

# AIRHEADS COMMUNITY




# PREPARING FOR INTELLIGENT EDGE

DISCOVERING IOT DEVICES IS  
JUST THE BEGINNING...

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# ECONOMIC DRIVERS OF SMART BUILDING IOT

- Total economic impact of IoT in 2025 is \$70-140B
- Top areas include:
  - Human productivity monitoring \$48-115B
  - Energy monitoring \$12-21B
  - Building security \$3-6B

McKinsey Global Institute, *Unlocking The Potential Of The Internet of Things*,  
June 2015



Elevator  
Call



Site  
Navigation



Smart  
Lighting



Streaming  
Multimedia



Analytics



Machine  
Monitoring



Security

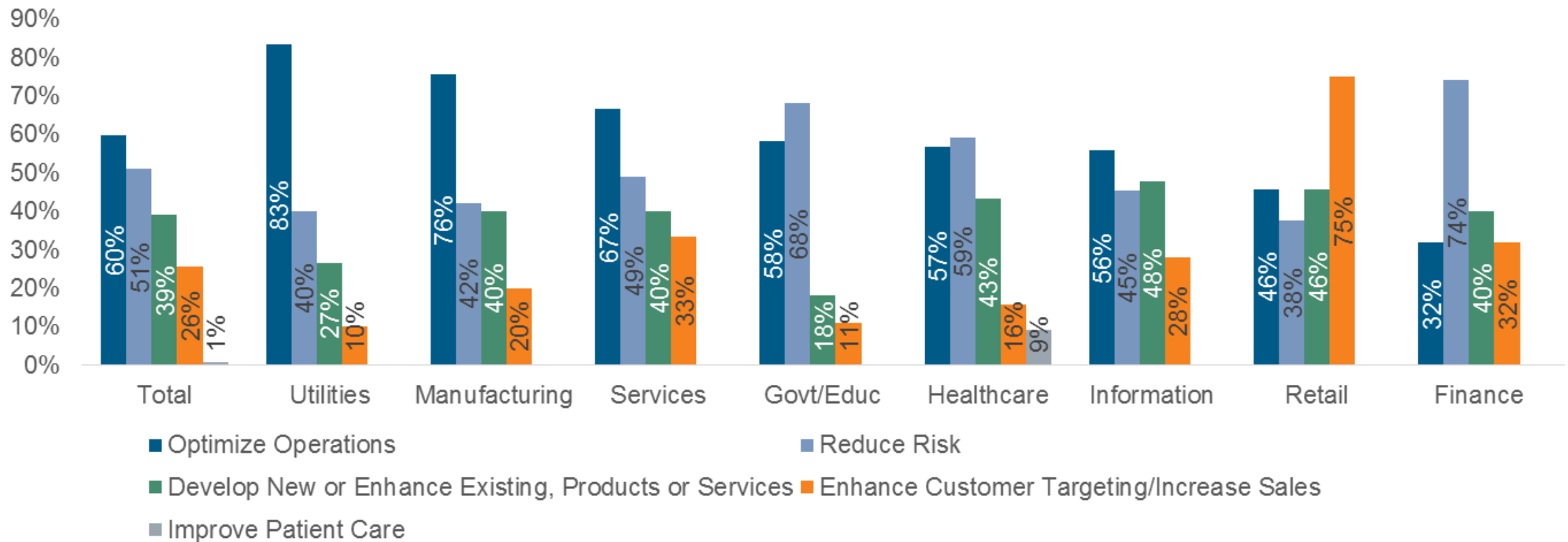


Wi-Fi  
Calling





# THE BUSINESS REASONS FOR IOT VARY BY INDUSTRY



Source: 451 Research, Voice of the Enterprise Internet of Things (IoT) Q1 2016 [N = 590]

# What are the Challenges?

## Challenge #1

Real-time **visibility** into device behavior is essential to managing costs and **enhancing user experiences**, comfort, and safety

## Challenge #2

**Legacy IoT** devices have to be supported, protected, and monitored side-by-side with the new devices using a wide variety of communications media. Even on a **new network architecture**.

## Challenge #3

**Legacy networks** can't reliably support critical building and in-room IoT systems, location services, wireless sensors, mobile devices, streaming multimedia.

