

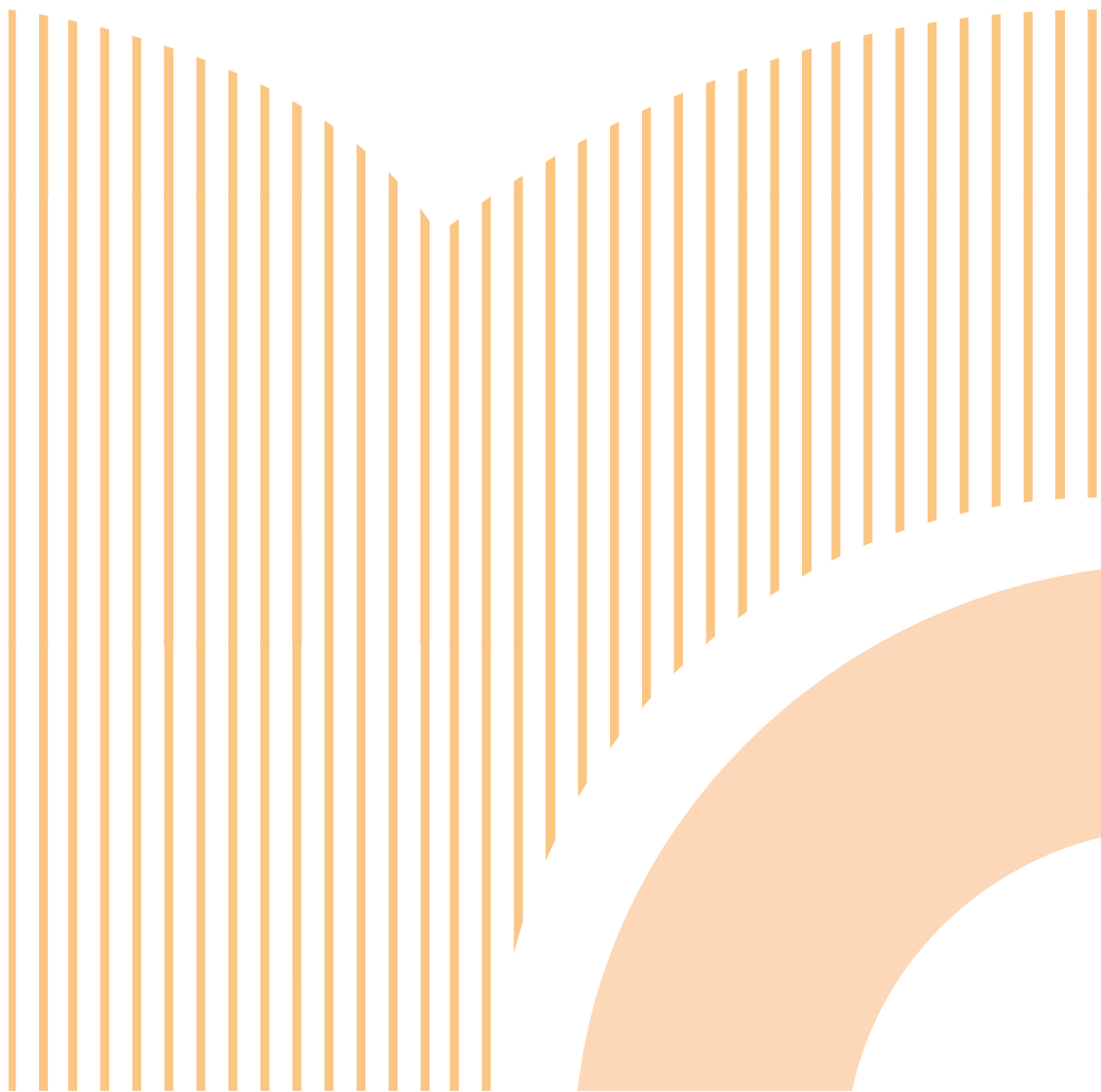


aruba

a Hewlett Packard  
Enterprise company

# Edge Services Platform

Guide to vertical offerings





Aruba, a Hewlett Packard Enterprise company, is the global leader in secure, intelligent edge-to-cloud networking solutions that use AI to automate the network, while harnessing data to drive powerful business outcomes.

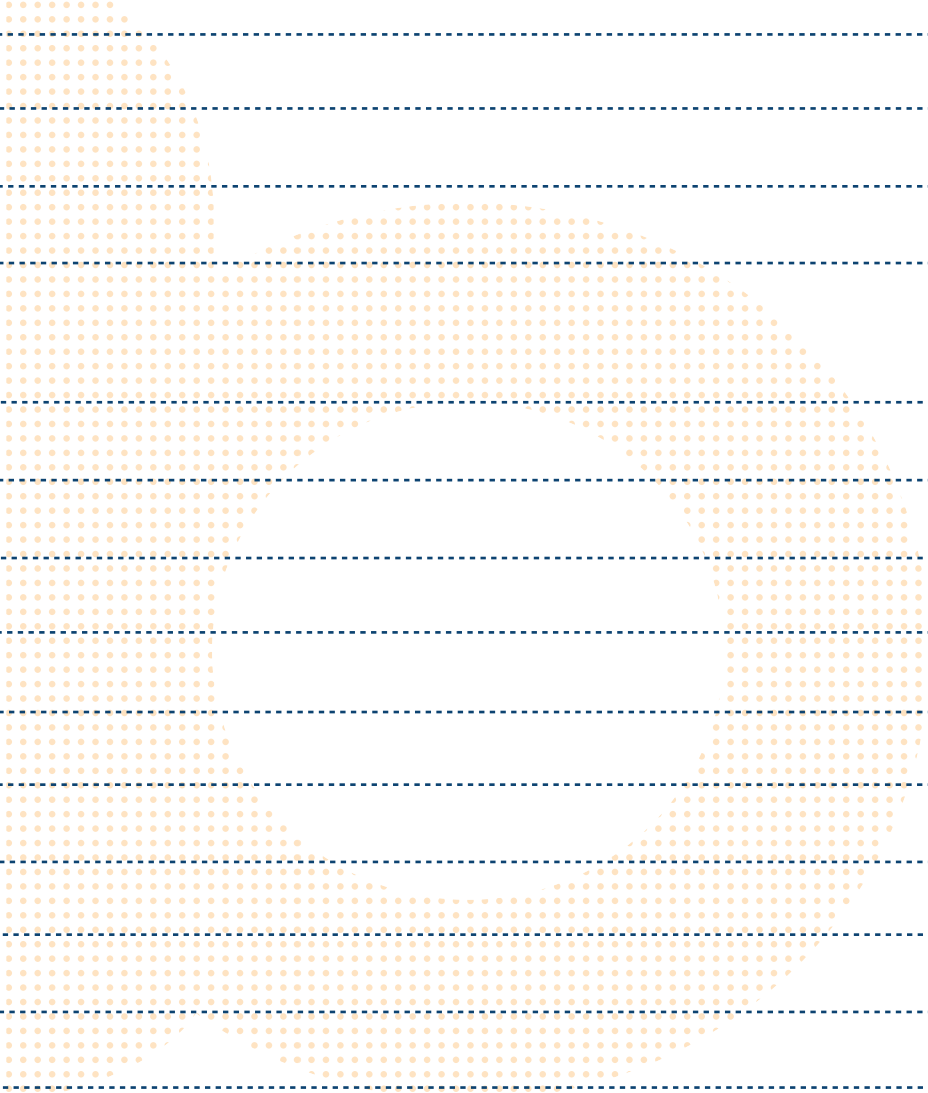
With Aruba ESP (Edge Services Platform) and as-a-service options, Aruba takes a cloud-native approach to helping customers meet their connectivity, security, and financial requirements across campus, branch, data center, and remote worker environments, covering all aspects of wired, wireless LAN, and wide area networking (WAN).







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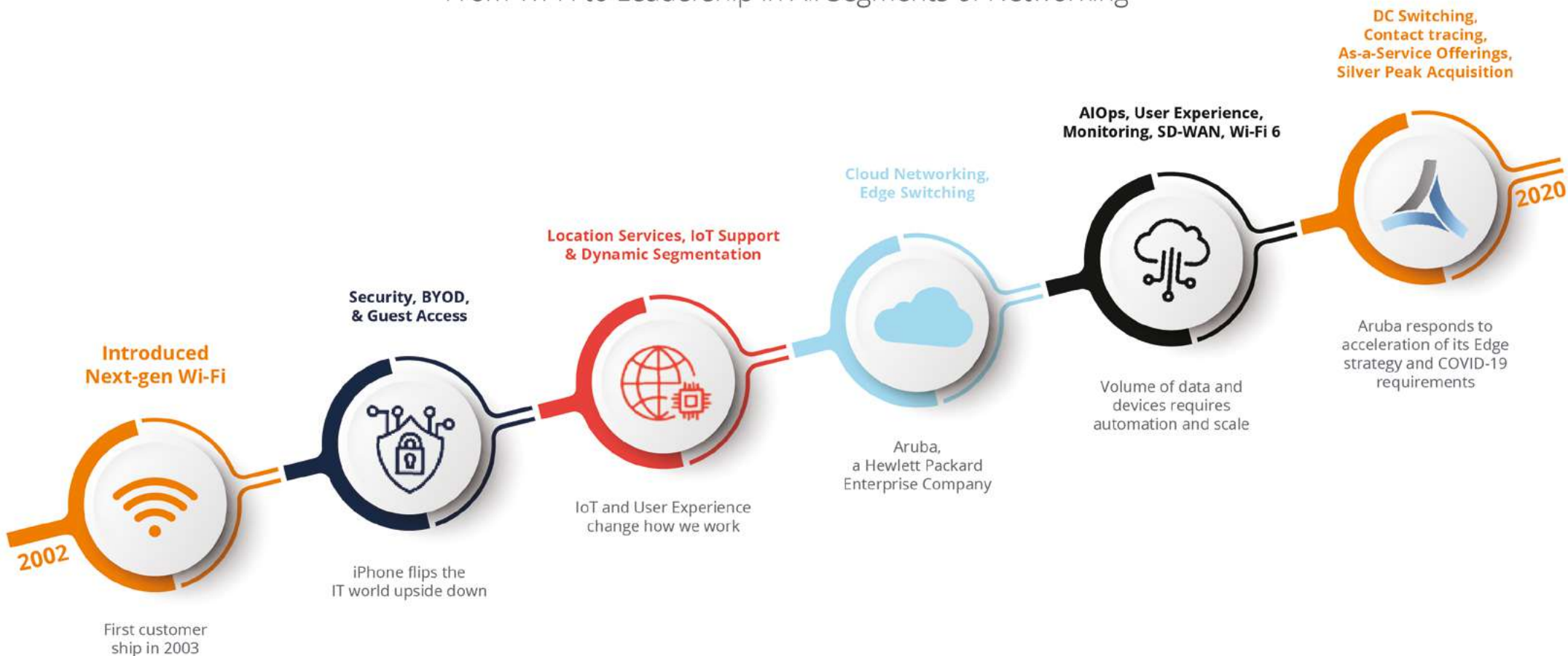


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# Aruba's 18 Year Journey

From Wi-Fi to Leadership in All Segments of Networking





# Leading

## The Edge of Transformation

**850 Million**  
Switch Ports Sold

**15 Million**  
Access Points Sold

**500,000**  
Customers

**300**  
Fortune 500

**50%**  
Top 20 Universities  
in the World





# Foundation

for Building your Edge

## Core Customer Benefits

### AIOps

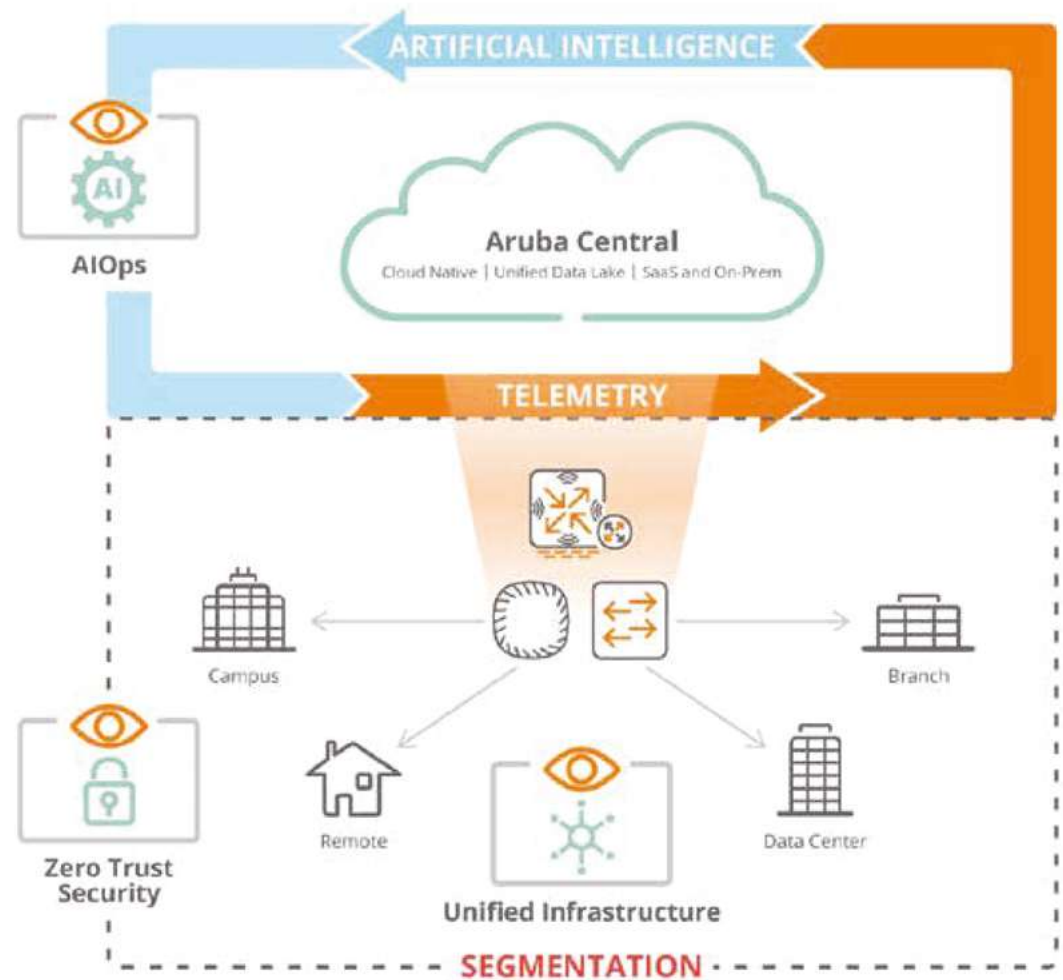
Automated IT Intelligence

### Zero Trust Security

Secure access from anywhere

### Unified Infrastructure

One portfolio for any use case





# Aruba ESP Portfolio

Start from Anywhere—the More You Add, the More You Gain







## Introducing Aruba ESP (Edge Services Platform)

A Foundation for Building your Edge

# Aruba Portfolio

## Explained

### WIRELESS

- Certified Wi-Fi 6 access points.
- Ai-Powered RF optimization.
- Rich user and application intelligence.
- Smart management.

### LOCATION SERVICES

- Connecting people, places, and things in a mobile world.
- Asset tracking and navigating.

### AI INSIGHT

- Data collected from over 750,000 aps, switches, and gateways.
- Proactively identifies and solves issues, and provides pinpoint configuration recommendations.

### USER EXPERIENCE & INSIGHTS

- End-user perspective
- Big picture view for any app or site



### WIRED

- Access to data center platforms.
- Purpose-built for cloud, mobile and IoT.
- With analytics and automation.
- Built-in analytics cut its complexity.

### SD-WAN

- Full stack solution.
- Simplify wan routing.
- Control wan traffic and gain visibility for all existing branch deployments.

### CLEARPASS

- Agentless visibility.
- Dynamic role-based access control.
- Seamless security enforcement.

### DEVICE INSIGHT

- Know what's connecting on your network.
- IOT is now manageable.



# Use Cases



INCREASE  
STUDENT ADMISSION



ROI  
WITH SERVICES



VEHICLE  
TRACKING



GEO FENCING  
ALERT



STUDENT  
AUTO ATTENDANCE



GUEST  
DEMOGRAPHICS



ENERGY  
MANAGEMENT



IOT  
USE CASES



DIGITAL  
ACCESS



STUDENT & STAFF  
SAFETY



INFANT  
TRACKING



AI DRIVEN  
AUTONOMOUS WIRED



FACILITY  
MANAGEMENT



ANALYTICS &  
ASSURANCE



NURSE  
CALLING INTEGRATION



CONSOLIDATE  
APP INTEGRATION



72% SAVING  
ON ENERGY



SD-BRANCH



CONTENT FILTERING  
WEB SECURITY



APP LOCATION  
& NOTIFICATION SERVICES



CERTIFIED Wi-Fi 6  
SOLUTION



GUEST  
ANALYTICS



COMPLETE USER &  
DEVICE SECURITY



ALWAYS ON  
NETWORK



SURVEILLANCE  
INTEGRATION



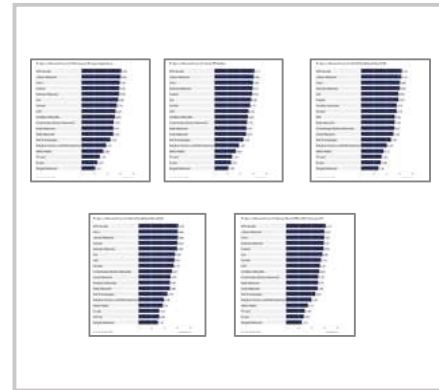
# Analyst Validation

**Gartner**  
Magic Quadrant



*15<sup>th</sup> consecutive year as a Leader*

**Gartner**  
Critical Capabilities



*Highest scores in 6 out of 6 use cases*

**FORRESTER**  
New Wave



*Only vendor placed in the Leaders Quadrant*

**IDC**  
Analyze the Future  
Market Space



*1 of only 2 Leaders*



# Aruba delivering value to business

CEO Disruptor   Growth and Profitability   People first									
Top of Agenda / Stakeholders	Digital Collaboration Team	Marketing Stakeholders	Operations	IT	Finance	Security	Corporate Compliance	Real Estate	Aruba Offering
Customer Acquisition & Retention	✓	✓					✓		Hyper personalized experiences under GDPR framework.
'Always On' Enterprise			✓	✓		✓			High availability network devices and software.
Secure Intelligent Venues & Workplaces	✓		✓			✓		✓	Digitally enabled workplaces that enhance productivity and deliver amazing experiences.
Network & Cybersecurity	✓		✓			✓	✓		Role-based access technology, Dynamic Segmentation and identity-based intrusion.
Monetization	✓			✓	✓			✓	Aruba's Analytics solution collects and analyses data to deliver analytics that help IT and business groups.
Predictive Network & IOT maintenance			✓	✓	✓				AIOps uses AI and analytics to identify exact root causes and proactively monitor and tune the network.
New business models	✓	✓	✓						Open and Flexible Experience driven architecture powered by Ecosystems (5g/WiFi/Cloud / OnPrem).





# Flexible Consumption & Financing



## Cloud Services

Simplifies the adoption of network software

*Cloud-based network management & administration*



## On-Prem Services

Brings the flexibility of the cloud on-site

*On-premises cloud experience for network management & administration*



## Managed Services

Avoids the heavy lifting tied to traditional network operations

*Service intelligence automation for improved efficiencies, refresh, and utilization*



## Flexible Financing

HPE Financial Services for today's economic climate

*Equipment acquisition, payment deferral, equipment recycling, and other forms of financial support*





# Aruba Solutions for Vertical Industries



EDU PRIMARY



HOSPITALS



RETAIL



WORKPLACES



GOVERNMENT



MANUFACTURING



CLINICS



BANKING



HOSPITALITY



WAREHOUSE



LARGE  
PUBLIC VENUE



ROAD  
TRANSPORT



RAIL



AVIATION



SHIPPING  
& PORTS

# SMART WORKPLACES





# Reimagined Workplace

*Phase 1*

**Secure Work Remote**

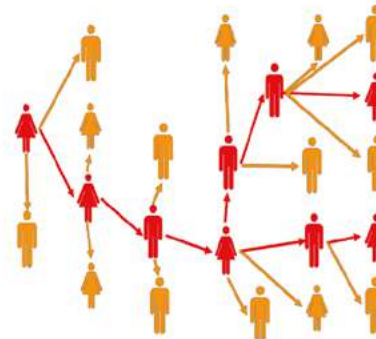
*Business Continuity*



*Phase 2*

**Return to Office**

*Employee Health and Safety*



*Phase 3*

**The Hybrid Workplace**

*The New Normal*







# Meeting Requirements for Remote Workers



## Security / Privacy

Encrypted traffic to the corporate network

*Zero Trust security controls*

*VDI support*



## Performance & Management

Enterprise grade hardware

*Centralized IT monitoring & troubleshooting*

*Cloud managed*



## User Experience

Zero Touch Provisioning

*In-office experience and connectivity*

*Access to local services*



# PHASE 1: Enabling Secure Work from Home

## Priorities and Pain Points

- Easily installed remote connectivity
- Re-creation of corporate office environment
- Corporate security policies enforced
- Enterprise Scale
- Centralized management



### Aruba Virtual Intranet Access

*Single worker requiring remote access using a device running Windows, MacOS, IOS, Android or Linux.*



### Aruba Remote Access Points

*Corporate network projected to the home*



### Aruba Instant VPN

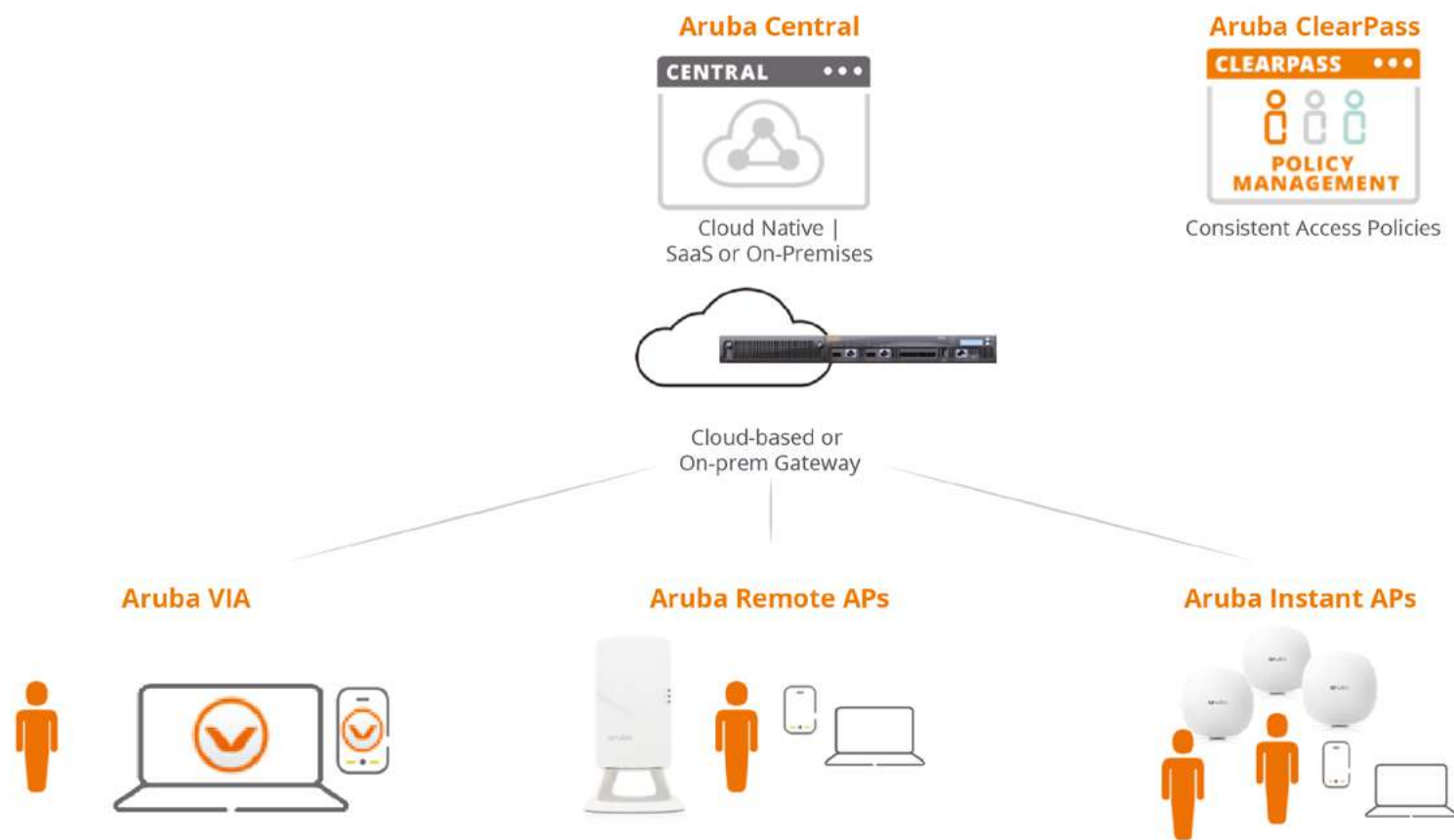
*Multiple workers with multiple wired or wireless devices in branch offices and remote offices*





# Remote Worker Solutions

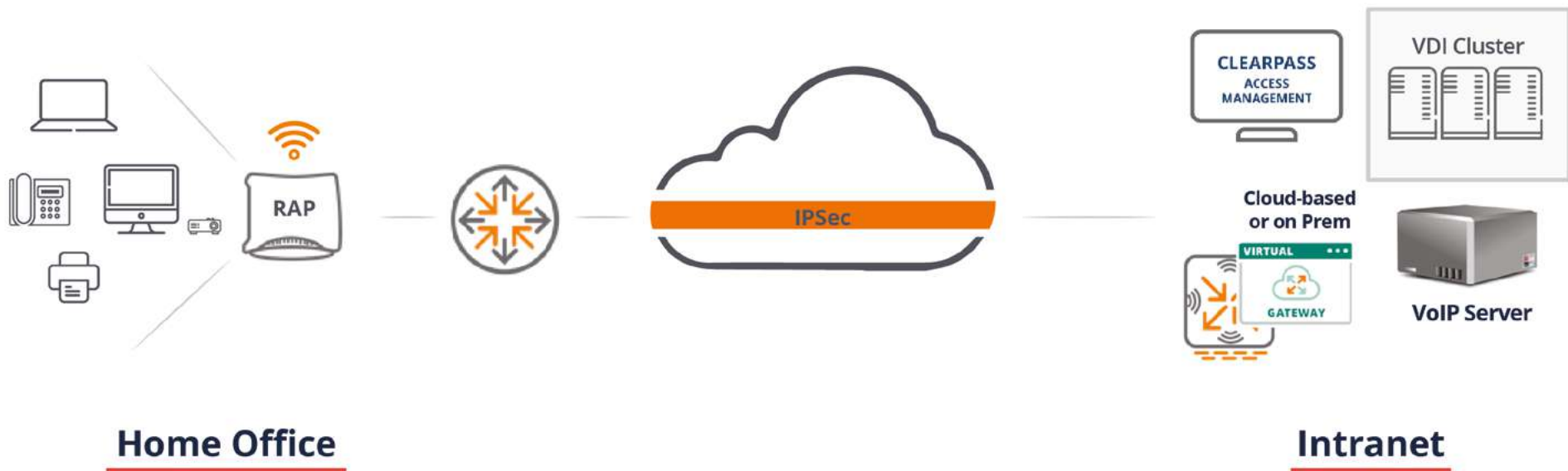
## Cloud or On-Prem Management via Aruba Central





# Remote Access Points

## A Secure In-Office Experience



- Each user and device follows corporate policies and have only the access they need
- IT has fully visibility for monitoring and troubleshooting



# “ARUBA RAP’S Received a Standing Ovation during WFH” - Major University



## Aruba 203H / 203R / 203RP (PoE)

802.11ac Wave 1  
USB for cellular  
1 Uplink and 2 Ethernet for devices  
PoE out for VoIP phone



## Aruba 303H

802.11ac Wave 2  
Higher encryption throughput  
USB, Ethernet, and PoE



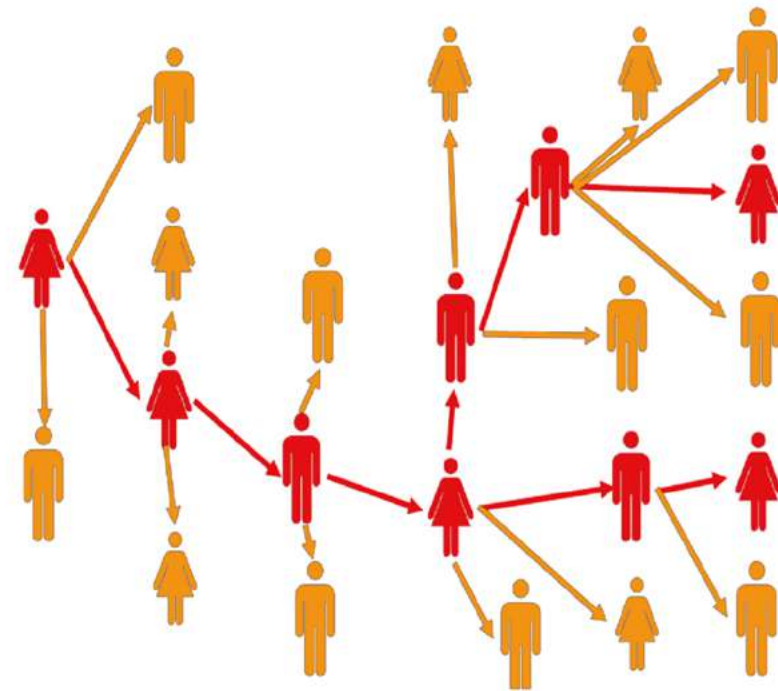
## Aruba 505H

802.11ax (Wi-Fi 6)  
Higher density  
Aruba Air Slice  
USB, Ethernet, and PoE



## *PHASE 2:* **Return to Office** Priorities and Pain Points

- Establish employee confidence through enhanced health and safety processes
- Leverage current infrastructure; limited budgets
- Security and privacy





# Context that we 'ALREADY' have

## Connectivity And Location



### Aruba 300/500 Series Access Points

- Platform for both WI-FI and BLE-based contact tracing and location analytics.
- Enables customized solutions via Aruba's partner ecosystem using USB expandability.





# ARUBA AIOPS delivers ML-BASED Insights from WI-FI LOCATION DATA

## Client Device Classifier

Device fingerprinting for  
more accurate profiling

## Client Boundary Classifier

Detects walls that separate  
people to prioritize more  
problematic face-to-face  
interactions

## Targeted COVID Modeling

Per user client and device  
proximity metric based on  
location and time

## Use Cases

Per AP Zone (building, site,  
floor, group) hotspot  
monitoring, enforcement,  
cleaning, etc.

Potential Exposure List  
(Contact Tracing)

# Contact & Location Tracing

## With WI-FI Location Data



Aruba APs listen for users, Wi-Fi devices

Proximity apps process location data ingested from Airwave or Central with AI/ML Proximity Models



HR informed of potential sick person

### Contacts traced

(sorted by total contact minutes) with each infected person



### Locations traced

listing dwell time at various AP/building locations for sick person.



# WI-FI Contact Tracing Example

With Aruba Central

The screenshot shows the Aruba Central interface for Contact Tracing. The top navigation bar includes 'Global', 'Network Health', 'WAN Health', 'Summary', 'AI Insights', and 'Contact Tracing'. A search bar is present with the text 'Search or ask Aruba'. The left sidebar lists various management and analysis tools. The main content area features a search form with fields for Username, MAC Address, Minimum Overlap (Minutes), Start Date, and End Date, followed by a 'Submit' button. Below the form is a table titled 'CONTACT INFORMATION' with 208 entries. The table has columns for 'CONTACT USERNAME', 'TOTAL MINUTES', and a download icon. The data rows are as follows:

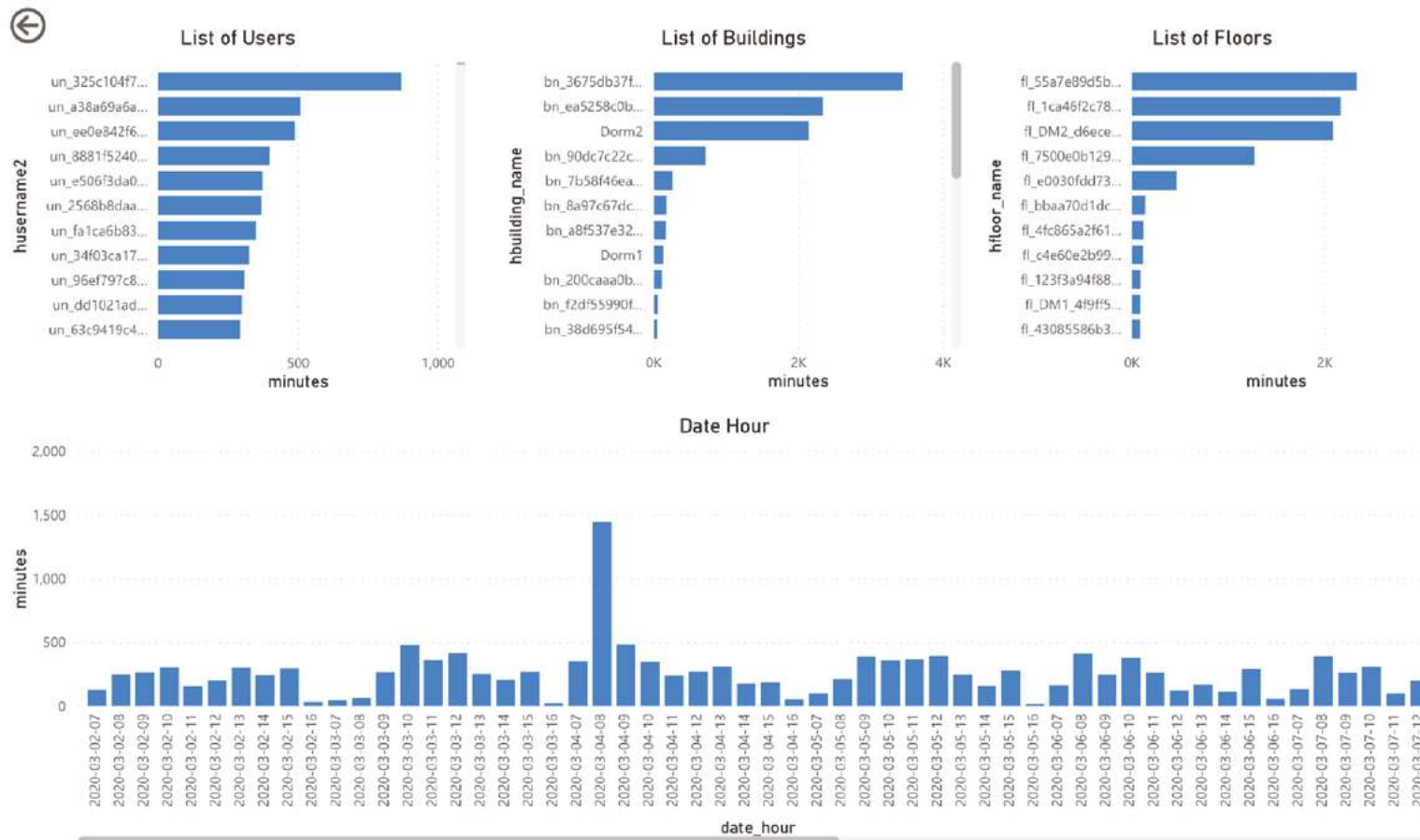
CONTACT USERNAME	TOTAL MINUTES
un_325c104f74e54	868
un_a38a69a6ac444	508
un_e0e842f6a6a4	488
un_8881f5240a93d	397
un_e506f3da02981	372
un_2568b8daa159b	369
un_fa1ca6b839d50	351

A 'Clear' button is located at the bottom right of the table area.



