Microsoft

IoT in Action

#IoTinActionMS

Microsoft

Unlocking IoT's Potential

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Azure IoT
Microsoft

IoT in Action

IoT fuels digital transformation

20B IoT Devices

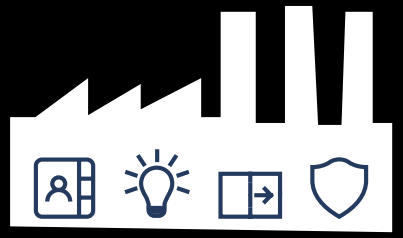
People
1.5 GB per day

20 billion connected devices by 2020

– Gartner

50 GB per day
Smart Home

Smart City
250 PB per day



Smart Factory

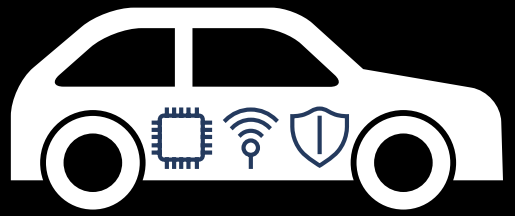
1 PB per day

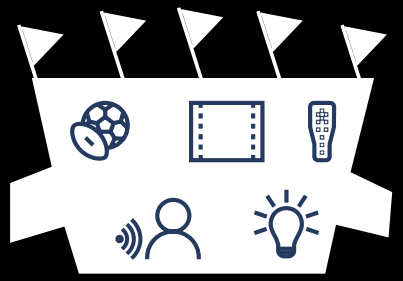
1 million/ hour

new devices coming online

Autonomous Vehicle

5 TB per day





Smart Stadium

200 TB per game

IDC

180 zettabytes of digital data by 2025

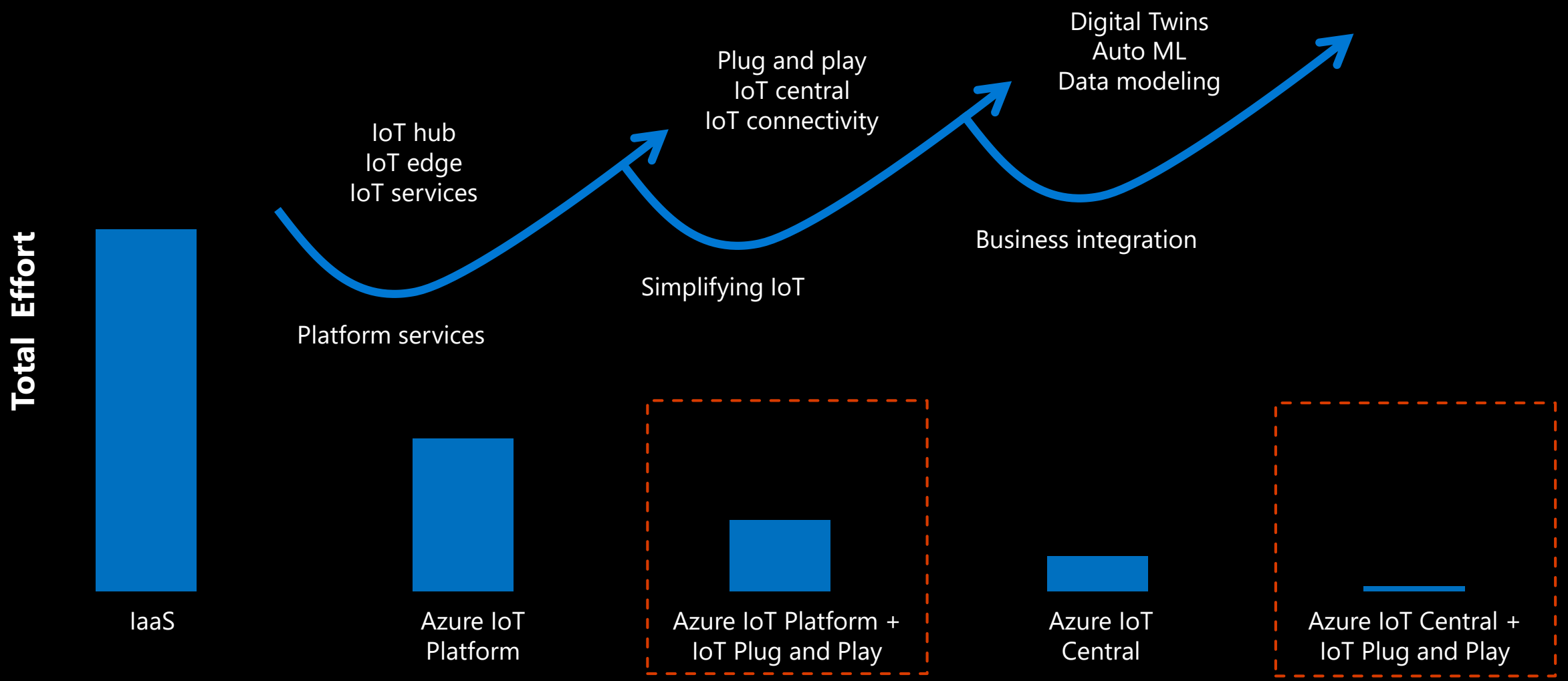
Smart Office

150 GB per day

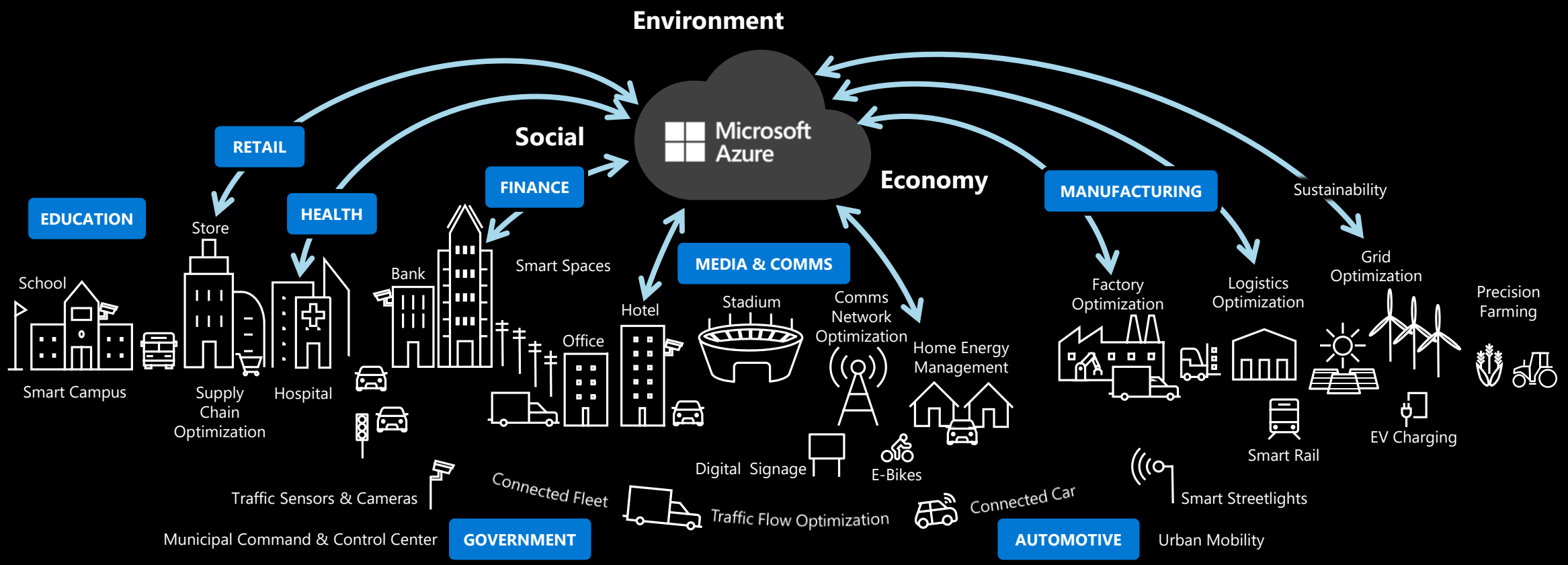
How can I quickly generate business insights from sensor values?

Accelerating IoT adoption

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



Microsoft invests $5 billion in IoT



Our goal is to give every customer the ability to transform their businesses, and the world at large, with connected solutions

Industrial IoT leadership

MindSphere runs on Azure IoT

Ability runs on Azure IoT

PlantWeb runs on Azure IoT

EcoStruxure runs on Azure IoT

