

<http://aka.ms/AngelbeatJune2018Texas>

Modernize your infrastructure and application portfolio

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



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June 2018



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Checkout other Regional Events

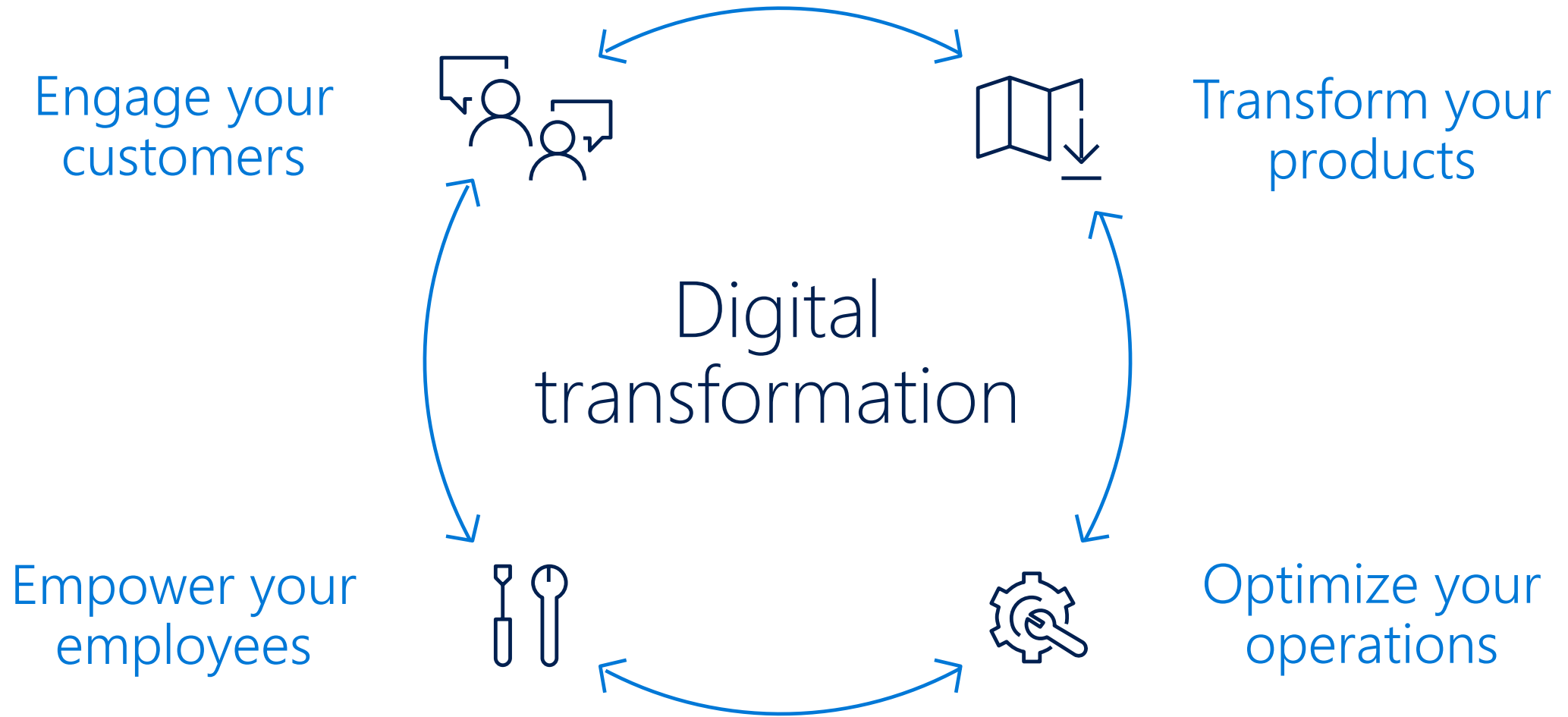
<https://aka.ms/AustinEvents>

More info about OCP

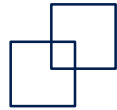
<http://aka.ms/USPartnerBriefing>



<http://www.UserGroup.tv>



Azure—cloud for all



Productive

Hybrid

Intelligent

Trusted

Unparalleled developer productivity



Integrated tooling

Visual Studio
third-parties | DevOps



100+ services

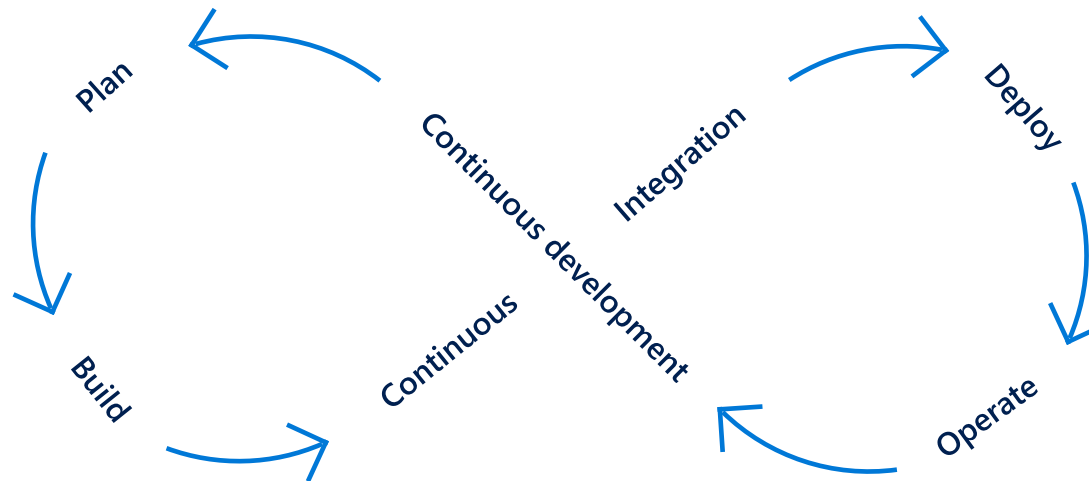
Azure Functions
Kubernetes | Logic Apps

<http://aka.ms/AzureCards>



Unified management

Single cloud | Policy
and Governance



Open source support

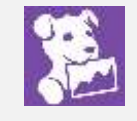
DevOps



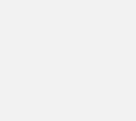
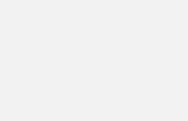
Nagios



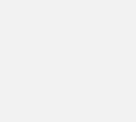
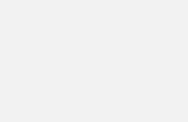
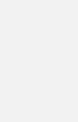
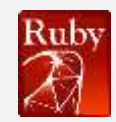
Management



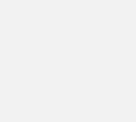
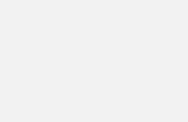
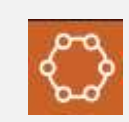
Applications



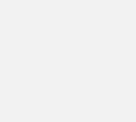
App frameworks & tools




Databases & middleware

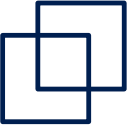


Infrastructure



The only consistent, hybrid cloud


Productive


Hybrid


Intelligent


Trusted

Azure Active
Directory



Common
identity



Active
Directory

Azure
services

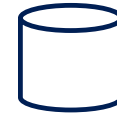


Unified cloud
platform



Azure
Stack

Azure
data services

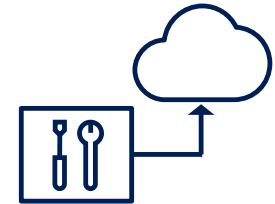


Data
platform



SQL
Server

Azure security
and management



Security and
management



On-premises
infrastructure

Comprehensive deep learning, machine learning as a service



Productive



Hybrid



Intelligent



Trusted



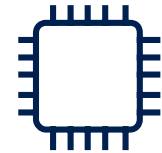
Customizable services

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

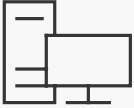
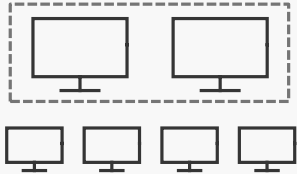
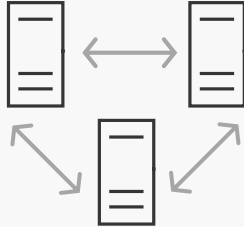
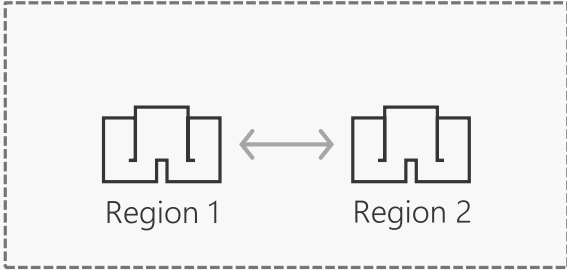
Azure covers 73 compliance offerings

