Containers a la carte.

The secret to shipping cloud workloads

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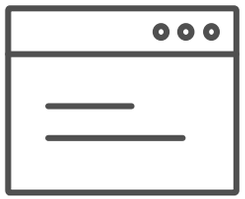
What we hear from **developers**



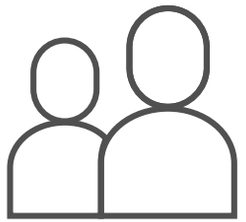
I need to create applications at a competitive rate without **worrying about IT**

New **applications run smoothly** on my machine but malfunction on traditional IT servers

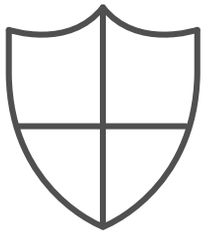
My **productivity** and application innovation become suspended when I have to wait on IT

What we hear from **IT**

I need to manage servers and maintain compliance with little disruption



I'm unsure of how to integrate unfamiliar applications, and I require help from developers



I'm unable to focus on both server protection and application compliance

What is the Answer ?

DevOps

… but this requires cultural change

What is the Answer ?

Containers

… remove developer / IT friction
… reduce downtime
… grease the wheels for DevOps

Agenda

Introduction to Containers

Containers on Azure

Deploying and Scaling Containers

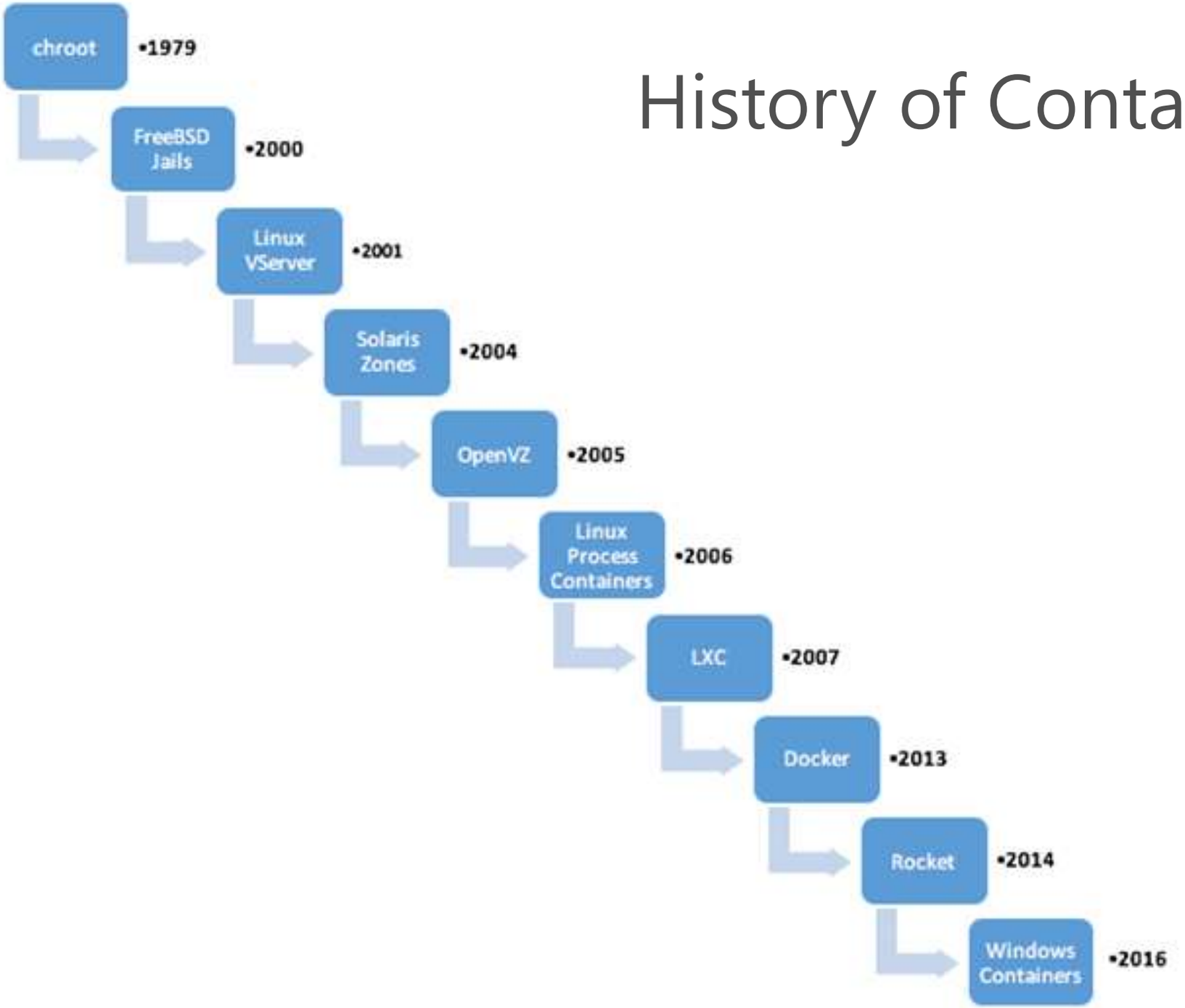
Q&A & Wrap Up

Industry analysts **agree**

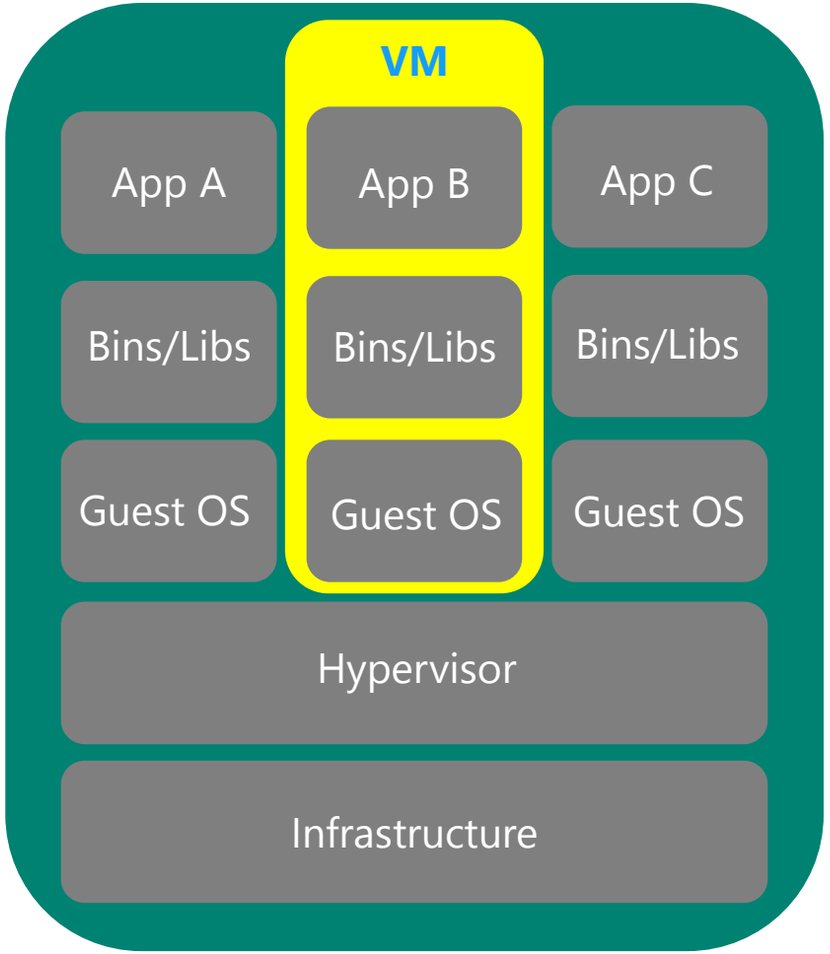
"By 2020, more than 50% of enterprises will run mission-critical, containerized cloud-native applications in production, up from less than 5% today."

