IoT u teoriji i praksi

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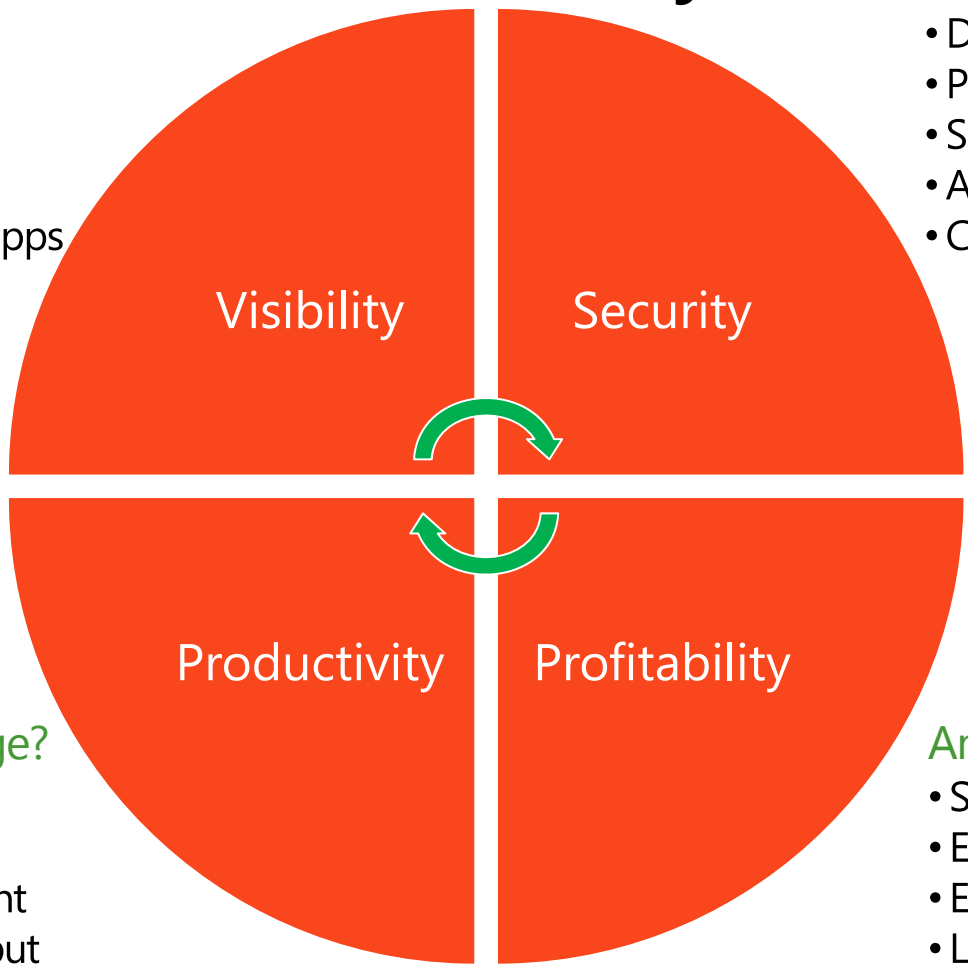
IoT Value Cycle

Am I fully connected?
- M2M, cellular, and telematics
- Industrial grade wireless
- Switching and data centers
- Remote sites, users, data centers
- Management of devices, users, apps

Am I fully protected?
- Data at-rest and in-motion
- Physical security
- Secure BYOD
- Application security
- Compliance, health, and safety



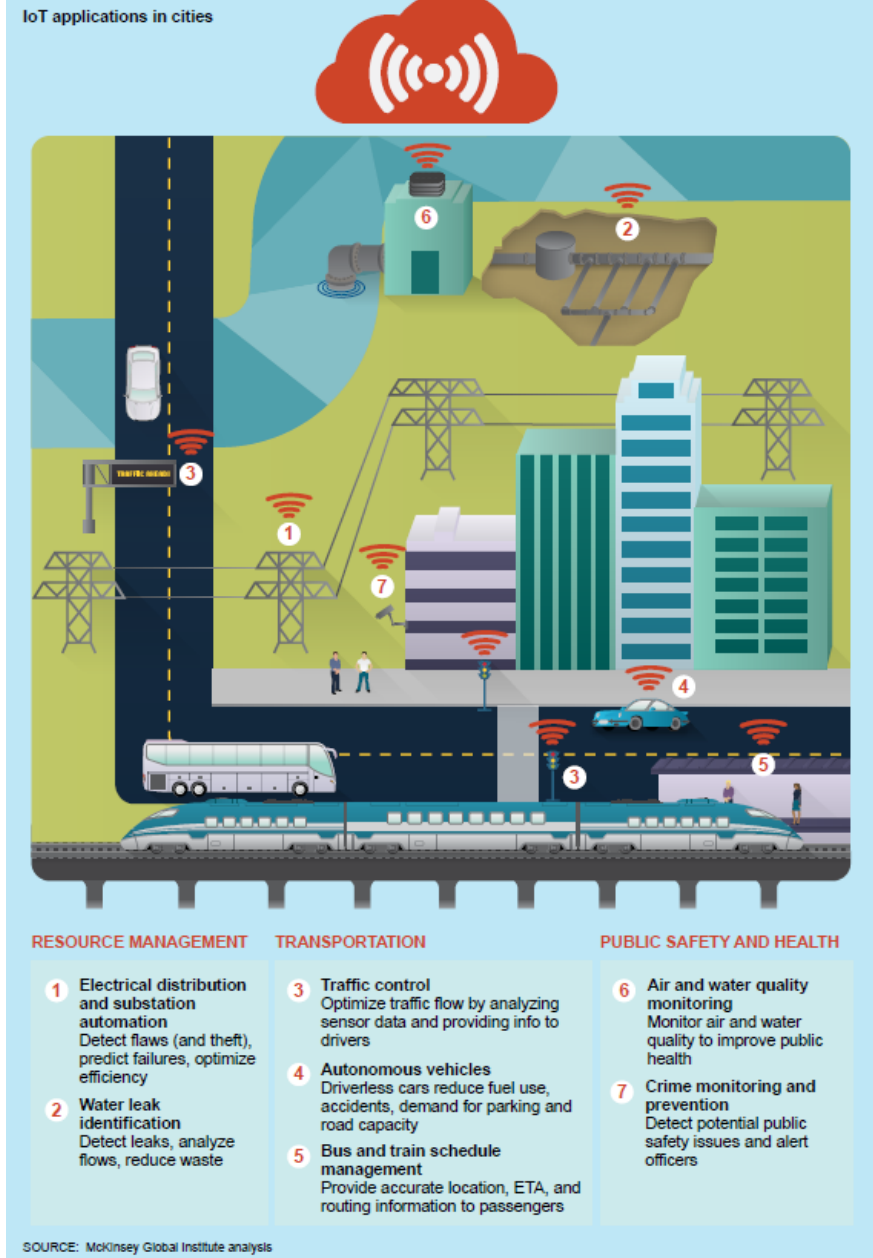
Am I fully unlocking knowledge?
- Uptime, high MTBF, low MTTR
- Customer behavior
- Contractor and staff management
- Kanban, efficiency, and throughput
- Responsiveness

