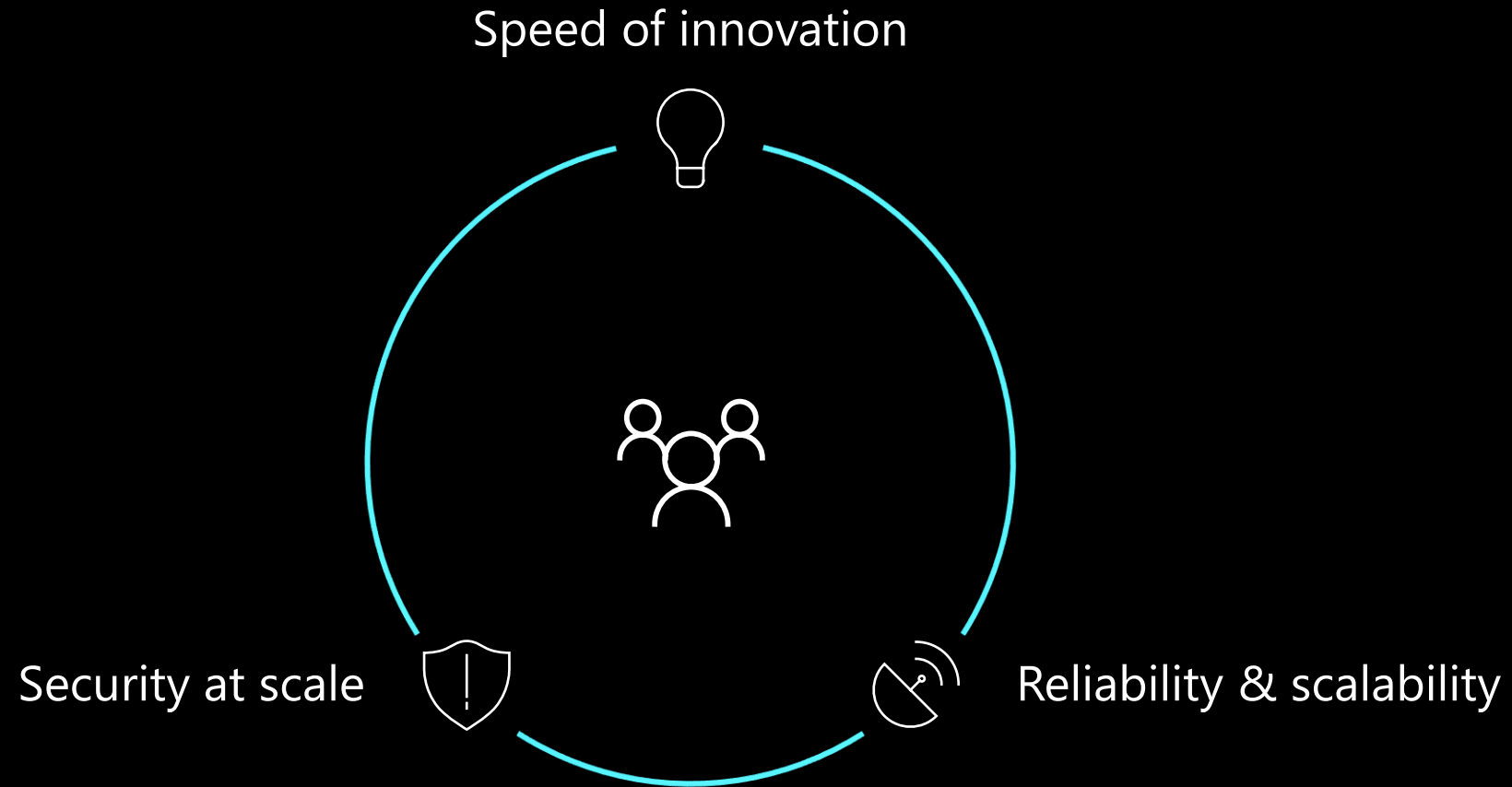


# Serverless Update Overview & Demo

Julien Strebler,  
App Innovation | Cloud Solution Architect

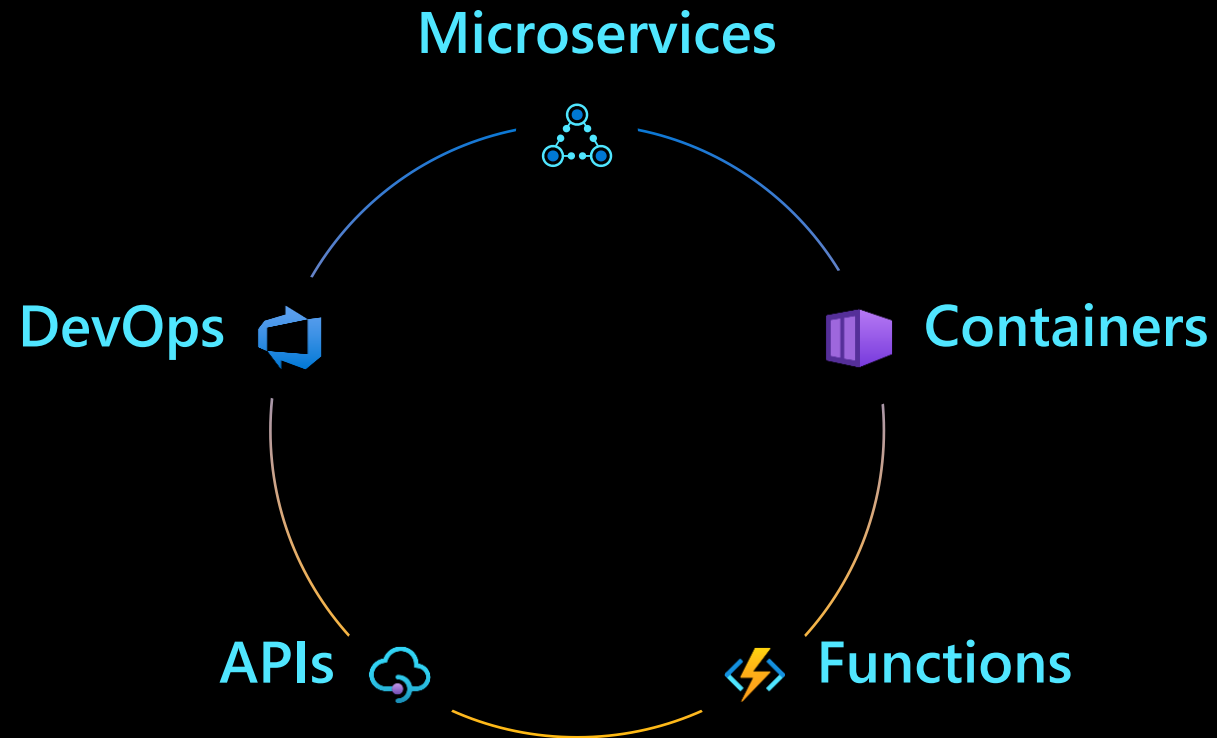


# Why cloud native?

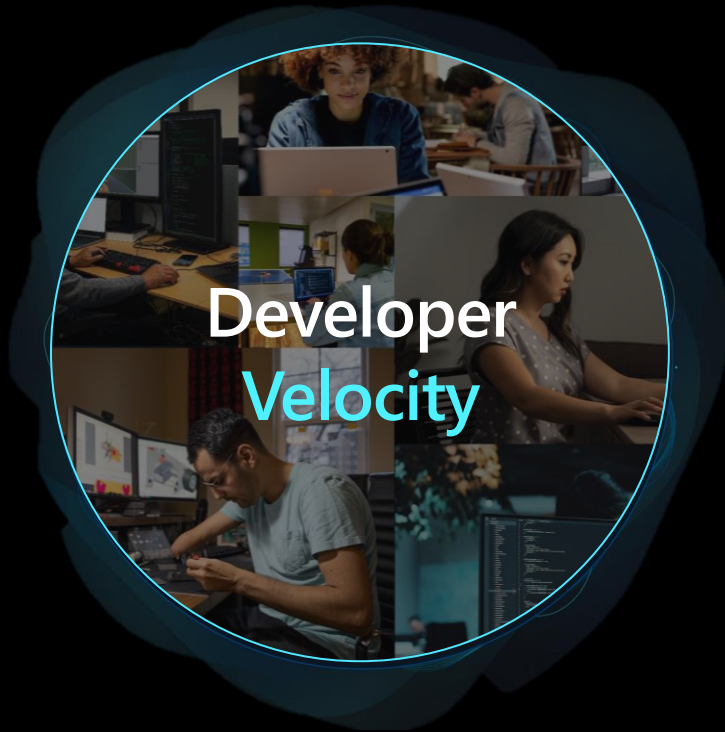


# What is cloud native?

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



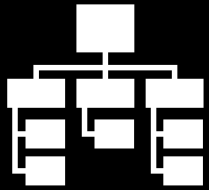
# What is Developer Velocity?



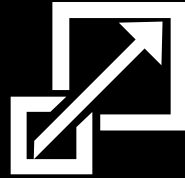
Driving business performance through software development by empowering developers, creating the right environment for them to innovate, and removing points of friction.

