



Modernizing Applications for the Edge

*Write Once Deploy Anywhere - Run
Cloud Native Applications Where
They Are Needed Most*

Damir Bersinic
Azure Hybrid Cloud Technical Sales Lead – Canada
C+E Global Black Belt Team
damirb@microsoft.com



neo

Gold Sponsors



Community Supporters



Challenges and opportunities driving accelerated innovation

Manufacturers are facing disruptive changes



92%
of manufacturers either piloting or scaling digital technologies to target cost reduction



83%
currently seeing services business model as major opportunity area

Retailers are adopting a digital first mind set



72%
consumers say only engaged in personalized marketing



Data explosion
More data generated in next 3 years than in the past 30

Ongoing healthcare system impacts



14M
By 2030, providers will suffer from a projected shortage of healthcare workers worldwide



\$6.2B
Loss per year to data breaches, amid growing pressures in security and compliance

Next-generation technologies are pushing Finance



54%
of banks think removing friction from the customer journey is the most important trend in retail banking



37%
of bank executives plan to upgrade their IT infrastructure to cut cost and improve efficiency

Industry Practices

Manufacturers are facing disruptive changes

- Build more agile factories
- Create more resilient supply chains
- Engage customers in new ways

Retailers are adopting a digital first mind set

- Reimagine in person retail experiences
- Deliver differentiated online experiences
- Know the customer and empower employees

Ongoing healthcare system impacts

- Enhance patient engagement
- Empower health team collaboration
- Improve clinical and operational insights

Next-generation technologies are pushing Finance

- Modernize payments and core banking
- Manage risk across the organization
- Combat financial crime

Application Demands

New Innovations

More applications in more locations

App should never be down

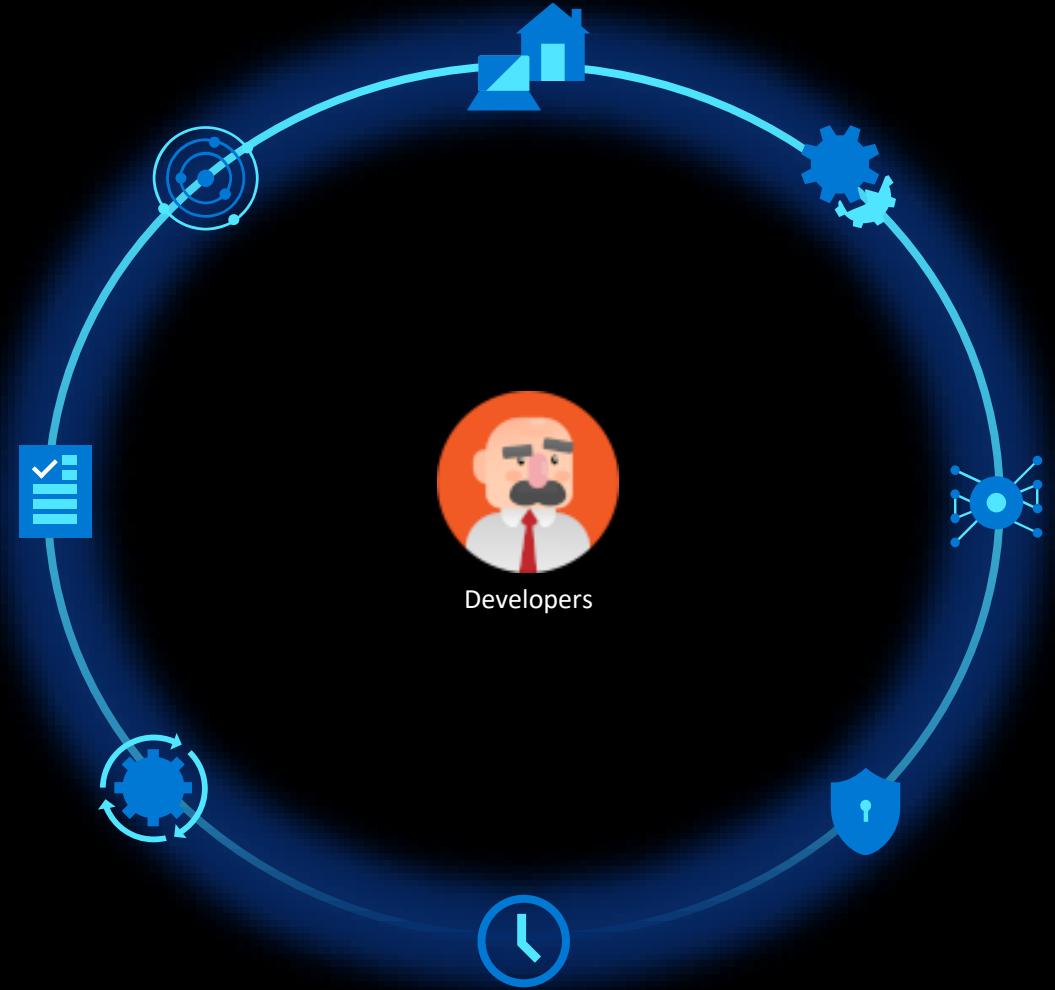
Need faster development and deployment

Keep App and Data safe and Compliant

Use modern tools and techniques

Applications should Run Anywhere

Managing legacy applications, too



Developers



What is Developer Velocity?

Driving business performance through software development by empowering developers, creating the right environment for them to innovate, and removing points of friction.

azure.com/developervelocity

**Companies with top
Developer Velocity Index (DVI)
outperform the market**

4-5x

Higher revenue growth

55%

Higher innovation¹

McKinsey & Company: Driving business outcomes through Developer Velocity 2020

1 Measured by level of adoption of new technologies and ability to innovate faster and beat competition through innovation led growth

