Microsoft

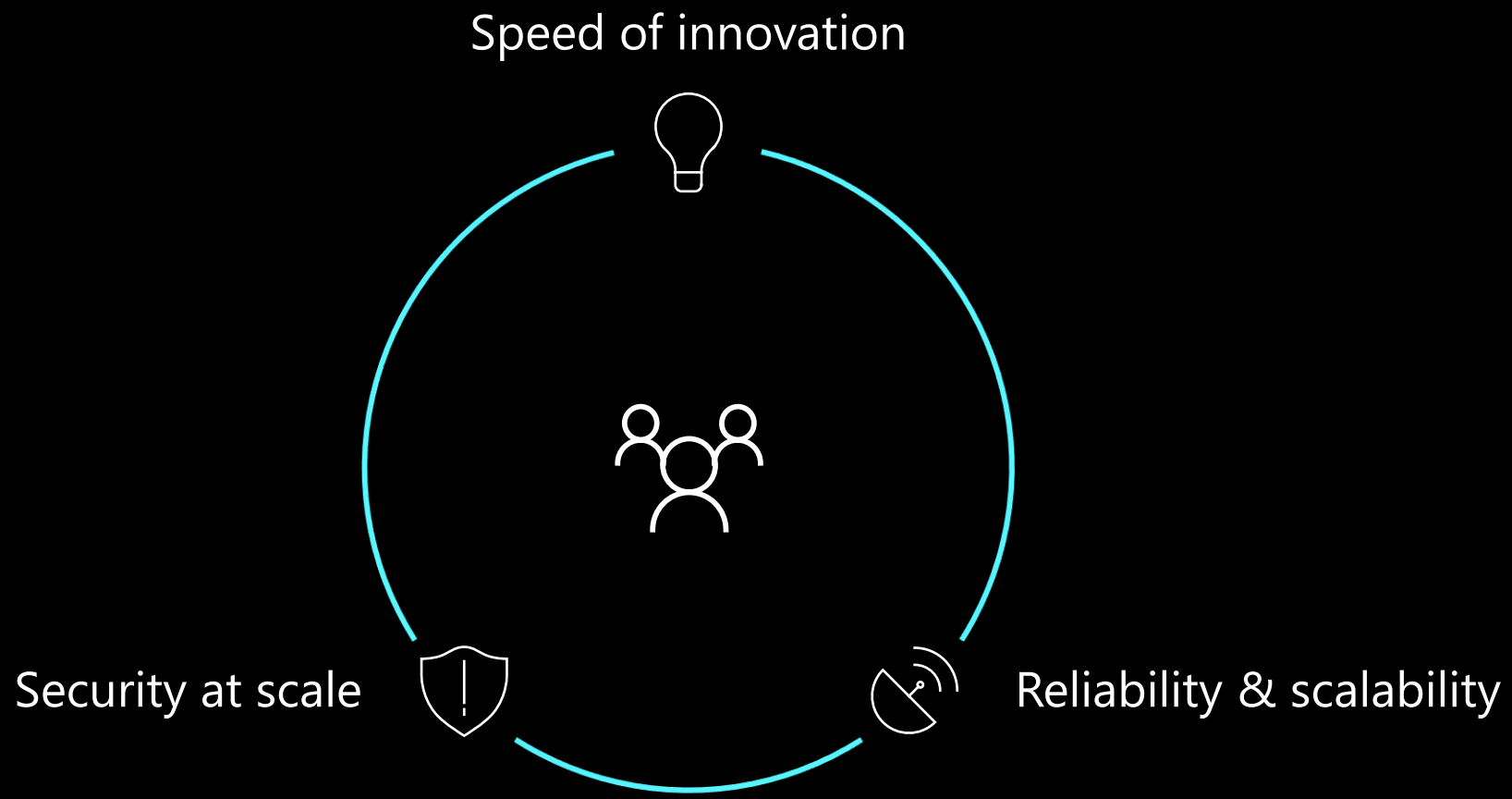
Serverless Update

Overview & Demo

Julien Strebler,
App Innovation | Cloud Solution Architect

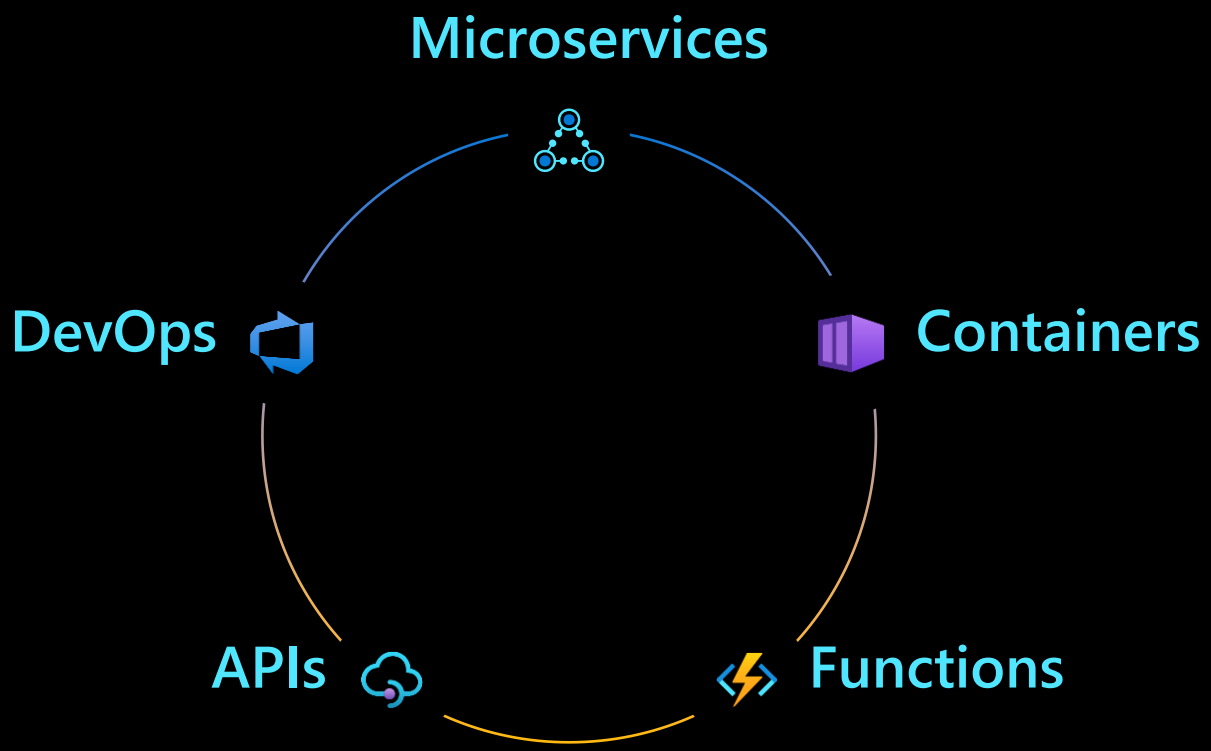
Invent with purpose.

Why cloud native?

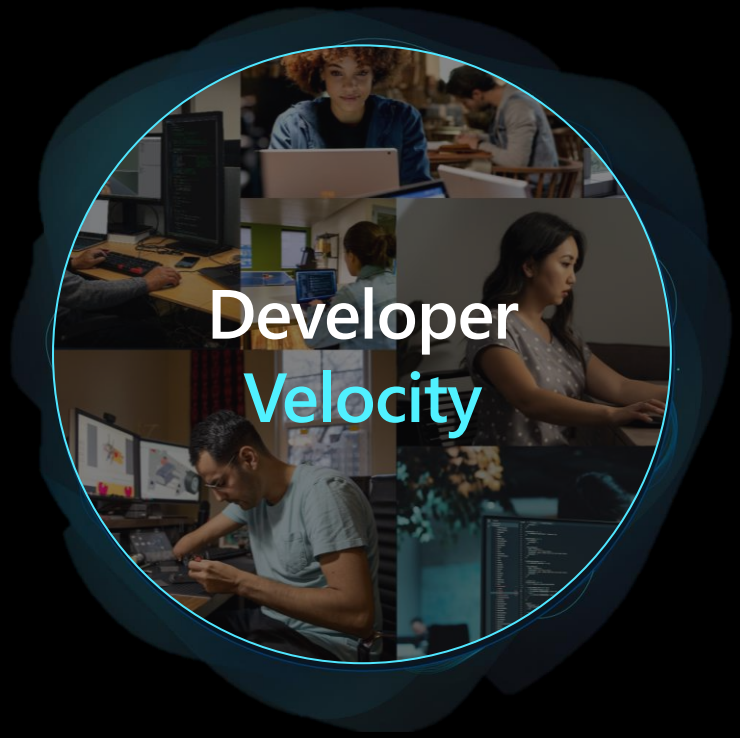


What is cloud native?

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



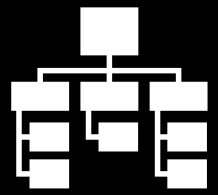
What is Developer Velocity?



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

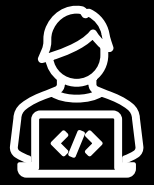
Why Serverless ?