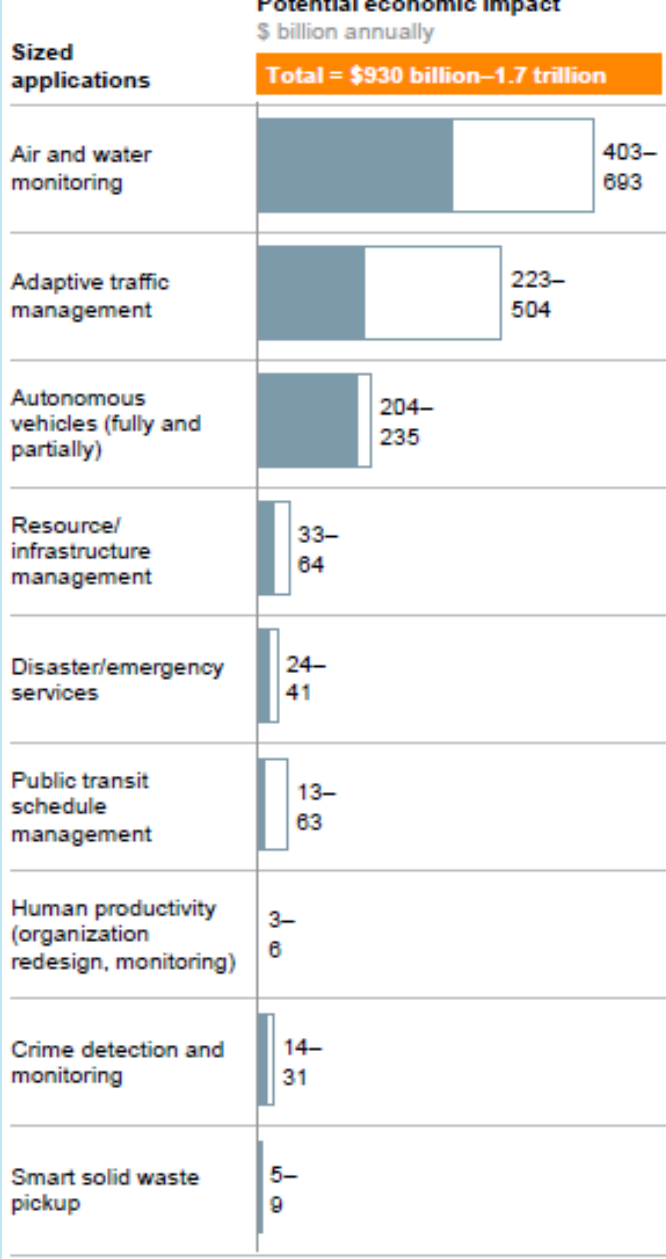
Am I fully innovating?
- Service excellence
- Engagement and differentiation
- Ease of use and interaction
- Loyalty and product validation
- Monetization as a service

Smart City IoT

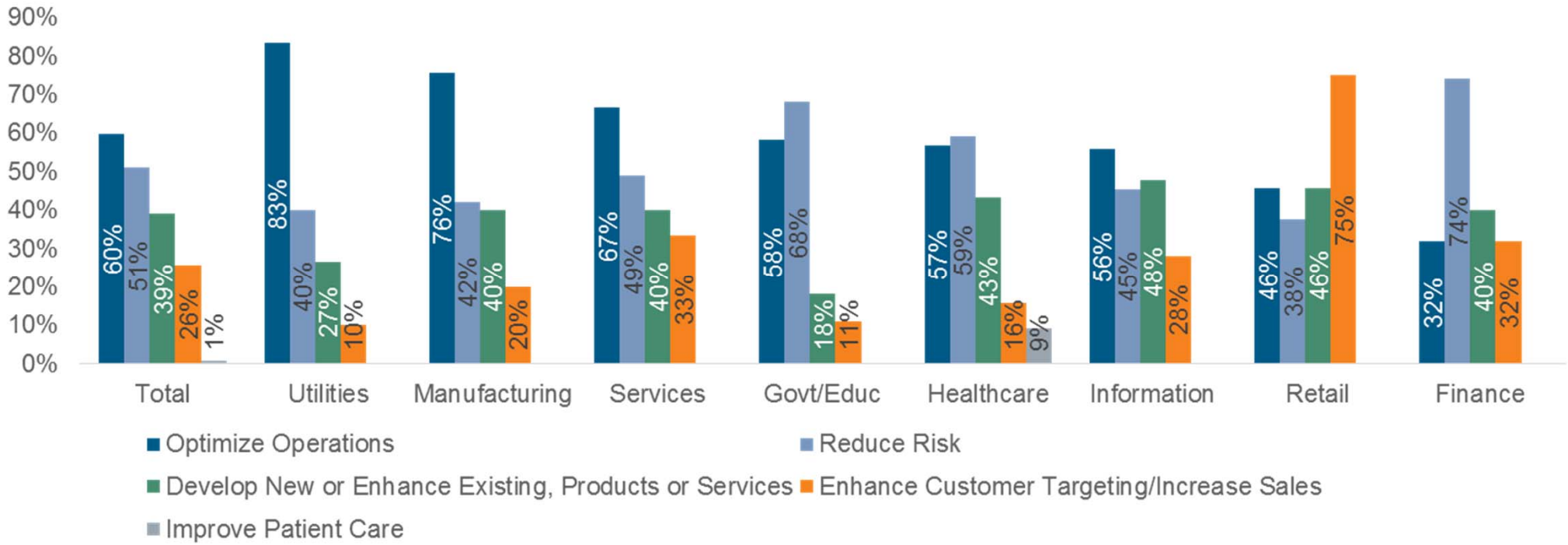
- Total economic impact of IoT in 2025 is $930B-$1.7T
- Top areas
  - Safety and public health
  - Transportation
  - Resource management