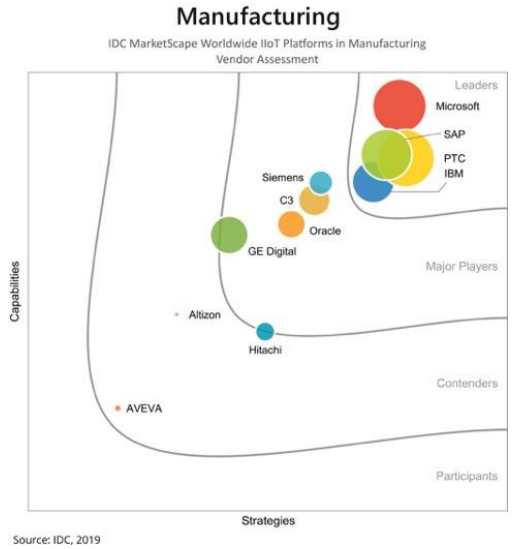
FactoryTalk runs on Azure IoT

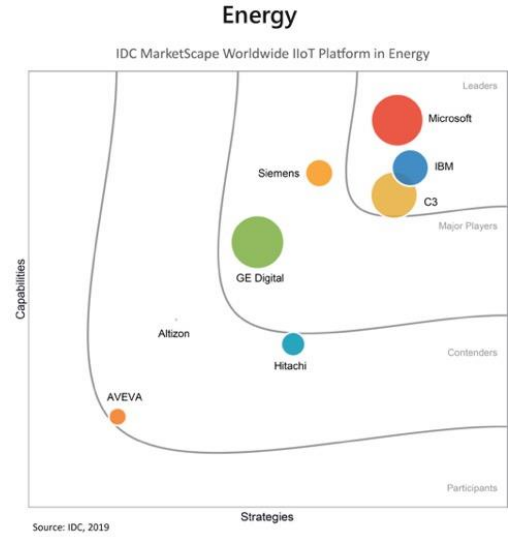
Sentience runs on Azure IoT

Yokogawa's IIoT Platform runs on Azure IoT

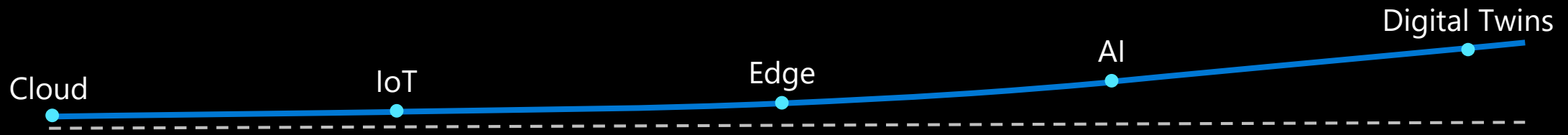
Leonardo runs with Azure IoT

Armstrong runs with Azure IoT





Microsoft's comprehensive IoT portfolio



Azure Security Center for IoT

Azure IoT priority verticals

Manufacturing | Retail | Agriculture | Energy | Smart Cities | Healthcare | Transportation

Azure IoT Solutions

- Azure IoT Central (SaaS)
- Azure IoT Reference Architecture & Accelerators (PaaS)
- Dynamics Connected Field Service (SaaS)

Azure Services for IoT

- Azure IoT Hub
- Azure IoT Hub Device Provisioning Service
- Azure Digital Twins
- Azure Time Series Insights
- Azure Maps
- Azure Stream Analytics
- Azure Cosmos DB
- Azure AI
- Azure Cognitive Services
- Azure ML
- Azure Logic Apps
- Azure Active Directory
- Azure Monitor
- Azure DevOps
- Power BI
- Azure Data Share
- Azure Spatial Anchors

IoT & Edge Device Support

- Azure Sphere
- Azure IoT Device SDK
- Azure IoT Edge
- Data Box Edge
- Windows IoT
- Azure Certified for IoT—Device Catalog
- Azure Stream Analytics
- Azure Storage
- Azure ML
- Azure SQL
- Azure Functions
- Azure Cognitive Services