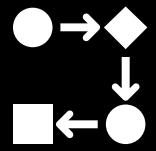
Manage apps not servers

Scale based on demand

Micro-Billing



Reduced Dev & Ops

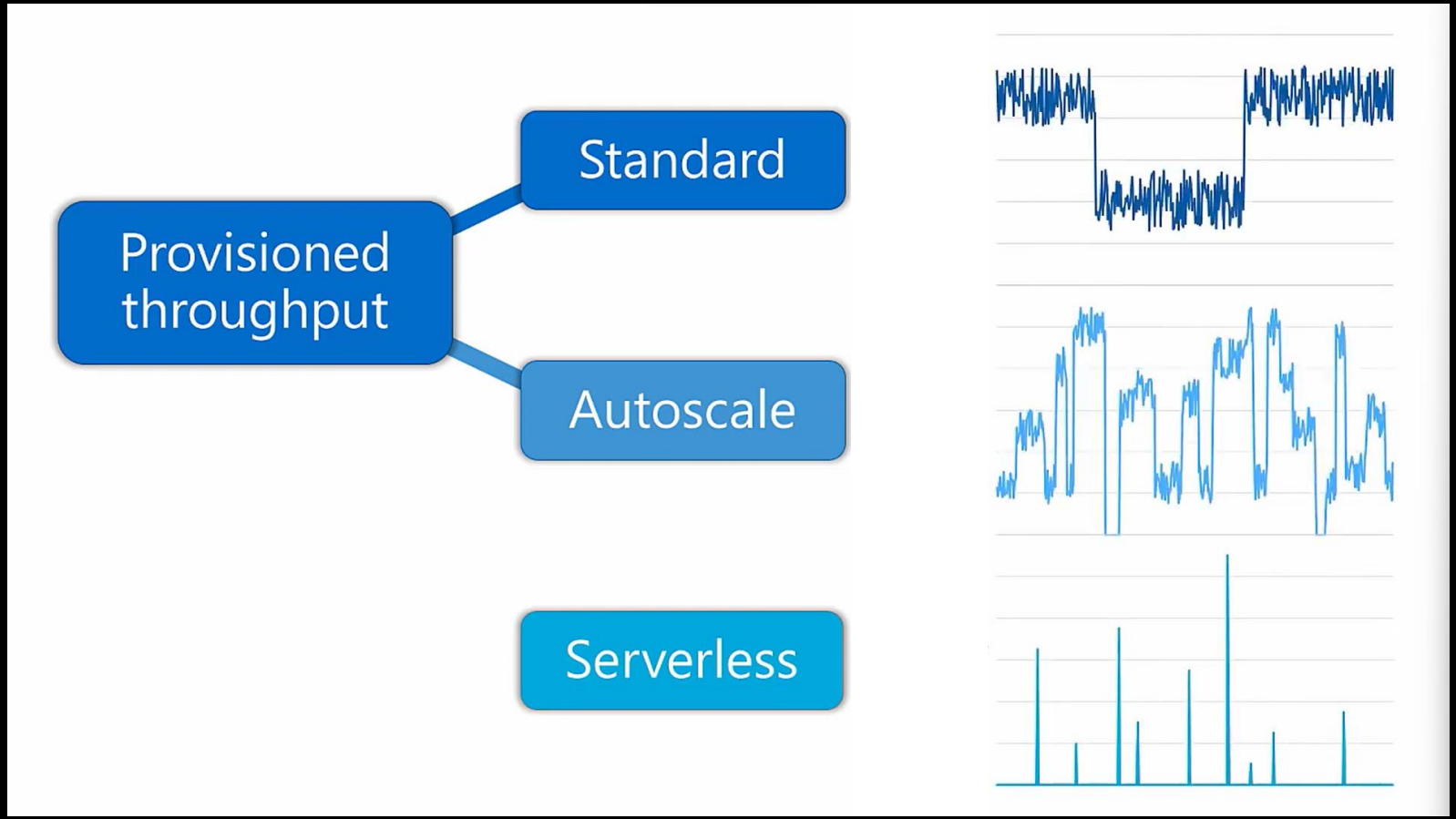


Event Driven

Faster time to Market

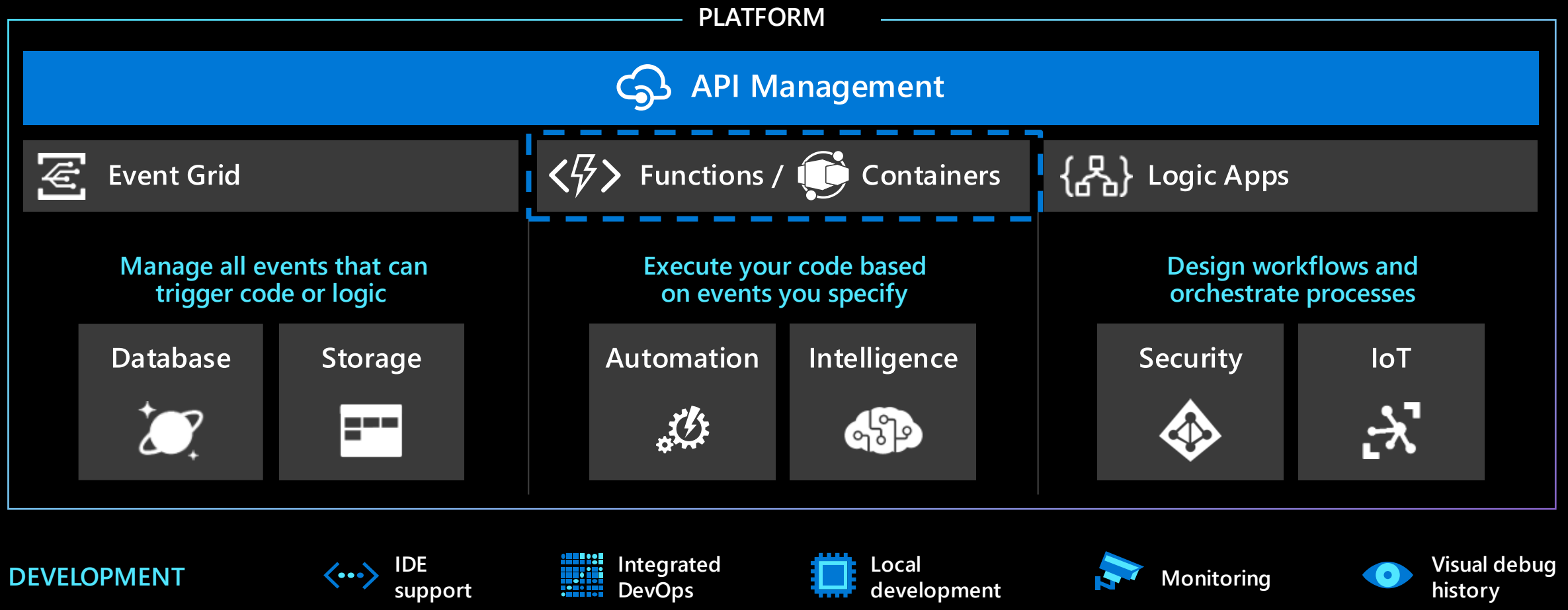
Why Serverless ?

