



**aruba**  
a Hewlett Packard  
Enterprise company

# Safe and Performant Connectivity The experience

# EDGE

Alain Vercammen

# THE EXPERIENCE EDGE



Workplaces



Schools



Stores



Hotels



Hospitals



Factories

**The places where people work, learn, visit, and go...  
where experiences are becoming smart and digital.**

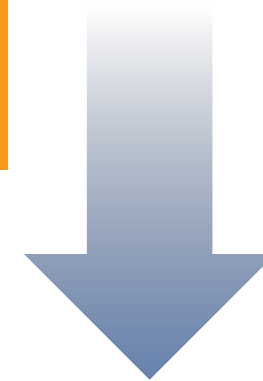




# EXPERIENCE ECONOMY



VALUE



Extract  
COMMODITIES  
**\$0.02**

Make  
GOODS  
**\$0.10**

Deliver  
SERVICES  
**\$1.50**

Stage  
EXPERIENCES  
**\$2.75**

CUSTOMER  
SACRIFICE

# Industry Drivers

Modern experiences require **Highly Reliable Networks**

**MOBILE**



**6.4B**  
Connected  
Things

**CLOUD**



**\$127B**  
Cloud Spending

**IOT**



**20.8B**  
IoT Devices

# Traditional View of Aruba Access Point

802.11 Wi-Fi Radios  
802.11 network access



Bluetooth Radio  
Wayfinding and geofencing

USB Port  
Cellular interfaces

# ACCESS POINT AS A PLATFORM

802.11ax Wi-Fi Radios

802.11ax network access

Asset tracking tags

Personnel location badges

Smart wrist bands with telemetry sensors

Worker safety smart helmets

Sensors, actuators, and smart lighting systems

Bar code scanners and mobile printers

802.15.4 Radio

Food safety sensors

Cooking and refrigeration sensors

Heating, air quality, presence, security, panic, call,

button, lighting, leak sensors

Load controls and actuators

Door locking and access systems



Bluetooth 5 Radio

Wayfinding and geofencing

Energy harvesting heating, air quality, presence, security, panic, call, button, lighting, leak sensors

Load controls and actuators

Door locking and access systems

High accuracy industrial and Ex asset and personnel location tags

USB Port

Cellular interfaces

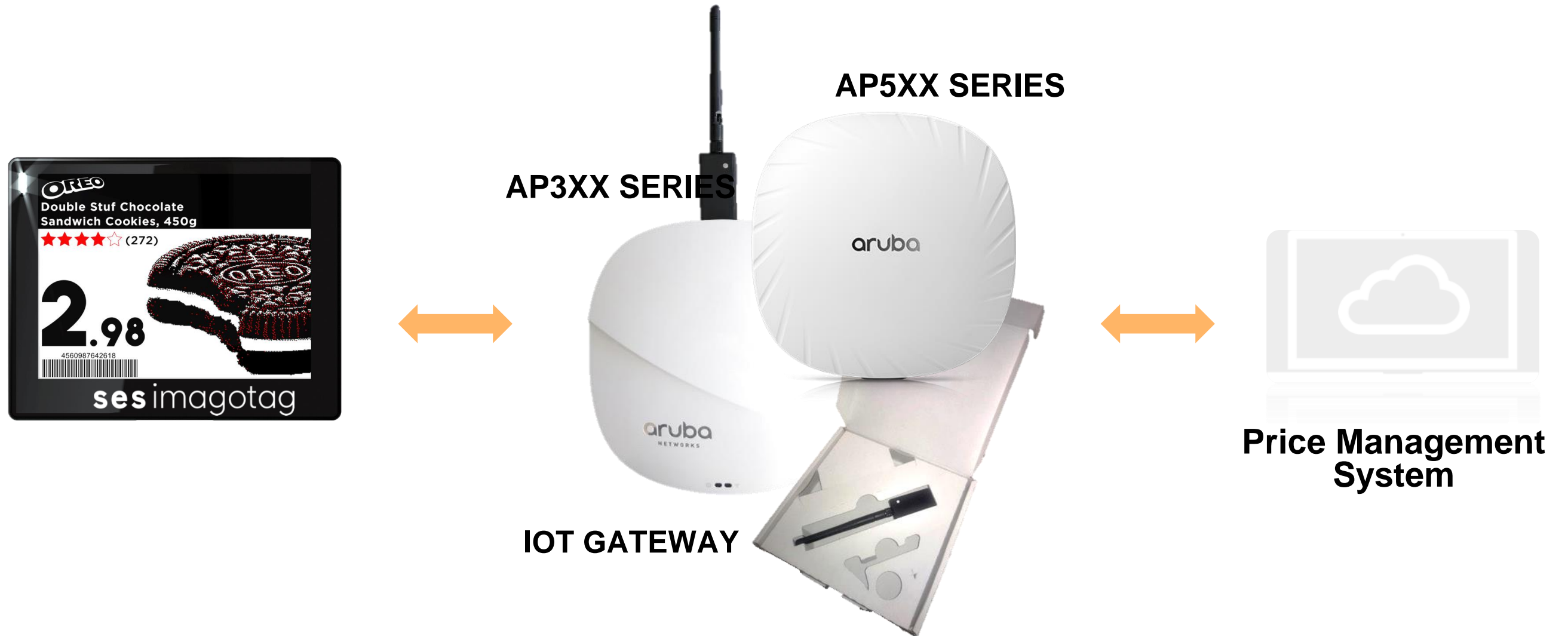
Electronic shelf labels

Gun shot detectors

Retrofit ZigBee interface for existing deployments

Custom interfaces

# A BETTER WAY TO DEPLOY AND SUPPORT IOT SOLUTIONS



# ZEBRA AND ARUBA

**RFID, industrial computer, auto ID and data collection, and mobile printing solutions**

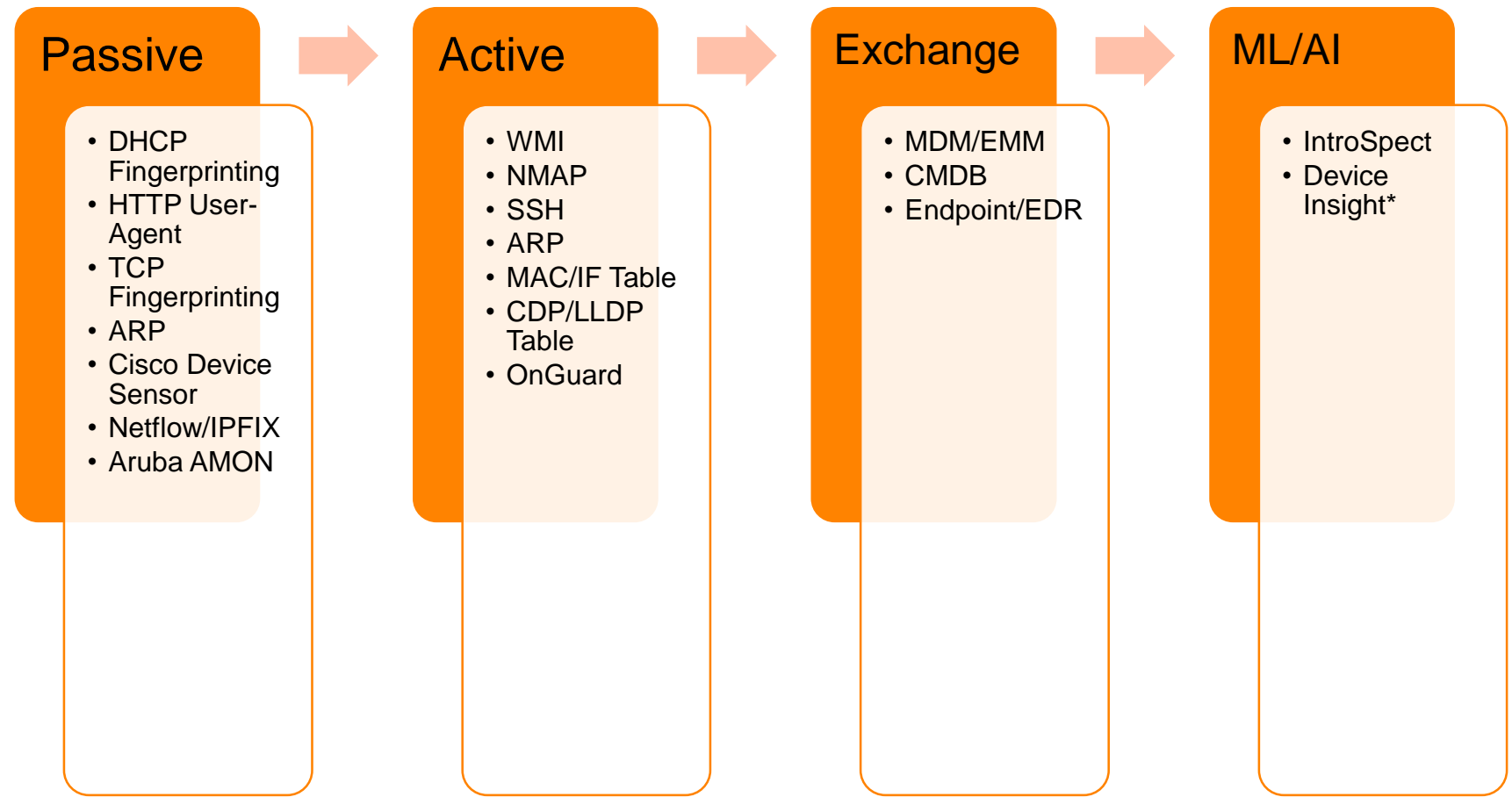
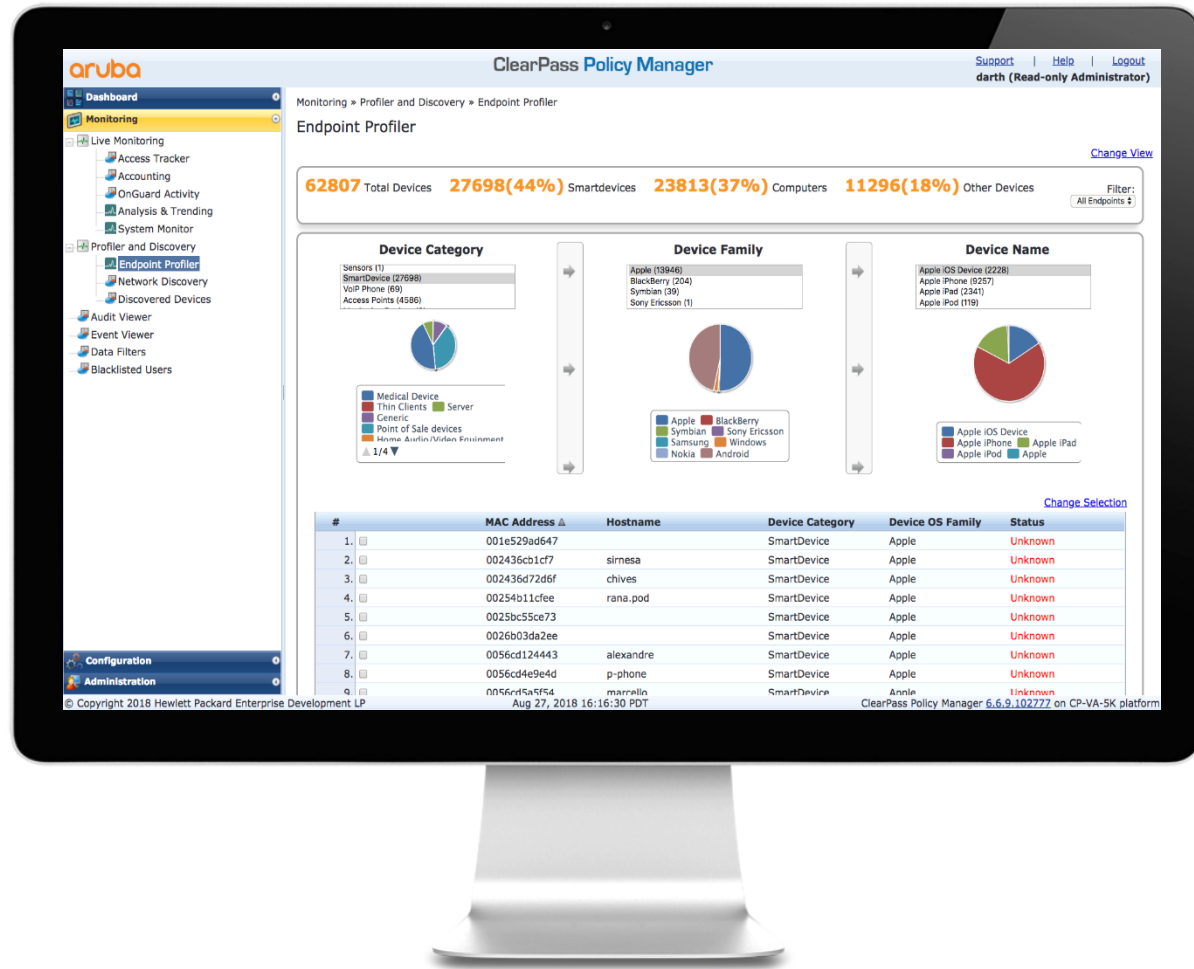


