

# Microsoft IoT

Digital Transformation and  
the Internet of Things



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

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

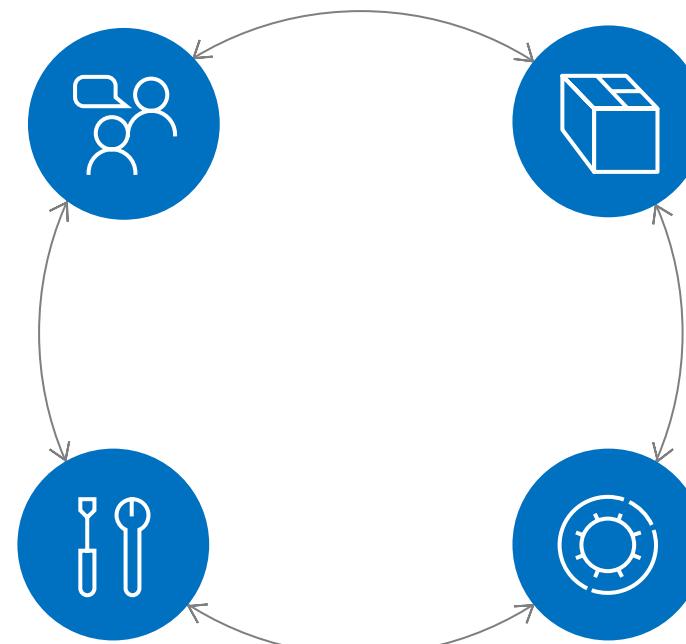
# Digital transformation has four imperatives

Engage your  
customers

Transform  
your products

Empower your  
employees

Optimize your  
operations



# Waves of Innovation

## Cloud

Globally available, unlimited compute resources

## IoT

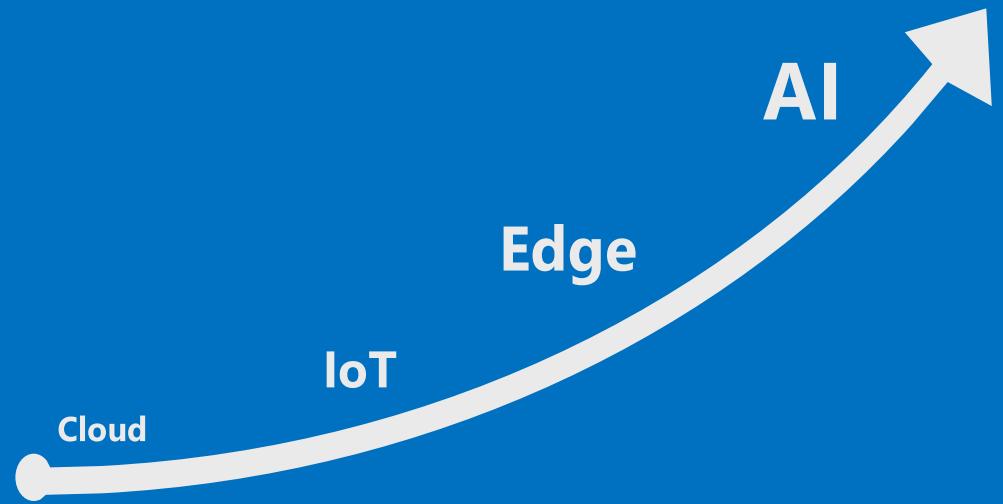
Harnessing signals from sensors and devices,  
managed centrally by the cloud

## Edge

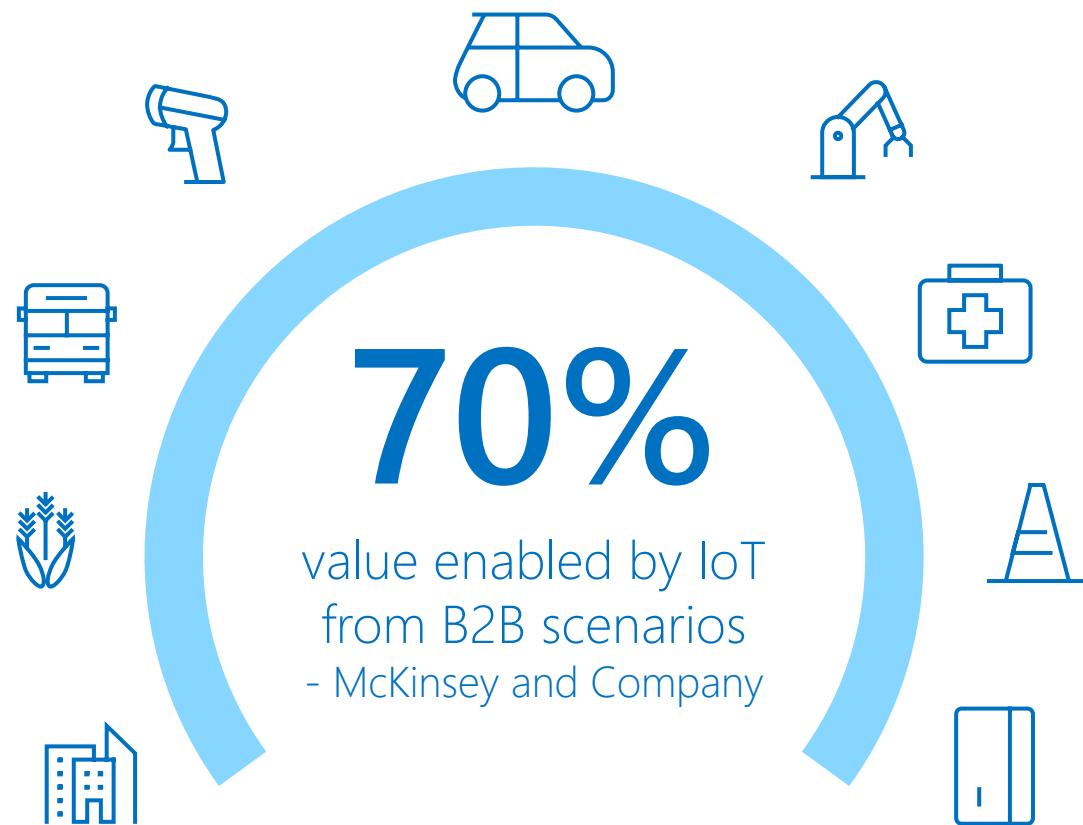
Intelligence offloaded from the cloud to IoT devices

