Microsoft

Azure

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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Checkout other Regional Events

https://aka.ms/AustinEvents

More info about OCP

http://aka.ms/USPartnerBriefing

UserGroup.TV

http://www.UserGroup.tv

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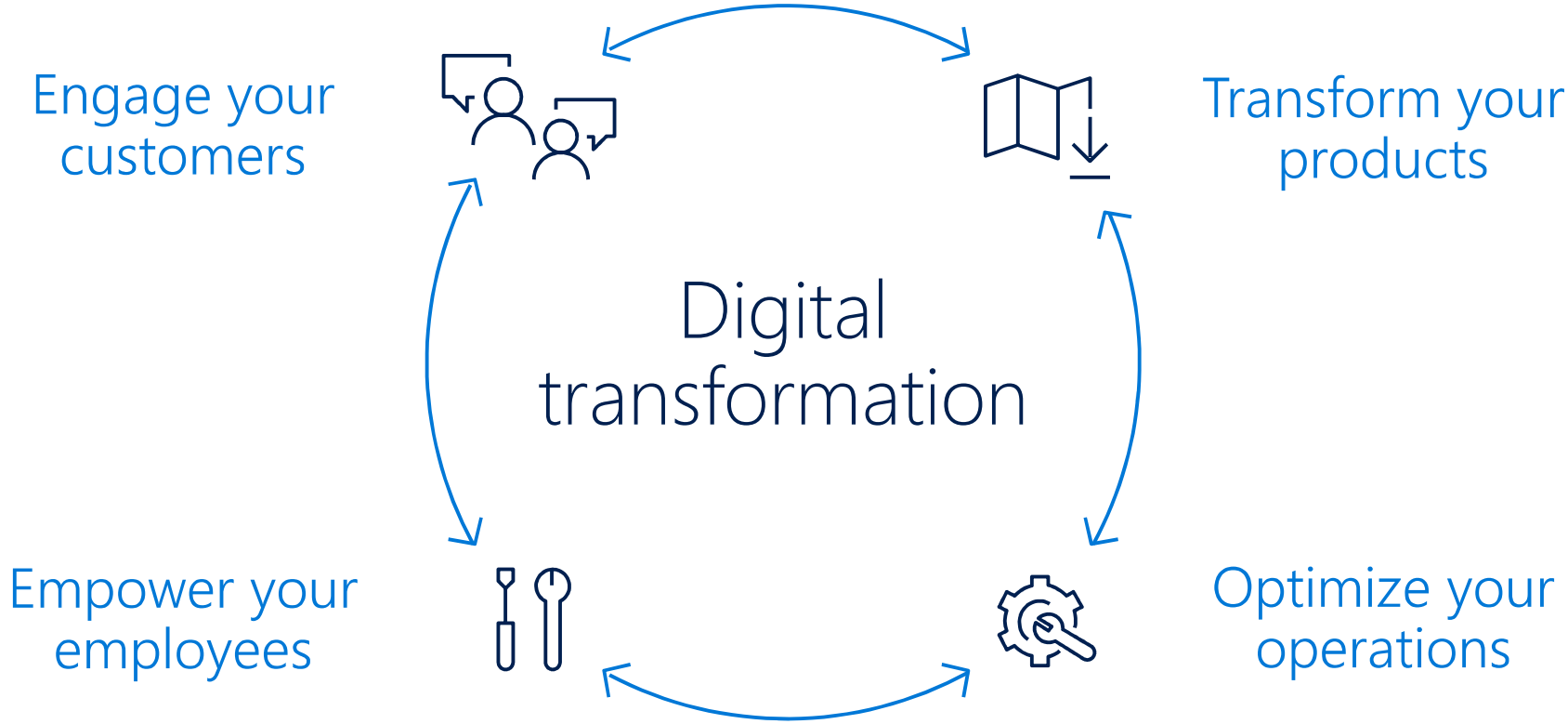
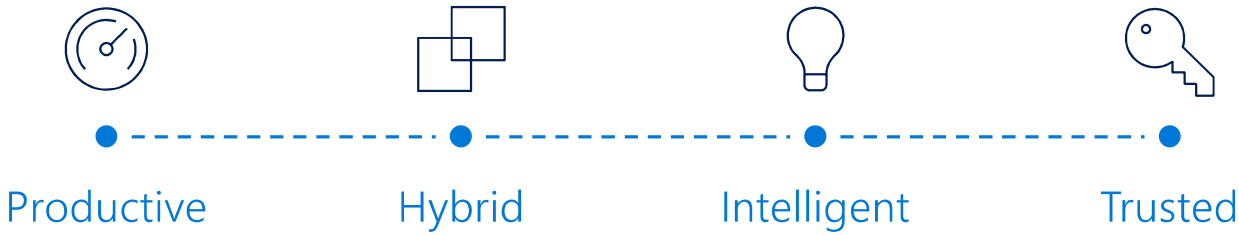
Microsoft


Engage your customers
Transform your products
Digital transformation
Empower your employees
Optimize your operations

Azure—cloud for all



Productive

Hybrid

Intelligent

Trusted

Unparalleled developer productivity

Integrated tooling

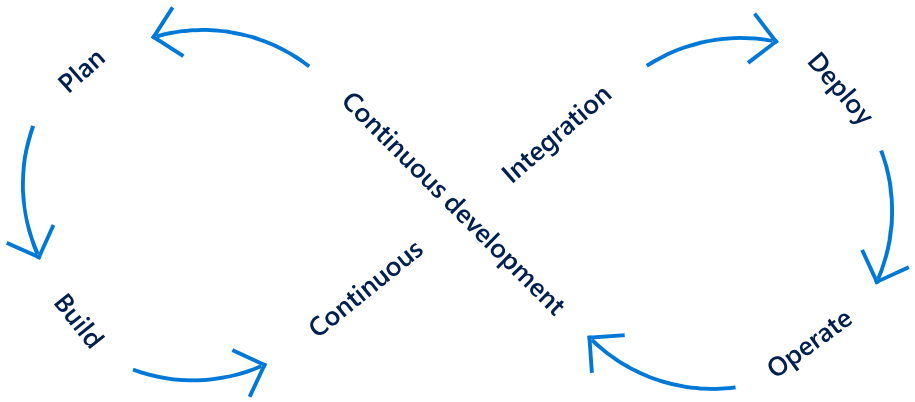
Visual Studio
third–parties | DevOps

100+ services

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

Unified management

Single cloud | Policy
and Governance



Open source support

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

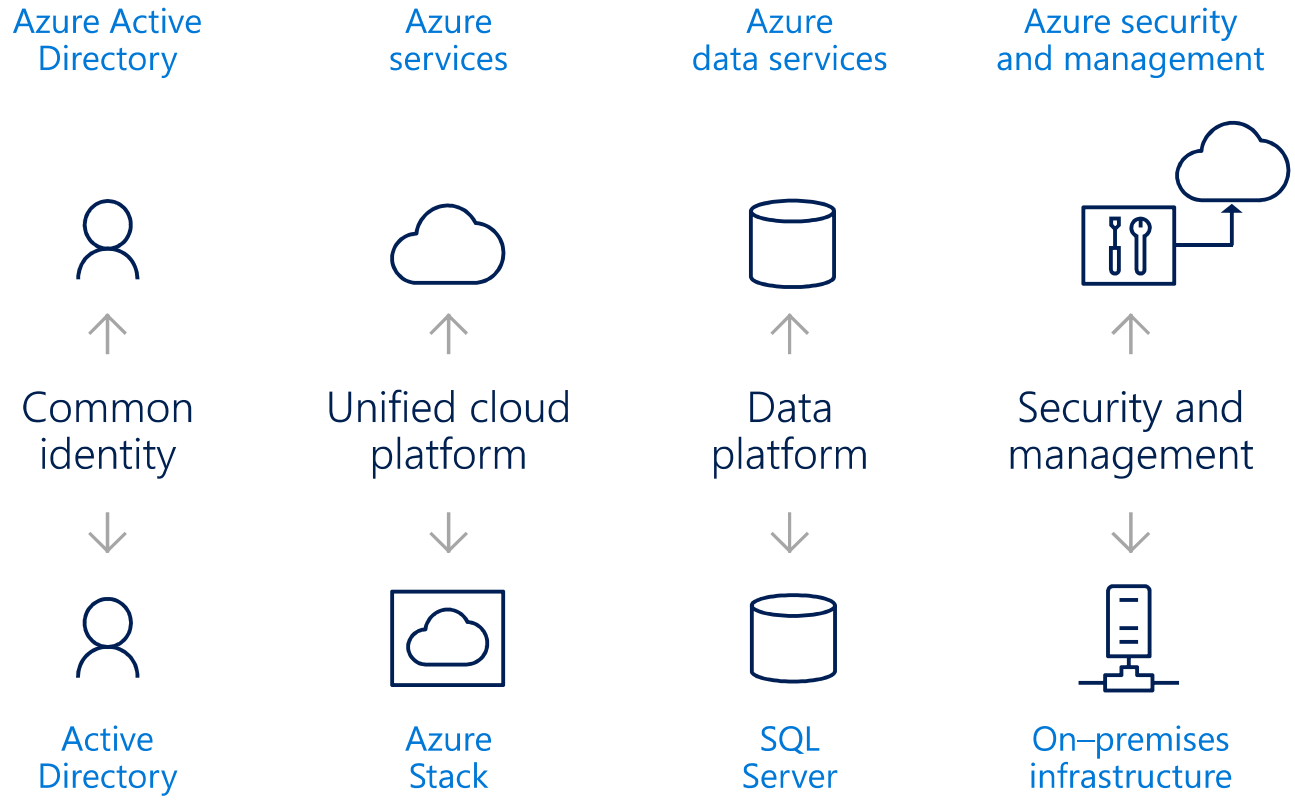
Productive

Hybrid

Intelligent

Trusted

The only consistent, hybrid cloud



Productive

Hybrid

Intelligent

Trusted

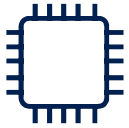
Comprehensive deep learning, machine learning as a service