[azure.com/developer/velocity](https://azure.com/developer/velocity)

# Why Serverless ?



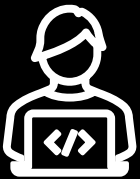
Manage apps  
not servers



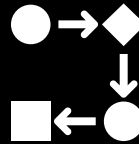
Scale based  
on demand



Micro-Billing



Reduced Dev & Ops



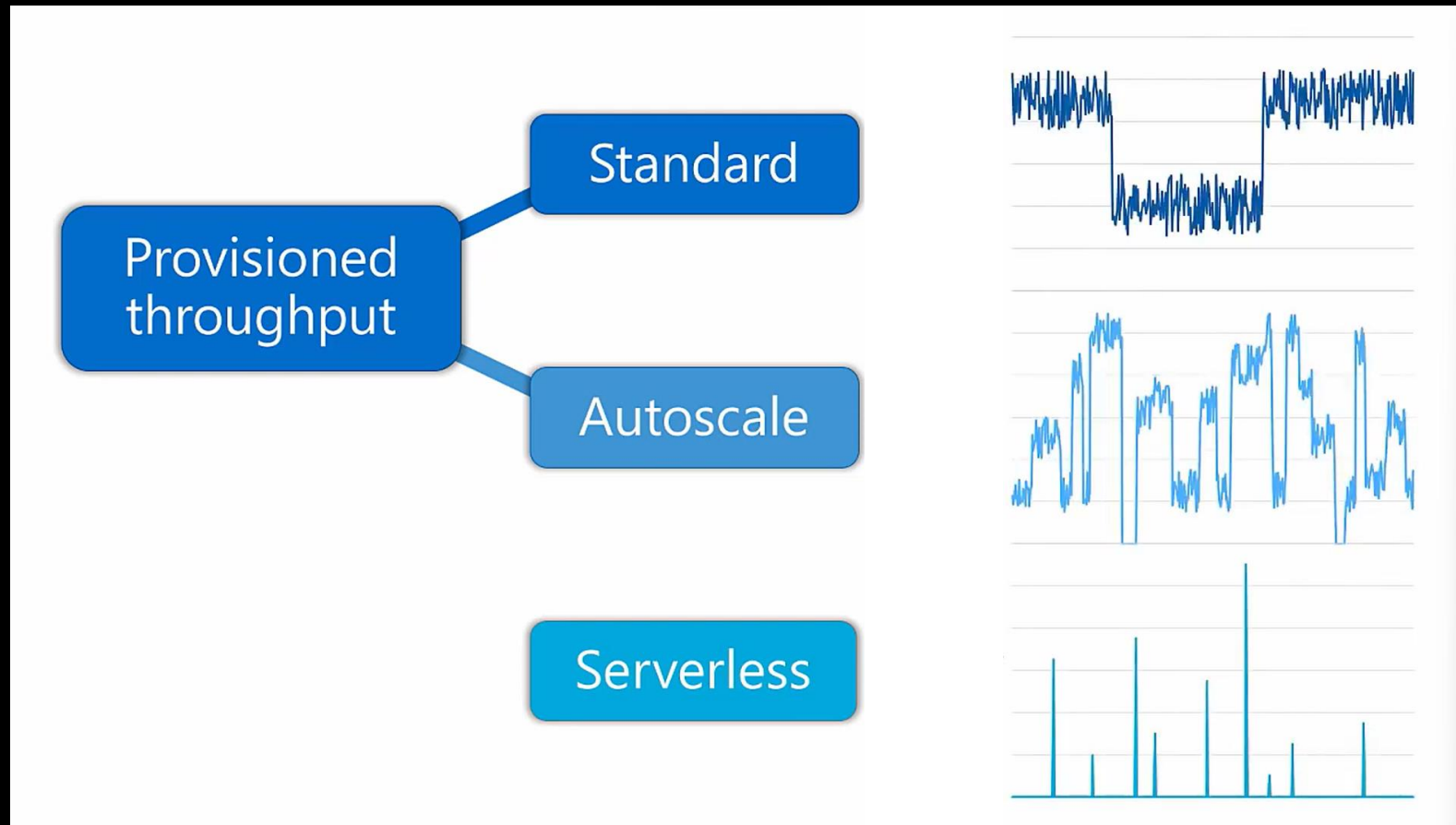
Event Driven



Faster time to  
Market

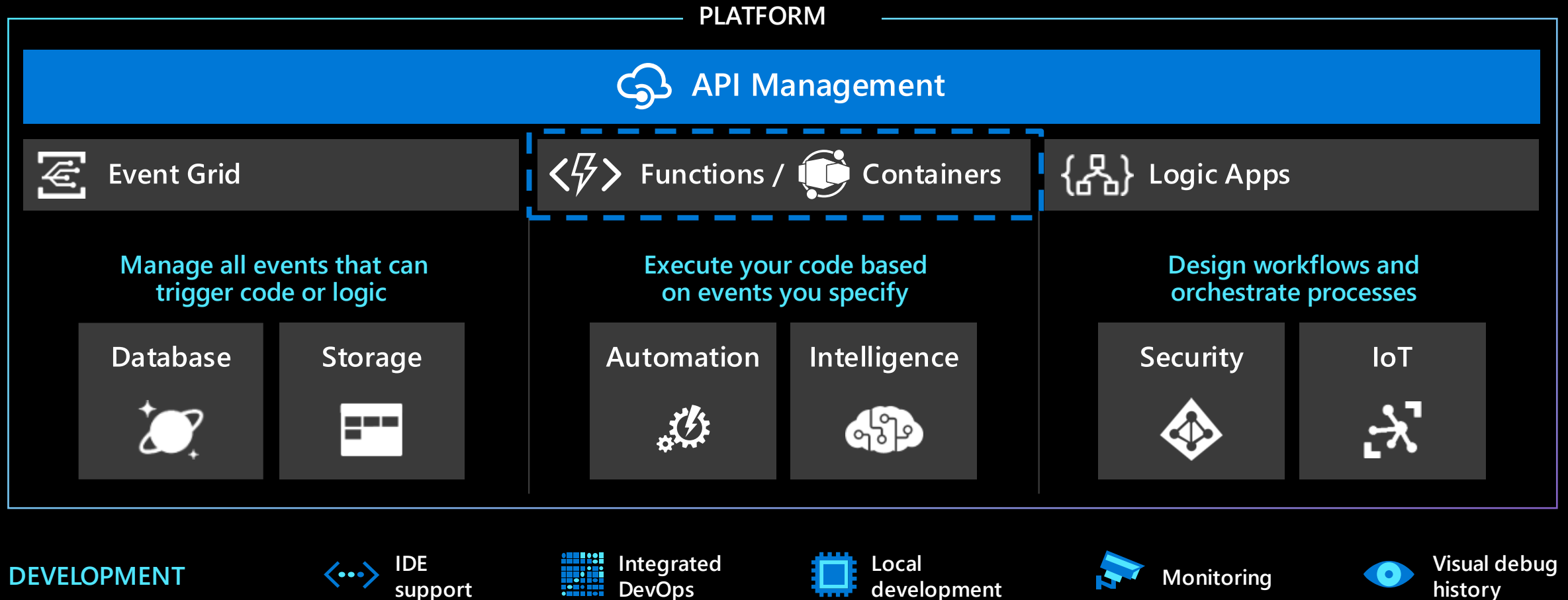
# Why Serverless ?

