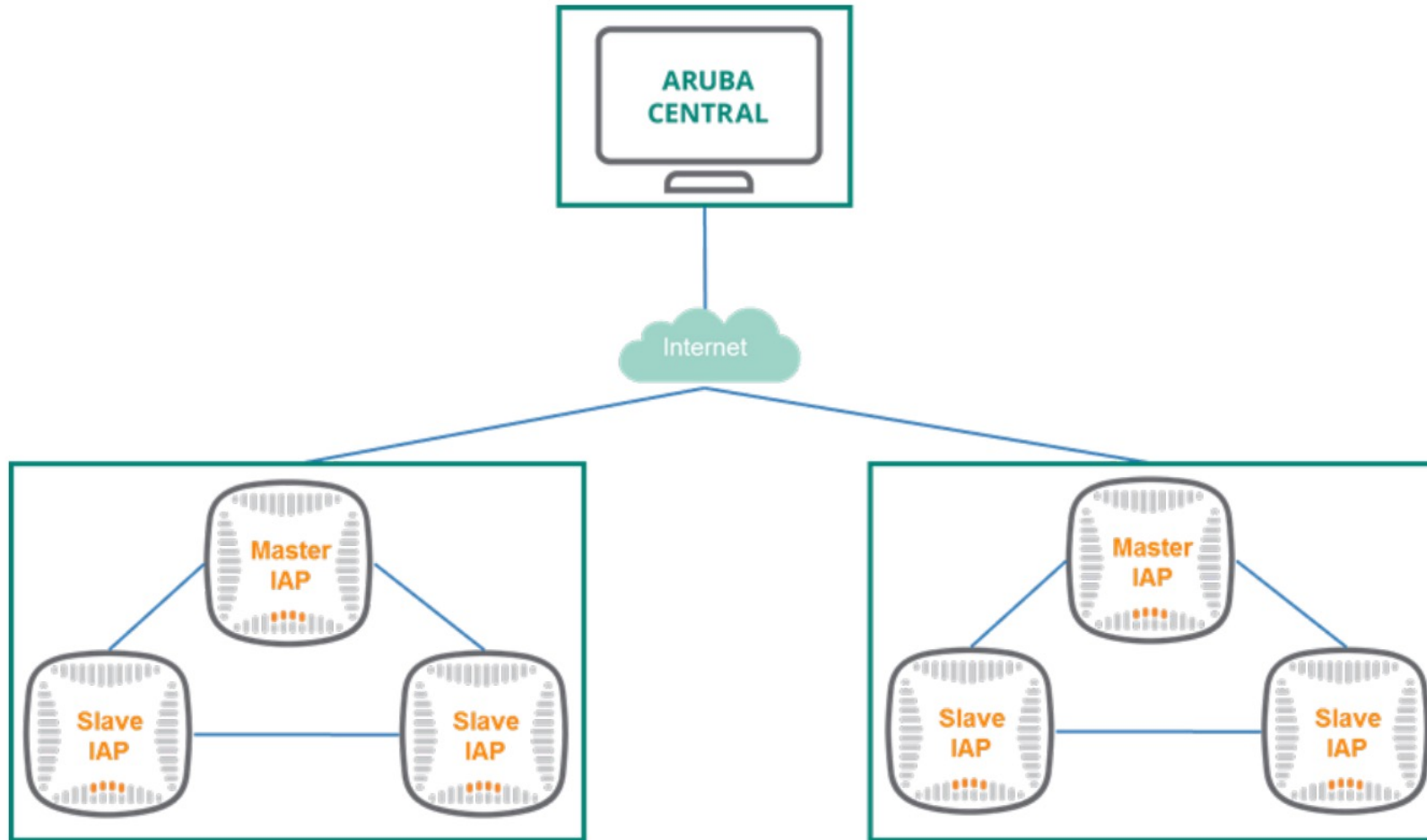
# Data Plane



# Management Options — Airwave



# Management Options — Central\*

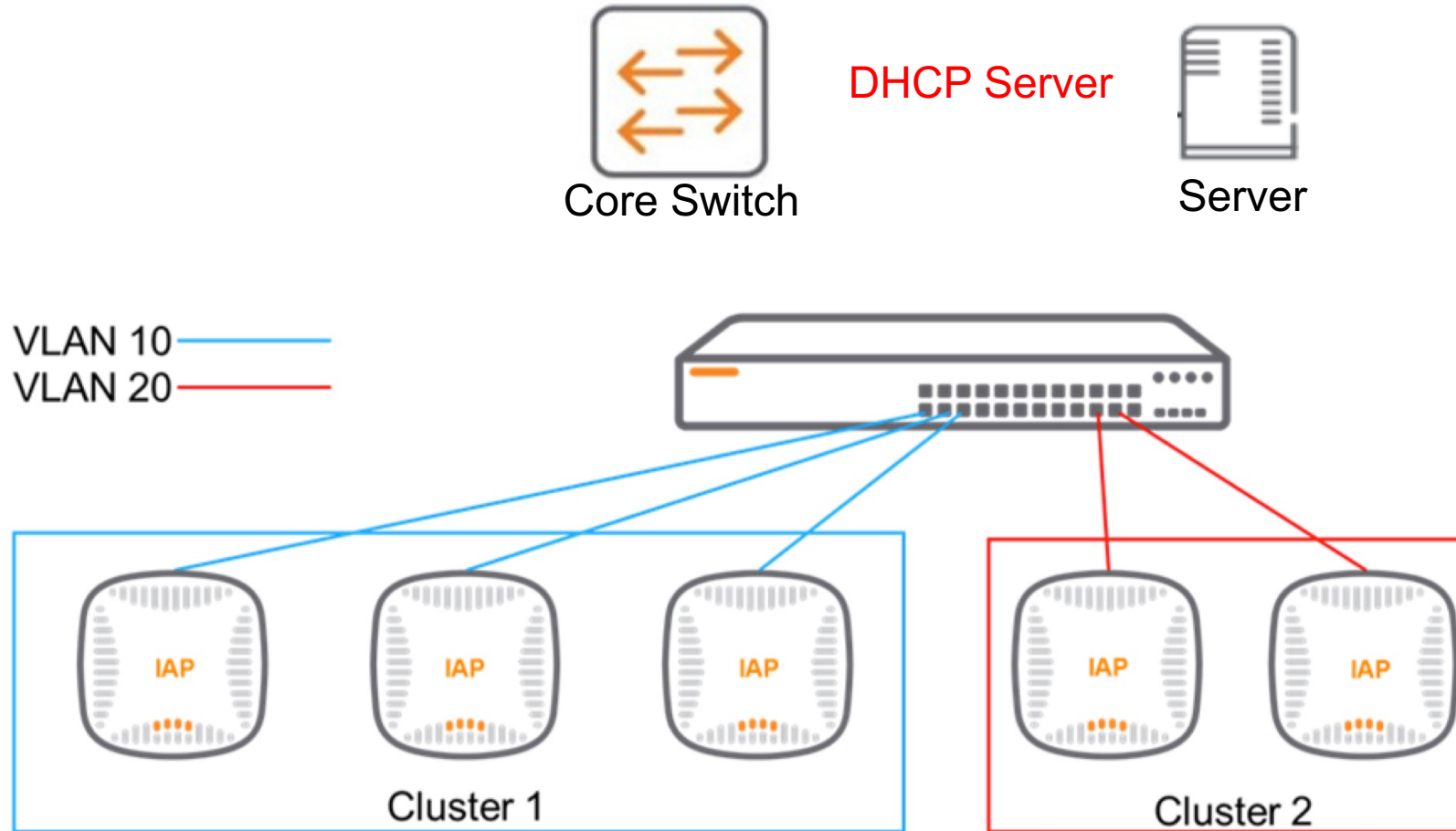


# WLAN Configuration - Local

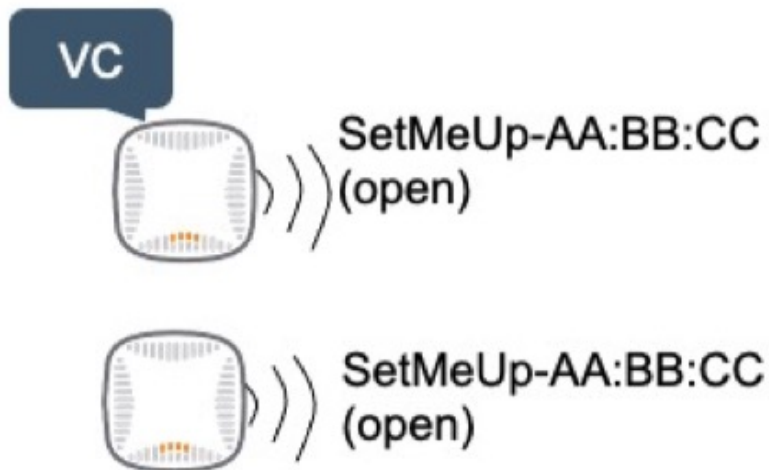




# Deployment



# Local Initial Setup



<http://instant.arubanetworks.com>

aruba  
a Hewlett Packard Enterprise company

Welcome to Instant

admin 用户名 admin

Password 密码 SN大写

Log In

English

- العربية
- Deutsch
- ✓ English
- Français
- Hungarian
- Italiano
- Japanese
- Korean
- Русский
- Español
- Turkish
- 简体中文
- 繁體中文

Enable Cloud Management

Free 90-day cloud management for your Wi-Fi Network

- Anytime/Anywhere network visibility and troubleshooting
- Centralized management and zero-touch config for dispersed Wi-Fi networks
- Network summary reporting for both APs + Switches
- Upcoming Features: Visitor Management, Application level visibility and control, Network heat map

