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Aruba Mobile First Platform: An Introduction ArubaOS 8

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Agenda

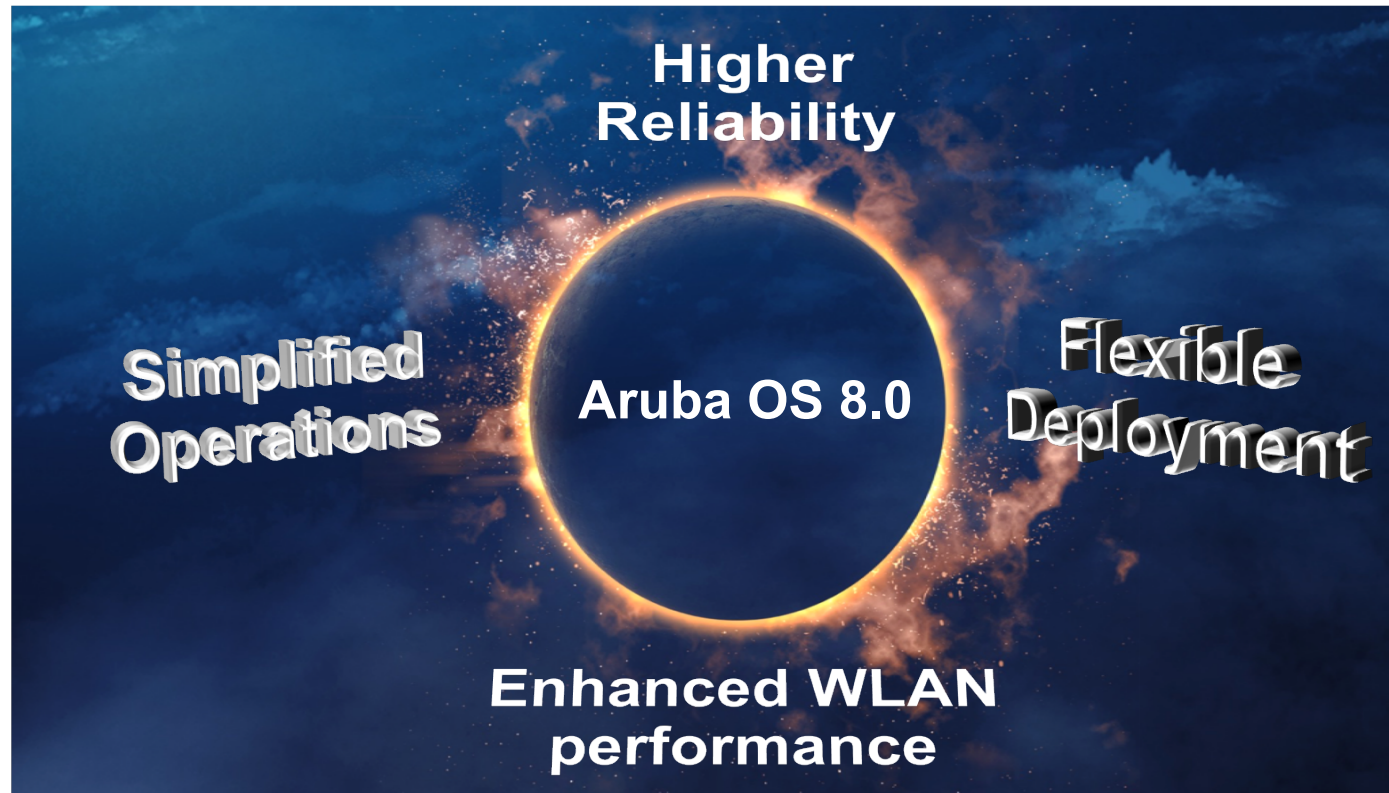
- Aruba OS 8 New Architecture
- Product Portfolio Controller comparison
- Controller Modes comparison
 - ArubaOS 6.X v's 8.X
- Zero Touch Provisioning and Hierarchical Configuration introduction
- Features & Functionality
 - VMM only
 - MM scalability
 - General for 8.0 Enhancements
 - Clustering & MultiZone specifics
- Upgrading & Roadmap

Aruba OS 8.0.X Release Deliverables

Launch of New Architecture

- **Mobility Master** (on x86 VMware, and x86 H/W in 8.1) – Control-plane only
 - Traditional H/W Controllers (70xx, 72xx) if set in Master Controller Mode have capped feature set
- **Virtual Mobility Controller** (on x86 VMware managed by MM in 8.0.1) – Control & Data-plane

Mobility Master



VMC



Firewall throughput
of ~5 Gbps

Evolution of Deployment Models

6.x



8.0



8.x

Master Controllers

Local Controllers

Mobility Master

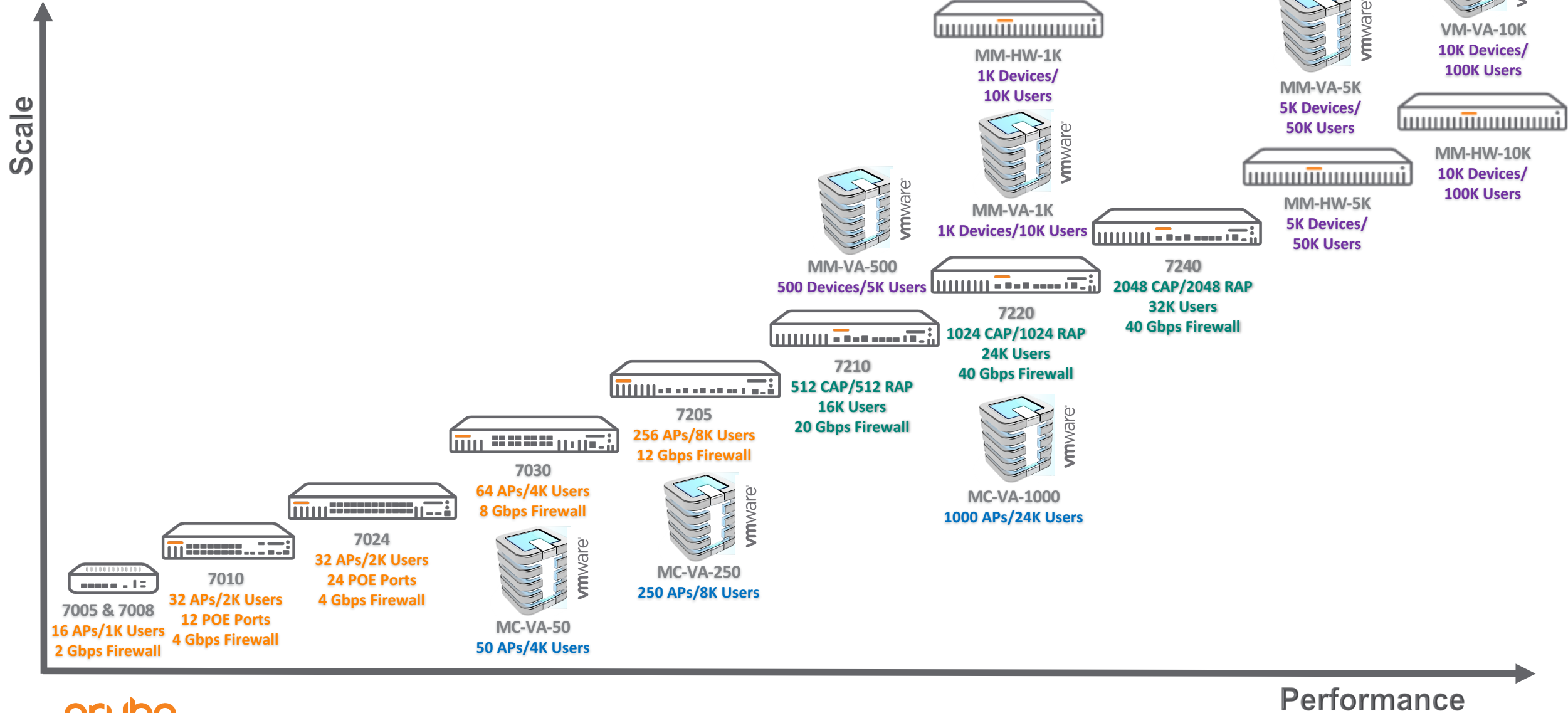
Local Mobility
Controller Cluster

Mobility Master

Virtual Mobility
Controller

Product Portfolio

Controller SKU Evolution



Controller Modes

6.X v's 8.X Code Base

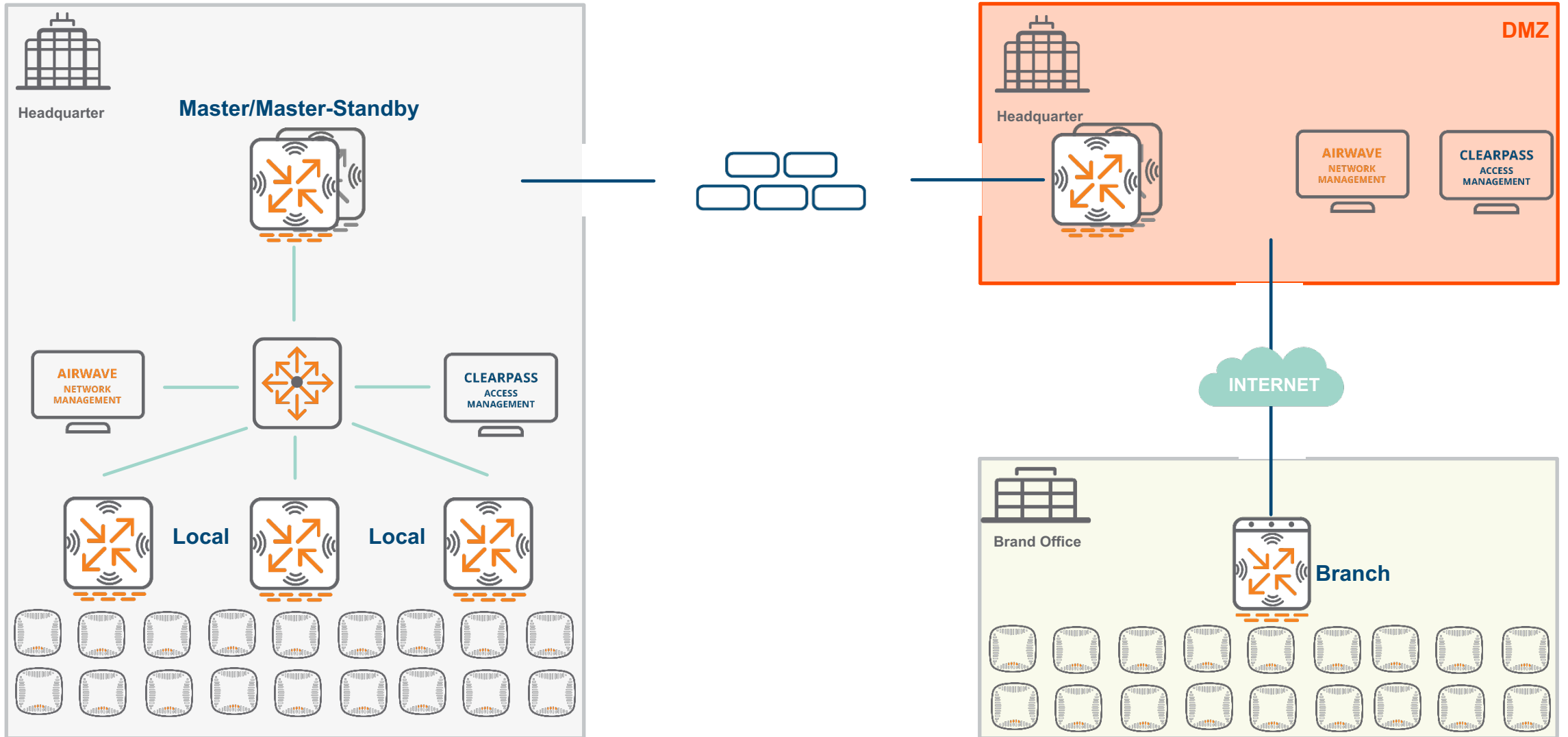
Summary

6.X Code base

- 1 A controller in Master mode can partially manage configuration for a local and fully manage a branch controller
- 2 A controller in Local mode depends on partial configuration from its Master
- 3 A controller in Branch mode is capable of Zero Touch deployment and is fully managed by the master controller (Needs to be 72xx as Master)
- 4 All controllers support Master, Local and Standalone mode. 70xx support the additional Branch mode

