



# IoT in Action

#IoTinActionMS



# Architecting the Intelligent Edge

Darryl McCartney  
Director, Americas IoT Technical Sales

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IoT Solution Architect

**IoT** in Action



# The Evolution of **IoT** in Action



Year 1 2017

# The Evolution of IoT in Action



Year 2 2018



# The Evolution of IoT in Action

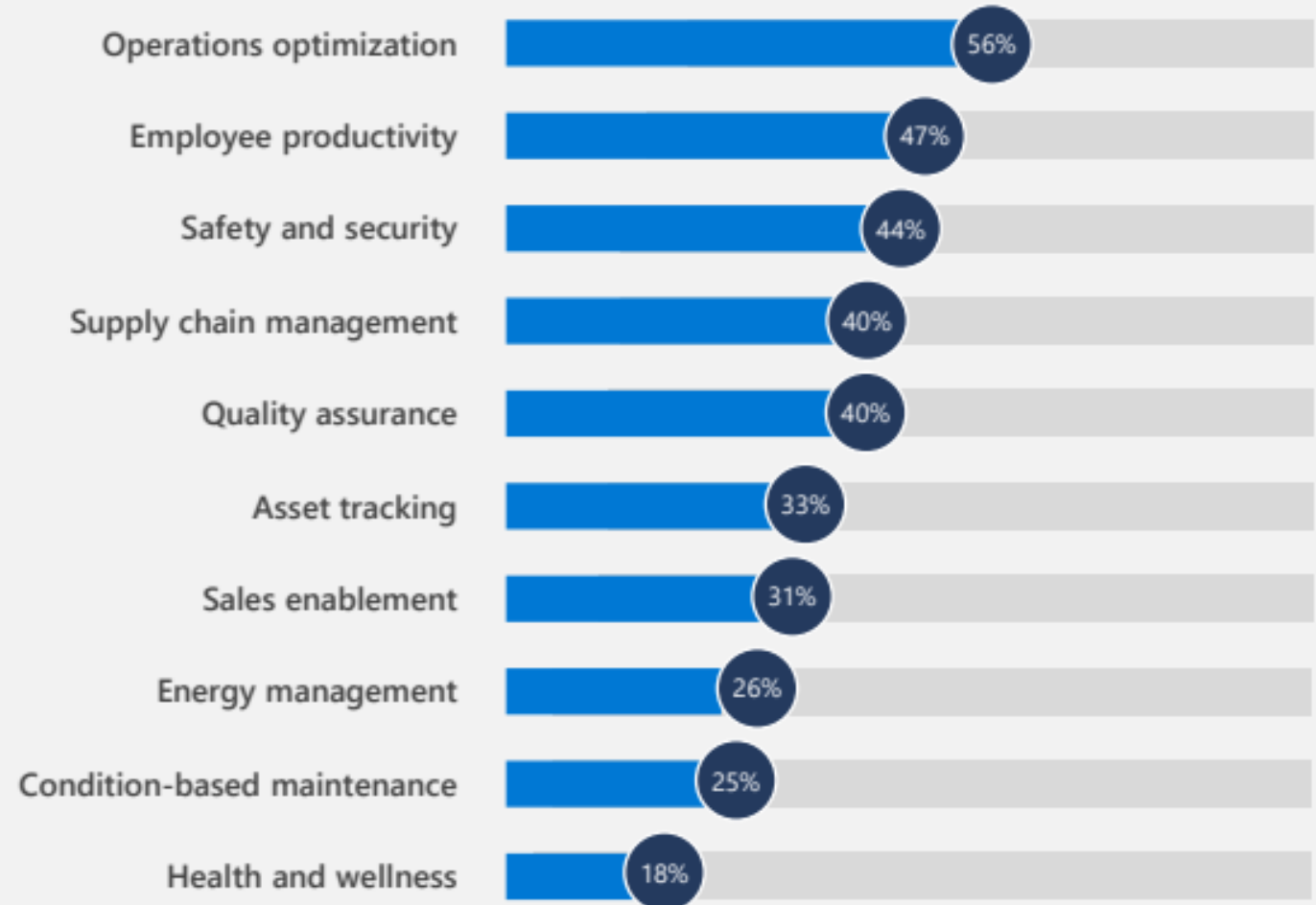


Year 3 2019

# IoT Signals

SUMMARY OF RESEARCH LEARNINGS  
2019

## Reasons for IoT adoption



# IoT Signals

SUMMARY OF RESEARCH LEARNINGS  
2019

## Top Use Case by Industry



### RETAIL/ WHOLESALE

Supply chain optimization 64%

Inventory optimization 59%

Surveillance and security 48%

Loss prevention 44%

Energy optimization 40%



### TRANSPORTATION

Fleet management 56%

Security, surveillance, and safety 51%

Manufacturing operations efficiency 40%

Vehicle telematics and infotainment 38%

Predictive maintenance 33%



### GOVERNMENT

Public Safety 48%

Infrastructure and facilities management 40%

Regulations and compliance management 38%

Fleet and asset management 37%

Incident response 29%



### HEALTHCARE

Tracking patient, staff, and inventory 66%

Remote device monitoring and service 57%