Generic Use Case



Azure Serverless

The platform for next-gen apps, today



Azure Functions

Event-driven Serverless Compute

Integrated Programming Model

End to end development experience

Hosting Options flexibility

Fully managed and cost-effective

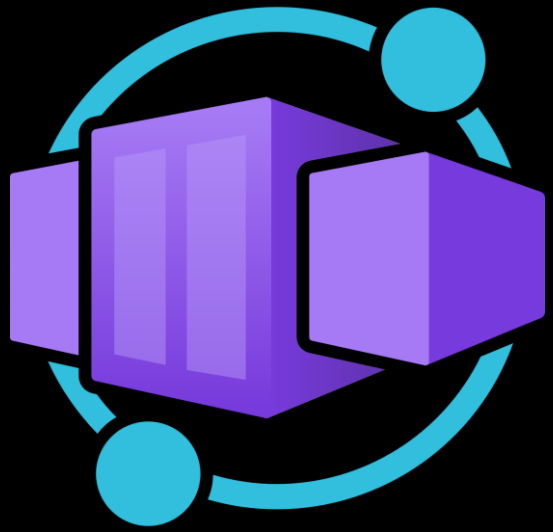
Azure Container Apps

Serverless containers for microservices

Build modern apps on open source

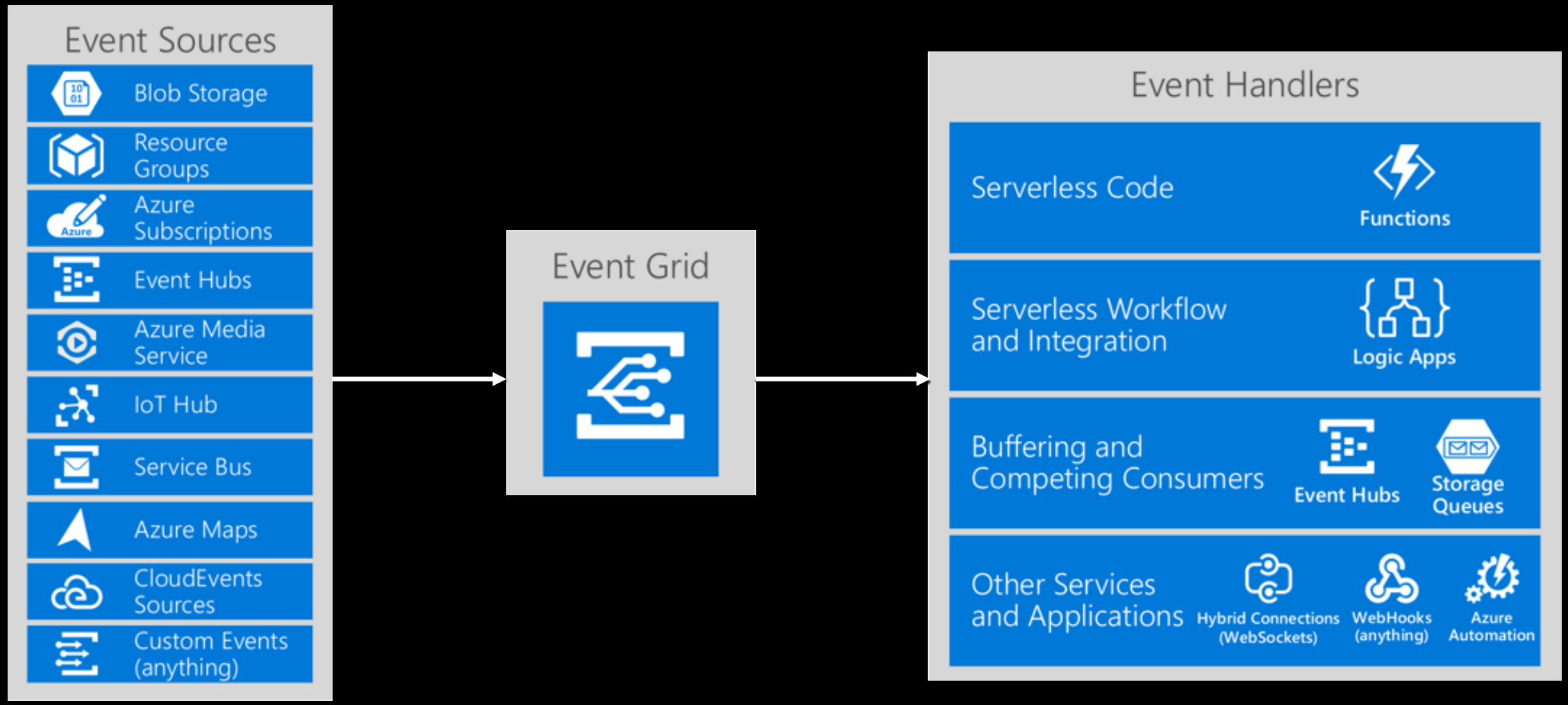
Focus on apps, not infrastructure

Scale dynamically based on events

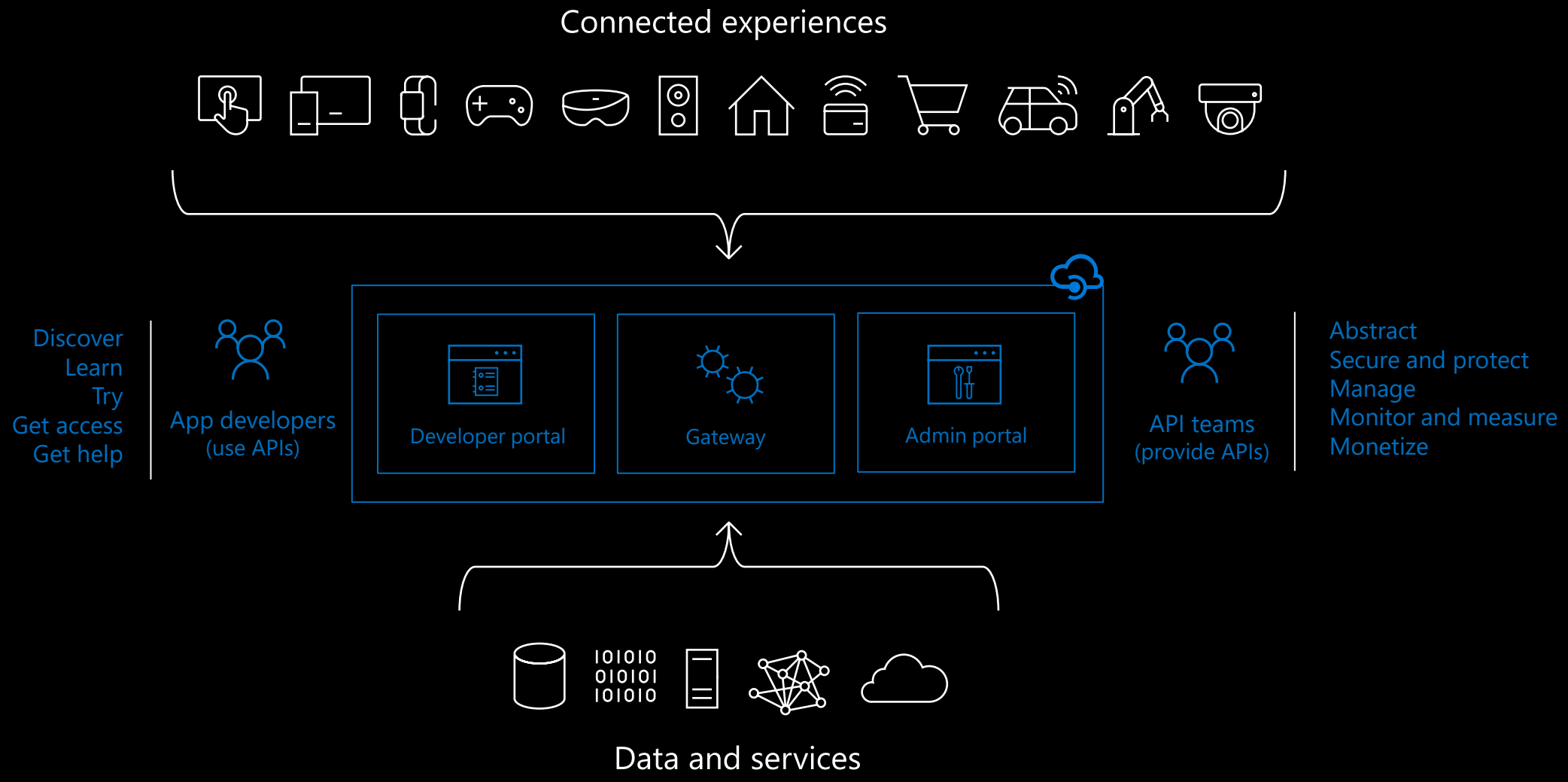


Kubernetes KEDA dapr DAPR envoy Envoy

Azure Event Grid



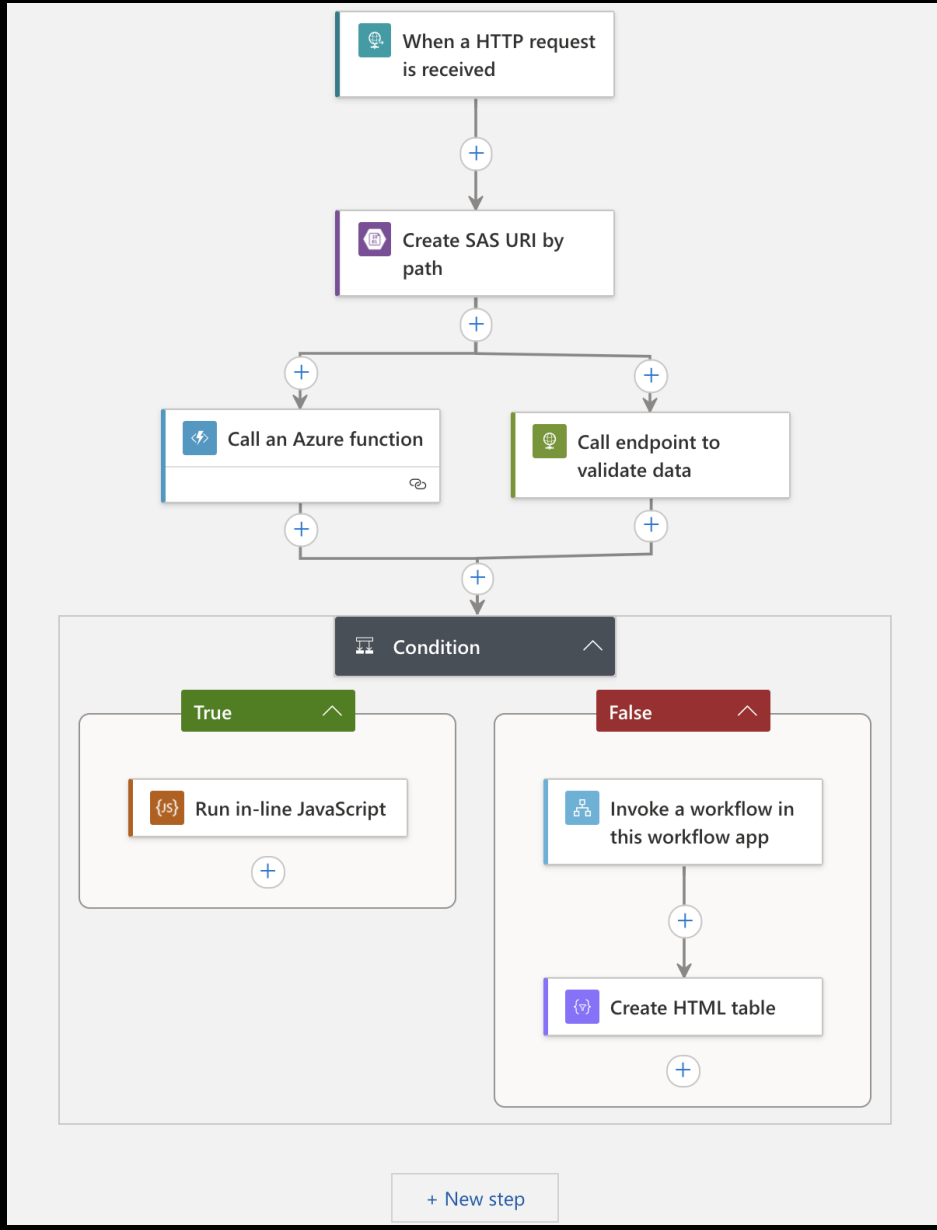
Azure API Management



Azure Logic Apps

Automate workflows and orchestrate business processes easily

- Out-of-the-box connectors reduce integration challenges to integrate data from the cloud to on-premises using a smart visual designer
- Connect to Azure, Microsoft, and/or 3rd party services with 400+ connectors out-of-box.
- Custom connectors to connect to any REST/SOAP endpoint as it is Deeply integrated with Azure Functions, API Management, Event Grid, etc.
- High resiliency, designed for mission critical workloads



Azure Cosmos DB

A globally distributed, massively scalable, multi-model database service

Table API

cassandra

SQL

Cosmos DB's API for MongoDB

Gremlin

Key-value

Column-family

Document

Graph

Guaranteed low latency at the 99th percentile

Elastic scale out of storage & throughput

Five well-defined consistency models

Turnkey global distribution

Comprehensive SLAs

Microsoft

Azure Functions

Event-driven serverless compute

Azure Functions

An event-based, serverless compute experience that accelerates app development

Integrated programming model

Use built-in triggers and bindings to define when a function is invoked and to what data it connects