# PROTECT

## ARUBA 360 SECURE FABRIC

### Aruba 360 Secure Fabric

**ClearPass | IntroSpect**

Integrated Attack Response

**Aruba Secure Core**

Secure Boot | Encryption | DPI | VPN | IPS | Firewall

**Aruba  
360 Secure  
Exchange**

ArcSight  
an HP Company

**McAfee**

 **paloalto**  
NETWORKS

360° active cyber protection and secure access  
from the edge, to the core, to the cloud—for any network

# What are the steps for Innovation?

## Innovation Always:

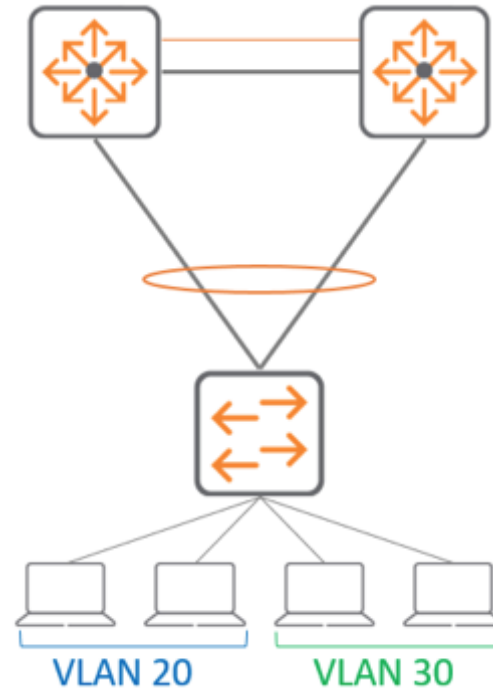
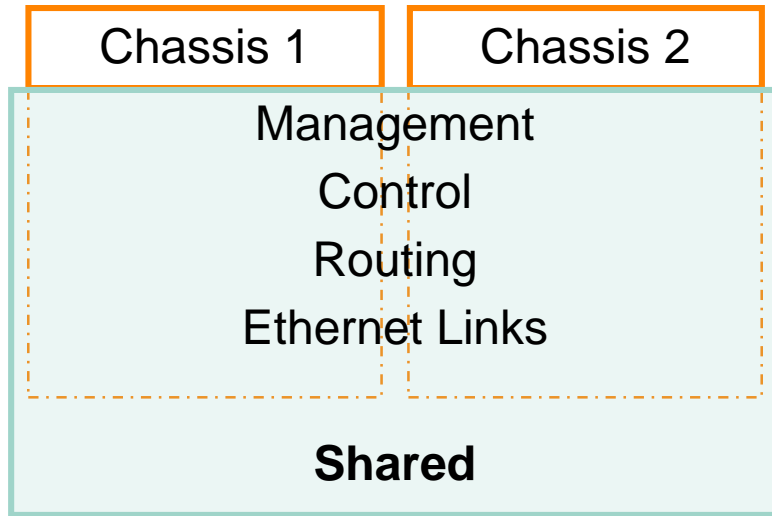
- Starts with a use case/goal
- A new technical solution is created
- Manufacturers create a branding for their version

## Example - Goal: How to Increase reliability of LAN

- Redundant links between network devices
- Spanning-tree
- Dual-homed Link-aggregation
  - Virtualization techniques



# Virtualization Solutions Compared



# What happens in the Access Layer?

Goal: Secure network access of users and devices

- Static configuration of wired access port
- Policy: ACL/QoS local significance to switch port
- Segmentation: VLAN based on topology and IP subnets

Hop-by-Hop configuration

# What happens in the Access Layer?

Goal: Secure network access of users and devices

- **Radius/policy-control**
  - Network service for all device
  - Different for Wired and Wireless
- **Wired LAN**
  - Static configuration of wired access port
  - Policy: ACL/QoS local significance to switch port
  - Segmentation: VLAN based on topology and IP subnets

What is next?