# WI-FI Contact Tracing Screenshot

Exported to PowerBI template





# WI-FI Contact Tracing Screenshot

Exported to Tableau Template

Analysis for user: un\_ac53...

### List of Users

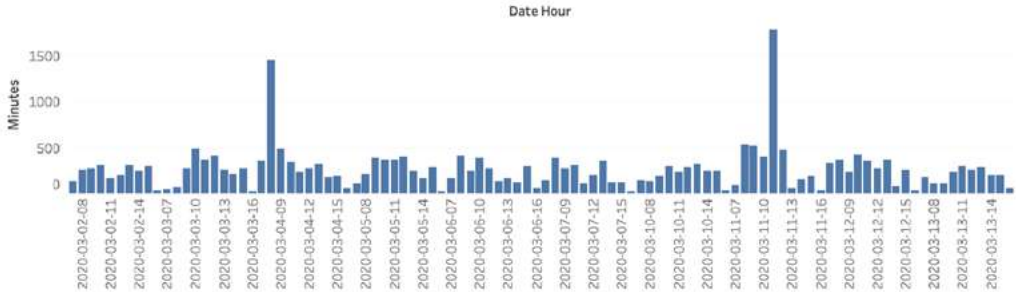
Husername2	
un_325c104f74e54	868
un_a38a69a6ac444	508
un_ee9e842f6a6a4	488
un_8881f5240a53d	397
un_e506f3da02981	372
un_2568b8daa159b	369
un_fa1ca6b839d50	351
un_34f03ca17e5ee	324
un_96ef797c8c792	309
un_dd1021ad37cca	300
un_63c9419c4ef63	293
un_2da01a54da0f2	275
un_72ca57923e93a	272
un_bd4dada224f49	262
un_6e3154e9d60ad	248
un_5fd3ddba2e680	248
un_941a64753bd05	246
un_d68b7e6b1a967	240

### List of Buildings

Hbuilding Na..	
bn_3675cb37f0443	3,432
bn_ea5258c0b96db	2,336
Dorm2	2,141
bn_90dc7c22c3e15	713
bn_7b58f46eae327	259
bn_8a97c67dccc1c	180
bn_a8f537e32e337	170
Dorm1	135
bn_200caaa0bc86e	106
bn_f2df55990f4d8	54
bn_38d695f5422e1	43
bn_d6d8219011a77	24
bn_677d772231f3e	22
bn_1495ffd75ee05	18
bn_73f74cbc37be8	13
bn_09dc1c9f8004a	12
bn_55fac53d87906	10
bn_5abb922270f2d	8

### List of Floors

Hfloor Name	
fl_55a7e89d5bc40	2,330
fl_1ca46f2c78dce	2,161
fl_DM2_d6ecec58002ba	2,086
fl_7500e0b1293f2	1,271
fl_e0030fdd738ce	457
fl_bbaa70d1dcb32	131
fl_4fc865a2f61b8	115
fl_c4e60e2b996d0	110
fl_123f3a94f88ed	85
fl_DM1_4f9ff5ee34aea	82
fl_43085586b3fcc	80
fl_1fa99ad136764	74
fl_0d299fa3a73c7	72
fl_5ae8deef6e00a	69
fl_df185e587e261	64
fl_DM2_5fa8111cbc5fa	55
fl_b9ae5cc054221	43
fl_2c2ed9b8e6cda	38



\* Pre-production – final tool subject to change





# Contact & Location Tracing

With Meridian and BLE Location Data



Users are issued Aruba Tags



Aruba 300/500 series APs sense tags



Meridian cloud determines tag locations



Data streamed to visualization and rules engine SW



User is sick and informs HR



HR looks up user tag and queries contact tracing SW for potential user and location contacts



- Contacts traced (sorted by total contact minutes) with each infected person
- Locations traced listing dwell time at various AP/building locations for sick person.



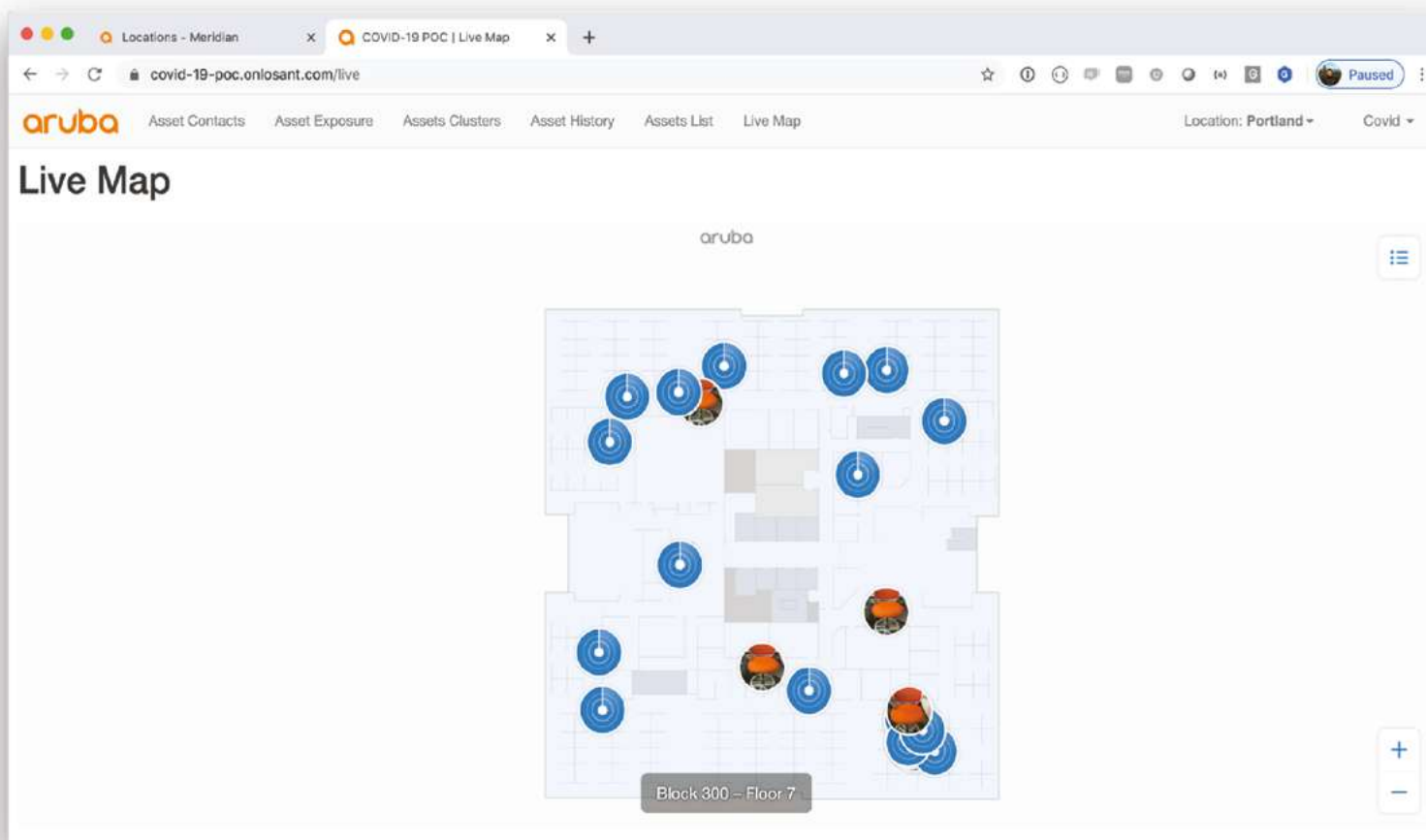
# ARUBA ASSET TAG



## KEY FEATURES

- Uses prevalent BLE asset tracking technology
- A modern Wi-Fi installation provides necessary coverage
- BLE-enabled Aruba AP's only require a firmware upgrade to support asset tracking
- Solution is scalable to thousands of assets
- 3-4 year maintenance free battery
- True location on map, not just general proximity
- Tags are designed to endure stringent requirements, including medical use
- Multiple attachment options support a variety of use cases and asset types

# BLE Contact & Location Tracing Screenshots





# BLE Contact & Location Tracing Screenshots

The foreground screenshot displays the 'Asset History' interface with the following table:

Timestamp ↓	Map ID	Zone ID
Thu May 21 2020 17:15:00 GMT-0700 (Pa...	5653104741580800	
Thu May 21 2020 17:14:00 GMT-0700 (Pa...	5653104741580800	734
Thu May 21 2020 17:13:00 GMT-0700 (Pa...	5653104741580800	734
Thu May 21 2020 17:11:00 GMT-0700 (Pa...	5653104741580800	734
Thu May 21 2020 17:09:00 GMT-0700 (P...	5653104741580800	
Thu May 21 2020 17:08:00 GMT-0700 (P...	5653104741580800	
Thu May 21 2020 17:07:00 GMT-0700 (Pa...	5653104741580800	
Thu May 21 2020 17:07:00 GMT-0700 (Pa...	5653104741580800	
Thu May 21 2020 17:06:00 GMT-0700 (P...	5653104741580800	734
Thu May 21 2020 17:05:00 GMT-0700 (P...	5653104741580800	734
Thu May 21 2020 17:04:00 GMT-0700 (P...	5653104741580800	734

The interface also includes search filters for Start (05/08/2020 12:00 AM) and End (05/22/2020 11:59 PM), a search button, and radio buttons for 'Selected point' and 'All'. The map shows red circular markers on a floor plan labeled 'Block 300 - Floor 7'.

## What's Right For You?

	Wi Fi-based	Bluetooth-based
Cost	Included	Hardware Tags Meridian License
Data	10m accuracy	1-3m accuracy
Deployment	Immediate	Tag setup
Additional Hardware	None	Asset tags (3xx or 5xx ap's)
Aggregation	AirWave or Aruba Central	Meridian





# Rich Proximity Partner Ecosystem



Proximity Detection | LBS Campus App | Touchless Kiosks | Spatial Analytics | Thermal Imaging





# AI-POWERED Proximity solutions help meet return to Office Challenge



## Security / Privacy

Encrypted traffic to the corporate network

Identity-based access controls



## Leverage What You Have

Wi Fi -based proximity solutions utilize any supported AP

Bluetooth available with 3xx and 5xx AP's

Aruba Central or Airwave-based

Aruba Wi Fi solutions no additional cost

Location data exportable to 3rd party tools



## Proximity Solutions

Contact and location tracing; hot spot ID's

AI-powered location data enhancement

Bluetooth precision

Rich partner ecosystem



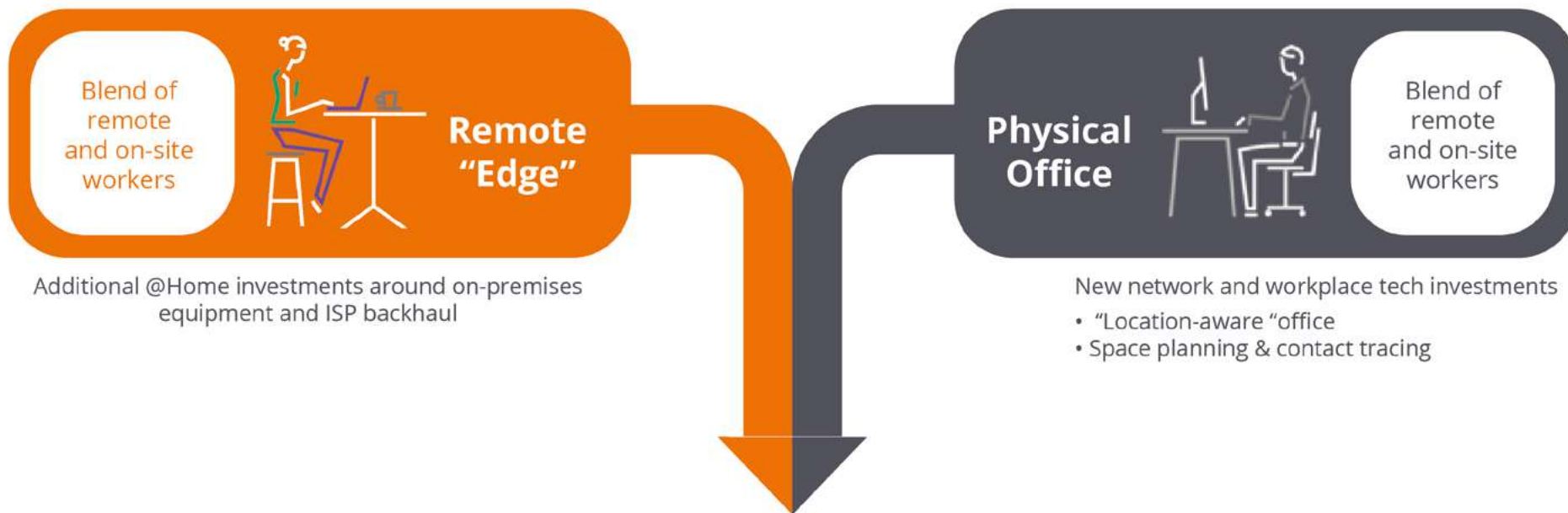
## *PHASE 3:* **Hybrid Workplace** Priorities and Pain Points

- Traditional office space transitions to more on-demand and modular spaces
- Focus on “touchless” & autonomous workplace technologies
- Increased collaboration between facilities and IT teams





# Future Hybrid Workplace



## Supporting a hybrid workplace through a location-aware mobile app & IoT

### Convenience & Safety

- Health assessments & touchless reservations
- Realtime space info (e.g. conf rms, desks)
- Digital badging

### Community

- Latest company news & site info
- Townhall & all-hands events





# Creating a Modern Guest Experience

- What is the Enhanced Guest Experience?
- What is new in regards to the Guest Experience?
- How will the Guest Experience change once we get back to the office?

## Visitor Flow



Check-in?



Guest Wi-Fi?



Finding Conference Room



Amazing Meeting







# Emailed Invitations with QR Code

**aruba**

a Hewlett Packard  
Enterprise company

## Get ready for your visit

Sean Rynearson will see you at Aruba Lab HQ on  
Thursday, October 17 at 11:45 am

3333 Scott Blvd, Santa Clara, CA 95054, USA

[Get directions →](#)

### Sign in faster

Scan this code when you arrive to sign in.  
Check in to sign in faster. [Check in now →](#)

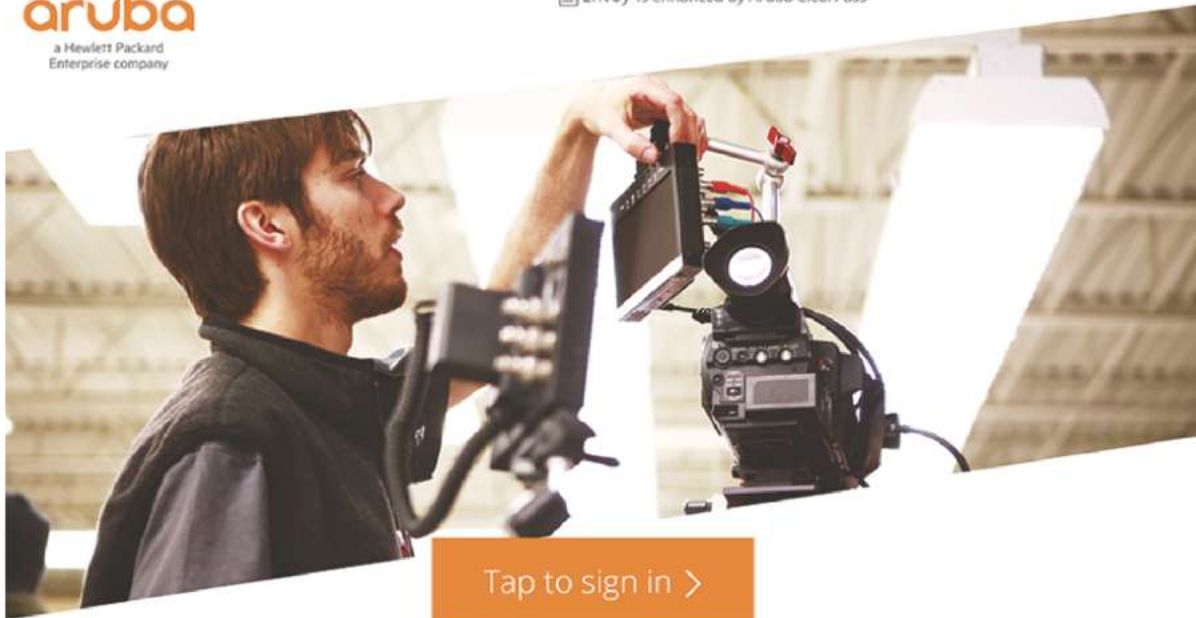




# Easy Visitor Sign-in

**aruba**  
a Hewlett Packard  
Enterprise company

Envoy is enhanced by Aruba ClearPass





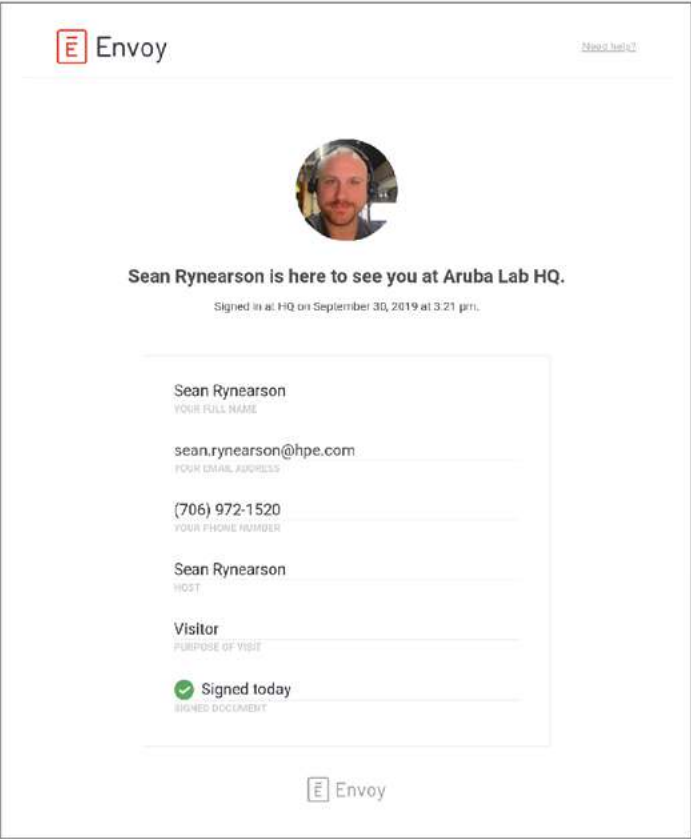
# Automatic Badge Printing



Visitor badge starts printing immediately after visitor has signed in.



# Automatically Notify Host



The host of the visitor will be automatically notified.



# Automatic Creation of Guest Wi-Fi credentials

Thursday • 5:51 PM



Thank you for joining us today. To access the Guest wifi connect to RYNO-OPEN and use 28289 as your Access Code

Thu 5:51 PM



Copy "28289"



Text message



SMS

Visitors will automatically receive a text message with guest Wi-Fi credentials.





# Finding the Conference Room



Visitors can use Meridian for turn by turn directions.



# Social Distancing

## Guest Count

- Limit the number of simultaneous guest in the office as well as staggered arrival

## Eliminating Touch Points

- Removing as many touch points as possible. This includes the visitor kiosk.
- Receptionist interacts with envoy to input the necessary information for the visitor.

## Use Envoy Protect

- Envoy is currently in beta but will be releasing their protect module soon.
- Envoy Protect will allow visitors to check in/out of the facility via the Envoy App or

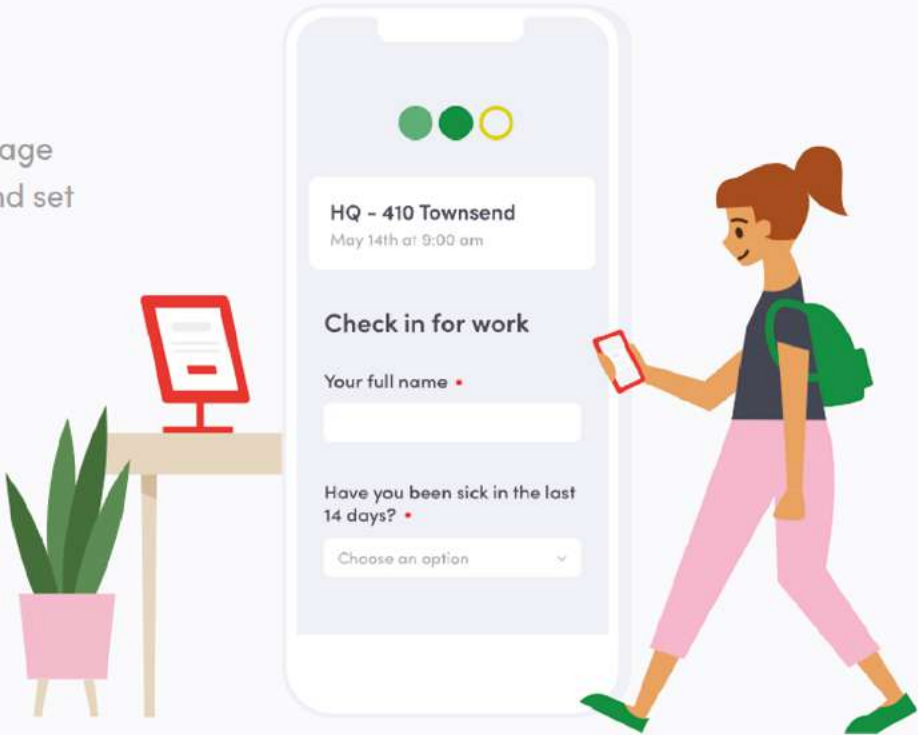


# Envoy for Employee?

BETA

## Welcome employees to your office with confidence

Keep your employees safe and healthy with Envoy Protect. Give your team the tools they need to manage employee registration, perform wellness checks, and set and enforce capacity limits.





# Envoy + Openpath integration



## Streamline physical security with Openpath

Add value to your existing Openpath deployment with the Envoy + Openpath integration. This integration makes the visitor experience as welcoming as possible with Openpath's "Cloud Credentials". Visitor credentials can be assigned based on access groups and expired at intervals of your choosing.

When you connect your Openpath account, Envoy can assign visitor flows to specific privilege groups in Openpath. When visitors are assigned cloud credentials their access will be logged in Openpath, as well as any subsequent activity performed using the credentials.



*Work with your security team to configure the correct Openpath privilege groups, site location, building and/or role for your visitor records.*

## Benefits

- ✓ Create a record of visitor activity based on your preferences
- ✓ Automatically assign access credentials based on your preferences
- ✓ Automatically disable access for visitors after a preset time of your choosing







**BANKING**



# The Banking Industry - Stakeholders

The People that determine the **Success** or **Failure** of the Organization

STAFF



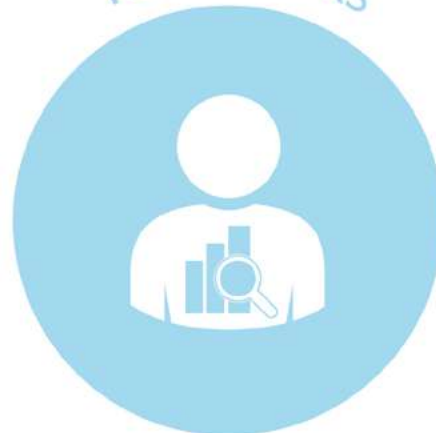
CLIENTS



SHAREHOLDERS



REGULATORS



SOCIETY





# Customer Case 1

*Personal Banking Customer*



# Personal Banking Customer

## *Service & Innovation*

- Always On Service
- Real-Time View of Closest Bank
- Services status & offering

## *Safety & Security*

- Number of People in a Branch / ATM
- Touchless Access & Services
- Temperature Checks
- Auto Queueing with ability to wait in vehicle and be alerted when its my turn

## *Convenience*

- Reminder that Card is Expiring when walking pass branch
- Bank to come to me

*Trust. Integrity. Partnership.*

Banking institutions no longer refer to their remote sites as branches, they're now called "banking centres" and/or "banking cafes" where customers can come, relax & get all of their questions answered & financial needs met.



# Touch-free Solutions

## Challenges

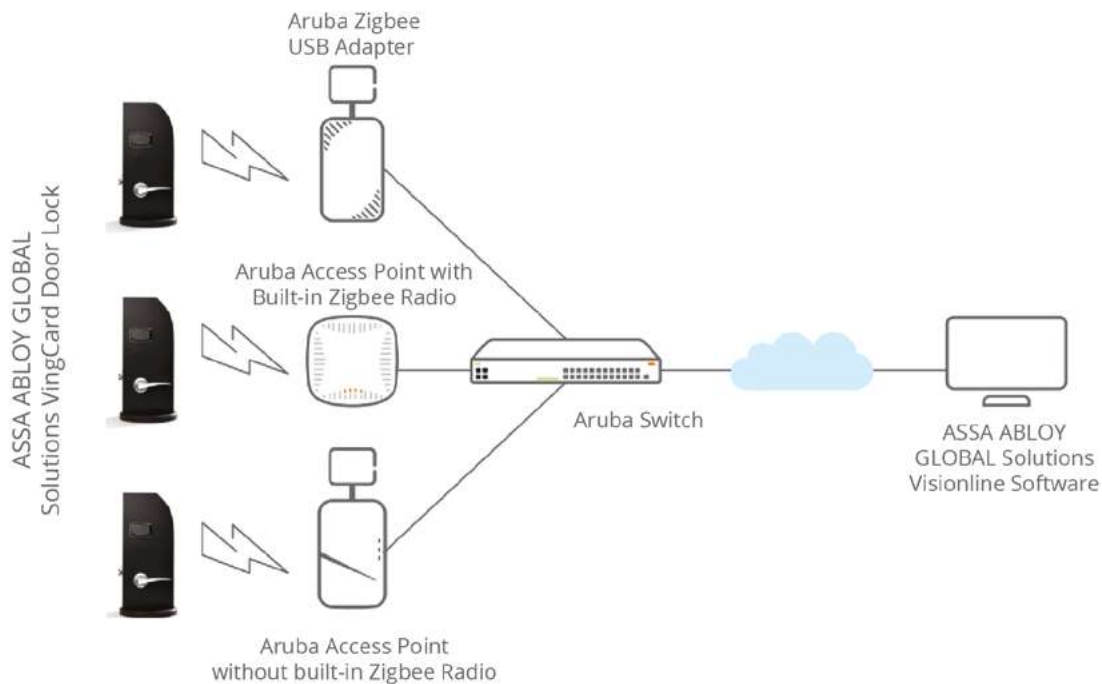
*Branch Safety*

## Business Focus Area

*Client & Staff Safety*

## Solutions/Technology

*Touch-free Operation*



### Supported use-cases:

- Smart Door-locks
- Smart sensors
  - Lights
  - Temperature
- Location services

### Wireless Technology



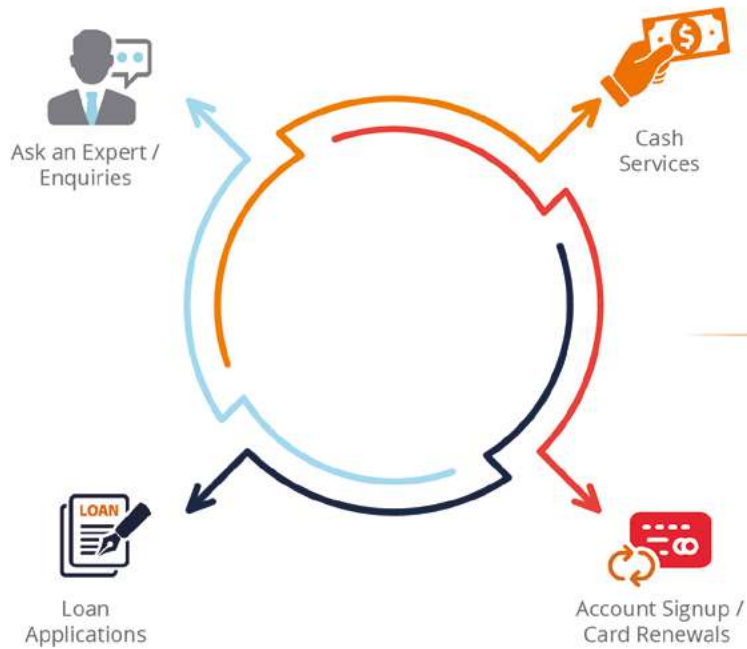
IEEE 802.15.4

ESL 2.4 GHz





# Touch-free Solutions



**Analytics – Crowd Capacity**

**IOT – Thermal / Security Cameras**

**WAN – Secure WAN Services with Wireless Docking and LTE failover**

**LAN / Local – Secure LAN Services with HPE Edgeline for Real-Time Analytics**



# Customer Case 2

*Current Business Banking Customer  
Vertical: Retail*



# Current Business Banking Customer

## *Service & Innovation*

- How can the Bank help them keep the doors open
  - Can the Bank ensure Always-On Services in the event of Unforeseen circumstances – Pandemic, Riots, Natural Disasters
  - Can the Bank provide Innovative, Intelligent & Affordable Solutions that keep staff and customers safe – Physical & Digital
  - How can the Bank Partner with them to Reduce costs and help Increase sales

## *Trust. Integrity. Partnership.*

### **Location Based Digital Messaging:**

Zone based personalized messaging can include time of day greeting acknowledgement for customers entering the banking centre with a prior scheduled mobile app appointment or they can be sent current home/auto/ mortgage/business loan rates that are relevant to the customer.

# Visitor Management & Social Distancing

## Challenges

*Safe Branch / Office Experience*

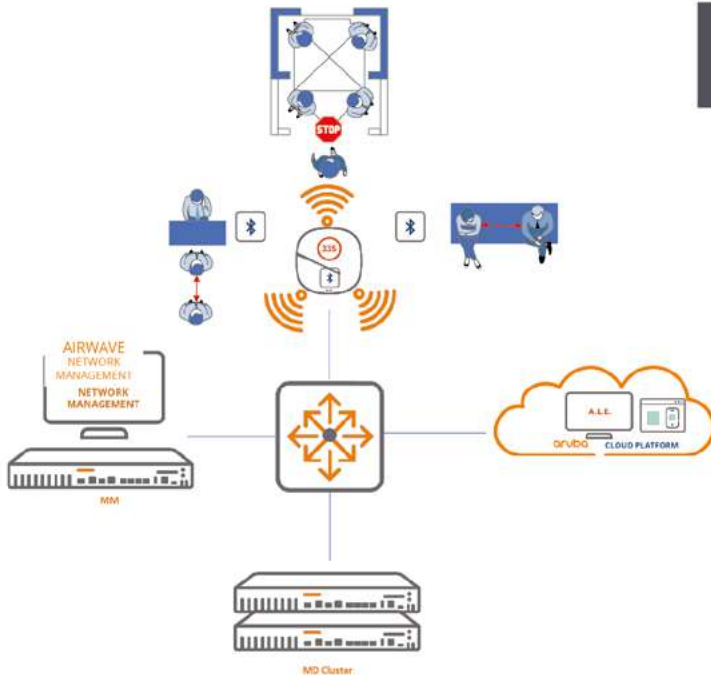
## Business Focus Area

*Control Physical Access*

*Digital Banks*

## Solutions/Technology

*Crowd/Capacity Management & Social Distancing*



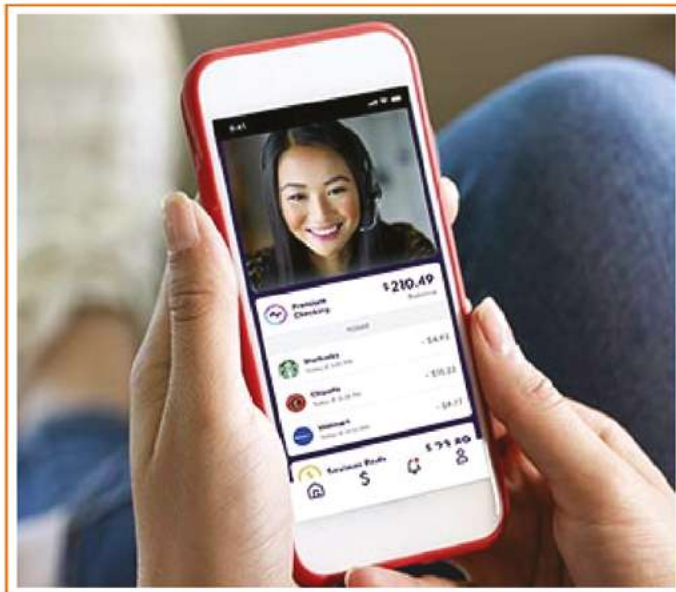




# Ensure Always-On Services When Unforeseen Circumstances Strike

Enabling Digital Financial Advisement Continue At *Anytime, Anywhere*

Customers can connect live via video conferencing to a financial subject matter expert (SME) armed with an iPad or tablet.