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





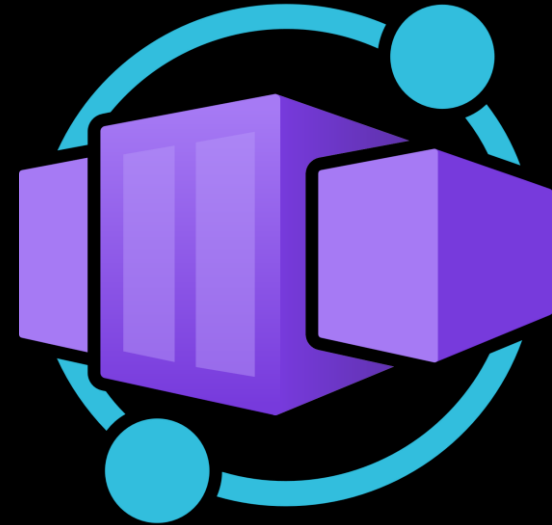
# Azure Container Apps

Serverless containers for microservices

Build modern apps on open source

Focus on apps, not infrastructure

Scale dynamically based on events



Kubernetes



KEDA

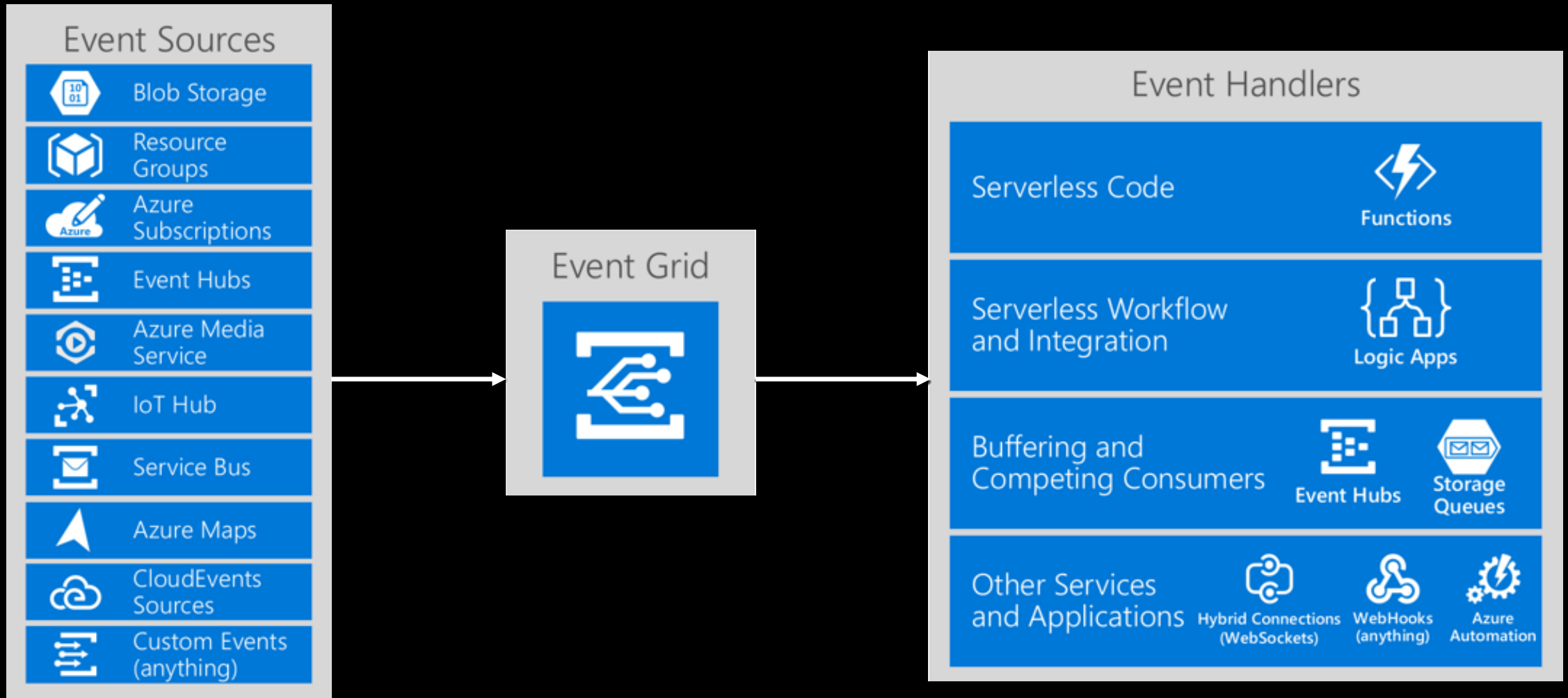


DAPR

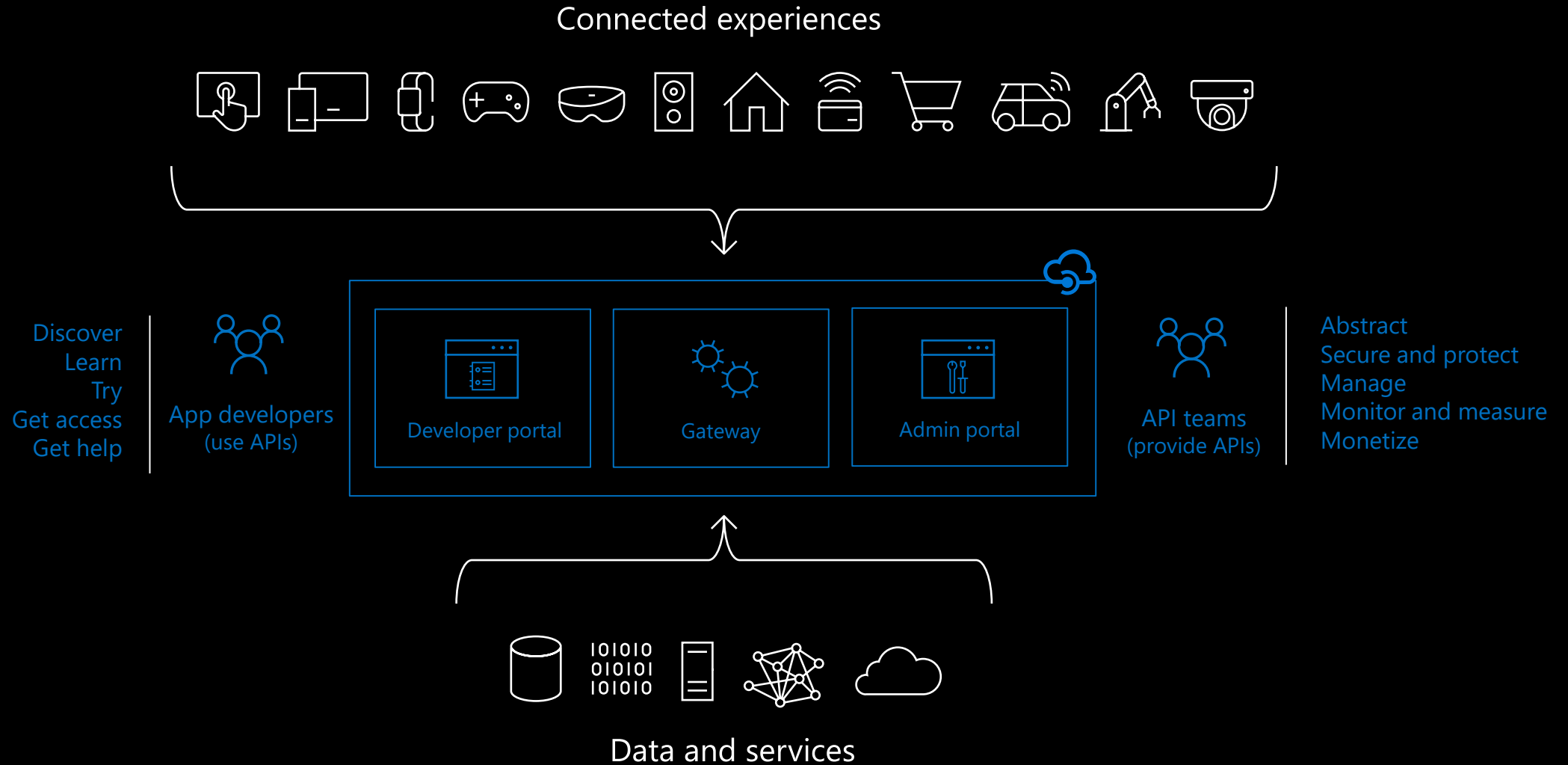


Envoy

# Azure Event Grid



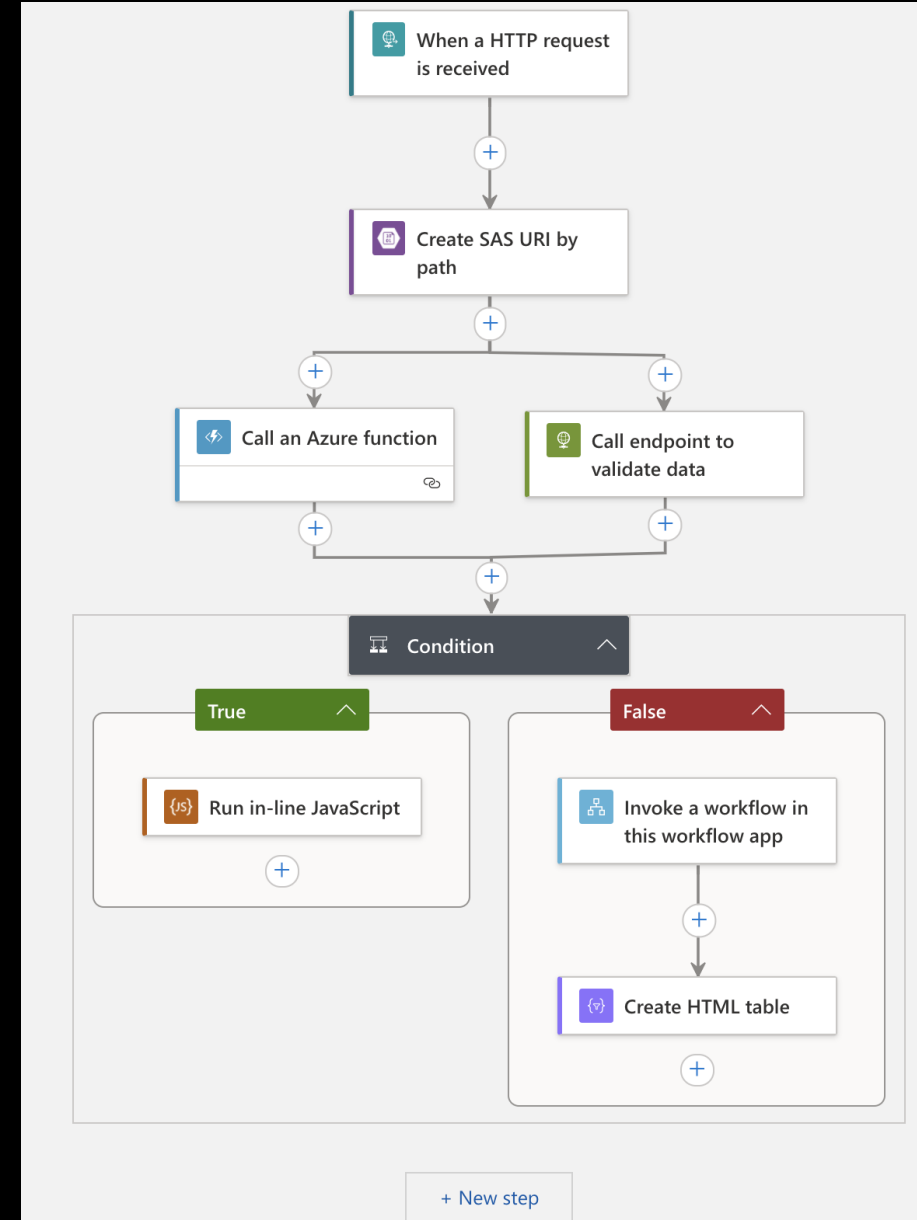
# Azure API Management



# 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 3<sup>rd</sup> 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