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





Data & Context Driven Business Imperatives: What Are The Business Reasons For IoT?



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

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Challenge #1

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

- The Internet of Things (IoT) is comprised of stationary and mobile devices used to harness the world around us
- Mining device data enriches decision making to a degree no one device could facilitate on its own
- Only trusted devices and data with verified integrity should be leveraged to make decisions
- Today's IoT isn't trustworthy: it's a riddle of PHYs, wrapped in an enigma of protocols, protected by a hairball of security

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Challenge #2

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

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Connectivity Must Be Flexible & Secure

- Secure Wi-Fi, wired, cellular support are essential
- IoT devices built for speed and reliability may have little, no, or outdated security
- Management visibility into status and performance should be from a single pane of glass

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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

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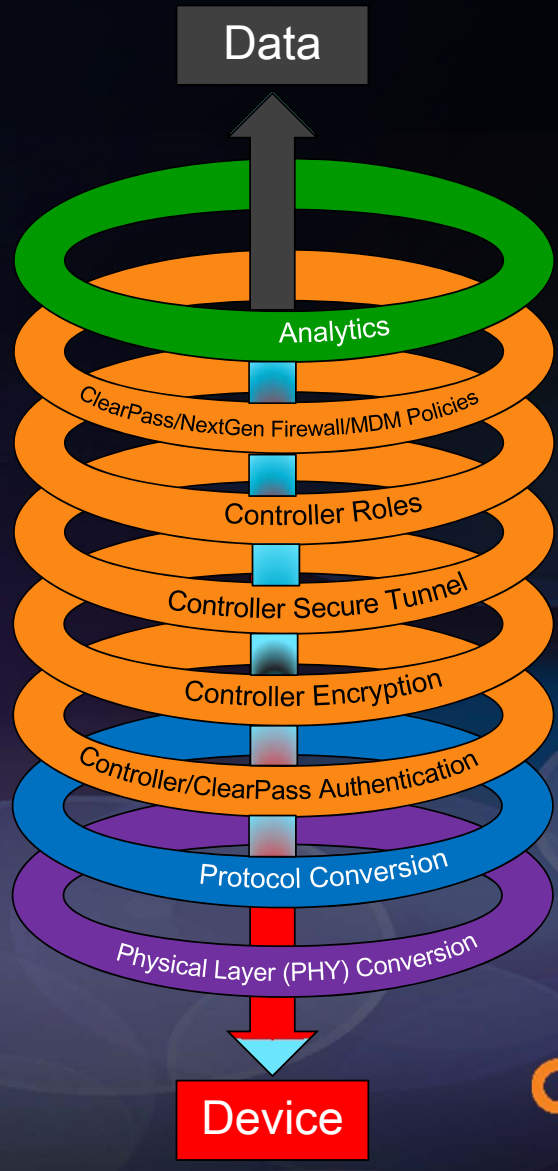
Connect & Protect

- Establishes trustworthy data sources for business intelligence and decision making
- Eight steps to trust
  1. Make a physical layer (PHY) connection
  2. Talk the talk with existing device protocols
  3. Establish authenticity of devices and users
  4. Encrypt the data
  5. Secure communication pathways
  6. Establish and enforce device and user roles
  7. Implement access and usage policies
  8. Monitor for vulnerabilities



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HPE/ARUBA Portfolio from access to data center

Software
Management, policy & location-based services

Mobility infrastructure

Campus switching

Data center switching

HPE Aruba Products Overview

103/205/215/225 indoor + outdoor

Wireless Infrastructure

APs, RAPs, Sensors, Beacons…

Wired Infrastructure

Switches

Network controls

AOS8 with REST APIs to share context and program infrastructure

Location analytics

Analytics and Location Engine (ALE) with northbound REST APIs

Cloud networking

Central with REST APIs to share context and program infrastructure

Network management

AirWave with northbound XML APIs for data consumption

Policy management

ClearPass with a unified API library and Extensions repository

Micro-location services

Meridian with mobile app development SDK and REST APIs

Switching That Meets the Needs of Today and Tomorrow

Gigabit Access

Multi-Gig Access

Aruba 2530

Aruba 2930F

Aruba 2920

Aruba 3810

Aruba 5400

	Aruba 2530	Aruba 2930F	Aruba 2920	Aruba 3810	Aruba 5400
Smart Rate Multi-Gig Ports				●	●
Stacking			●	●	VSF
SDN Ready		●	●	●	●
POE+	●	●	●	●	●
AirWave & ClearPass	●	●	●	●	●

