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## Hospitality Solutions Event

# Agenda

**16:30** Welcome and Opening note

Zouheir Diab and Tareq Qutish

**16:45** Hospitality Trends and Vision

Graeme Kane

**17:15** ARUBA Solutions for Hospitality

- Wireless Solutions
- Network Security
- Aruba Switching and IOT
- Mobile Engagement

Mohamed Heiba  
Mohamed Abu Ghalioun  
Ahmed Ibrahim  
Mohamed Abu Ghalioun

**18:15** Activities & Dinner

**19:30** Dinner

A man and a woman in business attire are sitting at a desk, looking at a tablet together. The man is wearing glasses and a suit, and the woman is also in a suit. They are both smiling and appear to be in a collaborative work environment. A laptop and a glass of water are visible on the desk in the foreground.

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**Graeme Kane**

BDM, Hospitality CEEMA

# Building the Guestroom of the Future

## Connectivity for In-Room Technology



Guest Access



Location



Wi-Fi Calling



IPTV



Analytics



Staff Ticketing



IP Cameras



Mobile Engagement / IoT

# Why Hospitality and LPV Chooses **Aruba**



**Aruba infrastructure:**  
Wi-Fi, BLE, Wired, WAN



**Policy management**  
ClearPass with a unified API library  
and Extensions repository



**Location analytics**  
Analytics and Location Engine  
(ALE) with northbound REST APIs



**Micro-location services**  
Meridian with mobile app  
development SDK and REST  
APIs



**Network management**  
AirWave with northbound XML APIs  
for data consumption



**Network controls**  
AOS8 with REST APIs to share  
context and program infrastructure



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# Wireless Update

An Always On Network with ArubaOS 8

Mohamed Heiba

Solutions Architect –HPE Aruba

**Wi-Fi went down for five minutes, so i had to talk to my family. They seem like nice people.**



[DespicableMeMinions.org](http://DespicableMeMinions.org)

# TECHNOLOGY DISRUPTIONS **STILL ON THE RISE**

## MOBILE



**70%**  
Of all enterprise  
employees  
are mobile workers

## CLOUD



**\$127B**  
Cloud Spending

## IOT



**7.6B**  
Enterprise IoT  
Devices

## IT BUDGET

IT BUDGET



**0-2%**  
Growth in IT  
Budgets

Gartner Forecast Overview: Enterprise Communications Services, Worldwide, 2017

IDC Forecast: Public IT Cloud Services

Gartner Forecast Overview: Devices, Worldwide, 2017 Update

# MODERN DESIGN PHILOSOPHY: ARUBA'S HERITAGE AND VISION



BORN IN THE  
MOBILE-CLOUD  
AND IOT ERA



SOFTWARE-DEFINED,  
API-FIRST

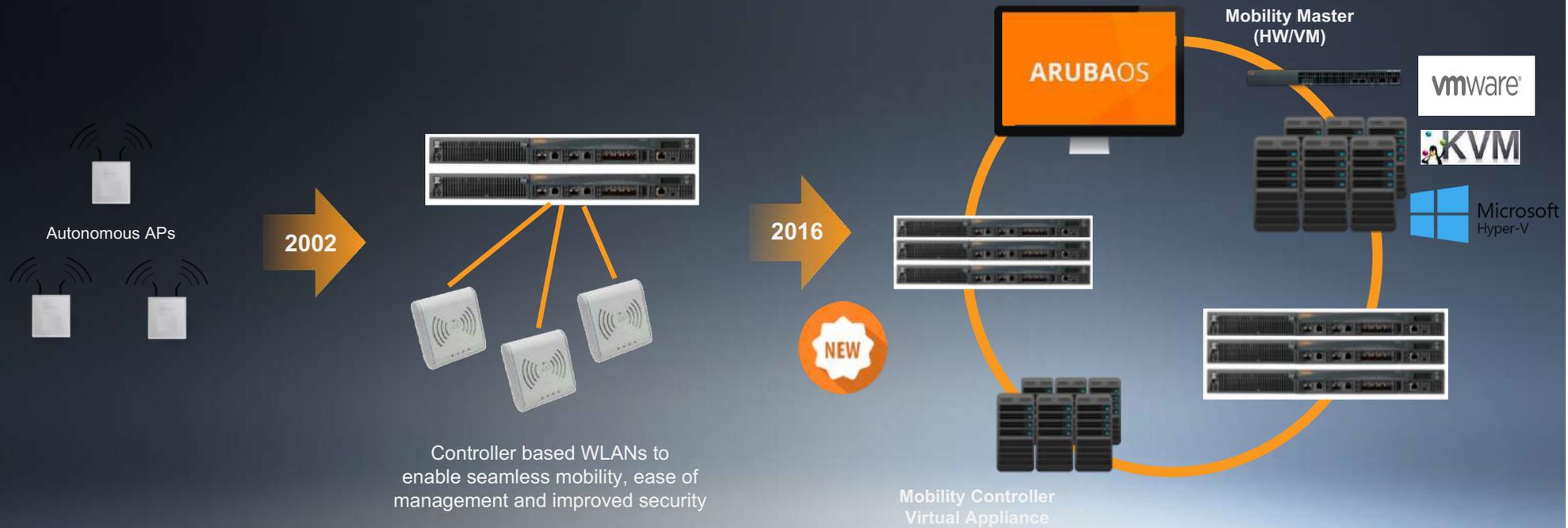


OPEN,  
MULTI-VENDOR



SECURITY  
DRIVEN

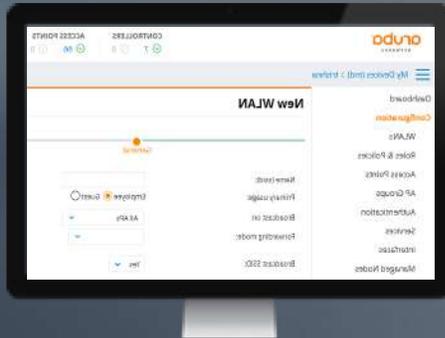
# Simplify & scale campus wireless LANs with virtualization



# Aruba Mobility Master – Virtual and Hardware appliance



Aruba Mobility  
Master-VA



Aruba Mobility  
Master - HW



Aruba Virtual  
Mobility  
Controllers



Aruba Mobility  
Controllers

## Next generation Master controller

- **Centralized management**
- **Hitless failovers** during controller failures
- **Real-time upgrade** with no downtime
- **User and AP load balancing** across controllers
- **Automated RF management** for better network throughput in congested environment
- **Multi-tenant wireless networks** for better network efficiency
- Network intelligence with **NBAPIs**

MM VA/HW which one should I use?

Whatever works best with your operational standards.

# Mobility Controller options – Virtual and hardware appliance



Virtual Mobility  
Controllers



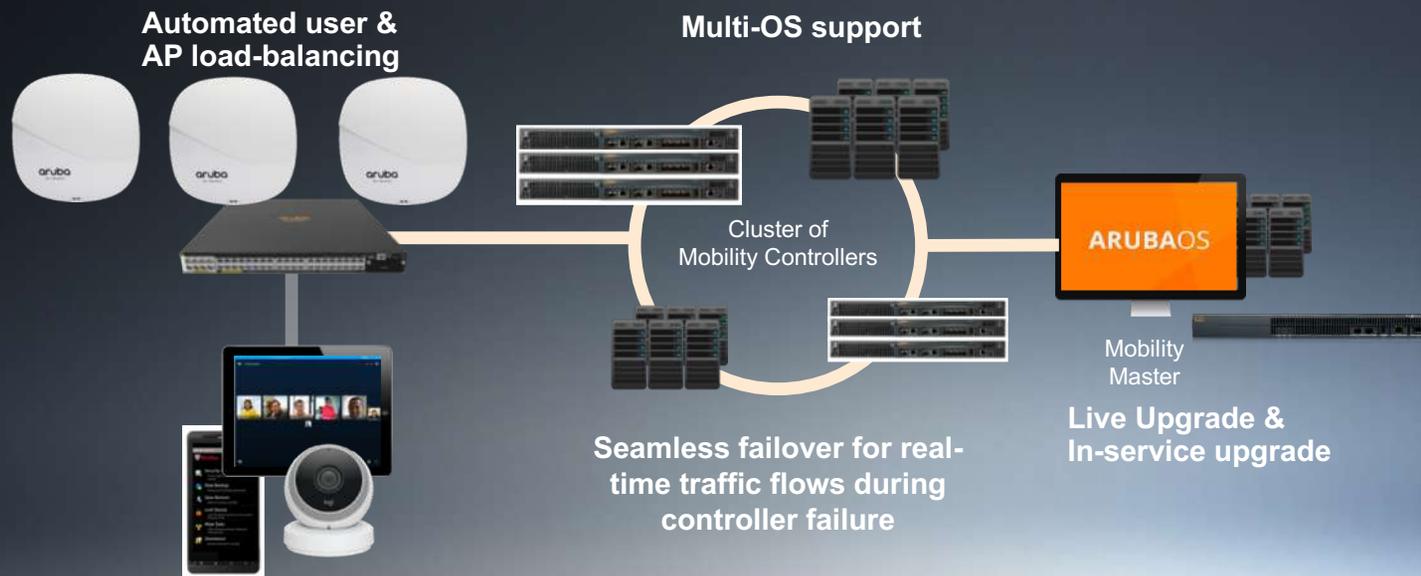
## Mobility Controller Virtual Appliance

- Ease of moves, changes and use
- 99% feature parity with hardware appliance
- Cost effective if building for redundancy
- Operate as a standalone controller or managed by the Mobility Master

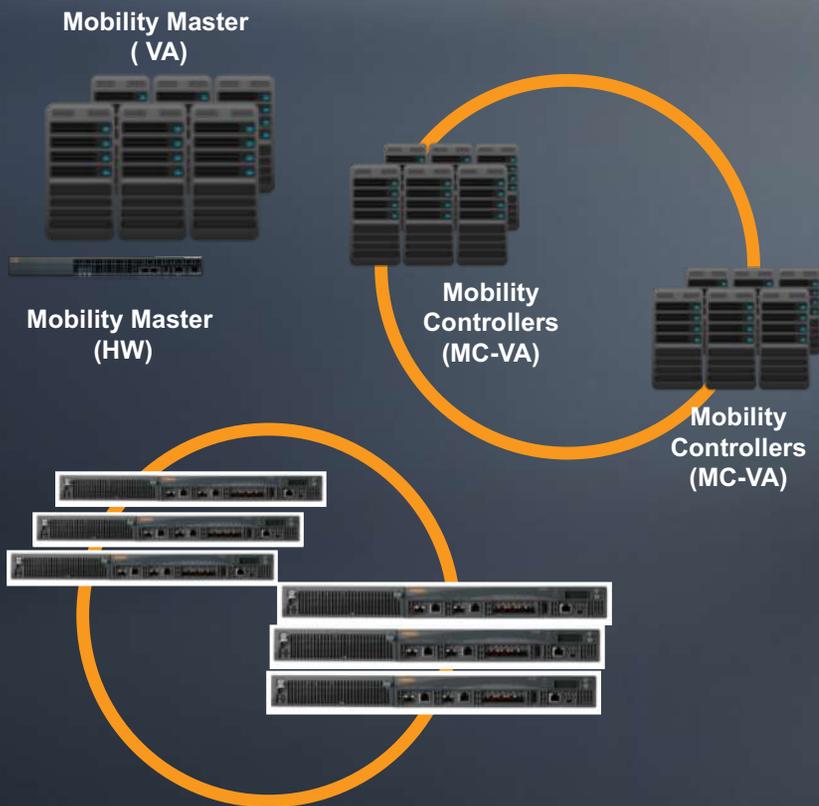
## Mobility Controller Hardware

- 70xx and 72xx supported in 8.x
- Simplified support model
- Cost effective for high throughput needs
- Operate as a standalone controller or managed by the Mobility Master