End-to-end development experience

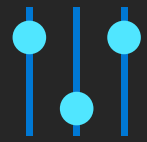
Take advantage of a complete, end-to-end development experience with Functions—from building and debugging locally on major platforms like Windows, macOS, and Linux to deploying and monitoring in the cloud

Hosting options flexibility

Choose the deployment model that better fits your business needs without compromising development experience

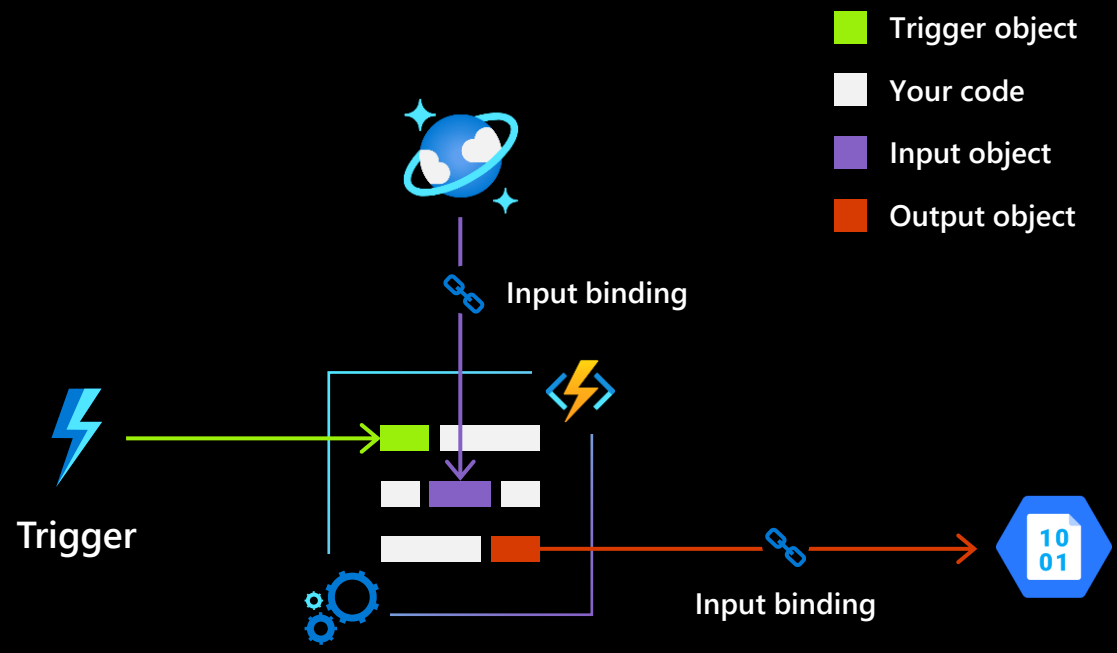
Fully managed and cost-effective

Automated and flexible scaling based on your workload volume, keeping the focus on adding value instead of managing infrastructure



Integrated programming model

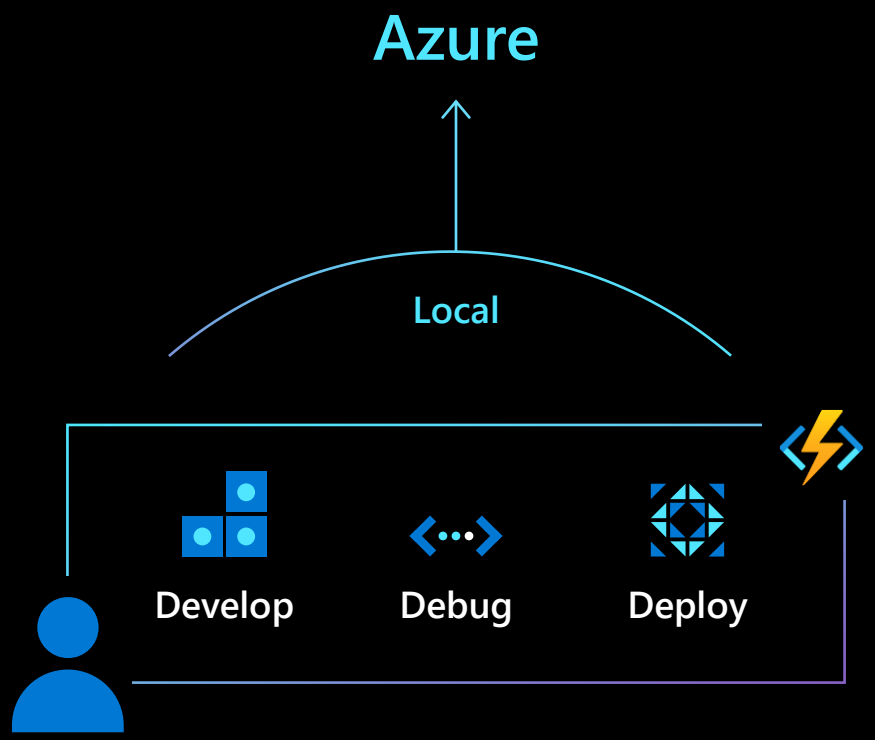
Azure Functions features input/output bindings which provide a means of pulling data or pushing data to other services. These bindings work for both Microsoft and third-party services without the need to hard-coding integrations.



End-to-end development experience

Azure functions offers the best-in-class end-to-end development experience, from developing and debugging to monitoring and deploying with built-in DevOps capabilities and integrated tools. Azure Functions integrates with VS and VS Code which let you locally develop, debug, and deploy functions to Azure.

Azure Functions Core Tools lets you develop and test your functions on your local computer from the command prompt or terminal, and the local functions can connect to live Azure services.

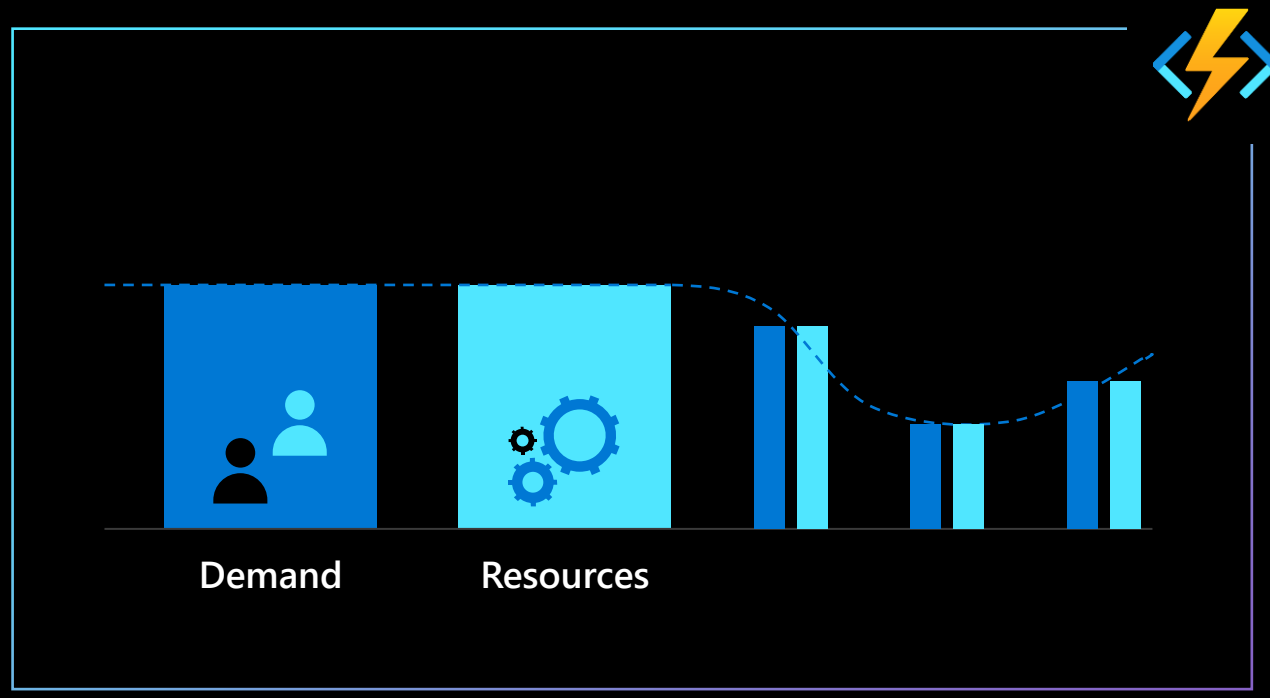


Hosting options flexibility

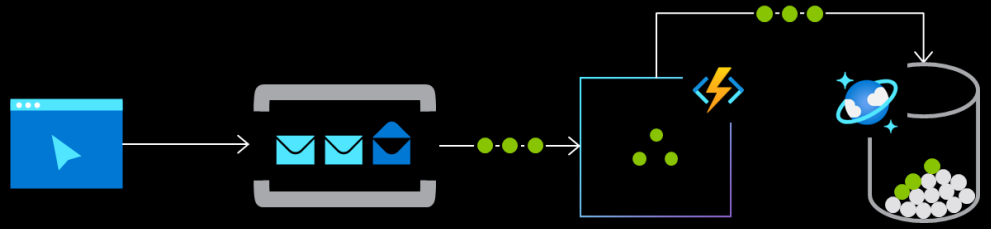
Hosting Plans	Consumption	Flex Consumption	Premium	App Service	Container Apps	Azure Kubernetes Services (or ARC-enabled)
Scale to Zero	✓	✓	-	-	✓	✓
Scale behavior	Event-driven	Fast Event-driven	Event-driven	Metrics based	Event-driven with KEDA	Event-driven with KEDA
Virtual networking	-	✓	✓	✓	✓	✓
Dedicated compute and prevent cold start	-	Optional with `Always Ready`	Minimum of 1 instance required	Minimum of 1 instance required	Optional with minimum replicas	Optional with minimum replicas
Max scale out (instances)	200	1000	100	40-60	300	Depends on AKS cluster size

