



Microsoft Azure

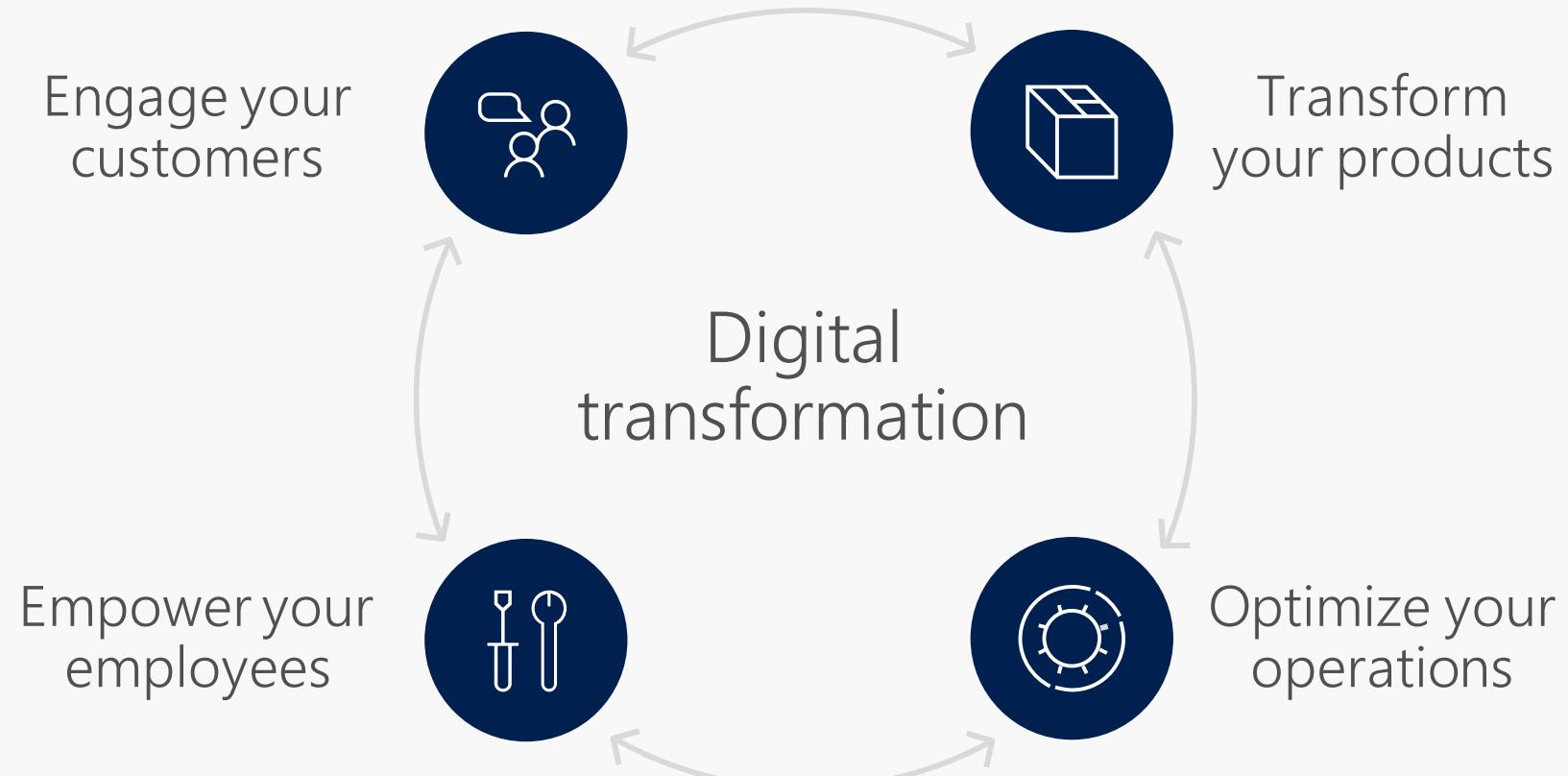
The cloud platform for digital transformation

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Principal Technical Evangelist
Microsoft



Session objectives and takeaways

Learn about the Microsoft Cloud
The Azure IoT Reference Architecture



Microsoft Azure



Application innovation

Accelerate innovation with the cloud



Data and intelligence

Power decisions & apps with insights



Openness and flexibility

Build freely, deploy anywhere



Trust

Protect your business

Application innovation

Accelerate innovation with the cloud



Build apps faster and easier

Manage applications proactively

Deliver native mobile apps seamlessly

Build apps faster and easier



Build on PaaS

Existing frameworks

Web and mobile

Microservices

Serverless Compute

Build on IaaS



Storage

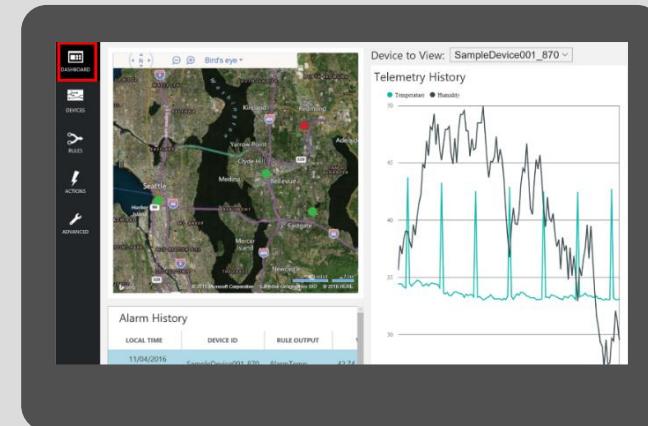


Virtual machines

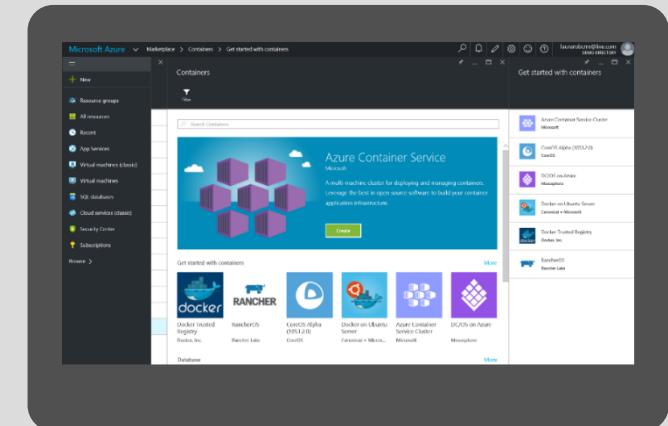


Networking

Azure Internet of Things



Azure Marketplace



Manage applications proactively



Azure Portal

The screenshot shows the Azure Portal interface with the following sections:

- Application map:** Displays a network diagram with nodes for Client side, Server side, and various endpoints. Metrics like 1.56 s for availability and 1.13 s for latency are shown.
- Requests and errors:** A chart showing requests over time with a total of 1.09 K.
- Service health:** A world map showing service status across regions.
- Overview timeline:** A chart showing response time over the last 24 hours.