Remote health monitoring and assistance 55%

Safety, security, and compliance 53%

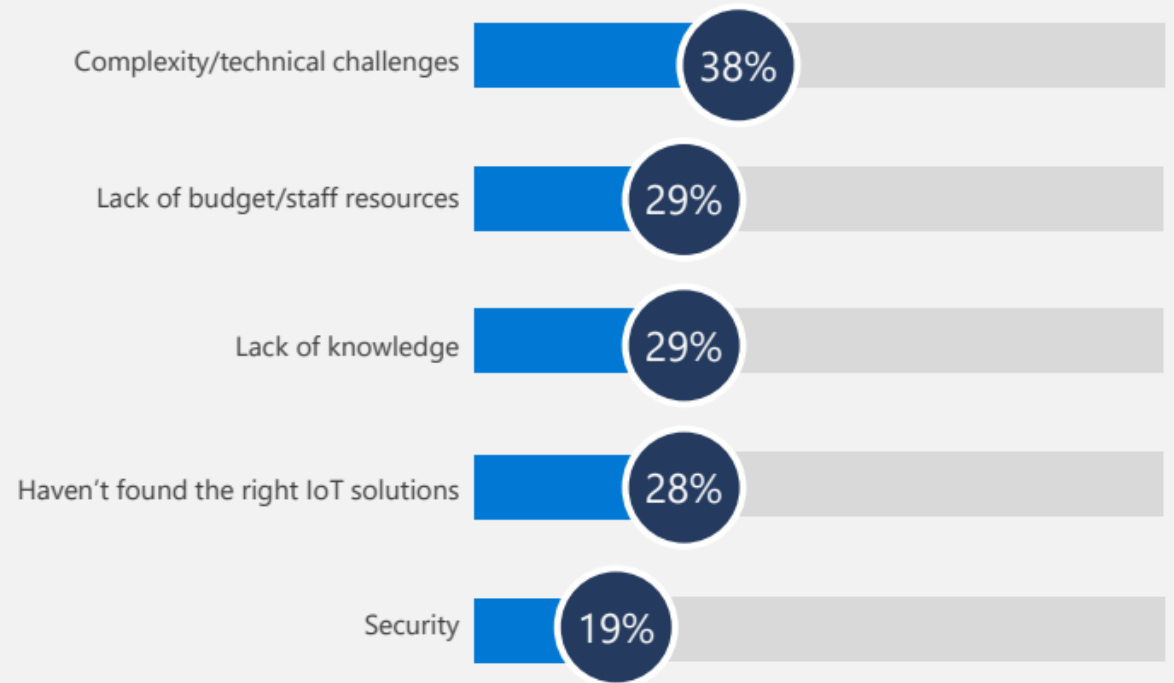
Facilities management 42%



# IoT Signals

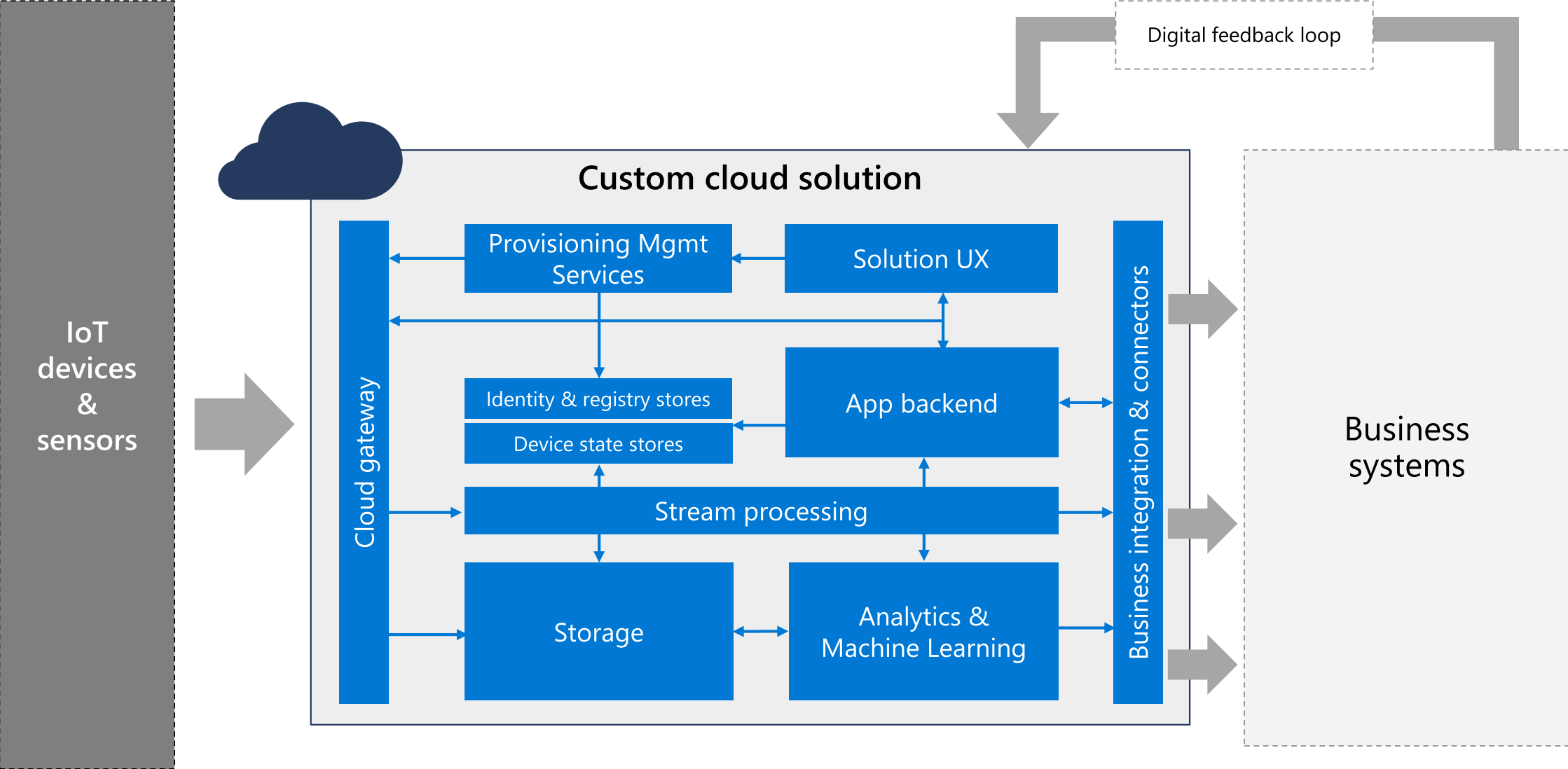
SUMMARY OF RESEARCH LEARNINGS  
2019

## Top challenges

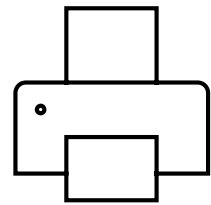




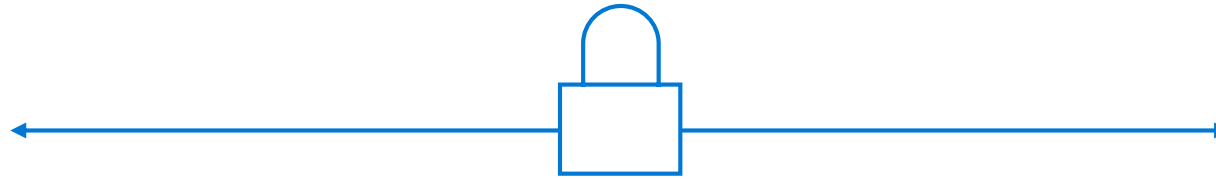
# Solution architecture—DIY



# We had a similar challenge in the past...

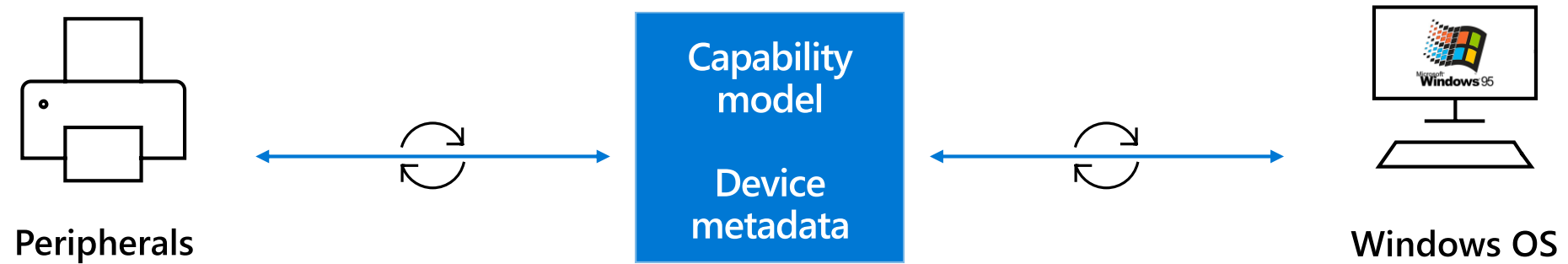


Peripherals



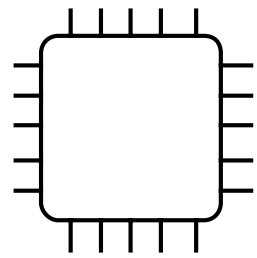
Windows OS

# That was solved with Windows Plug and Play

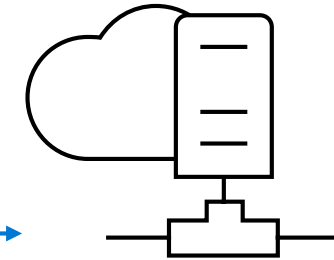
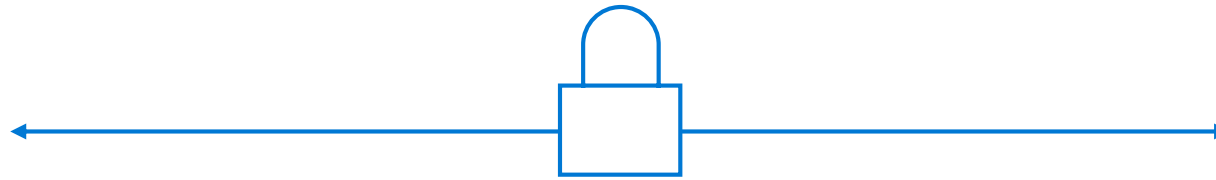


Devices published their capability models and adhered to them  
Windows used the capability model to know how to interact with them

# IoT today



IoT devices

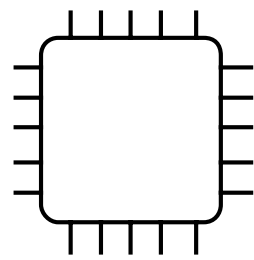


Cloud IoT solutions

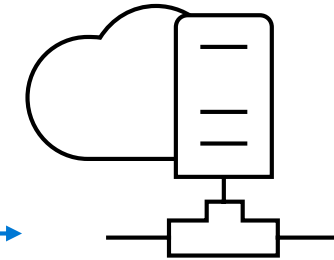
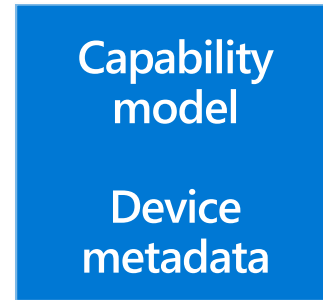
Tight coupling between software on device and IoT solution in the cloud



# IoT Plug and Play



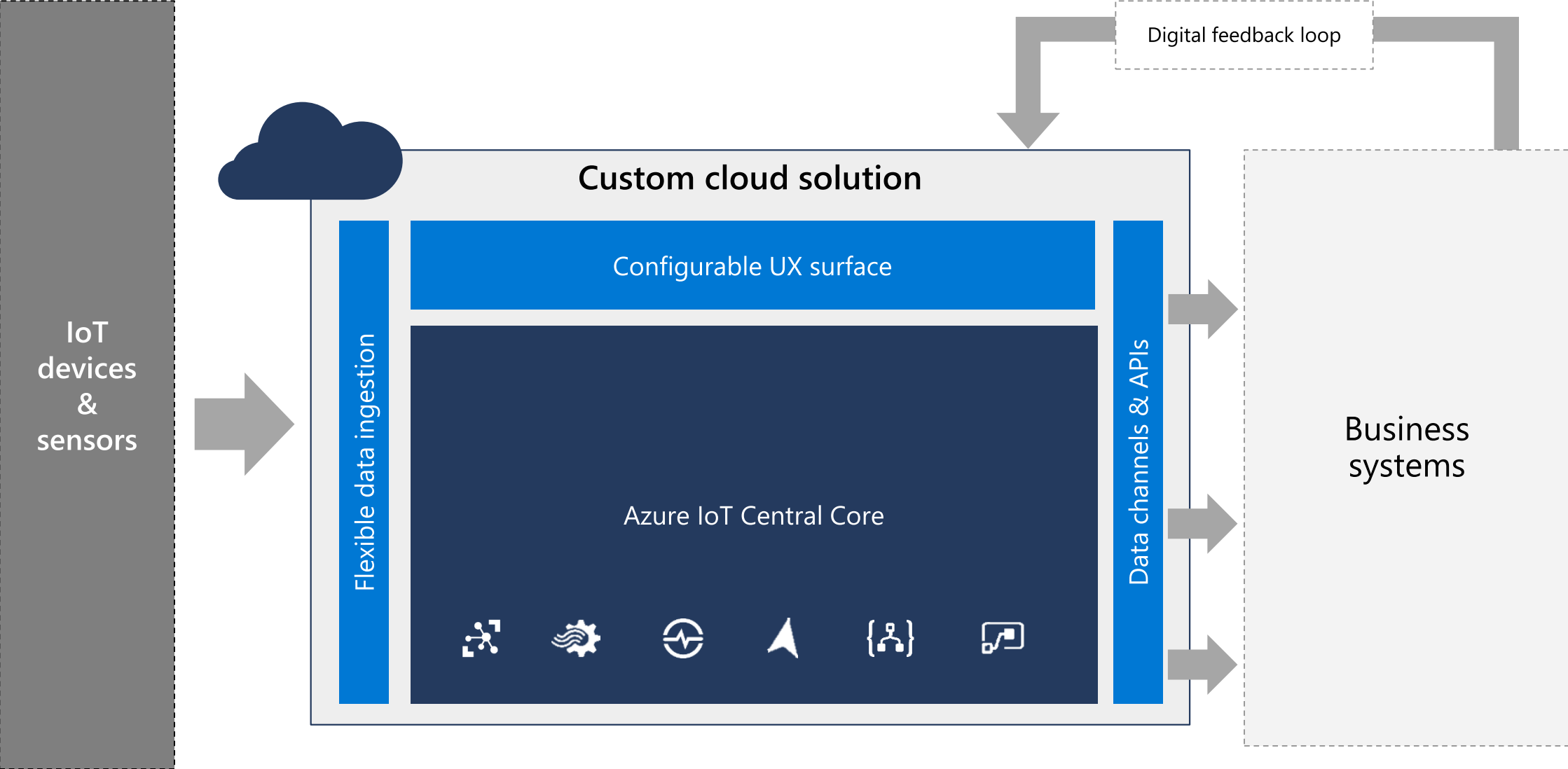
IoT devices



Cloud IoT solutions

Devices publish their capability model.  
Cloud IoT Solutions configure themselves according to the model.