Gartner

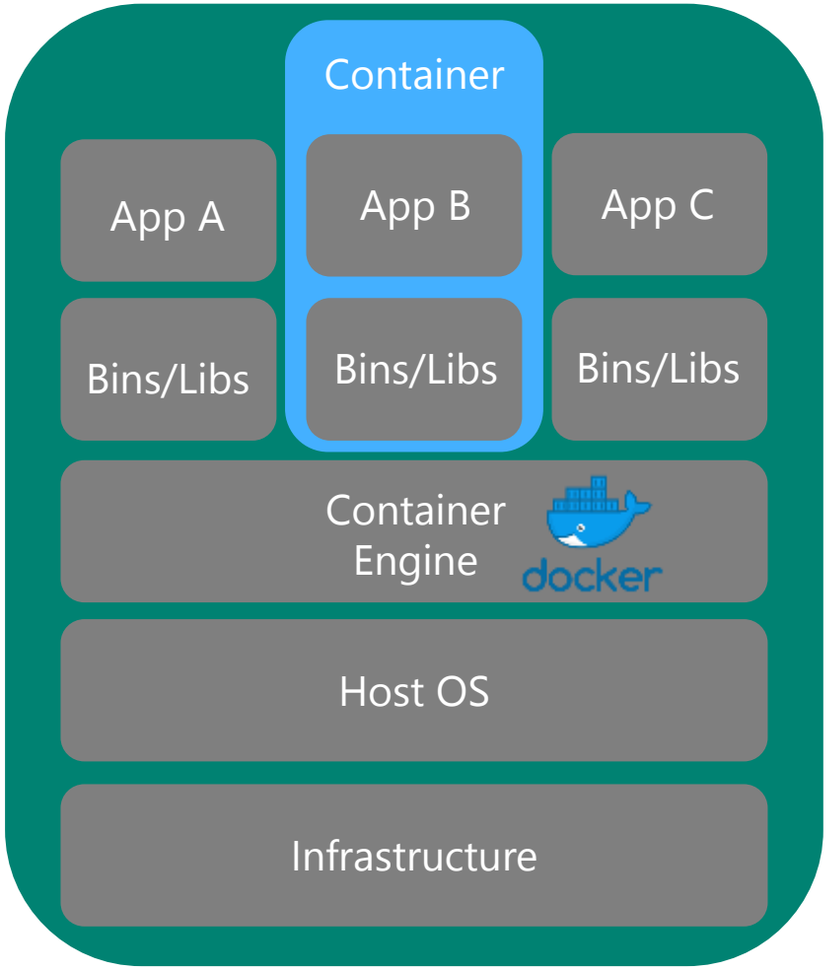
History of Containers



VM vs Container



Virtual Machines



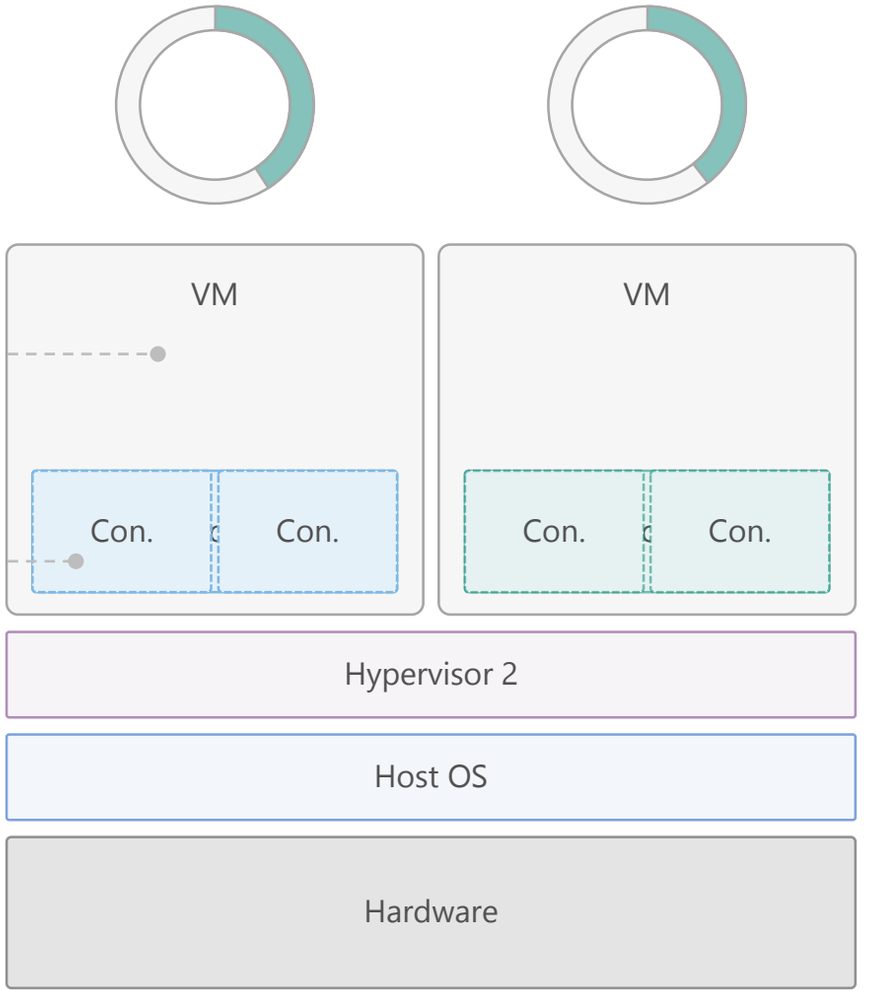
Containers

The container **advantage**

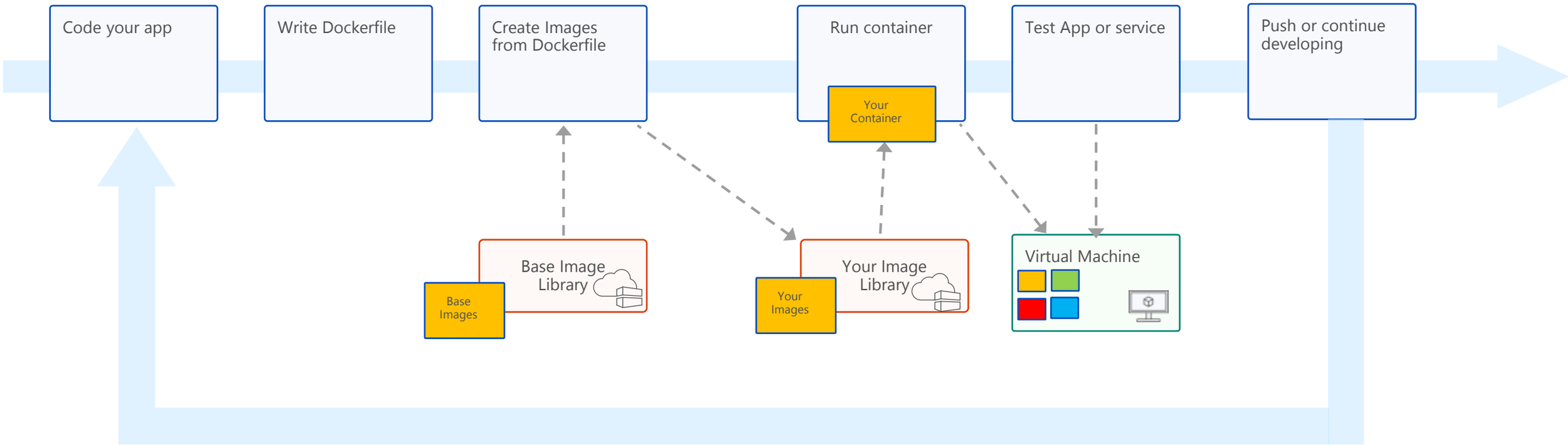
Traditional virtualized environment

Low utilization of container resources

Containerization of applications and their dependencies



Container **development workflow**



Simple Dockerfile

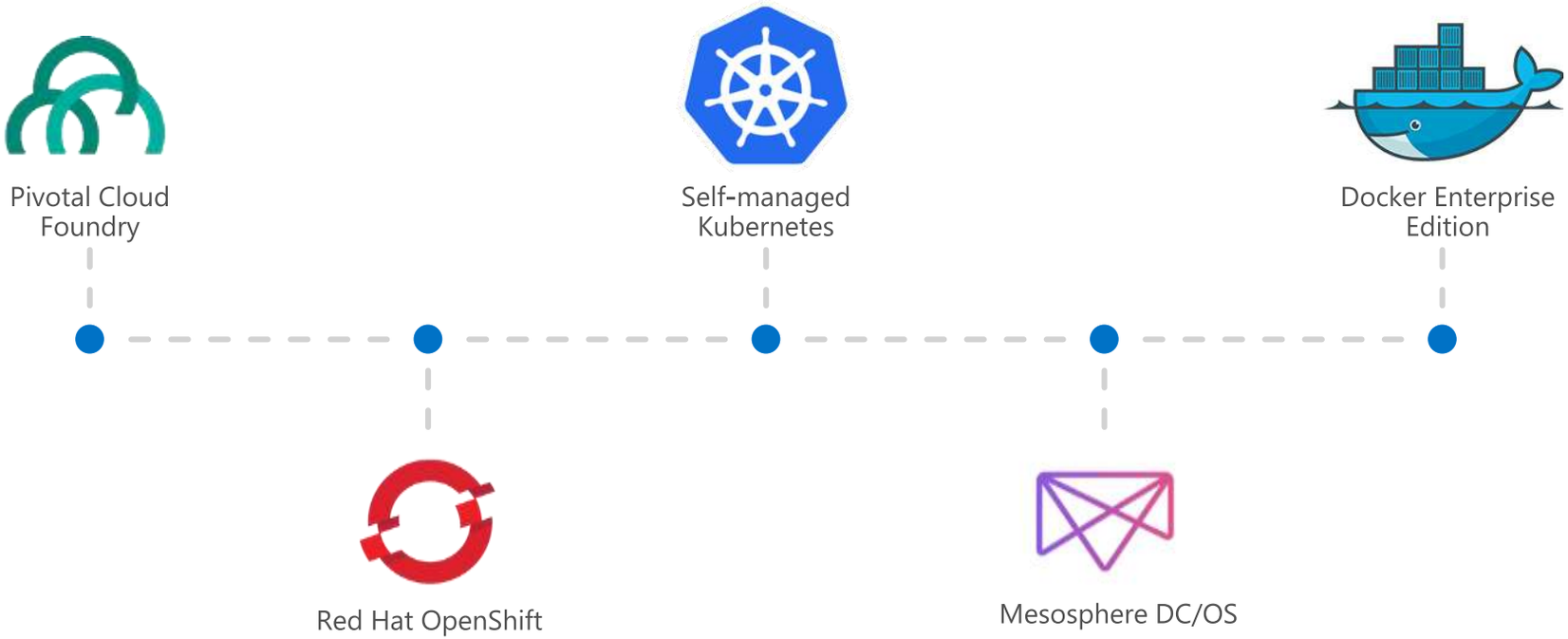
```
FROM microsoft/aspnetcore-build:1.1
WORKDIR /app

# Copy the published web app
COPY /aspnet-core-dotnet-core/ /app

# Run command
ENTRYPOINT ["dotnet", "aspnet-core-dotnet-core.dll"]
```

Containers On Azure

If you have a preferred container platform

Pivotal Cloud Foundry · Kubernetes · Docker Enterprise Edition

Red Hat OpenShift · Mesosphere DC/OS



You could bring that platform to Azure

If you are without a preferred container platform…

Let’s profile your needs and help you select the right option

