Azure Kubernetes Hackfest

Delivering modern cloud native applications with open source technologies on Azure

Kevin Harris
Open Source Solutions Lead
Azure Global Black Belt
Microsoft Canada

Kevin.Harris@Microsoft.com
@KevBHar

Ray Kao
Open Source Solutions Lead
Azure Global Black Belt
Microsoft Canada

Ray.Kao@Microsoft.com
@RayKao

Mathieu Benoit
Cloud Solution Architect
Microsoft Canada

Mathieu.Benoit@Microsoft.com
https://aka.ms/mabenoit

Agenda

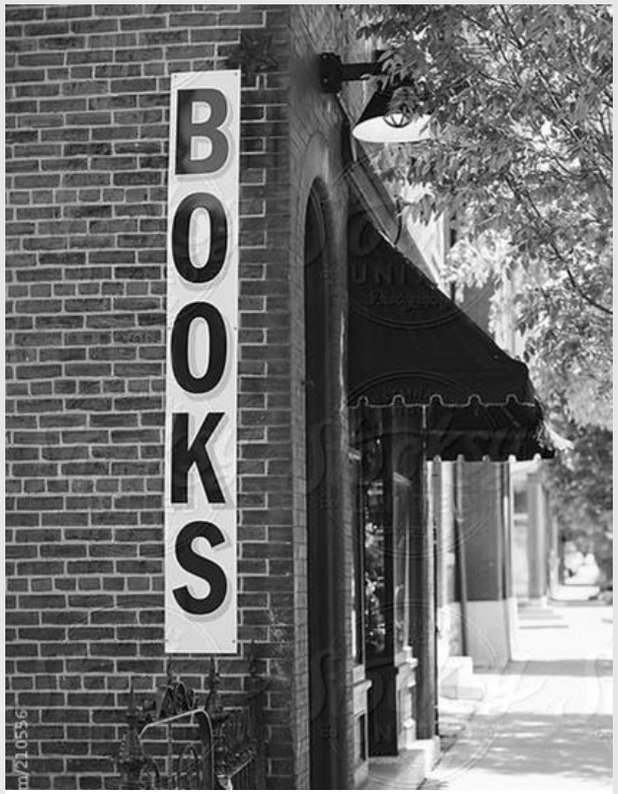
Time	Topic
8:30 – 9:00	Breakfast and Getting Settled
9:00 – 10:00	Cloud Native Applications, Containers, and Docker
10:00 – 11:15	**HANDS-ON: Labs 1, 2**
11:15 – 12:00	Kubernetes Overview, Azure Kubernetes Service
12:00	**Lunch**
1:00 – 2:00	**HANDS-ON: Labs 3, 4, 5**
2:00 – 2:45	Kubernetes Concepts, ACI, ACR, Operations / Management Concepts, Scaling
2:45 – 3:15	**HANDS-ON: Labs 6, 7**
3:15 – 3:30	Managing Storage and State, Online Service Broker, Upgrading
3:30 - 4:30	**HANDS-ON: Labs 8, 9, 10**
4:30 – 5:00	Release Tools, Q&A, Wrap-Up

Why Modernize Apps?

NETFLIX

UBER

skype™



amazon.com®

Digital is disrupting industry fundamentals

Products and technologies

Connected cars

OnStar · QOROS · uconnect

Autonomous cars

DELPHI · Google · Apple

Electric vehicles

BMW · TESLA · NISSAN

Customer expectations

New experiences

waze (OUTSMARTING TRAFFIC, TOGETHER) · brightbox · BestParking.com

Sales and service relationships

cars.com · TRUECar · whocanfixmycar.com

Business models

Car sharing services

CAR2GO · zipcar · UBER

Pay-as-you-go insurance

Metromile

Fleet management services

Omnitracs · ATA

Smart ecosystems

Smart homes

nest · ADT Pulse · TurboCord (EV Charging Made Easy.)

Smart infrastructure

PlugShare · GLOBAL PARKING SOLUTIONS · ABB

Smart cities

SmarterCities · CITYWORKS (a UI LABS Collaboration)

Why should customers care about **containers** and **microservices**?

In reality, they shouldn’t…

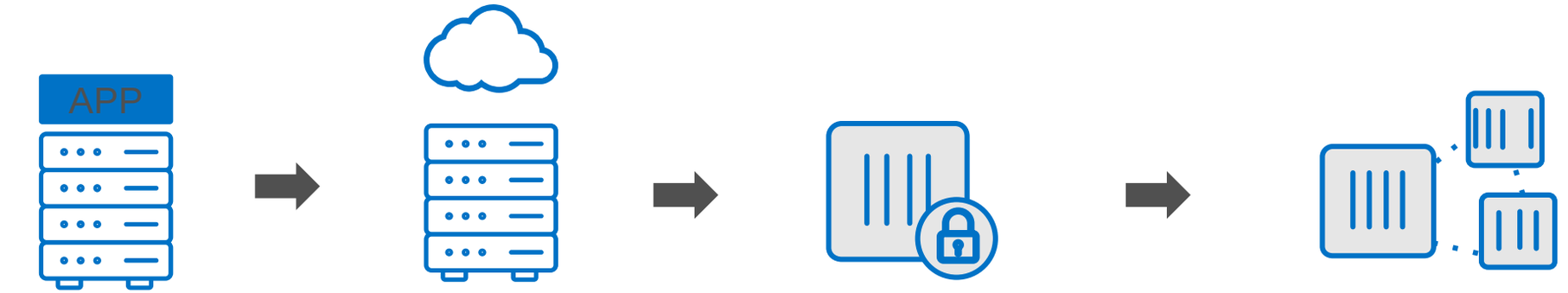
They do care about cloud native applications

"Unlimited" Scale

Global reach

Rapid innovation
-> time to market

From traditional app to modern app



Existing Application

Modern Infrastructure

rehost as VMs or refresh to modern container platform.

Containerize Applications

Re-architect apps for scale with containers.