Broad 802.11ac Aruba Instant Portfolio

	Model	Location	Performance	Density	Vertical
	200 Series	Indoor	Moderate	Moderate (50 active)	K-12 Retail Hospitality
	210 Series	Indoor	High	Moderate (75 active)	Carpeted space Hospitality - Lobby
	220 Series	Indoor	High	High (125+ active)	Lecture Halls Venues
	310 Series	Indoor	High	Moderate (75 active)	Carpeted space across verticals
	320 Series	Indoor	High	High (125+ active)	Higher Ed Venues
	330 Series	Indoor	Very High	High (125+ active)	Higher Ed Venues
	270 Series	Outdoor	High	High (125+ active)	Outdoor

270 Series and 228 Hardened AP Portfolio

AP-275
Integrated Omnis
Dual Radio 11ac 3x3:3SS

AP-274
Connectorized
Dual Radio 11ac 3x3:3SS

AP-277
Integ. Directional
Dual Radio 11ac 3x3:3SS

AP228
6 x RPSMA
Dual Radio 11ac 3x3:3SS

Hot Spots That Blend In

- Ultra high performance outdoor 802.11ac 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

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CLIENTMATCH™

Intelligently steers devices to the best AP

No client-side software required

REAL-TIME RF CORRELATION

DEVICE TYPE LOCATION CONGESTION INTERFERENCE MU-MIMO Aware’

AppRF technology

On-Board DPI

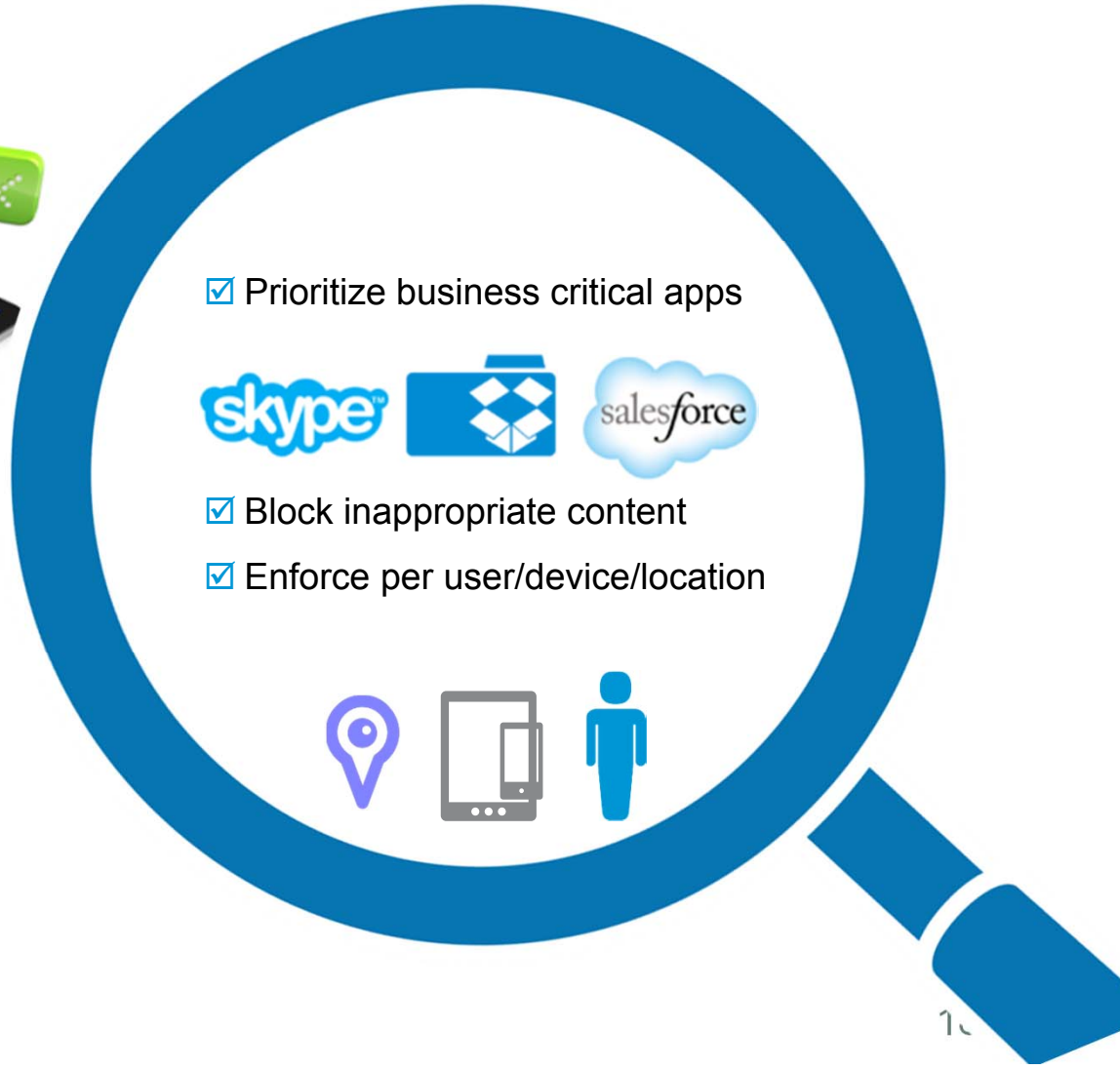
- Depth - common apps
- Enterprise traffic

Cloud-Based Web Policy Enforcement

- Breadth - less common apps
- Web traffic

GRANULAR VISIBILITY & CONTROL

- ❑ App category
- ❑ Individual app
- ❑ Web category
- ❑ Web reputation
- ❑ Allow/deny
- ❑ QoS
- ❑ Throttle
- ❑ Log
- ❑ Blacklist



