# IT CHALLENGES AT THE
# EDGE

**Exponential Growth in Devices**

**Security Threats Rising**

**Operational Complexity Exploding**

aruba

a Hewlett Packard
Enterprise company

# WHAT DOES IT TAKE TO DELIVER ON
# CUSTOMER EXPECTATIONS?

PERFORMANCE

SECURITY

CLOUD

OPERATIONS

INSIGHTS

aruba

a Hewlett Packard
Enterprise company

# INTRODUCING
# THE ARUBA ARCHITECTURE

Integration with IT Workflows and IOT Use Cases
Robust Ecosystem of Edge Technology Partners

**Ecosystem Apps**

Elasticity for Any Size Deployment
Unified Data Set for Analytics & AI

**Cloud Services**

Limited Reliance on Underlying Connectivity
Flexibility to Use Existing Segmentation

**Policy**

Unified Operating Model

IOT Ready

**Connectivity**

aruba

a Hewlett Packard
Enterprise company

# DELIVER SECURE AND RELIABLE WI-FI IN CROWDED AREAS

# 802.11ax (Wi-Fi 6) Technology

Increase **4x average throughput of the entire system** in a dense deployment scenario

**Maximizing capacity and efficiency** by ensuring that **all devices in a crowded network get the bandwidth they require**

**Improve power efficiency** of client devices- battery saving

**4x better capacity in dense deployment**

802.11ac

802.11ax

aruba

a Hewlett Packard
Enterprise company

# Wireless Standards Over Time

| 802.11n (2008) | 802.11ac (2012) | 802.11ax (2018) |
|---|---|---|
| • 2.4 and 5 GHz | • 5 GHz only | • 2.4 GHz and 5 GHz |
| • 40 MHz Channels | • 80 and160 MHz Channels | • 1024-QAM Rates |
| • 64-QAM Rates | • 256-QAM Rates | • Multi-user MIMO, 8 clients |
| • Up to 4 Streams | • Up to 8 Streams | • OFDMA uplink and downlink |
| • Beam forming (explicit and implicit) | • Beam forming (explicit) | • Better battery life (Target Wake Time) |
| • Backwards compatibility with 11a/b/g | • Multi-user MIMO | • Spatial re-use (BSS color) |
| | • Backwards compatibility with 11a/b/g/n | • Enhanced outdoor long-range performance |
| | | • Backwards compatibility with 11a/b/g/n/ac |

# High performance experience with multi user features
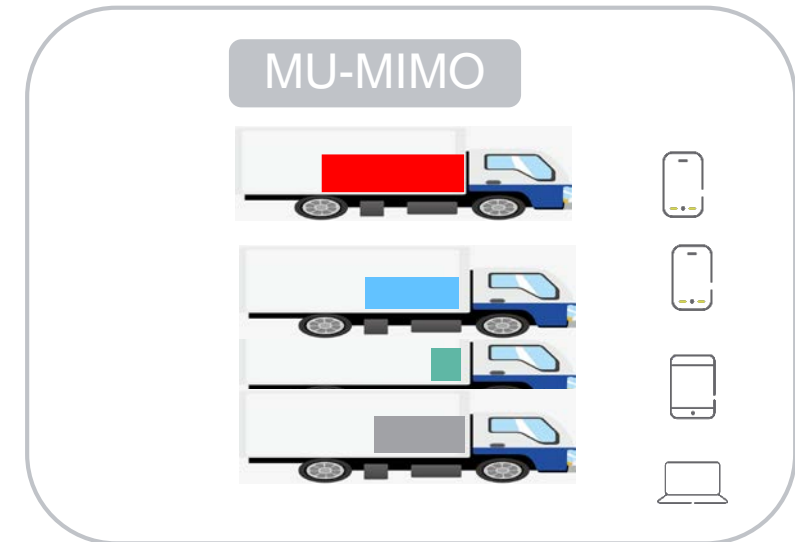## OFDMA( uplink and downlink) and MU-MIMO ( downlink)