Enabling e-account opening & e-signatures to personal, auto loans, mortgages & other e-business financial transactions.



Next gen ATMs offer live concierge banking services that go beyond traditional ATM cash/check deposit and withdrawal transactions, i.e. pay credit card balances, process home mortgage/s, car loans, business loans, etc.







# Customer Case 3

*New Business Banking Customer  
Vertical – High Technology*



# New Business Banking Customer

## *Service & Innovation*

- How can the Bank help them succeed
  - Can the Bank provide Innovative, Intelligent & Affordable Solutions that help them compete against established competitors
  - Can they leverage the Banks already established footprint for Ad-hoc services and Presence (Physical / Virtual)
  - Can the Bank ensure Always-On Services in the event of Unforeseen circumstances – Pandemic, Riots, Natural Disasters

## *Trust. Integrity. Partnership.*

### **Cross Selling Opportunities at Banking Centres:**

Together with traditional consumer & small business banking transactions, retail banking institutions are increasingly looking to expand their services portfolio to include other lines of business that have traditionally existed at separate remote sites or in corporate/campus locations.

# The Bank as a Service Provider

of Financial Services, Technology, MVNO, Real Estate,  
Customer Reach & Digital Platforms

*Extended Market Reach  
Through The Bank For SMB's*

*Repurposing Of Branch & Campus Real Estate  
For SMB Co-working Spaces*





# Banking Industry Small "Startup Bundle" Example

Offering - Small Business Bundles



Optional Items



Remote Access  
Small Branch & Remote User



Onsite Enterprise  
Cloud Managed Wi-Fi



WAN + LAN + SECURITY





# Customer Case 4

*The Bank Itself*





# The Bank - Internal and Customer Facing

## *Service & Innovation*

- Always On Service
  - Insight & Automation
  - Unified & Flexible Infrastructure
  - Reducing Cost / Changing Models
- Grow Service Offering
  - Technology Services
- Obtain & Provide Real-Time Insight (AI, Markets, Analytics)

## *Safety & Security*

- Safe Adoption of Technology within the Bank
  - Number of People in the Banking Workspace
    - Food Courts
    - Collaborative Spaces
  - Touchless Access & Services
  - Temperature Checks

*Trust. Integrity. Partnership.*

# Remote Work Solutions

## Challenges

*Has Always Been Working Onsite*

*Call Center, Sales, Operations*



## Business Outcome

*Secure Business Continuity*



**VPNC**



IPSEC VPN Tunnel



## Solutions

*Remote Workforce*



Virtual Intranet Access



Remote Access Points



Instant AP - VPN



# Branch Connectivity

## Challenges

*Secure, Resilient WAN*

*Faster WAN to reduce wait and in-Branch time*

*Fast Rollout of Branches Closer to Customers (especially Digital)*

## Business Outcome

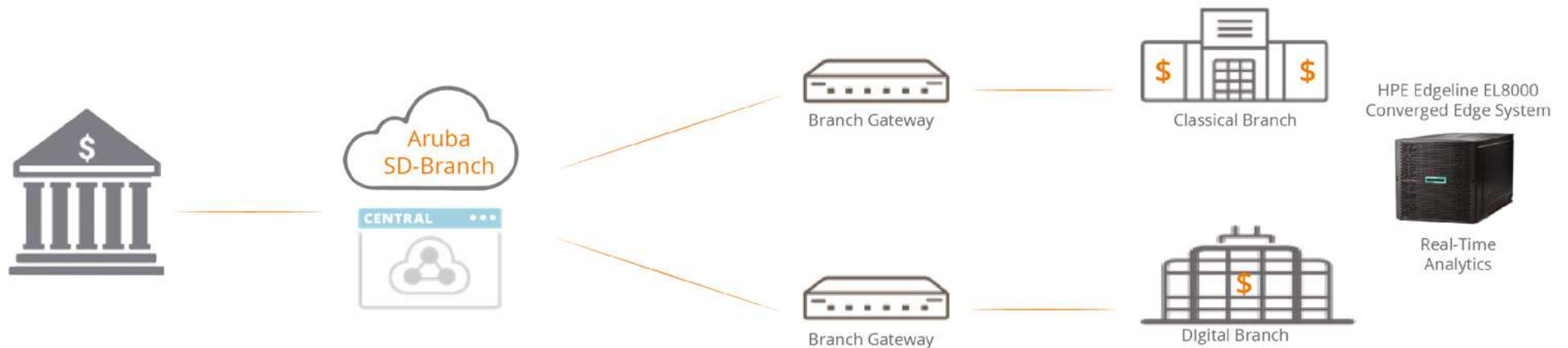
*Secure Business Continuity*

*Controlled Physical Access*

*Digital Banks*

## Solutions

*Branch Connectivity*





**RETAIL**



# Retail Trends, Use Cases, and Outcomes

## Trends

- Customer Experience and frictionless shopping
- Personalization and Location contributing to the smart digital store
- Data will be the foundational intelligence for much of digital transformation

## Use Cases

- Click and collect, in aisle check out
- Knowing customer preferences, visits, conversion rates; leveraging analytics for dwell time, inventory, traffic flows
- Improve experiences and store operations with electronic price tags/intelligent inventory

## Outcomes

- **Happy and loyal customers**
- **Improved data-driven operations**
- **Increased revenue**



# Supporting New Mandates & Experiences

**BOPIS**  
Frictionless shopping  
Click and collect shopping



**Always-on tools**  
Reduce shopper abandonment  
VIP customer awareness



**Intelligent inventory**  
Electronic shelf tags  
Analytics for dwell time, traffic flows,  
customers preferences, visits, conversion rates





# Use Cases

## Retail

### ARUBA OFFERING



CERTIFIED Wi-Fi 6 SOLUTION



AI DRIVEN AUTONOMOUS WIRED



CONTENT FILTERING & WEB SECURITY



COMPLETE USER & DEVICE SECURITY



ANALYTICS & ASSURANCE



SD-BRANCH UNIFORM OUTLETS



ALWAYS ON NETWORK



APP LOCATION & NOTIFICATION SERVICES

### ARUBA + ECO PARTNER OFFERING



INCREASE REPEAT FOOTFALL



ROI CAMPAIGNS



RE-TARGET CUSTOMERS DIGITAL CHANNEL



GROW LOYALTY INCREASE REVENUE



CREATE CUSTOMER ENGAGEMENT



72% ENERGY SAVING

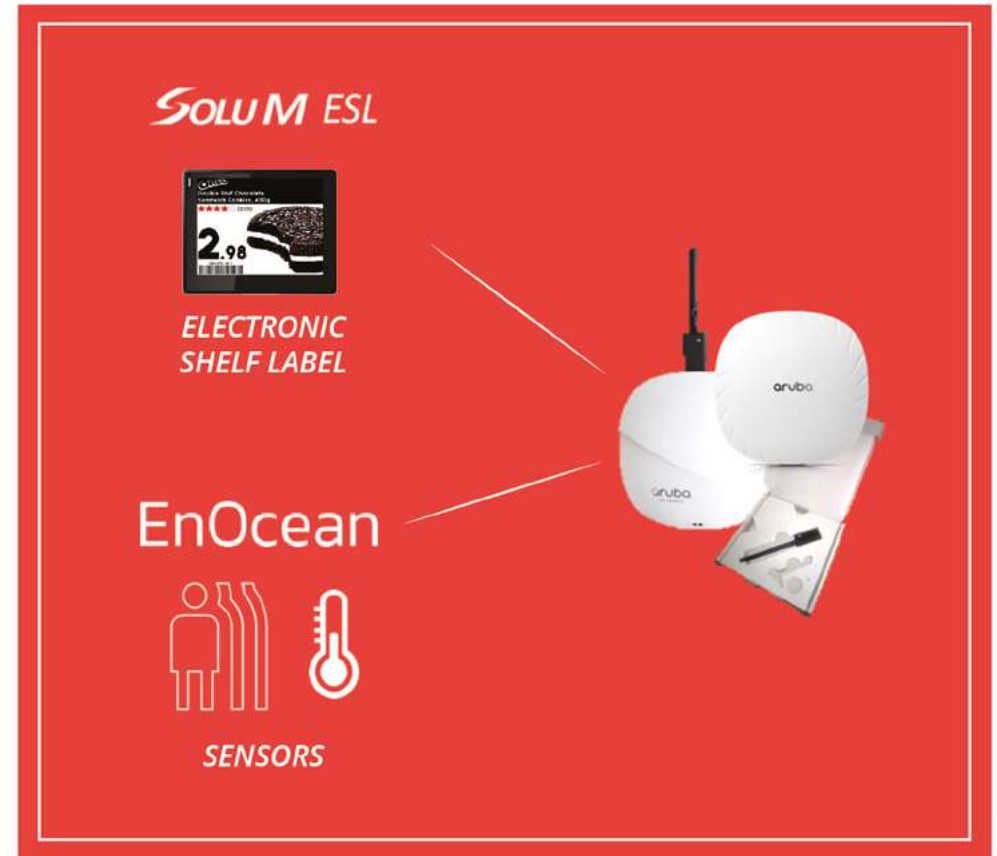


SOCIAL WIFI CONNECTION

# Use Cases



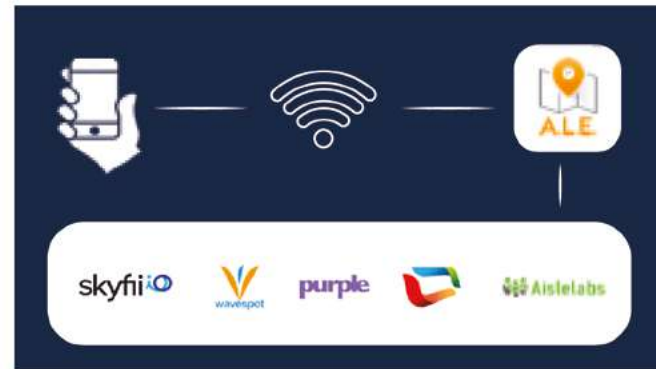
*Outdoor APs for  
"Buy online, pick up at store"*



*Leveraging the AP  
as an IoT platform*



# Leverage the power of analytics



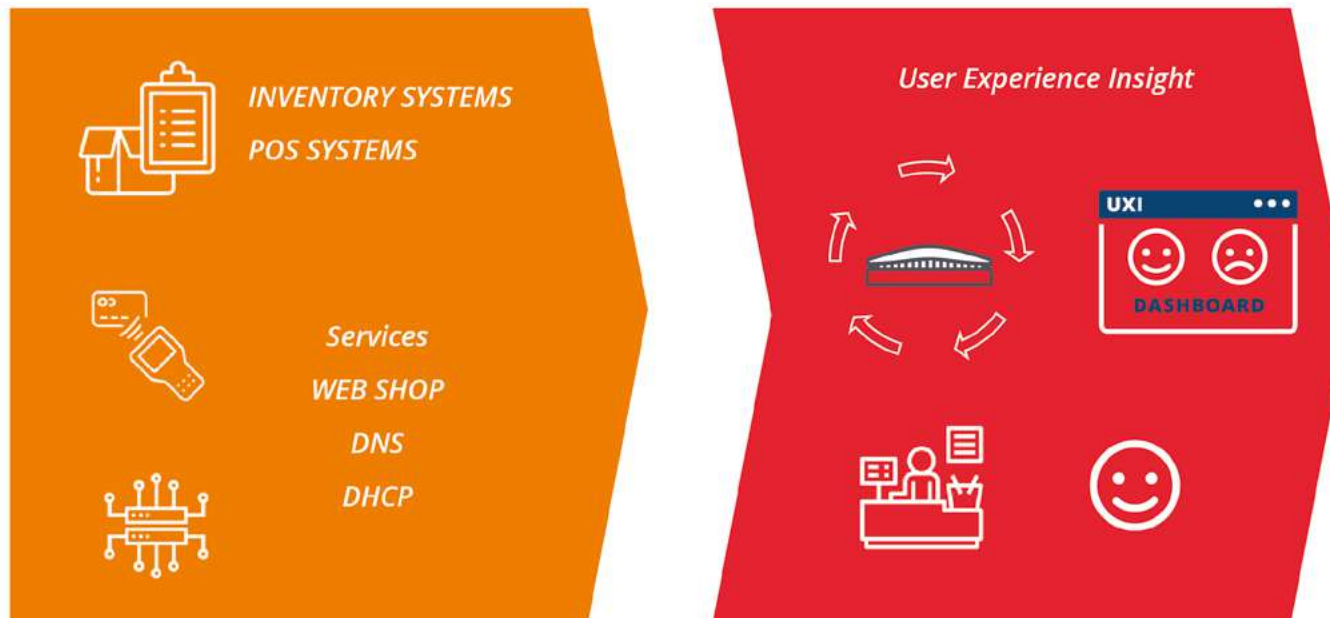
*Dwell time and traffic flows*  
*Space utilization and people movement*  
*Loyal customers*

*"Were these individuals in the same space?"*  
*"Does this space need cleaned?"*



# Ensure Application Performance

*You can't afford a slow transaction or a negative customer experience*







# How can customers be Smarter?

How many of them are potential customers?

An aerial, high-angle photograph of a busy shopping mall. The floor is a light-colored, polished tile. Numerous people are walking, some pushing shopping carts, some carrying bags. The image is overlaid with several orange callout boxes connected by thin lines to specific areas of the mall. The callouts pose questions about customer behavior and retail strategy. The overall scene is a blurred, dynamic representation of a retail environment.

Do we have enough cashiers?

Is this sales promotion working?

Will this customer make a purchase?

Could the display be better?



# Powering In-Store Wi-Fi Analytics

- Capture conversion rates
- Know what sites and products customers are browsing
- Understand shoppers path thru the store

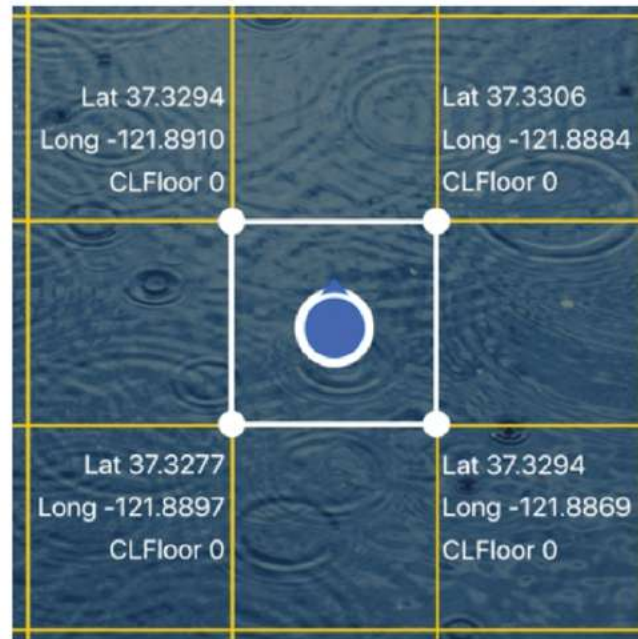






# WLAN ANALYTICS

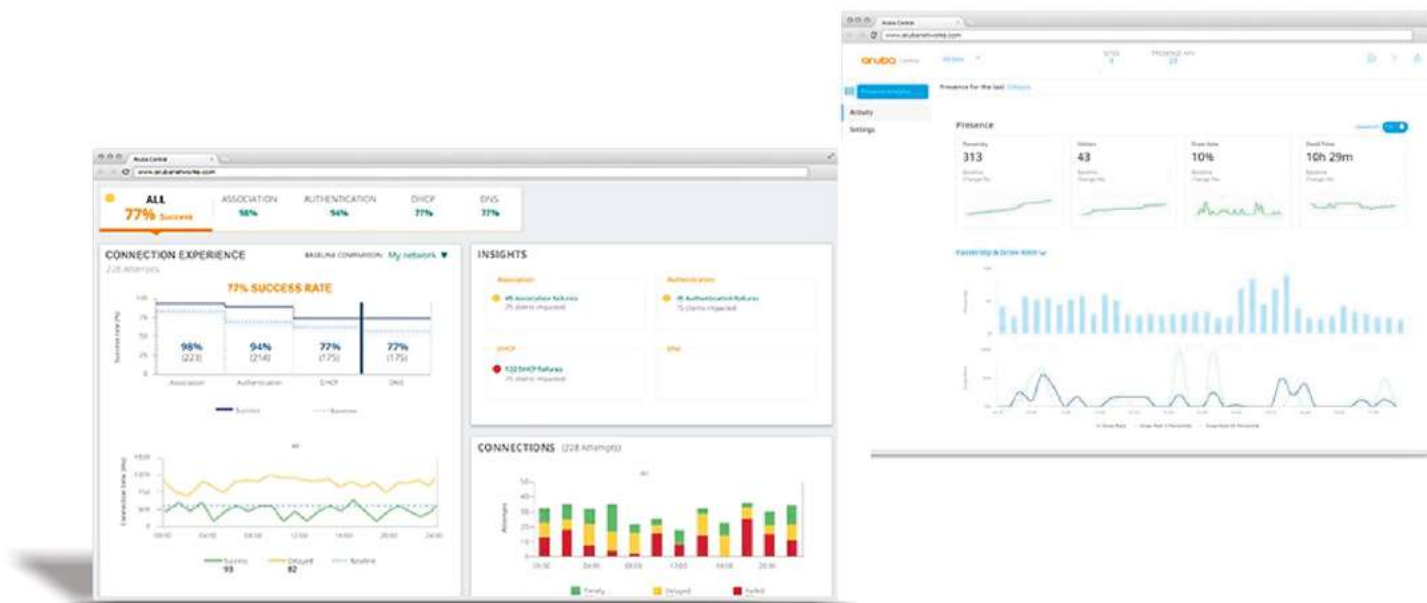
How does it work?



- Leverages WLAN Anonymous polling from multiple Aruba Aps.
- Uses deeper integration with inbuilt sensors and gyros to aid movement speed and smoother experience (if using App).
- Integration with Airwave / ALE and CLE and enhances location.
- Possible addition of 802.11mc for sub 2m accuracy (TBA)

# ARUBA ESP

## CENTRAL PRESENCE ANALYTICS OR ALE WITH POWER BI



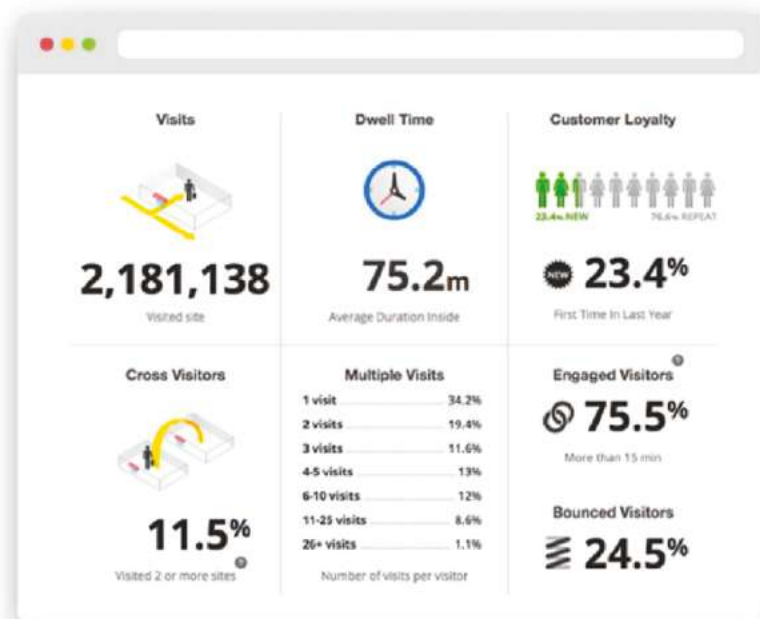
Aruba's analytics solution collects and analyzes data captured from the WLAN and mobile devices to deliver analytics that help it and business groups, of all types and sizes, make smarter operational decisions.

Leverage data that reveals how your staff or customers move throughout your location. Use Aruba ALE to make smarter decisions that benefit your business.



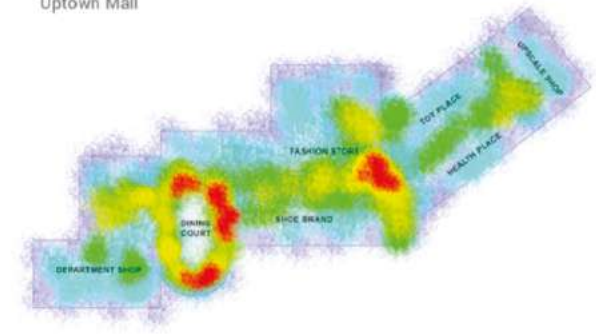
# AISLELABS FLOW

HEATMAP & LOCATION ANALYTICS (CCTV & ARUBA WIFI) -  
CENTRAL PRESENCE 2.5 (18 API'S NOW STREAMING)



- Visualize all users across a property whether they sign onto the guest WiFi or not.
- Observe which parts of a site are the most popular in real-time as well as over the course of time.
- Obtain metrics that include how many guests visited and dwell times which are then broken down by spaces.

Uptown Mall





# AISLELABS FLOW

Retail Comparison & EPOS Integration (POS & Aruba WIFI)

**\$1,247,067**  **142**

	Transactions	Revenue (\$)	Visits	Visit Value (\$/Visit)	Dwell Time (mins)	Dwell Value (\$/min)
Starbucks	140	26899	35342	0.76	20.12	0.04
True Burger	127	71485	8143	8.78	8.92	0.98
Tim Horton's	168	40997	10553	3.88	14.91	0.26
Duty Free	142	1247067	27745	44.95	15.72	2.86
Casey's	125	54865	15948	3.44	12.86	0.27

- Breakdown retail performance even further by each store and get a true understanding of the value of each tenant.
- Whereas some tenants bring in much higher retail spend, others are able to bring in more shoppers.

Revenue vs Dwell Time



Revenue vs Visits



Highest Day

**Saturday**

Lowest Day

**Tuesday**



Highest Time

**5 PM**

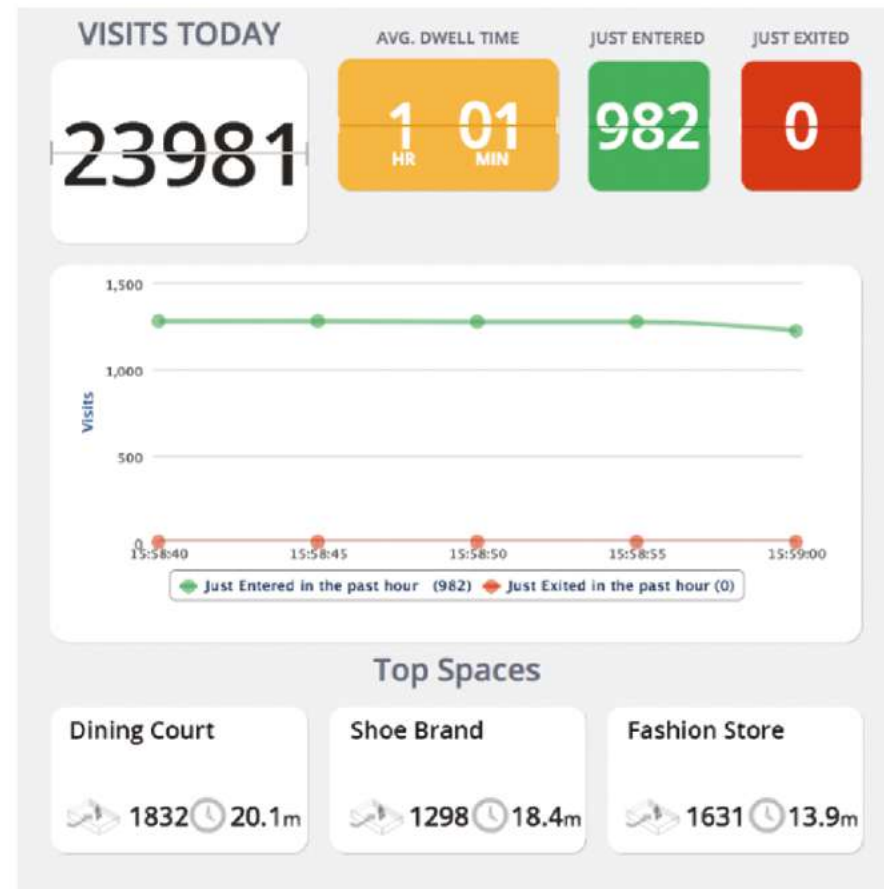
Lowest Time

**8 PM**

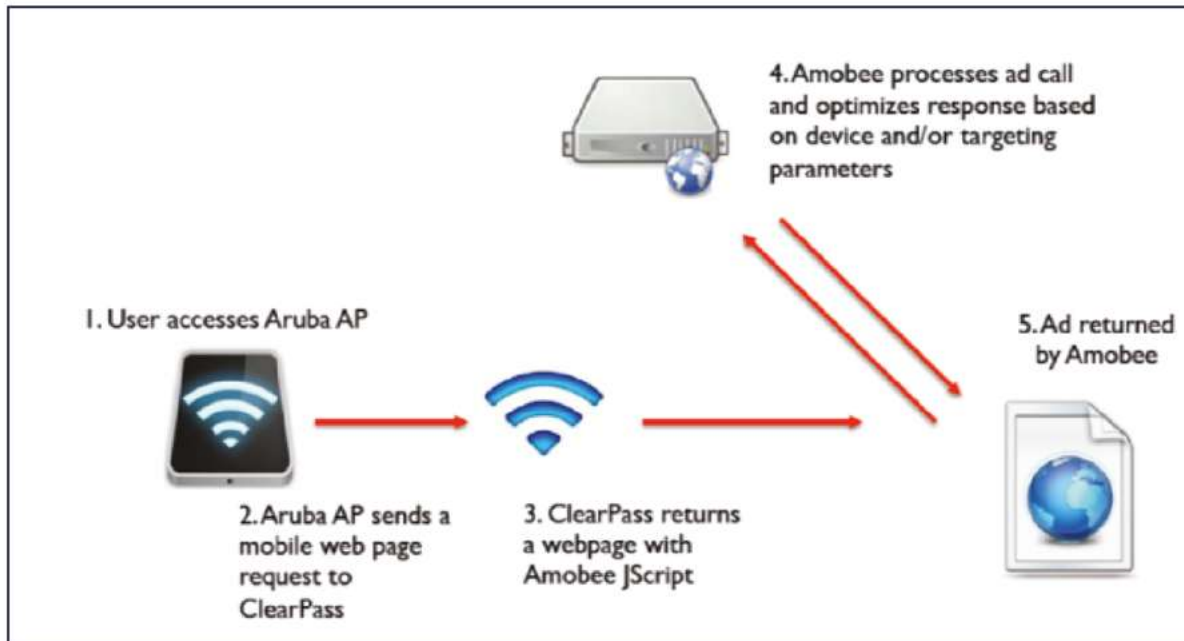
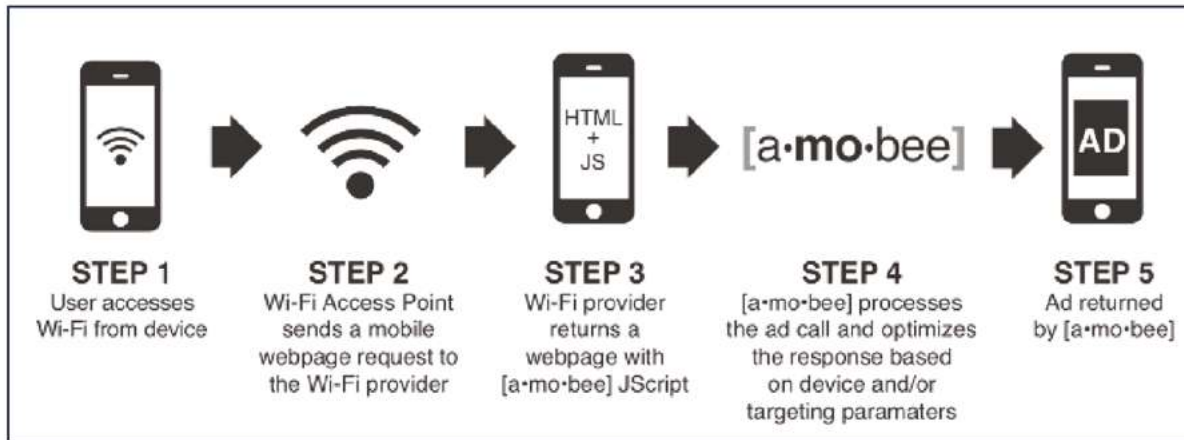


# AISLELABS Data Connector (API)

- Breakdown retail performance even further by each store and get a true understanding of the value of each tenant.
- Whereas some tenants bring in much higher retail spend, others are able to bring in more shoppers.



# Monetisation



- Drives new, high-margin revenue via targeted advertising.
- 70% of click-through revenue goes to the network owner.
- Leverages ClearPass guest registration, self-service, and log-in pages.
- Works with smartphones, tablets, laptops, and PCs
- Requires no network changes or capital investments
- Programmatic bidding via an advanced mobile real-time bidding (rTb) engine.
- Automated demand and supply pricing requires no manual intervention.
- Up to 50% higher effective yield per thousand impressions (eCPMs).
- Hyper-local, highly targeted ads to increase overall value. Leveraging context aware campaigns.

# ROI CALCULATOR

## Wifi & App Application Advertising Calculator

	Remarks	Key Variables	Scenario 1
Total forecasted Users / Month	Total users accessing the system every month	*	400000
Sessions / Per month / per user	Number of times users will log in per month	*	4
Available Advertising Inventory / pmnth	Every login will create one advertising engagement opportunity		1,600,00
Fill Rate	Volume of available inventory available for sales	*	90%
%Sold - Direct	Direct sales in undertaken by own/partner sales org	*	100%
Average Direct eCPM	Market rate : differs in each market and ad format	*	\$6.00
Total Revenue Direct Sales	Revenue earned via direct/partner sales effort		\$8,640
% Sold - Mediation	Sold via an auction engine		0%
Average Mediation eCPM	Market rates via an auction engine will vary based on formats	*	\$0.30
Total Revenue Mediation Sales	Revenue earned via an auction engine		\$0
Total Revenue			\$8,640
User Data / Target Enrichment	Assuming there is enriched demographic, behavioural or location targeting attributes		
Data - Yield Increase (x)	Price increase with data	*	2
Total Revenue / per month			\$17,280

### Example:

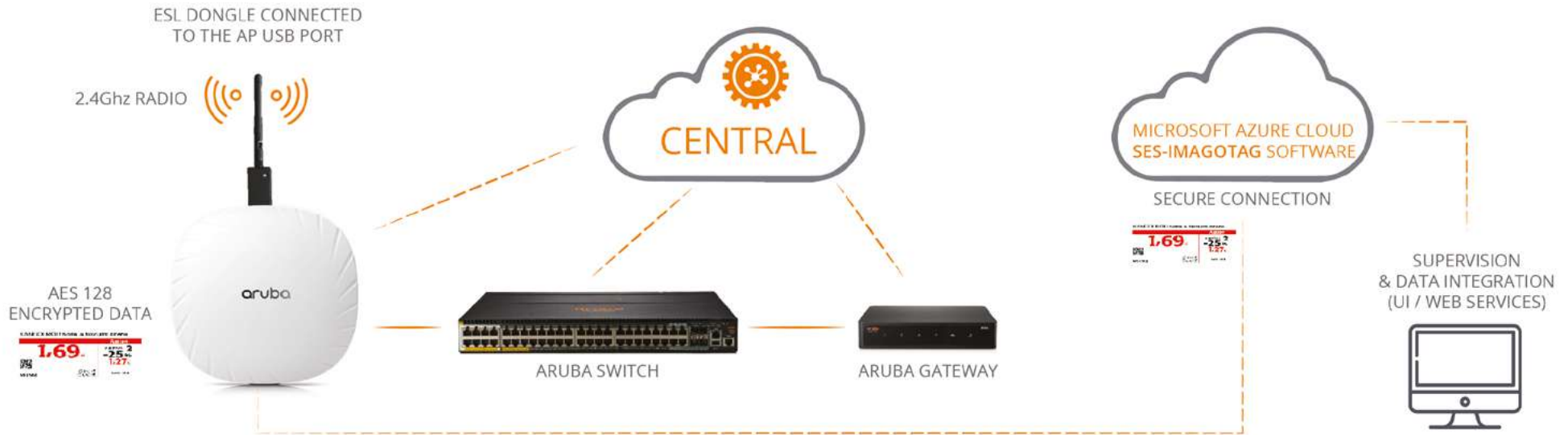
Brand funded managed service model of Central:

- Cost of Aruba network solution: \$10,000 per month.
- Income average: \$15,000 per month
- Profit: \$5,000 per month.





