



Azure

<http://aka.ms/AngelbeatJune2018Texas>

# Modernize your infrastructure and application portfolio

using Microsoft Azure with IaaS, PaaS, Serverless, Containers, IoT and Blockchain



**Shawn Weisfeld**

[shawn.weisfeld@microsoft.com](mailto:shawn.weisfeld@microsoft.com)

Cloud Solution Architect

Microsoft One Commercial Partner

June 2018



# Shawn Weisfeld

Cloud Solution Architect  
Microsoft One Commercial  
Partner

shawn.weisfeld@microsoft.com

@shawnweisfeld

<https://www.linkedin.com/in/shawnweisfeld/>



Checkout other Regional Events

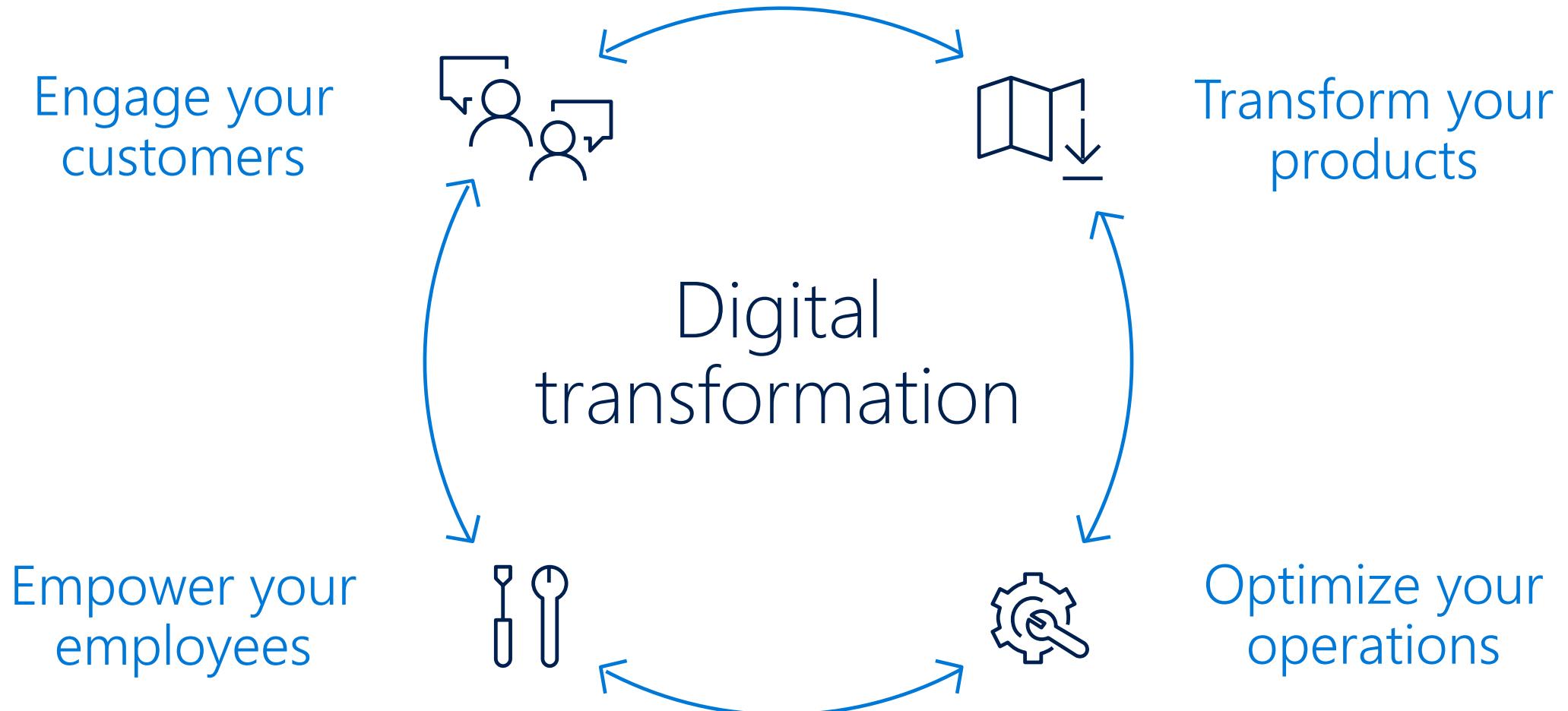
<https://aka.ms/AustinEvents>

More info about OCP

<http://aka.ms/USPartnerBriefing>



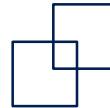
<http://www.UserGroup.tv>



# Azure—cloud for all



Productive



Hybrid



Intelligent

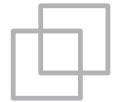


Trusted





**Productive**



**Hybrid**



**Intelligent**



**Trusted**

# Unparalleled developer productivity



## Integrated tooling

Visual Studio  
third-parties | DevOps



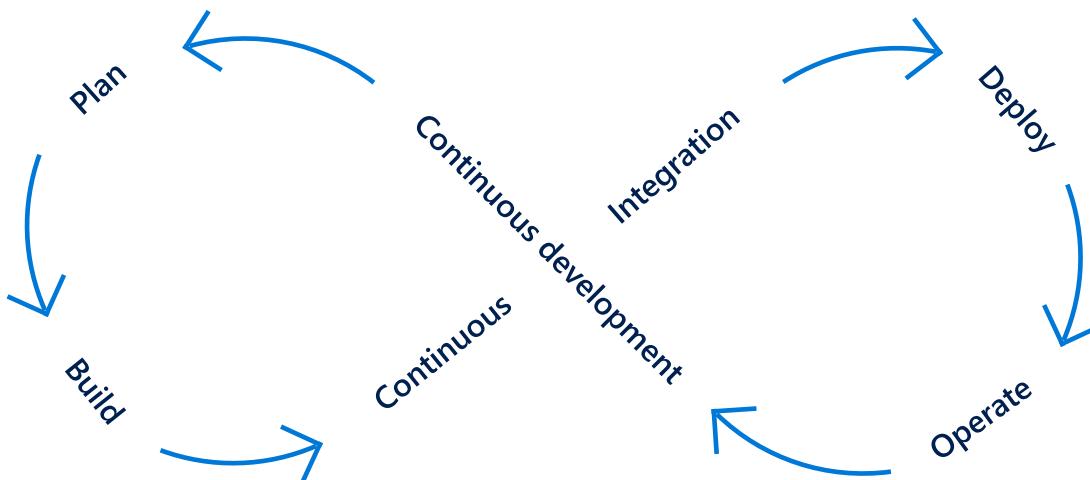
## 100+ services

Azure Functions  
Kubernetes | Logic Apps  
<http://aka.ms/AzureCards>

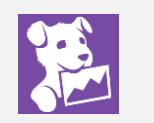
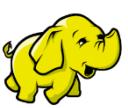


## Unified management

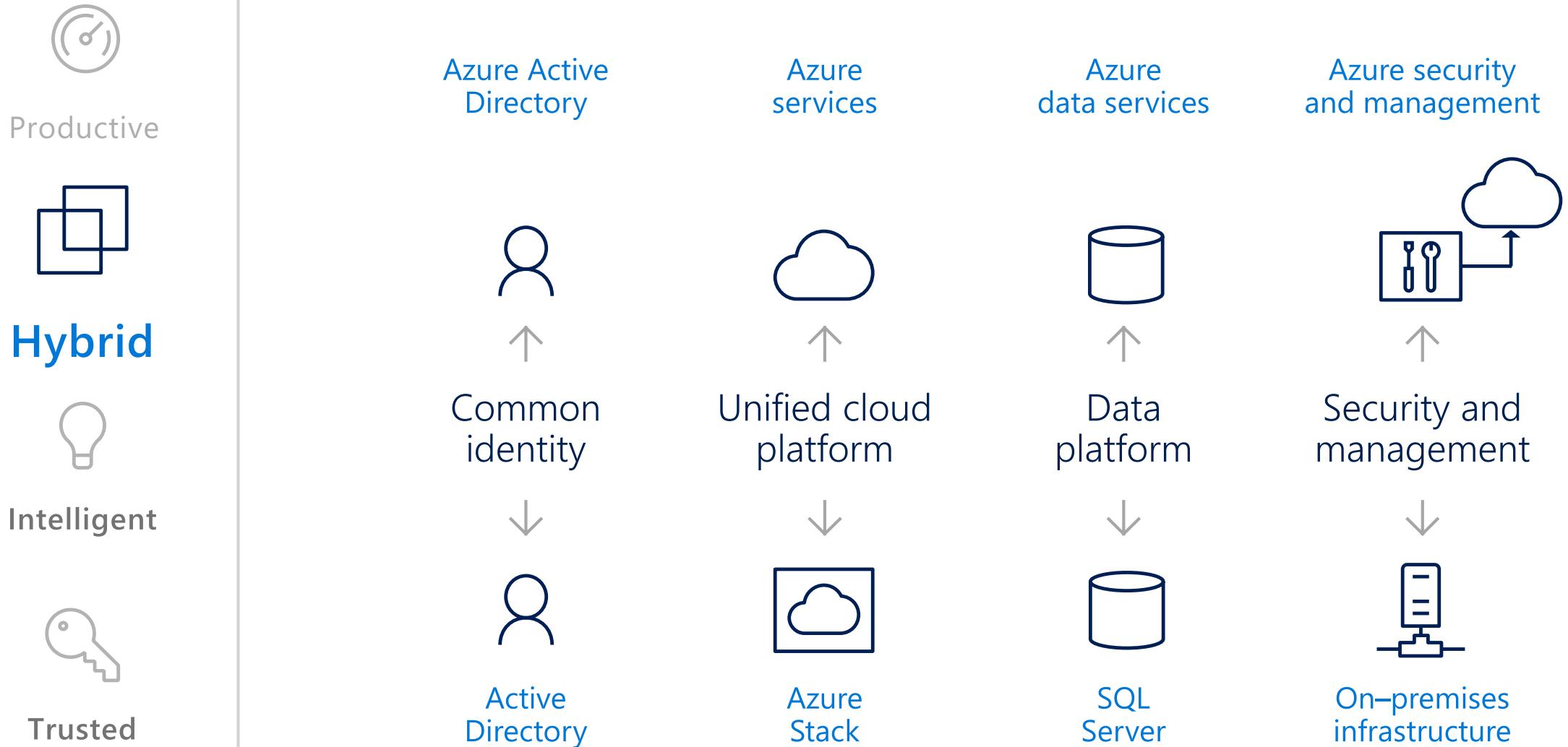
Single cloud | Policy  
and Governance



# Open source support

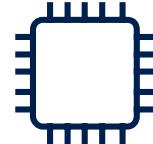
<b>DevOps</b>										
<b>Management</b>										
<b>Applications</b>										
<b>App frameworks &amp; tools</b>										
<b>Databases &amp; middleware</b>										
<b>Infrastructure</b>										

# The only consistent, hybrid cloud





# Comprehensive deep learning, machine learning as a service



## Customizable services

VS, ML STUB, Tensor, Caffe

## Tools

Bots, Cognitive, ML

## Infrastructure and compute

CPU, GPU, FPGA



# Azure



Productive



Hybrid



Intelligent



Trusted



50 Azure  
regions incl. 3 National Clouds

Video Tour: [https://www.youtube.com/watch?v=0uRR72b\\_qvc](https://www.youtube.com/watch?v=0uRR72b_qvc)

# Azure covers 73 compliance offerings

Azure has the deepest and most comprehensive compliance coverage in the industry

Global

- ISO 27001:2013
- ISO 27017:2015
- ISO 27018:2014
- ISO 22301:2012
- ISO 9001:2015
- ISO 20000-1:2011
- SOC 1 Type 2
- SOC 2 Type 2
- SOC 3
- CSA STAR Certification
- CSA STAR Attestation
- CSA STAR Self-Assessment
- WCAG 2.0

US Gov

- FedRAMP High
- FedRAMP Moderate
- EAR
- DoD DISA SRG Level 5
- DoD DISA SRG Level 4
- DoD DISA SRG Level 2
- DFARS
- DoE 10 CFR Part 810
- NIST SP 800-171
- NIST CSF
- Section 508 VPATs
- FIPS 140-2
- ITAR
- CJIS
- IRS 1075

Industry

- PCI DSS Level 1
- GLBA
- FFIEC
- Shared Assessments
- FISC (Japan)
- APRA (Australia)
- FCA (UK)
- MAS + ABS (Singapore)
- 23 NYCRR 500
- HIPAA BAA
- HITRUST
- 21 CFR Part 11 (GxP)
- MARS-E
- NHS IG Toolkit (UK)
- NEN 7510:2011 (Netherlands)
- FERPA
- CDSA
- MPAA
- FACT (UK)
- DPP (UK)
- SOX

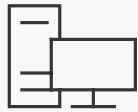
Regional

- Argentina PDPA
- Australia IRAP Unclassified
- Australia IRAP Protected
- Canada Privacy Laws
- China GB 18030:2005
- China DJCP (MLPS) Level 3
- China TRUCS / CCCPPF
- EN 301 549
- EU ENISA IAF
- EU Model Clauses
- EU – US Privacy Shield
- Germany IT-Grundschutz workbook
- Germany C5
- India MeitY
- Japan CS Mark Gold
- Japan My Number Act
- Netherlands BIR 2012
- New Zealand Gov CIO Fwk
- Singapore MTCS Level 3
- Spain ENS
- Spain DPA
- UK Cyber Essentials Plus
- UK G-Cloud
- UK PASF

