

Microsoft IoT

Digital Transformation and
the Internet of Things

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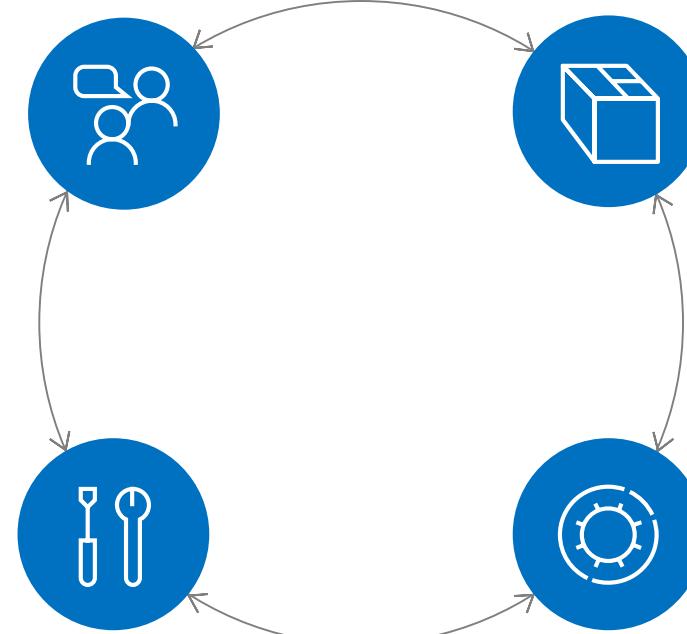


The Internet of Things **isn't**
a technology revolution...

...IoT is a **business revolution**,
enabled by technology

Digital transformation has four imperatives

Engage your
customers



Transform
your products

Empower your
employees

Optimize your
operations

Waves of Innovation

Cloud

Globally available, unlimited compute resources

IoT

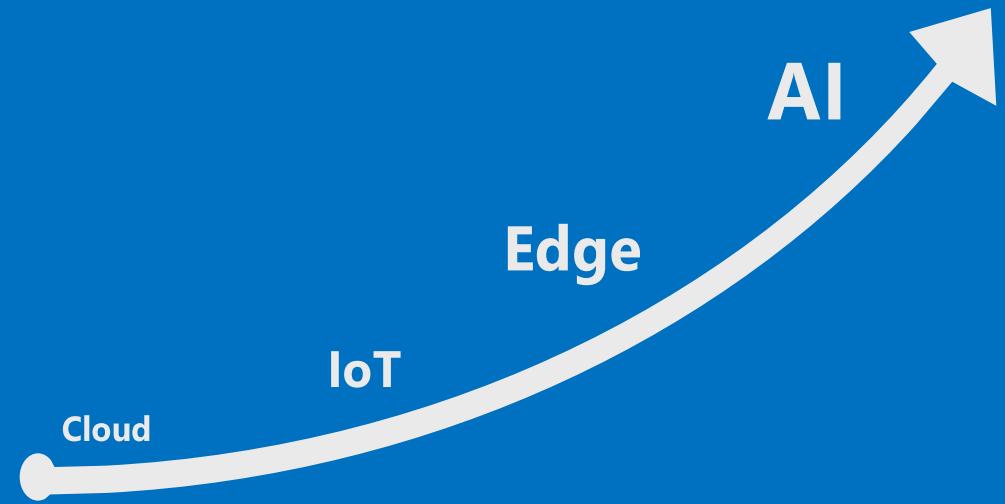
Harnessing signals from sensors and devices,
managed centrally by the cloud

Edge

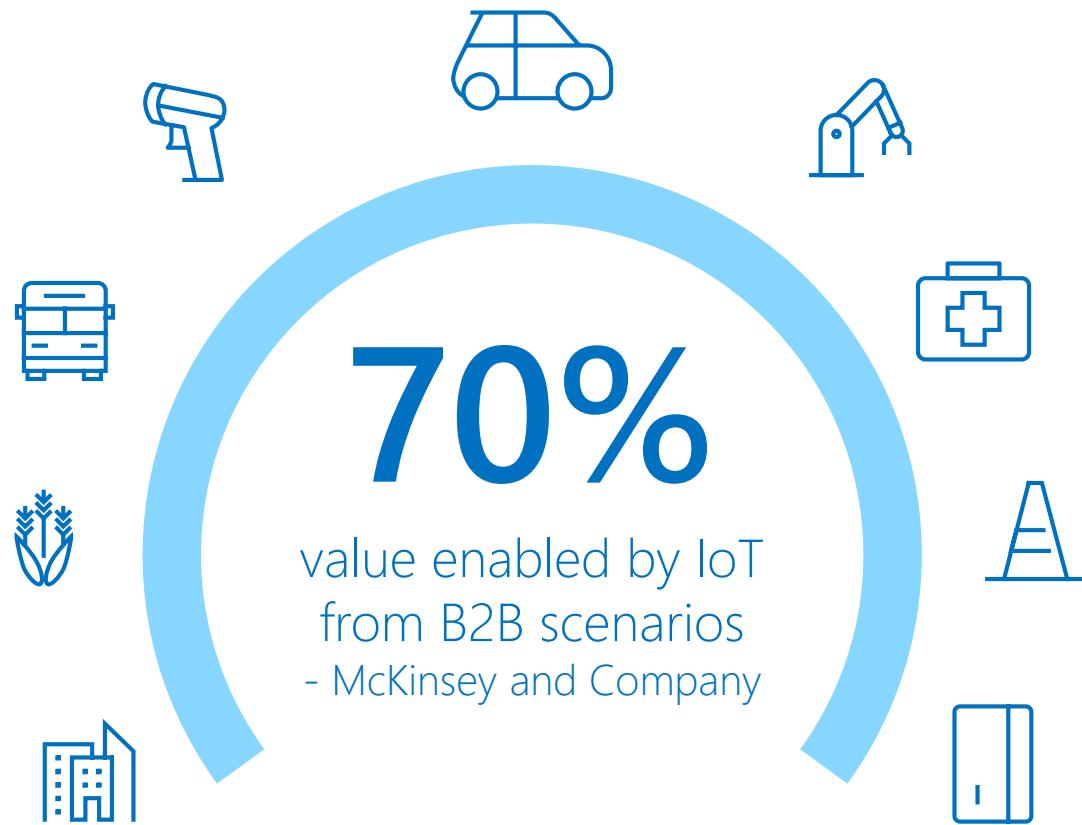
Intelligence offloaded from the cloud to IoT devices