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

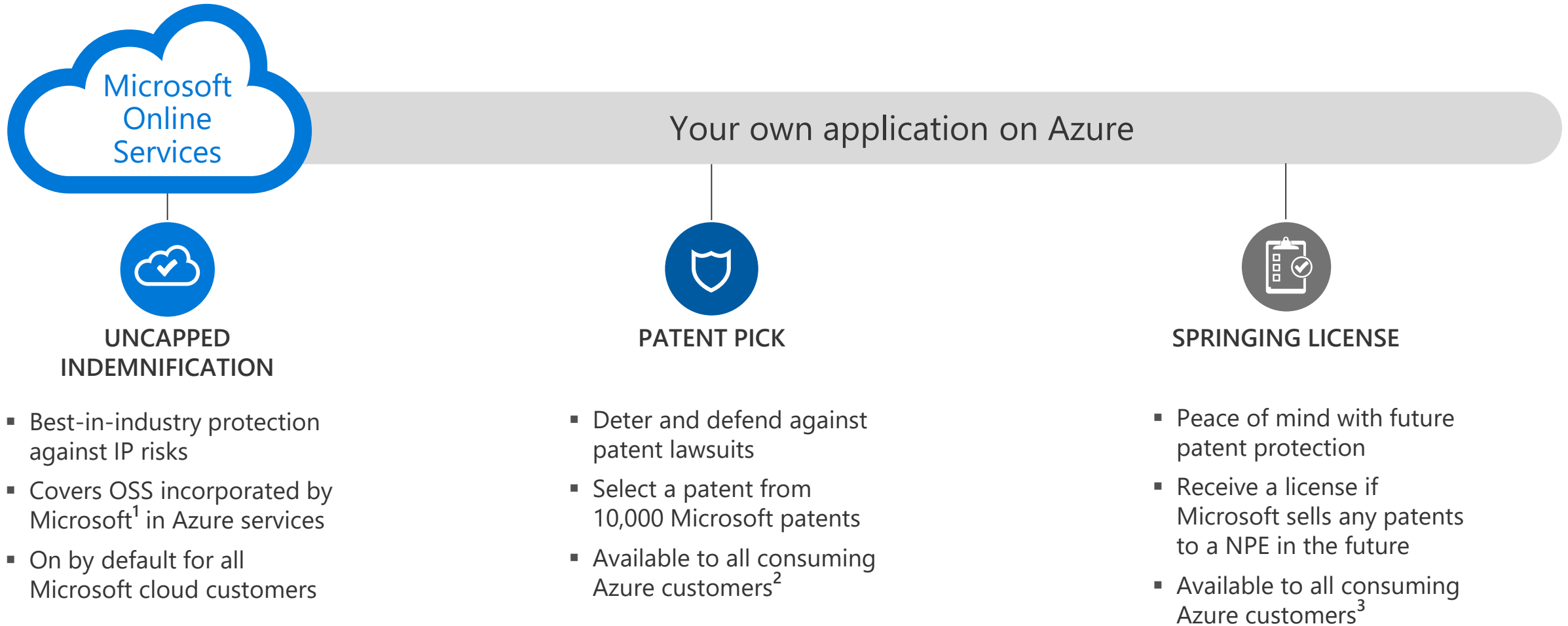
Global	<ul style="list-style-type: none">✓ ISO 27001:2013✓ ISO 27017:2015✓ ISO 27018:2014	<ul style="list-style-type: none">✓ ISO 22301:2012✓ ISO 9001:2015✓ ISO 20000-1:2011	<ul style="list-style-type: none">✓ SOC 1 Type 2✓ SOC 2 Type 2✓ SOC 3	<ul style="list-style-type: none">✓ CSA STAR Certification✓ CSA STAR Attestation✓ CSA STAR Self-Assessment✓ WCAG 2.0
US Gov	<ul style="list-style-type: none">✓ FedRAMP High✓ FedRAMP Moderate✓ EAR	<ul style="list-style-type: none">✓ DoD DISA SRG Level 5✓ DoD DISA SRG Level 4✓ DoD DISA SRG Level 2✓ DFARS	<ul style="list-style-type: none">✓ DoE 10 CFR Part 810✓ NIST SP 800-171✓ NIST CSF✓ Section 508 VPATs	<ul style="list-style-type: none">✓ FIPS 140-2✓ ITAR✓ CJIS✓ IRS 1075
Industry	<ul style="list-style-type: none">✓ PCI DSS Level 1✓ GLBA✓ FFIEC✓ Shared Assessments✓ FISC (Japan)✓ APRA (Australia)	<ul style="list-style-type: none">✓ FCA (UK)✓ MAS + ABS (Singapore)✓ 23 NYCRR 500✓ HIPAA BAA✓ HITRUST	<ul style="list-style-type: none">✓ 21 CFR Part 11 (GxP)✓ MARS-E✓ NHS IG Toolkit (UK)✓ NEN 7510:2011 (Netherlands)✓ FERPA	<ul style="list-style-type: none">✓ CDSA✓ MPAA✓ FACT (UK)✓ DPP (UK)✓ SOX
Regional	<ul style="list-style-type: none">✓ Argentina PDPA✓ Australia IRAP Unclassified✓ Australia IRAP Protected✓ Canada Privacy Laws✓ China GB 18030:2005✓ China DJCP (MLPS) Level 3	<ul style="list-style-type: none">✓ China TRUCS / CCCPPF✓ EN 301 549✓ EU ENISA IAF✓ EU Model Clauses✓ EU – US Privacy Shield✓ Germany IT-Grundschutz workbook	<ul style="list-style-type: none">✓ Germany C5✓ India MeitY✓ Japan CS Mark Gold✓ Japan My Number Act✓ Netherlands BIR 2012✓ New Zealand Gov CIO Fwk	<ul style="list-style-type: none">✓ Singapore MTCS Level 3✓ Spain ENS✓ Spain DPA✓ UK Cyber Essentials Plus✓ UK G-Cloud✓ UK PASF

<https://aka.ms/AzureCompliance>

Most comprehensive resiliency and best SLA

INDUSTRY-ONLY	INDUSTRY-LEADING HIGH AVAILABILITY SLA		INDUSTRY-LEADING DISASTER RECOVERY
VM SLA 99.9%	VM SLA 99.95%	VM SLA 99.99%	REGIONS 50
			
SINGLE VM Protection with Premium Storage	AVAILABILITY SETS Protection against failures within datacenters	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



