

The background features a solid red circle in the upper-left corner and a dark blue area with a white dotted pattern that fills the rest of the frame.

Education: Trends and Challenges

Education Vertical

- **Global Aruba revenue:**
 - ~US \$400-500 million
- **Aruba's largest vertical**
 - Split into K-12 (55%) vs. HED (45%) – with regional nuances
 - Some EDU \$\$ captured under GOV revenue
 - Fairly recession proof due to high government priority
 - “Sharing” community – not as competitive as corporate sector
- **US eRate funding**
 - Mandated \$\$s to support K-12

JPAC	\$	61,426,018	12.6%
EMEA	\$	61,652,445	12.6%
Americas	\$	364,921,126	74.8%

FY2018



GLOBAL EDUCATION

- **1.7 billion students**
- 200+ million in higher education
- 1.5 billion in primary/secondary education (K-12)



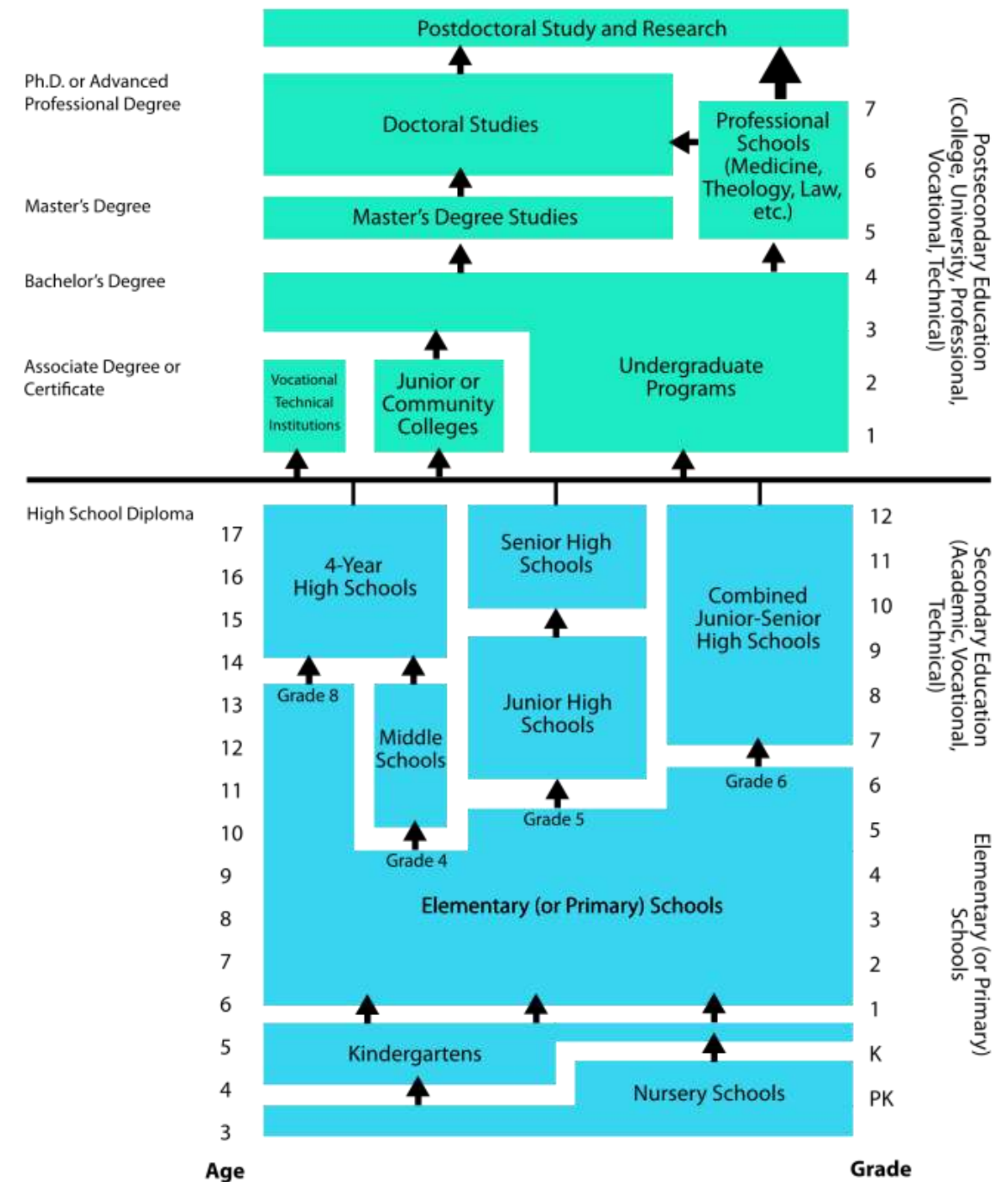
Sample: US Ed market

• K-12 Education

- 13,600 school districts
- 130,930 schools
- Elementary schools: 87,498
- Secondary schools: 26,727
- Combined schools: 15,804
- Other: 901

• Higher Education

- 4,298 degree-granting institutions
- 1,626 public colleges
- 1,687 private nonprofit schools
- 985 for-profit schools



PRIORITIES BEFORE COVID-19*



K-12

1. Scaling and Sustaining **Innovation**
2. **Data Privacy** and Ownership
3. Evolution of Teaching and Learning
4. Pedagogy vs. **Technology Gap**
5. Digital Equity

**CoSN 2020 United States K-12 Innovation Survey*

HIGHER EDUCATION

1. **Information Security** Strategy
2. **Privacy**
3. Sustainable Funding
4. **Digital Integration**
5. Student-Centric

**EDUCAUSE 2019*

COVID-19 – GLOBAL REACTION



GLOBAL

- 105 country-wide closures
- 60% of all learners
- 1B students affected

UNESCO data – as of Aug 3, 2020



PLANNING

- Remote teaching and learning
- Reduced on-site instruction
- Hybrid/HyFlex modalities
- **FLEXIBILITY!**



ACTIONS

- Institutions open/closed
- Majority of learning online
- Increase access and equity
- Next steps?

EDUCATION CHALLENGES



**Access &
Support**

**Evolving
Instruction**

**Class Delivery
Engagement**

**Labs, Sports,
Graduation**

**Student and
Employee Health
& Safety**

CHANGE MANAGEMENT



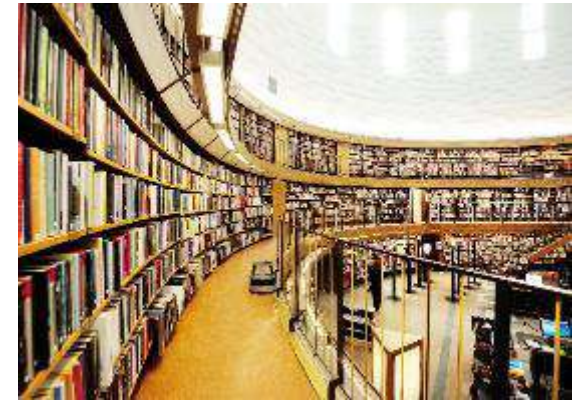
**Talk about RAPs
and outdoor
APs**



**Talk about
increase in APs
for student
housing**



**Listen to
customer
challenges**



**Talk about
network
flexibility and
ESP**

PANDEMIC RESPONSE



- **Devices**
 - Free or loaner
- **Internet service**
 - Free or low-cost
- **Personal hotspots**
 - Remote Access points
 - Free or loaner hotspots
- **Alternative & Mobile access**
 - Parking lot
 - Mobile bus/vehicle
 - Outdoor classrooms
 - Community hotspot

Target audiences

Title	Cares about
CIO	Operating budget; support levels; uptime; service delivery to business, long-term tech integration
CTO	Technology innovation; AI/ML; data visualization; outcome delivery
CSO	Security posture; consolidated tools; alert fatigue; attack surface reduction; data and user security
Director of Security	Hardware and software implementations that keep students, teachers and staff securely connected (gov mandates)
Director of IT Services / Networking	Ease of use; ability to operate; interoperability
IT Manager	Technical performance, ease of use, speeds/feeds
Network Engineer	Performance specifications, management plane, troubleshooting, installation
Facilities Director	Building management automation, ROI, and ease-of-use