# Most comprehensive resiliency and best SLA

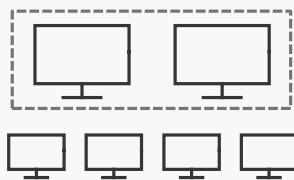
## INDUSTRY-ONLY

VM SLA  
99.9%



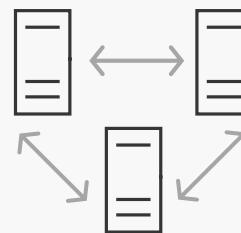
## INDUSTRY-LEADING HIGH AVAILABILITY SLA

VM SLA  
99.95%



**SINGLE VM**  
Protection with Premium Storage

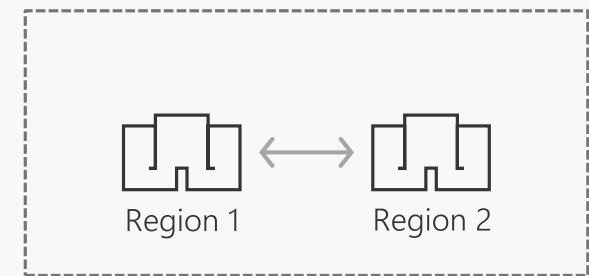
VM SLA  
99.99%



**AVAILABILITY SETS**  
Protection against failures within datacenters

## INDUSTRY-LEADING DISASTER RECOVERY

REGIONS  
50



**AVAILABILITY ZONES**  
Protection from entire datacenter failures

**REGION PAIRS**  
Protection from disaster with Data Residency compliance

# 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

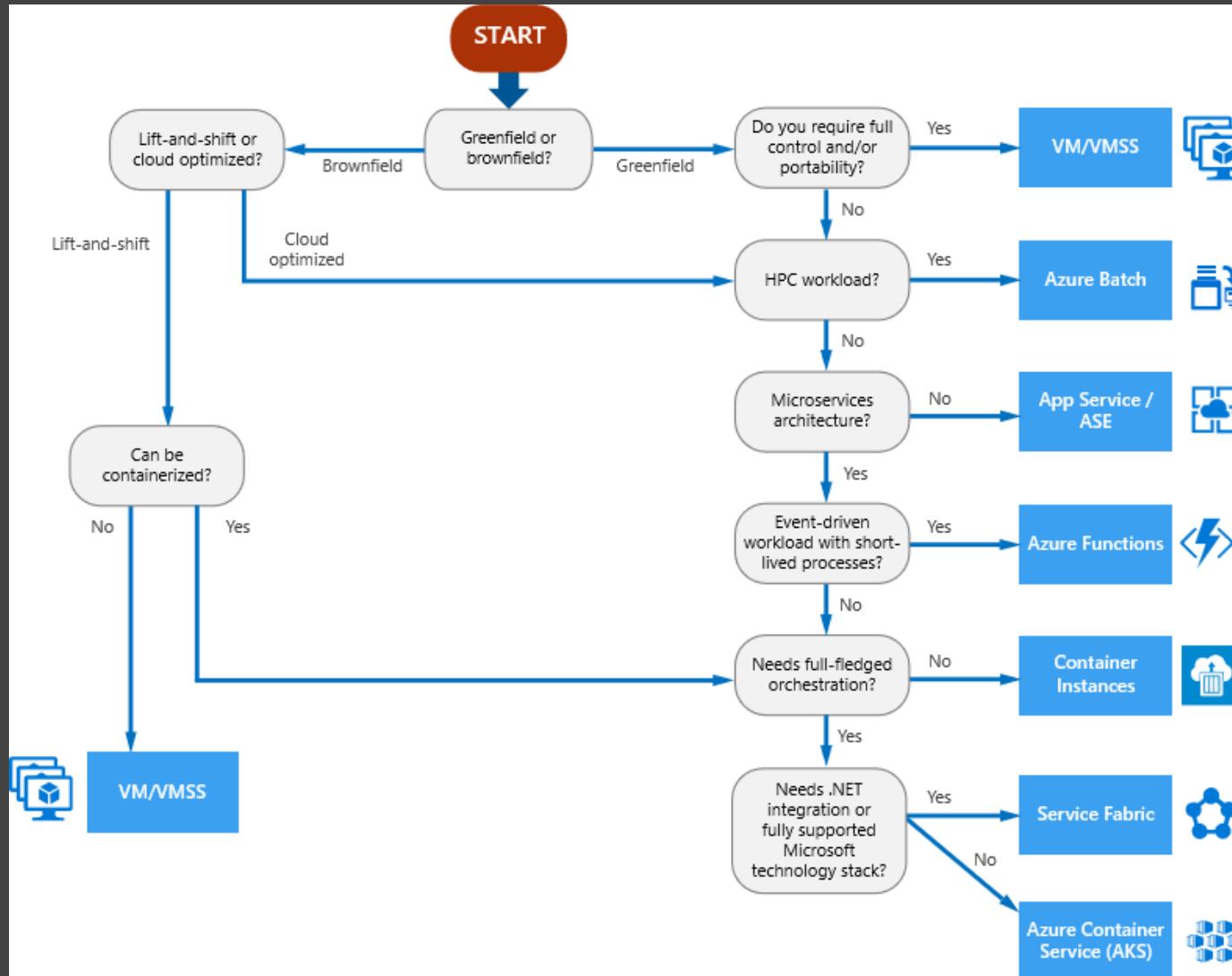
- Peace of mind with future patent protection
- Receive a license if Microsoft sells any patents to a NPE in the future
- Available to all consuming Azure customers<sup>3</sup>

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

# Azure compute services



Source: <https://docs.microsoft.com/en-us/azure/architecture/guide/technology-choices/compute-decision-tree>

# Blockchain

“...a sweeping vista of opportunity to reimagine how the financial system can and should work in the Internet era, and a catalyst to reshape that system in ways that are more powerful for individuals and businesses alike”

- Marc Andreessen, A16z

## Forbes

How Blockchain Can Create Owned And Trusted Health Care Records

How Blockchain Technology Could Work in the Insurance Industry

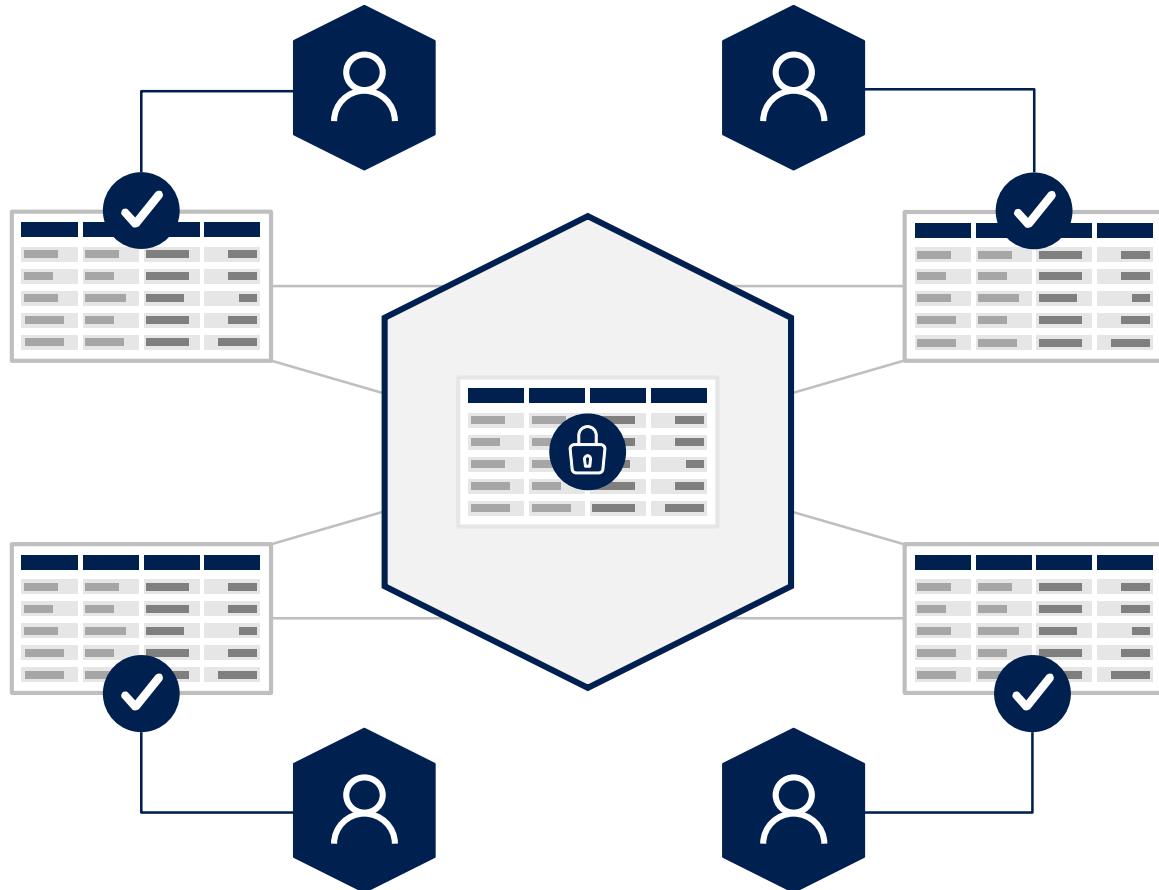
By The Guardian

CIO JOURNAL

Blockchain will be the killer app for supply chain management in 2018

Are You Eating Sustainable Fish? Blockchain May Provide the Answer

# Blockchain establishes a secure, shared source of truth



Data is stored in a ledger—a record of every transaction

Everyone in the network has an individual, identical copy

The ledger can only be updated by network consensus, and information can't be altered or deleted without the knowledge of the whole network

# The types of assets vary across industries



- Ensuring supply chain integrity e.g. sensitive pharmaceuticals
- Managing movement across a complex supply chain
- Preventing tampering and counterfeit



- Improving the process for issuing bank guarantees
- Creating ease of access for guarantee beneficiaries and applicants
- Ensuring security of sensitive documents



- Facilitating thousands of hotel bookings on a daily basis
- Coordinating between many different booking systems
- Mitigating discrepancies that lead to booking errors



- Creating a system to track reward points
- Enabling system to span multiple partner organizations
- Reducing the risk of discrepancy