Fully managed and cost-effective

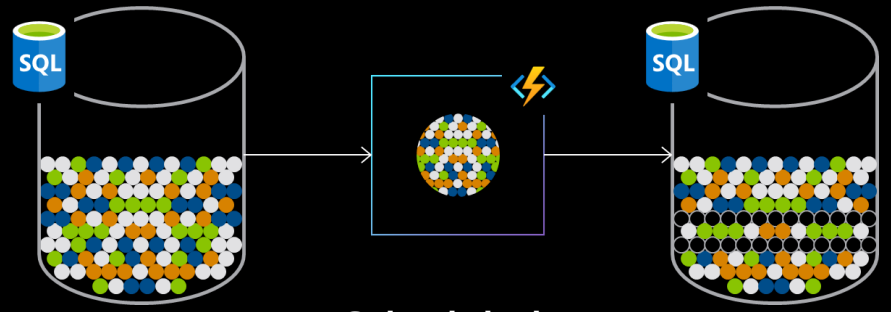
- Automatically handles all maintenance and updates
- Serverless and auto scale options keep costs low by matching resources to demand and eliminating capacity management and resource over-provisioning during busy or slow times
- Cost-effective serverless model responds to app patterns and is ideally suited for small, spiky workloads with moderate performance requirements



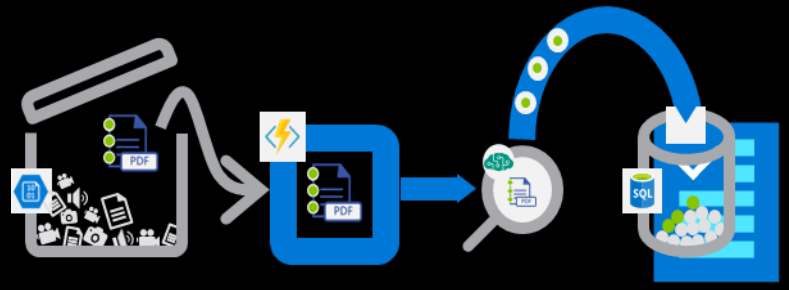
Common Functions Scenarios



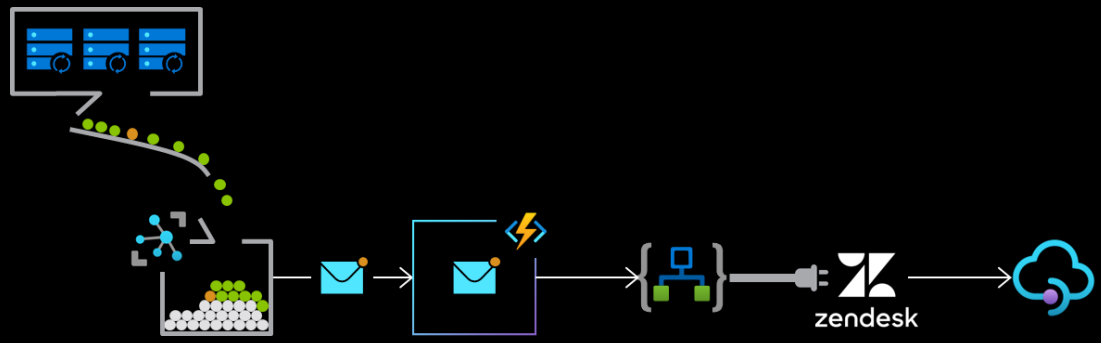
Web/Mobile
application backends



Scheduled
task automation



Real-time
stream processing



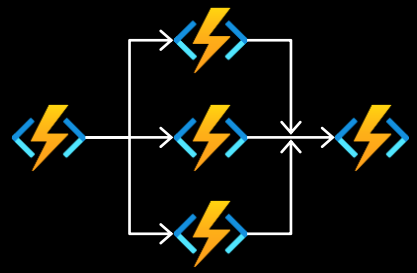
IoT-connected
backends

Workflows and orchestration with Durable Functions

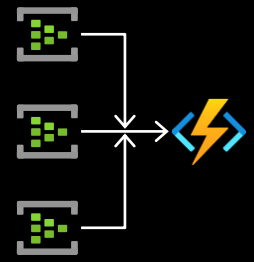
PATTERNS/USE CASES

Durable Functions is an extension of Azure Functions that lets you write stateful functions in a serverless compute environment

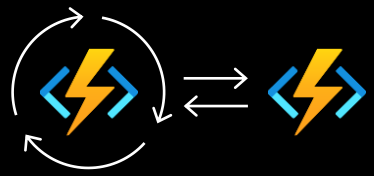
Manageable sequencing + error handling/compensation



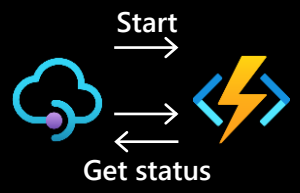
Fanning out and fanning in



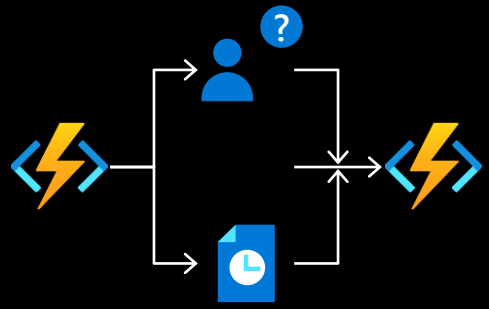
External events correlation



Flexible automated long-running process monitoring



Http-based async long-running APIs



Human interaction

Azure Static Web Apps

Streamlined full-stack development from source code to global high availability

Global Hosting

Bring your content closer to your customers with automated content geo-distribution

End-to-end development experience

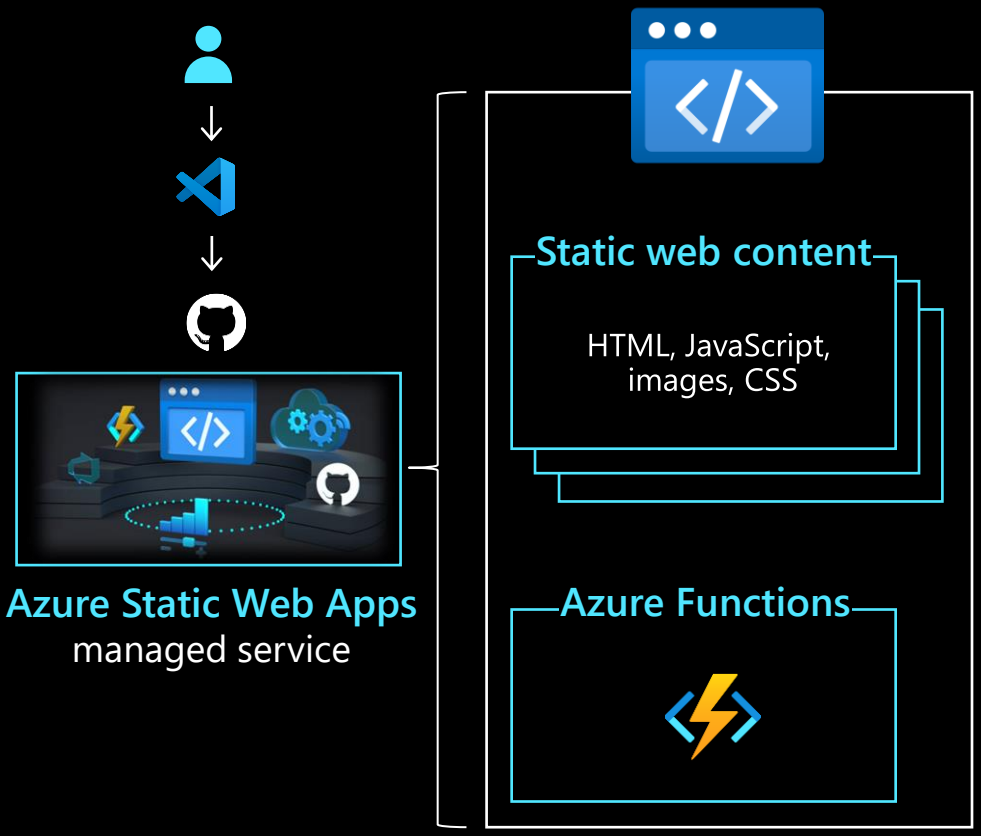
Complete, end-to-end development experience —from building and debugging locally to deploying and monitoring in the cloud

Streamlined build and deployment

Azure Static Web Apps takes care of the deployment and infrastructure while you focus on your app