# How ESL (ELECTRONIC SHELF LABEL) works?



- One Dongle can manage up to 10000 ESL
- ESL Tags with 5 to 6 years of battery life
- Secured connection over TCP & TLS 1.2
- Wi-Fi + ESL wireless assurance
- Improved IT visibility into ESL radio

ARUBA AND SES-IMAGOTAG INTEGRATION



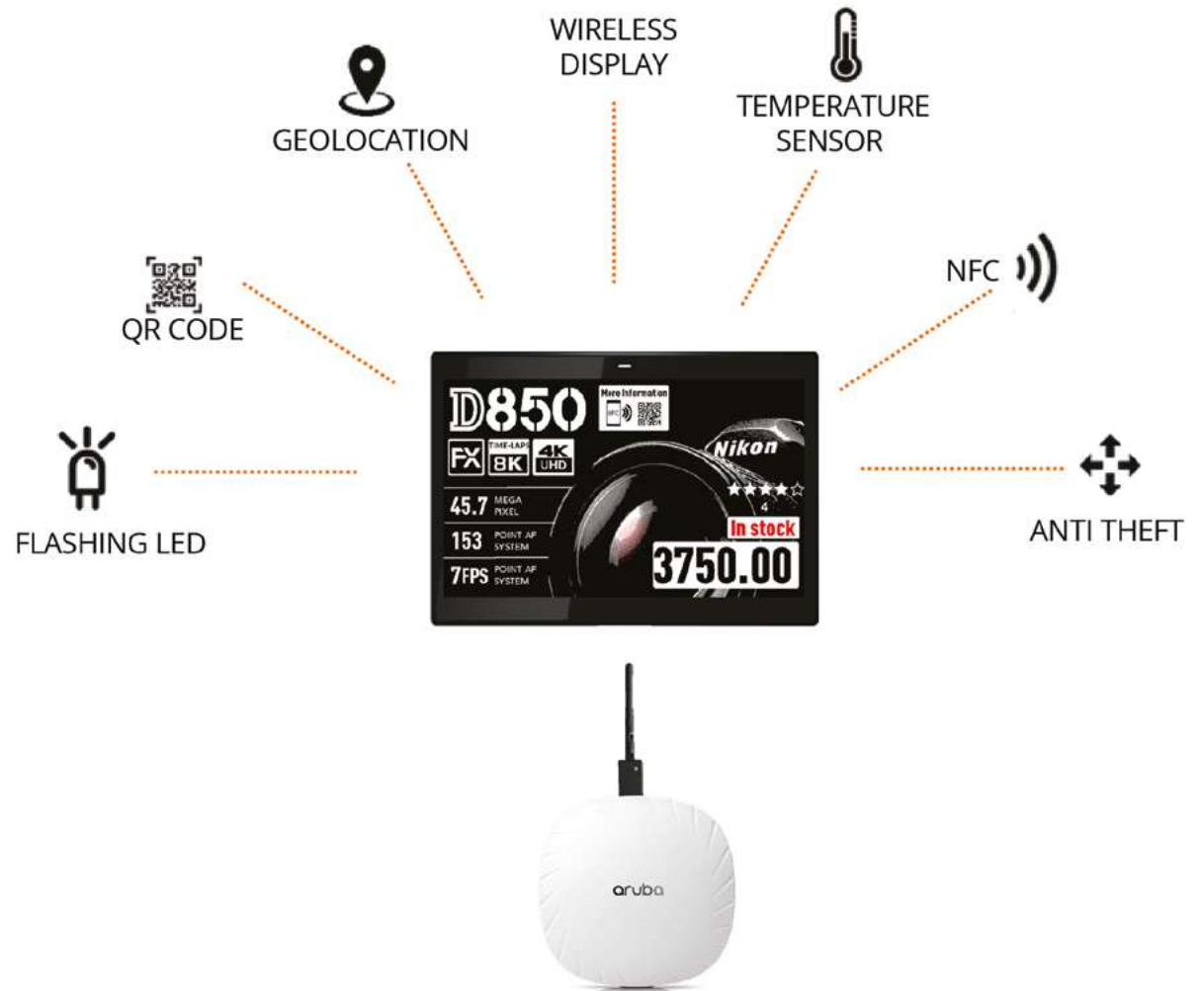
# What are **ESL** (ELECTRONIC SHELF LABEL) **benefits?**

## BENEFITS FROM ESL TO RETAILERS

- ACCURATE PRICING
- SAVE COSTS
- PRODUCT FINDER
- IN-STORE HEATMAPS
- DIGITAL SIGNAGE

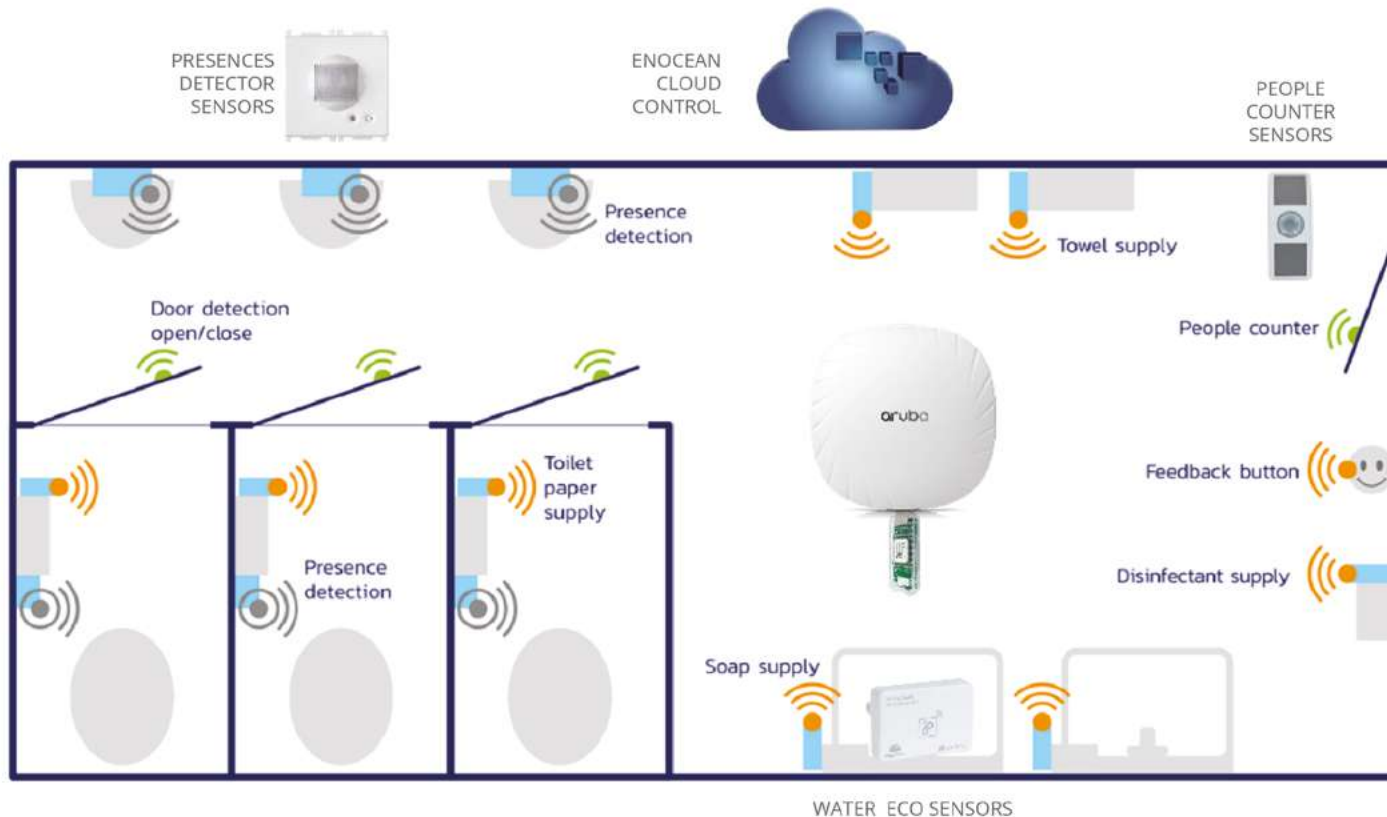
## BENEFITS WITH ARUBA & ESL

- CLOUD MANAGED END TO END
- SINGLE IT INFRASTRUCTURE
- ENABLING MULTIPLE USE CASES
- GREAT VALUE PROPOSITION FOR LOB



# Facility monitoring & Enablement

## Restroom Utilization Management



Sensors Collect Data and Send them to the Enocean USB Stick

ENOCEAN USB Stick the Networked Access Point receives the Sensor Data via Enocean Radio.

The Aruba access point sends the collected data to the Cloud.



# Automate Customer Connectivity

Aruba Air Pass for Automated Cellular to Wi-Fi Transfer



CARRIER ABC  
ABC WiFi



ABC WiFi

# Enable Frictionless Shopping

Convenient, fast, and requires less touches



Great Wi-Fi is key to a great frictionless shopping experience!



User your phone to shop



Scan bar codes



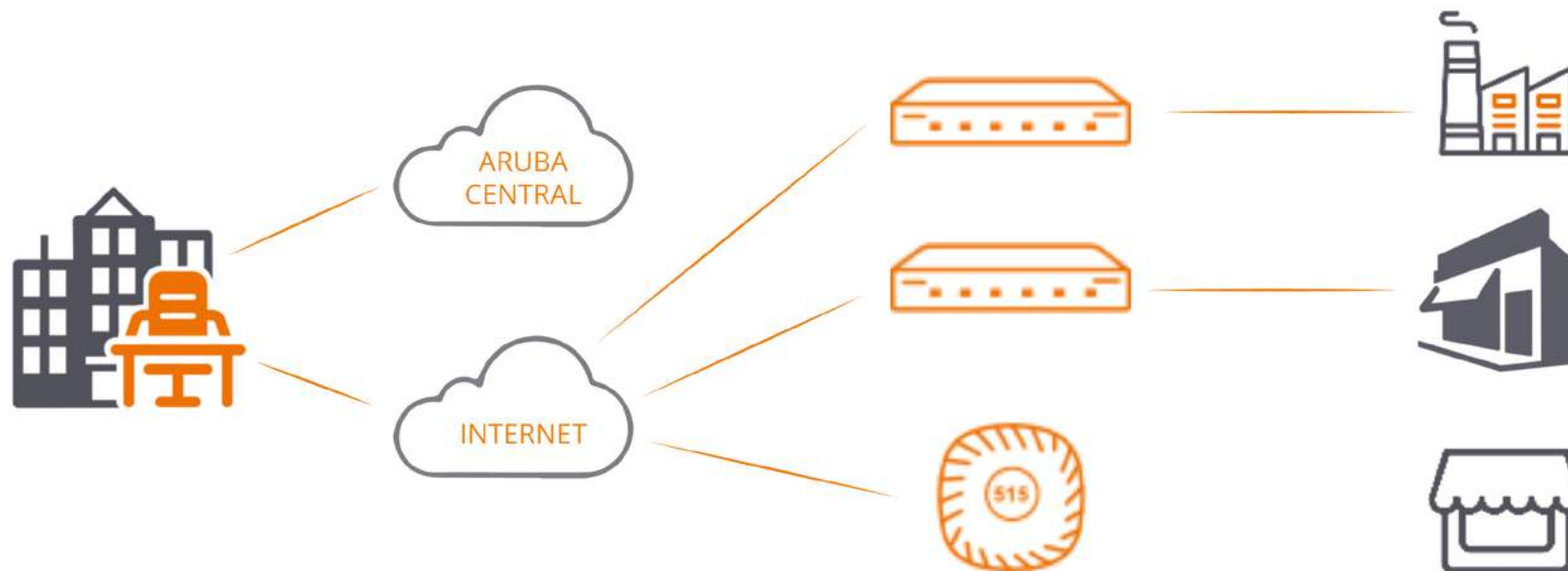
Pay and leave with a QR code



# Simplify Branch Management

Extend with SD-WAN management capabilities

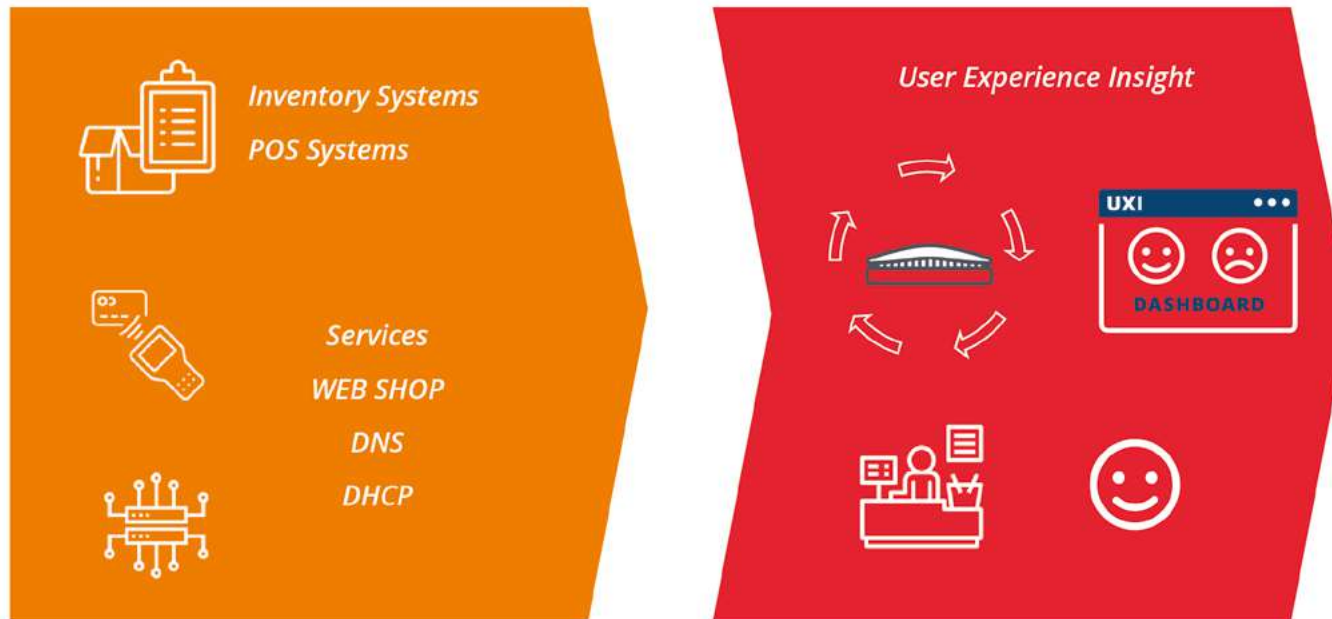
Neighborhood Stores, Factories, Large Stores





# Ensure Application Performance

Prevent a slow transaction or a negative customer experience



RETAIL



# HOSPITALITY





# Hospitality Trends, Use Cases, and Outcomes

## Trends

- Hyper personalization
- Tech-powered Hospitality
- Location based interactions
- Mobile first, mobile everything
- IoT enablement
- Pervasive AI & ML

## Use Cases

- Frictionless guest on-boarding and experience
- Leveraging IoT devices and security in a true infrastructure convergence way
- Enabling guest room amenities and services
- Mobile device controlled roomlighting, entertainment systems
- Keyless Entry
- Panic buttons, inventory trackers, boost staff safety

## Outcomes

- Strengthen guest loyalty
- Guest behavior insight and social sentiment
- Maximize your infrastructure investment, lower OpEx
- Boost staff safety and operational effectiveness



# Hospitality Industry Challenges





# The Future of Travel



## Planning & Booking

End-to-End Single Platform

- Hotel
- Cruise
- Transportation
- Packaging



## Notifications

Relevant by Exception

- Alerts/Delays
- Upgrades/Offer
- Transportation
- Services
- Overbooked



## Check-in

Remote Automation

- Proactive
- Special requirements
- Select room
- Room upgrade
- Biometric



## Airport

Automated Single Token

- Security
- Immigration
- Boarding
- Restaurants
- Retail



## Transportation Services

Automated Single Token

- Directed
- Automotive
- Options



## Hotel

Personalization Automation

- Electron Key
- Identity Mgmt
- Wayfinding
- Automated room

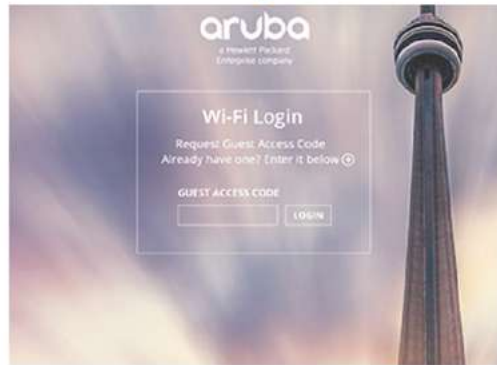
200b devices will be connected to the IOT by 2020. 89% of organizations are focusing on digital transformation as part of their strategy. 50% of organizations want to improve customer experience through digital transformation. 6% of organizations are aggressive and disruptive in their use of digital technologies. <10% of data is currently used effectively.

# Aligning to Hospitality Business Drivers

## Guest Experience & Loyalty



## Associate & Staff Experiences



## Brand Growth



## Owner Value



### Guest Experience & Loyalty

- Scalable personalization
- Consistent experience across venues & properties
- End-to-end guest travel journey
- Capture millennial guests into loyalty
- Personalized guest engagement, AI, ML
- Contactless Experiences post COVID-19



### Associate Experience

- Improve associate satisfaction & safety
- Optimize resources
- Mobile enable staff to spend more time focusing on guests
- Reduce work not focused on serving guests
- Social distancing and contact tracing
- Fever detection



### Global Growth

- Increase brand awareness
- Grow loyalty program
- Expand to new emerging markets
- Accelerate new property acquisition
- Security & privacy
- Global control & increased visibility



### Owner Value

- Improve staff engagement with guests
- Reduce on premise costs
- Add value add services to increase revenue
- Guest behavior insight and social sentiment
- Green program
- Limit risk and financial liability with secure solutions



Count people

Occupancy control

People tracking

Contact tracing

Face mask enforcement

Thermal Monitoring

Face Recognition

Dashboard & Reporting

Behavior analysis

Automatic notification

Signage

Keyless locks

Smart app & portal

Secure Connectivity

Restaurant Reservation

SPA Reservation & Mgmt

Contact tracing (opt-in)

Environmental monitoring

Remote staff assistance

Automatic notification

E-Training

Collaboration tools





# CohuHD Thermographic + AI Facial Recognition



3212HD

A Non-contact measurement solution based on AI-Face Capture, suitable for crowd temperature screening (30 people max)



# Guest & Staff Safety

- Staying Safe & Sound: Protecting Hospitality Workers Using Location-Based Services
- React Mobile offers an open and flexible platform that allows organizations to quickly deploy a response system
- Eliminates the cost of purchasing, deploying, and maintaining a separate overlay ESD alarm and location services network

**ARUBA & REACT MOBILE**  
Staying Safe & Sound: Protecting Hospitality Workers Using Location-Based Services

Emergency workers are routinely exposed to job-related safety issues that are hidden from public view – abusive or threatening behavior from guests, malicious items left behind in rooms, and guest medical emergencies. The impact on employee morale and retention represents a serious threat to an organization's ability to recruit and the liability experienced by owners and franchisees.

Industry associations and major hotel brands are committed to addressing these issues and are leveraging digital technology. In the U.S., the American Hotel & Lodging Association have committed to providing hotel workers with personal panic buttons by 2018, and are allocating other resources to improve employee safety. In Europe, the UK's Health and Safety Executive and the European Agency for Safety and Health have also identified the need for control measures as this is a growing problem.

Personal panic buttons, also referred to as employee safety devices (ESDs), will alert security personnel in the event of dangerous or threatening situations. With the addition of location capabilities, safety personnel are quickly able to identify where an incident has occurred and how to best reach the location. Besides raising awareness, the personal presence of ESDs can also serve as a visible deterrent to individuals with malicious intent.

Aruba's React Mobile supporting ESDs is a through-the-wireless-infrastructure as a service that understands both Bluetooth and other protocols being used by ESD vendors. This allows IT teams to rollout an ESD solution more quickly, minimize the purchase of additional infrastructure and/or equipment, simplify and/or upgrade their existing network.

**WHY ARUBA & REACT MOBILE?**

- Allows guests to be vocal indoors and outdoors without the need for new wiring and infrastructure
- Eliminates the cost of purchasing, deploying, and maintaining a separate overlay ESD alarm and location services network
- Dynamic segmentation of devices, location, and other data, helps reduce operational costs and security concerns
- Simple set up and easy-to-use interface

**REACT MOBILE**

As a leading provider of unified communications (UC) and related monitoring applications, React Mobile offers an open and flexible platform that allows organizations to quickly deploy a response system. Beyond this, we have the exact location of an emergency within seconds of an alert, and can get help whenever it's needed – even off property. The React Mobile solution is comprised of a mobile app, Bluetooth beacons, and a 4G/LTE land mobile panic button.

# PATROCINIUM

## Safety & Physical/Social Distancing



- Aruba is the foundation for Patrocinium's safety, security, and communications features
- Meridian lets mobile app users see their location relative to incidents, exits, fire hoses, etc.
- Wayfinding guides people to designated safety zones away from danger.
- Declaring yourself safe/unsafe via the mobile app makes responders situationally-aware.
- 4D picture gives responders the tools to visualize the interior of all buildings.





# HID BLE BEACONS



BLUVISION

The advertisement features a blue gradient background with several HID badge beacon devices. On the left, there are two white rectangular beacons. In the center, a larger white beacon is shown with the 'BLUVISION BEACON CARD' logo and the HID logo. To its right is a white badge with a photo of Jenny Evans, labeled 'Jenny Evans ENGINEER'. Further right is a white smartphone with a photo of Jenny Evans and the name 'Jenny Evans' on the screen. Below these items is a white rectangular beacon with the HID logo. The text 'BEEKs™ Badge Beacons' is written in white on the left side of the blue background.

BEEKs™ Badge Beacons



# ARUBA ASSET TAG



## KEY FEATURES

- Uses prevalent BLE asset tracking technology
- A modern Wi-Fi installation provides necessary coverage
- BLE-enabled Aruba AP's only require a firmware upgrade to support asset tracking
- Solution is scalable to thousands of assets
- 3-4 year maintenance free battery
- True location on map, not just general proximity
- Tags are designed to endure stringent requirements, including medical use
- Multiple attachment options support a variety of use cases and asset types



# Assa Abloy Mobile Key Access



# Assa Abloy Integration



Door Lock



AP515



Guest & Discovery Card  
& Programming Cable



Controller

API IoT Data (JSON)

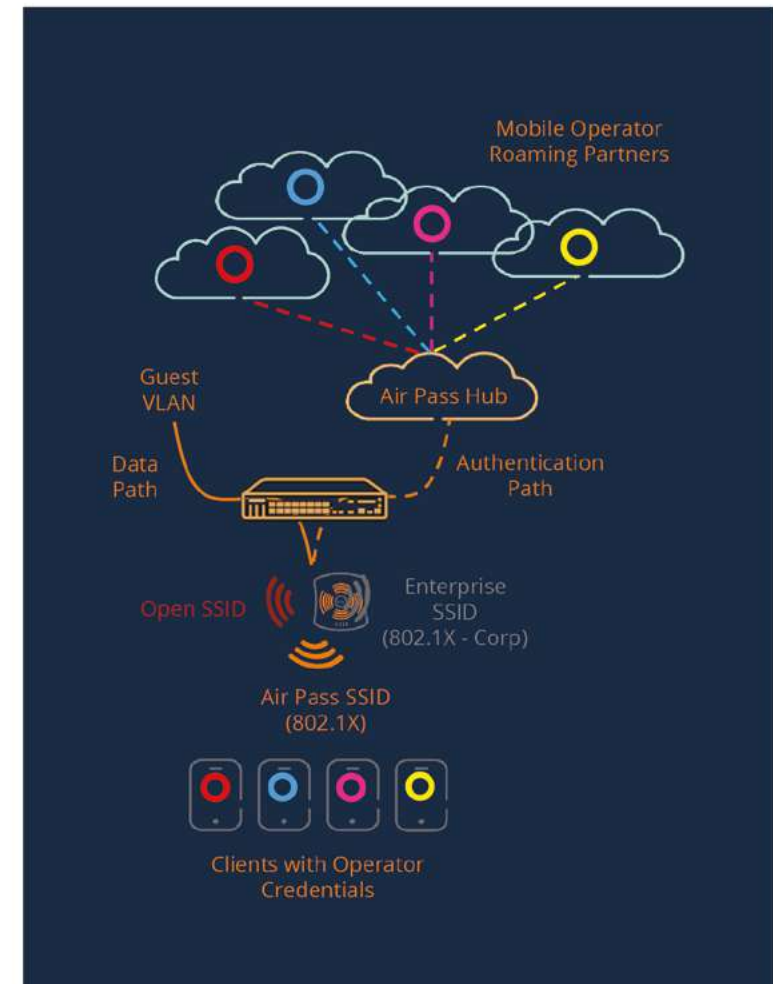


Visionline Server



# Aruba Air Pass Extends Cellular Experience with Wi-Fi

- Automatic Wi-Fi discovery and authentication
- Always-on Wi-Fi Calling and text messaging
- Eliminates onboarding friction for guests
- Simplifies enterprise BYOD support
- Improves analytics and security
- Secure, always-encrypted network access
- Compatible with existing infrastructure
- Supports MEC and local breakout architecture
- 5G ready





# USER EXPERIENCE INSIGHT

- ANY ENVIRONMENT
- FLEXIBLE AND SECURE MOUNTING
- ZERO TOUCH ONBOARDING
- UNIQUE COLUMN DESIGN



**UXI G-SERIES  
SENSOR**






# INDUSTRIAL & MANUFACTURING



# Use Cases



OT / IT  
COLLABORATION



AUTOMATING PLANT  
NETWORK ACCESS



MIGRATING FROM  
BREAK/FIX TO  
PREDICTIVE  
MAINTENANCE



PLANT MONITORING  
& ENABLEMENT



REAL-TIME PERSONNEL  
& ASSET SAFETY  
MONITORING



REAL-TIME INTEGRATED  
EMERGENCY RESPONSE  
& NOTIFICATION



CCTV SURVEILLANCE  
AND SECURITY



SMART DIGITAL  
WORKPLACE





# Secure IT & OT Integration

Converging the IT and OT networks is be very cost effective and can ensure that user and device needs are met in a secure, reliable, and efficient manner. Aruba provides security controls and traffic separation tools to allow IT and OT to share a common infrastructure.

What are the benefits?

- End-to-End visibility of IT and OT networks
- Full network management of IOT devices and headless devices
- Full Secure Network Access control and audit trail based on users profile
- Threat mitigation
- Data analytics



# Secure IT & OT Integration



OT DEVICES



IIOT DEVICES



OFF-NETWORK DEVICES



# IIOT Visibility, Segmentation & Security

The main areas of an industrial business where an 'always on - secure video surveillance systems' can play a valuable role: from the car park, to entrances and exits, office areas, delivery and dispatch and, of course, the manufacturing and assembly areas themselves.

What are the benefits?

- Full network security.
- Visibility thru continuous monitoring systems, networks, devices, personnel, and the environment for possible threats.
- AI based insights and real-time threat intelligence.
- Incident reporting and audits



# IIOT Visibility, Segmentation & Security

CLEARPASS DEVICE INSIGHT  
ENHANCED DISCOVERY / PROFILING



- 
- 
- 
- 
- 
- 
- 
- 
- 



OT SECURITY SYSTEM INTEGRATION





# IOT Visibility, Segmentation & Security

The Envoy + Aruba ClearPass integration allows you to easily provide Wi-Fi network access to your visitors and employees. It securely provisions network access with context-aware policies that you can control and configure. Upon sign-in, the visitor will receive an email or text message with username and password information for Wi-Fi access.

What are the benefits?

- Provision unique Wi-Fi network and password information for each visitor
- Choose between email or text message to share credentials with visitors
- No more insecure guest network policies



# Automating Plant Network & Site Access



SAM'S ACCESS CARD IS PRINTED



CONTRACTOR - SAM



SAM SELF REGISTERED  
SAM RECEIVES SECURED  
WI-FI ACCESS DETAILS



APPROVED ACCESS



- ENVOY & CLEARPASS INTEGRATION
- REAL TIME ACTION
- PLANT MANAGER APPROVAL



ACCESS GRANTED



ACCESS DENIED



SECURITY MONITORING CENTER



# Migrating From Break/Fix To Predictive Maintenance

Up-time and defect-free processes are prime objectives of operations groups, whose charge is to keep plant and equipment running non-stop. Addressing maintenance proactively to minimize downtime, and maximize the utilization and performance of assets, can reduce maintenance costs by up to 40.

What are the benefits?

- By instrumenting equipment, monitoring for degradation, and identifying potential problems in advance of failure,
- Visibility into the performance of assets
- Ensure high availability
- Maximize the returns on often substantial capital investments.



# Migrating From Break/Fix To Predictive Maintenance

END USER EQUIPMENT

ARUBA ACCESS POINT

ARUBA WLAN OPERATIONS

ABB CLOUD MANAGEMENT



**KPI DATA**  
ABB SMART SENSORS MEASURES AND PROCESS SEVERAL PARAMETERS LIKE TEMPERATURE, VIBRATION, MAGNETIC FIEL AND OTHERS

**ARUBA API**  
CUSTOMIZED FOR SMART SENSORS COMMUNICATION

**GATEWAY WORKFLOWS**  
LOAD MEASUREMENTS, UPDATE FIRMWARE, SUPPORT FOR ARUBA API AND COMMUNICATION ON STACK

**CLOUD INTERFACE**  
ADVANCED DATA ANALYTICS FAULT PREDICTION

## ARUBA & ABB INTEGRATION OVERVIEW





# Plant Monitoring & Enablement

In the Internet of Things (IoT), sensors are the sensory organs of intelligent buildings. They collect the raw data that form the basis for the analysis and visualization of a smart building. This includes environmental parameters such as temperature, humidity or light, but also information on whether doors and windows are open or closed, as well as data on space utilization.

Until now, the crux of IoT projects in the building sector has often been how the sensors deliver the collected data to the cloud safely and cost-effectively. Aruba and EnOcean have solved this challenge together:

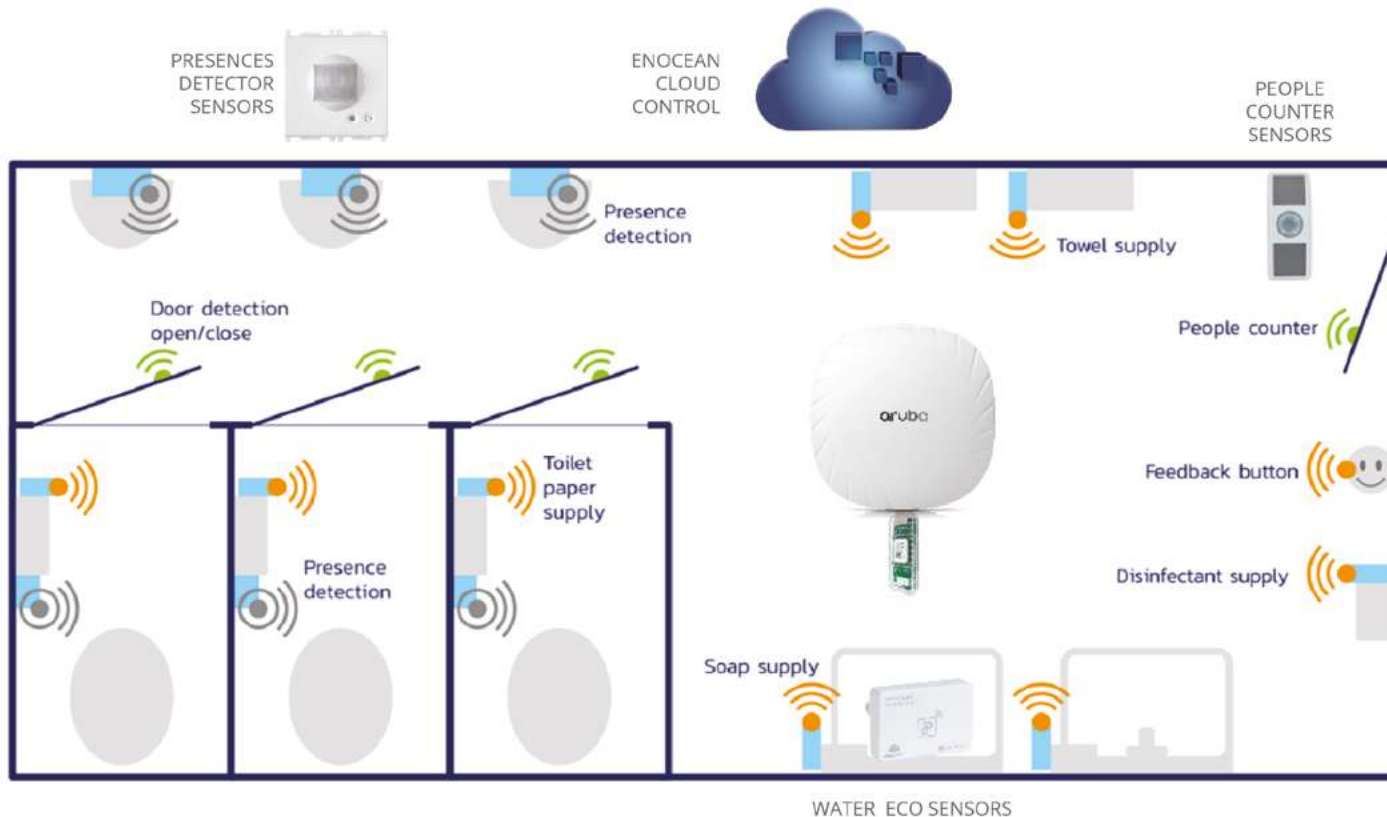
What are the benefits?