AI

Breakthrough intelligence capabilities, in the cloud
and at the edge



The Internet of Things opportunity

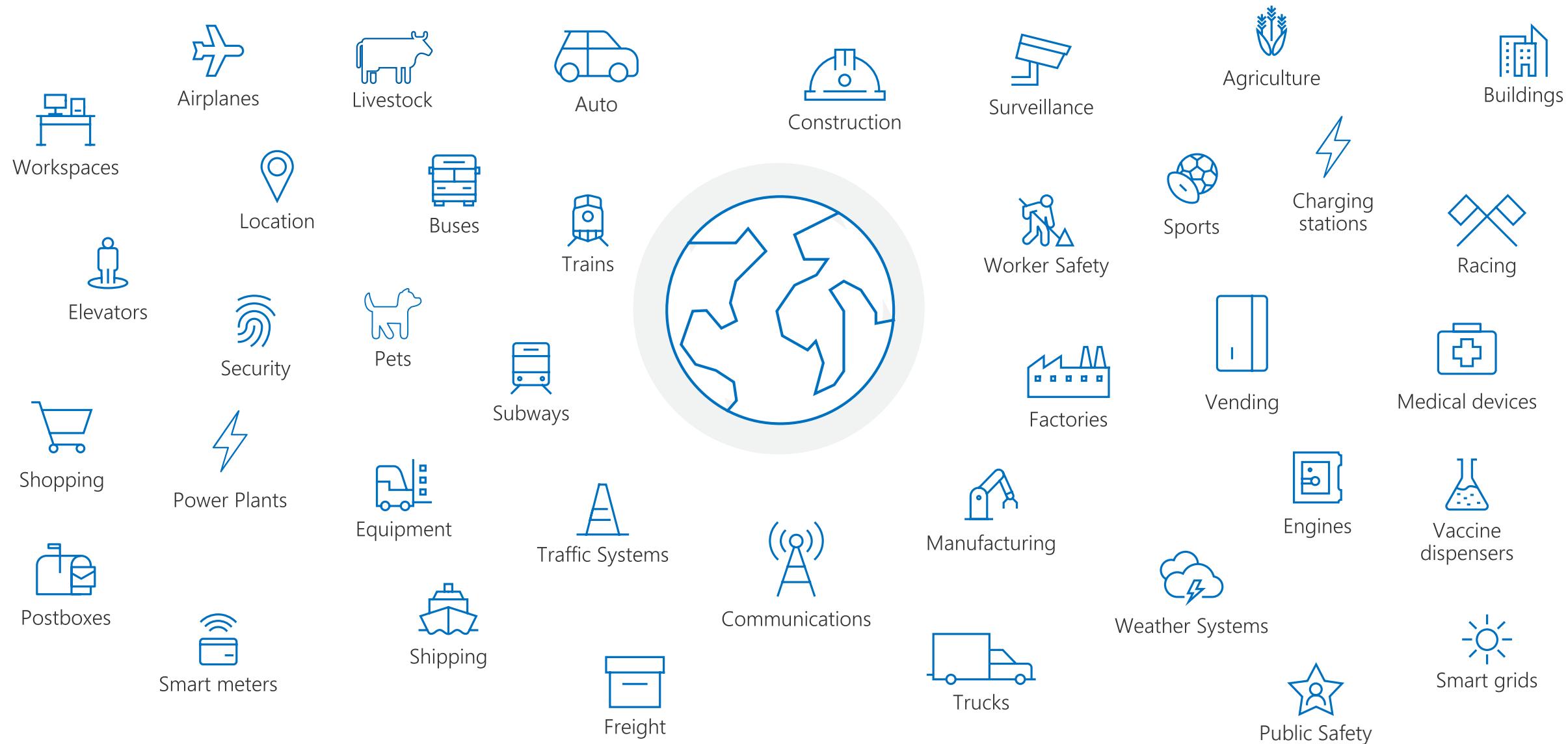


80 billion
connected "things" by 2025 - IDC

180 zettabytes
digital data by 2025 - IDC

\$457 billion
global IoT market by 2020 - Gartner

Innovation at work – real IoT use cases







Connected chillers are back online 9x faster than unconnected equipment, avoiding more than **\$300,000 in hourly downtime costs**



Reduced its accident rate by 25% and fuel usage by 20%, **reporting annual savings of \$1.8 million**



Cut down-time cut for each packaging line by up to 48 hours, **saving €30,000 for customers**



thyssenkrupp

Data from sensors and systems to create valuable business intelligence and **reduce downtime by 50%**



Keeping farmers informed about irrigation, disease control diseases, and pest has led to **increased yields of 30%, and a 20% reduction in water use**



Licorice extruders on Twizzler's production line are performing at peak optimization, **saving over \$500K/year on materials alone**



Rolls-Royce

Rolls Royce "power by the hour" model provides maximize availability by cutting fuel consumption by 1% and **up to \$250,000 per plane, per year.**

Rockwell Automation

Access to production and supply chain data worldwide, **reduced downtime costs by as much as \$300,000 per day**



Enabled customers to transport more than **1M additional tons of cargo, and reduce fuel consumption by 17%**





Preventing unnecessary farm closures costing \$120,000 per day

Taking the guess work out of Australian agriculture with the Internet of Oysters

Being filter animals oysters are highly susceptible to water quality, if there's been a lot of rain flooding into the estuaries where oysters grow, they can quickly pick up contaminants that could make people ill. Farmers and regulators want to avoid that at all costs – and so when there is a perceived risk, oyster farms have to close until conditions improve. To ensure successful outcomes for the Australian oyster industry, The Yield partnered with Microsoft to provide on-farm IoT sensors, intelligent digital solutions, and predictive analytics to help farmers make faster, more informed, data based decisions when it comes to the weather and improving their yields.



Products and Services

Azure
Azure IoT Hub
Azure Machine Learning

Organization Size

Small

Industry

Agriculture

Country

Agriculture

Partner

Bosch

Business Need

Operational Efficiency
Predictive Analytics
Increasing ROI





Enabling product innovation for customer security solutions

Building a new future: Transforming Australia's construction industry with digital technologies

ATF Services, a leading provider of security and safety solutions for Australia's construction industry, has launched a pioneering, intelligent, multisensor, IoT alarm system using Microsoft Azure Service Fabric and Azure IoT Edge. The firm teamed up with software developer Two Bulls to create a platform that connects low-powered IoT devices to Azure and a mobile app. Easily installed virtually anywhere, the new platform puts sophisticated site surveillance within reach of everyone from private homeowners to large construction firms.



Products and Services

Microsoft Azure
Azure IoT Edge
Azure Service Fabric

Organization Size

Medium

Industry

Professional Services

Country

Australia

Partner

Two Bulls

Business Need

Business Agility



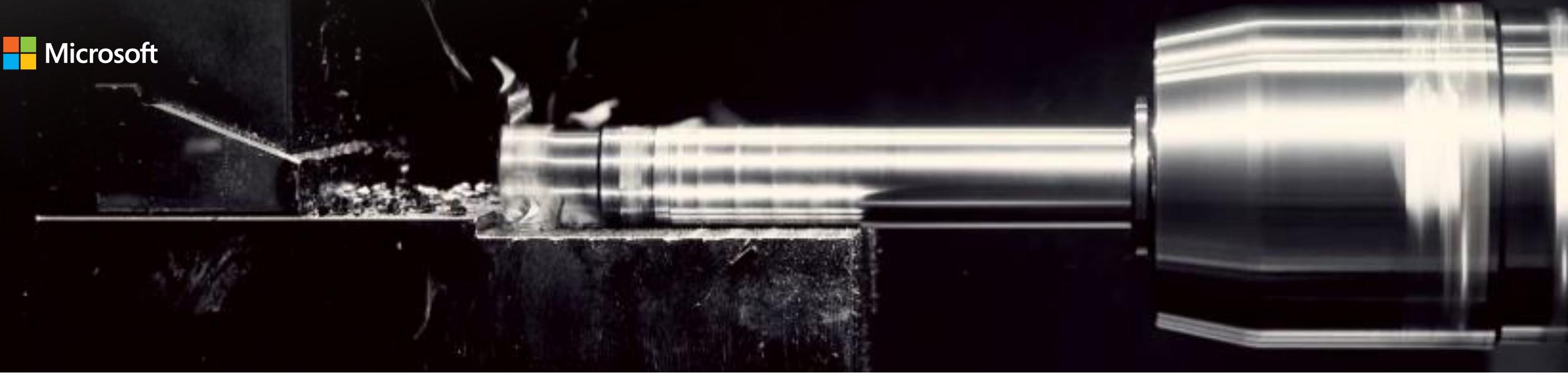


*Increasing safety
and reducing data
costs with IoT edge*

Oil and gas experts use machine learning to deploy predictive analytics at the edge

For companies with connected assets distributed across a country or around the world, edge analytics makes remote asset management easier by putting application logic on-site. However, some businesses may have remote assets without easy access to the cloud, and they may be reluctant to send data outside their own networks. Schneider Electric is out to solve that challenge for the oil and gas industry. The company has pushed edge solutions into new, predictive realms with the help of Azure Machine Learning and Azure IoT Edge.





Improving processes, efficiency, and human decision making with predictive maintenance and tool-level data

Predictive maintenance brings Sandvik to the cutting edge of digital manufacturing

To help improve the scalability and global tooling solutions it delivers to its customers, Sandvik optimized its manufacturing process and created a predictive maintenance schedule using Azure IoT, Cortana Intelligence, and Dynamics 365. Sandvik is creating extremely powerful predictive maintenance models by integrating the deep knowledge of the machining process that sets Sandvik knowledge into the algorithms used to analyze the wealth of data their IoT solution collects.