Fully managed and cost-effective

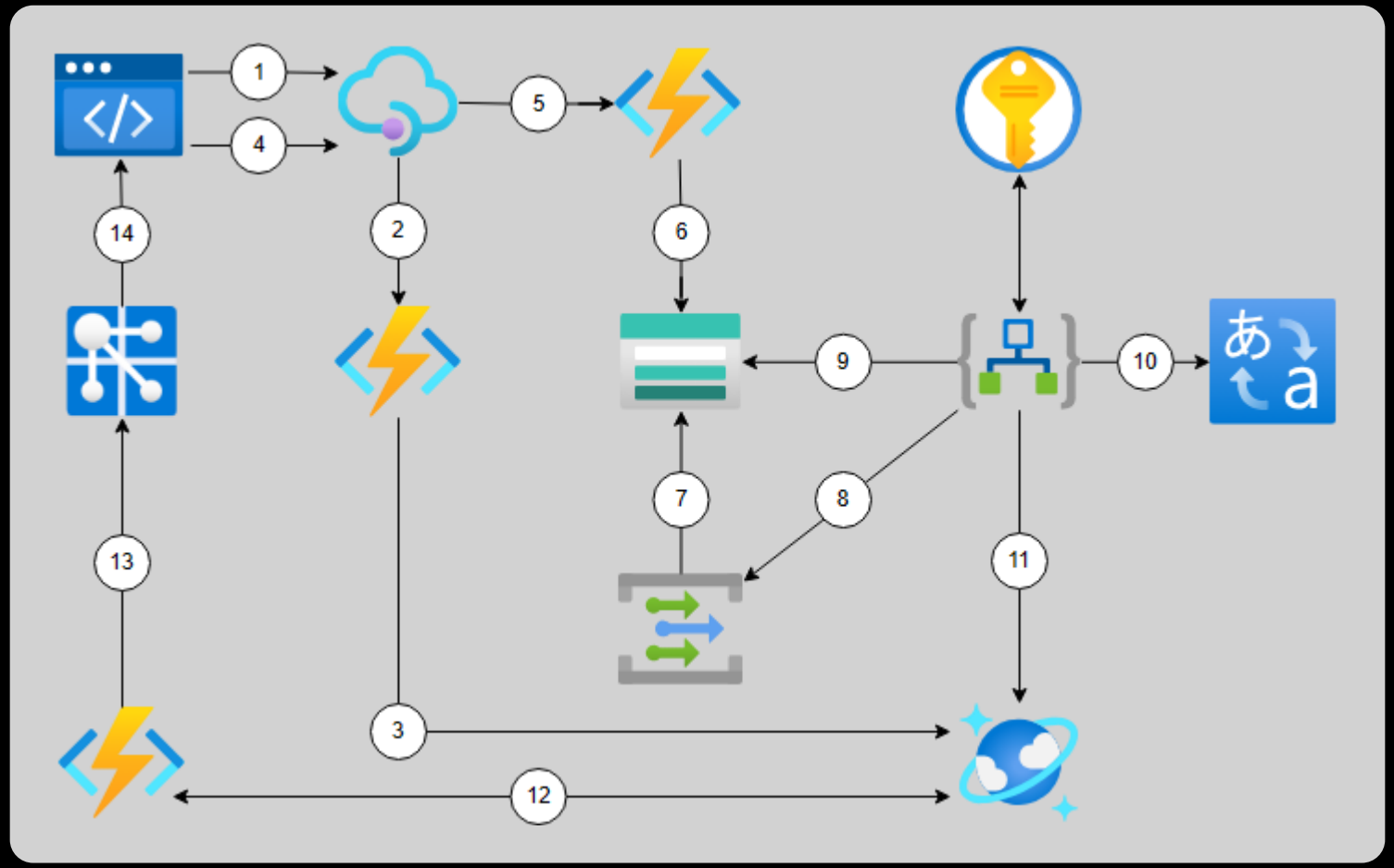
Automated and flexible scaling based on your workload volume, keeping the focus on adding value instead of managing infrastructure or security