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

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

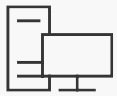
- ☑ Argentina PDPA
- ☑ Australia IRAP Unclassified
- ☑ Australia IRAP Protected
- ☑ Canada Privacy Laws
- ☑ China GB 18030:2005
- ☑ China DJCP (MLPS) Level 3
- ☑ China TRUCS / CCCPPF
- ☑ EN 301 549
- ☑ EU ENISA IAF
- ☑ EU Model Clauses
- ☑ EU – US Privacy Shield
- ☑ Germany IT-Grundschutz workbook
- ☑ 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

https://aka.ms/AzureCompliance

Most comprehensive resiliency and best SLA

INDUSTRY-ONLY

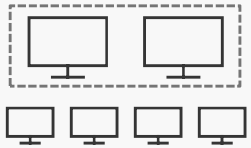
VM SLA
99.9%



SINGLE VM
Protection with Premium Storage

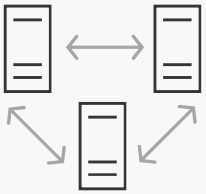
INDUSTRY-LEADING HIGH AVAILABILITY SLA

VM SLA
99.95%



AVAILABILITY SETS
Protection against failures within datacenters

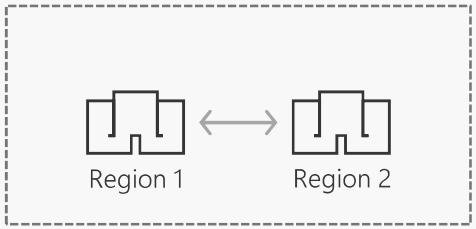
VM SLA
99.99%



AVAILABILITY ZONES
Protection from entire datacenter failures

INDUSTRY-LEADING DISASTER RECOVERY

REGIONS
50



REGION PAIRS
Protection from disaster with Data Residency compliance

Microsoft Azure IP Advantage | Protecting your innovation in the cloud

Your own application on Azure

UNCAPPED INDEMNIFICATION

- Best-in-industry protection against IP risks
- Covers OSS incorporated by Microsoft[1] in Azure services
- On by default for all Microsoft cloud customers

PATENT PICK

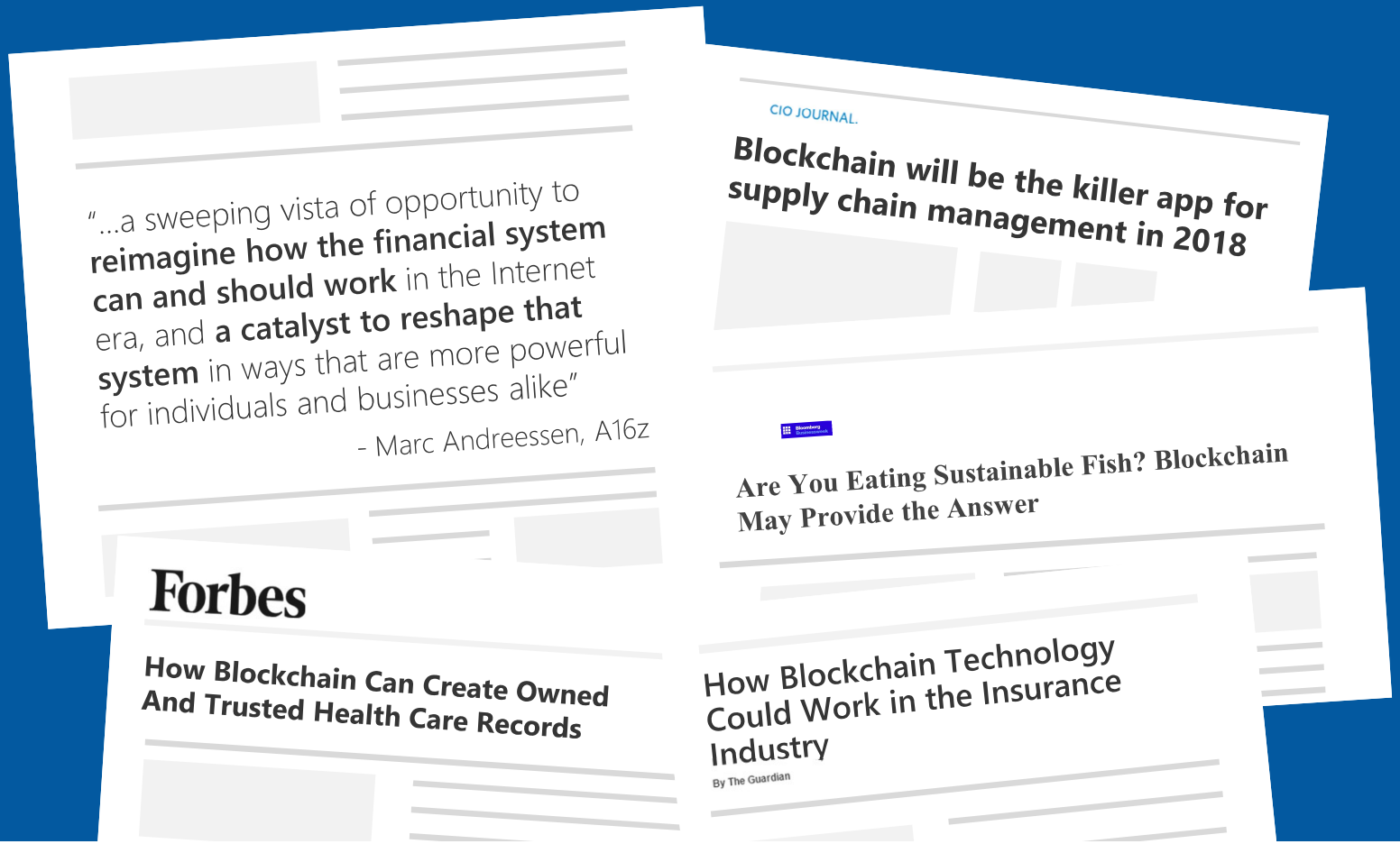
- Deter and defend against patent lawsuits
- Select a patent from 10,000 Microsoft patents
- Available to all consuming Azure customers[2]

SPRINGING LICENSE

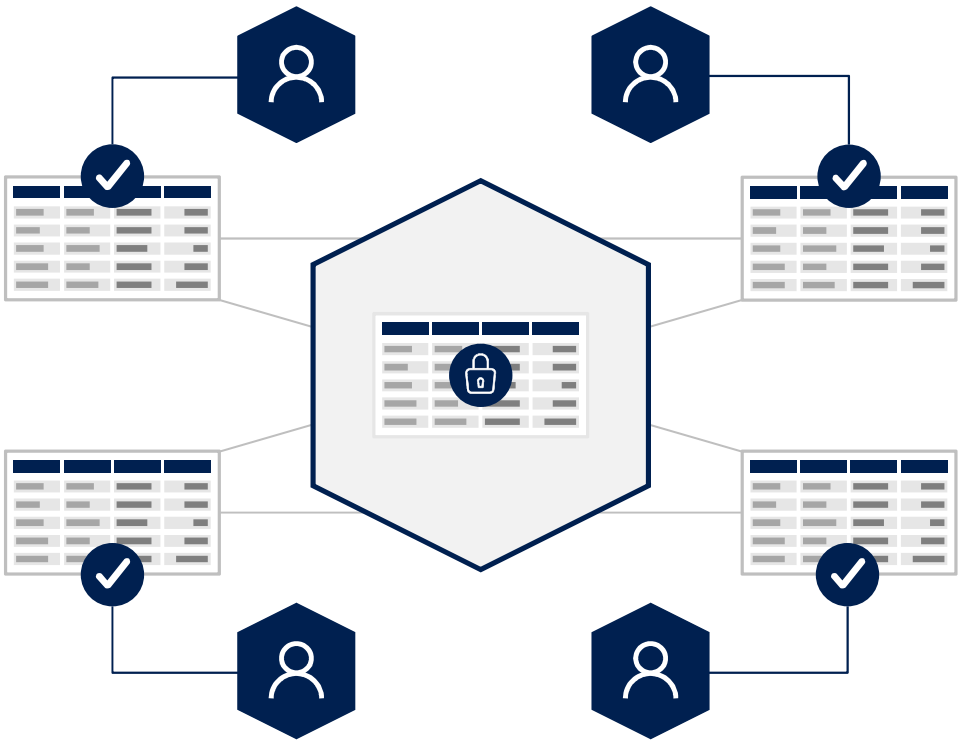
- Peace of mind with future patent protection
- Receive a license if Microsoft sells any patents to a NPE in the future
- Available to all consuming Azure customers[3]

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

Microsoft

The types of assets vary across industries

3M	bank hapoalim	webjet.com.au	SINGAPORE AIRLINES
• 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

Microsoft

We've seen this pattern in scenarios across industries

Manufacturing

Asset tracking

Real-time auction for supplier contracts

Supply chain transparency

Dynamic commodities pricing

Retail

Loyalty tracking

Product provenance

Logistics management

Digital rewards

P2P selling

Ticket purchases

Insurance

Claims management

MBS/Property payments

Fraud detection

Automated underwriting

Banking and Capital Markets

Audit compliance

Bond issuance

Trade finance

Loan syndication

Post trade settlement

Global payments

Derivatives trading

KYC/AML

Government

Licensing and ID

Land registry

Benefits distribution

Aid tracking

Military security

Voting

Copyrights

Justice system administration

Health

Personalized medicine

Records sharing

Compliance

Pharmaceutical provenance

Asset transfer and provenance

Cross-organizational workflow

Multiparty auditing

Microsoft

Customers looking for similar set of outcomes

Reduce cost

Remove friction and enable direct interaction between parties

Mitigate risk

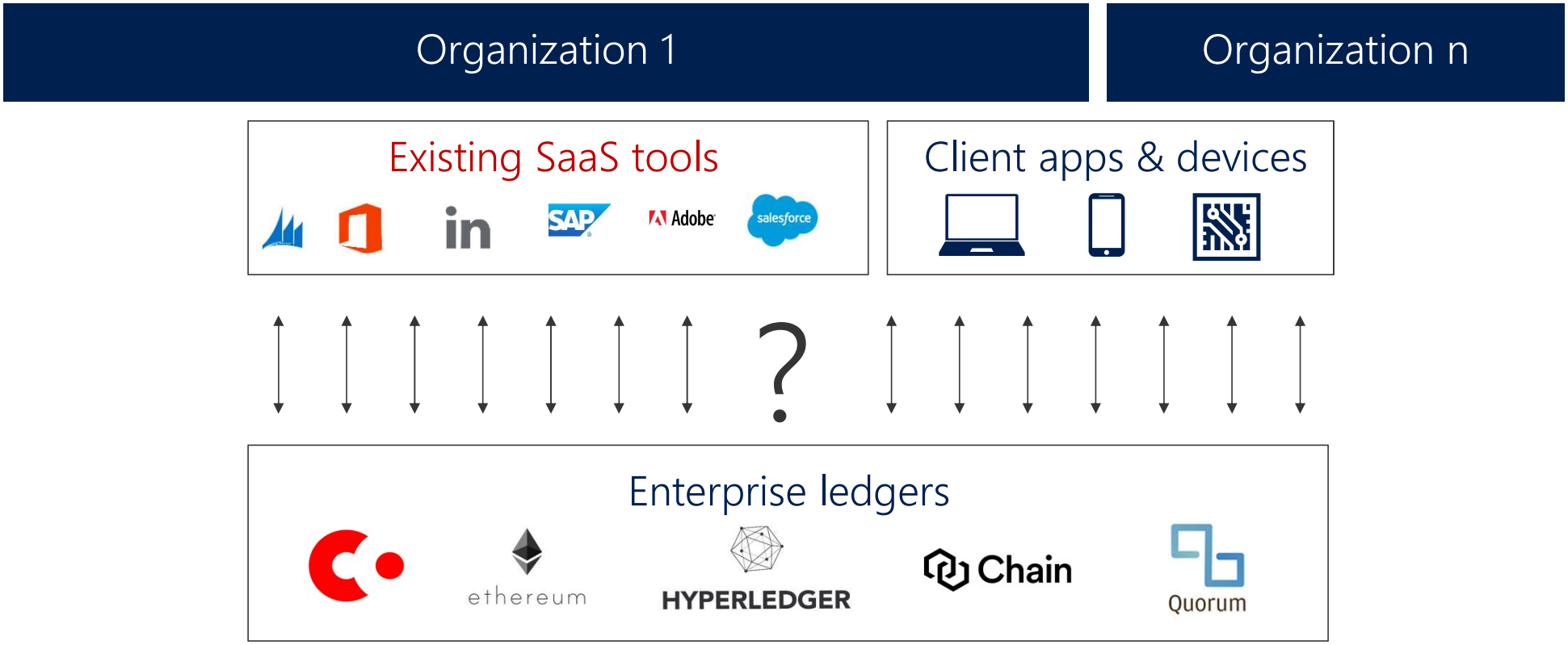
Reduce security threats from fraud, hacking, and data manipulation