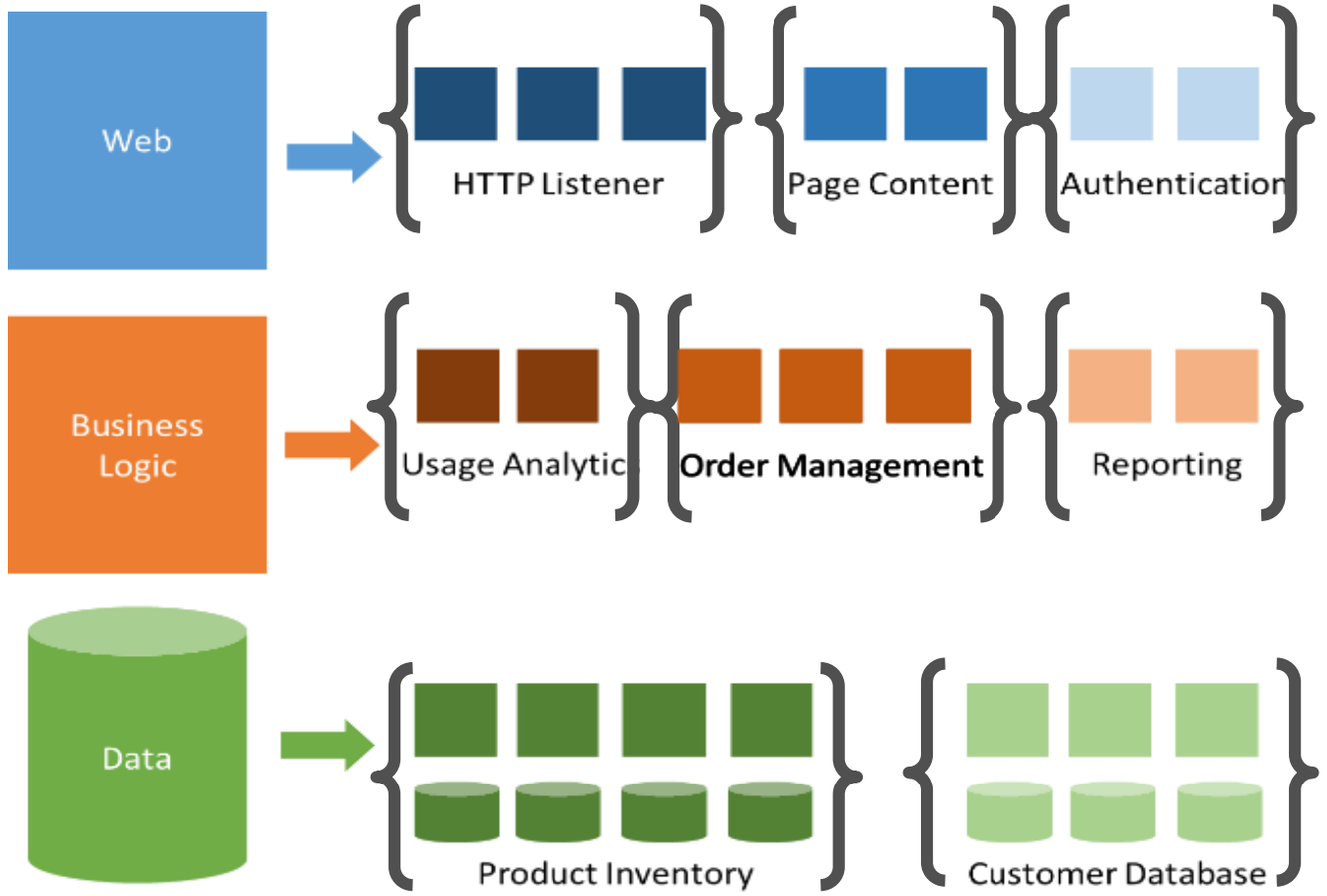
Modern Microservices

Add new services or start peeling off services from monolithic code.

On-Premises	IaaS	Containers	PaaS	Serverless
Infrastructure Platform	*Infrastructure Platform* "lift & shift"	*Container Platform*	*Application Platform*	

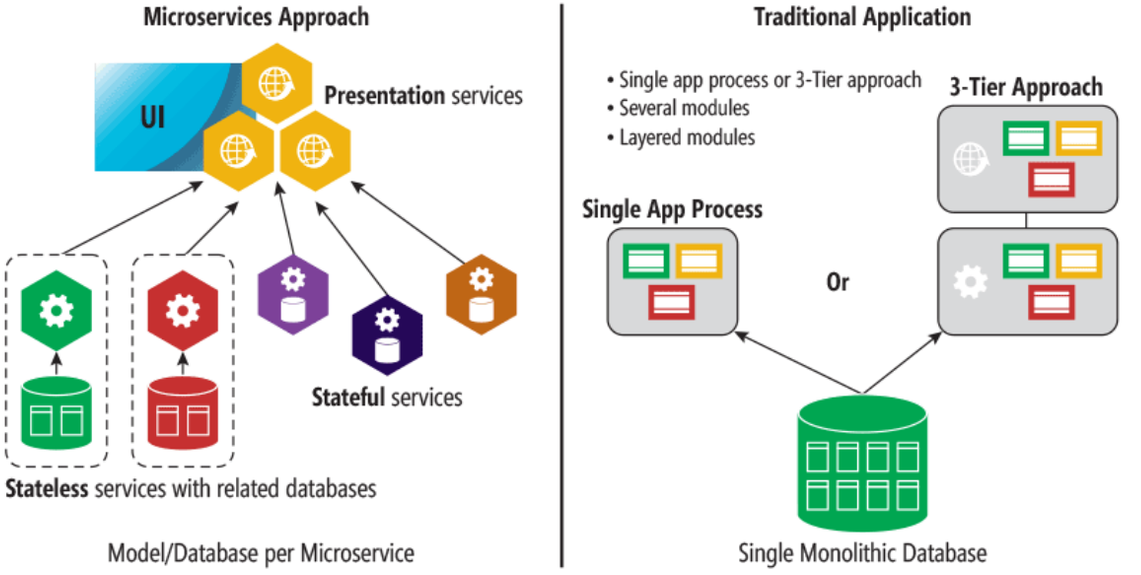
Modernization with microservices

- Individually built and deployed
- Small, independent services
- Integrate using published API
- Fine-grained, loosely coupled



Microservices Benefits

- ✓ Independent deployments
- ✓ Enables continuous delivery
- ✓ No downtime upgrades
- ✓ Improved scale and resource utilization per service
- ✓ Fault isolation
- ✓ Security isolation
- ✓ Services can be distributed across multiple servers or environments
- ✓ Multiple languages / diversity
- ✓ Smaller, focused teams
- ✓ Code can be organized around business capabilities
- ✓ Autonomous developer teams



Microservices – The Hard Part

- ✓ Deployment is complex
- ✓ Testing is difficult
- ✓ Debugging is difficult
- ✓ Monitoring/Logging is difficult
- ✓ New service versions must support old/new API contracts
- ✓ Distributed databases make transactions hard
- ✓ Cluster and orchestration tools overhead

- ✓ Distributed services adds more network communication
  - ✓ Increased network hops
  - ✓ Requires failure/recovery code
  - ✓ Need service discovery solution
- ✓ Advanced DevOps capability: short-term pain for long-term gain

The Twelve-Factor App

http://12factor.net

12-Factor Apps (1-5)

1. Single root repo; don’t share code with another app
2. Deploy dependent libs with app
3. No config in code; read from environment vars
4. Handle unresponsive app dependencies robustly
5. Strictly separate build, release, & run steps
   - Build: Builds a version of the code repo & gathers dependencies
   - Release: Combines build with config ReleaseId (immutable)
   - Run: Runs app in execution environment

12-Factor Apps (6-12)