ARUBA SOLUTIONS

CAMPUS



Parking lot | Outdoor Classrooms |
Mobile Wi-Fi



HOME

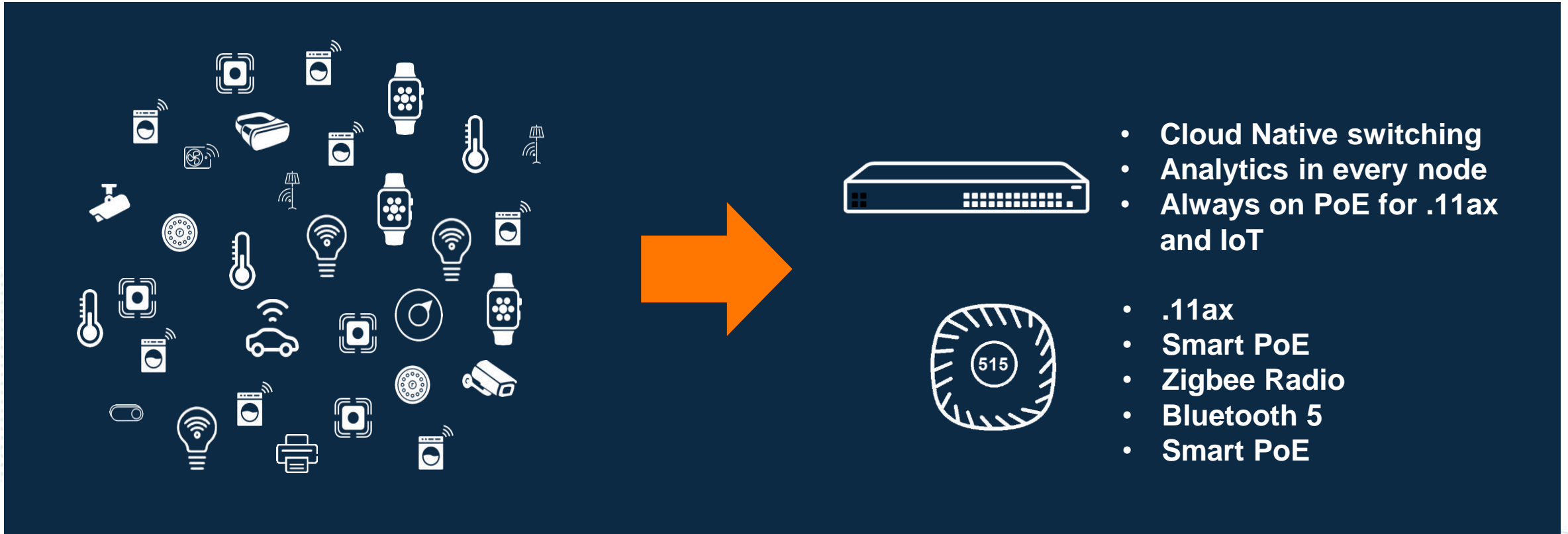


Remote learning |
Working from home



ENABLE IoT USE CASES

Leverage existing infrastructure and support wired and wireless IoT



Students IoT: PlayStation, Roku, Amazon Firestick, Google ChromeCasts, Fitbit, digital assistant, smart speakers, smart watches, printers, etc.

Building Systems IoT: Lighting, thermostats, heating, door locks, security cams, smoke detectors, shotgun detectors, smart outlets, chargers, temperature sensor, humidity sensors, laundry

An Open Ecosystem

From Access Security. To Contact Tracing.



The background of the slide is a dark blue color. On the left side, there is a large, solid red circle. On the right side, there is a large, semi-transparent red circle with a halftone dot pattern. The text "Aruba ESP: Solutions for Education" is written in white, bold, sans-serif font, positioned in the upper left quadrant of the slide, overlapping the solid red circle and the dark blue background.