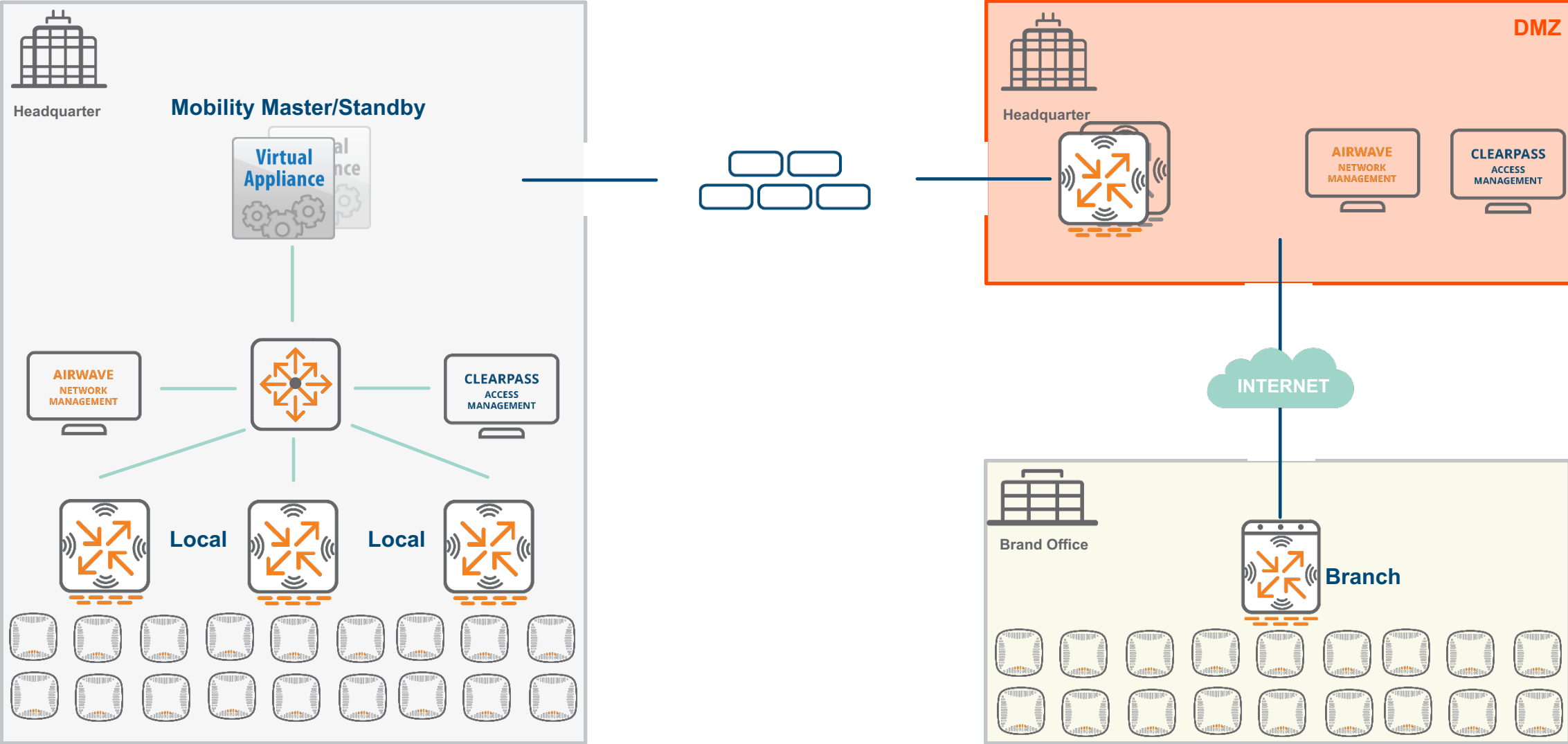
Architecture

6.x based Topology



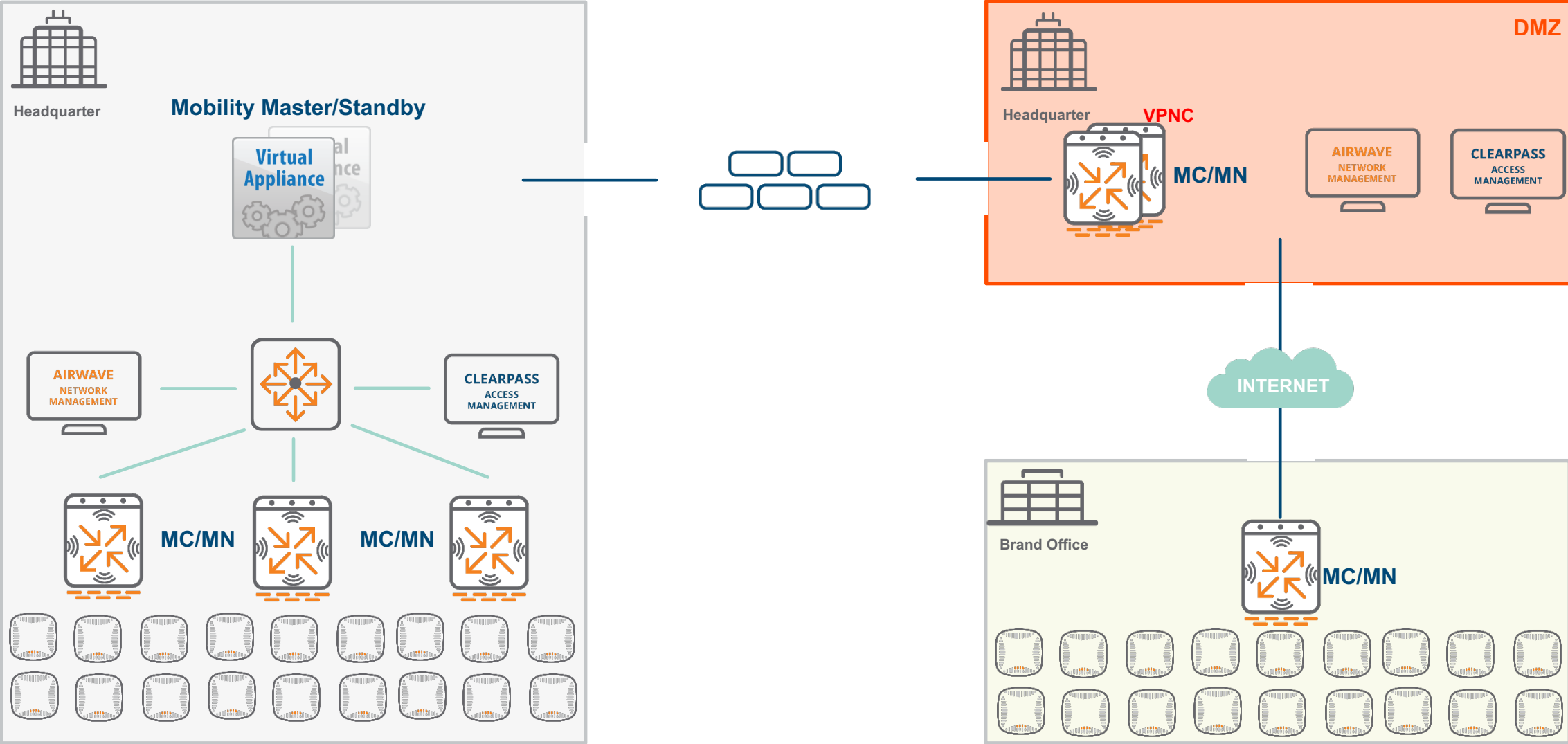
Architecture

8.0 based Topology



Architecture

8.0 based Topology



Summary

8.0 Code base

- 1 Introduces VM based Mobility Master (MM) as a single point of configuration and image management
- 2 Introduces Mobility Controller or Managed Node which is completely managed by MM using Zero Touch Provisioning unlike 6.x Master-Local
- 3 The MM can only be a VM and not a controller
- 4 All 72xx/70xx Controllers can be setup as a MC/MN or standalone

Summary Controller Modes

6.X vs 8.0

AOS 6.x

Master Controller

Standalone

Local

Branch

AOS 8.0

Mobility Master (only on VM)

Standalone (only on Hardware or VMC)

Mobility Controller (or Managed Device)

Mobility Controller (or Managed Device)

Zero Touch and Hierarchical Configuration 8.0

Zero Touch Provisioning for all Controllers

8.0 Code

1

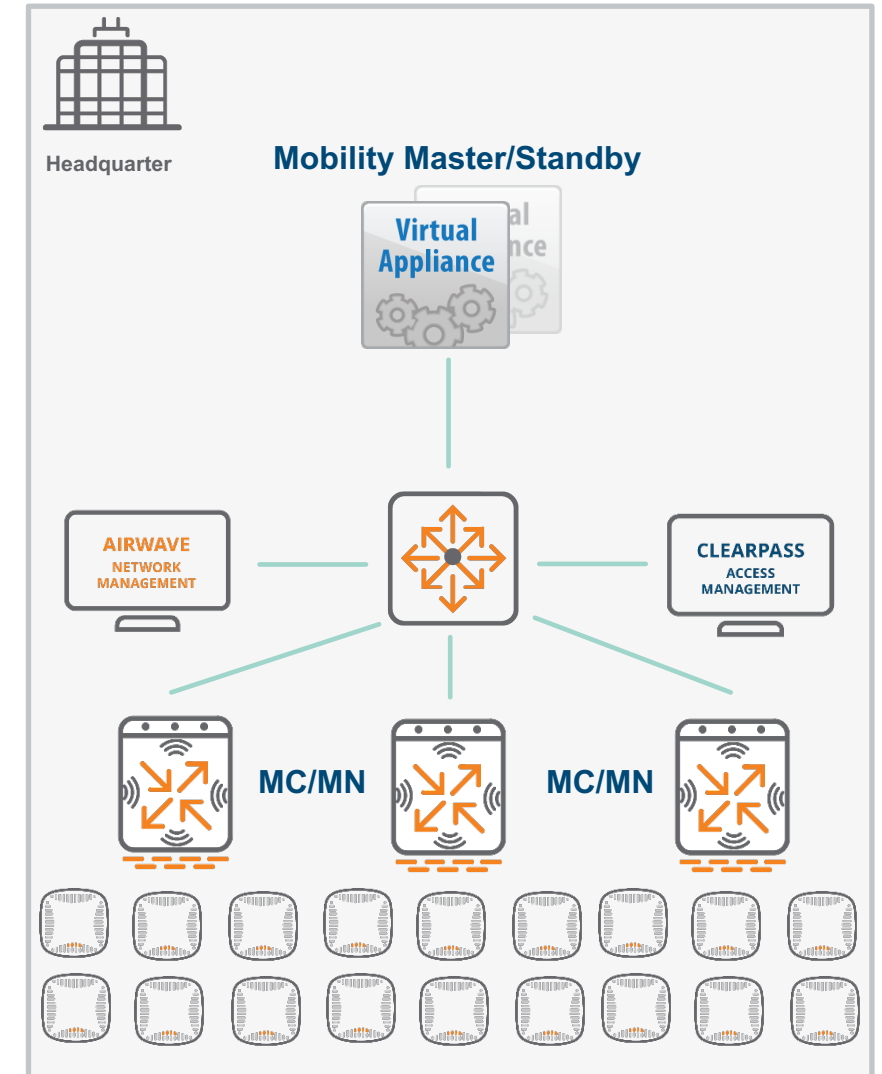
All Controllers support ZTP with the aid of DHCP Options or Activate