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

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

CIO JOURNAL

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

Are You Eating Sustainable Fish? Blockchain May Provide the Answer

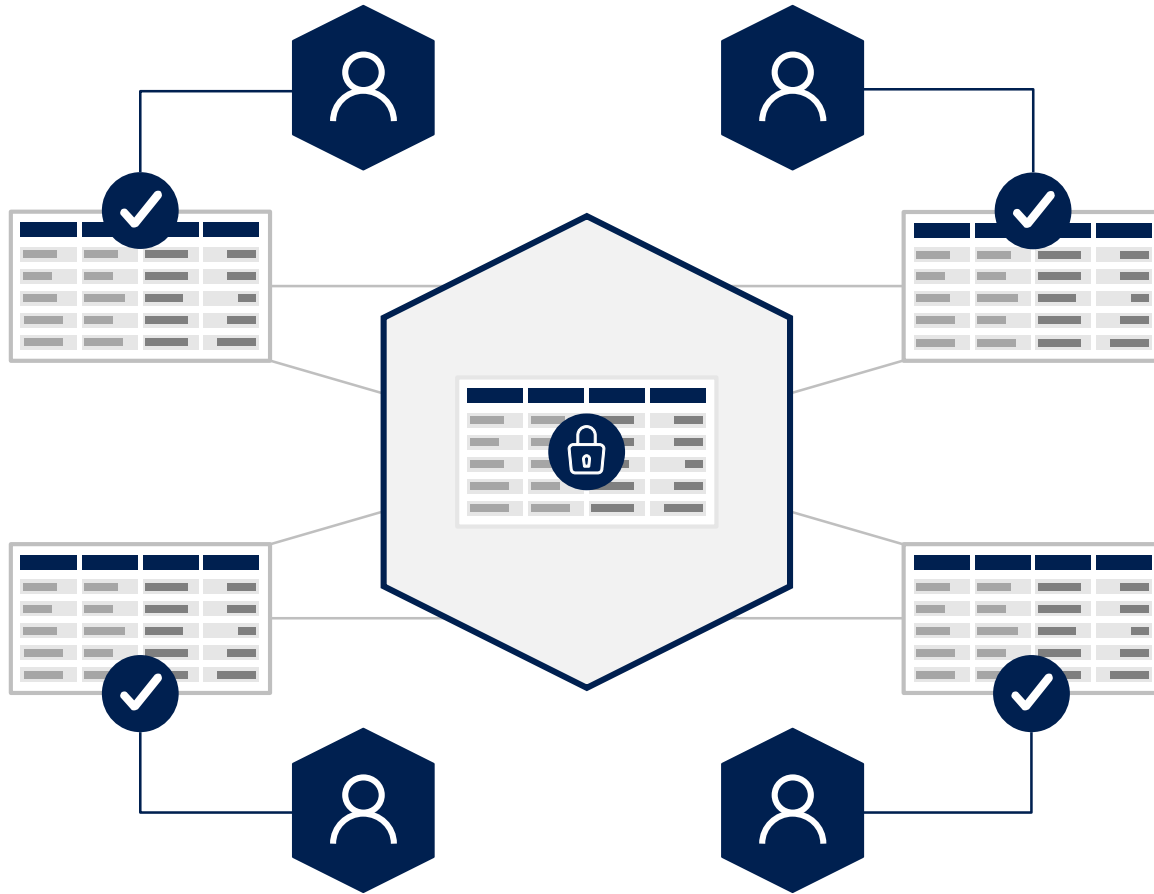
Forbes

How Blockchain Can Create Owned And Trusted Health Care Records

How Blockchain Technology Could Work in the Insurance Industry

By The Guardian

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

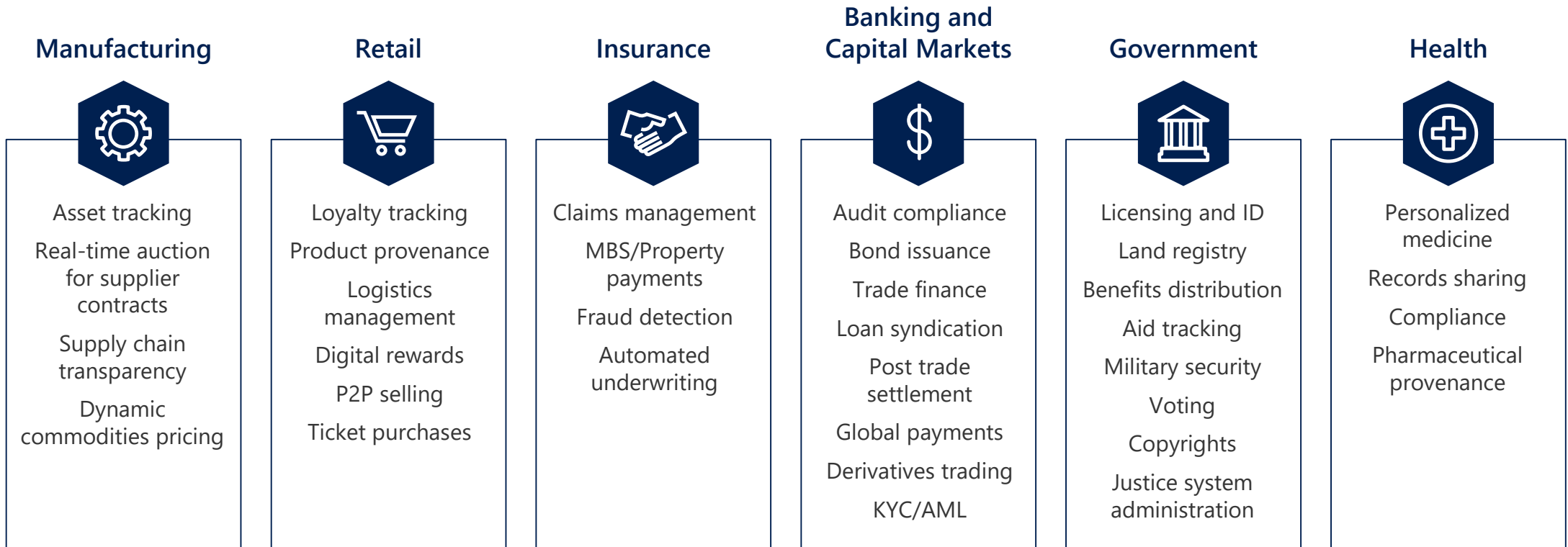


Cross-organizational
workflow



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

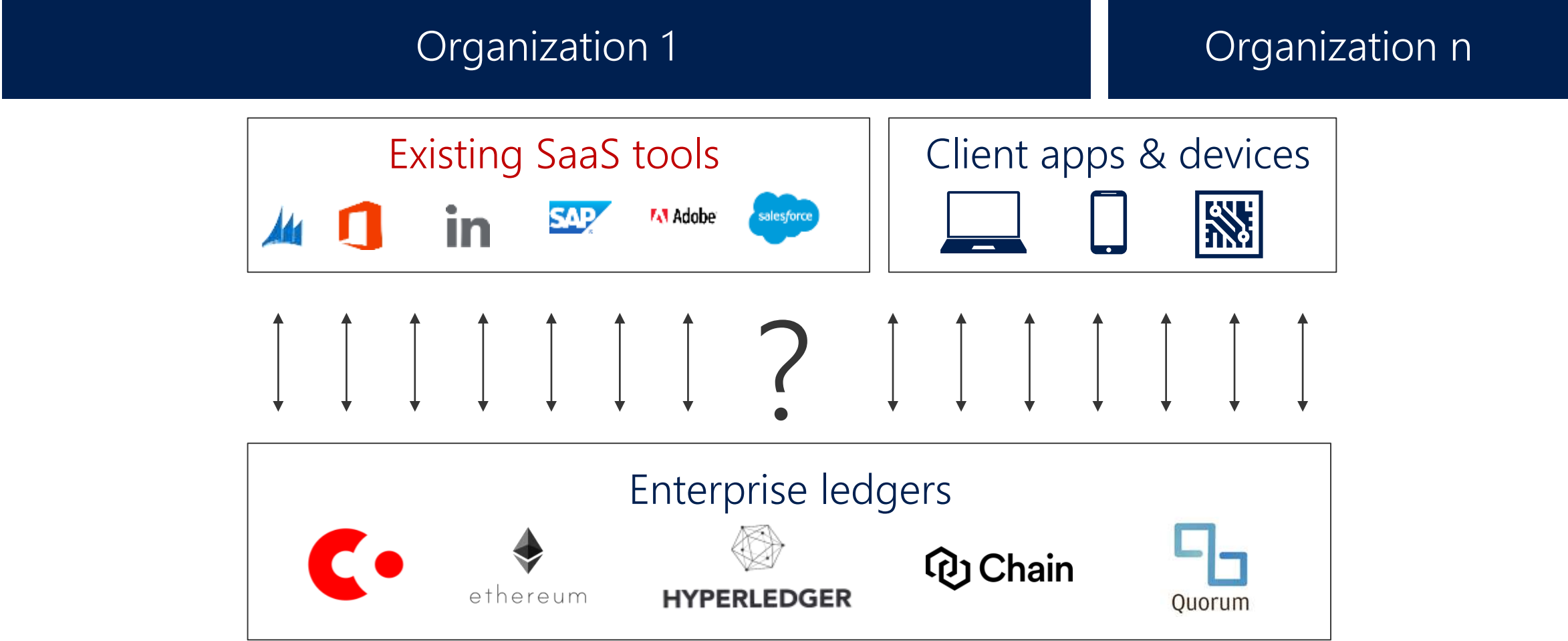
Mitigate risk

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

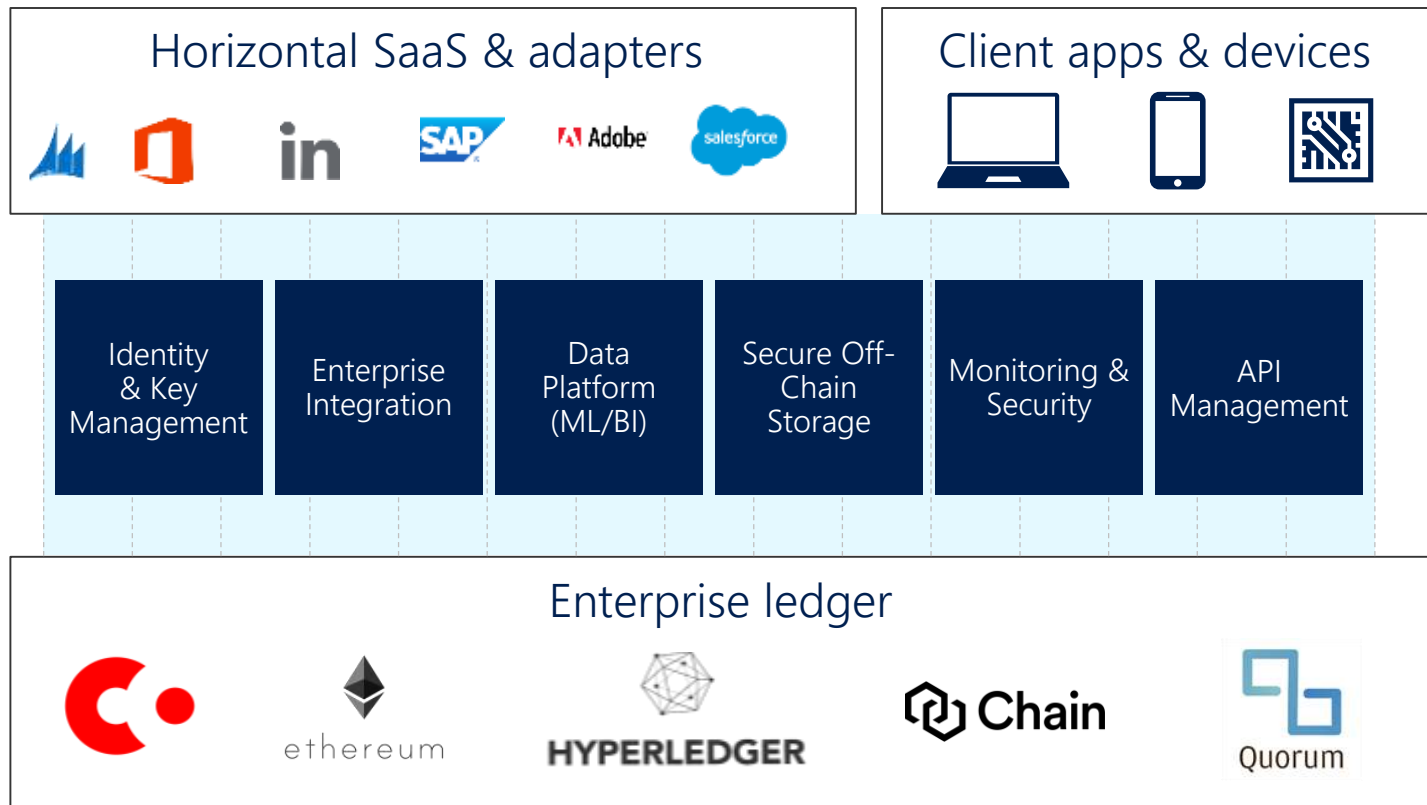
Ledger and topology choice



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

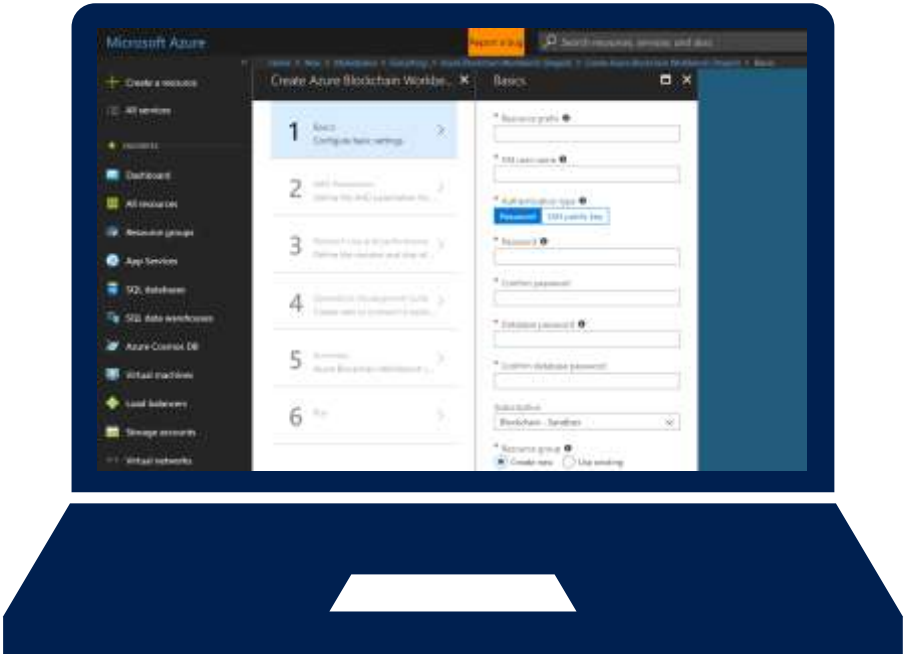
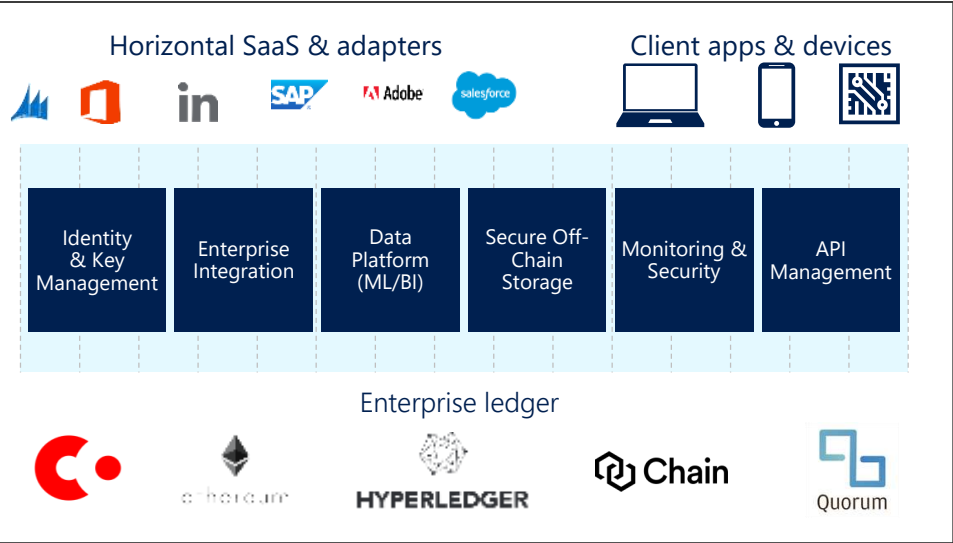