Reimagine processes

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

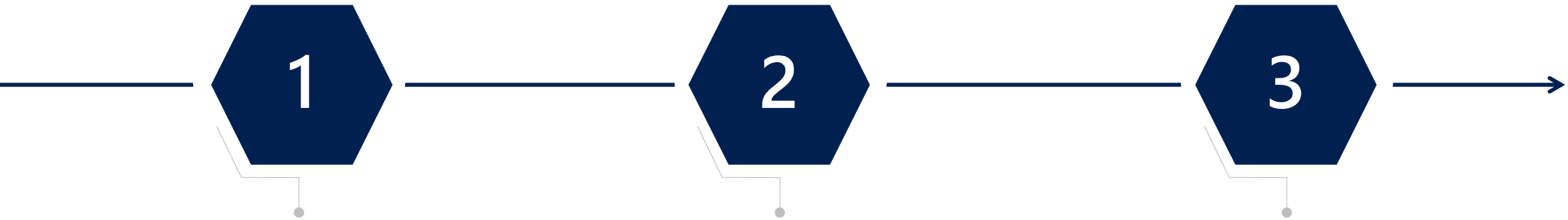
Microsoft

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



Microsoft

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



Populated preconfigured networks

Integrated relevant cloud services

Built a simple interface

Microsoft

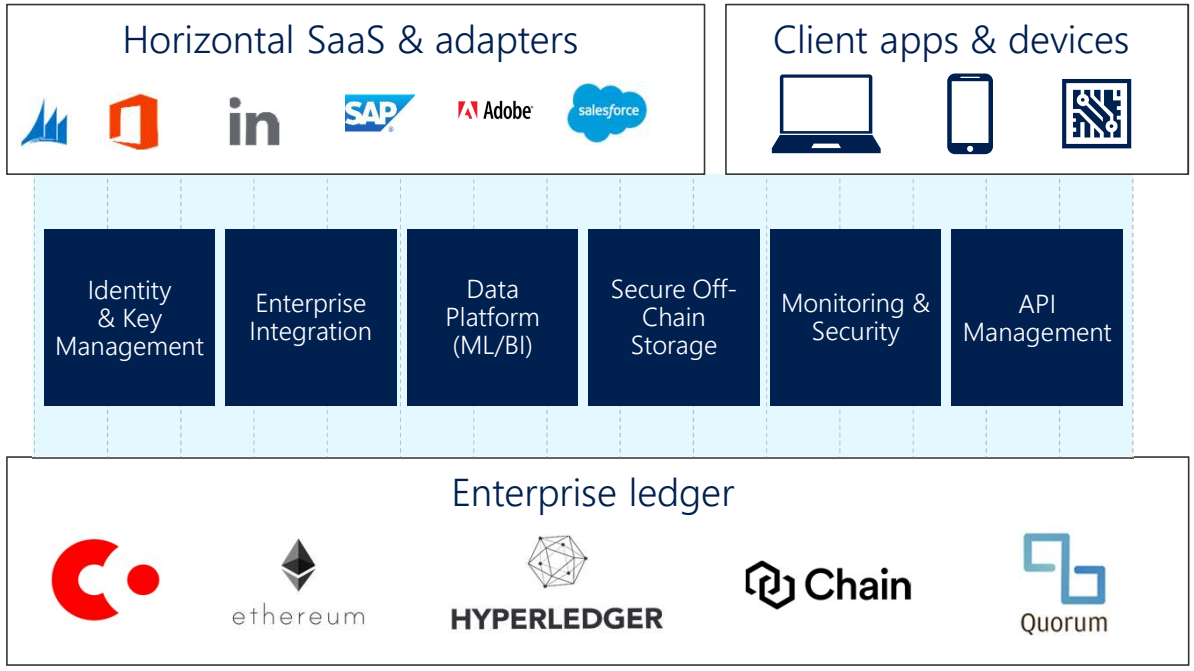
We started by populating modular preconfigured templates and infrastructure

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

Microsoft

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

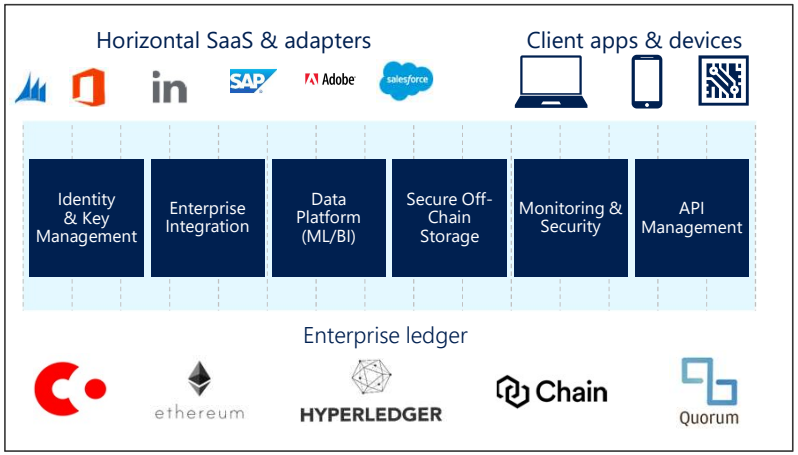


Quickly integrate with business apps

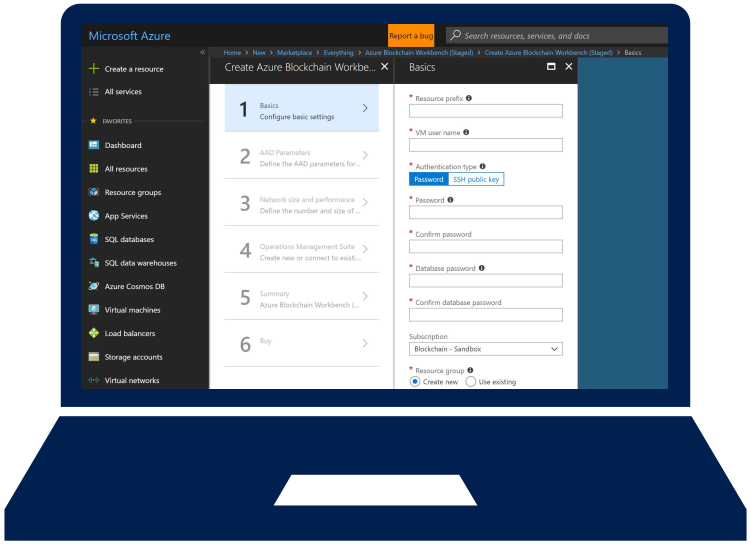
Connect to the cloud without the heavy lifting

