Microsoft

IoT in Action

#IoTinActionMS

Microsoft

Architecting the Intelligent Edge

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EMEA IoT Technical Sales Director
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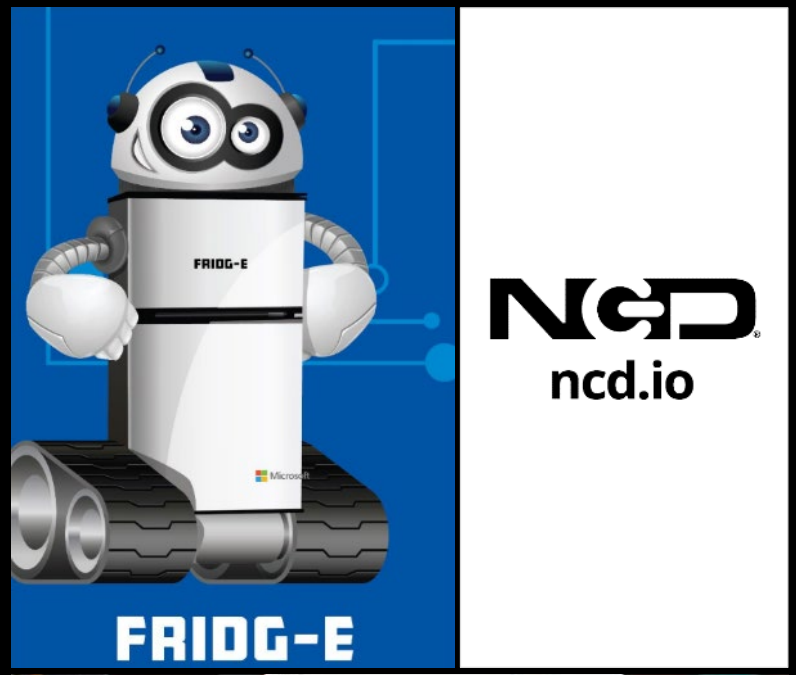
Sr. IoT Solution Architect, Microsoft