MultiZone: Use Cases and Benefits

Airport

British Airways Wi-Fi

United Airlines Wi-Fi

Security Wi-Fi

Public Wi-Fi

Air France Wi-Fi

Singapore Airlines Wi-Fi

Shopping Mall

Shopping Mall public Wi-Fi

Uniqlo Private Wi-Fi

H&M Private Wi-Fi

Levi's Wi-Fi

Give additional Wi-Fi sponsorship opportunities to your existing customers in public venues

Offer significant cost savings to operators of public venues, by eliminating use of separate Wi-Fi systems

The Many Faces Of Smart City IoT

Gateway

Converged IoT System

Switching

Cellular Backhaul

Hazardous Areas

Outdoor

Mobile

PHY And/Or Protocol Converters

Native Ethernet

Native Wi-Fi

Power Line Twisted Pair RF BLE

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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

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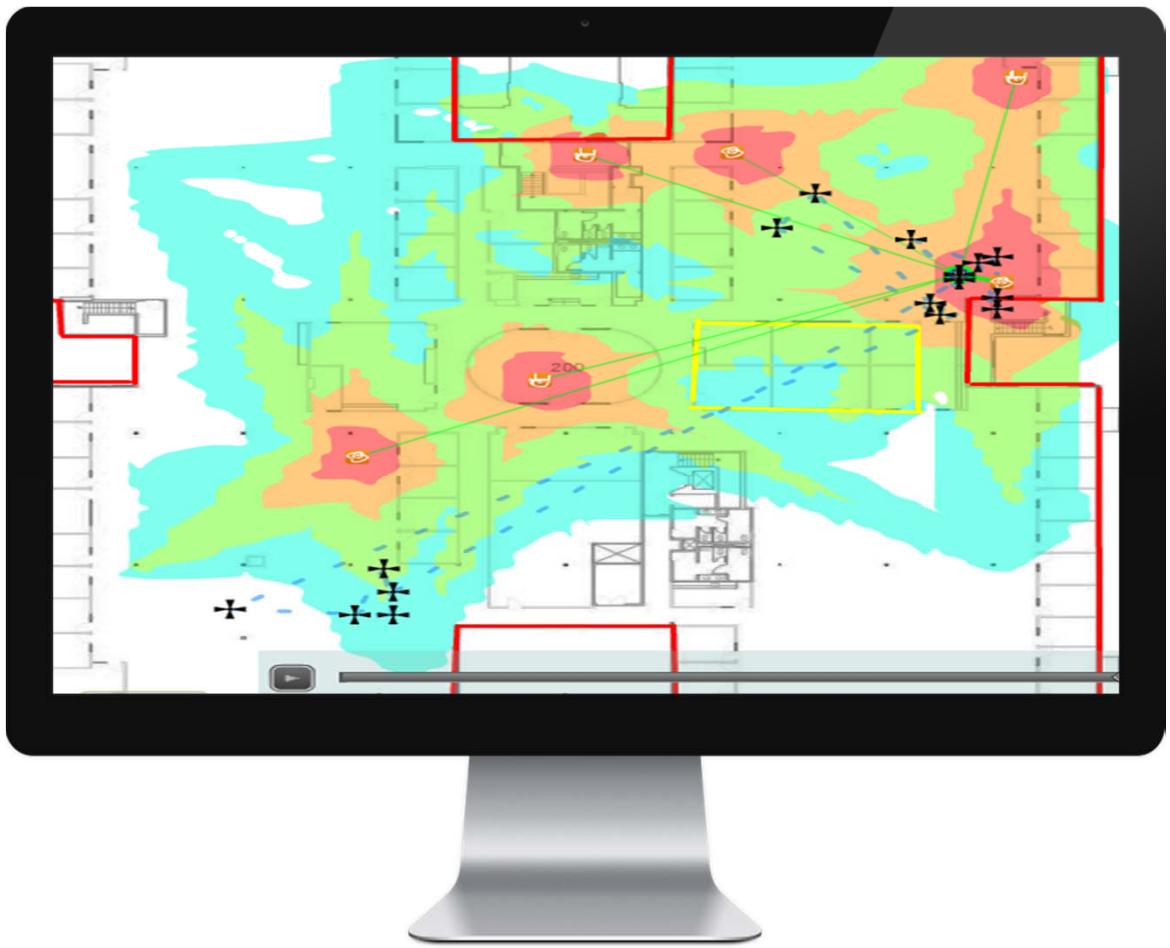
Flexible management choices

	Instant Local Management	Central	Airwave
Deployment	**n/a**	**Cloud** Management as a Service no hardware, no software	**On-site**
Management	**Decentralized** Instant Clusters	**Centralized Management** Instant APs, multiple sites, multiple clusters	**Centralized Management** Instant & ArubaOS APs, Third Party Wired & WLAN
Advanced Capabilities	Simple Guest Wi-Fi	Guest/Visitor management with custom captive portal	VisualRF, advanced reporting alerts & customizations
Pricing	**Free**	**No upfront costs** Subscription per AP 1/3/5yr Tech Support included	**Lower recurring costs** Perpetual SW license per AP/Switch + recurring annual maintenance + HW (optional)

AirWave Visual RF: Tracking Physical Assets



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IT Solution Overload

How do I onboard personal devices?

How do I keep enterprise data safe?

How do I protect my network?

What if a mobile device is lost?