# Solution architecture—IoT Central



# Azure IoT Central

IoT app platform with security, global scale, high availability, disaster recovery built in



Device connectivity and management



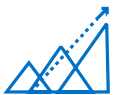
Telemetry ingestion and command and control



Monitoring rules & triggered actions



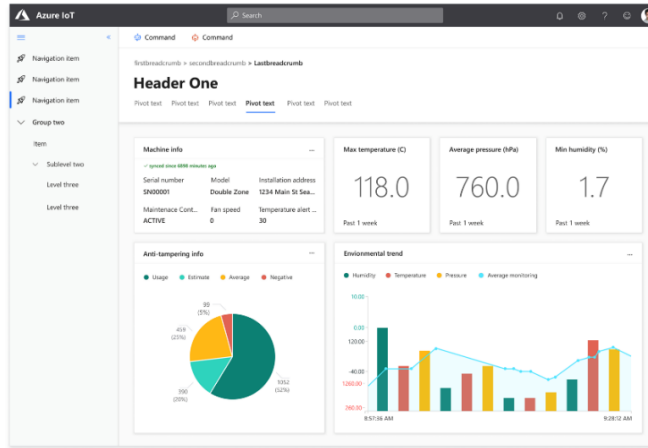
User roles and permissions



Dashboards, visualization and insights



Fully hosted and managed by Microsoft



White labeling  
Your SaaS – Your Brand



IoT Plug-and-Play  
Public Preview



IoT Edge support  
Incl. Module Management



Multi-tenancy & RBAC



Extensibility  
APIs



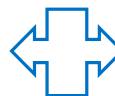
Solution Builder App Templates



Maps, location telemetry and geofencing



Device Bridge  
Ingest data from other clouds



Continuous Data Export  
Bring data into downstream business applications

# IoT Central App Templates



App templates  
for Priority Industry Verticals

App  
Templates  
for  
Industries



## Retail

Digital distribution center  
In-store analytics  
Checkout, Condition monitoring  
Connected logistics  
Smart inventory management



## Healthcare

Continuous patient monitoring



## Energy

Smart meter analytics  
Solar power monitoring



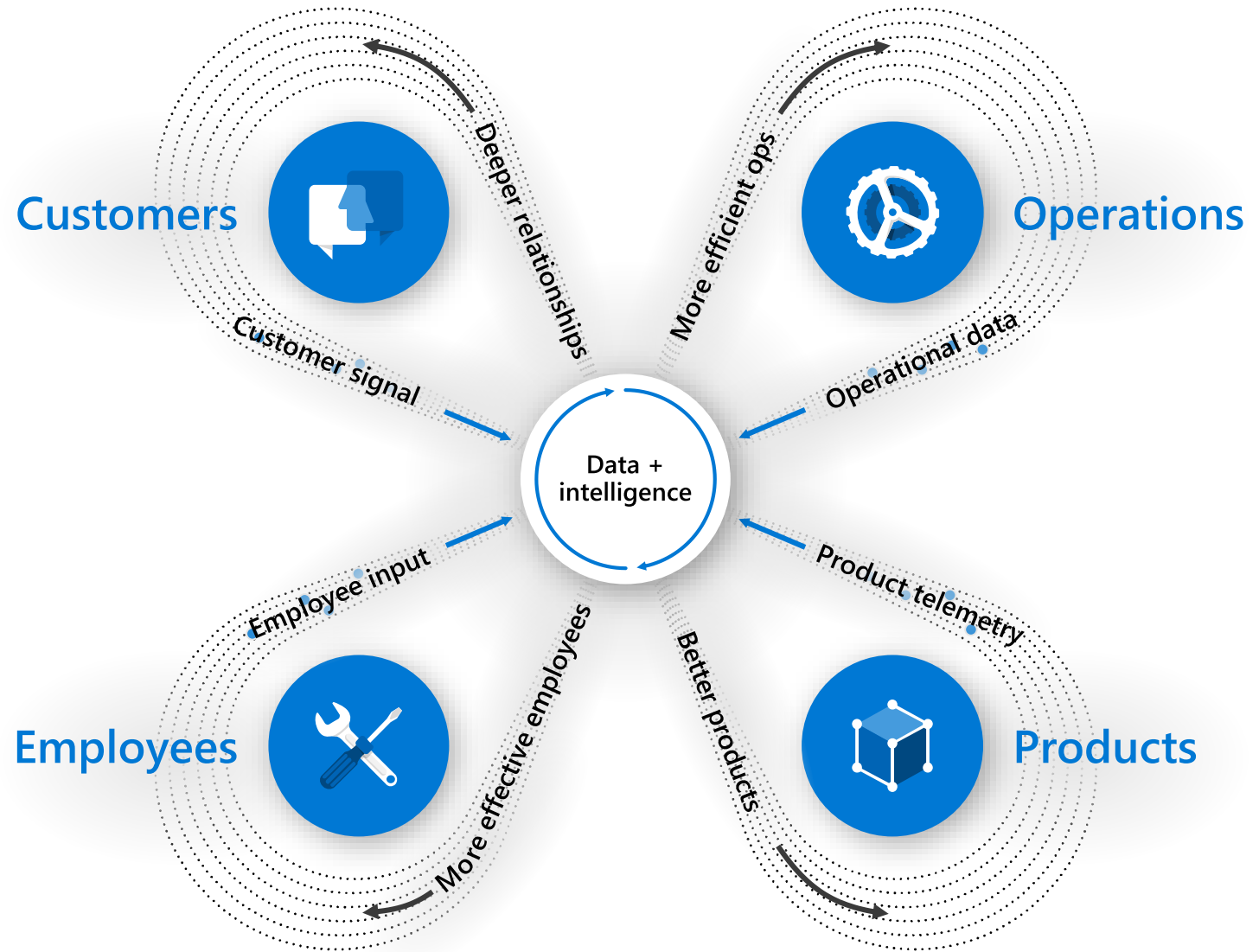
## Government

Water quality monitoring  
Water consumption monitoring  
Connected waste management



# The digital feedback loop

- 1 Data: Capture digital signal across business
- 2 Insight: Connect and synthesize data
- 3 Action: Improve business outcomes



What is  
confidential  
computing?

The ability to store, transport,  
**and act** on compute workloads  
without compromising privacy  
of data and intellectual property

# Why confidential computing in IoT

Intelligent edge computing creates the need to protect code and data in use in addition to protection in storage and transit

