aruba
a Hewlett Packard Enterprise company

TECH TALK

Aruba solutions for Manufacturing Vertical

Industrial Revolution

Efficient Systems
Improvement driven by mechanical automation

Industry 1.0

Mechanization, Steam Power, Weaving Loom

Organized systems
Improvement driven sequencing operations

Industry 2.0

Mass production, Assembly line, Electrical energy

Automated systems
Improvement driven automation in silos

Industry 3.0

Automation, Computers and electronics

Connected systems
Improvement driven data capture & analysis

Industry 4.0

Cyber Physical System, Internet of Things, Network

Increased **safety**

Increased **cybersecurity**

Optimized **maintenance**

Reduction in **downtime**

Optimize **resource utilization**

Smarter **decisions**

Intelligence at the Edge

Industry 4.0 “refers to the fourth industrial revolution, which connects machines, people, and physical assets into an integrated digital ecosystem that seamlessly generates, analyzes and communicates data, and sometimes takes action based on that data without the need for human intervention.”

PwC’s Insights

Smart Manufacturing

Smart Manufacturing Characteristics

- ❑ Digitization of every part of a manufacturing enterprise with interoperability and enhanced productivity
- ❑ Connected devices and distributed intelligence for real-time control and flexible production of small batch products
- ❑ Collaborative supply chain management with fast responsiveness to market changes and supplying chain disruption
- ❑ Integrated and optimal decision making for energy and resource efficiency
- ❑ Advanced sensors and big data analytics through product lifecycle to achieve fast innovation cycle

Connected
- Seamless connectivity for IoT and Applications
- Collaboration between departments

Optimized
- Predictable production capacity and asset utilization

Transparent
- Live metrics to support quick and consistent decision making

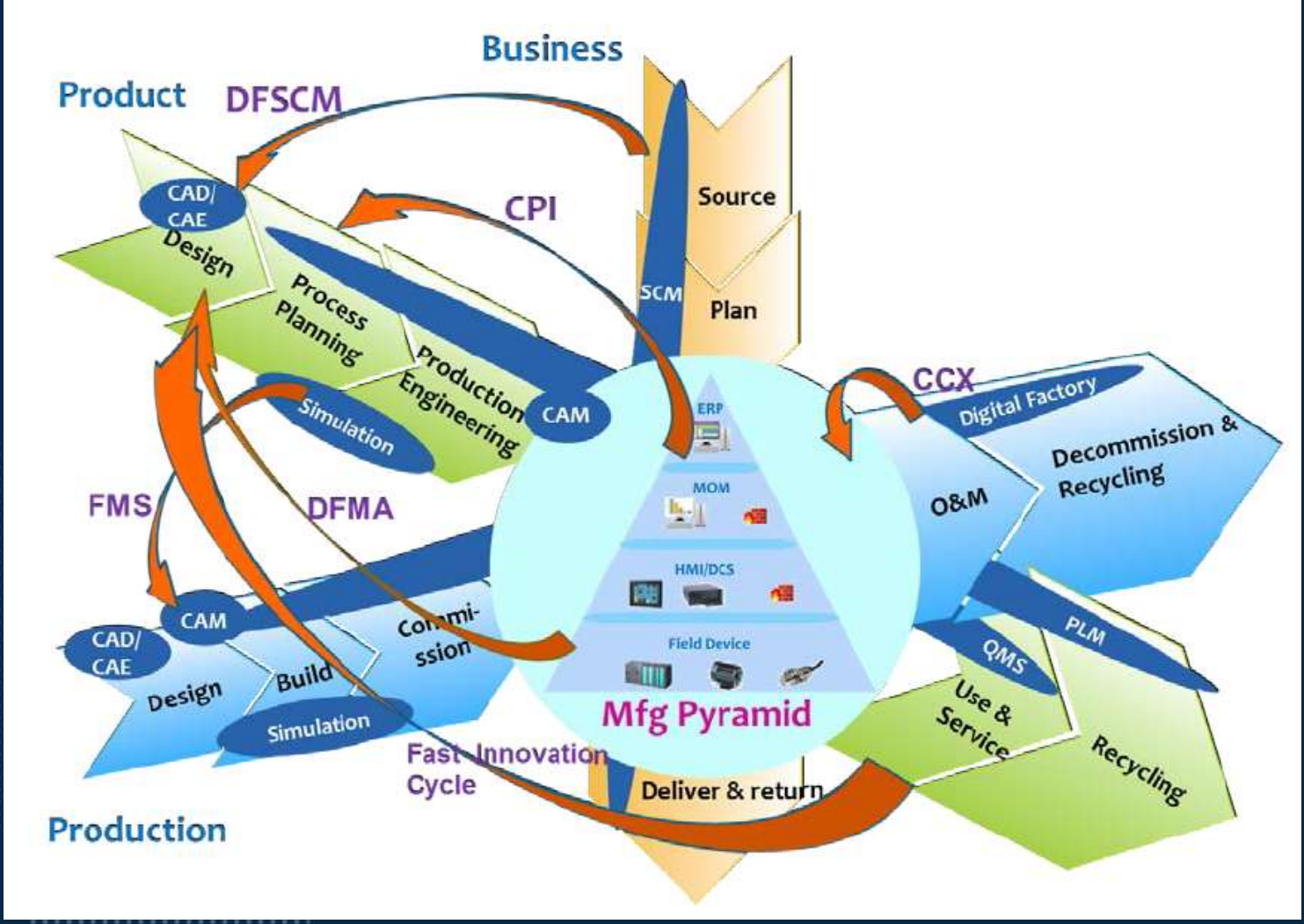
Proactive
- Predictive anomaly identification and resolution
- Real-time safety monitoring

