Kubernetes on Azure

Lorenzo Barbieri
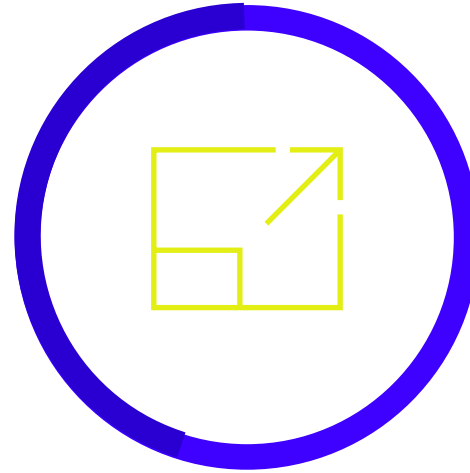**Principal Consultant**
lorenzo.barbieri@SoftwareOne.com

What's behind Kubernetes' growth?

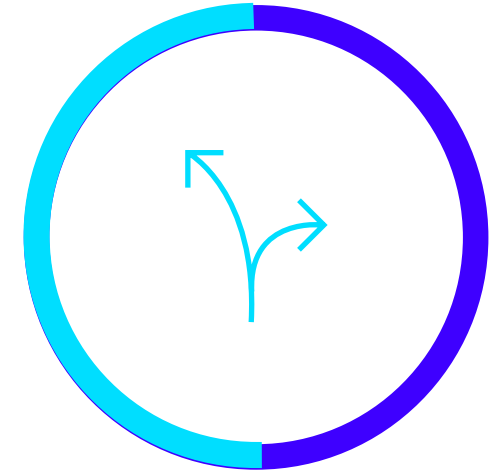Kubernetes: the leading orchestrator shaping the future app development and management
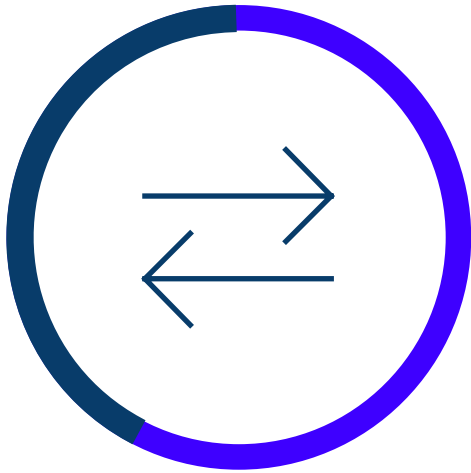
42%
portability