Activate Your 90-Day Free Trial of Aruba Central

OK



也可以通过uplink IP直接访问，默认跳转VC地址

# WLAN Wizards

1

Basic

2

VLAN

3

Security

4

Access

Name  
Employee  
Voice

Guest



Virtual Controller Assigned

Default  
Custom

Network Assigned

Default  
Static  
Dynamic



Enterprise  
Personal  
Open

Captive Portal



Role Based  
Network Based  
Unrestricted

# VLAN Assignment

Create new network

1 Basic 2 VLAN 3 Security

**Client IP & VLAN Assignment**

Client IP assignment

Virtual Controller managed

Network assigned

Client VLAN assignment

Default

Custom

2 options

虚拟控制器管理：

- default : 172.31.98.x
- Custom : 自定义，在VC配置dhcp

网络指定：（跟 uplink 网络相关）

- default : 与uplink一致
- static : 指定vlan ID
- dynamic : 根据属性动态下发VLAN

Create new network

1 Basic 2 VLAN 3 Security

**Client IP & VLAN Assignment**

Client IP assignment

Virtual Controller managed

Network assigned

Client VLAN assignment

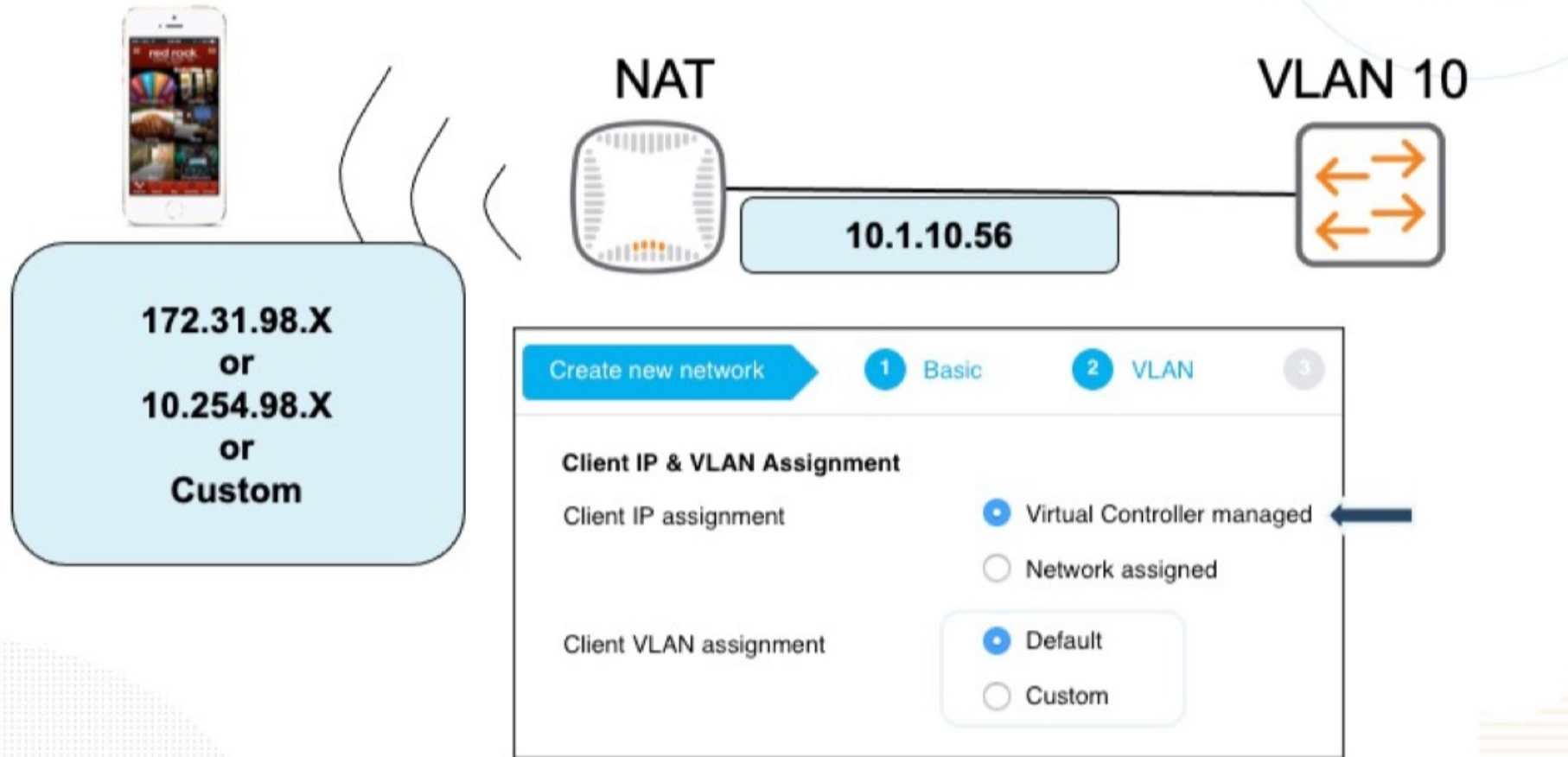
Default

Static

Dynamic

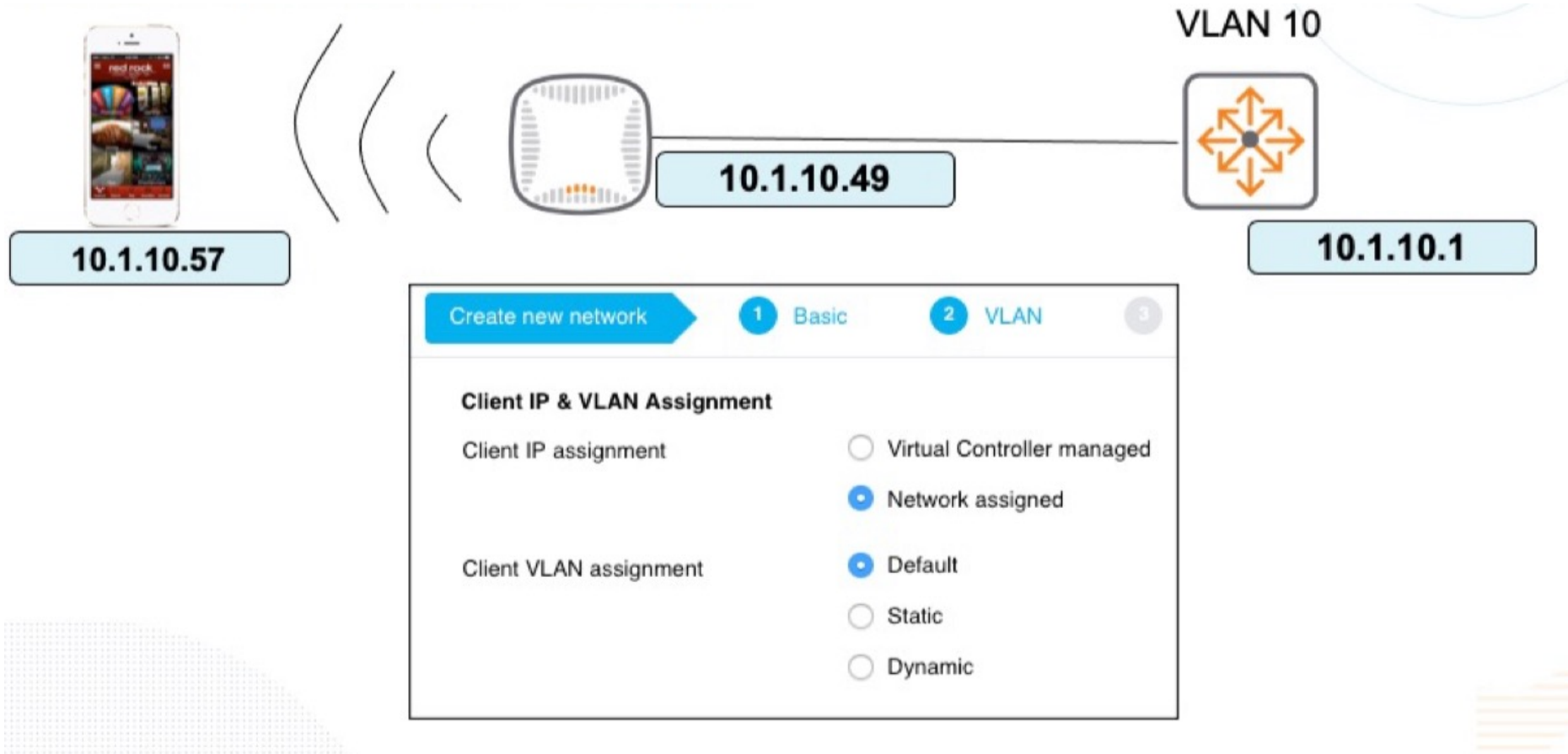
3 options

# VC managed

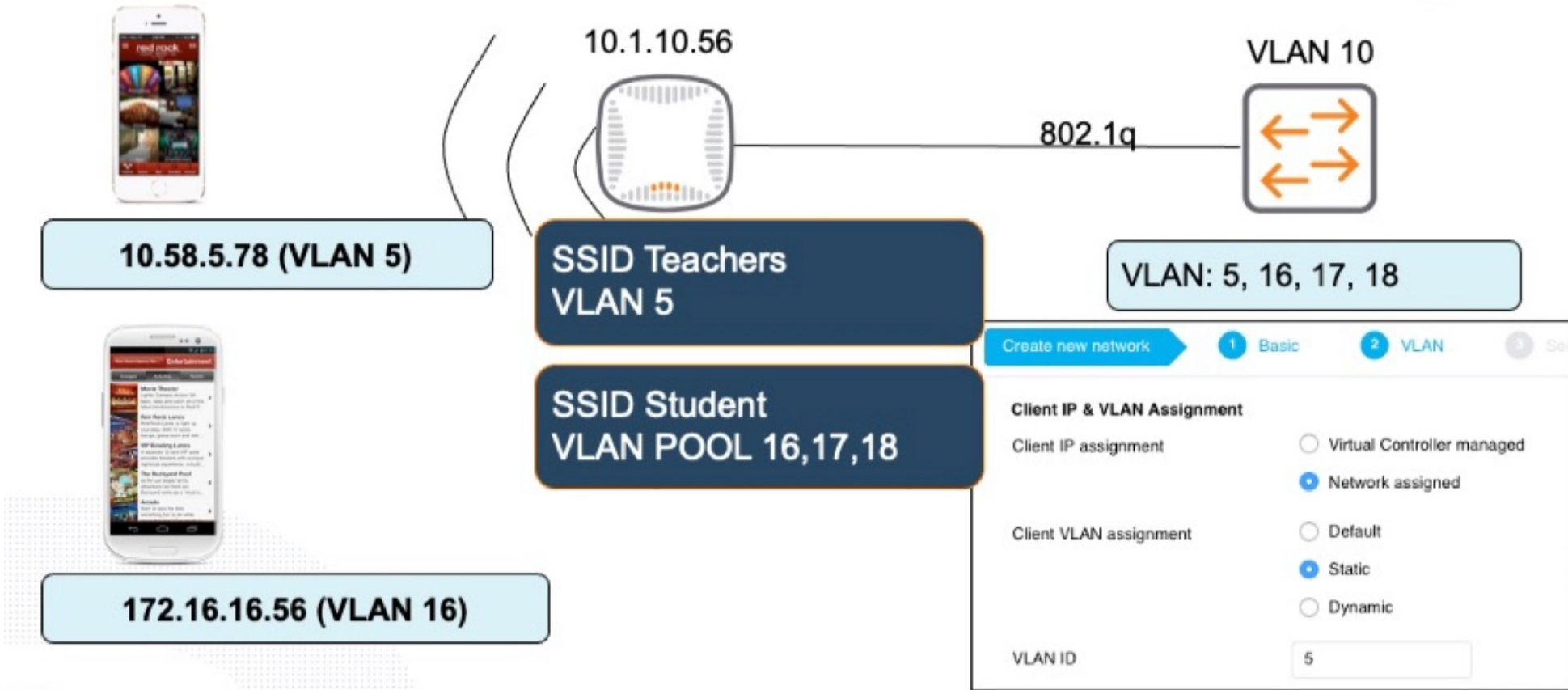




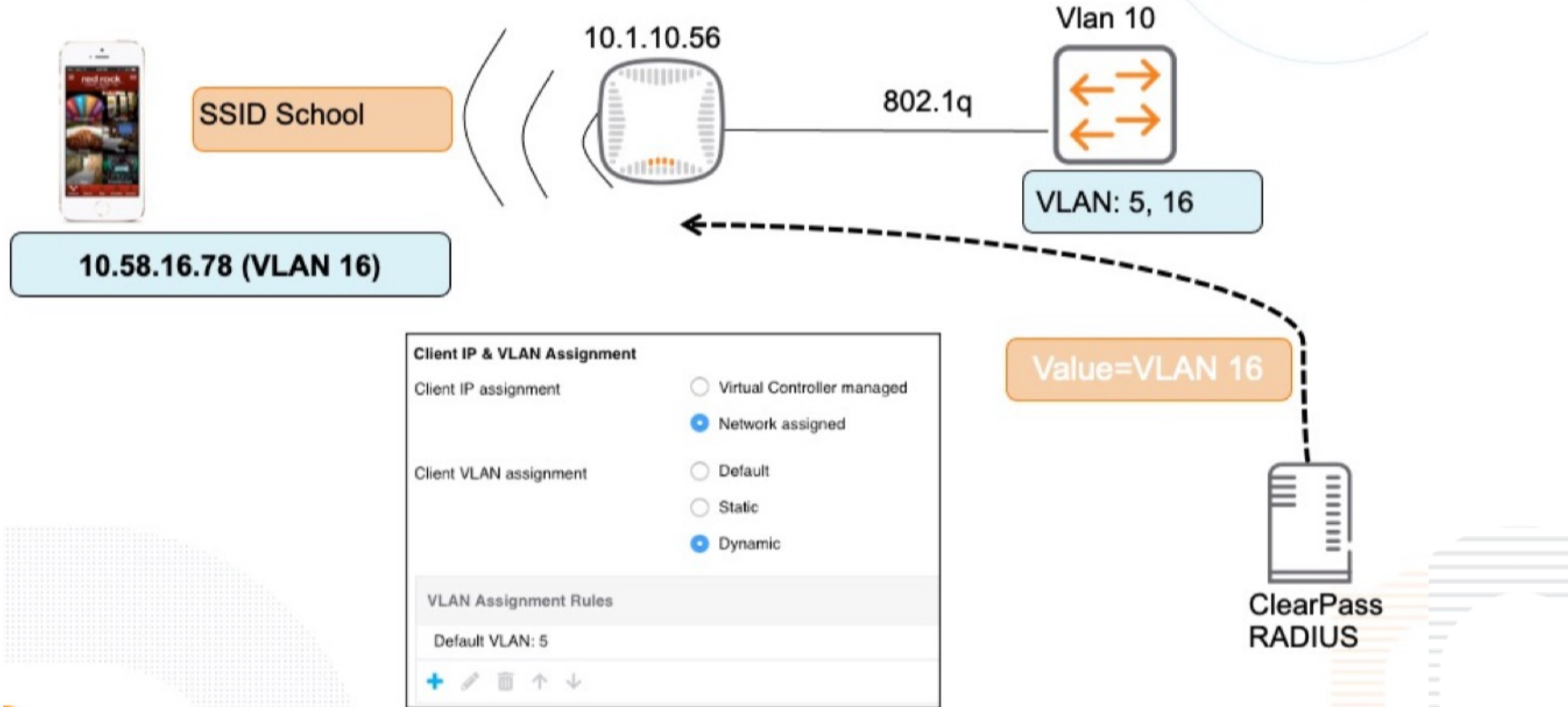
# Network assigned



# Network Assigned -Static



# Network Assigned -Dynamic



**Client IP & VLAN Assignment**

Client IP assignment

- Virtual Controller managed
- Network assigned

Client VLAN assignment

- Default
- Static
- Dynamic

**VLAN Assignment Rules**

Default VLAN: 5

+ ✎ 🗑️ ⬆️ ⬇️

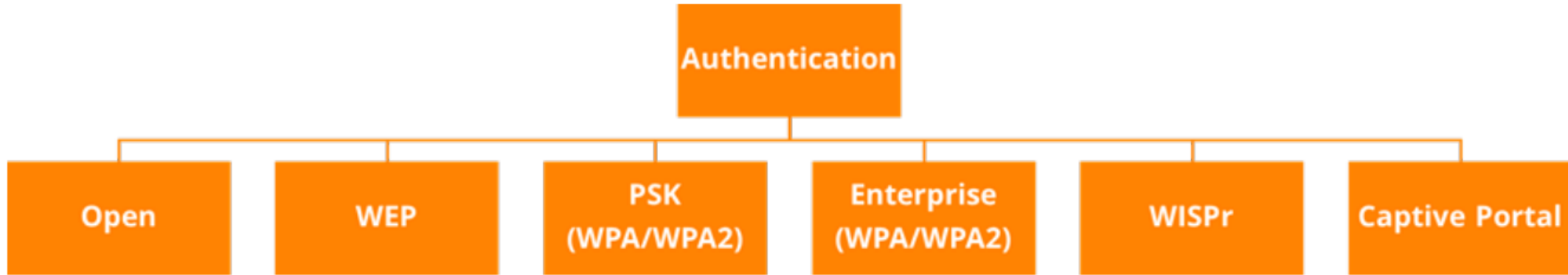


# IAP Forwarding Modes

External DHCP	Local external DHCP Server and Default Gateway(DG). Not used with VPN
Local	VC is the DHCP Server and DG
Local L2	VC is DHCP Server and DG is outside the IAP