Application Insights

The screenshot shows the Application Insights interface with the following sections:

- Metrics Explorer:** A chart showing metrics like CPU usage rate at 44.2%.
- Application health:** A table showing event counts for various categories.

Operations Management Suite

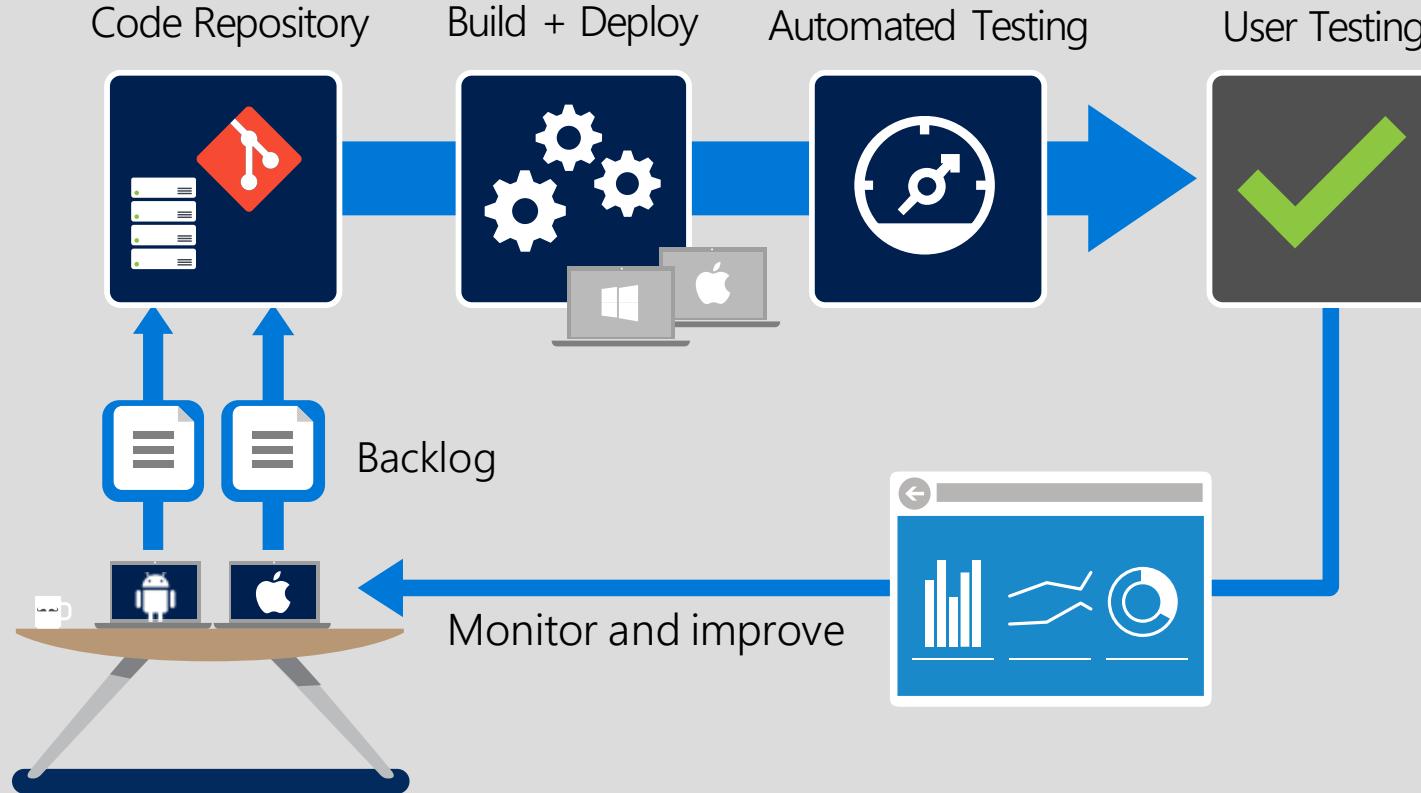
The screenshot shows the Microsoft Operations Management Suite dashboard with the following sections:

- AD Assessment:** 1 driver assessed on Sun May 16 2016.
- Alert Management:** 137 active critical alerts in the last 24 hours.
- Backup:** 2 servers backed up.
- Change Tracking:** 382 changes in the last 24 hours tracked by OMS.
- Container:** 0 containers with >90% utilization.
- Configuration Assessment:** 11 drivers with alerts based on the last 24 hours.
- Network Performance Monitor:** 36 unhealthy infrastructure links.
- Security and Audit:** 49 active computers in the last 24 hours.
- SQL Assessment:** 6 drivers assessed on Wed May 11 2016.