## AI

Breakthrough intelligence capabilities, in the cloud  
and at the edge



# The Internet of Things opportunity

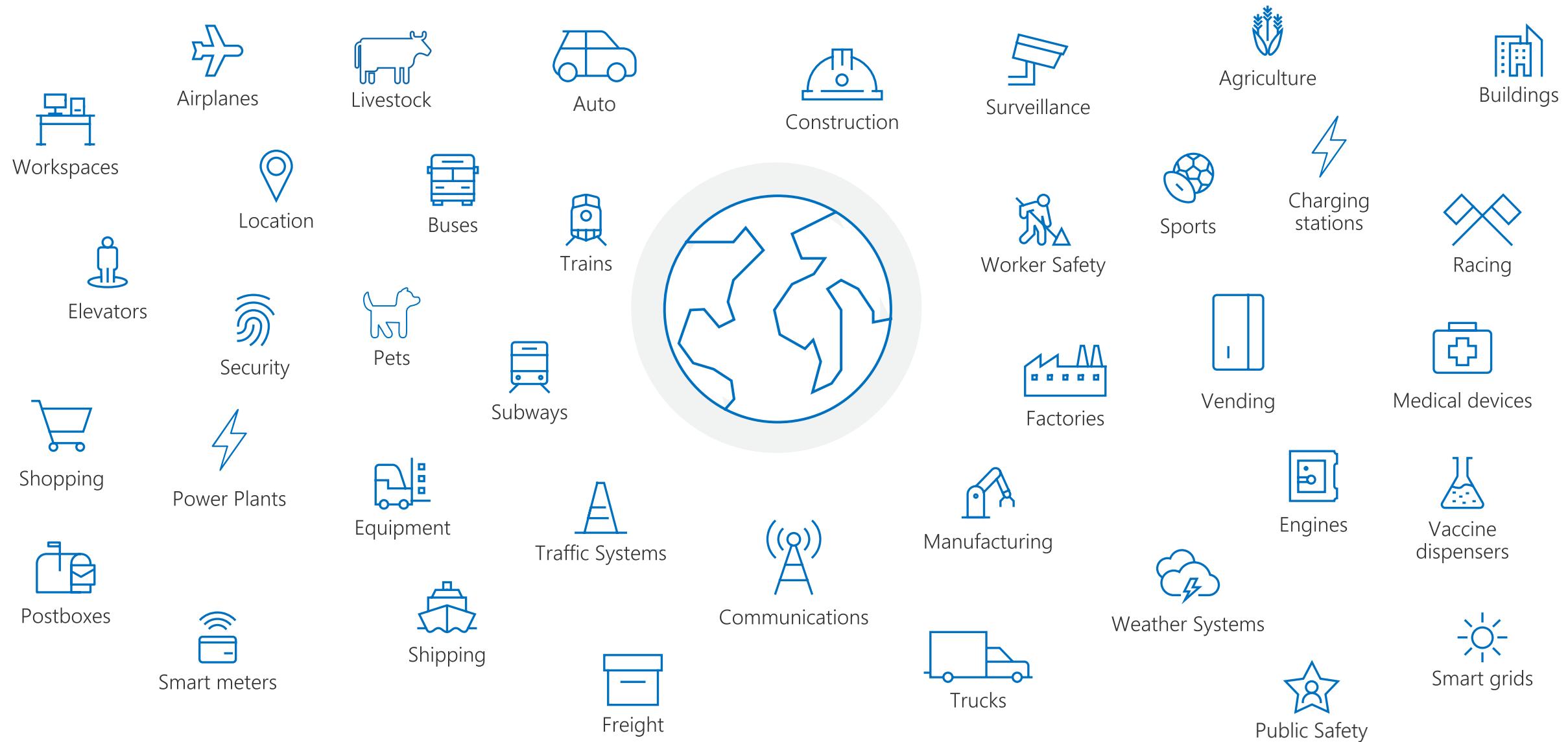


**80 billion**  
connected "things" by 2025 - IDC

**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**

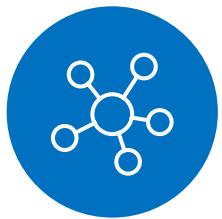
Access to production and supply chain data worldwide, **reduced downtime costs by as much as \$300,000 per day**



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



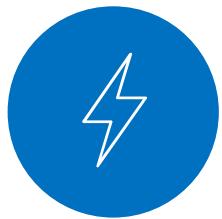
# Defining IoT



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

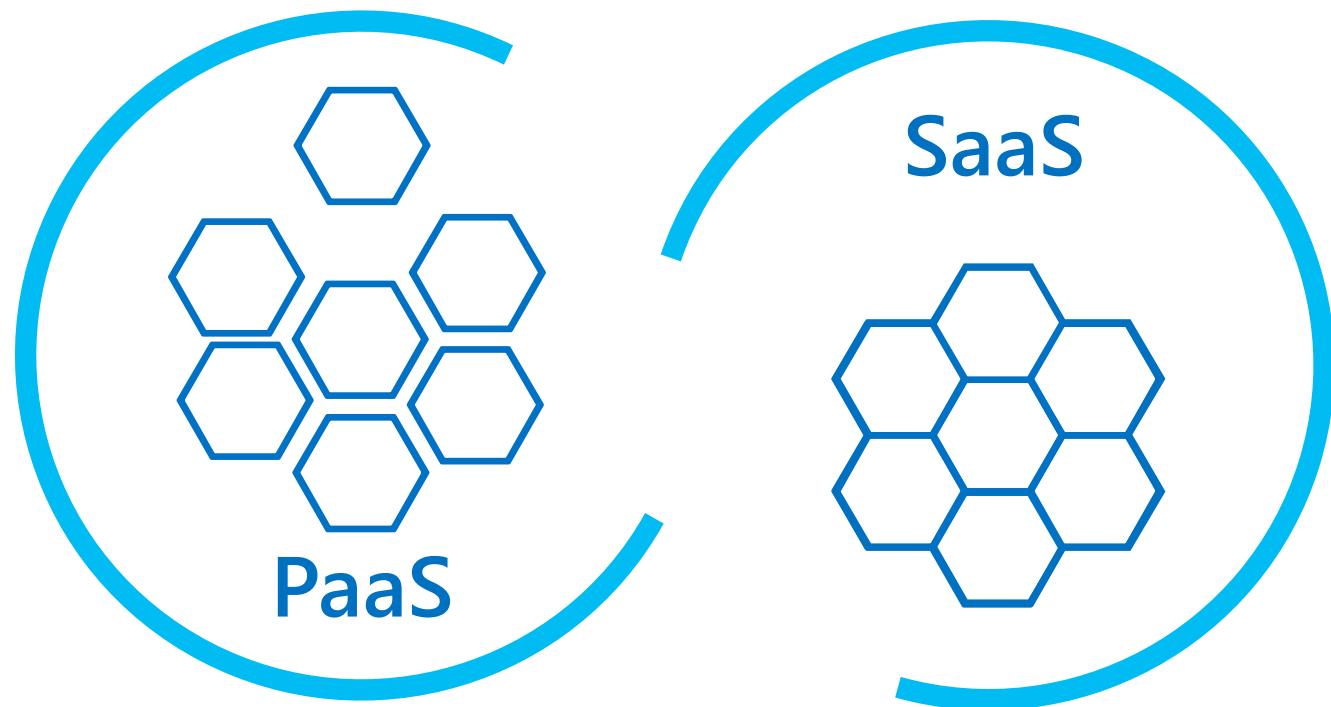
# Azure IoT Suite approach

## 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

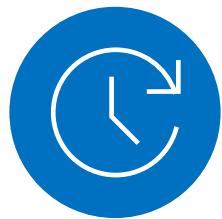
- Preconfigured solutions
- Deploy in minutes
- Accelerate time to value
- Ideal for solutions that require ultimate control