Intelligent cloud

IoT Hub – Most Mature, Scalable, Secure Cloud Platform

Azure IoT Hub

Bi-directional communication

Millions of devices

Multi-language, open source SDKs

HTTPS/AMQPS/MQTTS

Send telemetry

Receive commands

Device management

Device Twins

Queries & jobs

Enterprise scale and integration

Billions of messages

Scale up and down

Declarative message routes

File upload

WebSockets and multiplexing

Azure monitor

Azure Resource Health

Configuration management

End-to-end security

Per device certificates

Per device enable/disable

TLS security

X.509 support

IP whitelisting/blacklisting

Shared access polices

Firmware/Software updates

Azure Security Center Support

Device Provisioning Service

IoT-scale automated provisioning

Zero-touch provisioning

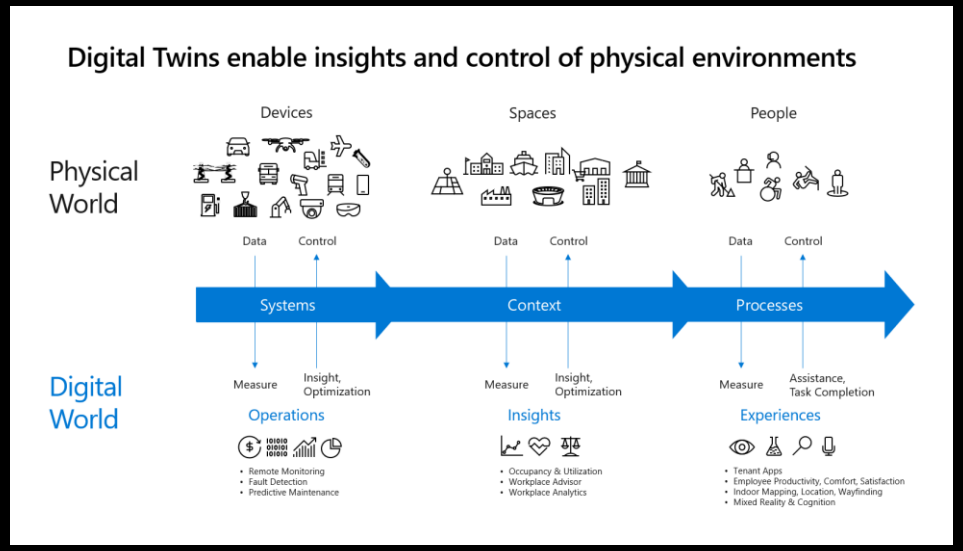
Centralize your provisioning workflow

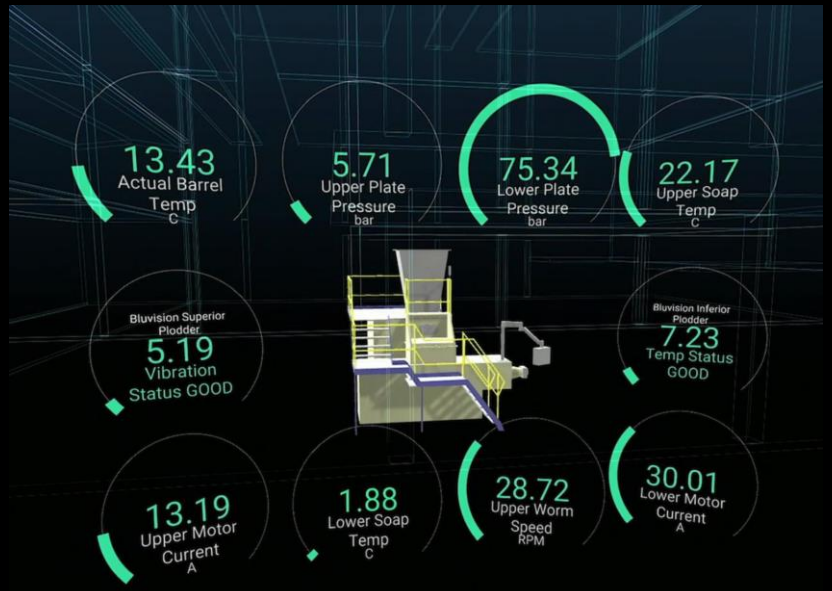
Load balance across multiple IoT Hubs

Re-provisioning support

Supports TPM + X.509

Digital Twins





Verticalization

AI, simulation, and predictions

Visualizations and physics

Partner DT solution

Common

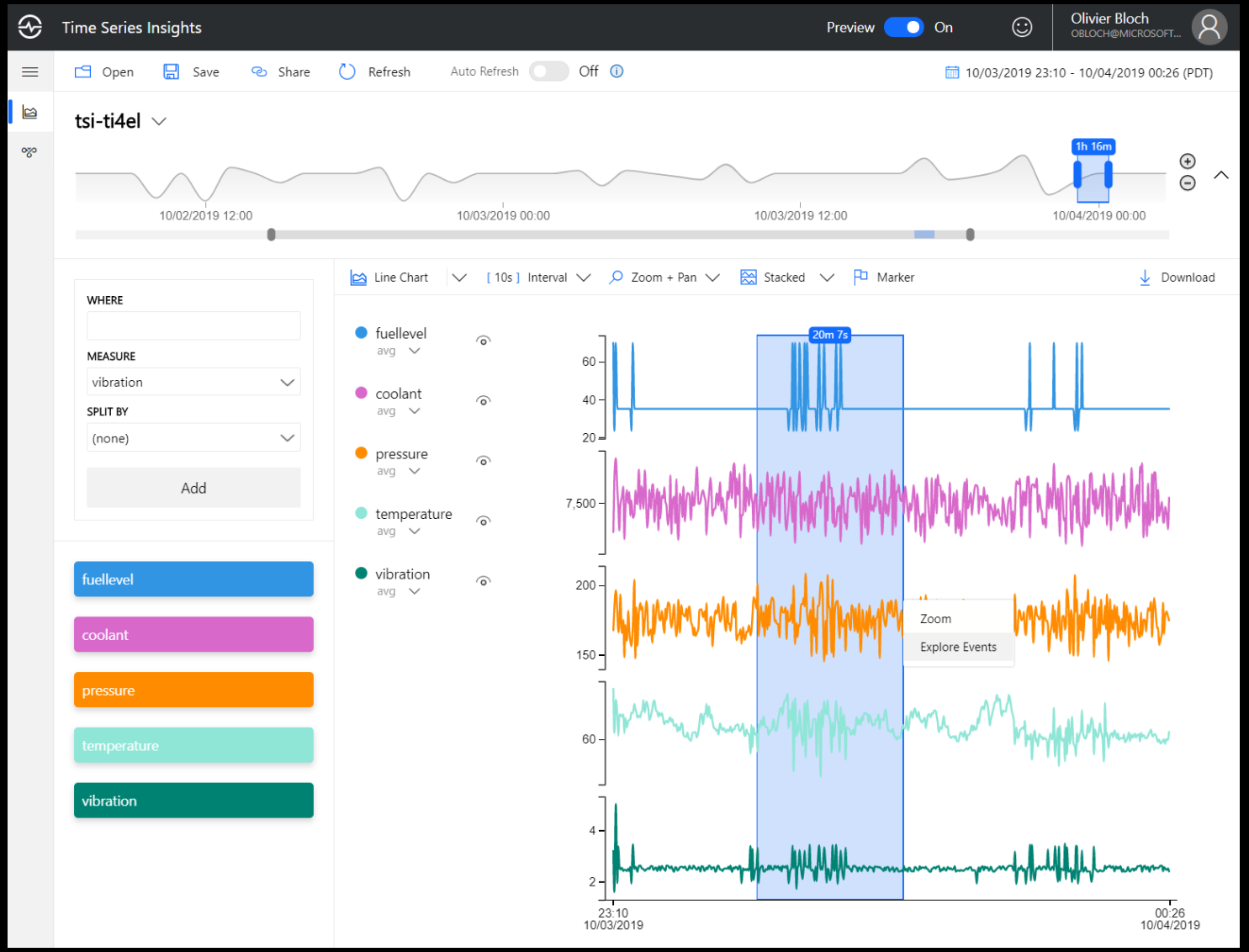
- Hyperscale platform for common architecture patterns (e.g., graphs, data, security, action)
- Dynamic execution environment for live business logic
- First class time-series history support