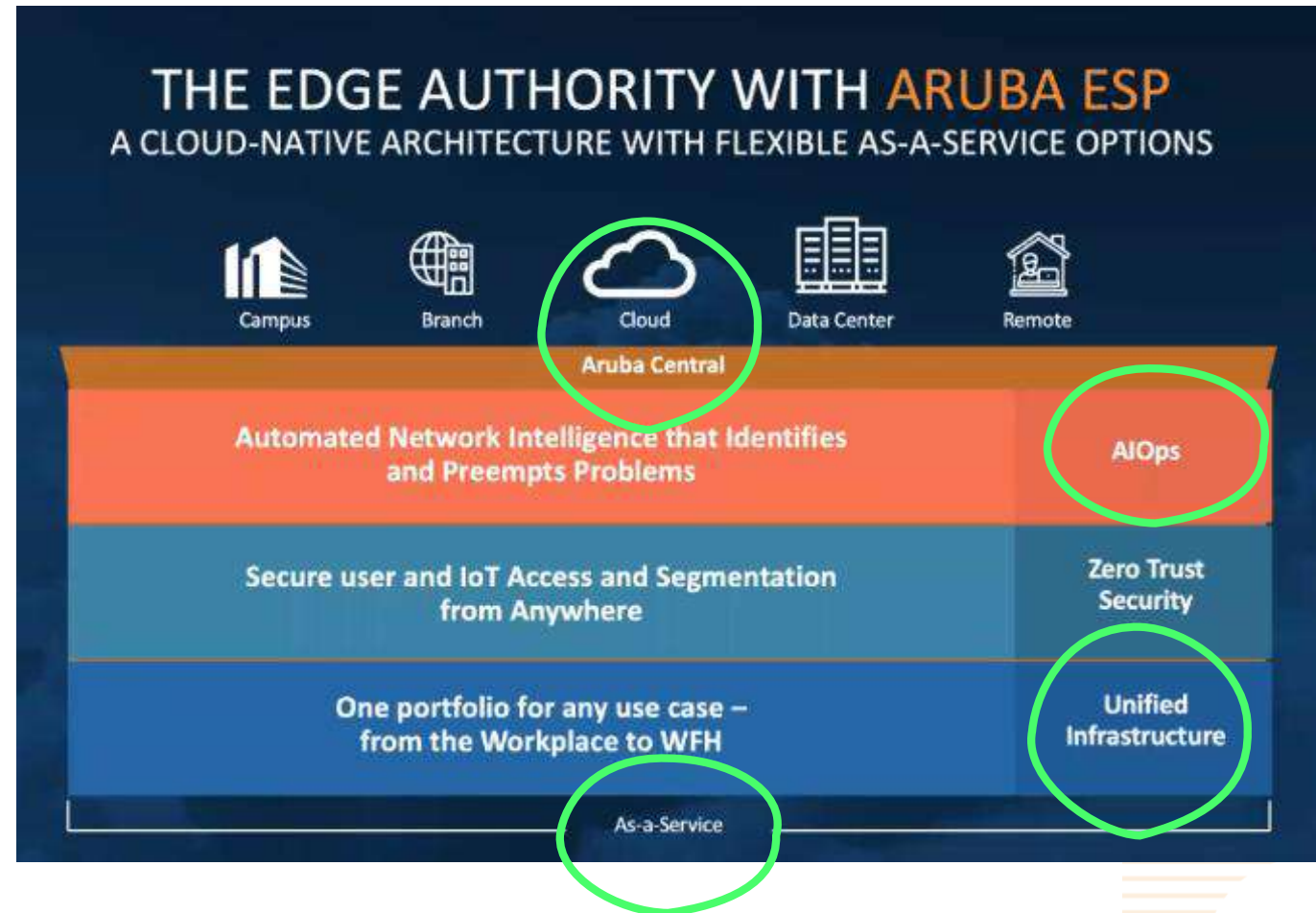
Aruba ESP: Solutions for Education

ESP: Back to School. It's time for 2 + 1

1. Aruba Central as the *Management Platform* for EDU

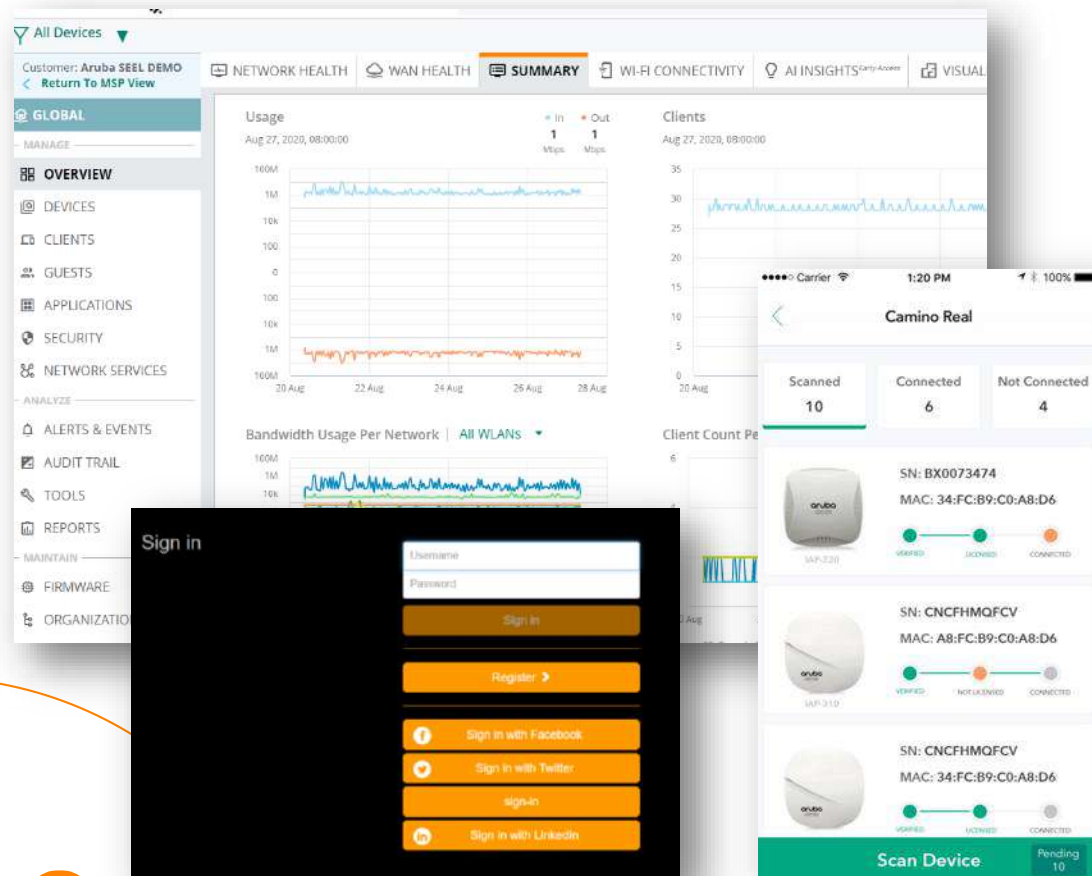
2. AI-OPS Automatically *Ensures* Application Performance and *Amplifies* IT Staff Skills

+ 1. Position the Future of the *Network as a Platform*

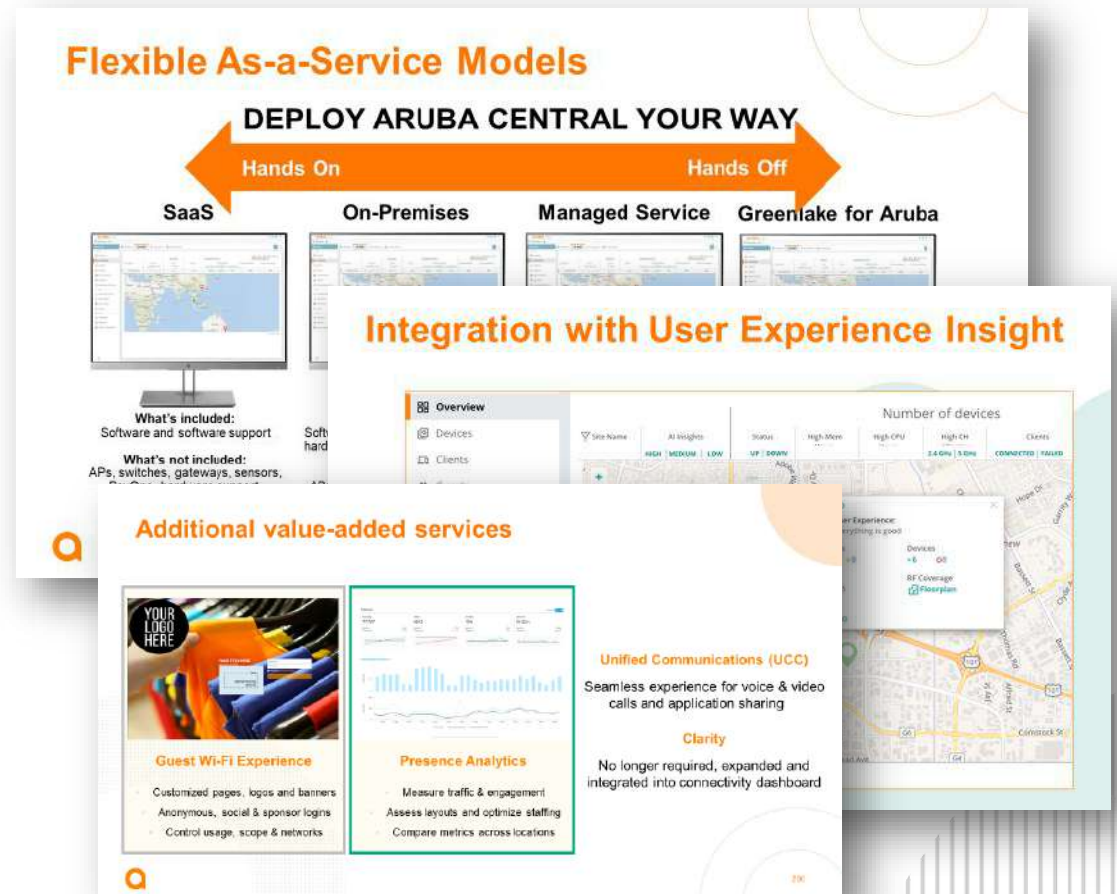


Central is Being Built for EDU: Scale, Choice, Agility

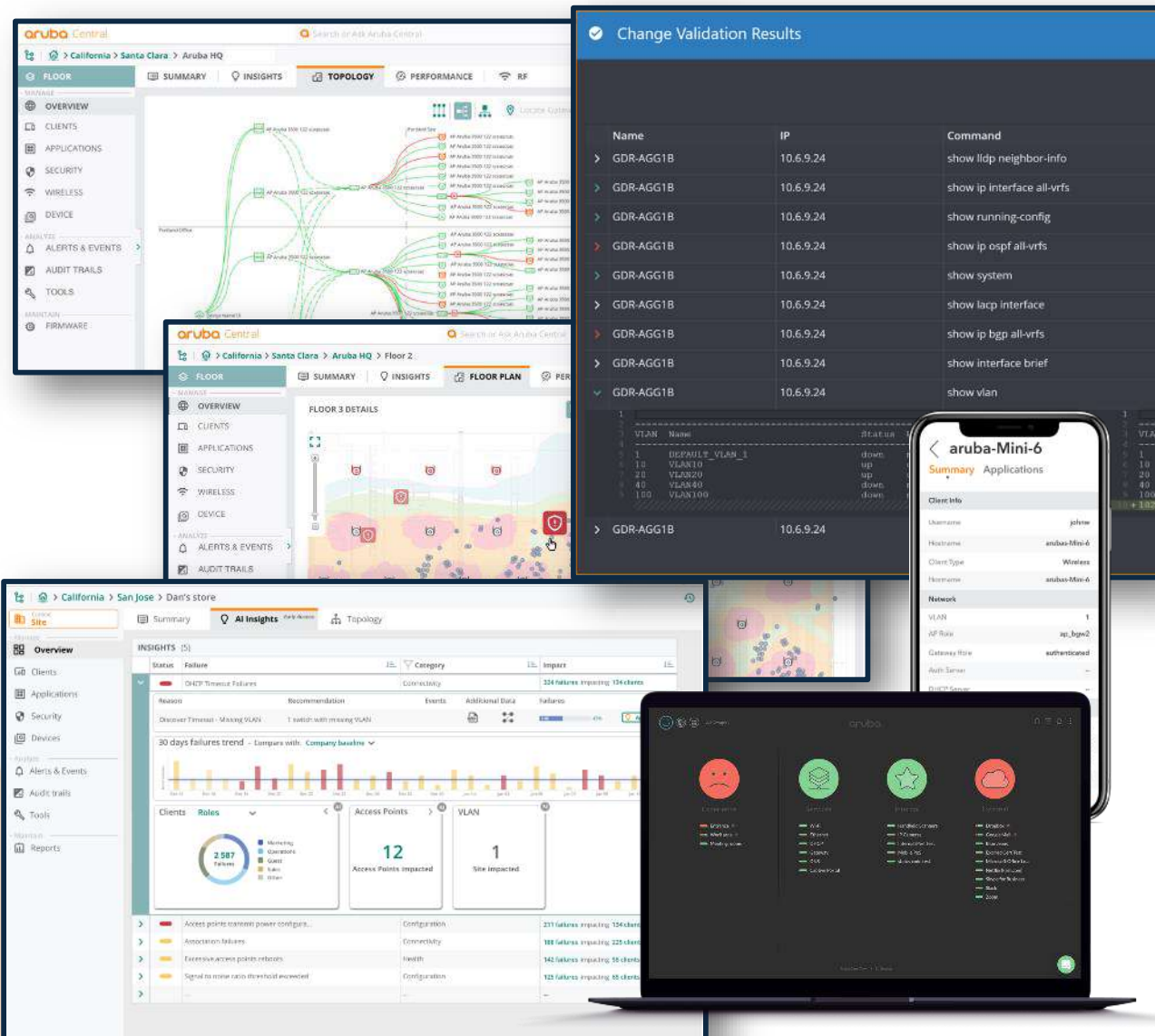
Aruba Central for K-12 Schools / ISDs



Aruba Central Is About Choice and Agility



ESP and Central becomes a Platform for Mid-Large EDU



– Operations Features

- Aruba Central as a cloud-scale management platform for all infrastructure, networks and use cases
- Aruba Cloud Platform as a now and future architecture for network-centric services
- ZTP, Mobile app for installers and operators
- Network-wide planning, configuration management, auditing and validation through NetEdit
- Device and network management through API and Ansible