- No need for additional IT infrastructure to integrate IoT sensors into their network.
- Track consumption of supplies



# Plant Monitoring & Enablement

## Restroom Utilization Management



Sensors Collect Data and Send them to the Enocean USB Stick

ENOCEAN USB Stick the Networked Access Point receives the Sensor Data via Enocean Radio.

The Aruba access point sends the collected data to the Cloud.



# Real-time Personnel & Asset Safety Monitoring

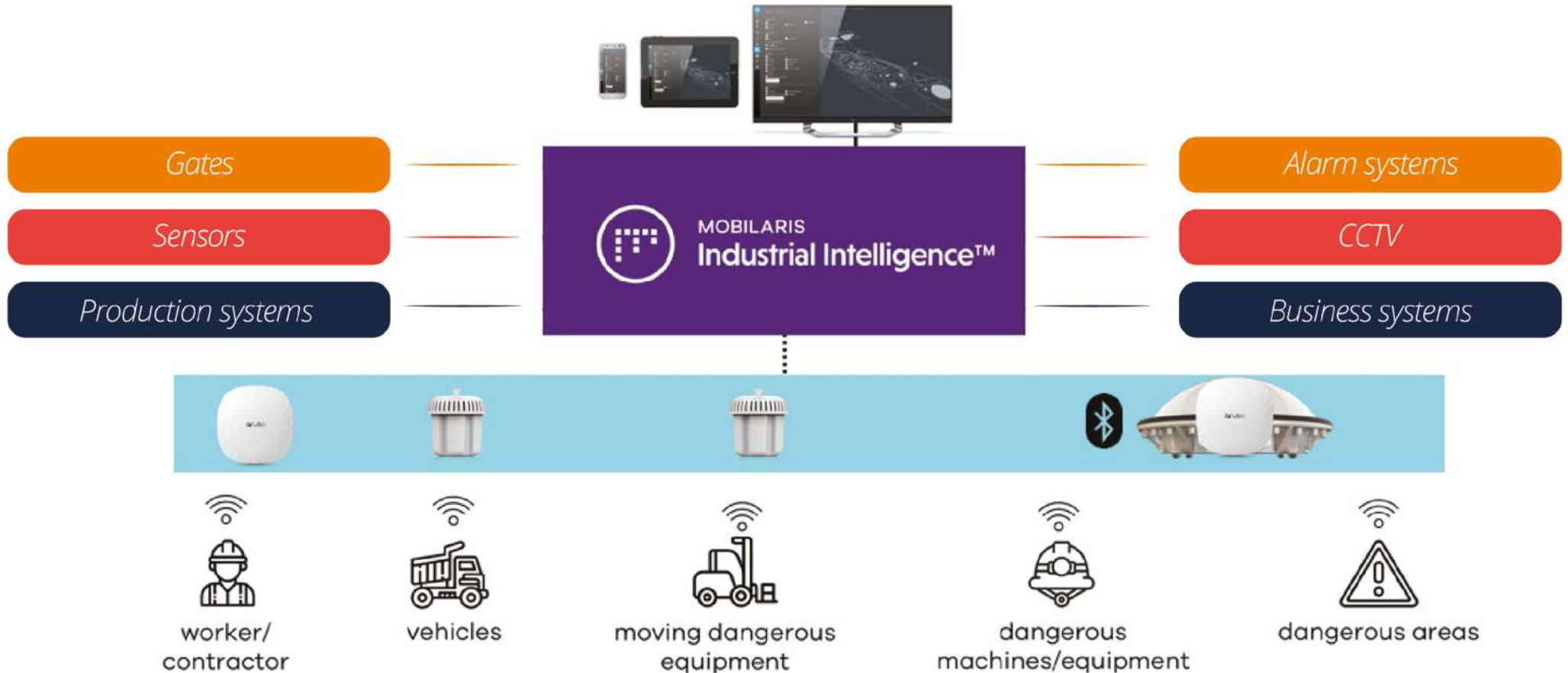
Mobilaris and Aruba have partnered to enhance worker safety and asset tracking in industrial sites and mines. Real-time location data, gathered by Aruba access points from tags on workers and equipment, are relayed over a secure tunnel from Aruba controllers to the Mobilaris system, and then on to workforce safety situation awareness applications.

What are the benefits?

- Access to real-time information about personnel location
- 3D site map visualization for status reporting
- Instant notifications of worker during calamity.



# Real-time Personnel & Asset Safety Monitoring







# Real-time Integrated Emergency Response & Notification

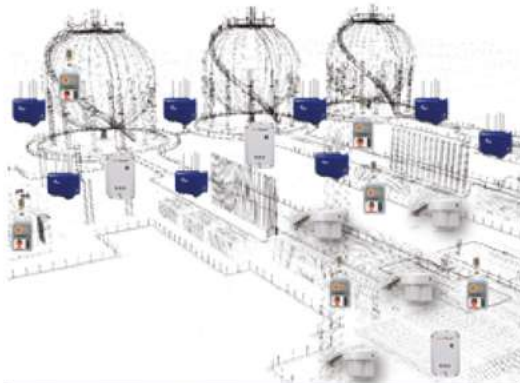
Patrocinium, in partnership with Aruba, takes an innovative approach leverage indoor location and mobile applications to inform people of incidents and how they should take action. Using the combined solutions, facilities and stakeholders can communicate and share real-time information with tenants, visitors, and staff. A unique 4D capability allows stakeholders to see within buildings to visualize incident information and better understand the situation.

What are the benefits?

- Empower users with situational awareness indoors
- 4d visual awareness
- Location based user status
- Targeted communications

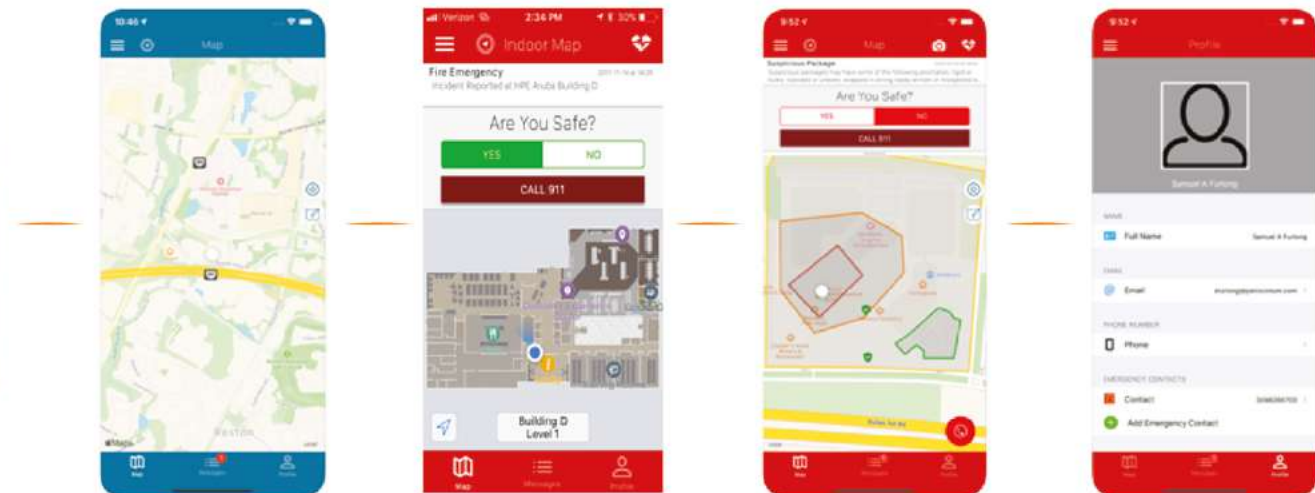
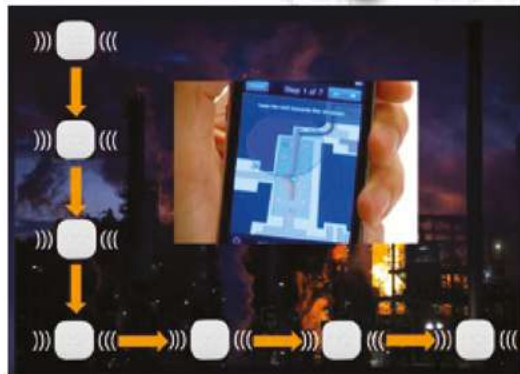


# Real-time Integrated Emergency Response & Notification



- EMPOWER USERS WITH SITUATIONAL AWARENESS INDOORS
- 4D VISUAL AWARENESS
- LOCATION BASED USER STATUS
- TARGETED COMMUNICATIONS
- RECORDING OF INCIDENT DATA

SAFE. ANYTIME. ANYWHERE.





# Secure Video Surveillance

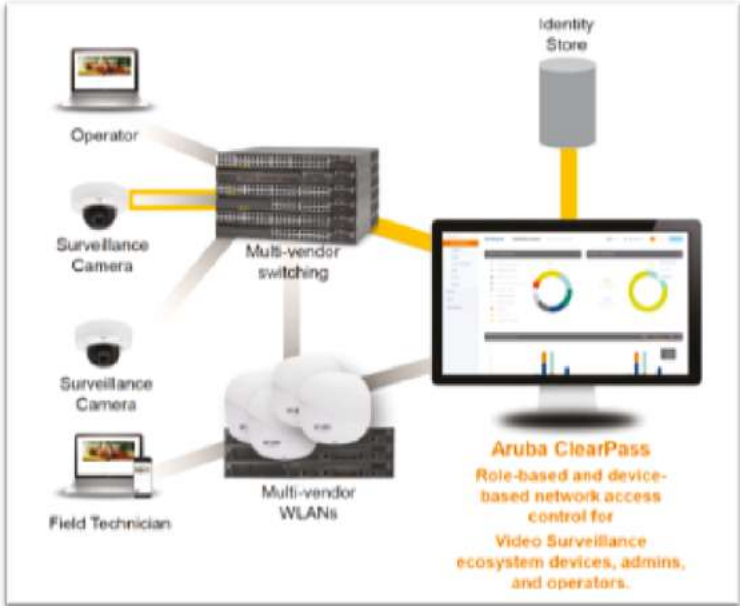
The main areas of an industrial business where an 'always on - secure video surveillance systems' can play a valuable role: from the car park, to entrances and exits, office areas, delivery and dispatch and, of course, the manufacturing and assembly areas themselves.

What are the benefits?

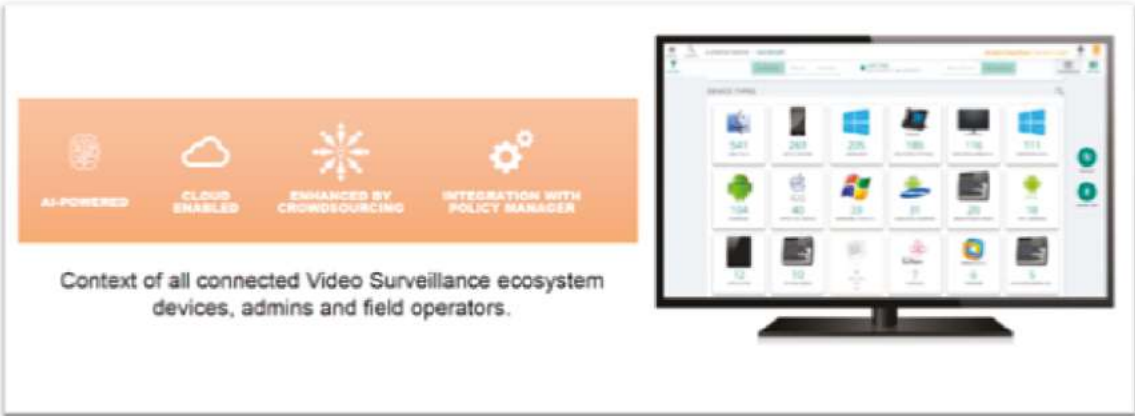
- Security of the business, machinery and product
- Safety of employees and site visitors
- Monitoring of the manufacturing process
- Optimization of business processes



# Secure Video Surveillance



1



2

3



Reliable switches backed up by the commitment of Life Time Warranty to reduce the risk of the disconnection.





# HYBRID - Digital Workplace

The new generation of collaborative digital workplaces, a surge in IoT devices, and the increased speed of doing business on mobile are leading us to the question — is the network infrastructure ready? Aruba's mobile-first approach focuses on software-powered innovation to differentiate itself from traditional hardware-focused solutions — integrating the wired and wireless infrastructure, giving network operators a crystal ball into network performance, and enabling security amidst the growing number of mobile and IoT devices.

As we transition from business recovery to a new type of workplace post COVID-19, the network will serve as the foundation for remote and in-office workers as well as the services needed to keep people safe and productive. This reimagined workplace—with services like contact tracing and heat mapping—starts with the network you already have.

What are the benefits?

- Human Productivity Optimization
- Automating Guest Access To Enhance Staff Efficiency
- Network and IOT Security
- Secure connectivity for 'Work from Home' scenarios
- Human Activity Monitoring and Analytics



**Always On networks**

- Reliable Secure Connectivity
- Network insights and problem detection

**Personal workspace**

- Find a desk
- Find team members
- Auto-desk setup

**Digital guest management**

- Digital login
- Auto-guest wifi
- Directions
- Security



**Huddle spaces**

- Instant innovation space
- Easy to book – e.g. via Slack

**Meeting rooms**

- Find a room
- Auto-detect
- Auto-setup
- Control temperature and lighting

**Work from Home**

- Office like experience
- Secure connectivity



# Other Use Cases



ZF Openmatics TAG IP69K, and are resistant to compressed water, rough treatment, and harsh weather conditions.



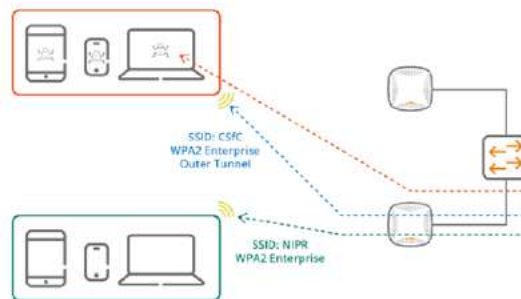
Zebra Technologies and Aruba have partnered to address the roaming voice picking and data capture requirements of industrial customers



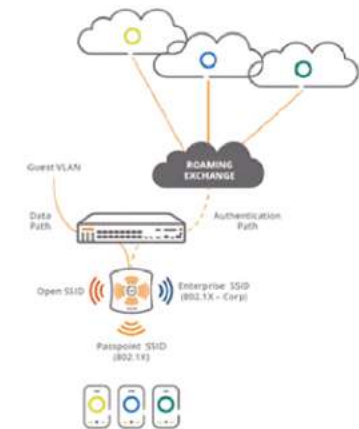
COVID-19 Social Distancing Solutions.



High-Speed Outdoor Point-To-Point Link



MultiZone, Securely sharing plant wireless networks without losing control .



Seamless 5G to Wi-Fi roaming without distributed antenna systems.



# Manufacturing Facility of the Future



SMART  
WORKPLACE

AI-BASED  
SECURE FACILITIES

DATA DRIVEN  
WORKPLACE

SECURE STAFF  
& GUESTS



# HEALTHCARE





# Healthcare Challenges



**Fear of  
Impending Surge**



**Lack of Space  
& Supplies**



**Traditionally  
Work Onsite**



**Revenue Growth  
& Costs**

# Use-case Narrative

## Challenges

- Impending surge of patients & testing
- Lack of space and supplies to support impending surge and new norm
- Work is no longer exclusively at the hospital, ie, new paradigms for infrastructure and geographic distribution of providers and care settings
- Operational excellence deterred by prolonged revenue growth and new set of costs (experts, equipment, patient behaviour)

## Needs

- Flexible design and construction of greenfield facilities designed to enable faster re-purposing of beds
- Virtual ICUs
- Concentrated Centers of Specialists
- A single, digital-first “front door” for health services with growing categories of remote services needing more input of clinical information
- Enhanced visit planning
- Enhanced data collection for research, feeding treatment, and remote services
- Crowd, asset and inventory management

## Aruba Offering

- Supporting Business Continuity and Essential Services Operations
- Enabling Remote Services
- Enabling Social Distancing
- Guaranteeing Operational Excellence





# Stakeholders' Needs





# Business Needs & Solutions Mapping





# Branch Connectivity

## Healthcare Challenges

*Fear of Impending Surge*

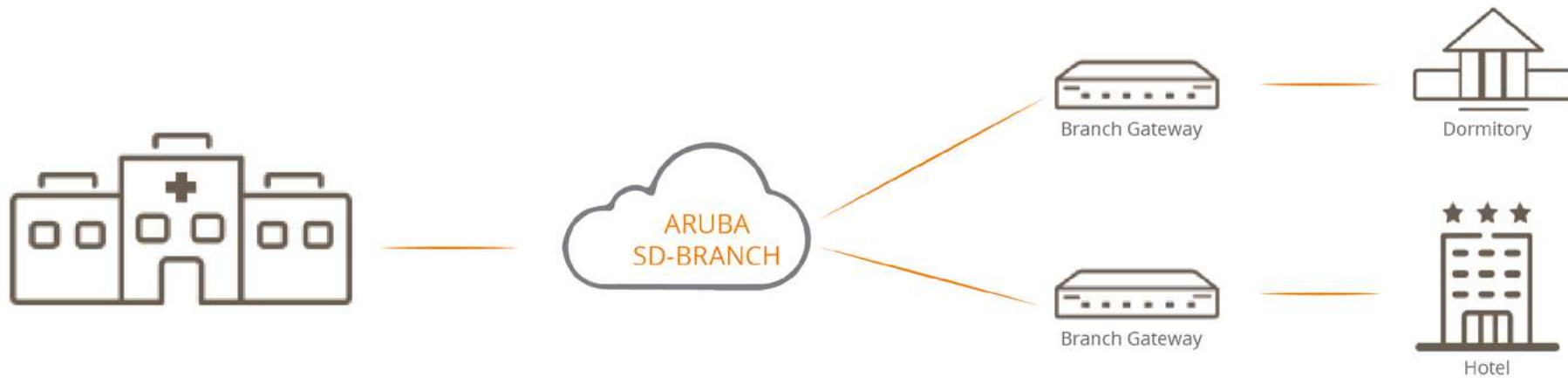
*Lack of Space and Supplies*

## Business Outcome

*BCP, Essential Services*

## Solutions

*Branch Connectivity*



# Remote Work Solutions -1

## Healthcare Challenges

*Traditionally Work Onsite*

*Clinical & Non-Clinical Staff*

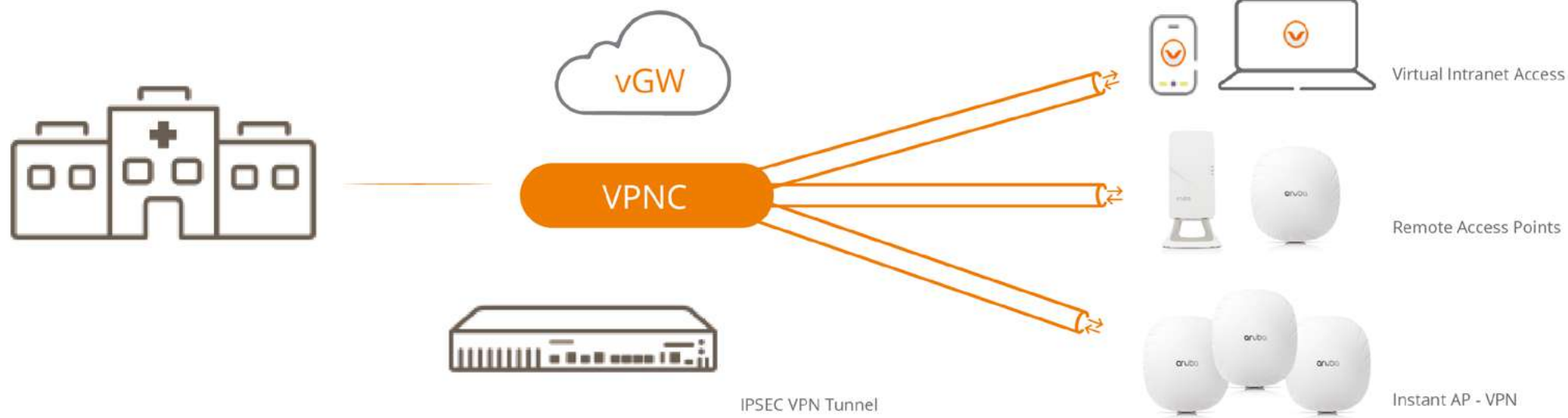


## Business Outcome

*Remote Services*

## Solutions

*Remote Work, Triage, & Patient Care*



# Remote Work Solutions - 2

## Healthcare Challenges

*Fear of Impending Surge*

## Business Focus Area

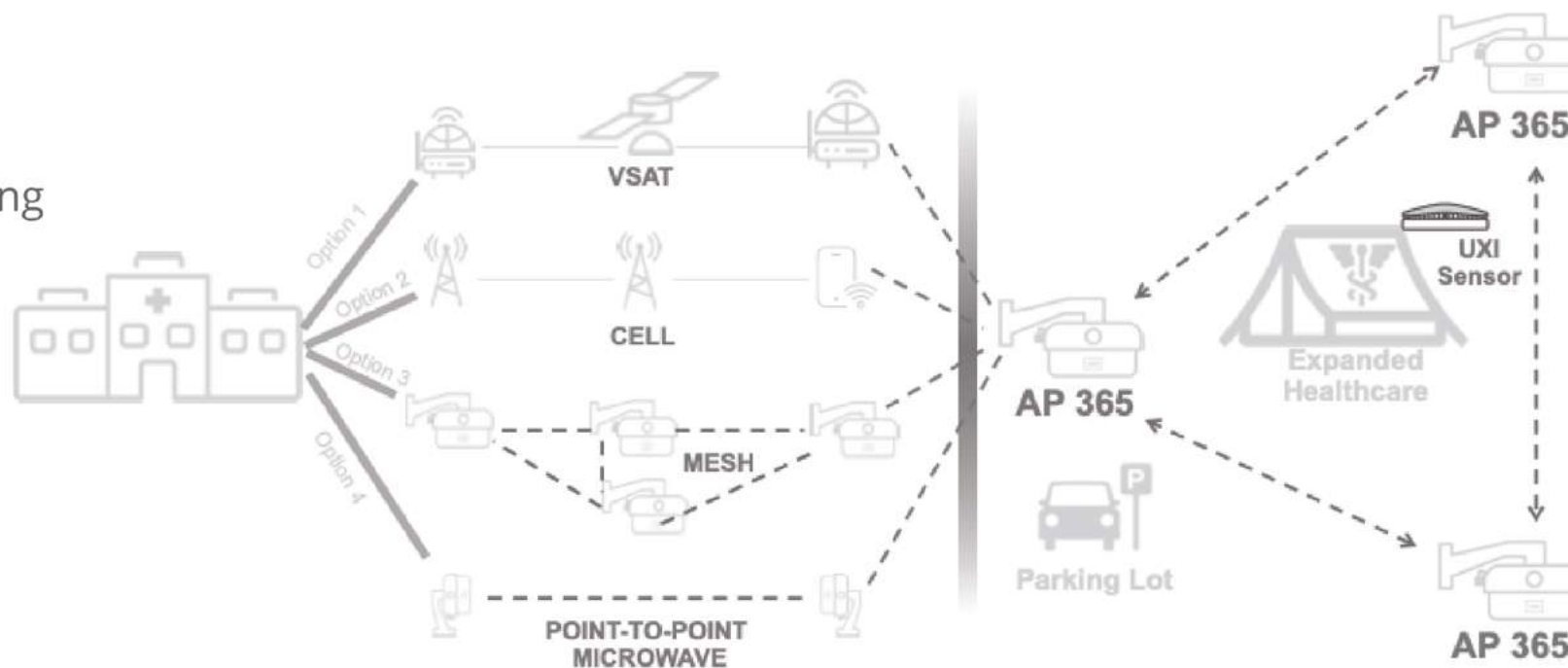
*BCP, Essential Services*

*Remote Services*

## Solutions/Technology

*Remote Solutions*

Remote Testing & Triage





# Express Site Mobilization - 1

## Healthcare Challenges

*Fear of Impending Surge*

*Lack of Space and Supplies*

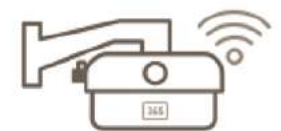
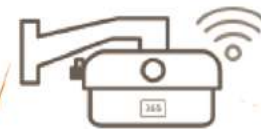
## Business Outcome

*BCP, Essential Services*

## Solutions

*Express Site Mobilization*

Remote Testing  
& Triage





# Express Site Mobilization - 2

## Healthcare Challenges

*Fear of Impending Surge*

## Business Outcome

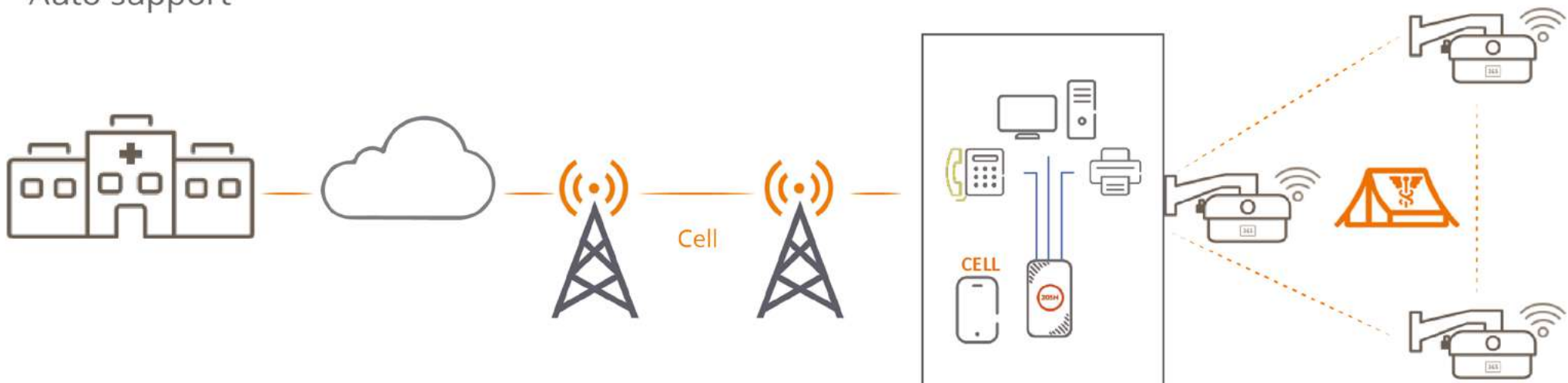
*BCP, Essential Services*

## Solutions

*Remote Work, Triage, & Patient Care*

*Express Site Mobilization*

Emergency  
Auto support



# Security & Compliance

## Healthcare Challenges

*Fear of Impending Surge*

*Revenue Growth & Costs*

## Business Outcome

*Operational Excellence*

## Solutions

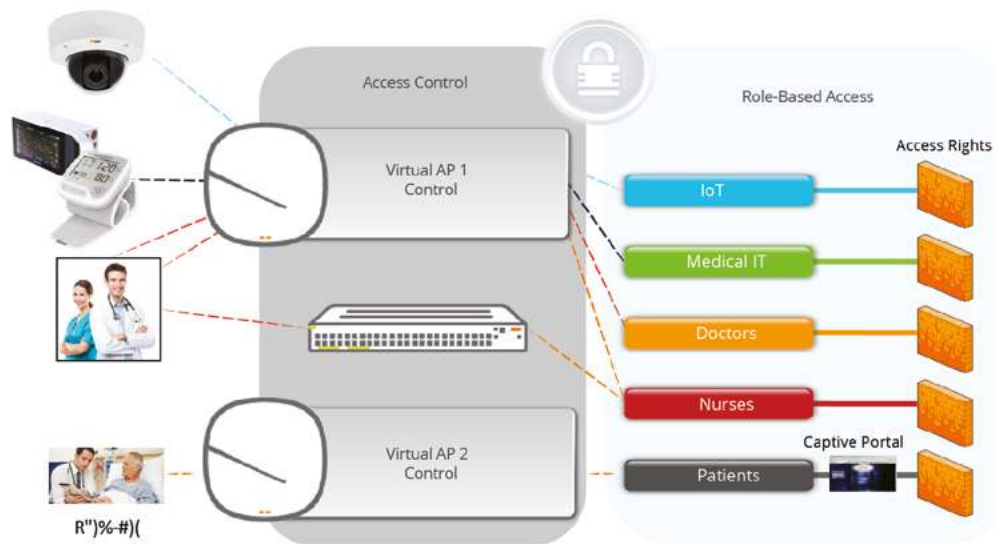
*Security & Compliance*



**CPDI**  
ENHANCED  
DISCOVERY /  
PROFILING



**CCPM**



**AirWave**  
HIPAA  
& Regulatory  
Compliance



# Patient Digital Experience

## Healthcare Challenges

*Fear of Impending Surge*

## Business Outcome

*Operational Excellence*

## Solutions

*Patient Digital Experience*

### Aruba Infrastructure



### Aruba Meridian



### Certified Ecosystem



- Enable location services
- Publish doctor information
- Health information and videos
- Access electronic health records
- Live appointment schedules, chat, and e-arrival options





# Crowd Management & Social Distancing

Healthcare Challenges

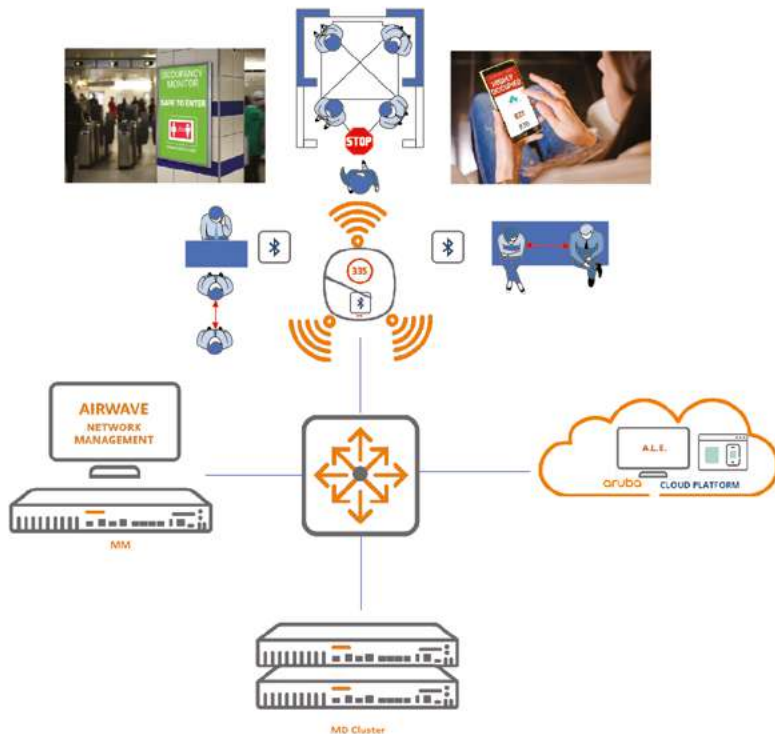
*Fear of Impending Surge*

Business Focus Area

*Social Distancing*

Solutions/Technology

*Crowd Management & Social Distancing*



ECOSYSTEM PARTNERS





# Touch-free Solutions

## Healthcare Challenges

*Traditionally Work Onsite*

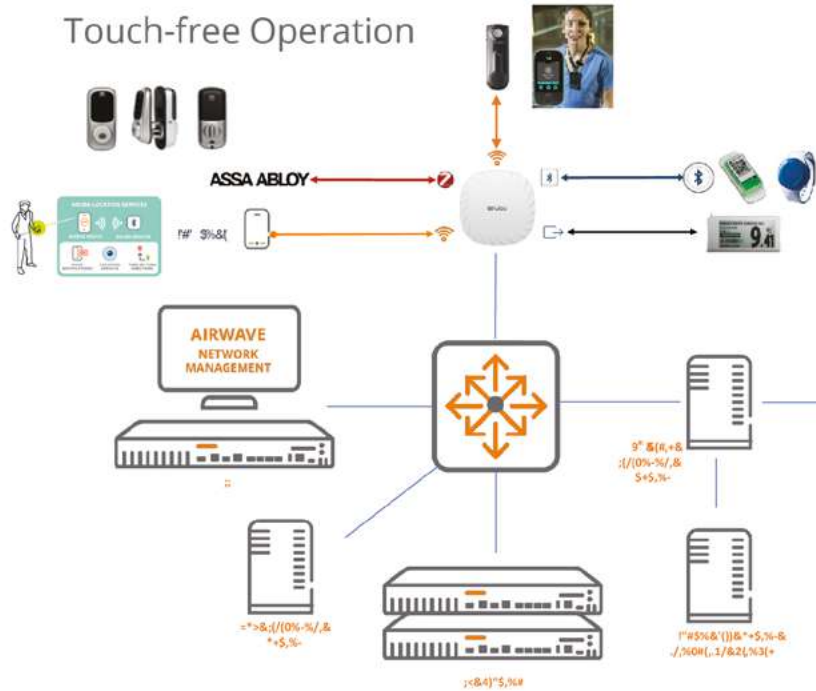
## Business Focus Area

*BCP, Essential Services*

## Solutions/Technology

*Crowd Management & Social Distancing*

### Touch-free Operation



- Supported use-cases:
- Hands-Free UCC
  - Asset Tracking
  - Location Services
  - Smart Door-Locks
  - Smart Sensor
  - Electronic Shelf Labels (ESL)