# Reliability at all levels- Always On Network



# Network reliability- Controller Clustering



## Controller Clustering

- **Seamless failovers** in an event of a controller failure, No disruption to real-time voice and video apps
- **Automated user & AP load-balancing** in a controller cluster – better use experience in congested area
- **Seamless roaming with clustering** – better user experience when roaming

# Reliable network upgrade



## Live Upgrade

Real-time upgrade to the latest OS with min downtime

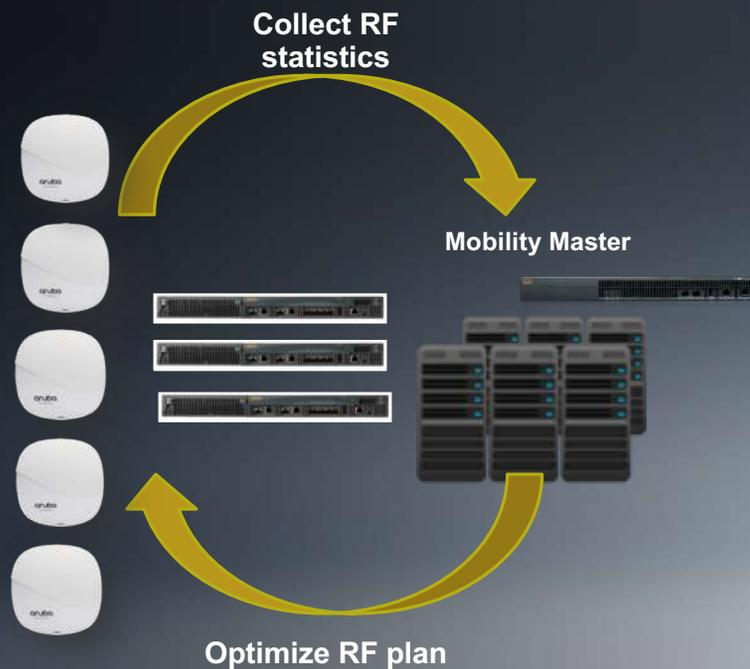
- No need for through upgrade planning or maintenance window
- Healthcare, Higher Ed and manufacturing cannot afford downtime

## In-service Upgrade

- Upgrade major features and functions, such as NB APIs, AirGroup, AppRF, ClientMatch
- **Multi-OS support**
  - Run multiple OS on the network- A gradual migration tool to adopt new innovations while minimizing risk.
  - Only available on ArubaOS 8.2 +

*The average Fortune 500 company experiences 1.6 hours of downtime per week. That's **\$164m** in lost productivity every year.*

# AirMatch : Automated high density RF optimization



## AirMatch

- Enhanced user experience while roaming in large dense environments
- Next-gen self-optimizing RF planning - enhancement to ARM
- Even channel assignment, dynamic channel width adjustment and automated power planning for APs
- Mobility Master required

# Reliable performance with Aruba ClientMatch™

## Predictable Wi-Fi performance across the network

Intelligently steers devices to the best AP

Reduces “sticky” clients issues => fewer helpdesk tickets

No client-side software required

### REAL-TIME RF CORRELATION



DEVICE TYPE



LOCATION



CONGESTION



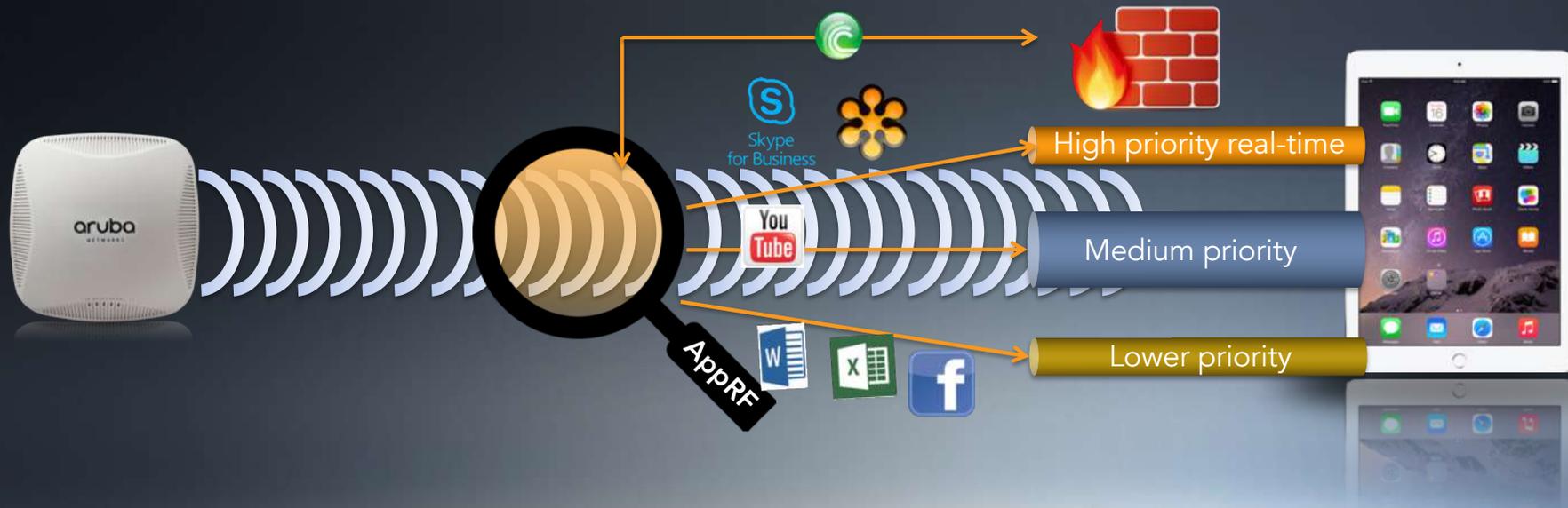
INTERFERENCE



'MU-MIMO Aware'

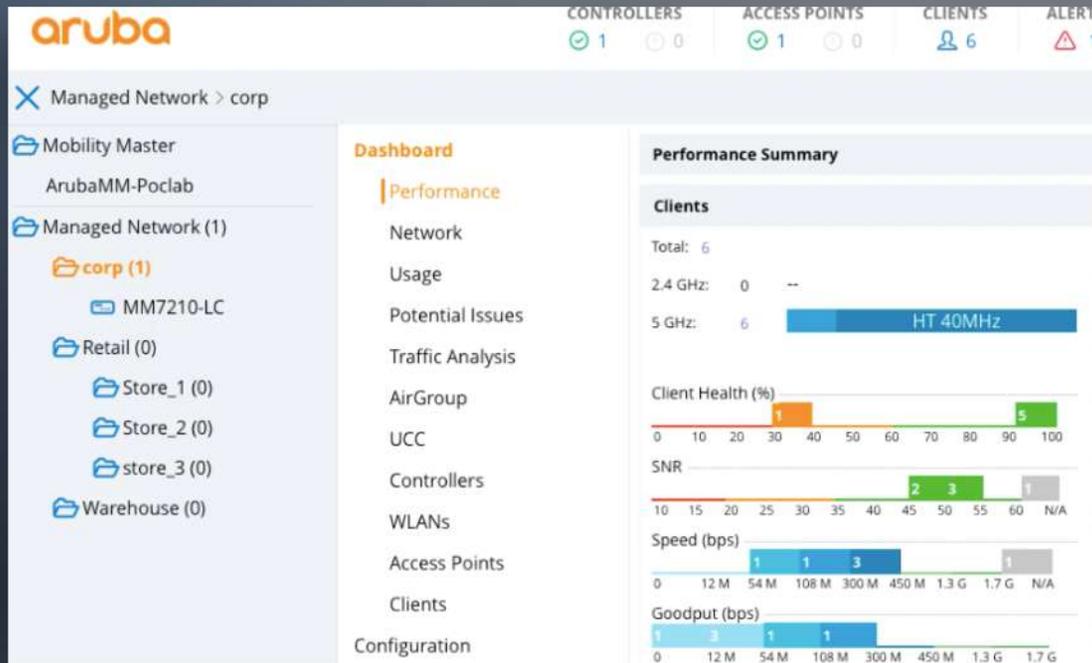


# Intelligent traffic control with AppRF™



Automatically identifying traffic and prioritizing traffic per user and device

# Ease of network scaling –Hierarchical Config

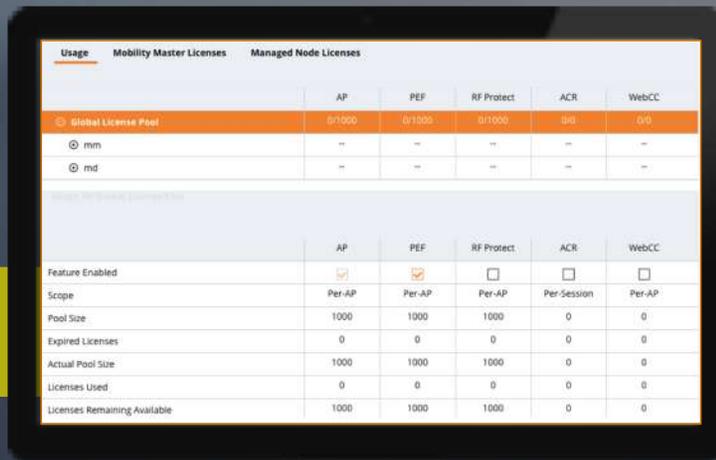


## Hierarchical configuration

- One centralized place to push all configuration to all controllers
- More modern and simple UI
- Reduce time to configure network
- Provision APs and wireless networks with simple steps

# More flexibility for license deployment

University  
500 license



Usage	AP	PEF	RF Protect	ACR	WebCC
Global License Pool	0/1000	0/1000	0/1000	0/0	0/0
mm	--	--	--	--	--
md	--	--	--	--	--

Feature Enabled	AP	PEF	RF Protect	ACR	WebCC
Scope	Per-AP	Per-AP	Per-AP	Per-Session	Per-AP
Pool Size	1000	1000	1000	0	0
Expired Licenses	0	0	0	0	0
Actual Pool Size	1000	1000	1000	0	0
Licenses Used	0	0	0	0	0
Licenses Remaining Available	1000	1000	1000	0	0