**Preferred wireless, wired, SD-WAN, security and mobile engagement solutions**

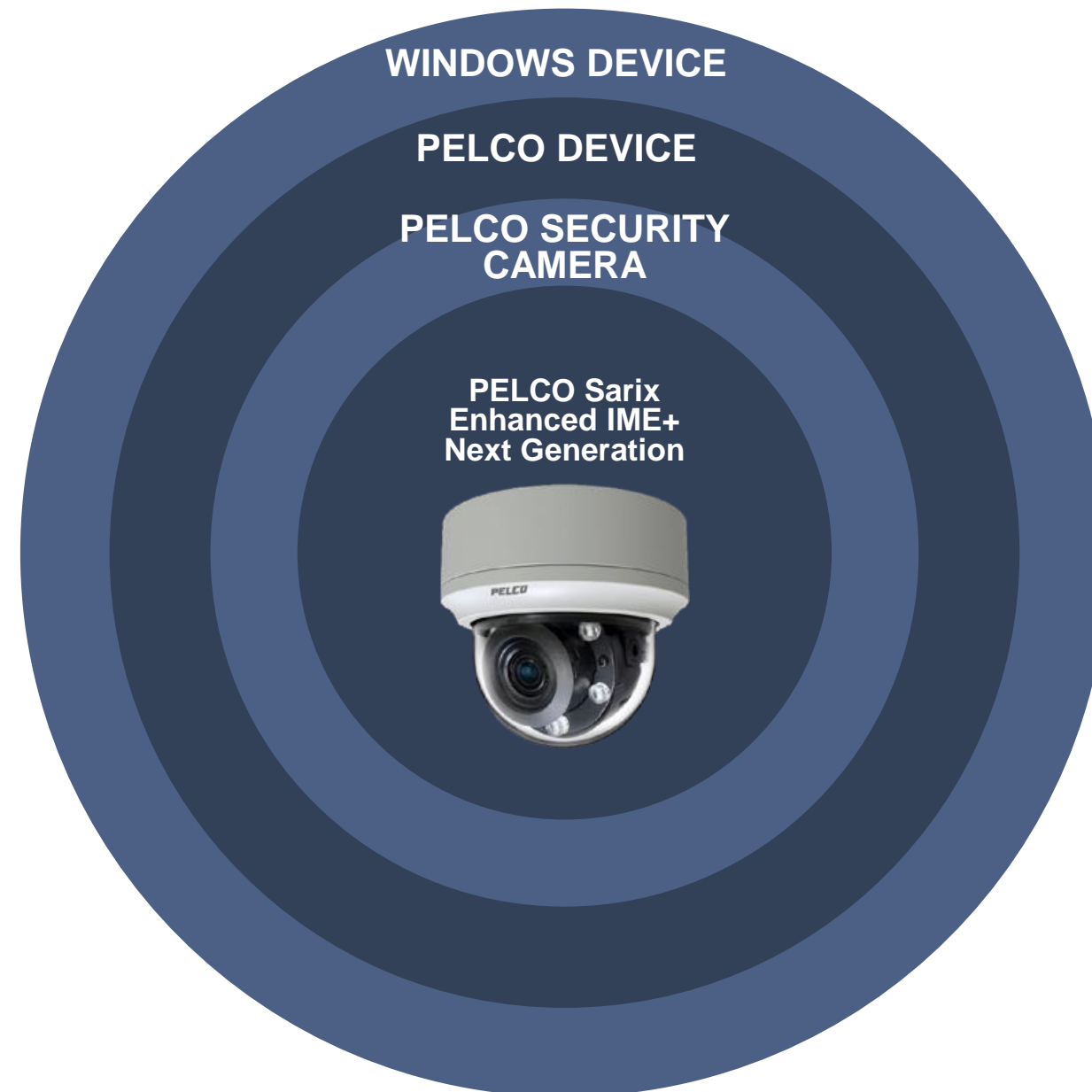




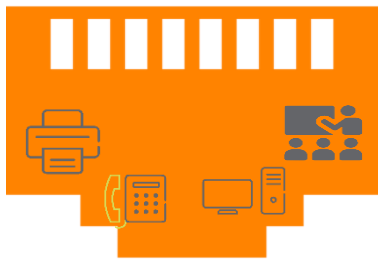
# Visibility



# From Generic to Granular



# “Best Fit” Control



## Basic Port Control

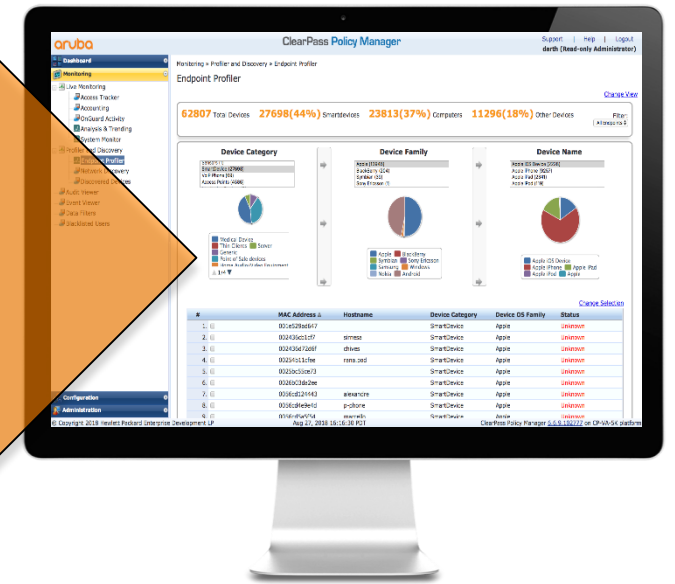
- **AuthN/AuthZ:**
  - SNMP
- **Enforcement:**
  - Port Based VLAN
  - SNMP/CLI

## Basic Session Control

- **AuthN/AuthZ:**
  - MAC Authentication
  - Allowall
- **Enforcement:**
  - Session Based ACL, Role, VLAN
  - RADIUS

## Full Visibility and Control

- **AuthN/AuthZ:**
  - Multi Auth 802.1X, MAC, WEB
- **Enforcement:**
  - Session Based ACL, Role, VLAN
  - RADIUS