Microsoft

Demonstration

Serverless Architecture with Azure Functions



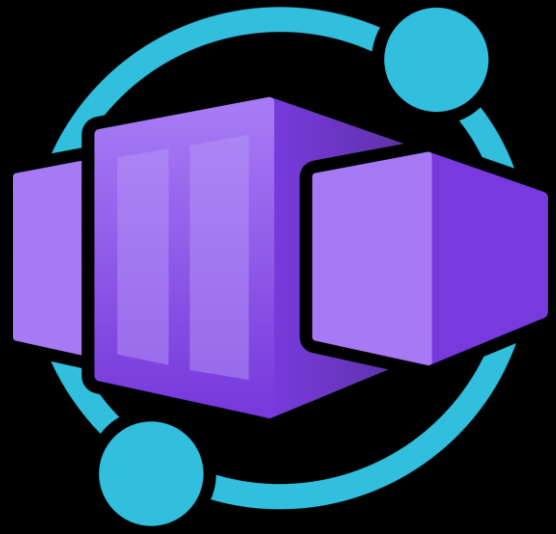
Azure Container Apps

Serverless containers for microservices

Build modern apps on open source

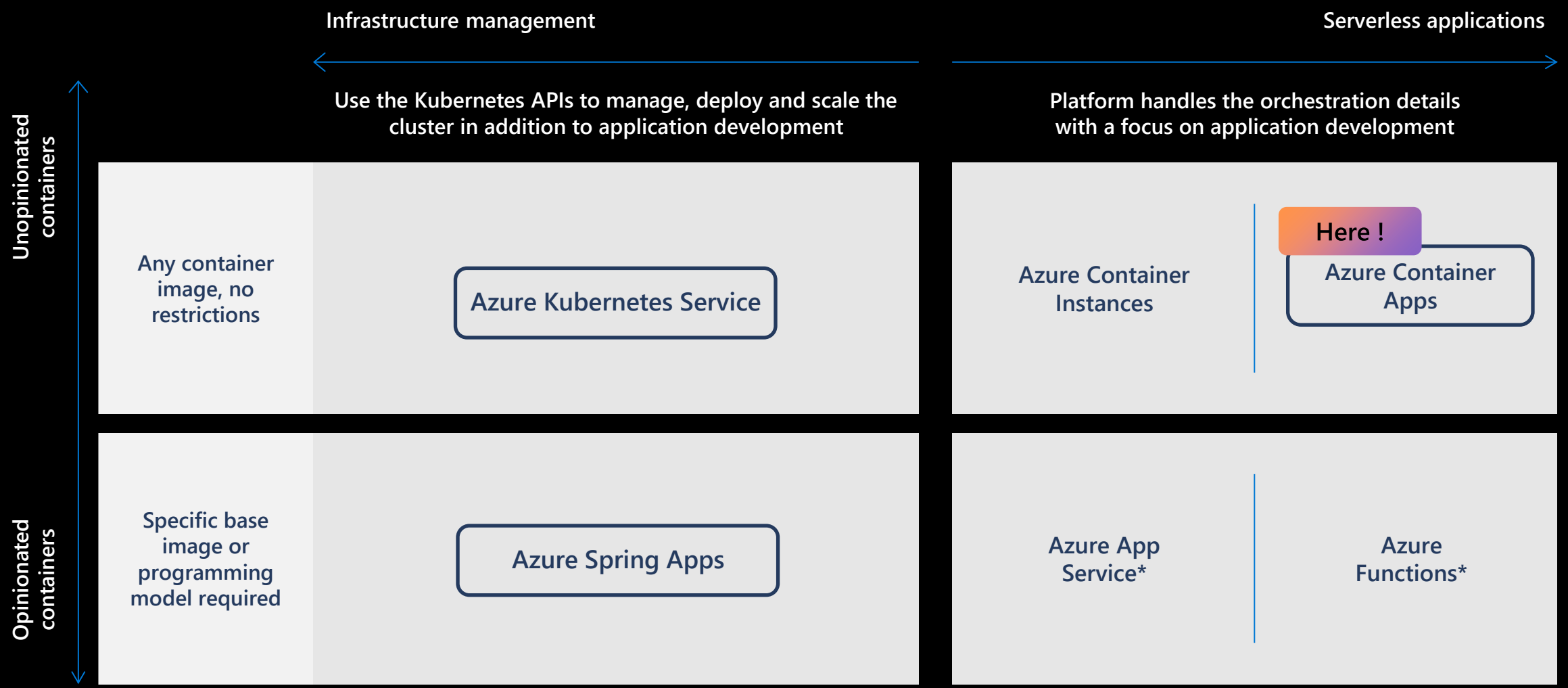
Focus on apps, not infrastructure

Scale dynamically based on events



Kubernetes KEDA dapr DAPR envoy Envoy

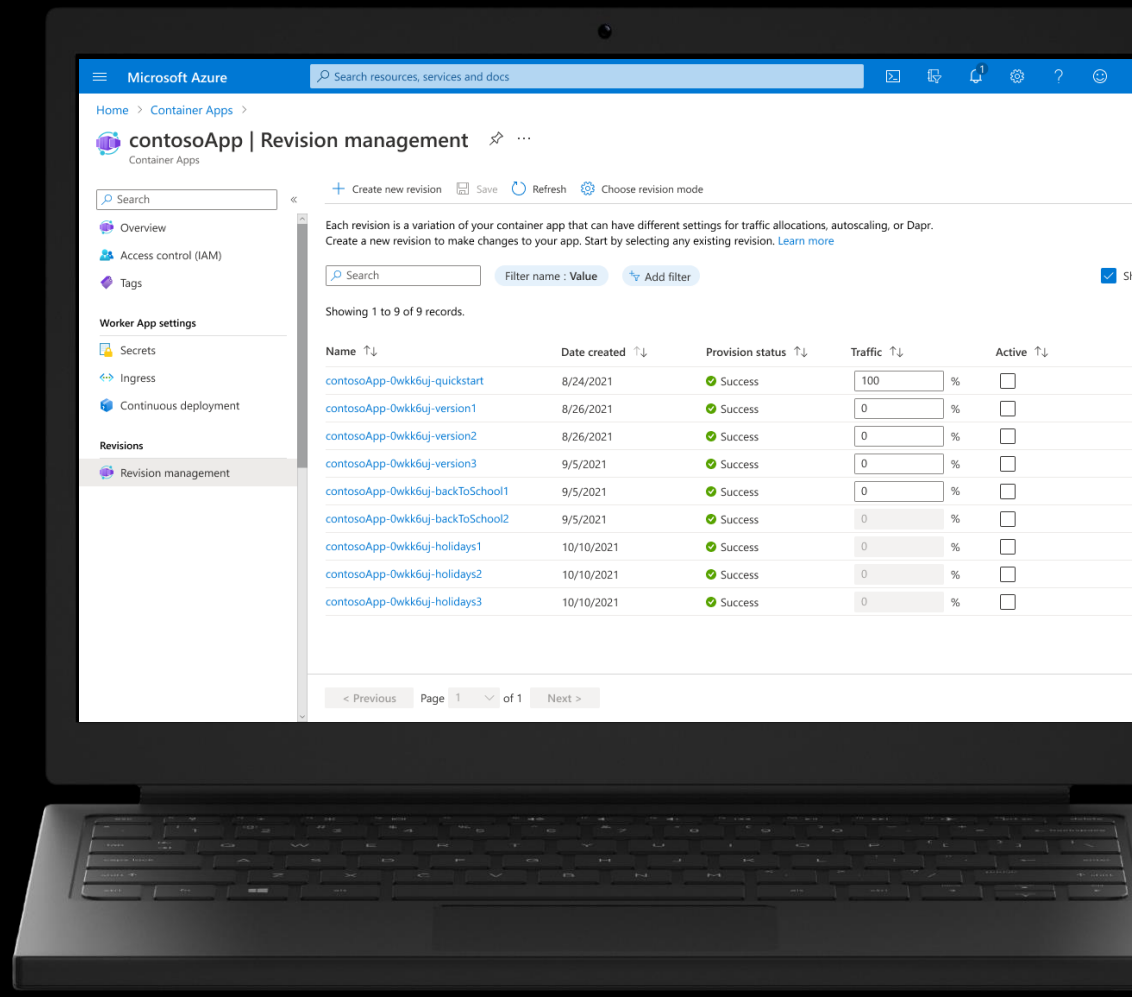
Azure Containers Options



* When used with containers

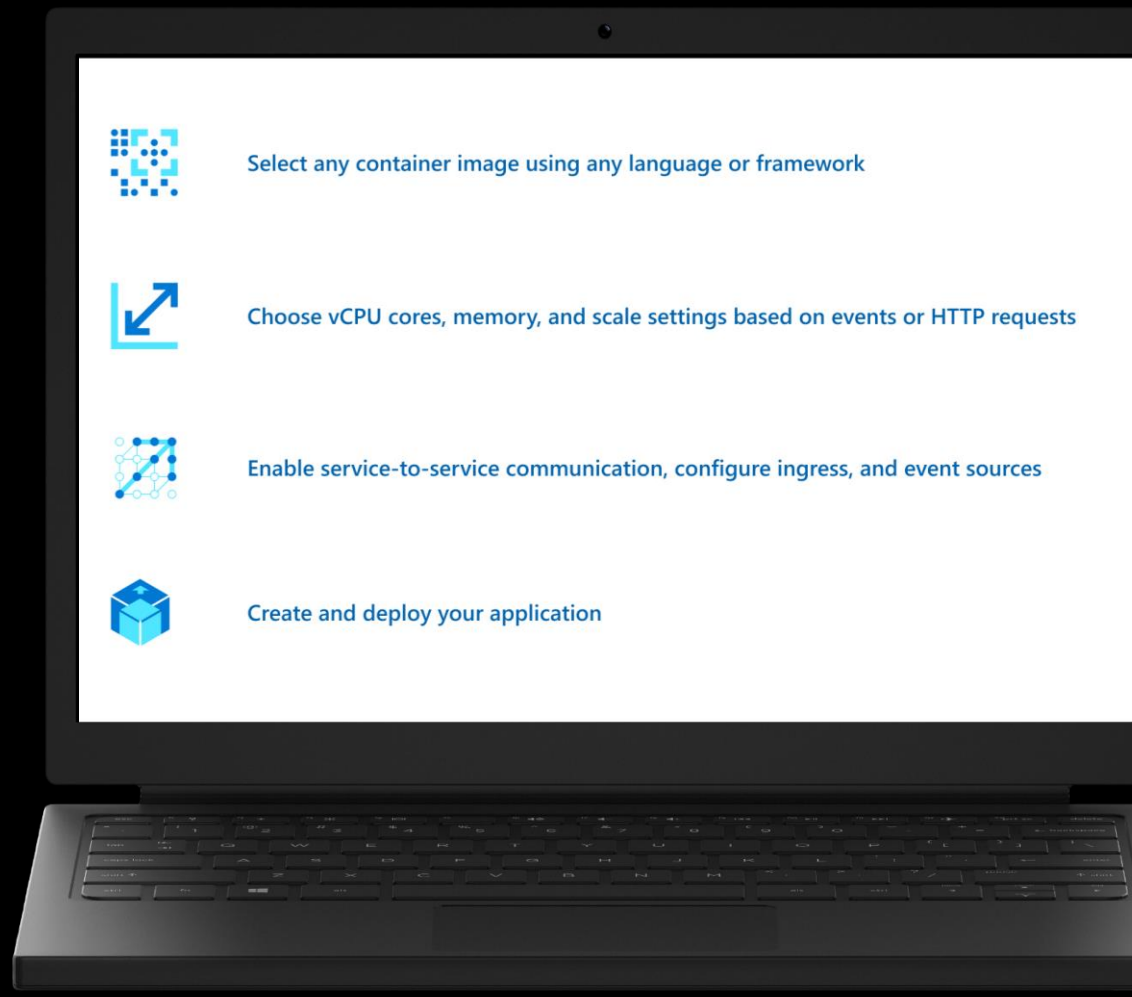
Build modern apps on open-source

- App portability powered by open standards and APIs
- App patterns and best practices encapsulated by products like Dapr
- Service capabilities influenced by OSS contributions
- Benefit from streamlined application lifecycle for upgrades and versioning, traffic shifting, service discovery, and monitoring.



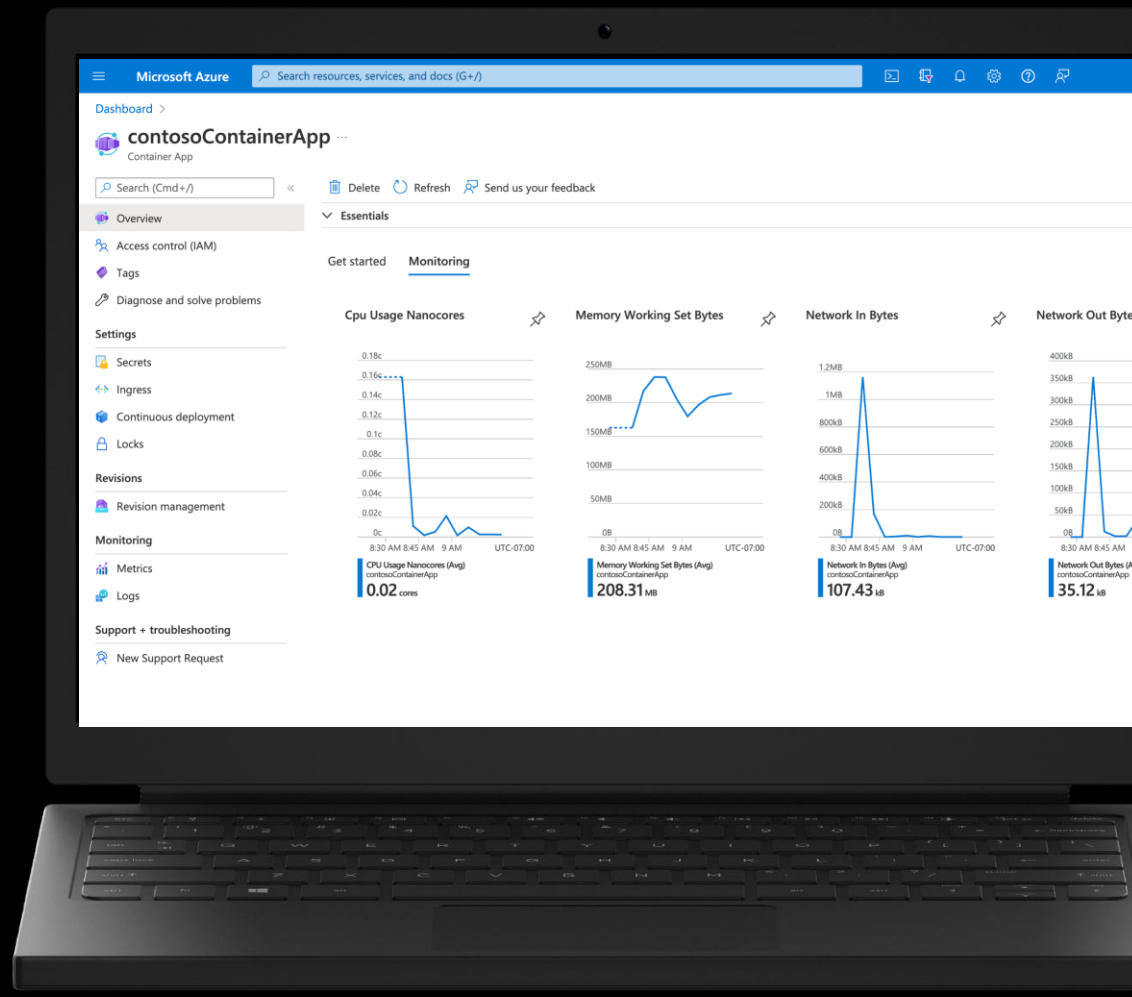
Focus on apps, not infrastructure

- Apps with any development stack, any Linux container image
- No opinionated programming model
- High productivity development experience
- Set up a code-to-cloud pipeline using GitHub Actions.



Scale dynamically based on events

- Serverless autoscale based on HTTP requests, KEDA event scale triggers, or CPU and Memory
- Declarative scaling rules eliminate the need to manage complex infrastructure
- Scale to 0 and pay per use by second