IoT in Action

The evolution of IoT in Action



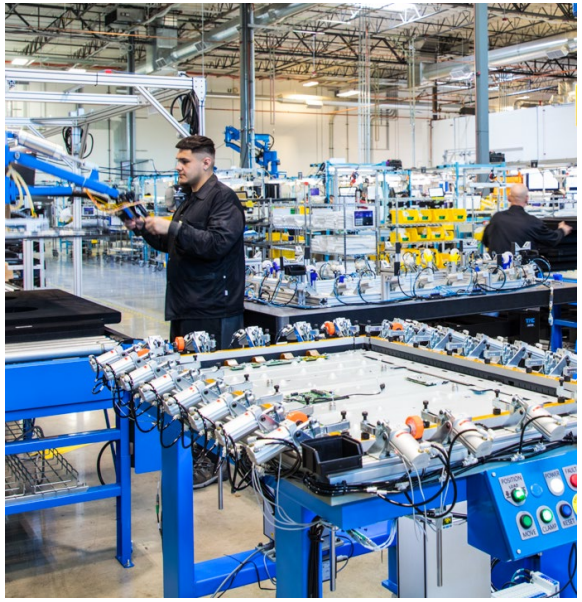
Year 1 2017

The evolution of IoT in Action

Insight

Year 2 2018

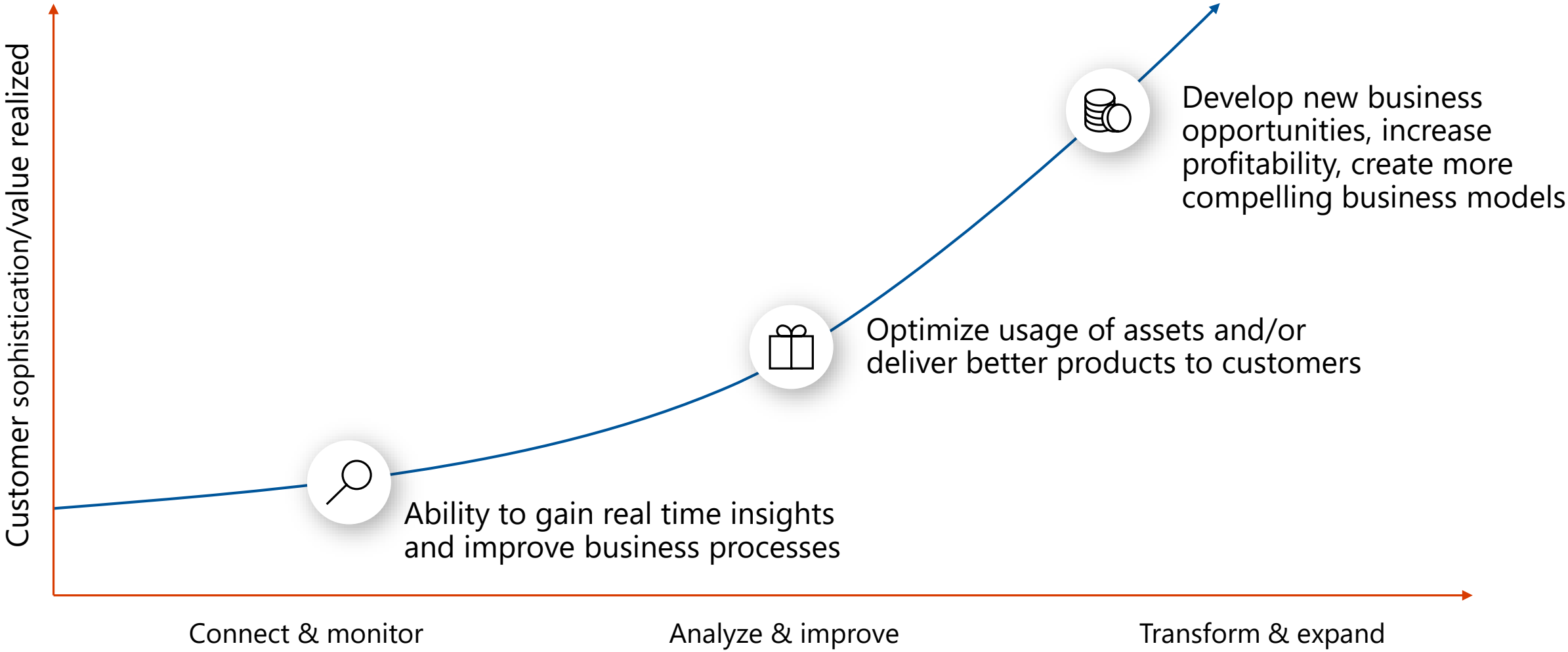
The Evolution of IoT in Action



Year 3 2019

The IoT journey has multiple stages

Each stage has dramatic benefits



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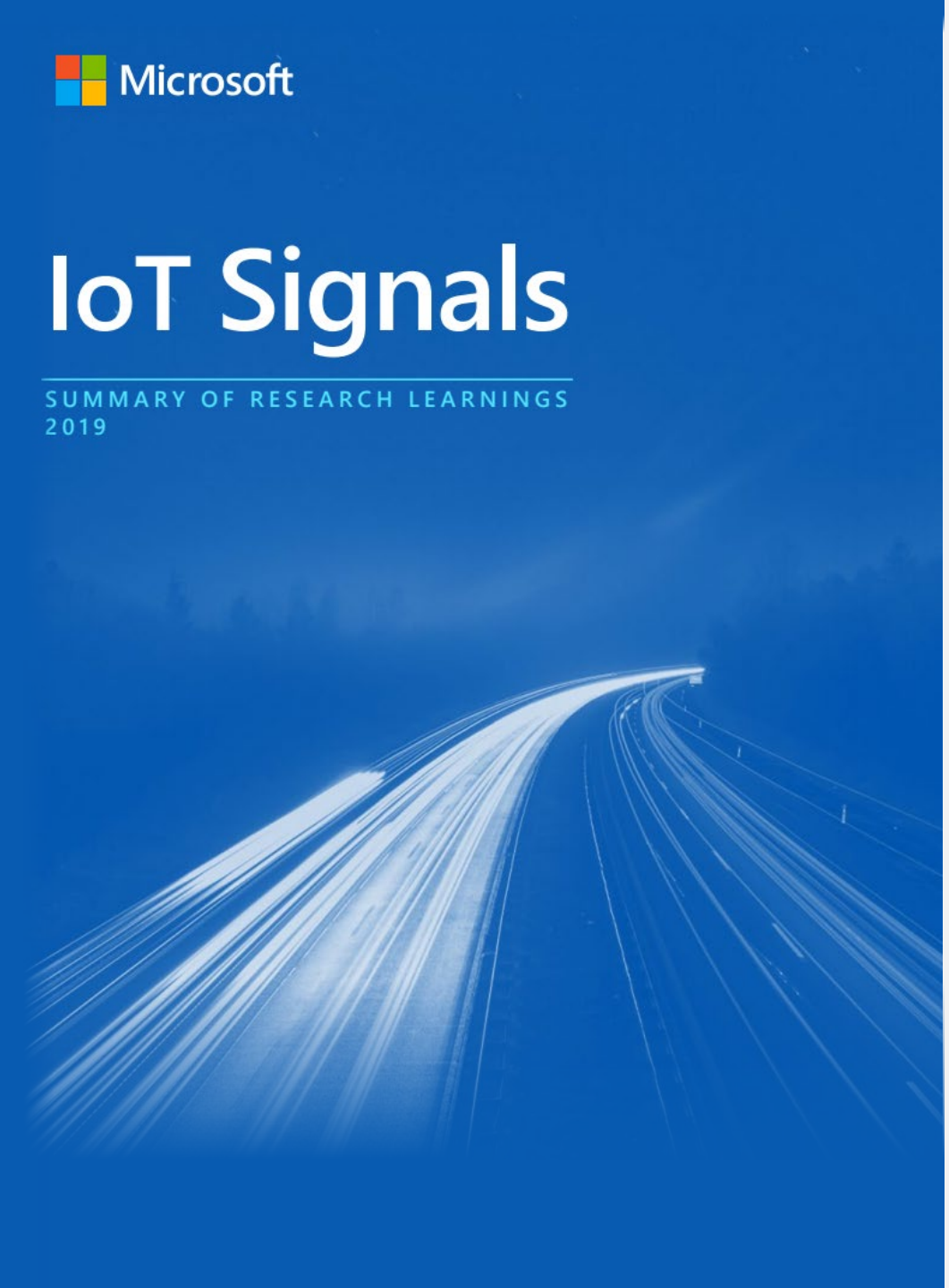
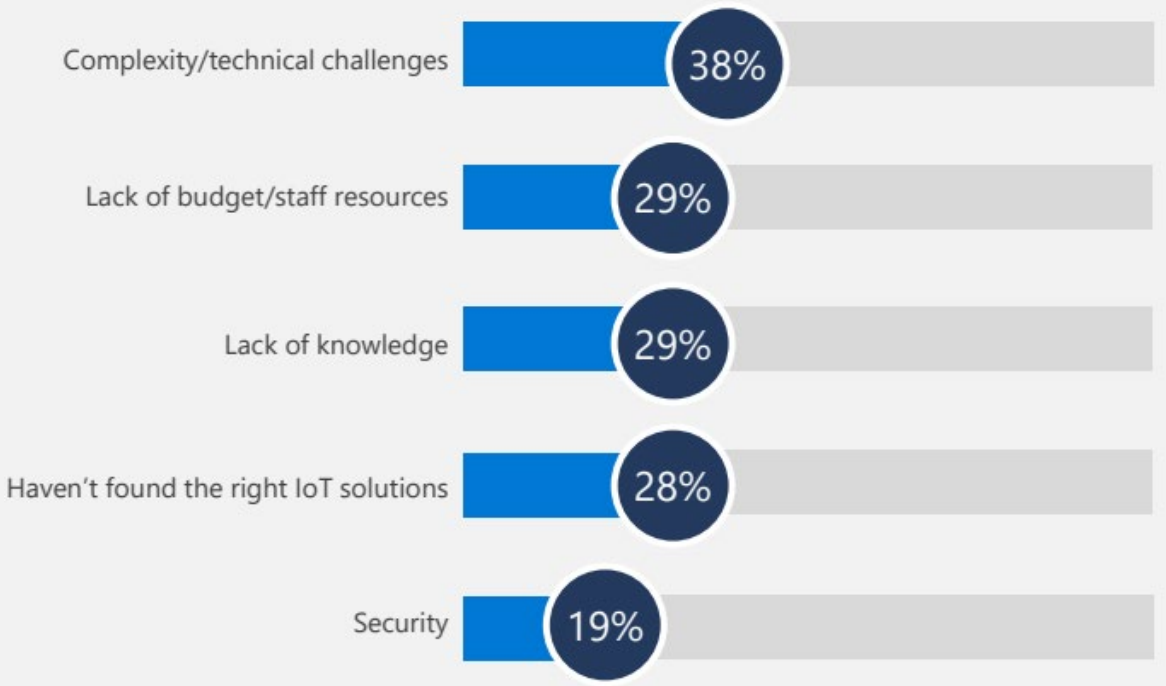
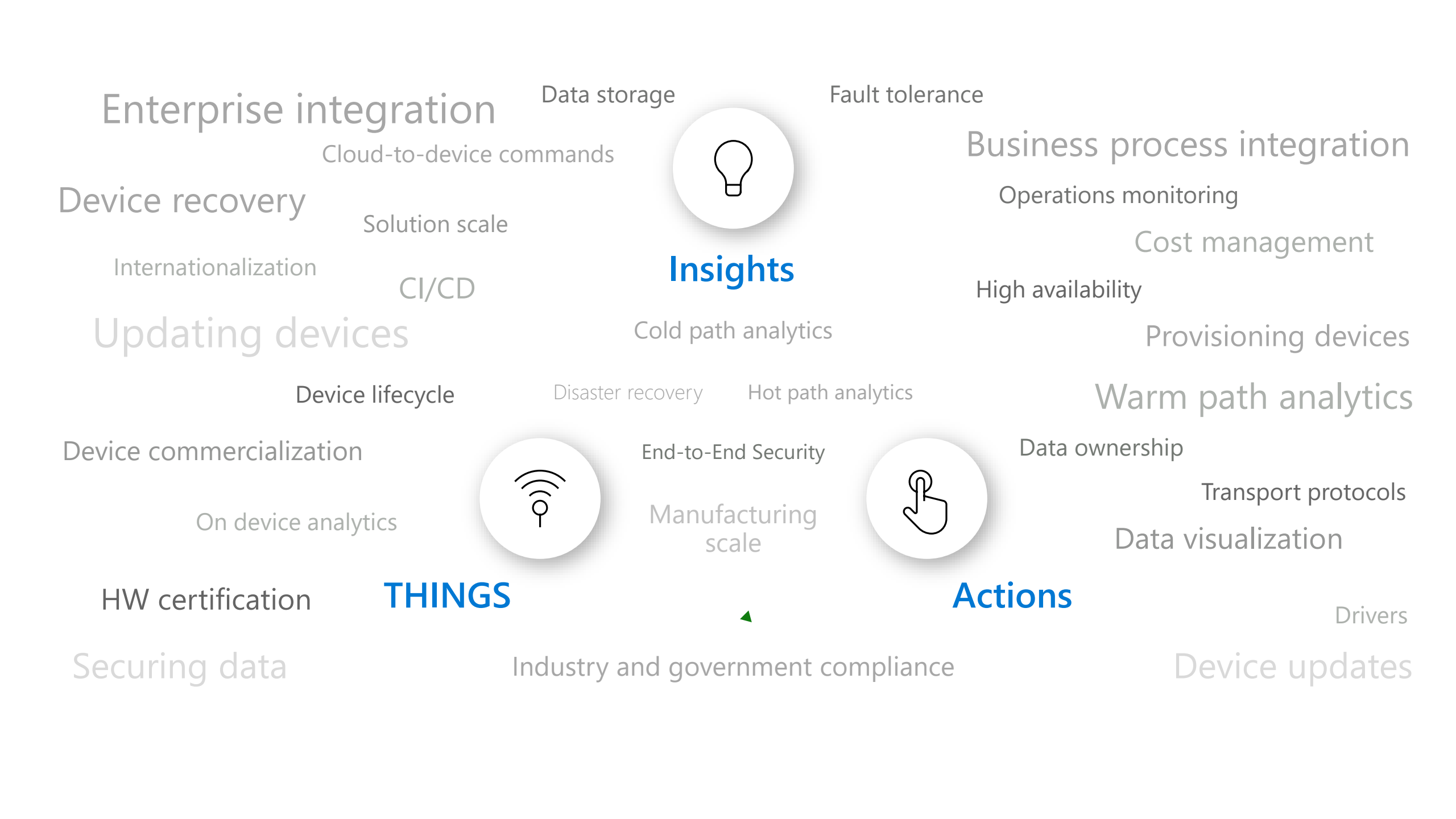
IoT Signals