Quickly integrate with business apps

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

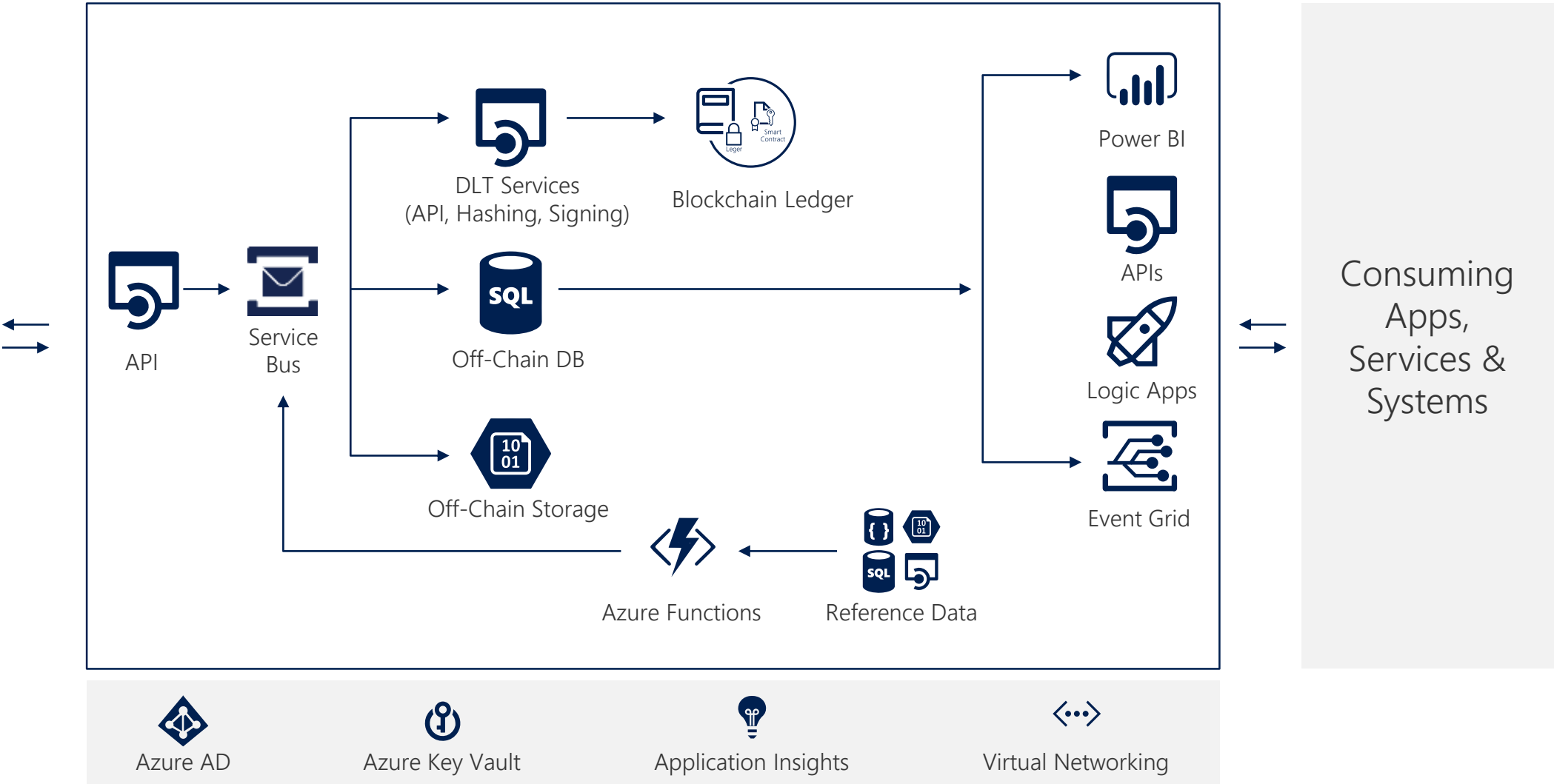


With a clear, simplified approach

Data Sources

Apps

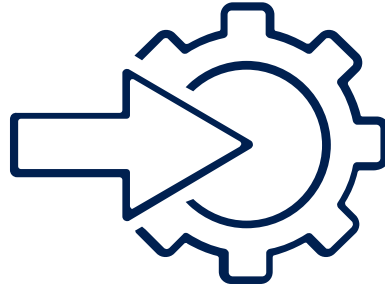
Sensors Data



Azure Blockchain offers significant benefits to developers



Simplify
development



Accelerate
time to value



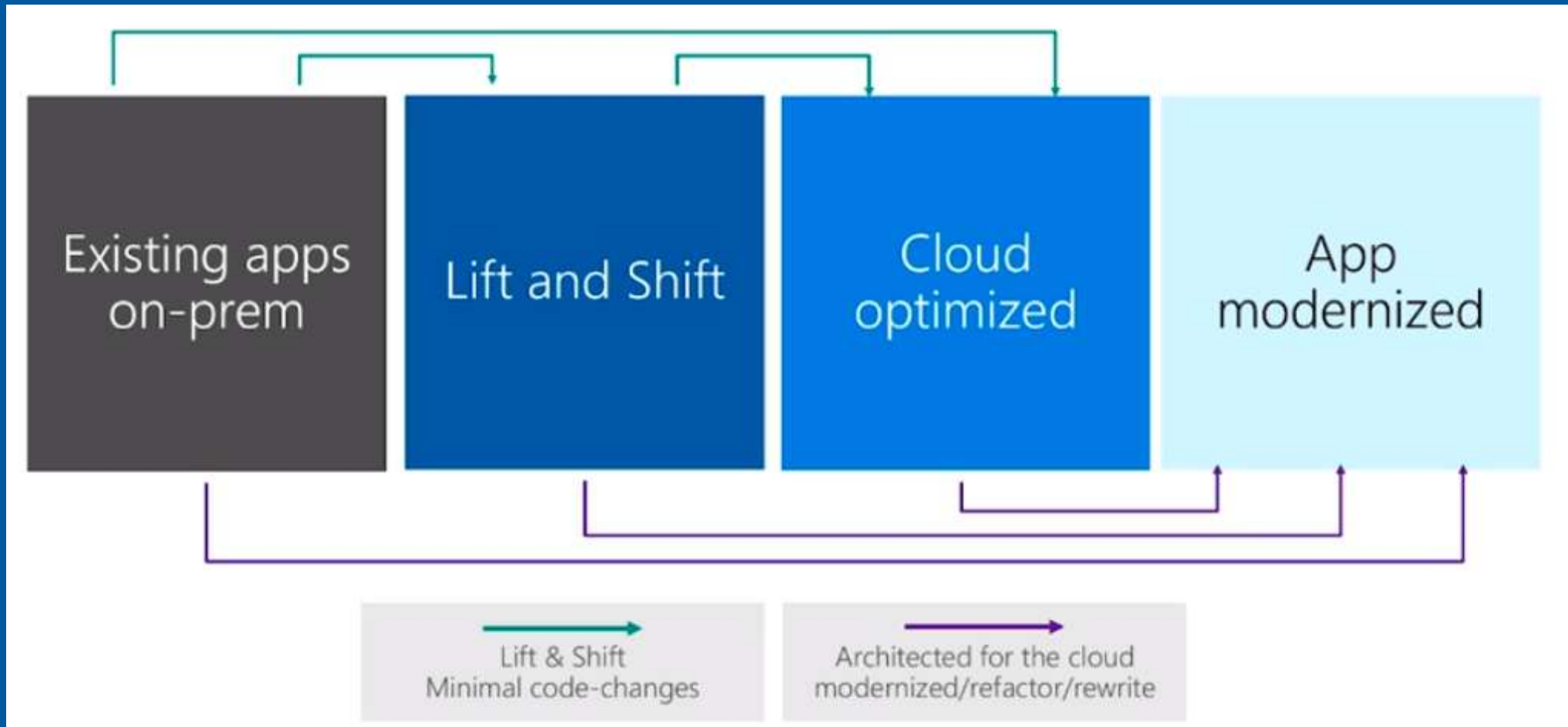
Innovate
with confidence

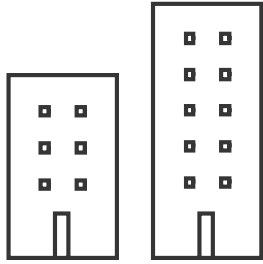
More Info:

Part 1 - <https://www.youtube.com/watch?v=gwrYspdaOx8>

Part 2 - https://www.youtube.com/watch?v=mlRx52p61_g

Application Modernization with PaaS, Serverless, Containers and DevOps





Business needs



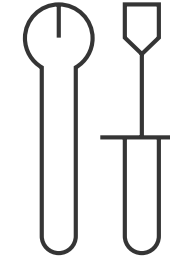
Rapid innovation



Connect with customer
and empower employees



Close the gap from data
to decision



IT challenges



72%¹ budget assigned to
keep-the-lights-on functions



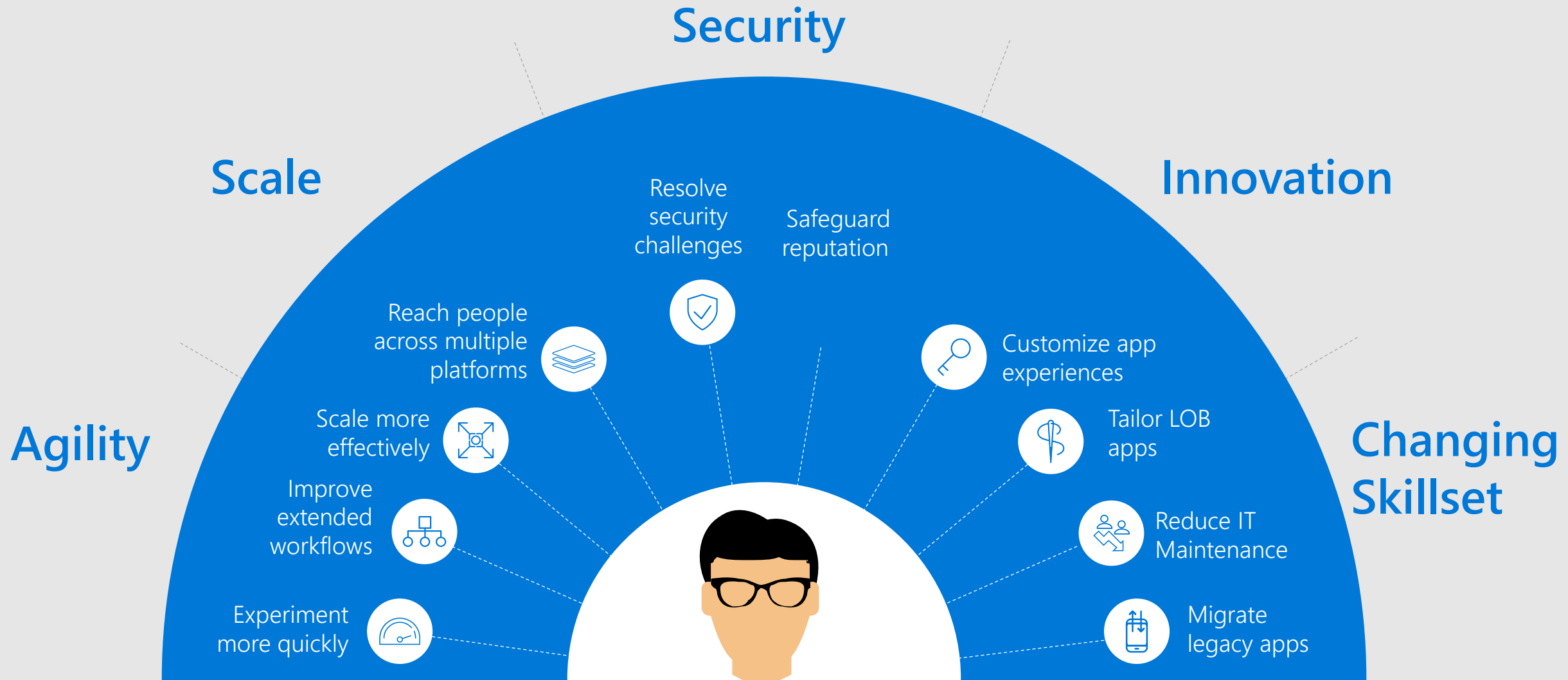
Demand for mobile
apps **>5x** the capacity of IT



Only half decision makers
could get help from
technologists with their
analysis needs ²

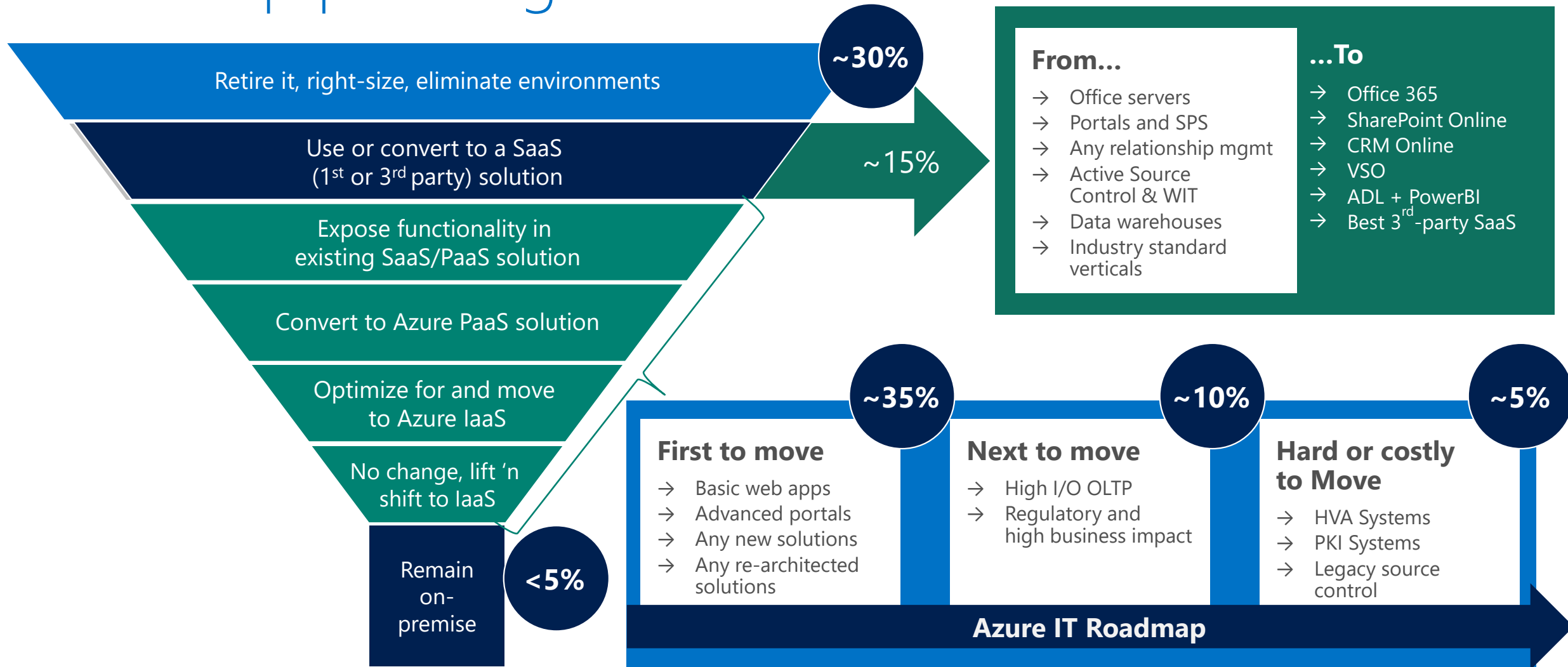
Widening digital divide between Business and IT