6. App executes as 1+ stateless process & shares nothing
7. App listens on ports; avoid using (web) host
8. Use processes for isolation; multiple for concurrency
9. Processes can crash/be killed quickly & start fast
10. Keep dev, staging, & prod environments similar
11. Log to stdout (dev=console; prod=file & archived)
12. Deploy & run admin tasks (scripts) as processes

Microservices, Containers & Serverless

"Microservices is an architectural design point; containers & serverless are implementation details that often helps."

eShopOnContainers Reference App

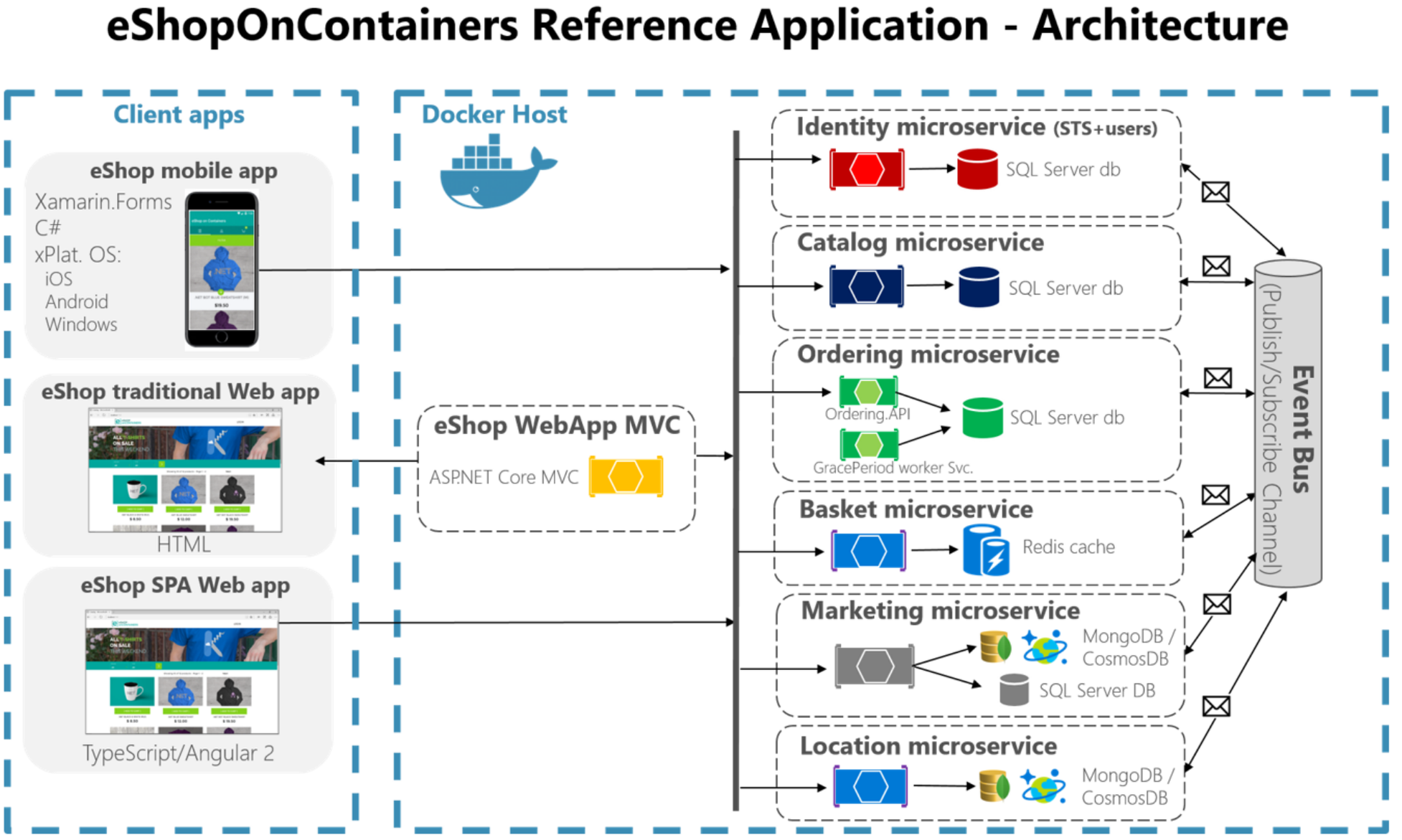
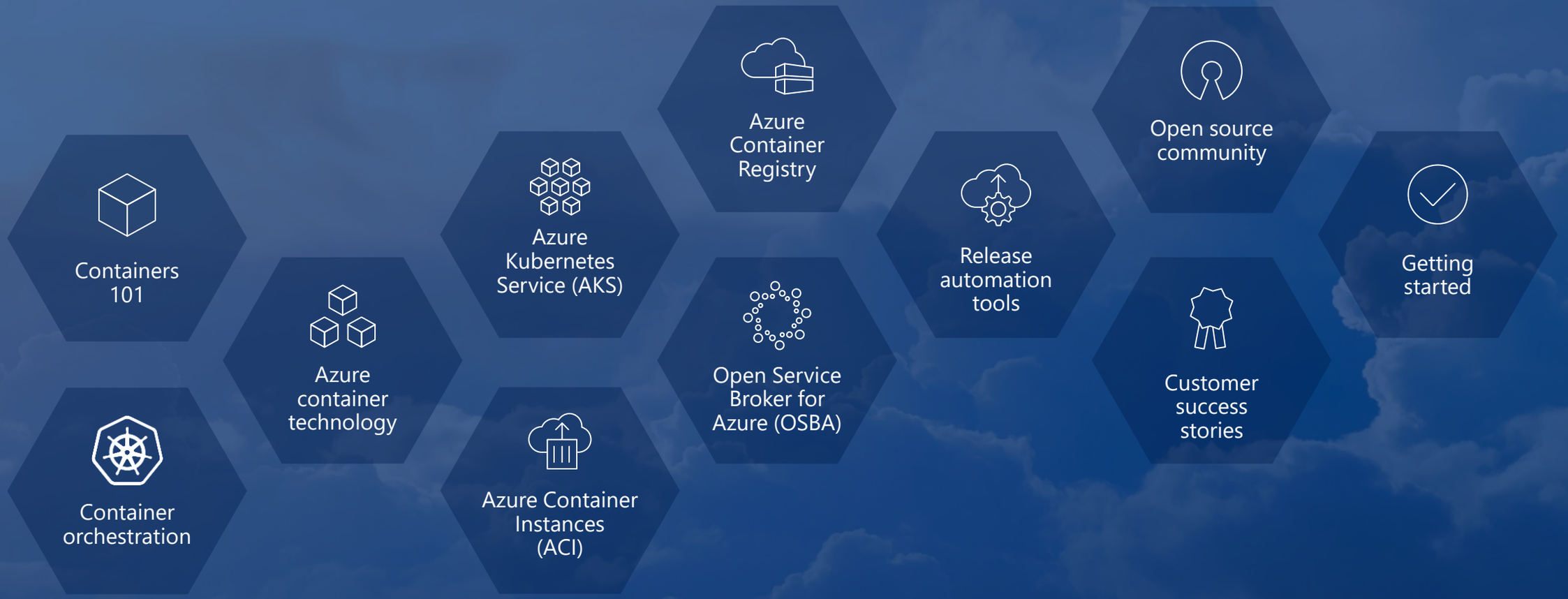
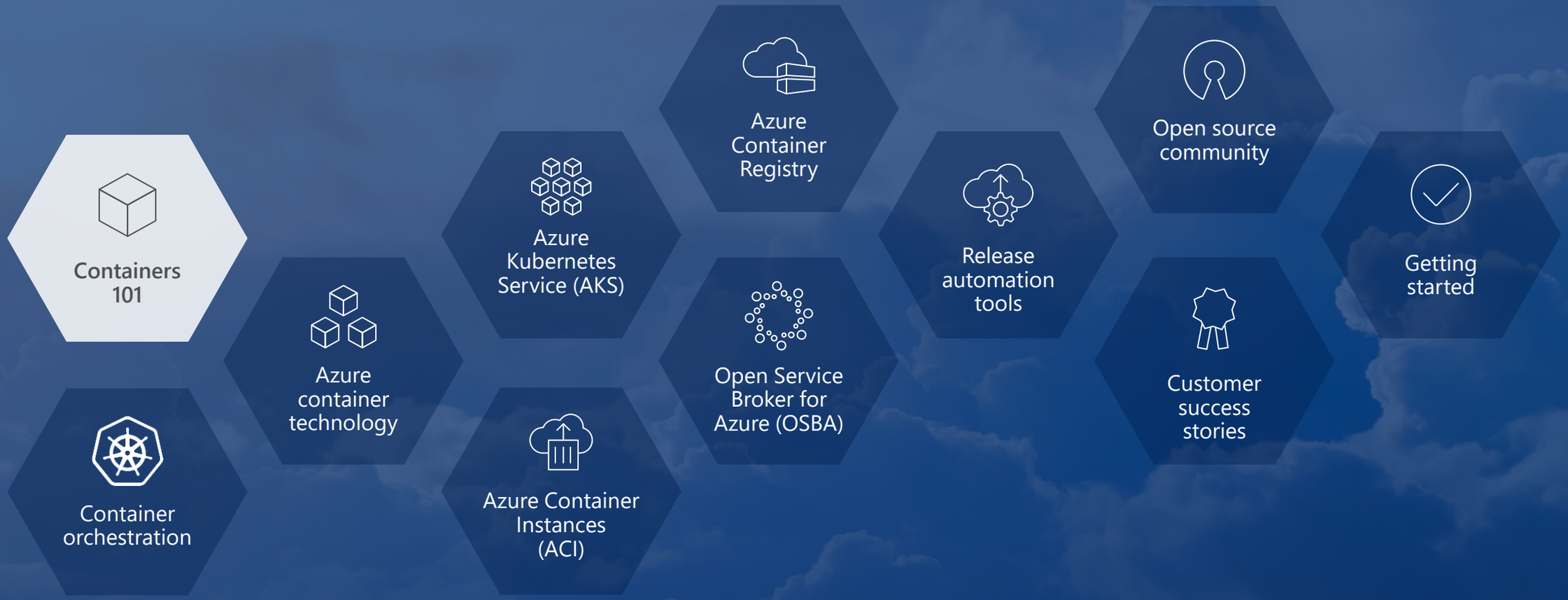