Products and Services

Azure IoT
Azure IoT Hub
Microsoft AI
Dynamics 365 for Field Service

Organization Size

Large

Industry

Chemicals

Country

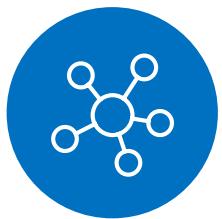
Sweden

Business Need

Predictive Maintenance



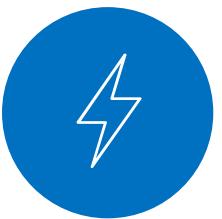
Defining IoT



Things



Insights

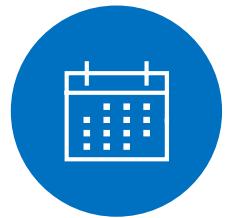


Action

IoT projects are still complex



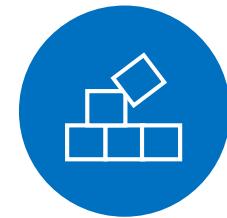
Security
is a **challenge**



Time-consuming
to get started



Incompatible with
existing infrastructure



Challenging
to scale

The industry's most comprehensive portfolio

Solutions (PaaS)

Azure IoT Suite (PaaS)

Preconfigured solutions for common IoT scenarios

Solutions (SaaS)

Microsoft IoT Central

IoT SaaS

Microsoft Dynamics

Connected Field Service

Technologies (PaaS)

Device support

Azure IoT Device SDK

Azure IoT certified devices

Security Program for Azure IoT

Windows 10 IoT

IoT

Azure IoT Hub

IoT Hub Device Provisioning Service

Edge

Azure IoT Edge

Data and Analytics

Azure Stream Analytics

Azure HD Insight

Azure Time Series Insights

Azure Data Lake Analytics

Azure Machine Learning

Azure Data Lake

Cosmos DB

Visualization and Integration

Microsoft Flow

Azure Active Directory

Azure Logic Apps

Microsoft Power BI

Notification Hubs

Azure Monitor

Azure Websites

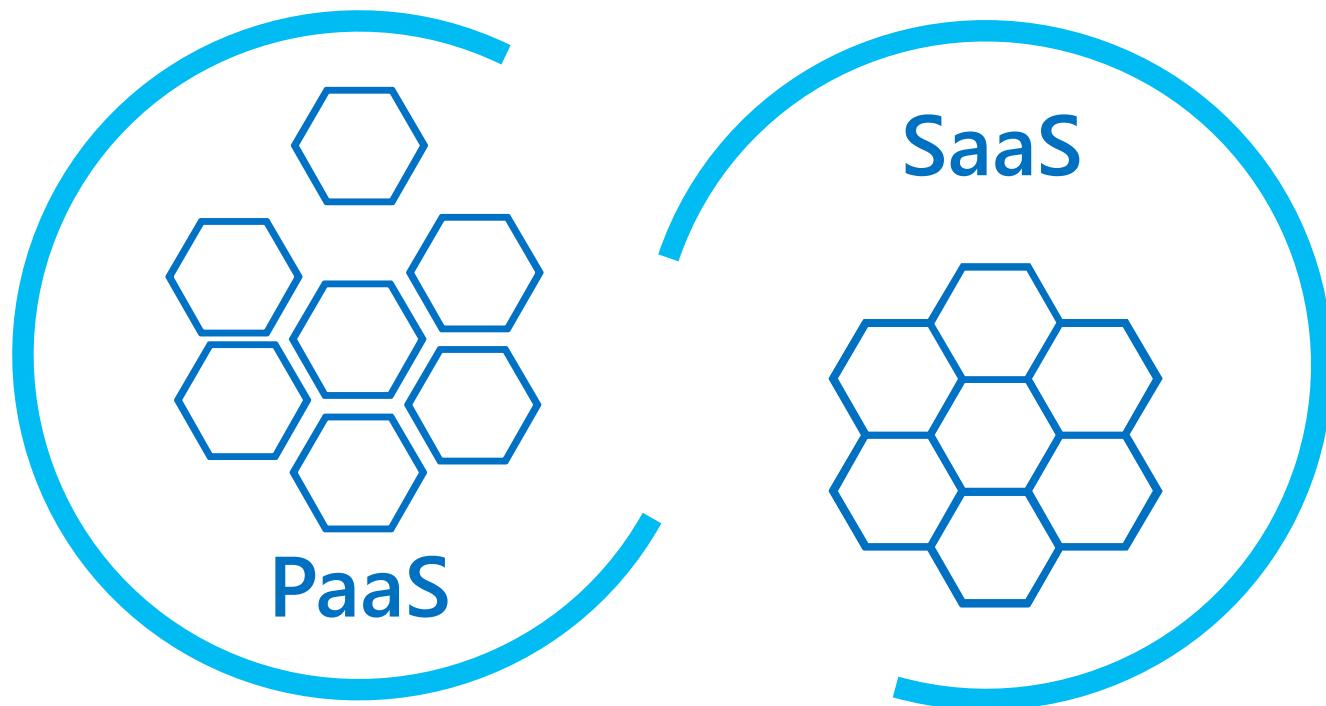
Azure IoT Suite approach

SaaS – Microsoft IoT Central

- Fully managed IoT SaaS
- No cloud solution development expertise required
- Configurable to your needs
- Ideal for straightforward IoT needs

PaaS – Azure IoT Suite

- Preconfigured solutions
- Deploy in minutes
- Accelerate time to value
- Ideal for solutions that require ultimate control



Azure IoT



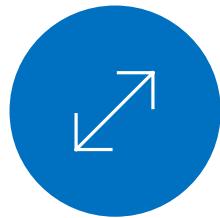
Secure
end-to-end



Fast
start in minutes



Open
connect anything



Scalable
grow effortlessly



Azure IoT Suite

-  End-to-end implementation
-  Completely customizable
-  Open-source microservices based architecture
-  Device connectivity and management
-  Dashboards, visualization and insights
-  Workflow automation and integration
-  Command and control
-  Preconfigured solutions
 -  Remote Monitoring
 -  Connected Factory
-  Predictive Maintenance
-  Device Simulation