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:


 **70%** infrastructure consolidation



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:

 **12** month to build vs 2 years.



Customer Engagement Innovator with
rich mobile app

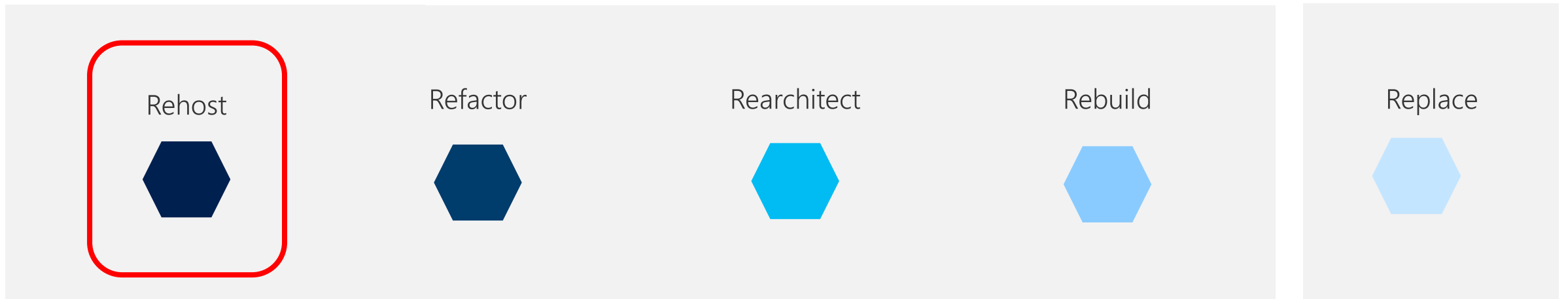
Challenge: **pain points engaging customers via mobile**: add themselves to a wait list, get alerts, pay via mobile phone, and earn points in reward system. The process needs to be streamlined.

Success:

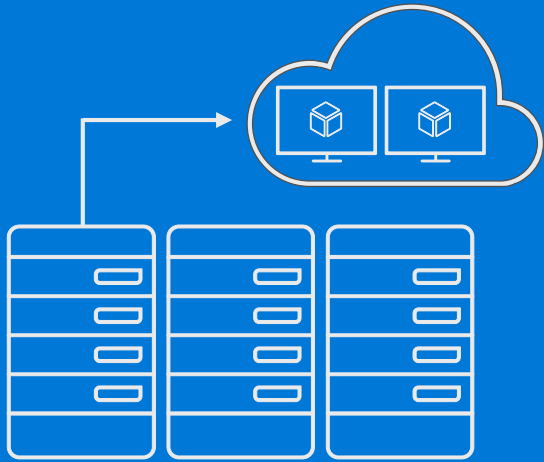


Winner of 2016
Restaurant Breakthrough
Award

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'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.

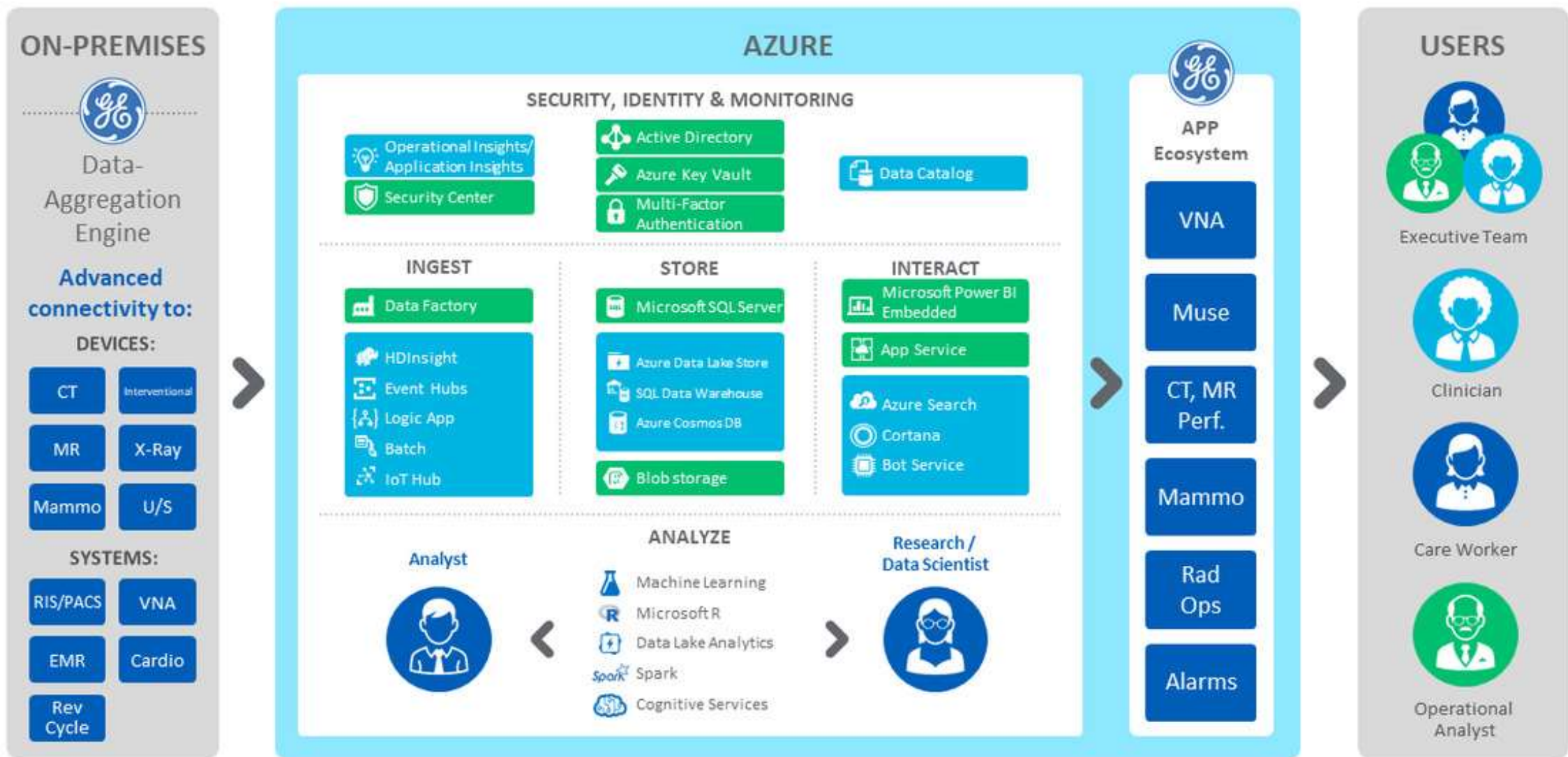


<https://customers.microsoft.com/en-US/story/ge-healthcare-delivers-core-customer-solutions-on-the>

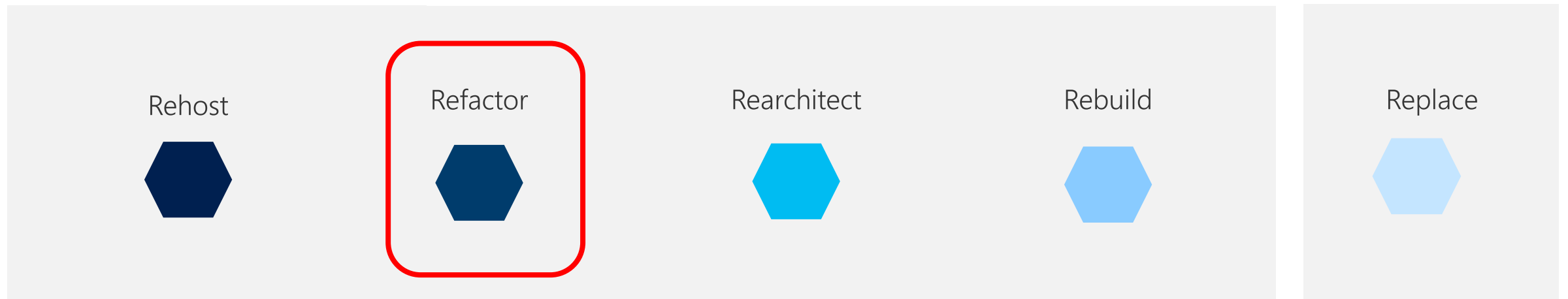
GE Applied Intelligence on Microsoft Azure

Currently used by GE

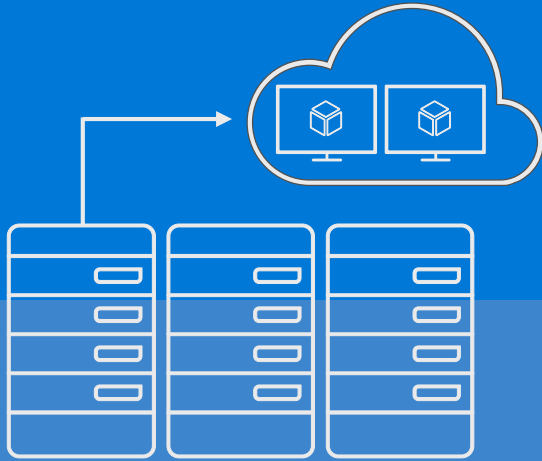
Opportunities



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](#)

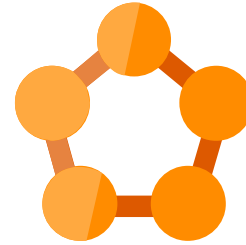
Azure Container Technologies



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

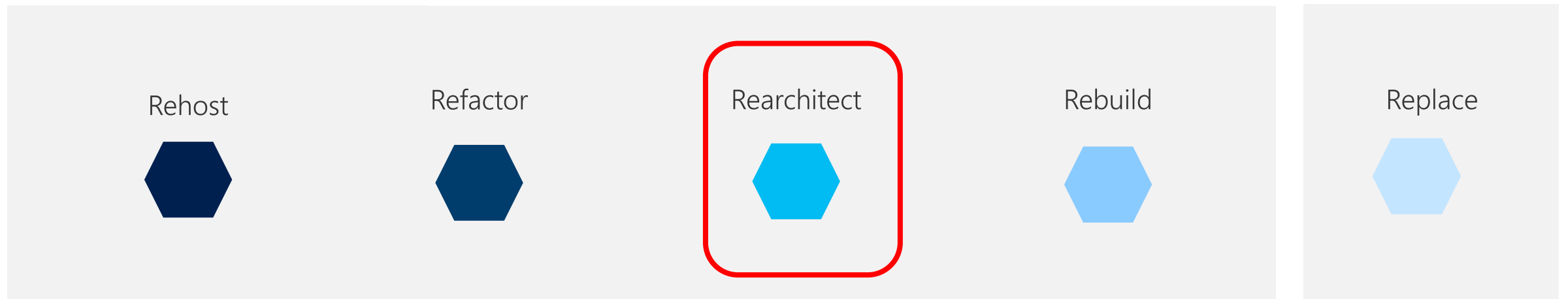
- Immediately modernized key legacy application with elasticity. "By using Windows Server Containers and Docker, we gain better consistency and control between developers, testers, and deployment teams without changing the application"
- Faster time to the market with minimal to zero downtime.
- The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

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

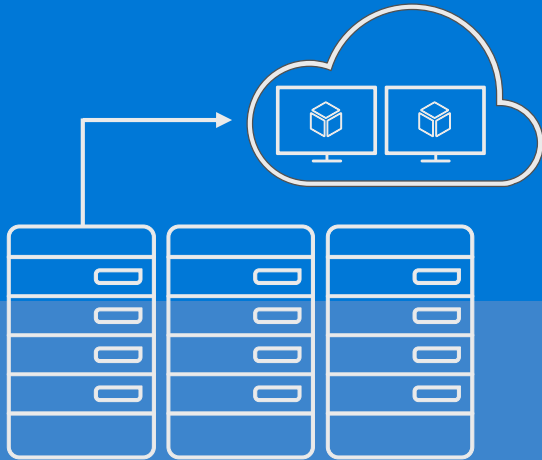
safety and security
variety of markets.