SUMMARY OF RESEARCH LEARNINGS
2019

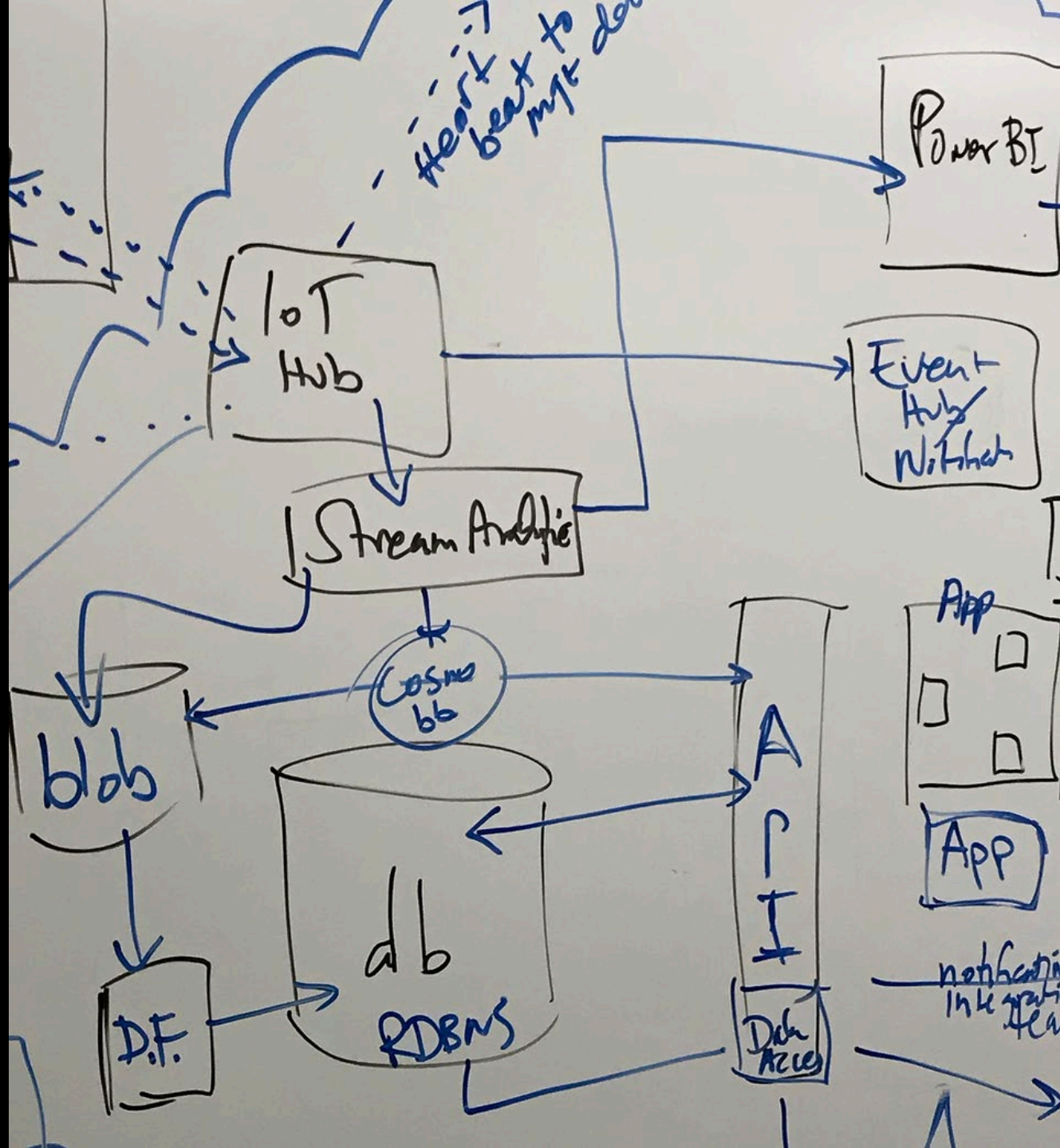


Top challenges

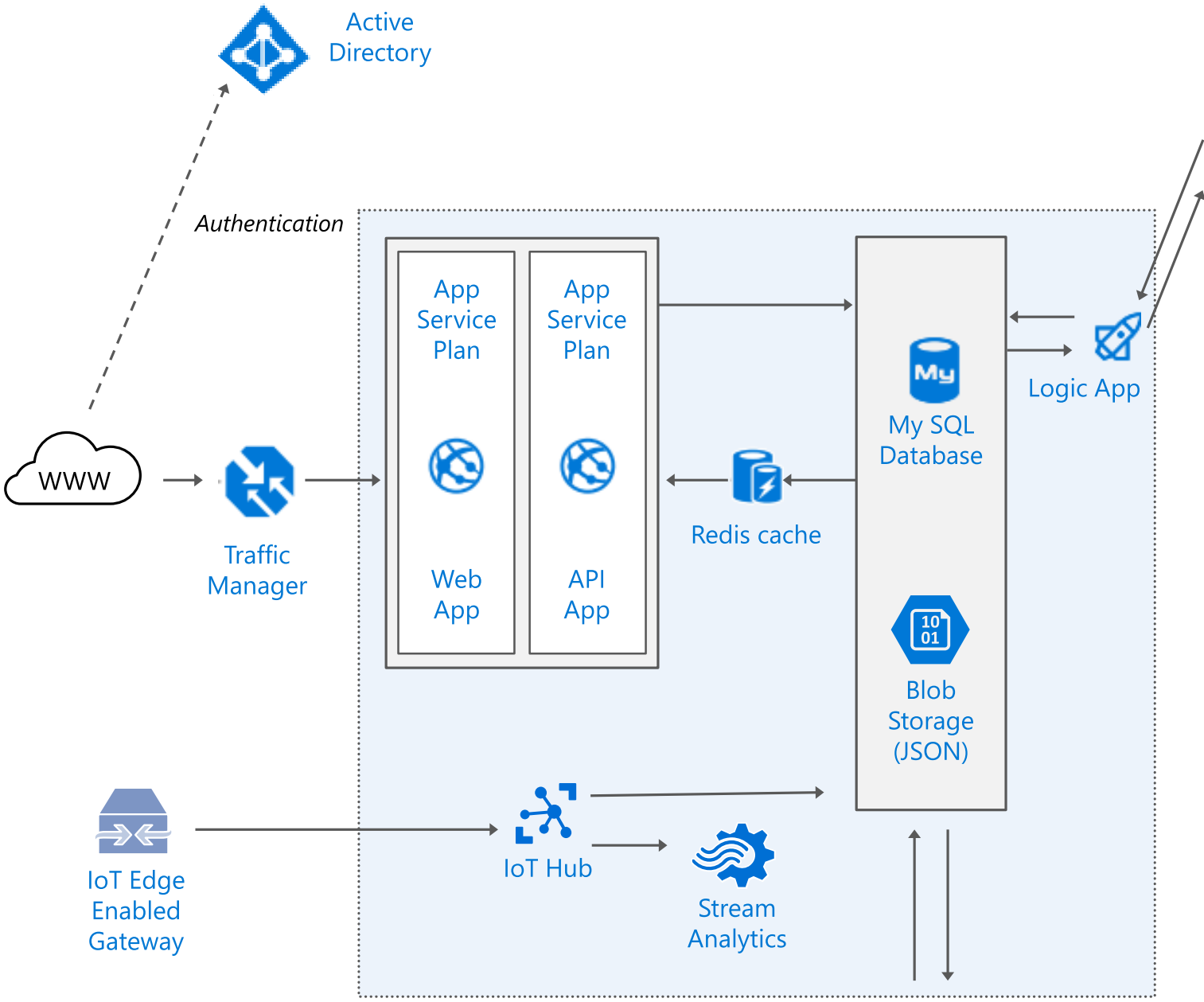



Enterprise integration
Data storage
Fault tolerance
Cloud-to-device commands
Business process integration
Device recovery
Operations monitoring
Solution scale
Cost management
Internationalization
Insights
CI/CD
High availability
Updating devices
Cold path analytics
Provisioning devices
Device lifecycle
Disaster recovery
Hot path analytics
Warm path analytics
Device commercialization
End-to-End Security
Data ownership
Transport protocols
On device analytics
Manufacturing scale
Data visualization
HW certification
THINGS
Actions
Drivers
Securing data
Industry and government compliance
Device updates