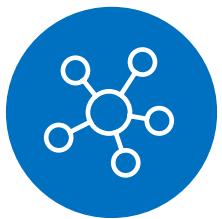
# Azure IoT



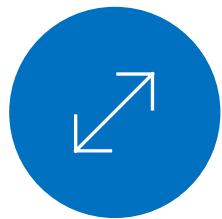
Secure  
end-to-end



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

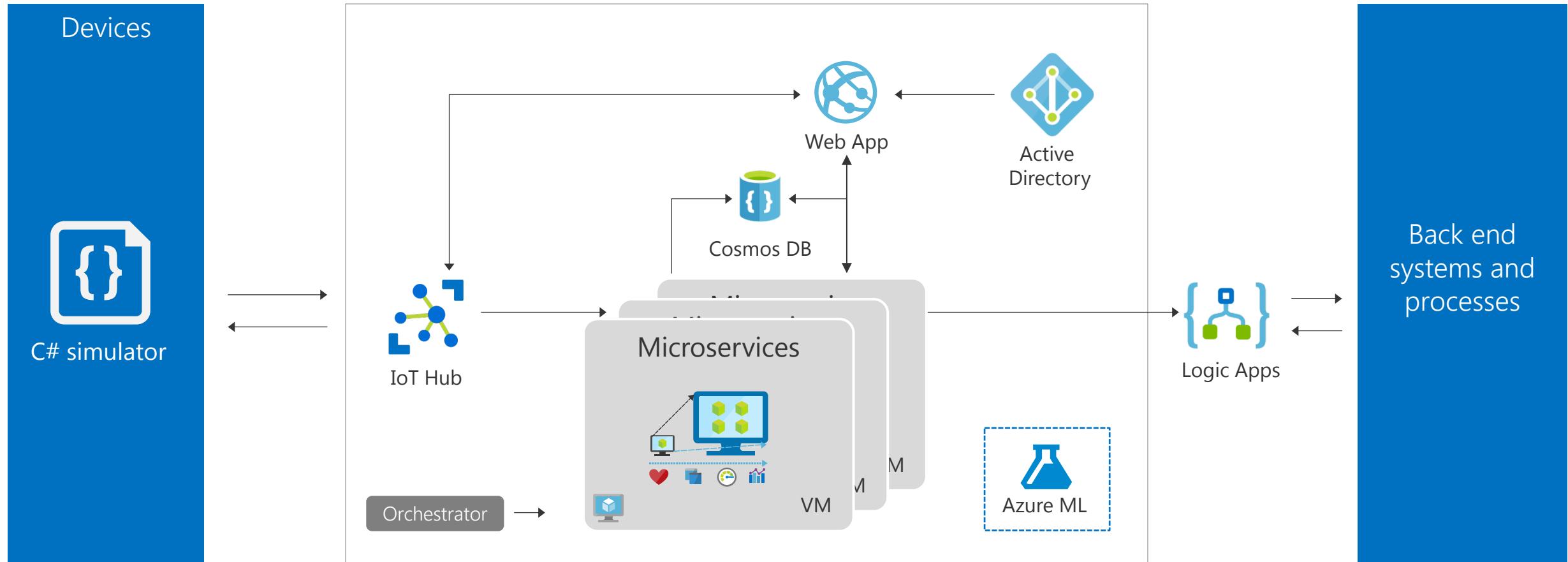


- Get started in minutes
- Modify existing rules and alerts
- Add your devices and begin tailor to your needs

- 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

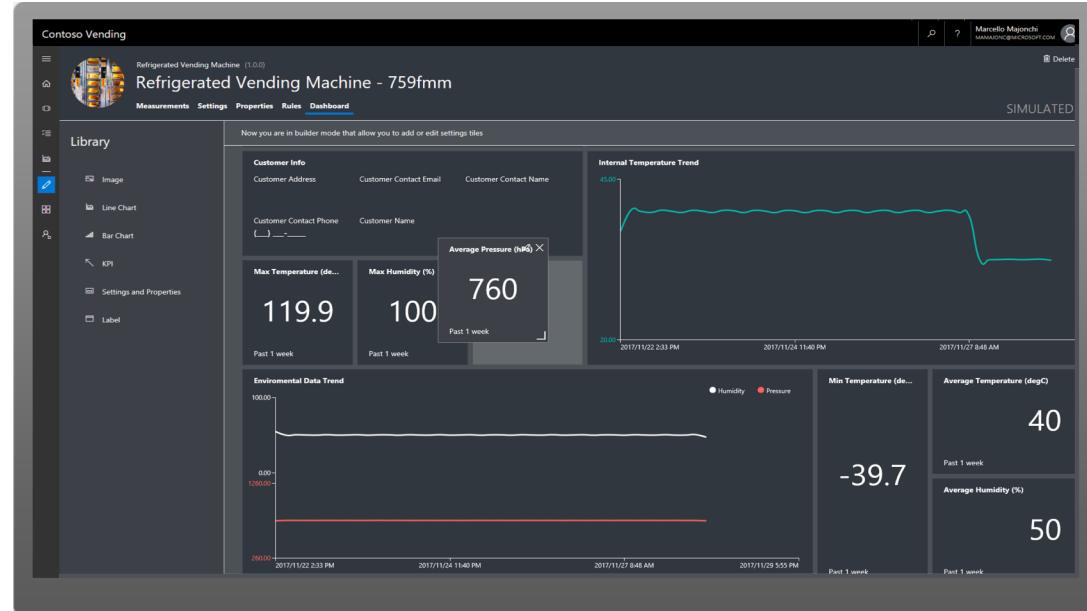
Remote monitoring | Predictive maintenance | Connected factory | Device Simulation