Local L3	VC is DHCP Server and DG assigns IP address from local subnet
Distributed L2	VC is DHCP Server and DG is corporate network
Distributed L3	VC is DHCP Server and the VC is the DG with a Corporate subnet. Traffic is routed
Centralized L2	DG is Controller or a router in the Corp and DHCP server is also in the Corp
Centralized L3	DHCP server is corporate network and VC is DG. Traffic is routed



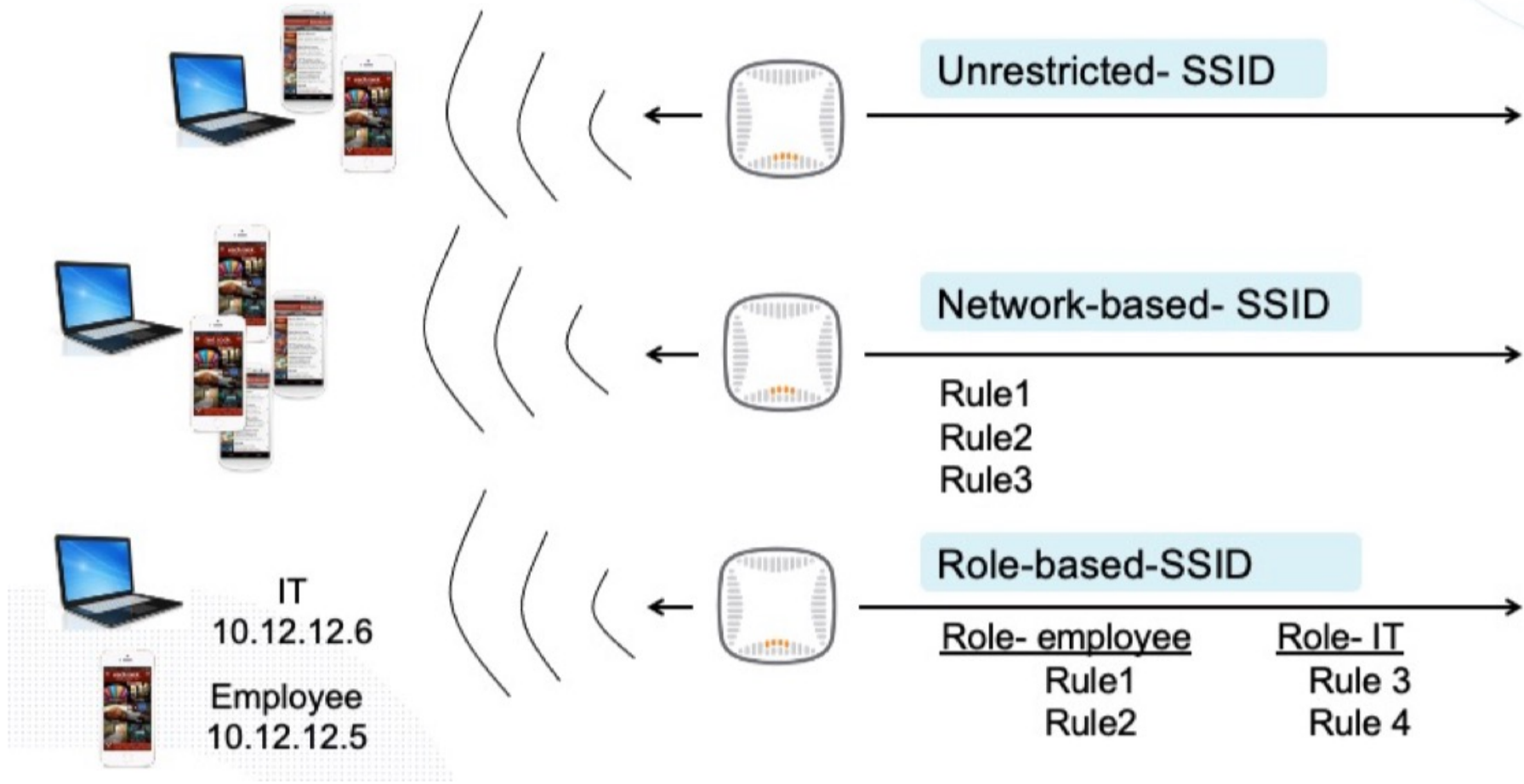
# Security — Authentication



Authentication Type	Employee	Guest
Open	Not Recommended	Recommended with a higher-level authentication method
WEP	Not Recommended	Not Recommended
PSK	Recommended for devices that do not support stronger authentication	Can be used but the PSK key should be rotated in a regular basis
802.1X	Recommended	N/A
WISPr	N/A	Recommended in public places such as airports
Captive Portal	N/A	Recommended