– Performance Assurance Features

- Essentially unlimited scale of operations
- AI Insights – big data and ML network monitoring, automated fixes, proactive problem reporting
- User Experience Insight - End-user monitoring and reporting of apps and performance affecting network services

– Simplicity of Adoption

- Cloud architected, push-to-subscribe software

– Ease of Operations

- Chain-able automated actions and proactive responses

– Low cost of ownership

- True single platform with multiple personas for planning, operations, validation, security, other services

Aruba AI OPS Leads to the Self-Driving Network

AI OPS Infrastructure Avoids Problems

AirMatch

AI-powered RF optimization

Dynamic RF Assignments

Automated channel, channel-width and transmit power configurations

Improved User Experience

Seamless roaming with intelligent RF capacity and coverage controls

Automation and Assurance

Optional NetInsight adds predictive analytics and peer benchmarking

Reliable performance with Aruba ClientMatch

Predictable Wi-Fi performance across the network

Intelligently steers devices to the best AP
Reduces "sticky" clients issues => fewer helpdesk tickets
No client-side software required

REAL-TIME RF CORRELATION



Application Aware QoS- Air Slice

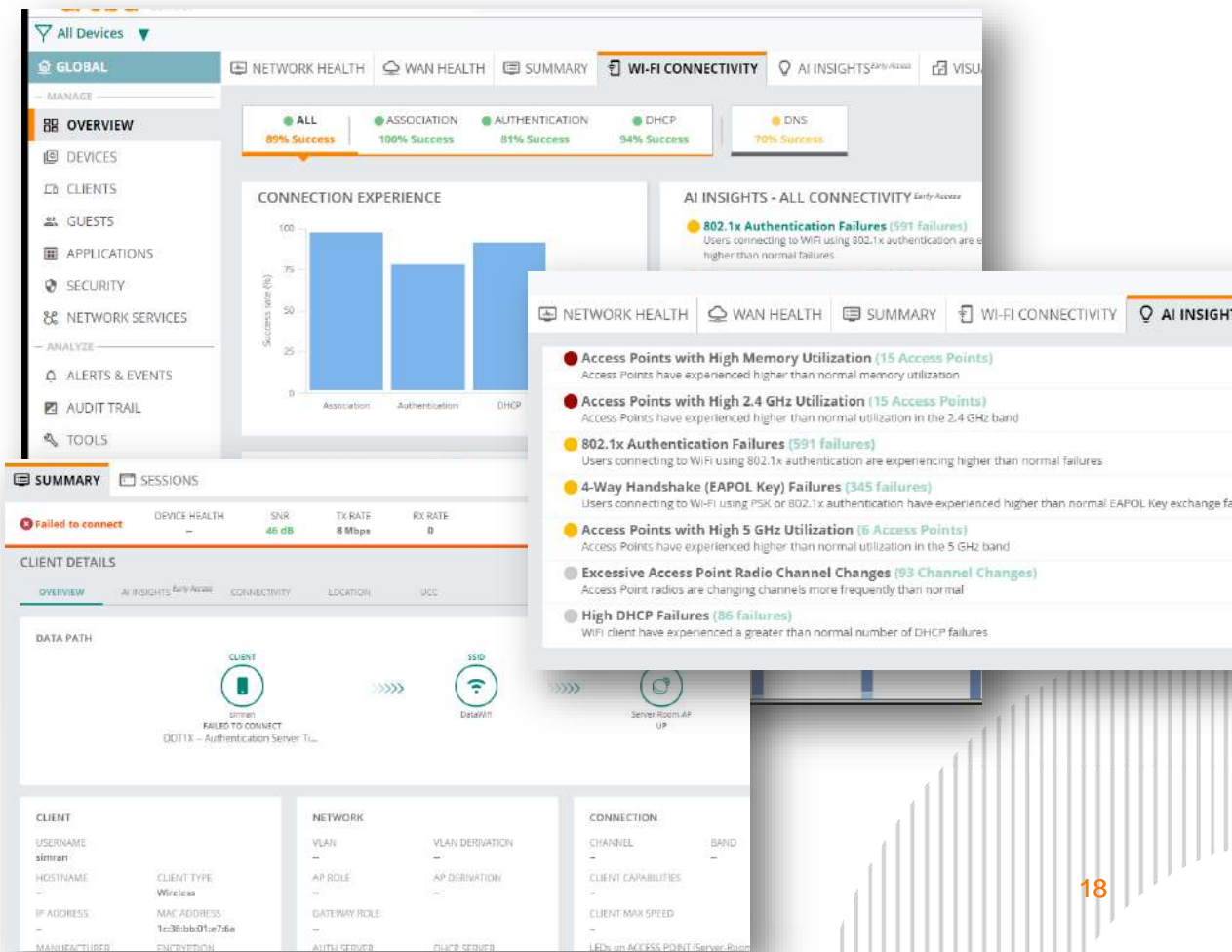


- > SLA- Grade Application Assurance For Latency Sensitive Applications
- > Air Slice Allocates Wi-Fi 6 Radio Resources Based On Application Intelligence From PEF
- > Air Slice Complements ClientMatch And Air Match As Part of Aruba's RF Optimization Technologies

Applications List

Skype For Business
Amazon Web Services
Office 365
FaceTime
GoTo Meeting
Slack
Cisco WebEx
Zoom
DropBox
GitHub
Custom Applications

AI OPS Amplifies Network Operator Skills



The EDU Network as a Platform

SEEMS FUTURE-Y. BUT IT'S A POWERFUL CAPABILITY TODAY.

The Access Point is a Platform

Many IoT Applications To Be Explored

CONNECT: ACCESS POINT AS A PLATFORM

802.11 Wi-Fi Radios

802.11ax network access
Asset tracking tags
Personnel location badges
Smart wrist bands with telemetry sensors
Worker safety smart helmets
Sensors, actuators, and smart lighting systems
Bar code scanners and mobile printers

802.15.4 Radio

Food safety sensors
Cooking and refrigeration sensors
Heating, air quality, presence, security, panic, call, button, lighting, leak sensors
Load controls and actuators
Door locking and access systems

Bluetooth Radio

Wayfinding and geofencing
Energy harvesting heating, air quality, presence, security, panic, call, button, lighting, leak sensors
Load controls and actuators
Door locking and access systems
High accuracy industrial and Ex asset and personnel location tags

USB Port

Cellular interfaces
Electronic shelf labels
Gun shot detectors
Retrofit ZigBee interface for existing deployments
Custom interfaces



Designing hyper-aware industrial facilities

Secure infrastructure and partner solutions for chemical, defense, food & beverage, logistics, manufacturing, petrochemical, pharma, transportation, and utility applications.

EXECUTIVE OVERVIEW

At its core, the Internet of Things (IoT) is an amalgamation of machines in the physical world, logical representations of the physical phenomena acted upon by those machines (voltage, temperature, flow, speed), contextual data generated by networks connecting the machines (identity, location, applications in use), and business applications that analyze, mine, share, and respond to those data. In Industrial IoT (IIoT) systems the machines and applications are tailored to factories, process operations, material handling, transportation, utility services, and logistics.

By securely interfacing IIoT devices, and generating contextual information, Aruba's networks enable industrial control and business applications to become hyper-aware of their operating environments. Aruba's unified infrastructure, zero-trust security, and AI-powered software - used in conjunction with solutions from key technology partners - enable industrial facilities to successfully deploy and exploit IIoT solutions. The richer the set of available data and context, the greater the opportunities to optimize operations, implement predictive maintenance, optimize inventory, bolster health and safety, and maximize human productivity.

