

Serverless Containers with Azure Container Apps

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Talking Points

What we will cover today

- Introduction
- Introducing Azure Container Apps
- Running containerized workloads in Azure Container Apps
- Deployment and Monitoring
- Inner-loop performance
- Conclusion

*Do we really need another service to run containers in
Azure?*

Yes, we do!

Introduction

Why do we need another service for containers?

- There is no serverless pricing-model for AKS (although we have cluster autoscaling and other features)
- Kubernetes itself could become complex
- It's hard to find, hire, and keep people that **really know** Kubernetes
- *Azure Container Instances* and *Web App for Containers* have some “glitches” and gotchas

Introduction

The new Azure landscape for containers*



Azure WebApps for Containers



Azure Container Instances



Azure Kubernetes Service



Azure Container Apps

* Azure has more services that can run containers, however those are typically a bit more specialized

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Introducing Azure Container Apps

What is Azure Container Apps?

- Serverless platform to run containerized applications
- Customers will be charged on actual compute allocation (consumption)
- Built on top of powerful open-source projects
 - Kubernetes | Envoy | Dapr | KEDA
- Hides most of the complexity from the customer

Introducing Azure Container Apps

What is Azure Container Apps?

In Azure Container Apps we can run different shapes of applications

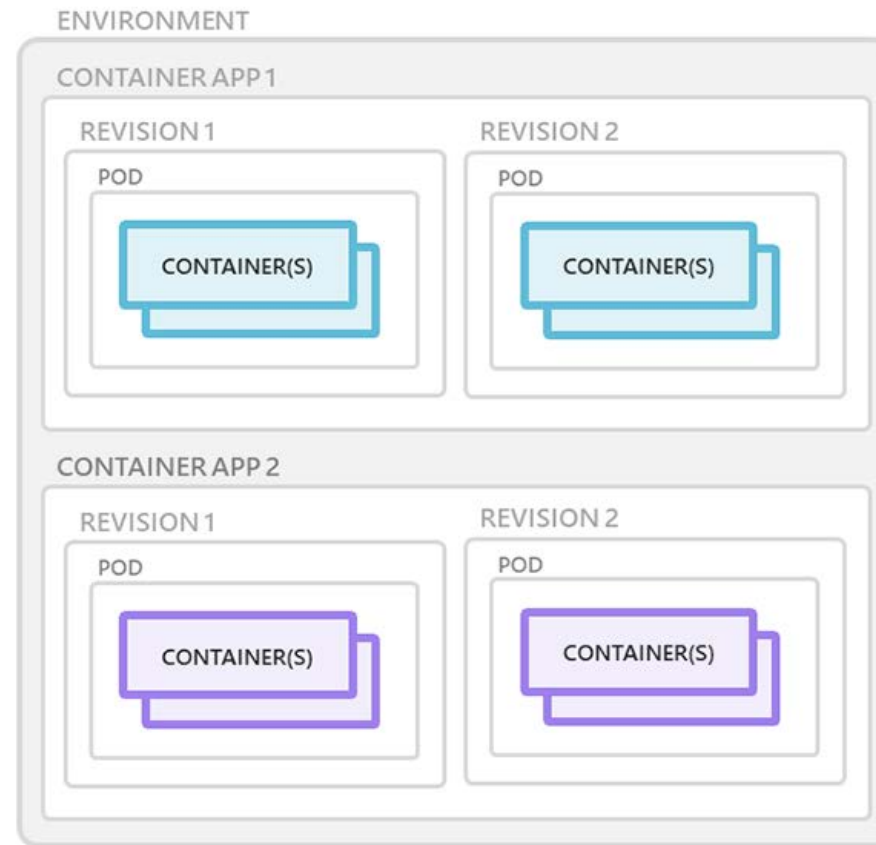
- Public API Endpoints
- Microservices
- Event-driven applications
- Background processing

Introducing Azure Container Apps

Building Blocks



Containers for an Azure Container App are grouped together in pods inside revision snapshots.



<https://docs.microsoft.com/en-us/azure/container-apps/containers>

Introducing Azure Container Apps

Ingress (Envoy) capabilities

- Envoy (<https://www.envoyproxy.io/>) acts as Ingress controller for your workloads
- Apps could be exposed to the internet
- We can implement traffic split (see SMI Spec)
 - (<https://github.com/servicemeshinterface/smi-spec/blob/main/apis/traffic-split/v1alpha4/traffic-split.md>)
- Apps exposed internally and hosted in the same environment, can interact with each other
 - In this case, think of regular fully qualified Kubernetes service
`(myservice.mynamespace.svc.cluster.local)`

Introducing Azure Container Apps

Microservice capabilities

- Dapr (Distributed Application Runtime - <https://dapr.io>) is baked into Azure Container Apps
 - Dapr makes building Microservices **easier**
- Dapr components will be injected automatically
 - Kubernetes sidecar-pattern
- Dapr is 100% optional! You don't have to use Dapr if you don't want to

Introducing Azure Container Apps

Scaling (KEDA) capabilities

- In Azure Container Apps you can scale your apps professionally
- KEDA (<https://keda.sh>) allows you to scale certain workloads based on a different scalers
 - A scaler describes scaling behavior based on external (or internal) signals e.g.:
 - Azure Service Bus Queue
 - Redis
 - Apache Kafka
 - Utilization e.g., CPU or memory
- Scaling configuration is part of the overall deployment manifest

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Demo

Running workloads in Azure Container Apps

- Hello Azure Container Apps



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Deployment and monitoring

How to deploy Azure Container Apps

- Azure Container Apps comes as a set of regular Azure Resource Manager (ARM) entities
- **Project Bicep** is currently the best approach to provision Azure Container Apps
- Use AzAPI provider to provision Azure Container Apps with **Terraform**
 - AzureRM provider lacks support of Azure Container Apps
 - See: <https://github.com/hashicorp/terraform-provider-azurerm/issues/14122>
- **Pulumi** supports Azure Container Apps
- Azure CLI integration is available via preview extension

Demo

Azure Container Apps Deployment with Bicep

- Provision and Deploy Azure Container Apps with Project Bicep



Deployment and monitoring

How to deploy workloads to Azure Container Apps

- Containers can be consumed from any kind of container registry
- Public and Private registries are supported
- If required, authentication is supported via
 - Username and Password
 - Managed Service Identities (both System Assigned and User Assigned)

Deployment and monitoring

How to monitor workloads in Azure Container Apps

- Seamless Azure Monitor integration
- Container logs will be streamed to Log Analytics Workspace (Azure Monitor)
- Logging agents enrich logs written to STDOUT and STDERR with contextual information e.g.:
 - Container App Name
 - Revision Name
 - Environment Name
 - Container Image
 - ...

Demo

Deployment and Monitoring

- Multi-container apps in Azure Container Apps
- Investigating with Azure Monitor



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Inner-Loop Performance

Get up and running in minutes

Starting from zero you can showcase an app
running in Azure Container Apps in ~ 3 mins

Demo

Inner-Loop Performance



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Conclusion

- Frictionless runtime for multi-container apps (essential parts of Kubernetes)
- Probably powerful enough for many use-cases
- Overall integration with Azure Service grows continuously
- Azure Container Apps is long awaited addition to the Azure service landscape
 - It's **not a replacement for** Azure Kubernetes Service or Web Apps for Containers
- Track ACA issues and roadmap at <https://github.com/microsoft/azure-container-apps/issues?q=label%3Aroadmap>

Samples



Articles about Azure Container Apps