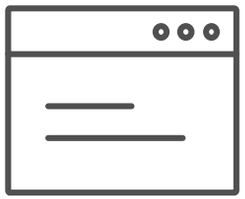
Table of Contents



Containers 101



What we hear from **developers**



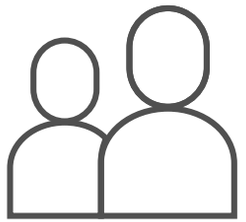
I need to create applications at a competitive rate without worrying about IT

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

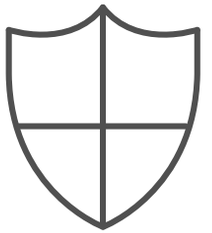
My productivity and application innovation become suspended when I have to wait on IT

What we hear from **IT**

I need to manage servers and maintain compliance with little disruption



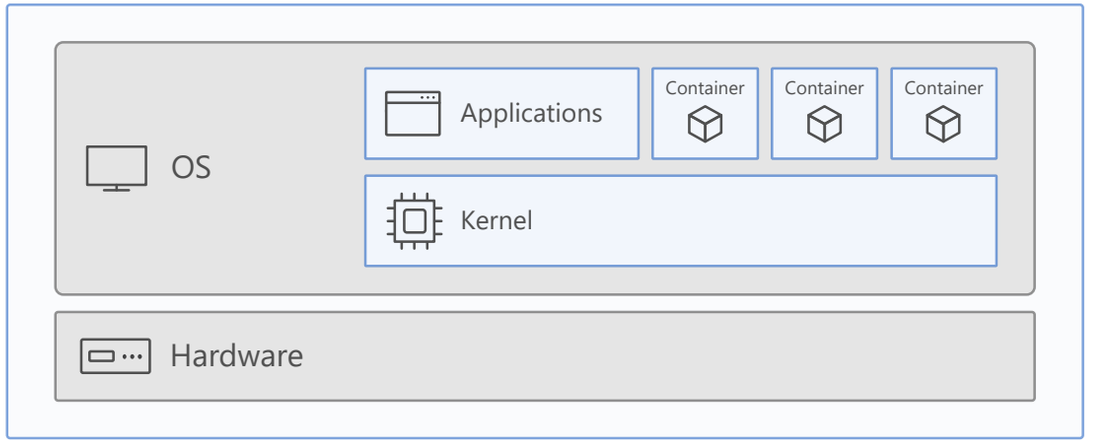
I'm unsure of how to integrate unfamiliar applications, and I require help from developers



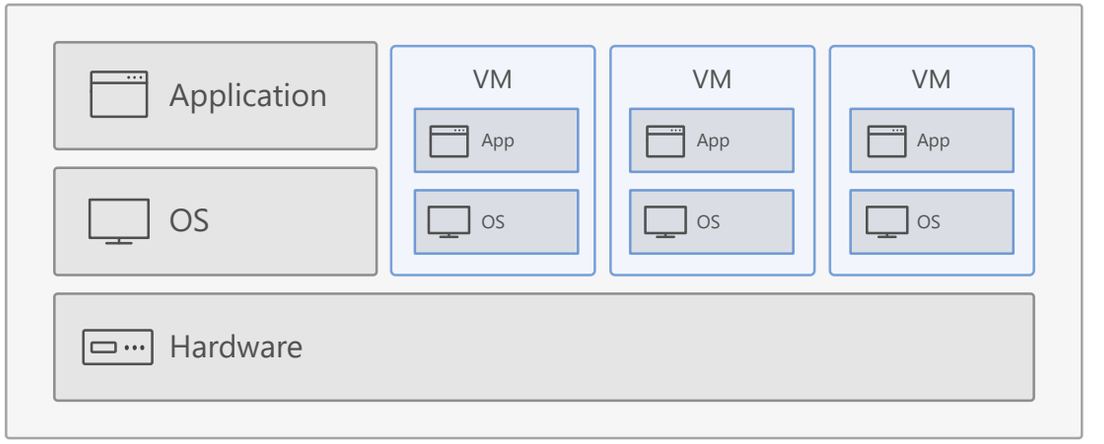
I'm unable to focus on both server protection and application compliance

What is a **container**?