Deliver native mobile apps seamlessly



Mobile DevOps



Mobile Back-end Services





Demo

Microsoft Azure



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Support business strategy with any data

Predict and respond proactively

Learn and engage with artificial intelligence

Support business strategy with any data



Back-end power

Big data



Web data



Traditional
data



Front-end insights



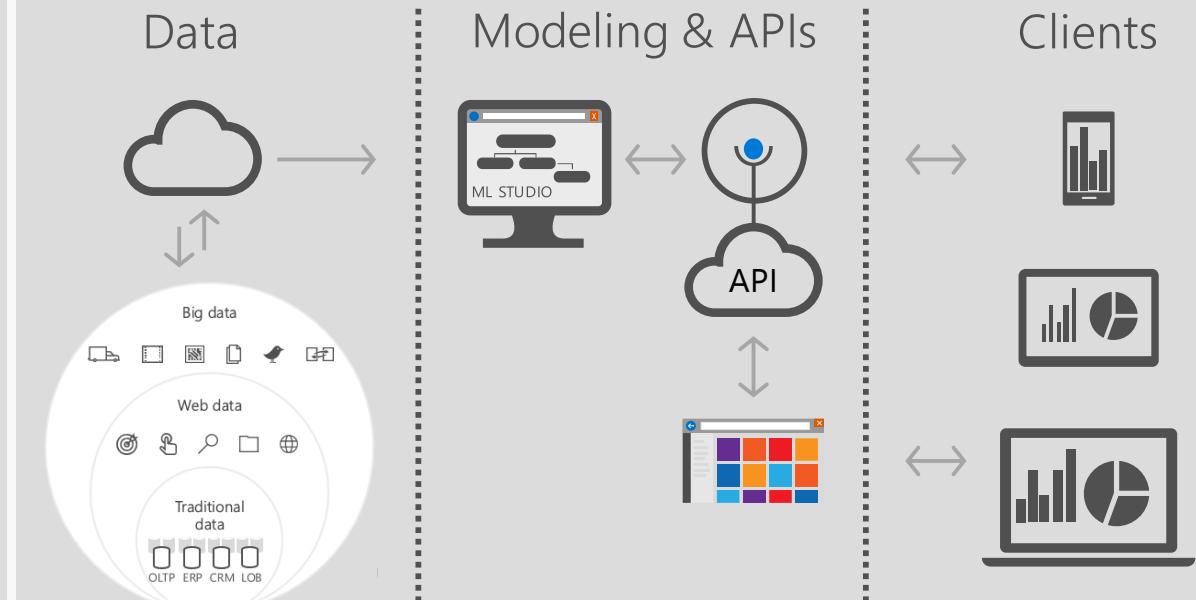
Predict and respond proactively



Azure Machine Learning templates

- ↗ Demand forecasting
- 🔧 Predictive maintenance
- 🚗 Vehicle telemetry

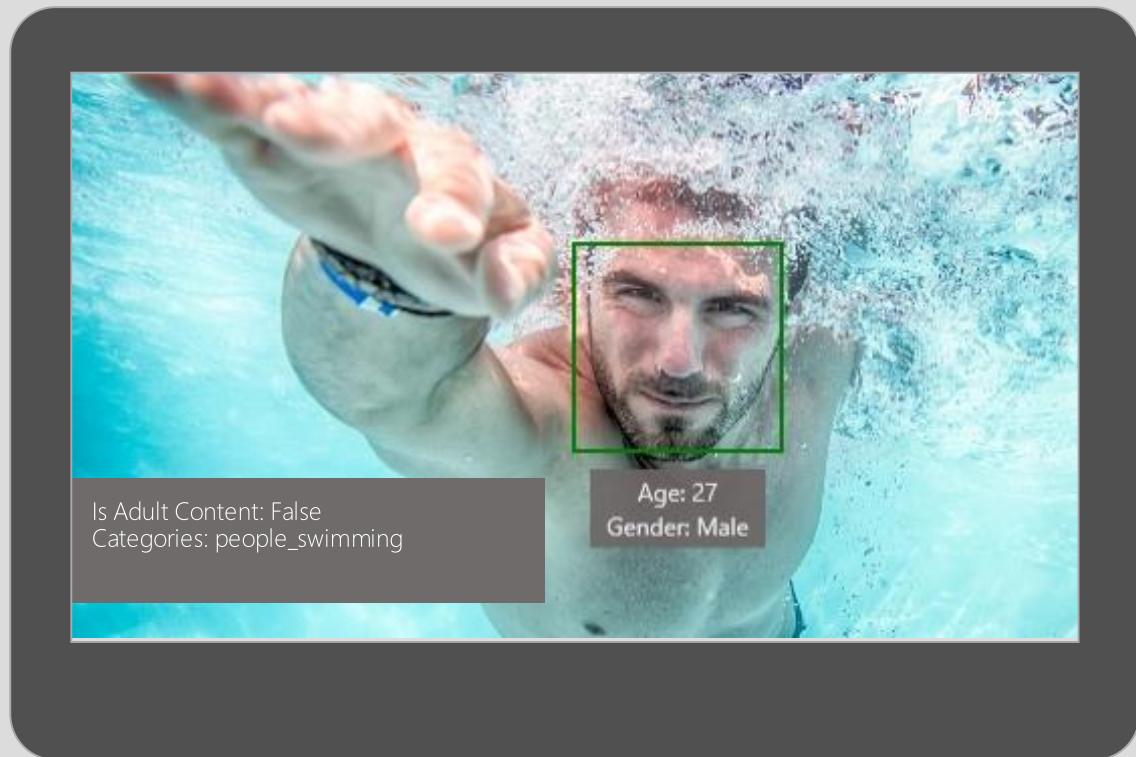
Azure Machine Learning service



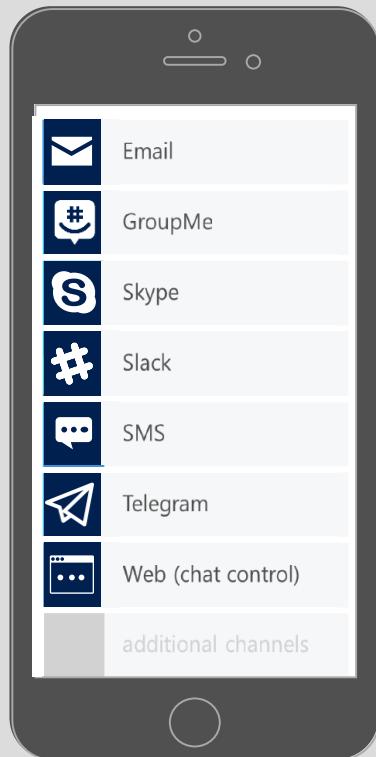
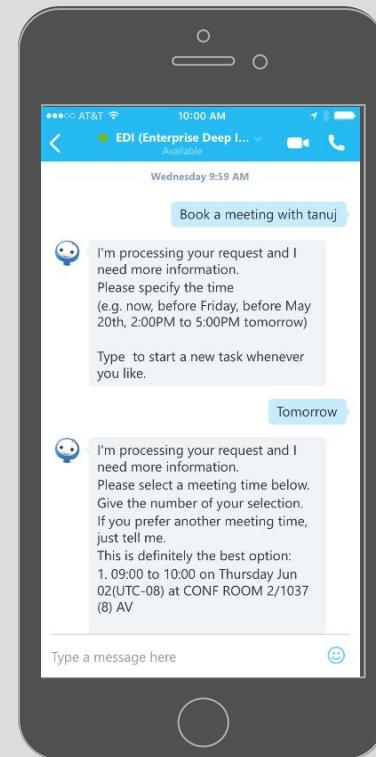
Learn and engage with artificial intelligence