45%
scalability
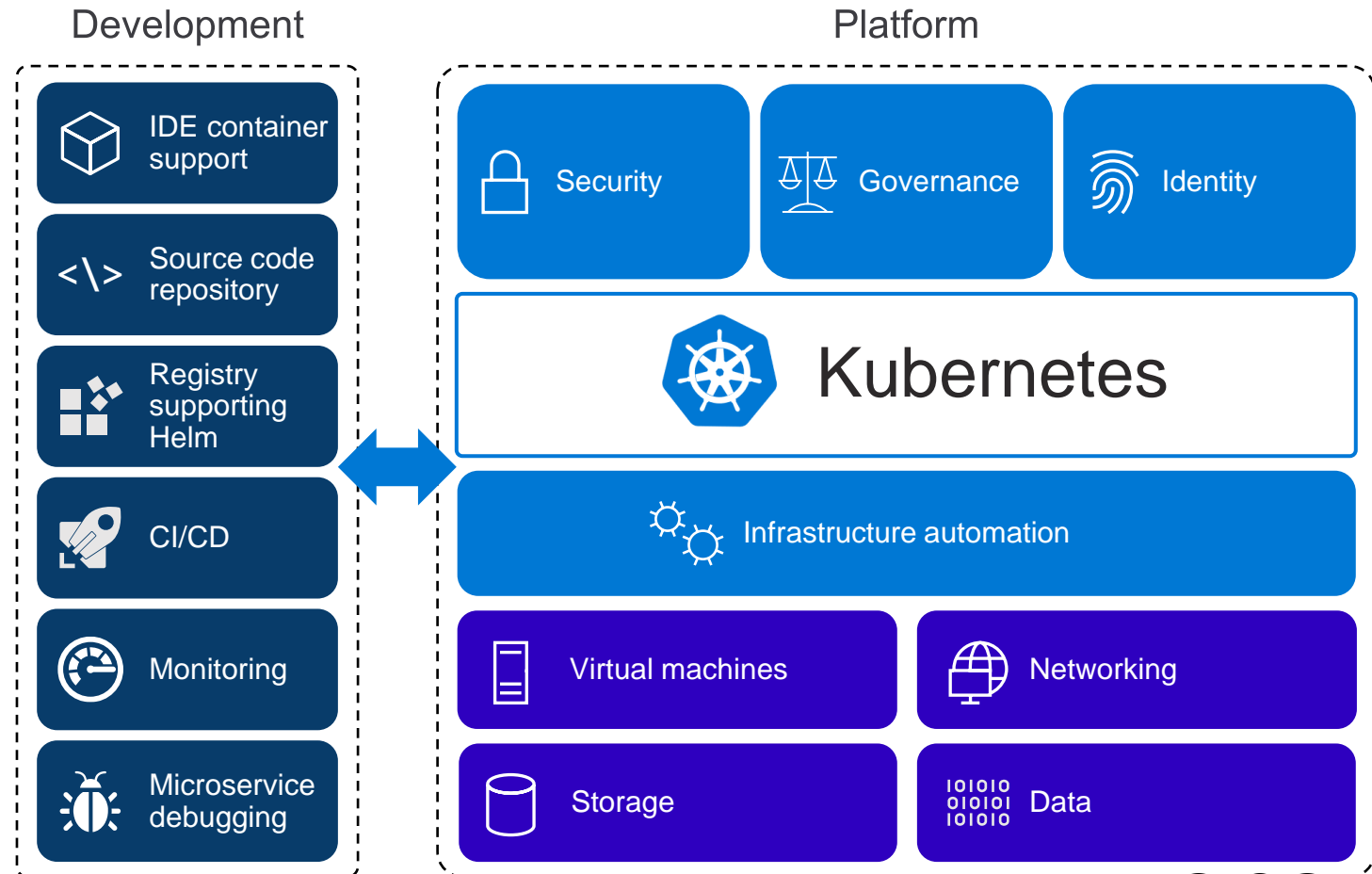
50%
agility

The perceived benefits of Kubernetes

Kubernetes on its own is not enough

Save time from infrastructure management and roll out updates faster without compromising security

Unlock the agility for containerized applications using:

- **Infrastructure automation** that simplifies provisioning, patching, and upgrading

- Tools for **containerized app development and CI/CD workflows**

- Services that support **security, governance, and identity and access management**

Development

| IDE container support |
| Source code repository |
| Registry supporting Helm |
| CI/CD |
| Monitoring |
| Microservice debugging |

Platform

| Security | Governance | Identity |

Kubernetes

Infrastructure automation

| Virtual machines | Networking |
| Storage | Data |

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Kubernetes on Azure

Manage Kubernetes with ease

Infrastructure automation

Now with Azure Copilot support!

- Automated provisioning, upgrades, patches

- High reliability, availability

- Easy, secure cluster scaling

- Self-healing

- API server monitoring

- At no charge (you don't pay the managed control plane)