Containers in Azure

App Service

Deploy web apps or APIs using containers in a PaaS environment

Service Fabric

Modernize .NET applications to microservices using Windows Server containers

Kubernetes Service

Scale and orchestrate Linux containers using Kubernetes

Container Instance

Elastically burst from your Azure Kubernetes Service (AKS) cluster

Ecosystem

Bring your Partner solutions that run great on Azure

Azure Container Registry

Docker Hub

Choice of developer tools and clients

Azure Container Registry (ACR)

App Service

Azure Container Instances (ACI)

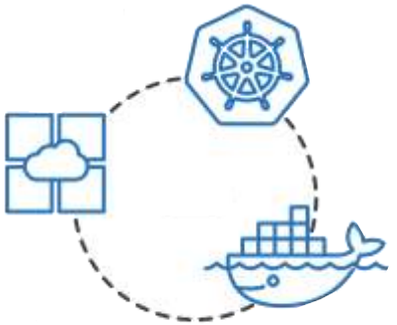
Service Fabric

Azure Batch

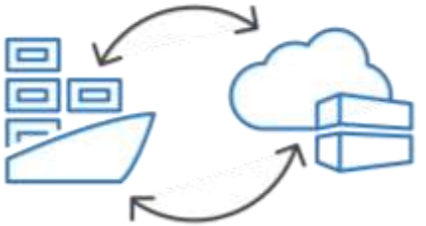
Azure Kubernetes Service (AKS)

Azure Container Registry (ACR)

Manage a Docker private registry as a first-class Azure resource



Manage images for all types of containers

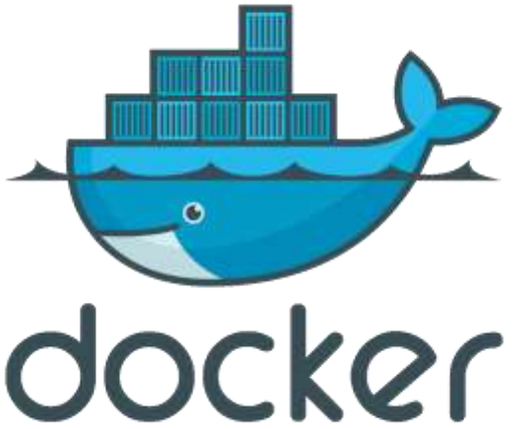


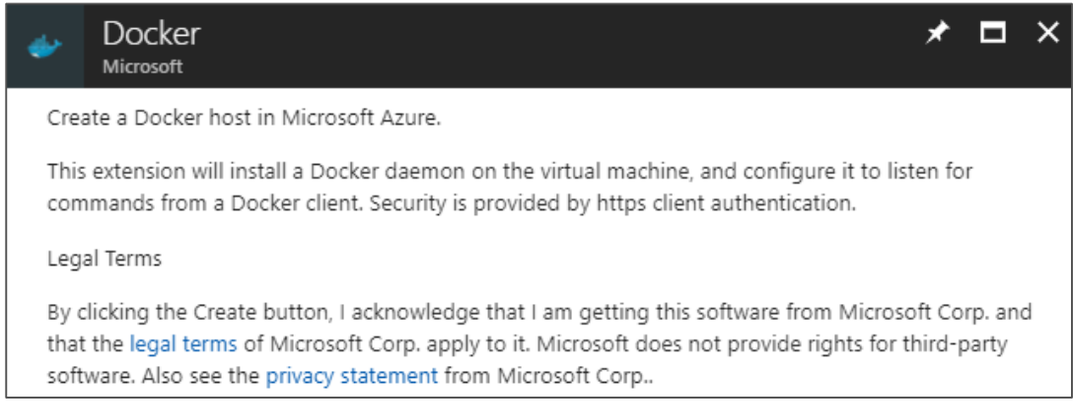
Use familiar, open-source Docker CLI tools