- 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



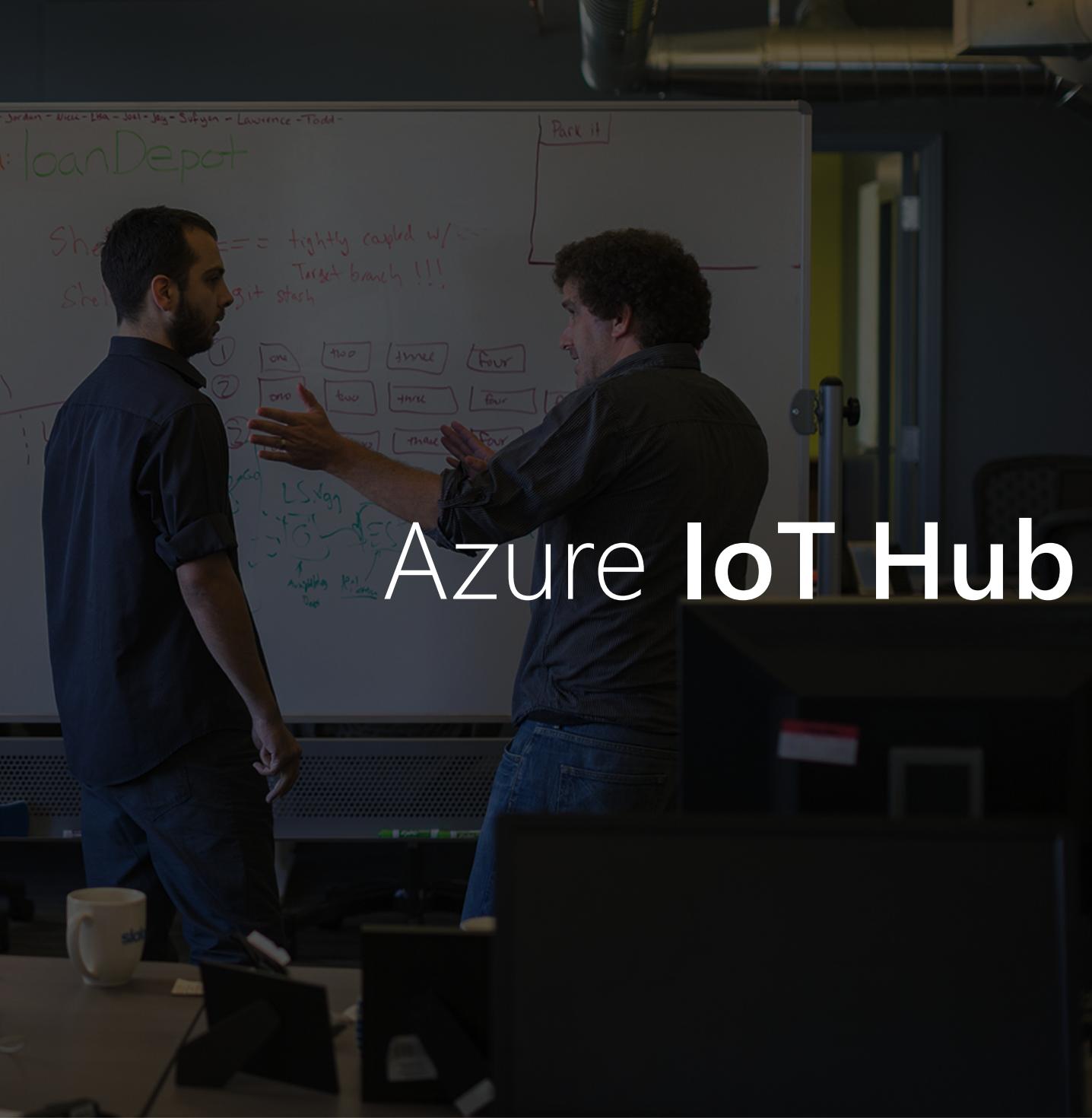
Analytics & dashboards



Time-series Insights



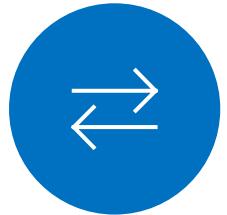
Alerts and actions



# Azure IoT Hub

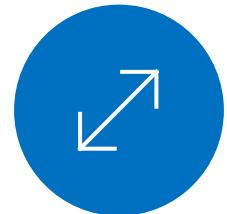
- Establish bi-directional communication with billions of IoT devices
- Enhance security with per device authentication
- Provision devices at scale w/ IoT Hub Device Provisioning Service
- Manage devices at scale with device management
- Multi-language and open source SDKs

# 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

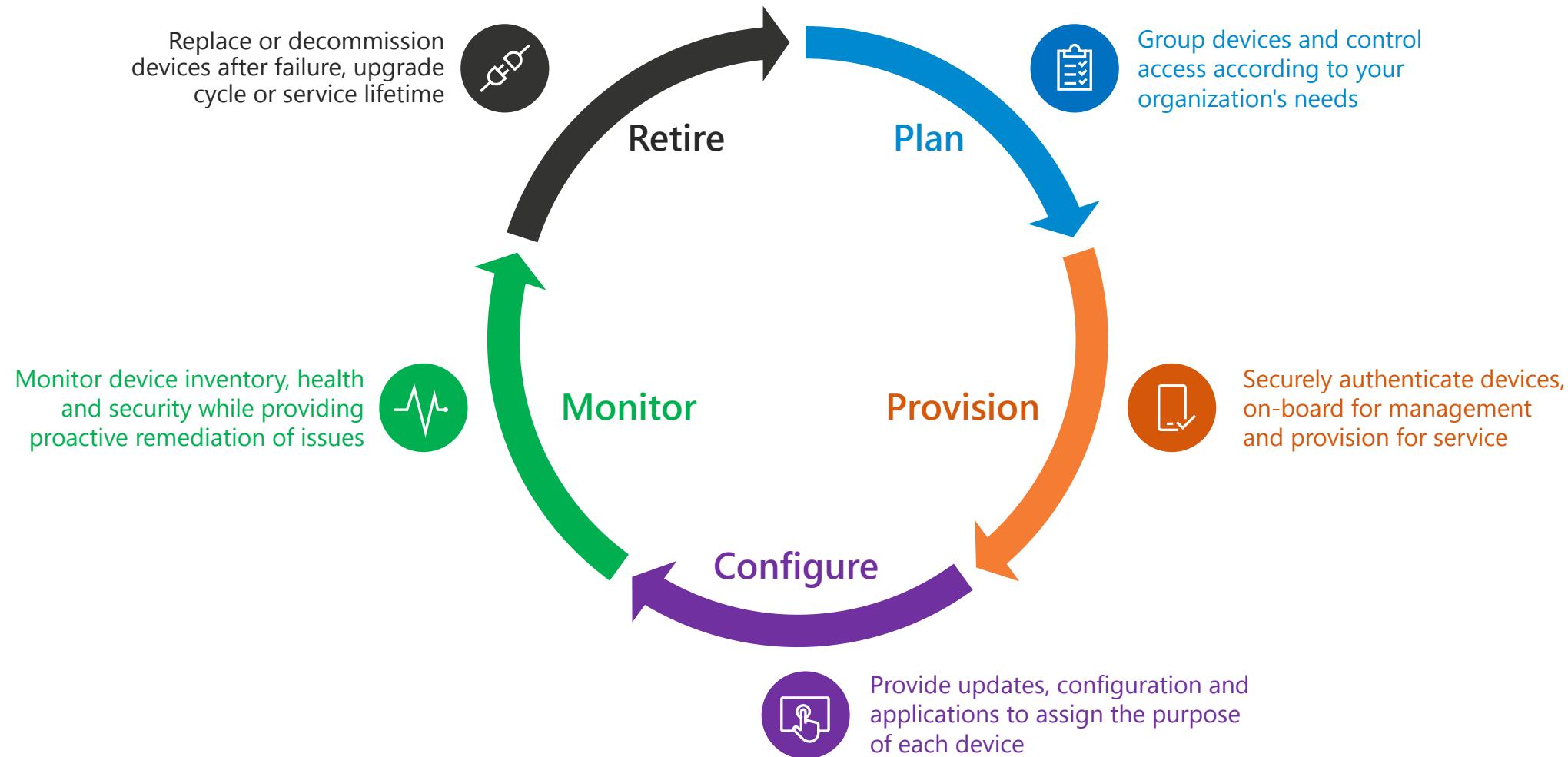
- Billions of messages
- Scale up and down
- Declarative message routes
- File upload
- Web sockets and multiplexing
- Azure monitor
- Azure resource health
- Configuration management