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.

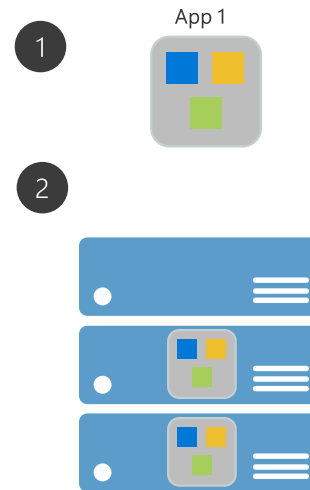
Core technologies

- PaaS, microservices, containers and FaaS

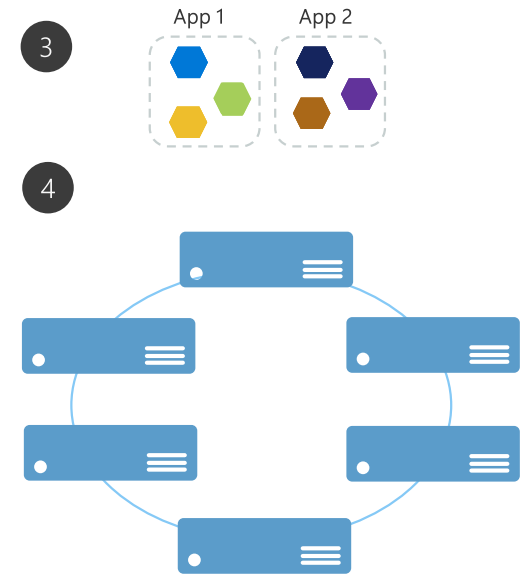
Rearchitect: from monolithic app to microservices

- 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

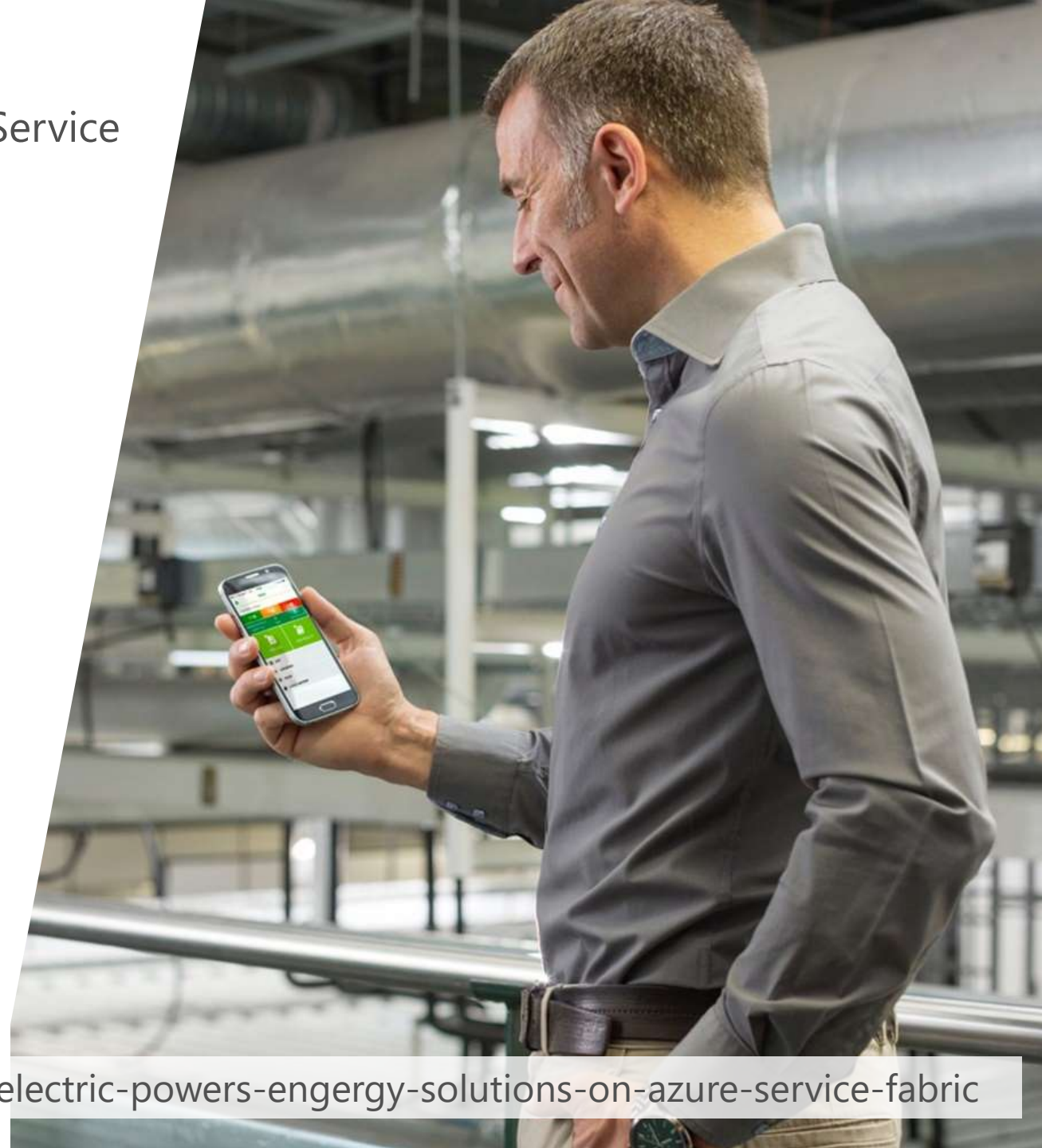
- Register and manage millions of connected devices
- Support multiple devices communicating over different protocols
- Query device state and execute commands on a device
- Scale to incorporate more devices, services and data.

Solution:

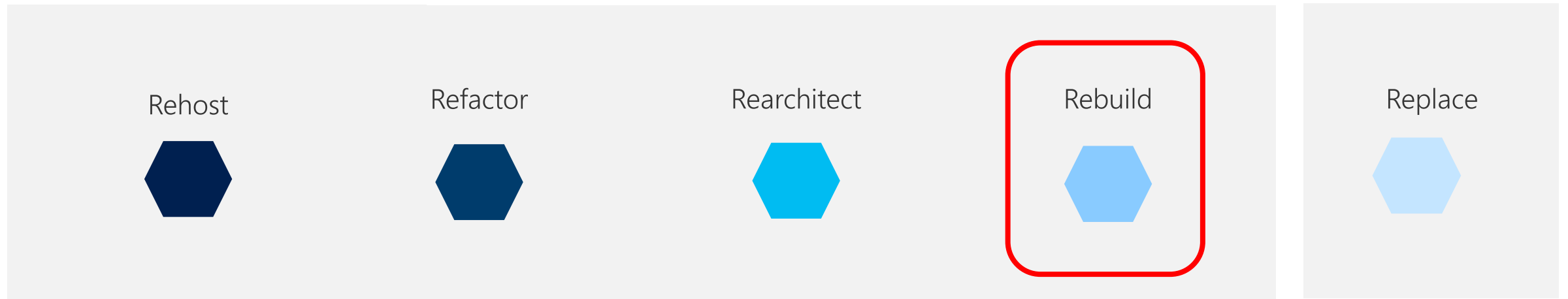
Using Service Fabric in order to better process data, provide device logic, and provide the device-connectivity framework

Results

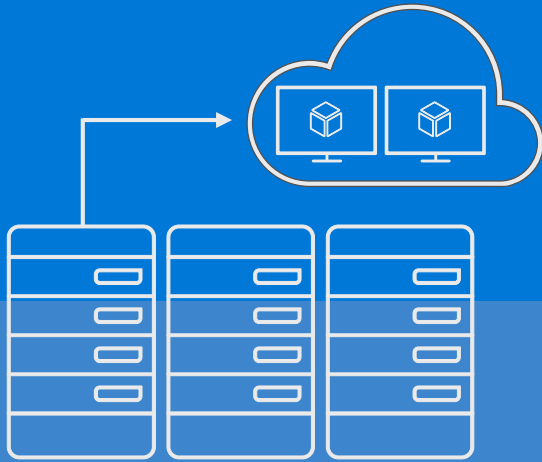
- Using Azure IoT with Service Fabric provides them with an **open, flexible, and highly scalable platform**.
- Elastic scalability: talk to projects that might have a thousand devices or a million devices



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.