Chemistry  
300 license

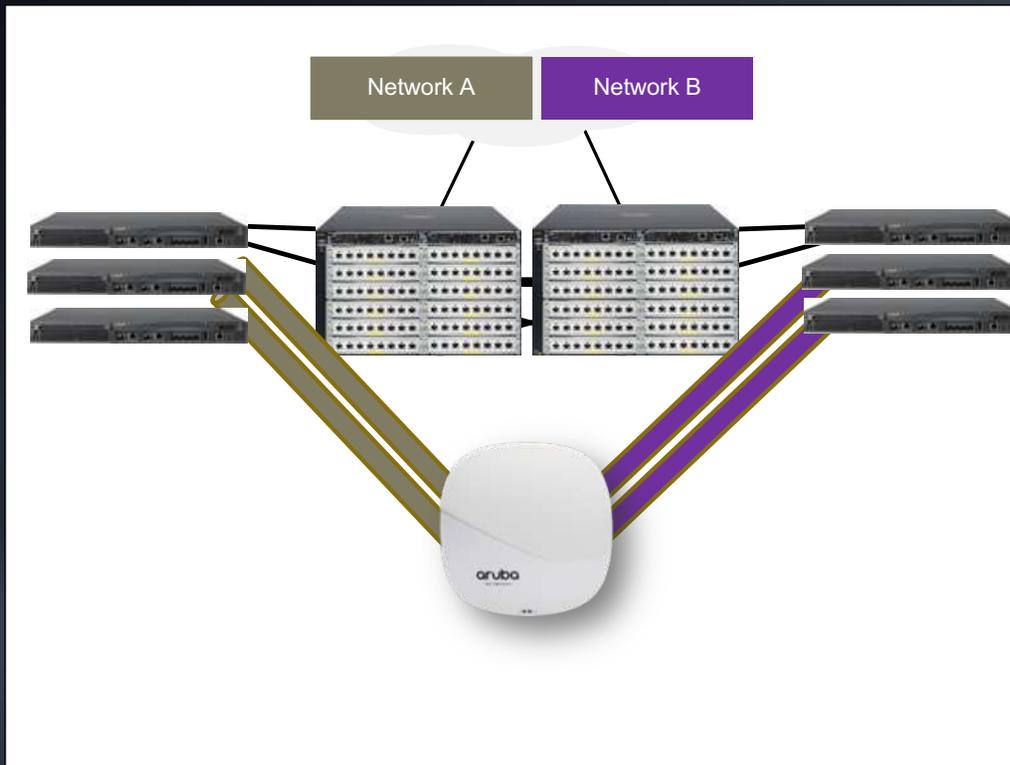


Mathematics  
200 license

## Centralized licensing

- Centralized licensing – all licenses hosted from one single location MM
- Optional segmentation of **license pools** across different departments within the same organization

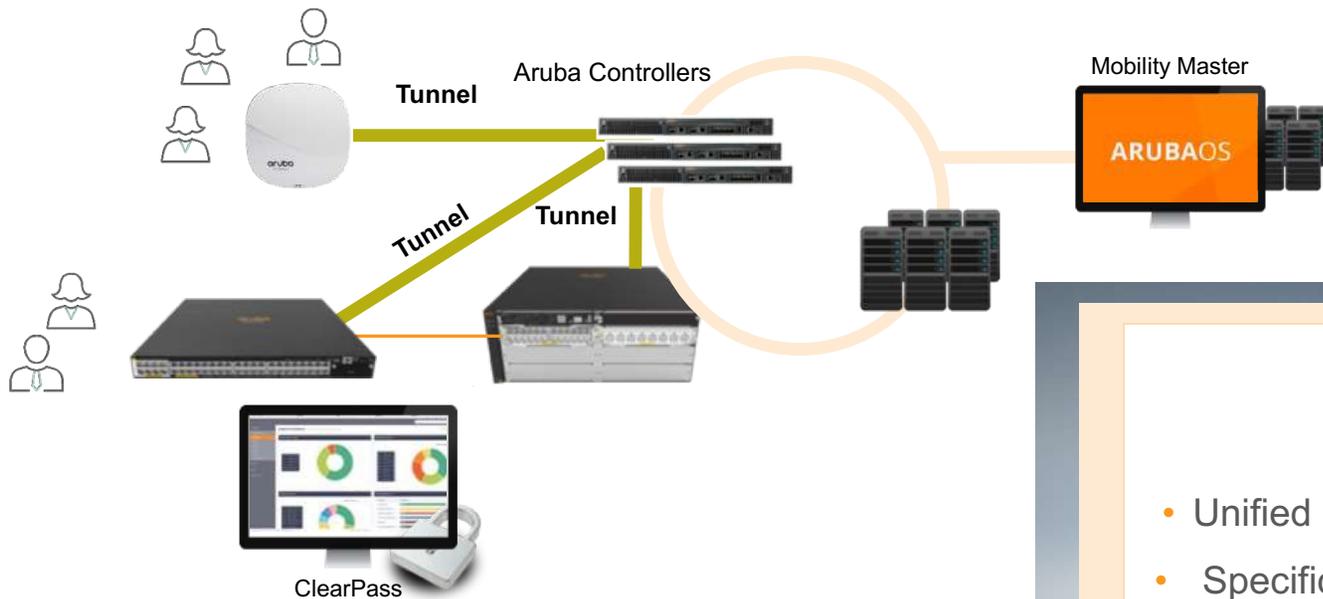
# MultiZone : Multiple tenants on the same access point



## MultiZone

- Multiple secure separated networks
- SSIDs terminate on different controllers
- Efficient use of Wi-Fi resources
- Secure data separation
- Multiple vertical use cases:
  - Government (classified vs. unclassified)
  - Airports (public, airport security, airline staff)
  - Shopping malls (staff, service provider, retail stores)
  - Service providers such as AT&T and Verizon

# Tunneled Node : Unified wired & wireless policy



## Tunnel node

- Unified and centralized policy control
- Specific traffic user/device role is sent to the Controller
- Extending controller access roles such as firewall to wired access users

Thank you





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# Aruba Security

Muhammad AbuGhalioun

# MOBILE FIRST ARCHITECTURE



Mobile First | Secure | Open | Insightful and Autonomous

# INHERENTLY SECURE

360 Secure Fabric

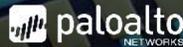
Embedded in the Network

Open, Unmatched  
Control & Analytics

Best-in-Class Ecosystem

Secure Boot | Trusted Platform Module | VPN | DPI | IPS | AMON

RBAC and NAC with Common Criteria | Multi-Vendor |  
Tunneled Node | User & Entity Behavioral Analytics



# Aruba RF Protect

# Why Wireless Intrusion Protection?

## Uncontrolled wireless devices

- Rogue APs
- Laptops acting as bridges
- Misconfigured laptops
- Ad-Hoc networks



## Attacks against the WLAN

- Denial of Service/flooding
- Forged de-authenticate/disassociate
- Man-in-the-Middle
- WEP cracking
- WPA-PSK cracking



# RFProtect: Protect the Air



## Prevent threats and eliminate vulnerabilities

- Prevent DoS, man-in-the-middle and other attacks
- Identify and contain uncontrolled wireless devices
- Automatic classification of security threats vs non-threats

## Complete spectrum visibility

- Identify sources of RF interference
- Channel optimization from noise sources via ARM
- Capture and playback of intermittent interference events

## Lower cost of deployment

- Aruba 11n APs are WIP and spectrum analyzer ready
- No need for additional appliances, sensors, or laptop clients

# RF Protect Deployment Architecture

## **Access Point**

### Hybrid AP

- Client Access
- Scan 2.4 and 5 GHz
- IDS detection
- Rogue detection
- Interference detection
- Interference classification

### Dedicated Air Monitor

- Air monitor 2.4 and 5 GHz
- Air monitor 4.9 GHz
- IDS detection
- Rogue detection
- Rogue containment
- Interference detection

### Spectrum Monitor

- Air monitor 2.4 and 5 GHz
- IDS detection
- Rogue detection
- Interference detection
- Interference classification



## **Mobility Controller**

- WLAN Services
- RFProtect Software Module License
  - Wireless Security
  - Spectrum Analysis

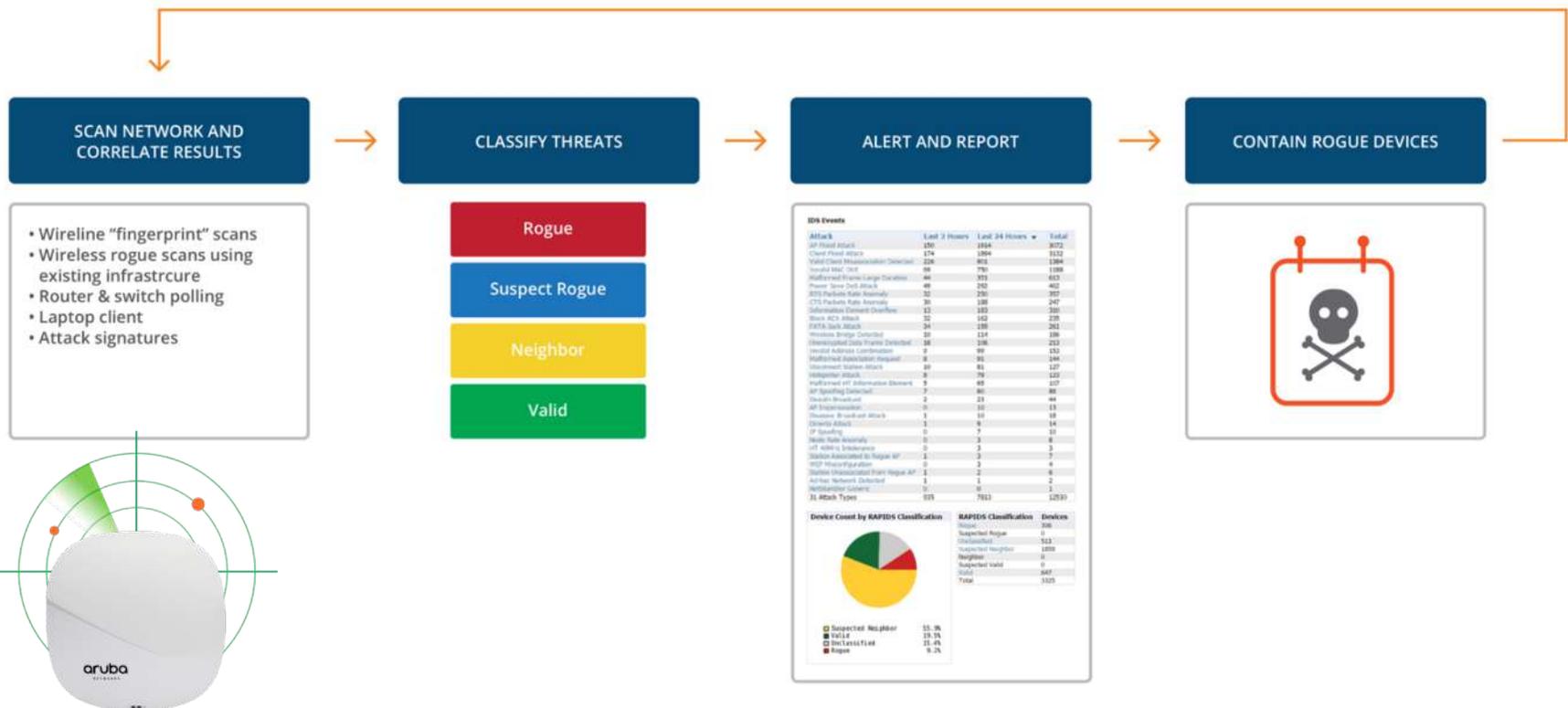


## **Airwave Wireless Management Suite**

- Centralized monitoring, reporting, RF visualization
- Location services
- WIP policy/event management
- Rogue classification rules
- Wired switch polling & rogue correlation
- Compliance reporting services