## Code and data confidentiality



Proprietary code and algorithms

Sensitive data like patient information and ML models

## Actions from insights



Safe actions from insights out of intelligent edge processing

Trustworthy I/O for command and control of critical infrastructure

## Valued transactions

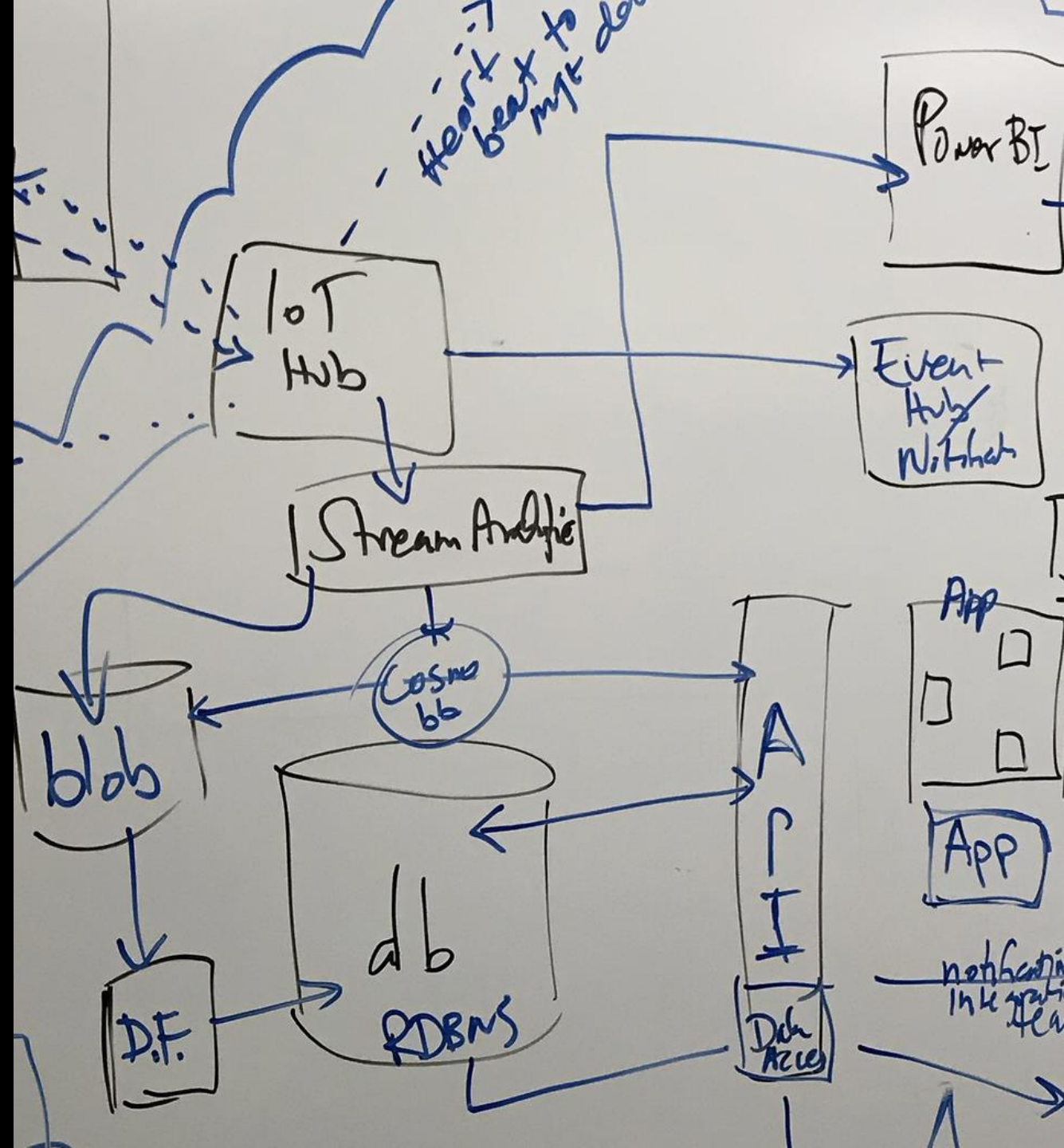


Metering actions for billing

Events tracking e.g., violations for warranty management

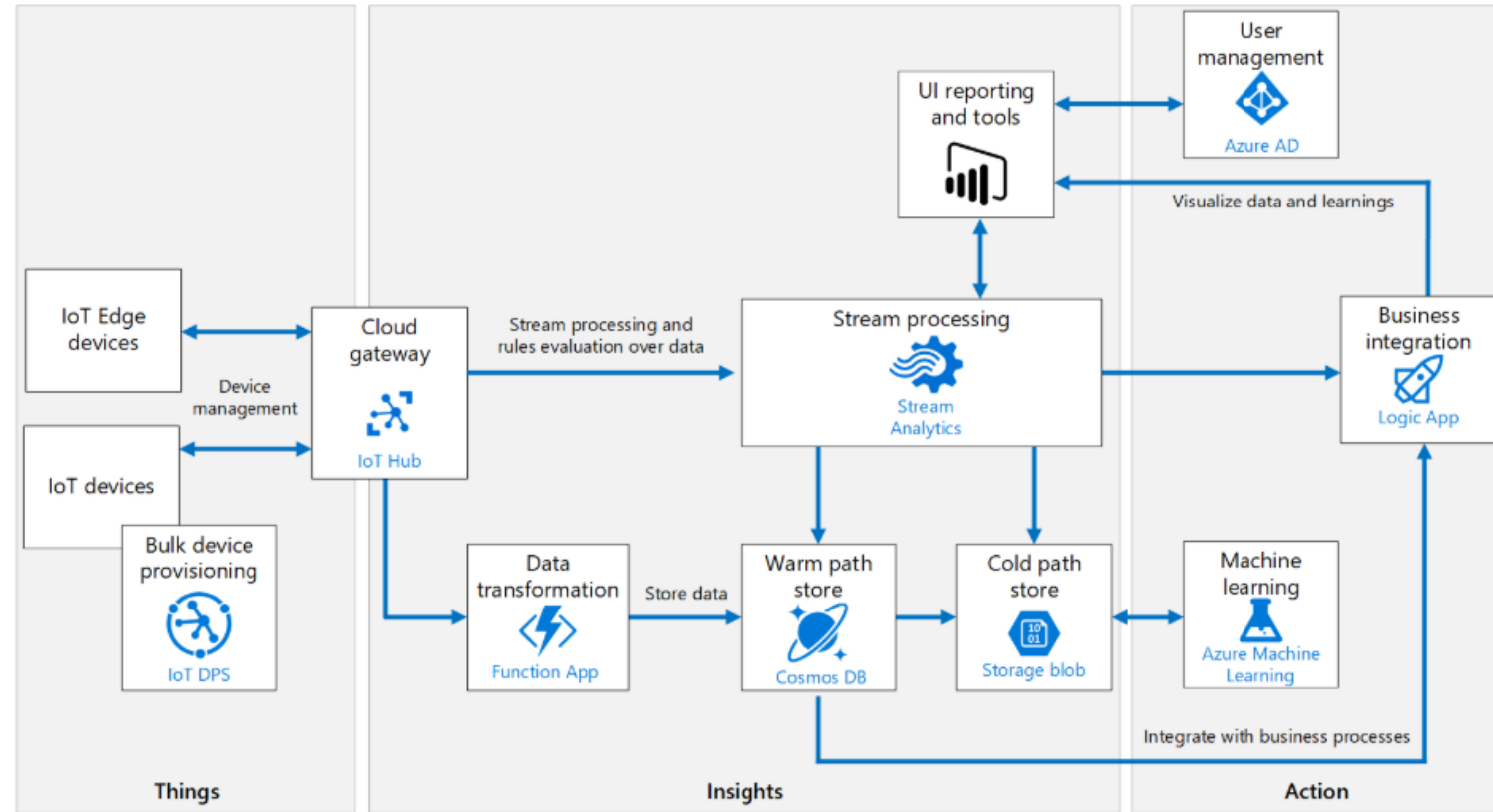


# The anatomy of the architectural design session





# The output







Partners make **more** possible







# SafetyAware

24/7 monitoring and response to keep workers safe

**Robert Forget**  
CTO

**Darrell Graham**  
SVP, Sales & Marketing

# The Intelligent Edge



- People focused use cases
- Improved decision making
- Safety and efficiency improvement



Platform

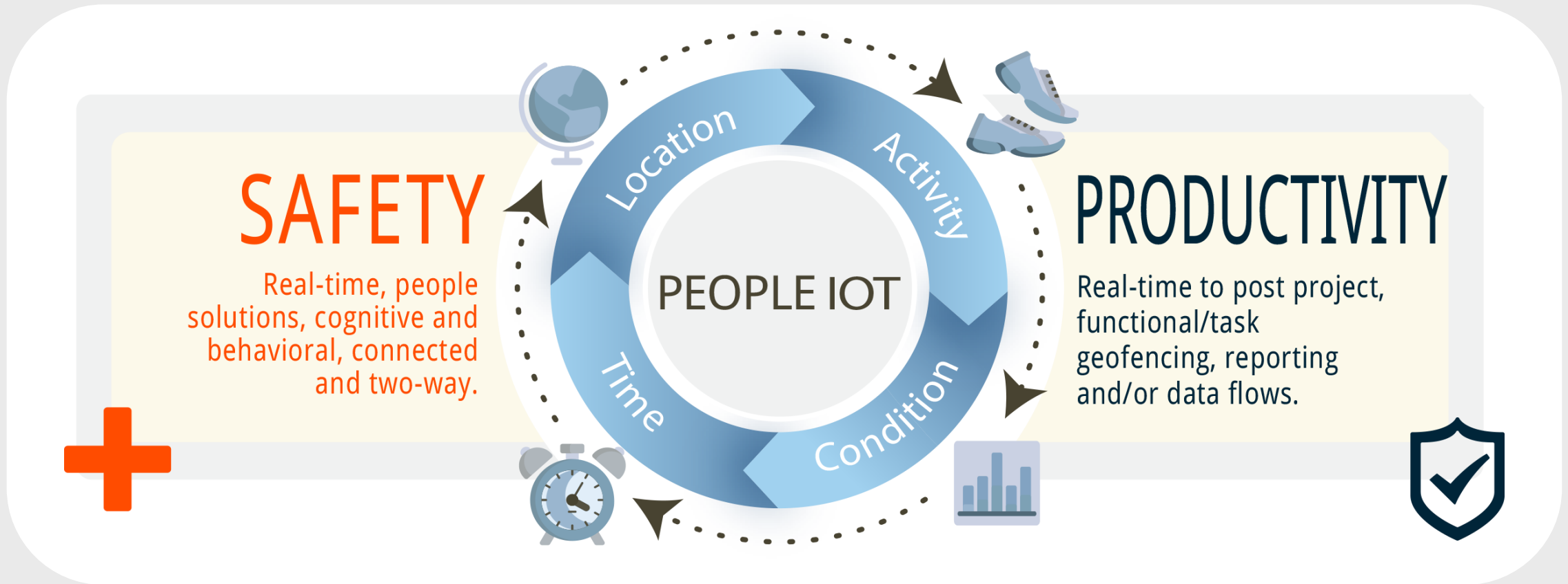
- Exception-based, real-time
- Designed around decisions
- Ecosystem integration focus



Response

- Activity, Condition, Location and Time
- Real-time Response Management
- Improved processes/decision making