Azure Digital Twin (PaaS)

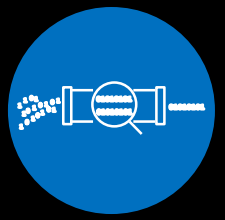
Microsoft

Modular Azure architecture for better scale

Time Series Insights



Industrial IoT data characteristics



IoT data lacks structural consistency

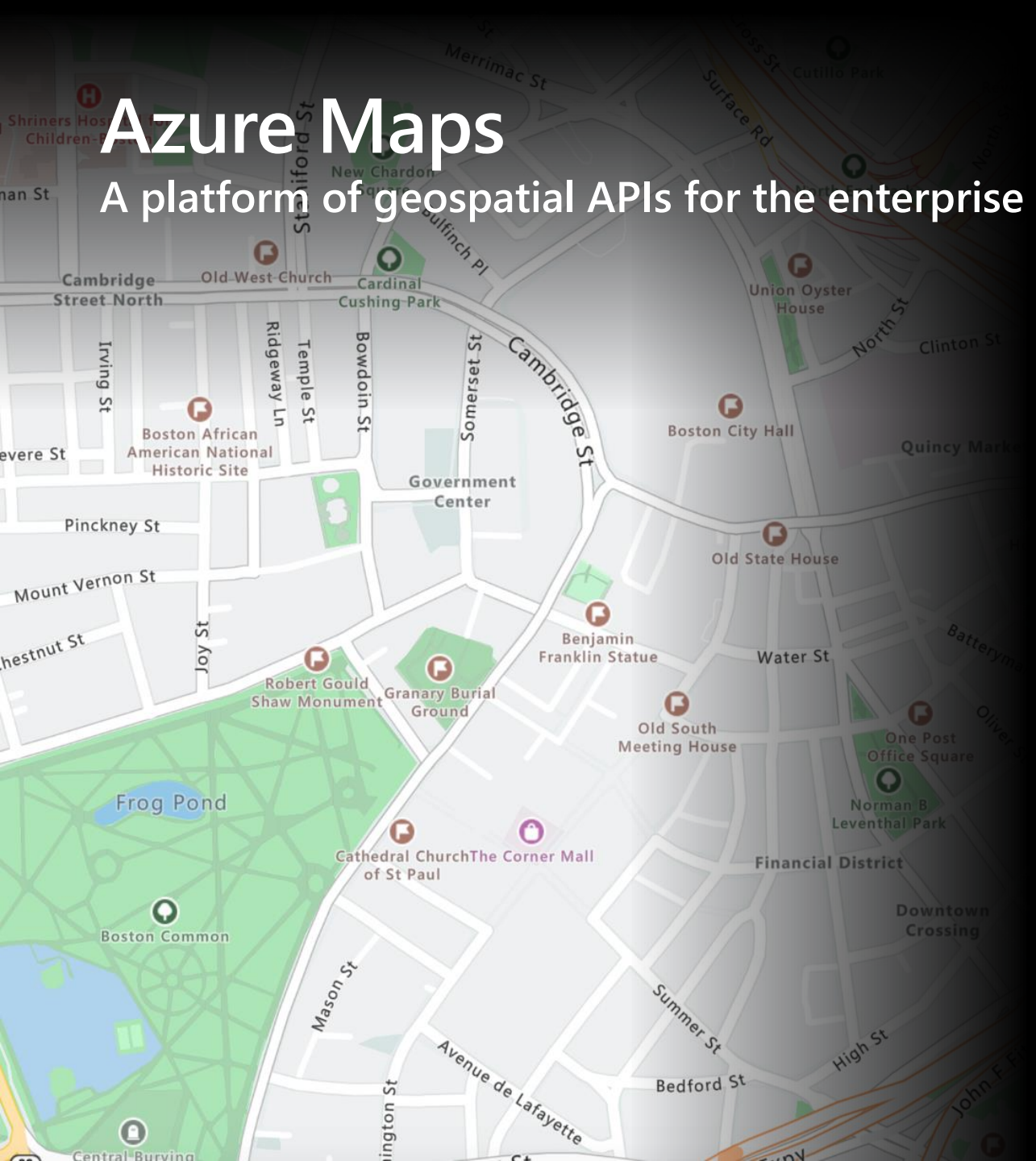
IoT data needs contextualization

IoT data is used with other data from first or third party sources

IoT data is characterized by infinite retention

Azure Maps

A platform of geospatial APIs for the enterprise



Maps
Render maps and satellite imagery across many geographies

Map control
Integrate rich mapping visualizations into applications

Routing
Calculate routes from N to N points

Search and geocoding
Convert places and addresses to coordinates

Traffic
Show real time traffic information

Time zones
Obtain time zone and current time information

Geolocation
Obtain IP-based location information

Spatial operations
Perform common geospatial operations, including geofencing, buffers, and closest point functions