Unleash the full potential of your Developers

Build
productively

Scale
innovation

DevOps

Collaborate
globally & securely



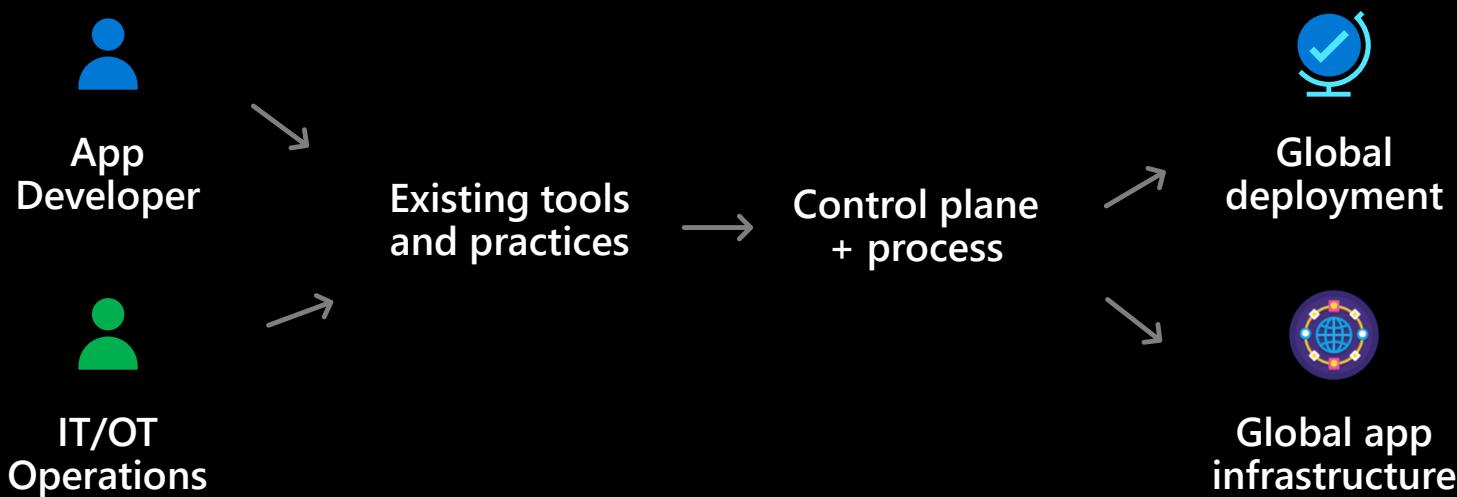
The app of the future
is **cloud native**

What is cloud native?

Package application code and dependencies in containers, deploy as microservices and manage them using DevOps processes and tools

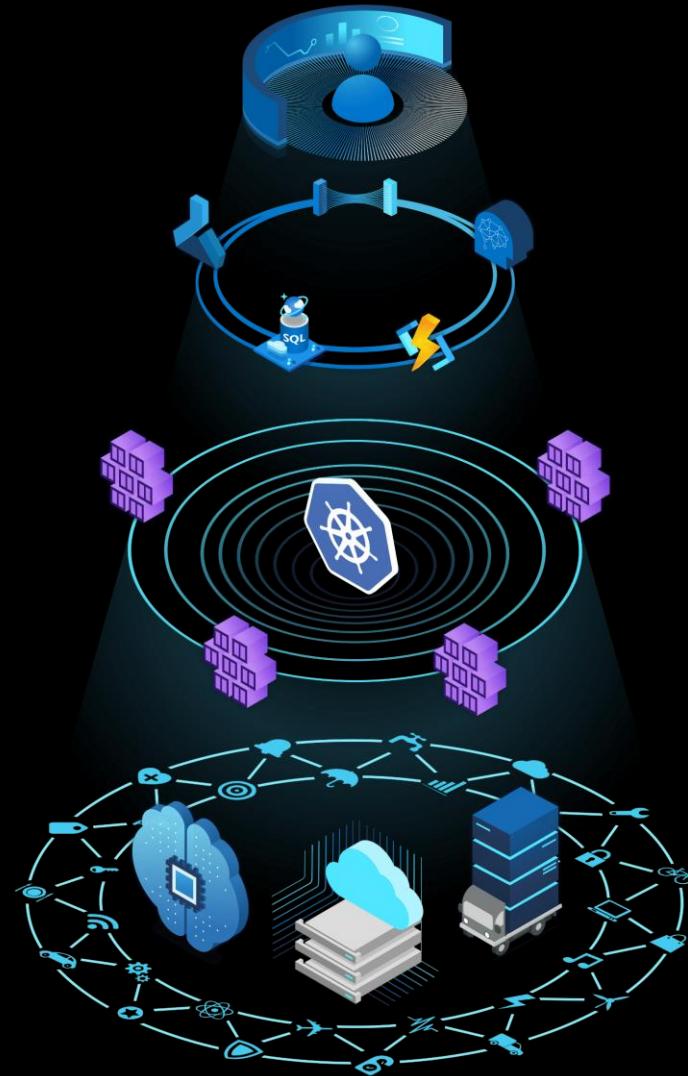


Modernize applications to run *anywhere*



Scenario	Flexibility to deploy anywhere to meet local requirements Support traditional applications with modern processes Provide low-latency requirements that your application needs
----------	---

What's unique about hybrid scenarios?