Azure Container Registry geo-replication

Running Docker on Azure VMs

- Support for Linux and Windows Containers





Azure Kubernetes Service (AKS)

App Service

Azure Container Instances (ACI)

Service Fabric

Azure Batch

Azure Container Registry (ACR)

App Service

Easily deploy and run container-based web apps at scale

Accelerated outer loop

Tight integration w/ Docker Hub, Azure Container Registry

Built-in CI/CD w/ Deployment Slots

Intelligent diagnostics & troubleshooting, remote debugging

Fully managed platform

Automatic scaling and load balancing

High availability w/ auto-patching

Backup & recovery

Flexibility & choices

From CLI, portal, or ARM template

Single Docker image, multi container w/ Docker Compose

IntelliJ, , Jenkin, Maven Visual Studio family

Azure Kubernetes Service (AKS)

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Azure Container Registry (ACR)

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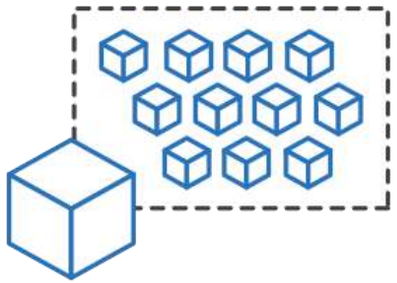
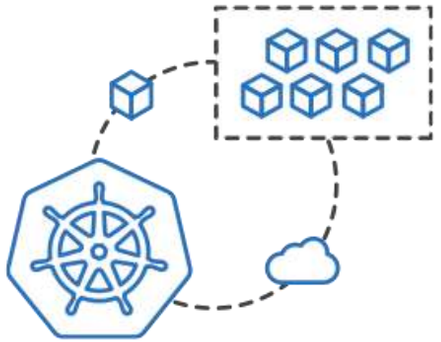
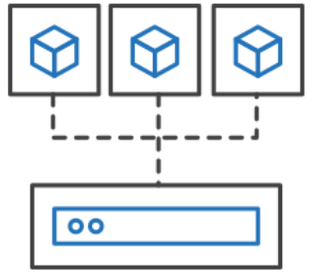
Easily run containers on Azure without managing servers



Run containers without managing servers



Increase agility with containers on demand



Secure applications with hypervisor isolation

Azure Container Service (AKS)

Azure Container Instances (ACI)

Azure Container Registry

Open Service Broker API (OSBA)

Release Automation Tools

Azure Container Instances (ACI) Demo

Get started easily

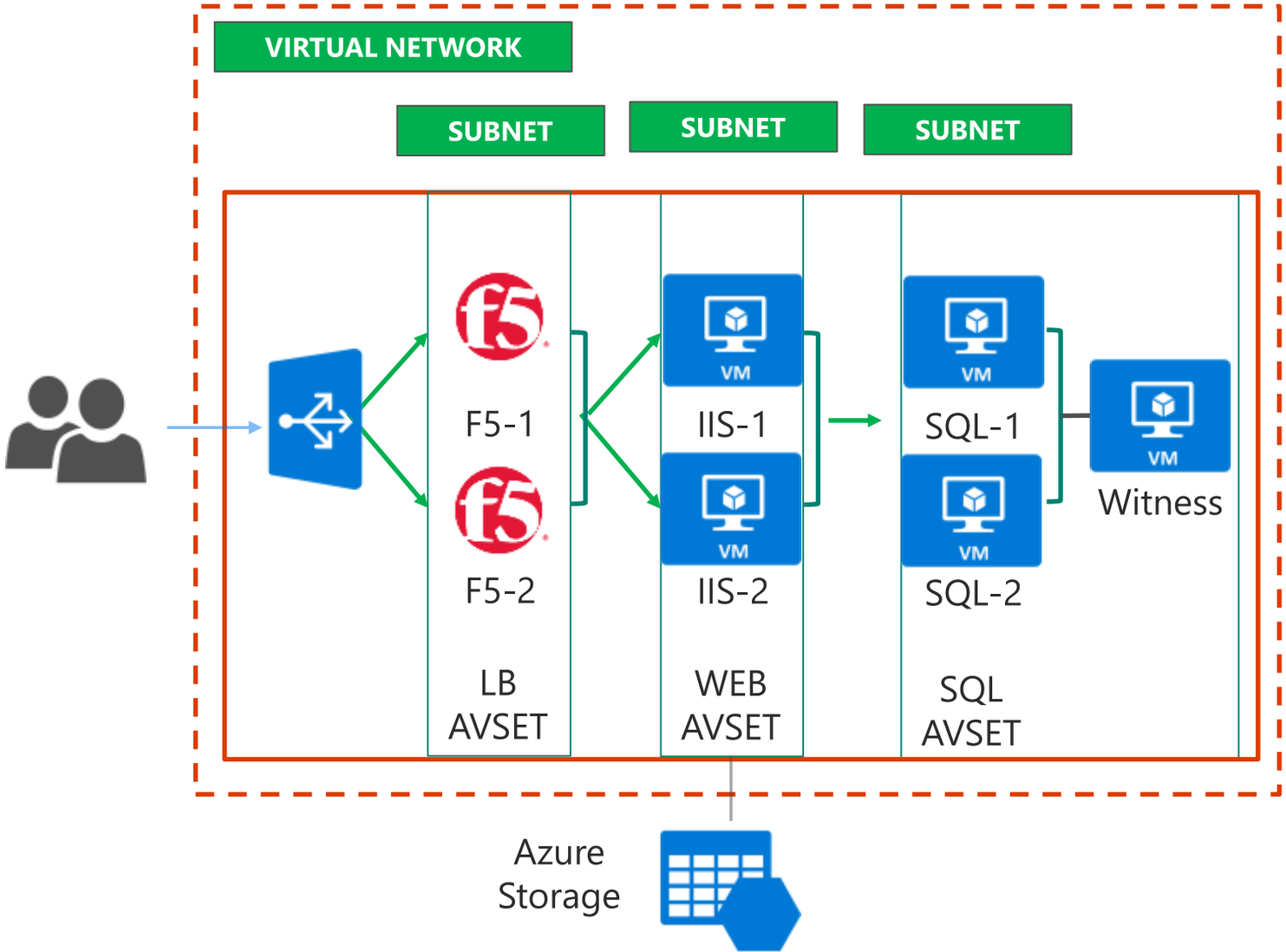
```
$ az container create --name mycontainer --image microsoft/aci-helloworld --
resource-group myResourceGroup --ip-address public
  "ipAddress": {
    "ip": "52.168.86.133",
    "ports": [...]
  },
  "location": "eastus",
  "name": "mycontainer",
  "osType": "Linux",
  "provisioningState": "Succeeded",
```

```
$ curl 52.168.86.133
<html>
<head>
  <title>Welcome to Azure Container Instances!</title>
</head>
```