Congestion and delay
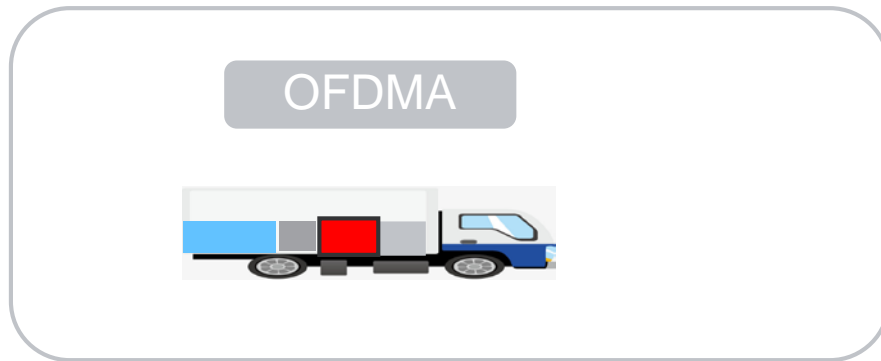
OFDMA

MU-MIMO

| | |
|---|---|
| OFDMA increases capacity | MU-MIMO increases capacity |
| OFDMA reduces latency for voice and IoT | MU-MIMO results in higher speed and throughput per user – transmit to up to 8 clients |
| Ideal for low bandwidth , small packets ( voice and IoT), latency sensitive applications | Ideal for higher bandwidth applications such as HD Video or large files |

aruba
a Hewlett Packard
Enterprise company

# ARUBA WI-FI 6

Wi-Fi 6 CERTIFIED

Smart PoE  / Zigbee Radio  /Air Slice

AI and Green AP

Live Upgrade

## #1 IN WI-FI 6 MARKET SHARE

**3,000+** Customers

**300,000+** Units shipped since 2018

**ARUBA 500 SERIES**

**ARUBA 510 SERIES**

**ARUBA 530 SERIES**

**ARUBA 550 SERIES**

aruba
a Hewlett Packard
Enterprise company

### Summary of Certifications

| CLASSIFICATION | PROGRAM |
|---|---|
| Connectivity | Wi-Fi CERTIFIED 6™ |
| | Wi-Fi CERTIFIED™ a, b, g, n, ac |
| | WPA™ – Enterprise, Personal |
| | WPA2™ – Enterprise, Personal |
| | WPA3™ – Enterprise, Personal |
| | Wi-Fi Enhanced Open™ |
| Optimization | Wi-Fi Agile Multiband™ |
| | WMM® |
| | WMM®-Power Save |
| Access | Passpoint® |

# Aruba's Wi-Fi AP portfolio

**550 Series**
Extreme Density
Wi-Fi 6

**530 Series**
Very High Density
**Wi-Fi 6**

**510 Series**
High Density
**Wi-Fi 6**

**500 Series**
Mid Density
**Wi-Fi 6**

**500H Series**
Hospitality/Remote
**Wi-Fi 6**
*Expected Summer*

**518 Series**
Ruggedized
**Wi-Fi 6**
*Expected Summer*

**570 Series**
Outdoor
**Wi-Fi 6**
*Expected Summer*

**340/330/320/310/300 Series**
Very High to Mid Density Wi-Fi 5
Indoor Ceiling/Wall Mount

**303H/203R/203H Series**
Mid Density Wi-Fi 5
Wall, Hospitality and Remote

**370/360 Series**
Very High to Mid Density
**Omni/Directional**

**370EX Series**
Hazardous
Location

**387 Series**
Point to Point
**802.11ad**

**\*Models are not to scale**

# ARUBA AIR SLICE

*Usage based app prioritization*

1. App1
2. App2
3. App3

OFDMA

MU-MIMO

TWT

**Air Slice**

Wi-Fi Calling, Skype, Zoom, Jabber

High bit rate Apps (VR, Collaboration)

IoT

Application identification via Aruba's DPI engine

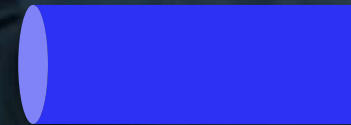Scheduling intelligence provides fine-grained QoS assurance for individual applications

RF SLAs: Guaranteed bit rate, improved battery life, bounded latency/jitter/packet loss

Built on top of Wi-Fi 6 constructs: MU-MIMO, OFDMA, TWT (Target Wake Time)