Mobility (transit)
Access real-time intelligence for transit stops and routes

Bringing Plug and Play to IoT

Benefits

DEVELOPERS

Dramatically reduces the effort needed to build software on devices

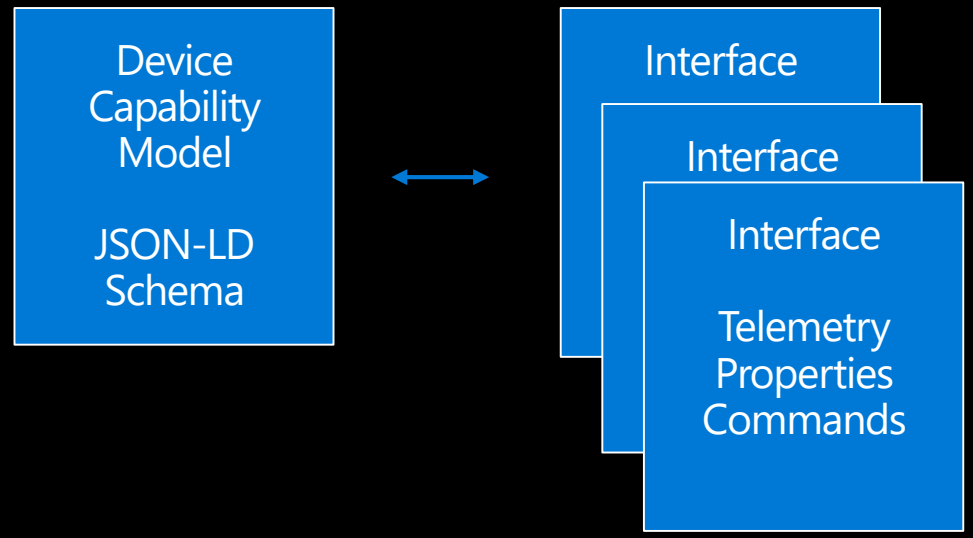
CUSTOMERS & PARTNERS

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

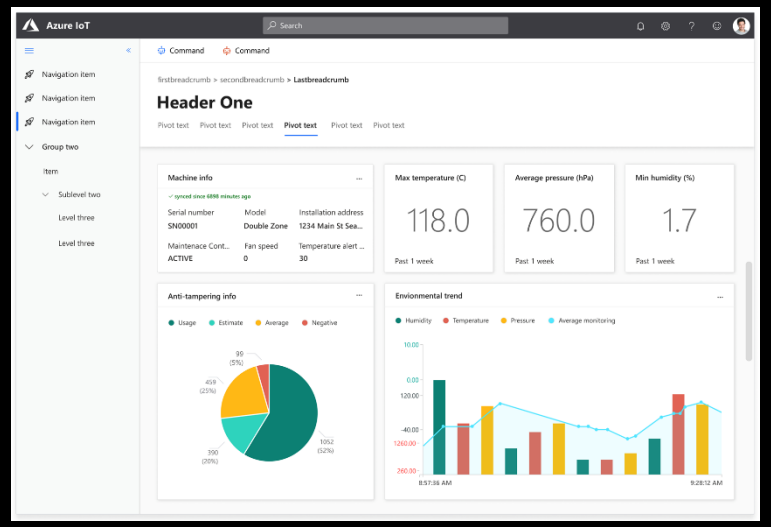
DEVICE PROVIDERS

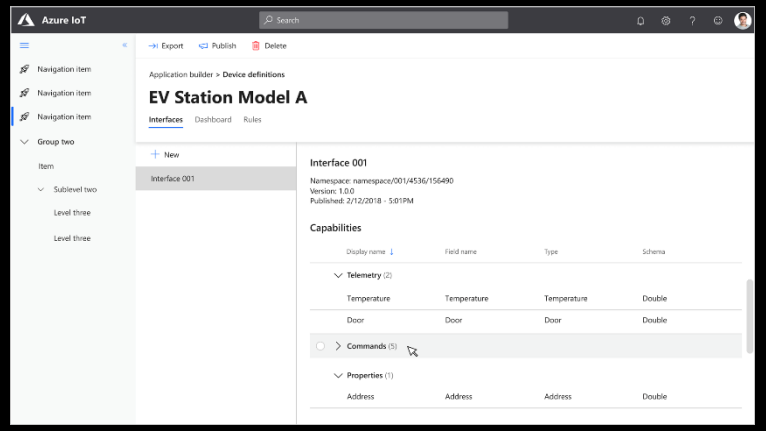
Certify your device for IoT Plug and Play and it can be used with any Azure IoT solutions

Open source and using open standards



IoT Central

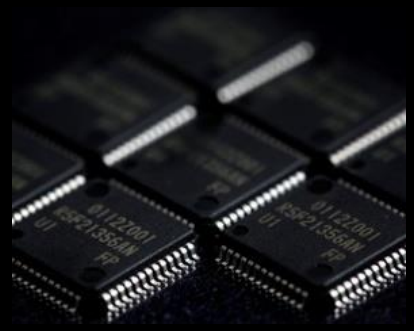


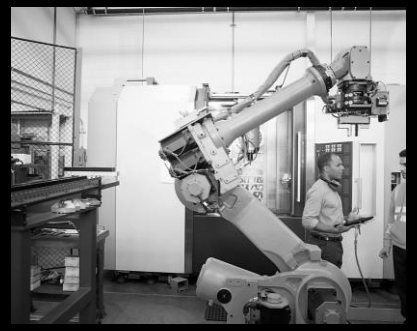


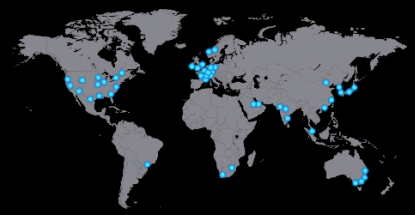
- Device connectivity and management
- Telemetry ingestion and command and control
- Monitoring rules and triggered actions
- User roles and permissions
- Dashboards, visualization, and insights
- Fully hosted and managed by Microsoft
- White labeling
- Plug and Play
- Extensibility and customization
- Location telemetry and geofence
- Industry solution templates (coming soon)
- Edge support (coming soon)

Intelligent Edge

The most comprehensive IoT and Edge offerings in the market







Devices + Sensors | **Sensors to interactive** | **Integrated platform** | **Global scale processing**

IoT devices
Azure IoT Device SDK

Endpoint devices such as appliances, vehicles, or factory machines that connect, interact, and exchange data

1,300+ devices, 300+ partners—all certified to work great with Azure IoT Services

Cross-platform and open source: Windows IoT, Linux, RTOSs, ThreadX and more

Device security
Azure Sphere

Integrated hardware, software, and cloud services work seamlessly together to deliver security by default

Deployment options to securely connect existing equipment and build security into new edge devices

Over 10 Years of security and OS updates delivered directly to each device by Microsoft