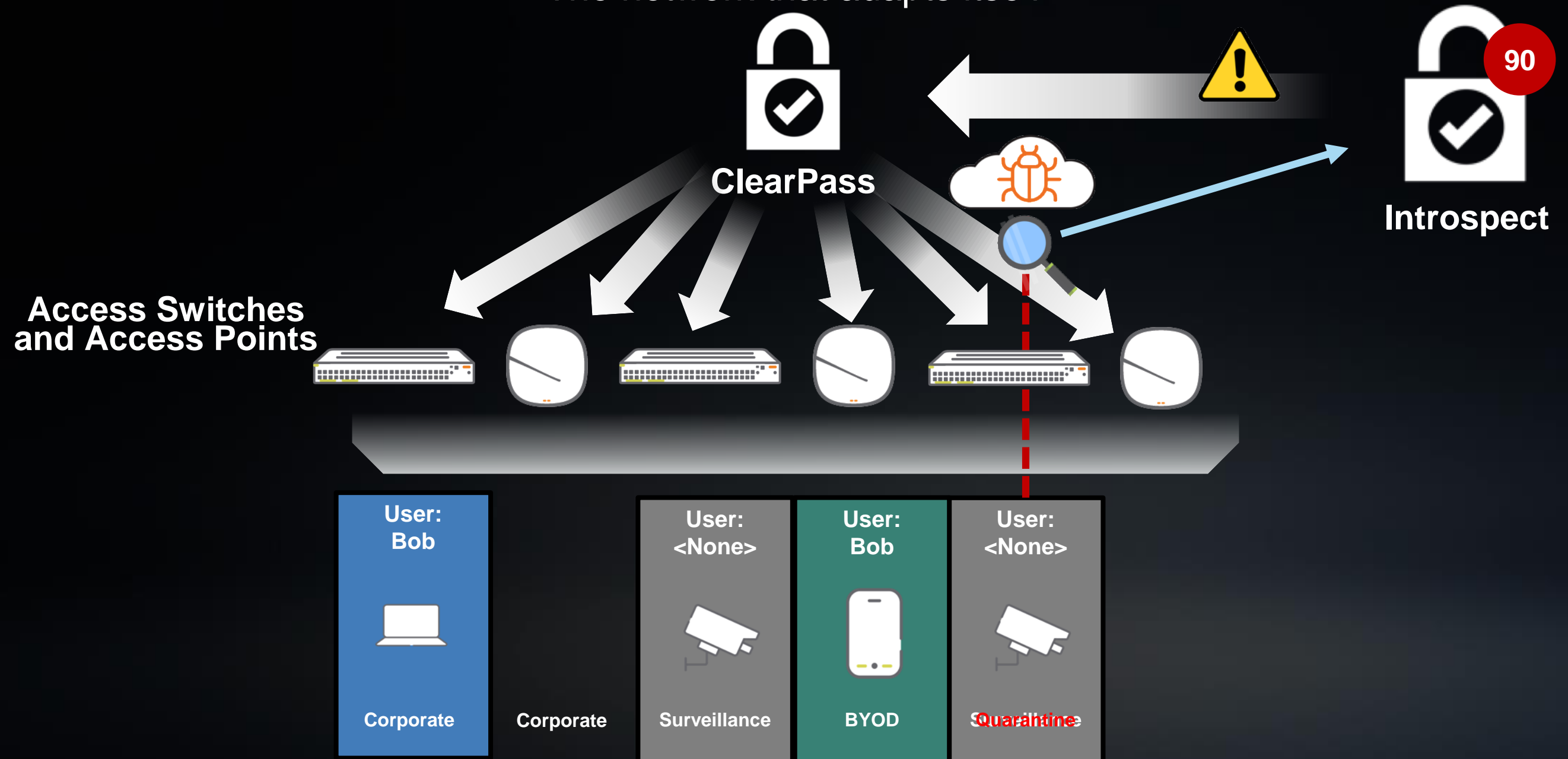
# Experience/Security Orchestration



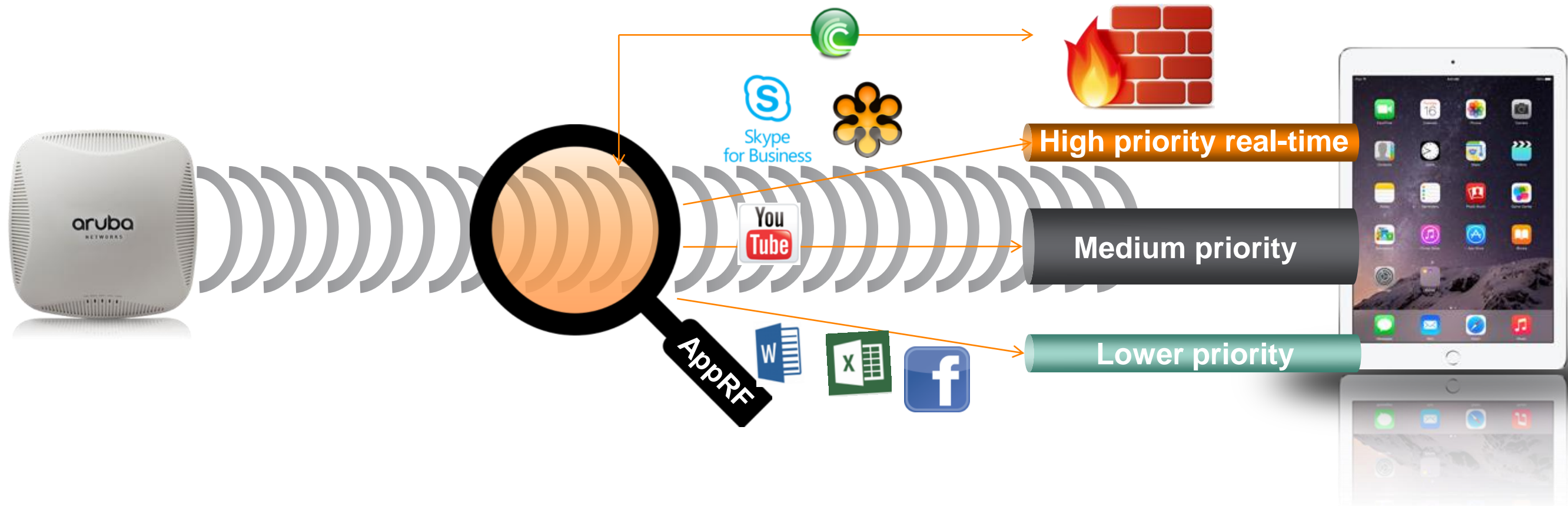


# The invisible network

The network that adapts itself



# Intelligent Traffic Control with AppRF™



# Application Visibility

## Applications



APPLICATION	CATEGORY
Google Play	Mobile App Store
linkedin.com	Social Networking
XMPP Protocol (Jabber)	Instant Messaging
Office 365	Web
Instagram	Social Networking
Skype	Instant Messaging
Amazon	Web
Snapchat	Web
Microsoft Lync	Instant Messaging
WebEx	Unified Communications
Google Maps	Web
Apple Push Notification(APNs)	Mobile App Store

## Websites



REPUTATION	USAGE
Trustworthy	82.136%
Moderate Risk	17.817%
Low Risk	0.036%
Suspicious	0.011%
Incomplete	0.000%

CATEGORY	USAGE
Streaming Media	433.9 GB (60.97%)
Unclassified	112.6 GB (15.82%)
Games	103.6 GB (14.56%)
Business and Economy	41.2 GB (5.78%)
Social Networking Web	5.3 GB (0.74%)

# Heuristic Information

FILTER UNIFIED COMMUNICATIONS  
All Devices

TEMPORAL FILTER  
1 MONTH

UC Health  
**Good!**

Total Sessions  
17

Audio  
16  
(94%)

Wireless



Good Fair Poor Unknown

Poor Sessions  
0%

UC Clients  
4

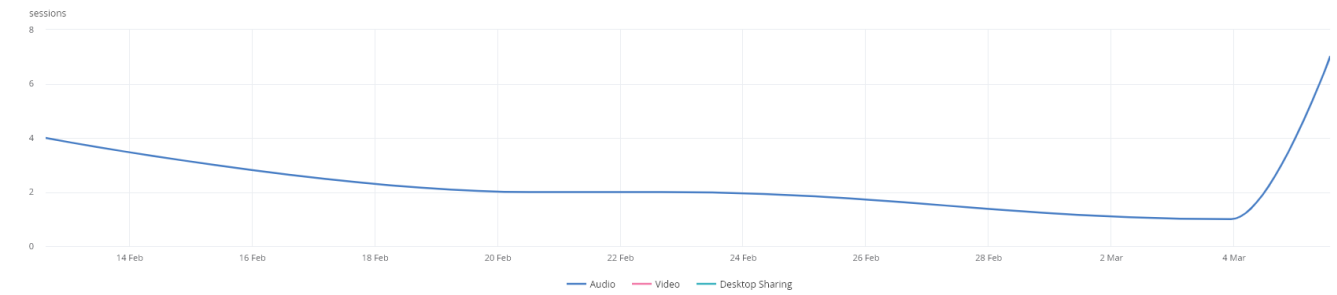
Video  
1  
(5%)