Benefits both .ax and non-.ax client devices, based on use of internal queuing

aruba

a Hewlett Packard Enterprise company

# Introducing Aruba Air Slice
5G equivalent deterministic performance

## Usage based app prioritization

- **Scheduling intelligence**
  - **F**ine-grained QoS assurance for all applications
- **Leverages 5G constructs:**
  - MU-MIMO, OFDMA, TWT
- **Guaranteed RF SLAs**
  - Battery life boost, bounded latency, jitter, packet loss
- **Application identification**
  - Aruba's DPI engine
- **Per Role, App QoS**
  - Aruba's "AirSlice"

Phones, laptops and IoT

- App 1
- App 2
- App 3
- App 4
- App …

**Wi-Fi 6 Performance Enhancements**

OFDMA
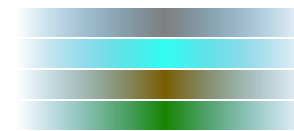
Wi-Fi Calling, Skype, Zoom, Jabber, etc.

MU-MIMO

High Bitrate Apps (VR, Collaboration)

TWT

Battery life for phones and IoT

aruba
a Hewlett Packard
Enterprise company

# WI-FI GOES
# GREEN

## GREEN AP AUTOMATION

aruba
a Hewlett Packard
Enterprise company

# WI-FI GOES GREEN FOR DIGITAL WORKSPACES WITH THE 5XX SERIES

- •Built-in **"Deep Sleep Mode"** support in Aruba 5XX series. A.k.a "Green AP."

- With the help of AI/ML, NetInsight will identify underutilized APs.

- N.I. puts underutilized APs into Deep Sleep Mode, while ensuring sufficient coverage remains in the area.

- Up to 72% in power can be saved (e.g. from approx. 21W to 6W).

**ACCESS POINT AS**
**IOT PLATFORM**

Bluetooth 5  |  Zigbee Radio

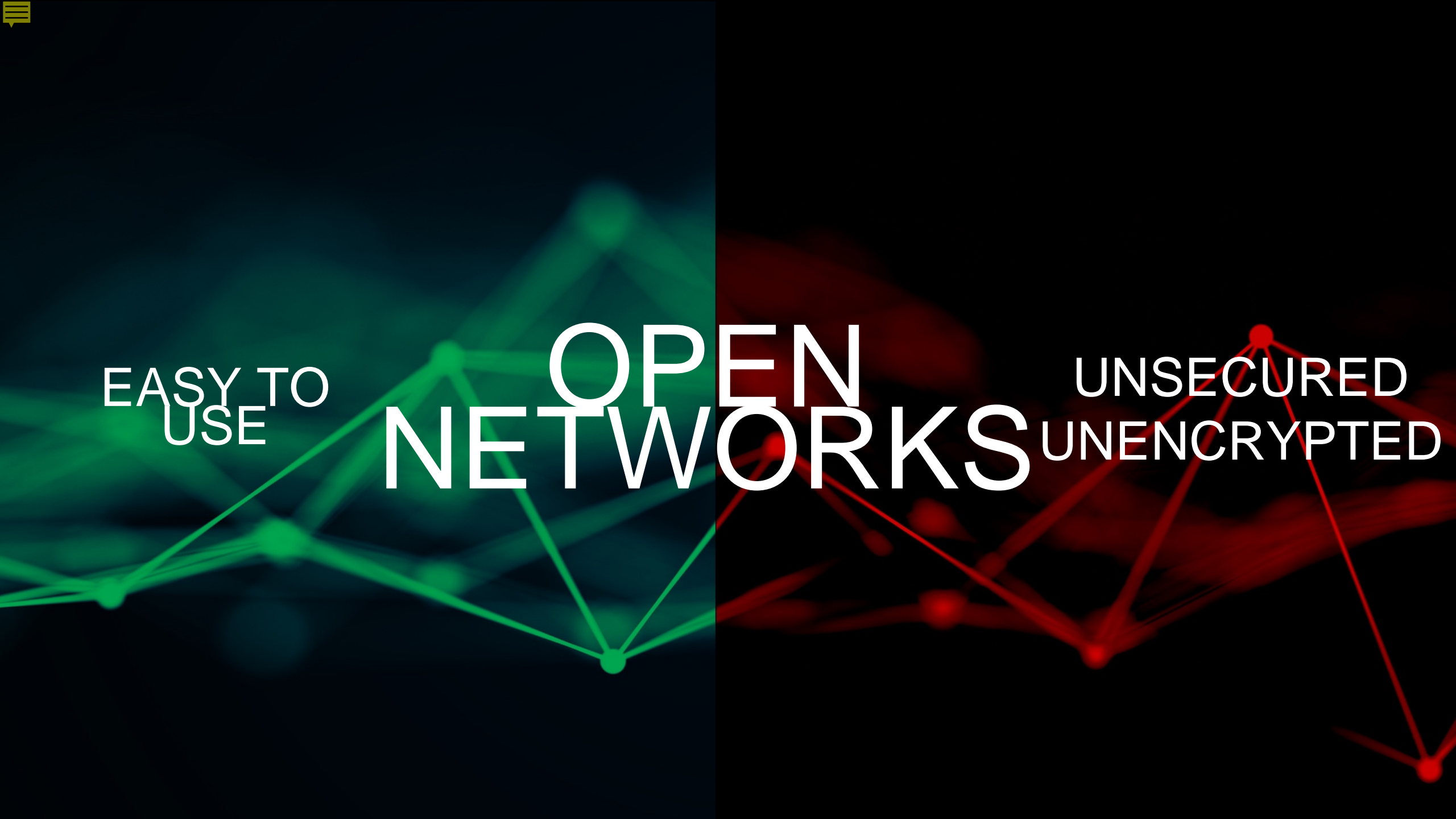# WFA CERTIFIED WPA3 & ENHANCED OPEN
## Included with AP-5XX