Agile
- Flexibility to implement product changes

Source: Current Standards Landscape for Smart Manufacturing Systems, NIST IR 8107

Smart Manufacturing Ecosystem

Orchestration of …



Source: Current Standards Landscape for Smart Manufacturing Systems, NIST IR 8107

REIMAGINE MANUFACTURING
Challenges forcing reinvention

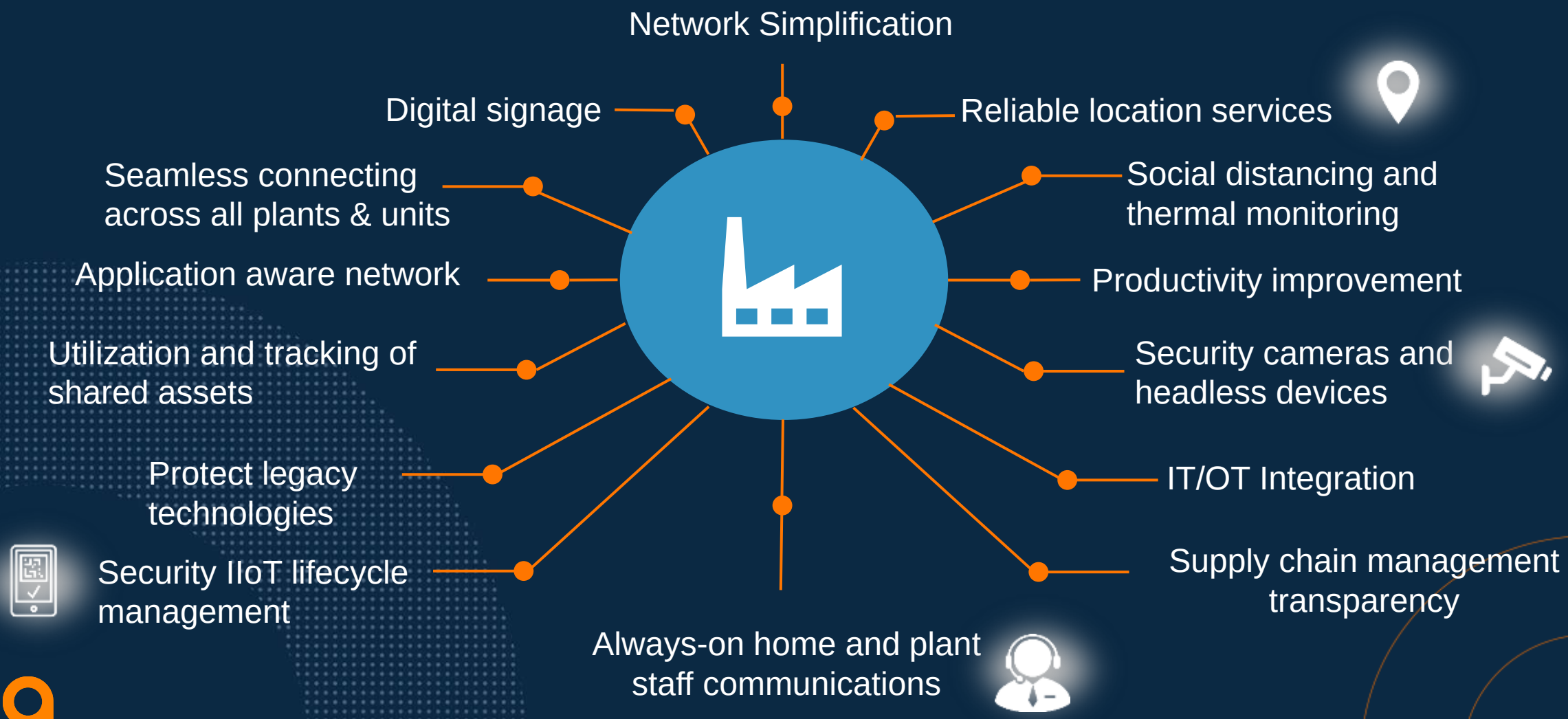
Covid 19
Lost Revenue | Employee Loss
Supply & Demand

Employee Experience
Health and Safety
Effectiveness | Touchless Experiences

Competition
Local | Overseas
Improved Operations and Efficiencies

Smart Manufacturing

Connecting departments to deliver better business outcomes



Aruba Solutions for Smart Manufacturing

Connectivity options for Smart Manufacturing

Machine & Vehicle Telemetry

High-Speed Telemetry & Edge Analytics

Converters

Edge Data Collection,, and Analytics

Switching

Native Ethernet

Cellular Backhaul

Material Carriers & Mobile Robots

Outdoor

Hazardous Areas

Uncontrolled Indoor

Native Wi-Fi
APs With Integrated BLE For Wayfinding & Asset Tracking

ARUBA Ex Rated ACCESS POINTS

AP-375EX and AP-377 derivatives certified to
Class 1 Division 2 (Groups A/B/C/D/T4) and Class 1 Zone 2 (Groups IIC/T4)

ACCESS POINT AS A PLATFORM

802.11ax Wi-Fi Radios

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

802.15.4 ZigBee Radio

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

Bluetooth 5 Radio

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

USB Port

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

ZF deTAGtive

Industrial location tags

ZF OPENMATICS

Bluetooth based location services

- Enable real-time location monitoring across the entire plant without significant investments in new infrastructure
- Update cloud-based applications without impacting workflows
- Share location data and asset status via open APIs to optimize time-and-motion, maintenance, and asset storage process
- Protect factory workflow information with end-to-end security