# What Next in the Access Layer?

Goal: Secure network access of users and devices

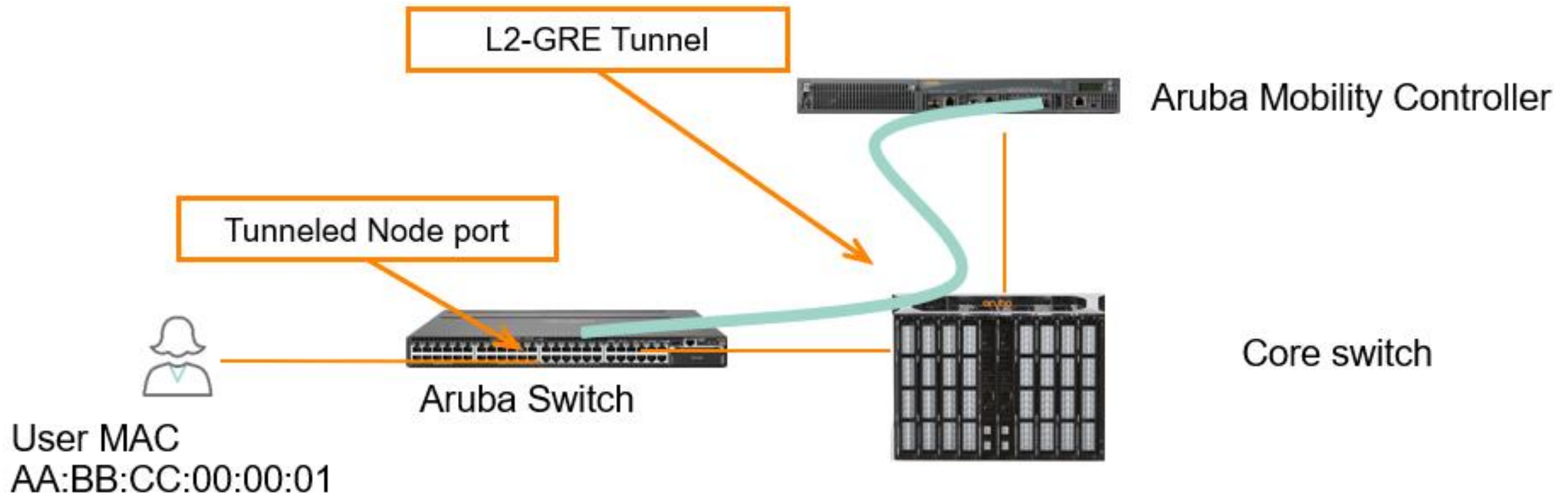
- **Role based Access – Wired and Wireless unified**
  - Roles tied to device or user types defines policy: VLAN, QoS, ACL, Rate-limits
  - Policy follows user/device no matter how/where they connect
  - Centralized Policy Management for Wired and Wireless
- **Simplify Access layer configuration**
  - Access port dynamically configured based on connected device
    - Remove need to statically configure access ports
    - Reduce IT staff resources for Add, Move and Changes
- **Segmentation**
  - Legacy VLAN / local-switching
  - Tunneled wired device to controller with stateful firewall/policy control

# Mobile First - Dynamic Segmentation

- **Simplify Access layer configuration**
  - Colorless Ports
- **Segmentation**
  - User Based Tunneling (UBT)
  - Port Based Tunneling
  - Legacy VLAN based local Switching
- **Policy control**
  - Local or Downloadable User Roles (DUR)

# PORT-BASED TUNNELING: WHAT IS IT?

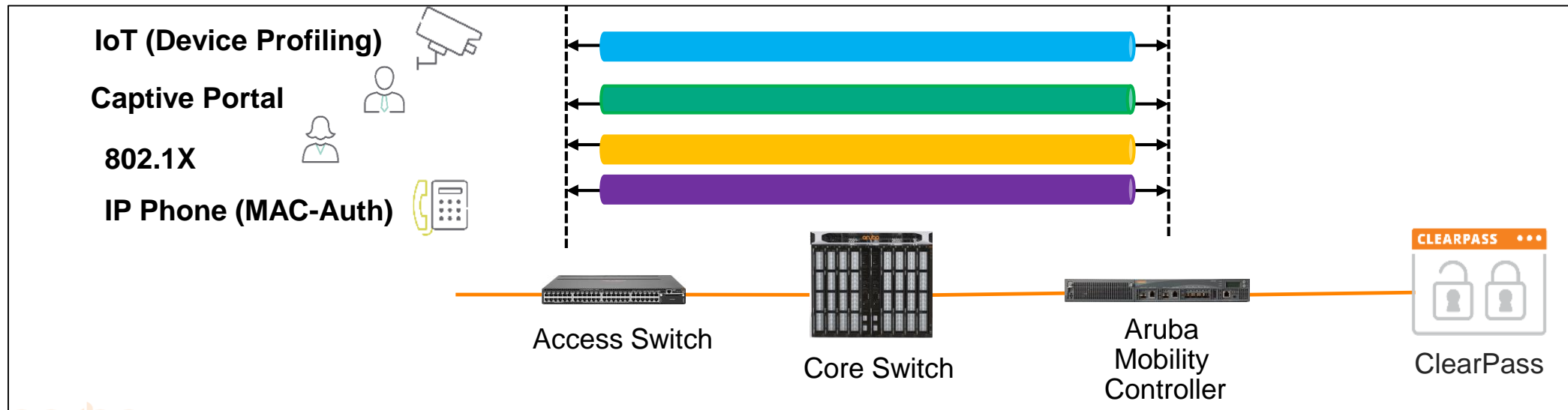
- Traffic on wired switch port is handled by a central Aruba Mobility Controller
- It's a tunnel, therefore MAC address table size relief on the intermediate devices