# Enhancing Safety and Productivity



# Industries Served



Oil & Gas



Public Sector



Utilities



Mining



Construction



Manufacturing



Social Services



Field Services

# Aware360 Partner Ecosystem





# Introducing SafetyAware

A flexible, cost-effective solution to keep lone workers safe and productive



**Protect and save  
lives**

**8**

**Lives saved in  
2018**



**Improve productivity  
and efficiency**

**400+**

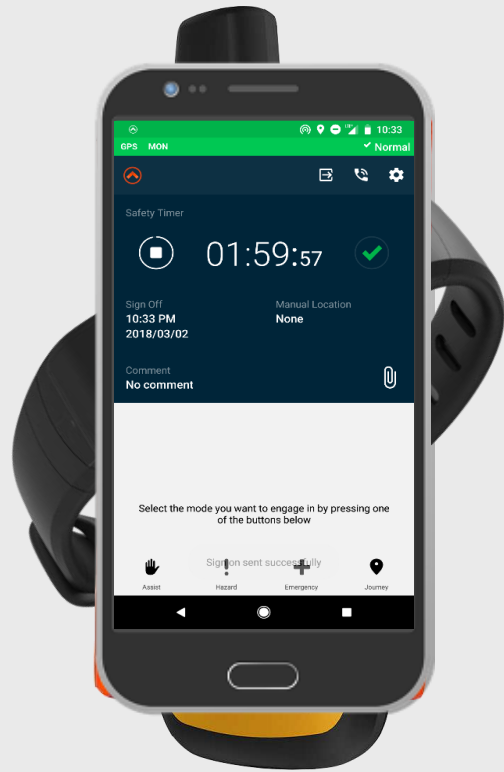
**Emergency SOS  
responses / year**



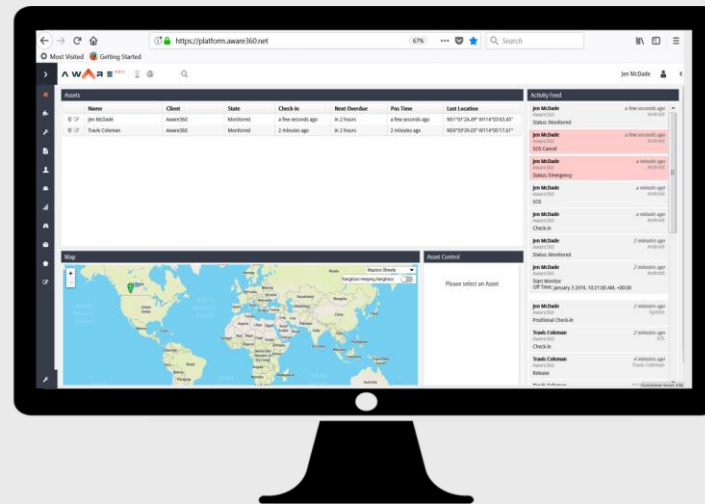
**Stay secure and  
compliant**

# Introducing SafetyAware

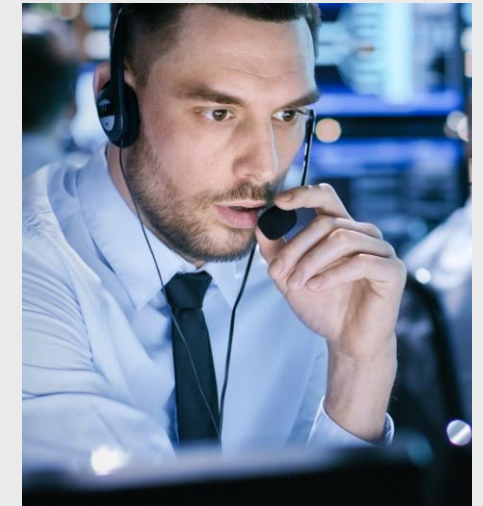
A flexible, cost-effective solution to keep lone workers safe and productive



Edge devices to connect your workers



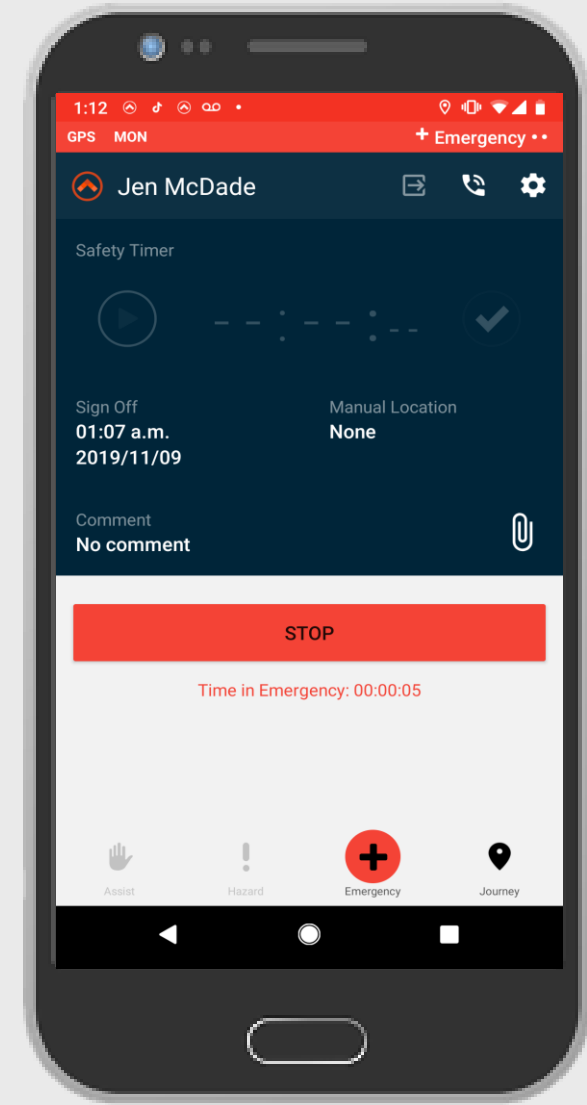
Cloud-based real time IoT platform



3<sup>rd</sup> party professional monitoring

# SafetyAware App

- Normal state
- Assist
- Hazard
- SOS / emergency



# Control Center

The screenshot displays the Aware360 Control Center interface. At the top, the browser address bar shows the URL: `platform.aware360.net/asset/5eda62e6-66fa-4c34-be25-860a9ff71144/escalate`. The user is identified as Jen McDade.

**ESCALATION PROCEDURE**

**User Profile: Jen McDade**  
Aware360  
Last Check-In: a few seconds ago  
Medical History:  
Geographic Area:  
Notes:  
Details:

**Emergency Status**  
1 Devices  
Android Active Device

**Action**

**Step 1**  
Buttons: Resolve escalation, Escalate to next step

**Step 2**  
Call Manager Ned Flanders at +1 (333) 222-4444.

**Step 3**  
call OH&S Chief Wiggam at +1 (222) 222-2222

**Step 4**  
Call VP Dr. Nick at +1 (123) 321-1234 .

**Step 5**  
Call President Monty Burns at +1 (777) 111-3333 .

**Activity Log:**

- Jen McDade (Aware360) - a few seconds ago - Jen McDade - Take Action
- Jen McDade (Aware360) - a few seconds ago - Android - Status: Emergency
- Jen McDade (Aware360) - a few seconds ago - Android - SOS
- Jen McDade (Aware360) - a minute ago - Android - Status: Monitored
- Jen McDade (Aware360) - a minute ago - Android - SOS Cancel
- Jen McDade (Aware360) - a minute ago - Android - Status: Emergency
- Jen McDade (Aware360) - a minute ago - Android - SOS
- Jen McDade (Aware360) - a minute ago - Android - SOS

# Control Center

The screenshot shows the Aware360 Control Center web application. The browser address bar displays 'platform.aware360.net'. The user is logged in as 'Garrett Desruisseaux'. The main content area features a table of assets and a map.

Name	Client	State	Check-in	Next Overdue	Pos Time	Last Location
Elena Elian	Aware360	Safety Overdue	3 days ago	3 days ago	2 days ago	NS6°18'59.97" E44°03'34.27"
Garrett Desruisseaux	Aware360	Monitored	2 minutes ago	in 8 minutes	a few seconds ago	NS0°59'36.98" W114°05'17.18"
Al Renner	Aware360	Not Monitored	3 months ago	N/A	3 months ago	NS0°59'36.76" W114°05'16.24"
Alex	Aware360	Not Monitored	2 months ago	N/A	4 months ago	N11°01'29.76" E76°57'30.95"
Als trucks	Aware360	Not Monitored	3 months ago	N/A	N/A	
Amy Lund	Aware360	Not Monitored	4 months ago	N/A	N/A	
Apple Test	Aware360	Not Monitored	3 months ago	N/A	2 years ago	NS6°19'00.40" E44°03'34.96"
arvind	Aware360	Not Monitored	3 months ago	N/A	a year ago	N11°01'30.37" E76°57'30.07"
asset10	Aware360	Not Monitored	6 months ago	N/A	8 months ago	N11°01'30.39" E76°57'30.79"
aware	Aware360	Not Monitored	10 months ago	N/A	a year ago	N11°01'29.64" E76°57'31.34"
Aware_test1	Aware360	Not Monitored	6 months ago	N/A	7 months ago	N11°01'29.96" E76°57'30.88"
aware01	Aware360	Not Monitored	N/A	N/A	7 months ago	N11°01'29.74" E76°57'30.85"

Map: A world map showing asset locations with colored circles. A yellow circle with the number '9' is located in Europe, and a green circle with the number '76' is located in India. The map includes a search bar and a 'Neighbor Helping Neighbor' toggle.