How does this work

- Aruba AP forwards location data to ZF deTAGtive server
- When within reach of ZF TagFinder, it can download other cached info / upgrade firmware

Connected Worker Solution Framework

PTC Augmented Reality (Vuforia)

Problem statement: Ensure 24/7 skill availability on the factory floor

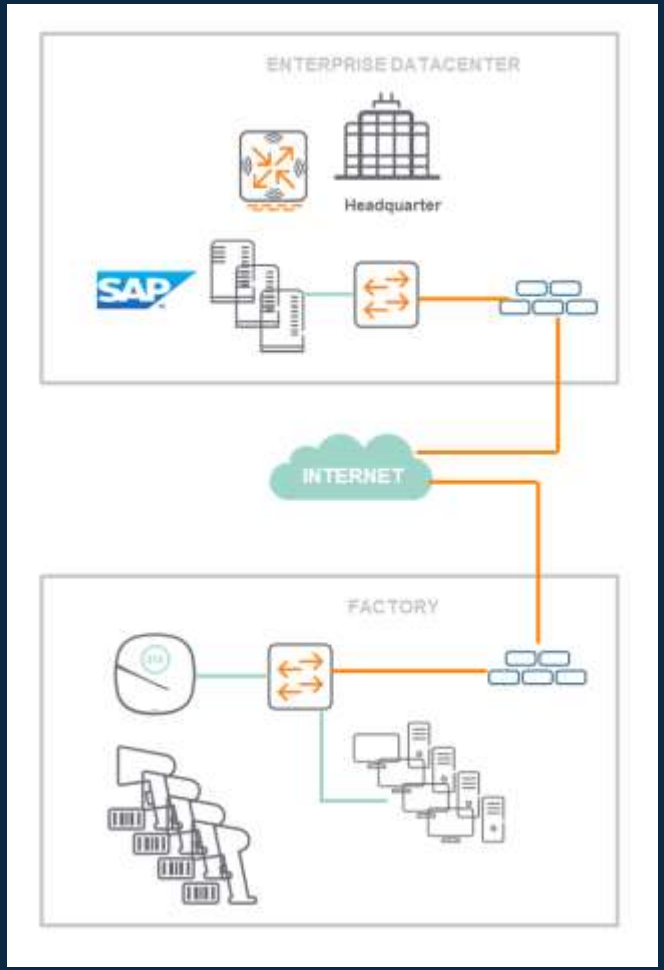
Solution: In-plant worker collaborates with remote Subject Matter Expert (SME) either in the Control Room or at a Vendor's or remote office, allowing the in-plant worker to be guided by the SME as to how to adjust equipment to provide desired results.

Technology: PTC ThingWorx & Vuforia running on HPE compute equipment and Aruba wireless mobility network, Aruba BLE Beacon to provide location and context accuracy

Product Quality Consistency

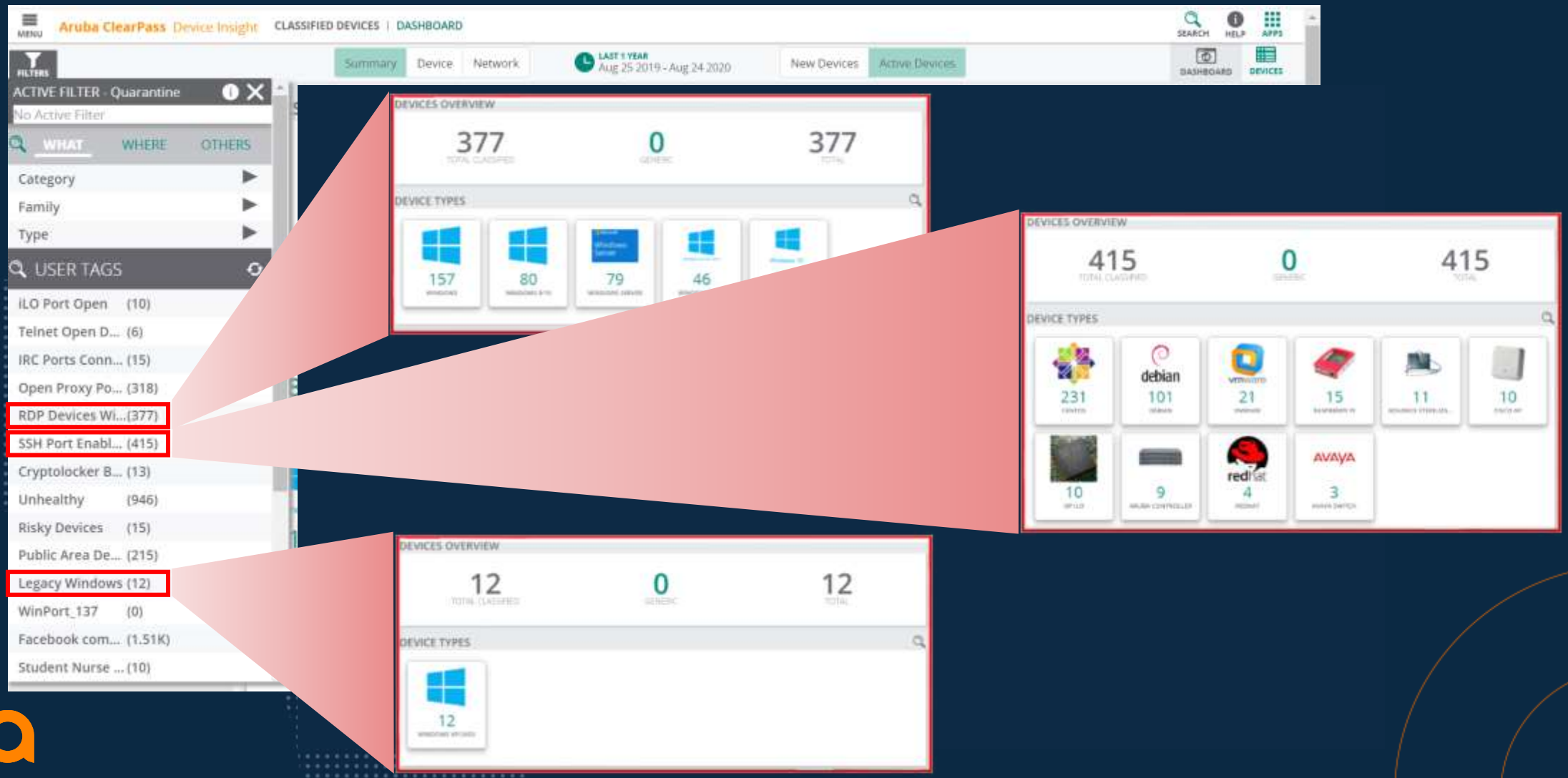
Real-time inventory management – global sites connect to central SAP instance