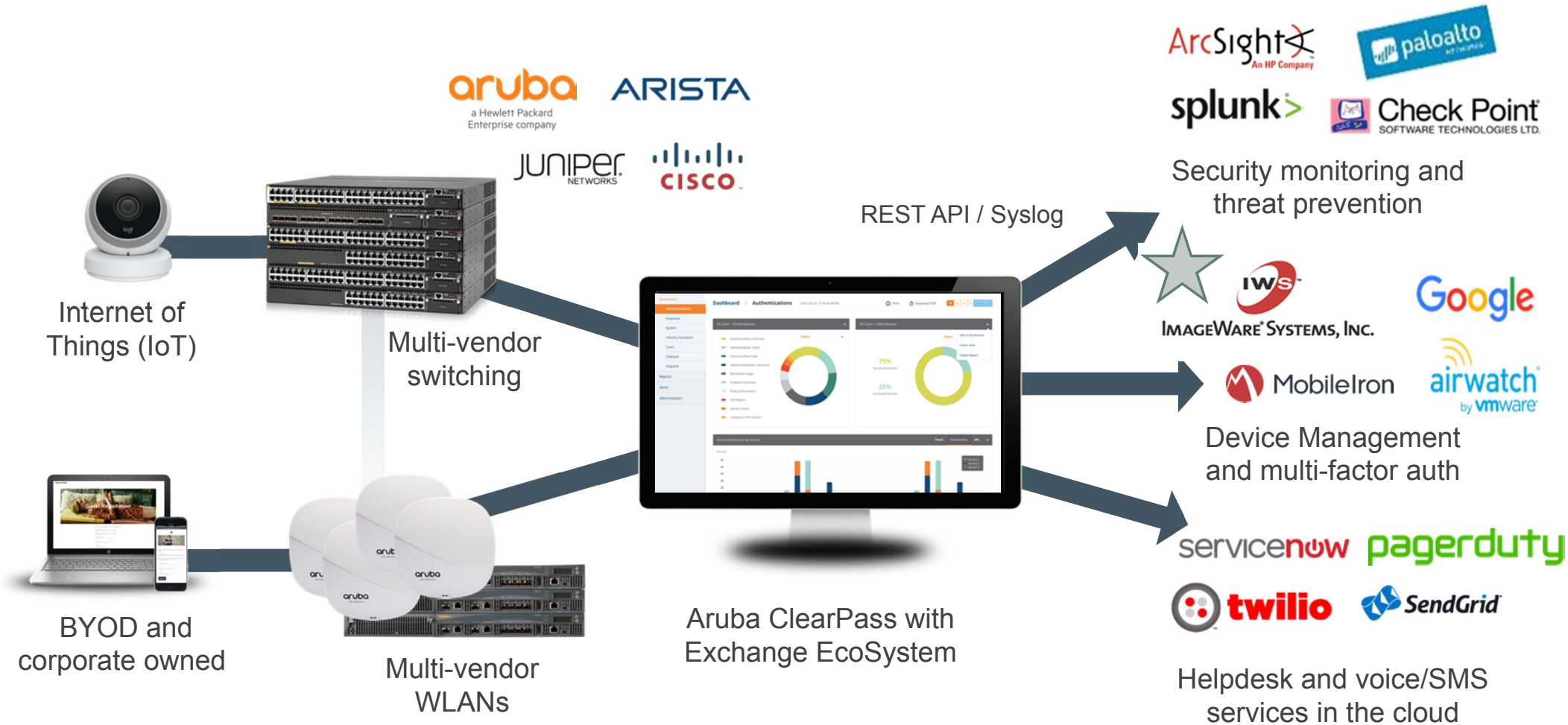
How do I maintain user privacy?

NETWORK: NAC?

DEVICE: MDM?

APP: MAM?

Aruba ClearPass



- Create a customized guest access portal.
- Self-registration, social logins and sponsor options
- In-browser advertising.

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

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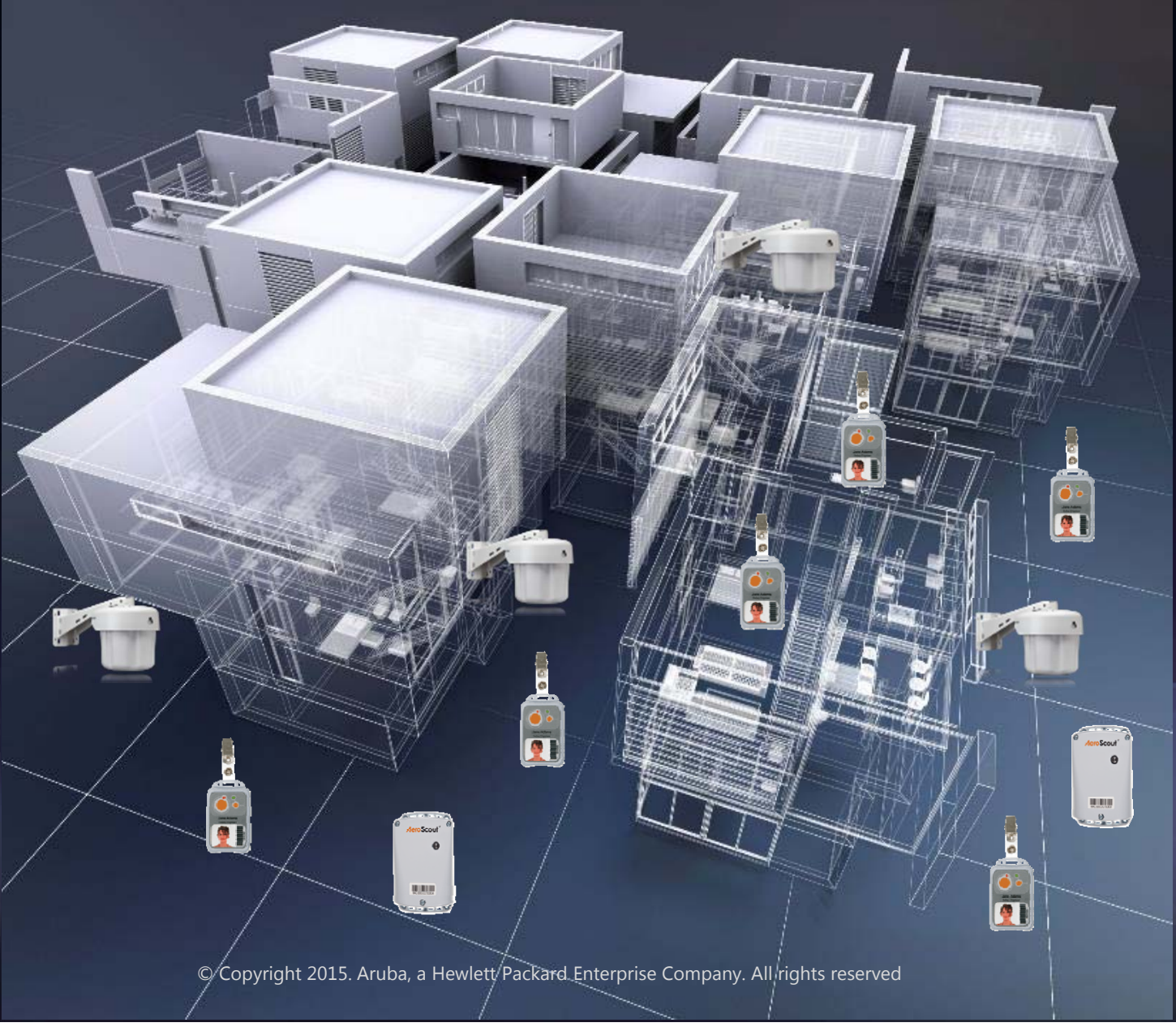