Microsoft

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

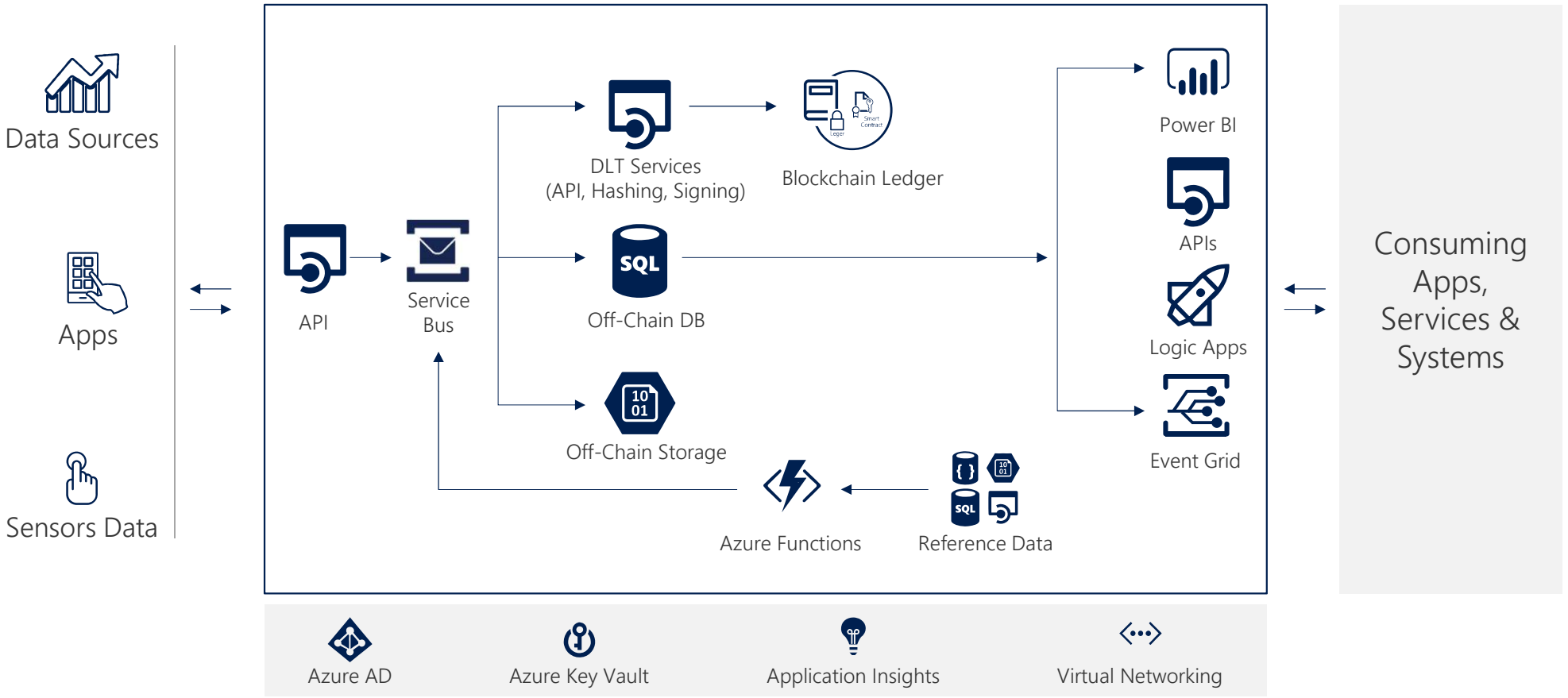


Azure Blockchain Workbench



Microsoft

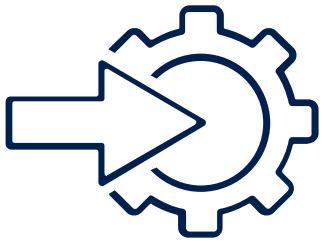
With a clear, simplified approach



Microsoft

Azure Blockchain offers significant benefits to developers

Simplify
development



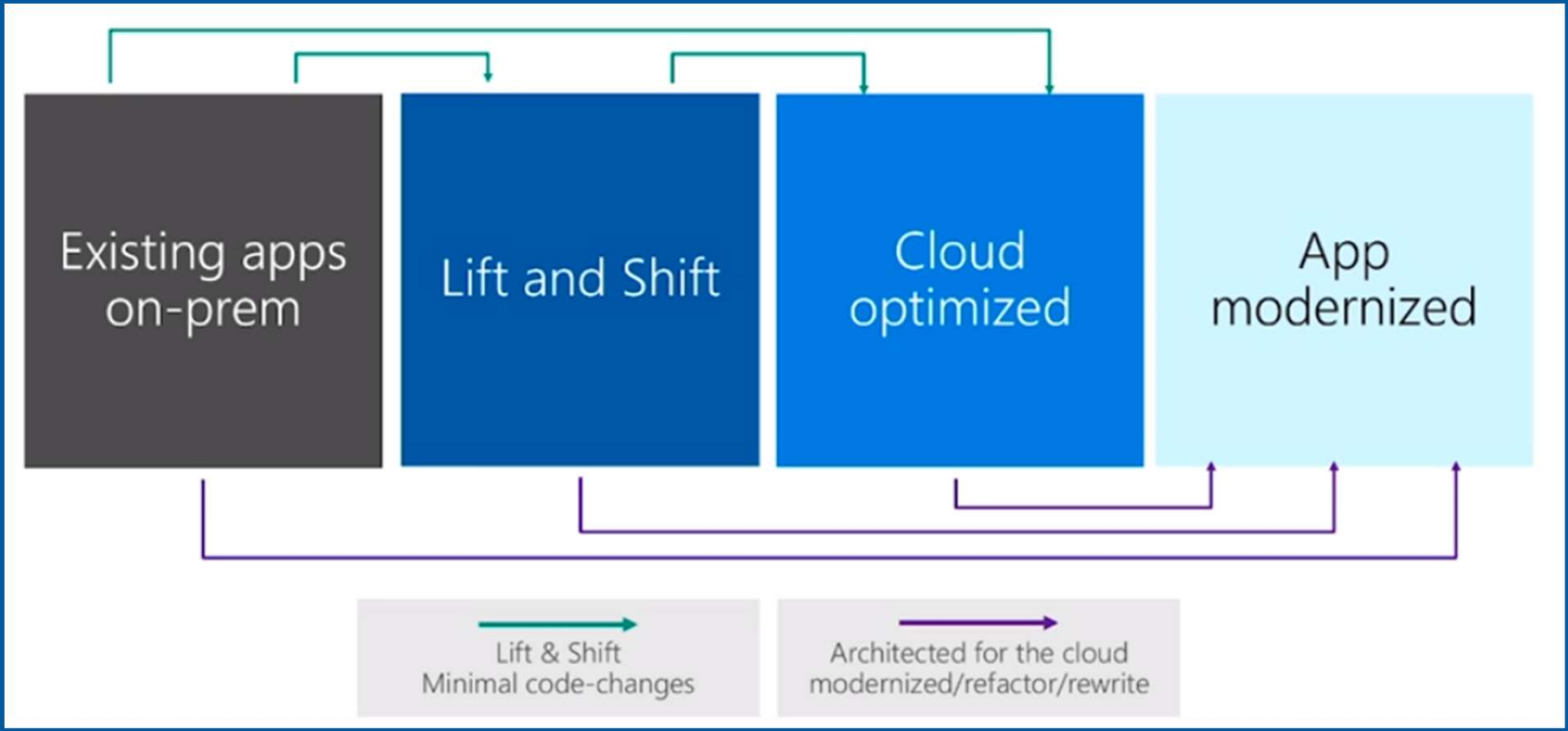
Accelerate
time to value

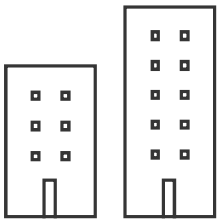
Innovate
with confidence

More Info:
Part 1 - https://www.youtube.com/watch?v=gwrYspdaOx8
Part 2 - https://www.youtube.com/watch?v=mlRx52p61_g

Microsoft

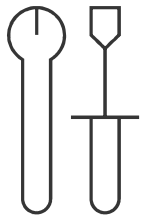
Application Modernization with PaaS, Serverless, Containers and DevOps





Business needs

- Rapid innovation
- Connect with customer and empower employees
- Close the gap from data to decision

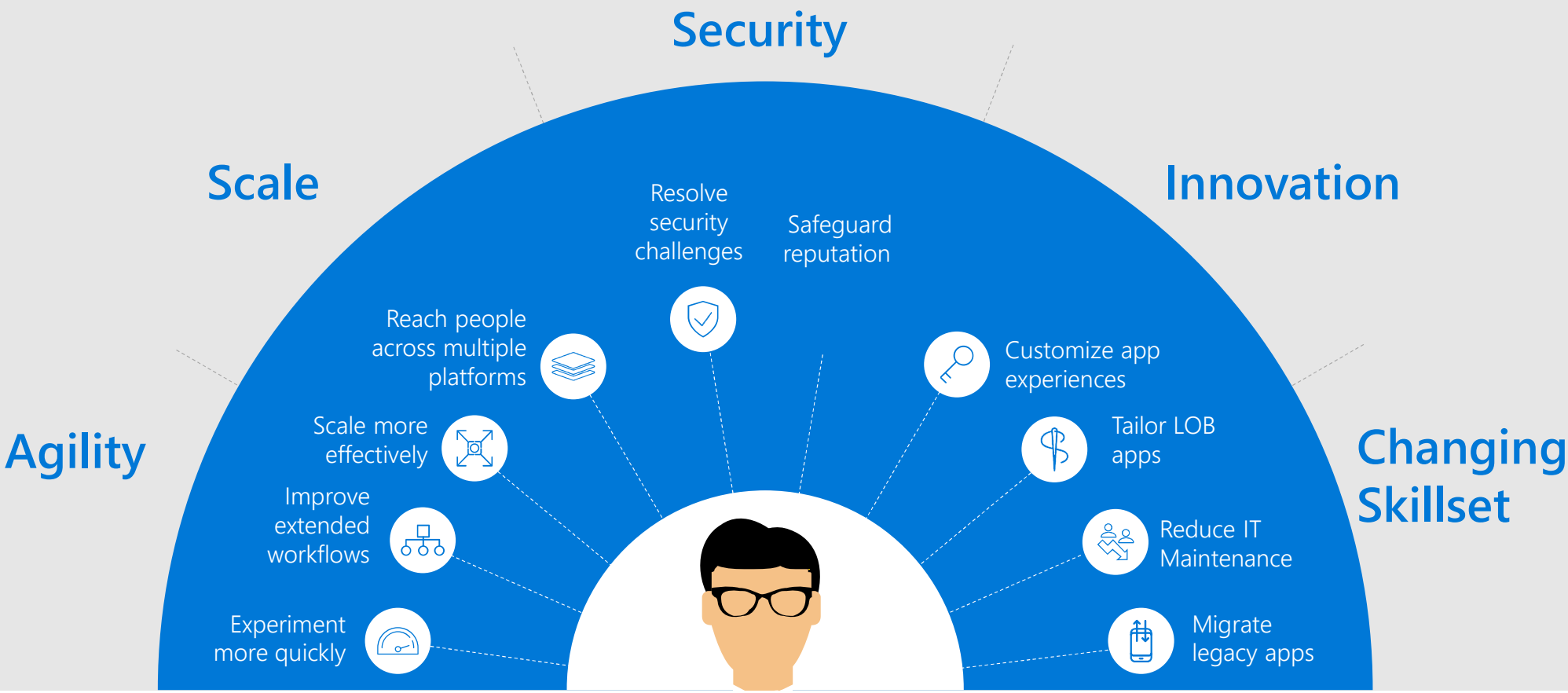


IT challenges

- **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]

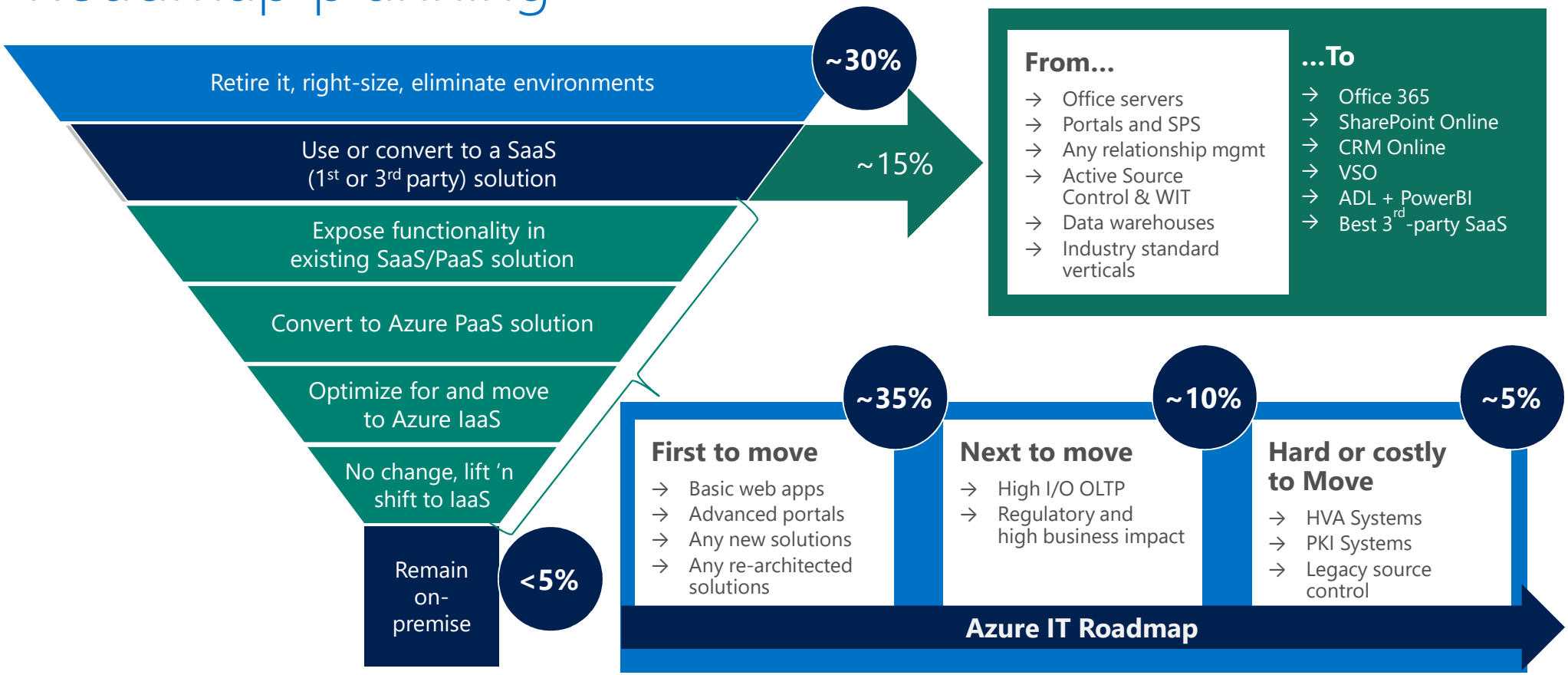
Widening digital divide between Business and IT