- **Customer problem:** Deliver consistency in product quality across global manufacturing sites – increase customer footprint
- **Solution:** Centralized SAP ERP infrastructure for all sites, wireless scanners to inward material, check-out material using wireless scanners to assemble final product with correct components, and maintain inventory consistency in ERP database (in real-time)
- **Technologies:** SAP hosted on HPE servers, Aruba Indoor access points covering Factory and outdoor yard locations, 3rd party wireless SKU scanners



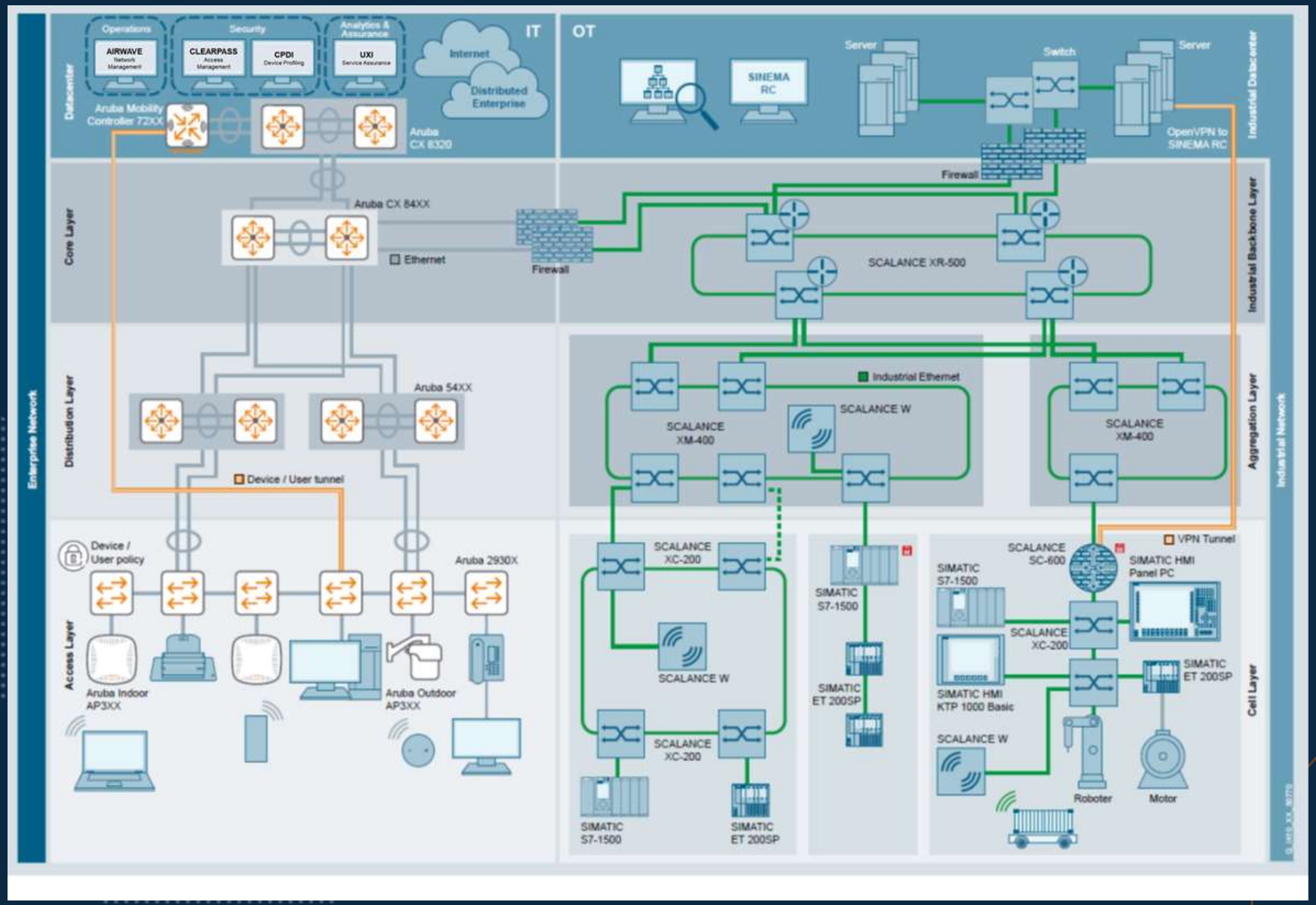
CISO Perspective – Insights to manage Risk

What are my organizations risk exposures?