### Ecosystem Partners



### Wireless Technology



# Data Gathering & Processing

Healthcare Challenges

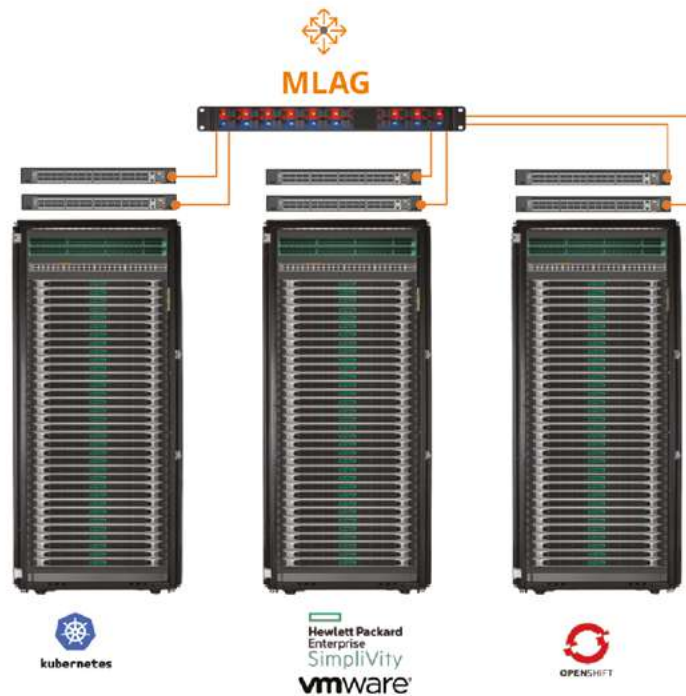
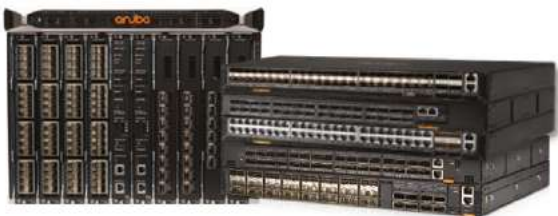
Business Focus Area

Solutions/Technology

*Revenue Growth & Costs*

*Operational Excellence*

*Crowd Management & Social Distancing (Wi-Fi, ALE, BLE)*



**Campus-Attached & Edge Data Centers**

Unified operating model for access-core-DC



**Top-of-Rack Switches**

High performance 10GbE 25GbE server networking



**Simple Leaf-Spine Architecture**

Simplified 25/100GbE aggregation for racks



Hybrid IT Compute, Storage, Cloud Opportunities and GreenLake



# Asset Tracking

## Healthcare Challenges

*Lack of Space and Supplies*

*Revenue Growth & Costs*

## Business Focus Area

*Operational Excellence*

## Solutions/Technology

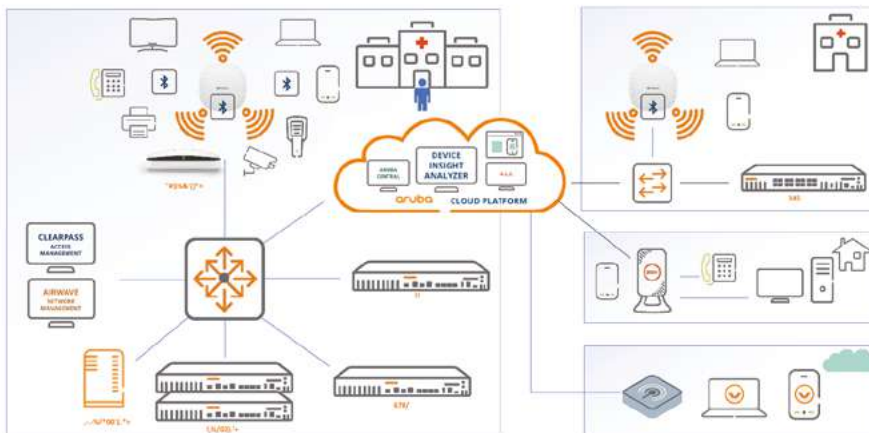
*Asset Tracking*





# Healthcare Solutions

- Pervasive and Guaranteed Connectivity, Anytime & Anywhere – Traditional Hospital, Remote Locations, Field Setups, and Mobile Ambulatory Services.
- Enterprise-grade Security Required to Maintain Security in Healthcare’s Critical Operation, Specially with Integrating On-the-fly Solutions for Crowd Management and Pandemic Response
- Patient Digital Experience that Help in Planning Visits, Support Social Distancing, Mitigate Patient Fears and Sustain Operational Excellence and Managing Surge
- Touch-free Setups and Social Distancing Crowd Management Ensuring the Well-being for Human Interaction and Sustaining Operational Excellence
- DCN Solutions Enabling Data Collection Operations Required for Analyzing New Ways of Treatment
- Asset Tracking Minimizing Costs and Guaranteeing Operational Excellence







**EDUCATION**



# Going Back?

## Stage 1

Crisis Management

**Business  
Continuity**

## Stage 2

Transition Back to New Normal

**Business  
Recovery**

## Stage 3

Operate in the New Normal

**Business  
"New Normal"  
Operation**



# Challenges & Needs



SAFETY



BUDGET



RESOURCES



OPERATIONS



FLEXIBILITY



CLOUD



PERFORMANCE



SECURITY



INSIGHTS



INNOVATIONS



# How can we help?

**Ensure Safe  
Campus**

**Extending  
Education Network**

**Simplify  
Operations**

**Maintain End-to-End  
Security**



**Ensure  
Safe  
Campus**



# Leverage Technology to Increase Efficiencies

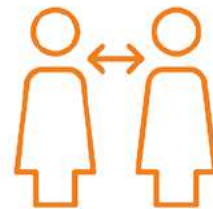
## Regaining Confidence

- Contact tracing for infected individuals
- Proximity violation notification
- Touchless visitor registration
- Fever monitoring



## Social Distancing & Compliance

- Real time and historical space utilization reporting and policy adherence
- Policy scenario modeling
- Building access control logs
- Location tracing of used/interacted spaces for sick person(s)
- Integration into LOB ticketing systems





# Which solution(s) are the right fit?





# (WIP) Contact & Location Tracing w/ Wi-Fi

During RTO



Aruba APs listen for users, Wi-Fi devices

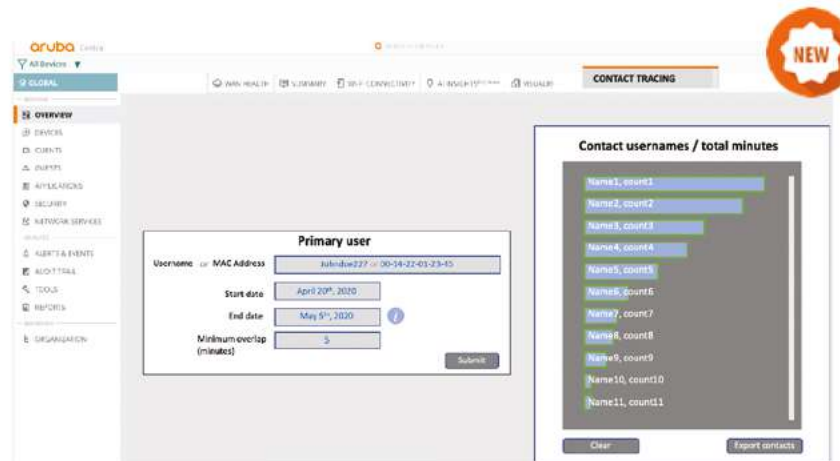
Central COVID UI tab



Central processes client association data ingested from Airwave\* or Central



At least 24 hours later HR informed of potential sick person

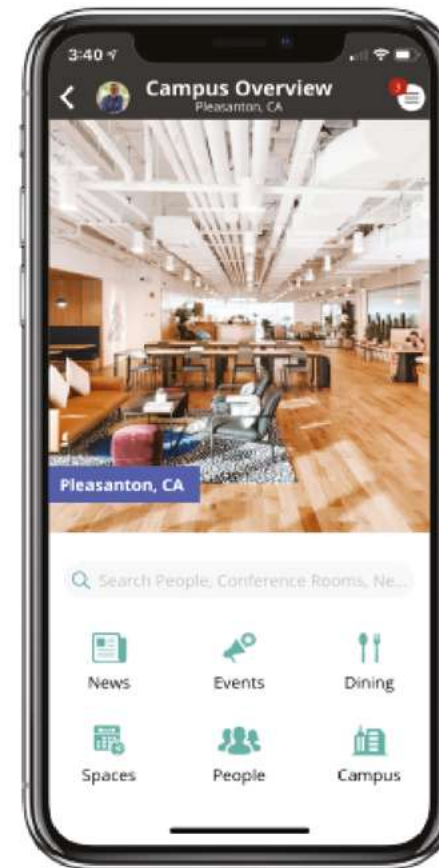
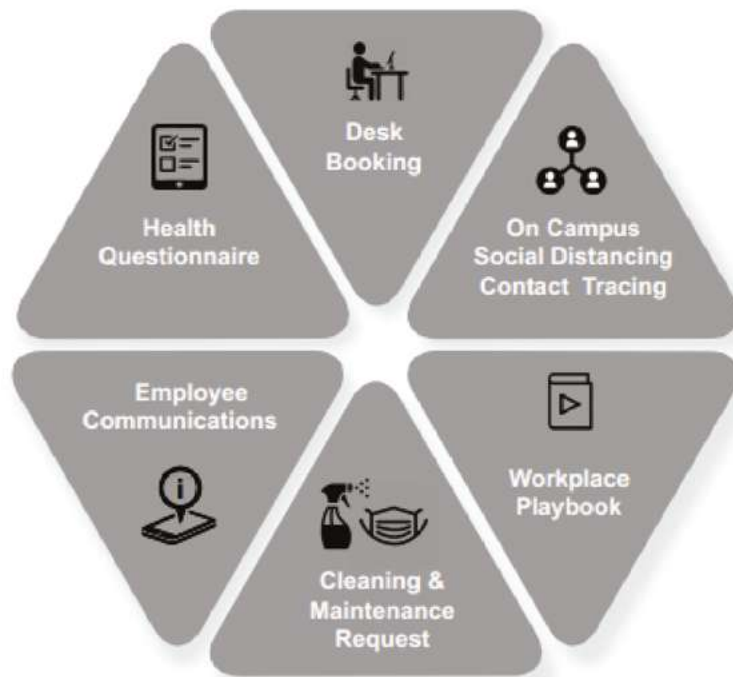


HR generates report of persons in contact (sorted by total contact minutes) with each infected person.

HR generates report listing dwell time at various AP/building locations for sick person. Enhanced cleaning can be focused on those areas.



# Ecosystem Partners

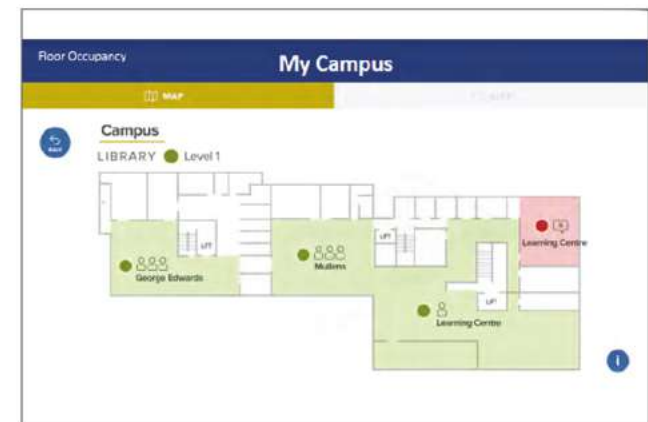
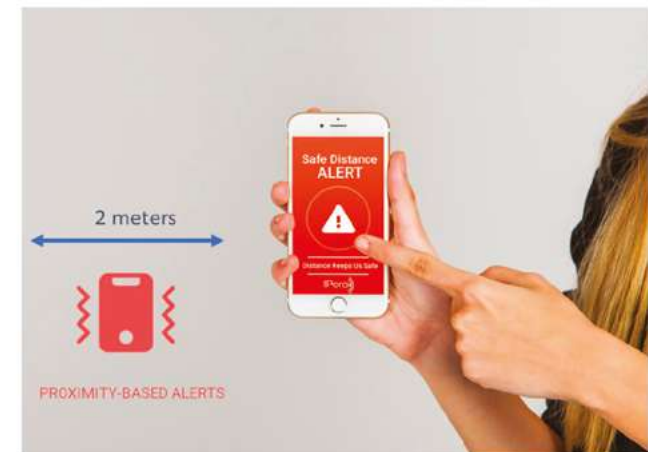




# Social Distancing & Contact Tracing

## Leverage Aruba Infrastructure to:

- Get real-time footfall & occupancy
- Enhance Employee & Visitors Safety
- Meet Local Regulations
- Contact tracing for infected individuals
- Proximity violation notification





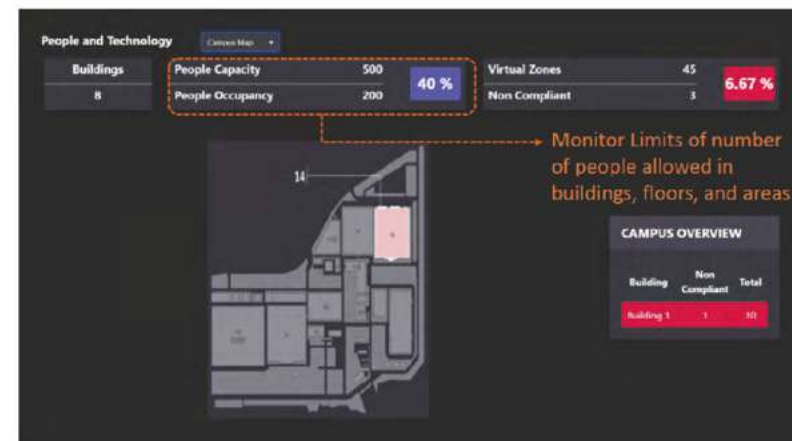
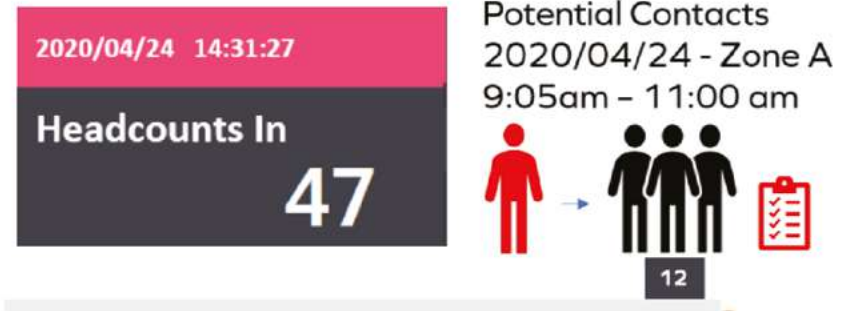
# Social Distancing & Contact Tracing

Leverage Aruba Infrastructure to:

- Enable Personal / Asset Tracking
- Ensure Compliance



AiRITSA Flow BLE Proximity Tags with Haptic Feedback



# Social Distancing & Contact Tracing



**CohuHD Non-Contact Thermographic and Facial Recognition Camera**

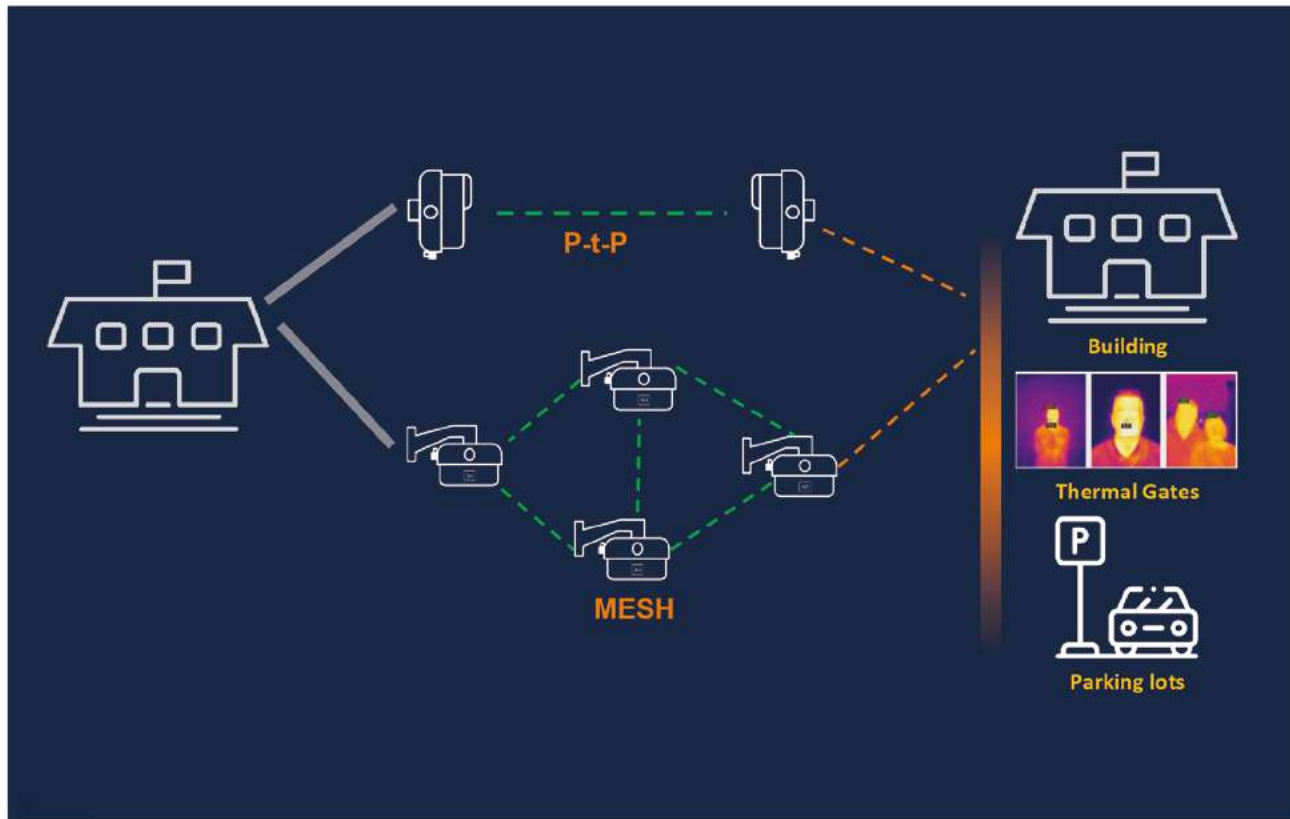


An abstract graphic design featuring several overlapping circles in shades of orange, red, and blue. A central area is filled with a grey halftone dot pattern. The text 'Extending Education Network' is written in white, bold, sans-serif font in the upper right quadrant.

# Extending Education Network



# Reaching New Limits without Cabling Hassle



Extending the network to new locations using controller-managed high performance wireless connectivity

- Point-to-point (Aruba AP-387)
- Meshed Network (Aruba outdoor APs)
- Extending network to support on-demand applications:
  - Thermal Screening/ Cameras
  - Touchless entries
  - Students Dorms
  - Parking lots
  - Etc.



# The Right Fit for Users & Sights

HARDWARE OR SOFTWARE VPN

CLOUD OR ON-PREM



## GATEWAY / SD-WAN

- Multi AP Roaming
- ZTP
- Multi uplink for failover
- Allow corporate and home Profile
- Secure wired ports



## IAP-VPN

- Multi AP Roaming
- ZTP
- VRRP redundancy
- Allow corporate and home Profile
- Secure wired ports



## REMOTE AP

- Single AP
- ZTP
- Corporate and home profile/SSID
- Stateful L2 failover with cluster
- Secured wired ports

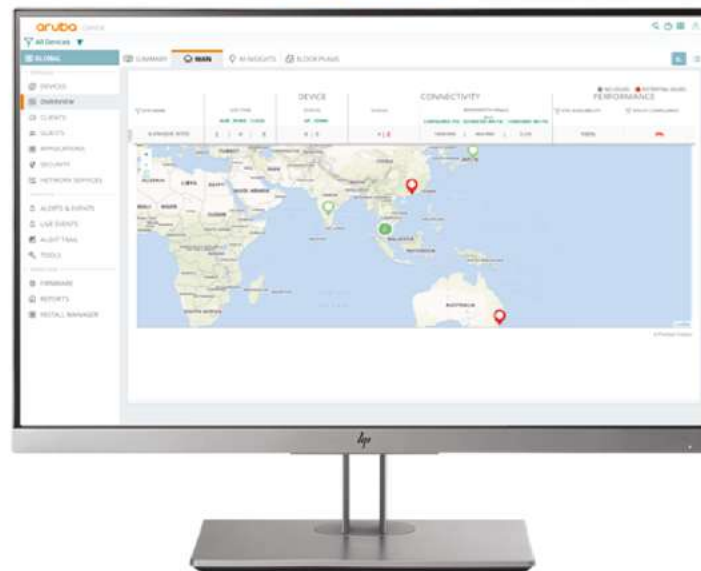


## VIA

- Cloud managed or On-Prem
- No Hardware to ship
- Users download the VIA client
- Works on most common OS

# What's new with Aruba Central?

ARUBA CENTRAL



LARGE CAMPUS



SD-BRANCH



REMOTE



PUBLIC CLOUD/  
DATA CENTER

An abstract graphic design featuring several overlapping circles in shades of dark blue, light blue, and grey. A central area is filled with a white halftone dot pattern. The text 'Maintain End-to-End Security' is positioned in the upper right quadrant of the dark blue circle.

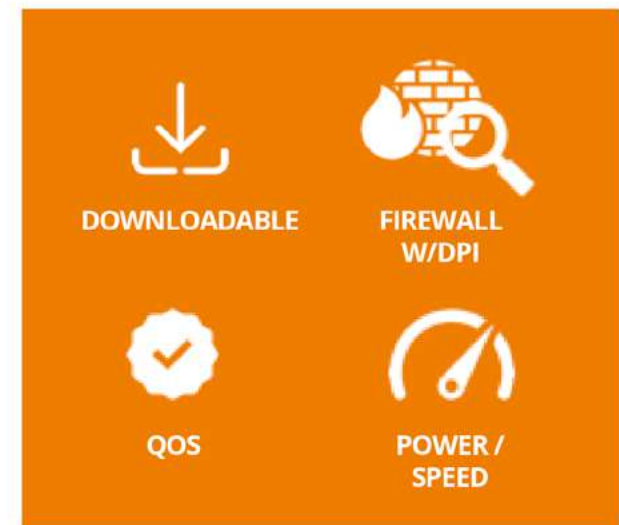
**Maintain  
End-to-End  
Security**



# Aruba ClearPass Dynamic Segmentation



**Context-aware Policies**

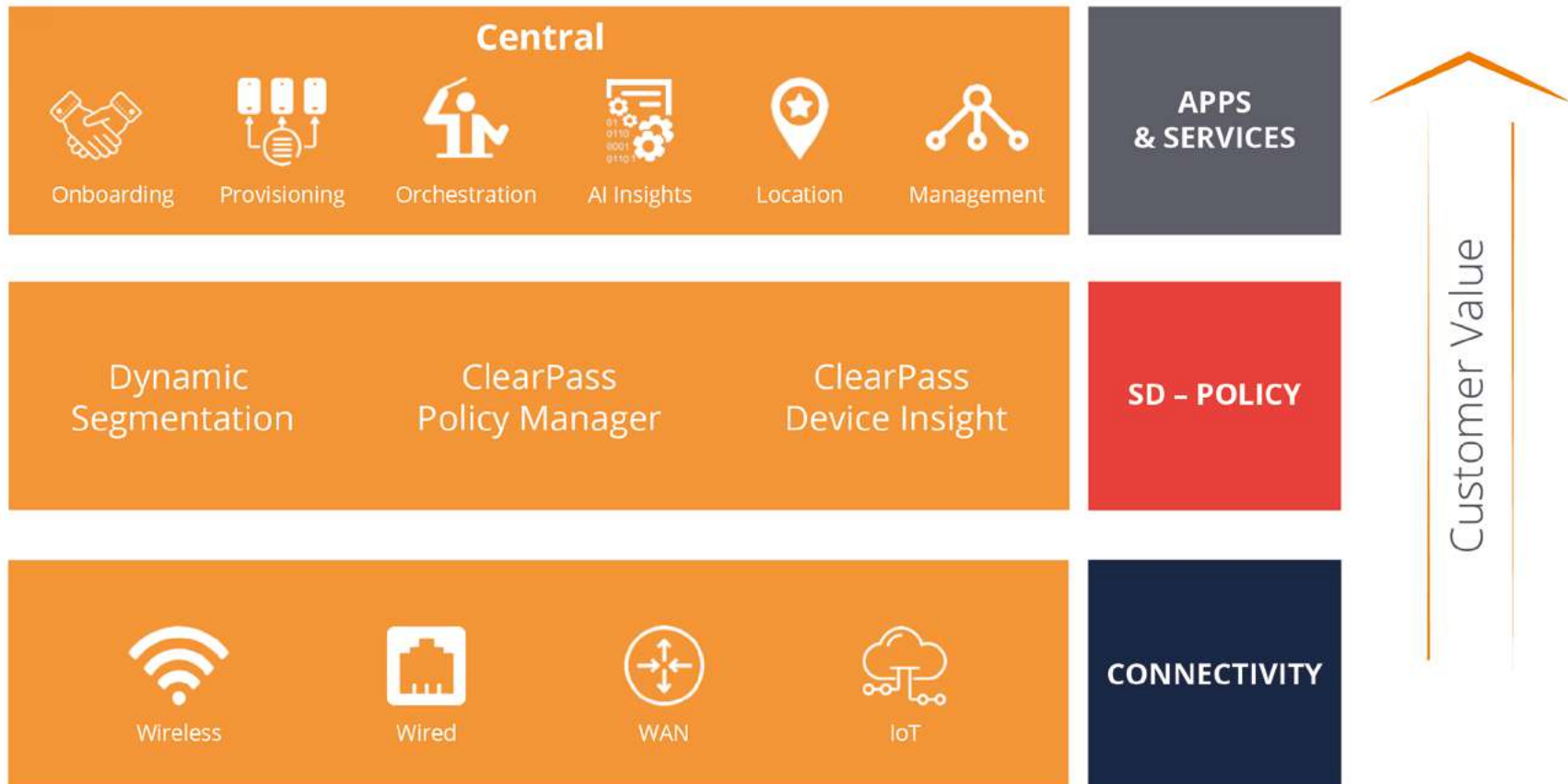


**Dynamic Enforcement**



**Simplify  
Operations**

# Aruba Edge Services Platform Architecture





# Assurance At The Edge

## FROM THE USERS' PERSPECTIVE



- Automated assessment of WLAN, LAN and WAN performance to internal and external apps from End-User Perspective
- Proactively Detect Issues
- Minimize Helpdesk complaints
- Ensure better quality of experience for students, faculty & staff for on-prem or cloud based apps



# PORTS & SHIPPING





# Use Cases In Ports & Shipping



SHIP-TO-SHORE-TO-SHIP  
CONNECTIVITY



AUTOMATING PORT  
ACCESS



BLE BEACON  
CONTAINER  
TRACKING



PORT MONITORING  
& ENABLEMENT



REAL-TIME PERSONNEL  
& ASSET SAFETY  
MONITORING



REAL-TIME INTEGRATED  
EMERGENCY RESPONSE  
& NOTIFICATION

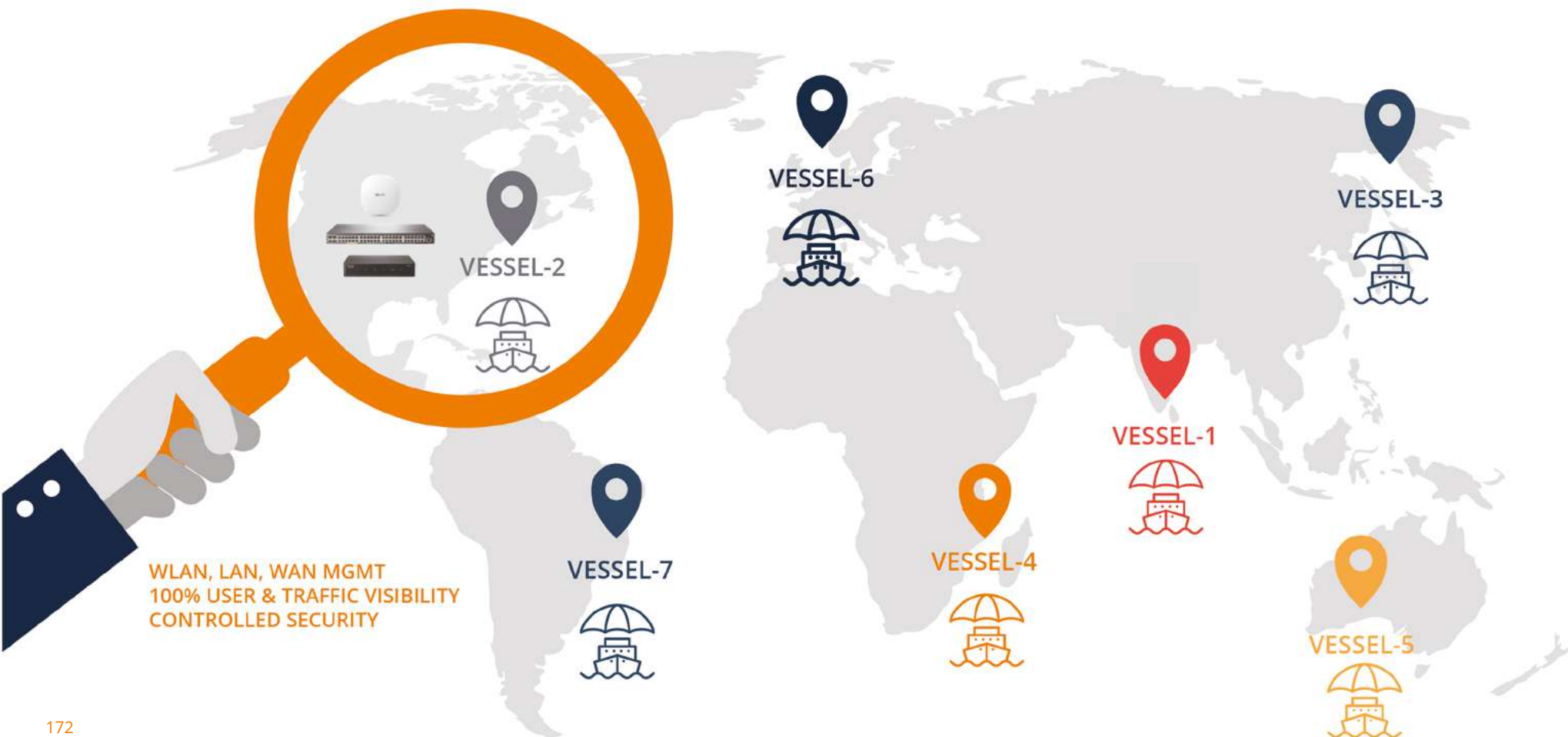


MIGRATING FROM  
BREAK/FIX TO PREDICTIVE  
MAINTENANCE

GREAT VALUE WITH SCALABLE INTEGRATION & VISIBILITY

# SINGLE-PANE-VISIBILITY

SD-BRANCH + VSAT

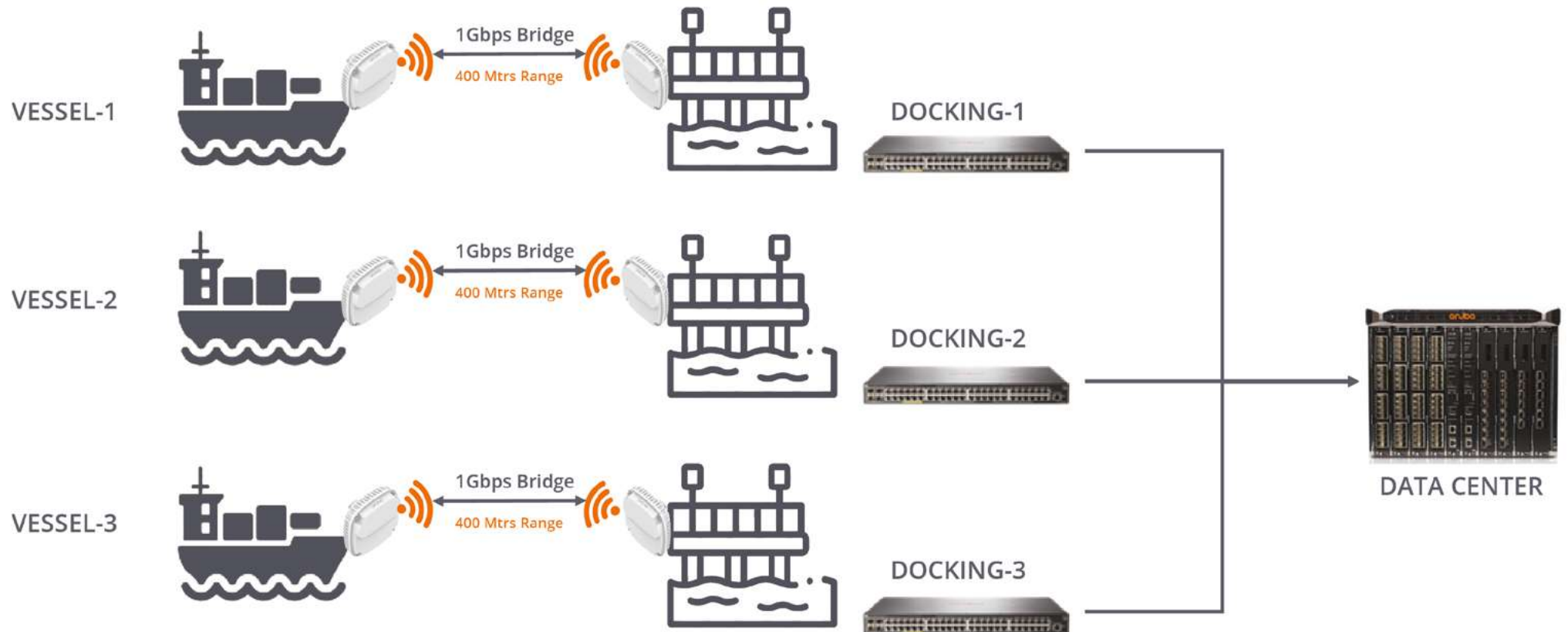






# Vessel Docking

## Connectivity Bridge





# BLE 5.0 Cargo Container Tracking

A BLUETOOTH LOW ENERGY (BLE) BEACON IS PLACED ON EVERY SHIPPING CONTAINER



- A container tracking system - right cargo is on the right ship
- The locations of all containers (e.g. Weight, size, port of loading, final destination) and current status
- Alerts if container is not placed in the right section of the terminal or if it is moved without permission.
- Reduce container dwell time and minimize repositioning costs, quickly identify delays and deviations,
- Set up automated alarms and alerts for proactive incident response.
- Tracking accuracy of 1 to 5 meters



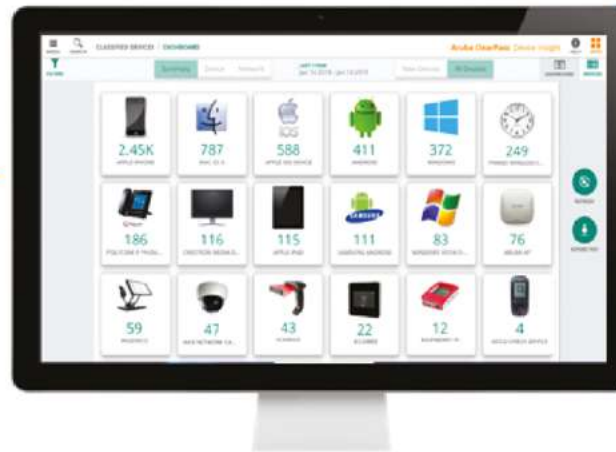
ZF Openmatics TAG IP69K, and are resistant to compressed water, rough treatment, and harsh weather conditions.