Deploying and Scaling Containers

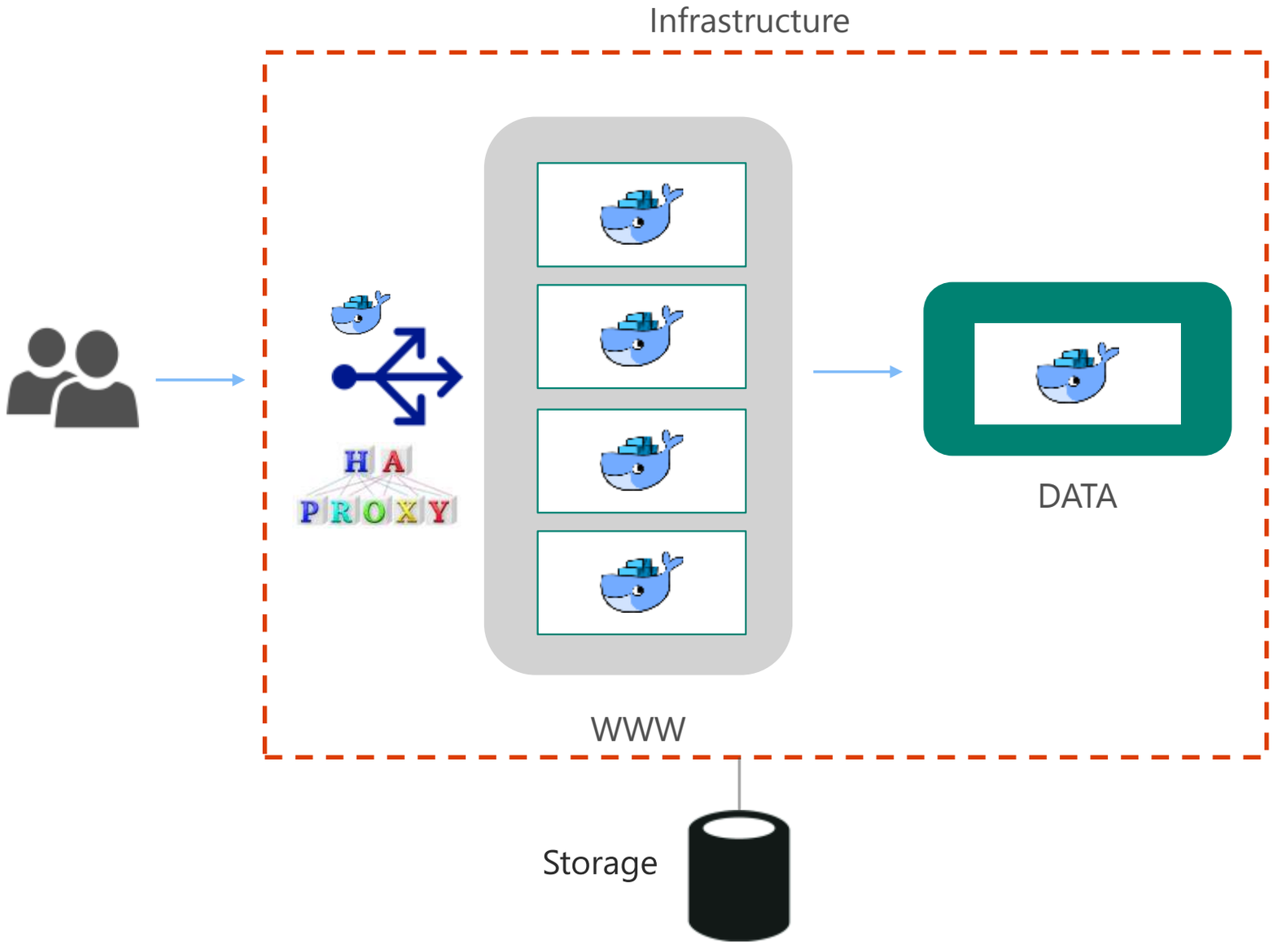
Web Deployment – Cloud IaaS

- Azure VMs, Azure Load Balancer, Azure Storage



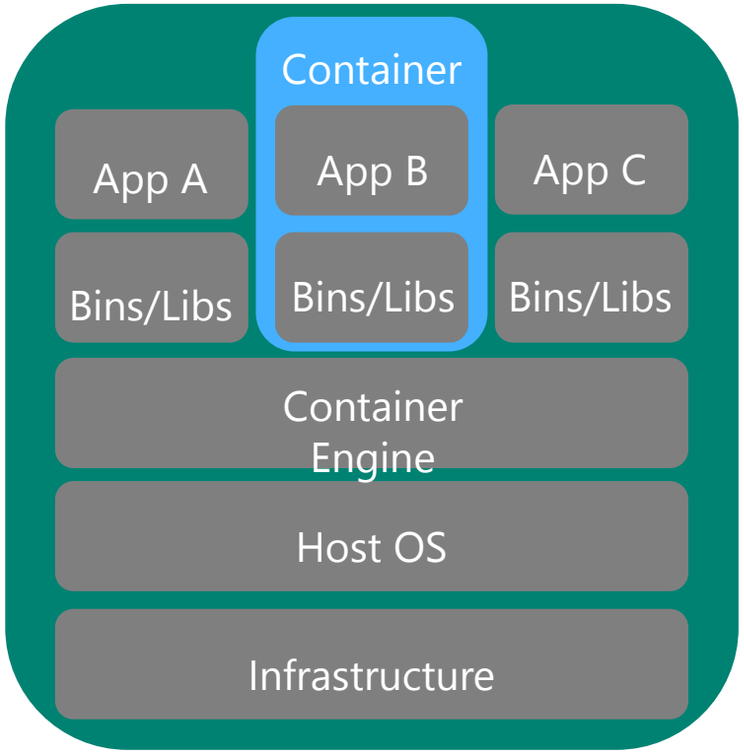
Web Deployment – Manual Docker

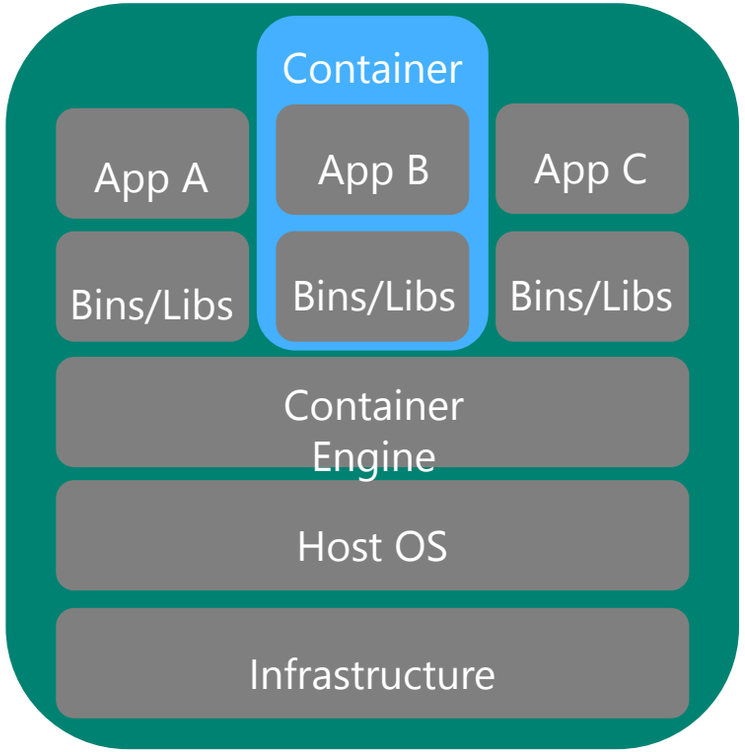
- Docker Containers on either Hardware or VMs