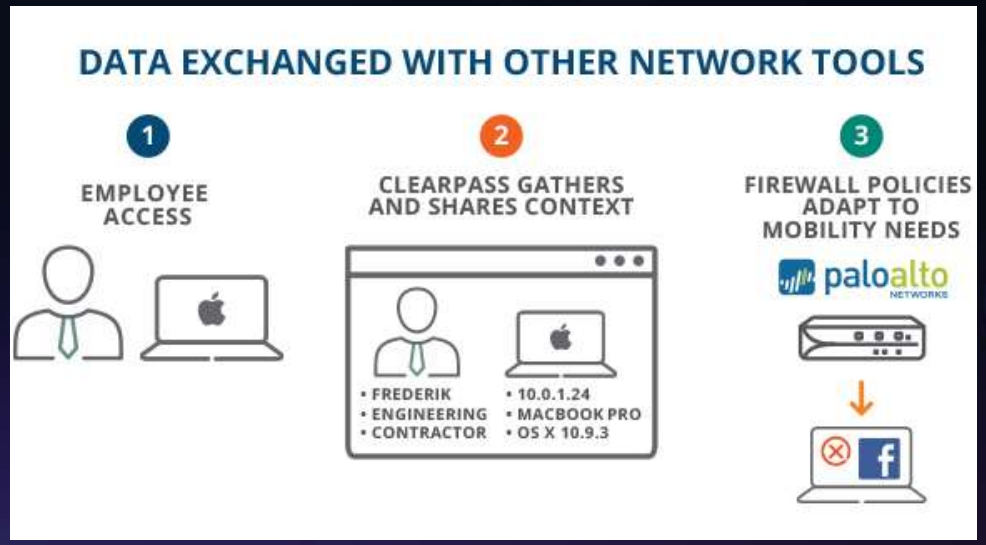


Source: Manufacturing Extension Partnership, NIST

Aruba – Siemens: Redefining IT-OT Integration



INTEGRATING IT & OT SECURITY



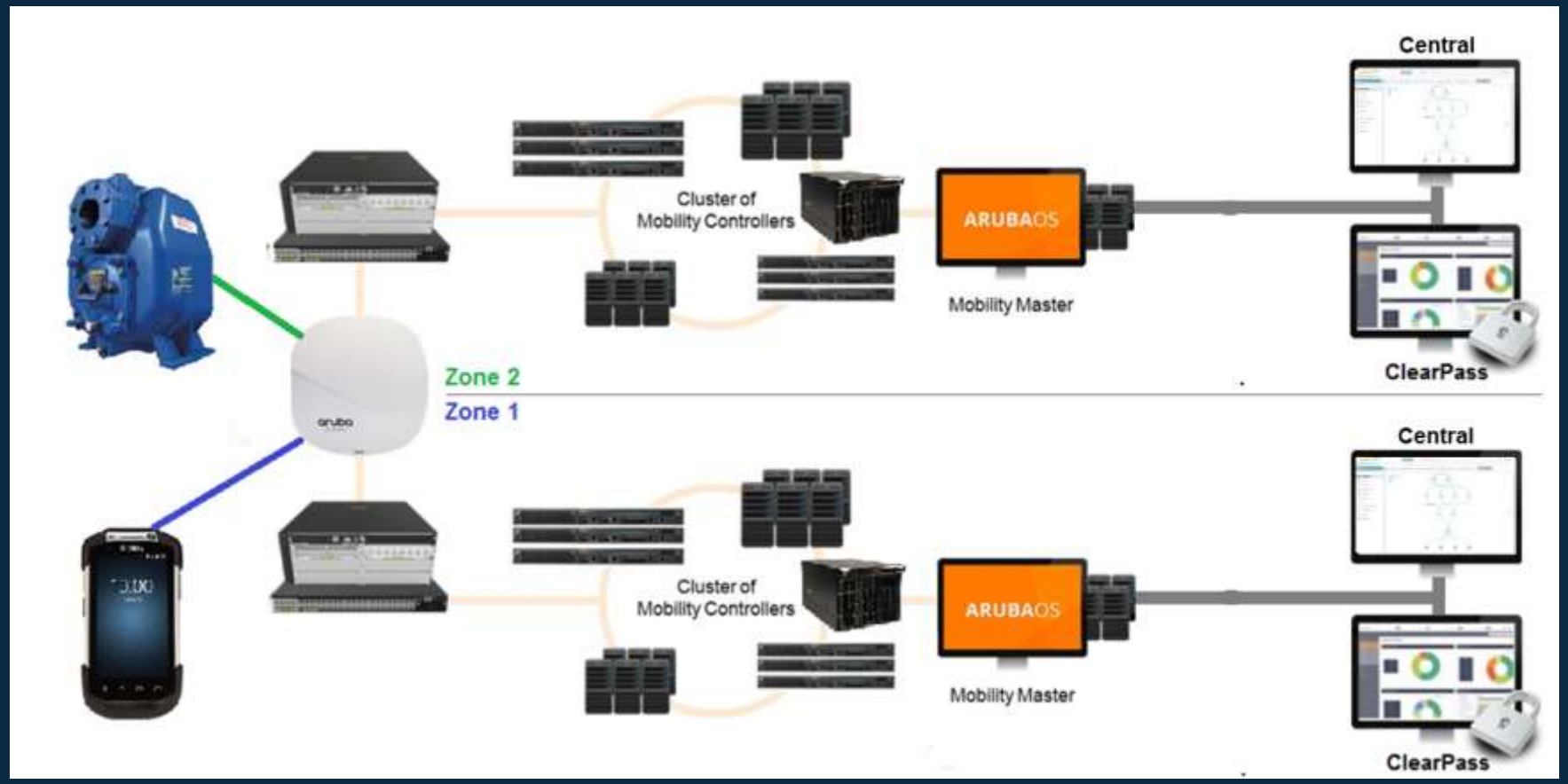
CLAROTY
Clarity For Your OT Networks

CyberX
Trusted. Industrial. Cybersecurity.