Accelerate time to value

Start quickly for
common IoT scenarios



Finish with your IoT
application

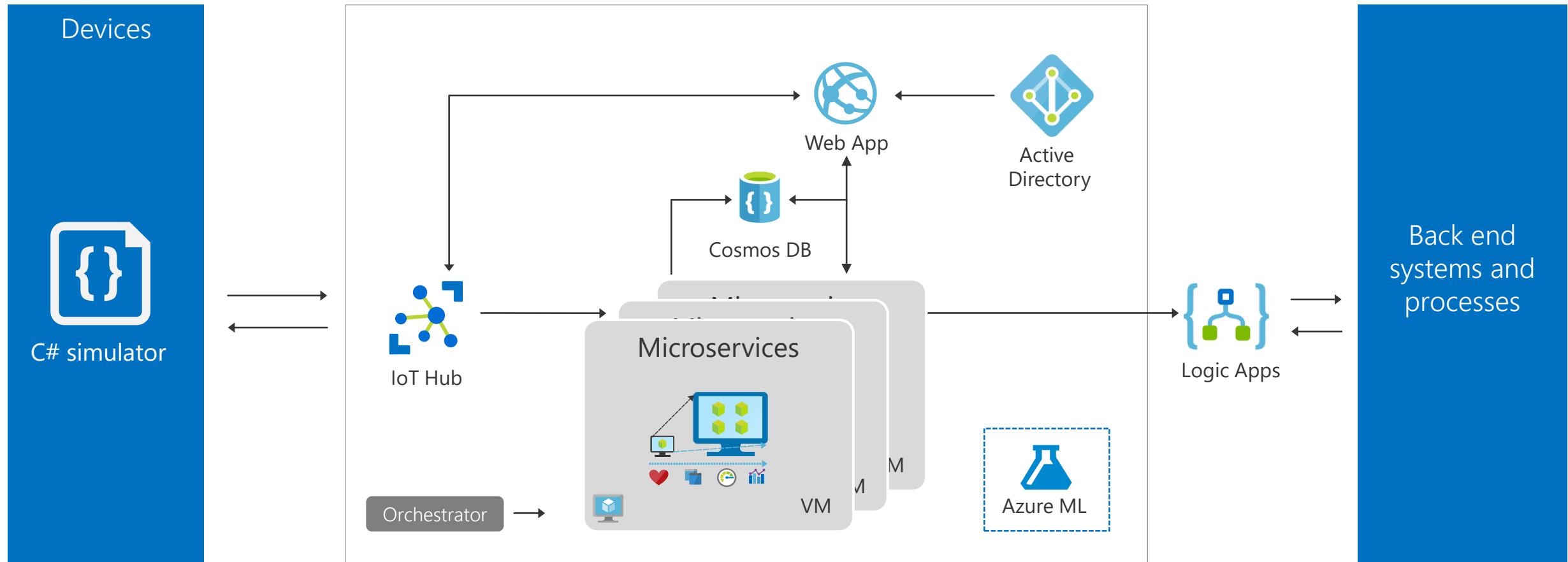


- Get started in minutes
- Modify existing rules and alerts
- Add your devices and begin tailor to your needs

- Fine-tuned to specific assets and processes
- Highly visual for your real-time operational data
- Integrate with back-end systems

Components of a preconfigured solution

Remote monitoring | Predictive maintenance | Connected factory | Device Simulation

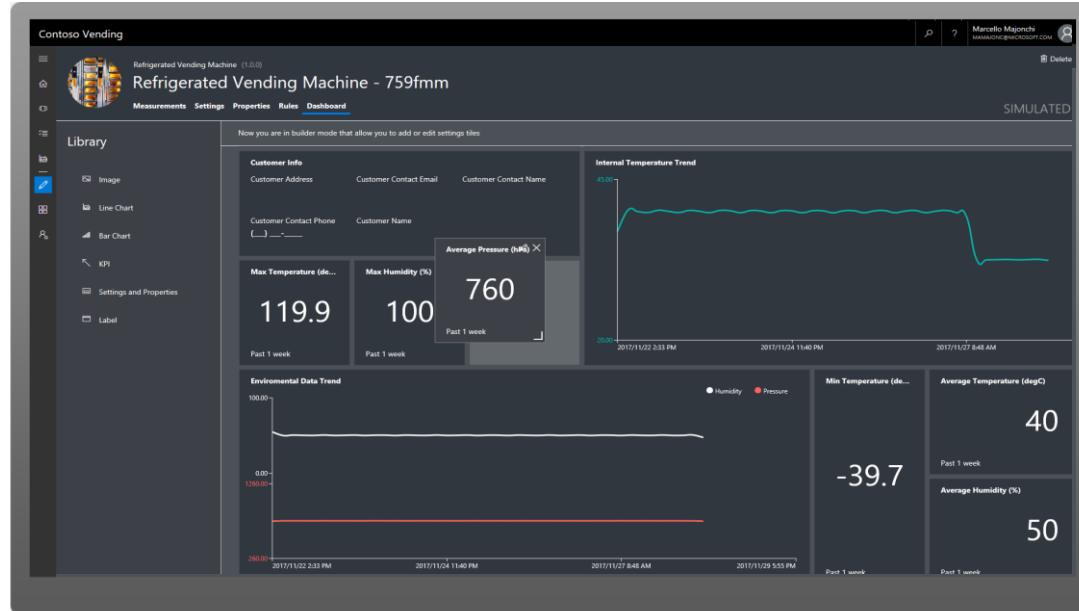




Microsoft IoT Central

- Fully hosted and managed by Microsoft
- No cloud development expertise required
- Device connectivity and management
- Monitoring rules and triggered actions
- User roles and permissions
- Analytics, dashboards and visualization
- Risk-free trial with simplified pricing

Builder



Operator



Product Modeler



Device settings



Template Management



Rules Workflows



User and identity management



Device management



Analytics & dashboards

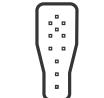


Time-series Insights

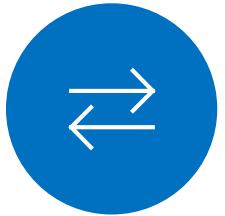


Alerts and actions

Azure IoT Hub

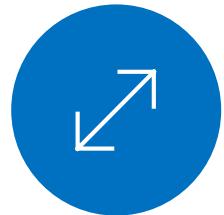
-  Establish bi-directional communication with billions of IoT devices
-  Enhance security with per device authentication
-  Provision devices at scale w/ IoT Hub Device Provisioning Service
-  Manage devices at scale with device management
-  Multi-language and open source SDKs

Azure IoT Hub



Bi-directional communication

- Millions of devices
- Multi-language, open source SDK
- HTTPS/AMQP/MQTT
- Send telemetry
- Receive commands
- Device management
- Device twins
- Queries and jobs



Enterprise scale and integration

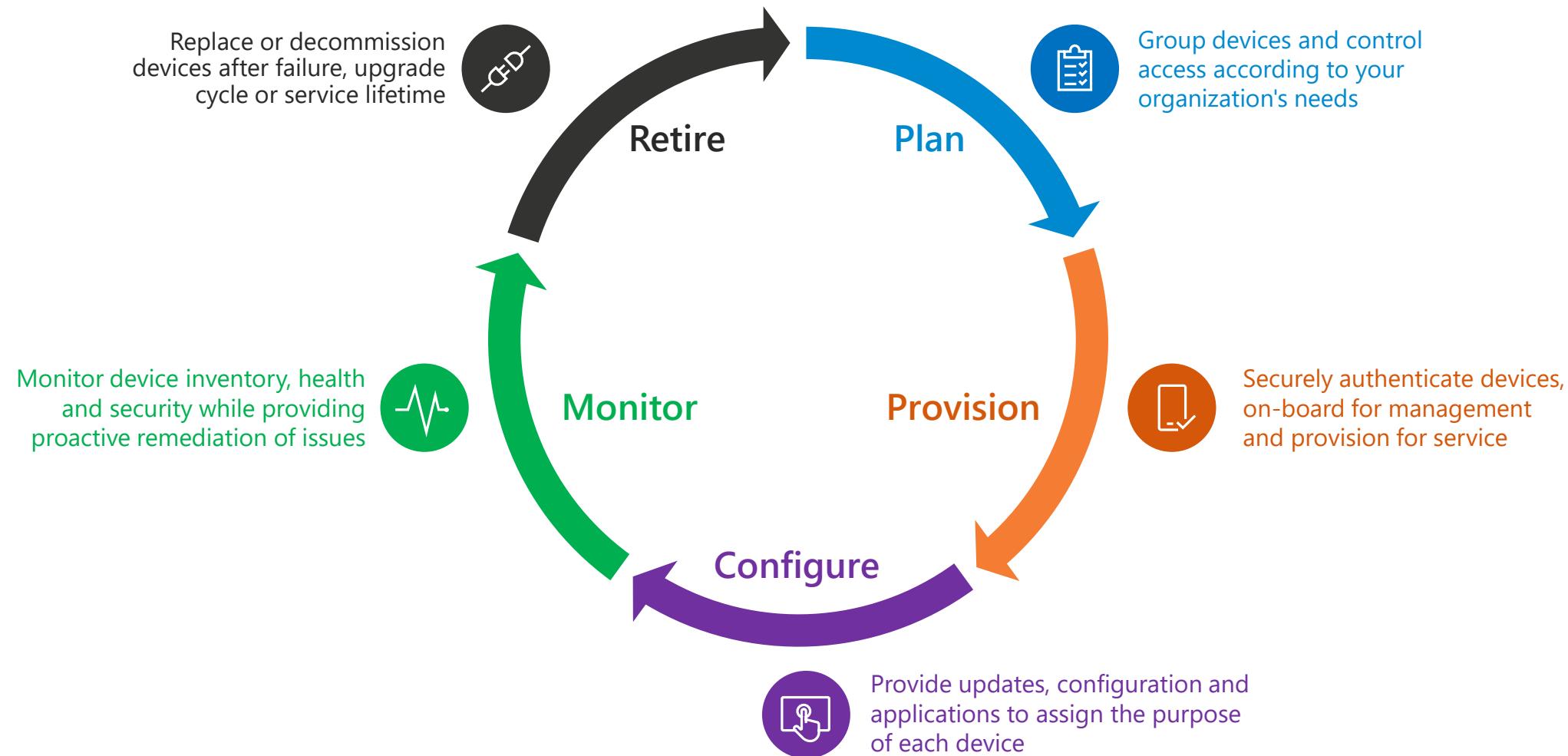
- Billions of messages
- Scale up and down
- Declarative message routes
- File upload
- Web sockets and multiplexing
- Azure monitor
- Azure resource health
- Configuration management