# Site & Vessel Wide IOT Visibility, Segmentation & Security

- 
- 
- 
- 
- 
- 
- 
- 
- 

CLEARPASS DEVICE INSIGHT  
ENHANCED DISCOVERY / PROFILING



OT SECURITY SYSTEM INTEGRATION



# Automating Port & Vessel Access





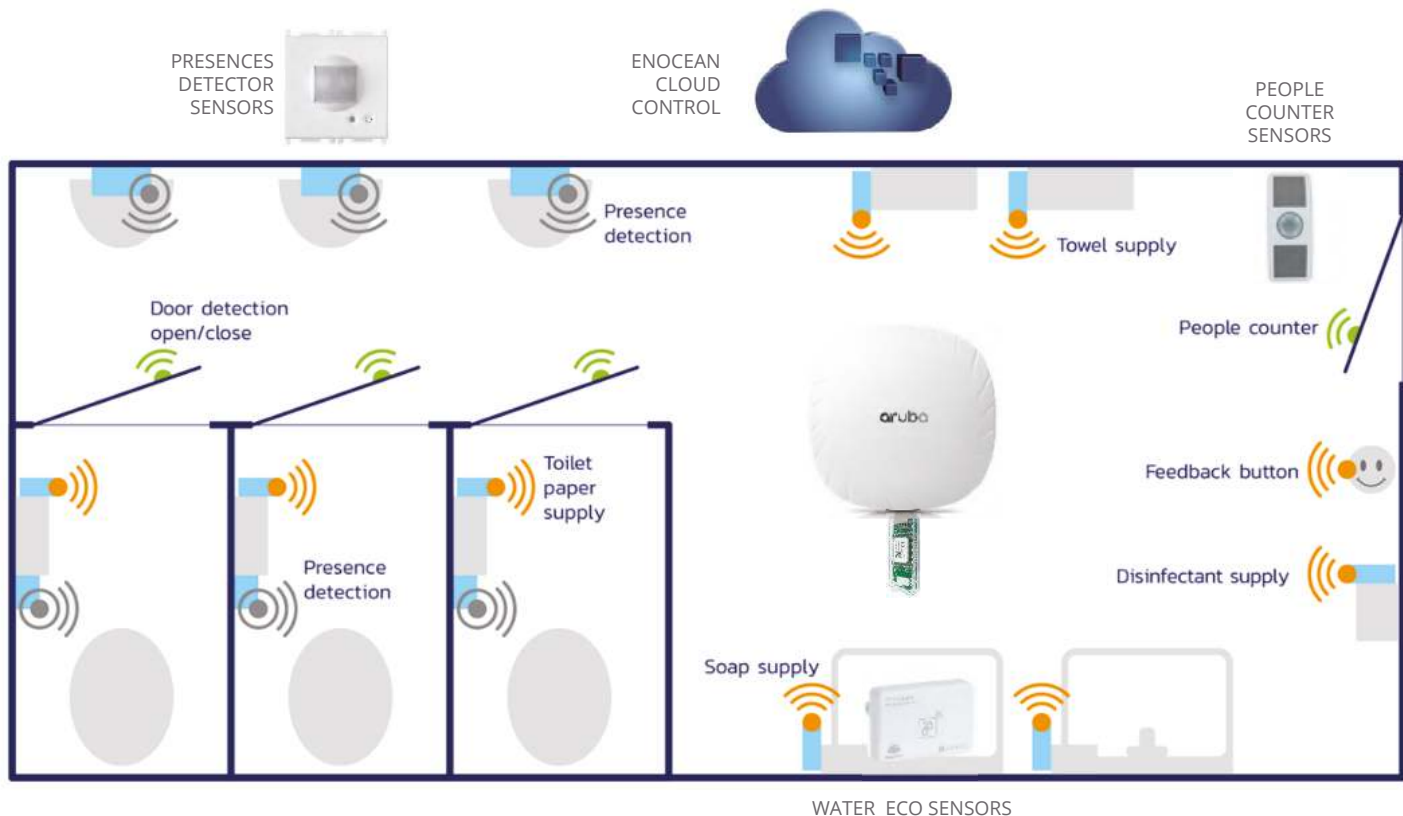
# Surveillance & Video Analytics



- PROACTIVE SURVEILLANCE WITH ANALYTICS
- AUTO CONFIGURATION AND POLICING OF CCTV CAMERA IN THE RIGHT ROLE AND ACCESS.
- DYNAMIC SEGMENTATION OF TRAFFIC FOR SECURED AND FAST CONNECTIVITY
- EXTENDING THE CONNECTION TO NO CABLE ZONE ALSO.
- CCTV INTEGRATION WITH GATE BARRIER SYSTEM
- CONNECT, PROTECT, ANALYSIS & ACT TECHNOLOGY



# Ports, Vessel Monitoring & Enablement



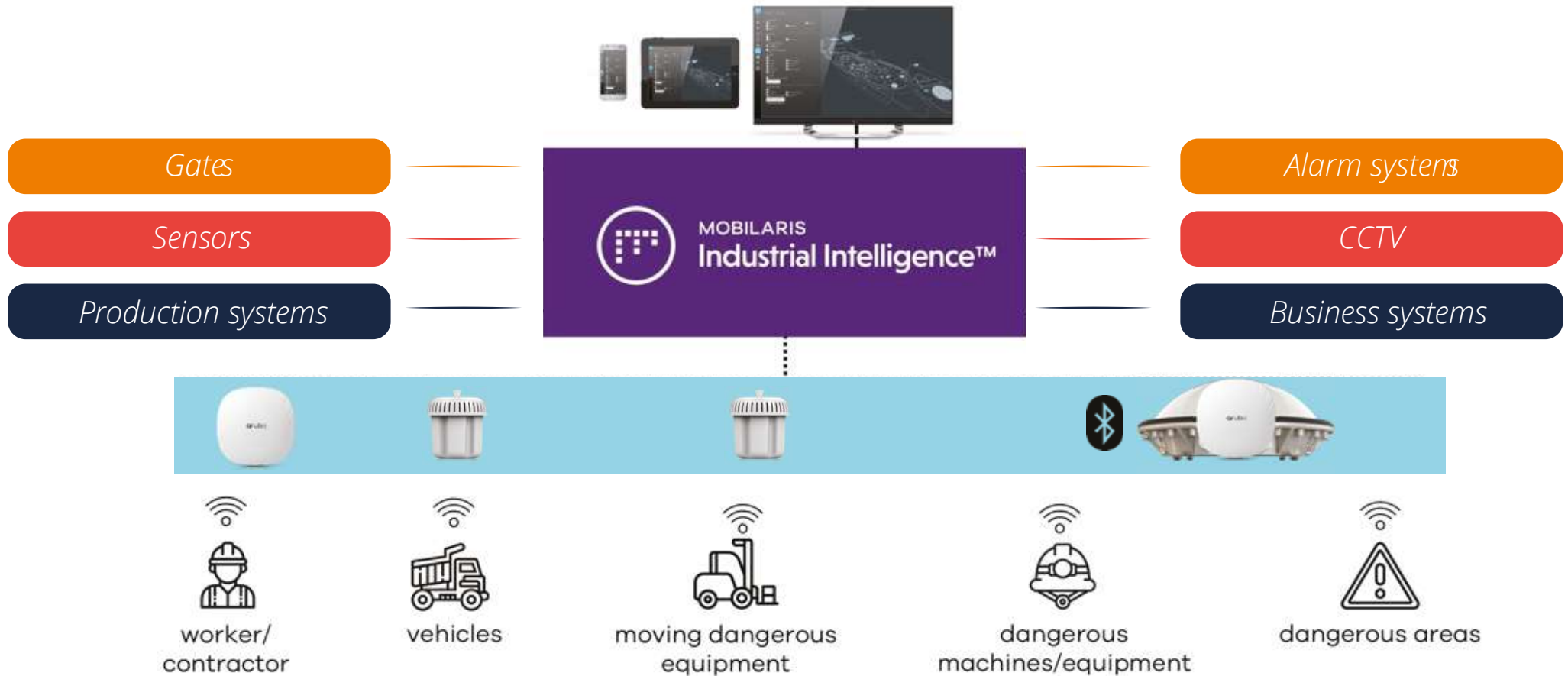
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ENOCEAN USB Stick the Networked Access Point receives the Sensor Data via EnOcean Radio.

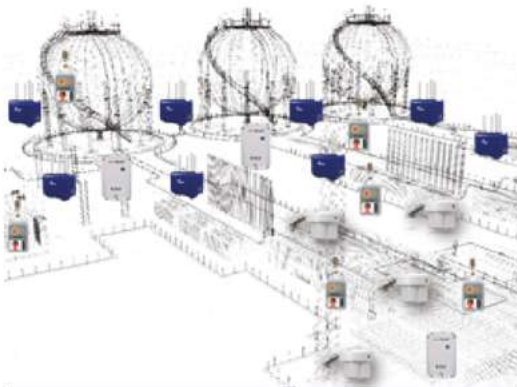
The Aruba access point sends the collected data to the Cloud.



# Real-Time Personnel & Asset Safety Monitoring

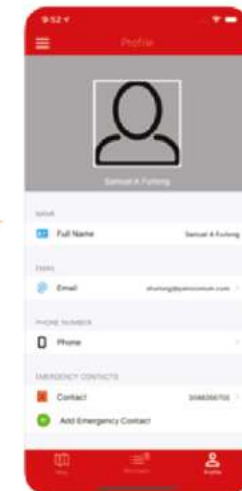
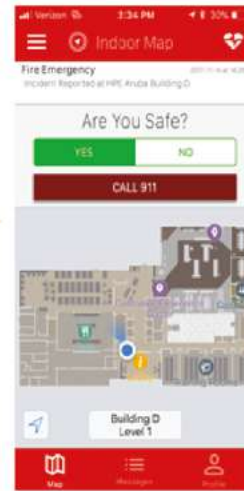
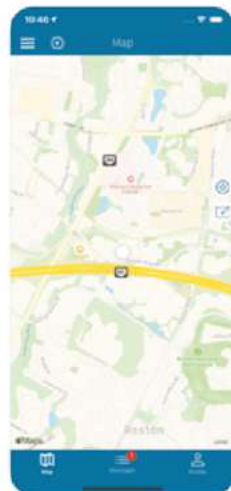
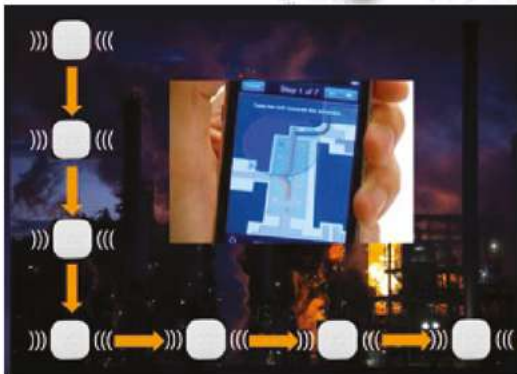


# Real-time Integrated Emergency Response & Notification



- EMPOWER USERS WITH SITUATIONAL AWARENESS INDOORS
- 4D VISUAL AWARENESS
- LOCATION BASED USER STATUS
- TARGETED COMMUNICATIONS
- RECORDING OF INCIDENT DATA

SAFE. ANYTIME. ANYWHERE.







# STADIUMS





# Driving Digital Transformation in Stadiums



## Ubiquitous, Connectivity

Aruba Wireless / Wired Infrastructure, DC facilities, Real Time Location Services, Technology Services (Consulting, Support, Construction Management)



## Re-invent User Experience

Smart Apps & Integrated Management Platform, Added-value Services / Wayfinding, Cashless Purchases



## Optimise Operations

Inventory management, resource optimization, revenue monitoring, digital campaigns, targeted ads, loyalty programs, Near real-time social media analytics



## Leverage Digital Media

Live Streaming / HD IPTV, Digital Signage, Digital Boards, Jumbo Screens integration



## Transformational Services

Business Workshops, Strategy & Roadmap, Architecture & Design, Integration & Implementation, Support Services, Managed Services, Financial Services



## Partner-driven Ecosystem

Integration of solutions and platforms from selected partners, such as VenueNext, Triple Play, Triple Jump Technologies



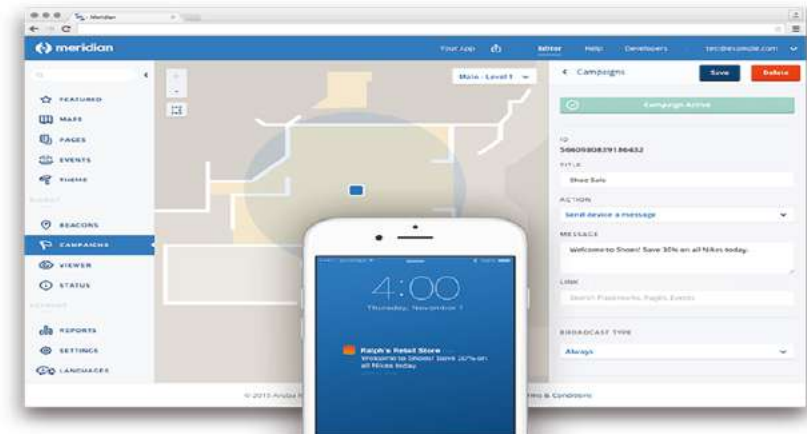
# Use Case

## Orlando International Airport

- **Personalize the Mobile Experience**
- **Self-Guided Wayfinding & Mapping**
  - Add directions & Points of Interest
  - Instant, real-time content updates
  - Location sharing for end users
- **Push Notifications**
  - Proximity-based customer engagement
  - Time & location relevant messaging



### Complete Ecosystem



- ALE – Presense Analytics
- Cloud-based Meridian Content Management System (CMS)
- Meridian Mobile App Platform (Meridian Editor, AppMaker, SDK, Location services)
- Aruba Beacons (battery or USB powered)



# Use Case

## Levi's Stadium

- Mobile App & Payments
- Tickets / eGates
- Security
- Wayfinding & Location Services
- Smart Notifications
- Loyalty Program
- Operations Dashboards
- In seat delivery / Seat upgrades








**17,000** to **203,000** fans.

**\$1.25 Million**

**\$125,000**

**5%**

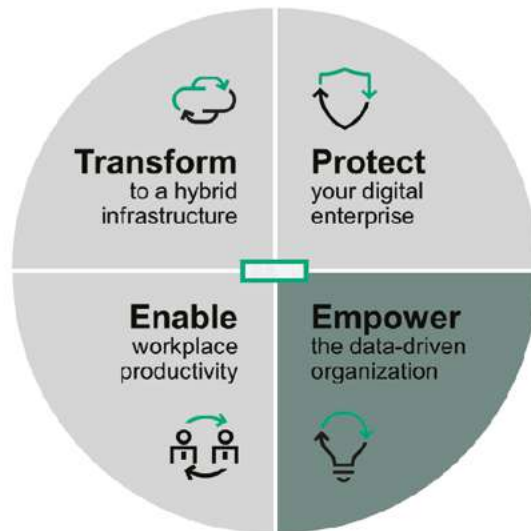
- Real-Time Data Management
- Food & Beverages
- Parking pass & Ticket scanning



# Use Case

## NASCAR

- **Social Media Analytics - Quickly understand social media activities**
  - Ready to react to fans sentiment
- **Enabled by HPE Big Data Solutions / HPE Autonomy / Unleash the power of text analytics**
- **Generate reports for key partners, sponsors, media partners, etc**



### Complete Ecosystem



- Run text analytics in near real-time from Facebook, Twitter and other media outlets
- Update reporting platform within 50sec after social media data are collected
- Launch marketing activities in response to fans reactions



# Redefine Experiences to Increase Revenue & Productivity

Case study: An improved fan experience drives revenue



## 95% fan satisfaction

Delights visitors with immersive connected experiences.

## Business flexibility

Enables event experiences beyond soccer.

### Edge-centric

- Large public venue consulting
- Edge networking expertise
- Network architecture and design

### Data-driven

- Fan experience ideation
- Experience architecture and design
- Edge solution integration with venue technology

### Cloud-enabled

- Data center infrastructure deployment and support
- Education and management of change

**Solution recipe**

# Realising the Digitisation Strategy



## Infrastructure & Basic Services

- Smartphone App
- Wired / Wireless
- RTLS / Wayfinding



## On-site Advanced Services

- E-services (restaurant, ticketing, merchandise)
- Digital Signage / IPTV



## Business Intelligence

- Venue Management
- Personalized Marketing
- Fans/Wireless Analytics



## Off-site Advance Services

- Social Media Analytics
- Loyalty Programs
- Online betting



# AVIATION





# The Many Faces of Airport Operations IoT

Class 1 Division 1

Gateway

Converged IoT System



Switching



Cellular Backhaul



Small Site



Ruggedized



Aircraft



PHY And/Or Protocol Converters



Native Ethernet



Native Wi-Fi



Power Line

Twisted Pair

BLE

RF



# Gateways, Converged IoT & Analytics



Microsoft Azure IoT Certified

EL10/EL20  
Gateways

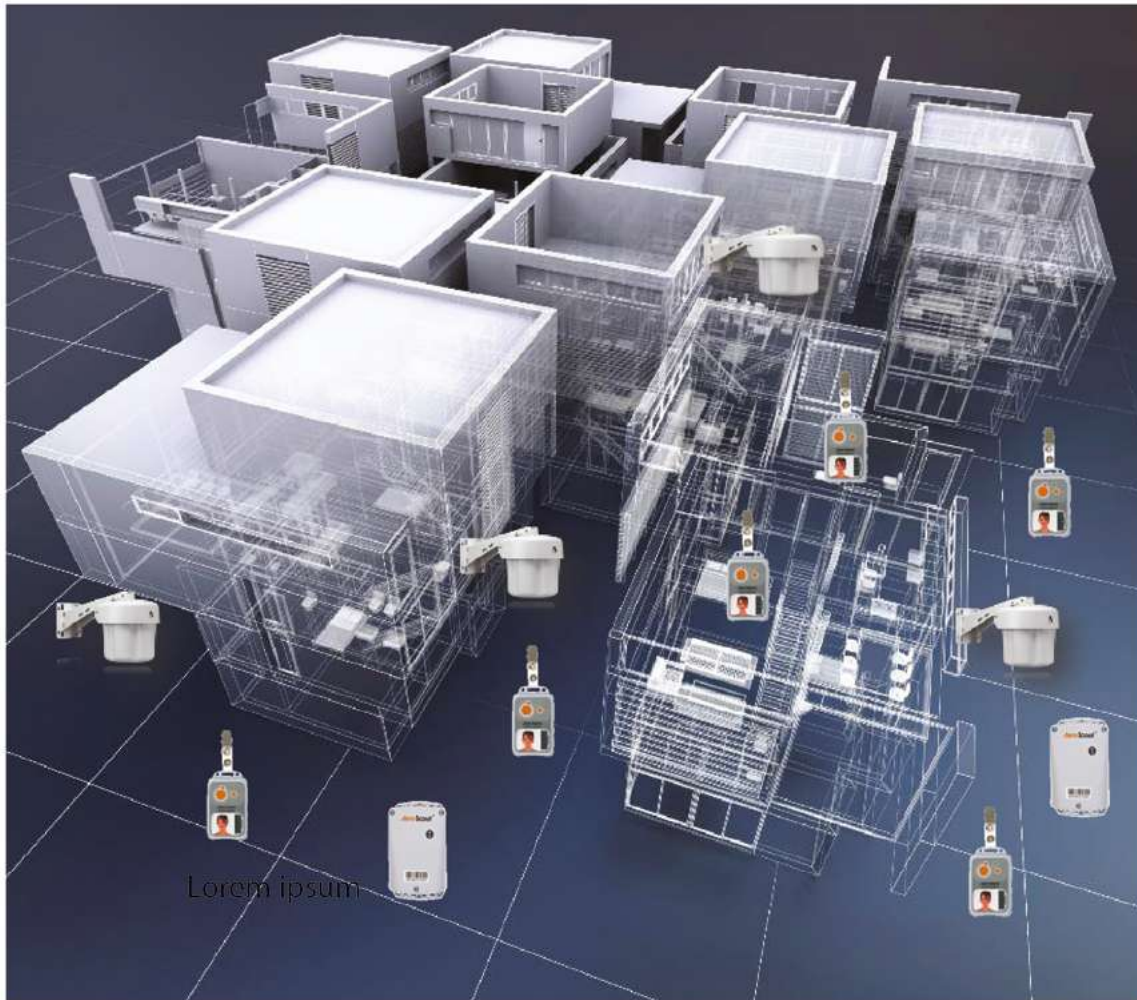
EL1000/EL4000  
Converged  
IoT Systems



- Powerful Edge Processing
- PXI Sensing & Control Interface
- Lights-Out Management



# Use Case: Asset Tracking



- **Active Wi-Fi tags track personnel and assets**
  - Wi-Fi personnel tags with man-down alert
  - Wi-Fi asset tags
- **Improves operational efficiency, helps direct first responders**
  - Shows who is where



# Use Case: Personalized Traveler Services



## Services:

On-line information assistance and chat, reserve business center rooms, request translation services.



## Club Services:

Reserve lounge services (showers and massage), wheel-chair requests, order quick-turn dry cleaning.



## To-The-Seat Food Service:

PCI-compliant mobile PoS, capture signatures, wirelessly monitor food storage temperatures for safety compliance.



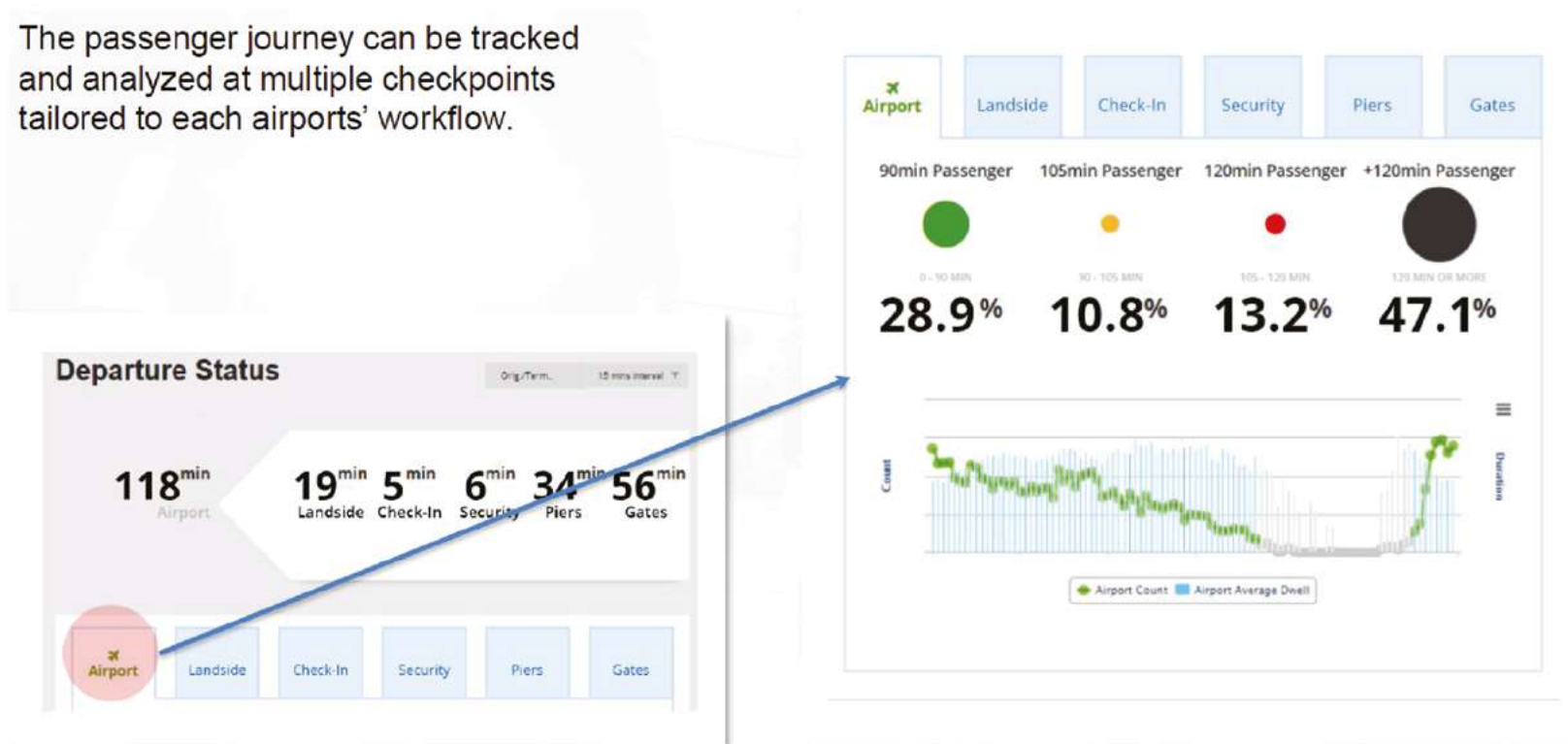
## Maintenance:

Quickly find closest personnel, wirelessly monitor building systems, send photos/video of repairs to archives, enable VoWiFi and IM.



# Use Case: Passenger Journey Analysis

The passenger journey can be tracked and analyzed at multiple checkpoints tailored to each airports' workflow.





# On-Boarding & Access Control:

## Class 1 Division 1 explosion proof Wi-Fi

- Reaches IoT devices in even the most hazardous locations

## 802.11ac 3x3 MIMO

- Handles telemetry, voice, video

## Skype for Business certified

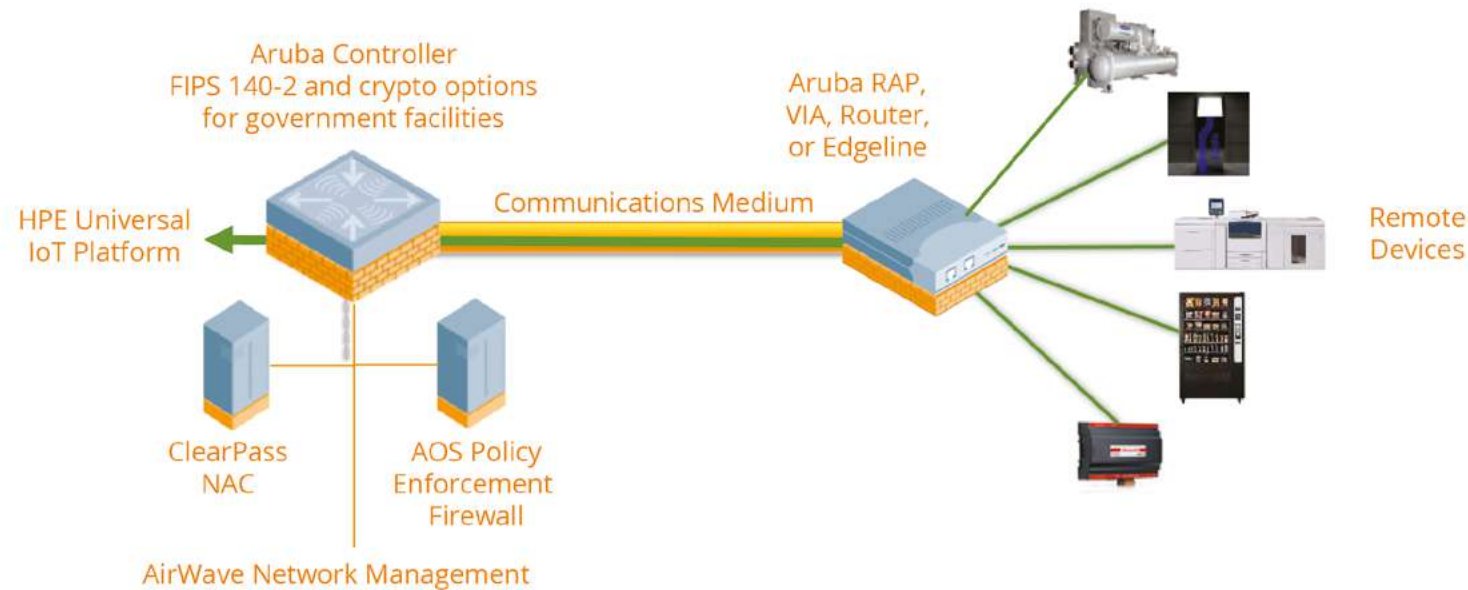
- Unified communication ready

## Cloud management option

- Zero-touch configuration with remote diagnostics and maintenance - no local IT expertise required



# Use Case: Fault, Alarm, & Telemetry Monitoring



- Scales from small municipal facilities to the largest international airports
- Broadband and cellular
- Security solutions for both commercial and government sites



# Use Case: Let In-Flight Services Take Off

Flight-qualified 802.11ac secure Wi-Fi (from partners) enables a broad range of innovative services:

- Internet access and multimedia entertainment including BYOD-only
- Flight crew documentation, flight plans
- Maintenance reports and e-manuals
- Catering and cleaning crew updates
- Telematics and telemetry
- Credit card (PCI) transactions

Lufthansa Technik

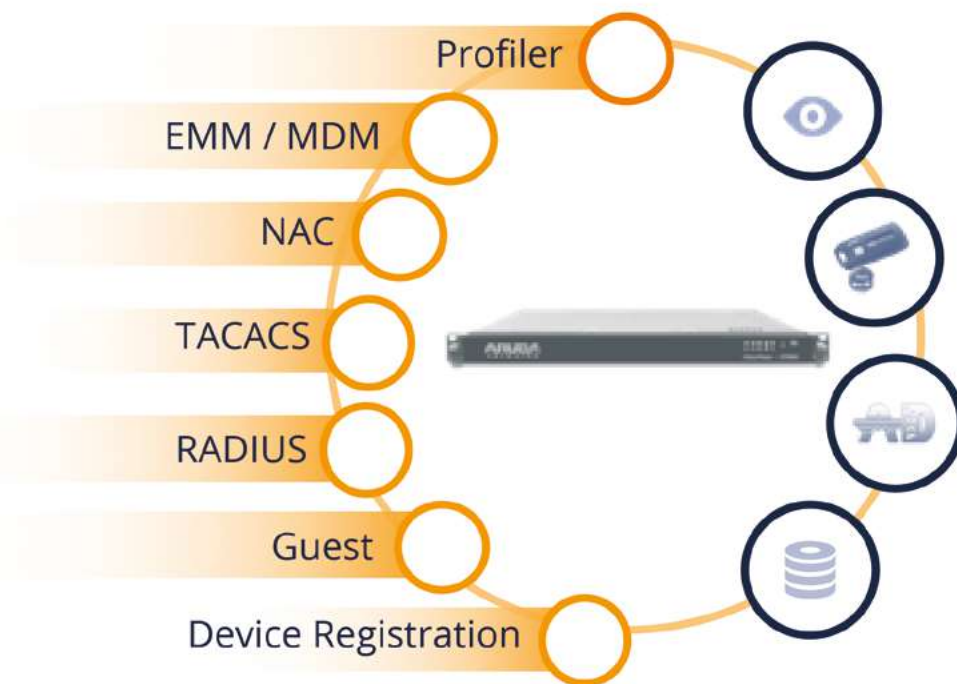


Telefonix

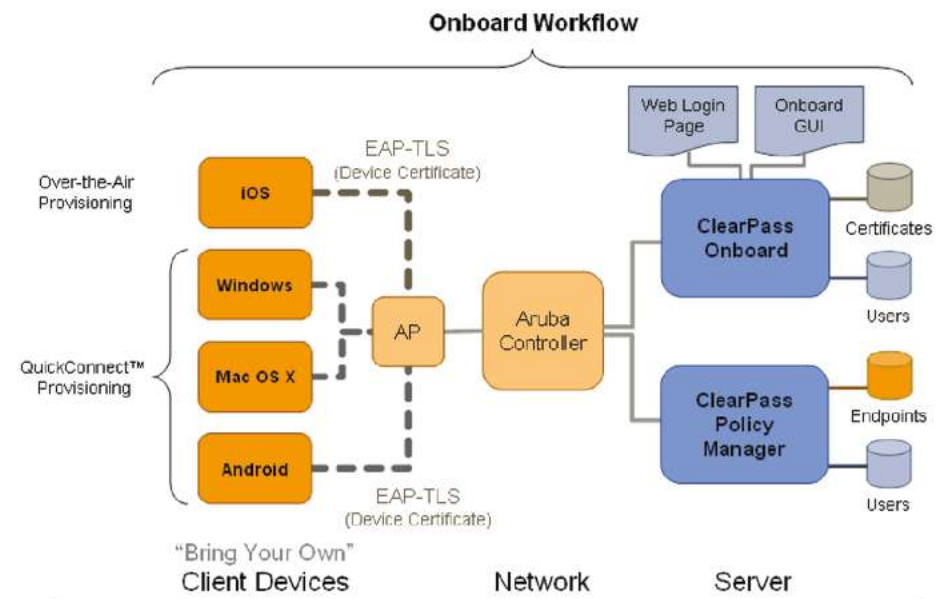
# Use Case: On-Boarding & Access Control

Devices, Employees, Contractors

## UNIFIED POLICY



## WIRELESS and WIRED SECURITY



# Use Case: On-Boarding & Access Control:

## Profiling

Fingerprints/classified devices as they connect to the wired, wireless, or remote access networks to differentiate between device types and to detect impersonators. Must be supplemented with identity, context, and posture to deliver full protection.