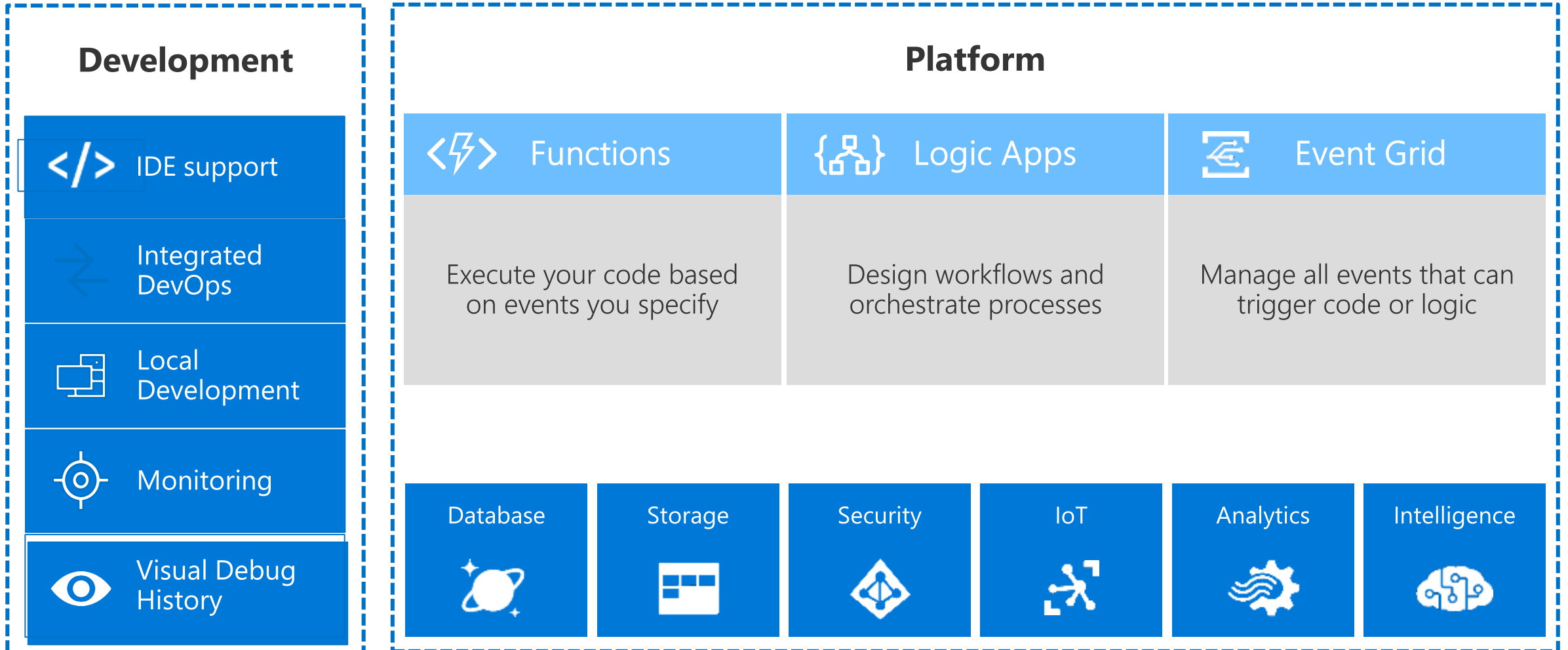
Benefits

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

Core technologies

- Serverless, PaaS

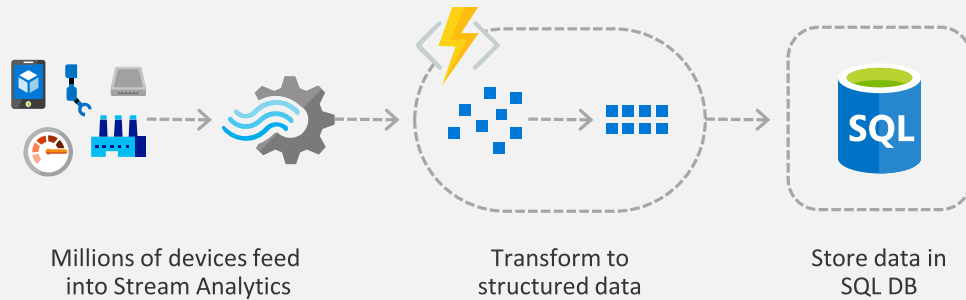
Serverless application platform components



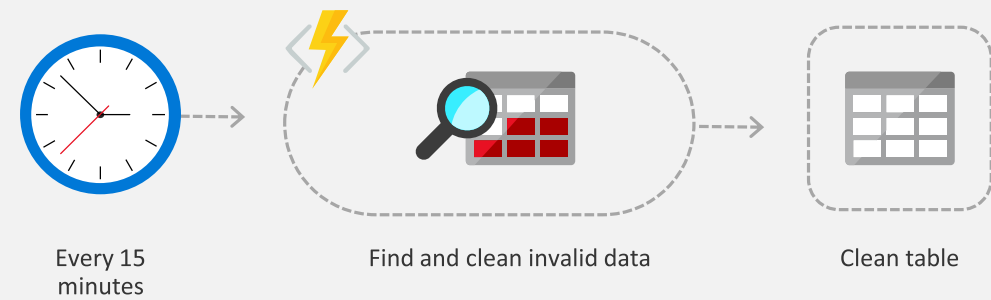
Scenarios for Serverless

Anything that needs to respond to events

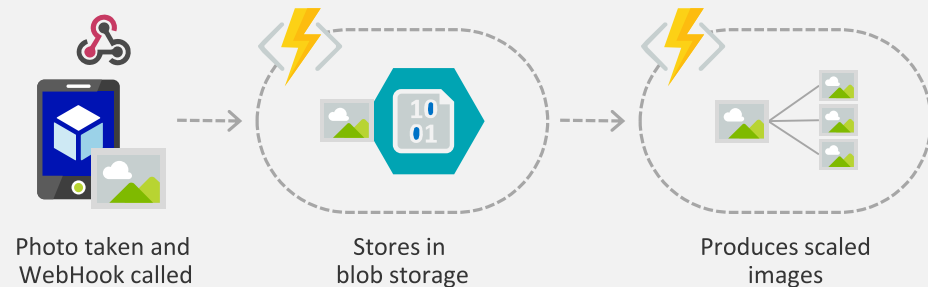
Real-time stream processing



Timer-based processing



Backends (Mobile/IoT/Web)



Real-time bot messaging





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.

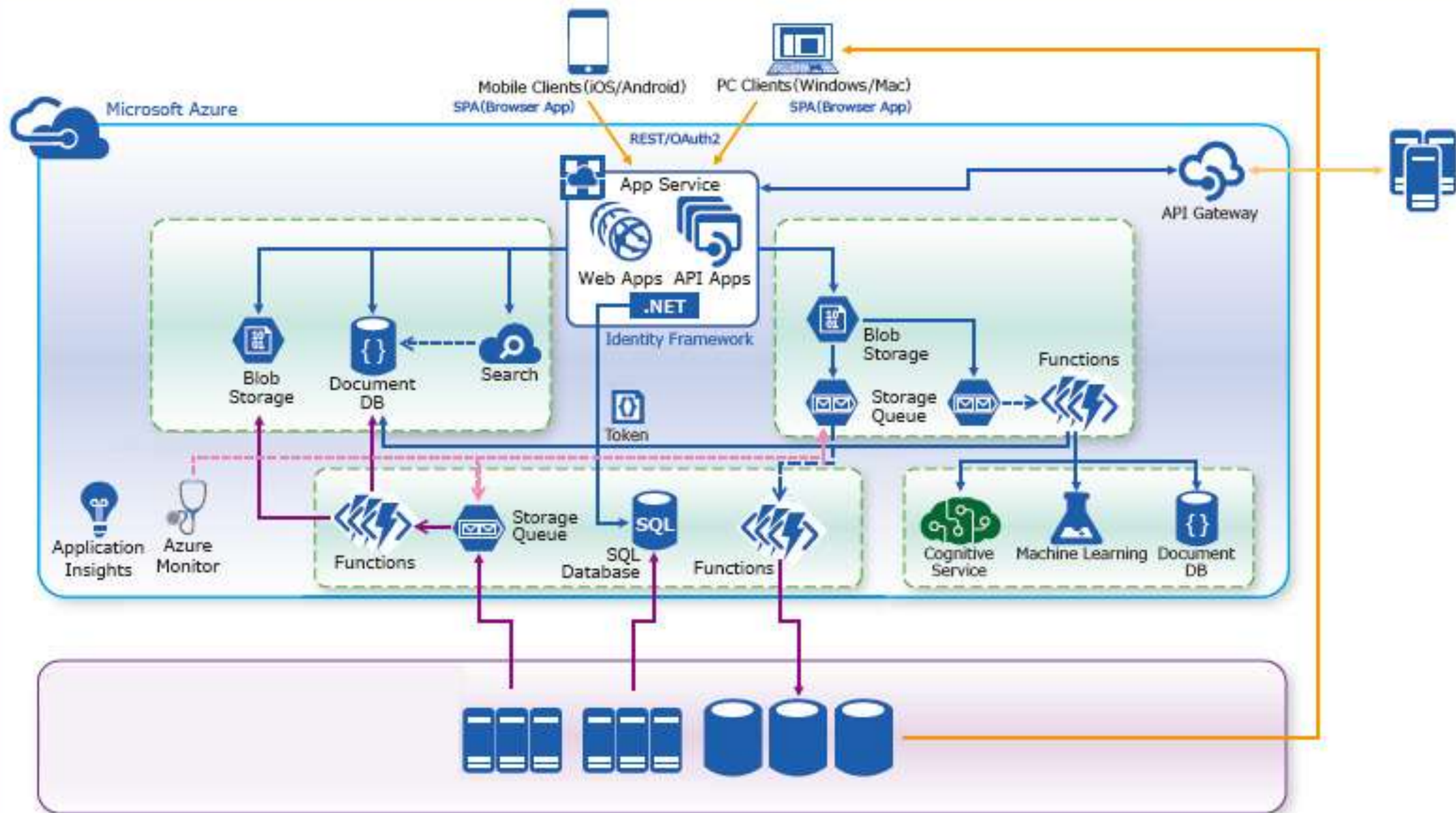
Solutions:

moved to Serverless architecture

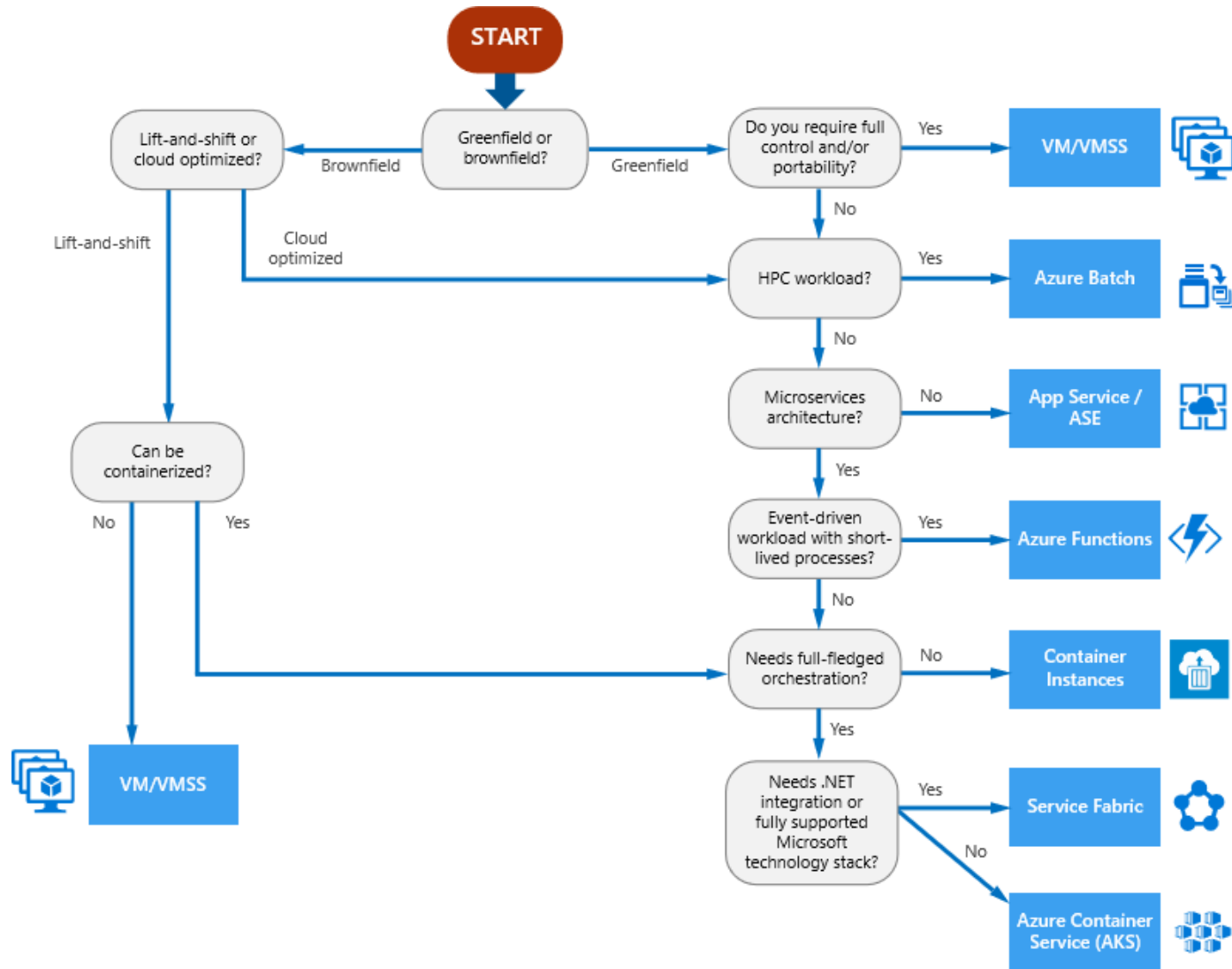
Results

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





Azure compute services



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.