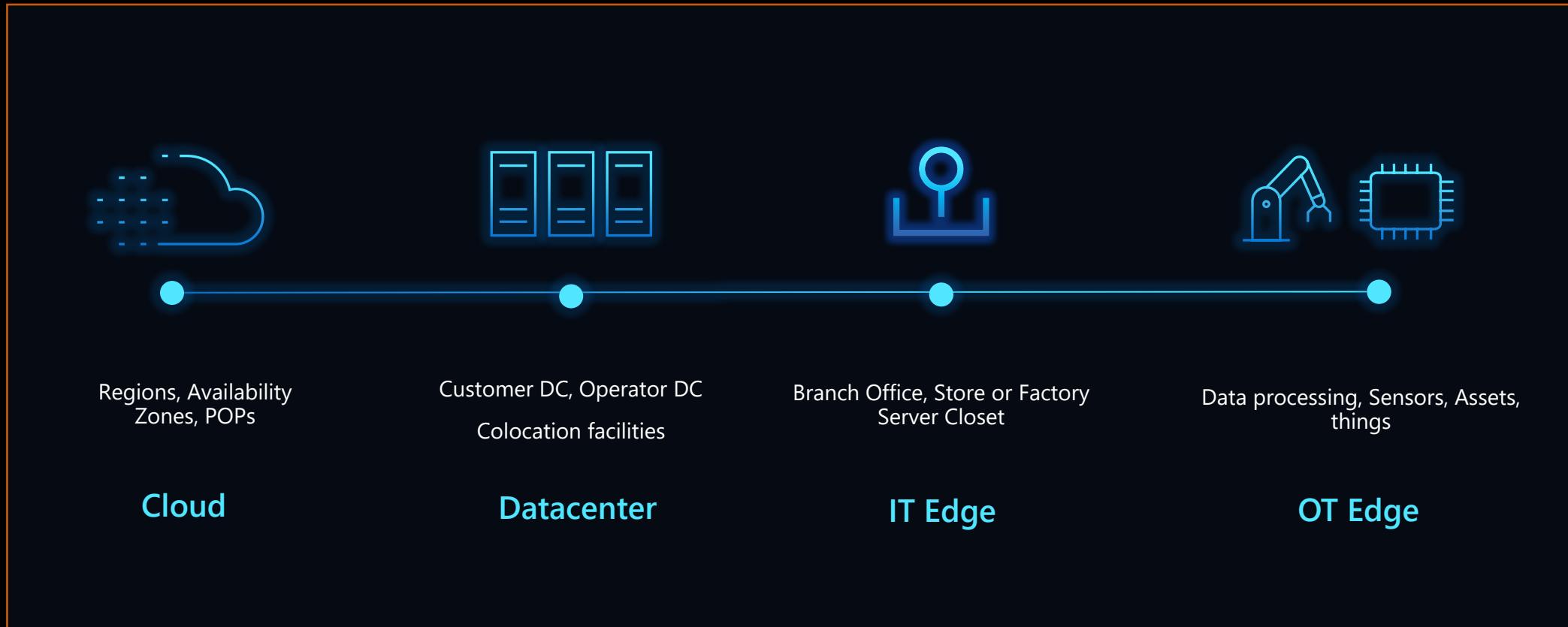
Deploy and Manage

Modern Apps and Data

App infrastructure

Anywhere

Anywhere you need applications to run



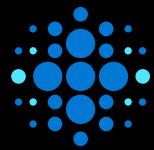
Common hybrid app development Patterns



**Consistent Application
Management and
Operation**



**App
Modernization**

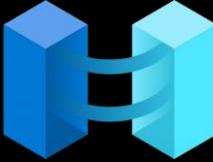


**Data Ingestion and
Pre-Processing at the
Edge**



**AI Inferencing at the
Edge**

Consistent Application Management & Operation across Cloud and Edge



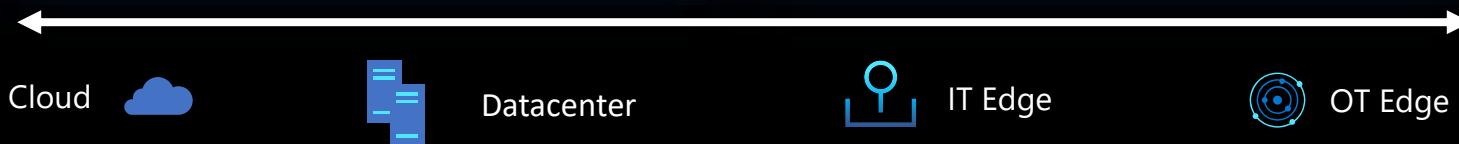
Cloud

Aggregating Security, Monitoring &
Data Insights
across the fleet

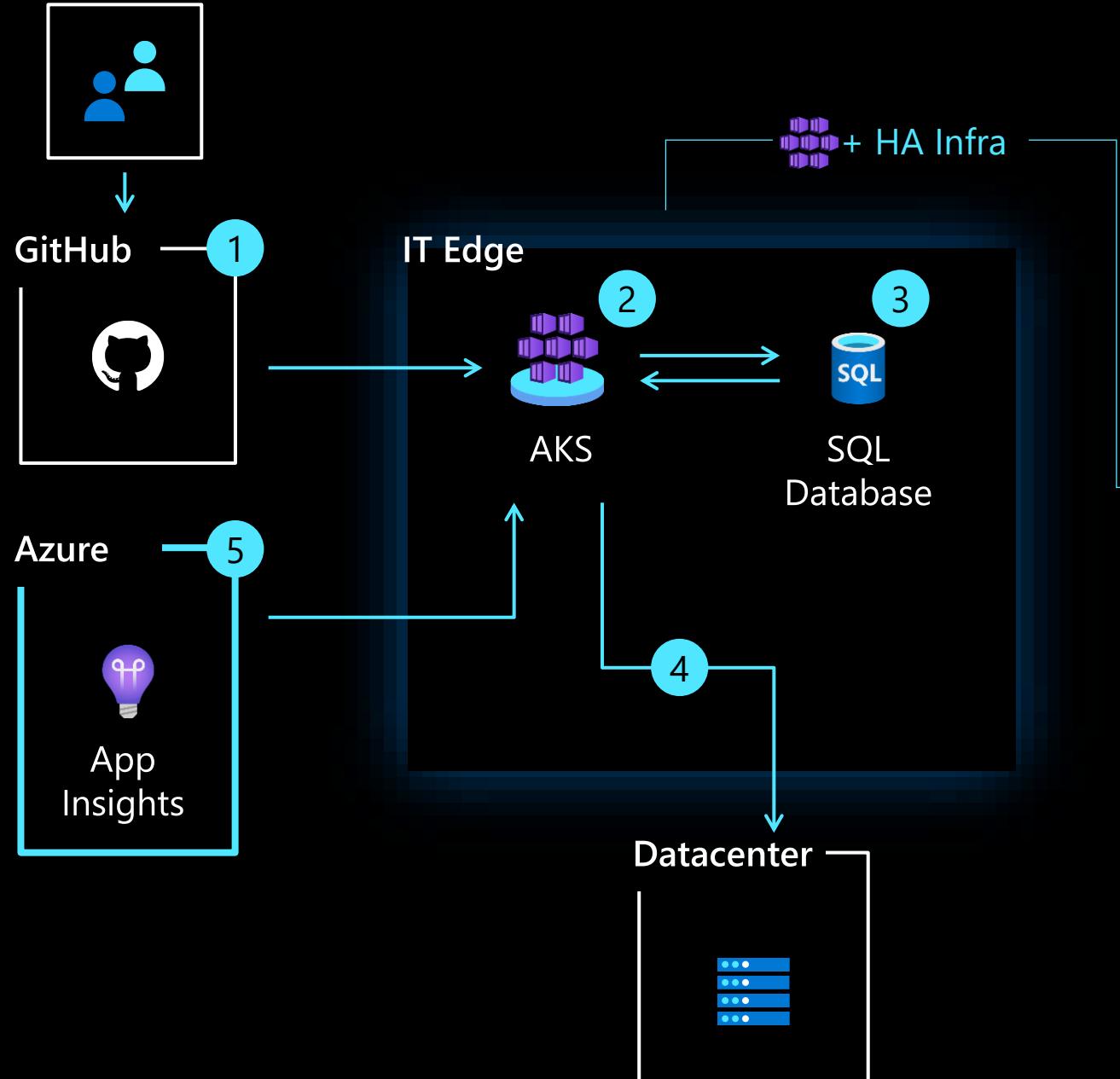
Edge..

Arc K8s Extensions
App Insights and Security
Agents Arc Enabled Services
DIY OSS Alternatives

1. Start with Cloud First Approach
2. Bring the Cloud Paradigms to the Edge
3. Implement Patterns for day-2 management and operations
4. Observability, Monitoring, Security