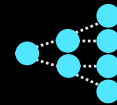
Gremlin



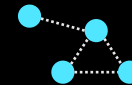
Key-value



Column-family



Document



Graph

Elastic scale out  
of storage & throughput

Guaranteed low latency at the 99<sup>th</sup> percentile

Five well-defined consistency models

Turnkey global distribution

Comprehensive SLAs



# 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



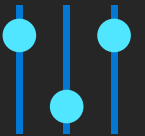
## Hosting options flexibility

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



## Fully managed and cost-effective

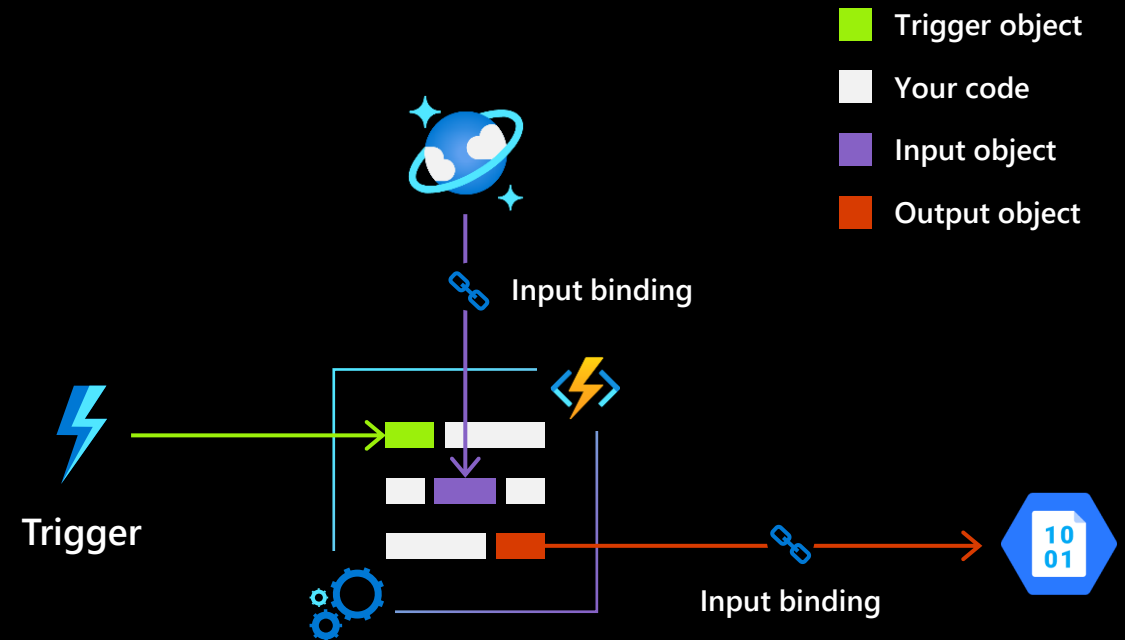
Automated and flexible scaling based on your workload volume, keeping the focus on adding value instead of managing infrastructure



# 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-code integrations.



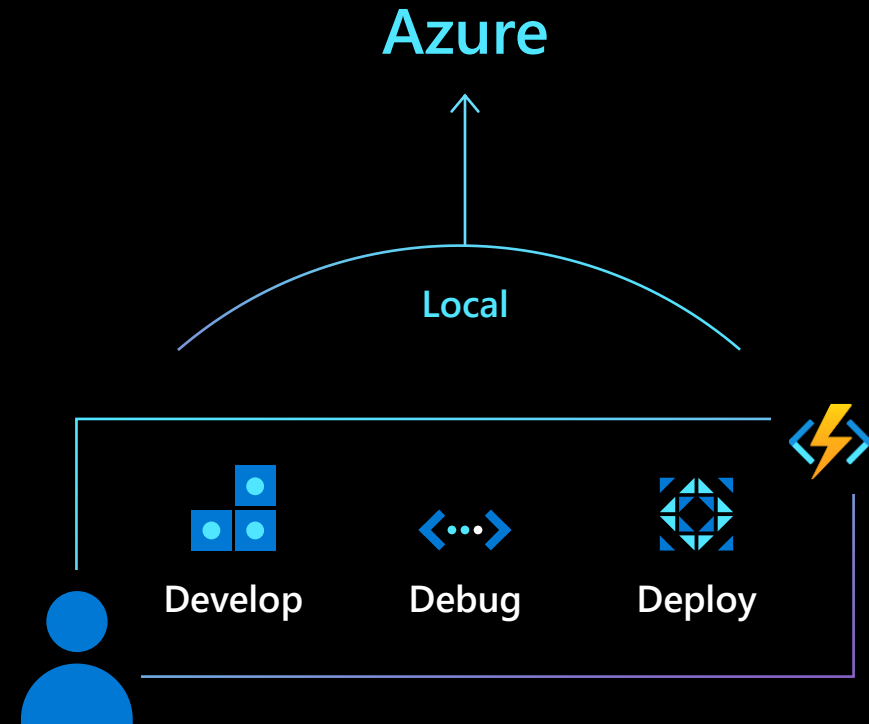


# End-to-end development experience



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.

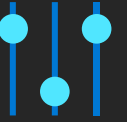


# Hosting options flexibility

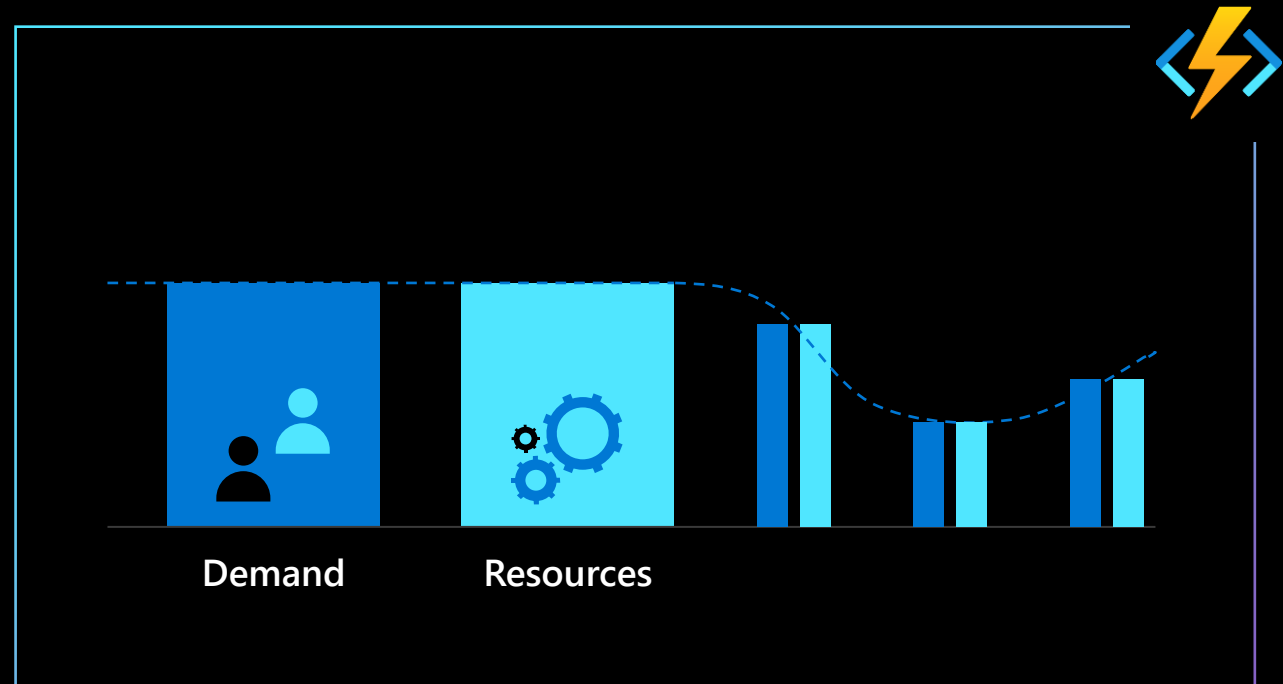


Hosting Plans	Consumption	Flex Consumption	Premium	App Service	Container Apps	Azure Kubernetes Services (or ARC-enabled)
Scale to Zero	✓	✓	-	-	✓	✓
Scale behavior	Event-driven	Fast Event-driven	Event-driven	Metrics based	Event-driven with KEDA	Event-driven with KEDA
Virtual networking	-	✓	✓	✓	✓	✓
Dedicated 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