You want to modernize apps also for these reasons



Microsoft's Own Journey to the Cloud

Roadmap planning



Helping you achieve more

MetLife

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

jet

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.

OUTBACK STEAKHOUSE

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:

Winner of 2016 Restaurant Breakthrough Award

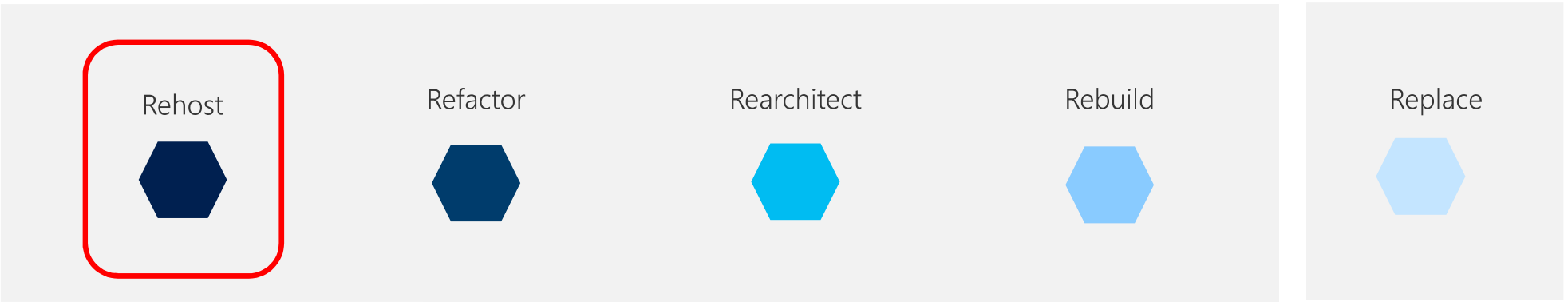
A1

Slide 30

A1 Nicole: need to swap out Alaska and TransAlta with 2 CFA stories

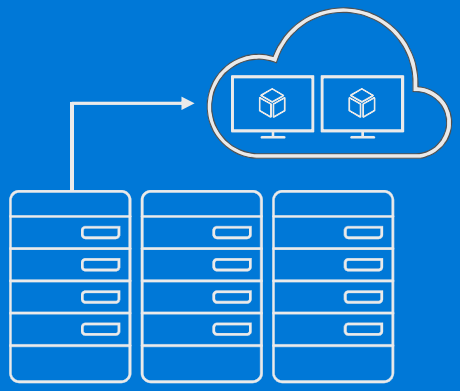
Author, 11/22/2017

The Journey to the Cloud



Source: Gartner: "Developing a Public Cloud IaaS Adoption and Migration Framework" published March 2017

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

Source: Gartner IT Glossary

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."

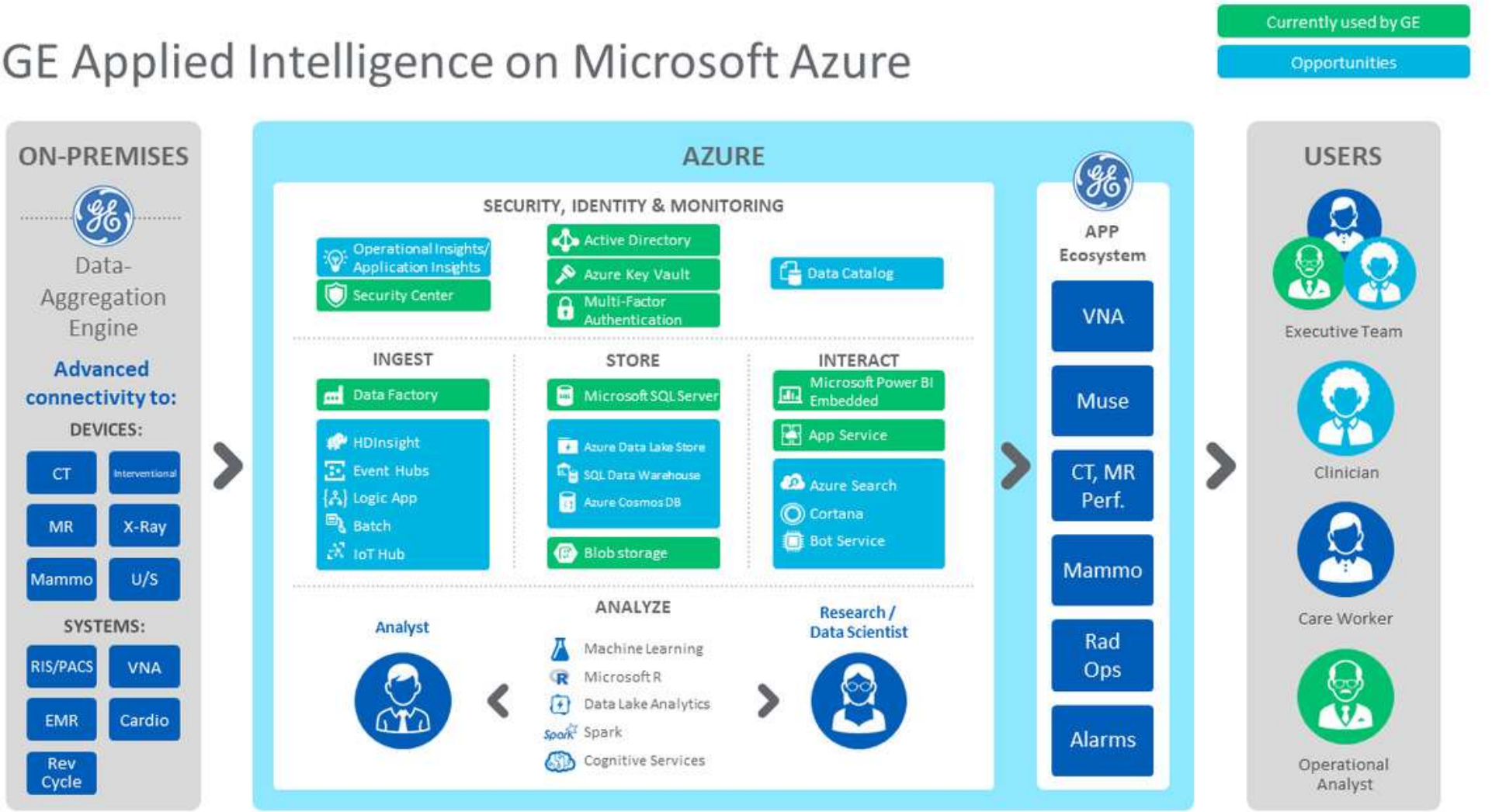
Jeanie Banks
GM of Commercial Cloud Solutions at GE

Result:

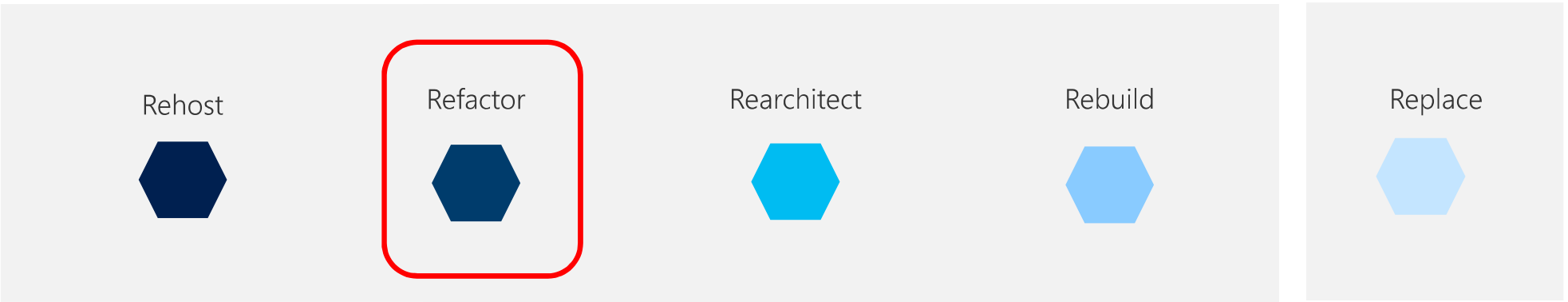
- Easy migration using Virtual machines to get on prem apps, SQL server and .net framework over to Azure with full compatibility.
- Fast time to market and lower operating cost
- Enables regulatory compliance (HIPAA BAA).
- Faster innovation when expanding to use PaaS post their Lift & Shift phase.

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

GE Applied Intelligence on Microsoft Azure

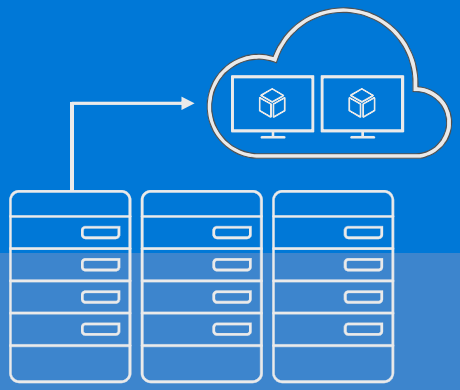


The Journey to the Cloud



Source: Gartner: "Developing a Public Cloud IaaS Adoption and Migration Framework" published March 2017

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

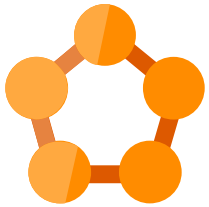
- Containers, container orchestration
- DevOps tools

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

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

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.