<https://blogs.microsoft.com/iot/2018/04/04/microsoft-will-invest-5-billion-in-iot-heres-why>

Waves of innovation

Cloud

Globally available, unlimited compute resources

IoT

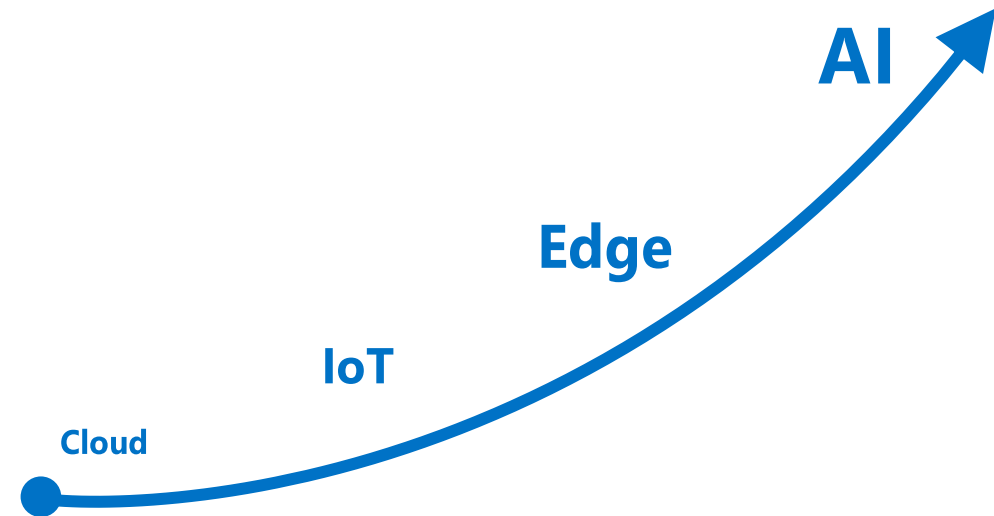
Harnessing signals from sensors and devices, managed centrally by the cloud

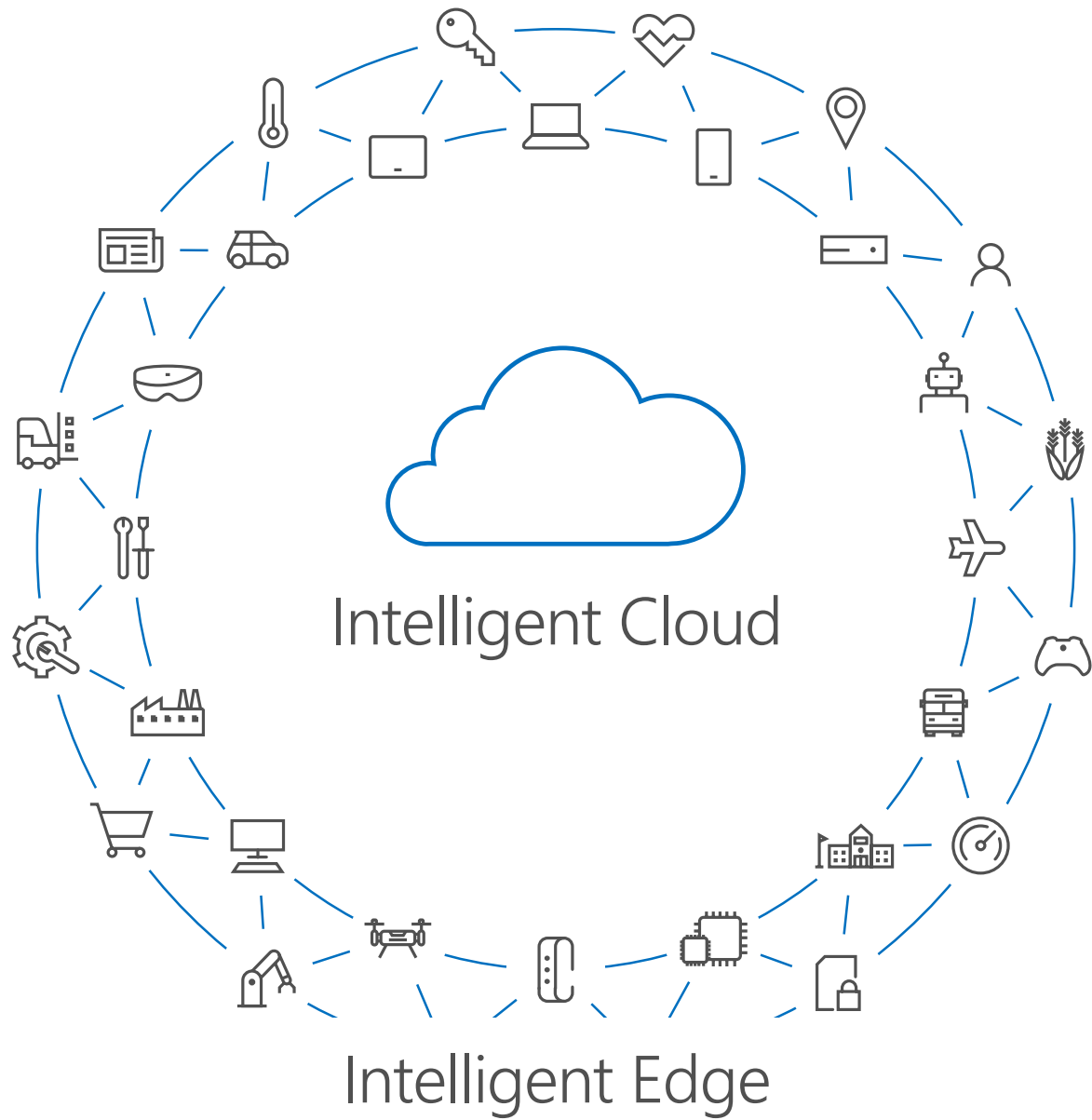
Edge

Intelligence offloaded from the cloud to IoT devices

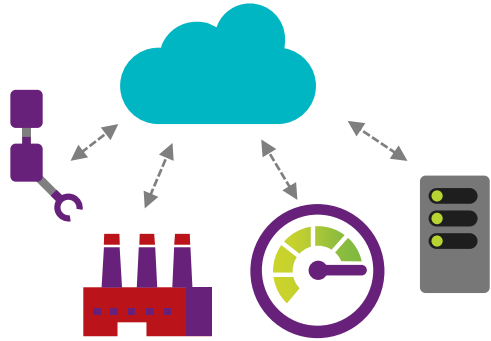
AI

Breakthrough intelligence capabilities





Why the edge?

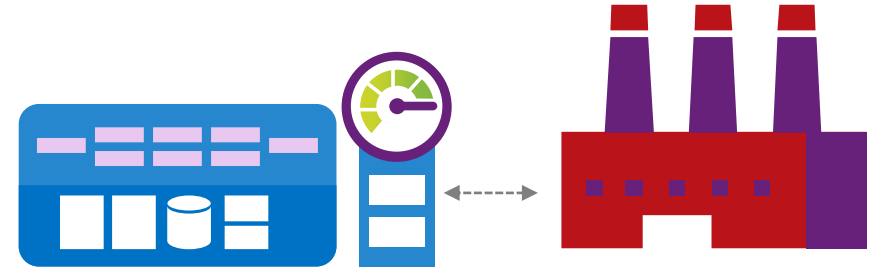


IoT in the cloud

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**



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**



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.**



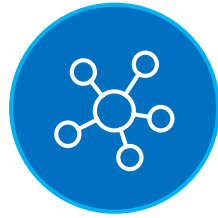
Access to production and supply chain data worldwide, **reduced downtime costs by as much as \$300,000 per day**



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



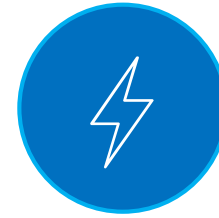
Defining IoT



Things



Insights



Action

IoT projects are still complex



Security
is a **challenge**



Time-consuming
to get started



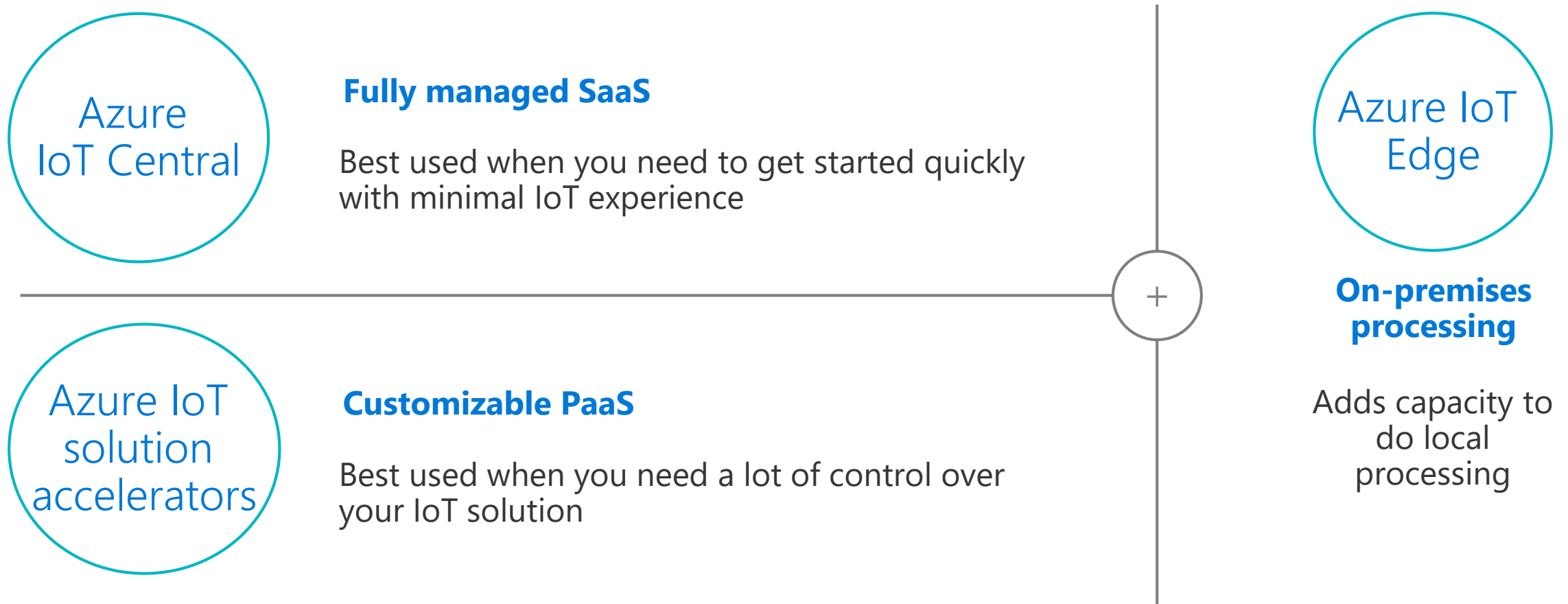
Incompatible with
existing infrastructure



Challenging
to scale

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



<http://aka.ms/AngelbeatJune2018Texas>



Thank you for joining us.