Solutions from Aruba and its technology partners are applicable across a broad range of vertical markets - chemical and petrochemical, food & beverage, logistics, manufacturing, pharmaceutical, utility, water, and wastewater. Use cases and partners discussed in this white paper include:

- Operations Optimization
 - Building A Contextually Adaptive Plant (ZF Openmatics)
 - Securing Control Networks That Can't Protect Themselves (Claroty, Microsoft CyberX, Nozomi, and Tenable iNode)
 - Connecting And Protecting Remote Sites (VIA, RPA, SD-Branch)
 - Running Profinet IO Over Shared Wireless Infrastructure (Profinet IO over Aruba APs)
 - Redundant Intra-Site Wireless Video And Data Links (Aruba 5160GHz Access Point)
 - Intercepting Quality-Impacting IIoT Issues In The Switching Fabric (Aruba NAE Python scripting)

- Bridging IIoT Plant-Wide For Uniform Visibility & Security (Siemens)
- Automating Plant Network Access For Service Personnel And Contractors (Aruba, Envoy)
- Securely Sharing Plant Wireless Networks Without Losing Control (Aruba MultiZone)
- Predictive Maintenance
 - Migrating From Break/Fix to Predictive Maintenance (ABB)
- Inventory Optimization
 - Increasing Inventory Turns By Reducing Picking Time (Zebra)
- Improved Maintenance
 - Plant Monitoring And Digital Twin Enablement (InOcean and Microsoft)
 - Seamless 5G To Wi-Fi Roaming Without Distributed Antenna Systems (AirFiber)
 - Reducing Mean Time To Repair With Real-Time Location Services (Aruba APs and Meridian)
- Health and Safety Monitoring
 - Physical Distance Monitoring And Contact Tracing (AIRISTA Flow, Aislelabs, ColuHD, Clapp, Kiana, Patrocinium, SkyFi)
 - Real-Time Personnel And Asset Safety Monitoring (Mobland)
 - Context-Aware, Real-Time Integrated Emergency Response And Notification (Meridian and Patrocinium)
 - Air Quality Monitoring (IP Video)
 - Gunshot Detection (AmberBio)



The background features a dark blue field with a large, solid red circle on the left. A large, semi-transparent red dot grid pattern is positioned on the right, partially overlapping the blue background and the red circle.

Aruba ESP: Return to School

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

CONTACT AND LOCATION TRACING

With WI-FI Location Data



Contacts traced
(sorted by total contact minutes)
with each infected person



WI-FI CONTACT TRACING EXAMPLE

With Aruba Central

aruba63 days leftCentral

Search or ask Aruba

Global

Network Health

WAN Health

Summary

AI Insights

Contact Tracing

3 hours

Manage

Overview

Devices

Clients

Applications

Security

Network Services

Analyze

Alerts & Events

Audit Trail

Tools

Reports

Maintain

Firmware

Organization

Username

un_ac5362893eb99

MAC Address

Minimum Overlap (Minutes)

30

Start Date

03/01/2020

End Date

03/14/2020

Submit

CONTACT INFORMATION208

CONTACT USERNAME	TOTAL MINUTES
un_325c104f74e54	868
un_a38a69a6ac444	508
un_ee0e842f6a6a4	488
un_8881f5240a93d	397
un_e506f3da02981	372
un_2568b8daa159b	369
un_fa1ca6b839d50	351

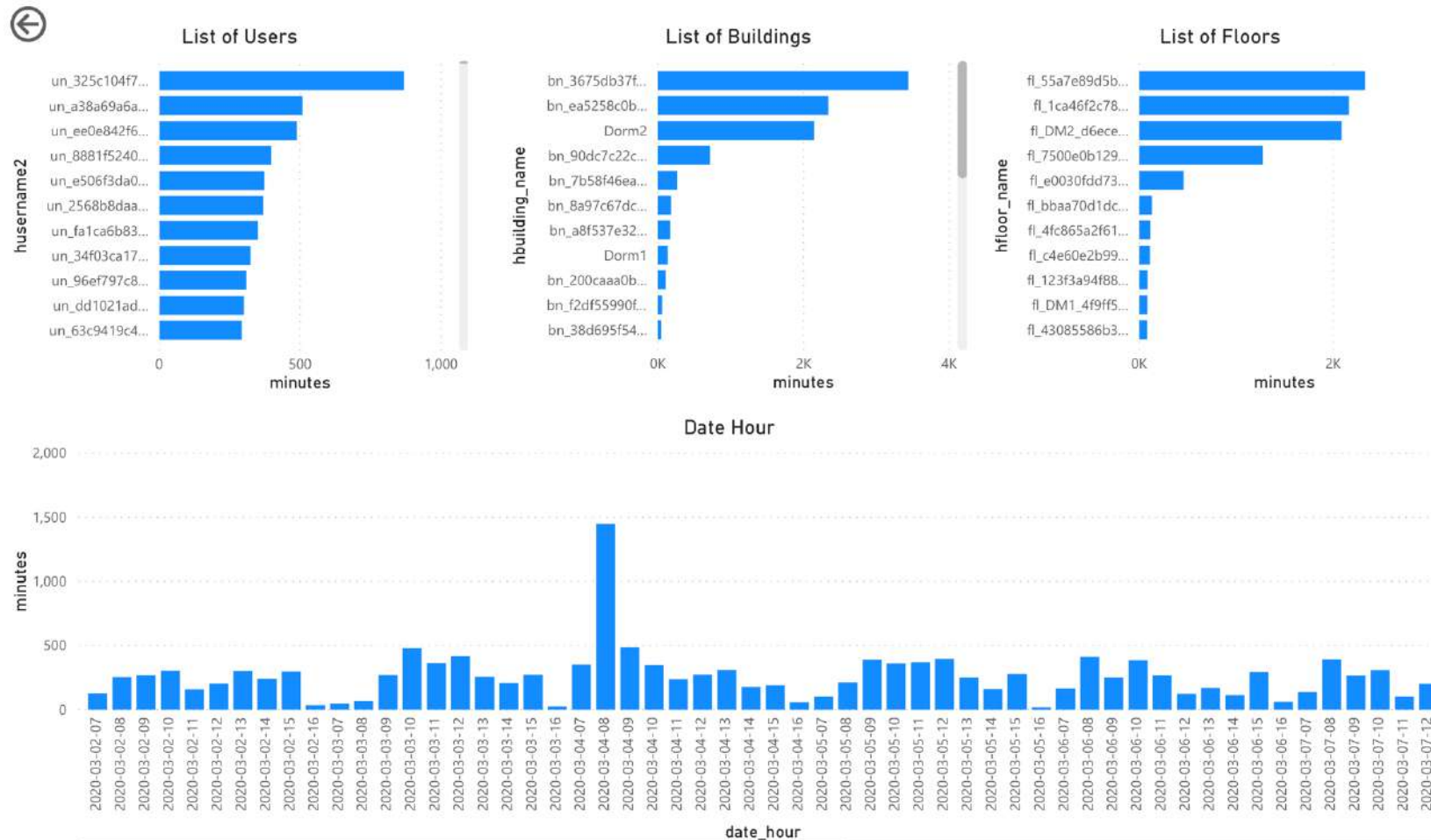
Clear



* Pre-production – final tool subject to change

WI-FI CONTACT TRACING SCREENSHOT

Exported to PowerBI template



* Pre-production – final tool subject to change

WI-FI CONTACT TRACING SCREENSHOT

Exported to Tableau Template

Analysis for user: un_ac53..