Cognitive services



Bot framework





Demo

Microsoft Azure



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Build and run open source solutions

Extend on-premises data and apps

Deploy the cloud on-premises

Build and run open source solutions



Any tool, application, framework

Applications



DevOps



Frameworks



Databases & middleware



Containers



Infrastructure



Extend on-premises data and apps



Hybrid Use Cases

Application Availability



Bottomless Storage

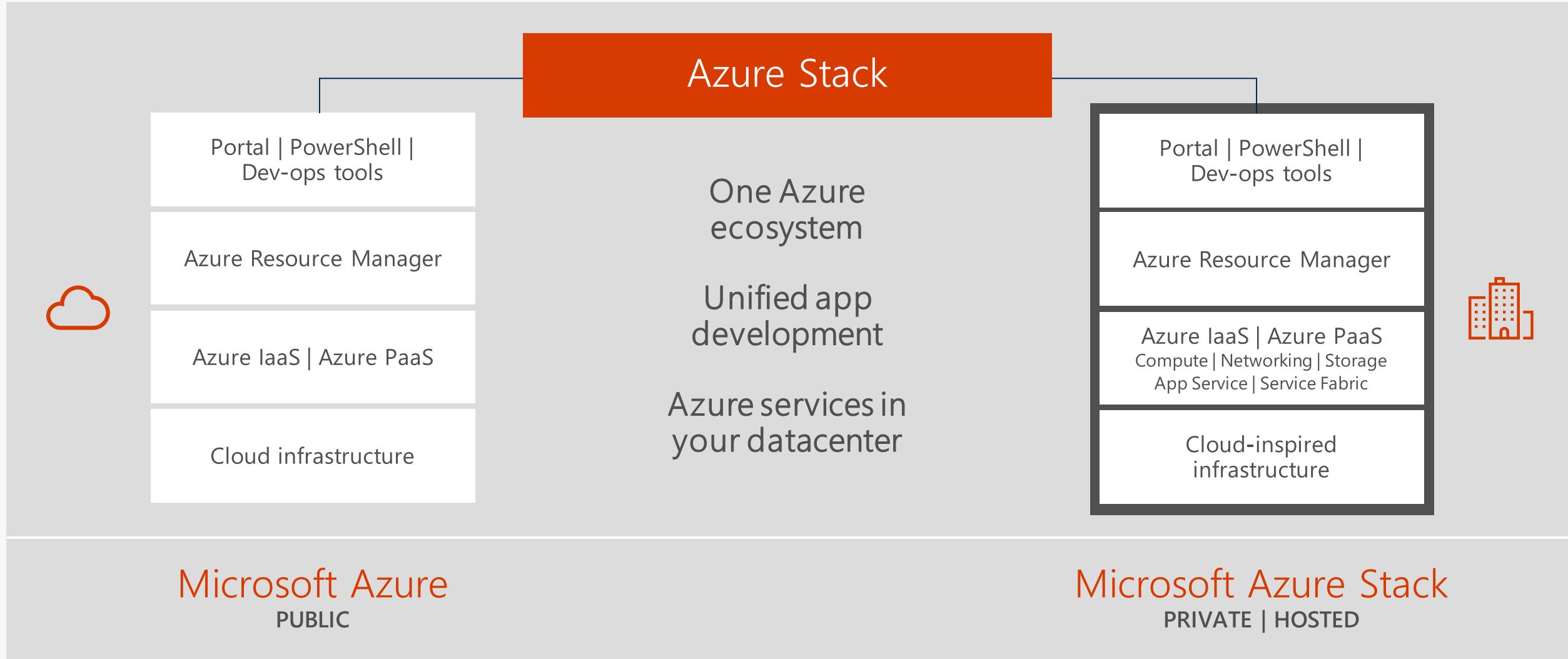
Identity Management

Full hybrid applications

Seamless & secure across:

INFRASTRUCTURE	Azure Backup
	Azure Site Recovery
DATA	Azure StorSimple
	SQL Server Stretch DB
USERS	Azure Active Directory
APPS	App Service Web Mobile Logic Apps API Apps
MANAGEMENT	Operations Management Suite