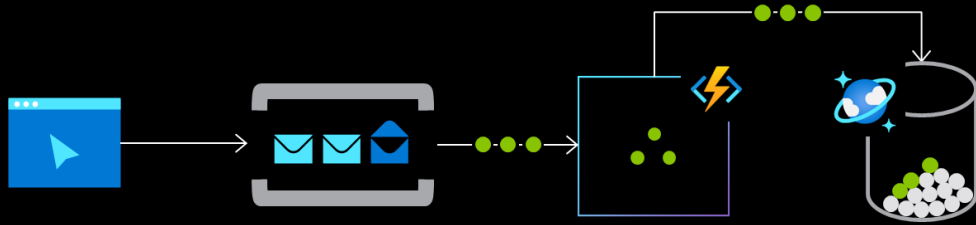
# Fully managed and cost-effective



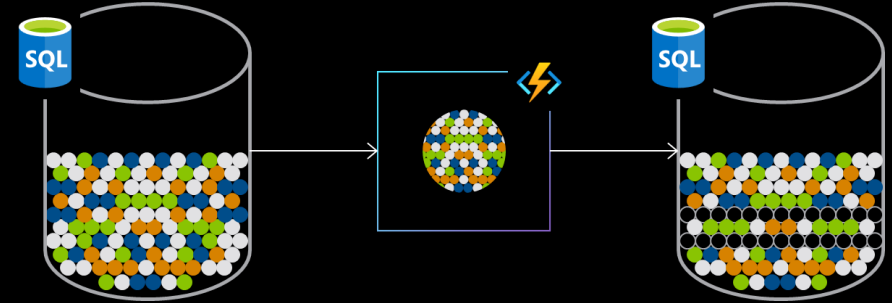
- Automatically handles all maintenance and updates
- Serverless and auto scale options keep costs low by matching resources to demand and eliminating capacity management and resource over-provisioning during busy or slow times
- Cost-effective serverless model responds to app patterns and is ideally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



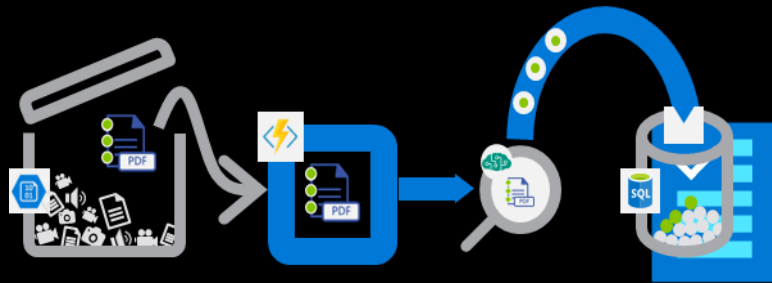
# Common Functions Scenarios



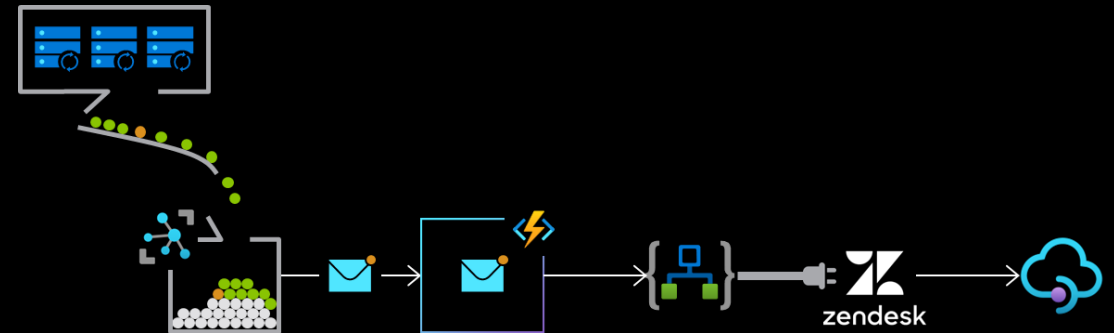
Web/Mobile  
application backends



Scheduled  
task automation



Real-time  
stream processing



IoT-connected  
backends

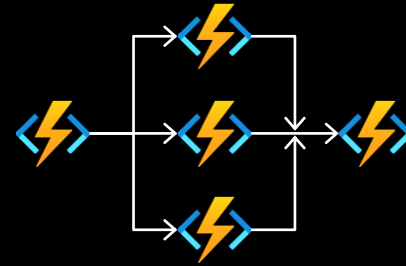
# Workflows and orchestration with Durable Functions

## PATTERNS/USE CASES

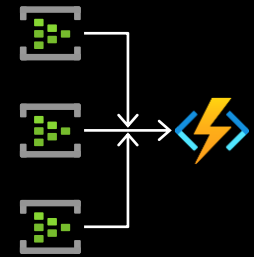
Durable Functions is an extension of Azure Functions that lets you write stateful functions in a serverless compute environment



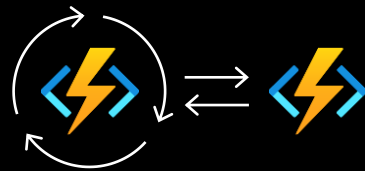
Manageable sequencing + error handling/compensation