Wired



Desktop Sharing  
0

Session Count by Type

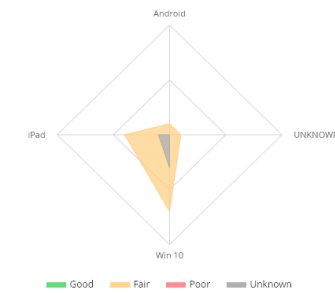


Session Quality by Session Type



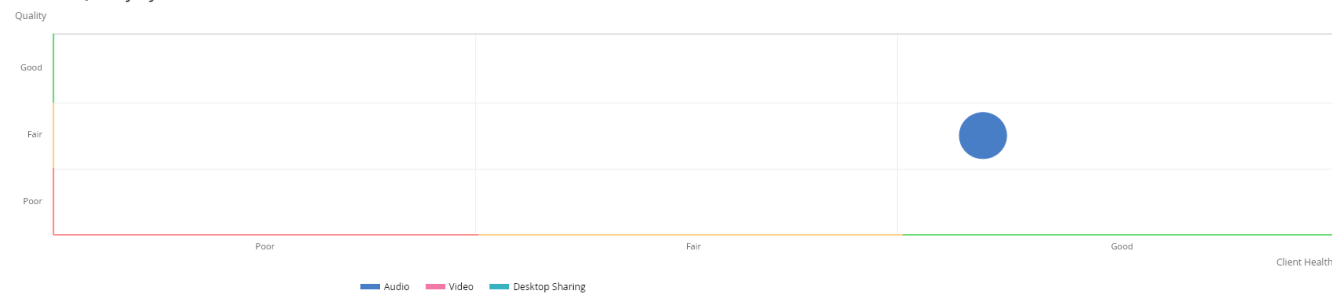
Good Fair Poor Unknown

Operating Systems



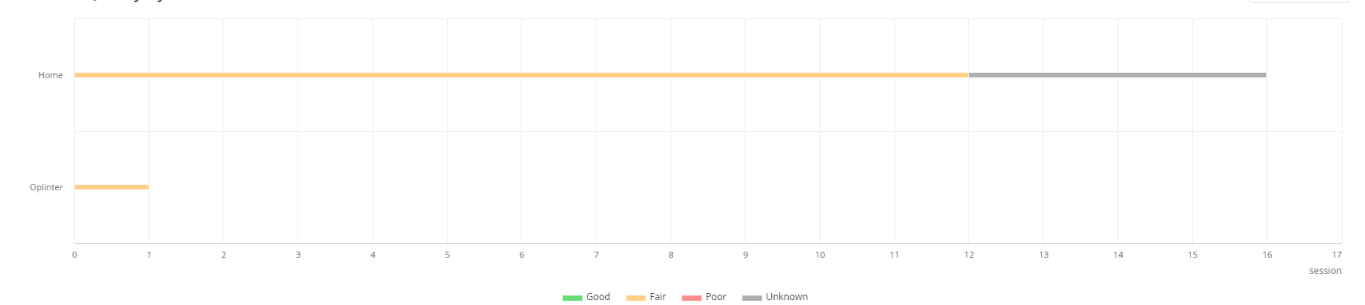
Good Fair Poor Unknown

Session Quality by Client Health



Audio Video Desktop Sharing

Session Quality by SSID



Good Fair Poor Unknown

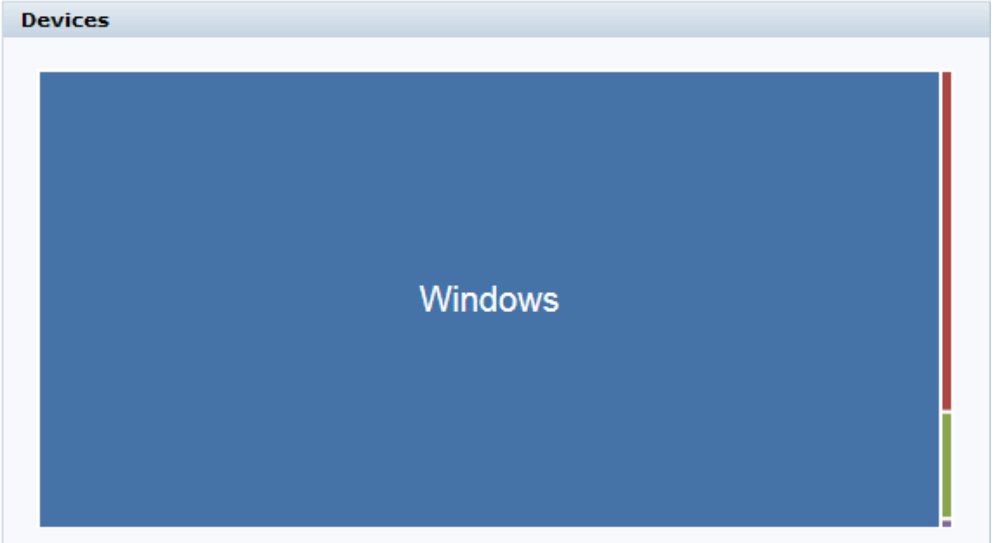
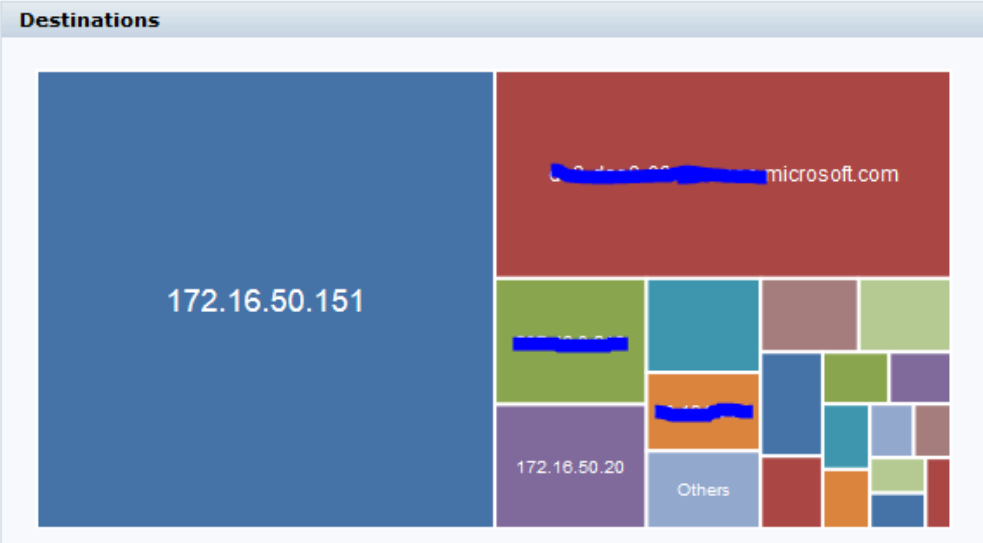
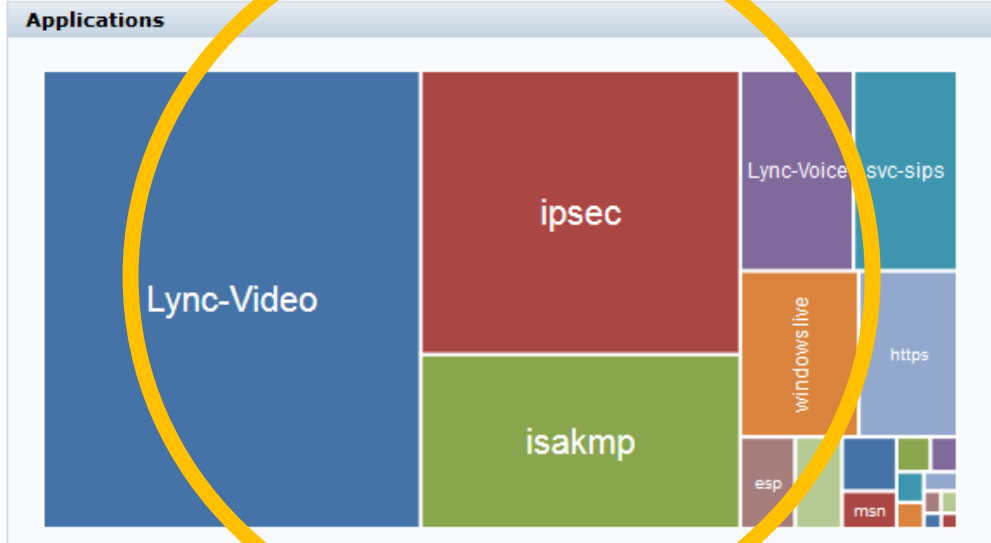
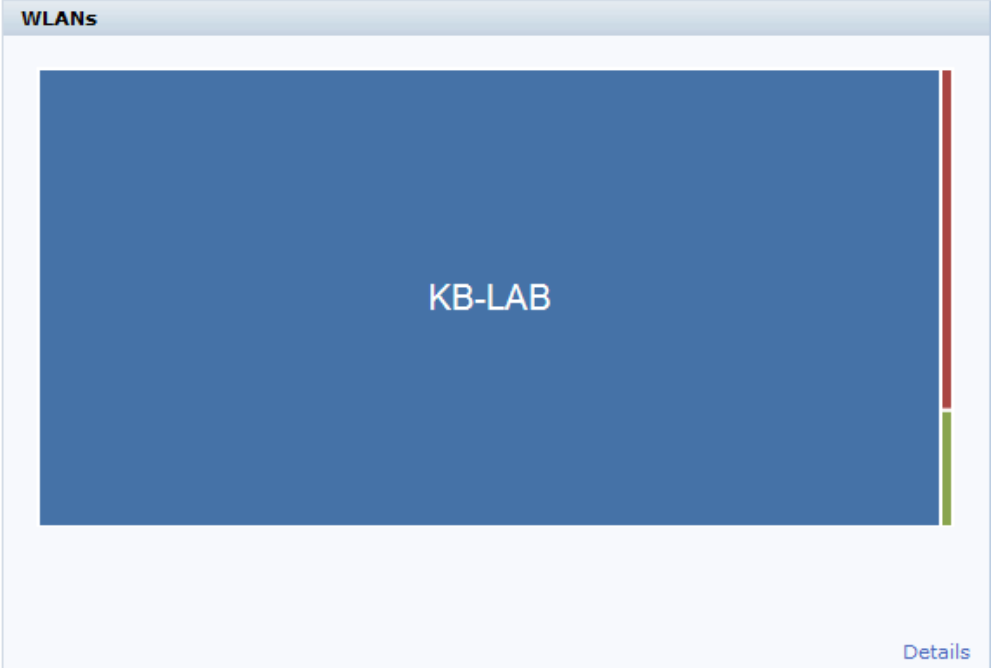
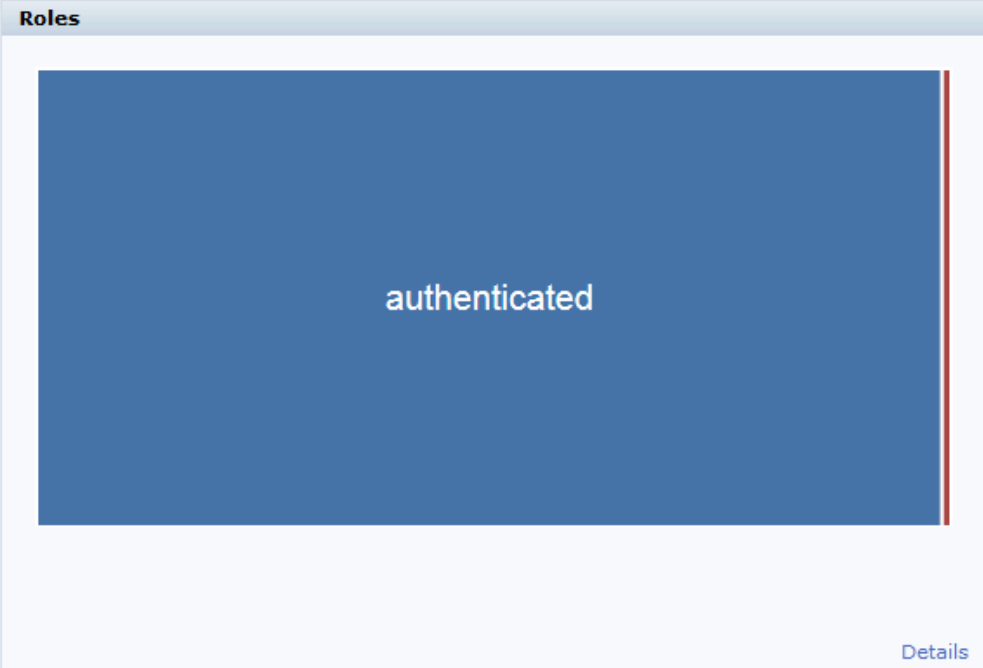
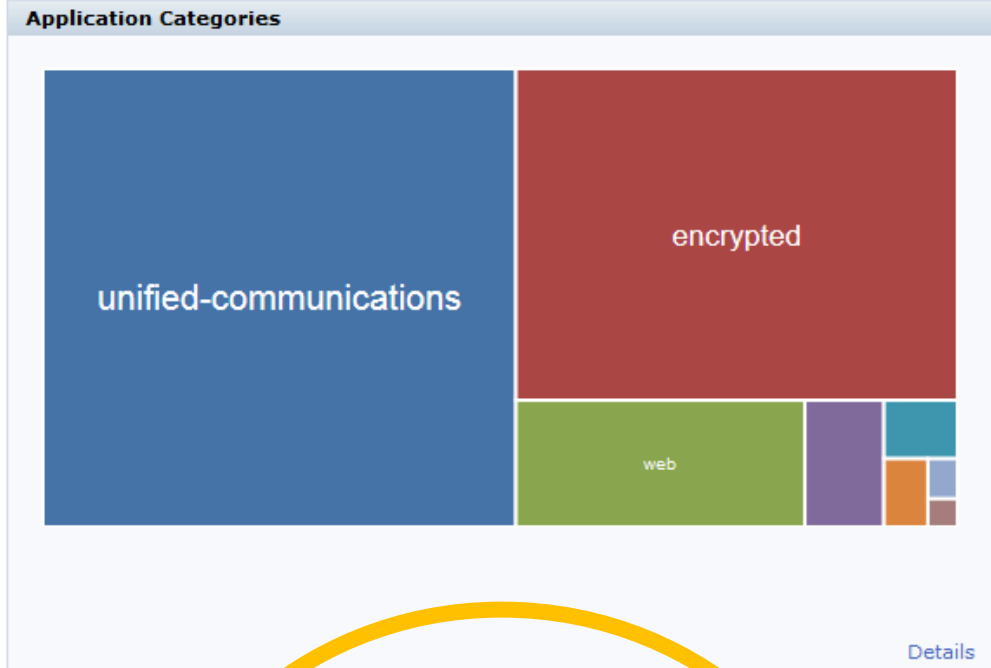
Session Count by Protocol