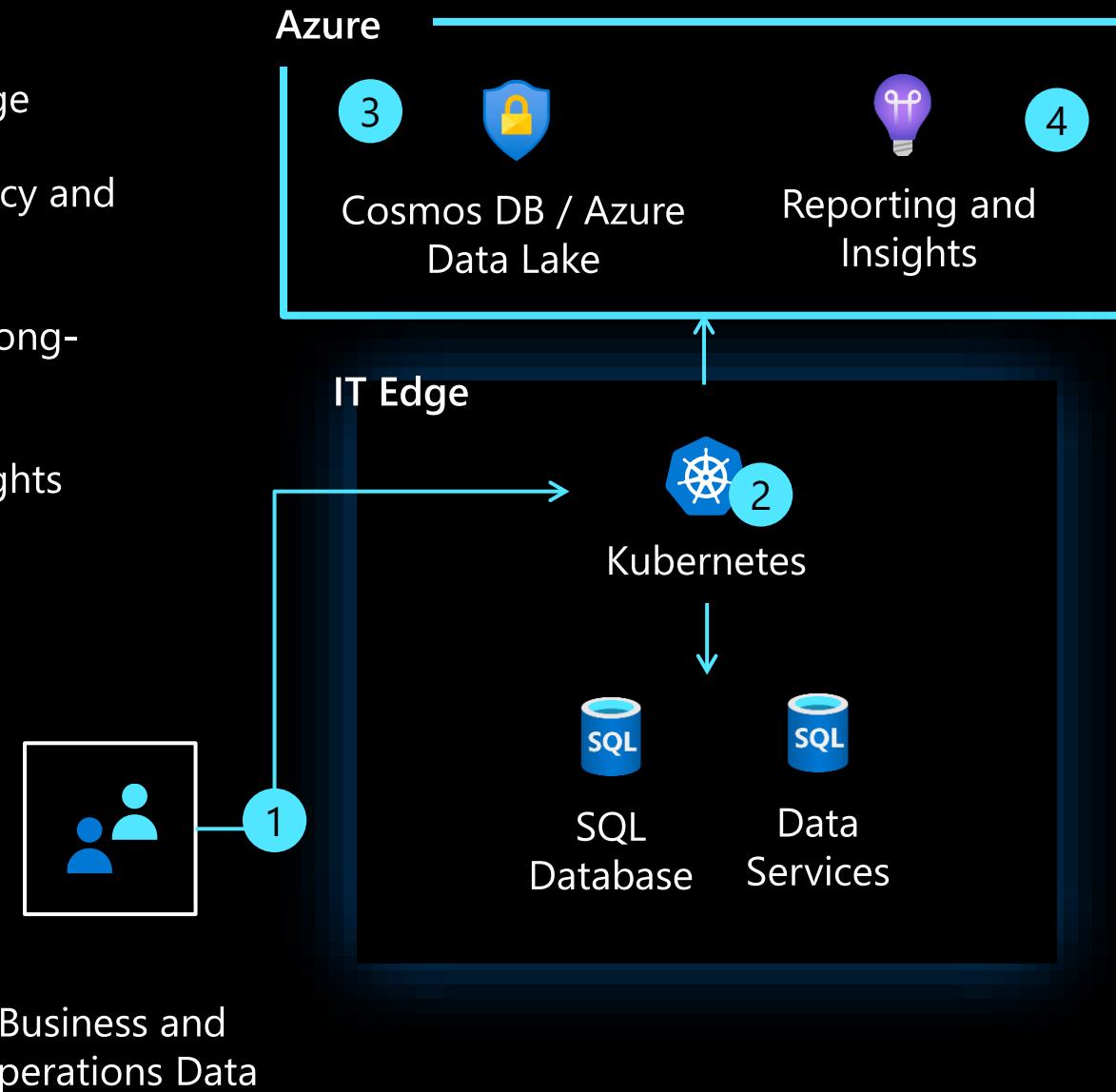
App Modernization



1. GitHub Actions for DevOps pipelines regardless of where the app is running
2. Container deployed locally for web app frontend
3. Data modernization using managed SQL database in edge location
4. Data from legacy systems is available on the local network
5. App Insights running in Azure to provide app telemetry and performance metrics

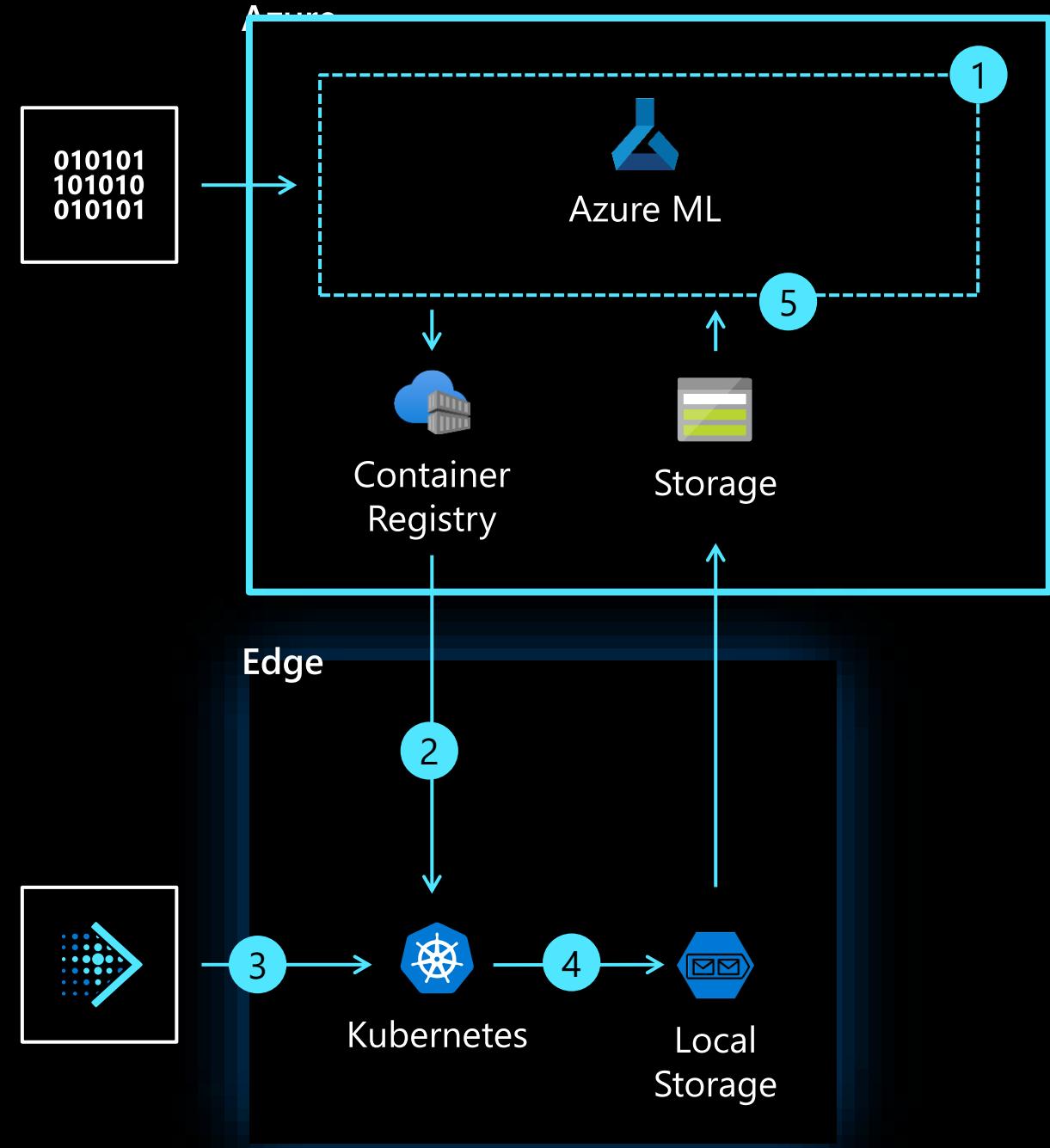
Data Ingestion and pre-processing at the Edge