NOZOMI NETWORKS

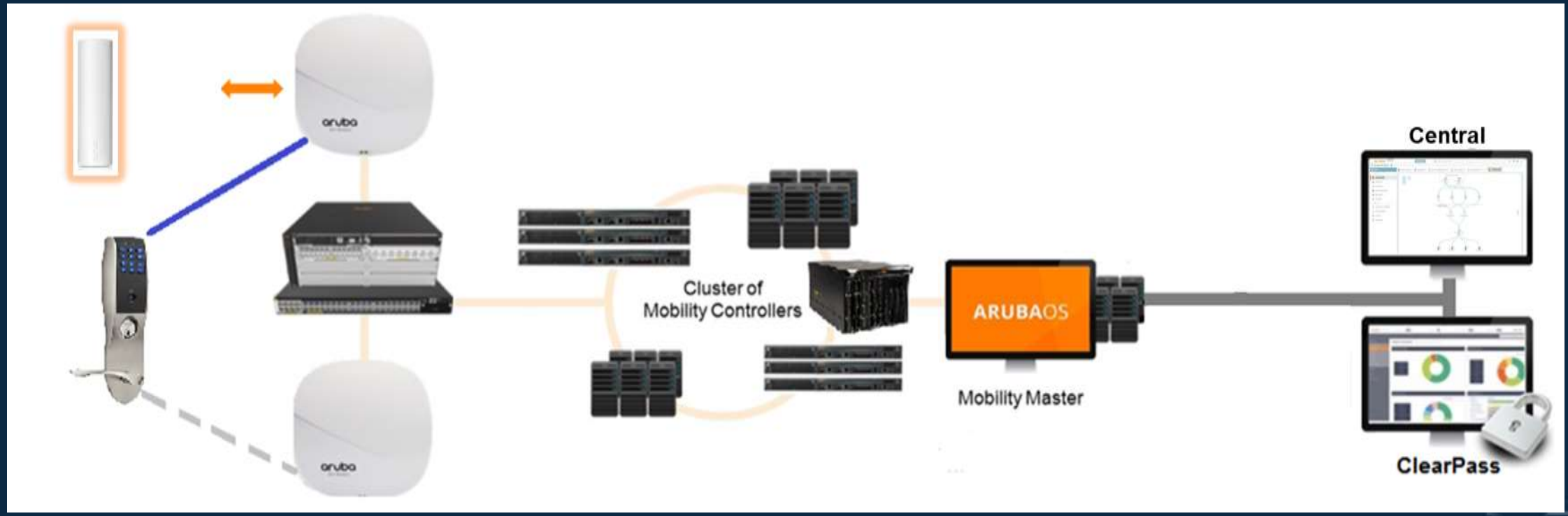
Indegy

MULTIZONE: MULTIPLE ENTITIES, EACH WITH DISTINCT SECURITY POLICIES, SHARE ONE INFRASTRUCTURE



A physical AP can serve as **up to 5 virtual APs**, each with its own security and policy settings