Azure managed control plane

User

App/ workload definition

Kubernetes API endpoint

Schedule pods over private tunnel

Customer VMs

Docker	Docker	Docker	Docker	Docker
Pods	Pods	Pods	Pods	Pods
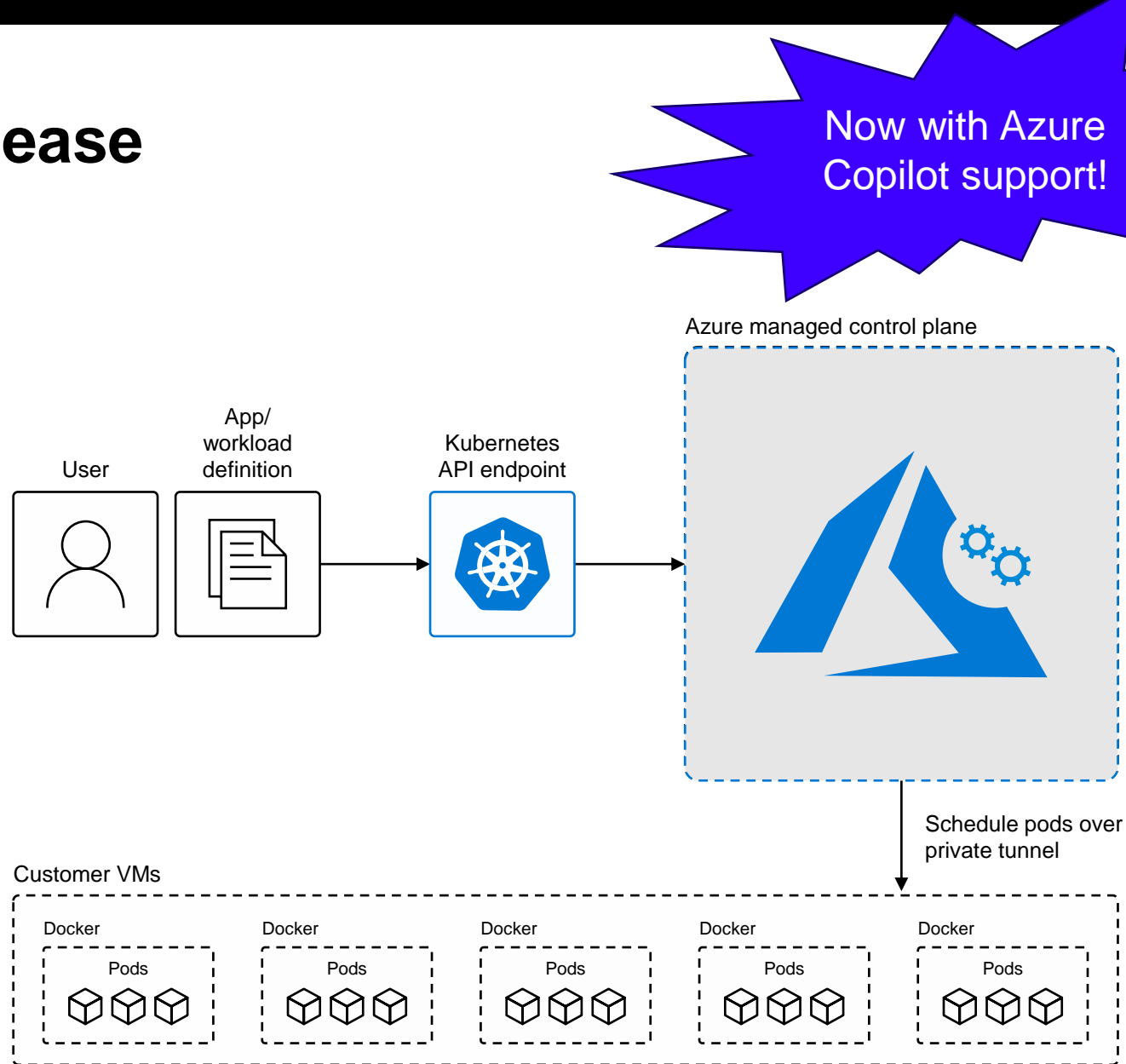
Microsoft runs AKS at scale
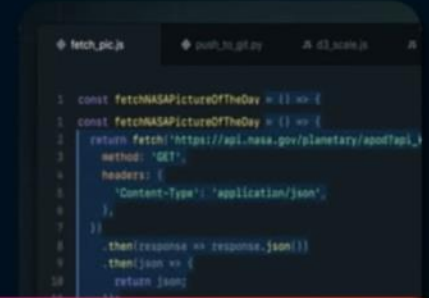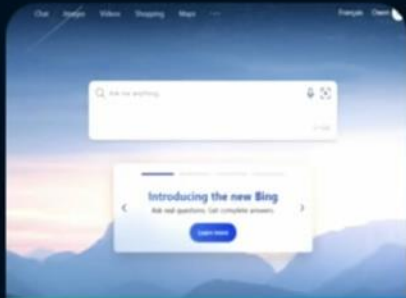
Microsoft modernized its own flagship apps to run on AKS

AI-based search with ChatGPT

Bing

Modern work across Office 365

Office

AI-powered meeting recaps

Microsoft Teams

Personalized recommendations

XBOX

Copilot assisted coding

GitHub

Configuring K8S and AKS is hard?