Edge devices
Azure IoT Edge

Devices that aggregate, process, and provide gateway capabilities for IoT endpoints

Deploy and manage Azure Services in containers on any IoT device

AI, Azure ML, Azure Stream Analytics, and more

Cross-platform and open source: Windows IoT, Linux

Edge appliances
Azure Data Box Edge

Integrated appliances that provide a subset of cloud edge roles, such as ML-inferencing

Data Box Edge: AI-enabled, storage, and compute Azure Edge appliance

Data Box: Offline, ruggedized data transport, 100 TB–1 PB

On-premises platform
Azure Stack

Scalable solutions that provide a full cloud stack, including IaaS and PaaS capabilities

Edge and disconnected scenarios

Regulatory requirements

Cloud app model on-premises

Hyperscale cloud
Edge Regions

First-party cloud regions

Full range hyperscale cloud services

Tiered service availability: Heroes > Hubs > Satellites

Open source-based services and tools

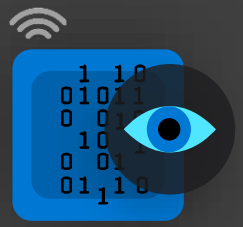
Most specialization — Full spectrum of Cloud + Edge form factors — Fewest form factors

Fewest services — Intentional and appropriate Azure service availability — Most services

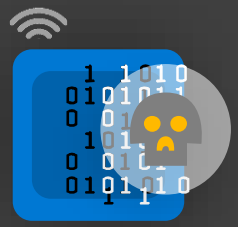
IoT attacks put businesses at risk

Devices bricked or held for ransom

Devices are used for malicious purposes



Data and IP theft



Data polluted and compromised

Devices used to attack networks

The cost of IoT attacks

Stolen IP and other highly valuable data

Compromised regulatory status or certifications

Brand impact (loss of trust)

Recovery costs

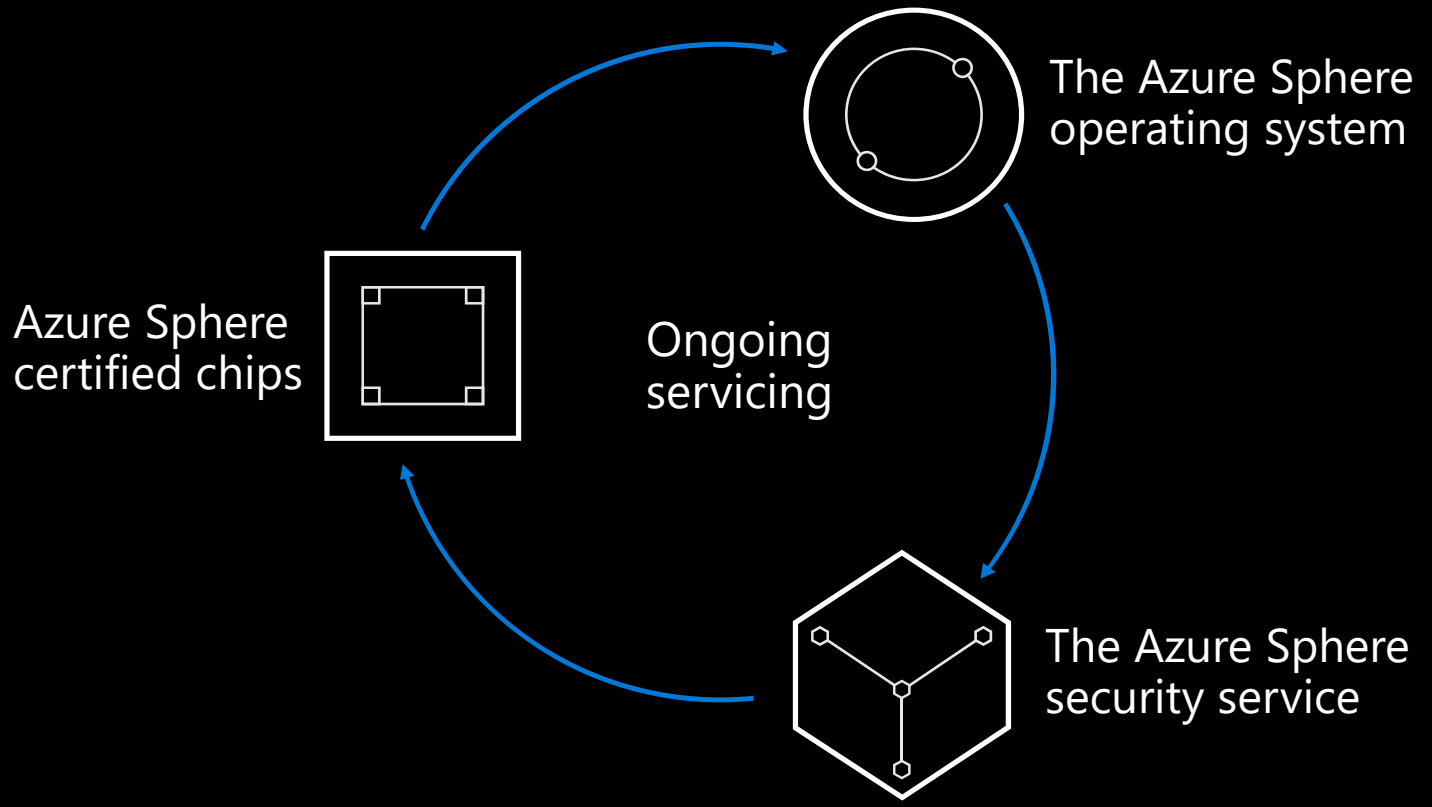
Financial and legal responsibility

Downtime

Security forensics

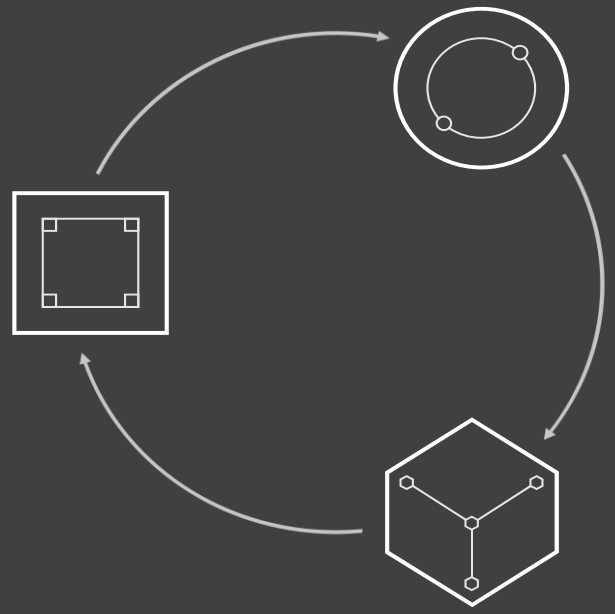
Azure Sphere

An end-to-end solution for securely connecting existing equipment and to create new IoT devices with built-in security. Ongoing updates from Microsoft keep your devices secured over time as threats evolve.