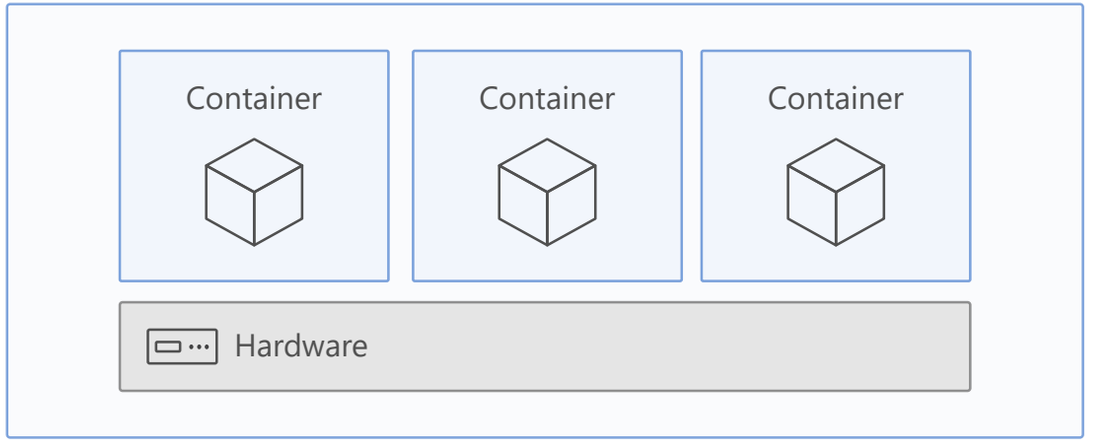
Containers = operating system virtualization



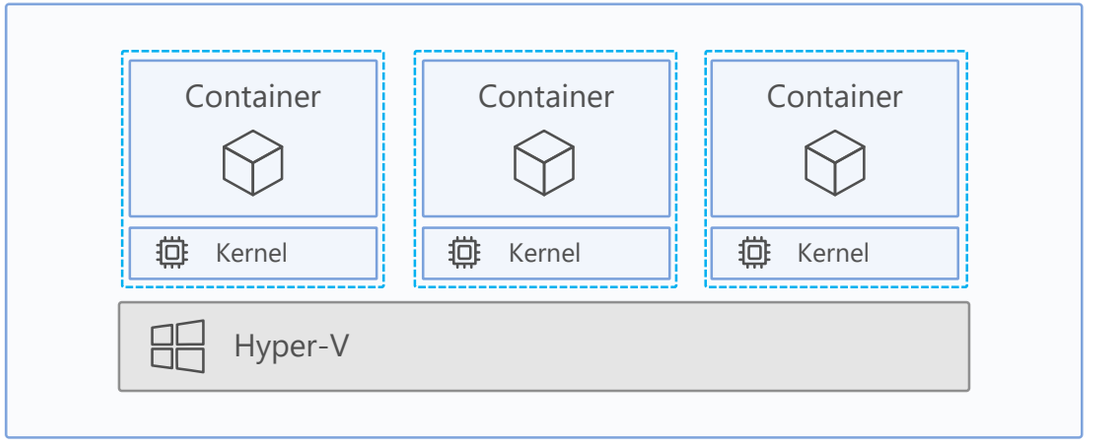
Traditional virtual machines = hardware virtualization



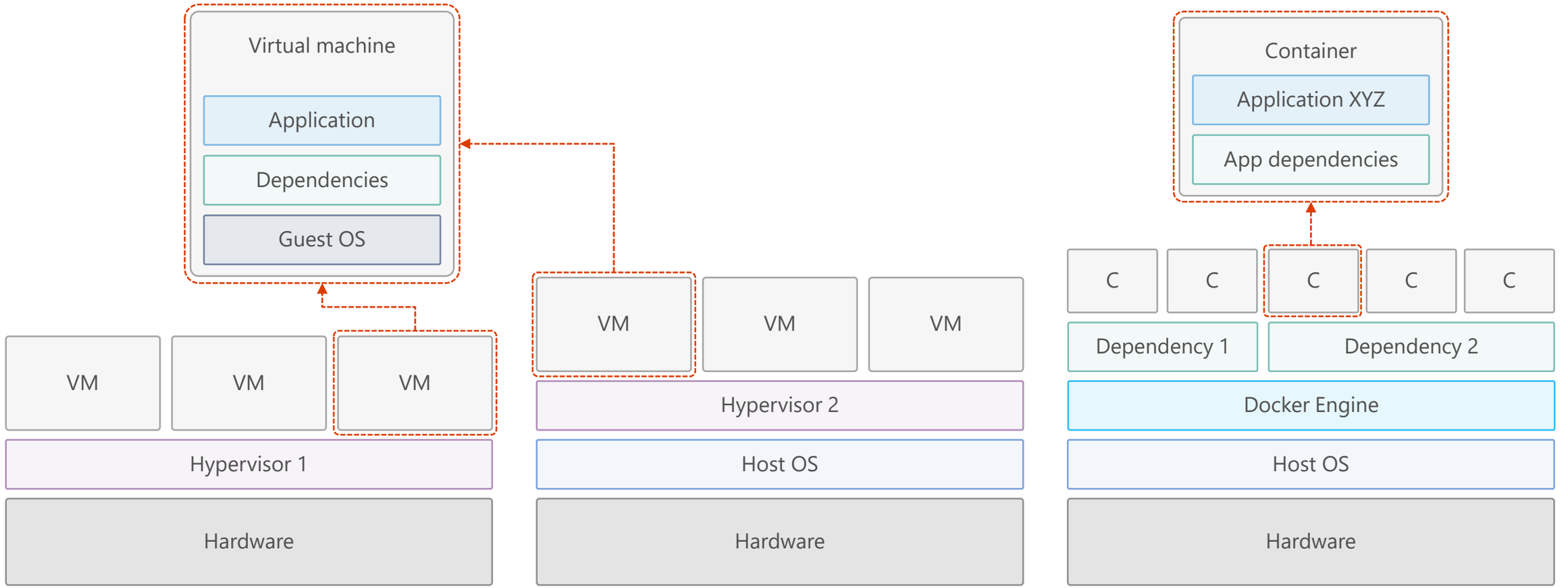
Windows Server containers: maximum speed and density