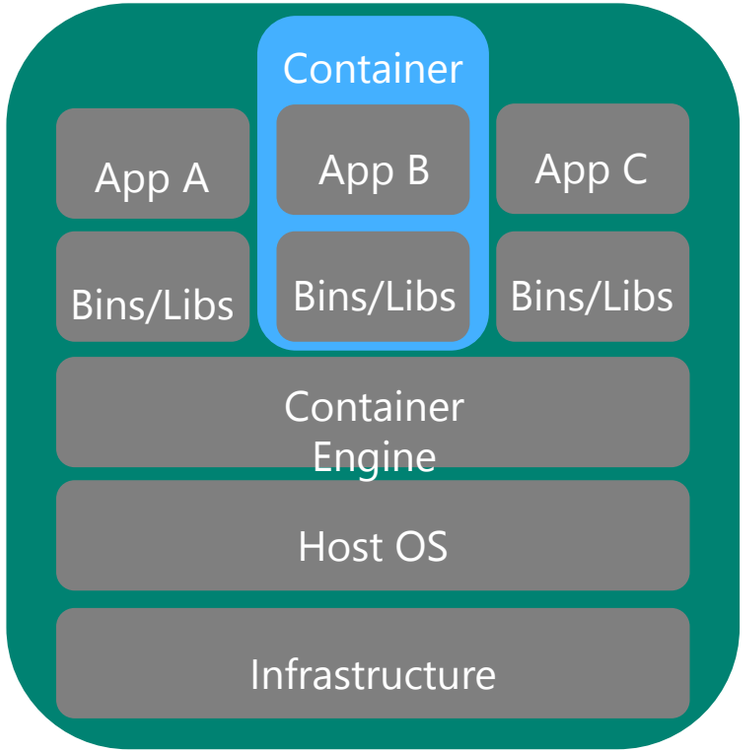


So how do you think this will pattern will scale?

I am going to want more VMs with containers!!

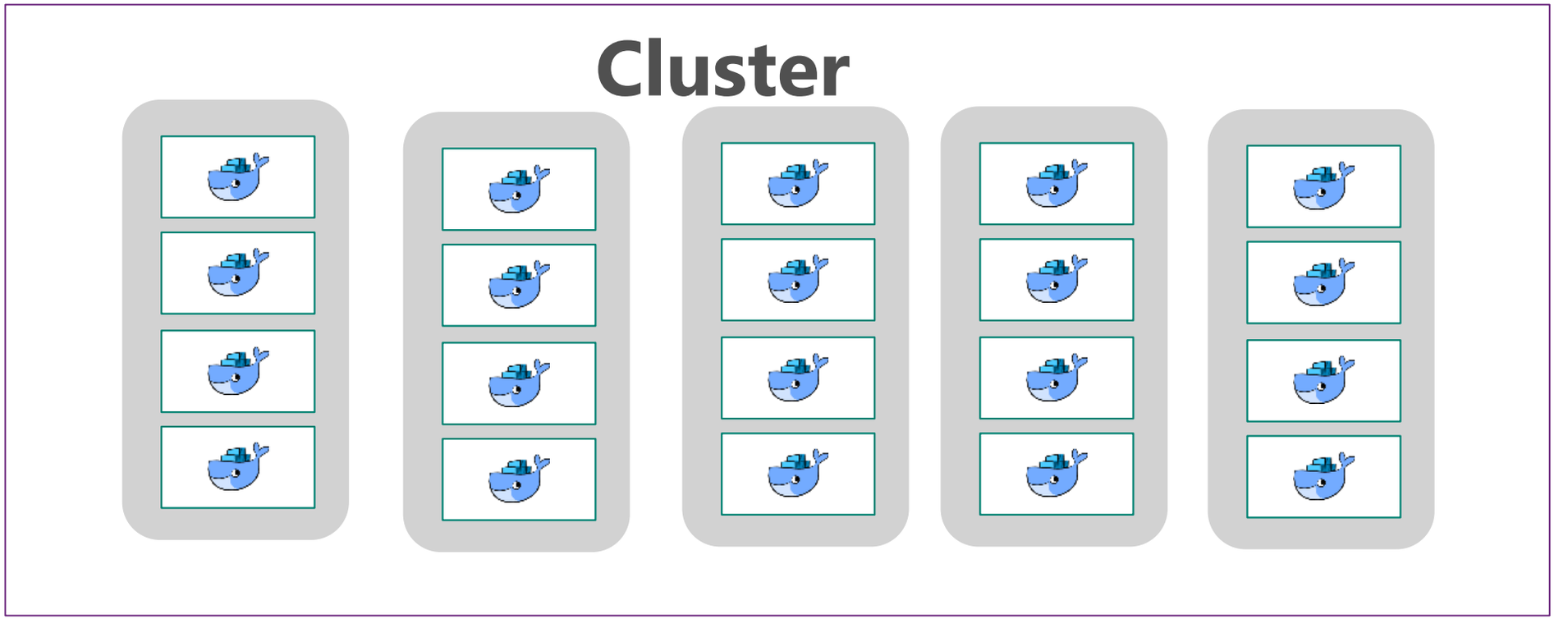






Introducing the Container Orchestrator!