List of Users

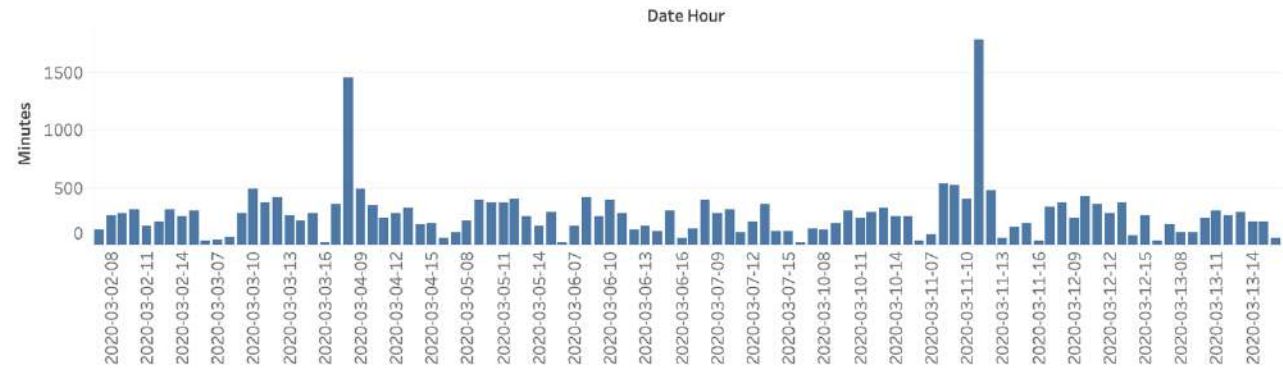
Husername2	
un_325c104f74e54	868
un_a38a69a6ac444	508
un_ee0e842f6a6a4	488
un_8881f5240a93d	397
un_e506f3da02981	372
un_2568b8daa159b	369
un_fa1ca6b839d50	351
un_34f03ca17e5ee	324
un_96ef797c8c792	309
un_dd1021ad37cca	300
un_63c9419c4ef63	293
un_2da01a54da0f2	275
un_72ca57923e93a	272
un_bd4dada224f49	262
un_6e3164e9d60ad	248
un_5fd3ddbba2a680	248
un_941a64753b0d5	246
un_d68b7e6b1a967	240

List of Buildings

Hbuilding Na..	
bn_3675db37f0443	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_6abb922270f2d	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 AND LOCATION TRACING

With Meridian and BLE Location Data



Users are issued
Aruba Tags



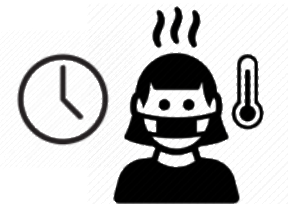
Aruba 300/500
series APs sense
tags in-building



Meridian cloud
determines tag
locations



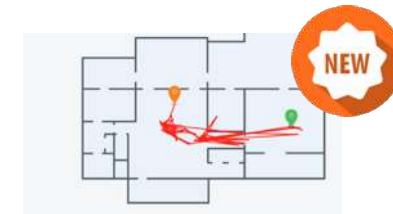
Data streamed to
visualization and
rules engine SW



User is sick and
informs HR



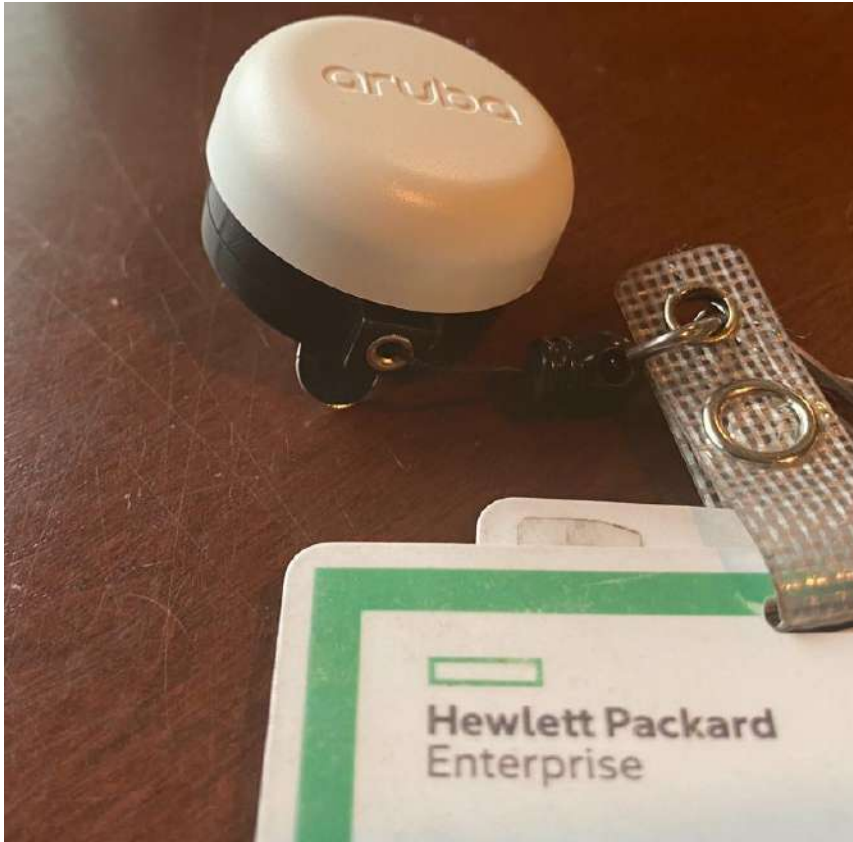
HR looks up user tag and queries
contact tracing SW for potential user
and location contacts



Contacts traced
(sorted by total
contact minutes) with
each infected person

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

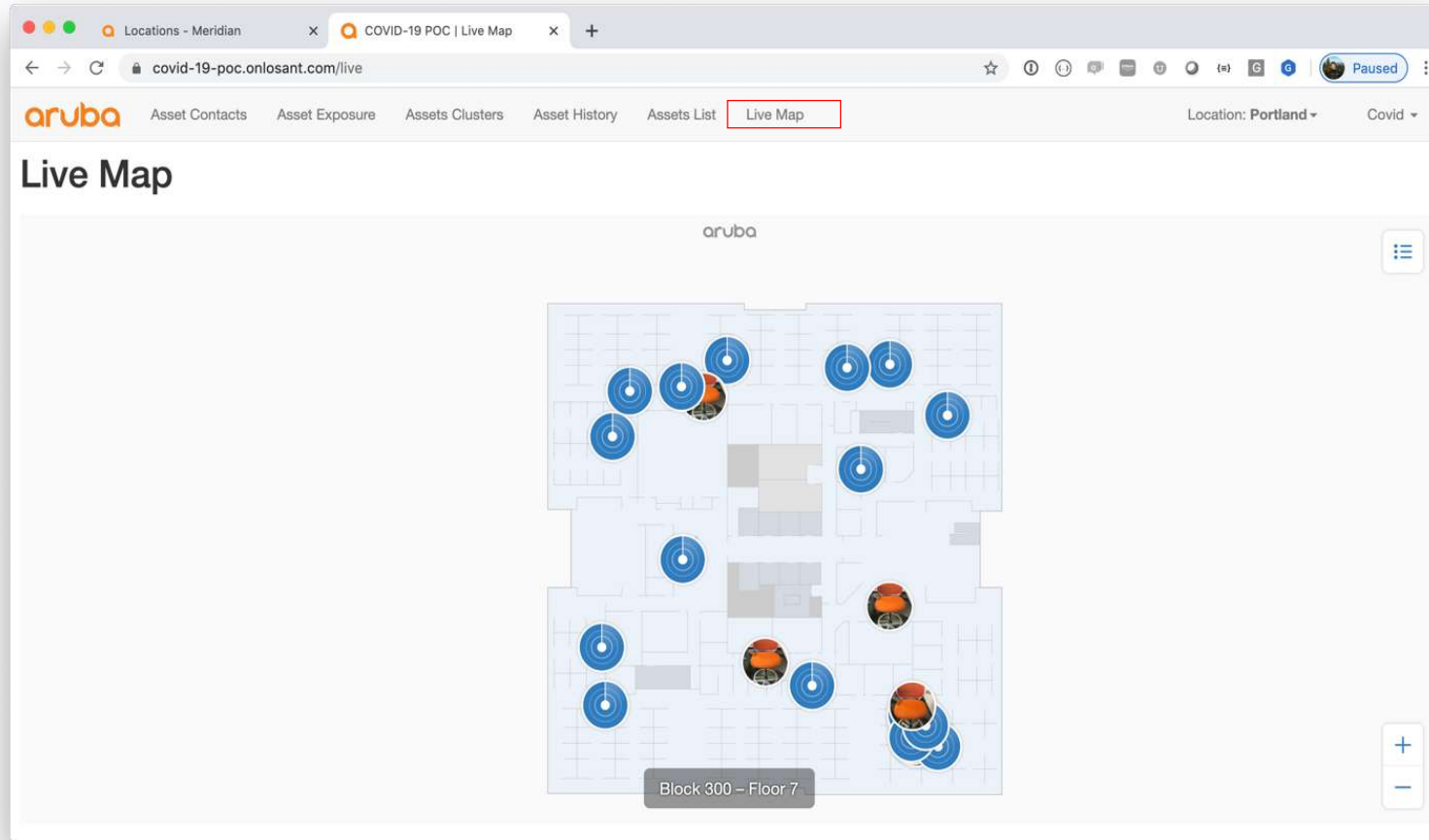
ARUBA ASSET TAG



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

BLE CONTACT & LOCATION TRACING SCREENSHOTS



** Pre-production – final tool subject to change*

BLE CONTACT & LOCATION TRACING SCREENSHOTS

The top screenshot displays the 'Live Map' interface. The browser address bar shows 'covid-19-poc.onlosant.com/live'. The navigation menu includes 'Asset Contacts', 'Asset Exposure', 'Assets Clusters', 'Asset History', 'Assets List', and 'Live Map' (highlighted). The location is set to 'Portland'. The map shows a floor plan with blue circular markers indicating asset locations.