# Access Rules-Role





# Rule

New rule ✕

Rule type: **Access control** (dropdown menu with options: Access control, VLAN assignment, Captive portal, CALEA, Bandwidth Contract, Redirect Page URL, Redirect Blocked HTTPS)

Service: **Network** (radio button selected; other options: Application, Application category, Web category, Web reputation)

Options:  Log,  Blacklist

Service dropdown menu (selected: any):

- any
- CUSTOM
- adp
- bootp
- cfgm-tcp
- cups
- dhcp
- dhcp-v6
- dns
- esp
- ftp
- gre
- h323-tcp
- h323-udp
- http-proxy2
- http-proxy3
- http
- https
- icmp
- icmp-v6

Action: **Allow** (dropdown menu with options: Allow, Deny, Source-NAT, Destination-NAT)

Destination: **to all destinations** (dropdown menu with options: to all destinations, to a particular server except to a particular server, to a network except to a network, to domain name, to AP IP, to AP network, to master IP)

802.1p priority

Cancel OK

**Many standard protocols predefined**

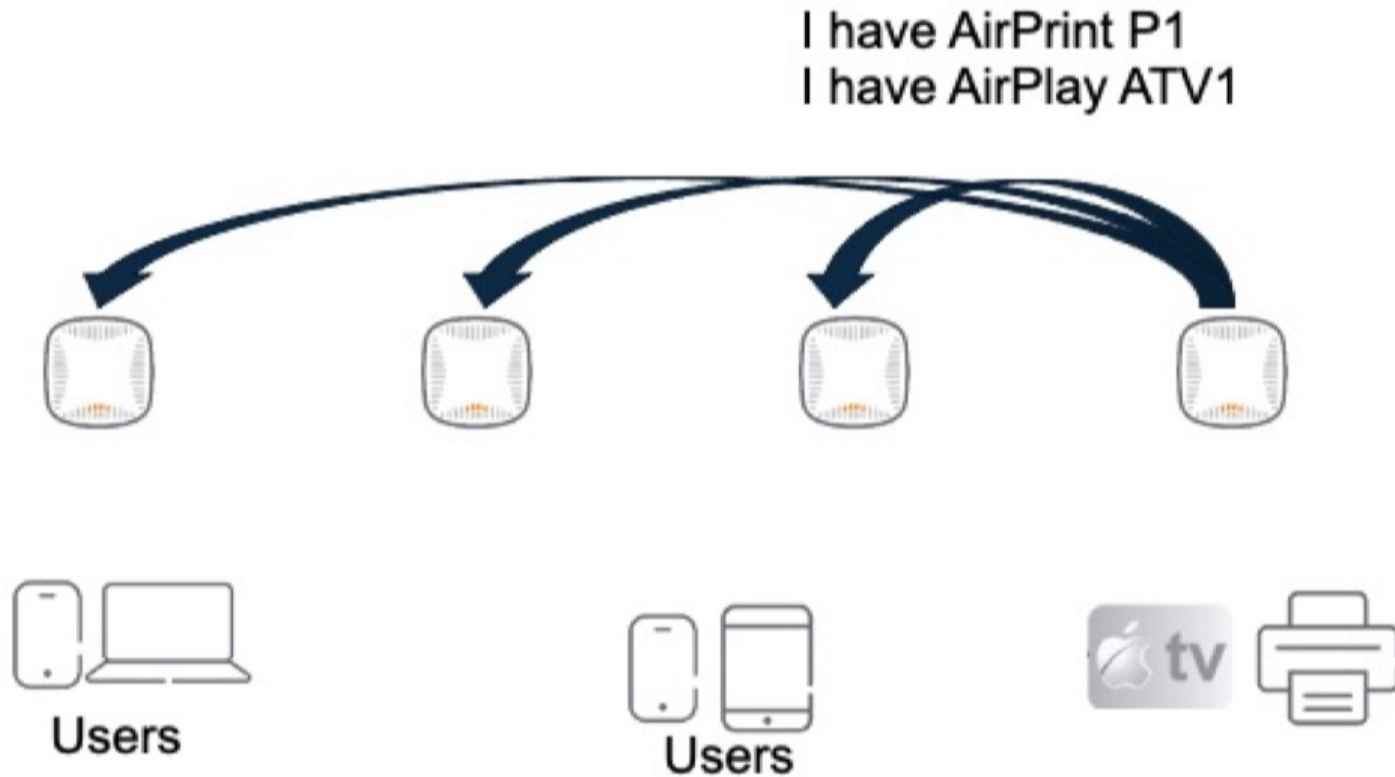


# ARM Best Practices

Feature	Default Setting	Sparse AP with Data Only	Dense AP with Data Only	Recommended Settings for Voice and Video	High Interference Environment
<b>Scanning</b>	Enabled	Enabled	Enabled	Enabled	Enabled
<b>Client Aware Scanning</b>	Enabled	Enabled	Enabled	Enabled	Disabled
<b>Background Spectrum Monitoring</b>	Disabled	Disabled	Disabled	Disabled	Enabled
<b>Client Match</b>	Disabled	Enabled	Enabled	Enabled	Enabled
<b>Band Steering</b>	Prefer 5Ghz	Prefer 5Ghz	Prefer 5Ghz	Prefer 5Ghz	Prefer 5Ghz
<b>Airtime Fairness</b>	Default Access	Fair Access	Fair Access	Fair Access	Fair Access
<b>Min Transmit Power</b>	18	18	9	18	12
<b>Broadcast Filtering</b>	Disabled	All	ARP	ARP (Disabled if running Multicast)	ARP
<b>Multicast Optimization</b>	Disabled	Enabled	Enabled	Enabled	Enabled
<b>Dynamic Multicast Optimization</b>	Disabled	Disabled	Disabled	Enabled	Disabled
<b>Interference Immunity Level</b>	2	2	2	2	2*
<b>Beacon Interval</b>	100ms	100ms	100ms	100ms	100ms
<b>Wide Channel Band</b>	5GHz	5GHz	5GHz	5GHz	5GHz
<b>Local Prob Req Threshold (db)</b>	0	0	25	25	25
<b>Dynamic CPU Management</b>	Automatic	Automatic	Automatic	Automatic	Automatic



# The Aruba AirGroup Solution



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mDNS Proxy

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Classifies servers and users