Asset Tracking

- 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

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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

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Municipal Lighting & Traffic Control

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

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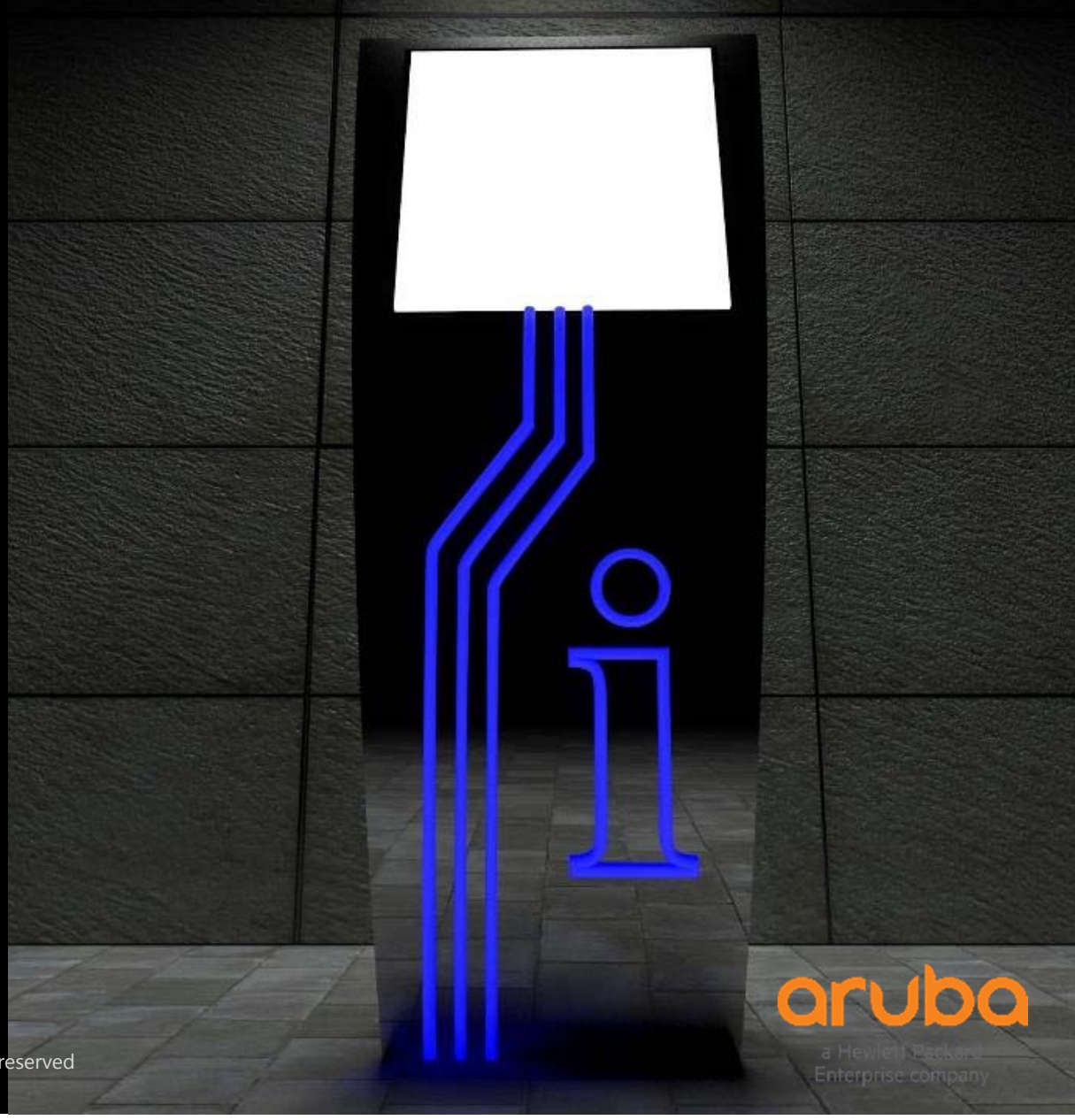
Kiosks

- 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



Mining Context

- 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
  - Site utilization
  - Usage-based maintenance optimization
  - First responder area occupancy
  - Time and motion optimization