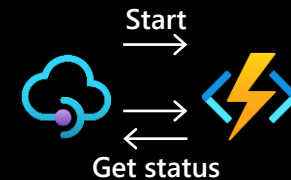
Fanning out and fanning in



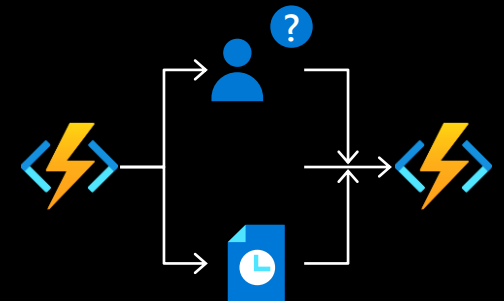
External events correlation



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



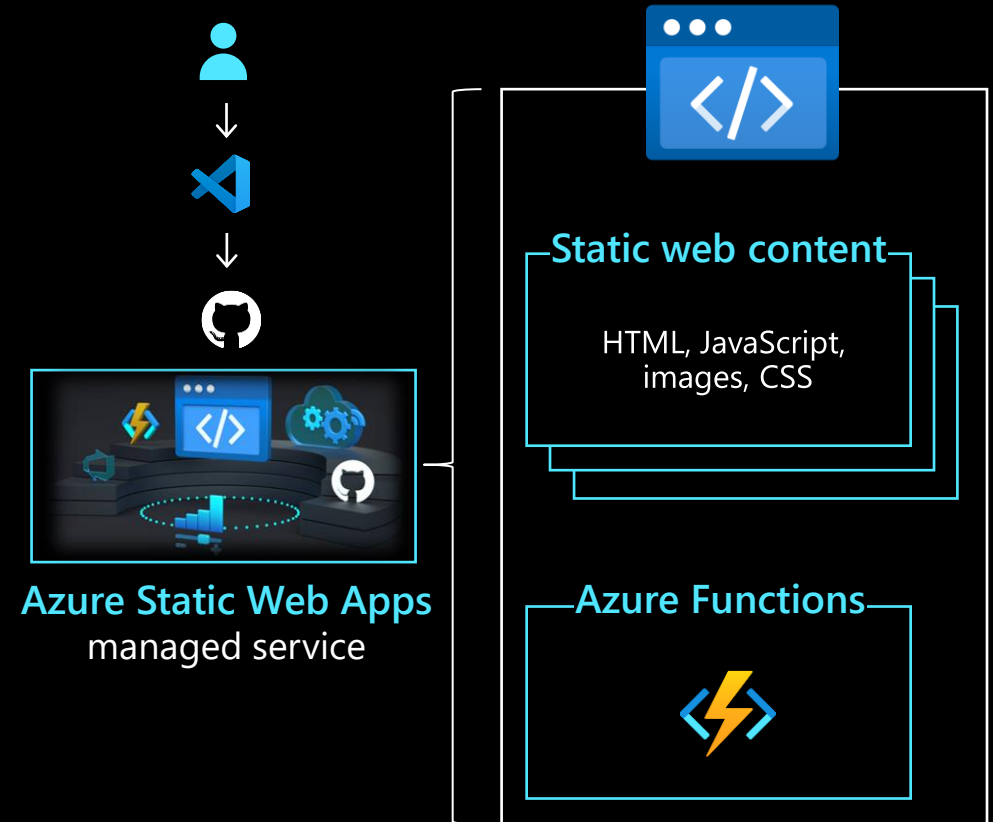
## Streamlined build and deployment

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



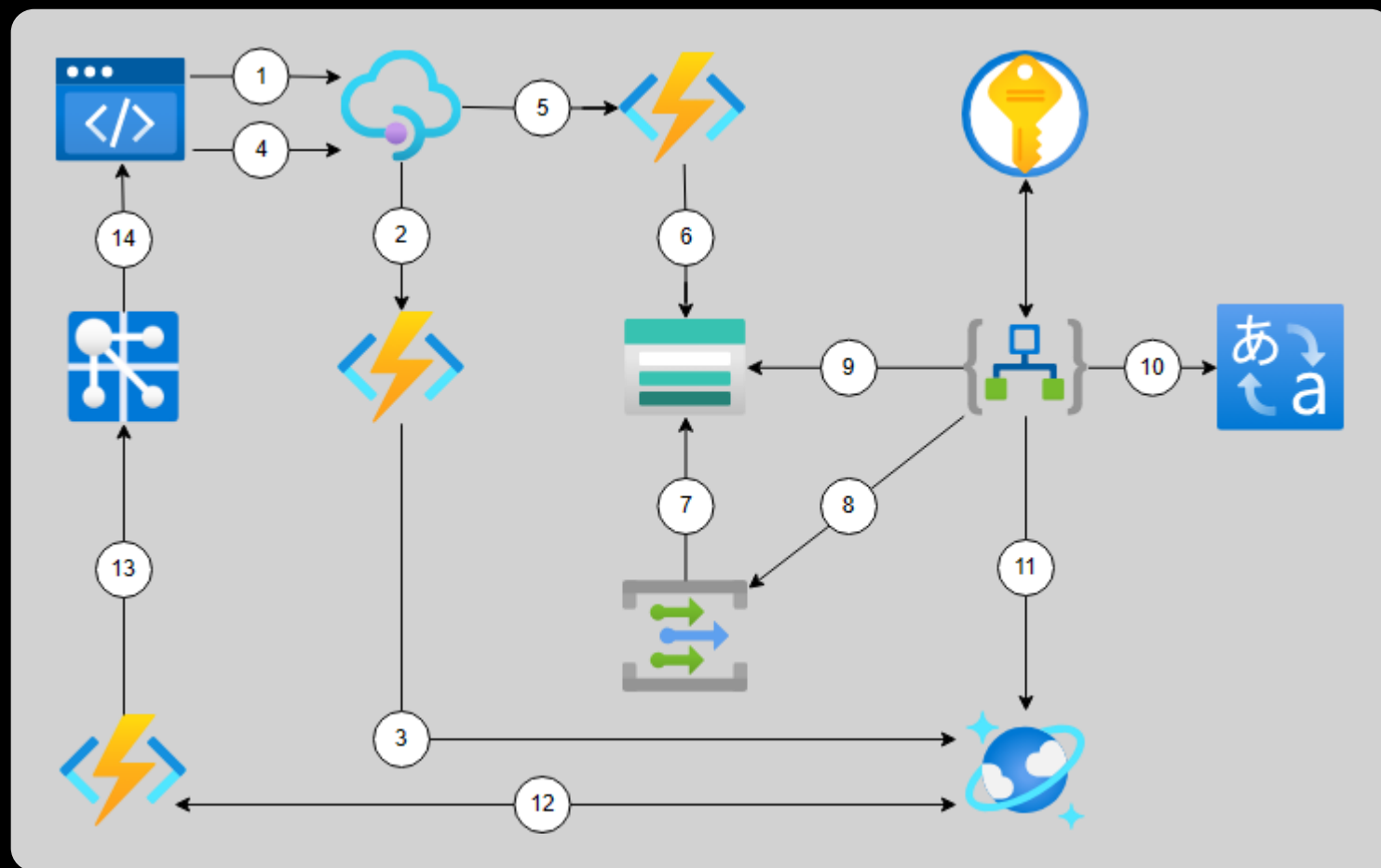
## Fully managed and cost-effective

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



# Demonstration

Serverless Architecture with  
Azure Functions



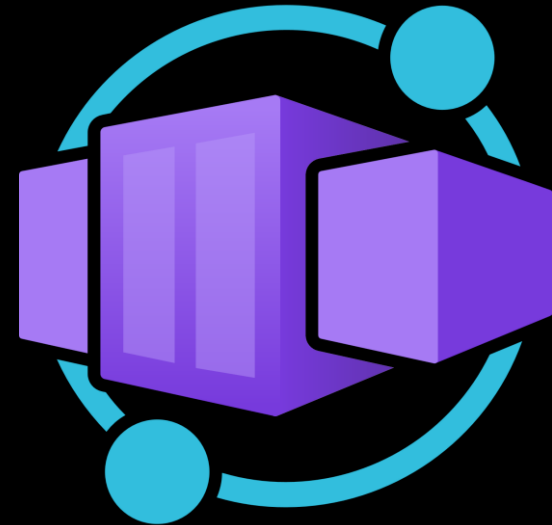
# Azure Container Apps

Serverless containers for microservices

Build modern apps on open source

Focus on apps, not infrastructure

Scale dynamically based on events



Kubernetes



KEDA



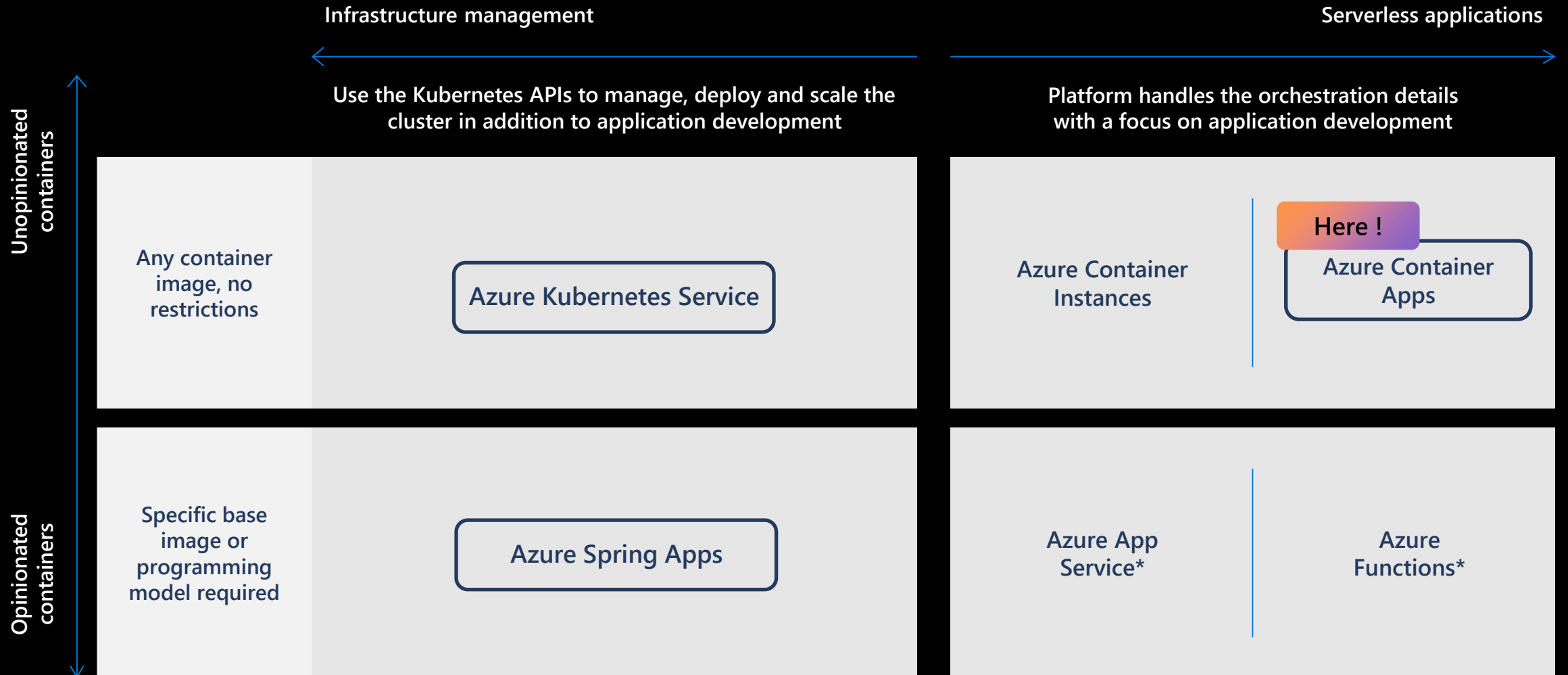