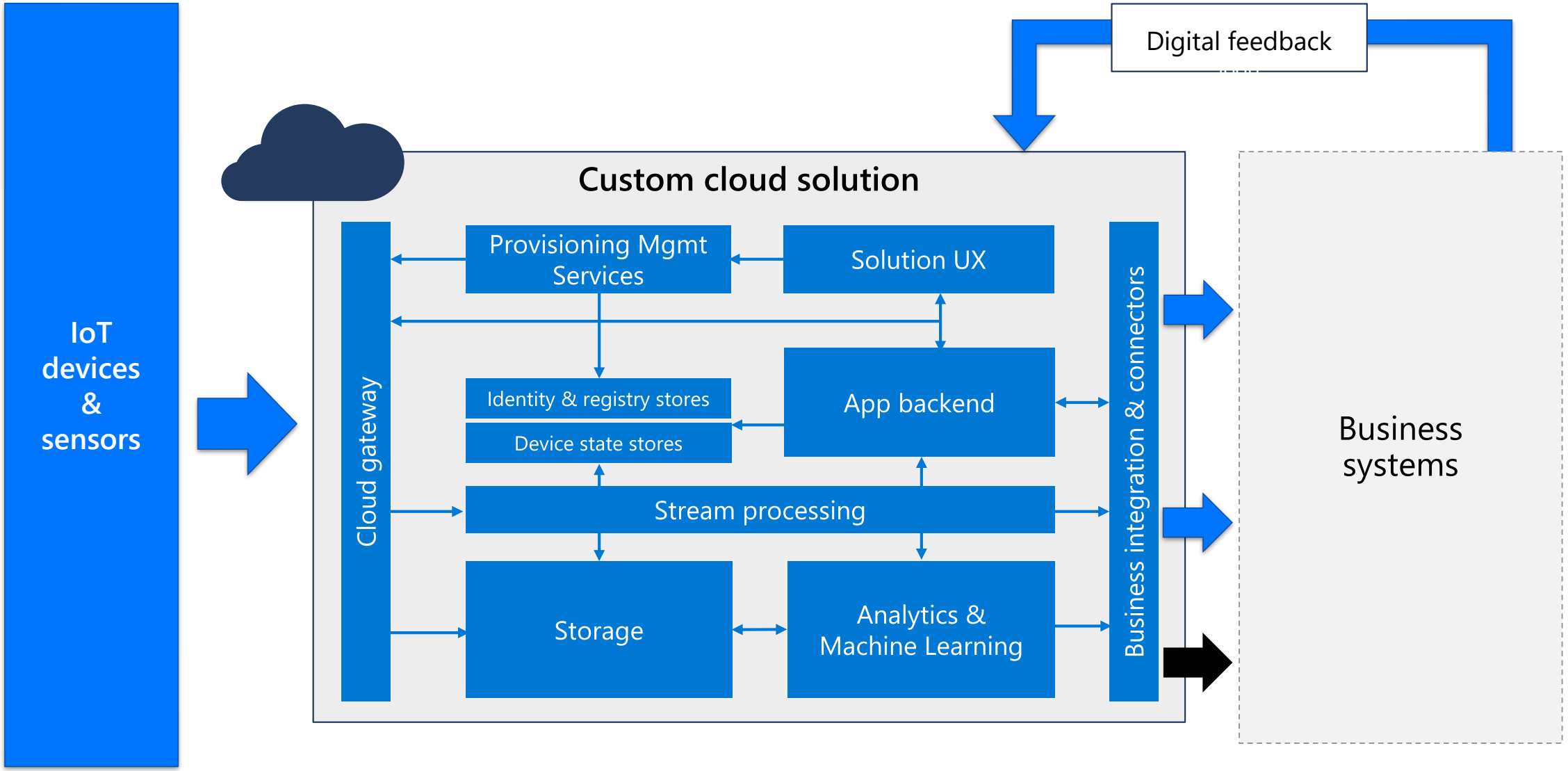
Architectural design sessions



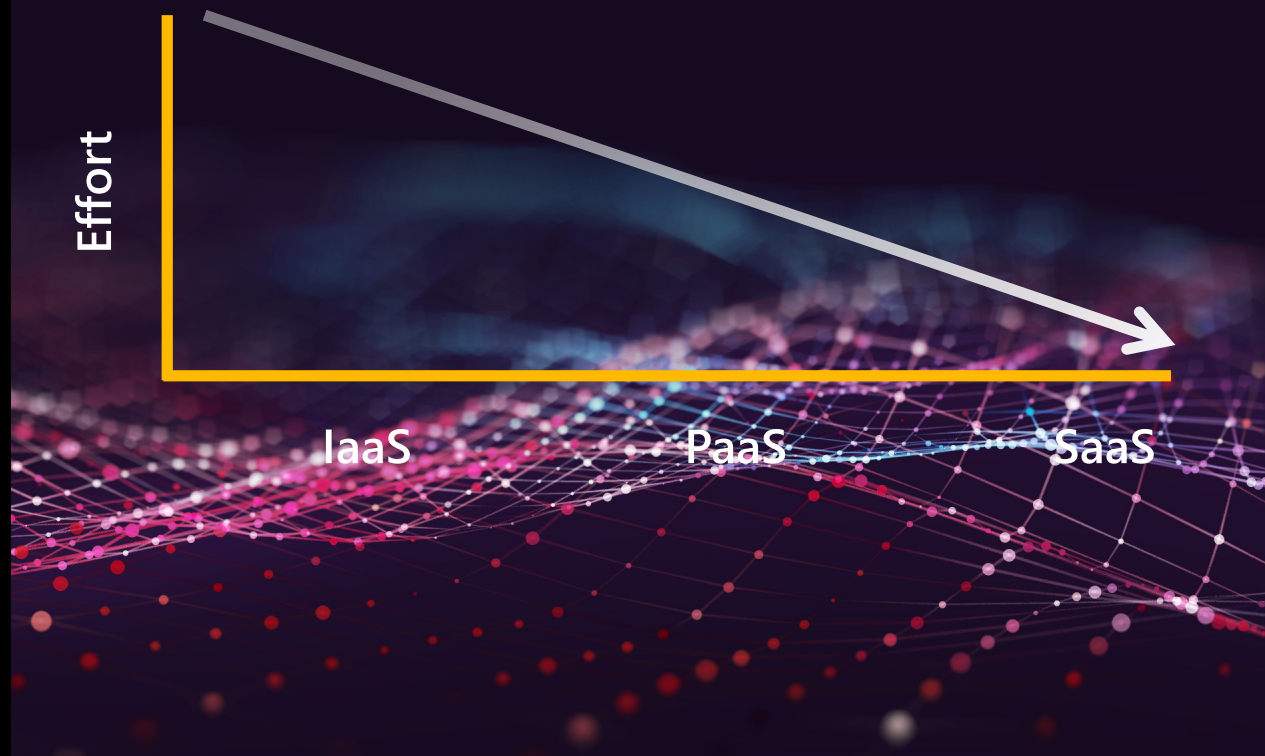
The output


Active Directory
Authentication
WWW
Traffic Manager
App Service Plan
Web App
App Service Plan
API App
Redis cache
My SQL Database
Logic App
Blob Storage (JSON)
IoT Edge Enabled Gateway
IoT Hub
Stream Analytics

Solution architecture—DIY

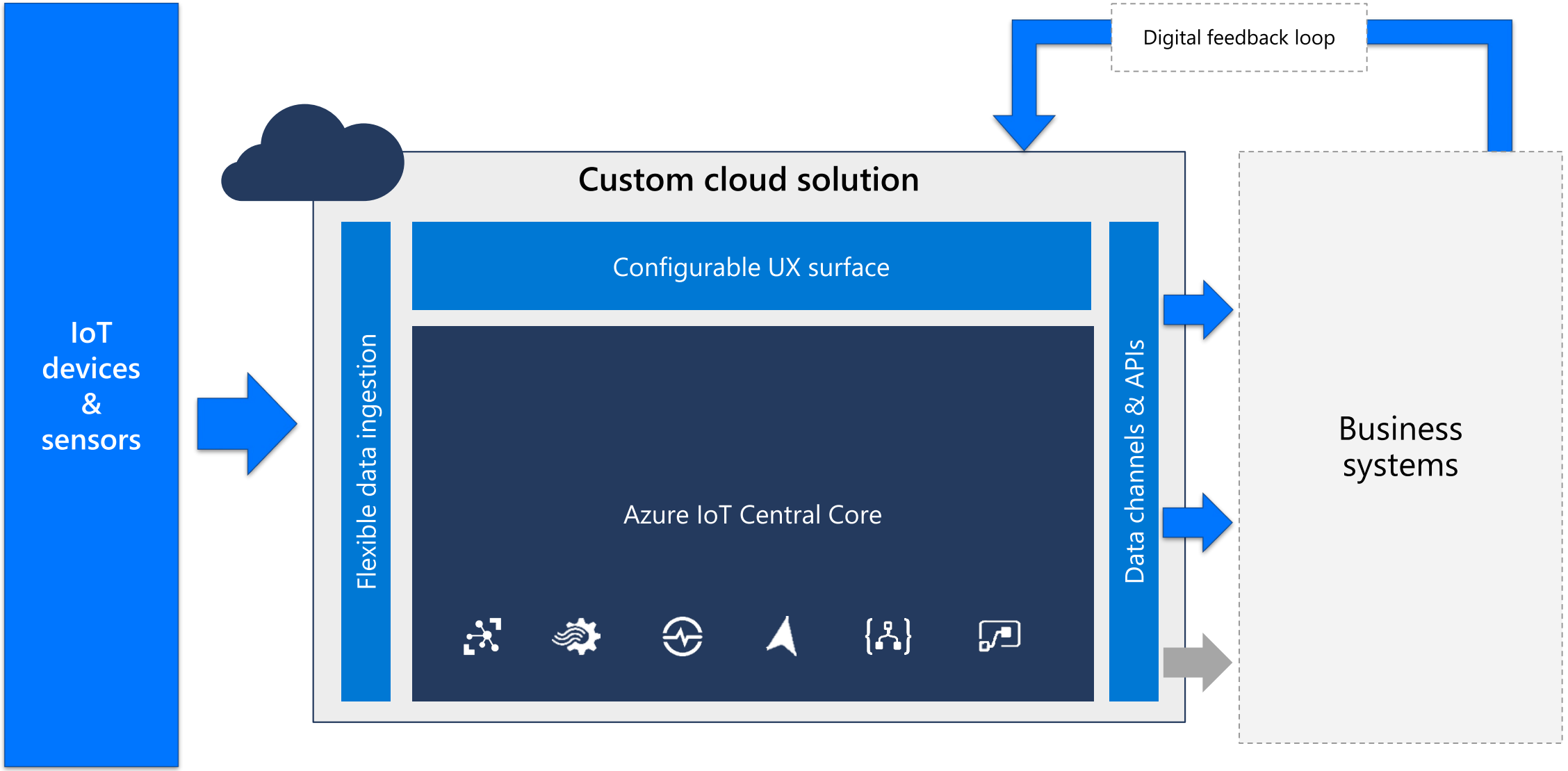


Making IoT seamless



The total effort to build and operate an IoT Solution is rapidly decreasing

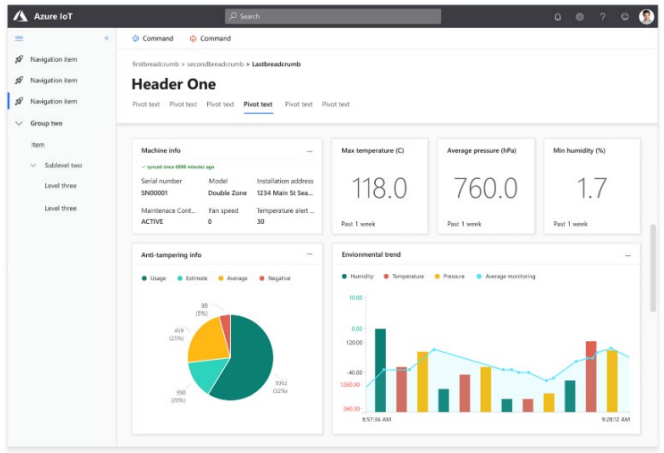
Solution architecture—IoT Central



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



- Maps, location telemetry and geofencing
- Device Bridge
  Ingest data from other clouds
- Continuous Data Export
  Bring data into downstream business applications