- **SAE (**Simultaneous Authentication of Equals) replaces **WPA2-PSK**
  **Problem**: Passive attack results in off-line dictionary attack to discover PSK
  **Solution**: Protocol is resistant to active, passive, and dictionary attack

- **WPA3-Enterprise now with Suite B/CNSA** grade ciphers
  **Problem**: mix-and-match nature of WPA2-Enterprise can result in less-than-optimal security
  **Solution**: create a cipher suite and a set of rules to ensure consistent primitive security

- **Enhanced Open - OWE** (Opportunistic Wireless Encryption) replaces **Open**
  **Problem**: all wireless traffic is passed in the clear
  **Solution**: all wireless traffic gets encrypted

OPEN NETWORKS

EASY TO USE

UNSECURED UNENCRYPTED

# DYNAMIC SEGMENTATION: FAST AND SIMPLE

Roles are **"Dynamic"**

**"Segmentation"** refers to the separation of traffic

**Users & Devices**

**Applications & Destinations**

Corp

BYOD

IOT

Guest

**Access Switch**

**Access Point**

ClearPass

**Campus Controller Cluster**

**Office 365**

**Academic Records**

**n0tma1ware .biz**

**AirGroup**
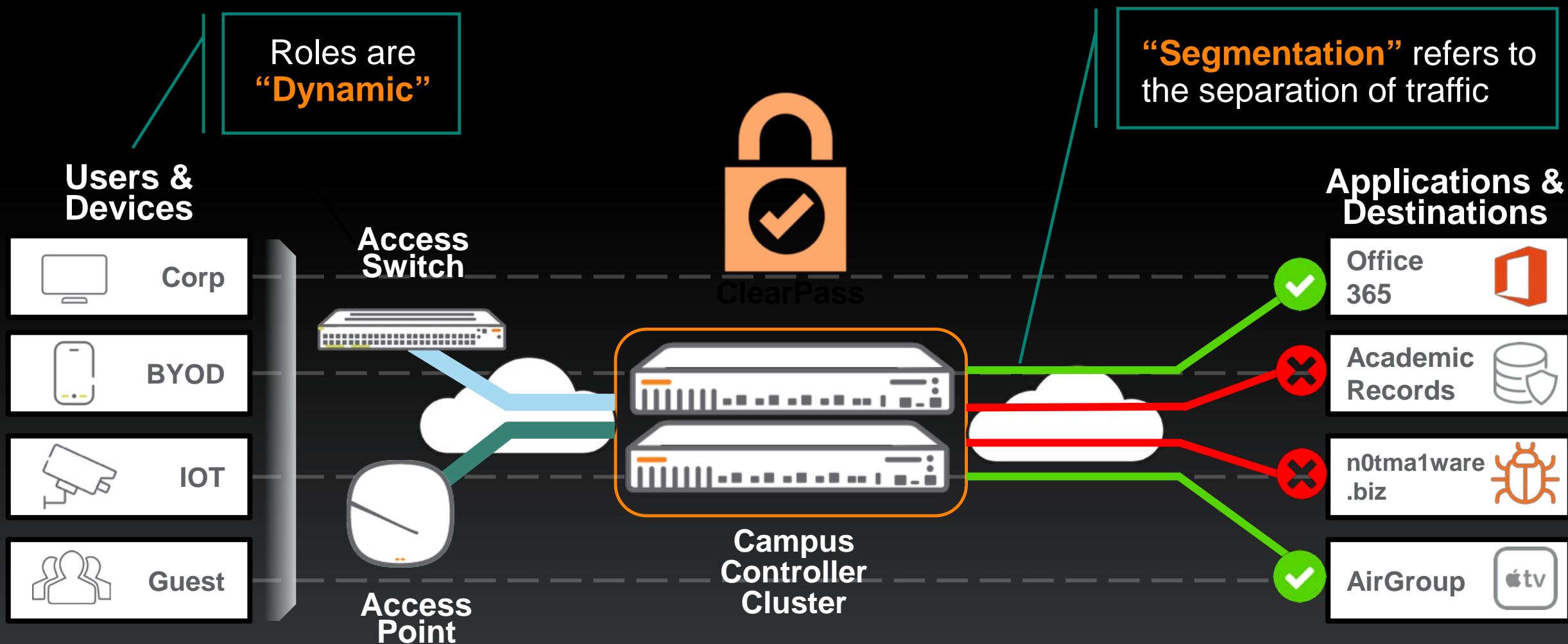
Solution Requirements:
Aruba 2930F, 2930M, 3810 and 5400R Campus Switches (Requires ArubaOS-Switch 16.04 or later)
Aruba Mobility Controllers with AOS 8.1
Aruba Branch Gateways with ArubaOS 8.4 and Aruba Central 2.4.3
Aruba ClearPass Policy Manager
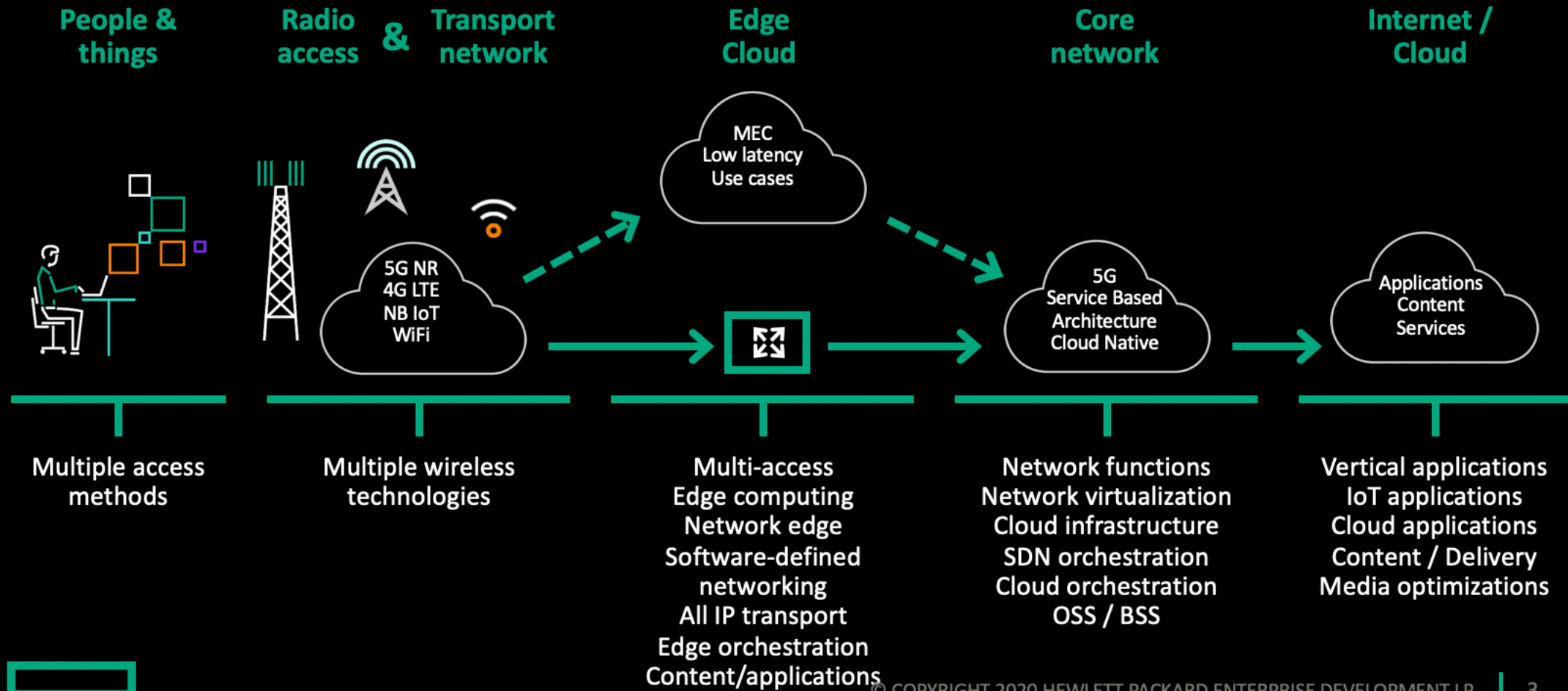
# WI-FI 6 IS YOUR ONRAMP TO 5G
## IMPROVED BUILDING COVERAGE AND CAPACITY