Deploy the cloud on-premises





Demo

Microsoft Azure



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Detect and mitigate threats

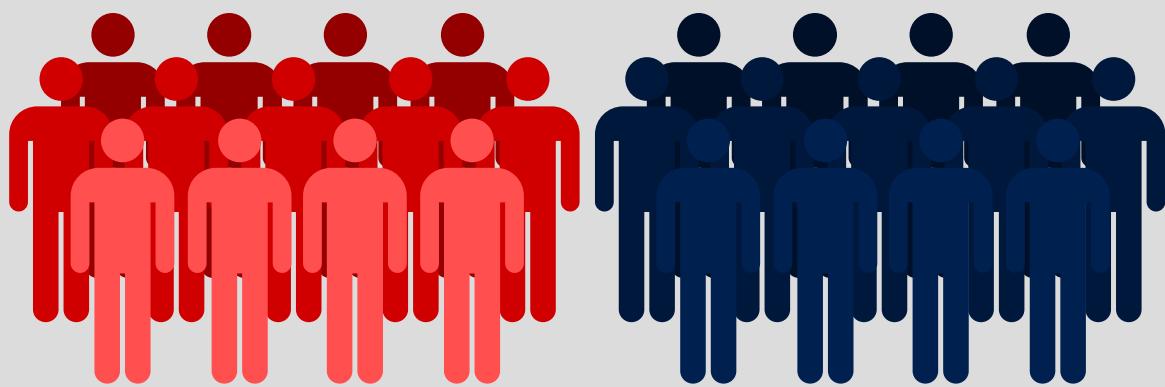
Achieve global scale, in local regions

Benefit from relentless business commitment

Detect and mitigate threats



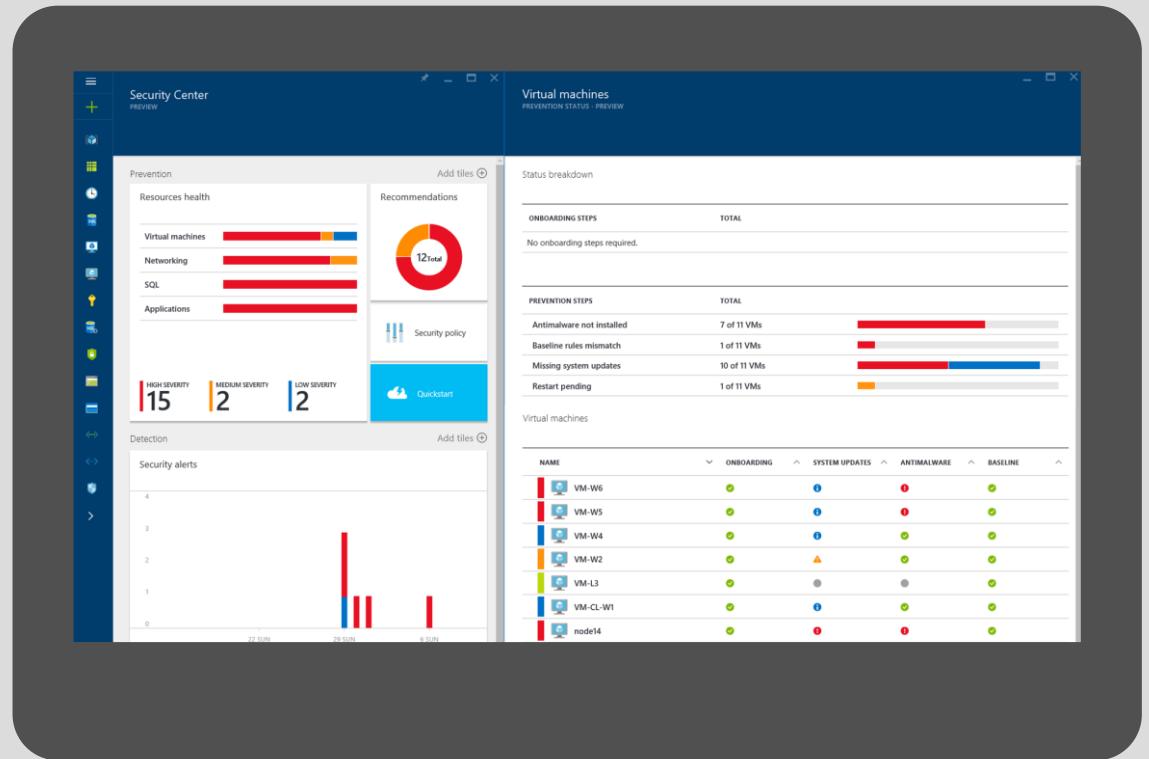
Securing the platform



RED TEAM

BLUE TEAM

Empowering you



Achieve global scale, in local regions



34
regions



Benefit from relentless business commitment



ISO 27001



SOC 1 Type 2



SOC 2 Type 2



PCI DSS Level 1



Cloud Controls Matrix



ISO 27018



Content Delivery and Security Association



SHARED ASSESSMENTS



FedRAMP
JAB P-ATO



HIPAA/
HITECH



FIPS 140-2



21 CFR
Part 11



FERPA



DISA Level 2



CJIS



IRS 1075



ITAR-ready



Section 508 VPAT



European Union Model Clauses



EU Safe Harbor



United Kingdom
G-Cloud



China Multi
Layer Protection
Scheme



China
GB 18030



China
CCCPPF



Singapore
MTCS Level 3



Australia
Signals
Directorate



New Zealand
GCIO



Japan
Financial
Services



ENISA
IAF

Microsoft Azure



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Momentum

120,000

New Azure customer
subscriptions/month



715million

Azure Active
Directory users



150billion

Azure SQL query
requests processed/day



120billion

Hits to websites run on
Azure Web App Service



>85%

of Fortune 500 use
Microsoft Cloud



What can you do with a device
connected to Azure IoT?

Azure IoT Hub features

Telemetry

Send high throughput telemetry data

Device Twin (coming soon)

Synchronize configuration properties between Cloud and device

Methods (coming soon)

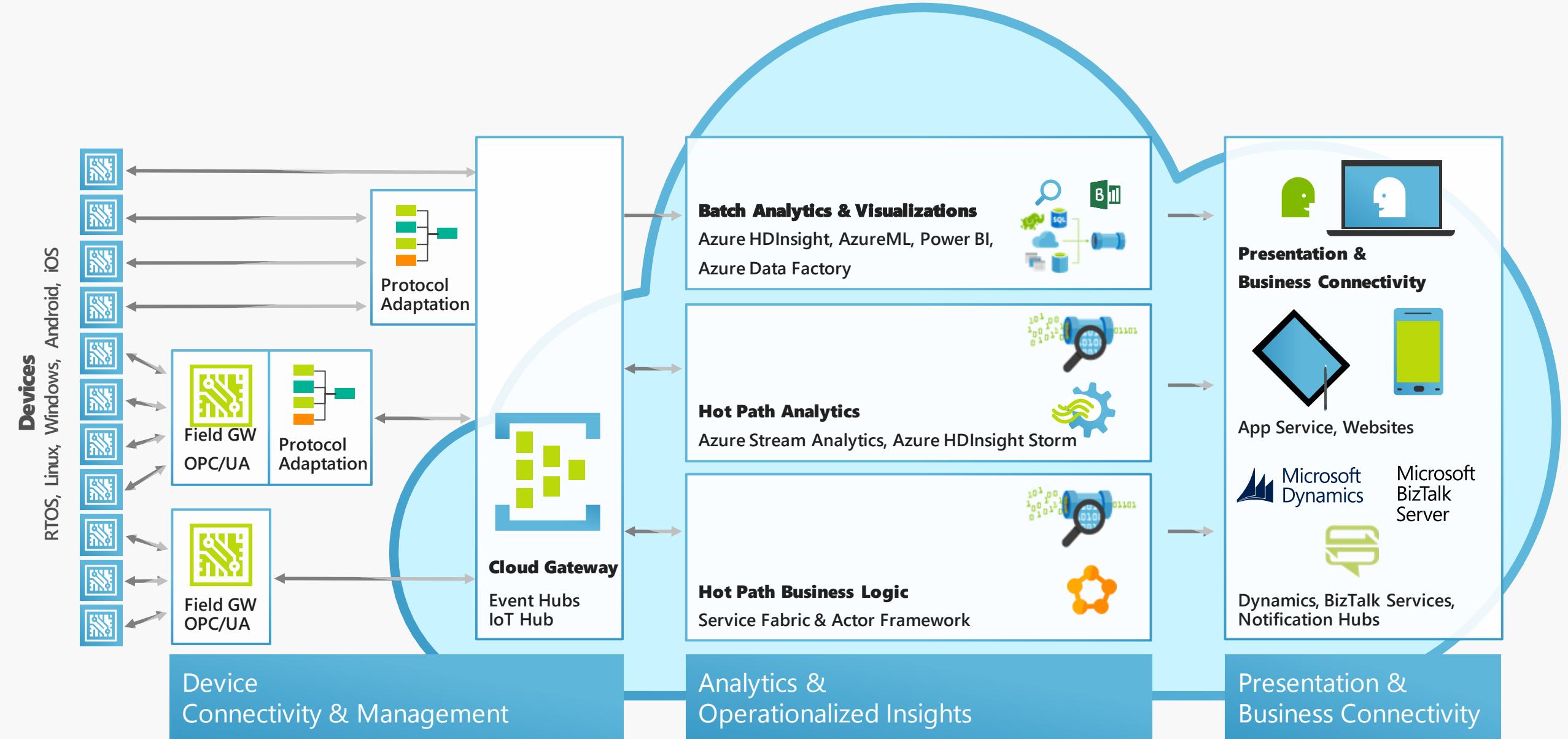
Imagine calling a method on a device from the Cloud... and vice-versa