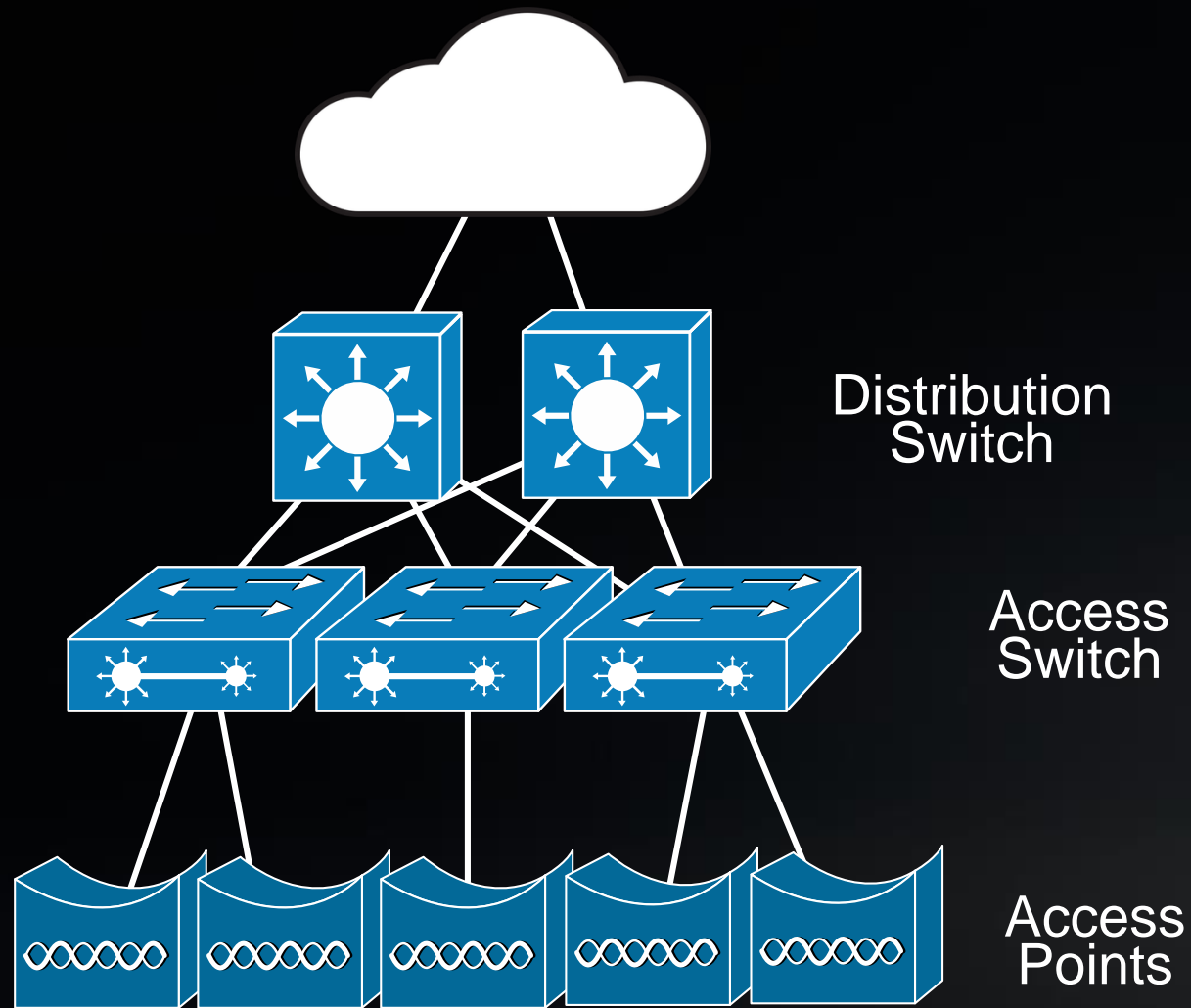
# Applications In-Flight

Total traffic: 3.6 M | Click on any rectangle to filter

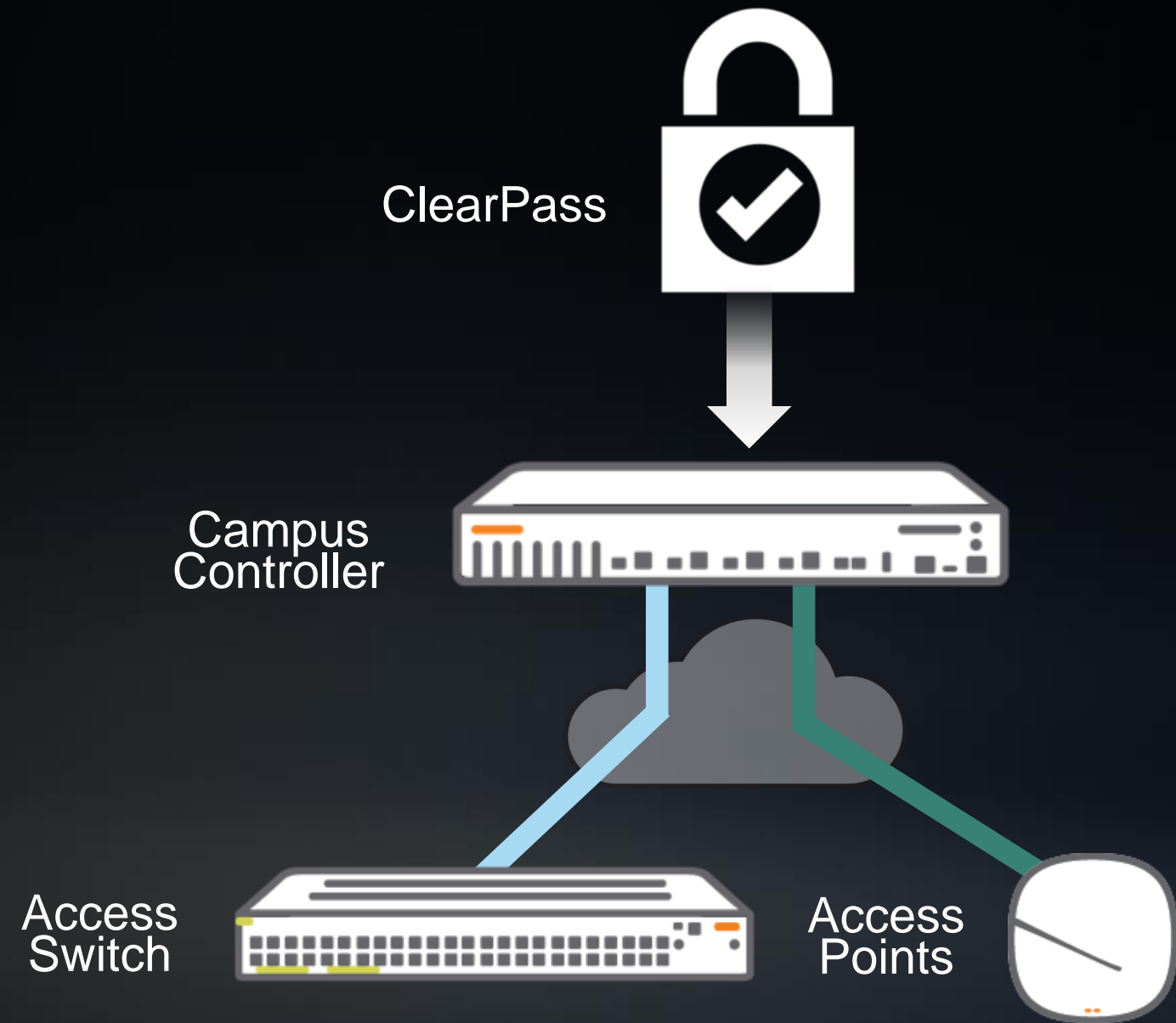
Block / Unblock Throttle QoS



# Visibility Enforcement L4-L7

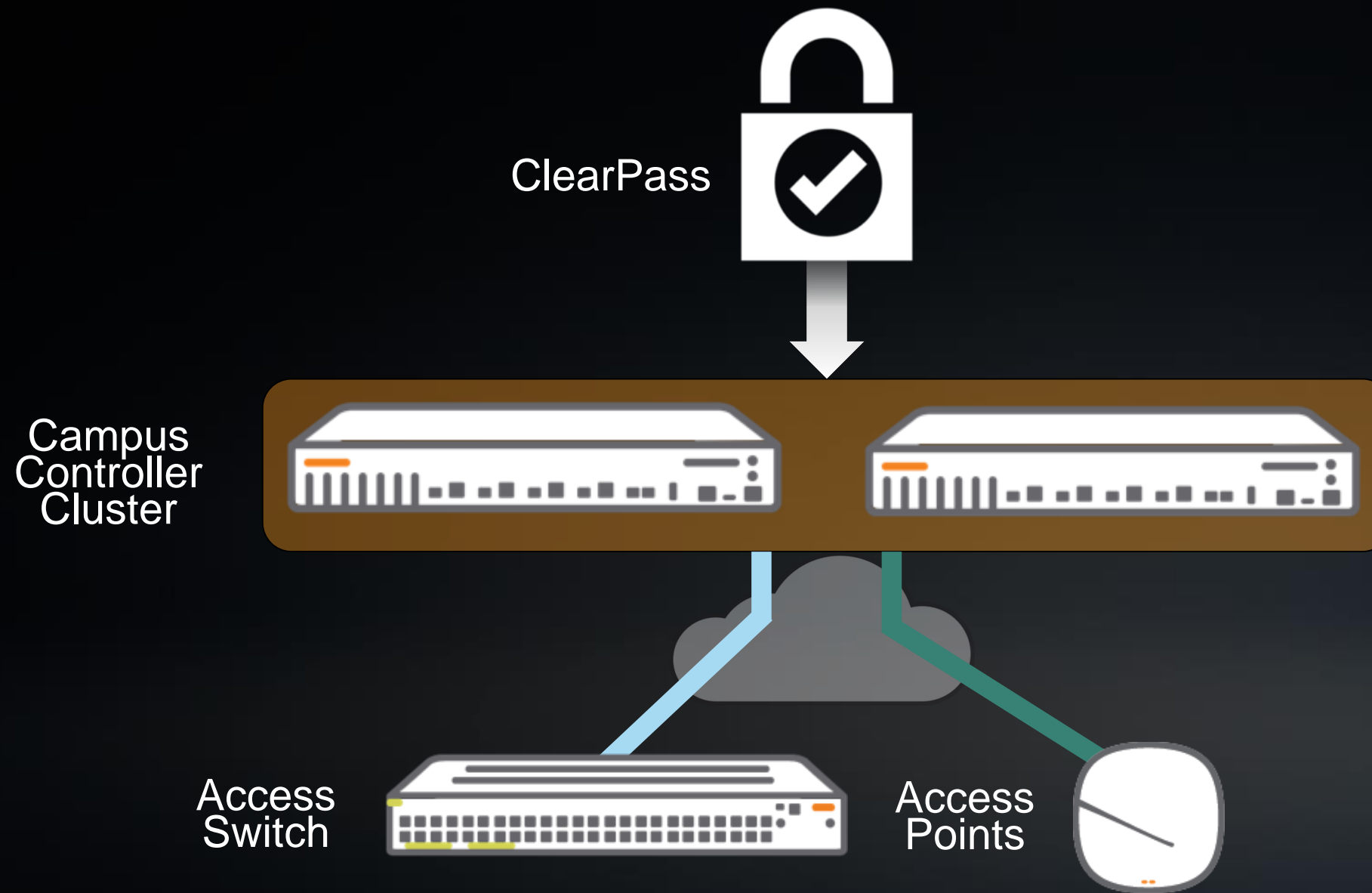


**aruba** Previous Model  
a Hewlett Packard Enterprise company

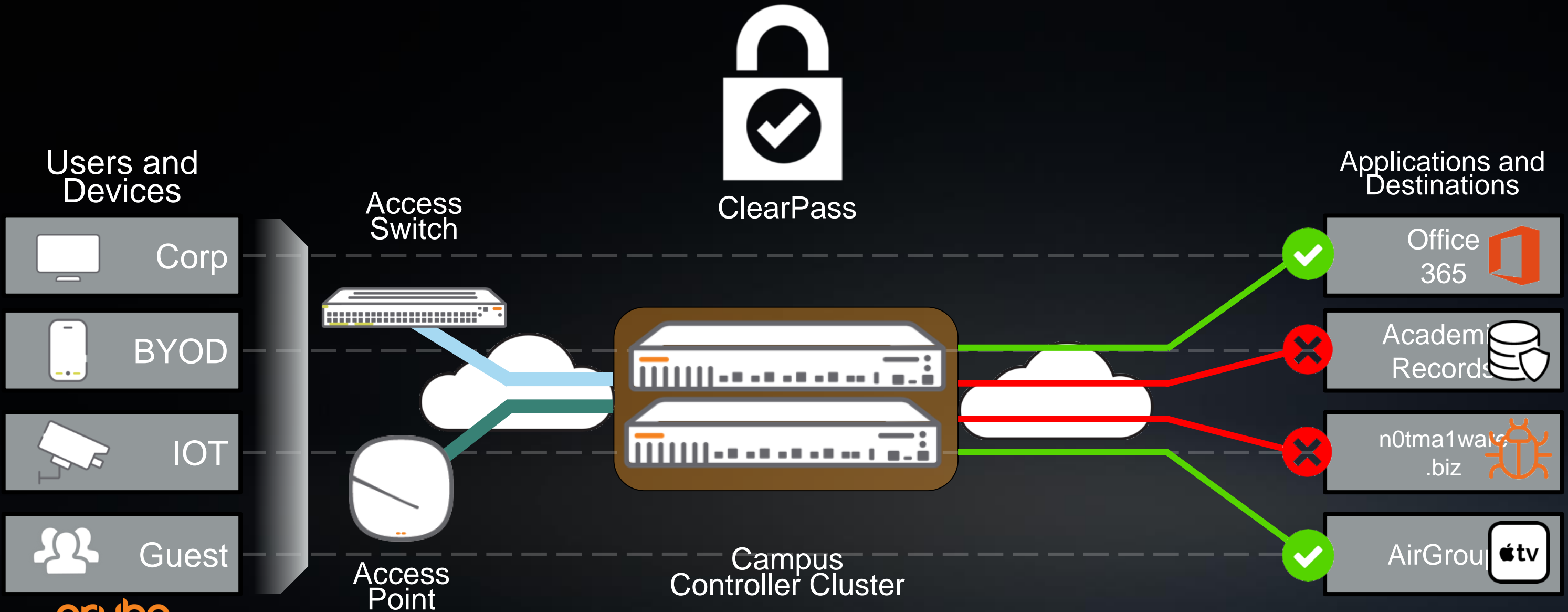


New Model

# HIGH AVAILABILITY



# DYNAMIC SEGMENTATION





# Deployment flexibility wired/wireless

## Controller Based

Centralized encryption/switching  
Larger mobility domains

Same AP  
hardware

## Controllerless (Instant)

Many individual remote sites  
One user interface per cluster

CONTROLLER

## AirWave

INSTANT

Large sites, many branches  
Multi-vendor controller and switch  
support  
End to end diagnostics and health  
checks

Same  
workflows

INSTANT

## Central

Cloud-based management  
Many independent branches

# Why a SD-Branch Solution?

Solve the Branch problem, not just the WAN problem ....

## LAN Side Challenges

- Larger number of devices, VLANs connected at branch
- End points going mobile require wireless refresh
- Poor visibility into branch clients/devices
- Lack of authentication of clients/devices connecting to the network
- Lack of common policy for users connecting via wired or wireless



## WAN Side Challenges

- MPLS is expensive and hard to deploy
- Lack of control and visibility into WAN traffic
- Complex management of the WAN and routing policy
- More SaaS traffic (O365, Box, SFDC, ...) directed over Internet.
- Lack security measures and control for the network

## Operation Challenges

- Multiple management platforms, Multiple operating models, Multiple vendors, Policy is distributed

# INTEGRATED, BEST-IN-CLASS SECURITY

## Branch Gateway



Single Point of Policy Enforcement

- Application and user aware firewall
- Web content filtering
- Dynamic Segmentation
- Unified WAN and LAN policy architecture



140+ ecosystem partnerships

Check Point®  
SOFTWARE TECHNOLOGIES LTD.