2

Mobility Master manages full configuration of devices

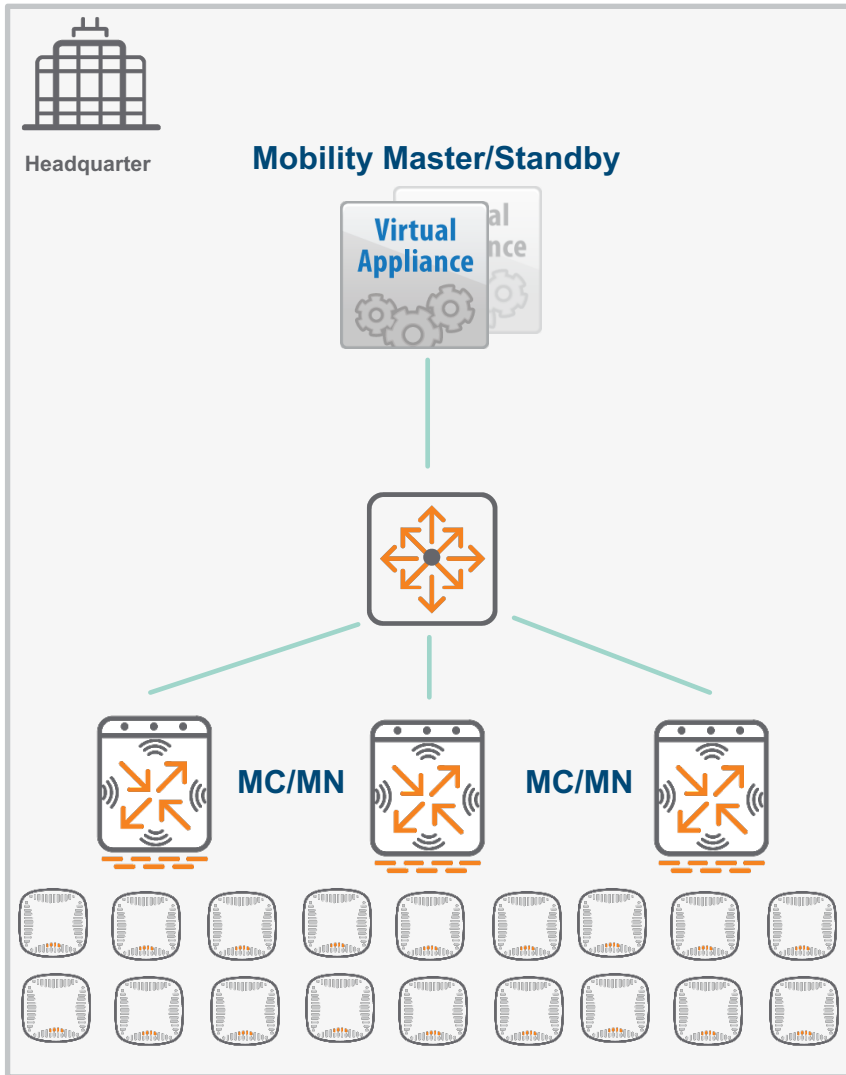
3

In a large deployment there is a single touch point in the form of MM



Hierarchical Configuration Model

8.0 Code



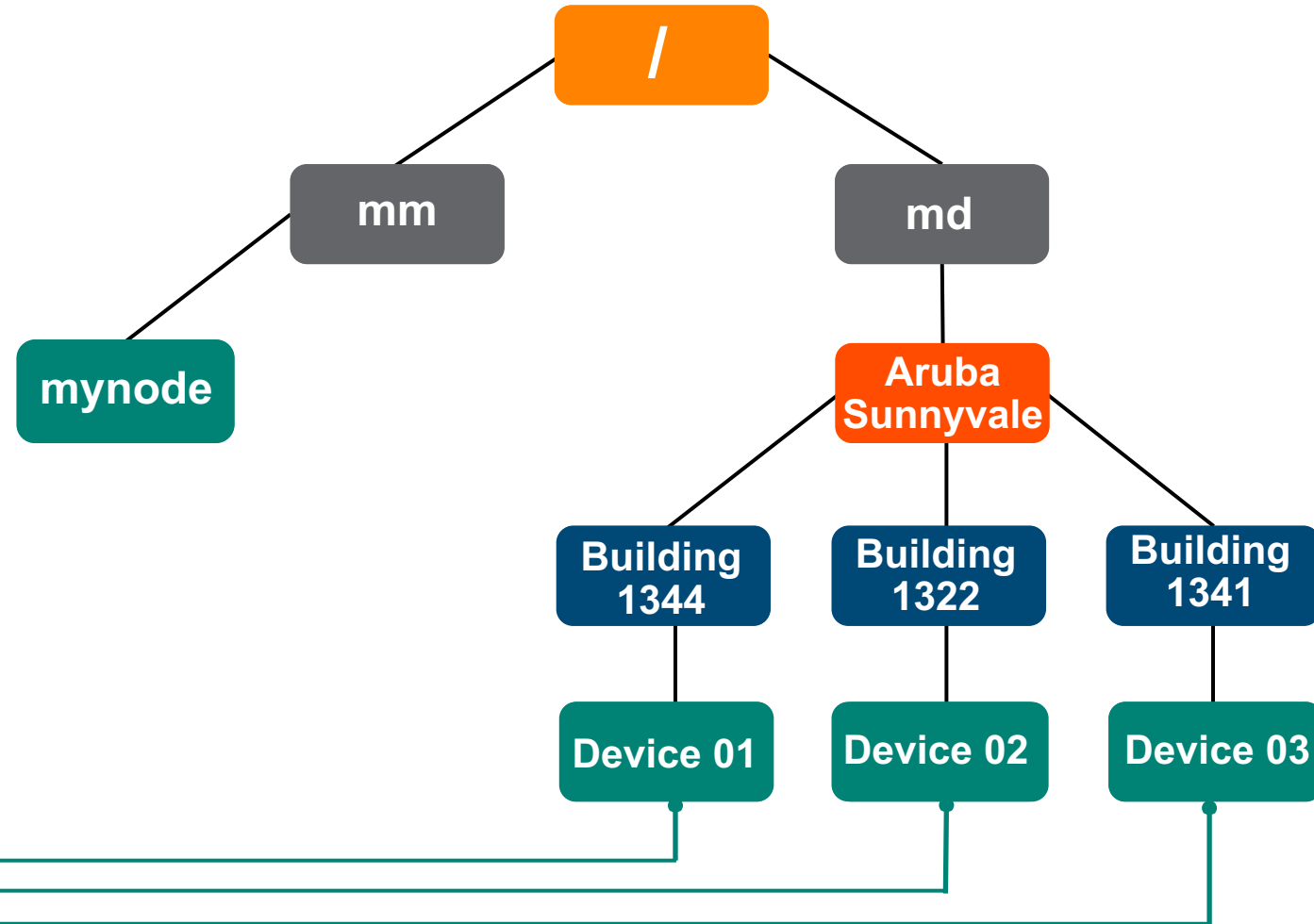
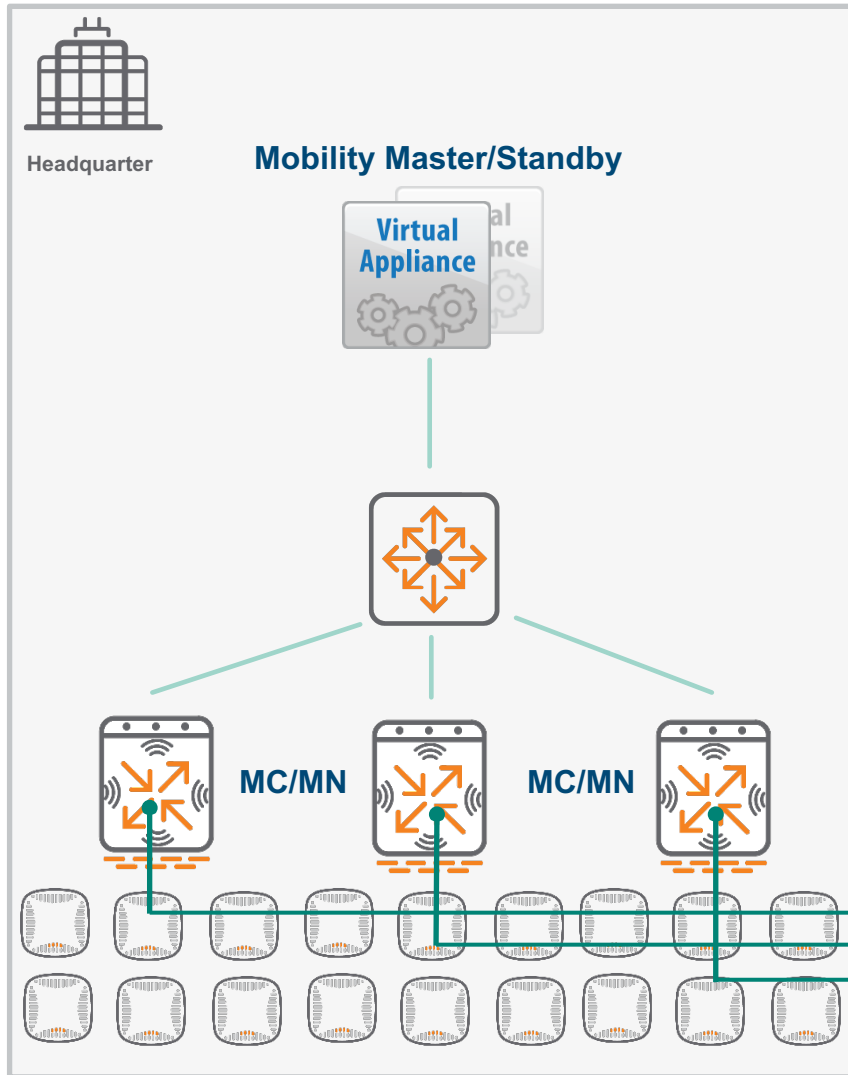
```
wlan ssid-profile "abc-  
ssid_prof"  
    essid "abc"  
    opmode wpa2-aes  
    a-basic-rates 12 24  
    a-tx-rates 12 24 36 48 54  
    g-basic-rates 12 24  
    g-tx-rates 12 24 36 48 54  
    ht-ssid-profile "abc-  
htssid_prof"  
    g-beacon-rate 12  
    a-beacon-rate 12
```

```
!  
  
interface gigabitethernet 0/0/0  
    description "GE0/0/0"  
    shutdown  
    trusted  
    trusted vlan 1-4094
```