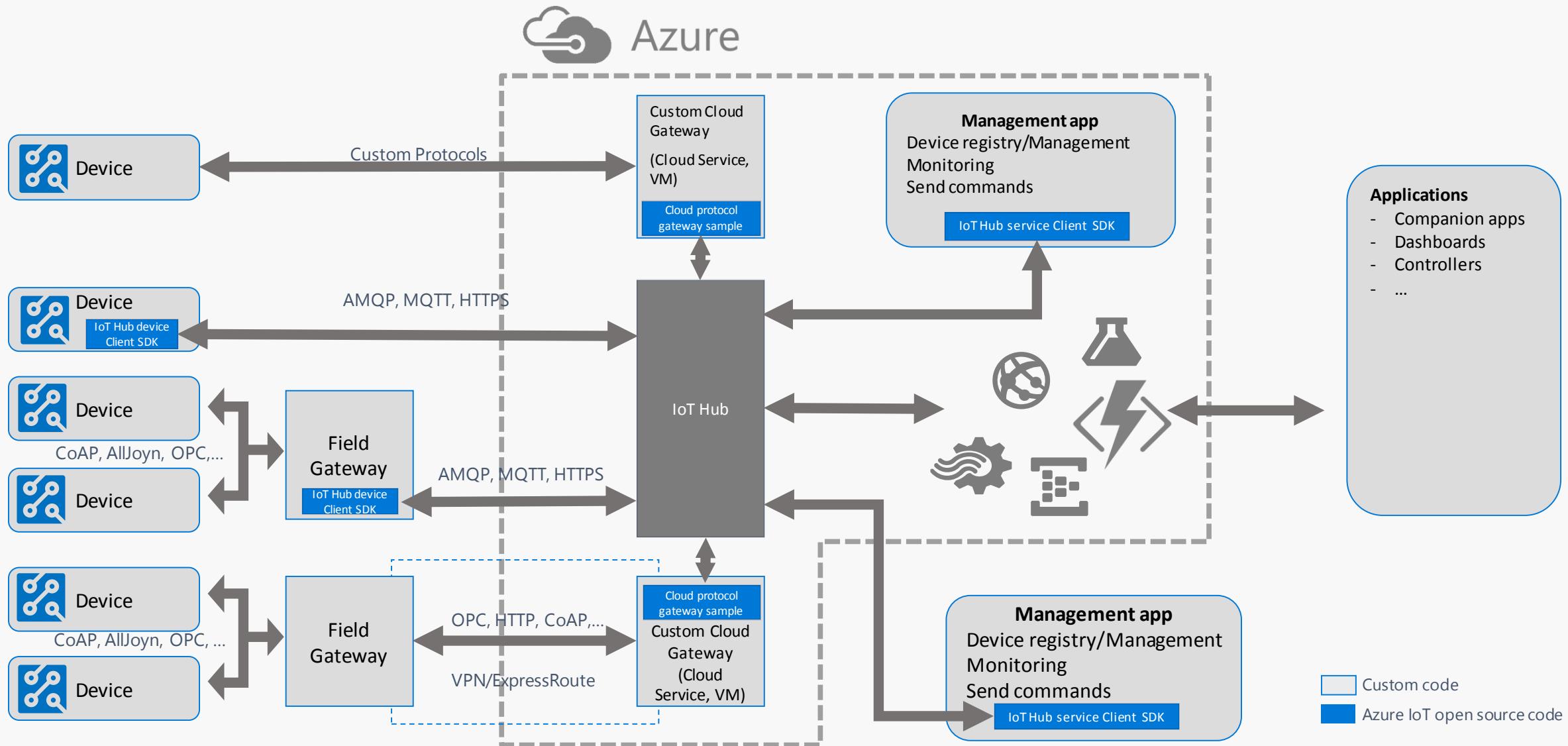
Device Management (Public Preview)

Enroll, organize, maintain, decommission devices

Connect Devices to Azure IoT

IoT Solution Patterns





Azure IoT SDKs

Open Source

Everything is on GitHub, open source under MIT license

Cross-Platform Support

Microcontrollers (ARM Mbed, Arduino, ESP8622, TI CC3200,...)