End-to-end security

- Per device certificates
- Per device enable/disable
- TLS security
- X.509 support
- IP whitelisting/blacklisting
- Shared access policies
- Firmware/software updates

IoT Device Management Lifecycle



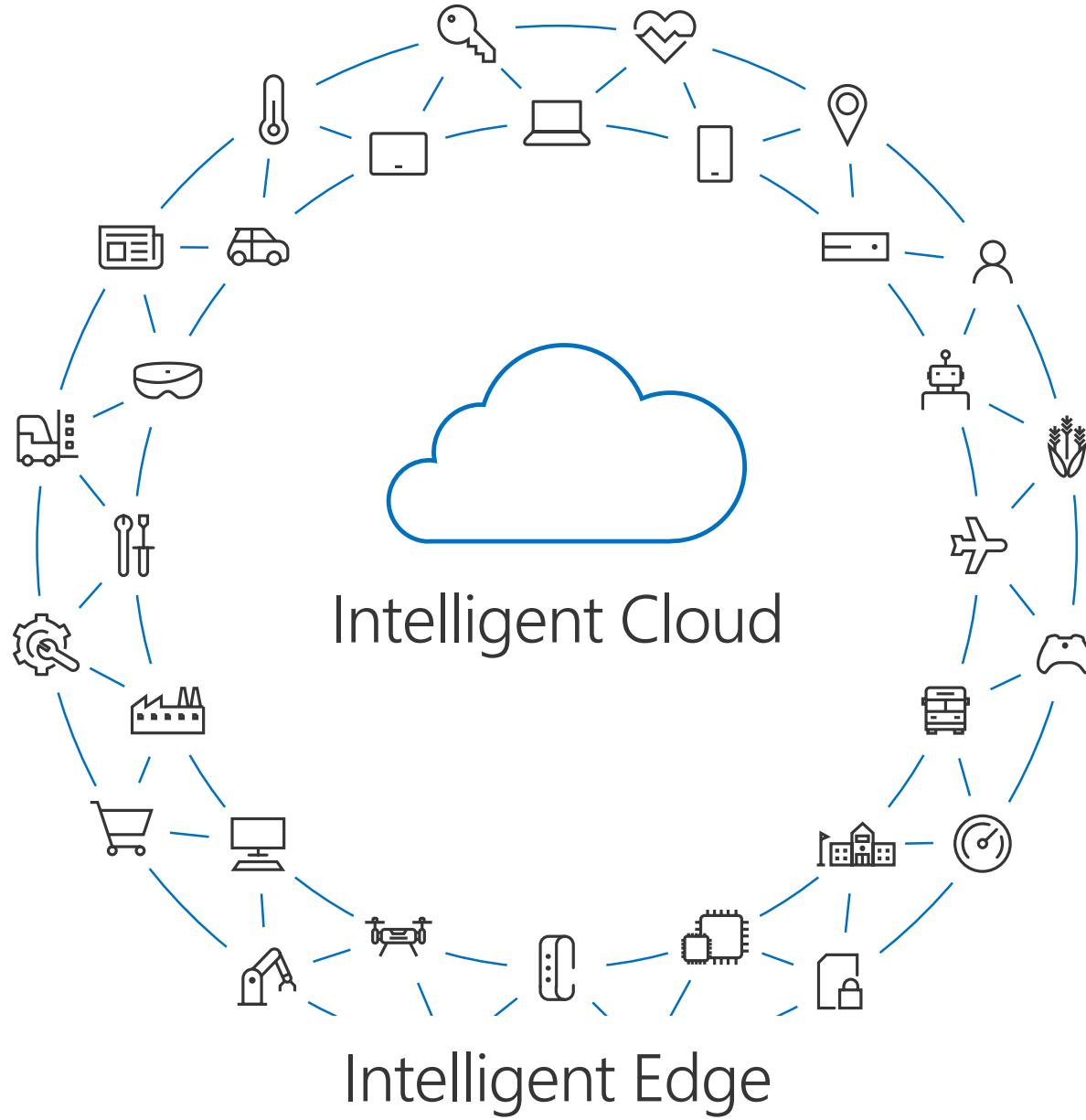
Azure IoT Hub Device Provisioning Service

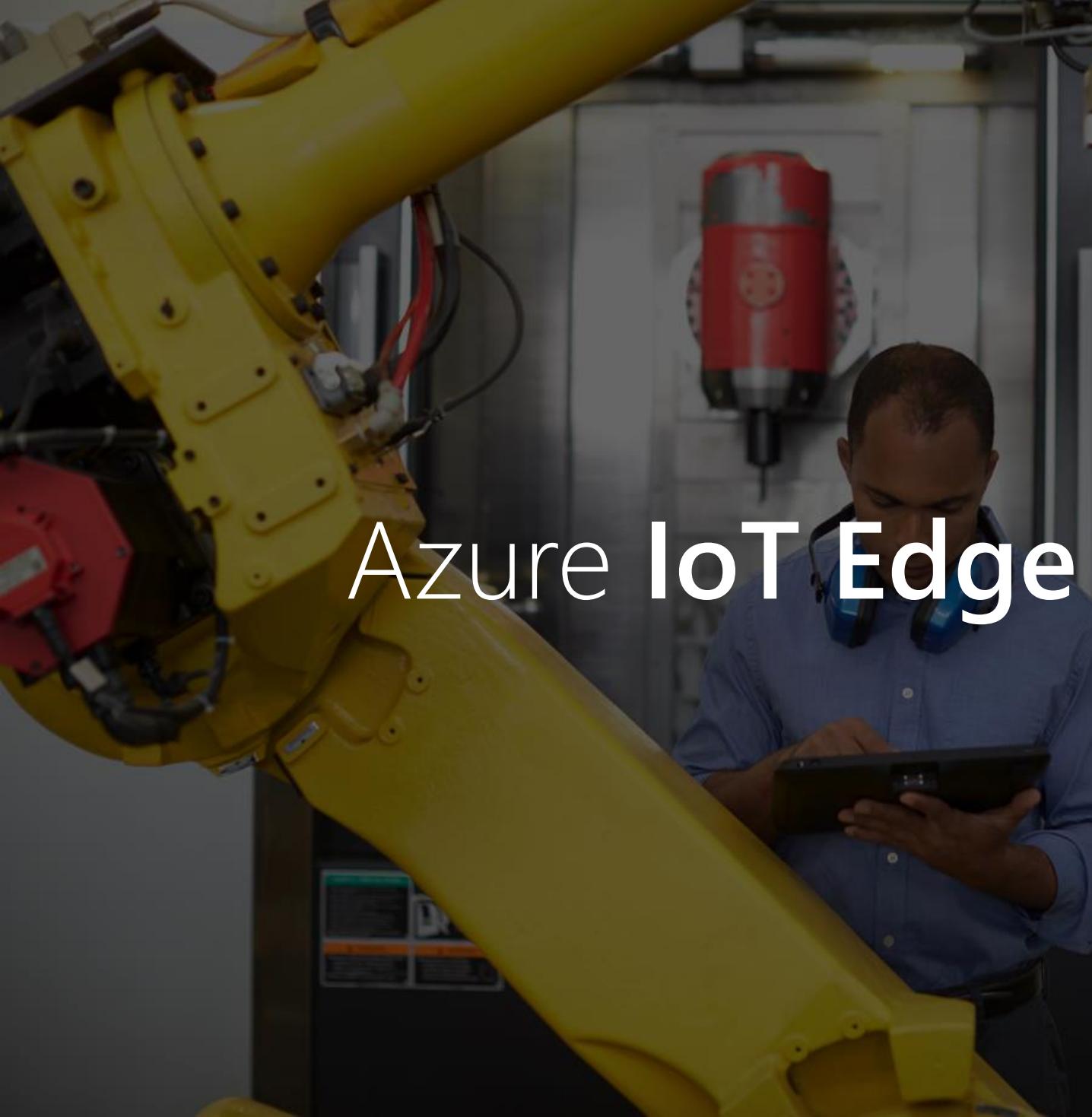
Azure IoT Hub Device Provisioning Service