## 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



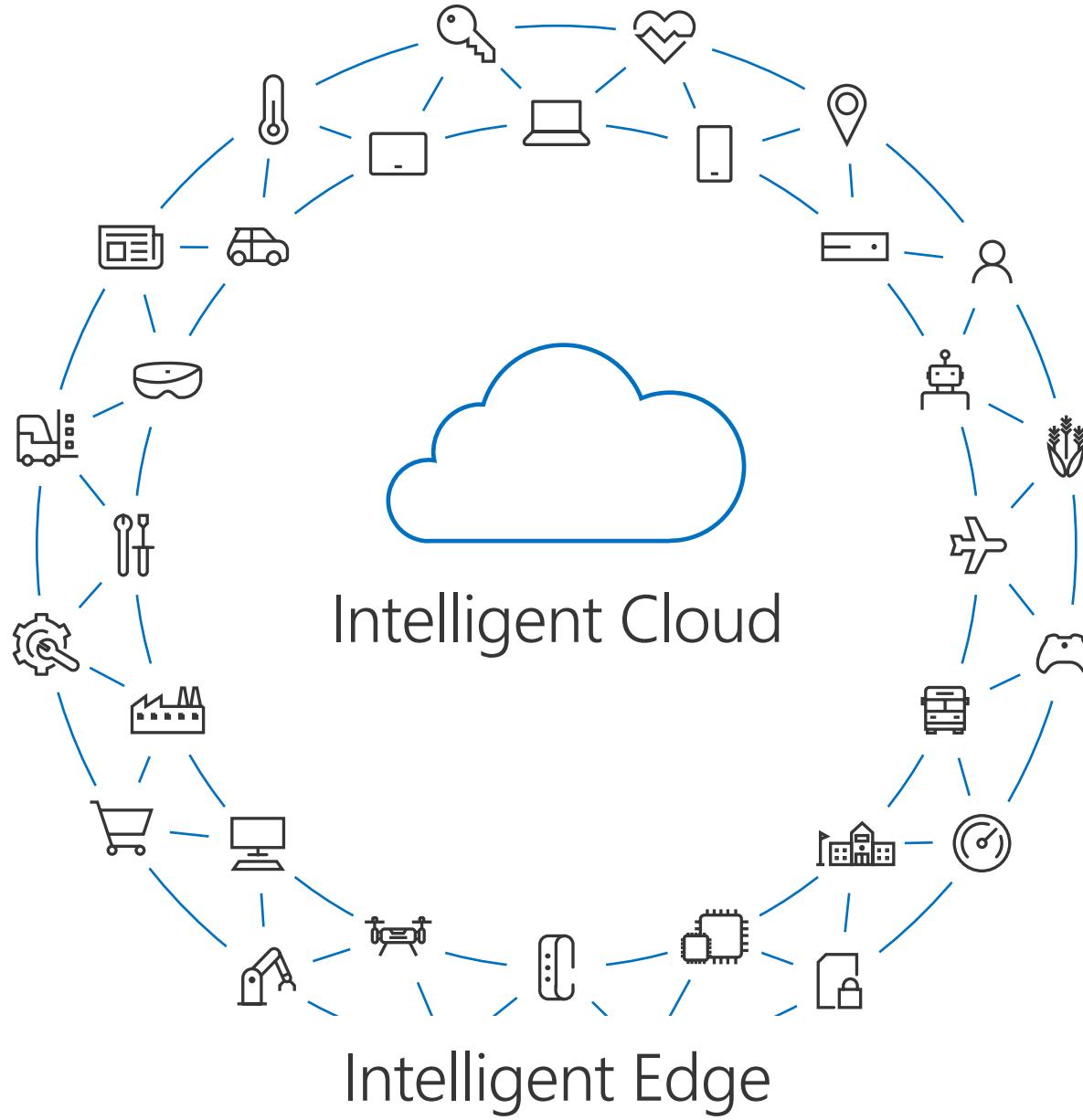
# Azure IoT Hub Device Provisioning Service

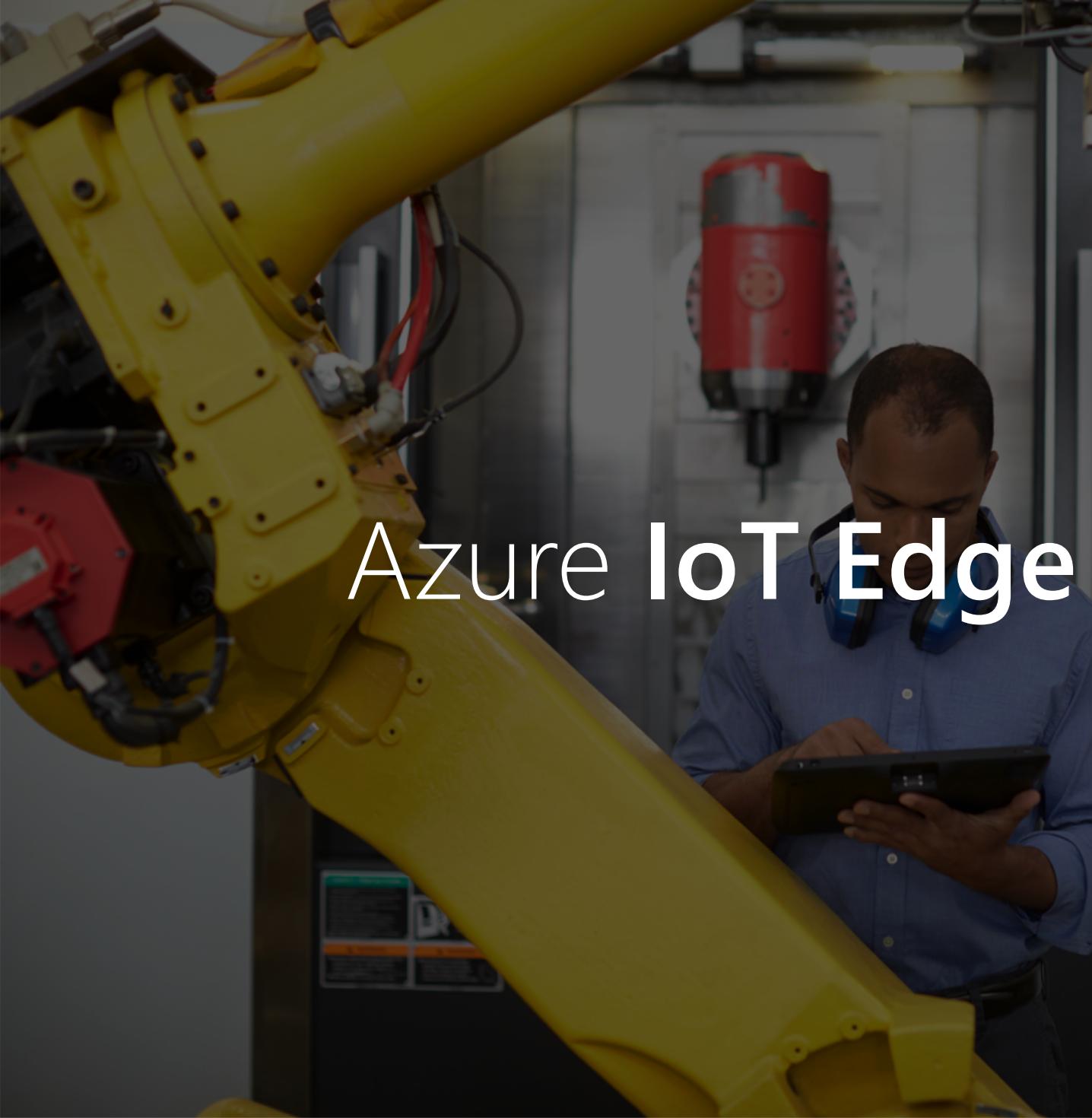
## Azure IoT Hub Device Provisioning Service