- 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

IoT Central App Templates

App templates for Priority Industry Verticals

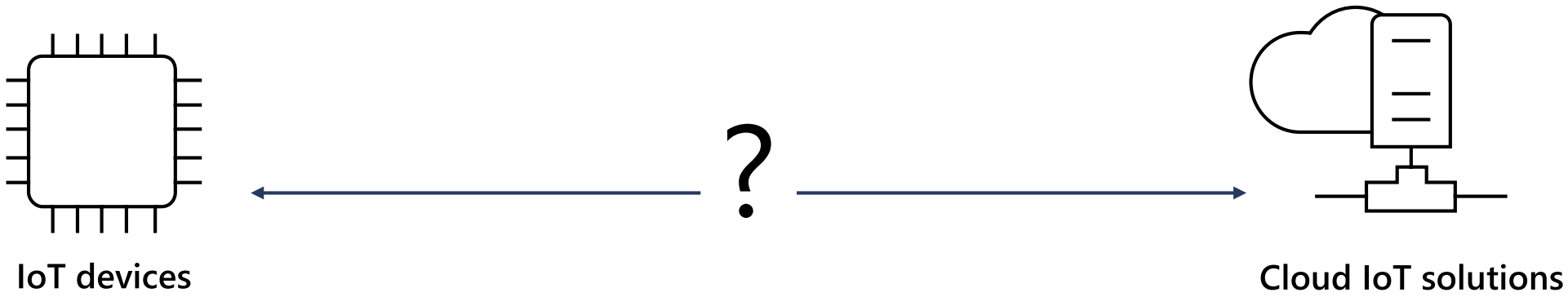
App Templates for Industries

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

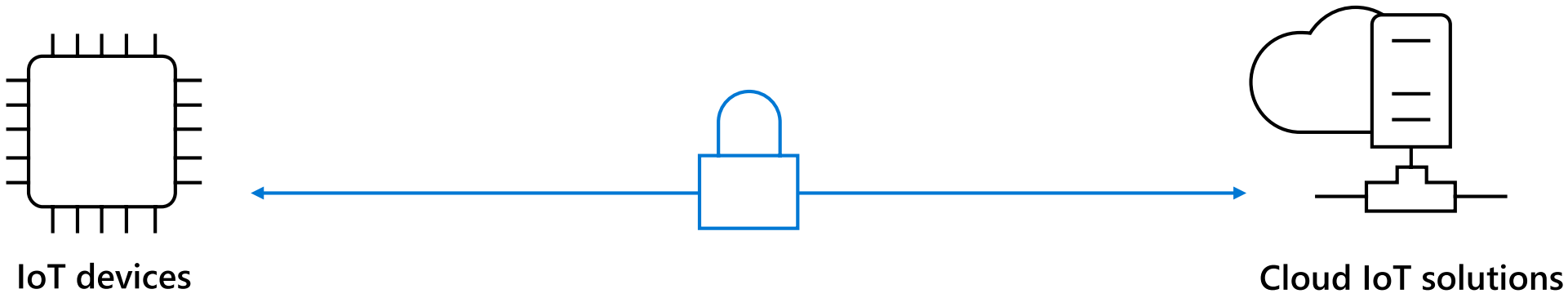
Healthcare
Continuous patient monitoring

Energy
Smart meter analytics
Solar power monitoring

Government
Water quality monitoring
Water consumption monitoring
Connected waste management

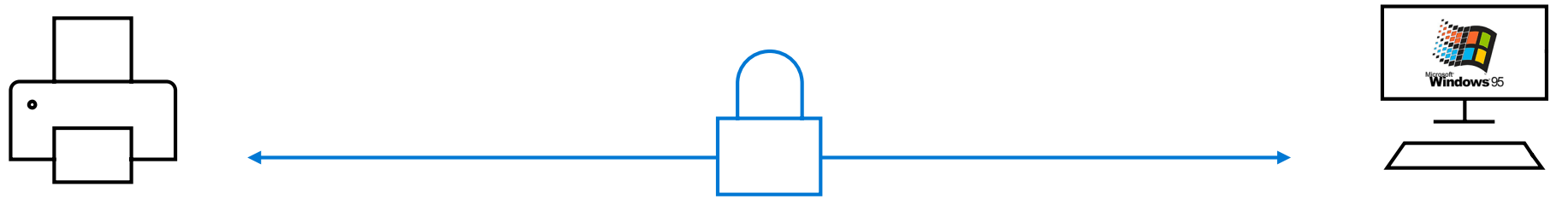

?
IoT devices
Cloud IoT solutions

IoT Today

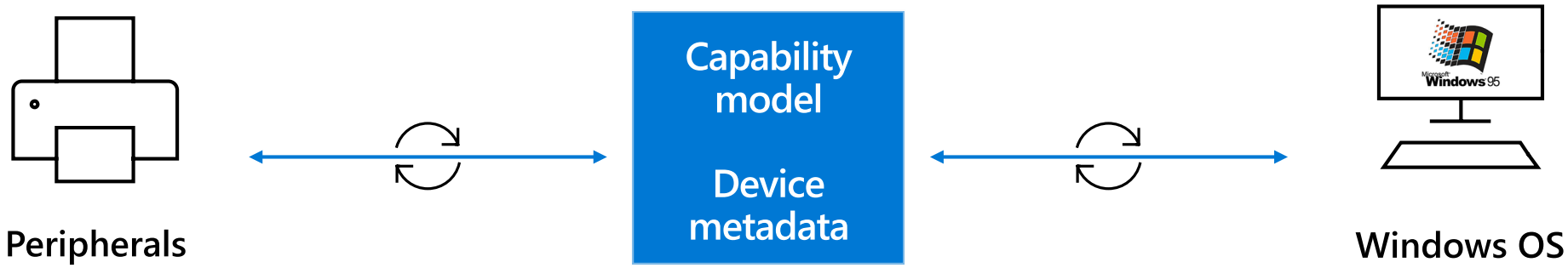


Tight coupling between software on device and IoT solution in the cloud

We had a similar challenge in the past…



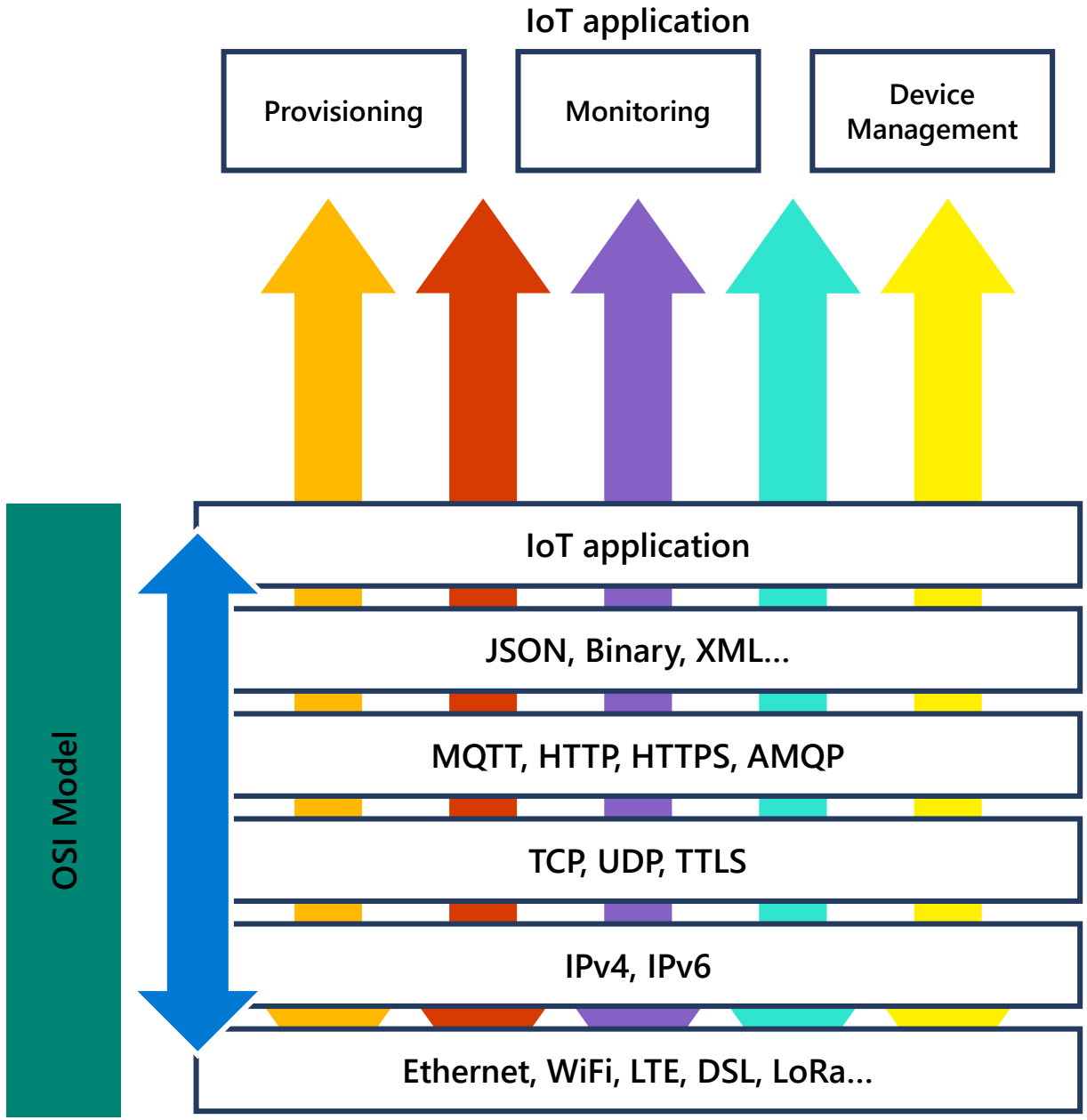
That was solved with Windows Plug and Play