The bottom screenshot displays the 'Asset History' interface. The browser address bar shows 'covid-19-poc.onlosant.com/history'. The navigation menu includes 'Asset Contacts', 'Asset Exposure', 'Assets Clusters', 'Asset History' (highlighted), 'Assets List', and 'Live Map'. The location is set to 'Portland'. The interface features a table with the following data:

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 17:06:00 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

Below the table is a map of 'Block 300 - Floor 7' showing red circular markers indicating contact events. The interface 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'. At the bottom, there are 'Play', 'Stop', and 'Restart' buttons.



* Pre-production – final tool subject to change

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

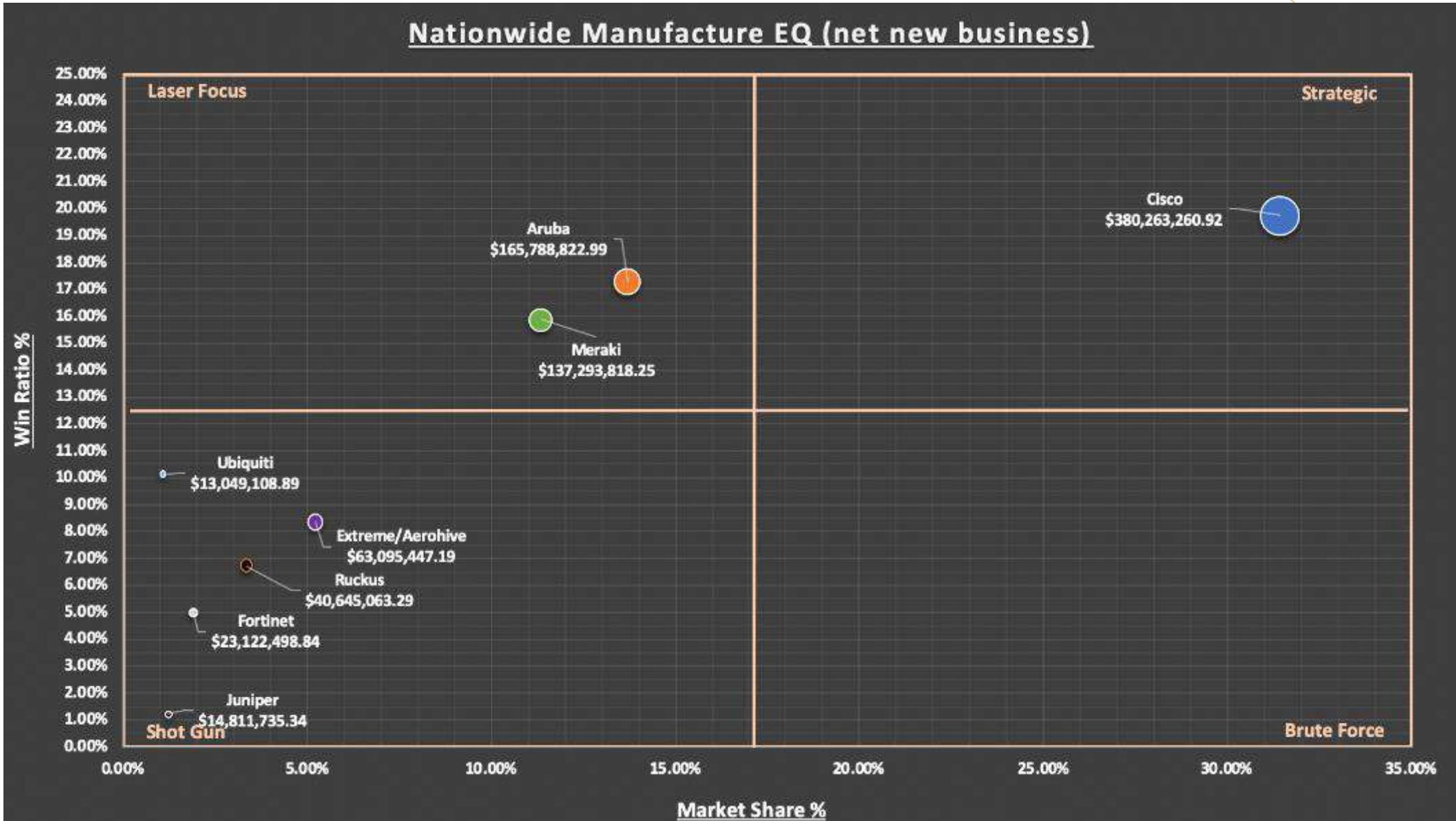




K-12 Opportunities with E-rate & Other Federal Funding

USA -Only

E-rate FY2020 Quadrant – How did Aruba do?



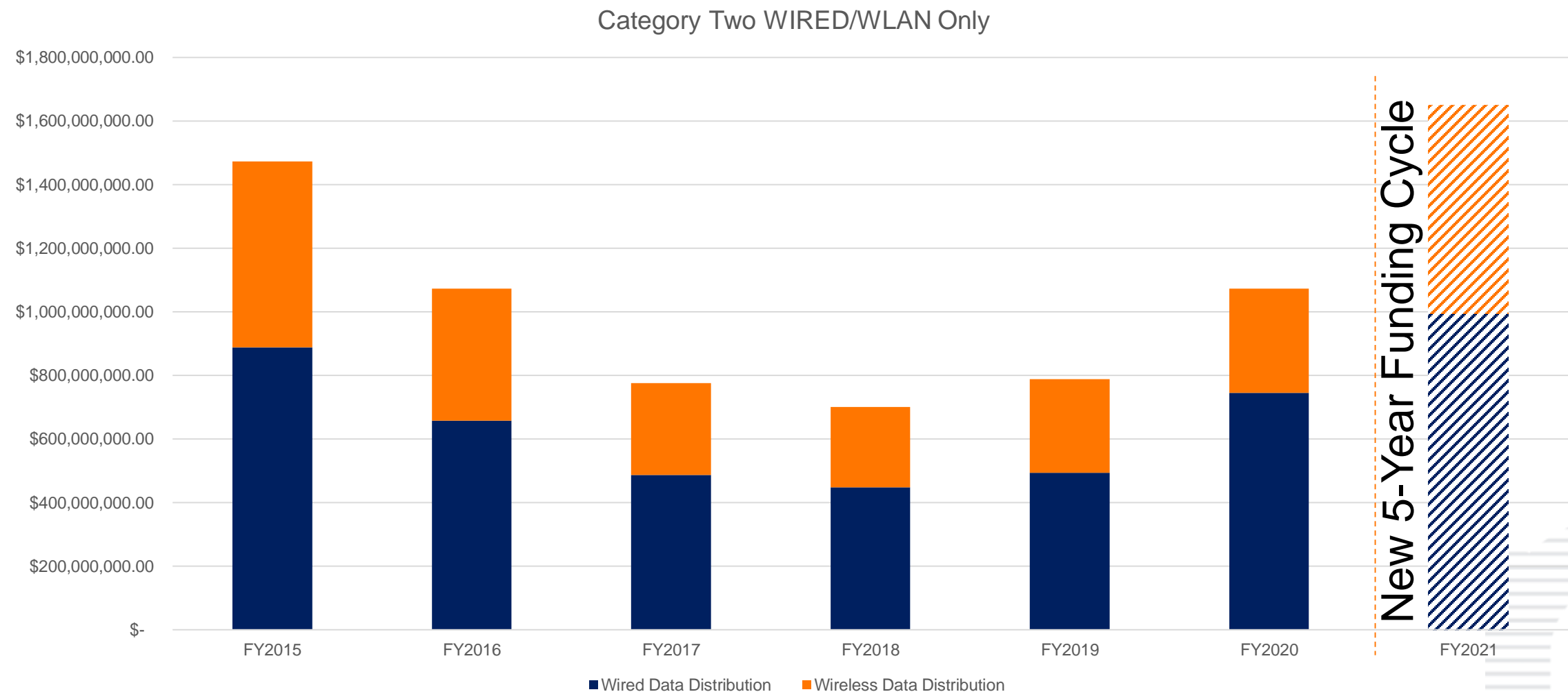
E-rate Funding Year 2021

E-rate Funding Year 2021

- All applicants get refreshed Category Two 5-Year Cycle Budget
 - More than \$9B in refreshed Category Two Budgets!
 - Schools - \$167/student ; Libraries - \$4.50/sq foot
 - Site Budget Floor - \$25,000
 - First Funding Cycle FY2021 to FY2025; Next Funding Cycle begins FY2026
 - No rollover of budget balances from cycle-to-cycle
 - Budget factors reset for inflation once every five years
 - Single “system wide” budget calculated for multisite applicants
 - Draft Eligible Services List
 - Released on July 21, 2020
 - Comments due August 20, 2020; Reply to Comments due September 4, 2020
 - One manufacturer recently echoed Aruba’s past comments on allowing Enhanced Network Security
 - No new services