# Knowing what is in the environment



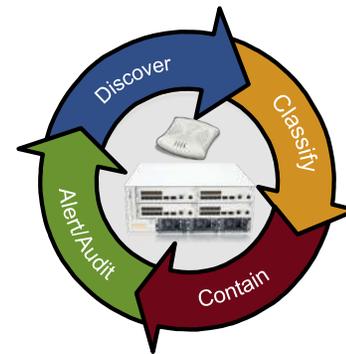
# Classify

## Automatic classification of threats and non-threats is critical

- Valid APs and stations
- Unauthorized employee-deployed APs
- Neighboring APs
- Hackers and malicious rogue APs
- Public Hotspots in range

## Automatic rogue classification and prevention

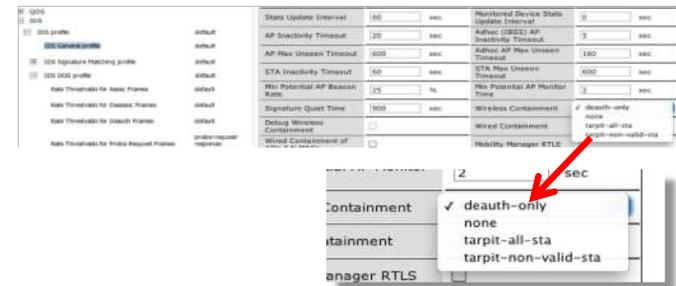
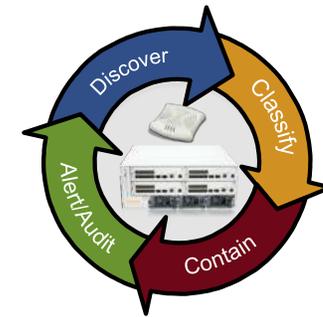
- Simple rule-based configuration



# Contain

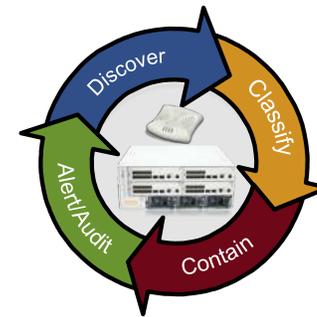
## Contain rogues while scanning for new threats

- **Tarpit Containment**
  - Establish fake associations to contain rogues
  - Low consumed bandwidth
- **Protect Valid Station**
  - Prevents valid stations from associating with interfering APs
- **Wired AP Containment**
  - ARP poisoning

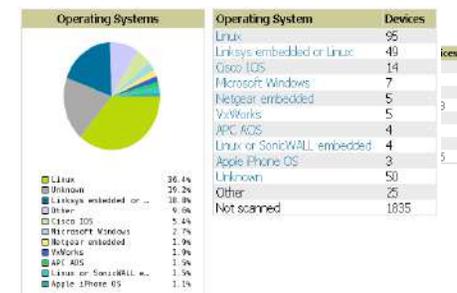


# Alert and Audit

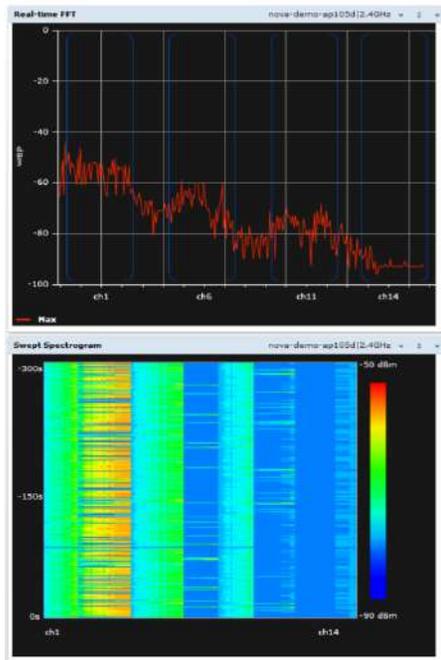
- **Integrated management and security dashboards**
  - WLAN health
  - Single view of security threats
  - Device inventory
- **Visibility of Security Threats**
  - Integrated RF planning tool and live heat map
  - Location tracking from all APs, including monitors and client APs
- **Automated historical reporting**
  - One-click security compliance reporting



Attack	Last 2 Hours	Last 24 Hours	Total
AP Impersonation	4	48	173
Deauth-Broadcast	0	0	2
Disconnect Station Attack (AP)	58	525	1237
Disconnect Station Attack (Station)	1	9	26
Null-Frame-Response	0	2	2
Station Associated to Rogue AP	150	1271	2548
Station Unassociated from Rogue AP	150	1221	2443
7 Attack Types	363	3076	6421



# RFProtect Spectrum Analyzer



## Why is it required?

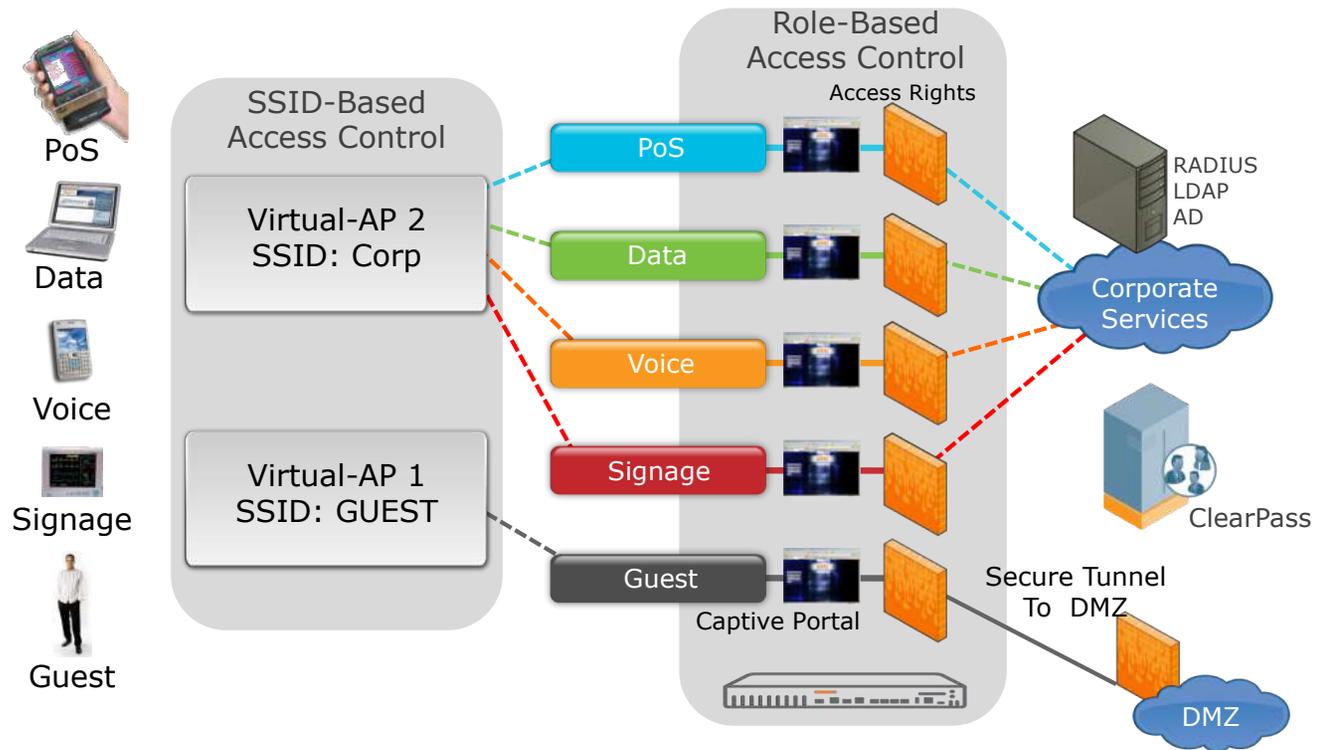
- RF interference is inevitable and unpredictable both in type and location
- For ensured link availability and performance, interfering devices need to be classified and mitigated quickly

## Benefits

- Operational cost savings through remote real-time analysis
- Lowest capital investment - integrated in all Aruba APs (802.11n and onwards)
- Single user interface for all reports ensures ease of management
- Record and playback of captured data for ease of troubleshooting

# Aruba Policy Enforcement Firewall

# Role Based Security Architecture



# Intelligent traffic control with application visibility



## On-Board DPI

- Depth - common apps
- Enterprise traffic



## Cloud-Based Web Policy Enforcement

- Breadth - less common apps
- Web traffic



## GRANULAR VISIBILITY & CONTROL

- |   |                                     |
|---|-------------------------------------|
| <input type="checkbox"/> App category   | <input type="checkbox"/> Allow/deny |
| <input type="checkbox"/> Individual app | <input type="checkbox"/> QoS        |
| <input type="checkbox"/> Web category   | <input type="checkbox"/> Throttle   |
| <input type="checkbox"/> Web reputation | <input type="checkbox"/> Log        |
|   | <input type="checkbox"/> Blacklist  |

- Prioritize business critical apps

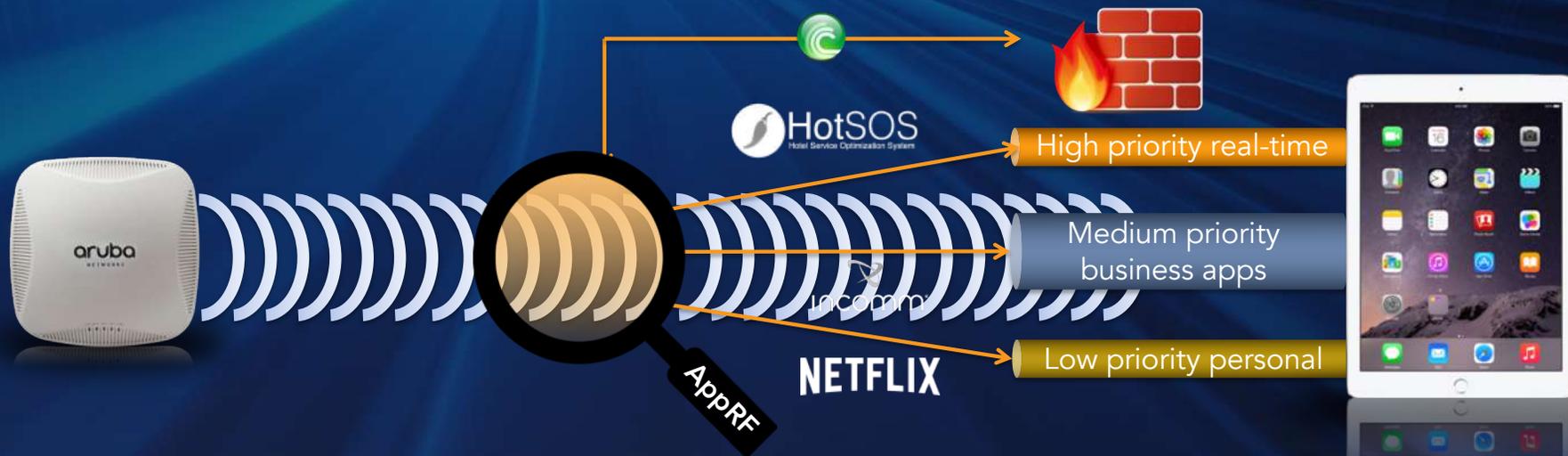


- Block inappropriate content

- Enforce per user/device/location



# Rich Experience through Intelligent Traffic Control with AppRF™



Critical communications and VIP traffic prioritized  
Leisure apps can be bandwidth shaped by user type