DAPR



Envoy



# Azure Containers Options



\* When used with containers

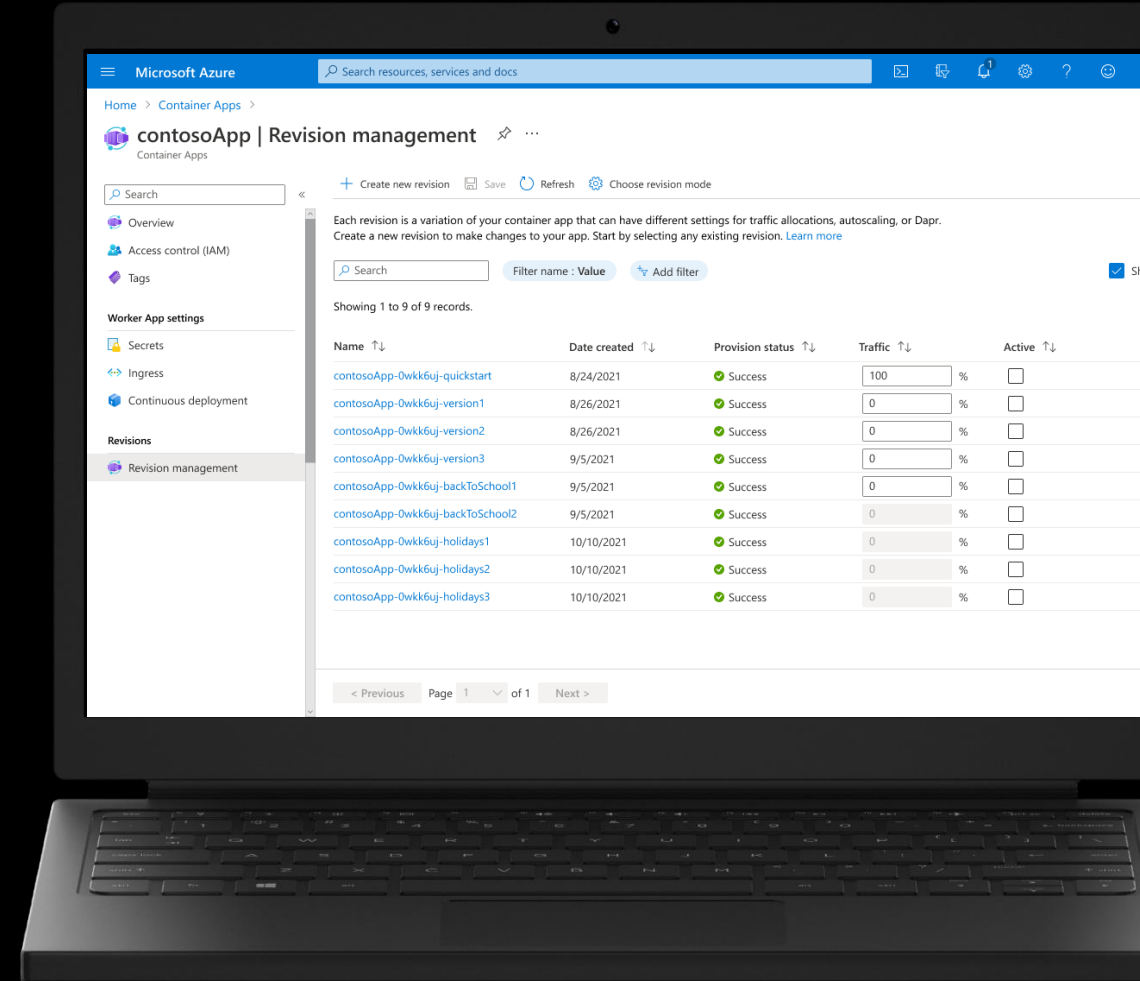
Build modern apps  
on open-source

Focus on apps, not  
infrastructure

Scale dynamically  
based on events

# 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.



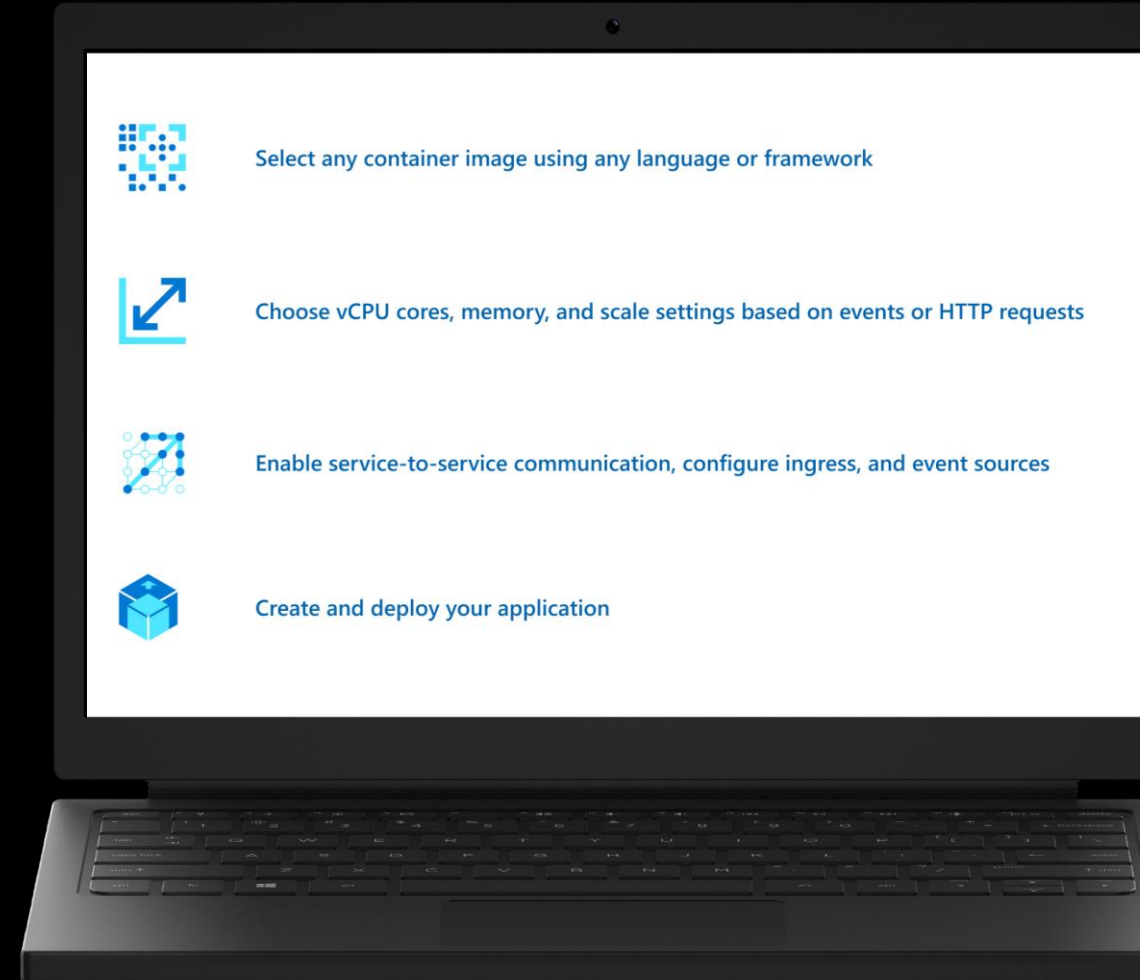
Build modern apps on  
open source

Focus on apps, not  
infrastructure

Scale dynamically  
based on events

## 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.



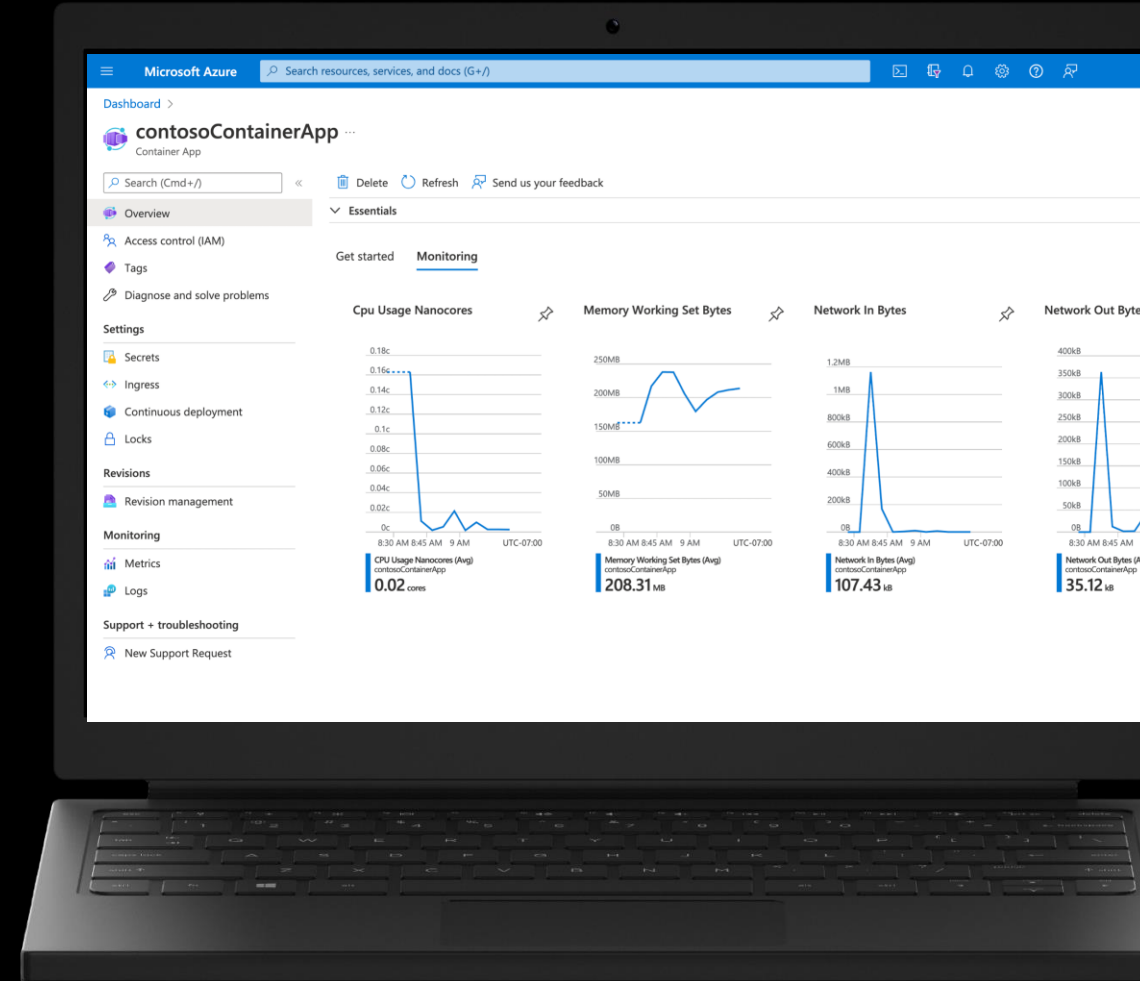
Build modern apps on  
open source

Focus on apps, not  
infrastructure

Scale dynamically  
based on events

# 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



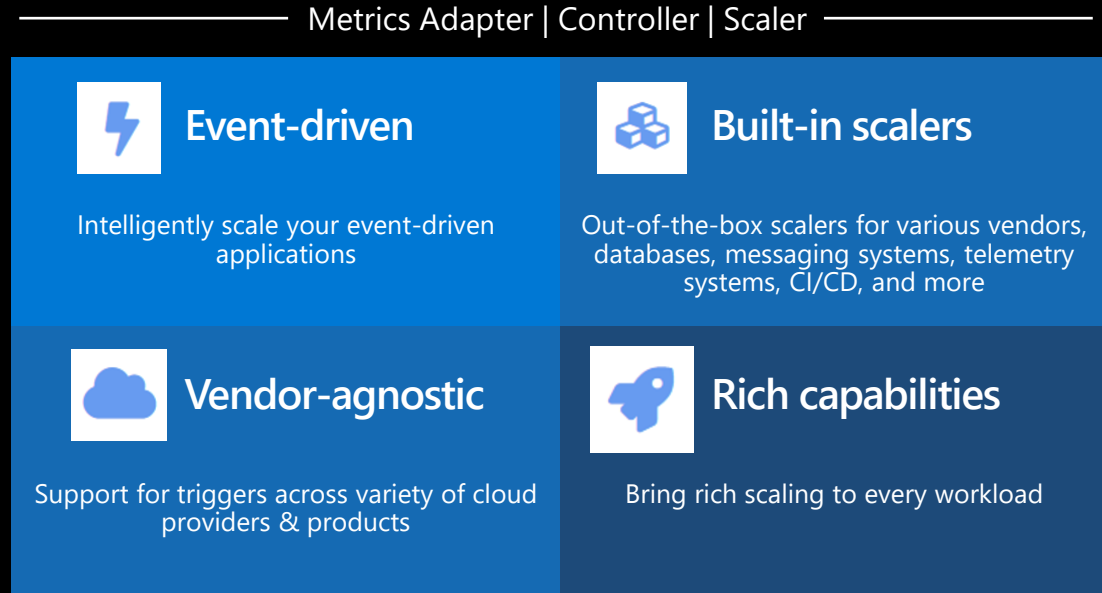
# Application autoscaling **made simple**