Hyper-V containers: isolation plus performance



Virtualization versus **containerization**

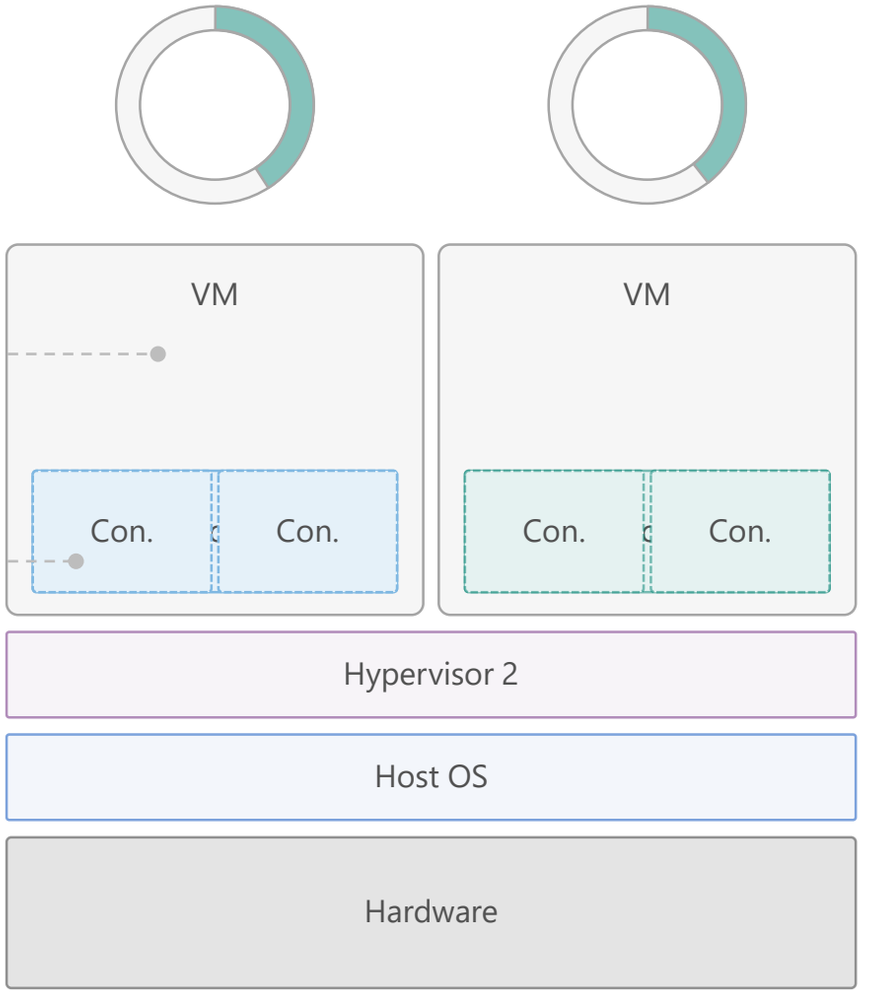


The container **advantage**

Traditional virtualized environment

Low utilization of container resources

Containerization of applications and their dependencies

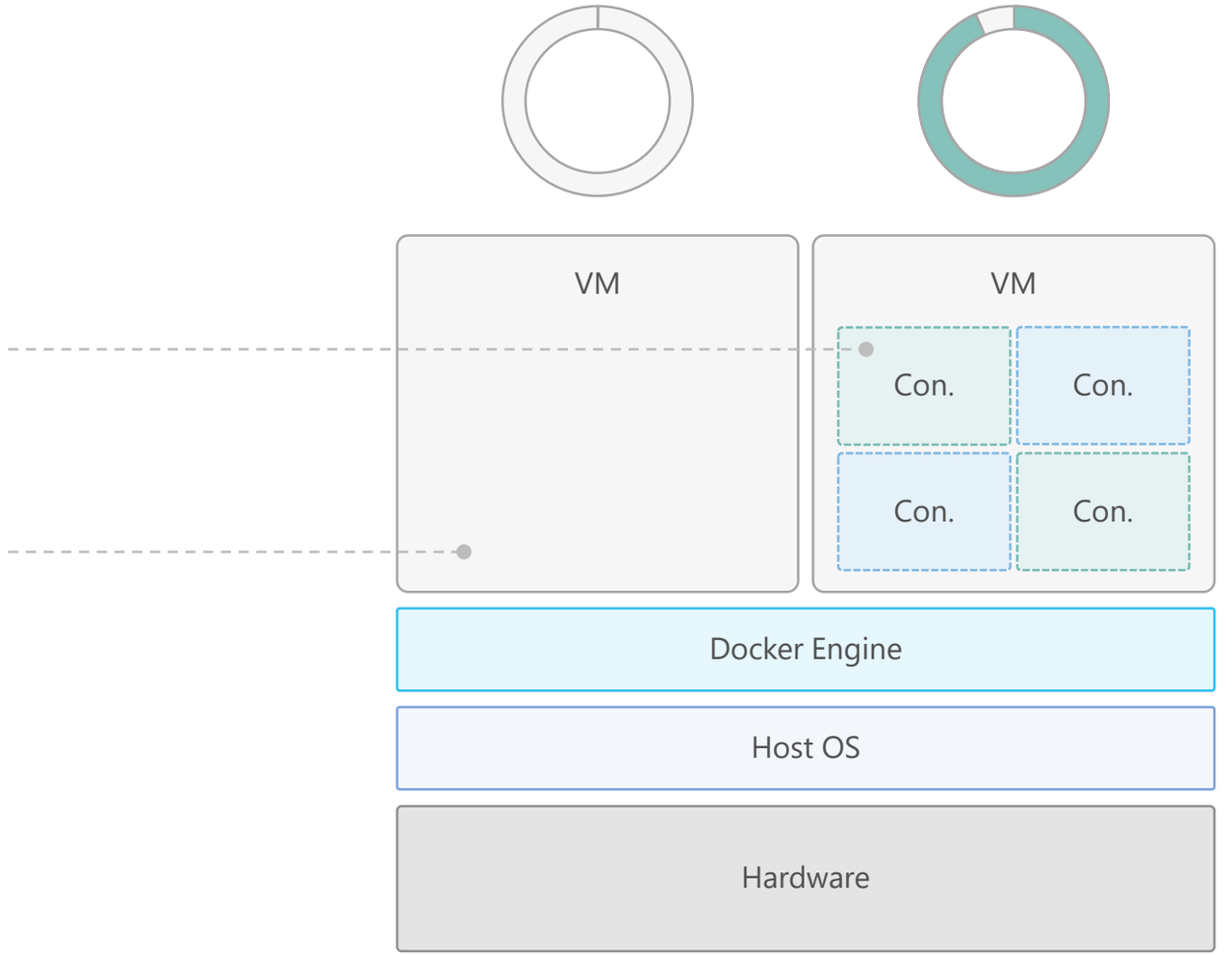


The container **advantage**

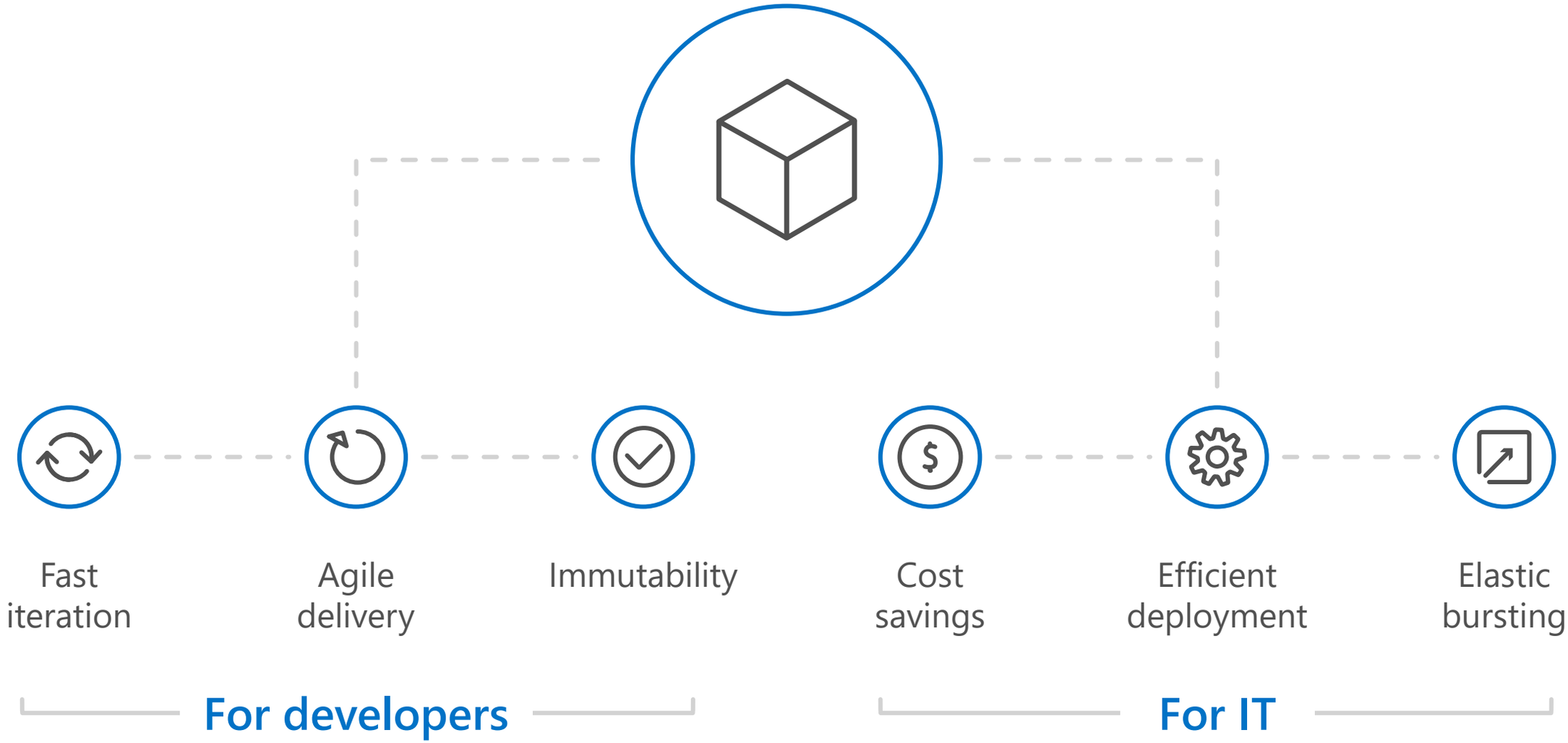
Containerized environment

Migrate containers and their dependencies to underutilized VMs for improved density and isolation

Decommission unused resources for efficiency gains and cost savings



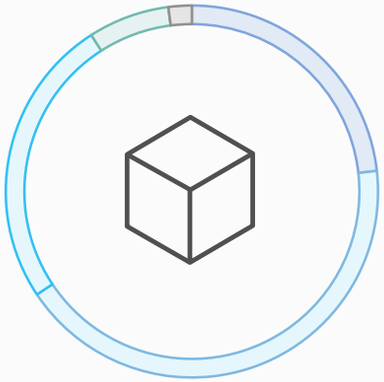
The container **advantage**



Containers are gaining **momentum**

Does your organization currently use container technologies?[1]

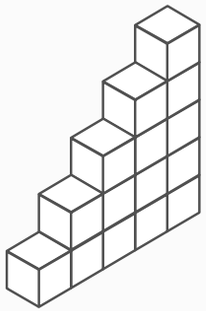
- 23% My org. is **evaluating** container technologies
- 42% **Yes**, my org. currently uses container technologies
- 25% **No**, my org. is not using container technologies
- 7% **Not sure**
- 2% **Not applicable**



Larger companies are leading adoption.[2]

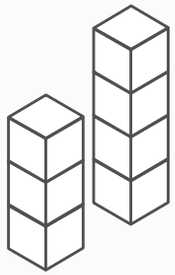
Nearly **60% percent** of organizations running 500 or more hosts are classified as **container dabblers** or adopters.

The average company QUINTUPLES its container usage within 9 months.[1]



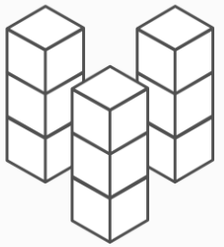
5X

Container hosts often run SEVEN containers at a time.[1]



7X

Containers churn 9 times FASTER than VMs.[1]



9X

Source:

1: Datadog: 8 Surprising Facts About Real Docker Adoption; 2: DZone: The DZone Guide to Deploying and Orchestrating Containers

Docker, Docker, Docker

Containers have been around for many years
Linux kernel: cgroups, namespaces

Docker Inc. did not invent them
They created open source software to build and manage containers

Docker makes containers easy
Super easy. Fast learning curve

Docker is a container format and a set of tools
Docker CLI, Docker Engine, Docker Swarm, Docker Compose, Docker Machine