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

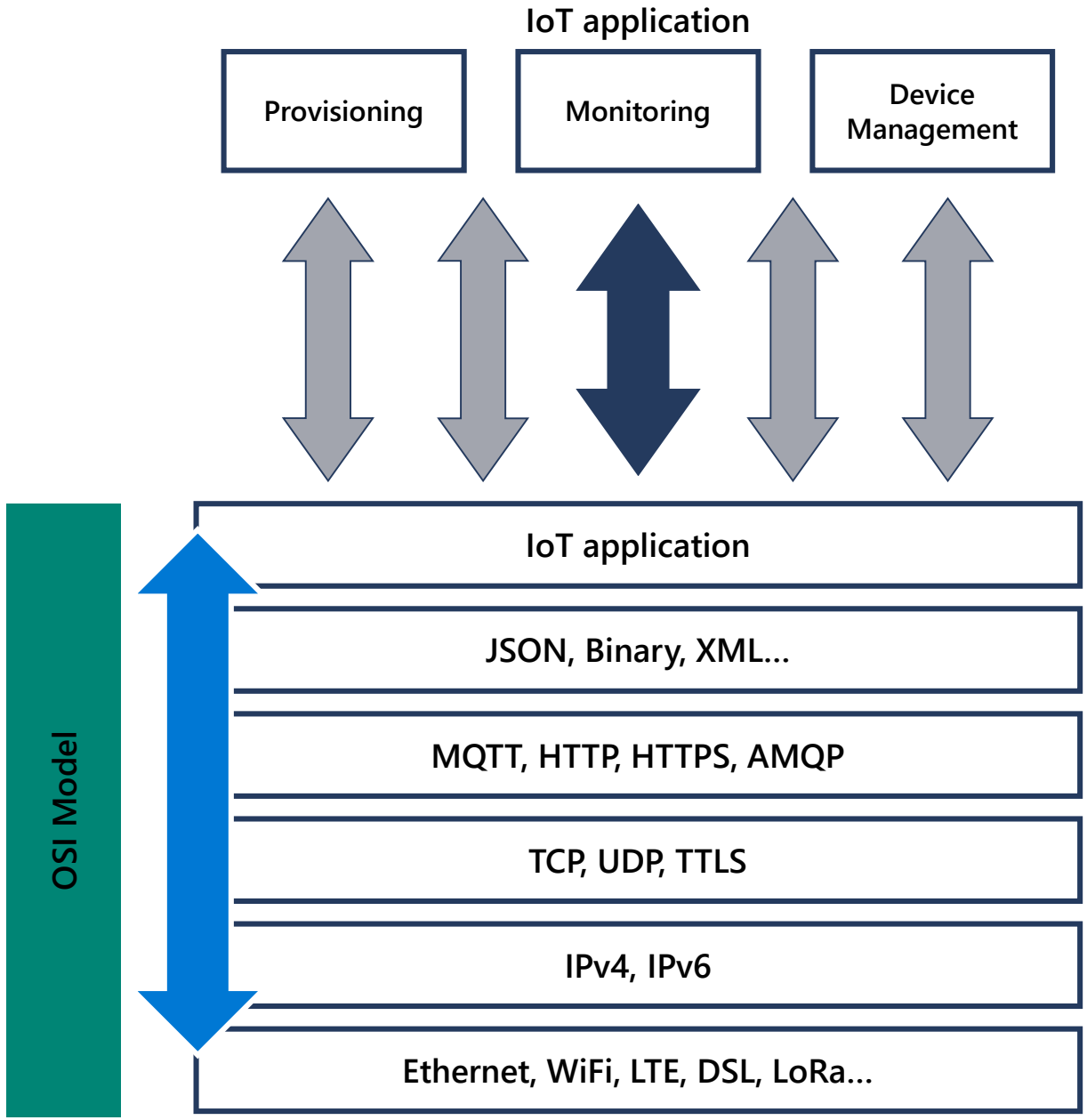
Connecting hardware is very “hard”

- Provisioning
- Configuration
- Device management
- Deployment
- Monitoring



IoT Plug and Play defines common language

- A platform feature to describe models and capabilities to Cloud
- Based on Digital Twin definition language
- Open source based on open standards (JSON-LD, RDF)



Benefits

Solution developers

Dramatically reduces the effort needed to build software on devices

Customers and partners

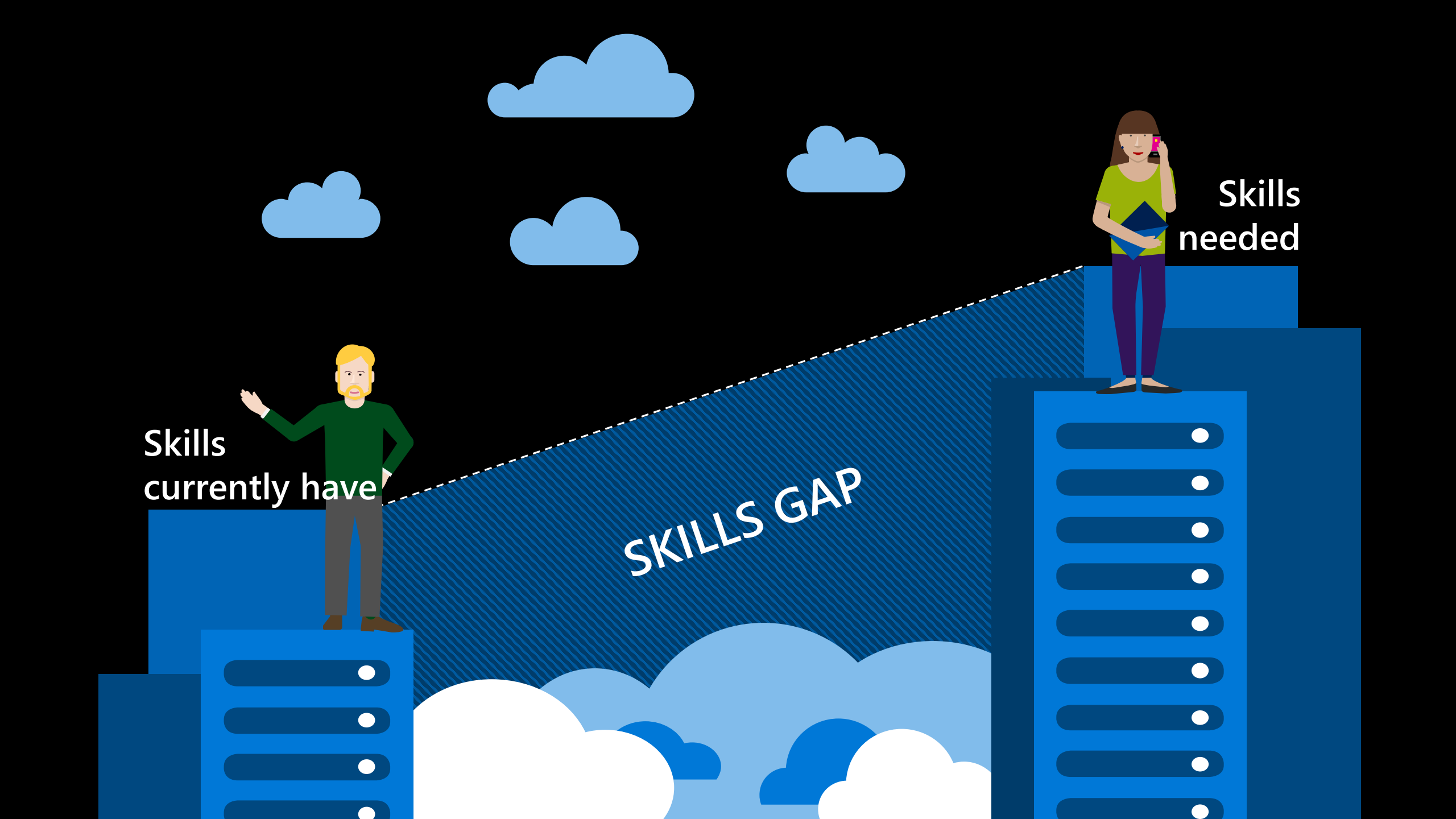
Large ecosystem of devices that just work with Azure IoT solutions, without any development required

Device builders

Certify your device for IoT Plug and Play and it can be used with thousands of Azure IoT solutions