ENHANCED

paloalto  
NETWORKS

ENHANCED

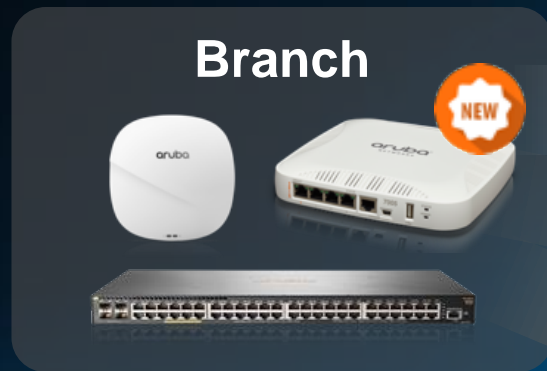
zscaler

NEW



# MULTICLOUD USE CASES

ARUBA CENTRAL



Branch



Direct to Internet

SaaS

Office365

Salesforce

SD-WAN overlay

SD-WAN overlay

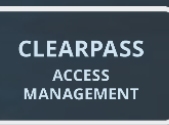
IaaS



AWS

Azure

Private Data Center

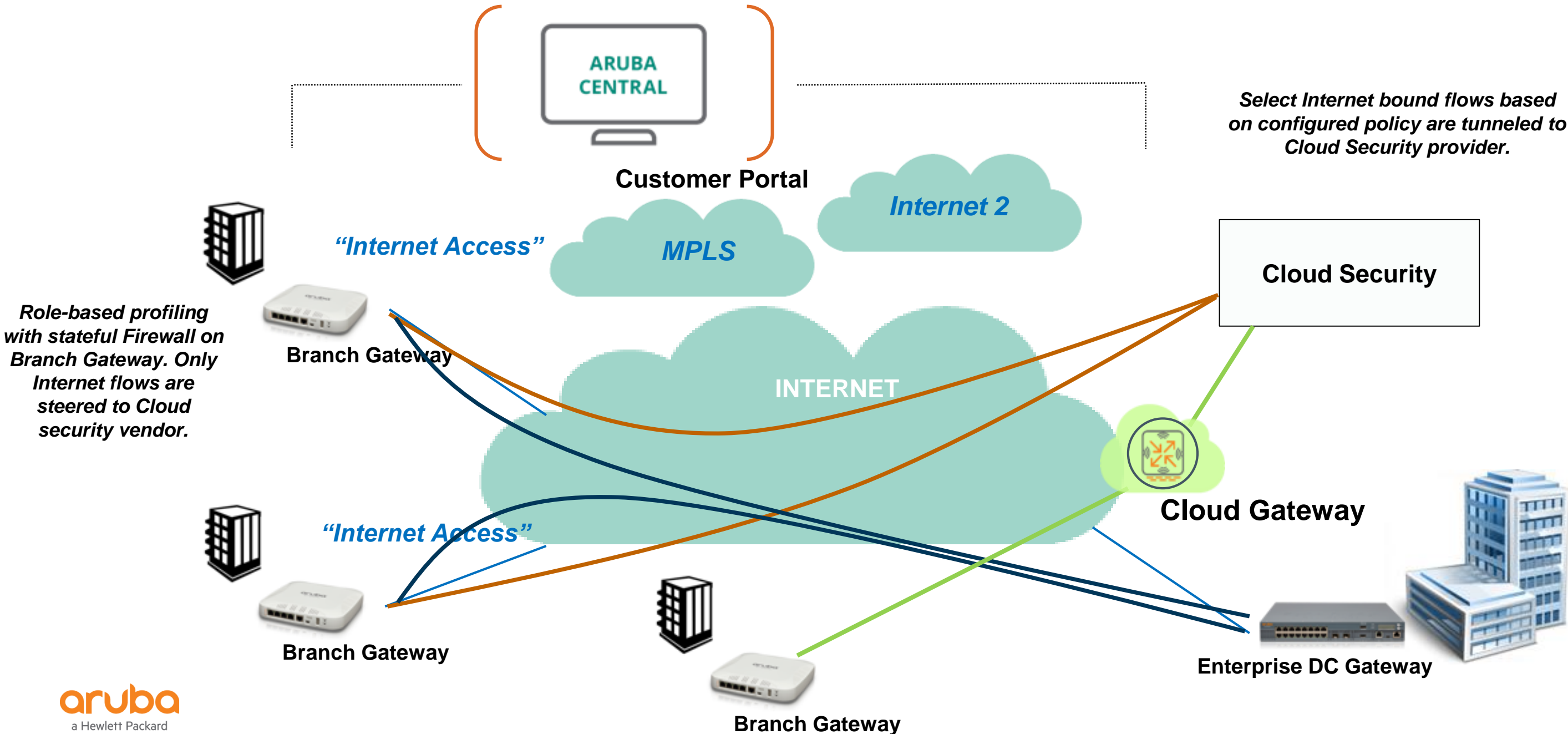


Headend Gateway



# Integration with Cloud Security

Tunnel Internet bound traffic to Cloud Security vendor



Role-based profiling with stateful Firewall on Branch Gateway. Only Internet flows are steered to Cloud security vendor.

Select Internet bound flows based on configured policy are tunneled to Cloud Security provider.

# User Centric Design Advantages

## Traditional access

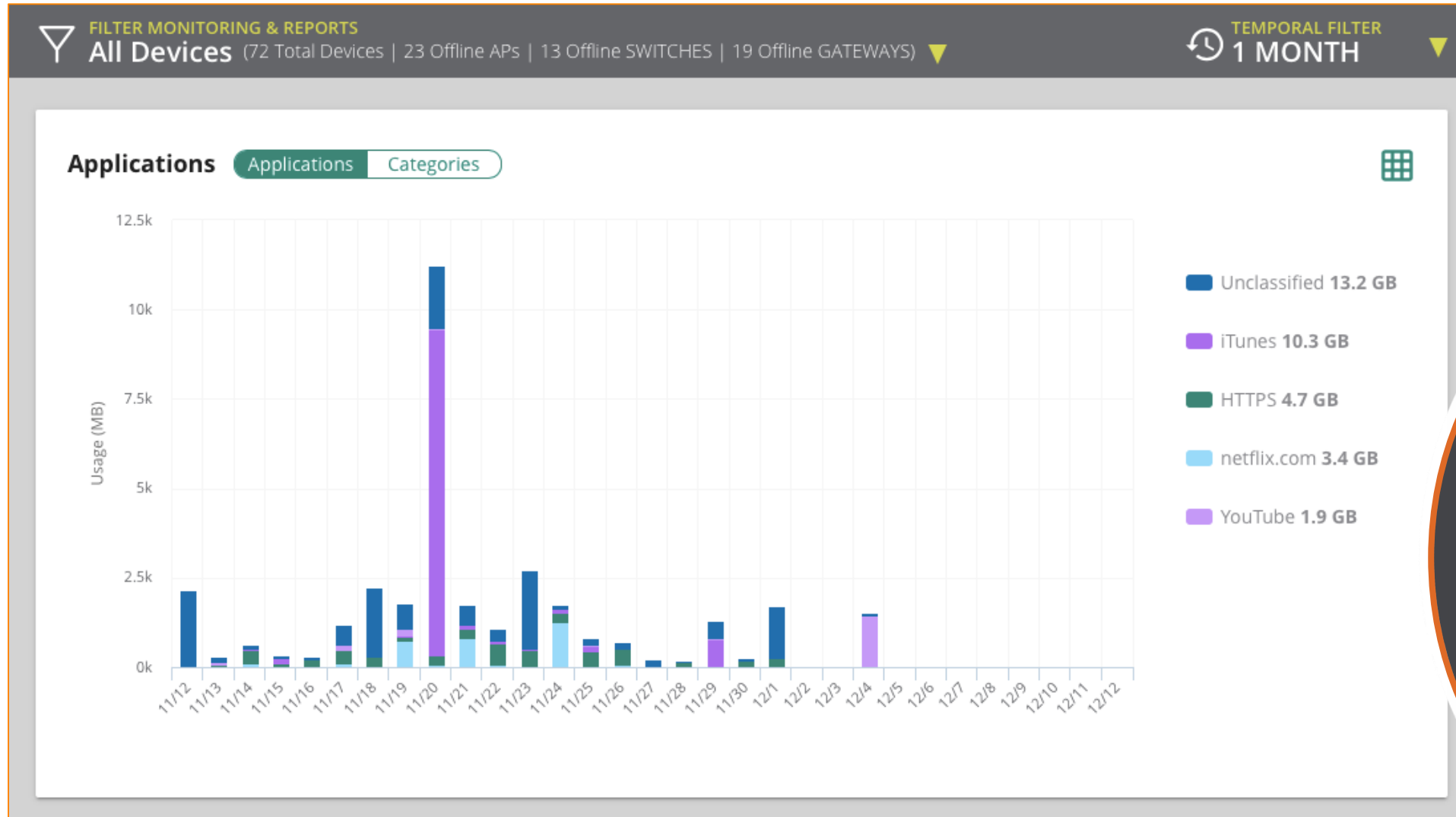
- Intra-vlan communication is allowed
- VLAN is assigned only once (manually)
- VLAN assigned based on physical port
- New services requires new VLAN deployment
- Ports are default-open, accidental access is possible
- DHCP scope fragmented per vlan
- WAN policy is defined by distributed routing