Register and provision devices with zero-touch in a secure and scalable way

- Simple "plug and play" provisioning
- Minimize manual connection requirements
- Enhanced security through HSM
- Global availability



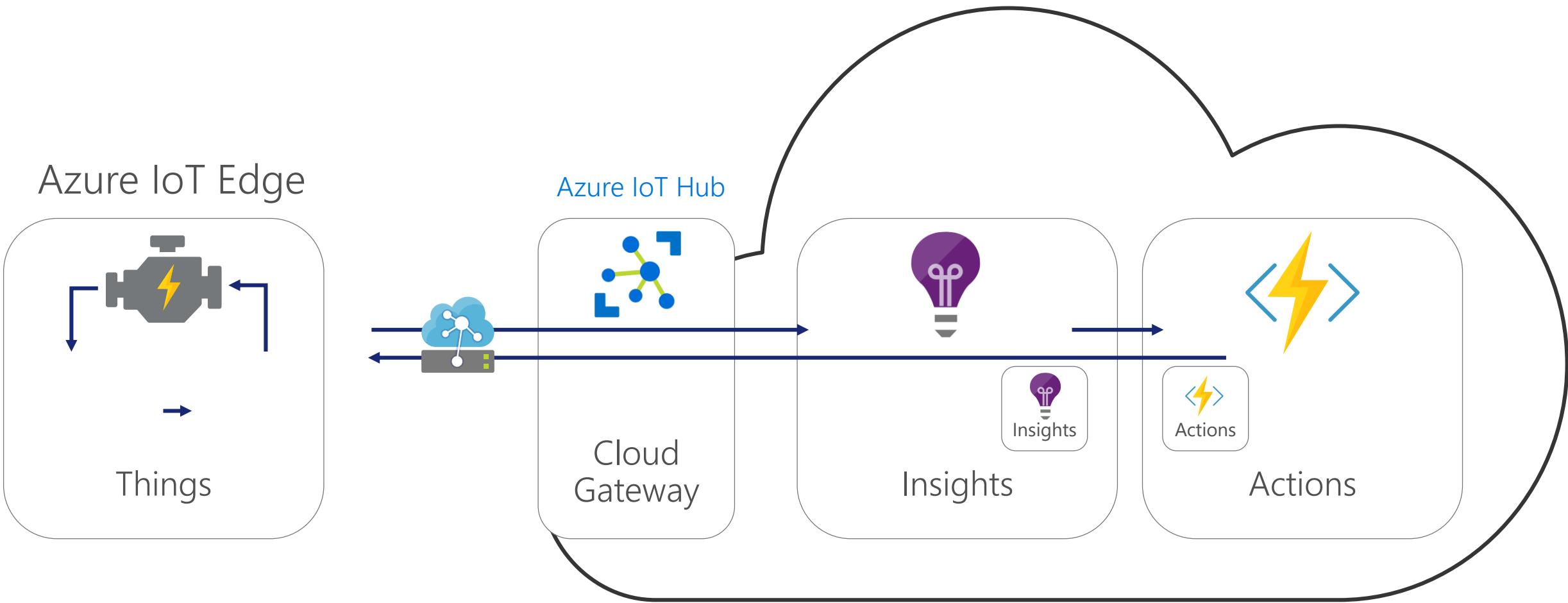


A photograph showing a man in a blue shirt and headphones using a tablet computer. He is standing in a factory or industrial setting, with a large yellow robotic arm and other industrial equipment visible in the background.

Azure IoT Edge

- ⬇ Move cloud and custom workloads to the edge, securely
- 🚀 Seamless deployment of AI and advanced analytics
- 📈 Configure, update and monitor from the cloud
- 🎯 Compatible with popular operating systems
- ⟳ Code symmetry between cloud and edge for easy development and testing
- 🔒 Secure solution from chipset to cloud

IoT Pattern + Edge



Azure Time Series Insights

-  IoT scale time-series data store
-  Schema-less store, just send data
-  Easy IoT Hub connection
-  Store, query and visualize billions of events
-  Get near real-time insights in seconds
-  Build apps using Time Series Insights APIs



Windows 10 IoT



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



Commercial OS for IoT devices and a modern user experience



Supports the languages and frameworks you already know



Trusted platform for security and servicing of cloud-connected devices



Bring power and capability to the edge



Enable a more natural user interface

Choosing Microsoft for the Internet of Things

Partnering for the best IoT security

Microsoft's Security Program for Azure IoT connects customers with partners who are experts at evaluating an IoT infrastructure end-to-end.



casaba



SecureGuard



Crowe Horwath.