# USER-BASED TUNNELING: WHAT IS IT?

- UBT uses the concept of a colorless access port
- It doesn't matter what you connect to the port
  - Roles and policies are assigned per device
- Authentication takes place at the access port level
  - Successful authentication enforces VLAN and ACL assignments
  - Can create a user or device-based tunnel to the Mobility Controller
  - Mobility Controller can enforce additional security
- It's a tunnel, therefore MAC address table size relief on the intermediate devices



# Dynamic Segmentation – So What

## Increased Flexibility and Security Wired Lan

- Roles
  - Roles follow user/devices no matter where/how they connect
    - Cameras, employee, guest, printer....
      - VLAN, QoS, ACL, Rate-Limits
- Tunneled-Node
  - Tunneled-Node + Roles enables segmentation without regard to IP subnets, I can create it is in total separated network.
  - In-line firewall
- Security
  - Downloadable User Roles provides a Single Source of Policy

# Dynamic Segmentation – What should I learn?

What is the risk-factor?

- Existing/Well-known Topologies and Protocols
  - Authentication, Network-Access, Switching and Routing
- Benefits of existing IT skill sets
- Freedom to choose best-in-breed infrastructure
  - What if a new innovation comes around?
- Segmentation Local Switching **AND** Tunneled as needed
  - Can choose what data is locally-switched, and what is Tunneled.
  - Tunneled traffic, GRE: same as today's wireless traffic (Aruba CAP, CAPWAP)
- Authentication/Authorization
  - Free to choose 3rd Party Radius/ additional benefits with Aruba Clearpass\*