RTOS, Linux (Ubuntu, Debian, Fedora, Raspbian), Windows 7/8/10, Android, iOS (with Xamarin)

Multi-Language Support

Service Client SDK – C#, Java, JavaScript, Python (on its way)

Device Client SDK – C, JavaScript, Java, C# (including PCL), Python

Xamarin Compatible

Includes Xamarin compatible libraries

Packages

NuGet, npm, maven, apt-get

Tools

X-plat CLI (iothub-explorer) and for Windows (Device-Explorer)

Easy To Get Started

Samples, walkthroughs to get you started quickly

The screenshot shows the GitHub repository page for 'Azure / azure-iot-sdks'. The page includes a summary bar with 1,394 commits, 8 branches, 10 releases, and 45 contributors. It features sections for Microsoft Azure IoT SDKs, Microsoft Azure IoT device SDKs, and Microsoft Azure IoT service SDKs, each with detailed descriptions and links to documentation.

Microsoft Azure IoT SDKs
This repository contains both IoT device SDKs and IoT service SDKs. Device SDKs enable you connect client devices to Azure IoT Hub. Service SDKs enable you to manage your IoT Hub service instance. Visit <http://azure.com/iotdev> to learn more about developing applications for Azure IoT.

Microsoft Azure IoT device SDKs
The Microsoft Azure IoT device SDKs contain code that facilitate building devices and applications that connect to and are managed by Azure IoT Hub services. Devices and data sources in an IoT solution can range from a simple network-connected sensor to a powerful, standalone computing device. Devices may have limited processing capability, memory, communication bandwidth, and communication protocol support. The IoT device SDKs enable you to implement client applications for a wide variety of devices. This repository contains the following IoT device SDKs:

- Azure IoT device SDK for C
- Azure IoT device SDK for Node.js
- Azure IoT device SDK for Java
- Azure IoT device SDK for .NET

Each language SDK includes sample code and documentation in addition to the library code. The API reference documentation is [here](#).

OS platforms and hardware compatibility
Azure IoT device SDKs can be used with a broad range of OS platforms and devices. See [OS Platforms and hardware compatibility](#).

Microsoft Azure IoT service SDKs
The Azure IoT Service SDKs help you to build applications that interact with your devices and manage device identities in your IoT hub.

- Azure IoT service SDK for .Net
- Azure IoT service SDK for Node.js
- Azure IoT service SDK for Java

Device & Service Client SDKs

Client	OS/Runtime	Version	Protocols	Packages
C device client	Debian Linux	7.5	HTTPS, AMQP, MQTT, AMQP over WebSockets	None
	Fedora Linux	20	HTTPS, AMQP, MQTT, AMQP over WebSockets	None
	mbed OS	2	HTTPS, AMQP, MQTT	https://developer.mbed.org/users/AzureIoTClient/
	TI-RTOS	2.x	HTTPS	None
	Ubuntu Linux	14.04	HTTPS, AMQP, MQTT, AMQP over WebSockets	https://launchpad.net/~aziotsdklinux/+archive/ubuntu/ppa-azureiot
	Windows desktop	10	HTTPS, AMQP, MQTT, AMQP over WebSockets	https://www.nuget.org/packages/Microsoft.Azure.IoT.Hub.IoT.Hub.Client/
	Yocto Linux	2.1	HTTPS, AMQP	None
	Arduino (MKR1000, Zero, ESP8266, Feather M0)	IDE 1.6.8	HTTPS	https://github.com/arduino-libraries/AzureIoTHub
Node.js Device client	Node.js	0.10+	HTTPS, AMQP, MQTT, AMQP over WebSockets	https://www.npmjs.com/package/azure-iot-device
Node.js Service client	Node.js	0.10+	N/A	https://www.npmjs.com/package/azure-iothub
Java Device client	Java SE (Windows)	1.7	HTTPS, AMQP, MQTT	http://mvnrepository.com/artifact/com.microsoft.azure.iothub-java-client/iothub-java-device-client
	Java SE (Linux)	1.7	HTTPS, AMQP, MQTT	http://mvnrepository.com/artifact/com.microsoft.azure.iothub-java-client/iothub-java-device-client
	Android	API 15	HTTPS, MQTT	
Java Service client	Java SE	1.8	N/A	http://mvnrepository.com/artifact/com.microsoft.azure.iothub-java-client/iothub-java-service-client
C# Device client	.Net	4.5	HTTPS, AMQP, MQTT, AMQP over WebSockets	https://www.nuget.org/packages/Microsoft.Azure.Devices.Client/
	UWP	10	HTTPS, AMQP	https://www.nuget.org/packages/Microsoft.Azure.Devices.Client/
	PCL (Xamarin, Mono, UWP, WP8.1, Win8.1)		HTTPS, AMQP, MQTT, AMQP over WebSockets	https://www.nuget.org/packages/Microsoft.Azure.Devices.Client.PCL/
C# Service client	.Net	4.5	N/A	https://www.nuget.org/packages/Microsoft.Azure.Devices/
Python Device client	Python	2.7.x, 3.4.x, 3.5.x	HTTPS, AMQP, MQTT	none

Azure IoT Gateway SDK

Open source IoT gateway middleware that enables:

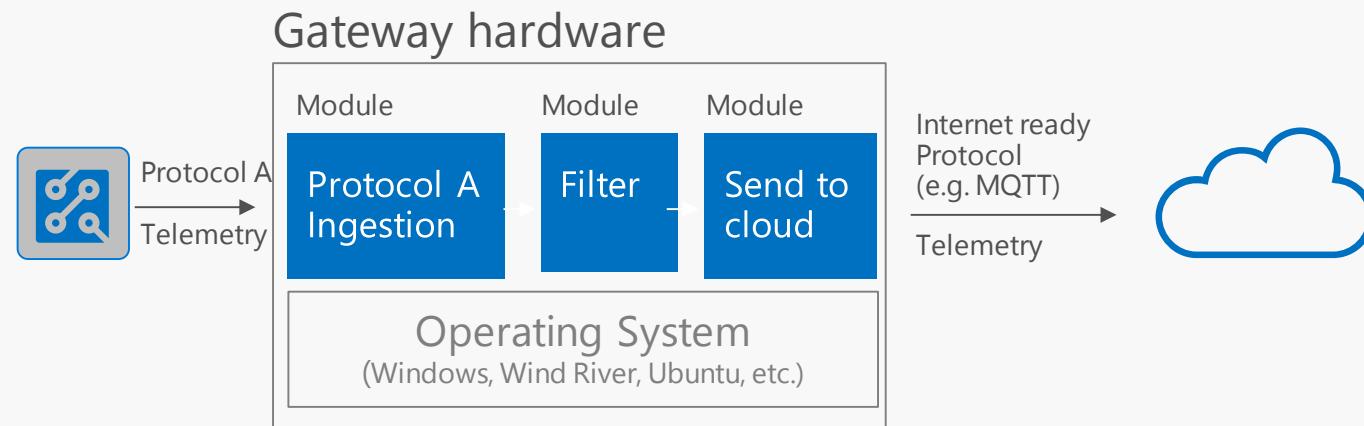
Cloud connectivity for devices that don't speak TCP/IP