In public preview

http://aka.ms/IoTPlugandPlay


Skills needed
Skills currently have
SKILLS GAP

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Microsoft.com/learn

Partners make it possible

Microsoft

Architecting the Intelligent Edge

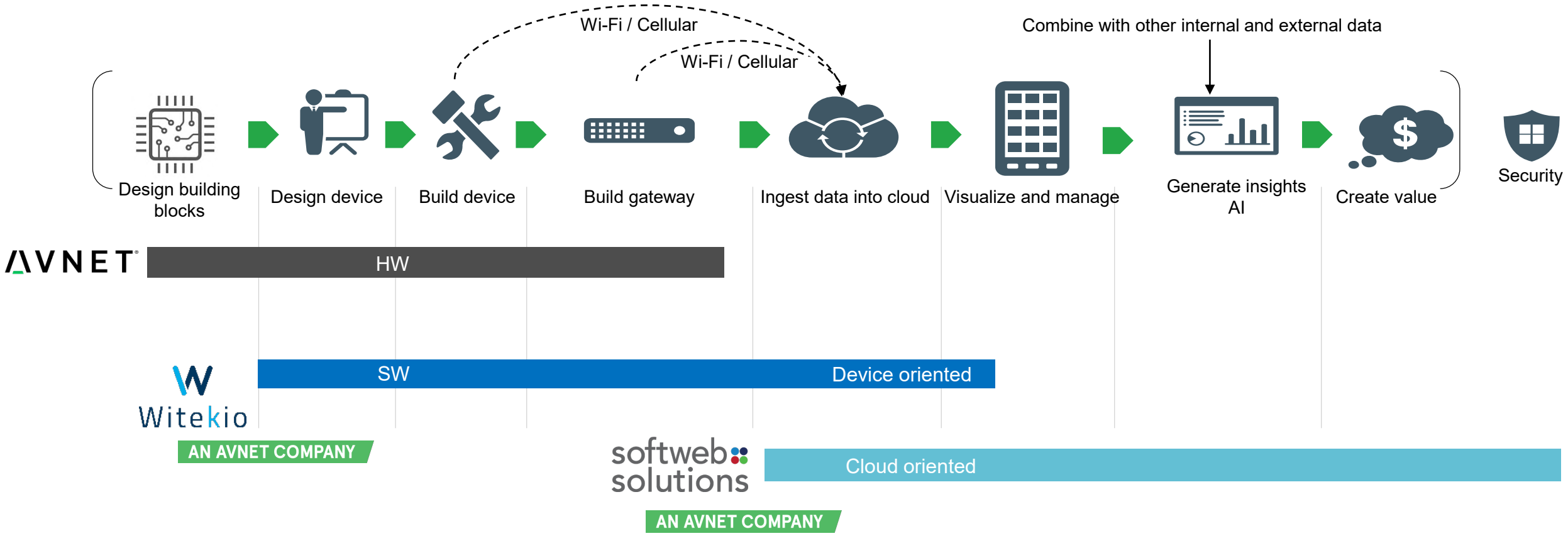
Marcel Boesing

Senior Technical Manager Microsoft IoT

AVNET EMG Silica

IoT in Action

The Avnet Value Proposition – Helping Businesses “See the Future”



We offer end to end capabilities to deliver real return on investment on IoT

AVNET

The #1 Challenge for IoT = IoT Security

"By 2020, more than **25% of identified attacks** in enterprises will involve **IoT.**" – Gartner IoT Survey 2016

"Over **50%** of CIO's and CTO's have identified **IoT Security** as the **#1 barrier/challenge** to IoT success." – Gartner IoT Survey 2017

AVNET

Highly-Secured Connected Devices require 7 Properties

Hardware Root of Trust

Is your device's identity and software integrity secured by hardware?

Defense in Depth

Does your device remain protected if a security mechanism is defeated?

Small Trusted Computing Base

Is your device's TCB protected from bugs in other code?

Dynamic Compartments

Can your device's security protections improve after deployment?

Certificate-Based Authentication

Does your device use certificates instead of passwords for authentication?

Failure Reporting

Does your device report back about failures and anomalies?

Renewable Security

Does your device's software update automatically?

= Silicon support required = OS support required = Cloud Service support required

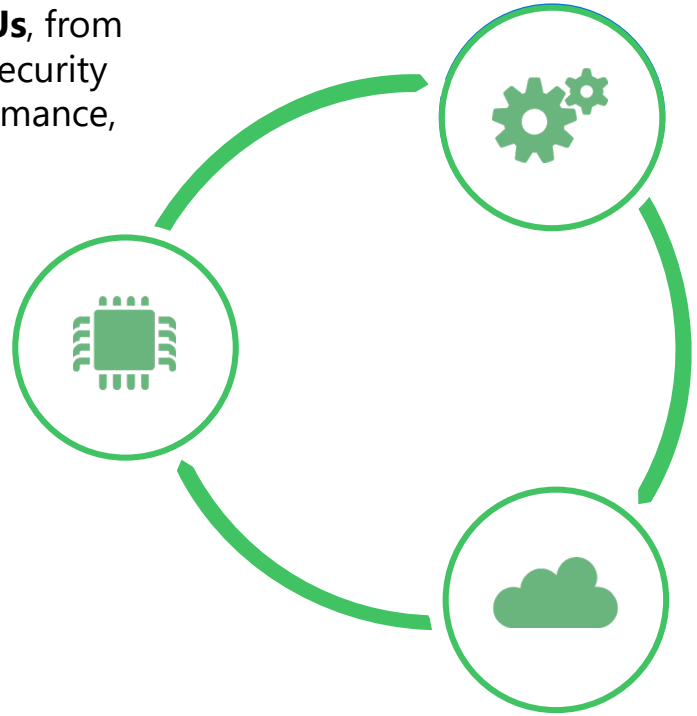
http://aka.ms/7properties

AVNET

The Security Solution - Azure Sphere

Secured **MCUs**

A new class of crossover **Azure Sphere MCUs**, from our silicon partners, with built-in Microsoft security technology provide connectivity, high performance, and a secured hardware root of trust.



Secured **Operating System**

The highly-secured **Azure Sphere IoT OS** combines the best of Microsoft and OSS technologies to create **a trustworthy platform** for new IoT experiences

Secured by our **Cloud Service**

The **Azure Sphere Security Service** guards every Azure Sphere device; it **protects** your devices and customers, **detects** emerging threats, and proactively **responds**.

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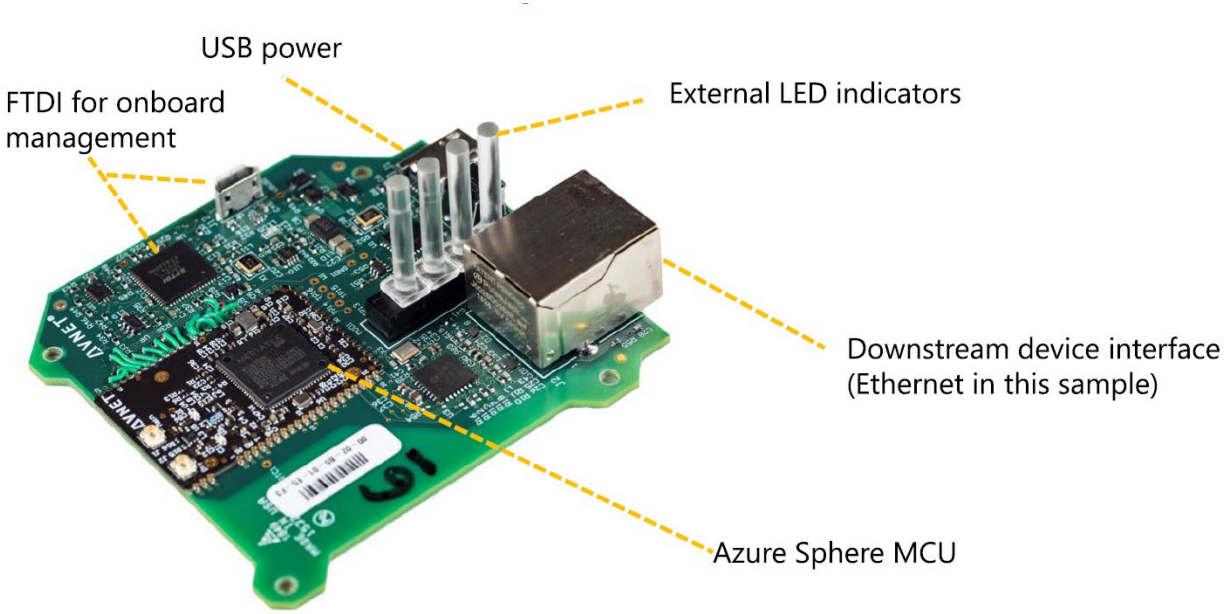
Two Types of Customer Implementations