Asset transfer and provenance

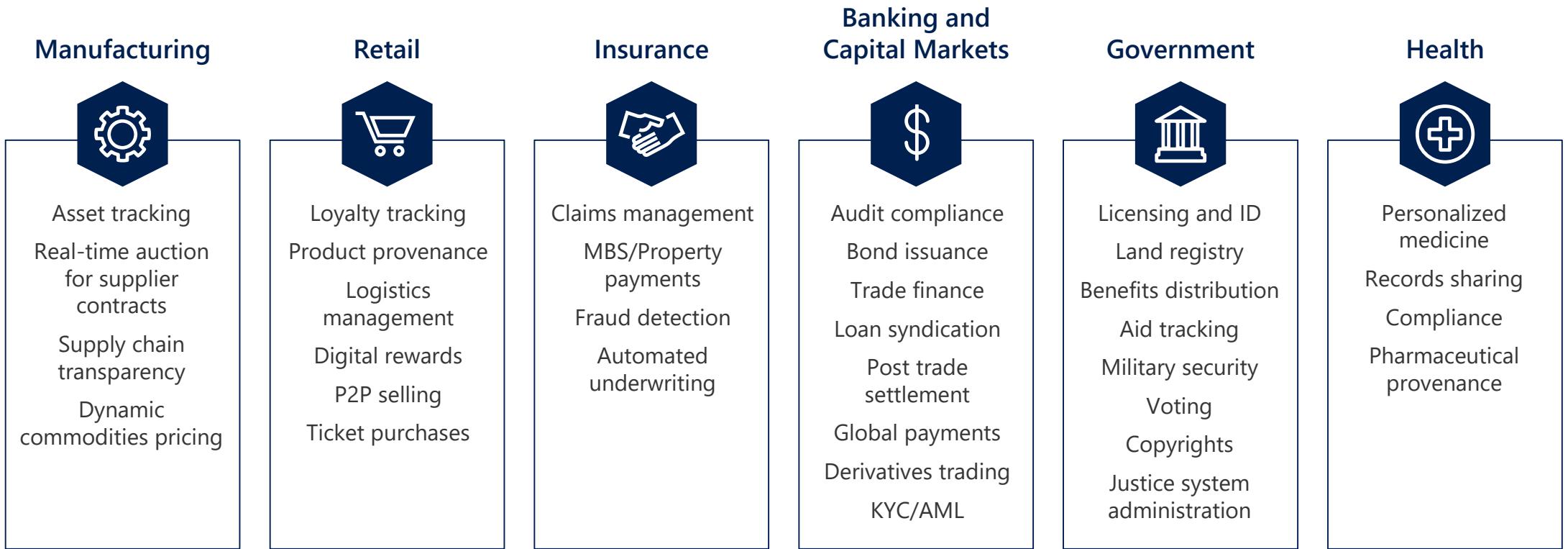


Cross-organizational workflow



Multiparty auditing

# We've seen this pattern in scenarios across industries



Asset transfer and provenance



Cross-organizational workflow



Multiparty auditing

# Customers looking for similar set of outcomes



## Reduce cost

Remove friction and enable direct interaction between parties

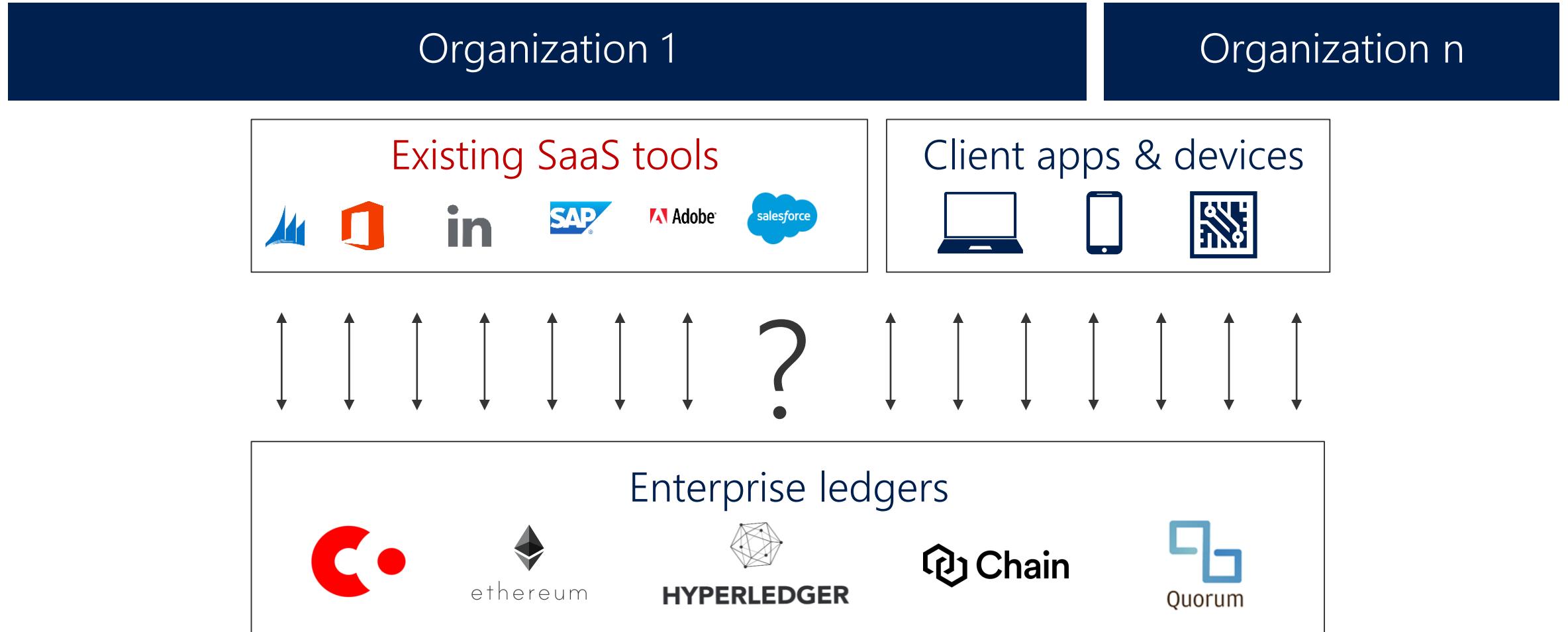
## Mitigate risk

Reduce security threats from fraud, hacking, and data manipulation

## Reimagine processes

Digitize processes beyond the four walls of your own business to reshape market dynamics

# It's hard to bridge the gap and deploy blockchain in your business



So we've taken steps to create a platform that would tackle those challenges



# We started by populating modular preconfigured templates and infrastructure

## Ledger and topology choice



ethereum



HYPERLEDGER



Chain

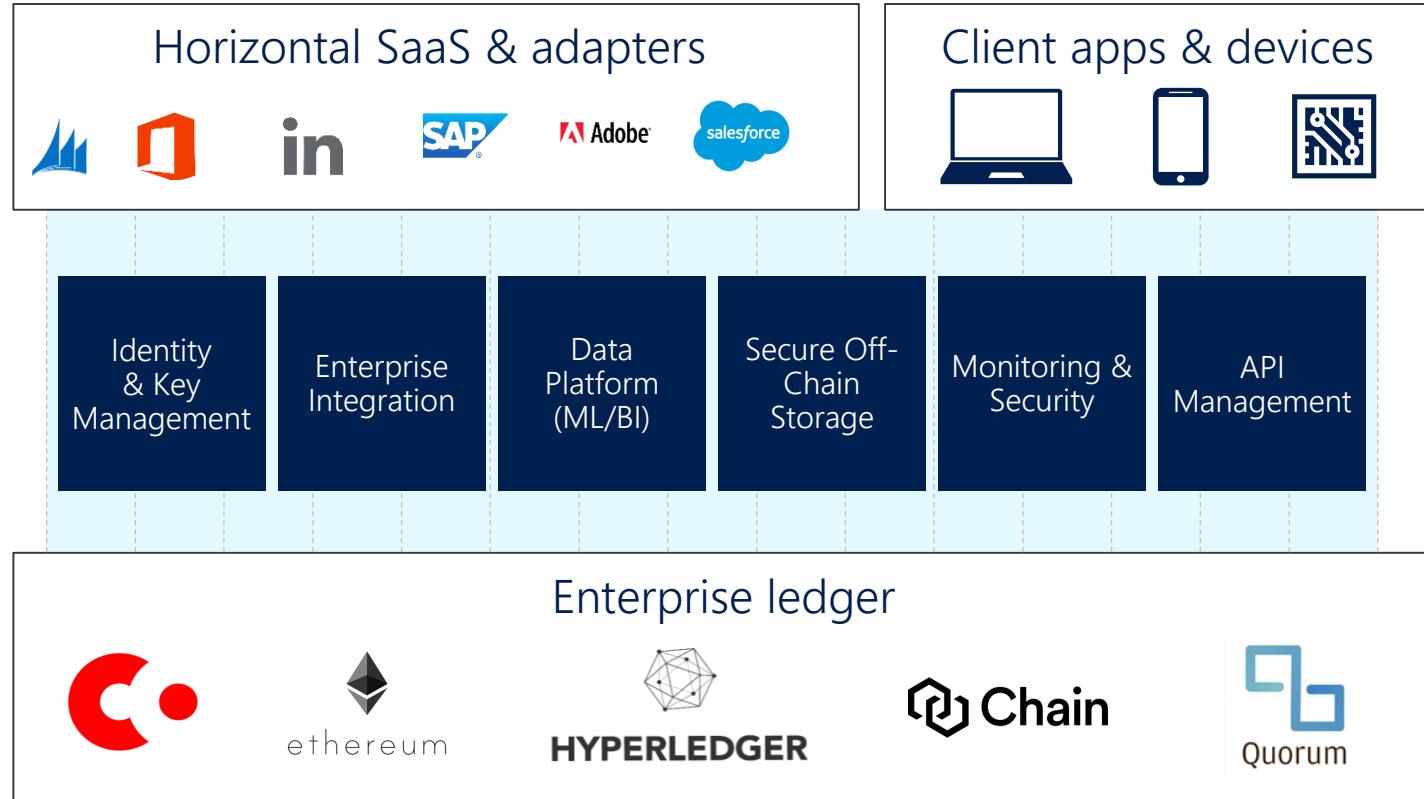


Quorum

**Choose the ledger** that meets your needs

**Deploy on flexible topologies** (dev test, single-node, or multi-node) so you can expand when you're ready

# Next, we enabled prebuilt connections to Azure and the tools you're already familiar with

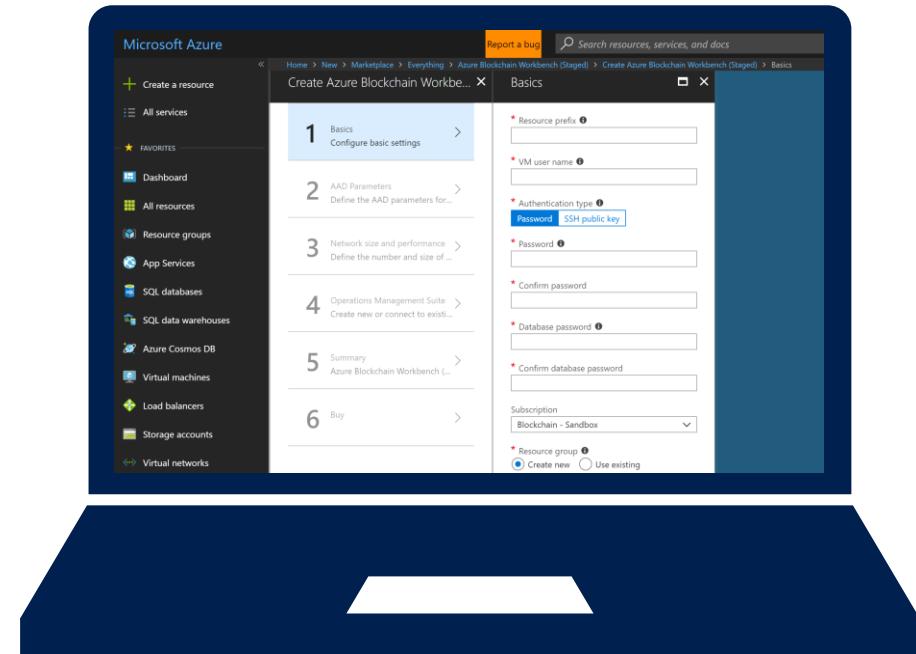
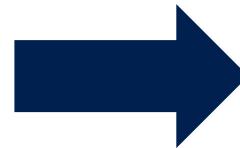
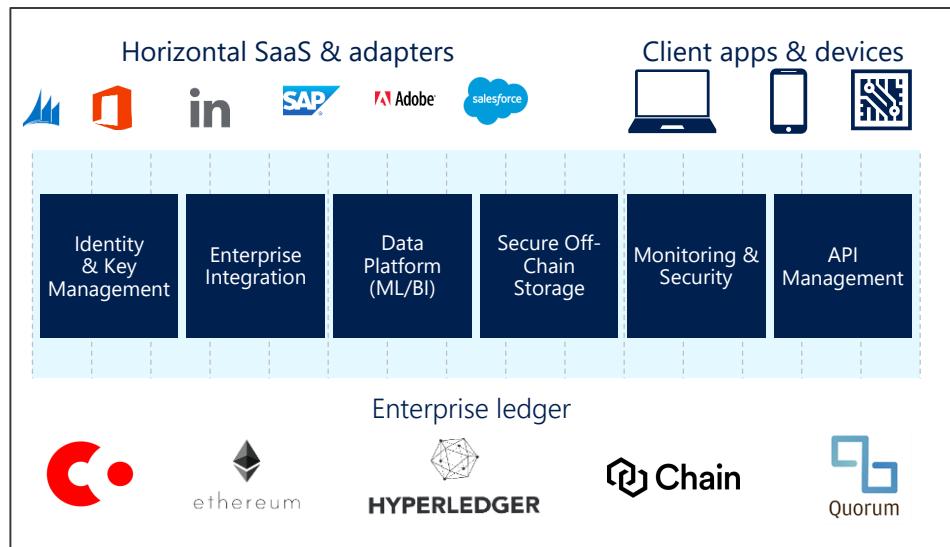


**Quickly integrate** with business apps

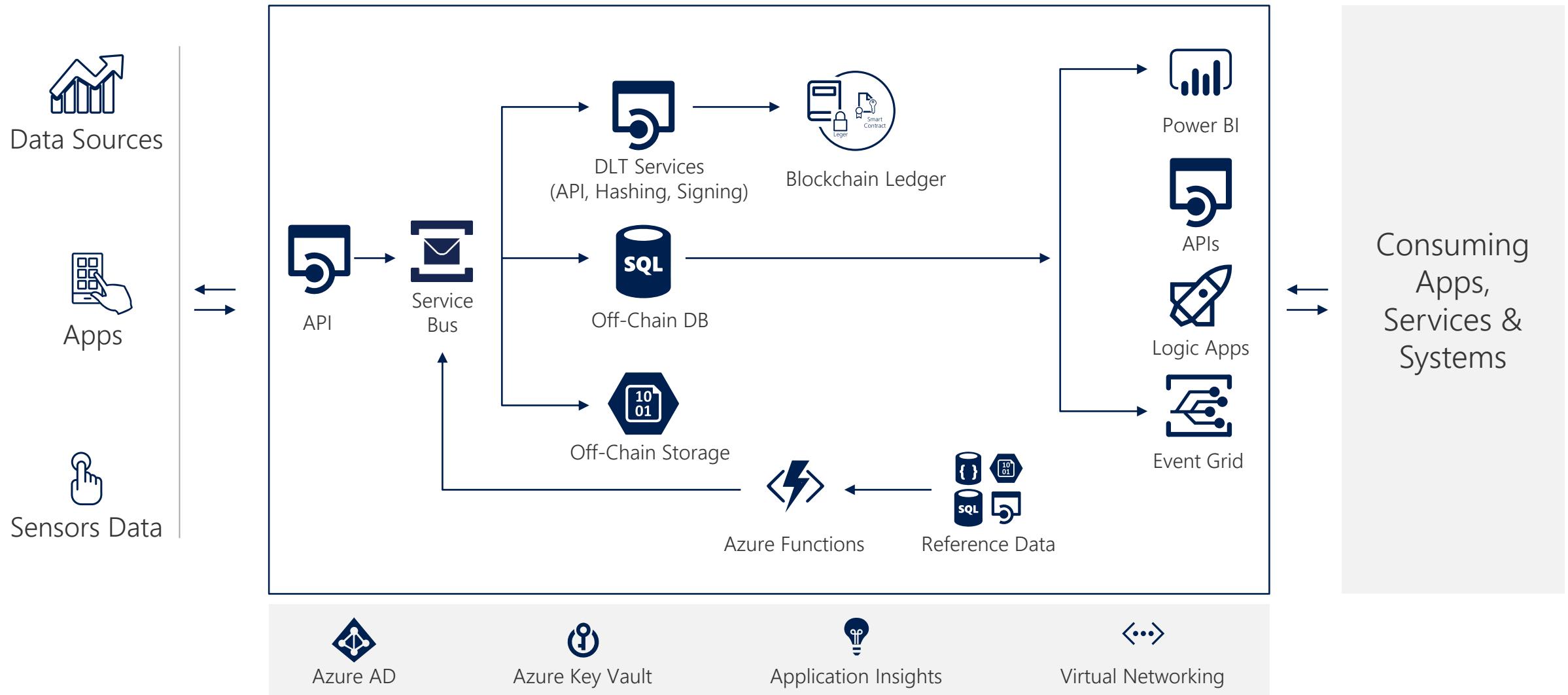
**Connect to the cloud** without the heavy lifting