Tech mahindra



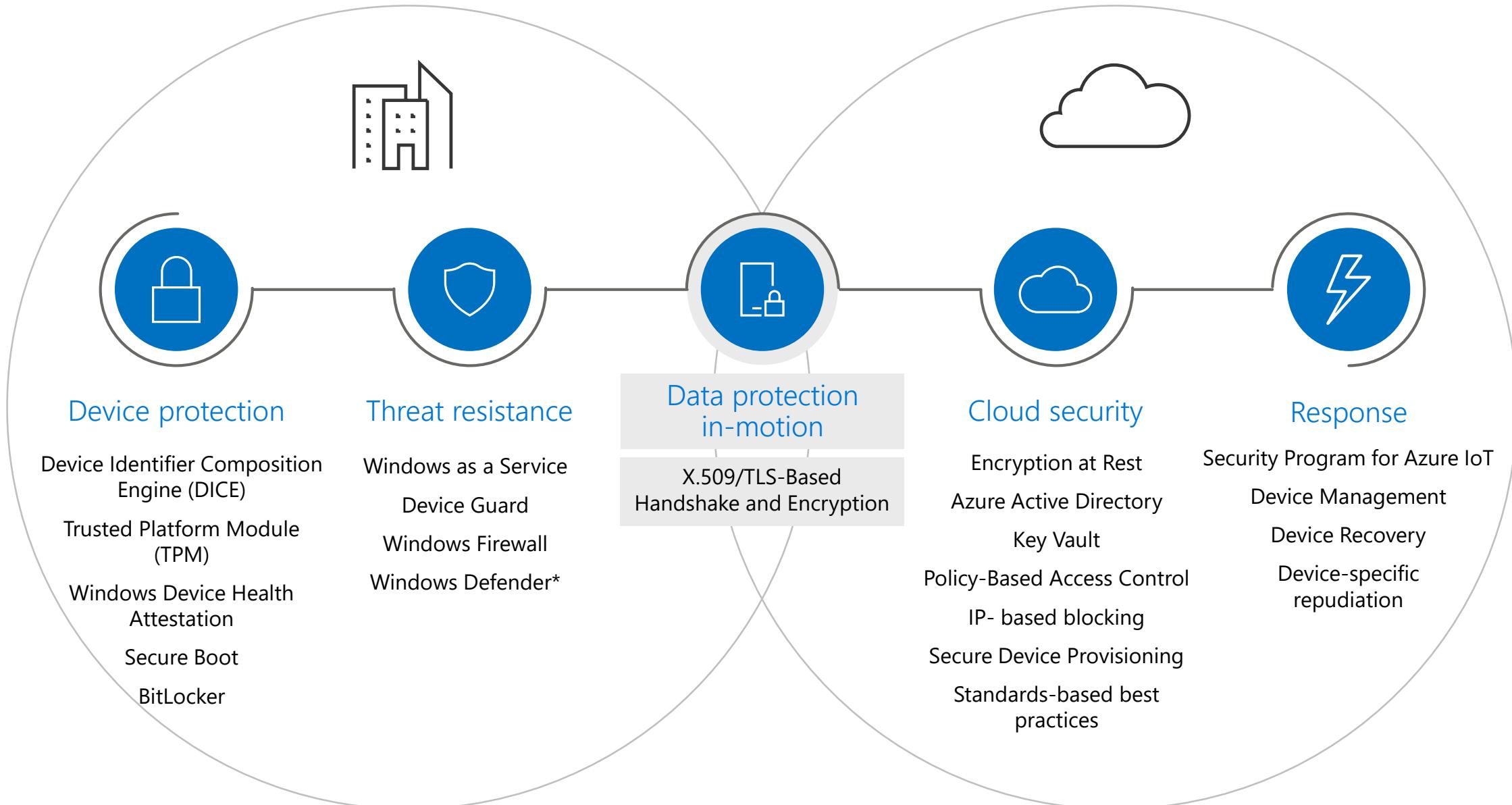
CyberX



UNISYS

Not all partners may be listed; check internetofyourthings.com for latest status

IoT protection stack





Microsoft IoT Security

-  Support for diverse secure hardware
-  Secure device provisioning and management
-  Cert-based device identity and attestation
-  Support to secure protocols (AMQP, MQTT, HTTPS)
-  Azure Security Center
-  Policy-Based Access Control

Compliance certifications

GLOBAL



ISO 27001



ISO 27018



ISO 27017



ISO 22301



SOC 1 Type 2



SOC 2 Type 2



SOC 3

cloud
CSA security
alliance™

CSA STAR
Self-Assessment

cloud
CSA security
alliance™

CSA STAR
Certification

cloud
CSA security
alliance™

CSA STAR
Attestation



PCI DSS
Level 1



CDSA



MPAA



FACT UK



Shared
Assessments



FISC Japan



HIPAA /
HITECH Act



HITRUST



GxP
21 CFR Part 11



MARS-E



IG Toolkit UK



FERPA



GLBA



FFIEC

INDUSTRY

REGIONAL



Argentina
PDPA



EU
Model Clauses



UK
G-Cloud



China
DJCP



China
GB 18030



China
TRUCS



Singapore
MTCS



Australia
IRAP/CCSL



New Zealand
GCIO



Japan My
Number Act



ENISA
IAF



Japan CS
Mark Gold



Spain
ENS



Spain
DPA



India
MeitY



Canada
Privacy Laws

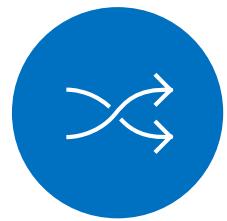


Privacy
Shield

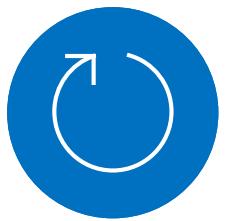


Germany IT
Grundschutz
workbook

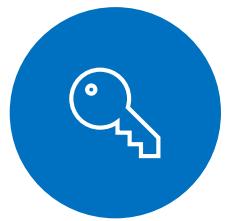
Microsoft IoT



Agile



Comprehensive

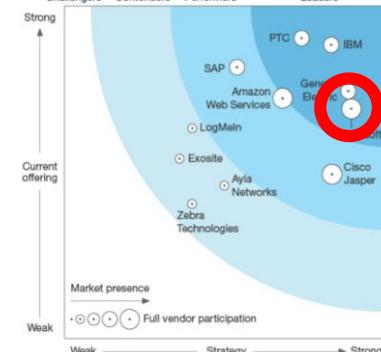
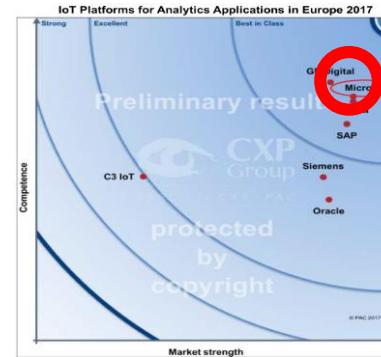


Secure

Microsoft is leading the industry



Azure IoT is the only cloud platform that was determined as **best in class in every category**



The first IoT mega-vendor to deliver

- Preconfigured solutions
- Offer both IoT SaaS and PaaS
- Extend AA/AI to the edge
- Solve device provisioning at scale
- Launch a security program
- Support OPC UA
- Announce a Connected Vehicle Platform
- provide the most regions of dedicated IoT service