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Traffic Pattern Analytics Enabled by ALE

- **Presence (Inside Venues / Conference Rooms)**
- **Capture Rates (Inside versus Walk-Bys)**
- **Dwell Times by Geofence**
- **Repeat versus New Visitors**
- **User Classification (Employees versus Guests)**

Meridian: A Beacon To Your Destination

- Turn-by-turn navigation for visitors, conventions, city centers, airports, hospitals, museums, public sites, schools
  - Cellular + Wi-Fi for redundancy
- SDK ties to your city's app or Meridian will make one for you
  - Manage maps from Meridian cloud
- Monetize systems using built-in push notification and geofencing

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Gartner Magic Quadrant for the Wired and Wireless LAN Access Infrastructure

Figure 1. Magic Quadrant for the Wired and Wireless LAN Access Infrastructure

Source: Gartner (August 2016)

Gartner once again positions HPE Aruba in the Leaders Quadrant of the latest Wired and Wireless LAN Access Infrastructure Magic Quadrant

HPE Aruba feels this should be considered further validation that HPE Aruba is a leader in connecting the world with intelligent mobility

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Source: Gartner Magic Quadrant for the Wired and Wireless LAN Access Infrastructure
August 2016. Tim Zimmerman, Christian Canales, Bill Menezes, Danilo Ciscato
ID Number: G00291908

Use Case: Wayfinding & Geofencing

Levi's Stadium

Orlando Int'l Airport

Stations Casino

American Museum of Natural History

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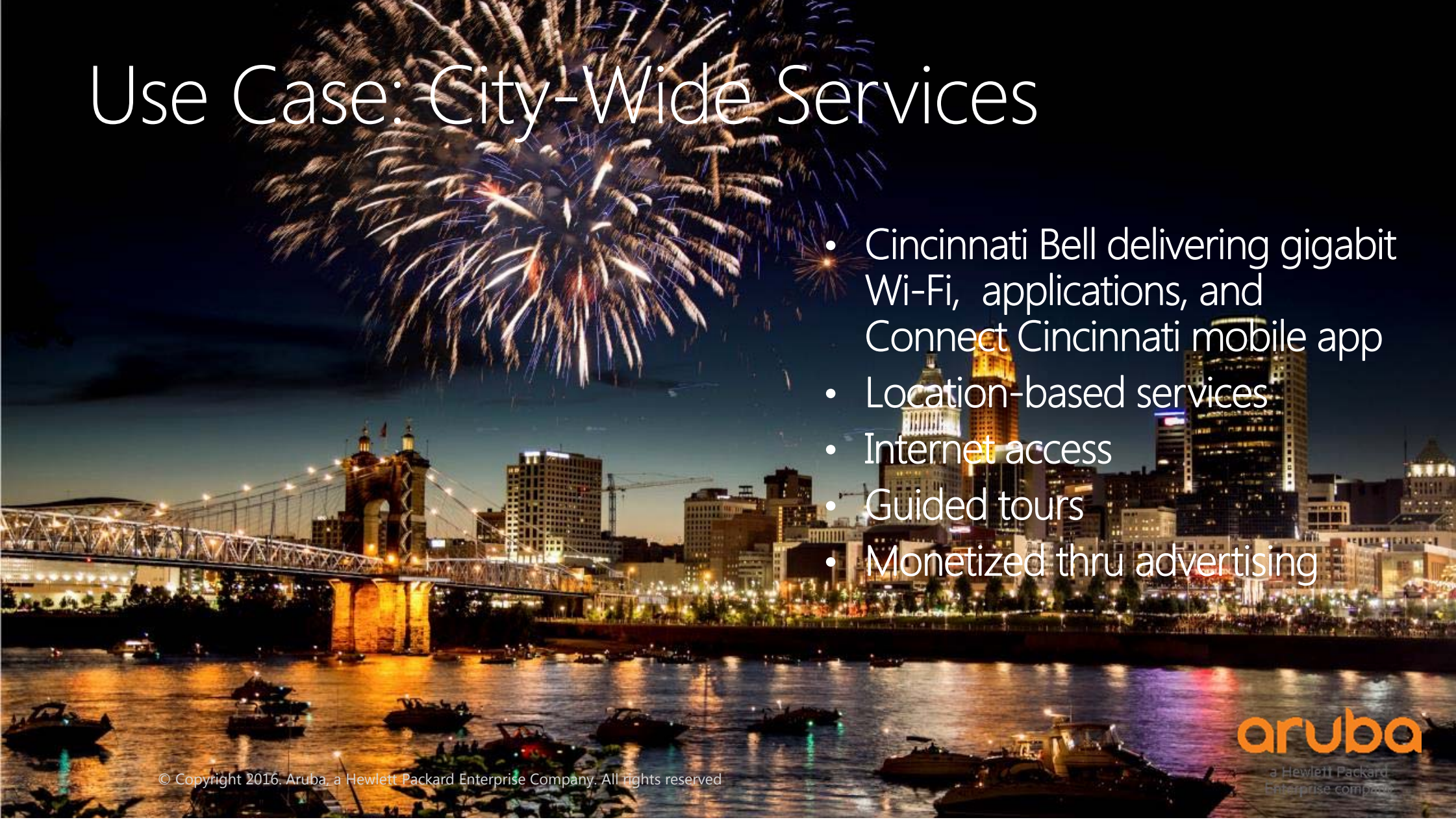
Use Case: City-Wide Services



- Cincinnati Bell delivering gigabit Wi-Fi, applications, and Connect Cincinnati mobile app
- Location-based services
- Internet access
- Guided tours
- Monetized thru advertising

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Use Case: Security & Video Surveillance

- 50km² city center network for Beijing Olympics
- Wi-Fi access, mobile patrol services, and video surveillance
- 600 access points in financial district and Olympic stadium surrounds

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