## Role based access

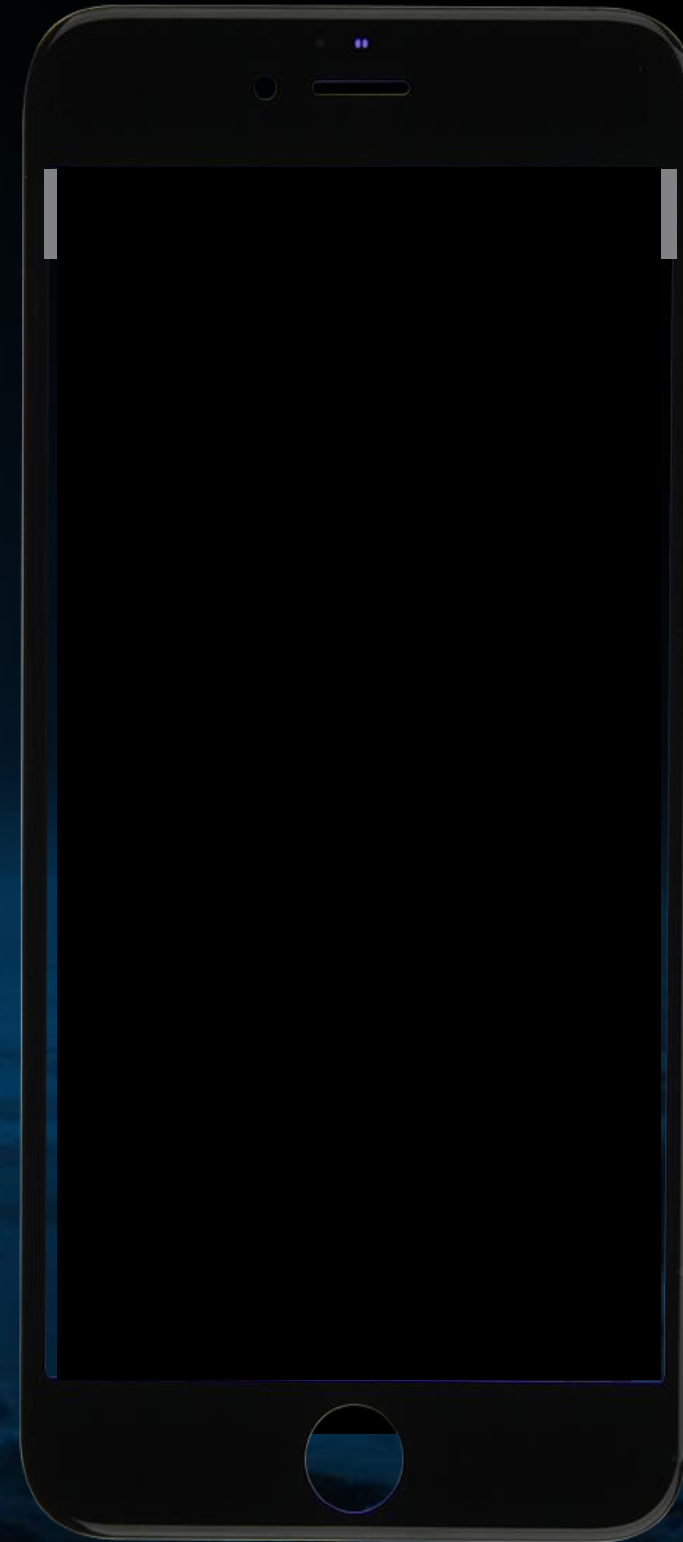
- Policy denies intra-vlan communication (micro-segmentation)
- Continuous profiling
- Role assigned based on AAA & Profiling
- Faster new services deployment (ZTP)
- All ports are secured
- Single DHCP scope per branch
- WAN policy is centrally defined by user, application and DPS



# Application Visibility dashboard: From wireless to the WAN



# DEMO 1: INSTALLER APP



# ARUBA SERVICE ASSURANCE ML-POWERED **USER ANALYTICS**



**SOFTWARE AS  
A SERVICE**



**SENSOR**

## **SIMPLE**

to deploy solution  
that directly  
measures the user  
experience

## **PROACTIVE**

and ongoing  
validation of  
access and app  
responsiveness

## **AGNOSTIC**

Wi-Fi and wired  
testing capabilities  
for any  
environment

## **SYNTHETIC TESTING**

**24/7 Remote Visibility**  
For **SaaS Applications**, and  
**Internal Network Services**

## **AUTOMATED INSIGHTS**

**Easy to Configure Tests and Alerts**  
**Aruba and Multi-vendor Network Support**

Enabled by application testing and machine learning



# SERVICE ASSURANCE SOLUTION OVERVIEW

Proactive troubleshooting and support

Intelligent network & app performance analysis

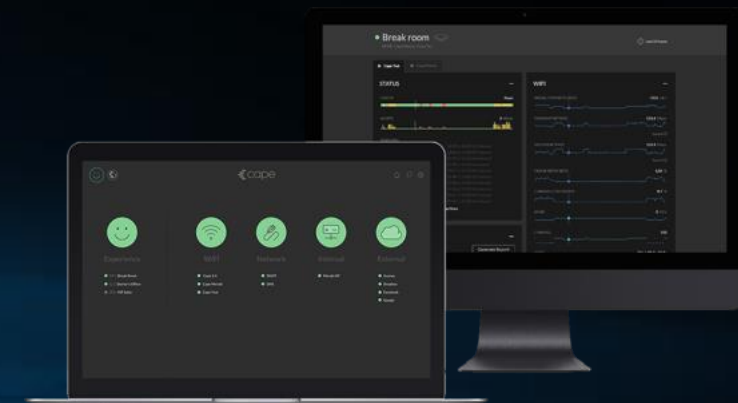
Visual Setup and Validation from anywhere



**1** Easy to setup sensors where users are most active



**2** Simple way to test the network and apps from user perspective



**3** Proactive alerts and troubleshooting help

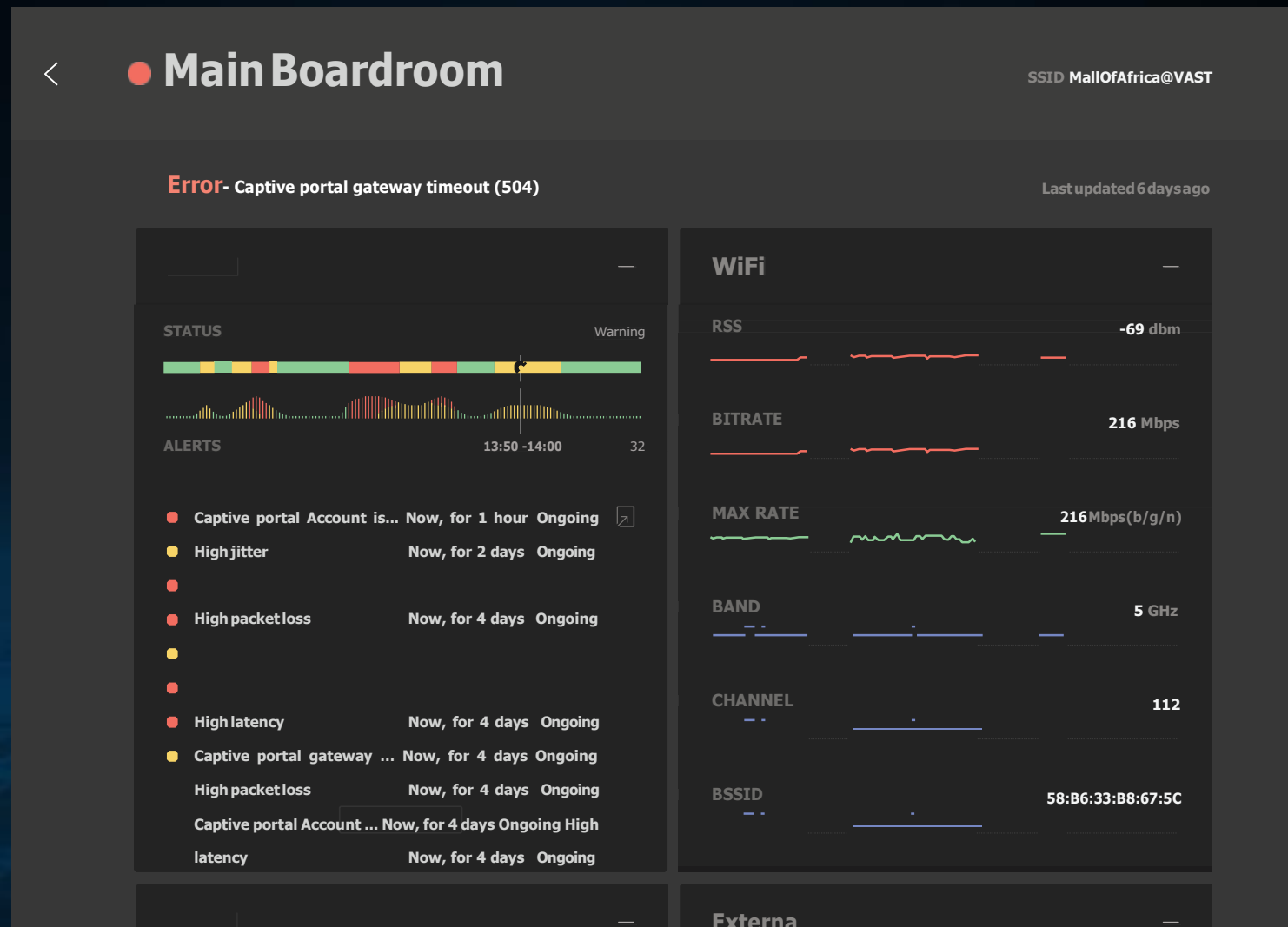
# INTUITIVE DASHBOARD & DETAILED VISIBILITY



# INTUITIVE DASHBOARD & DETAILED VISIBILITY



# ARUBA SERVICE ASSURANCE ML-POWERED **USER ANALYTICS**



User Experience Status, Warning and Issue Details and Signal Strength

Band, Channel, BSSID, DHCP Response and DNS Lookup Times

Latency, Jitter, Packet Loss and Throughput

Authentication, Captive Portal, Application and Service Status



# ARUBA SERVICE ASSURANCE

Delivering A Great Guest Experience @ the Open!

## Guests Want:

- Connectivity
- View tournament info
- Access to email, mobile apps, etc.
- Take pictures/video, send to friends

## Results:

2017	2018
8 Sensors	83 Sensors
On-site Management	Remote Management (from St. Louis, MO)

1. Captive Portal – Continuously run captive portal tests and ID improperly configured AP. WIN
2. Custom Script – Sensor detected and notified that SP's custom script worked on the captive portal configuration, but improperly configured short guard. WIN
3. Known Cisco Bug – APs were sporadically stopping DHCP due to known Cisco bug. Sensor helped pinpoint source.- WIN





# EXPERIENCE THE **EDGE**



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**SMART DIGITAL  
HOTEL**



**SMART DIGITAL  
HOSPITAL**