Mobility Controller Config

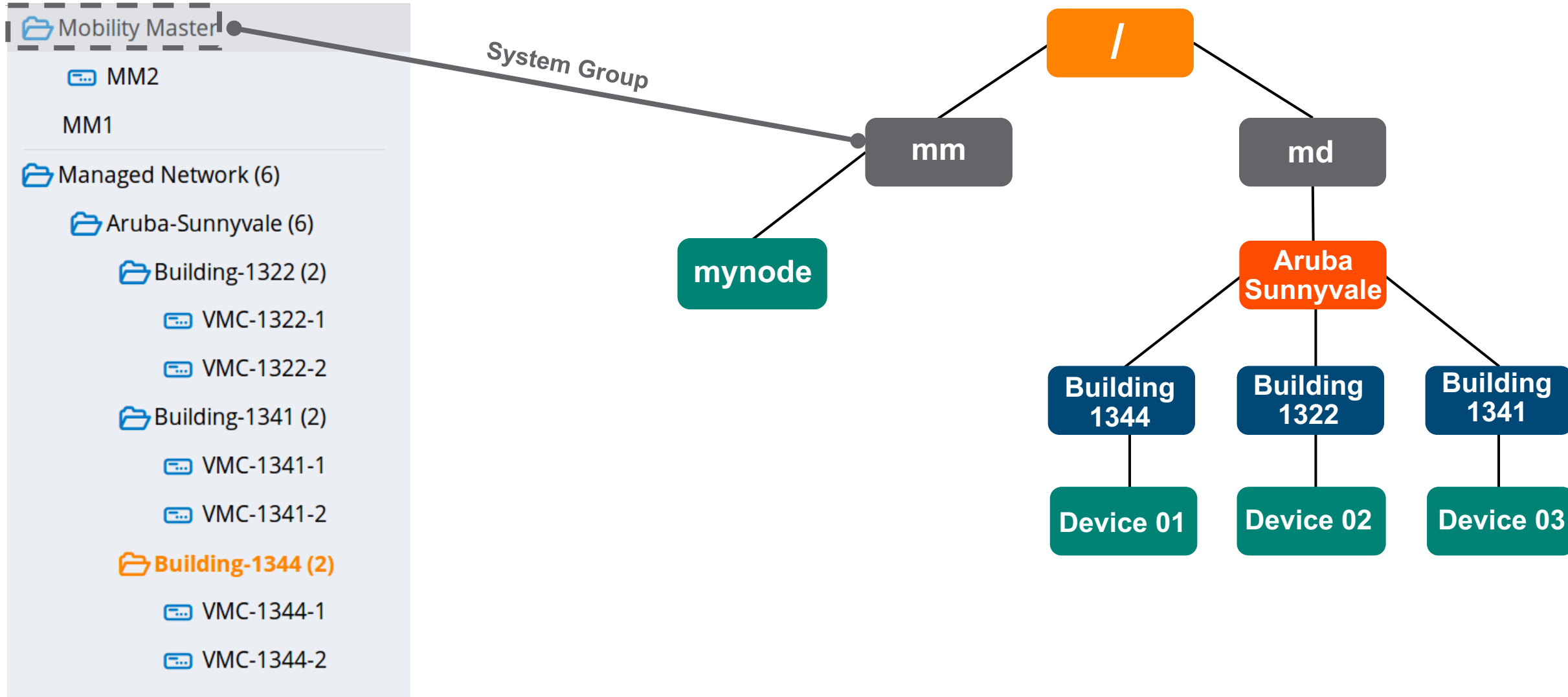
Hierarchical Configuration Model

Configuration Model Core Architecture



Hierarchical Configuration

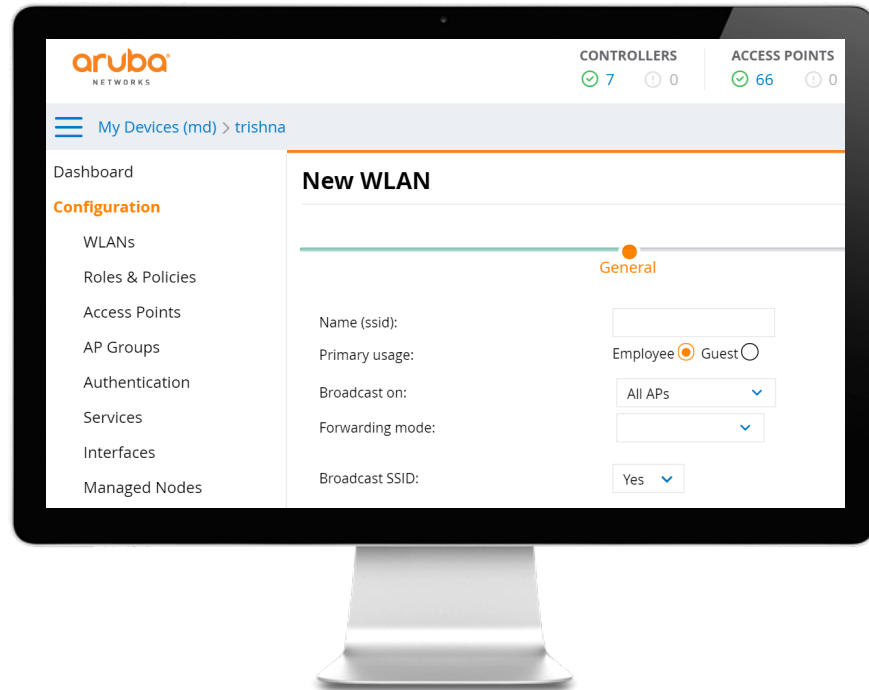
GUI Snapshot – mm (System Group)



Features & Functionality

8.0

Aruba OS 8.0 Improved reliability and ease of operations with virtualization



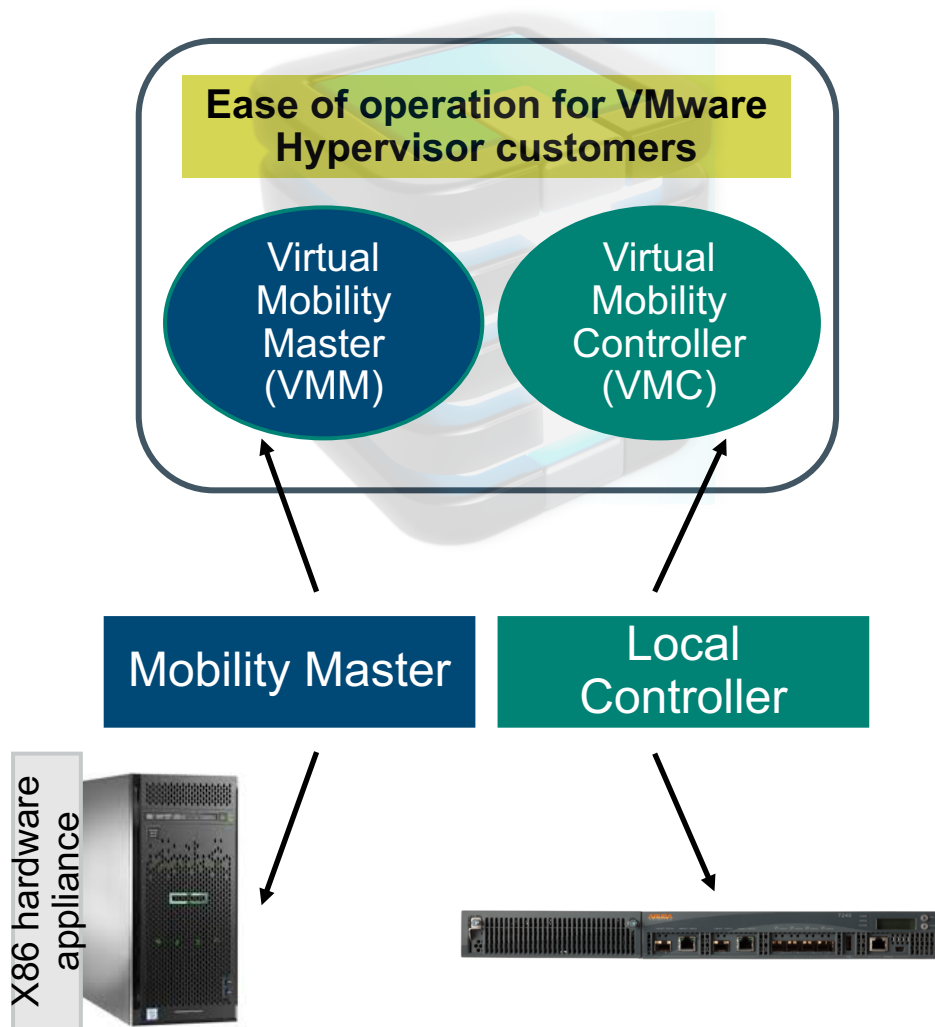
Key Software Features for MM

- **Controller Clustering** – Hitless Client Failover, seamless roaming, automatic user load balancing without disruption to real-time voice & video apps
- **MultiZone** – Secure Multi-tenant SSIDs on one AP with different end-point controller
- **AirMatch** – Centralized RF automation, learns & adapts RF environment for clients optimizing throughput
- **NorthBound API** – seamless integration with 3rd party Apps providing Network intelligence insights
- **AppRF Enhancements** – Custom App definition & Categorization, prioritizes App traffic, enforces policy per user/device/location
- **Enhanced Master Functionality** – New WebUI, Hierarchical configuration (global & local), Multi-version AOS8.x support
- **Simplified Device Deployment** – Provisioning with “Activate” & Zero Touch Deployment of VMC, Mobility (BOC & Local) Controllers
- **Loadable Service Modules** – In-service upgrades (AirGroup/AppRF/WebCC/WMS/Clarity/UCC/Lync)

Aruba OS 8.0 General Feature Enhancements

Ease of use and simple deployment	UCC enhancement
<ul style="list-style-type: none">• Zero touch deployment• Hierarchical configuration (global/local)• New Web UI• Centralized visibility and monitoring• Centralized licensing with pools• Config auto roll back• WebCC Proxy• Multi-threaded CLI• Auto-completion of profiles in CLI<ul style="list-style-type: none">• Profile name tab completion	<ul style="list-style-type: none">• Jabber support• Skype SDN API scaling for giant networks• Heuristics and SDN APIs coexisting for better user experience• Prioritize multiple voice application at the same time with Multi-ALG support
	AppRF enhancement
	<ul style="list-style-type: none">• Custom app definitions and categories• Update signatures like antivirus definitions
Branch enhancement	Enhanced security
<ul style="list-style-type: none">• Better trouble shooting with RAP health check• WAN Link bonding and load balancing	<ul style="list-style-type: none">• IKE fragmentation support• IPsec over IPV6

Mobility Master Platform & Scale



Aruba OS 8.0.x

- Runs on a Virtual Machine and deployed as OVA
- Support only on VMware ESXi or KVM Hypervisor
 - VMware 5.1, 5.5, 6.0 with vSwitch Promiscuous mode enabled
 - CPU oversubscription not support
- Rightsizing #CPUs, Memory, Disk based on the Scale
 - Bare Minimum of: 2 NIC (up to 4); 3 vCPUs; 8GB RAM (16GB preferred); 60GB Disk Space; QuadCore i5 1.9GHz processor with hyper-threading

Scale

- Supports up to
 - 1000 Mobility Controllers (Managed Devices)
 - 10K AP Deployment
 - 100K Clients
- AP Termination not supported (Control Plane Only)
- Full Scale needs a dedicated VM capacity of up to
 - 16 CPU Cores, 64G RAM, 2 to 4 Gig Ethernet Ports

Master Controller Mode Vs Mobility Master Mode

Features	Master Controller AOS 8.0.1	Mobility Master AOS 8.0
Services like UCC, AppRF, AirGroup etc.	Services are distributed to local controllers	Services are centralized at MM
Monitoring	Distributed	Centralized monitoring from MM
APIs	Monitoring via Rest and ZeroMQ	Monitoring via Rest and ZeroMQ; Configuration capability
Redundancy	VRRP, APFF	Hitless stateful failover with controller clustering. (VRRP, APFF also supported)
ARM	Legacy Channel and TX power management ClientMatch	AirMatch (enhancing ARM centrally) ClientMatch
MultiZone	✓	✓
Loadable Service Module	Not Supported	Upgrade services without affecting the network
ZTP	✓	✓
Multi-version support	Not Supported	✓
Auto config rollback	✓	✓
Licensing	Centralized Licensing	Centralized Licensing with Pools
Configuration	Centralized/Hierarchy	Centralized/Hierarchy
IPFIX	✓	✓