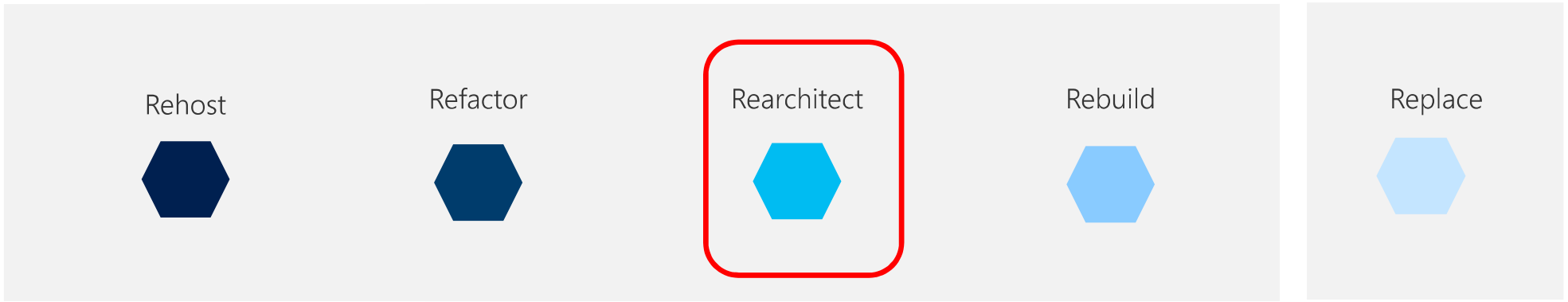
Solutions:

Lift & shift into Windows containers using Docker engine

Results

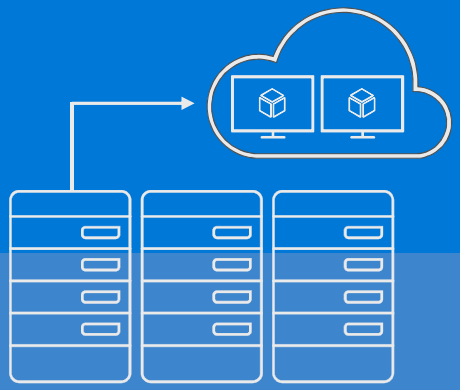
- Immediately modernized key legacy application with elasticity. “By using Windows Server Containers and Docker, we gain better consistency and control between developers, testers, and deployment teams without changing the application”
- Faster time to the market with minimal to zero downtime.
- The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

The Journey to the Cloud



Source: Gartner: "Developing a Public Cloud IaaS Adoption and Migration Framework" published March 2017

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.

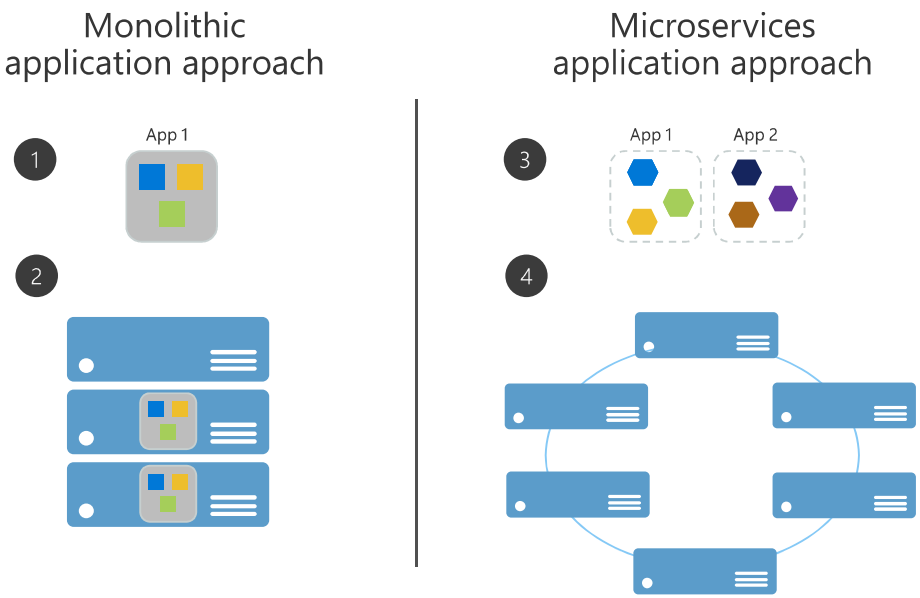
Core technologies

- PaaS, microservices, containers and FaaS

Source: Gartner IT Glossary

Rearchitect: from monolithic app to microservices

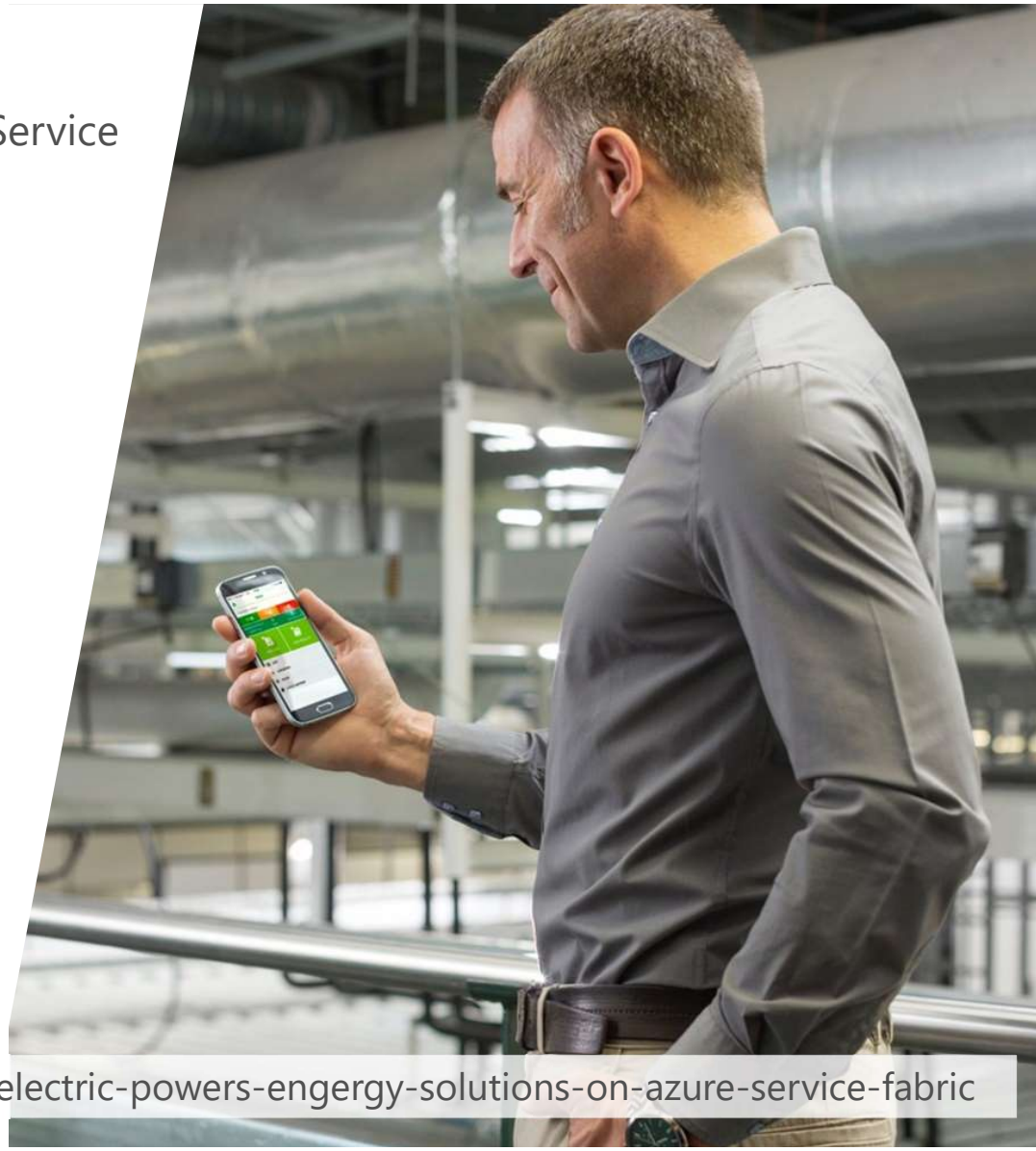
- Individually built and deployed
- Small, independently executing services
- Integrate using published API calls for overall application's functionality
- Fine-grained, loosely coupled application



Deploying faster using Azure DevOps suite

Streamline and speed up application delivery	Write better code with advanced developer tools	Save time and money with Cloud Dev/Test	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:

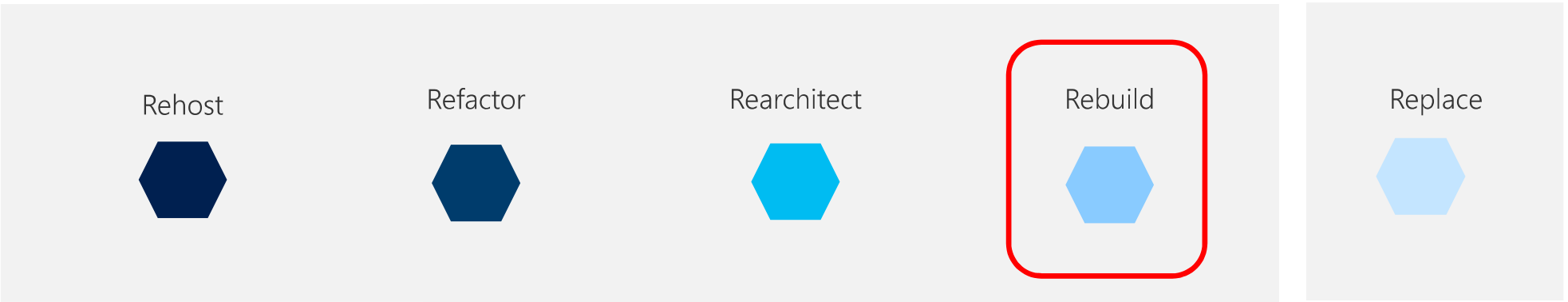
Using Service Fabric in order to better process data, provide device logic, and provide the device-connectivity framework