...and we're just getting started

A large and growing ecosystem

System integrators



Solution providers

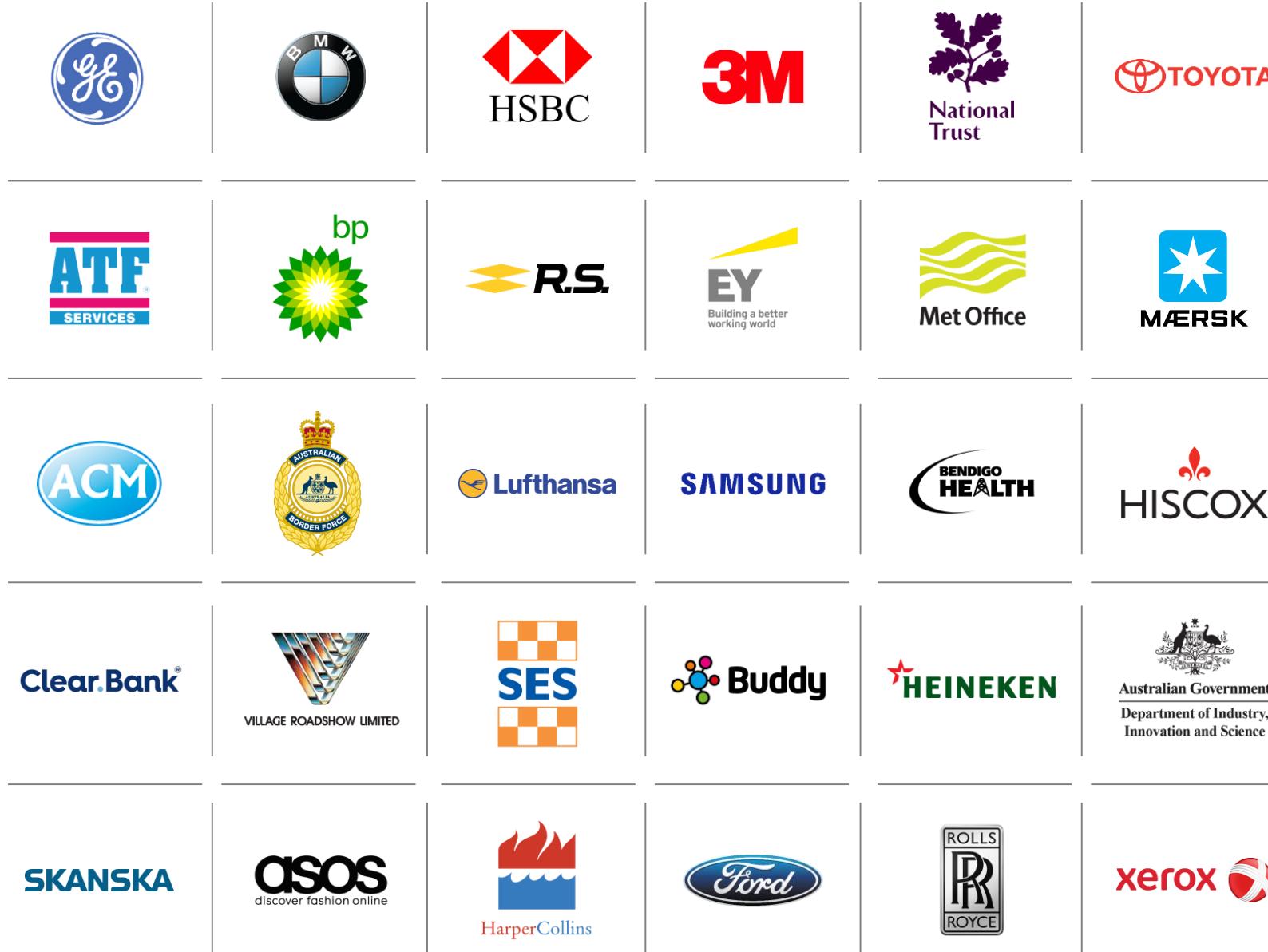


Azure certified
for IoT



Developer, IT
and productivity





95%

of Fortune 500 use
Microsoft Cloud

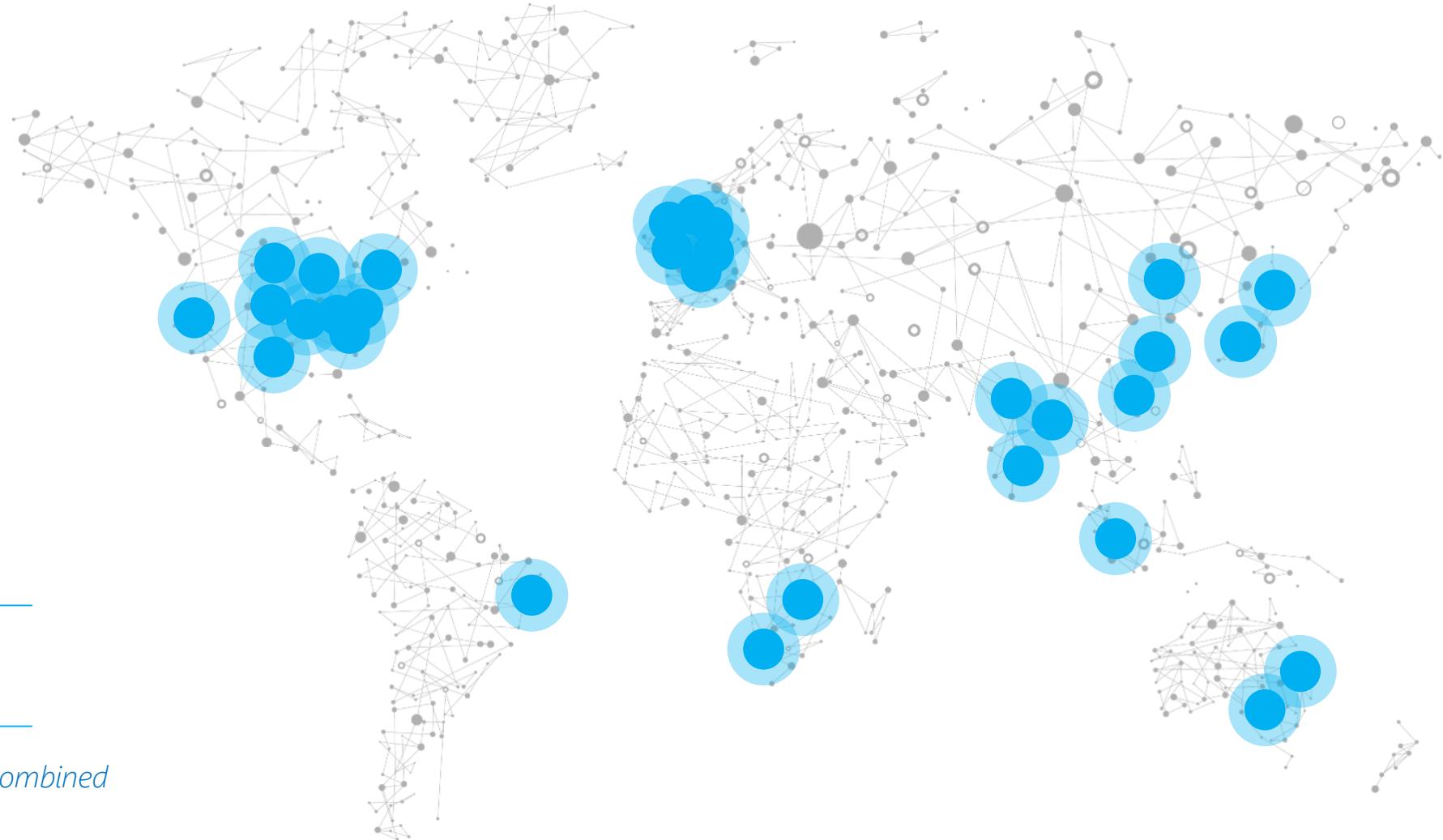
Built on an industry's leading hyperscale cloud...

42

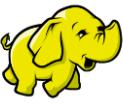
Azure regions
around the world

 AZURE REGIONS

More than AWS and Google Cloud combined



Open source support

DevOps	Nagios®	 VAGRANT		 GRUNT						
Management	 CHEF™		 ANSIBLE	 SALTSTACK						
Applications			 Drupal™							
App frameworks and tools										
Databases and middleware										
Infrastructure										

Microsoft Azure IP Advantage

Protecting your innovation in the cloud

Microsoft Azure IP Advantage | Protecting your innovation in the cloud



UNCAPPED INDEMNIFICATION

- Best-in-industry protection against IP risks
- Covers OSS incorporated by Microsoft¹ in Azure services
- On by default for all Microsoft cloud customers

Your own application on Azure



PATENT PICK

- Deter and defend against patent lawsuits
- Select a patent from 10,000 Microsoft patents
- Available to all consuming Azure customers²



SPRINGING LICENSE

- Peace of mind with future patent protection
- Receive a license if Microsoft sells any patents to a NPE in the future
- Available to all consuming Azure customers³

1. Terms and conditions apply

2. Must (i) have an Azure usage of \$1k/m over the past three months; (ii) have not filed a patent infringement lawsuit against another Azure customer for their Azure workloads in the last 2 years; and (iii) show evidence of a current patent litigation that occurred after Microsoft Azure Advantage launch

3. Must (i) have an Azure usage of \$1k/m over the past three months

Microsoft Azure IP Advantage | Differentiated value

			 Google Cloud Platform
 UNCAPPED INDEMNIFICATION	✓ Covers OSS incorporated by Microsoft in Azure services ¹	! No clear protection for OSS incorporated by AWS within services in AWS standard terms	! No protection for OSS incorporated by Google within services in GCP standard terms
 PATENT PICK	✓ 10,000 patents that Microsoft will make available to customers to deter and defend IP lawsuits	✗ No program to make patents available to customers	✗ No program to make patents available to customers
 SPRINGING LICENSE	✓ Protection against NPEs with no reciprocal commitment from customer for its patents	! Springing license requires reciprocal commitment of customer's patents	! Springing license requires reciprocal commitment of customer's patents

¹: Terms and conditions apply

Next steps

- Get IoT Cloud Workshop Australia [content](#)
- Learn more at about Microsoft IoT [on our website](#)
- Read about businesses like yours on the [Microsoft IoT blog](#)
- Get started with Azure IoT at:
 - [Azure IoT Hub](#)
 - [Azure IoT Suite](#)
 - [Microsoft IoT Central](#)
- [Find a partner](#)



Thank You!

ευχαριστώ

Salamat Po

متشکرم

شُكْرًا

Grazie

благодаря

ありがとうございます

Kiitos

Teşekkürler

謝謝

ខុបគុណគំរូ

Obrigado

شُكْرِيَّه

Terima Kasih

Dziękuję

Hvala

Köszönöm

Tak

Dank u Wel

дякую

Tack

Mulțumesc

спасибо

Danke

Cám ơn

Gracias

多謝晒

Ďakujem

הודות

நன்றி

Děkuji

감사합니다



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