# ClearPass

# ClearPass Policy Manager and NAC Solution

## CLEARPASS POLICY MGR

### Built-in:

- Policy Engine
- RADIUS/CoA/TACACS
- Profiling
- Accounting/reports
- Identity store



Expandable Applications

- BYOD onboarding
- Simple guest access
- Health assessments



Onboard



Guest



OnGuard

# Step Up Your HSIA Experience

Custom portals  
to showcase your property

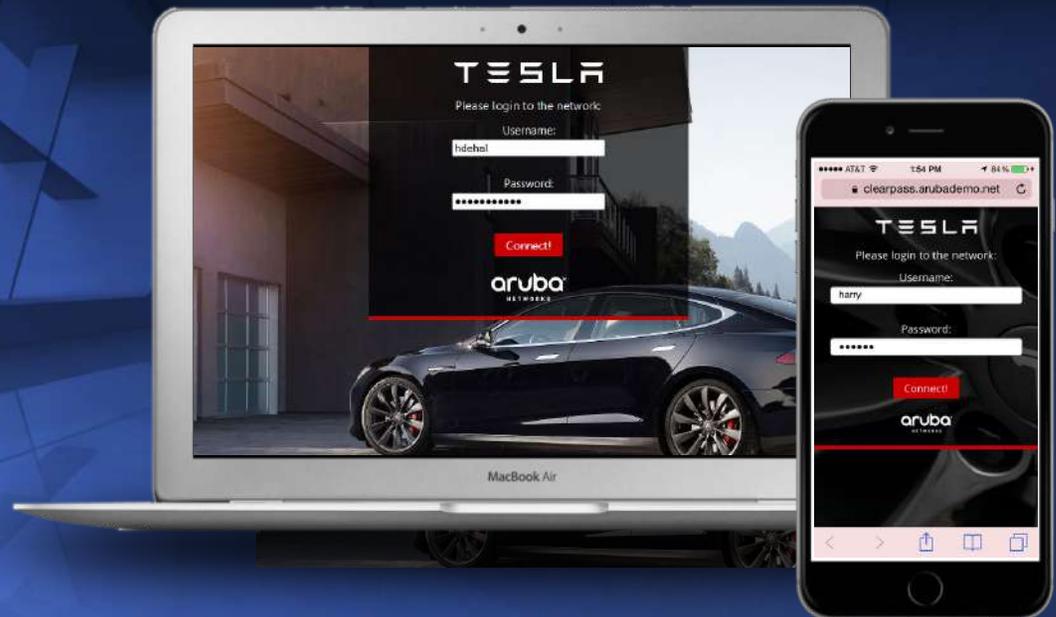
Can be used to advertise mobile  
app and deliver download link

Social logon support

One Wi-Fi login for repeat visitors

Integration with  
leading PMS providers

## ClearPass Guest





# Mobilize Your Back-of-House Operations

## ClearPass Onboard

### User and IT friendly:

One time user registration

**Secure:** 802.1x EAP-TLS

**Visibility:** Regain visibility for policy and troubleshooting

THANK YOU



**Hospitality Event Jeddah**

**Programmable Switches  
Ahmed Ibrahim SEM**

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# LINE OF BUSINESS TECHNOLOGY ADOPTION **IMPACTS ON IT**

## **MOBILE AND CLOUD**

More business and mobile apps are business critical, prioritization and segmentation required



## **IOT**

Growth in connections, different protocols, new traffic patterns, more exposure



## **DATA**

Too many data sources, integration challenges, difficult to gain insights



# Game Changing Network Agility Operating Through Change and Complexity



## Faster and Advanced Visibility

On-box, time series database for event and correlation history

Real-time access to network insights



## Faster Time to Detect, Diagnose, and Resolve

Rules-based, real-time monitoring and notifications

Intelligent notifications with automatic correlation to config changes



## Easier Automation and Integration

Business policy-based automation to simplify network functions

Easily programmable with modern tools and languages (e.g. Python)



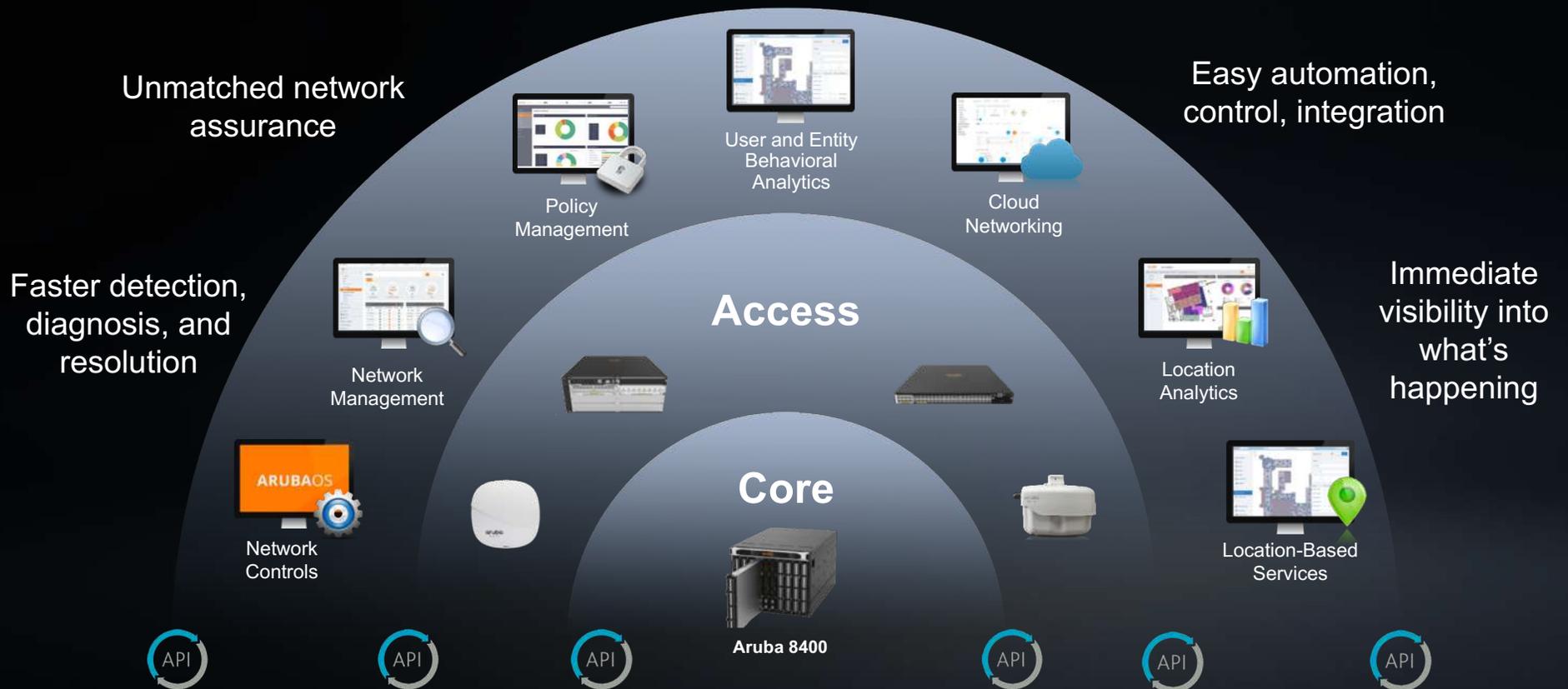
## Improved Network Assurance

Carrier-grade reliability to support growing traffic demands

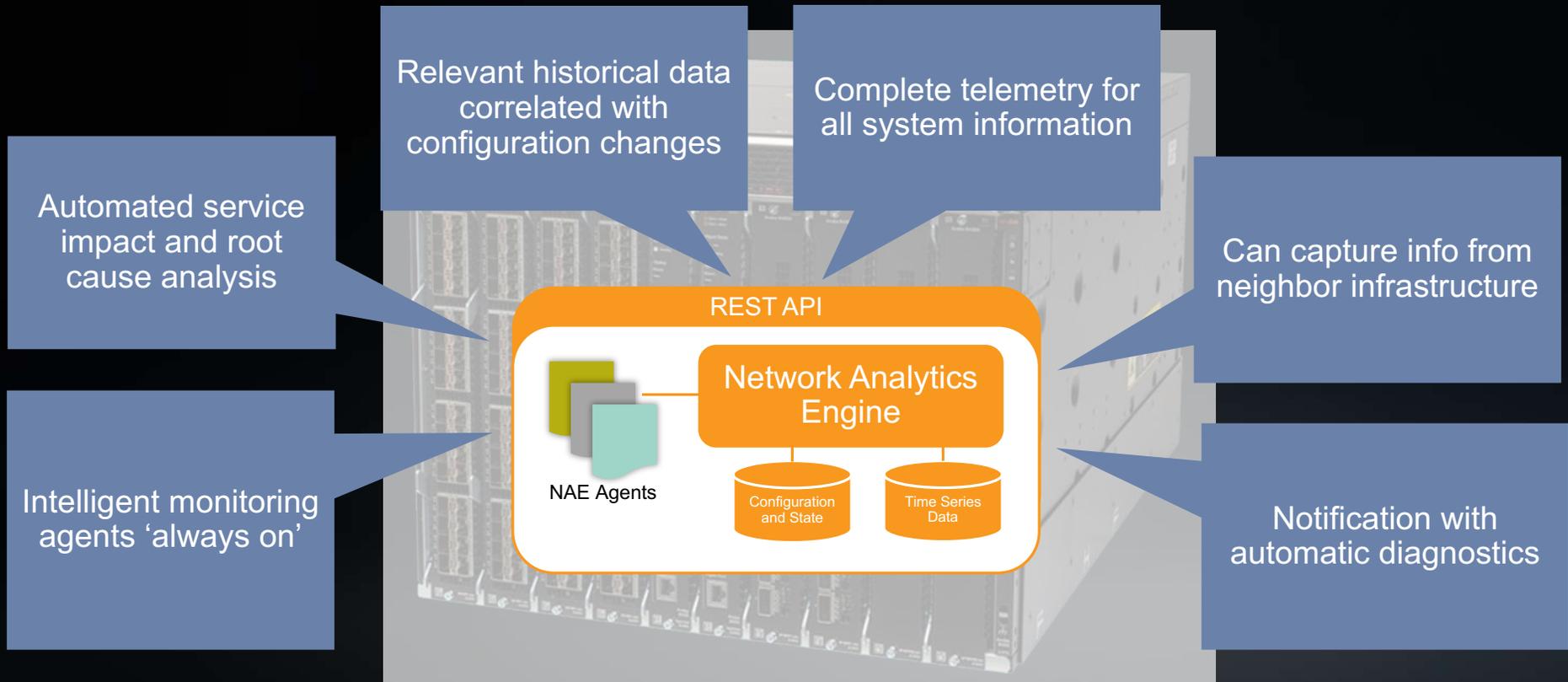
Eliminate bottlenecks with multi-terabit performance and high speed, high port density