# Now, we've built a simple interface for deploying these services and authoring smart contracts

## Azure Blockchain Workbench



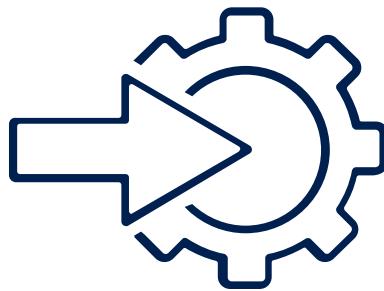
# With a clear, simplified approach



# Azure Blockchain offers significant benefits to developers



**Simplify**  
development



**Accelerate**  
time to value

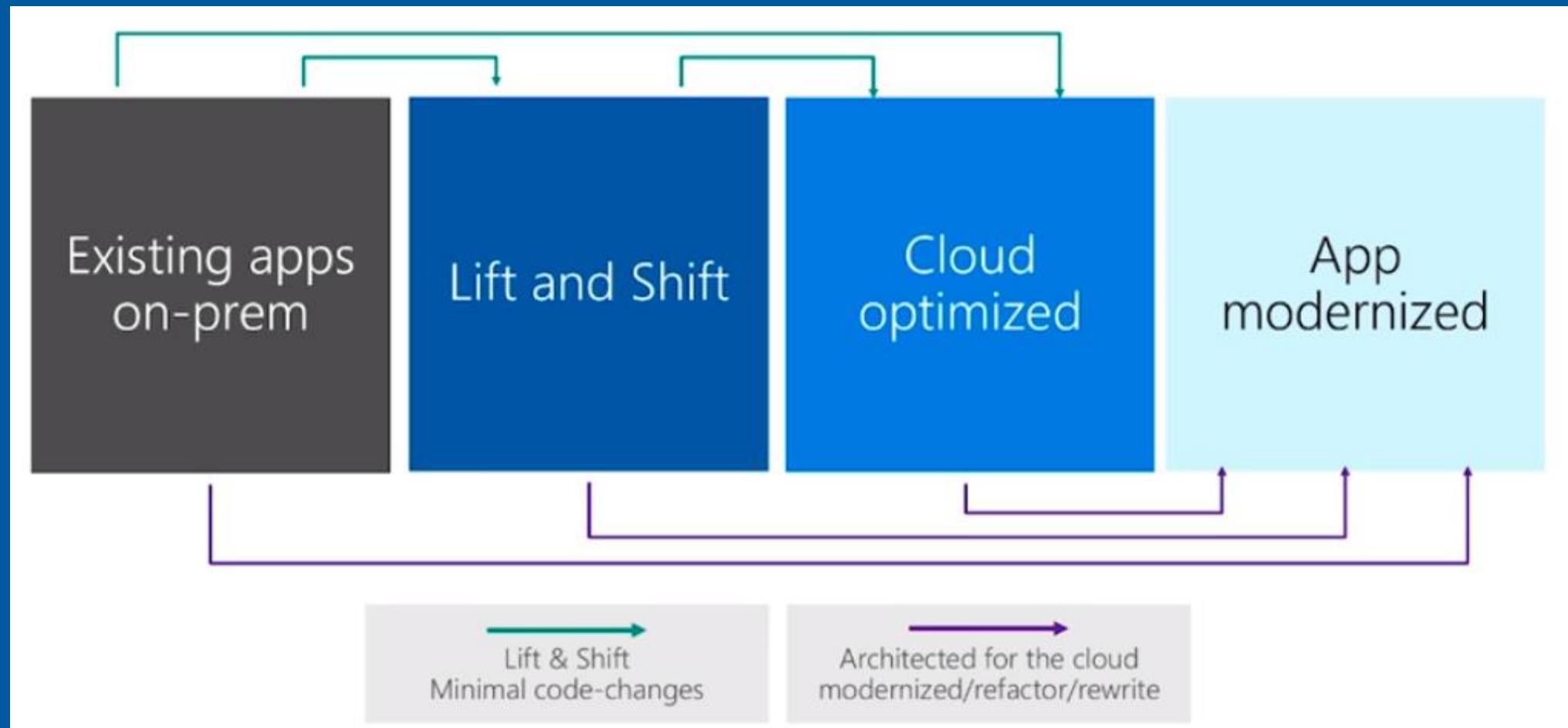


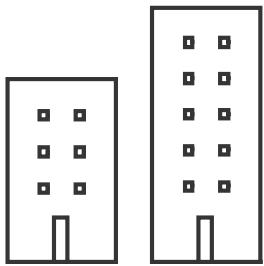
**Innovate**  
with confidence

More Info:

Part 1 - <https://www.youtube.com/watch?v=gwrYspdaOx8>  
Part 2 - [https://www.youtube.com/watch?v=mlRx52p61\\_g](https://www.youtube.com/watch?v=mlRx52p61_g)

# Application Modernization with PaaS, Serverless, Containers and DevOps



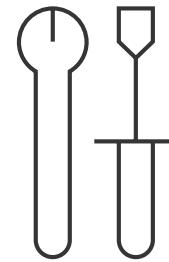


## Business needs

Rapid innovation

Connect with customer  
and empower employees

Close the gap from data  
to decision



## IT challenges

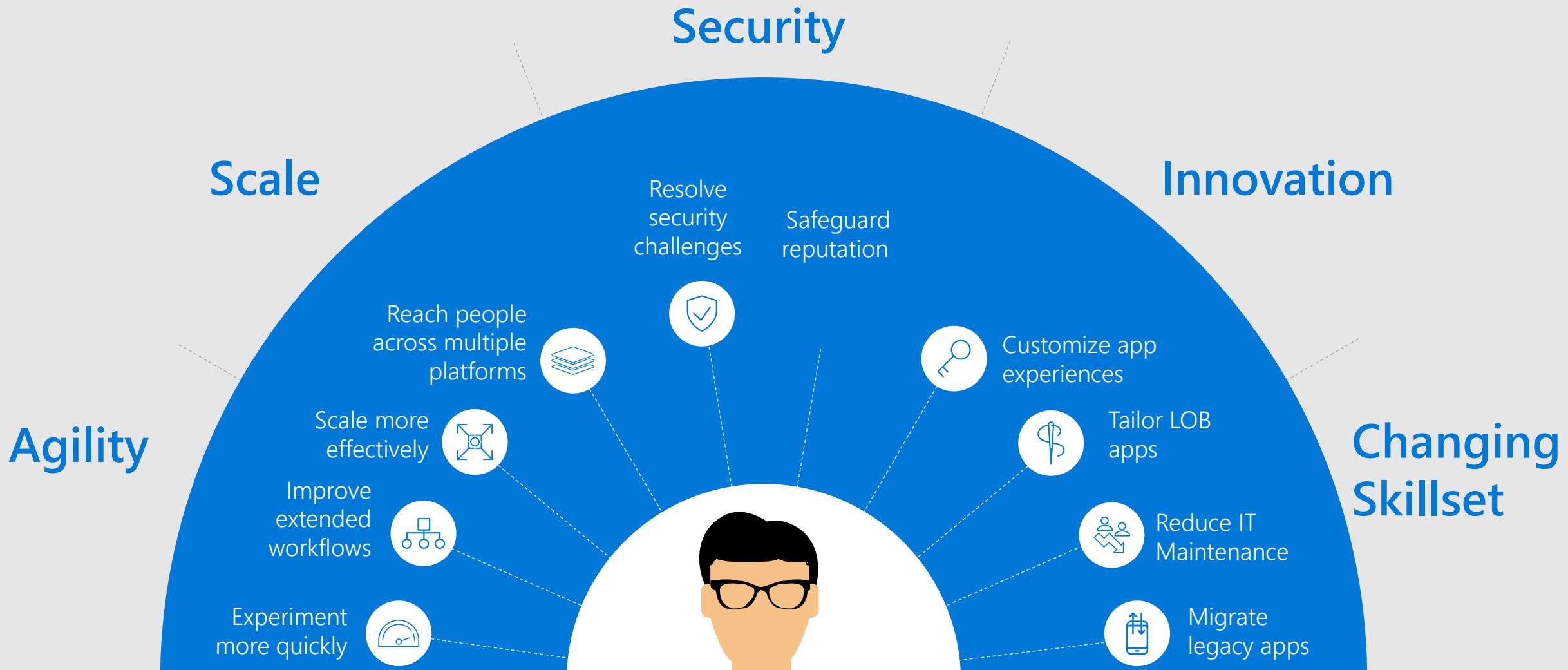
**72%**<sup>1</sup> budget assigned to  
keep-the-lights-on functions

Demand for mobile  
apps **>5x** the capacity of IT

**Only half** decision makers  
could get help from  
technologists with their  
analysis needs <sup>2</sup>

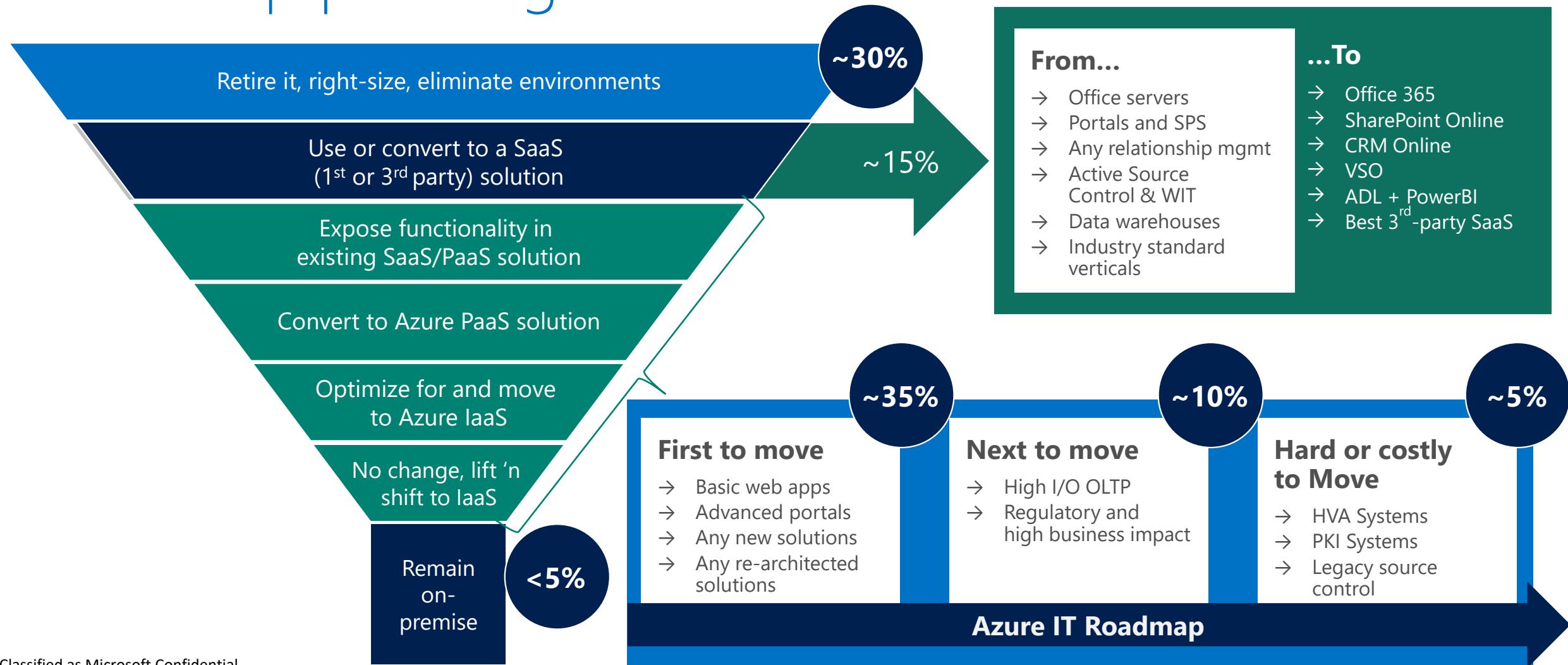
Widening digital divide between Business and IT

# You want to modernize apps also for these reasons



# Microsoft's Own Journey to the Cloud

## Roadmap planning



# Helping you achieve more



Deliver a modern experience  
on legacy systems

Challenge: Modern experience  
on top of their LoB apps, **400 systems of record, some are 30 years old**

Success:



From zero to a full-fledged  
ecommerce marketplace

Challenge: we will have to handle  
**millions of customers**. That  
requires a top-class e-commerce  
system built on a flexible, open  
cloud platform

Success:



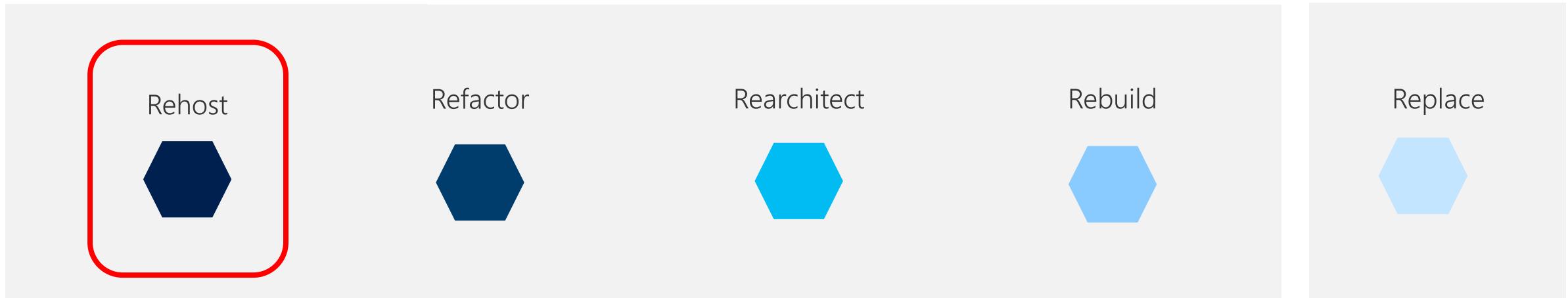
Customer Engagement Innovator with  
rich mobile app

Challenge: **pain points engaging customers via mobile**: add  
themselves to a wait list, get alerts,  
pay via mobile phone, and earn  
points in reward system. The  
process needs to streamlined.