## Identity

Device MAC addresses can be spoofed so identity of headless devices needs to be supplemented with strong authentication protocols (like 802.1x) and contextual data such as location, time of day, day of week, and current security posture to provide more granular role based access control.

## Posture

Device health check based on interactive interrogation of the device to determine known vulnerabilities, active ports, OS version, SNMP security, and openssl vulnerabilities. Known good devices may be denied access if the posture is sub-standard. Posture needs to be routinely verified to ensure compliance.





# Use Case: Hazardous Location Communications

- **Class 1 Division 1 explosion proof Wi-Fi**
  - Reaches IoT devices in even the most hazardous locations
- **802.11ac 3x3 MIMO**
  - Handles telemetry, voice, video
- **Skype for Business certified**
  - Unified communication ready
- **Cloud management option**
  - Zero-touch configuration with remote diagnostics and maintenance - no local IT expertise required





# Use Case: Facility Services Integration

Baggage Tracking

HVACR,  
Lighting,  
Security

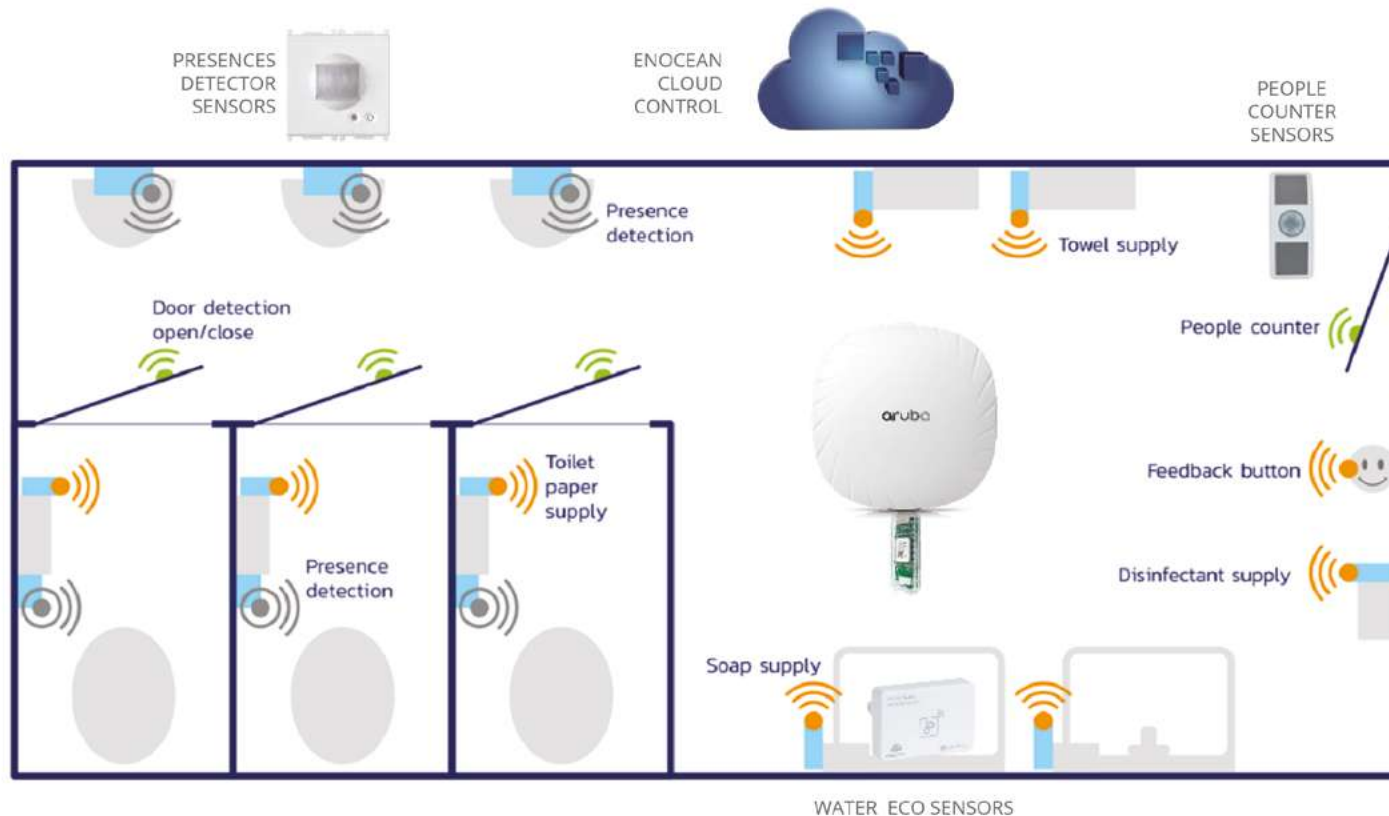
UCC Data,  
Voice,  
Video

Facility Analytics





# Facility Utilization Management



Sensors Collect Data and Send them to the EnOcean USB Stick

ENOCEAN USB Stick the Networked Access Point receives the Sensor Data via EnOcean Radio.

The Aruba access point sends the collected data to the Cloud.

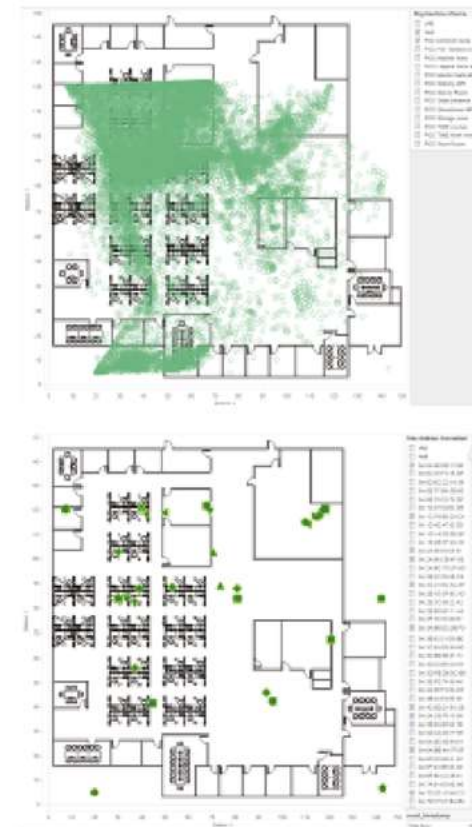
# Use Case: Facility Services Integration

- **Aruba's Analytics & Location Engine observes traffic flows, geofence triggers, Web activity**

- Monitors behavior so you can influence it in real-time

- **Analytics engines like Vertica can mine these data for insights**

- Effectiveness of marketing campaigns
  - First responder area occupancy
  - Staff-to-guest ratio imbalances
  - Sensor-less HVAC control
  - Maintenance optimization



# Use Case: Monitoring & Analytics:

## Universal IoT Platform



FEATURES	CORE BASELINE	OPTION	MODULE
Managing devices and services	Yes		DSM
Uplink and downlink data acquisition	Yes		NIP
Data acquisition and validation	Yes		DAV
APIs exposure	Yes		SGF PRM
Advanced dashboard	Yes		Console
Relational database	Yes		EDB
Dashboard designer		Yes	Console designer
Analytic columnar database		Yes	Vertica
Alarms handling and correlation		Yes	TeMIP/UCA
Micro service design and execution		Yes	SIS

- **IoT device data acquisition, monitoring, alarm handling, service management, analytics**

- Integrates diverse IoT devices using different device communication protocols
- Reduces dependency on legacy silo solutions

- **Integrates with Aruba infrastructure and devices connected by fixed/mobile networks**

- GPRS (2G and 3G), LTE 4G, and low throughput networks like LoRa



# Use Case: Rapid Deployment Solutions for Disaster Recovery

Takes just minutes to deploy  
high-speed 3x3 MIMO 802.11ac

Built by Aruba partners, solutions  
are highly customizable: fly-away  
cases, standby power, MIL-STD  
mounting, FIPS 140-2,  
switching/routing

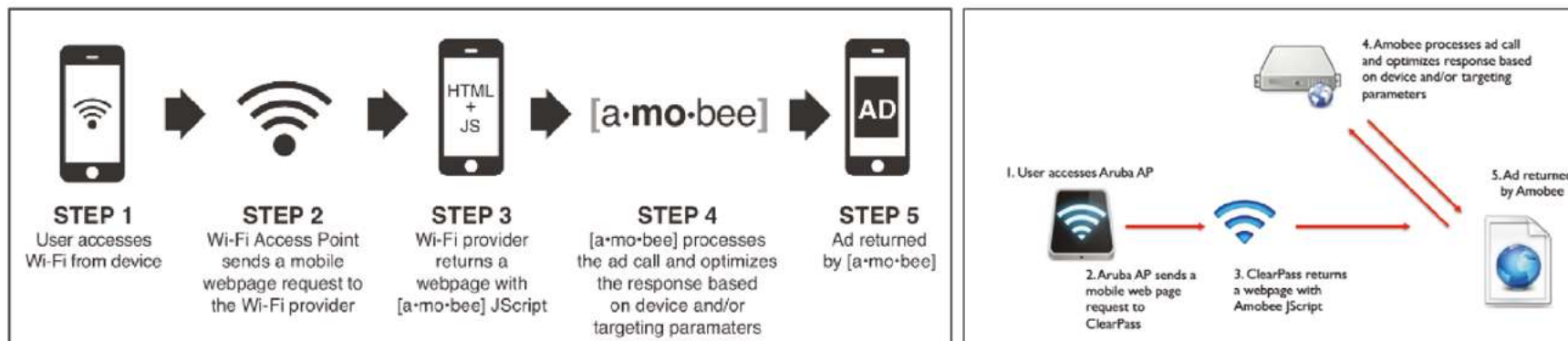
Optional cellular backhaul

Optional cloud management



# Use Case: Monetization

- Drives new, high-margin revenue via targeted advertising.
- 70% of click-through revenue goes to the network owner.
- Leverages ClearPass guest registration, self-service, and log-in pages.
- Works with smartphones, tablets, laptops, and PCs
- Requires no network changes or capital investments
- Programmatic bidding via an advanced mobile real-time bidding (rTb) engine.
- Automated demand and supply pricing requires no manual intervention.
- Up to 50% higher effective yield per thousand impressions (eCPMs).
- Hyper-local, highly targeted ads to increase overall value. Leveraging context aware campaigns.



# Use Case: Bluedot navigation & push notification



Battery powered  
Aruba Beacons

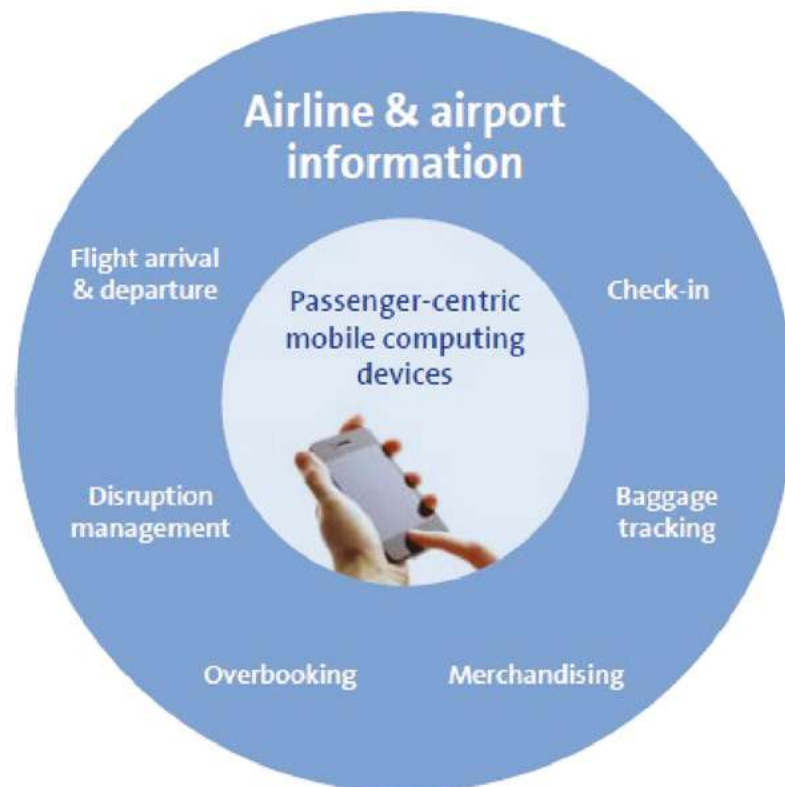


USB  
Aruba Beacons





# Personalize the Airport Experience



- Context-awareness promotes the right airline, club, and retail service to the right traveler at the right time
- Tailor services to each traveler to boost spend and satisfaction
- Network quality of service will follow in lock-step with the services and applications in use



# PUBLIC SECTOR & SMART CITIES





# Challenges for Public Sector & Smart Cities

## Challenge # 1

IoT systems are vulnerable to attacks that can wreak havoc on transportation systems, public safety, and city infrastructure.

## Challenge # 2

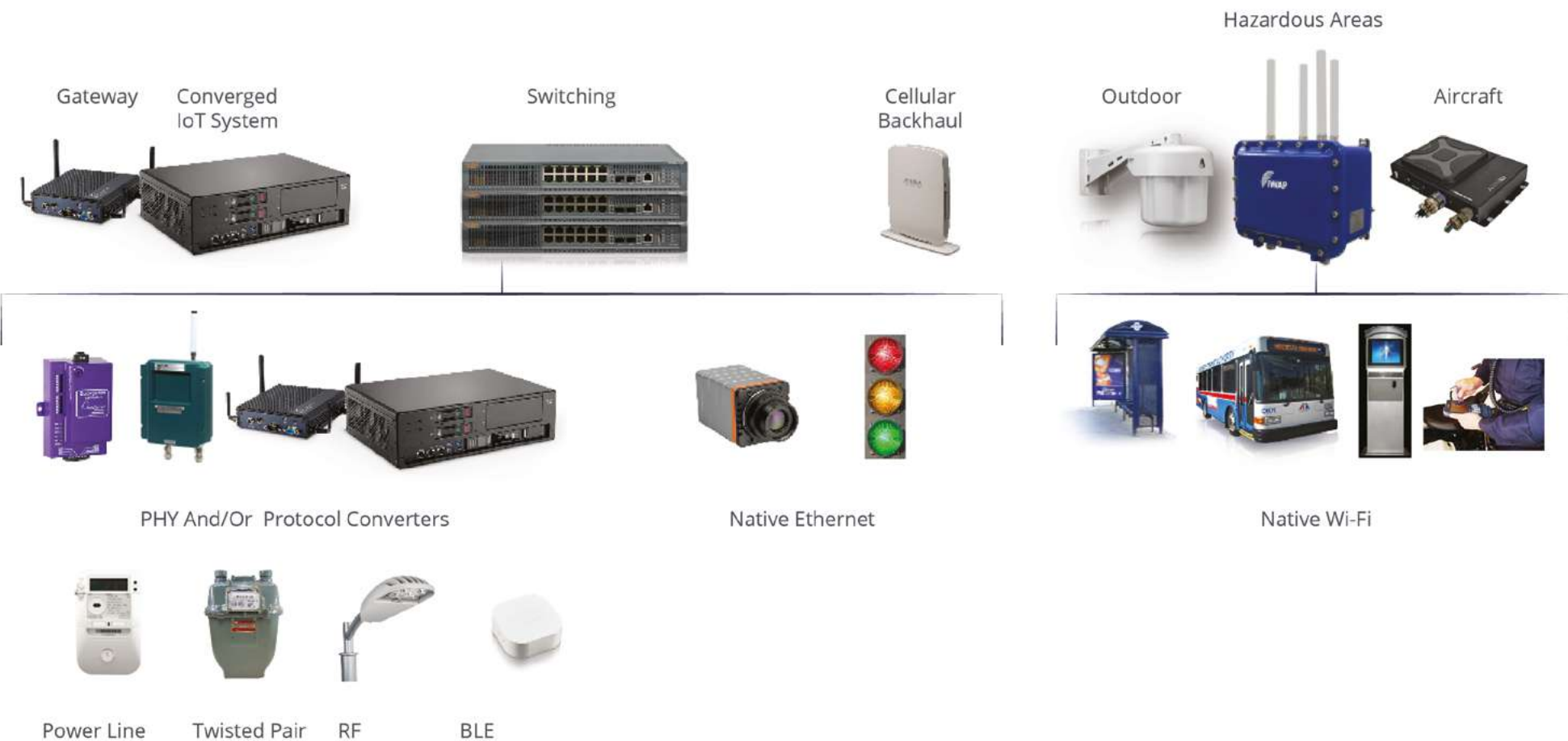
Communicating with IoT devices that are fixed and mobile, densely congregated and remotely dispersed, in hazardous areas and exposed to the elements.

## Challenge # 3

Legacy IoT devices have to be supported, protected, and monitored side-by-side with the newest street lighting, intersection controls, SCADA, and mobile devices.



# Aruba Connectivity Offering







# Use Case: Hot Spots That Blend In



- **Ultra high performance outdoor Wi-Fi that blends into any setting**
  - Enables hot spots even in architecturally sensitive areas
- **Cloud management option for zero-touch deployments using unskilled labor**
- **Third party power over fiber option from operates over 3km**







# Use Case: Hazardous Location

Communications Fuel refilling, generator-standby, vehicle depots

- **Class 1 Division 1/2 explosion proof Wi-Fi to reach IoT, voice, video devices in even the most hazardous locations**
- **Skype for Business certified**
- **Cloud management option with zero-touch provisioning  
ISA100a/WirelessHART option**





# Use Case: High-availability, high-speed, point-to-point links

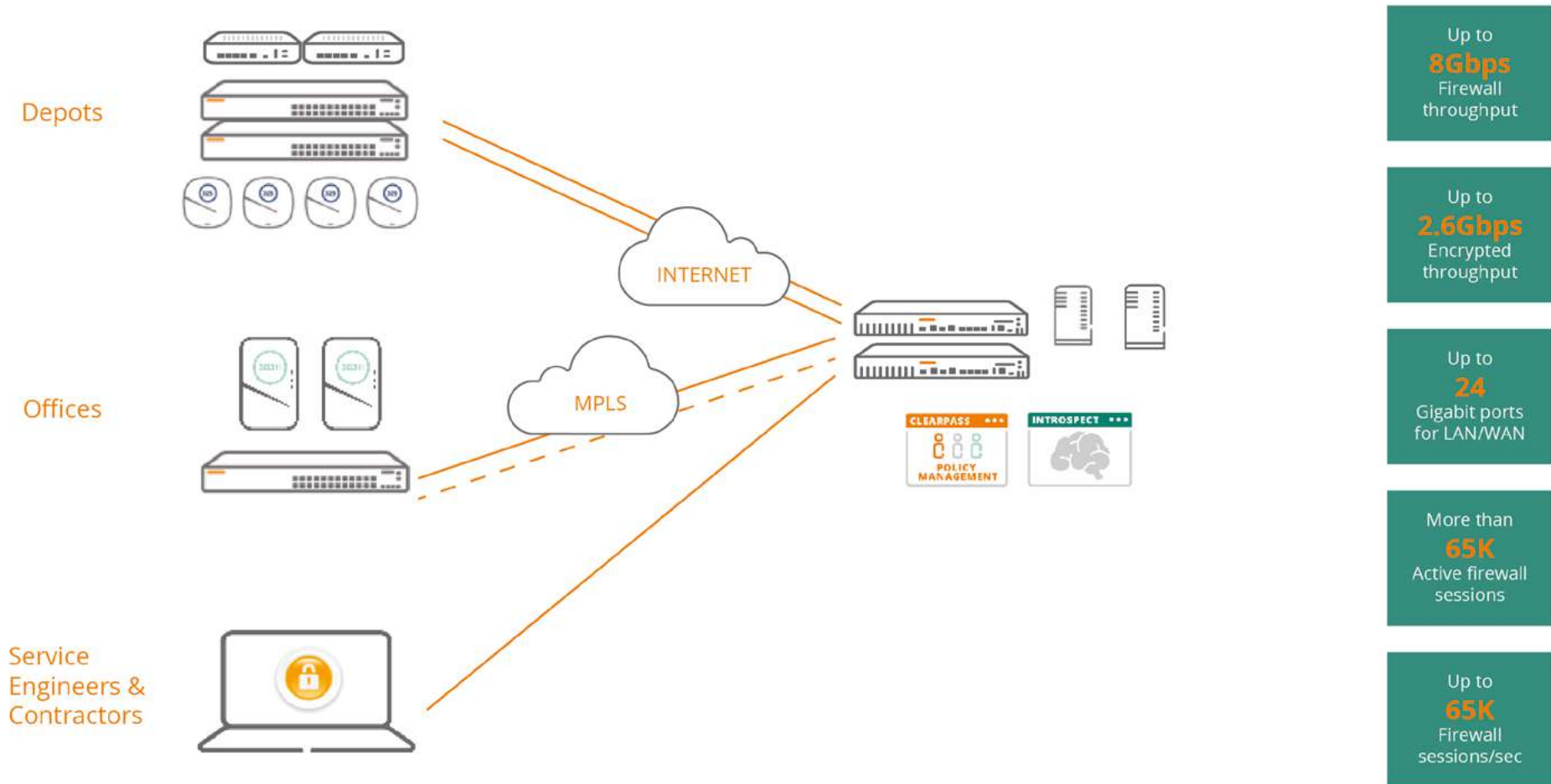


- **Delivers up to 3.37Gbps over-the-air throughput up to 400m (1/4 mile)**
  - Send IoT telemetry, video surveillance, unified communications
- **Intelligent fallback design with dual 802.11ad/80211ac radios**
  - 60GHz 802.11ad and 5GHz 802.11ac provides fallback/ failover in inclement weather
- **Self aligns with no delays or skilled labor required**





# Use Case: Secure SD-WAN for Depots, Offices & Contractors





# Use Case: Video Surveillance



- Aruba wireless video links can significantly cut the time and cost of installation versus trenching and conduit
- Ideal for point-to-point, point-to-multipoint, and mesh video, security, and access control applications
- Third-party power-over-fiber option allows the power supply to be located 3km away





# Use Case: Air, Gas & Toxic Hazard Detection

- **Monitor portable gas detectors at waste water and storage facilities**
  - Safer for workers than non-communicating handhelds
- **Defend against bio-weapons with chemical agent detectors**
  - Wi-Fi enables relocation as needed by threat conditions





# Use Case: Municipal Lighting & Traffic Control

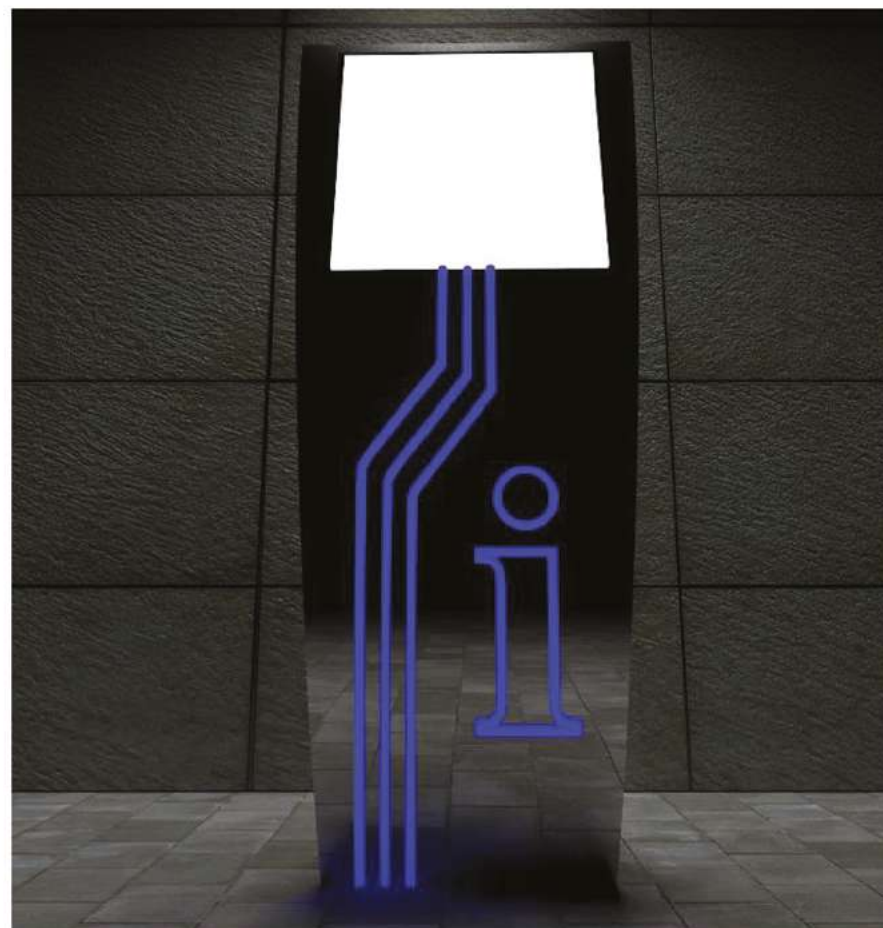


- Outdoor Wi-Fi interfaces with popular street lighting systems
- Enables remote monitoring and control without trenching or cable pulling



## Use Case: Smart Kiosks

- **Information, mass transit passes, advertising, parking passes, public safety**
  - With or without wireless hot spot
- **Aruba remote access solutions securely deliver data, voice, content, and PCI compliant credit card transactions**
  - WAN with cellular back-up





# Use Case: Rapid Deployment Solutions for Disaster Recovery

Takes just minutes to deploy  
high-speed 3x3 MIMO 802.11ac

Built by Aruba partners, solutions  
are highly customizable: fly-away  
cases, standby power, MIL-STD  
mounting, FIPS 140-2,  
switching/routing

Optional cellular backhaul

Optional cloud management







# Use Case: AI Based Security for IOT

## Full End-to-End Device Visibility and Insight

---

### Device Visibility

Continuous discovery and profiling of devices

### Device Classification

Classification using Advanced Machine Learning

### Device Attributes

What is it?  
Where is it?  
What is it doing?

### Policy Manager Integration

Leverages Aruba's 360 Secure Fabric

Evolve to Deep Insight for Increased Security



**Always On networks**

- Reliable Secure Connectivity
- Network insights and problem detection

**Personal workspace**

- Find a desk
- Find team members
- Auto-desk setup

**Digital guest management**

- Digital login
- Auto-guest wifi
- Directions
- Security



**Huddle spaces**

- Instant innovation space
- Easy to book – e.g. via Slack

**Meeting rooms**

- Find a room
- Auto-detect
- Auto-setup
- Control temperature and lighting

**Work from Home**

- Office like experience
- Secure connectivity

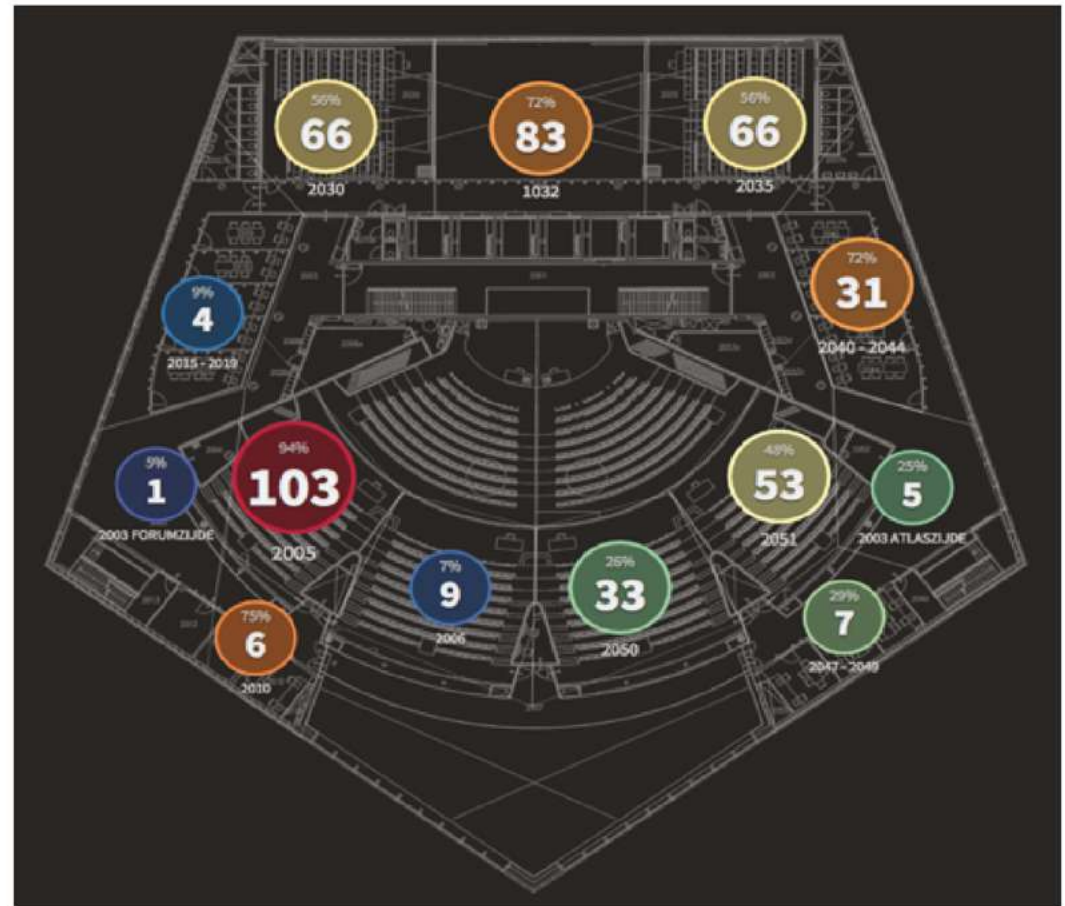




# NOC - Operations Dashboard

Dashboard: Zones, Counts, Occupancy and Utilization.

Realtime analytics for buildings. 24/7 analysis of usage of building, floors, zones and rooms through accurate occupancy data. Optimize building on the fly, all the way down to room level.





# Why Aruba?







# EDGE SERVICES PLATFORM



## AIOPS

AI INSIGHTS | USER INSIGHTS



## UNIFIED INFRASTRUCTURE

WI-FI | SWITCHING | SD-WAN | 5G | IOT



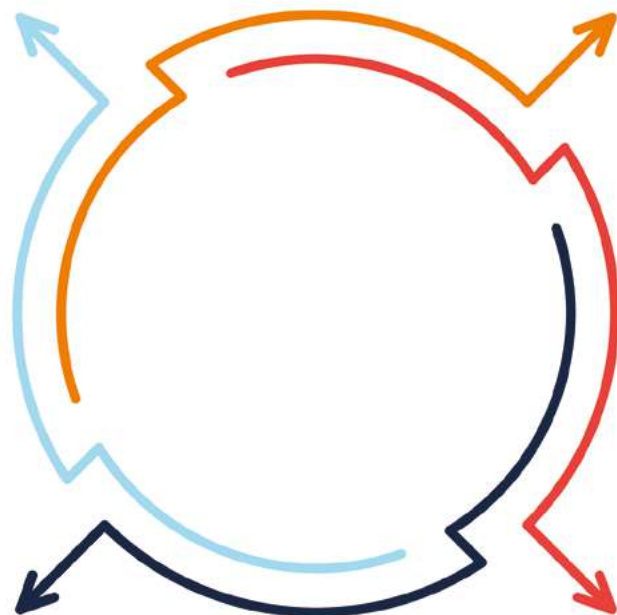
## ZERO TRUST SECURITY

DYNAMIC SEGMENTATION | DEVICE INSIGHT



## FINANCIAL & CONSUMPTION FLEXIBILITY

HPEFS | GREENLAKE



CUSTOMER FIRST  
CUSTOMER LAST



aruba

a Hewlett Packard  
Enterprise company

[www.arubanetworks.com](http://www.arubanetworks.com)