# COMPLETE SOFTWARE-DEFINED CAMPUS

## Automated and Intelligent Networking



# ARUBA NETWORK ANALYTICS ENGINE AUTOMATES TROUBLESHOOTING



*'It's like having a 24/7 network technician as part of the network'*

# Aruba Network Analytics Engine Automates Troubleshooting

BEFORE

MANUAL

Results:  
needle in a  
haystack  
investigation



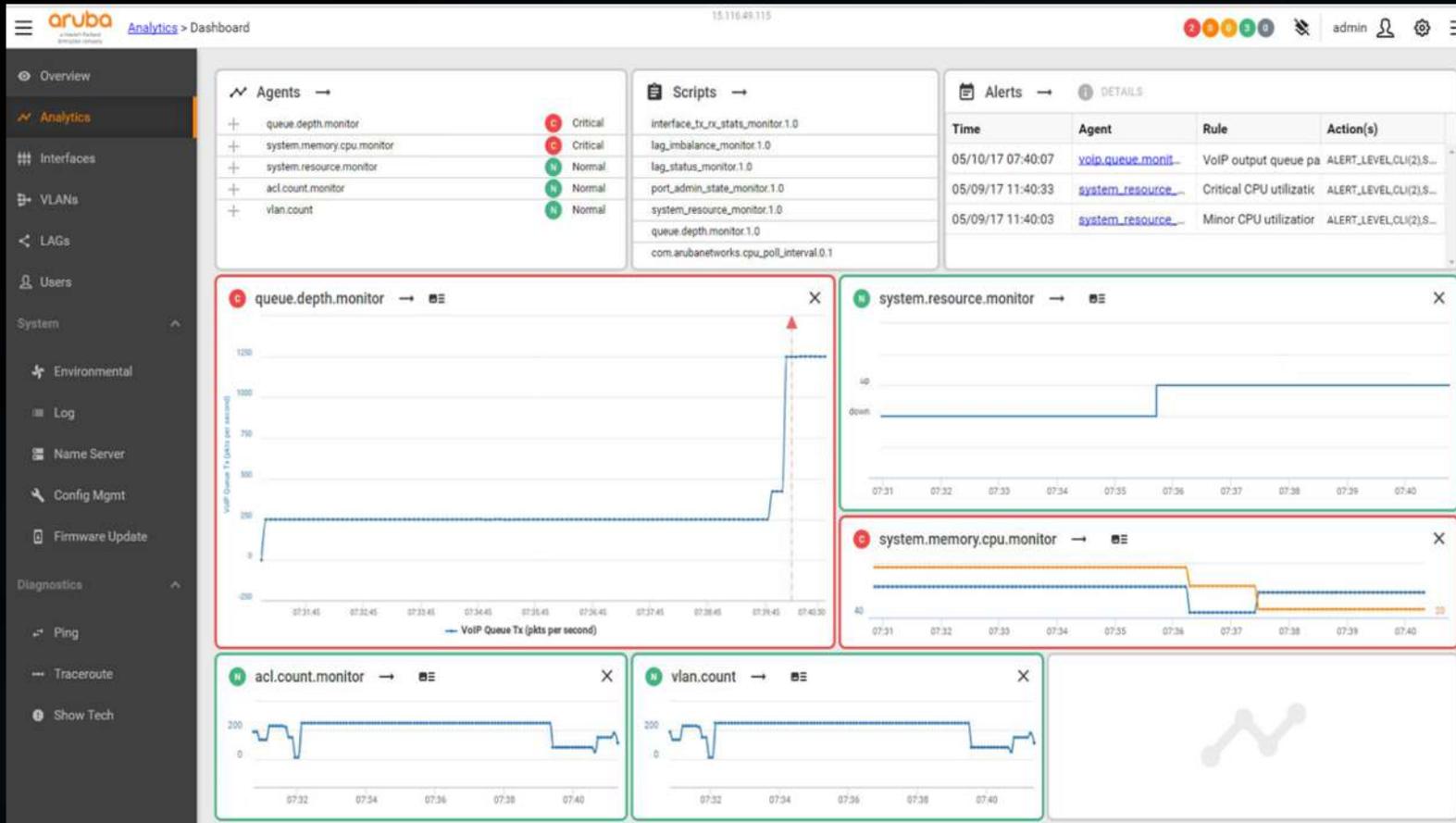
Aruba Network  
Analytics Engine

AFTER

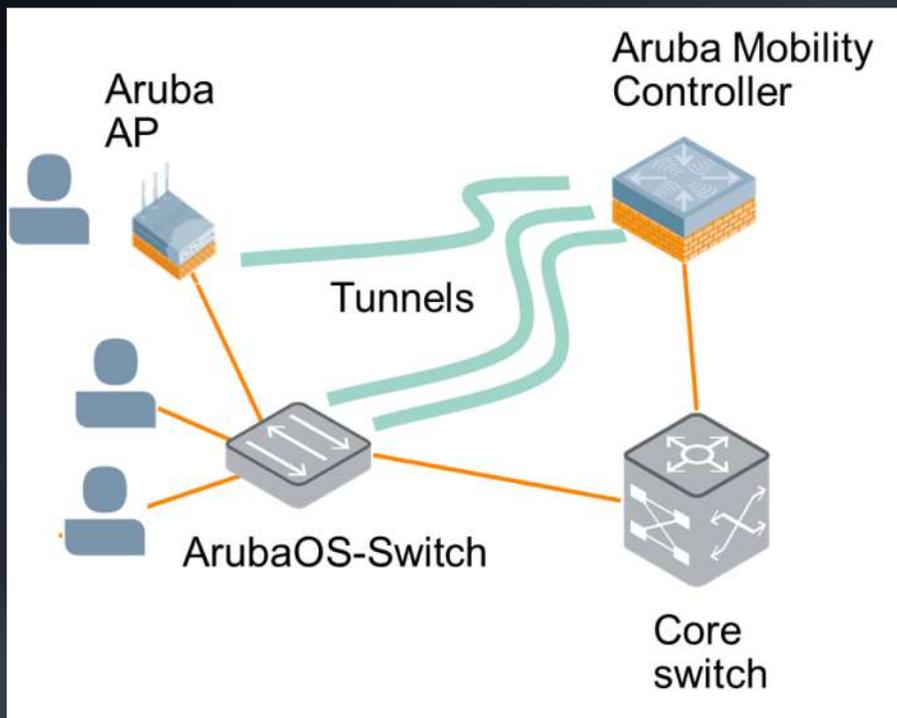
AUTOMATED

Results:  
faster  
resolution

# ARUBA NETWORK ANALYTICS ENGINE AT WORK



# TUNNEL NODE FOR UNIFIED POLICY AND DYNAMIC MICROSEGMENTATION



Centralized role-based policy enforcement for wired and wireless

Enhanced security with traffic separated by tunnels

Use Aruba controller's security features such as Firewall, packet inspection and finger printing

\* Tunnel Node is supported in 2920/2930F/2930M/3810/5400R. See platform matrix for more details.

# LEVERAGE HPE Smart Rate (802.3bz) TO BOOST SPEEDS USING EXISTING CABLING

## HPE Smart Rate Multi-gigabit Ethernet

MEMBER  
NBASE-T  
ALLIANCE™



- NBASE-T: basis for IEEE 802.3bz standard
- Update to ArubaOS-Switch 16.04 for new IEEE 802.3bz standard

**Faster**

**Simple**

**Leading**

# HPE's Low Total Cost of Ownership

## HPE's Limited Lifetime Warranty

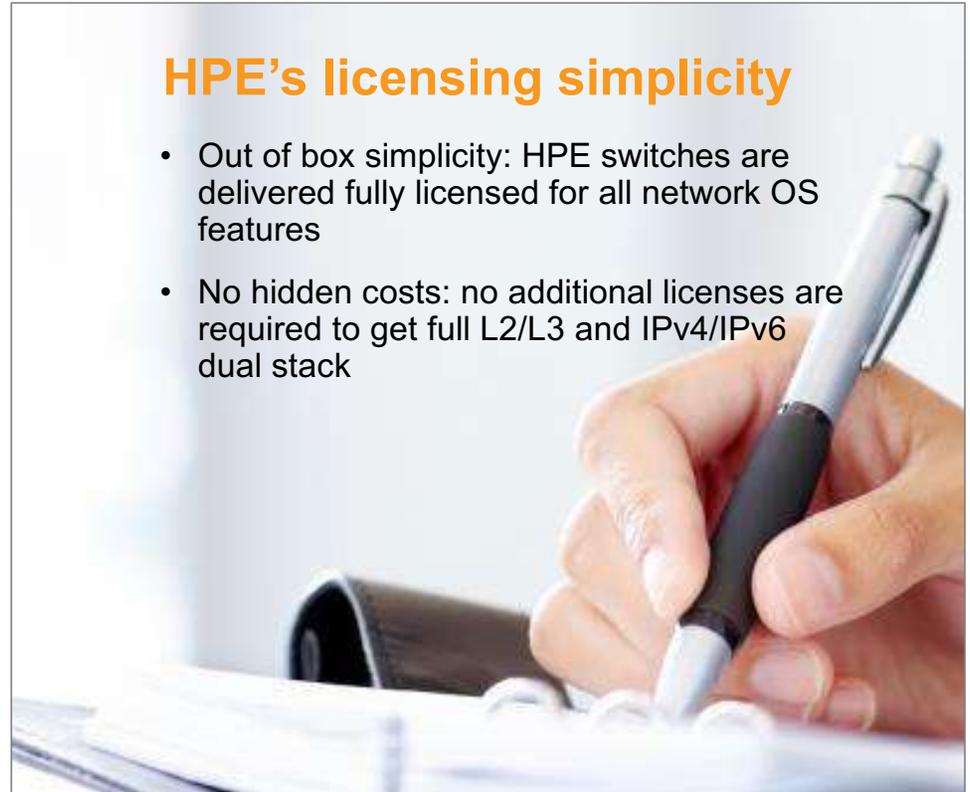
<b>Hardware Warranty</b>	<b>Lifetime for original owner*</b> <b>Next-Business ship*</b>
<b>Replacements</b>	
<b>Software Updates</b>	<b>Access to all posted SW releases</b>
<b>Phone Support**</b>	<b>Lifetime, 8x5 As long as owned, 24x7 90 day*</b>