# Dynamic Segmentation – What should I learn?

**AIRWAVE  
NETWORK  
MANAGEMENT**

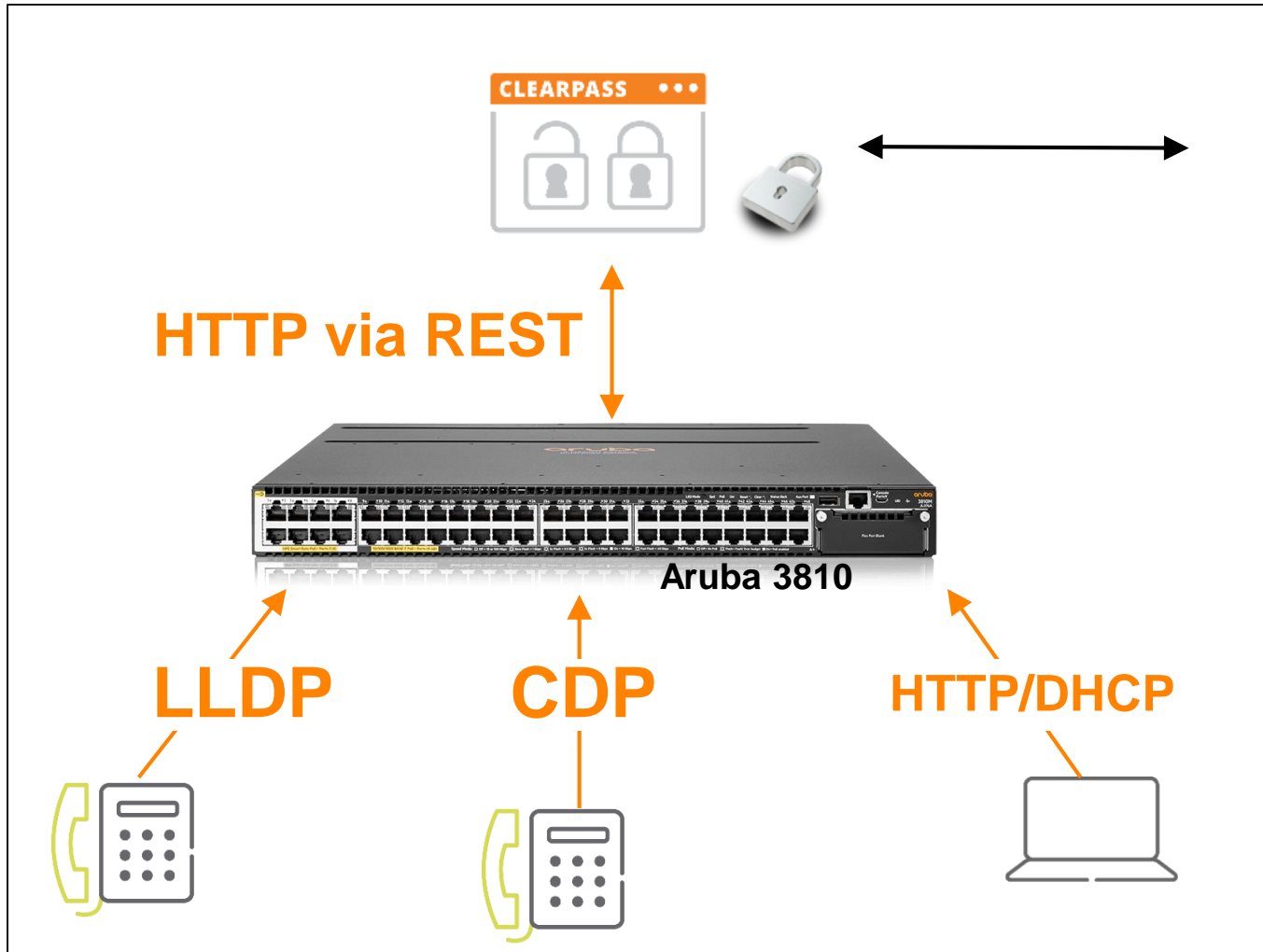
**Controller**

**Switch**

From controller perspective, a switch is an AP when it comes to licensing



# DEVICE FINGERPRINTING: PROTOCOLS



## UBEA Tools

### device-fingerprinting policy

#### Syntax

```
device-fingerprinting policy <profile_name>  
no device-fingerprinting policy <profile_name>
```

#### Description

Configures the device fingerprinting for profiles.  
The no form of this command removes the device fingerprinting for profiles.

#### Command context

config

### device-fingerprinting timer

#### Syntax

```
device-fingerprinting timer <time>  
no device-fingerprinting timer
```

#### Description

Configures the timer for switch to send the client data to CPPM. The default time is 120 seconds. The time range is 60 to 300 seconds.  
The no form of this command resets the timer to its default value.