Not with AKS Automatic!

https://learn.microsoft.com/en-us/azure/aks/intro-aks-automatic

AKS Automatic

Create an Automatic Kubernetes Cluster (preview)   ···

❌ **Basics**   Monitoring   Tags   Review + create

Azure Kubernetes Service (AKS) Automatic clusters are fully Azure-managed, with a simplified setup for more streamlined application deployment. This quicker, easier setup option includes sensible defaults that suit most production scenarios. Preview features must be registered to the selected subscription in order to create an Automatic Kubernetes cluster.
Learn more

ⓘ **Automatic Kubernetes Cluster manages these elements for you:**

- **Networking and Security** Azure CNI Overlay powered by Azure Cilium
- **Resource provisioning** Automated node provisioning and scaling
- **On-demand scaling** Optimal scaling tools like KEDA, HPA, and VPA
- **Kubernetes version upgrade** Automatic updates for enhanced stability
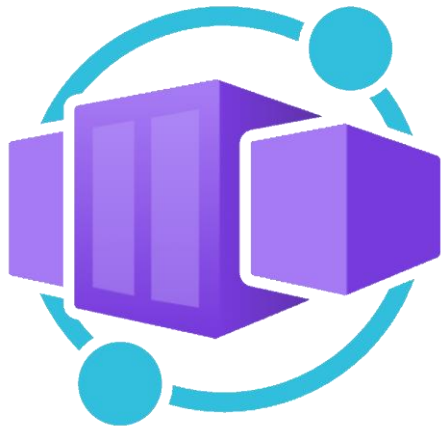
one software

"No one has ever been fired for choosing AKS ..."

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Azure Container Apps

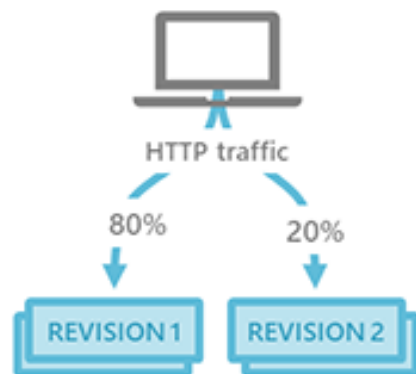A new serverless container platform for building modern apps and microservices

Built on a foundation of AKS, KEDA, Dapr, and Envoy

Azure Container Apps: Example scenarios

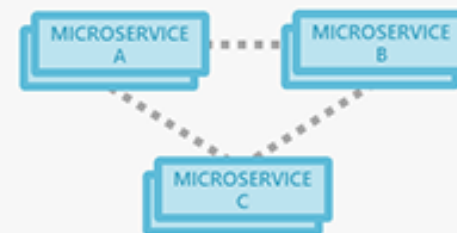| PUBLIC API ENDPOINTS	BACKGROUND PROCESSING	EVENT-DRIVEN PROCESSING	MICROSERVICES
HTTP requests are split between two versions of the container app where the first revision gets 80% of the traffic, while a new revision receives the remaining 20%.	A continuously-running background process that transforms data in a database.	A queue reader application that processes messages as they arrive in a queue.	Deploy and manage a microservices architecture with the option to integrate with Dapr.
AUTO-SCALE CRITERIA	**AUTO-SCALE CRITERIA**	**AUTO-SCALE CRITERIA**	**AUTO-SCALE CRITERIA**
Scaling is determined by the number of concurrent HTTP requests.	Scaling is determined by the level of CPU or memory load.	Scaling is determined by the number of messages in the queue.	Individual microservices can scale according to any KEDA scale triggers.

Azure Container Apps
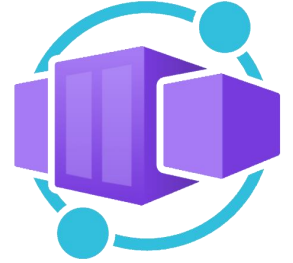
"Azure Container Apps enables executing application code packaged in any container and is unopinionated about runtime or programming model."