1. High-volume data ingested at the edge
2. Data processed locally including privacy and governance
3. Processed data sent to the cloud for long-term storage/data lake
4. Fleet data is kept in the cloud for insights across locations / geos



AI Inferencing at the Edge

1. A model is trained in the cloud using Azure ML tools and containerized
2. The model is deployed to an Arc-enabled Kubernetes cluster on-premises
3. Input is scored against the local ML model
4. Insights from scoring are stored locally
5. Retraining based on data from the Edge



Hybrid cloud models

DIY Open Source Platform architecture

Flexibility and leverage from the OSS ecosystem

Many components to assemble

Patch and update across all components can be challenging

Azure Arc integrated OSS components



Microsoft Enhanced Stack

Platform architecture

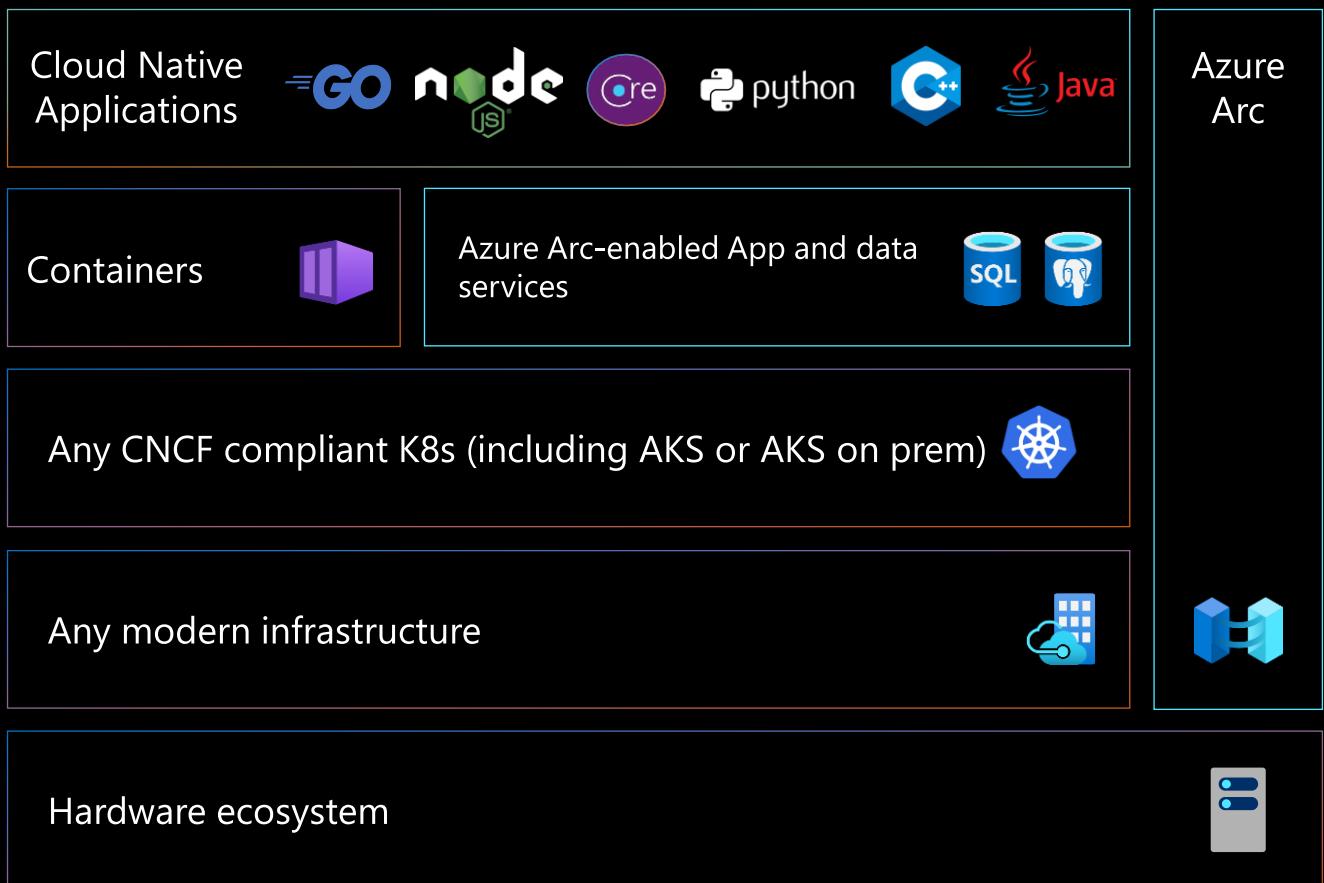


Application and data platforms for developer consistency

PaaS experiences backed by support

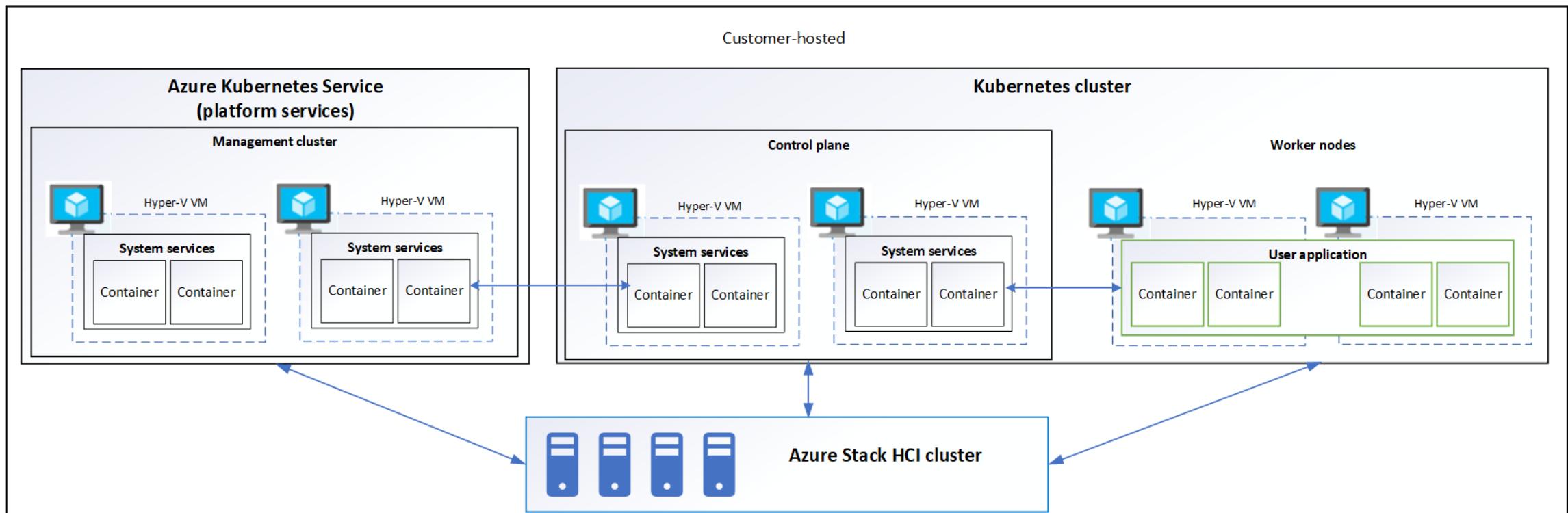
Flexibility and leverage from the OSS ecosystem