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Cache of services

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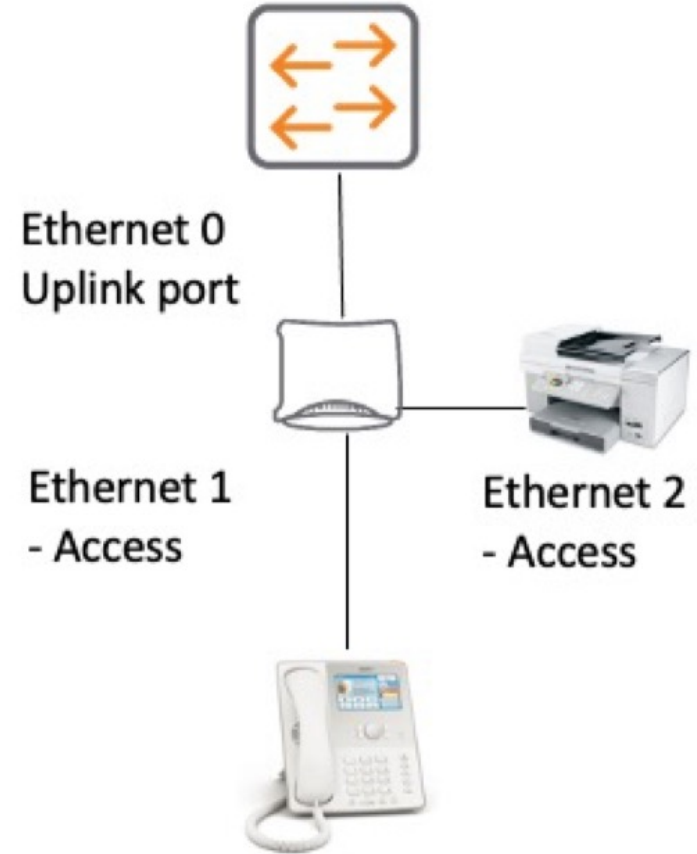
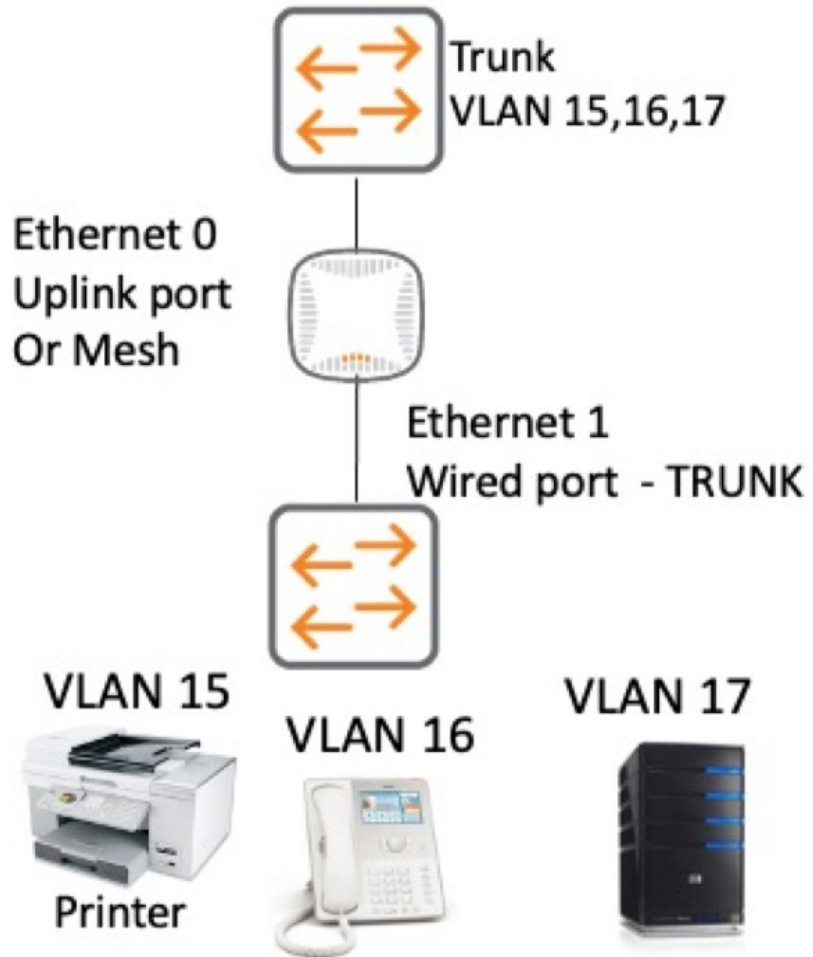
Multicast to unicast

---

Location attributes



# Wired Access Introduction



# AppRF Enabled

- Dashboard
  - Overview
  - Networks
  - Access Points
  - Clients
  - Configuration**
  - Networks
  - Access Points
- System**
  - RF
  - Security
  - IDS
  - Routing
  - Tunneling

**General**

Name: SetMeUp-32:8E:A4

System location: [ ]

Virtual Controller IP: 0.0.0.0

Allow IPv6 Management:

Virtual Controller IPv6: ::

Dynamic RADIUS Proxy:

Dynamic TACACS Proxy:

MAS integration:

NTP server: [ ]

Timezone: None

Preferred band: [ ]

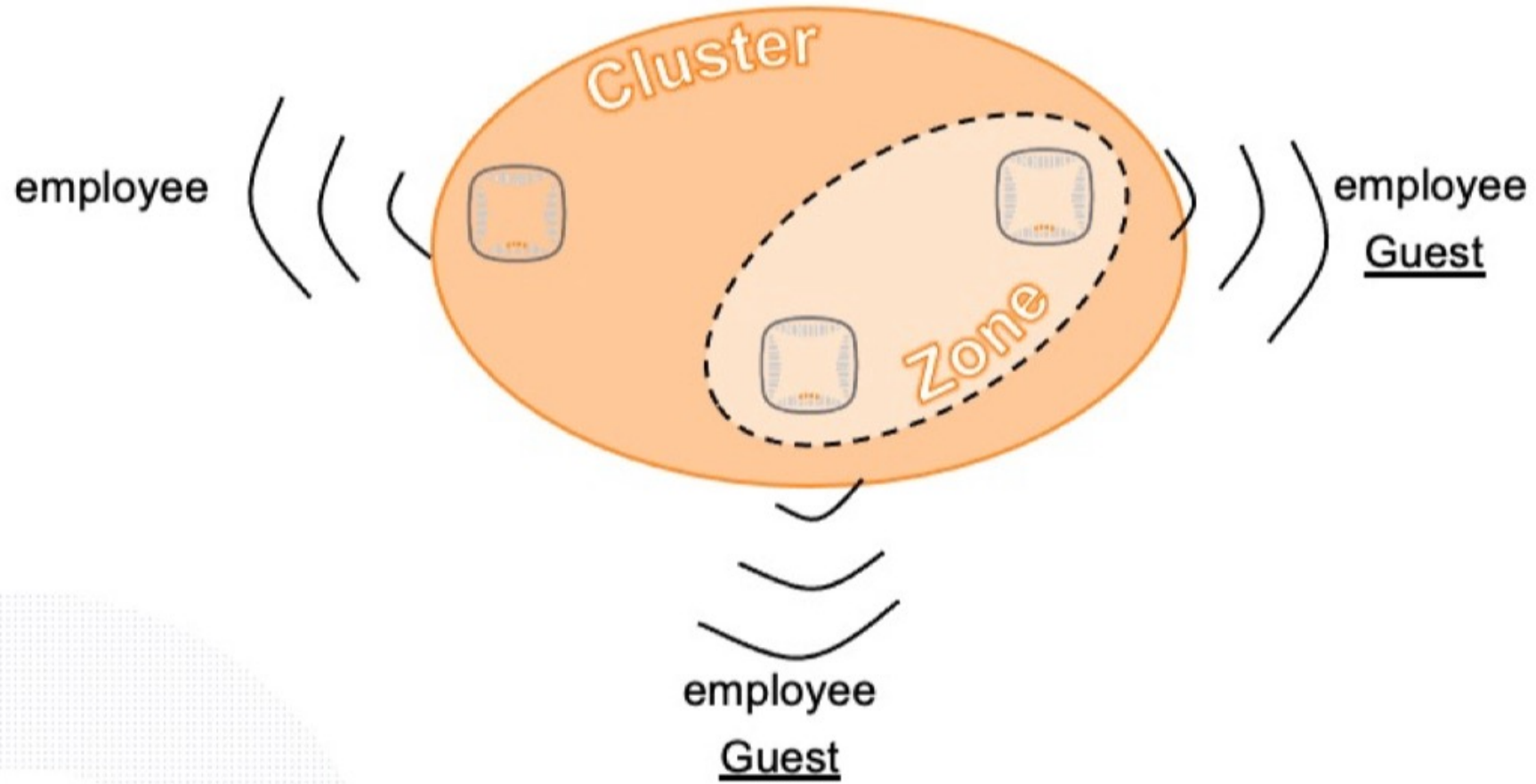
AppRF visibility:

URL visibility:

- App
- WebCC
- All
- None



# Zone







# Operation

# & Troubleshooting



# IAP OS

<b>Aries</b>	ArubaInstant_Aries_8.6.0.8_79369 Aruba Instant code for RAP-155 series
<b>Centaurus</b>	ArubaInstant_Centaurus_8.6.0.8_79369 Aruba Instant code for IAP- 220/224/225/228, IAP-210/214/215, IAP-270/274/275
<b>Draco</b>	ArubaInstant_Draco_8.8.0.1_80393 Aruba instant code for IAP 340/344/345 (UAP) 510/518/570
<b>Hercules</b>	ArubaInstant_Hercules_8.8.0.1_80393 Aruba instant code for IAP 310/314/315/318 320/324/325 374/375/377/387
<b>Gemini</b>	ArubaInstant_Gemini_8.8.0.1_80393 Aruba instant code for IAP 500/500H/560
<b>Scorpio</b>	ArubaInstant_Scorpio_8.8.0.1_80393 Aruba instant code for IAP 530/550
<b>Lupus</b>	ArubaInstant_Lupus_8.8.0.1_80393 Aruba instant code for IAP 330 series (UAP)
<b>Ursa</b>	ArubaInstant_Ursa_8.8.0.1_80393 Aruba instant code for IAP 303/304/305 360/365/367 303H
<b>Vela</b>	ArubaInstant_Vela_8.8.0.1_80393 Aruba instant code for IAP 203H/207/203R/203RP



# Image Upgrade

- Dashboard
  - Overview
  - Networks
  - Access Points
  - Clients
  - Mesh Devices
- Configuration
- Maintenance**
- About
- Firmware**
- Configuration

## Firmware

### Manual

Current Version

8.8.0.0\_79697 (Digitally Signed - Production Build)

Image file

Image URL

ALL IAPs in this Cluster

Image file for new version (Ursa)

Browse

Reboot all APs after upgrade



Upgrade Now

### Automatic

Check for New Version

Cloud-based



# Multi Class IAP cluster

Firmware

Manual

Current Version **8.8.0.0\_79697 (Digitally Signed - Production Build)**

URL for AP214/215/224/225/228/274/275/277 (Centaurus)

URL for AP303/303H/303P/304/305/365/367 (Ursa)

Reboot all APs after upgrade

Automatic

-- No new version available --

http://<IP-address>/ArubaInstant\_Ursa\_8.4.0.0\_xxxx  
tftp://<IP-address>/ArubaInstant\_Ursa\_8.4.0.0\_xxxx  
ftp://<IP-address>/ArubaInstant\_Ursa\_8.4.0.0\_xxxx  
ftp://<aruba:123456>@<IP-address>/ArubaInstant\_Hercules\_8.4.0.0\_xxxx





# Backup and Restore

The screenshot displays a network management interface with a sidebar on the left and a main content area. The sidebar includes a search icon, a 'Dashboard' link, and a list of menu items: Overview, Networks, Access Points, Clients, Mesh Devices, Configuration (with a gear icon), Maintenance (highlighted with a blue arrow), About, Firmware, Configuration (highlighted with a blue arrow), Certificates, and Reboot. The main content area shows 'Current Configuration' with a list of settings: version 8.8.0.0-8.8.0, virtual-controller-country US, virtual-controller-key cc6e6a6501, name VC-T14-Venu, virtual-controller-ip 10.49.140.100, terminal-access, clock timezone none 00 00, rf-band all, allow-new-aps, allowed-ap 20:4c:03:3d:4c:04, allowed-ap 20:4c:03:3d:7c:88, routing-profile, route 10.253.0.0 255.255.0.0 1, and arm. A modal dialog titled 'Confirm Clear Configuration' is overlaid on the right, containing a warning: 'Doing a complete configuration clear (equivalent to a factory reset) may cause connection issues with mesh deployment.' Below the warning is a checked checkbox for 'Remove all configurations including per-AP settings and certificates' and two buttons: 'Cancel' and 'Clear Configuration'. A red box highlights the dialog. A dark blue callout box with the text 'Start Over ?' points to the 'Clear Configuration' button in the sidebar. Another dark blue callout box with the text 'backup.cfg' points to a laptop icon, which is connected to the 'Backup Configuration' button in the sidebar by a dark blue arrow.