User Experience Insight (UXI) supervises IOT application Performance



Synthetic transactions identify problems networking monitoring can’t see

Selected Ecosystem Partner Integrations

IT CHALLENGES

THE NEED TO DELIVER OUTCOMES

NETWORKING CHALLENGES AT THE EDGE

Technology Siloes Hinder Agility

Lack of Network Automation & Visibility

Security Threats Rising

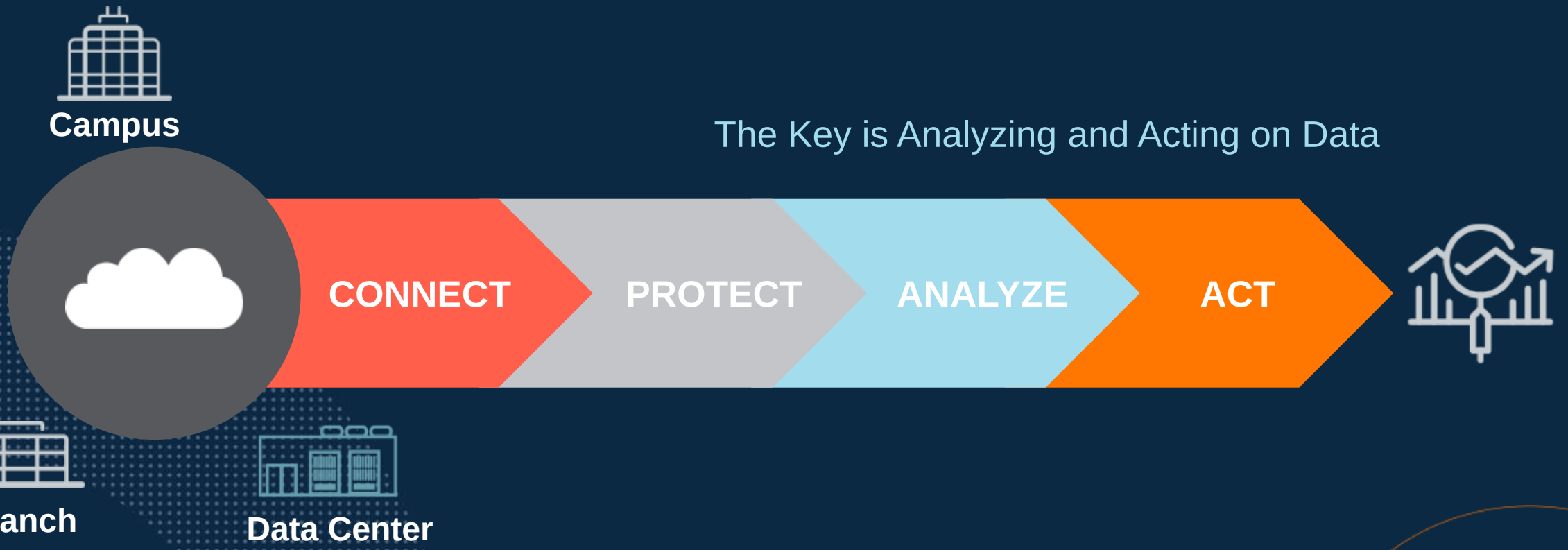
Economic & Resource Headwinds

Networks Must Do More

IT OPERATOR IMPERATIVES

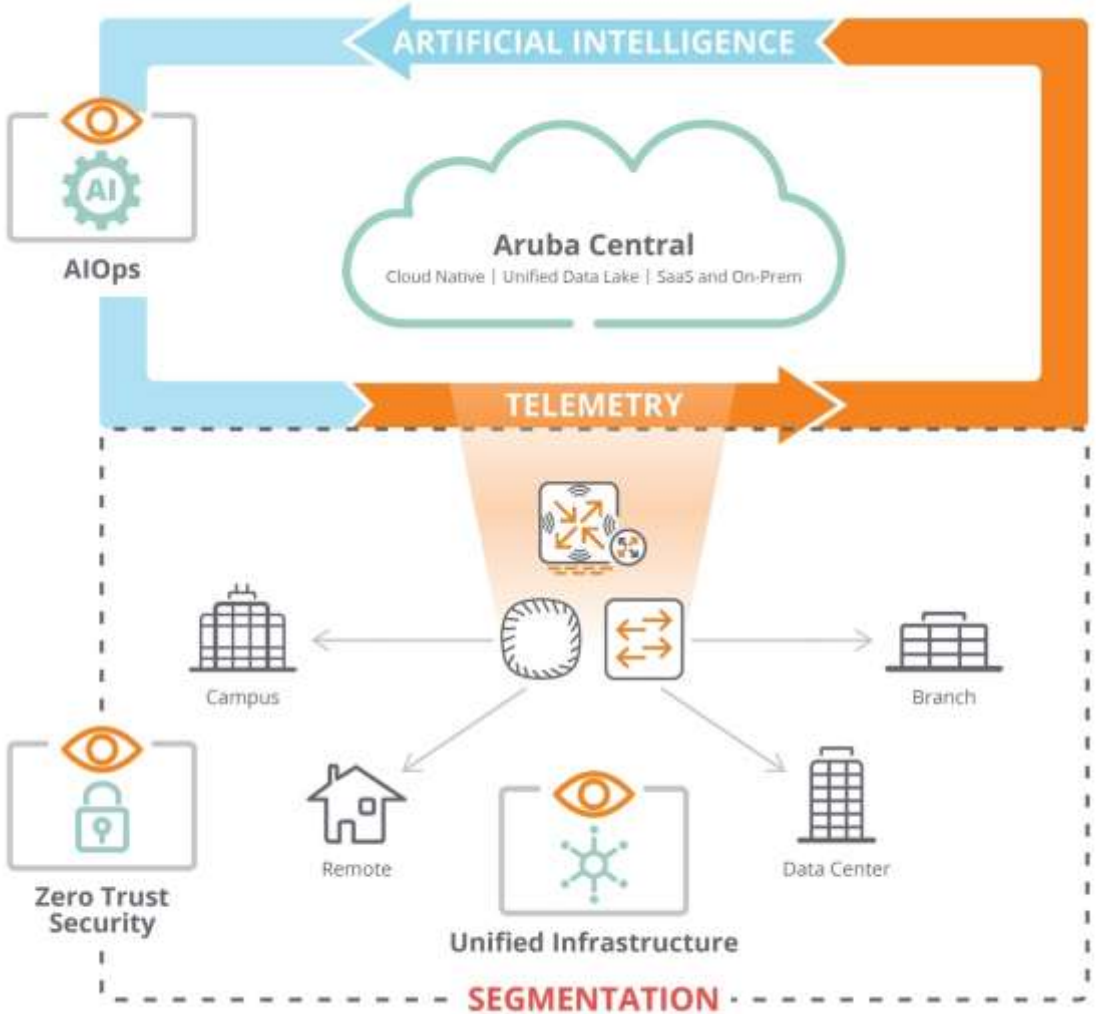
ARUBA VISION

Go Beyond Connect and Protect



ARUBA ESP

THE FOUNDATION FOR SMART MANUFACTURING



ARUBA EDGE SERVICES PLATFORM (ESP)