Clustering

8.0

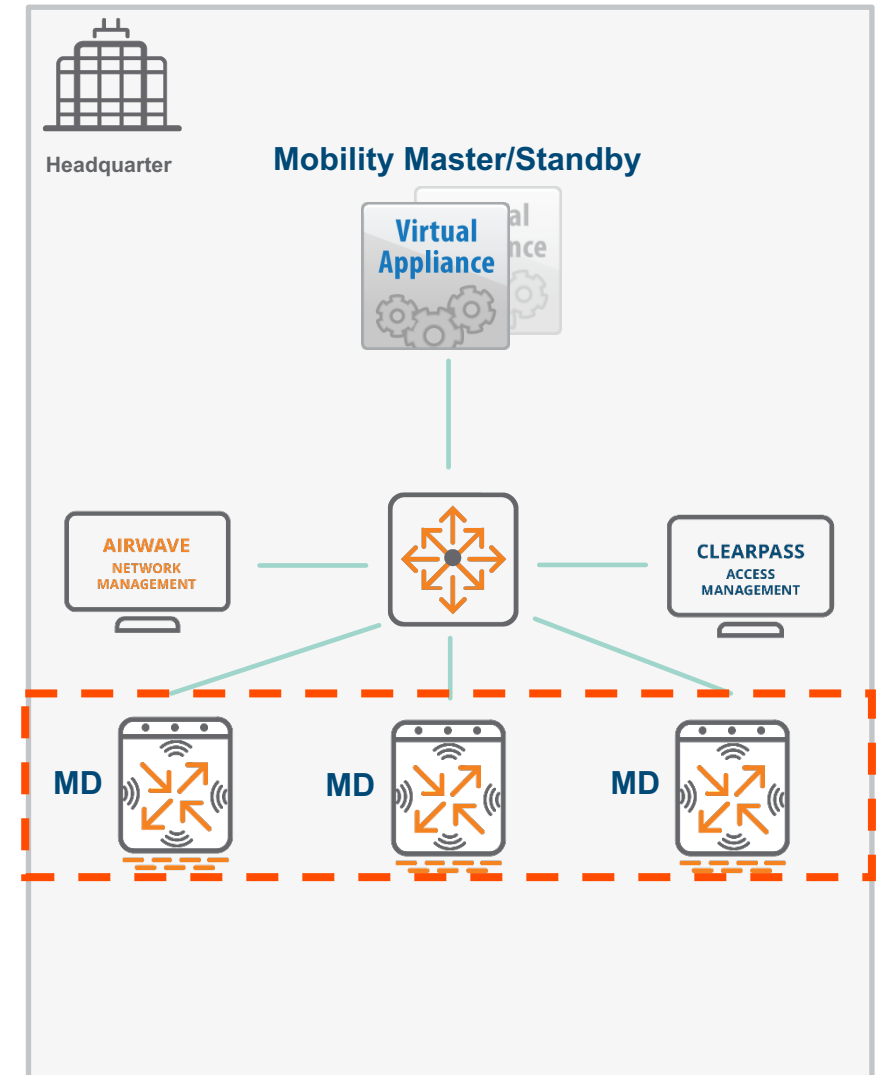
Clustering

Highlights

1 Available ONLY with Mobility Master

2 Only among Managed Devices (not MM)

3 No License needed



Clustering

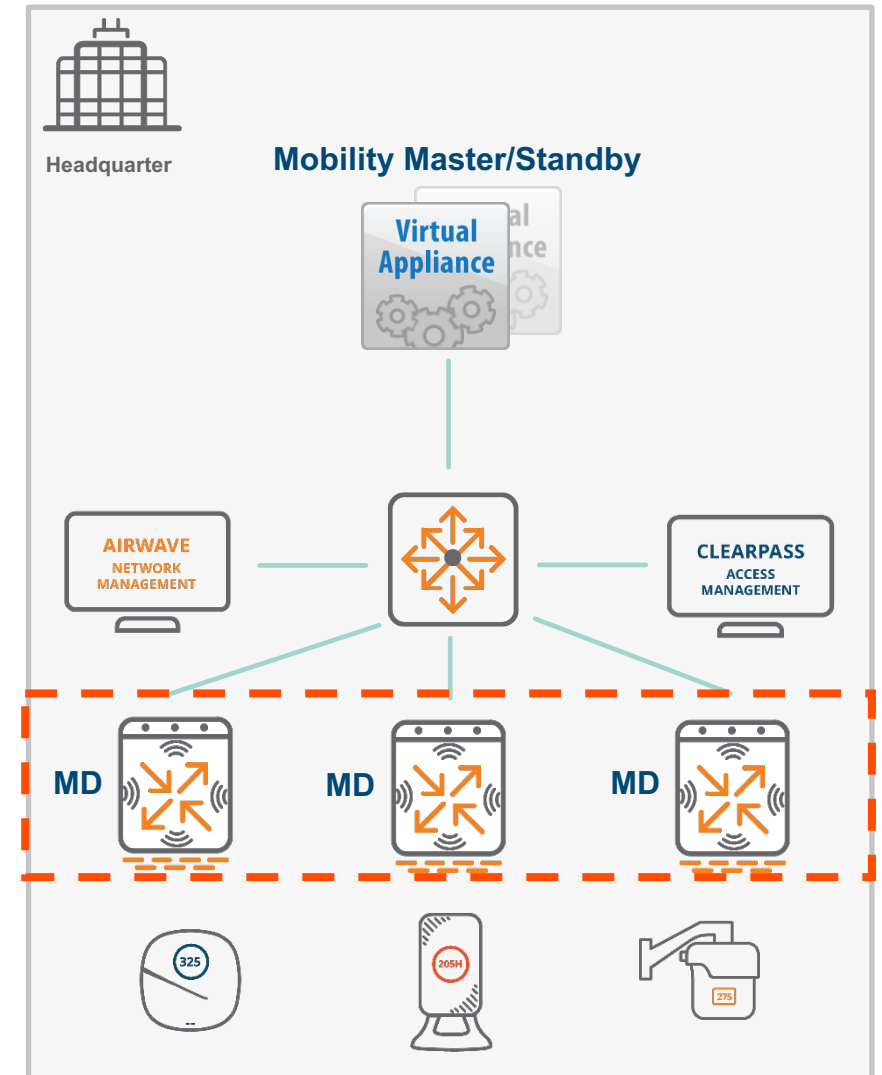
Highlights

1 Available ONLY with Mobility Master

2 Only among Managed Devices (not MM)

3 No License needed

4 CAP, RAP and Mesh AP support

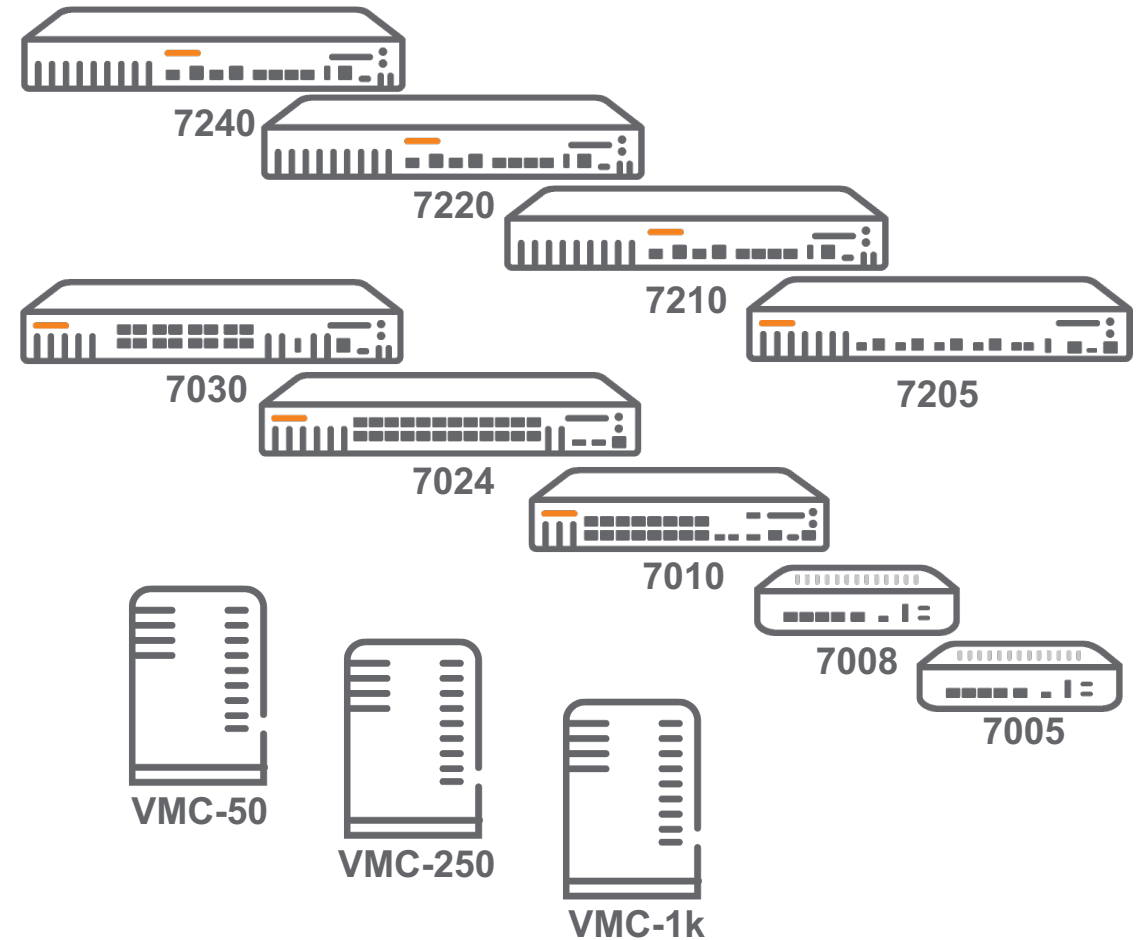


Clustering

Highlights

5

72xx, 70xx and VMC supported



Clustering

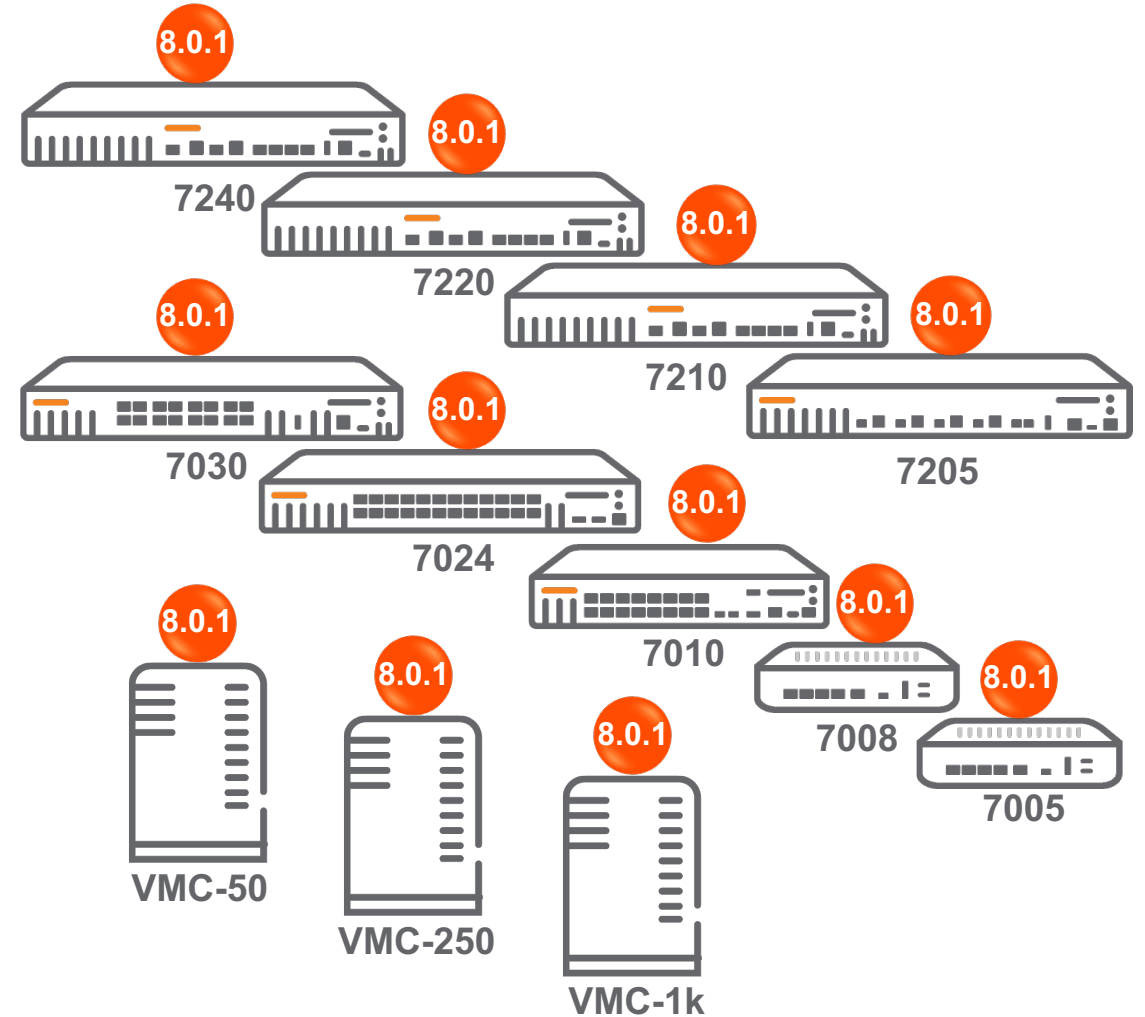
Highlights

5

72xx, 70xx and VMC supported

6

All Managed Devices need to run the same software version

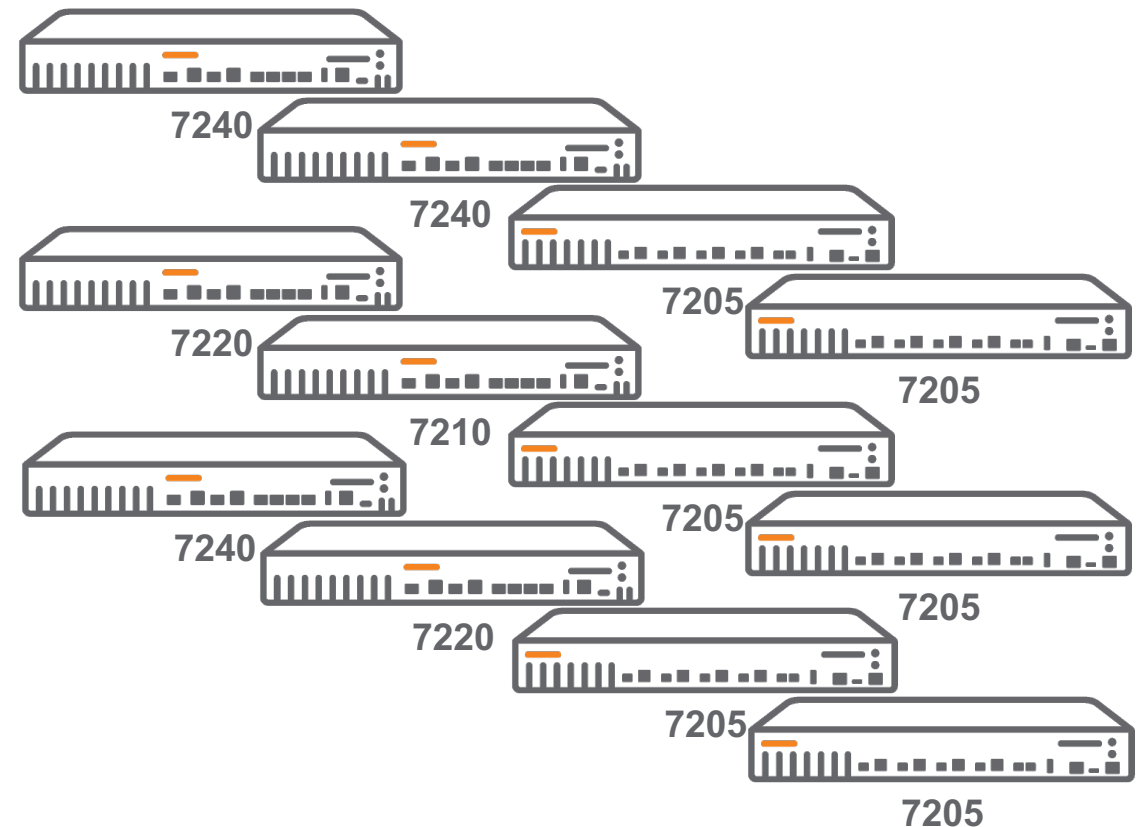


Clustering

Cluster Capacity

1

Up to 12 managed nodes in a cluster when using 72xx devices



Clustering

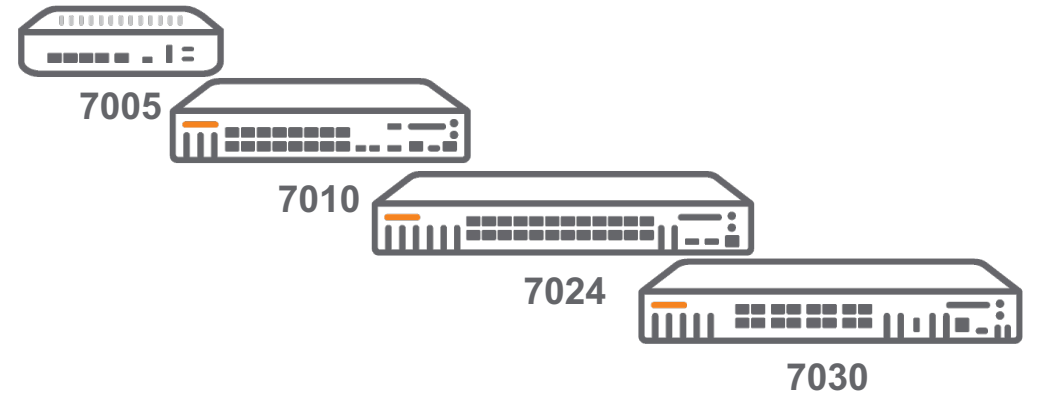
Cluster Capacity

1

Up to 12 managed nodes in a cluster when using 72xx devices

2

Up to 4 managed nodes in a cluster when using 70xx devices



Clustering

Cluster Capacity

1