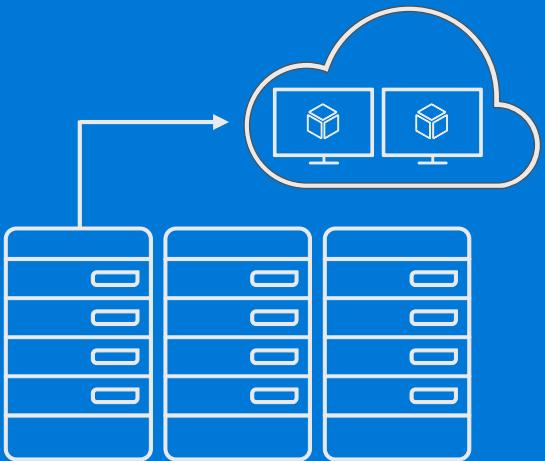
Success:



# The Journey to the Cloud



# Rehost



## Definition:

Rehosting is also referred to as a "lift-and-shift" migration. In essence, the application is moved into the IaaS environment of a cloud provider while avoiding as many modifications to the system as possible. In this case, you would not be taking advantage of cloud technology such as autoscaling, for example.

## When to consider

- Ideal when your goal is to improve operational efficiencies, and free up data center space
- Maintenance apps for which the hardware is not worth additional investment
- Compute-intensive applications that are built for parallelism but don't require high-performance interprocess communications (IPC) and have independent datasets, and applications for which load balancing already increases scalability and availability.

## Benefits

- Drives higher ROI ([435%](#) from migration to IaaS). Try our [TCO Calculator](#).
- No need to manage data centers
- Enjoy flexible and scalable infrastructure

## Core technologies

- VM, VM Scale Set



GE Healthcare

## GE Healthcare's seamless migration to Azure

"Doctors working in different locations can all look at the same diagnostic images simultaneously. By running our image exchange software in the cloud, we can help reduce information silos and help doctors collaborate more easily and quickly on treatment plans."

Jeanie Banks

**GM of Commercial Cloud Solutions at GE**

### Result:

- Easy migration using Virtual machines to get on prem apps, SQL server and .net framework over to Azure with full compatibility.
- Fast time to market and lower operating cost
- Enables regulatory compliance (HIPAA BAA).
- Faster innovation when expanding to use PaaS post their Lift & Shift phase.

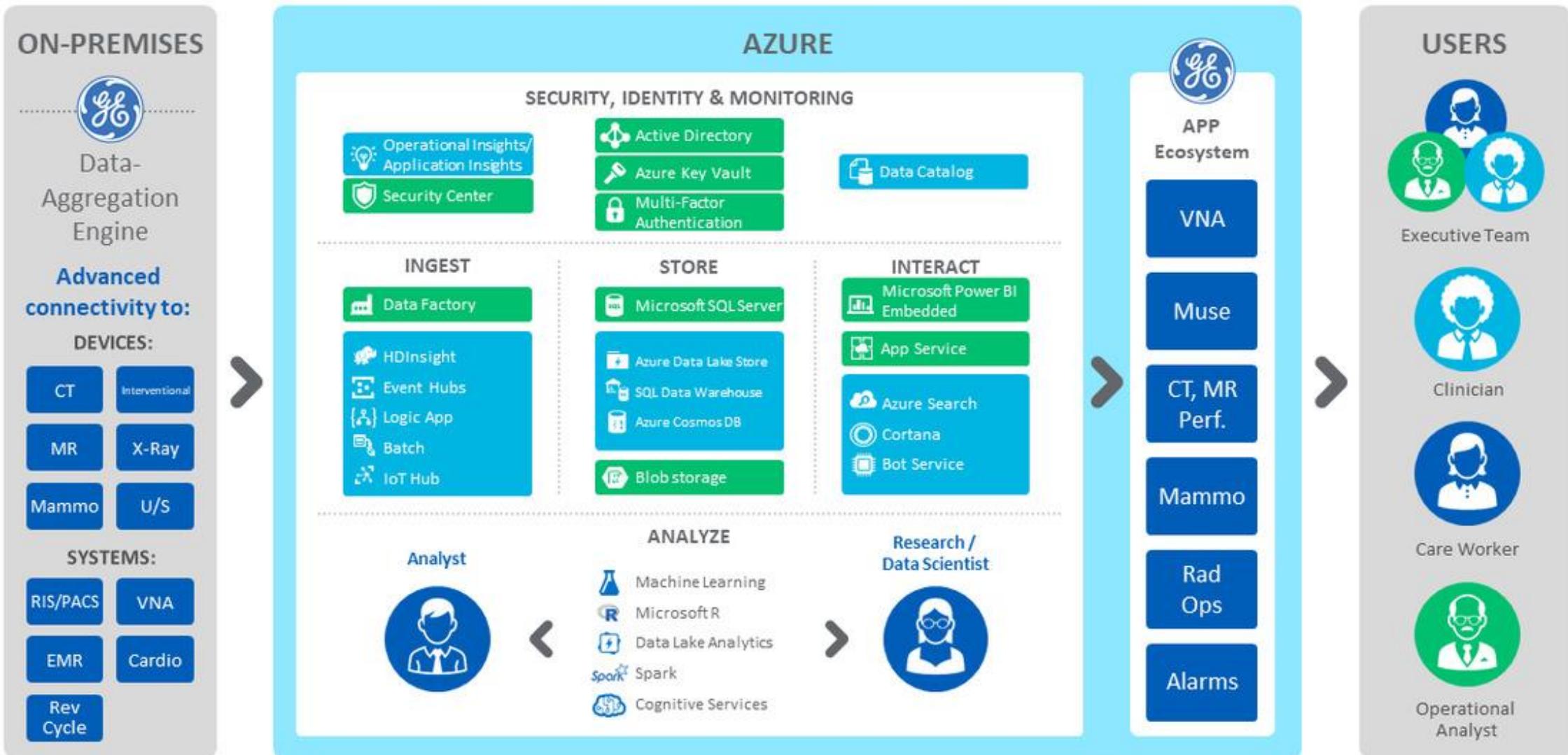


<https://customers.microsoft.com/en-US/story/ge-healthcare-delivers-core-customer-solutions-on-the>

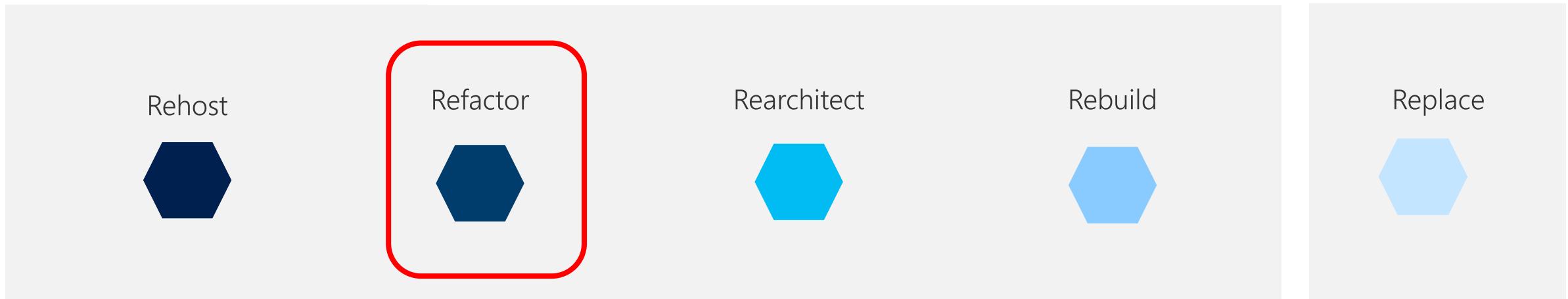
Currently used by GE

Opportunities

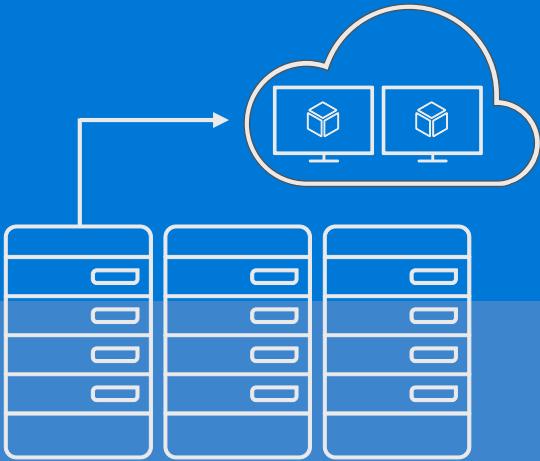
# GE Applied Intelligence on Microsoft Azure



# The Journey to the Cloud



# Refactor



## Definition

Refactoring an application involves some change to the application design, but not wholesale changes to the application code. The application takes advantage of IaaS and potentially PaaS capabilities from the provider while maintaining code strategic to the application's use case.

## When to consider

- You want to leverage existing development skills and codebase is paramount
- When code portability is a concern.
- You prefer a quick way to modernize your apps

## Benefits

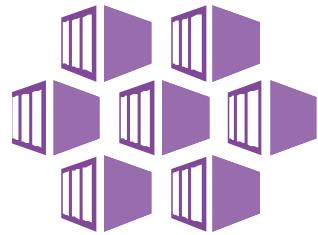
- Drive continuous innovation by leveraging built-in DevOps or using Containers.
- Easily scale up or down to meet the changing needs of the business
- Improved portability and density.
- Existing programming models, languages and frameworks that can be easily used and extended.
- Fast CI/CD.

## Core technologies

- Containers, container orchestration
- DevOps tools

Source: [Gartner IT Glossary](#)

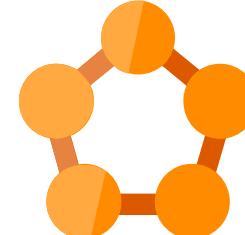
# Azure Container Technologies



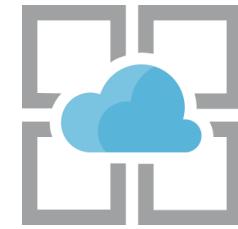
Azure Container  
Services (AKS)



Azure Container  
Instances



Azure Service  
Fabric



Azure App Service



Infrastructure Control

Developer productivity



# Run life-safety monitoring applications using Windows Server Containers and Docker

## Challenges

- Tyco has more than 3 million customers in 200 countries, protecting top companies and commercial vessels.
- The flagship monitoring application is very complex and contains hundreds of thousands of lines of code. Hard to deploy.
- Scalability: core apps need to support 18,000 Tyco users worldwide.

## Solutions:

Lift & shift into Windows containers using Docker engine

## Results

- Immediately modernized key legacy application with elasticity. "By using Windows Server Containers and Docker, we gain better consistency and control between developers, testers, and deployment teams without changing the application"
- Faster time to the market with minimal to zero downtime.
- The freedom to run apps anywhere

<https://customers.microsoft.com/en-us/story/tyco>

safety and security  
variety of markets.



Commercial & Industrial »



Government »



Home Security »

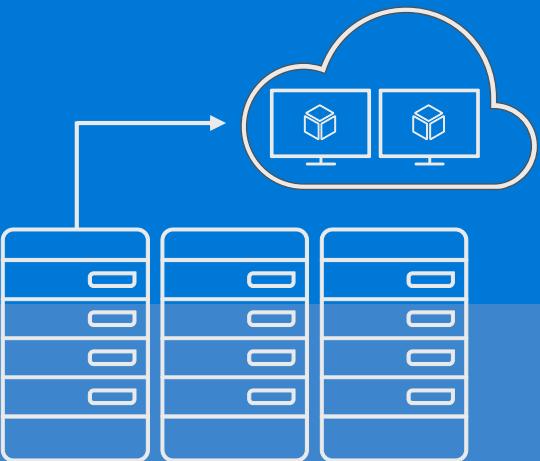


Marine »

# The Journey to the Cloud



# Rearchitect



## Definition:

Rearchitecting an application for cloud usage enables you to take advantage of technologies such as autoscaling and dynamic reconfiguration. This process will require developer resources to implement and can take significant time to implement.