STANDARDS

SPECTRUM

SCALE

aruba

a Hewlett Packard
Enterprise company

# WHAT YOU NEED TO BUILD A 5G NETWORK "END TO END"
## 10x latency reduction, 50x data rate improvement, 1000x network capacity

**People & things**

**Radio access** & **Transport network**

**Edge Cloud**

**Core network**

**Internet / Cloud**

MEC
Low latency
Use cases

5G NR
4G LTE
NB IoT
WiFi

5G
Service Based
Architecture
Cloud Native

Applications
Content
Services

Multiple access methods

Multiple wireless technologies

Multi-access
Edge computing
Network edge
Software-defined networking
All IP transport
Edge orchestration
Content/applications

Network functions
Network virtualization
Cloud infrastructure
SDN orchestration
Cloud orchestration
OSS / BSS

Vertical applications
IoT applications
Cloud applications
Content / Delivery
Media optimizations

a Hewlett Packard Enterprise company

# 5G WILL MAGNIFY THE INDOOR COVERAGE PROBLEM



- Low-emission glass, energy-efficient construction materials, and evolving building codes create more system problems for indoor cellular signal

- 5G amplifies the problem since it operates on a higher frequency.

- Wi-Fi is much better for indoor environments because of our experience and incumbency.
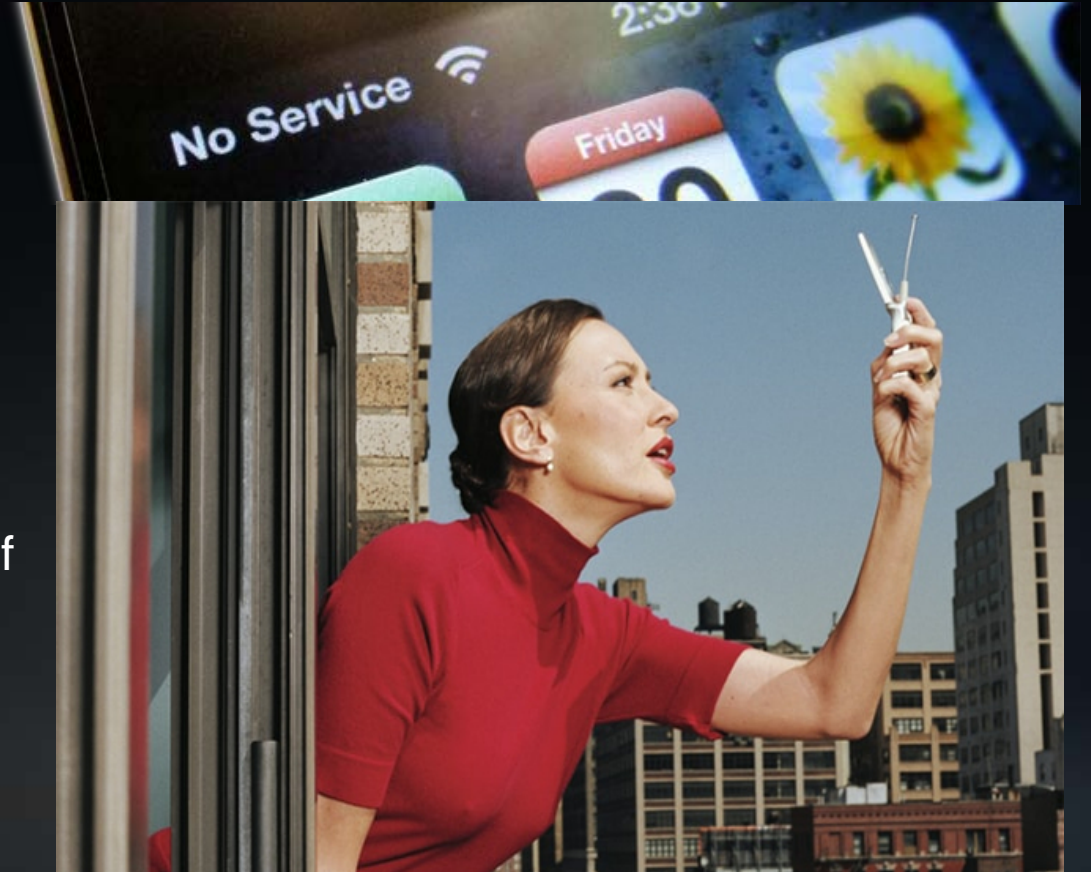
# INTRODUCING ARUBA AIR PASS

**Aruba Air Pass orchestrated
by Aruba Central**
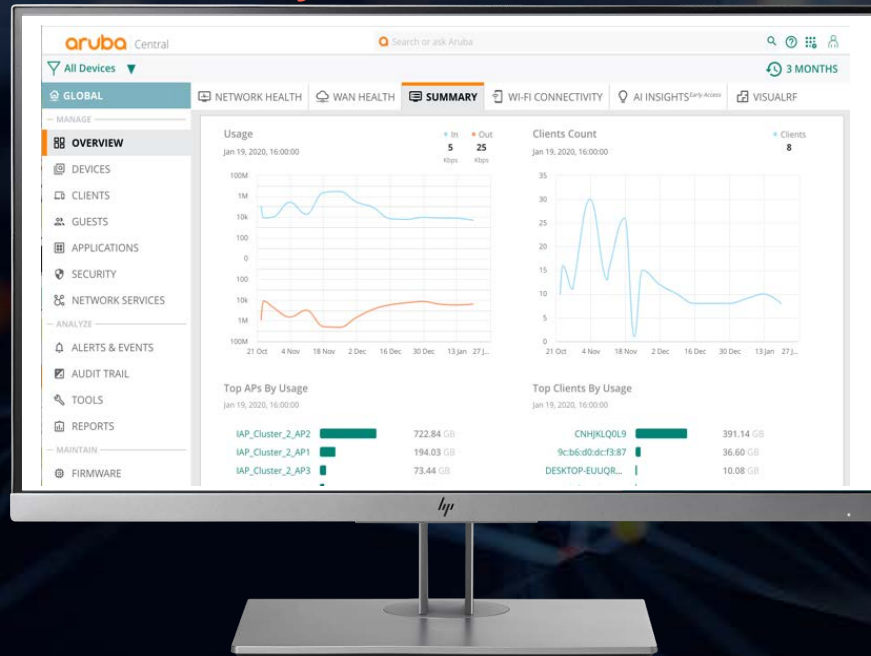


- **Seamless roaming for mobile phones using SIMs from major North American operators**

- **Enable always-on Wi-Fi Calling and SMS as well as high-bandwidth offload for mobile users**

- **Zero-trust framework and simplified device onboarding for guests, BYOD and other end-users**

- **Improves analytics and security with visibility of otherwise hidden traffic**

- **Secure, always-encrypted network access via WPA2 & WPA3-Enterprise 802.1X**

- **Compatible with existing Aruba infrastructure equipment and Wi-Fi client ecosystem**