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



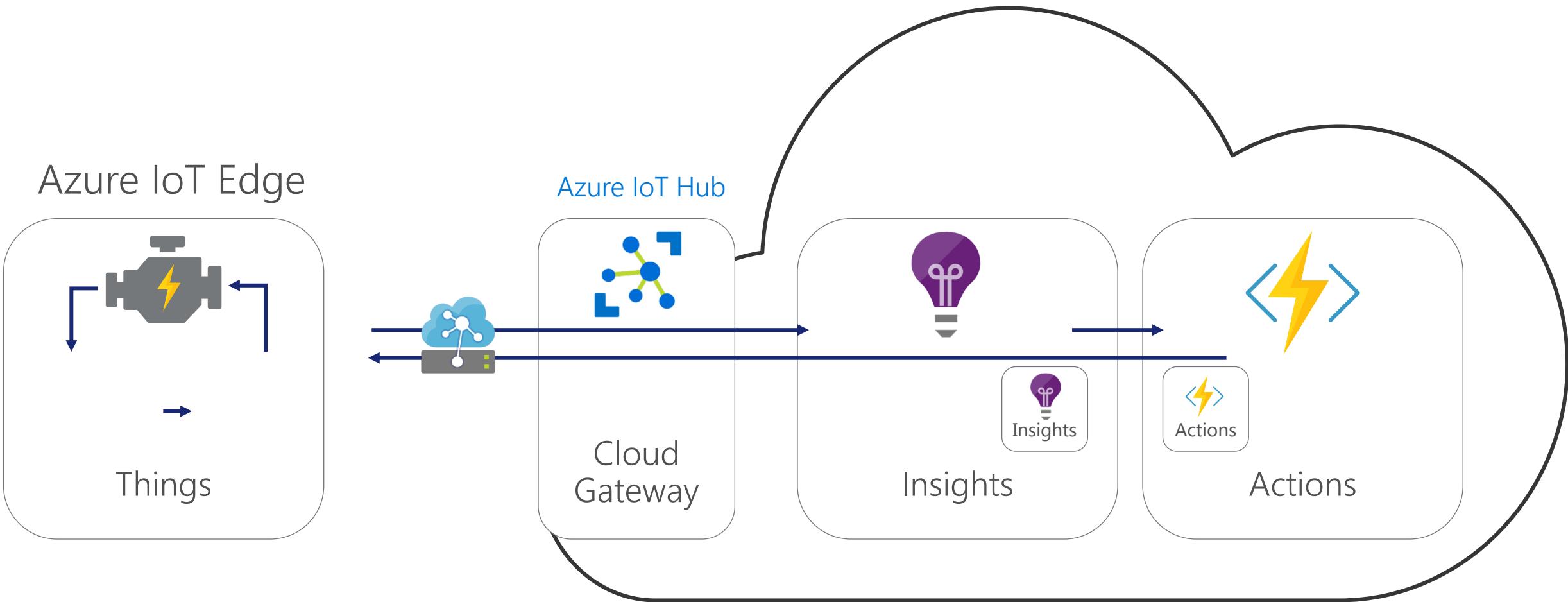




# Azure IoT Edge

-  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



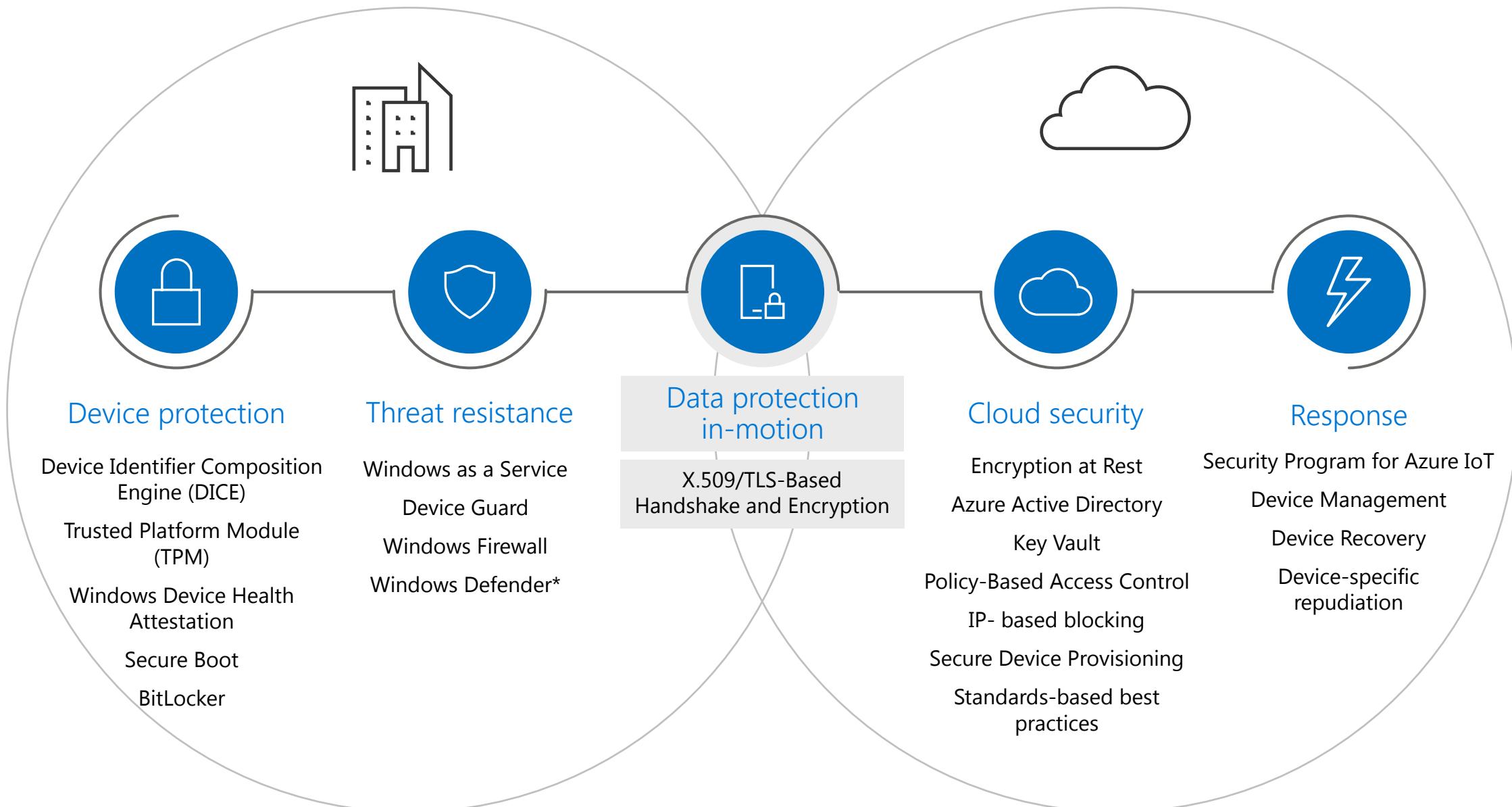
*CyberX*



UNISYS

Not all partners may be listed; check [internetofyourthings.com](http://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<sup>SM</sup>

CSA STAR  
Self-Assessment

cloud  
**CSA** security  
alliance<sup>SM</sup>

CSA STAR  
Certification

cloud  
**CSA** security  
alliance<sup>SM</sup>

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

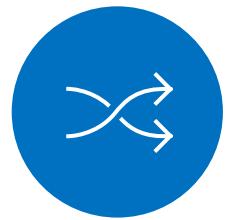


Privacy  
Shield

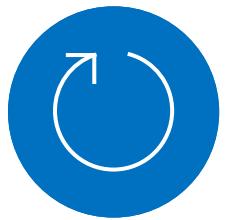


Germany IT  
Grundschutz  
workbook

# Microsoft IoT



Agile



Comprehensive

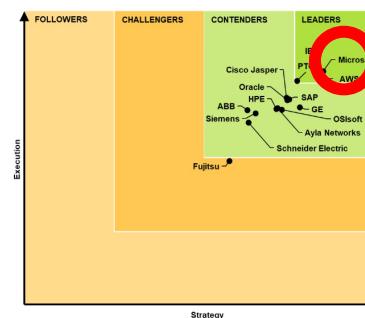
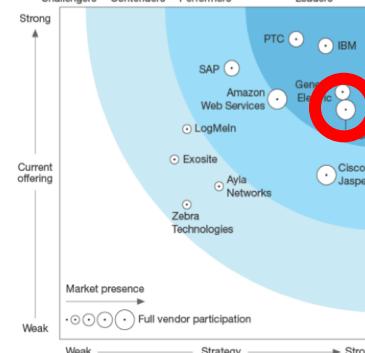
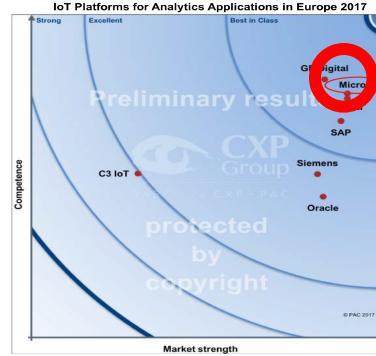