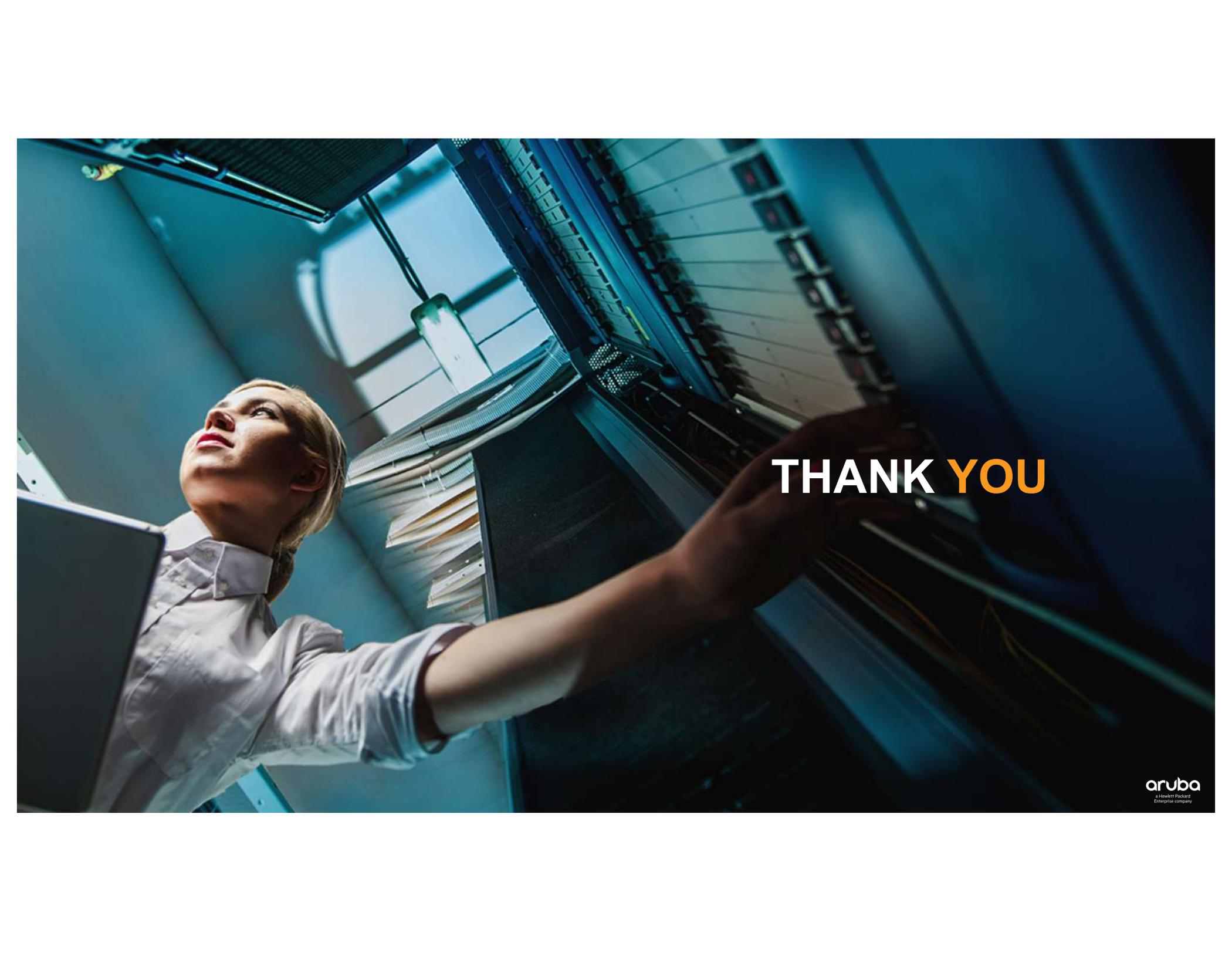
\* For details: [hpe.com/networking/warrantysummary](http://hpe.com/networking/warrantysummary)

\*\* Best effort, product conformance

## HPE's licensing simplicity

- Out of box simplicity: HPE switches are delivered fully licensed for all network OS features
- No hidden costs: no additional licenses are required to get full L2/L3 and IPv4/IPv6 dual stack



A low-angle shot of a woman in a white button-down shirt looking upwards at a server rack in a data center. The scene is lit with a cool blue light. The woman's hand is visible, reaching towards the server. The text "THANK YOU" is overlaid on the right side of the image.

**THANK YOU**

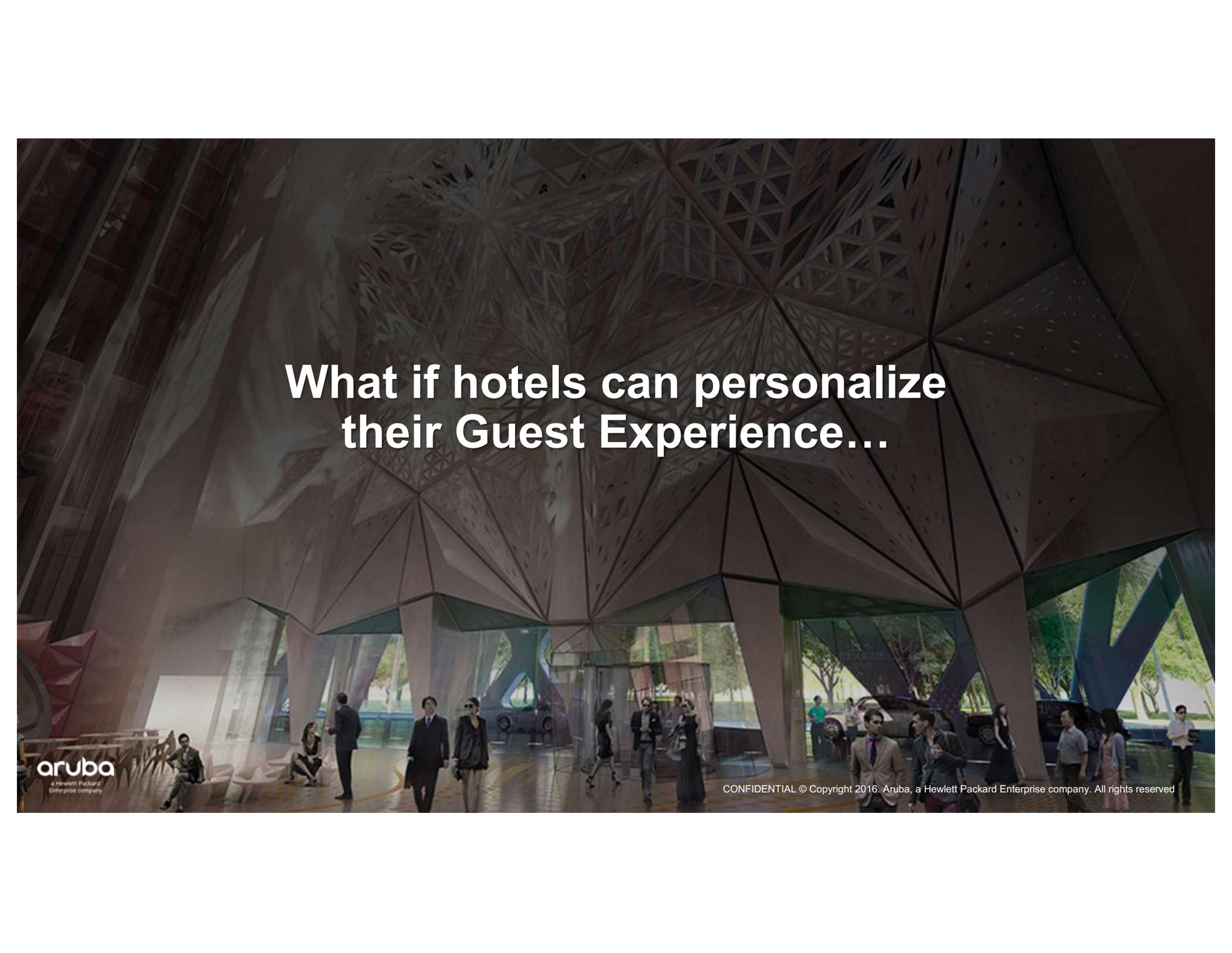
The Aruba logo is displayed in a bold, lowercase, orange sans-serif font. The background of the slide is a photograph of a modern airport terminal with large glass windows and a walkway with a glass railing. A man and a woman are walking away from the camera on the walkway, with the man pulling a blue suitcase and the woman carrying a bag. The scene is brightly lit, suggesting a sunny day.

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# Personalizing Guest Experience

Muhammad AbuGhalioun  
Senior SE, Jeddah



# What if hotels can personalize their Guest Experience...

**Engaging** your customer as soon  
as they are on premise

**Greet** your loyal customers  
with a customized message



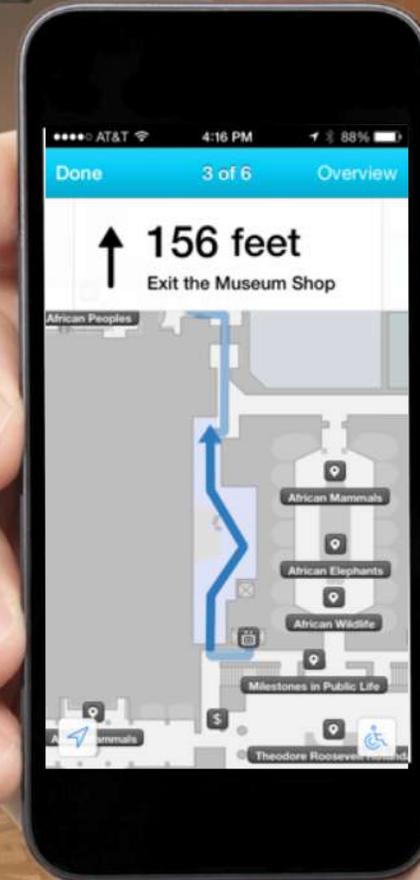
# What Can Venues Do with Aruba Mobile Engagement?

## Finding their Guest Room

Indoor turn-by-turn directions

## Guest Wi-Fi

Secure and customized network access portal



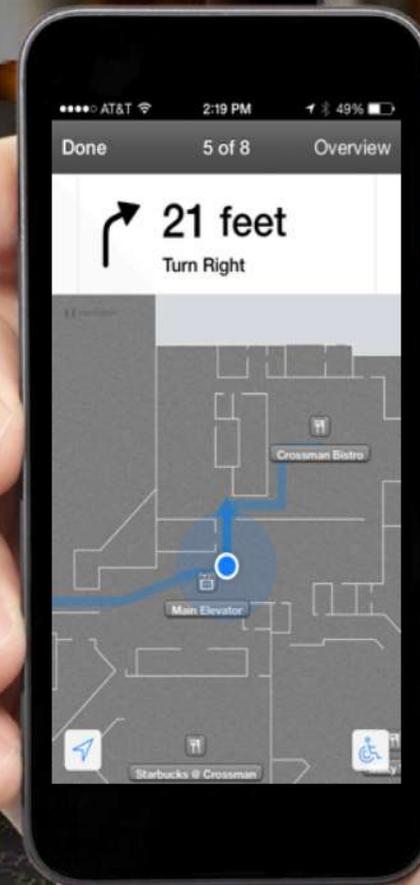
# Location Redefining Our Dining Experiences