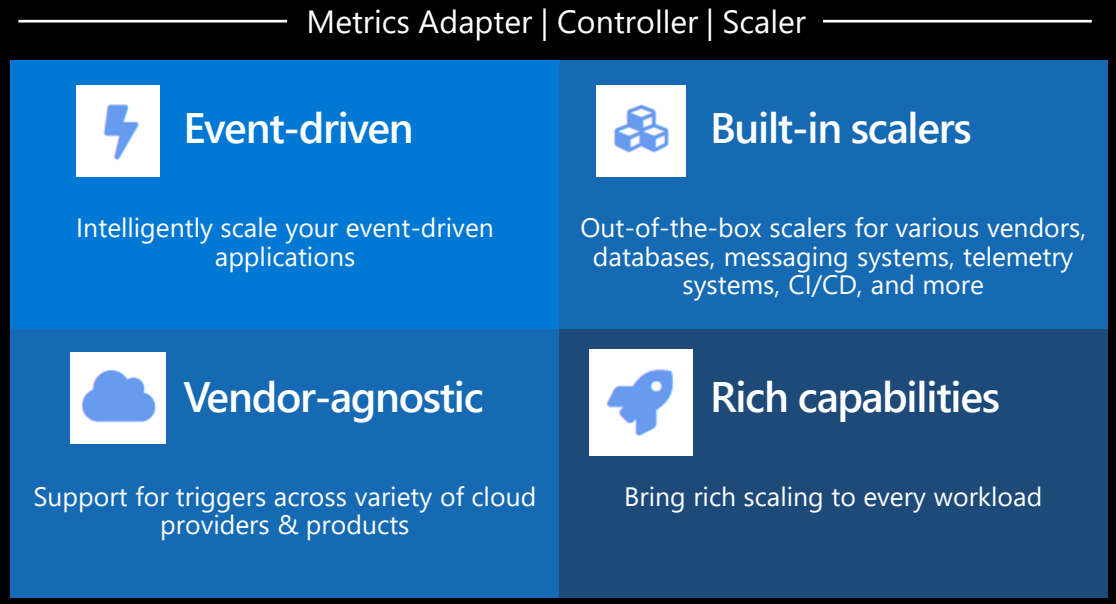
Application autoscaling made simple

Open-source, extensible, and vendor agnostic

KEDA

Kubernetes-based Event Driven Autoscaler

Drive the scaling of any container based on a growing list of 35+ event sources, known as: scalers



keda.sh

CLOUD NATIVE COMPUTING FOUNDATION

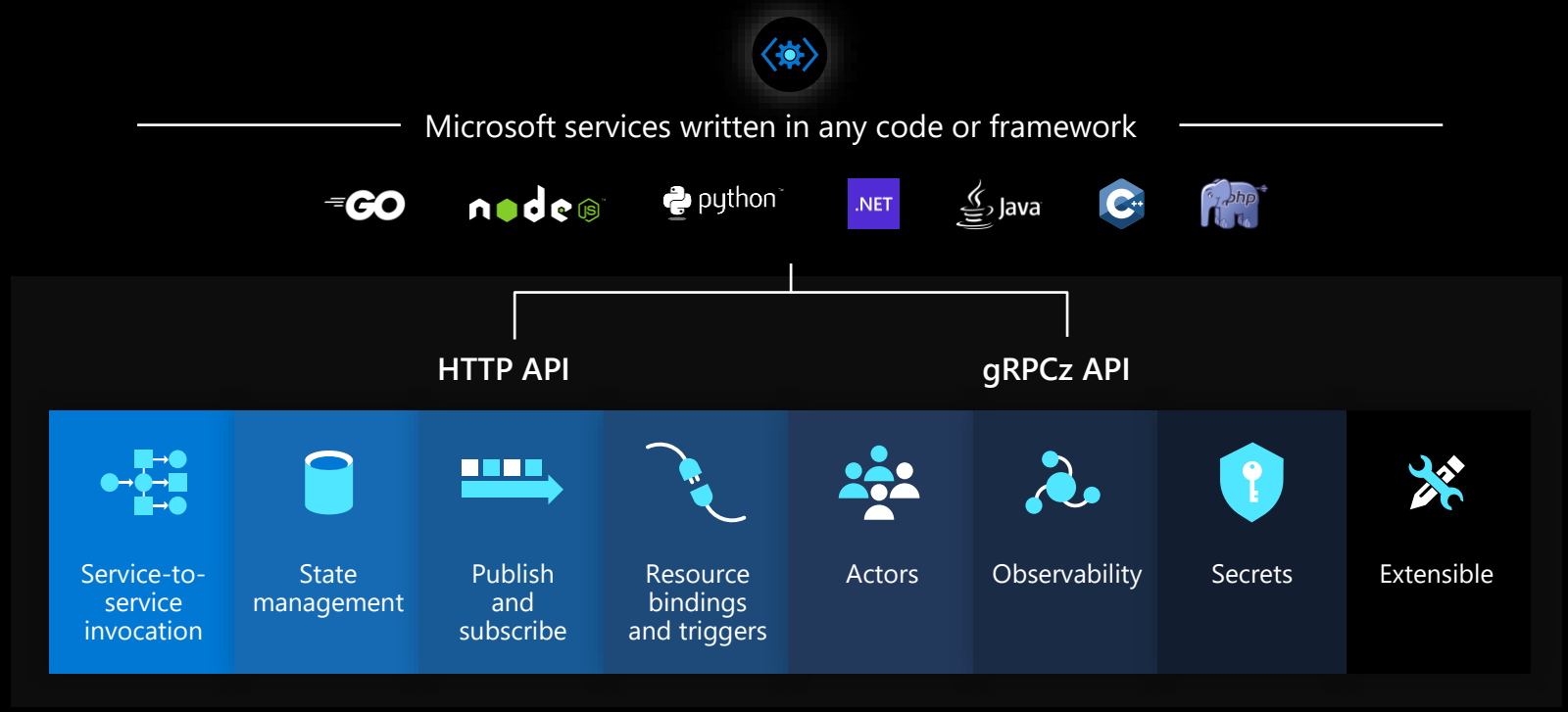
Microservices using any language or framework

Any cloud or edge infrastructure

dapr

Distributed Application Runtime

Portable, event-driven, runtime for building distributed applications across cloud and edge



Hosting infrastructure

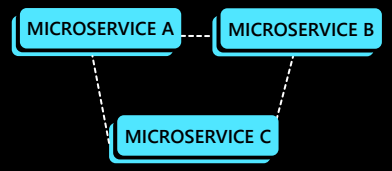
Microsoft Azure · Azure Arc · aws · Google Cloud · Alibaba Cloud · kubernetes · On-premises

dapr.io

CLOUD NATIVE COMPUTING FOUNDATION

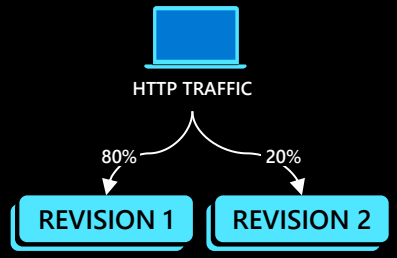
What can you build with Azure Container Apps?

Microservices



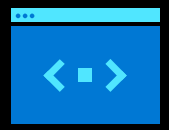
Microservices architecture with the option to integrate with Dapr

Public API endpoints



E.g., API app with HTTP requests split between two revisions of the app

Web Apps



E.g., Web app with custom domain, TLS certificates, and integrated authentication

Event-driven processing

E.g., Queue reader app that processes messages as they arrive in a queue

Background processing

E.g., Continuously running background process transforms data in a database

AUTO-SCALE CRITERIA

Individual microservices can scale independently using any KEDA scale triggers

Scaling is determined by the number of concurrent HTTP requests

Scaling is determined by the number of concurrent HTTP requests

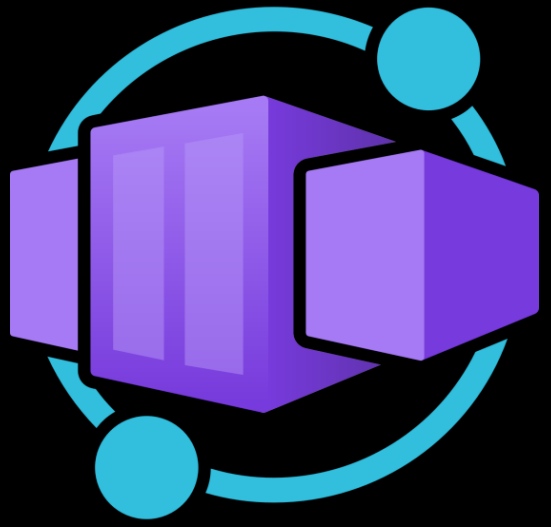
Scaling is determined by the number of messages in the queue

Scaling is determined by the level of CPU or memory load

Microsoft

Demonstration

Serverless Containers with Azure Container Apps



Azure Serverless - Quickstarts

Learn More about Azure Container Apps

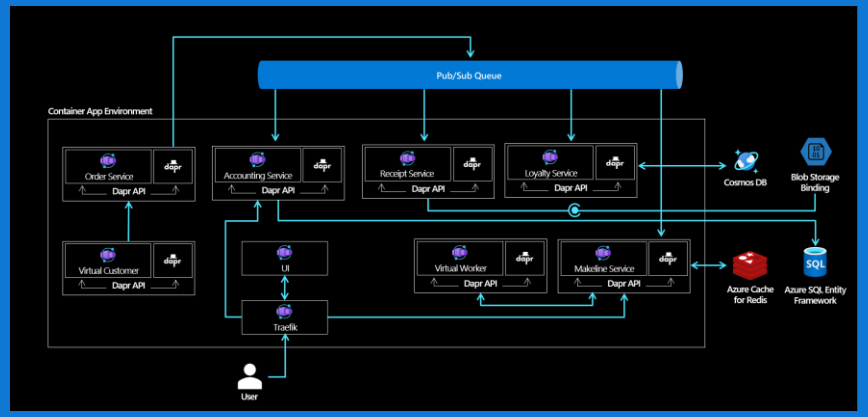
aka.ms/containerapps

Serverless Functions Architectures

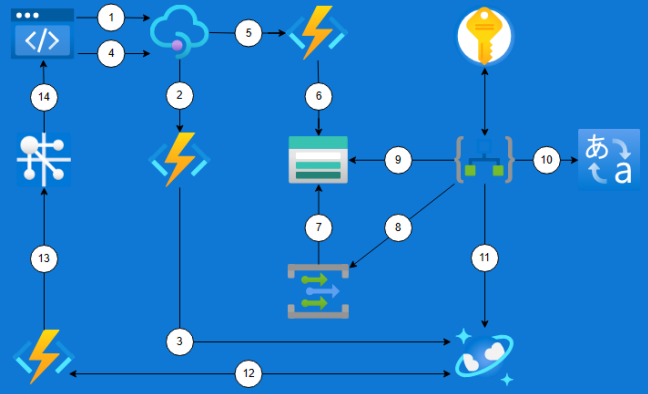
Reference Architectures

Serverless September

Hands-on Lab : Azure Container Apps aka.ms/hol-containerapps



Hands-on Lab : Azure Serverless Architecture aka.ms/hol-serverless



Thank you