#### Command context

config

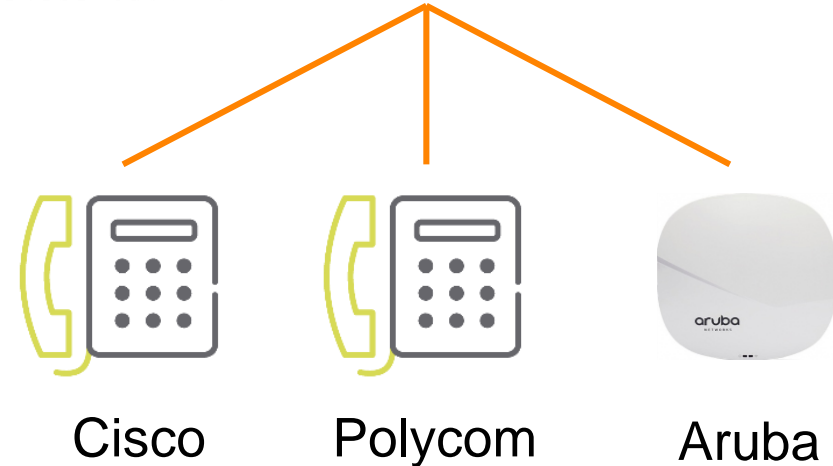
#### Parameters

##### time

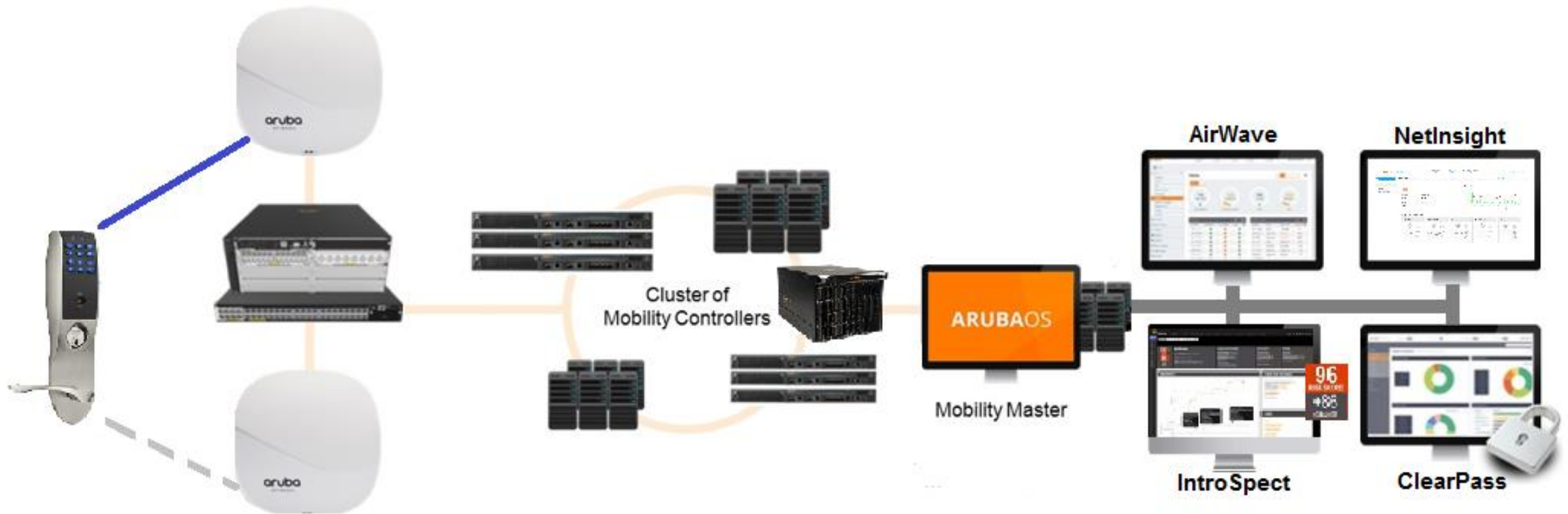
Configures the timer for switch to send the client data to CPPM. The range can be 60 to 300 seconds.

# CUSTOM DEVICE PROFILES

- Automatically detect device based on LLDP information received via switch port
- Device profile contains the following:
  - PoE Priority
  - PoE Power
  - VLAN Assignment (Tagged or Untagged)
  - Bandwidth limit
  - Port Speed
- Can use it with Aruba Access Points as well as a custom profile for any LLDP TLV



# HITLESS UPDATES

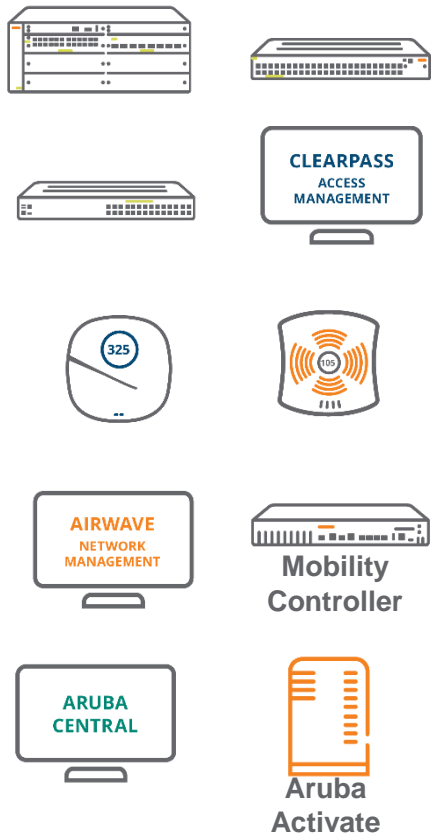


**Client loads transfer** to other APs prior to update/reboot



# Better Together

Powering and securing the Digital Workplace



## Unified Policy

- Authentication and setting policy using ClearPass Policy Manager
- User onboarding and guest access with ClearPass Policy Manager
- Simplify policy management and configuration with User Role