Azure Arc integrated OSS components



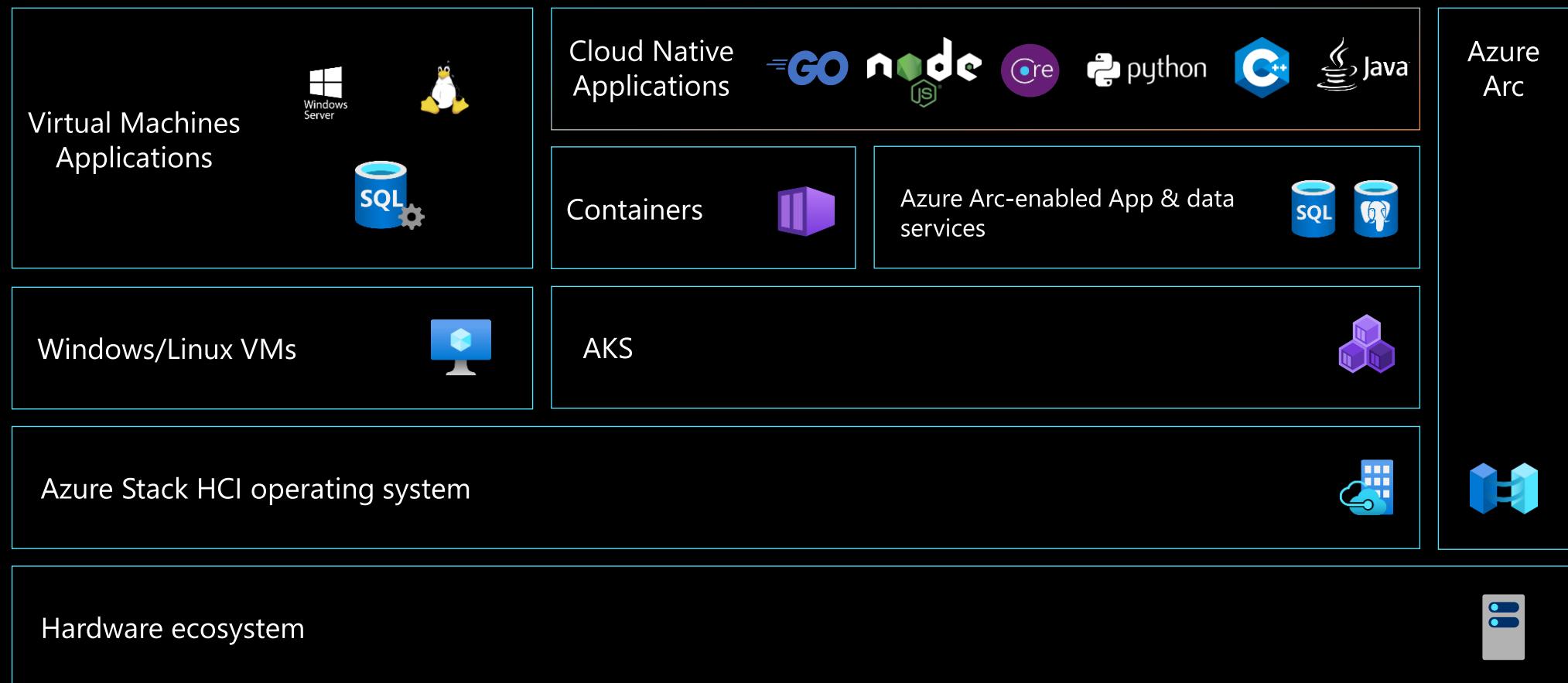
Architecture – AKS-HCI Components

Azure Kubernetes Service on Azure Stack HCI



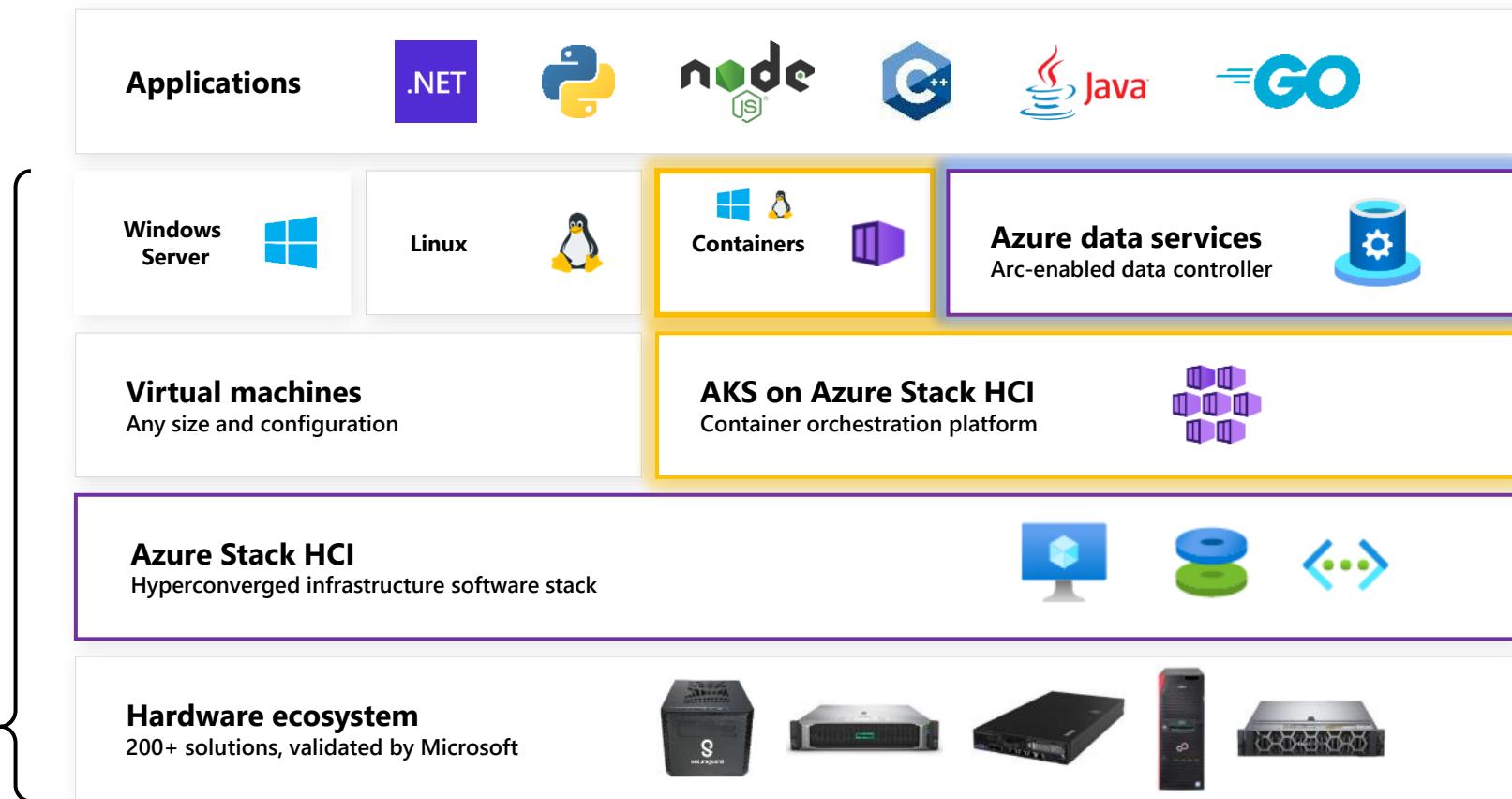
Azure Arc and Azure Stack HCI

Platform architecture



The Azure Hybrid view

Azure Arc
Cloud management



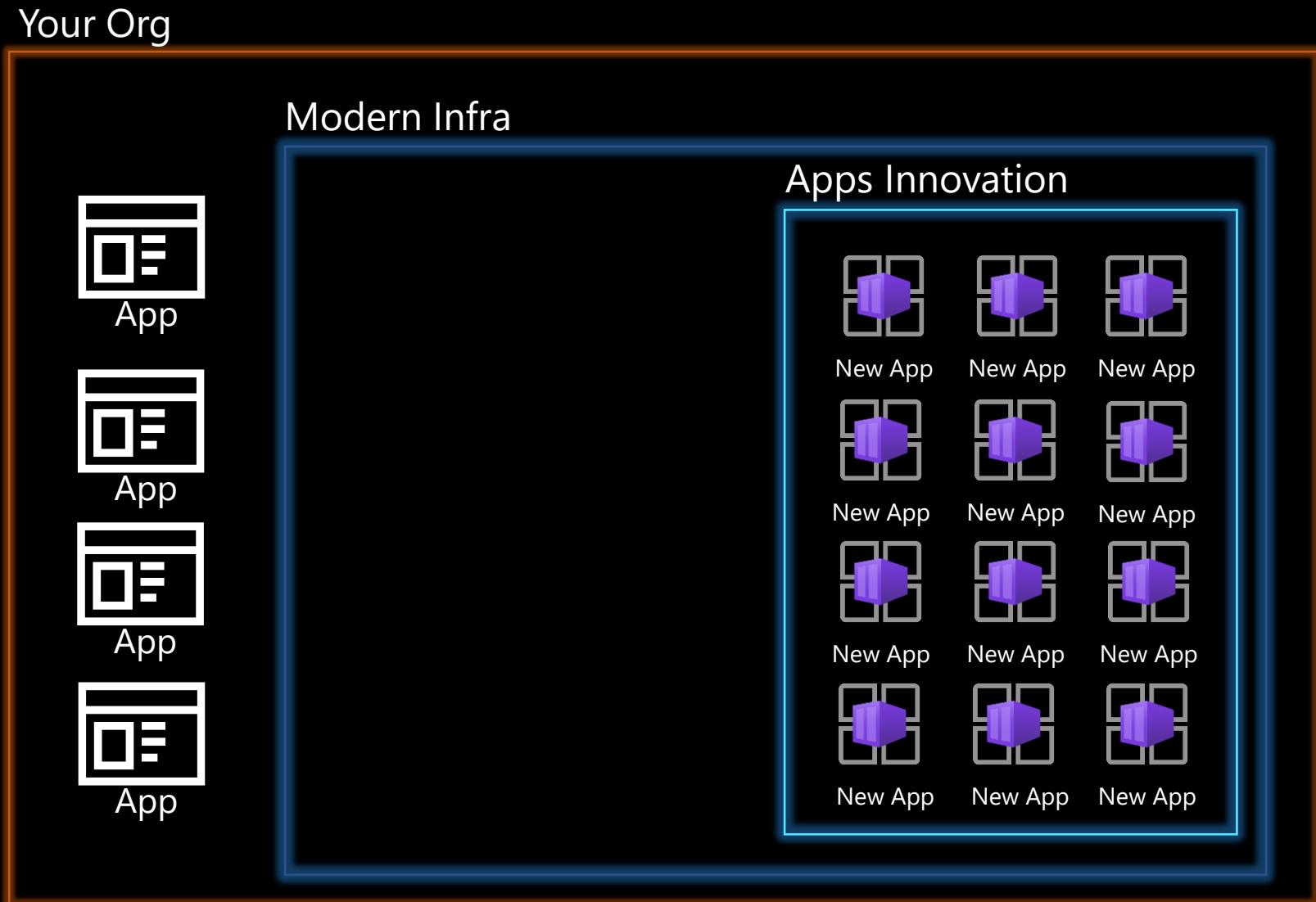
Admin Center
Edge-local management



Customer Journey

Struggling with operations?

1. Deploy modern infrastructure
2. Maintain legacy in parallel for ease transition
3. Migrate and/or create new apps
4. Rewrite/refactor existing applications
5. Continue to write net-new Cloud Native applications





With Azure Arc we are able to distribute solutions and workloads across multiple clouds and data centers to support our clients that would have otherwise been bound to a data center."

Aram Luxtermann
Director, Cloud
KPMG





“

Azure Arc-enabled data services give us the ability to do a lot right out of the box—the policy enforcement, the visibility, and the health monitoring of resources. From a security standpoint, that's where we've seen the biggest value for us”

Khaled Zaky
Director of Product Management
RBC



“

Azure Arc is a game-changer for us. It gives our customers choices and enables the continuous delivery of Kubernetes workloads from the cloud to the edge, at scale and as a service.”