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

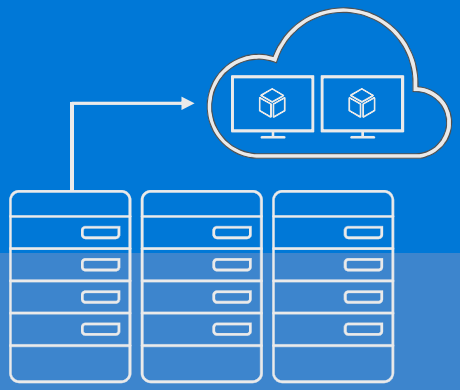
https://customers.microsoft.com/en-us/story/schneider-electric-powers-engergy-solutions-on-azure-service-fabric

The Journey to the Cloud



Source: Gartner: "Developing a Public Cloud IaaS Adoption and Migration Framework" published March 2017

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

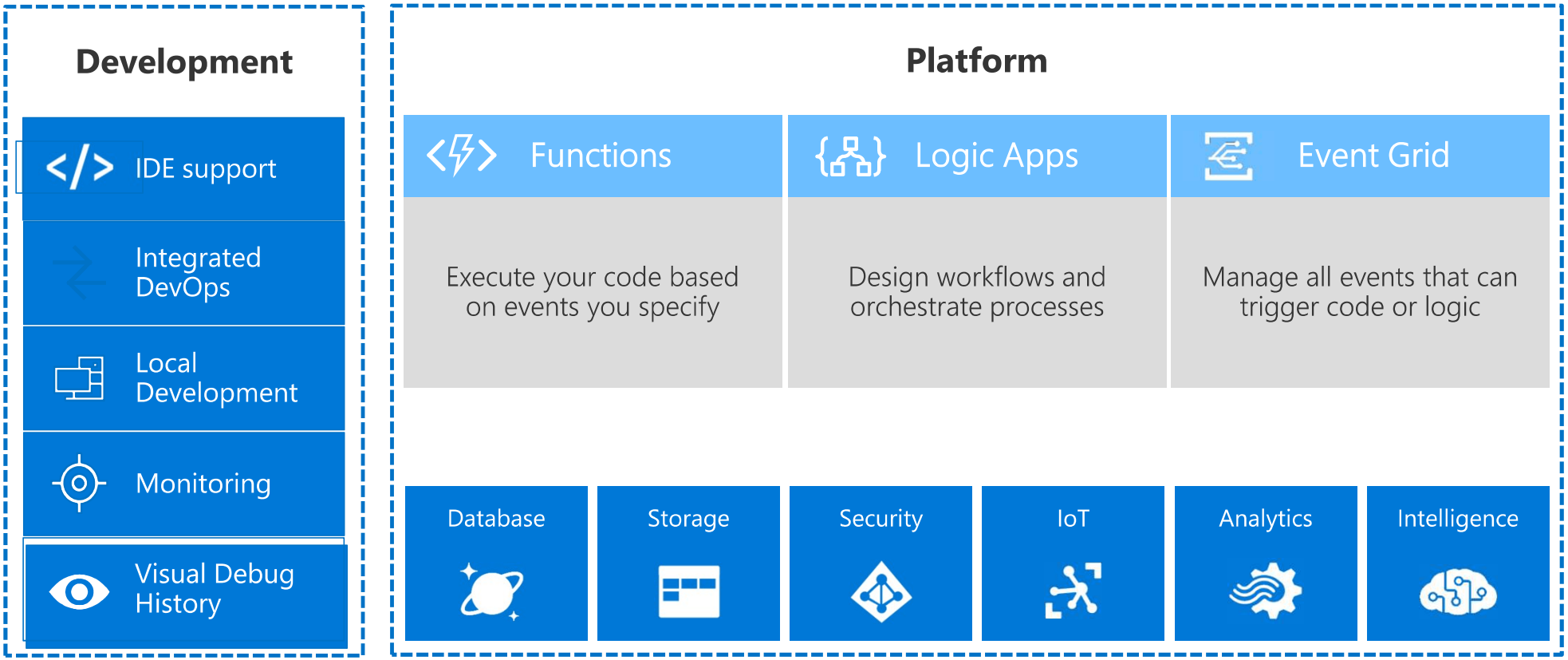
- Reduce TCO
- Fully leverage the cloud native capabilities and build applications faster
- Expedite your business innovation

Core technologies

- Serverless, PaaS

Source: Gartner IT Glossary

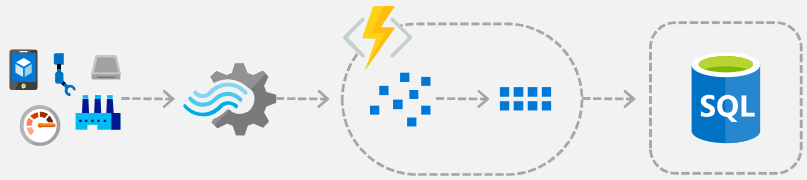
Serverless application platform components



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)

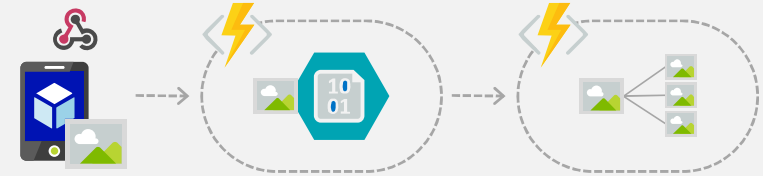
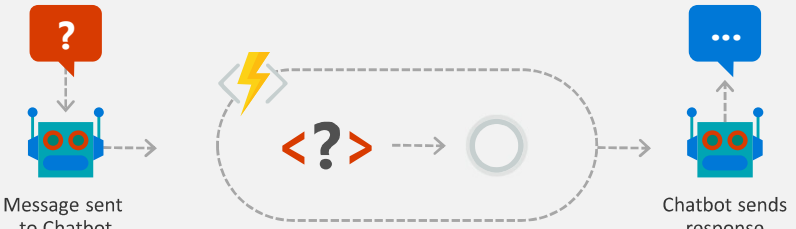


Photo taken and WebHook called

Stores in blob storage

Produces scaled images

Real-time bot messaging



Message sent to Chatbot

Cortana Analytics answers questions

Chatbot sends response

FUJIFILM

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.

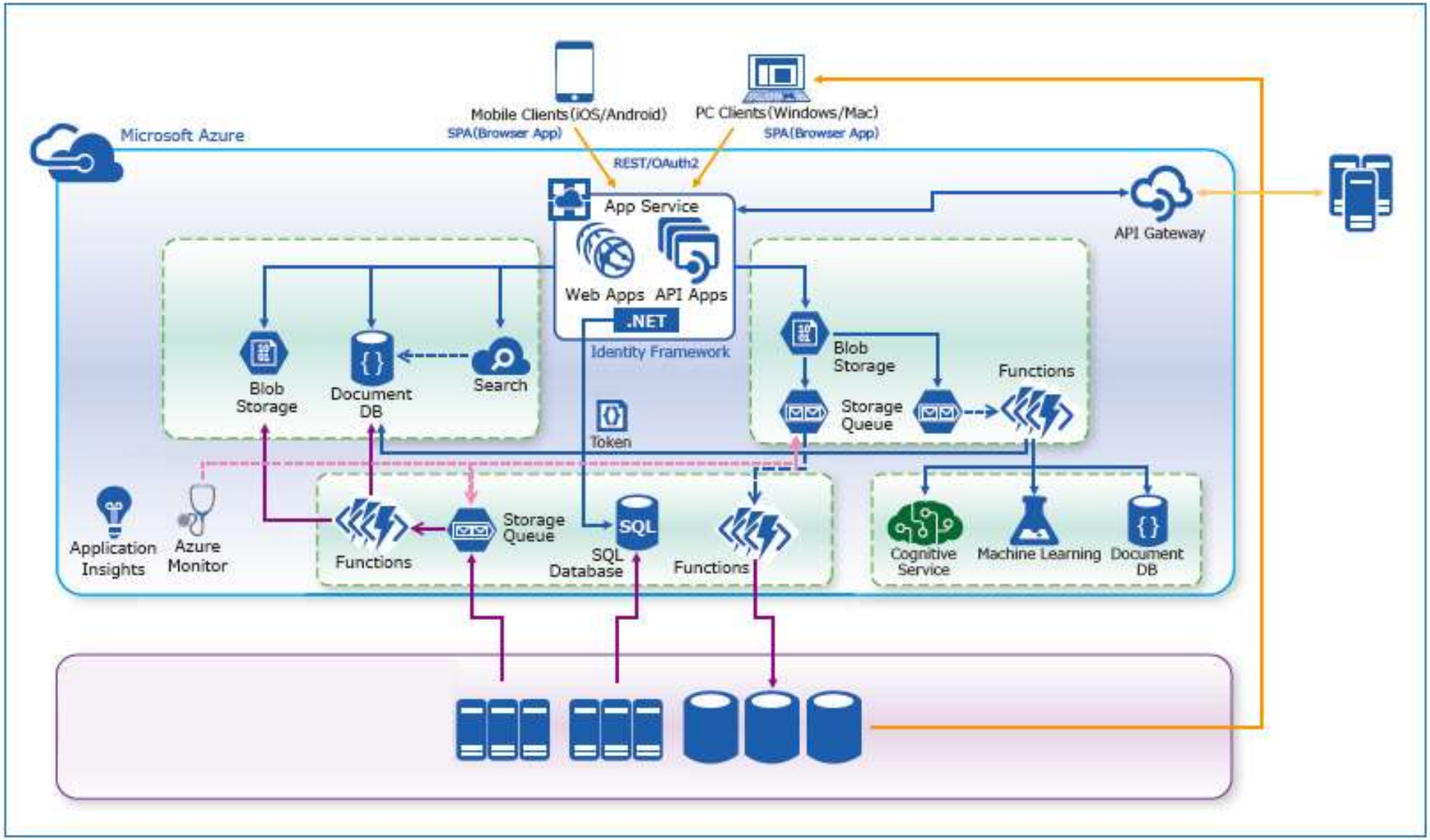
Solutions:

moved to Serverless architecture

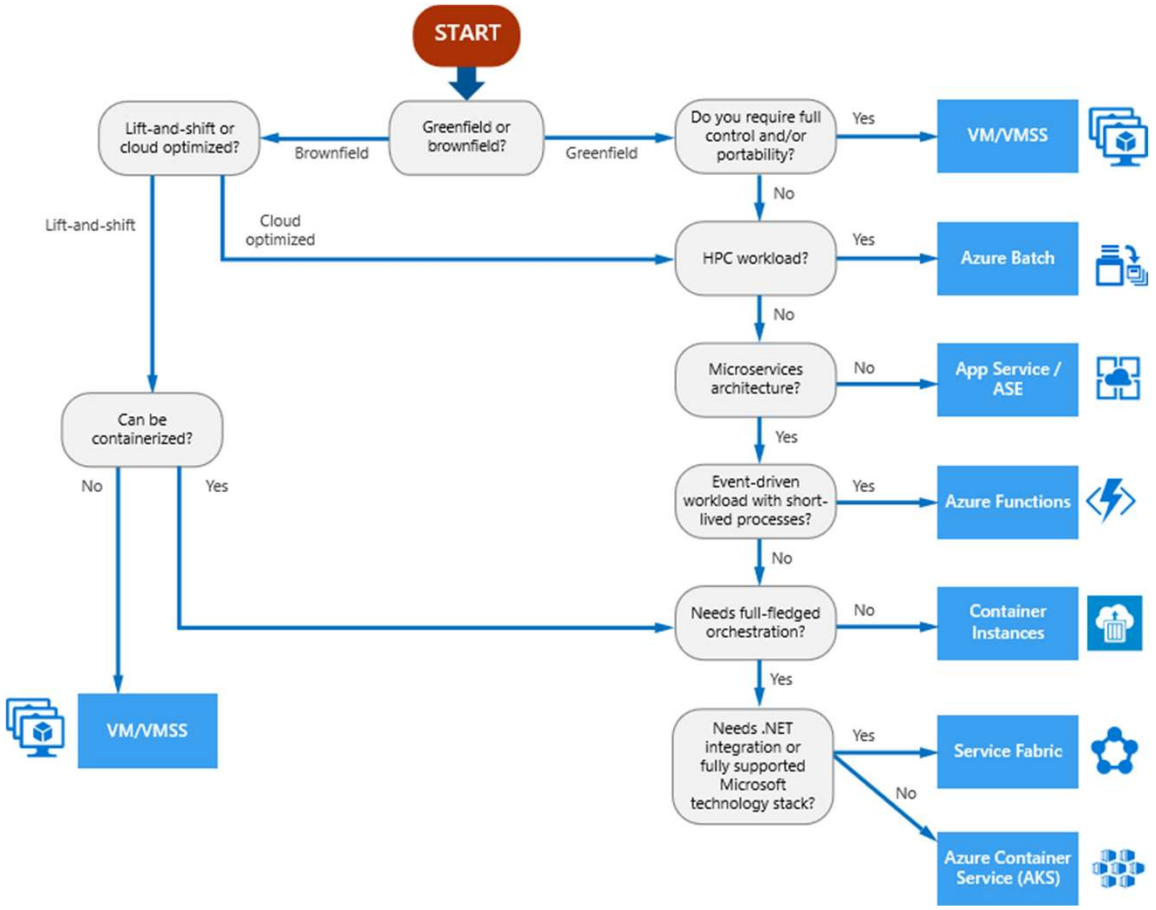
Results

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

https://customers.microsoft.com/en-us/story/fujifilm-software-co-ltd


Microsoft Azure
Mobile Clients (iOS/Android)
SPA (Browser App)
PC Clients (Windows/Mac)
SPA (Browser App)
REST/OAuth2
App Service
Web Apps
API Apps
.NET
Identity Framework
API Gateway
Blob Storage
Document DB
Search
Token
Blob Storage
Functions
Storage Queue
Application Insights
Azure Monitor
Functions
Storage Queue
SQL
SQL Database
Functions
Cognitive Service
Machine Learning
Document DB

Azure compute services



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

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

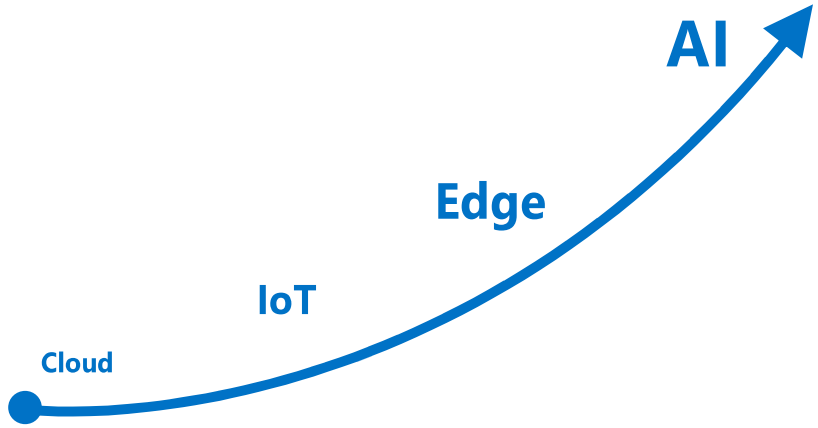
Harnessing signals from sensors and devices, managed centrally by the cloud

Edge

Intelligence offloaded from the cloud to IoT devices

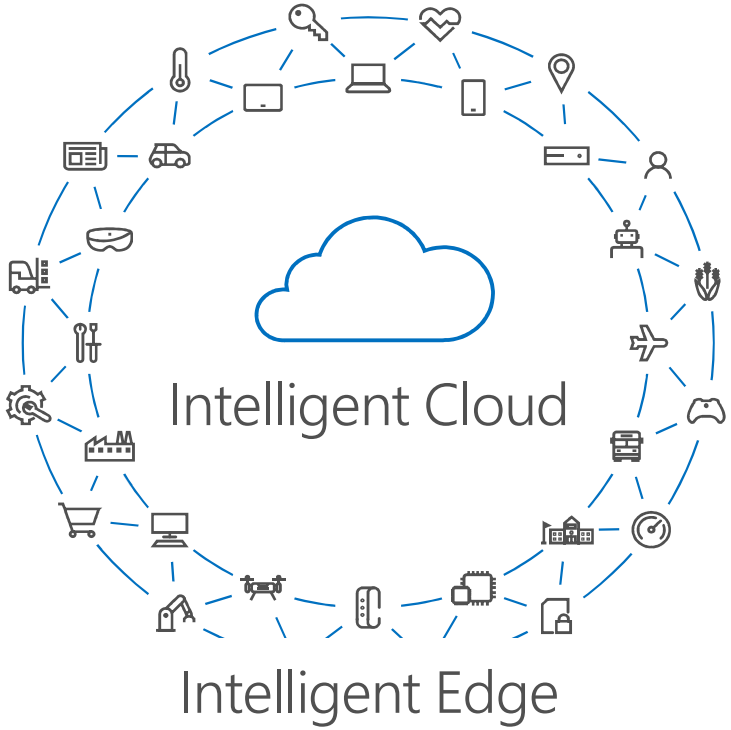
AI

Breakthrough intelligence capabilities



200 Billion objects by 2020

26 smart objects for every human



IoT for manufacturing >

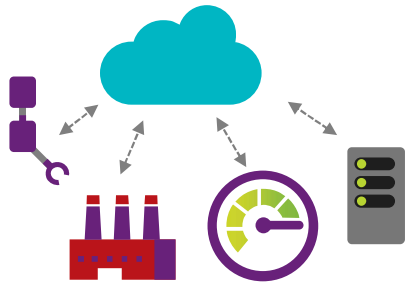
IoT for smart cities >

IoT for transportation >

IoT for retail >

IoT for healthcare >

Why the edge?

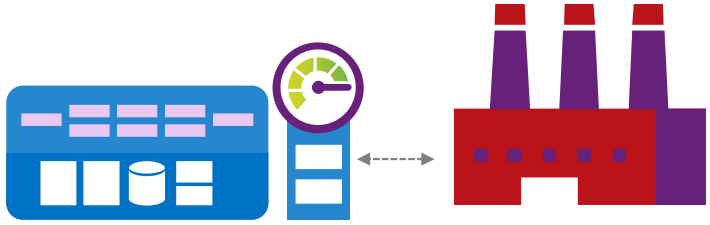


IoT in the cloud

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

Johnson Controls

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**

Tetra Pak

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%**

DUNAV NET

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%**

BMW FUJITSU KUKA Steelcase Schneider Electric KOHLER LIEBHERR JABIL ABB

Defining IoT

Things

Insights

Action

IoT projects are still complex

Security
is a **challenge**

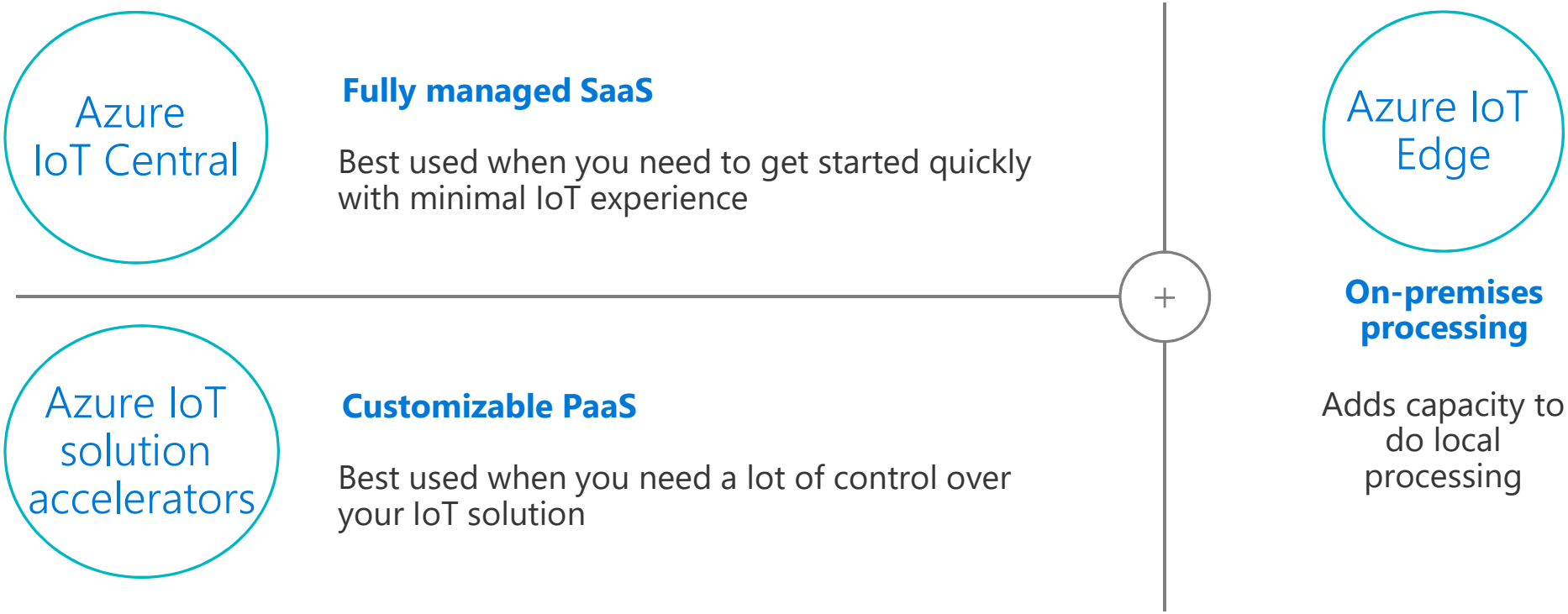
Time-consuming
to get started

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.