Up to 12 managed nodes in a cluster
when using 72xx devices

2

Up to 4 managed nodes in a cluster
when using 70xx devices

3

Up to 4 managed nodes in a cluster
when using VMC devices



VMC-50



VMC-250



VMC-1k



VMC-1k

Clustering

Key Considerations

1

Clustering and HA-AP Fast Failover mutually exclusive

2

Cluster members need to run the same firmware version

3

Size of Cluster terminating RAPs limited to 4

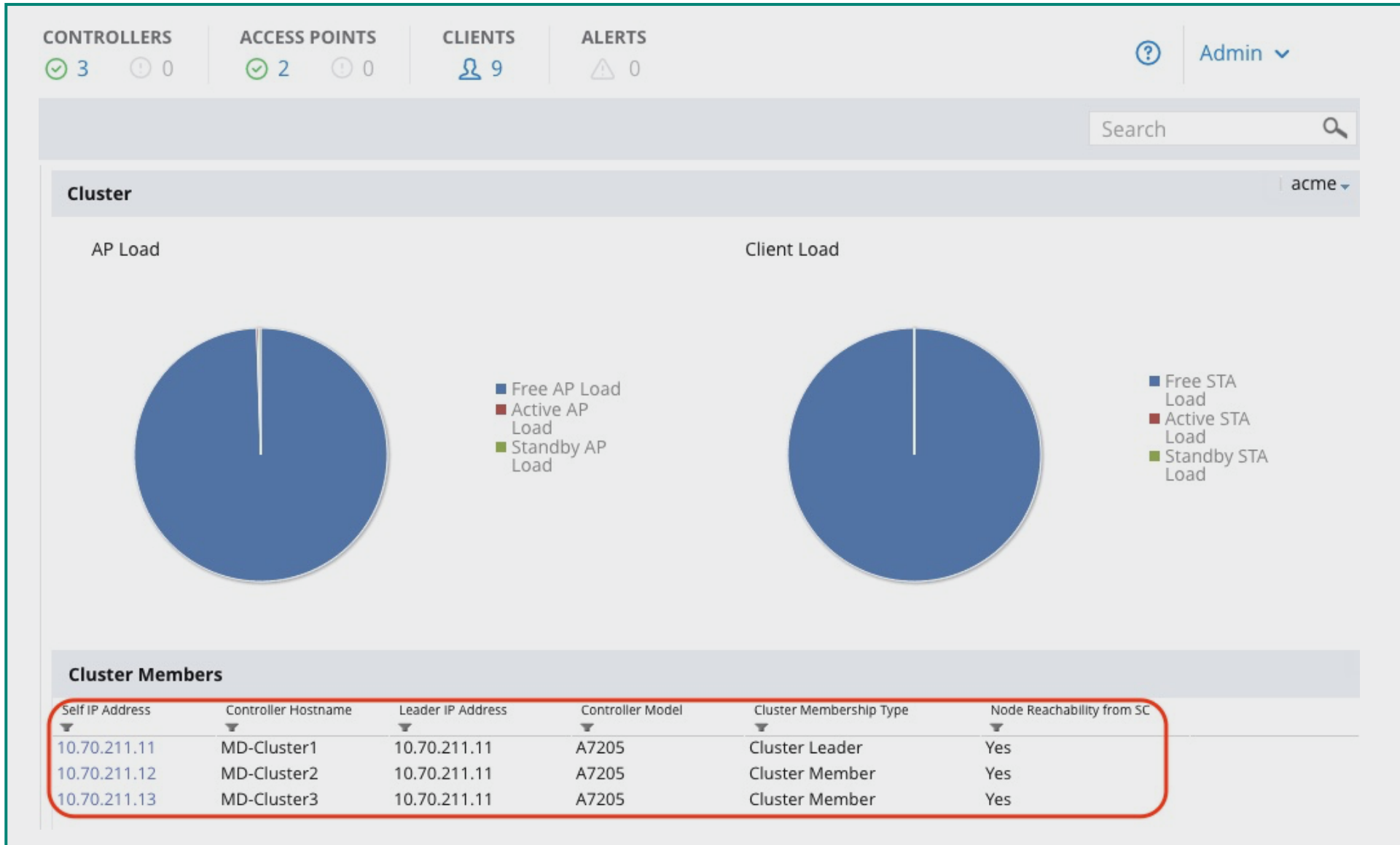
4

Mix of hardware and x86 Managed Devices in a cluster not supported

5

Mix of 72xx and 70xx devices in a cluster not recommended

Cluster Dashboard



MultiZone

8.0

Multizone AP

What is a Zone? What is a Multizone AP?

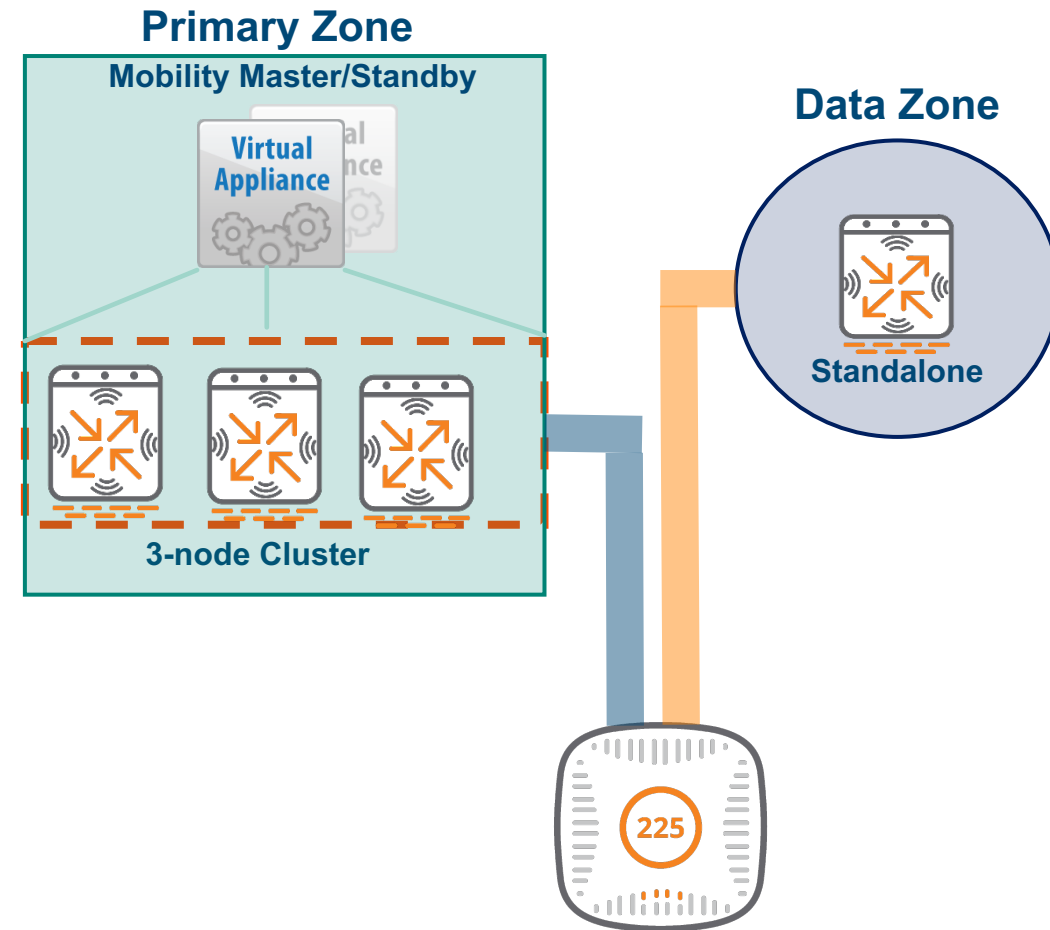
Zone

- 1 Collection of controllers under a single administration domain
- 2 Can be a single controller or a cluster of controllers

Multi-Zone AP

- 1 AP capable of terminating its tunnels on controllers residing in different zones

Note: 6.x deployments seen as a single zone!