Security Isolation for devices that can't be updated/secured

Protocol translation for existing and new protocols

Data transformation compression, annotation, filtering

Local intelligence and local processing for low latency needs



Azure Certified for IoT

Certified to Work Great with Azure IoT

Heterogeneous operating systems & devices

Over 70 Partners & Growing

Over 110 Devices Certified

Azure IoT Device SDK Supports Even
More!

Azure IoT Device SDK supports more than Azure Certified for IoT
and is easy to adapt to new devices and operating systems

Azure IoT Starter Kits



Raspberry Pi 2 Kit

Windows 10 and Raspbian
Samples in C and C#



Intel Edison Kit

Linux Yocto
Samples in JavaScript (Node.js)



Feather M0 Wi-Fi Kit

RTOS
Samples in Arduino IDE and C



ThingDev Kit

RTOS
Samples in Arduino and C



Feather Huzzah ESP8266 Kit

RTOS
Samples in Arduino IDE and C

<http://azure.com/iotstarterkits>

Resources

Azure IoT Client SDKs:

github.com/azure/azure-iot-sdks

Get started with Azure IoT Hub device management:

azure.microsoft.com/en-us/documentation/articles/iot-hub-device-management-get-started/

Azure IoT Gateway SDK repo:

github.com/Azure/azure-iot-gateway-sdk

Microsoft Azure IoT reference architecture:

azure.microsoft.com/en-us/updates/microsoft-azure-iot-reference-architecture-available/

Azure IoT Partner Portal:

aka.ms/AzureIoTPartner

Certified for Azure IoT:

www.azure.com/certifiedforiot

Azure IoT User Voice forum:

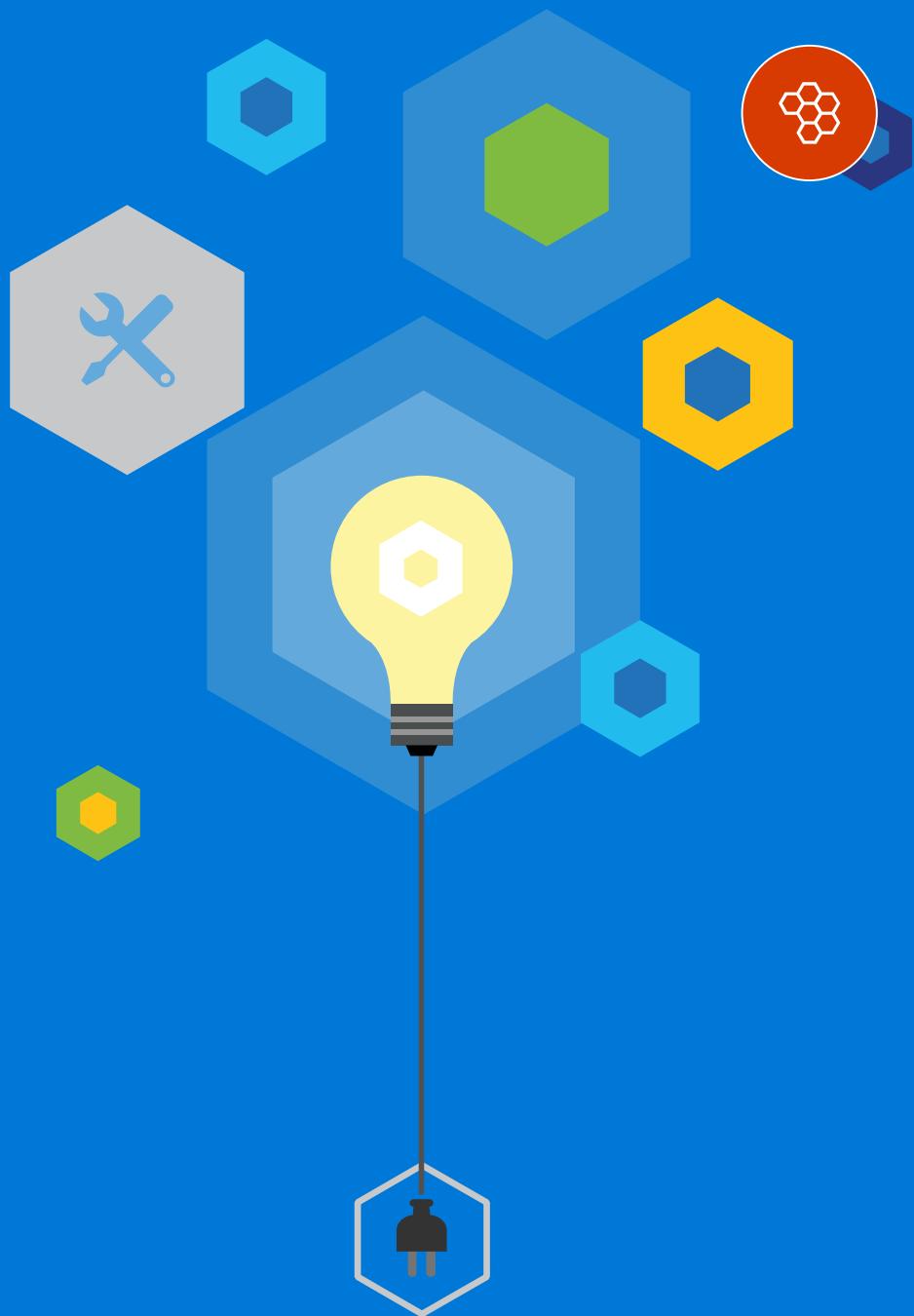
feedback.azure.com/forums/321918-azure-iot

IoT Advisors on Yammer:

www.yammer.com/azureadvisors/#/threads/inGroup?type=in_group&feedId=5495841

Q&A

Demo





Thank you