Open-source, extensible, and vendor agnostic



## Kubernetes-based Event Driven Autoscaler

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

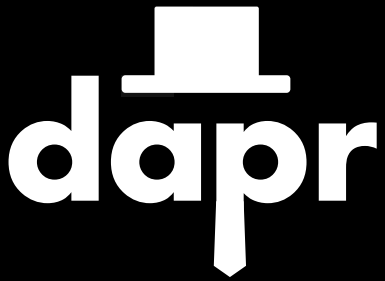


[keda.sh](https://keda.sh)



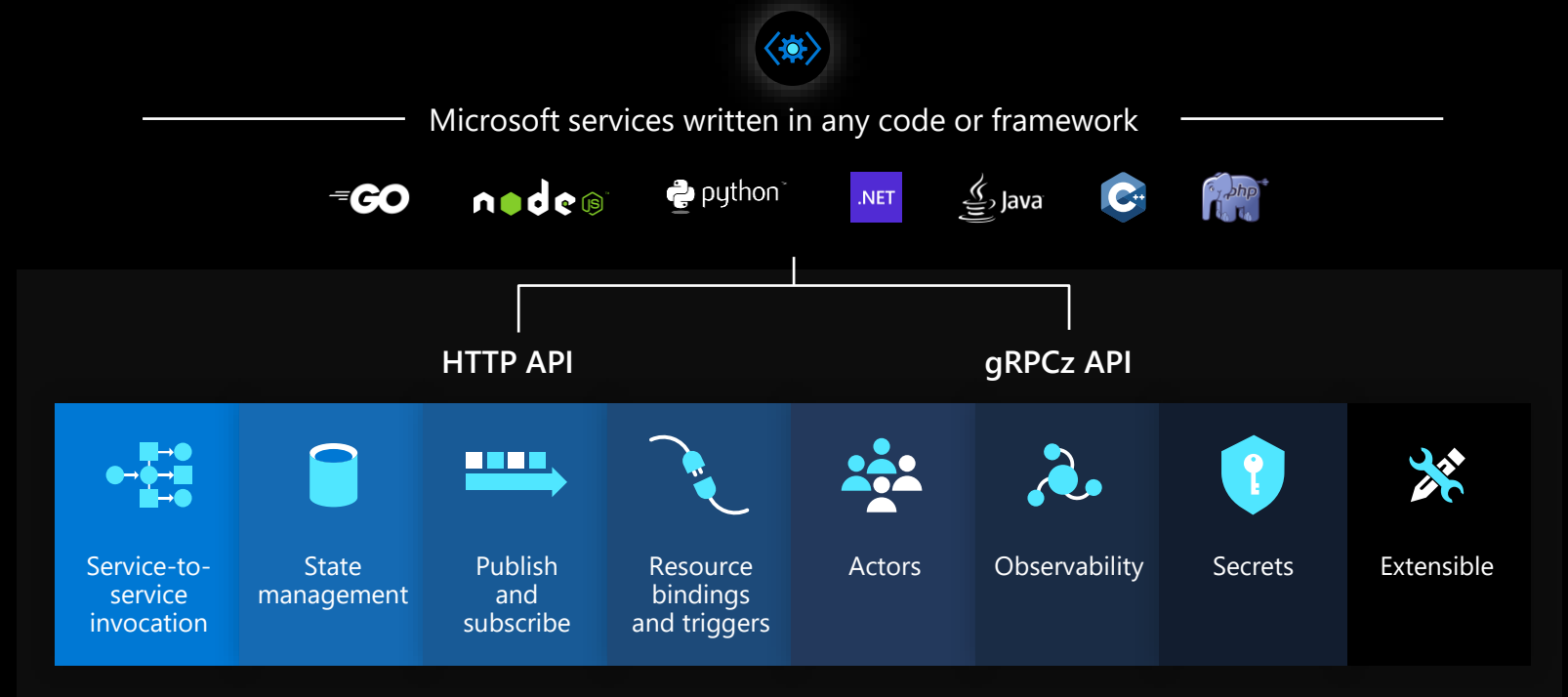
# Microservices using any language or framework

Any cloud or edge infrastructure



## Distributed Application Runtime

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



Hosting infrastructure

[dapr.io](https://dapr.io)



Microsoft Azure

Azure Arc

aws

Google Cloud

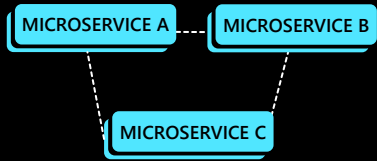
Alibaba Cloud

kubernetes

On-premises

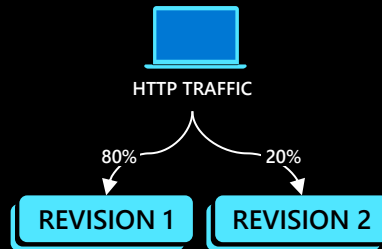
# What can you build with Azure Container Apps?

## 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

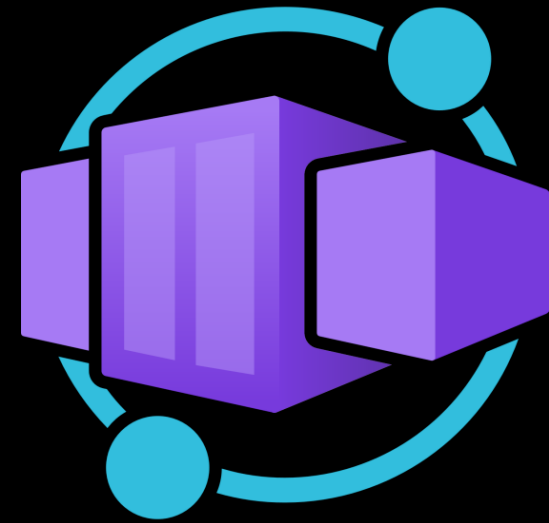
Scaling is determined by the number of concurrent HTTP requests

Scaling is determined by the number of messages in the queue

Scaling is determined by the level of CPU or memory load

# Demonstration

Serverless Containers with Azure Container Apps





# Azure Serverless - Quickstarts

## Learn More about Azure Container Apps

[aka.ms/containerapps](https://aka.ms/containerapps)



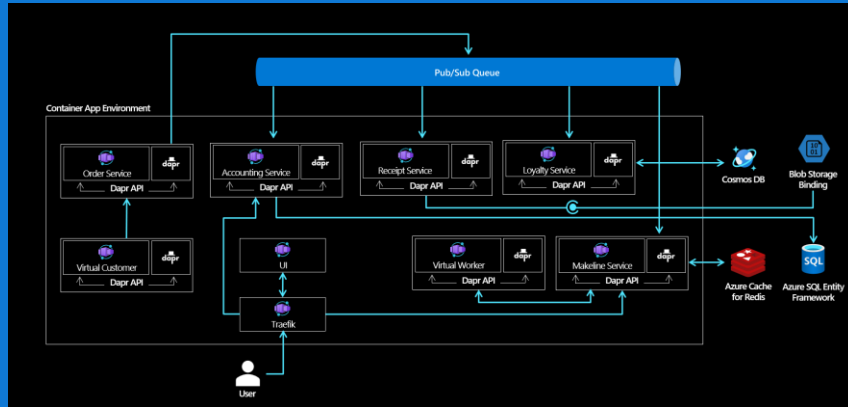
## Serverless Functions Architectures

[Reference Architectures](#)

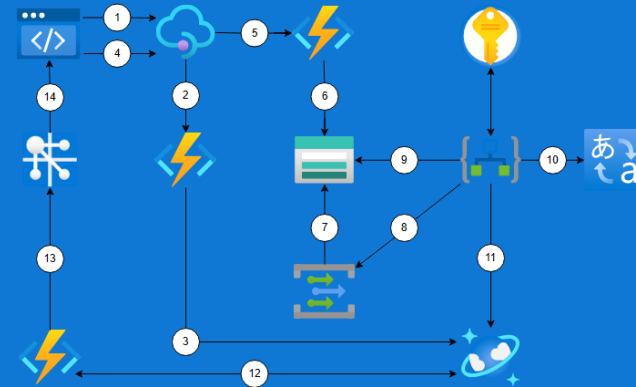
[Serverless September](#)



## Hands-on Lab : Azure Container Apps



## Hands-on Lab : Azure Serverless Architecture



Thank you