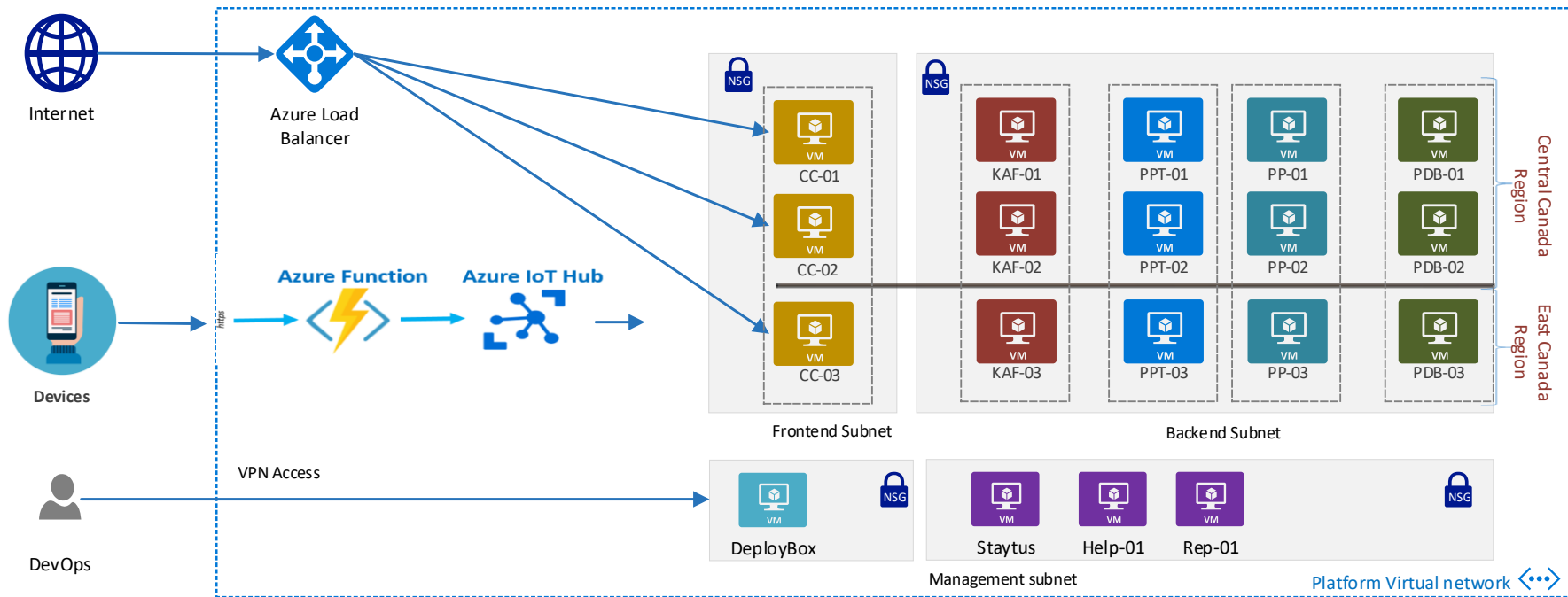
Right Panel: A list of actions for the user 'Garrett Desruisseaux' (Aware360, IOS). The actions include 'Enable Safety Timer' (2 minutes ago), 'Disable Safety Timer' (3 minutes ago), 'Status: Monitored' (3 minutes ago), and 'Start Monitor' (3 minutes ago). The 'Off Time' is listed as November 2 2019, 3:31:02 AM, -06:00.

Bottom Right: A placeholder text 'Please select an Asset'.

Bottom Center: 'Total Assets: 272'.

# AZURE CANADIAN INSTANCE

Https://platformcdn.aware360.net  
Version 1.0.1 02/2019



## Configuration

### Linux VMs: RHEL 7.6

CC-01  
CC-02  
Kaf-01  
Kaf-02  
Kaf-03  
PDB-01  
PDB-01  
PDB-02  
PDB-02  
PDB-03

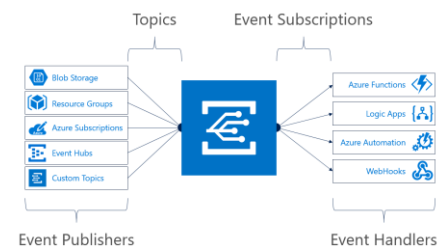
### Windows VMs: WES 2016

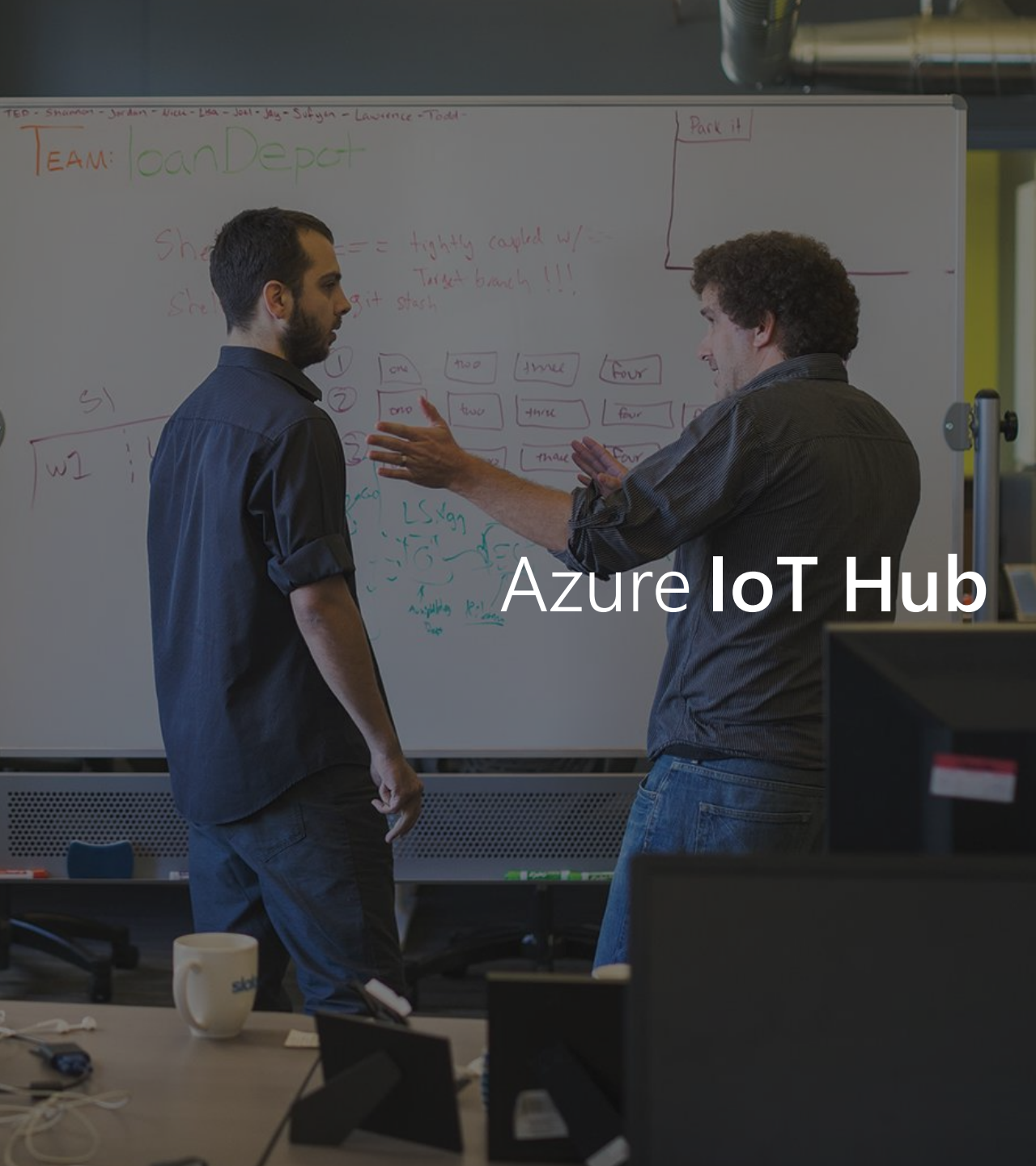
PPT-01  
PPT-02  
PPT-03  
PP-01  
PP-02  
PP-03

### VPN Solution:

- SSL/TLS + Authentication
- TLS Key : 2048 bit
- Encryption: AES-128-CBC
- Auth: SHA256-bit

### IoT Hub Event Grid Overview





# Azure IoT Hub



Establish bi-directional communication with billions of IoT devices

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Enhance security with per device authentication

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Provision devices at scale w/ IoT Hub Device Provisioning Service

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Manage devices at scale with device management

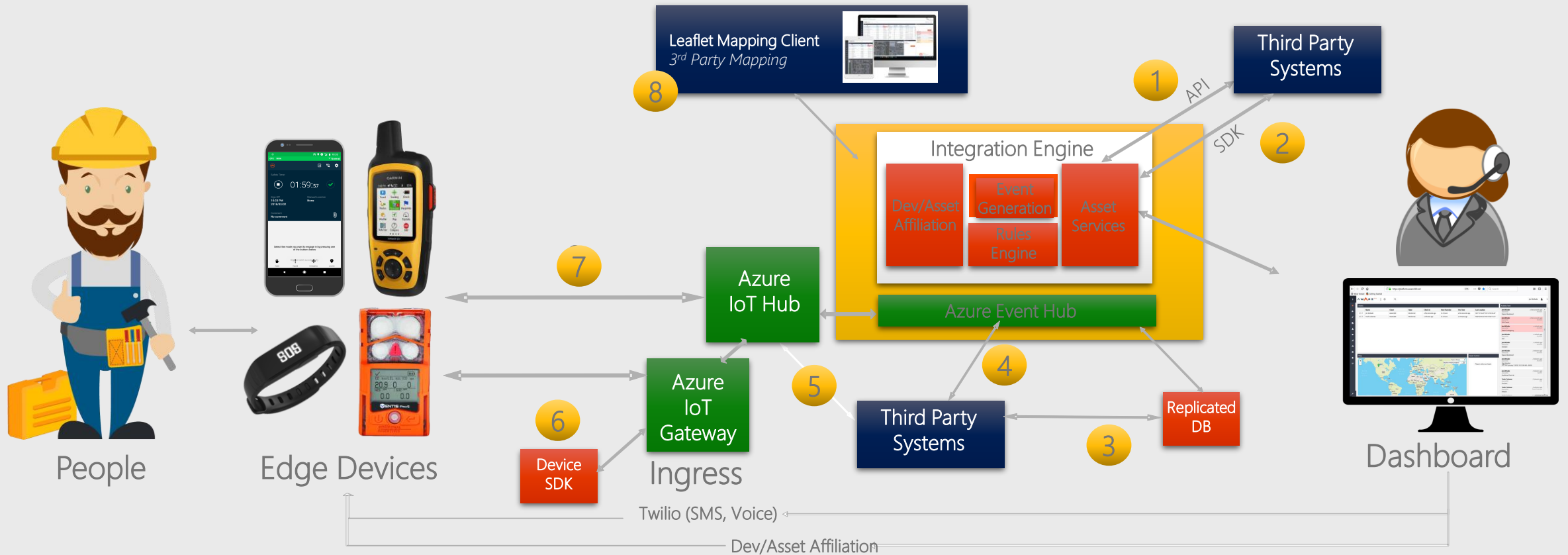
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Multi-language and open source SDKs