Over 10 years of security and OS updates delivered directly to each device by Microsoft

Protect your data, privacy, physical safety and infrastructure with Azure Sphere.



- **Integrated hardware, software, and cloud services** work seamlessly together and deliver active security by default.
- **Defense in depth** provides multiple layers of protection to help guard devices against and respond to threats.
- **Ongoing security and OS updates** from Microsoft keep your devices secured over time.
- **Implementation options** allow you to secure existing equipment and build security into new IoT devices.
- **Simplified business model with one-time upfront price** includes hardware, security service, and full OS update servicing for over a decade.

Intelligent edge devices require a new approach

Time

Many IoT solutions require months to set up

Security & trust

IoT poses unique security, privacy and, compliance challenges

Modernization

Newer technologies like ML/AI require new skill sets

Windows IoT family—fast, safe, smart

Windows 10 IoT Core

For small-footprint, smart devices

Enabling lower cost devices

Windows 10 IoT Enterprise

For fixed-function, smart devices

Locked down, full edition of Windows 10

Windows Server IoT 2019

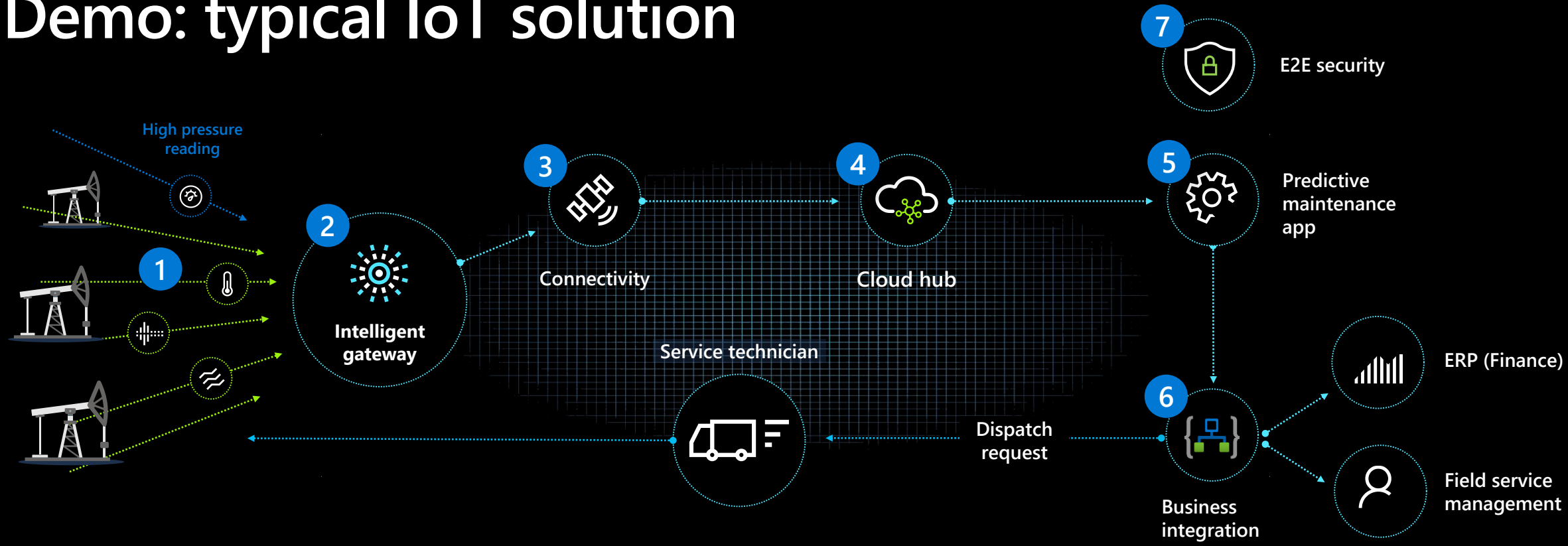
Advanced data analysis and storage

Enhanced security capabilities

10 years of OS Support, security & manageability

Demo
Olivier Bloch
Azure IoT
Microsoft Corporation

Demo: typical IoT solution



Need to source and integrate sensors

1

A rich catalog of **Plug and Play devices** enables device ingestion

Need to filter data and run safety workloads on the edge

2

IoT Edge manages and executes intelligent workloads

Need to provision devices and get data back to the cloud

3

Connectivity partners offer global Azure access

Need OT to have intuitive dashboard to manage and work with devices

4

IoT Central makes it seamless to monitor and manage devices

Need to extract valuable insights from devices data in real time

5

Azure ML brings the power of AI into your application

Need to integrate into the business processes

6

Logic Apps connects to hundreds of business applications

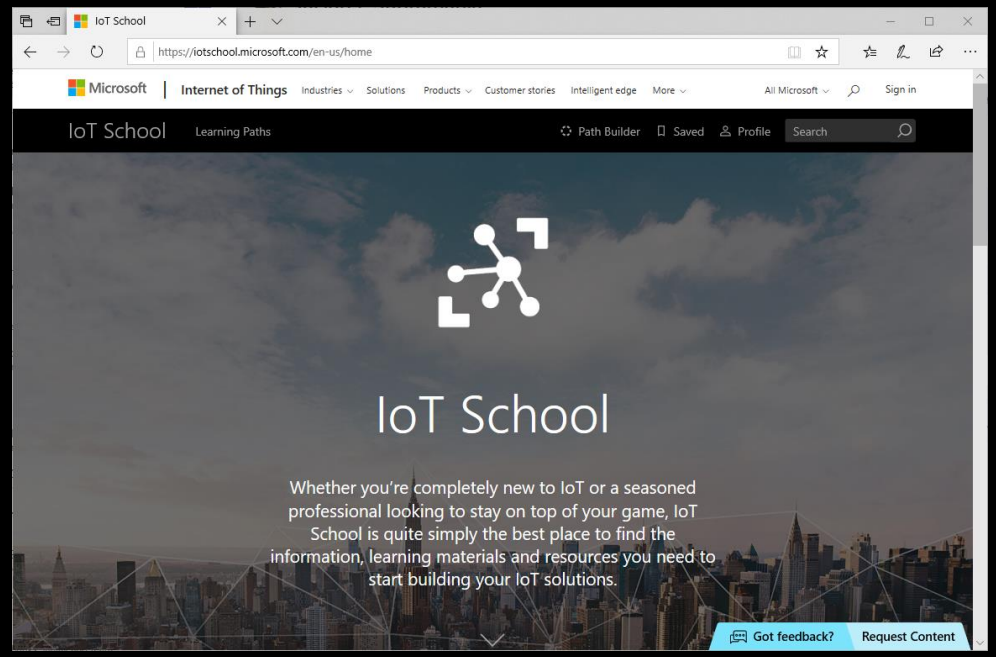
Need to secure the solution from silicon to Cloud