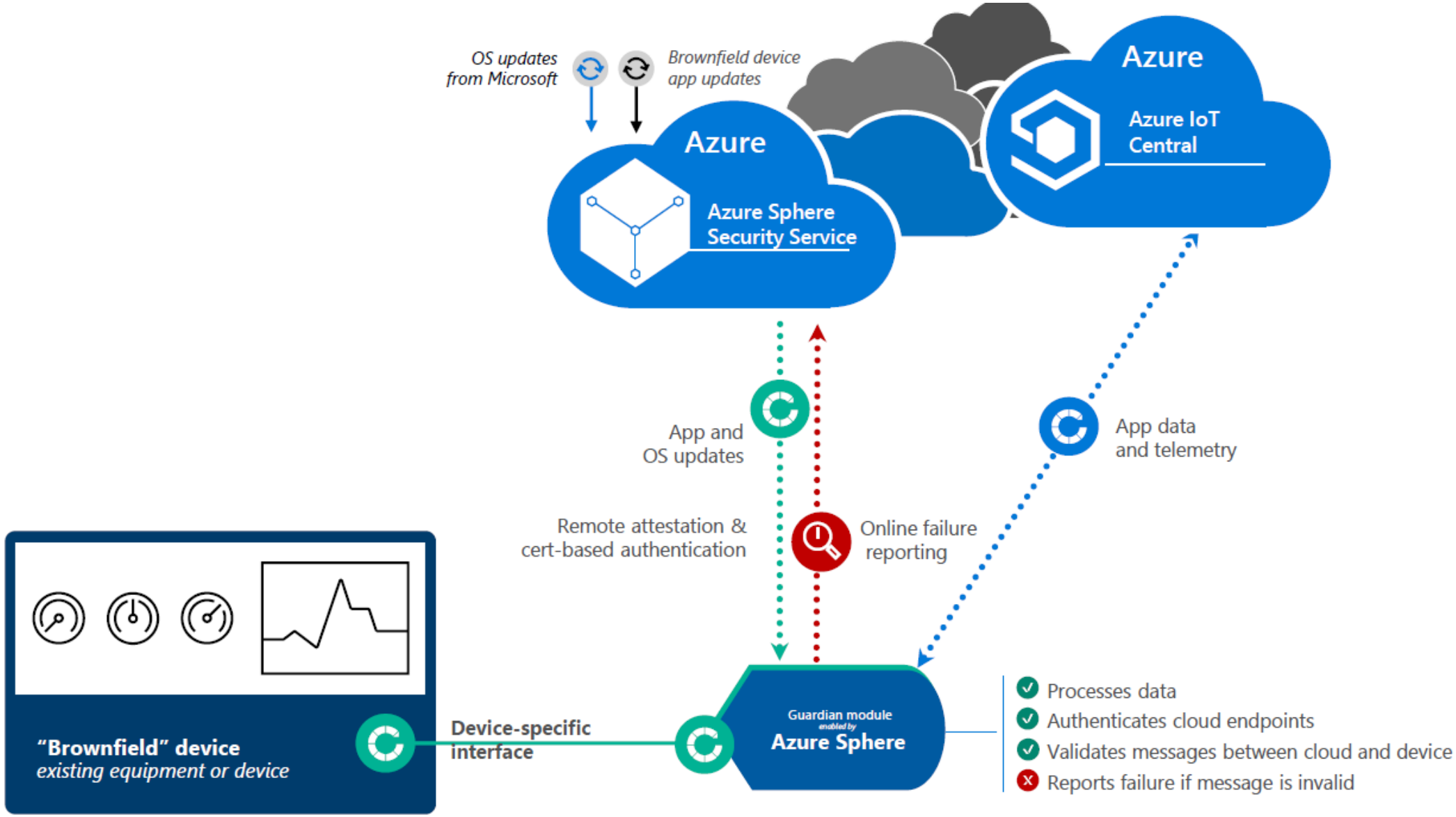
Azure Sphere for Brownfield

Guardian



DESIGNED BY AVNET

Securing Brownfield Devices with Guardian

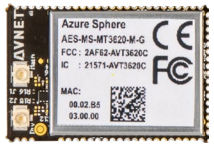


STARBUCKS

Azure Sphere enables Starbucks to put their Business Transformation Strategy into rapid gear.

- Cost savings: Reduce unnecessary maintenance truck rolls
- Customer experience: Deliver the perfect pour every time
- Operational efficiency: Download seasonal recipes directly to machines

Avnet's Sphere Product Roadmap

Chip	Module	Starter Kit	Guardian	
Targeting higher volume (>50K) applications	Certified and production ready for quick time to market	Eases prototyping and PoC development with expansion and add-ons	Production ready, Sphere-based system with enclosure for quick deployment. Off-the-shelf or customizable to meet exact application needs.	Target Applications
Available Now  **MT3620 Sphere MCU** - Arm Cortex A7 MPU with 4MB SRAM - Dual M4F MCUs with 64KB SRAM each - Dual band a/b/g/n WiFi - Up to 5 ISU interfaces configurable as UART, I2C, or SPI ports - Up to 72 GPIOs - PWM, I2S, ADC, RTC	Available Now  **Chip Antenna Module** - Based on the MT3620 - Dual band a/b/g/n WiFi - Chip antenna - Three ISU interfaces - 33 x 22 x 3 mm	Available Now  **MT3620 Starter Kit** - Based on the MT3620 Chip Antenna Module - Two MikroE Click Board expansion slots - Five on-board sensors - Optional OLED port - I2C Grove connector - User push buttons - User LEDs - USB powered	 Sampling Now Available Now **Guardian-I** - WiFi Uplink - Ethernet Up or Downstream - USB-UART Downstream	- Machine monitoring/control - Asset monitoring
	Available Now  **External U.FL Antenna** - Based on the MT3620 - Dual band a/b/g/n WiFi - TX/RX ant. Diversity - U.FL connectors - Three ISU interfaces - 33 x 22 x 3 mm		Under Development Coming November **Guardian-Ic** - WiFi Uplink - Ethernet Up or Downstream - USB-UART Downstream - Separate Program Cable - Compact size - Lower cost	- Machine monitoring/control - Asset monitoring
Coming 2H '20 Under Development **NXP Sphere MCU** - i.mx8 based			Under Development Coming November **Guardian-II** - WiFi Uplink - BLE/802.15.4 Downstream - UART/SPI/I2C Expansion - USB Mass Storage	- Secure gateway - Machine monitoring/control - Asset monitoring - Mesh network gateway - Remote patient monitoring

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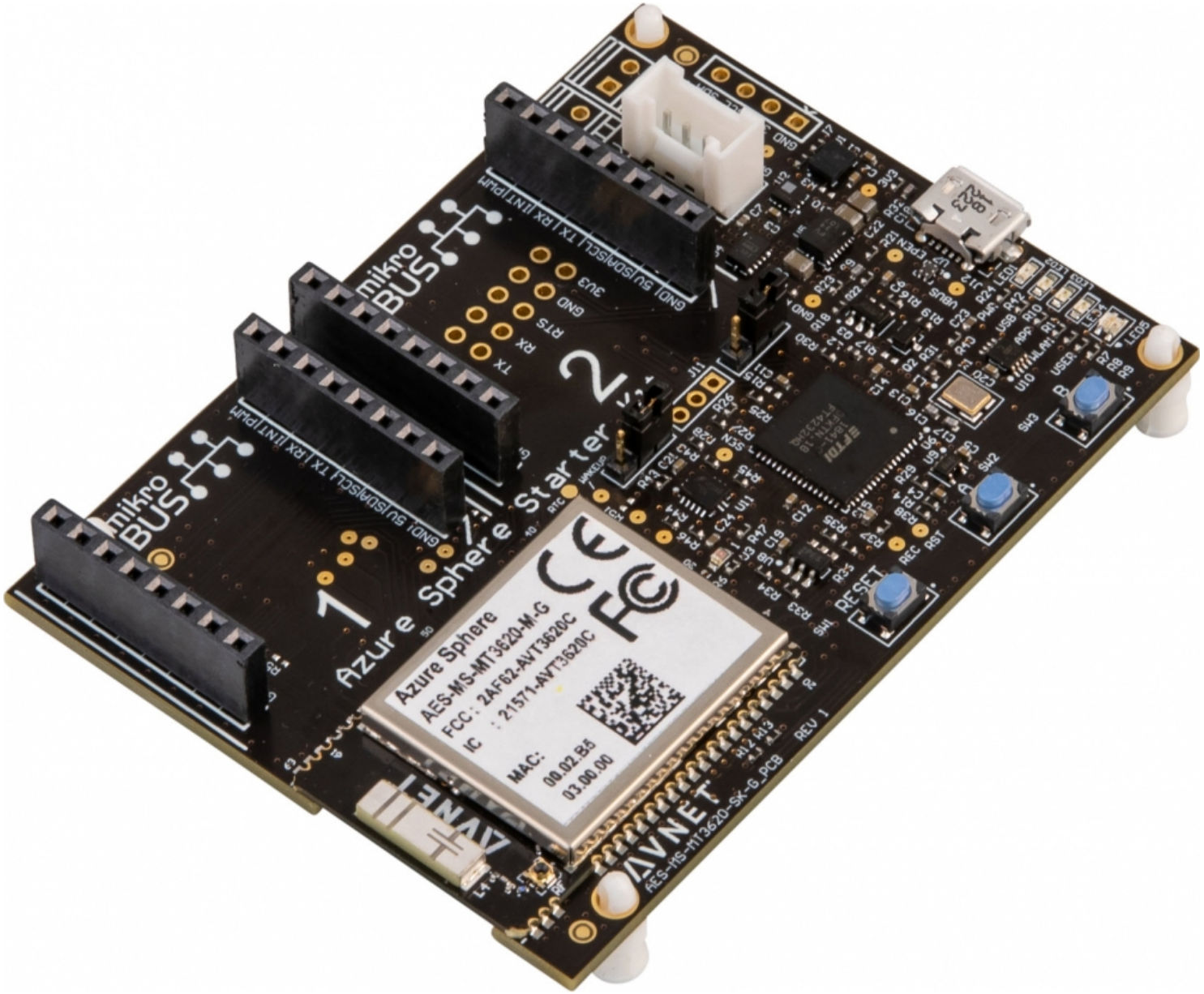
AVNET Azure Sphere Starter Kit



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Thank you!