Enjoy the **benefits of running containers** while leaving behind the concerns of **managing cloud infrastructure** and **complex container orchestrators**.
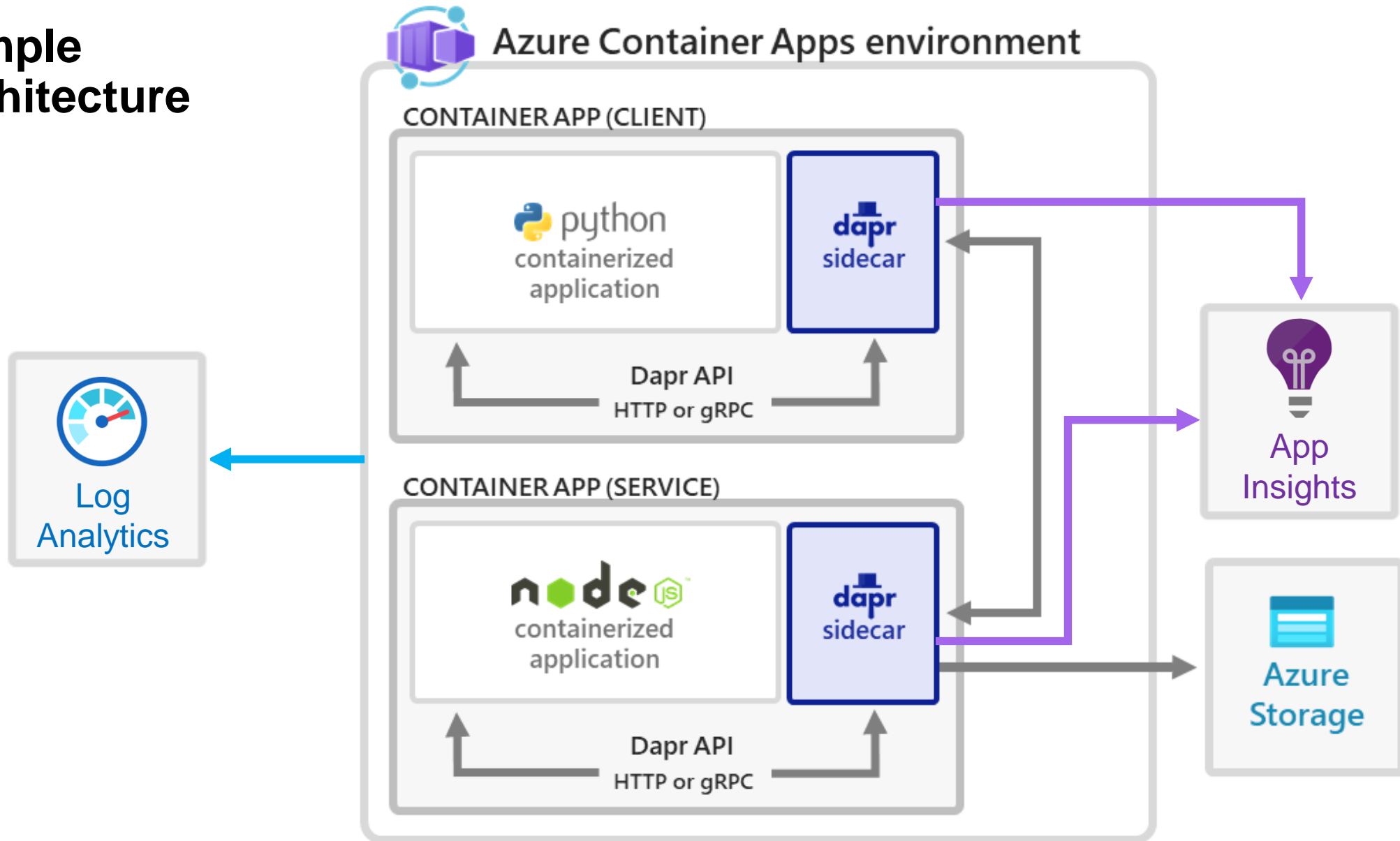
Serverless (scale to zero support)

Scale on HTTP requests, events, or run always-on background jobs

Automatic encryption for ingress and service-to-service communications

Built on a foundation of AKS, KEDA, Dapr, and Envoy

Sample Architecture

https://github.com/clarenceb/tutorial-dapr-cli

Thank You!

Q&A

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Microsoft MVP
Most Valuable Professional

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