# Solution Framework Offering





**Robert Forget**  
CTO



1(877)352-8522 x 325



robert.forget@aware360.com



@kaoswonder



/in/rforget



**Darrell Graham**  
SVP, Sales & Marketing



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darrell.graham@aware360.com



@DGinCtown



/in/darrellgraham1

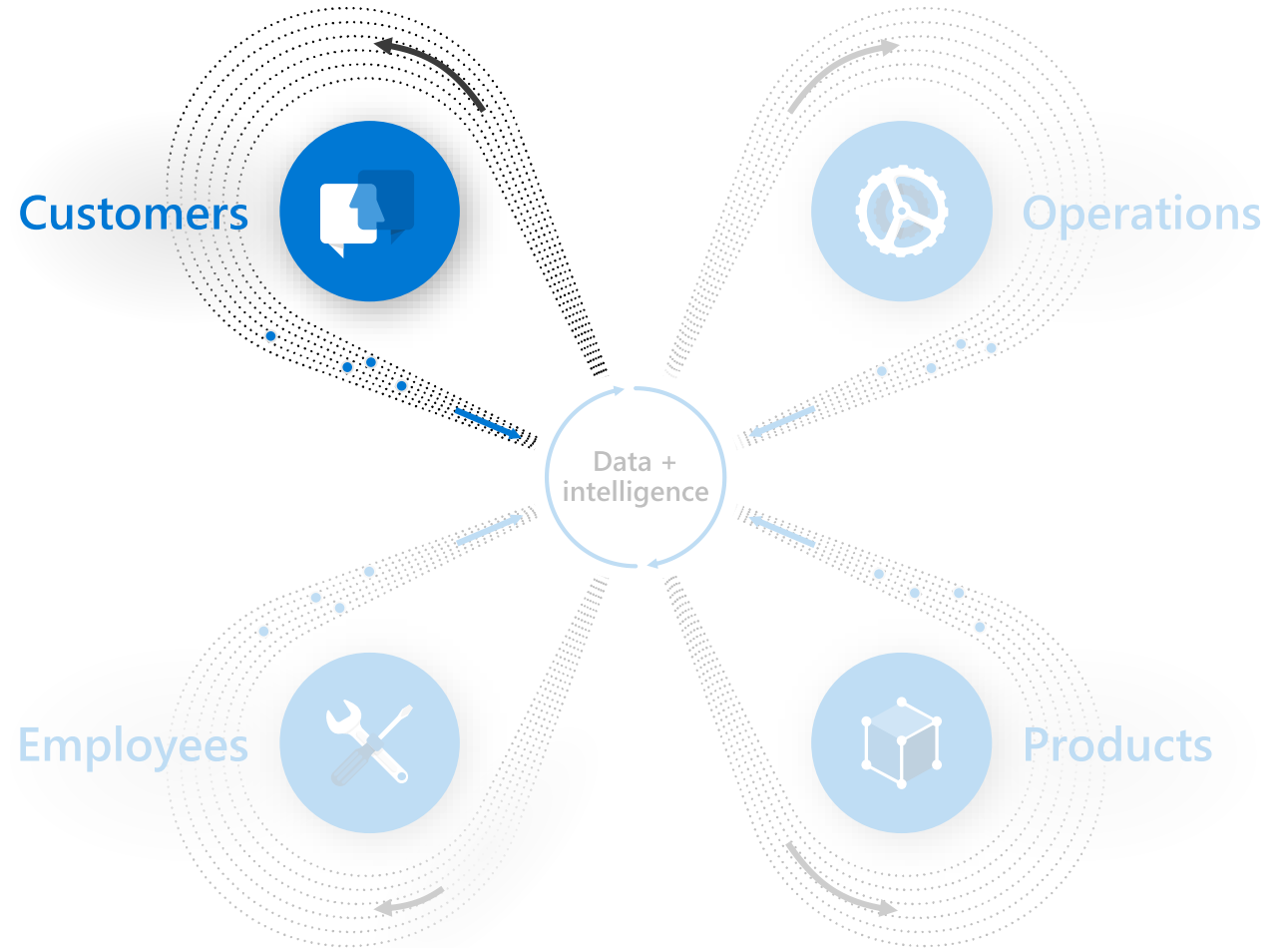
# Our partners are our strength

This is what we mean by our greatest strength is our ecosystem

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We can help create the better process this way together

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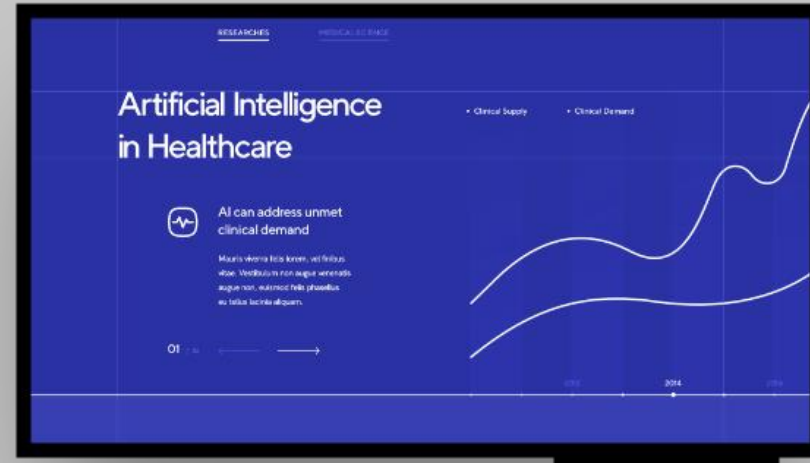


## Gajendra Ratnavel

Founder and Chief Technology Officer

## Brent Nacu

Global Director of Business Development  
and IoT Sales



L Squared Digital Signage provides enterprise-grade digital engagement tools designed to improve communication for the modern workplace and modern store.

It enables businesses to leverage back-end data, customize and share relevant information to targeted audience groups in real-time, powering intelligent data-driven decisions.

The screenshot displays the L Squared Hub dashboard. On the left is a dark sidebar with navigation options: Dashboard, Content Library, Templates, Schedules, Frame Layouts, Devices, Users, Emergency Message, and Reports. The main area is titled 'Dashboard' and includes a 'Demo' dropdown. Key features include:

- Device Status:** A card showing '1 Device Online out of 12' with a donut chart where 1 is green and 11 is grey.
- Content Count:** A card showing '1,301 Content' with a progress bar.
- Recent Activity Log:** A table with a search bar and a list of activities:

Activity	User	Time
Selected frame "Social" for sc...	John Doe	Yesterday 1:46 am
Created schedule "Next"	John Doe	Yesterday 1:46 am
Login.	John Doe	Yesterday 1:44 am
Login.	John Doe	Yesterday 1:44 am
Login.	John Doe	Oct 21, 2019 11:39 pm
Login.	John Doe	Oct 21, 2019 11:39 pm
Copied widget "TTC SCHEDUL...	John Doe	Oct 21, 2019 11:37 pm
- Devices:** A list of device locations with a search bar:
  - 401 Congress - 10th Floor
  - 401 Congress - Cafe 2
  - 401 Congress - Main Entrance
  - BNSF Logistics
  - Canada Cartage
  - JBS Training
  - Koch Logistics Demo
  - Libbey
  - LSN Demo
  - P66 Malaysia
  - Phillips 66 - North America

At the bottom right, the footer reads: '2019 © L Squared Digital Signage | V 2.1.0.241'.



## Global Market

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- MICROSOFT IOT REPEATABLE SOLUTION
- INTEL MARKET READY SOLUTION
- WORLD WIDE CO-SELL AND RESELLER NETWORKS
- DIRECT SALES OFFICES IN 4 COUNTRIES, INCLUDING US, UK, CANADA AND INDIA



## Integrate + Deploy

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- PROFESSIONAL SERVICES
- 20,000 TECHNICIANS WORLD-WIDE
- 50+ APP INTEGRATIONS



## Customer Success

---

- 24/7 SUPPORT
- ON-SITE TECH SUPPORT
- VIDEO TUTORIALS + ON-DEMAND TRAINING
- MULTILINGUAL USER-GUIDES AND INTERFACES
- COMMUNITY SUPPORT FORUMS

POWERED BY  Microsoft

# DIGITAL TRANSFORMATION

## What Problems are We Solving?

### Traditional Mediums

- ✓ Posters
- ✓ E-Mails
- ✓ Intranet
- ✓ Townhalls

### Limited Delivery

- ✓ No Complex Multi-User Management
- ✓ No Targeted Audience Segmentation
- ✓ No Cross-Regional or Global Presence
- ✓ Limited Remote Management Features

### Unsorted BIG Data

- ✓ Underutilized Data
- ✓ Lack of Integrations
- ✓ Insufficient Content Management
- ✓ Low Engagement and Limited Feedback



## Communication Challenges



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## Communication Challenges



## Modern **Workplace**



### Problem

- No centralized platform
- Limited transparency and consistency messaging employees across multiple locations
- Low Employee Engagement.



### Solution & Results

L Squared HUB was implemented as all-in-one CMS configured to deliver content to all Digital Screens and Desktop Screen Savers.