Container Orchestrator Leader

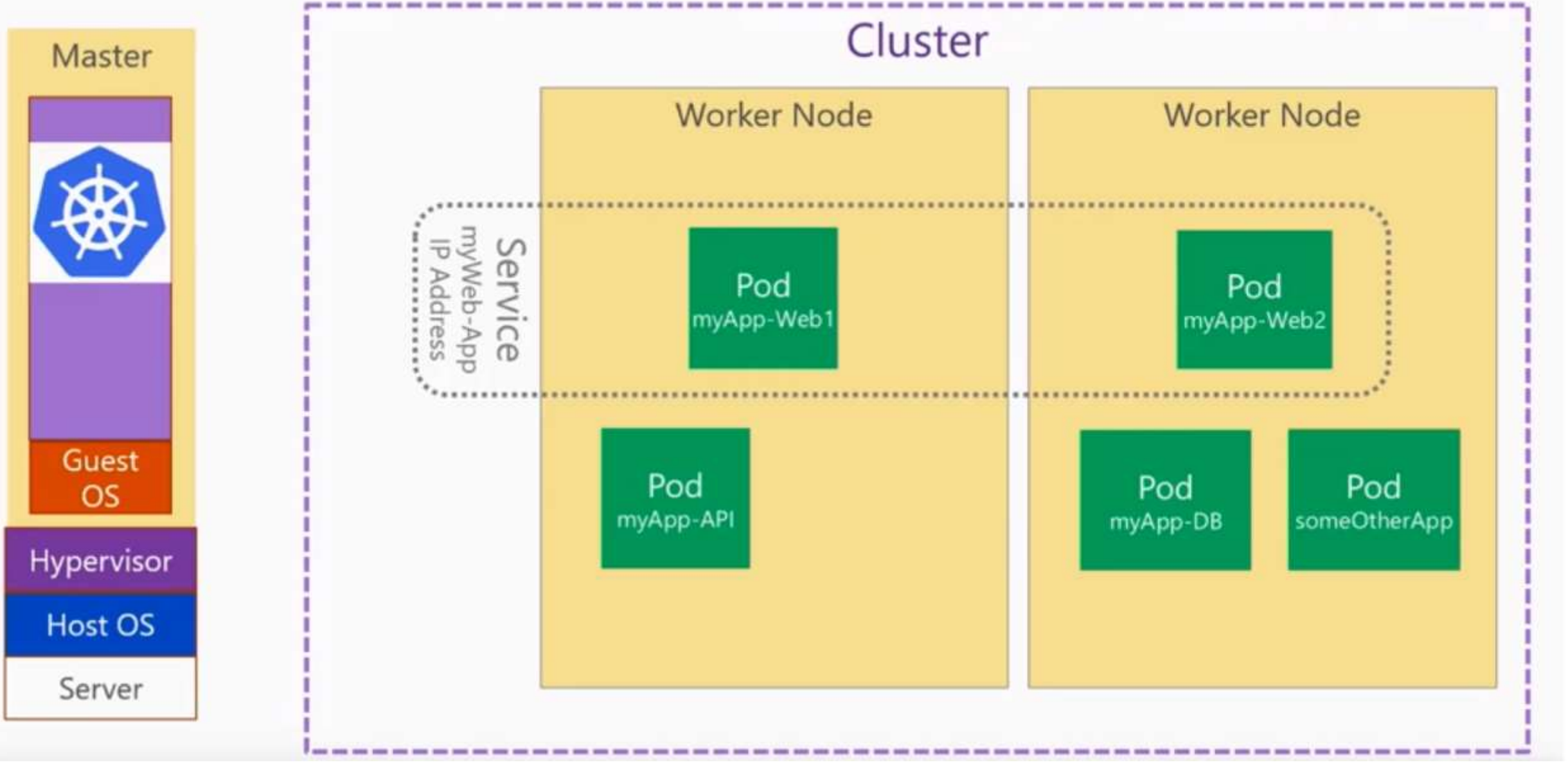


What is Kubernetes?

"Kubernetes is an open-source system for automating deployment, scaling, and management of containerized applications."

Kubernetes comes from the Greek word **κυβερνήτης:**, which means *helmsman* or *ship pilot*, ie: the captain of a container ship.

Kubernetes


Master
Guest OS
Hypervisor
Host OS
Server
Cluster
Worker Node
Worker Node
Service
myWeb-App
IP Address
Pod
myApp-Web1
Pod
myApp-Web2
Pod
myApp-API
Pod
myApp-DB
Pod
someOtherApp

Azure Container Service (AKS)

Azure Container Instances (ACI)

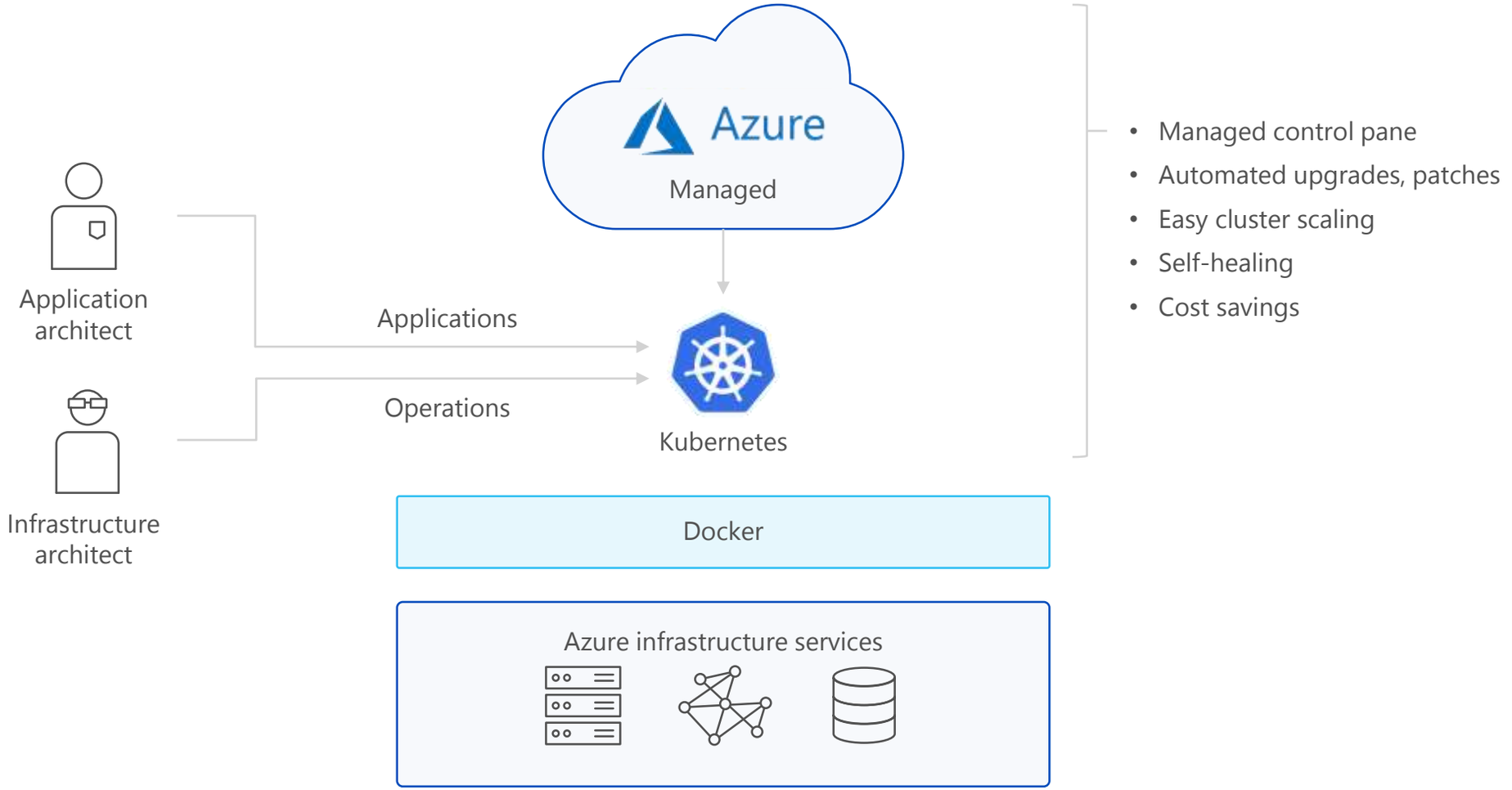
Azure Container Registry

Open Service Broker API (OSBA)

Release Automation Tools

Azure Kubernetes Service (AKS)