## Way-Finding

Indoor turn-by-turn directions to restaurants

## Integration with F&B ordering

Order on the application



# Building **Conference** Application

## **Personalized Agenda**

based on user credentials

## **Push Notifications**

Receives important push information

## **Interacting with attendees**

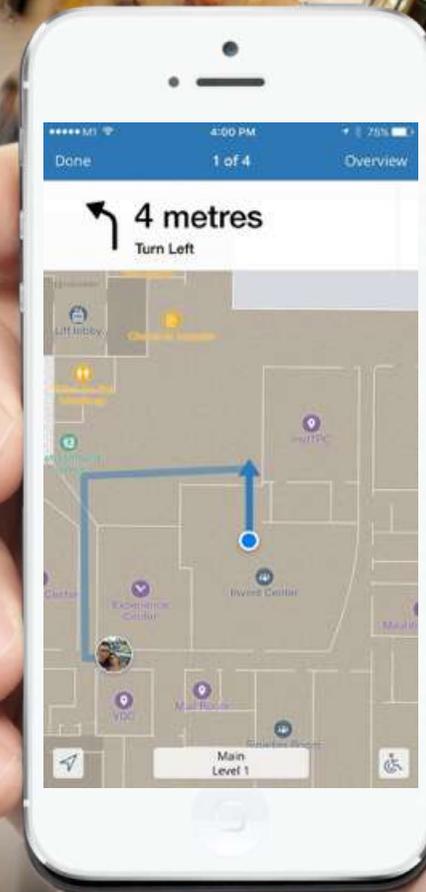
Conduct surveys and collect data



**Share** your location

**Share your location profile**

So friends and colleagues can find you easily

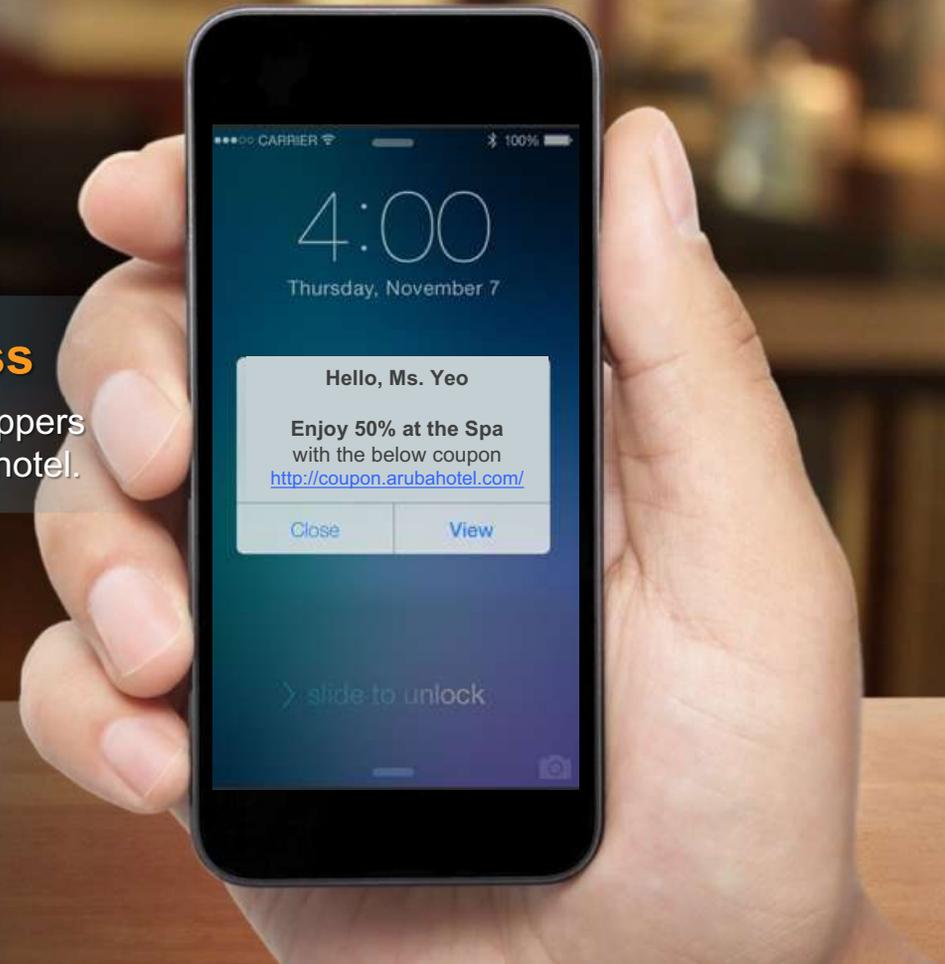


# Upsell Services

## Increase Share of Wallet

### Promote Services and create awareness

Proximity-based push notifications allow retailers to alert shoppers to services based on their dwell-time and their location in the hotel.



# MOBILE ENGAGEMENT TO REACH Guests

Aruba Wi-Fi



ClearPass Guest

Self-registration, app delivery, personalized advertising in the browser

ClearPass Guest prompts download of Meridian-powered app

Location-based and personalized content for apps with beacon management

Aruba Beacons

Indoor wayfinding with blue dot and notifications based on real-time position



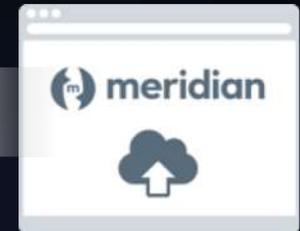
Bluetooth



Mobile App (AppMaker)

LTE or Wi-Fi and Bluetooth required

Meridian App Platform



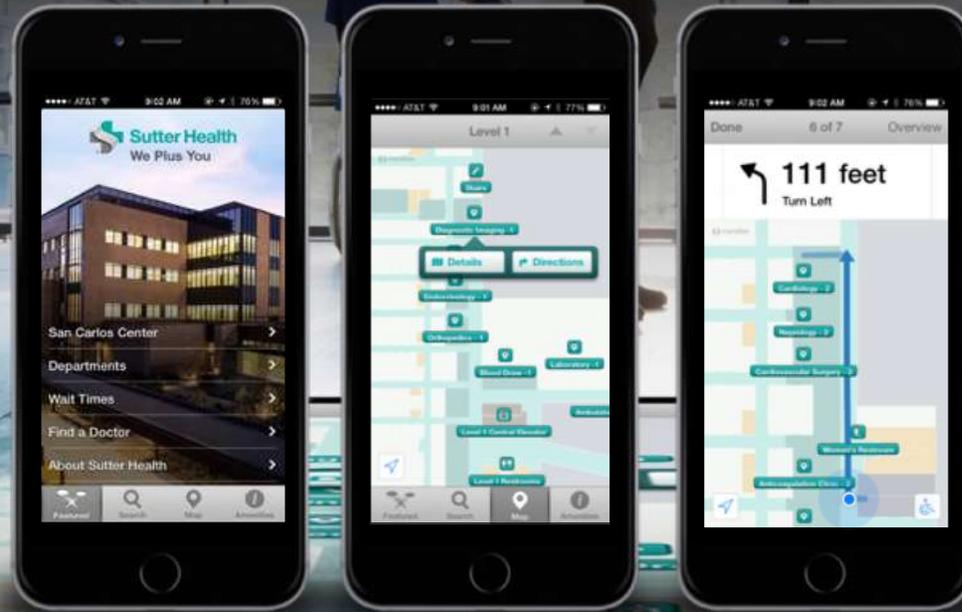


# AppMaker: Easily, Affordably Build an App

# AppMaker: Deliver Self-Guided Wayfinding



# AppMaker: Add Location Services for BluDot Location



# Personalized Push Notifications

Targeted for most loyal customers

Triggered per location, per campaign

Customized per time-of-day, identity

The image displays the Meridian mobile management interface on a computer screen. The interface includes a navigation menu on the left with options like FEATURED, MAPS, PAGES, EVENTS, THEME, BEACONS, CAMPAIGNS, VIEWER, STATUS, REPORTS, SETTINGS, and LANGUAGES. The main area shows a map with a location marker and a campaign configuration panel on the right. The campaign configuration panel includes fields for ID (5660980839186432), TITLE (Shoe Sale), ACTION (Send device a message), MESSAGE (Welcome to Shoes! Save 30% on all Nikes today.), LINK (Search Placemarks, Pages, Events), and BROADCAST TYPE (Always). A smartphone in the foreground displays a push notification for Best Buy: "Save 25% with Geek Squad on a PC Checkup".

## SDK: Improve Existing Apps with Meridian SDK



aruba

## SDK: NavKit for Adding Self-Guided Mapping



aruba

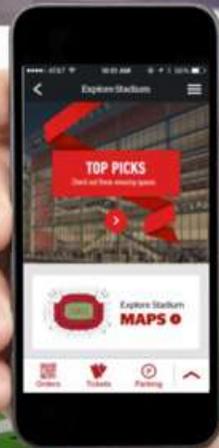


## SDK: BluDot Kit for Adding "Blue Dot" Mapping

Levi's  
STADIUM

BluDotKit

aruba



## SDK: ZoneKit for Proximity-Based Notifications

Neiman Marcus

ZoneKit

aruba



# Aruba Beacons with Bluetooth Low Energy (BLE)

Enterprise-grade and simple to deploy

Compatible with iBeacon API

Protects user privacy

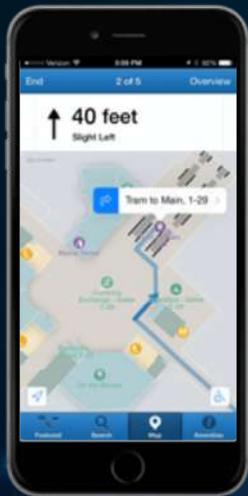
Battery life of 1.5 to 2 years or USB powered

Excellent accuracy (<1m) for location

Low latency (<2sec) for notifications



# Managed BLE beacon infrastructure for indoor mobile engagement



Battery powered  
Bluetooth Low Energy (BLE)  
Aruba Beacons



Aruba 802.11ac Wave 2  
with integrated beacon



Aruba Meridian  
mobile app and beacon  
management platform

# No Aruba Wi-Fi? No Problem.

## Manage Beacons over any Wi-Fi network with **ARUBA SENSOR (AS-100)**

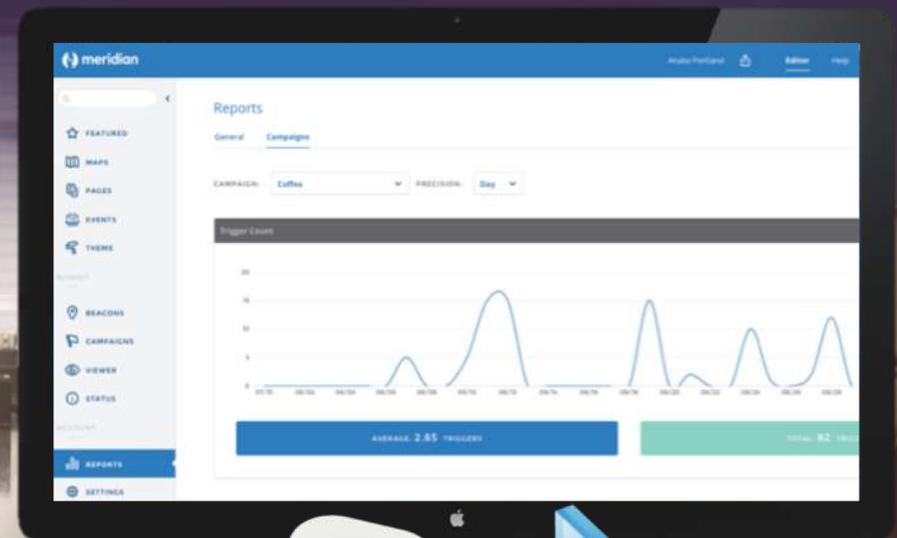
- Dual band 802.11n 1x1 client radio
- Bluetooth Low-Energy (BLE) radio
- Advanced Cellular Coexistence (ACC)
- Also acts as a normal Beacon with direct AC power plug-in, with option to power over USB



# Beacon Analytics to Gain Deeper Knowledge of Resource Utilization

Presence analytics can be recorded based on much smaller distances in terms of presence

Same platform for beacon management, campaigns and analytics





Thank You

**aruba**

a Hewlett Packard  
Enterprise company

**Thank you**