Multizone AP

Objectives

1

Same AP hardware
Different Controller domains

2

Secured Containers for different SSIDs

3

Air Wall between zones

Multizone AP

Zone Roles

Primary Zone

1

Zone AP connects to when booting up

2

Full Management and configuration of the AP features

3

Configure multizone profile to enable the feature

Multizone AP

Zone Roles

Data Zone

1

Secondary zone AP connects to after receiving multizone profile

2

Cannot reboot, provision or upgrade AP image

3

Tunnel mode VAP profile configuration
ONLY

Multizone AP

Topologies – Examples

1

Primary Zone: Standalone 1
Data Zone: Standalone 2

Primary Zone



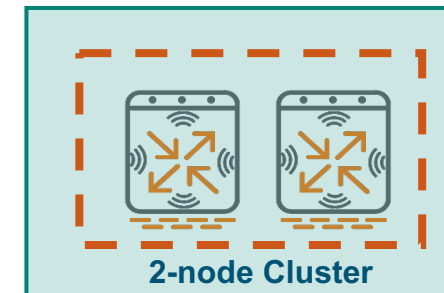
Data Zone



2

Primary Zone: 2-Node Cluster
Data Zone: Standalone

Primary Zone



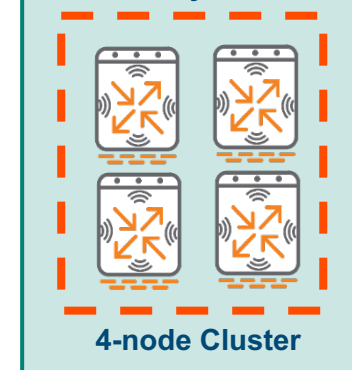
Data Zone



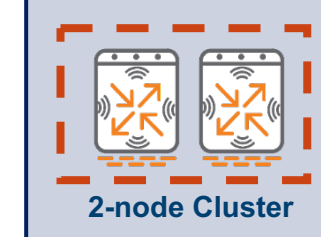
3

Primary Zone: 4-Node Cluster
Data Zone 1: 2-Node Cluster
Data Zone 2: Standalone

Primary Zone



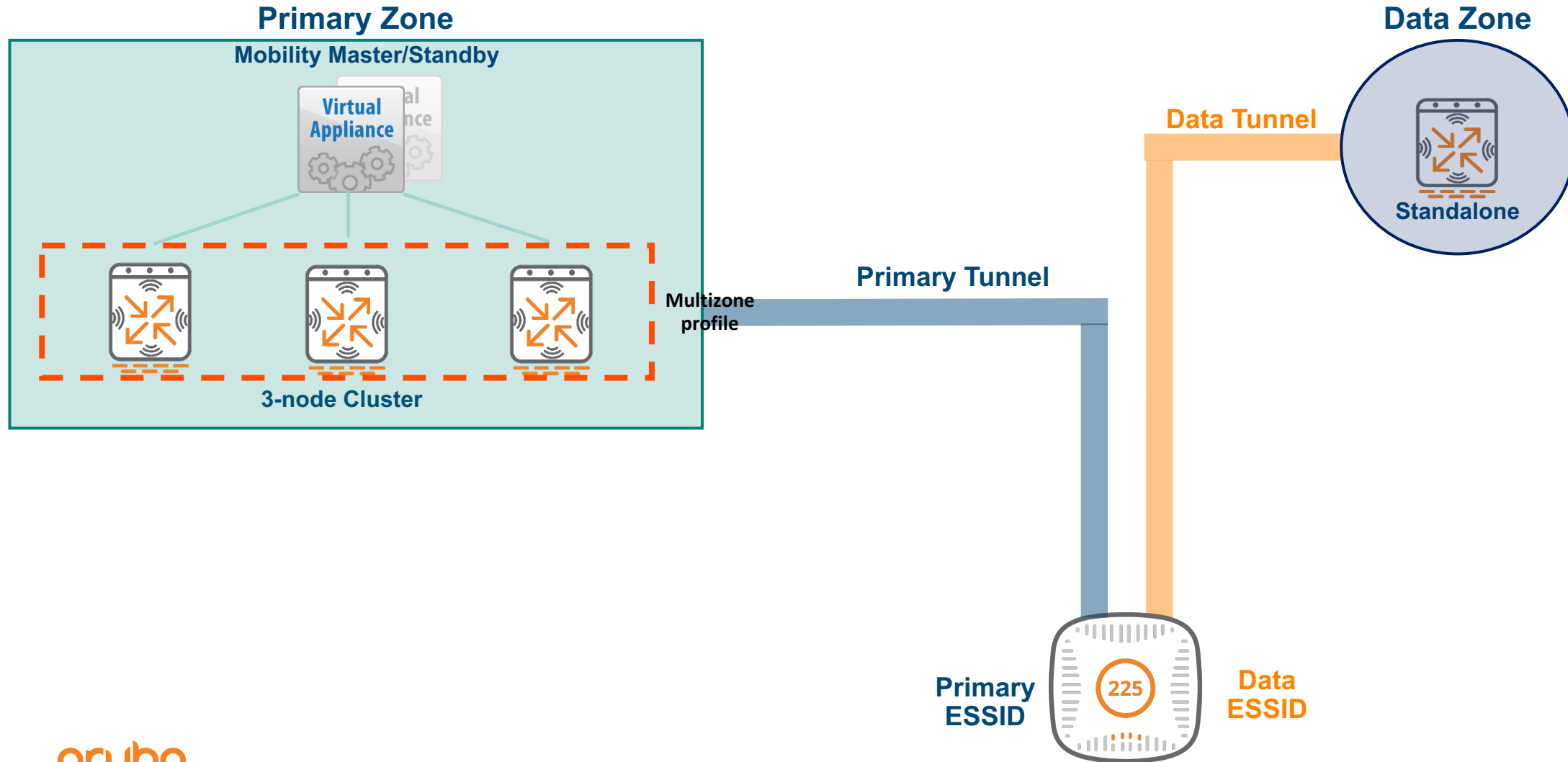
Data Zone 1



Data Zone 2



Multizone AP Architecture



Multizone AP

Multizone WebUI Configuration

General Admin Airwave CPSEC Certificates SNMP Logging **Profiles** More

All Profiles

- ⊖ AP
- ⊕ AM Filter
- ⊕ AP Authorization
- ⊕ AP Ethernet Link
- AP LACP LMS map information
- ⊕ AP LLDP
- ⊕ AP LLDP-MED Network Policy
- ⊖ AP multizone
- acme-mz**
- default

AP multizone profile: acme-mz

Data zone controller IP:

ZONE	IP	NUM_VAPS
1	10.70.213.11	2

+

Enable/disable multizone: ☒

Multizone AP

Key Considerations

- 1 Same AOS version in all zones
- 2 Same AP-GROUP and AP-NAME in Data Zones as Primary Zone
- 3 CPSEC is required
- 4 Primary and Data Zones Managed Devices cannot run from same MM
- 5 AP-22x & AP-13x supported in 8.0.0 and AP-31x, -32x, & -33x in 8.0.1

Multizone AP

Key Considerations

6

Max of 5 zones (1 primary + 4 Data)