The Foundation for the Smart Manufacturing

AIOPS

AI Insights | User Insights

UNIFIED INFRASTRUCTURE

Wi-Fi | Switching | SD-WAN | 5G | IOT

ZERO TRUST SECURITY

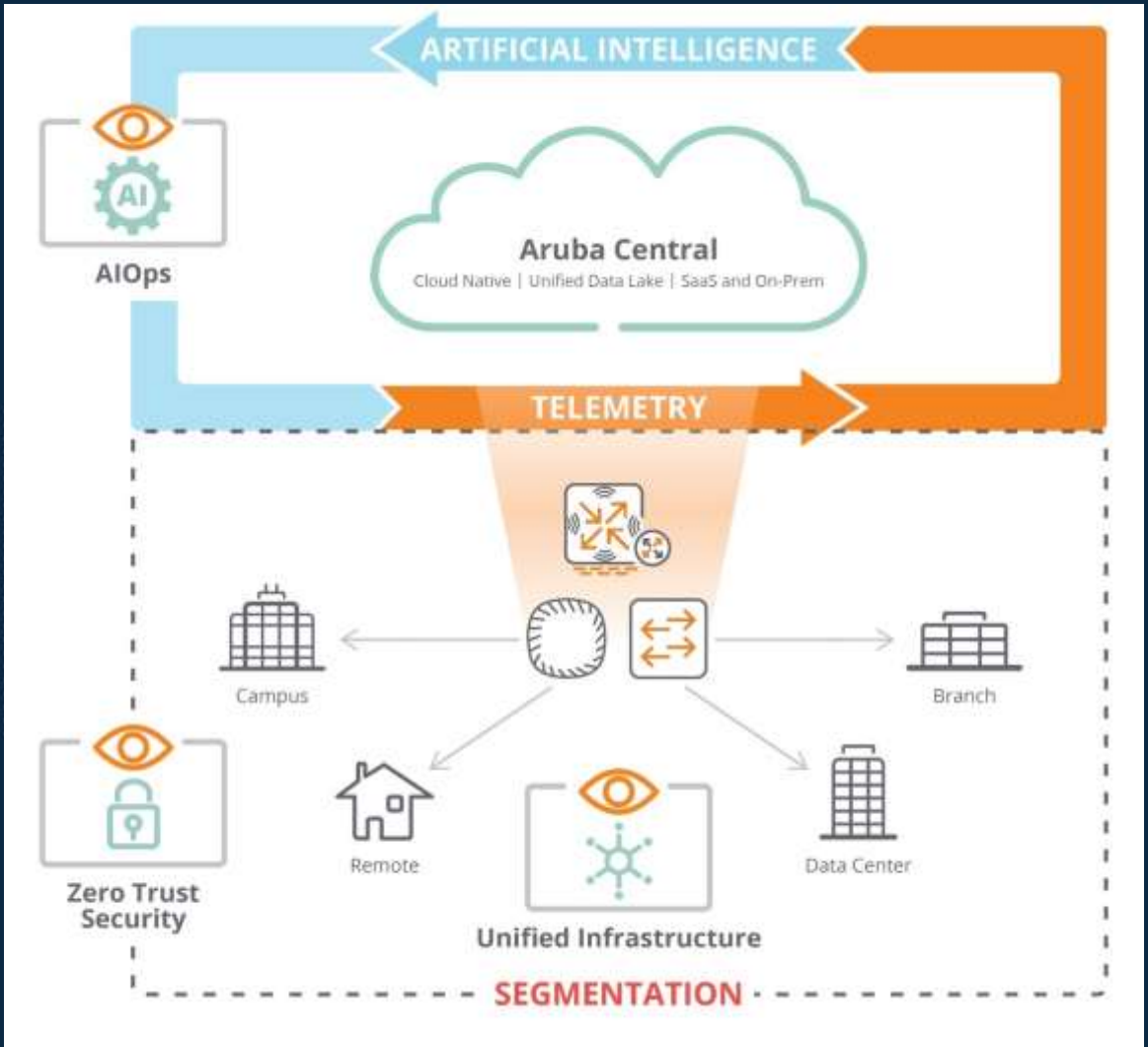
Dynamic Segmentation | Device Insight

Financial and Consumption Flexibility

HPEFS | Managed Connectivity Services

ARUBA EDGE SERVICES PLATFORM (ESP)

The Foundation for the Smart Manufacturing



Core Attributes

AIOps
Automated IT Intelligence

Zero Trust Security
Secure access from anywhere

Unified Infrastructure
One portfolio for any use case

ARUBA ESP FOR SMART MANUFACTURING

Unified Infrastructure

Wi-Fi | Switching | SD-WAN | 5G | IOT

Leverage the same infrastructure and management tools
for corporate offices, plants, warehouses, and factories

Network-in-a-box solutions
with mobile installer app – allows non-technical staff to deploy

Optimized for SD-WAN
using MPLS, Internet and LTE cellular connectivity.

Zero Trust Security

Dynamic Segmentation | Device Insight

Provide secure guest Wi-Fi
with automated segmentation

Protect Legacy Technologies
isolate Windows 7 systems

Deploy new IoT devices
and automate policies

Adapt to potential threats
on customers/employee devices

AIOPS

AI Insights | User Insights

Understand employee movements
by leveraging analytics

Prioritize applications
like ERP or inventory systems

Roam the plant
with high-performing Wi-Fi

Stay ahead of issues
on factory lines ensuring no downtime

THE NEW IT OPERATIONS MODEL
Simple. Secure. Smart.

ZTP

Unified Infrastructure

Always-on monitoring

End-to-end visibility

Zero-downtime updates

AI-powered insights for network and business improvements

Reduce IoT gateways

Deployment options

Zero-trust security for IoT, devices, and data with segmentation

SD-WAN operations

Proactive, predictive, pre-emptive

Agile changes

Financing and licensing options

Analytics driven decision making

HPE Infosys SGRE

Q&A