7

Azure Security Center brings Microsoft's decades of experience in security

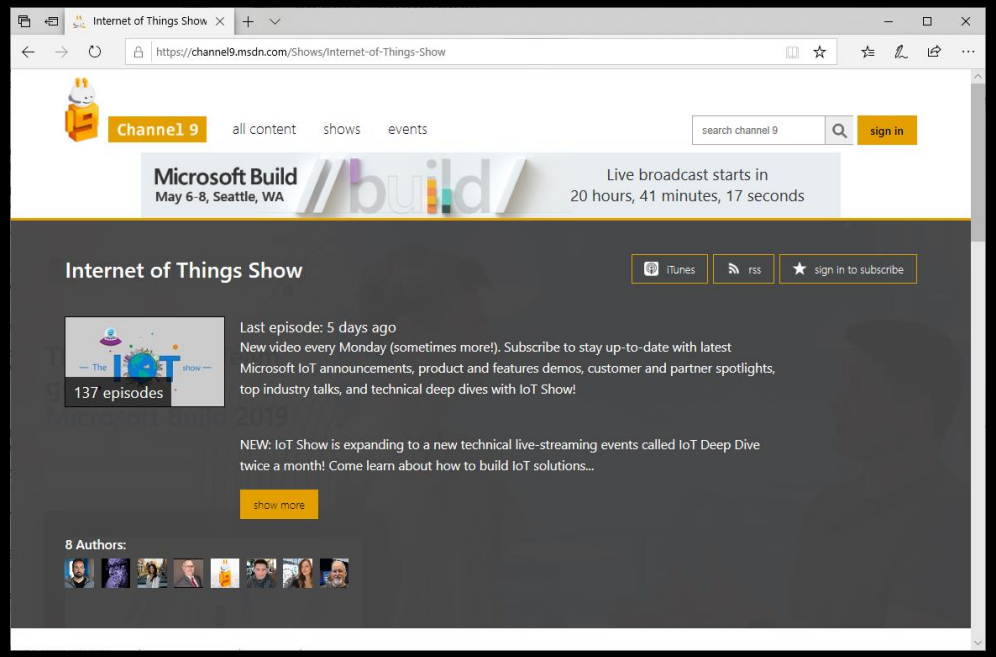
Great resources for developers

Learn IoT



http://aka.ms/learn/iot

IoT Show



http://aka.ms/iotshow

Ecosystem momentum

IHV → Device → Connectivity provider → ISV → Service provider → SI → Professional services → Consulting → Solutions → Customer

Developer community	Partner ecosystem	
Visual Studio, GitHub, hadoop, docker, php, nodeJS, Powershell, eclipse, python, ARM mbed, MySQL, Ruby, Java, mongoDB., Chef + Puppet	System integrators & advisors	accenture, CGI, HCL, EY Building a better working world, TATA CONSULTANCY SERVICES, HARMAN, eBECS, T-Systems, KPMG, Cognizant, Infosys, Tech Mahindra, SOGETI, avanade, pwc, DXC.technology, LARSEN & TOUBRO, REPLY, wipro, Capgemini, robotron, MOQdigital.
	Solution providers	Schneider Electric, ABB, esri, OSI, ICONICS, Rockwell Automation, ActionPoint, complement, codit, Johnson Controls, Honeywell, SAP, ptc, IoT, energisme, SIEMENS, Atos Worldline, DUNAV NET, Hitachi Solutions, Schlumberger, COPADATA, relayr.
	Solution aggregators	ARROW, SYNNEX CORPORATION, MESHSYSTEMS™, CUI, Insight, happiest minds, ICT+, AVNET, TechData, INGRAM MICRO, Mobiliya, SIGMA, AT&T, M
	Devices	life.augmented, intel, RENESAS, MOXA, Panasonic, NEXCOM, CISCO, Qualcomm, Hewlett Packard Enterprise, kontron, cradlepoint, ADVANTECH, Raspberry Pi, BECKHOFF, FUJITSU, DELL, HITACHI Inspire the Next, Toradex, libelium, embedded systems, Itron, TOSHIBA Leading Innovation, ARBOR

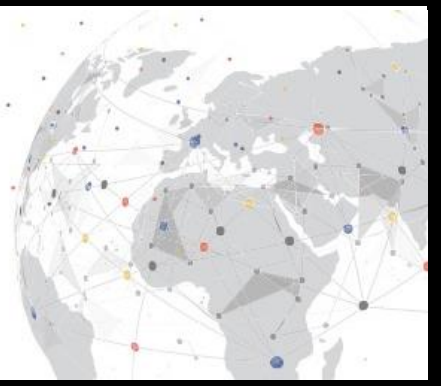
Vertical focus on co-sell Ready solutions (rich IoT services)

Prioritizing the most relevant customer solutions

1. Partner-led solutions

Industry	Vertical Solution Examples
Manufacturing	Condition Monitoring – Equipment Efficiency – Predictive Maintenance Operational Excellence – Grid Asset Management
Retail	Store & Customer Analytics – Distribution & Logistics Personalized Customer Experience – Inventory Optimization
Healthcare	Remote Patient Monitoring – Patient Analysis – Operational Analysis
Government	Urban Mobility & Transportation – Smart Cities – Security & Surveillance
Cross-Industry	Intelligent Supply Chain – Connected Field Service – Connected Products Smart Building Asset Tracking

2. IoT Co-Sell Ready Solutions Map



3. Microsoft Sales Force

4. Top customers by IoT propensity (IoT600)

Why choose Microsoft

Platform

Most comprehensive IoT services—mouse trap to nuclear power stations

Fast

Easy to build solutions

Ecosystem

Thousands of partner solutions across ISVs, advisories, systems integrators and connectivity providers

Powerful GTM channel

Relationships with the largest enterprise customers

Thank you

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