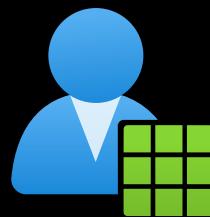
Thomas Gossler

Chief Architect for Teamplay
Siemens



CONTROL

PRODUCTIVITY



Plan for hybrid scenarios



Plan infrastructure funding model



Determine resiliency requirements



Evaluate app development plan



Select an app infrastructure



Identify operations model efficiencies



Scale to many locations



Cloud



Datacenter

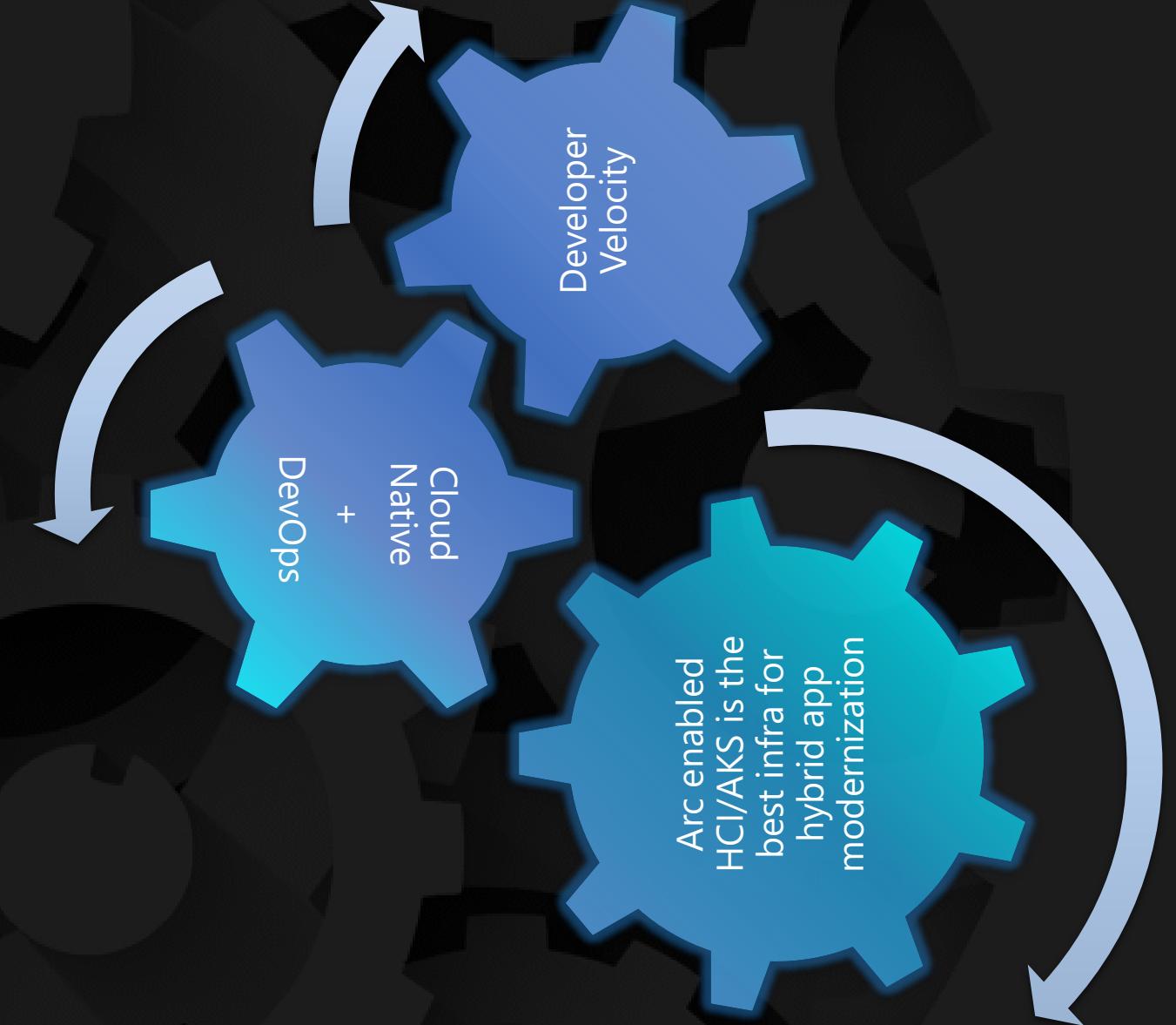


IT Edge

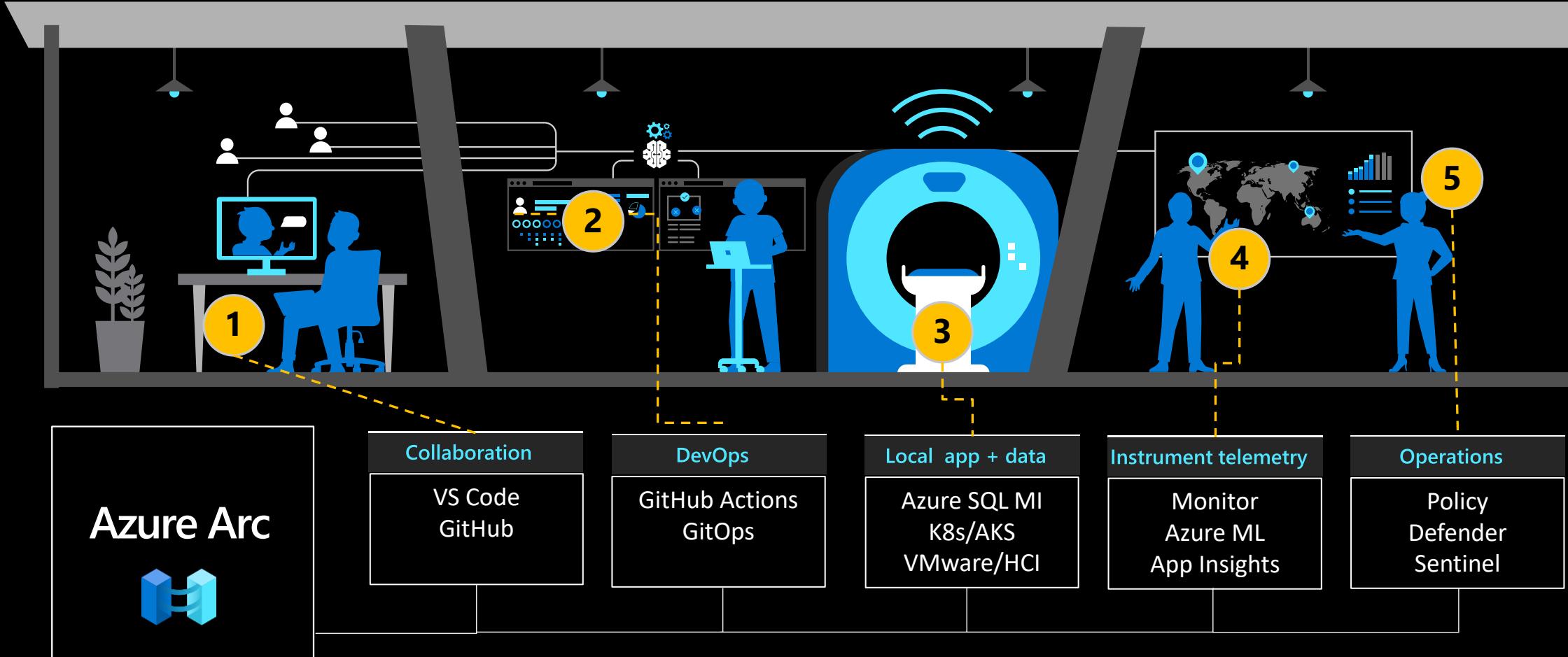


OT Edge

Build modern applications using cloud native practices to run anywhere



How it works: Accelerate and scale innovation



neo

Gold Sponsors



Community Supporters





Thank you