7

Max of 12 controllers for all zones

8

Max of 16 VAPs per radio for all zones

9

Mesh, RAP not supported

Upgrading & Roadmap

8.0.X

Upgrade at your own pace

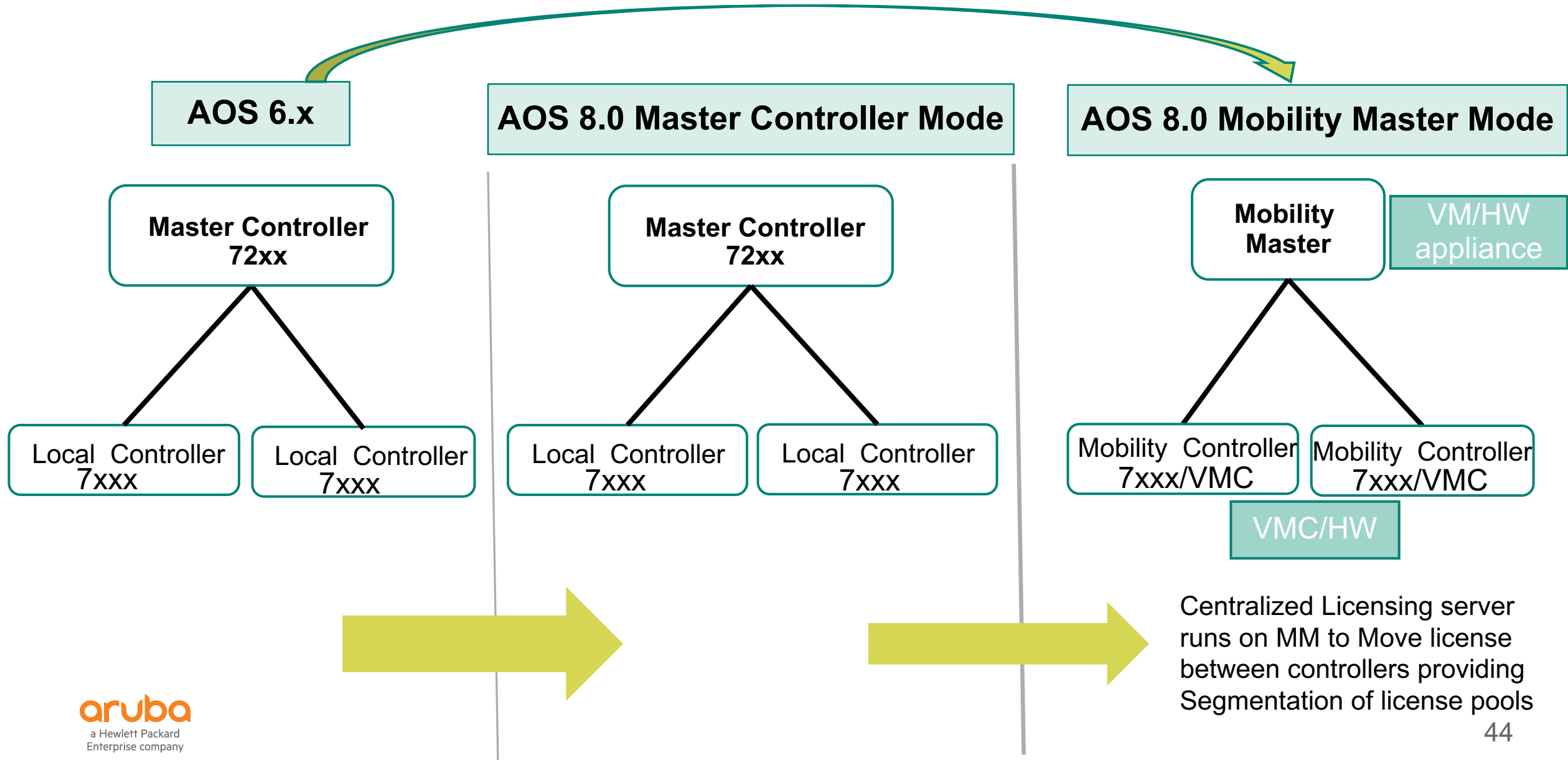
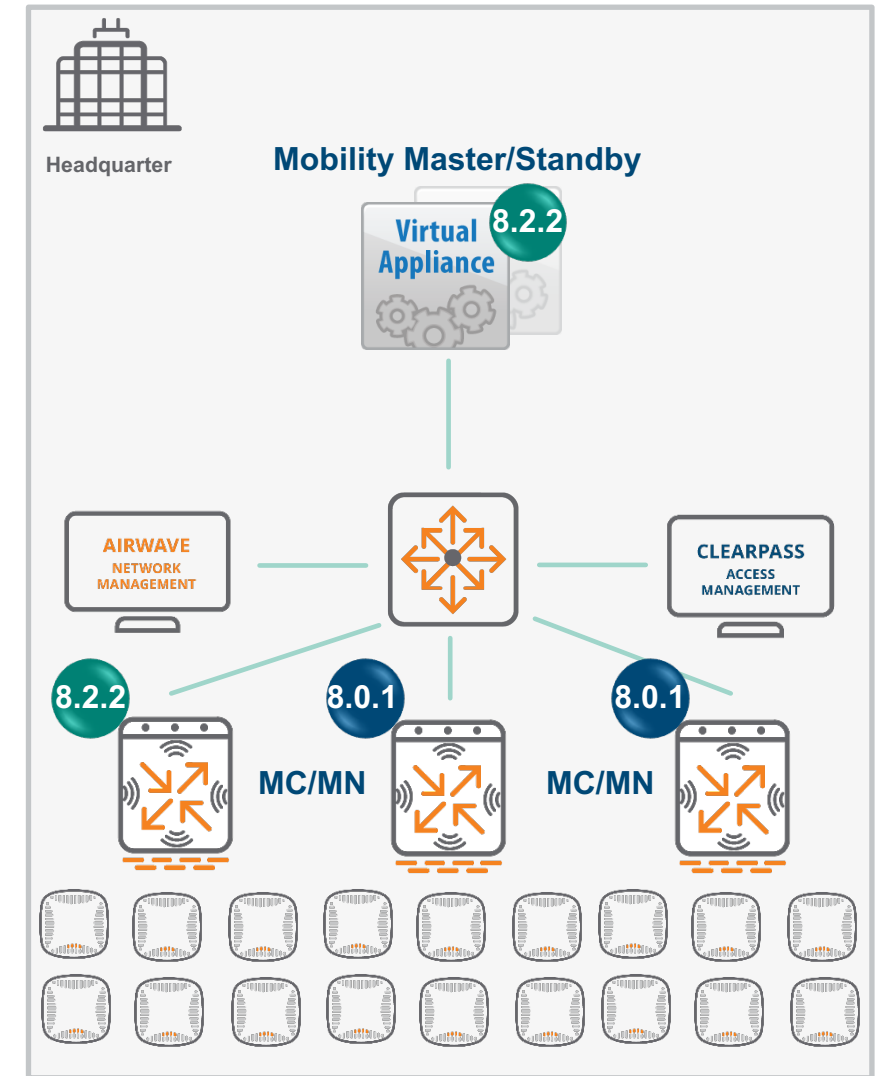
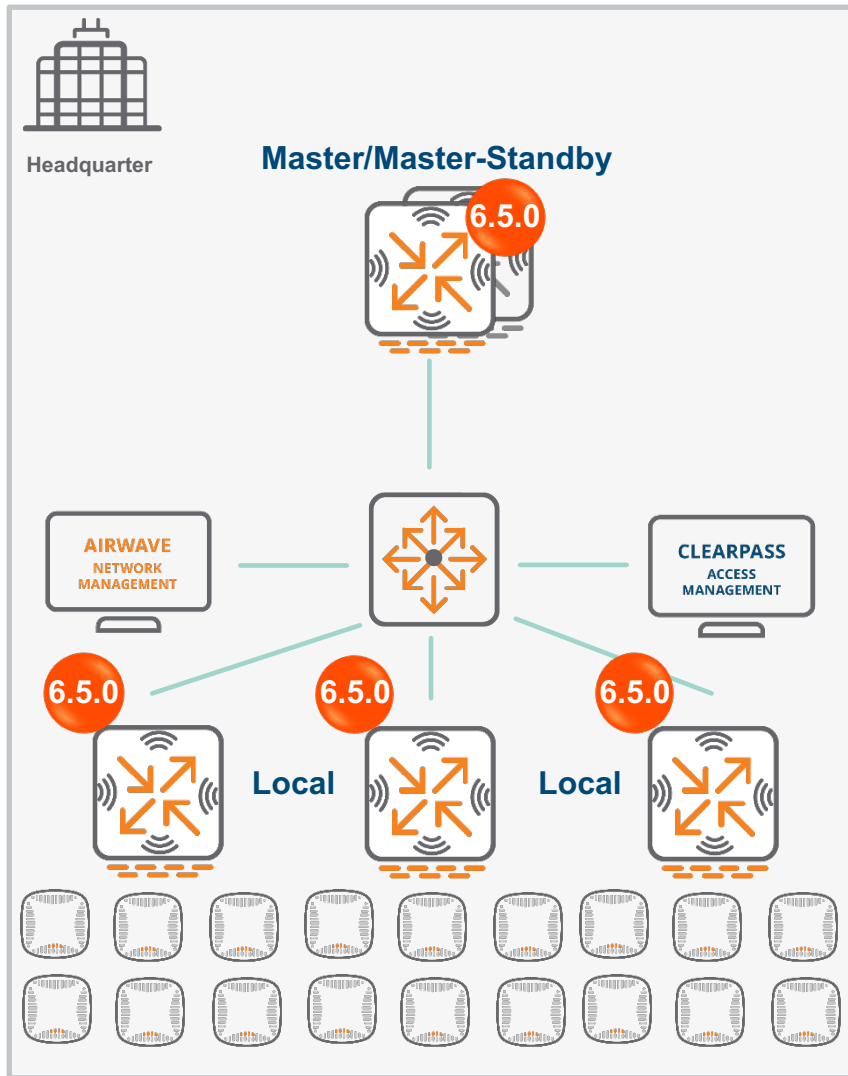


Image Upgrade

Comparing 6.x vs 8.0.0



8.0 Roadmap

Product	Availability
AOS 8.0 – <i>Soft Launch</i> Mobility Master (VMware Hypervisor only)	July, 2016
AOS 8.0.1 <ul style="list-style-type: none">• Master Controller Mode• Virtual Mobility Controller (VMC)• 310 & 330 APs• KVM Hypervisor support	November, 2016
AOS 8.1 <ul style="list-style-type: none">• HW Mobility Master (x86 HW)• 207 & 304/305 APs	Q1, 2017

Supported Hardware (Same as AOS 6.5):

- 70xx and 72xx controllers
- Most 11n APs
- 11ac APs- All 2xx,3xx APs

Unsupported hardware (Same as AOS 6.5):

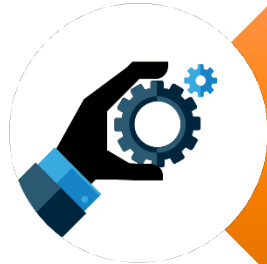
- AP-12x
- 11a/b/g APs
- 6xx/3xxx/6xxx controllers

ArubaOS 8.0: Key Benefits



Simplicity:

Multi-versioning, enhanced UI, campus ZTP, user load balancing, centralized licensing



Stability:

In-service upgrades, seamless client failover in cluster, auto config rollback



Innovation:

ClientMatch, AirMatch, MultiZone, AirGroup, AppRF

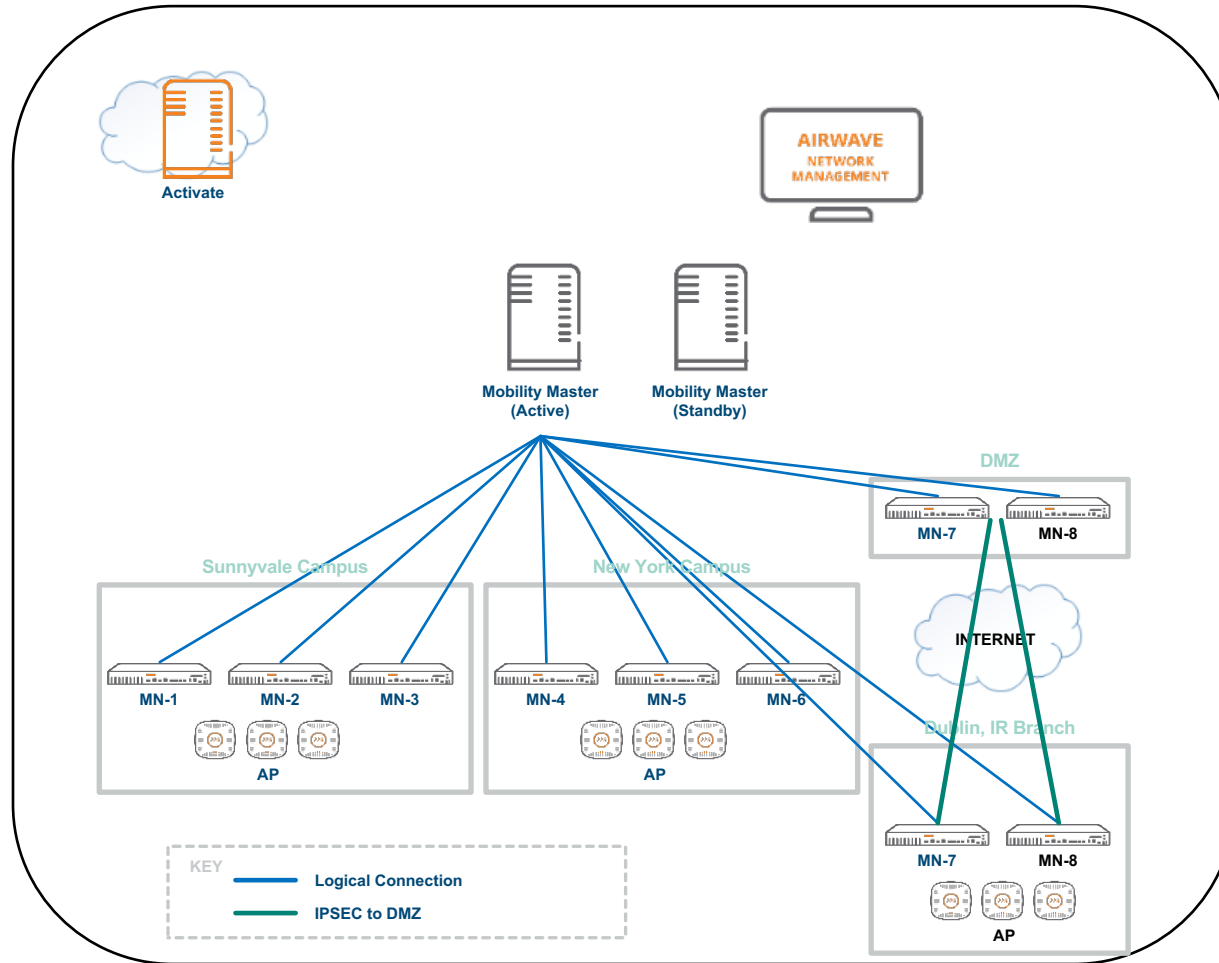


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Thank you

Contact information: nick.walters@hpe.com

ArubaOS 8.0: Mobility Master Architecture



Activate

- Provide provisioning info for Zero Touch Deployment

Airwave / Network Manager

- Monitoring
- Reports
- Long-term Dashboards

Mobility Master (MM)

- UI – Simplified and modernized
- Configuration
 - auto roll back
 - Hierarchical config
 - Multi-version support
 - Multi-threaded CLI
 - Only one kind of controller (No more Master, Local, Branch)
- Centralized Licensing with multiple pools
- Controller / AP Whitelist
- Services
 - **Inline service upgrades**
 - **Improved scale**
 - **AirMatch, RBCM, AppRF, AirGroup, SDN controller, etc.**
- Zero Touch Deployment
 - Static, DHCP, Activate
 - Controllers and APs boot without user intervention.
- Controller Cluster
 - Seamless Roaming across large campus
 - Stateful User Session Failover
 - User Load-Balancing