A fully managed Kubernetes cluster



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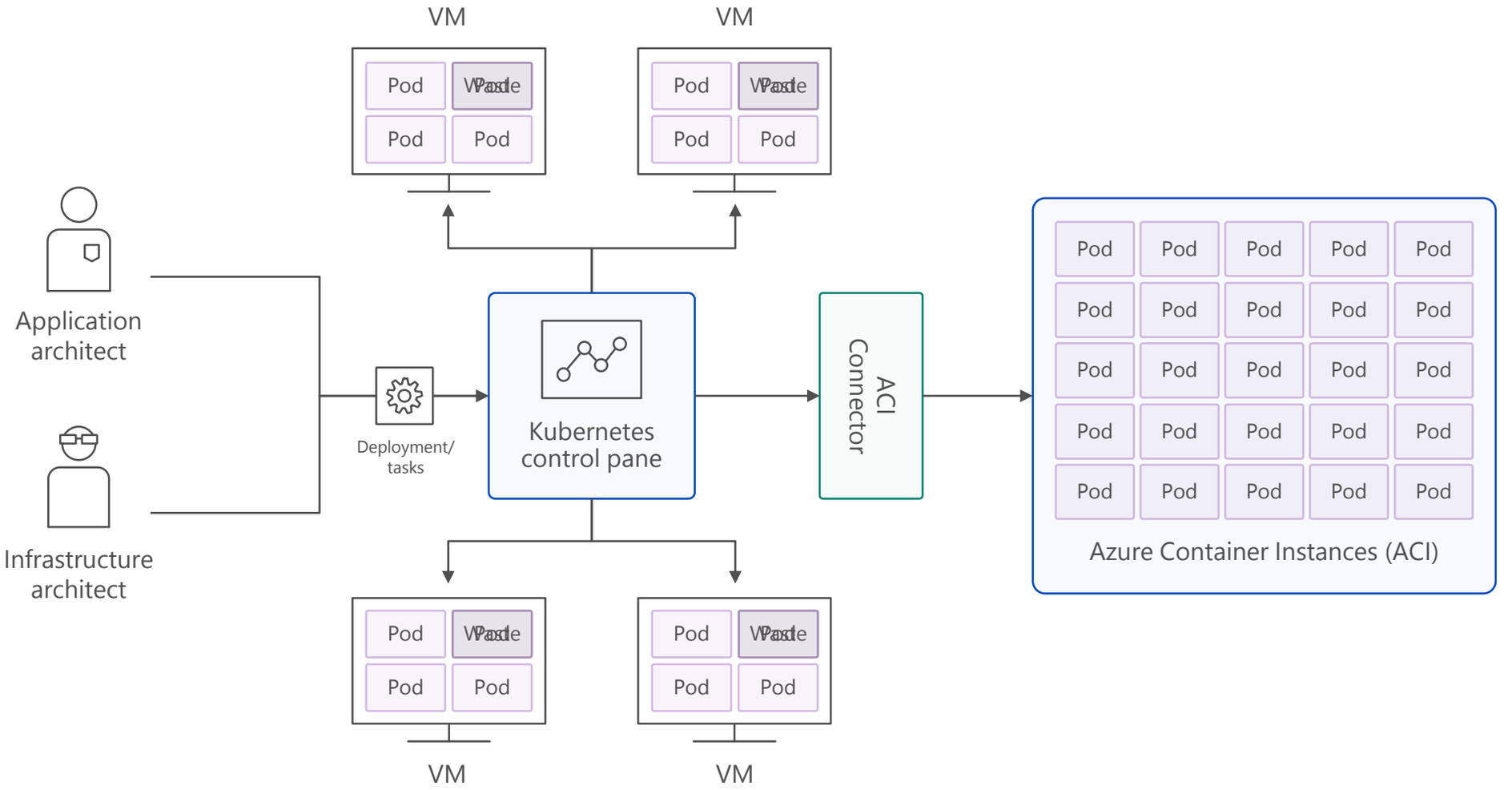
Bursting with the ACI Connector



Containers on Azure Cheat-Sheet

Finding the Right Azure Container Service

Use case	Azure Service
Scale and orchestrate containers using Kubernetes, DC/OS or Docker Swarm	AKS
Easily run containers on Azure with a single command	ACI
Store and manage container images across all types of Azure deployments	ACR
Develop microservices and orchestrate containers on Windows or Linux	Service Fabric
Deploy web applications on Linux using containers	App Service
Run repetitive compute jobs using containers	Batch

Session Takeaways

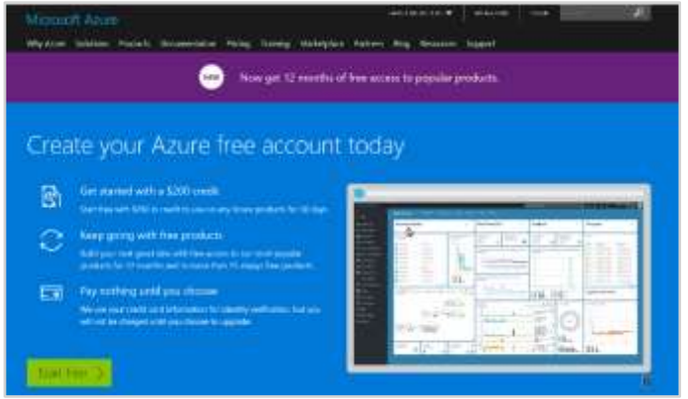
- Containers are about process isolation
  - Containers are NOT mini-VMs
- Containers require an orchestrator to do anything at scale
  - i.e Kubrenetes
- Azure Provide many ways to run containers
  - From single containers dev/test, through to large scale enterprise containers.

- Dive in and start today
  - 5 minutes to get your container running on ACI
  - 20 minutes to get your first AKS workload deployed

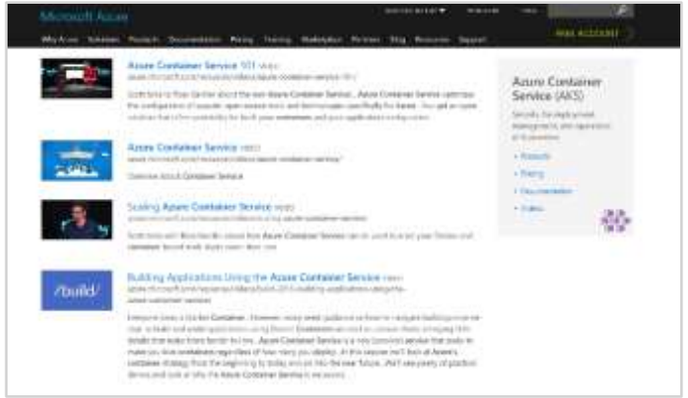
Check out **resources**

- Azure Container Service (AKS)
- Azure Container Instances (ACI)
- Azure Container Registry
- OSBA announcement blog
- Draft webpage
- Helm webpage
- Brigade webpage
- Kashti announcement blog

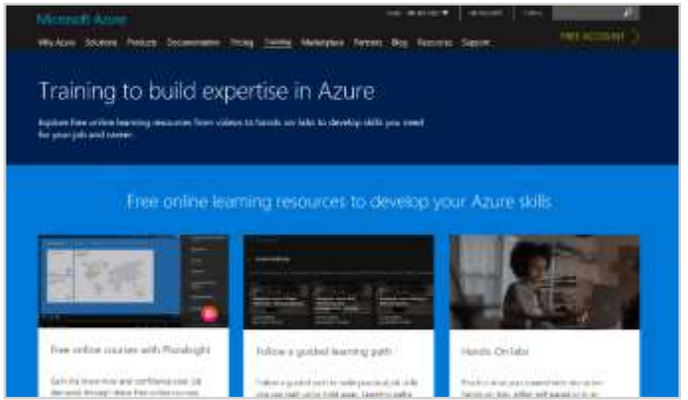
Sign up for a free Azure account



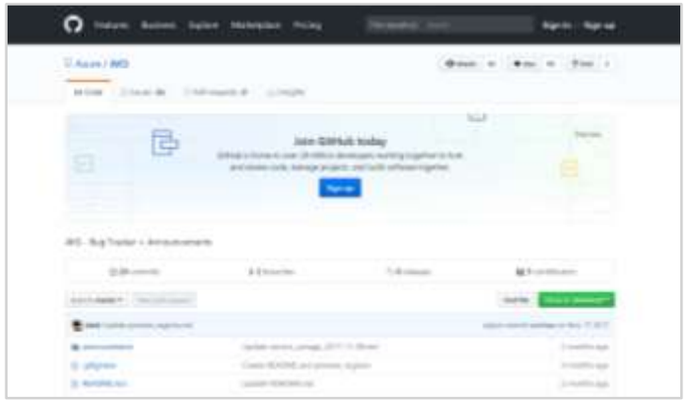
Check out the Azure container videos page



Hone your skills with Azure training



Get the code from GitHub



Questions?

Please Provide your feedback.

Microsoft