## Modern **Store**



### Problem

- Long Patient Wait Times – Cause of Frustration and Lost Time
- Underutilized Services, due to lack of Awareness, ie. Alternate Testing
- Low Customer Engagement



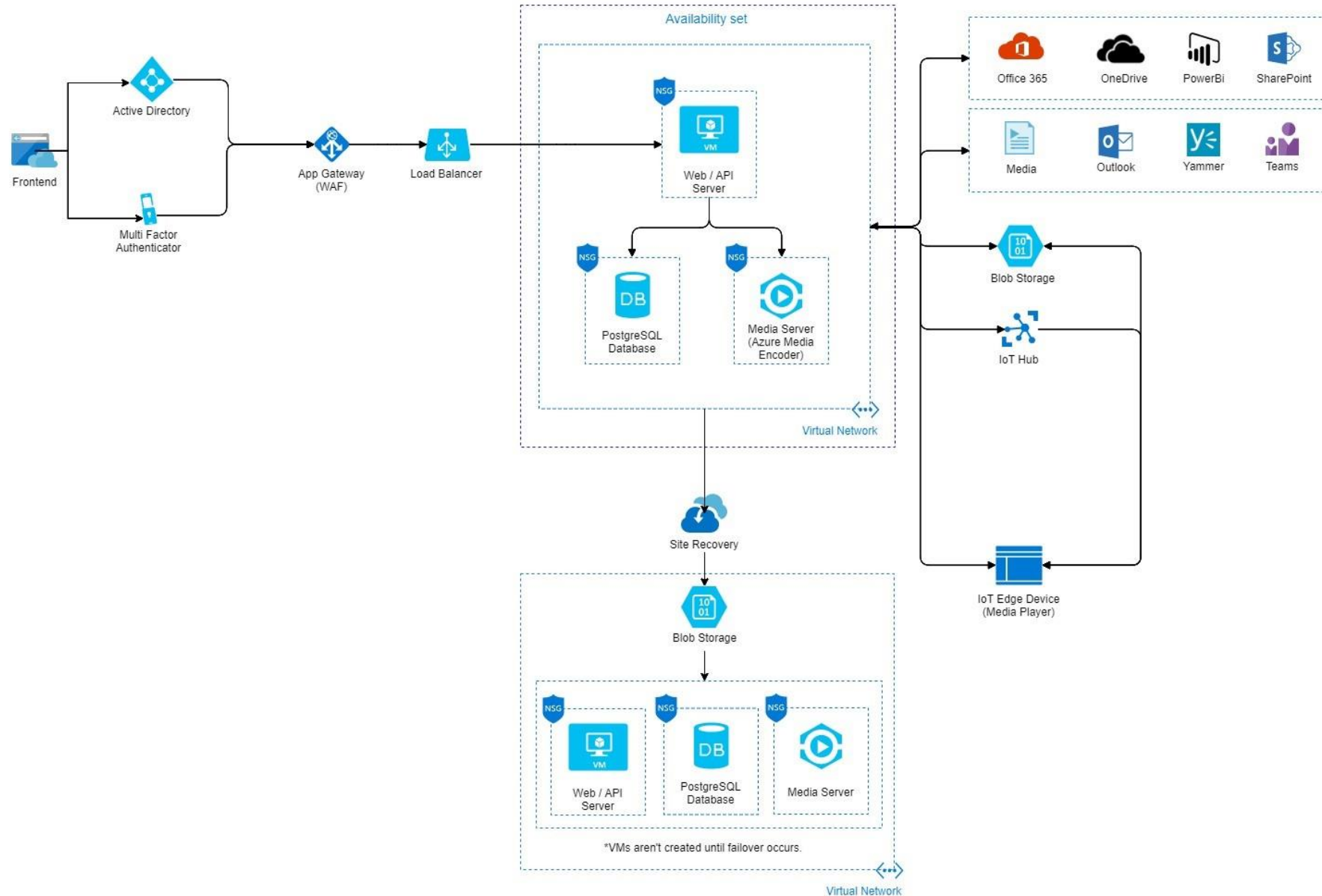
### Solution & Results

L Squared deployed a national program covering 350+ locations including in-store Digital Signage and integration with live patient wait times and other health-related metrics.

LifeLabs video (1 MIN)

# DEMO

# Architecture Diagram Walk Through







# Windows 10 IoT



Open platform that seamlessly connects things, endpoints, and the cloud

---



Commercial OS for IoT devices and a modern user experience

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Supports the languages and frameworks you already know

---



Trusted platform for security and servicing of for cloud-connected devices

---



Bring power and capability to the edge

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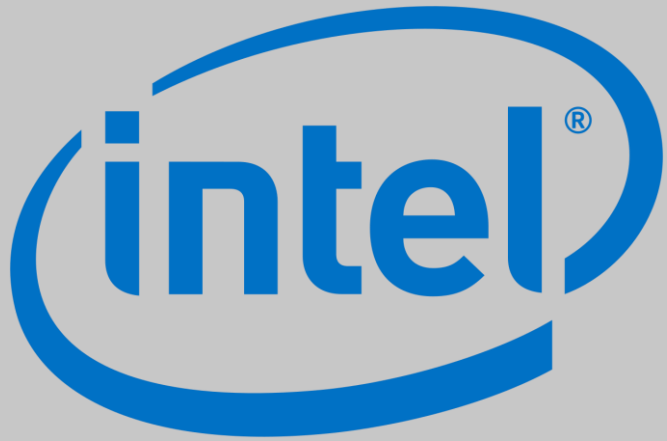


Enable a more nature user interface

# Summary & CTA

Please visit the Intel and Arrow Booths, to connect with one of our L Squared staff.

We can do deep dive demos and answer any questions you may have.



# info@LSquared.com



**Gajendra Ratnavel**  
GAJ@LSQUARED.COM



**Brent Nacu**  
BNACU@LSQUARED.COM

Skills currently have



SKILLS GAP

Skills needed



# Welcome to Microsoft Learn

[Microsoft.com/learn](https://Microsoft.com/learn)





## Azure fundamentals

12300 XP

8 hr 17 min remaining • Learning Path • 1 of 12 modules completed

Beginner Developer Solution Architect Administrator AI Engineer Business Analyst Business User  
Data Engineer Data Scientist Azure Azure Portal Azure Resource Manager Storage Virtual Machines

Interested in the cloud, but aren't quite sure what it can do for you? This path is the place to start.

In this learning path, you will:

- Learn cloud concepts such as High Availability, Scalability, Elasticity, Agility, Fault Tolerance, and Disaster Recovery
- Understand the benefits of cloud computing in Azure and how it can save you time and money
- Compare and contrast basic strategies for transitioning to the Azure cloud
- Explore the breadth of services available in Azure including compute, network, storage and security

Once you complete this learning path, you will have the necessary knowledge to take the [AZ900 Microsoft Azure Fundamentals Exam](#).

Prerequisites  
None

### Modules in this learning path



#### Cloud Concepts - Principles of cloud computing

✓ 1100 XP

1 hr 2 min • Module • 10 Units

★★★★★ 4.8 (23350)

Explore the core concepts of cloud computing and how it can help your business.

Overview ▾

Time  
investment  
expectation

Microsoft.com/learn



Microsoft.com/learn



## Azure fundamentals

8 hr 17 min remaining • Learning Path • 1 of 12 modules completed

- Beginner
- Developer
- Solution Architect
- Administrator
- AI Engineer
- Business Analyst
- Business User
- Data Engineer
- Data Scientist
- Azure
- Azure Portal
- Azure Resource Manager
- Storage
- Virtual Machines

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12300 XP

Total XP =  
12,300

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Overview ▾

Microsoft.com/learn



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12300 XP

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- Business Analyst
- Business User
- Data Engineer
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- Azure
- Azure Portal
- Azure Resource Manager
- Storage
- Virtual Machines

Interested in the cloud, but aren't quite sure what it can do for you? This path is the place to start.

In this learning path, you will:

- Learn cloud concepts such as High Availability, Scalability, Elasticity, Agility, Fault Tolerance, and Disaster Recovery
- Understand the benefits of cloud computing in Azure and how it can save you time and money
- Compare and contrast basic strategies for transitioning to the Azure cloud
- Explore the breadth of services available in Azure including compute, network, storage and security

Once you complete this learning path, you will have the necessary knowledge to take the [AZ900 Microsoft Azure Fundamentals Exam](#).

Prerequisites  
None

### Modules in this learning path



#### Cloud Concepts - Principles of cloud computing

1 hr 2 min • Module • 10 Units

★★★★★ 4.8 (23350)

Explore the core concepts of cloud computing and how it can help your business.

Overview ▾

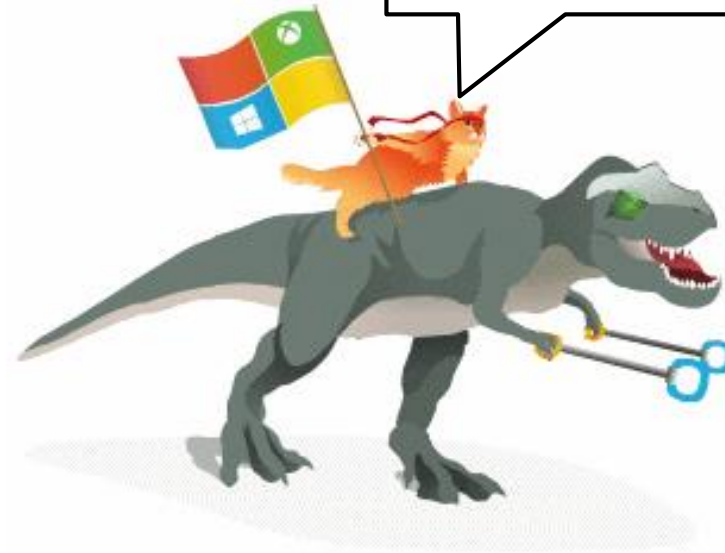
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Module XP=  
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# Leveling up your Azure skillz with Microsoft Learn



I can haz **ALL** the badgez!





Top Challenges

Complexity

IoT PnP, IoT Central

Knowledge

MS Learn

Security

Confidential Computing

Solution == Partners

**IoT** in Action