E-rate Discounts Requested (FY2015-FY2021*)



Other Federal Funding

CARES Act

Education Stabilization Fund

- Governor's Emergency Education Relief Fund
 - \$3 billion will be provided to Governors for emergency support grants to LEAs and IHEs that the state determines have been most significantly impacted by the coronavirus.
- **Elementary and Secondary School Emergency Relief Fund**
 - **\$13.5 billion will be provided directly to states to help schools respond to the coronavirus and related school closures.**

Bureau of Indian Education

- \$46 million to address cost of school closings, transporting students home, enhanced online learning, IT hardware capacity and Wi-Fi connectivity

Proposed Legislation

- Bills introduced in House and Senate
 - Most recent legislation includes \$70B for K12 Schools
 - Perfect time to start talking about Aruba RAPs for student home connectivity

What can you do now?

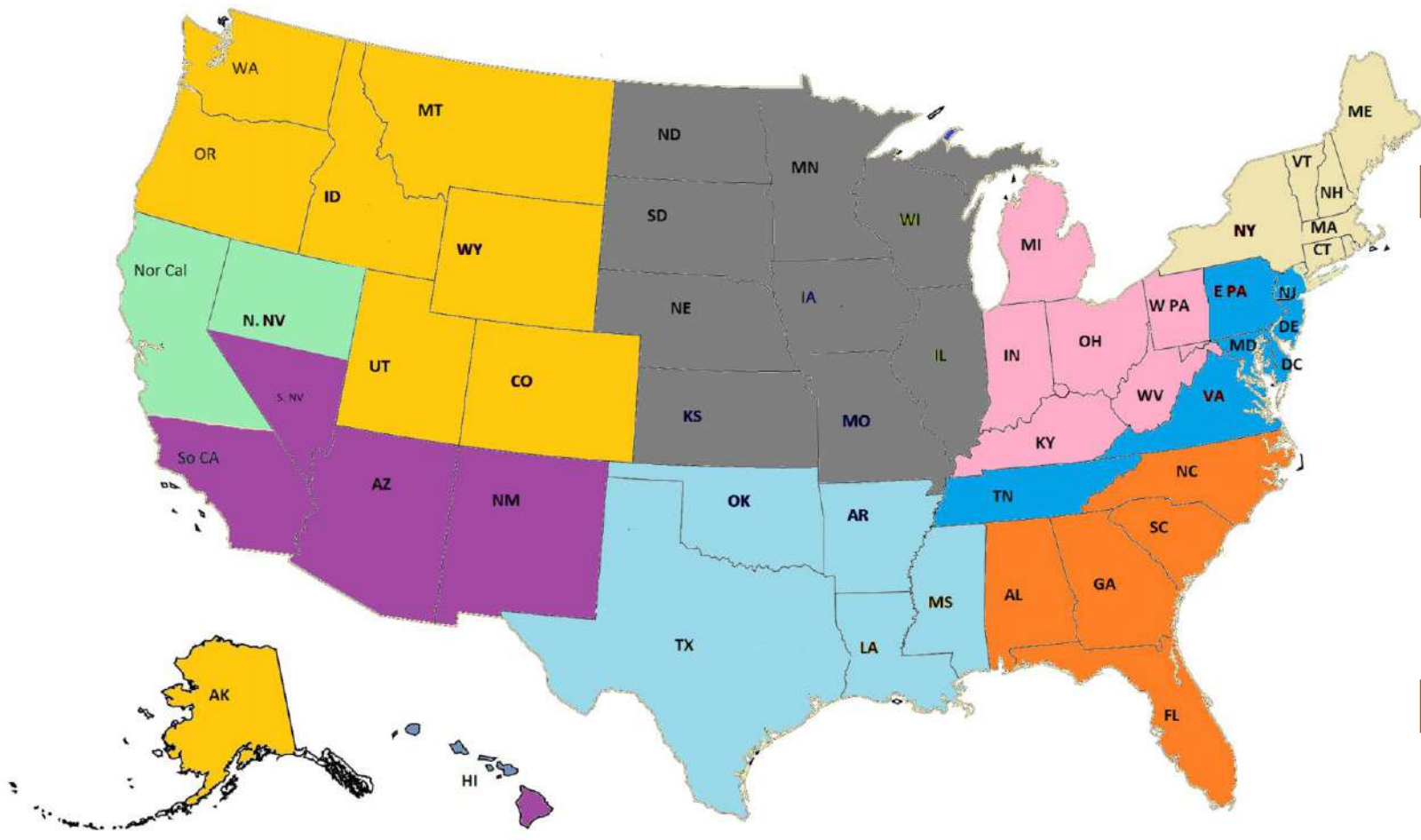
E-rate Funding Year 2020

- **Check the E-rate SharePoint**
 - Review Funding Waves each week
 - Contact Partners and End Users to close Funded Deals
- **Confirm 471 Review Status**
 - Forecast correctly
- **Know Distributor Programs**
 - Extended Terms for E-rate Deals
- **Use Aruba E-rate Eligibility Tool**
 - E-rate Eligibility by SKU
 - Approved Global Service Subs


E-rate Funding Year 2021

- **Get Ahead of the Deal with ROGER**
 - Identify partners to engage with
 - Work with K12-ISR to get leads out to partners
 - Use the EASY Tool for applicant history
- **Communicate with your K12-ISR and SER**
 - Track assigned partners to 470s
 - Check ROGER before approving Deal Reg
 - Attend K12-ISR Calls

Aruba K12/E-rate Team





 **Shaman Anderson – K12 ISR**
541-360-6214 - shaman.anderson@hpe.com

 **Leilani Cruz– K12 ISR**
503-676-6278, leilani.cruz@hpe.com

 **Anthony Rivera – K12 ISR**
541-360-6308, anthony.rivera@hpe.com

 **Matt Montgomery– K12 ISR**
541-360-6263, matt.montgomery@hpe.com

 **Ross Hering – K12 ISR**
541-360-6332, ross.hering@hpe.com

 **E.C. Mathews – K12 ISR**
503-966-8075, ethelwynne.mathews@hpe.com

 **Israel Orozco – K12 ISR**
541-360-6240, Israel.orozco@hpe.com

E-rate Partner Support
Peter Kaplan – E-rate Channel Manager
erate@hpe.com



The background features a solid red circle in the upper-left corner and a dark blue area with a white dotted pattern that fills the rest of the frame.

Key Takeaways

Summary

Education vertical is a large growth sector

Aruba ESP invites Education to go ALL IN

Contact tracing is a foot in the door to Education

Government funding drives Education purchasing

Call to Action

1

REVIEW school technology plans and objectives – available in the public domain

2

EXPLORE your customers' needs from their perspective (i.e., "student outcomes")

3

LISTEN to unique pain points and challenges affecting your education customer, "today"

4

UNCOVER how the pandemic has changed your customer's priorities and initiatives

RESOURCES

EDUCATION:

- HED:
 - [Reimagine Education](#) (PDF)
 - [Higher Education Solution Overview](#) (PDF)
 - [Anywhere Education: Moving teaching and learning online - At-a-Glance](#) (PDF)
 - [Modernizing cybersecurity in higher education](#) (PDF)
- K-12
 - [K-12 School Solution Overview](#) (PDF)
 - [Modernizing cybersecurity in schools](#) (PDF)
 - [IT Guide for K-12](#) (PDF)
 - Aruba K-12 Webinar – [3 Must-Haves for Flexible Hybrid Instruction](#)
 - Aruba Webinar – [Maximize your school's CARES Act Funding](#)
 - HPE - K12 Webinar – [Implementing a Distance Learning Strategy for Your School](#)

ARUBA WEBSITE

- [Aruba Higher Education](#) (URL)
- [Aruba K-12 Education](#) (URL)

ARUBAPEDIA

- [Higher Education](#) (URL)
- [K-12 Education](#) (URL)



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Thank you!

The background features large, overlapping curved shapes in shades of orange and red. On the right side, there is a series of horizontal lines that create a sense of depth and movement, resembling a stylized wing or a fan.