Secure

# 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

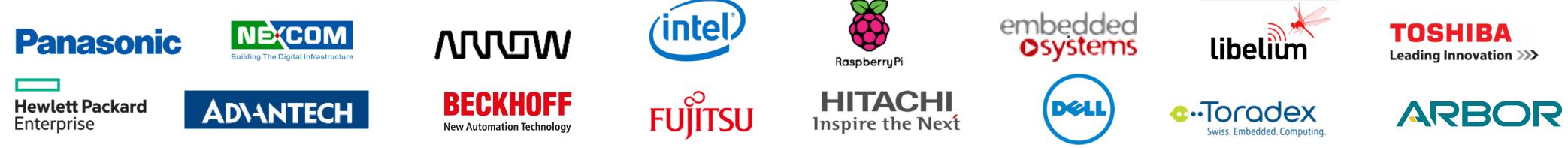
System integrators



Solution providers

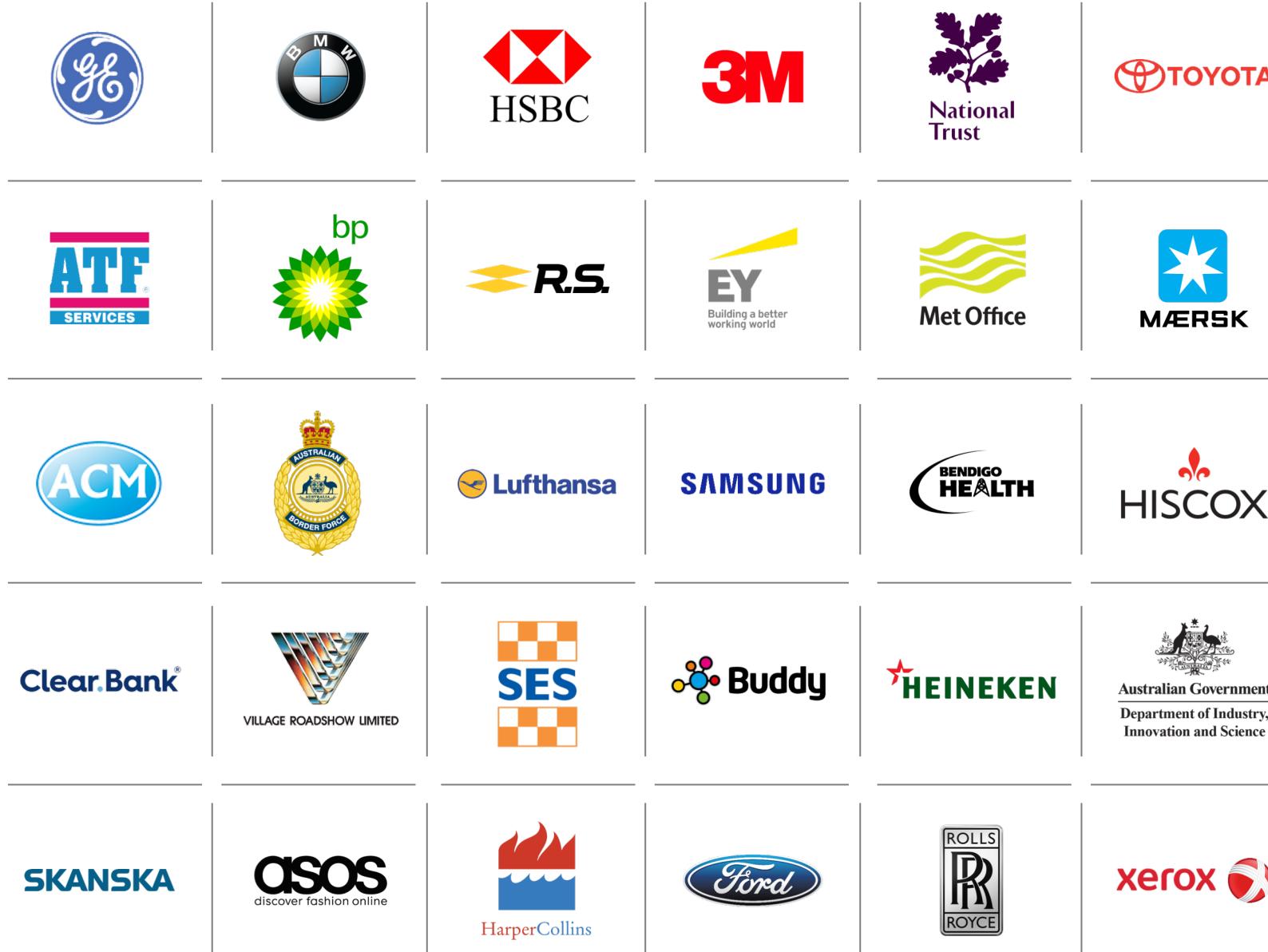


Azure certified for IoT



Developer, IT and productivity





95%

of Fortune 500 use  
Microsoft Cloud

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

42

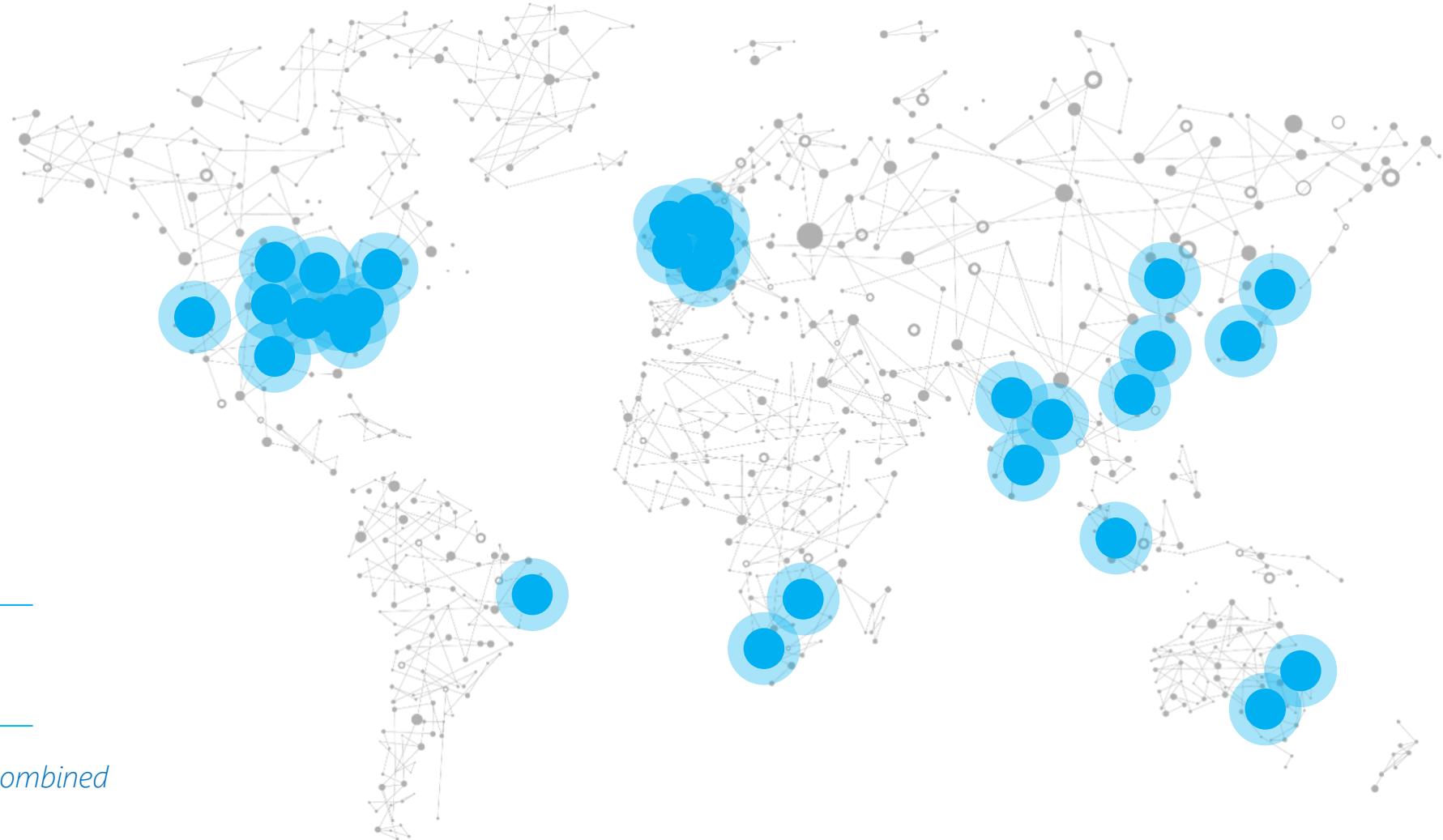
Azure regions  
around the world

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 AZURE REGIONS

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*More than AWS and Google Cloud combined*



# Open source support

DevOps	<b>Nagios®</b>	 VAGRANT		 GRUNT						
Management	 CHEF™	 puppet labs	 ANSIBLE	 SALTSTACK		 mist.io	 libcloud		 SCALR CLOUD MANAGEMENT	
Applications		 Joomla!	 Drupal™		 APPRENDA					
App frameworks and tools	 php	 nodeJS		 .JS	 Ruby	 IJ	 eclipse			
Databases and middleware		 redis	 CLEARDB	 cloudera	 MySQL™	 mongoDB	 Couchbase			
Infrastructure			 redhat	 suse		 bitnami	 ORACLE® LINUX	 FreeBSD	 docker	

# 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 Microsoft<sup>1</sup> 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 customers<sup>2</sup>



### 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 customers<sup>3</sup>

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 <sup>1</sup>	! 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

- 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](#)
- Connect with a [Microsoft IoT specialist](#)
- [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

ខុបគុណគេរំបៀប

Obrigado

شُكْرِيَّه

Terima Kasih

Dziękuję

Hvala

Köszönöm

Tak

Dank u Wel

дякую

Tack

Mulțumesc

спасибо

Danke

Cám ơn

Gracias

多謝晒

Ďakujem

תודה

ନେଣ୍ଟି

Děkuji

감사합니다



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