# Reset

1. Power off IAP

关闭电源

2. Press and hold Reset (use a paperclip)

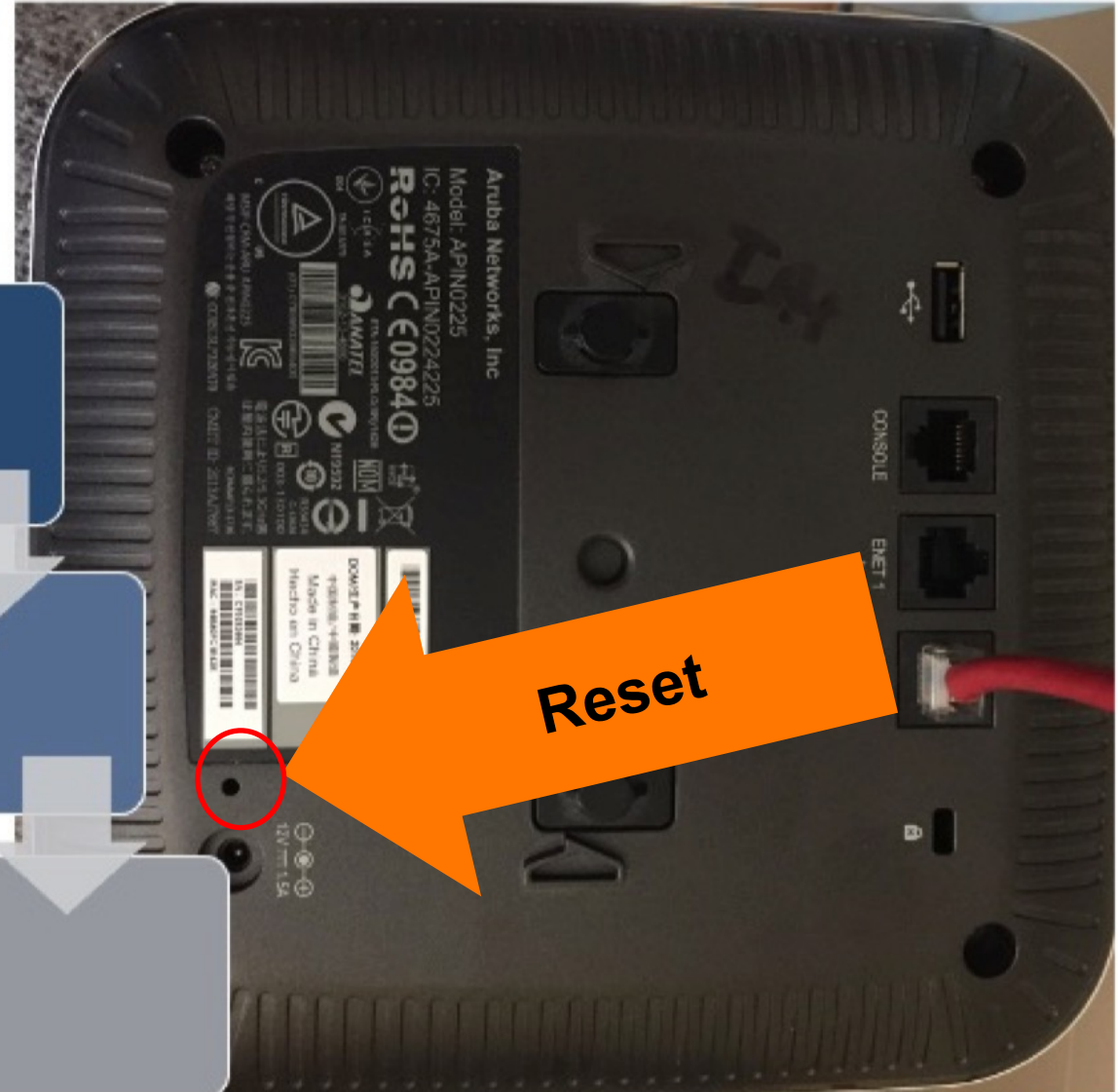
按住Reset按钮

3. Power on IAP without releasing Reset (Power LED flashes within 5 seconds)

AP加电，持续按住

4. Release Reset (IAP reboots with factory defaults)

待电源灯快闪后松开





# Converting IAP

- Dashboard
- Overview
- Networks
- Access Points
- Clients

Configuration

➔ Maintenance

About

Firmware

Configuration

Certificates

Reboot

➔ Convert

Regulatory

Convert

Convert one or more Access Points to

Hostname or IP Address of Mobility Controller

After conversion, all Access Points will be managed by the Mobility Controller

Convert

Remote APs managed by a Mobility Controller

Campus APs managed by a Mobility Controller

Standalone AP

Single AP

## Standalone AP

This feature allows you to deploy an Instant AP as an autonomous Instant AP, which is a separate entity from the existing virtual controller cluster in the Layer 2 domain.

**Single AP** mode is a new AP deployment mode suitable for Instant deployments with only one AP in a site. This mode is a type of standalone AP deployment with additional security when the AP is directly facing a WAN connection. When configured as a single AP, the AP will not send or receive management frames such as mobility packets, roaming packets, hierarchy beacons through the uplink port.

# Management frames

仪表盘

概述

网络

接入点

客户端

网状网络设备

配置

维护

支持

支持

命令: AP Management Frames

目标: Iris

运行

自动运行

Iris

```
*****
10/28/2022 11:12:59 AM Target: Iris Command: show ap debug mgmt-frames
*****
```

Traced 802.11 Management Frames

Timestamp	stype	SA	DA	BSS	signal	Misc
Oct 28 11:12:46.449	action	f4:2e:7f:79:5a:10	36:19:df:31:c1:34	f4:2e:7f:79:5a:10	15	radio-req-tsm
Oct 28 11:12:44.034	action	f4:2e:7f:79:5a:10	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	15	neighbor-req
Oct 28 11:12:44.034	action	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	f4:2e:7f:79:5a:10	0	neighbor-req
Oct 28 11:12:43.933	assoc-req	f4:2e:7f:79:5a:10	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	15	Success
Oct 28 11:12:43.928	assoc-req	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	f4:2e:7f:79:5a:10	42	-
Oct 28 11:12:43.926	auth	f4:2e:7f:79:5a:10	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	15	Success (seq num 0)
Oct 28 11:12:43.926	auth	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	f4:2e:7f:79:5a:10	92	-
Oct 28 11:12:33.921	disassoc	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	f4:2e:7f:79:5a:10	40	STA has left and is disassociated
Oct 28 11:12:24.432	action	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	f4:2e:7f:79:5a:10	0	radio-req
Oct 28 11:12:24.432	action	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	f4:2e:7f:79:5a:10	0	link-req
Oct 28 11:12:24.409	action	f4:2e:7f:79:5a:10	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	15	link-req
Oct 28 11:12:24.409	action	f4:2e:7f:79:5a:10	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	15	radio-req-beacon
Oct 28 11:12:17.394	action	f4:2e:7f:79:5a:10	36:19:df:31:c1:34	f4:2e:7f:79:5a:10	15	link-req
Oct 28 11:12:17.394	action	f4:2e:7f:79:5a:10	36:19:df:31:c1:34	f4:2e:7f:79:5a:10	15	radio-req-beacon
Oct 28 11:12:04.370	action	f4:2e:7f:79:5a:10	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	15	radio-req-tsm
Oct 28 11:11:22.607	action	d6:cf:d6:d4:7e:8e	f4:2e:7f:79:5a:10	f4:2e:7f:79:5a:10	0	radio-req





# Dashboard

概述 客户端匹配 AppRF

## 信息

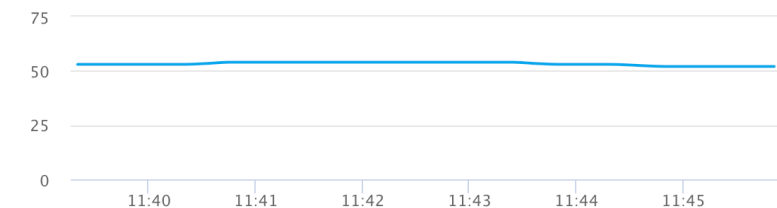
名称	HarmonyHub	IPv6 地址	--
IP 地址	192.168.10.105	MAC 地址	00:04:20:fc:c6:73
操作系统	NOFP	ESSID	HomeloT
接入点	Living room	频道	6
类型	GN	角色	HomeloT

## 射频仪表板

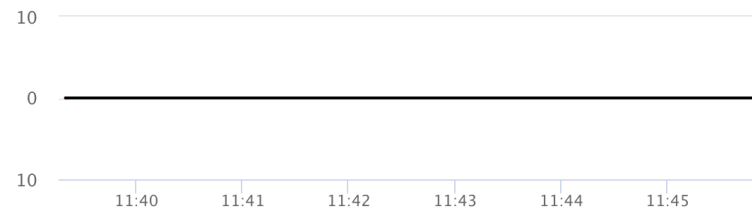
客户端	信号	速度
HarmonyHub		
接入点	使用率	噪声
Living room		
		错误

## 射频趋势

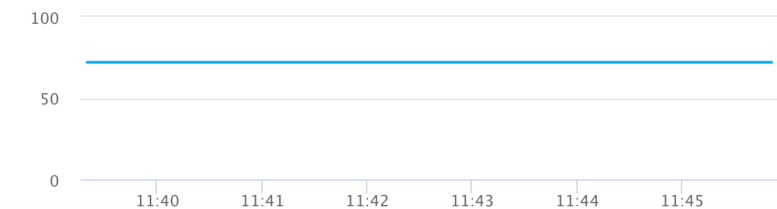
### 信号 (dB)



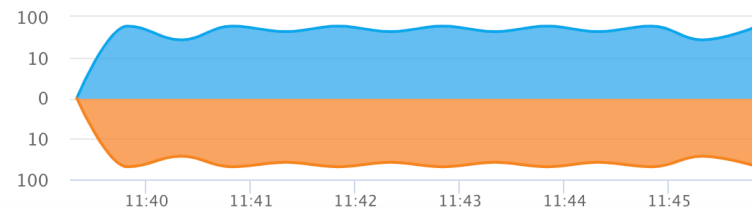
### 帧数 (fps)



### 速度 (mbps)



### 吞吐量 (bps)



## 移动路径

关联时间	接入点
04:04:03	Living room(94:64:24:9f:3e:a1)



# 参考文档

- **Instant VRD 2.0.pdf**

<https://higherlogicdownload.s3.amazonaws.com/HPE/MigratedAttachments/1F47BC48-DAFB-4B48-9FF1-2973BB3C2F87-8-Instant%20VRD%202.0.pdf>

- **User-Guide.pdf**

<https://www.arubanetworks.com/techdocs/Aruba-Instant-8.x-Books/810/Aruba-Instant-8.10.0.0-User-Guide.pdf>

- **Aruba Support**

<https://asp.arubanetworks.com/>

- **Aruba SE Club**

<https://arubase.club/>







# Thank You