## When to consider

- When apps need a major revision to incorporate new capabilities or take advantage of the cloud-native capabilities.

## Benefits

- Deliver **new capabilities and modernization** through modified codebase and a monolithic to micro services architectural revision.
- Reduce the volume of code needed to express a capability while still leveraging existing investments.
- Agility and scale.

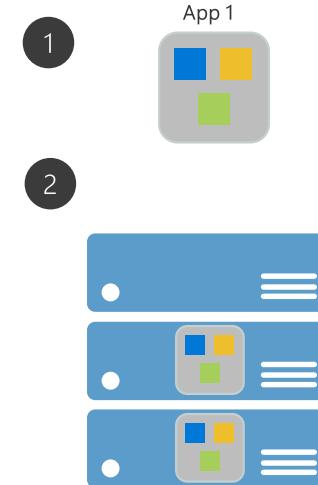
## Core technologies

- PaaS, microservices, containers and FaaS

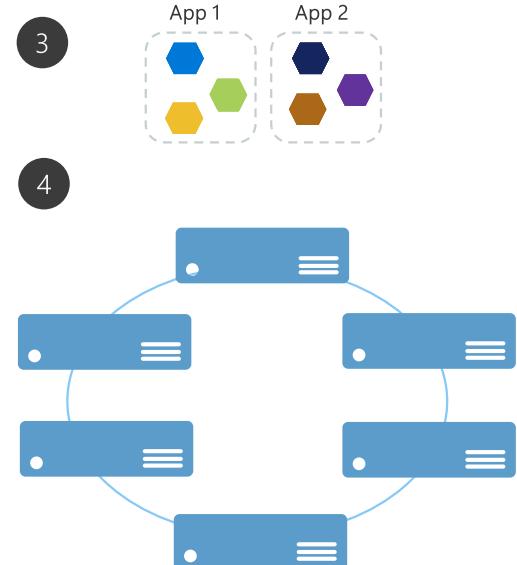
# Rearchitect: from monolithic app to microservices

- Individually built and deployed
- Small, independently executing services
- Integrate using published API calls for overall application's functionality
- Fine-grained, loosely coupled application

Monolithic application approach



Microservices application approach



# Deploying faster using Azure DevOps suite



## DevOps Tools

Streamline and speed up application delivery



## Developer Tools

Write better code with advanced developer tools



## Cloud Dev/Test

Save time and money with Cloud Dev/Test



## App Telemetry

Fix issues faster and improve applications with data and insights

**Visual Studio Team Services**  
Agile | Code | Build | Test | Deploy



**The Visual Studio Family**  
Visual Studio | Visual Studio Code |  
Visual Studio for **Mac** | Visual Studio  
App Center

**Microsoft Azure**  
Virtual Machines | Azure App Service | Azure Dev/Test Labs

**Microsoft Azure**  
Operations Management Suite  
Application Insights

## EcoStructure enabling IOT-driven operational intelligence via Azure Service Fabric

### Challenges

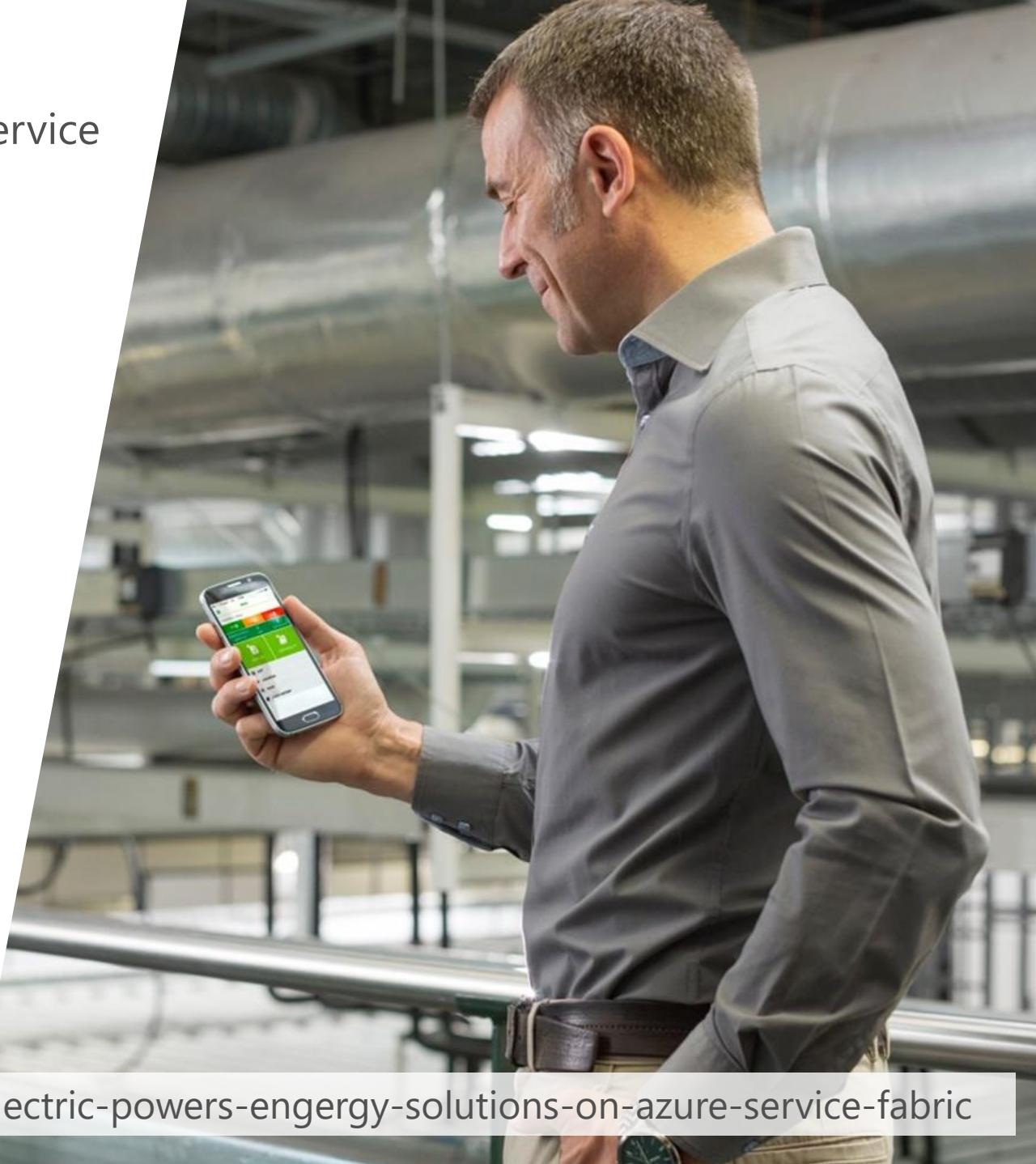
- Register and manage millions of connected devices
- Support multiple devices communicating over different protocols
- Query device state and execute commands on a device
- Scale to incorporate more devices, services and data.

### Solution:

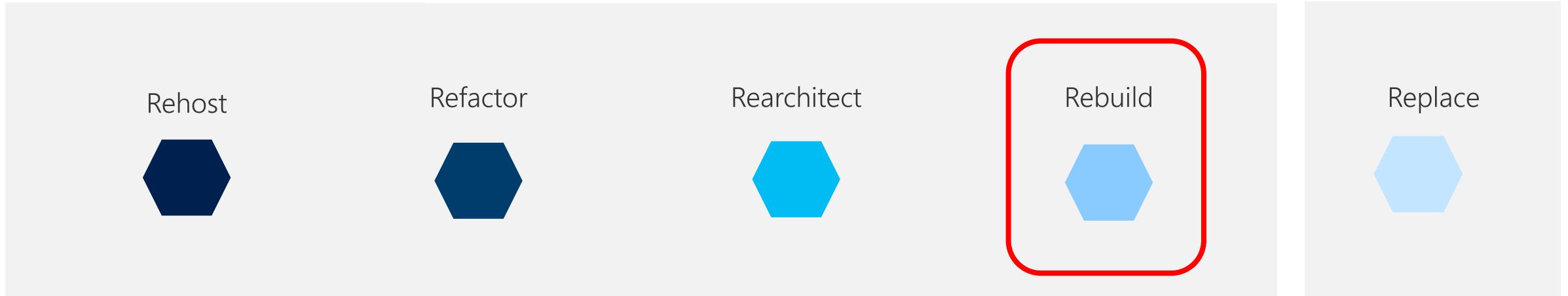
Using Service Fabric in order to better process data, provide device logic, and provide the device-connectivity framework

### Results

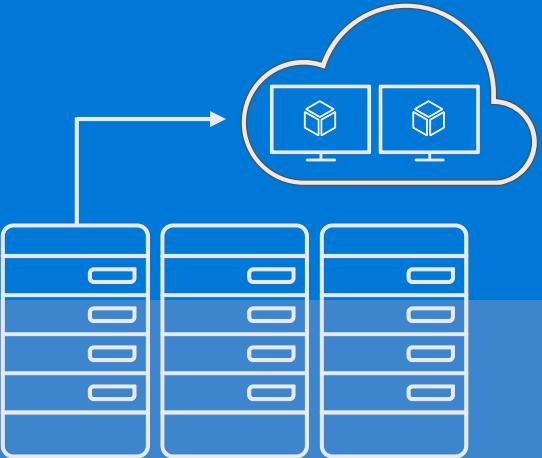
- Using Azure IoT with Service Fabric provides them with an **open, flexible, and highly scalable platform**.
- Elastic scalability: talk to projects that might have a thousand devices or a million devices



# The Journey to the Cloud



# Rebuild



## Definition:

Build new application using cloud native environment. Wherever possible, prioritize high-productivity PaaS - model driven or rapid application development

## When to consider

- You want to build for cloud-native PaaS environments from ground up.
- Leverage previous investment in a cloud platform, e.g. when customer data has already moved to the Cloud.
- Rapid prototyping is crucial or the scope of a current application is too limited in terms of functionality and lifespan.

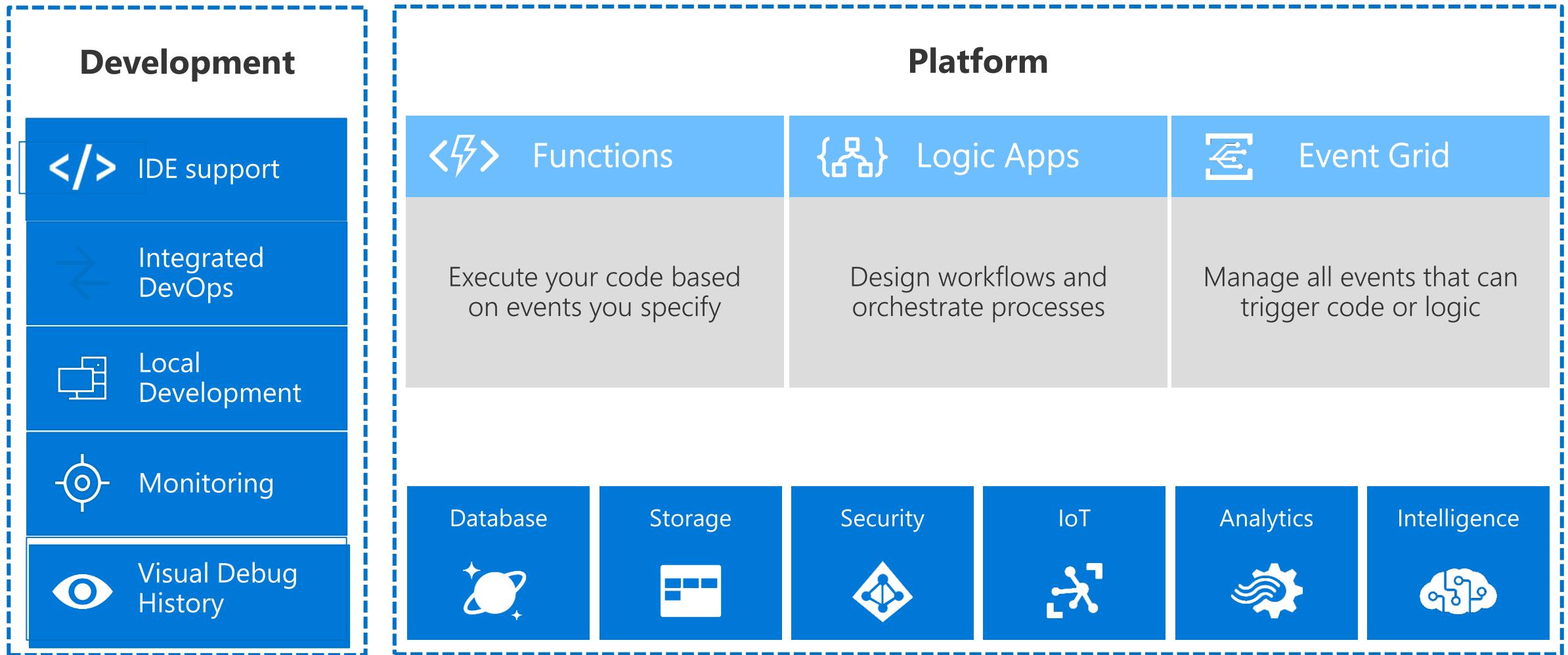
## Benefits

- Reduce TCO
- Fully leverage the cloud native capabilities and build applications faster
- Expedite your business innovation