## Consistent user experience

- Per port tunneling of all wired traffic to Mobility Controller
- Centralized policy management and enforcement
- All users have access to applications on the Controller

## Wired and Wireless Management

- End-to-end management of wired and wireless networks with AirWave
- Zero Touch Provisioning for rapid deployment with AirWave
- Cloud-based management with Aruba Central

## Wireless optimized

- Automatic configuration of switch port when Aruba AP is detected
- Working with IAP to contain rogue AP, add VLAN
- Set appropriate QoS of traffic from the AP

# What About You

What are the use cases that you encounter?

- Asset tracking
- Location services
- Monitoring

What are the protocols that you want us to interact with?

- We are known for our eco system, how should we extend it?
- BLE
- Zigbee
- Proprietary
- ....

# Airheads Community

community.arubanetworks.com

**AIRHEADS**  
COMMUNITY

Global Forums Register Sign In Help MENU

## Aruba Strikes Again!

[Read the blog](#)

**FEATURED**

**What you need to know about 802.11ax**  
The next advance in Wi-Fi, 802.11ax, is fast approaching.

**AOS-Switch Hardening Guide 16.06**  
The latest revision of the ArubaOS-Switch Hardening Guide has been released.

**Aruba Mobile First Campus Reference Architecture VRD**  
The VRD is now available.

**NEWS**

**Aruba Blogs Have Leveled Up!**  
By [Jamie E](#)

**We want to hear from you!**  
By [ecarroll](#)

**Give a kudos and help bring a Lithy home...**  
By [CMDumitrache](#)

[All News](#)

**DISCUSS**

**Can we install Airwave Glass using ISO i...**  
By [esupport](#)

**Can we reduce the nightly backups retain...**  
By [esupport](#)

**Re: Clearpass With Student Devices that ...**  
By [Victor Fabian](#)

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Blogs have moved! If you have any questions or comments, email the team at [hpe-aruba-](mailto:hpe-aruba-)

## Create your account

First Name \*

Last Name \*

Belgium \*

Email \*

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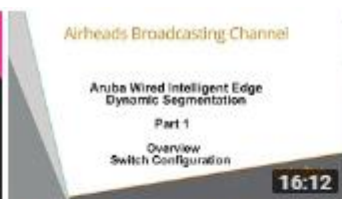
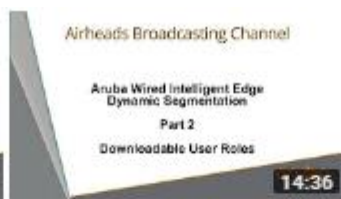









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## Airheads Broadcasting Channel

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# THANK YOU

# THANK YOU

# Dynamic Segmentation Scale

Controller	Maximum Supported Tunnels
7280	34816
7240 /7240XM	34816
7220	17408
7210	8704
7205	4352
7030	1088
7024	544
7010	544
7008	272
7005	272

Switch Series	Maximum Supported Tunnels
5400R – Per Switch/Stack	1024 tunnels
5400R – Per Port	32 tunnels
3810 – Per Switch/Stack	1024 tunnels
3810 – Per Port	32 tunnels
2930F/M – Per Switch/Stack	1024 tunnels
2930F/M – Per Port	32 tunnels

# Port-Based Tunneling Scale

Controller	Maximum Supported Tunnels
7280	34816
7240 /7240XM	34816
7220	17408
7210	8704
7205	4352
7030	1088
7024	544
7010	544
7008	272
7005	272

Switch Series	Maximum Tunneled Ports
5400R - Standalone	up to 288 (5412R)
5400R – VSF Stack	up to 576 (2 x 5412R)
3810 - Standalone	All ports
3810 - Stack	Up to 520
2930F – Standalone	All ports
2930F – VSF Stack	Up to 208
2930M – Standalone	All ports
2930M - Stack	Up to 520
2920 – Standalone	All ports
2920 – Stack	Up to 208
3800 - Standalone	All ports
3800 - Stack	Up to 520