- **Supports MEC and local breakout use cases**

- **5G ready**

aruba

a Hewlett Packard
Enterprise company

# ARUBA AIR PASS ADVANTAGE

**Enterprise End Users**

Policy driven access to enterprise resources over 5G

Seamless transition and authentication of 5G users to Wi-Fi networks

**Enterprise Customers**

Easy, centralized management of Wi-Fi and 5G services

Cost savings within the enterprise perimeter

aruba

a Hewlett Packard
Enterprise company

# AI-POWERED ARUBA NETINSIGHT

# AUTOMATION AND ASSURANCE
## EXPERIENCE THE AUTONOMOUS NETWORK.

NEW

Predictive Analytics
&
Peer Benchmarking

Closed Loop
Automation
& Validation

Learns
&
Adapts

aruba
a Hewlett Packard
Enterprise company

# ARUBA WLAN
# LEADS THE PACK

**4,000+**
Patents across
Aruba R&D*

**#1 IN WI-FI 6 MARKET SHARE**

3,000+
Customers

300,000+
Units shipped since 2018

The Wi-Fi AWARDS
**Finalist**

spaces4learning
NEW PRODUCT AWARD 2019
**500 Series**
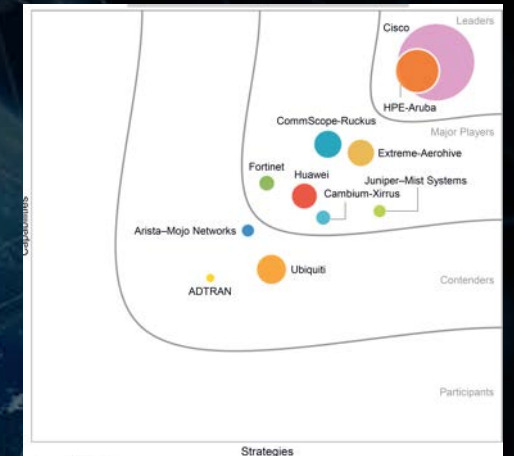
aruba
a Hewlett Packard
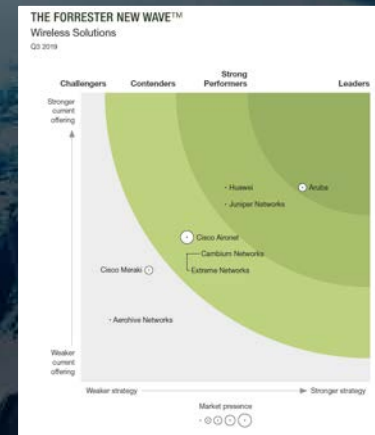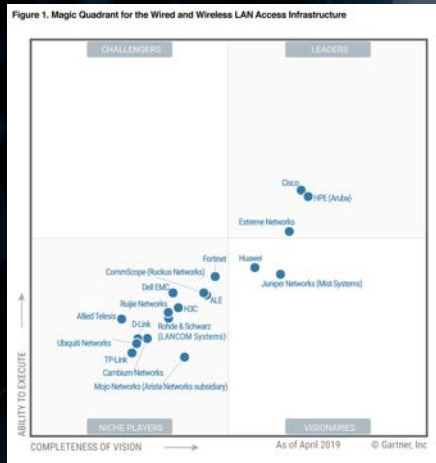Enterprise company

# ARUBA SWEEPS
# INDUSTRY RANKINGS



**Gartner**

Magic Quadrant

**Gartner**

Critical Capabilities

**FORRESTER**

New Wave

**IDC** *Analyze the Future*

MarketScape

aruba

a Hewlett Packard Enterprise company

# TARGET LPV CUSTOMERS WITH WIFI 6 ACCESS POINTS

- Highly available, high-density and performance driven network

- Ease of management and visibility

- Secure environment able to manage IoT

- Mobile-First solution, focused on fan experience

- WiFi 6 as an onramp to 5G

# UPGRADE TO ARUBA WI-FI 6 <span style="color:orange">NOW</span>

CLIENTS ARE HERE NOW

OUR PORTFOLIO IS READY

GET READY FOR THE CLOUD

IOT AND 5G ARE COMING

aruba

a Hewlett Packard
Enterprise company

aruba

a Hewlett Packard
Enterprise company

**THANK YOU!**