## Core technologies

- Serverless, PaaS

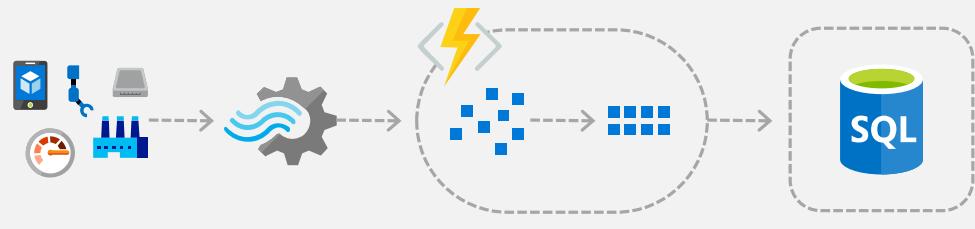
# Serverless application platform components



# Scenarios for Serverless

Anything that needs to respond to events

## Real-time stream processing

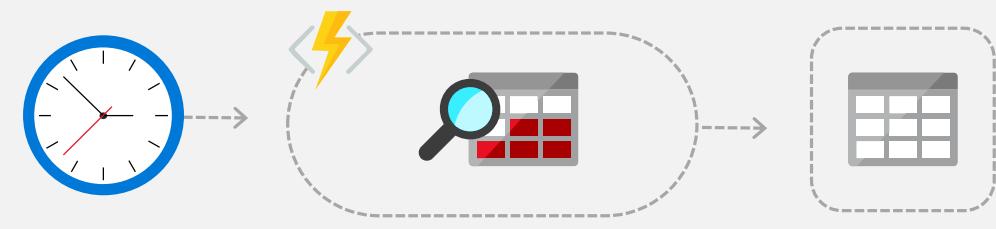


Millions of devices feed into Stream Analytics

Transform to structured data

Store data in SQL DB

## Timer-based processing



Every 15 minutes

Find and clean invalid data

Clean table

## Backends (Mobile/IoT/Web)

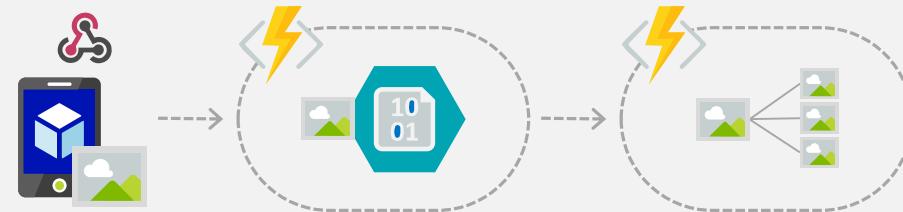


Photo taken and WebHook called

Stores in blob storage

Produces scaled images

## Real-time bot messaging



Message sent to Chatbot

Cortana Analytics answers questions

Chatbot sends response



## Transformed its service through **Serverless** technologies.

### Challenges

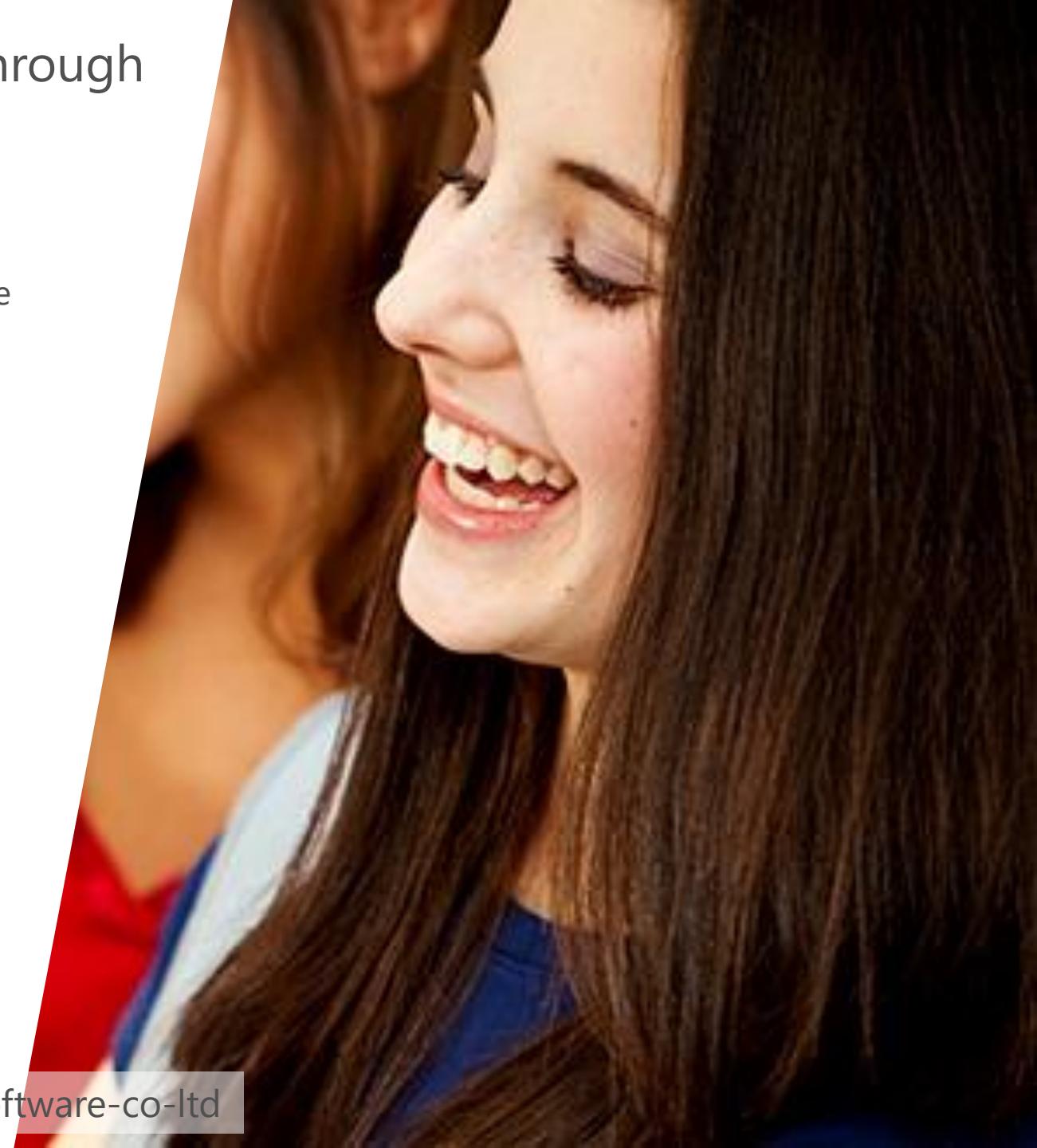
- The image haring service that handled more than a terabyte of data each day. They need reliability and lower latency in the service
- Add future enhancements more quickly and at a faster cadence
- Spent an inordinate amount of time in dealing with things that had nothing to do with the core business.

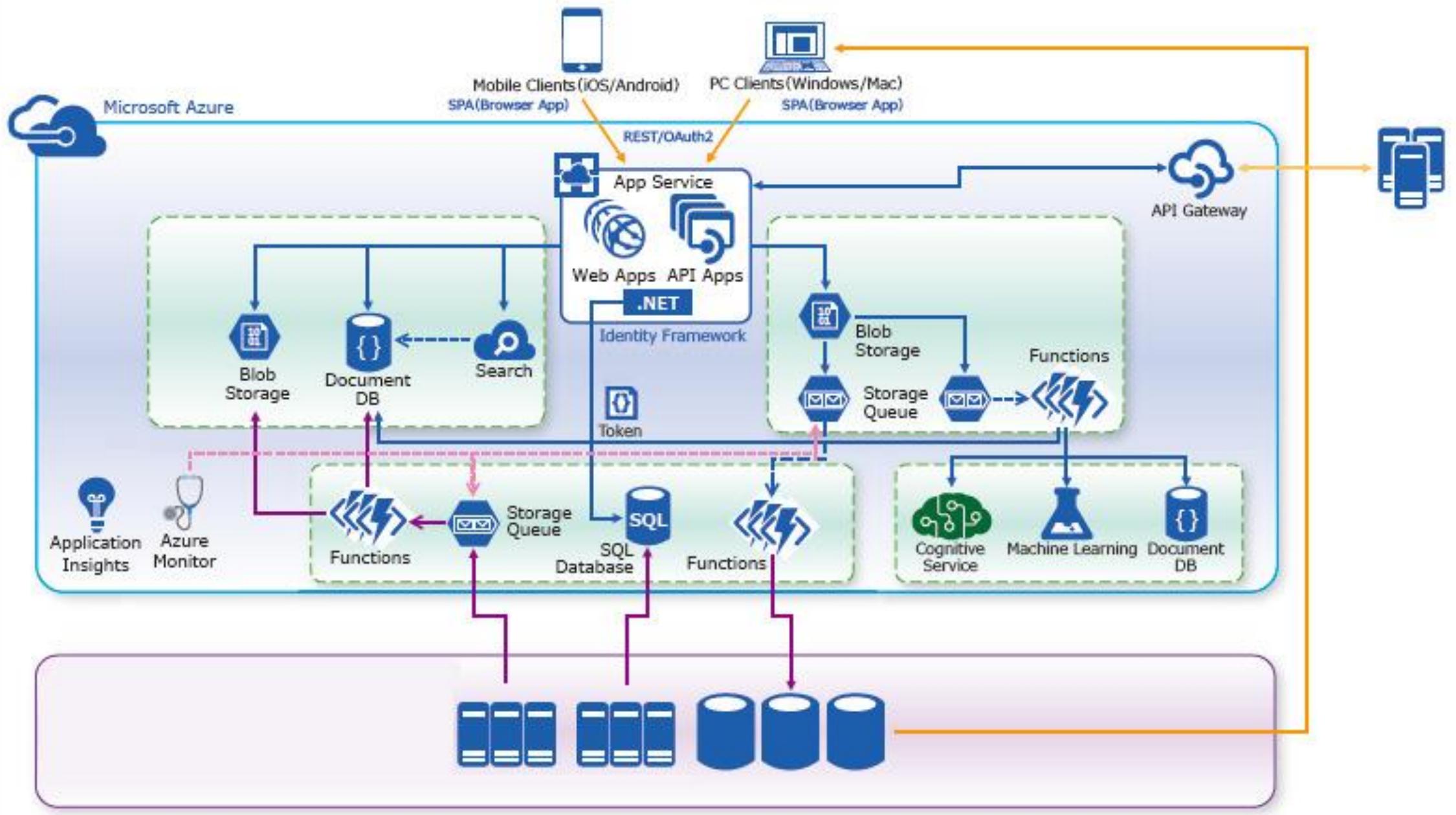
### Solutions:

moved to Serverless architecture

### Results

- Latency reduced by **95%**
- Development time reduced by **75%**
- Higher reliability
- Ability to add new features and releases faster and more frequently





IoT

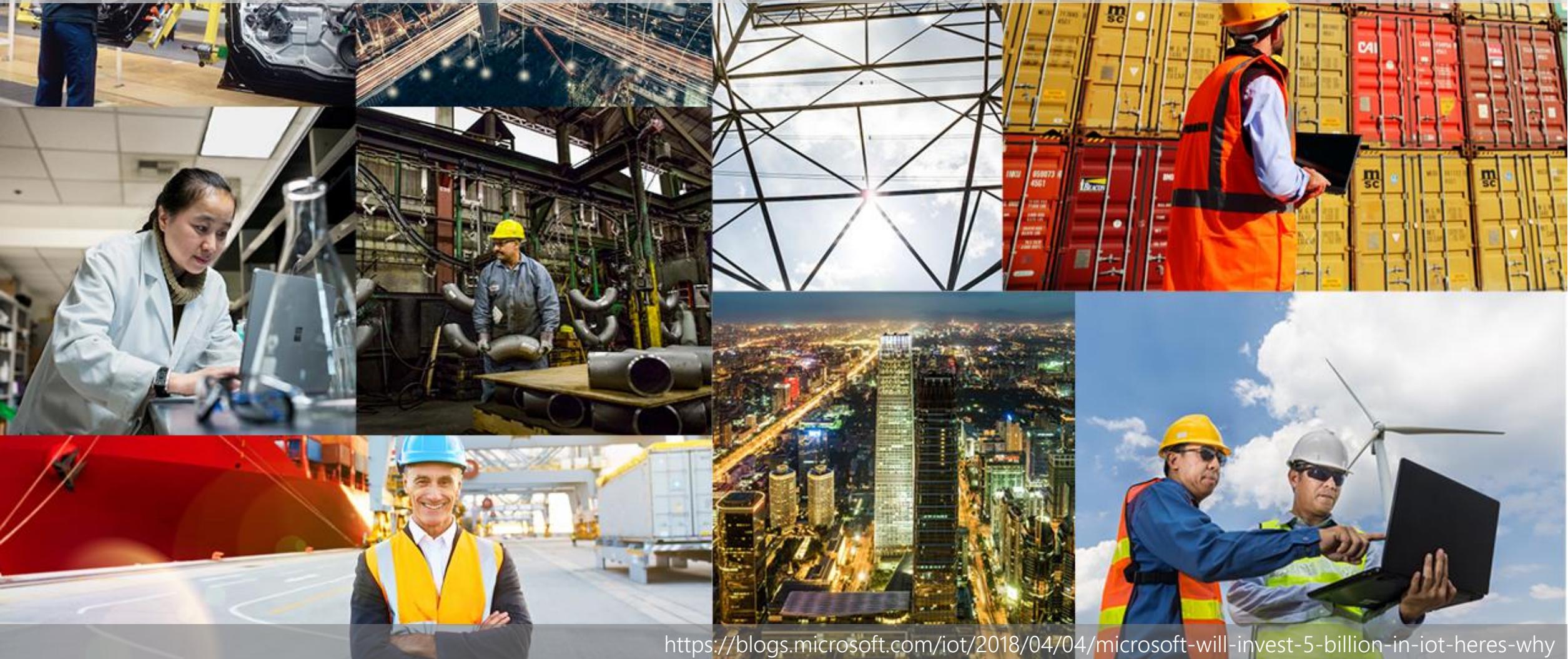


The Internet of Things isn't  
a technology revolution...

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

# MICROSOFT WILL INVEST \$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.



# Waves of innovation

## Cloud

Globally available, unlimited compute resources

## IoT

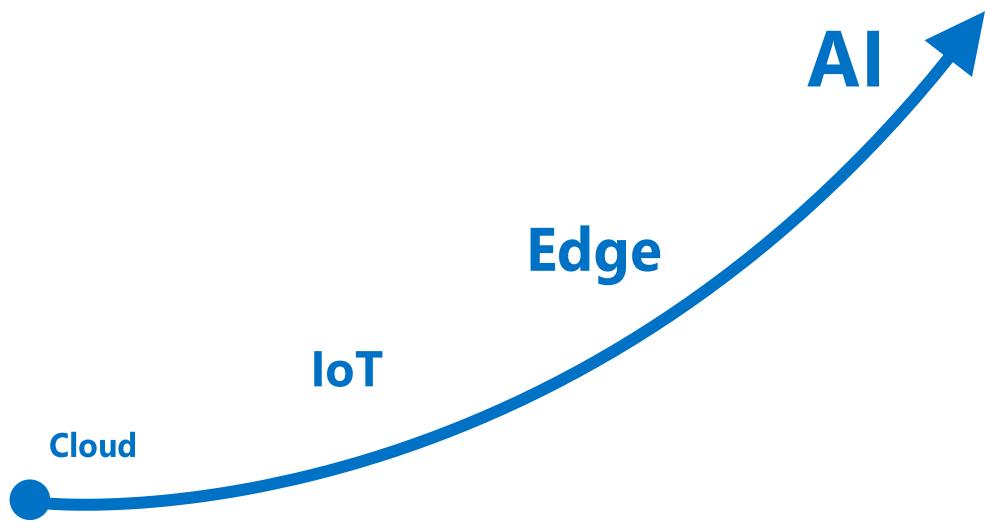
Harnessing signals from sensors and devices, managed centrally by the cloud

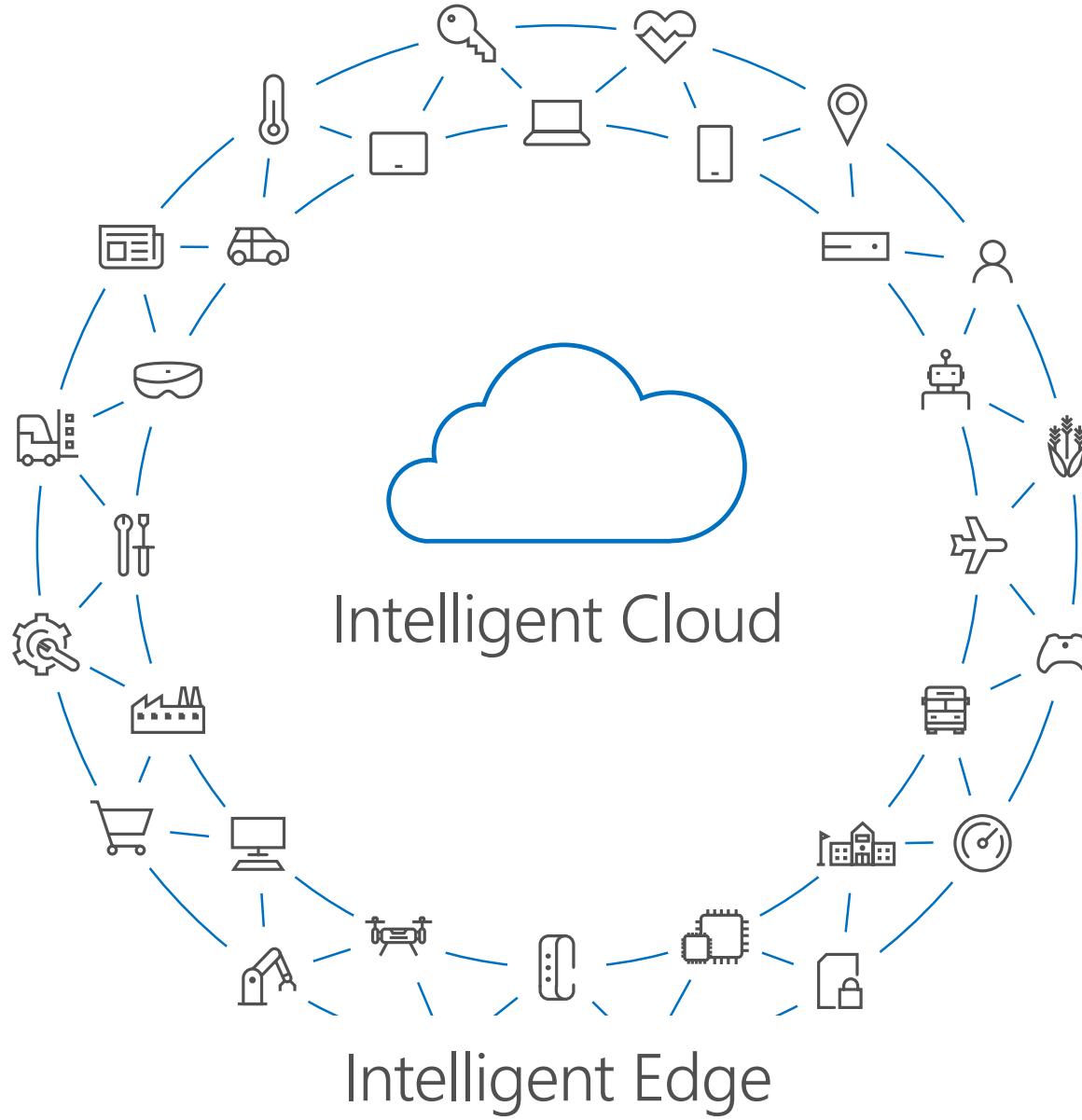
## Edge

Intelligence offloaded from the cloud to IoT devices

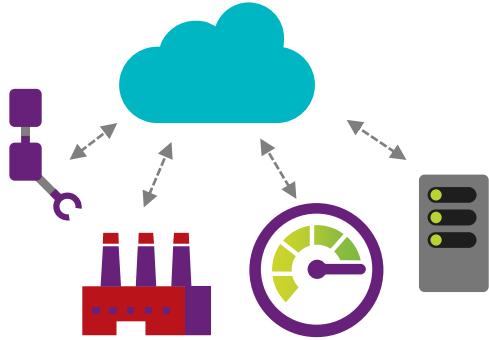
## AI

Breakthrough intelligence capabilities





# Why the edge?

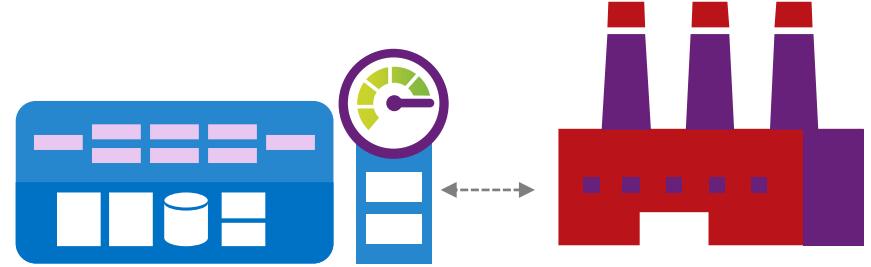


## IoT in the cloud

Remote monitoring and control

Merging remote data from across multiple IoT devices

Near infinite compute and storage to train machine learning and other advanced AI tools



## IoT on the edge

Low-latency, tight control loops require near-real-time response

Public Internet inherently unpredictable

Privacy of data and protection of IP



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

## RAC

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**

## HERSHEY'S

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

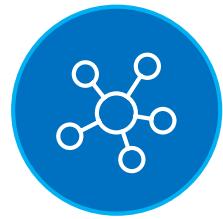
Access to production and supply chain data worldwide, **reduced downtime costs by as much as \$300,000 per day**

## FINNING CAT

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



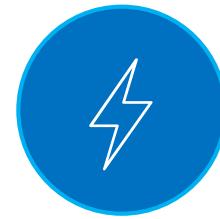
# Defining IoT



Things



Insights



Action

# IoT projects are still complex



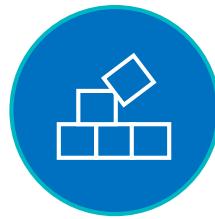
Security  
is a **challenge**



Time-consuming  
to get started



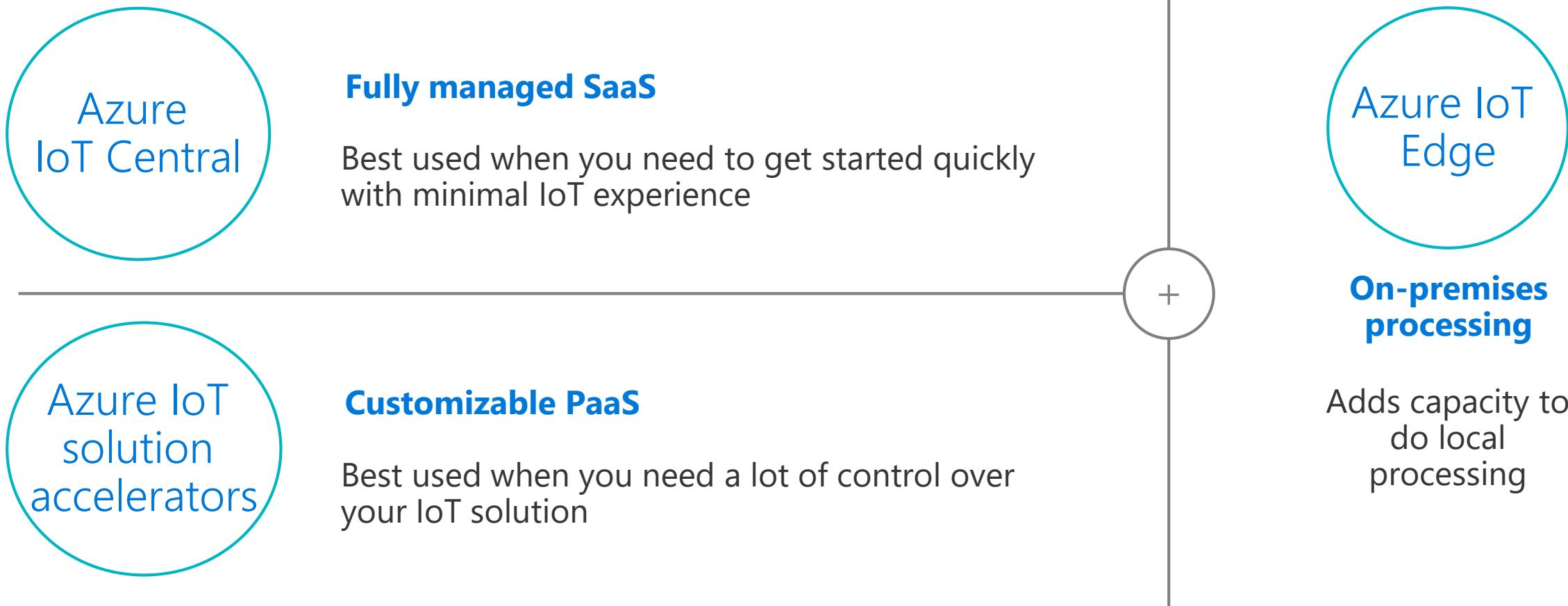
Incompatible with  
existing infrastructure



Challenging  
to scale

# Azure IoT Portfolio

Microsoft's vision is to democratize IoT by allowing everyone to access the benefits of IoT and provide the foundation for digital transformation





# Thank You!

ευχαριστώ

Salamat Po

متشکرم

شکرًا

Grazie

благодаря

ありがとうございます

Kiitos Teşekkürler

謝謝

ឧបករណ៍

Obrigado

شکریہ

Terima Kasih

Dziękuję

Hvala

Köszönöm

Tak

Dank u Wel

дякую

Tack

Mulțumesc

спасибо

Danke

Cám ơn

Gracias

多謝晒

Ďakujem

תודה

ശ്രദ്ധി

Děkuji

감사합니다

<http://aka.ms/AngelbeatJune2018Texas>



Thank you for joining us.