Docker Container Anatomy

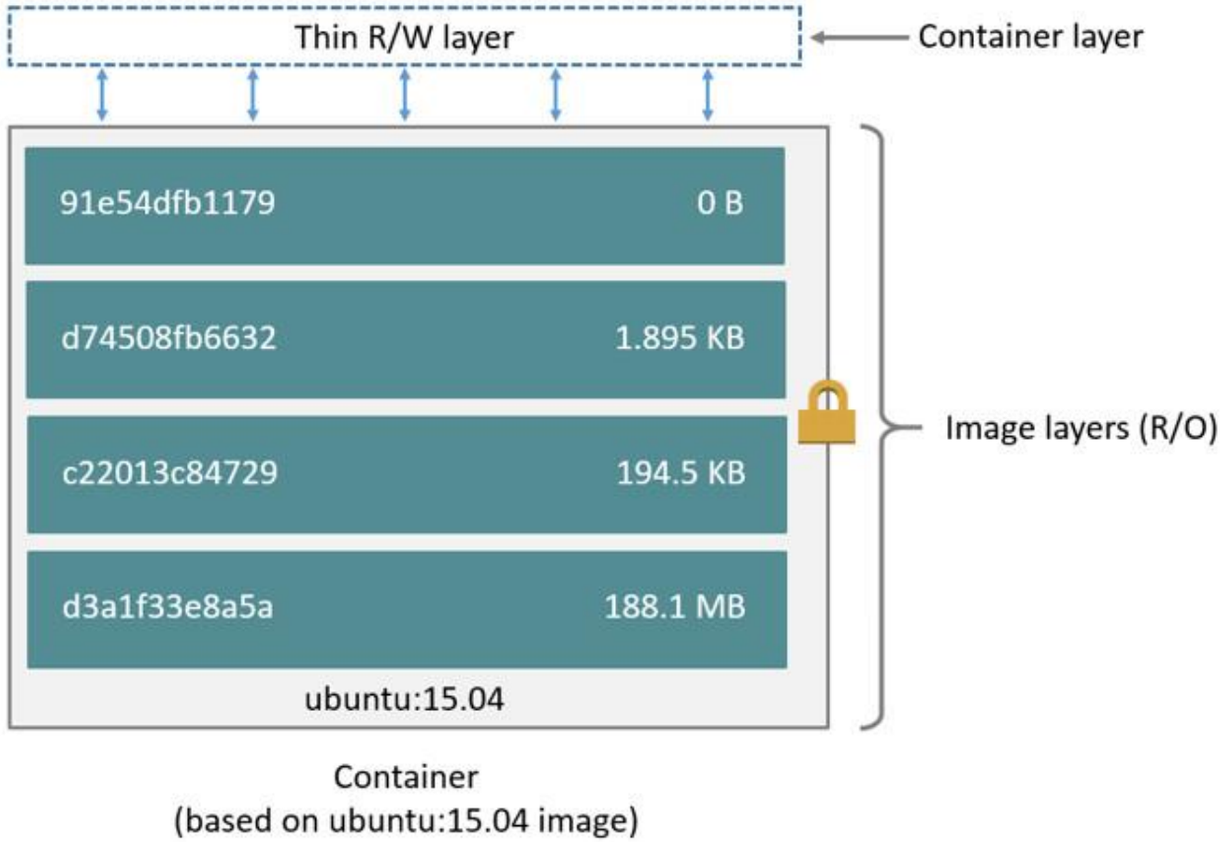
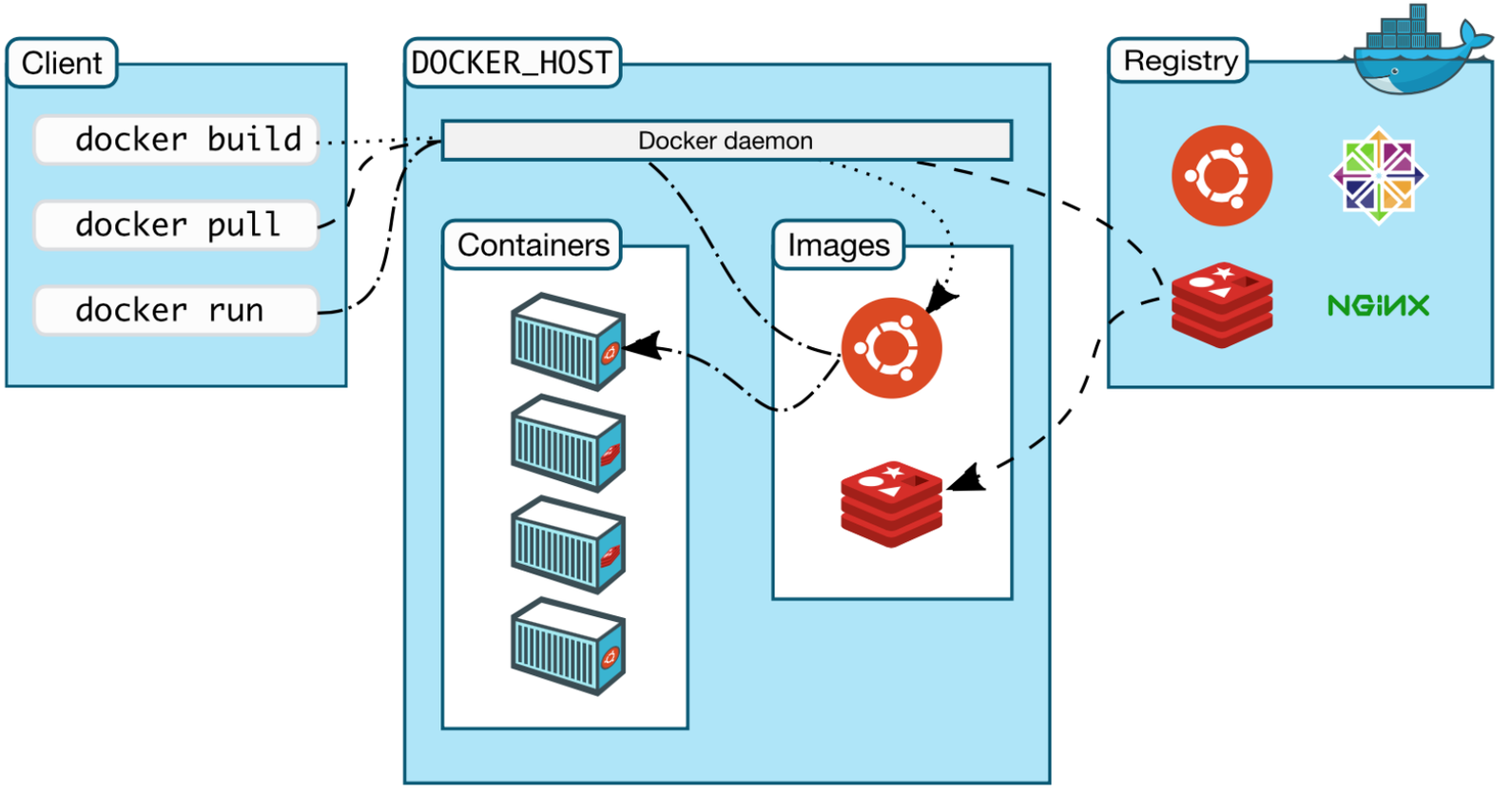


Image source: https://docs.docker.com/engine/userguide/storagedriver/imagesandcontainers/#images-and-layers

Docker Architecture



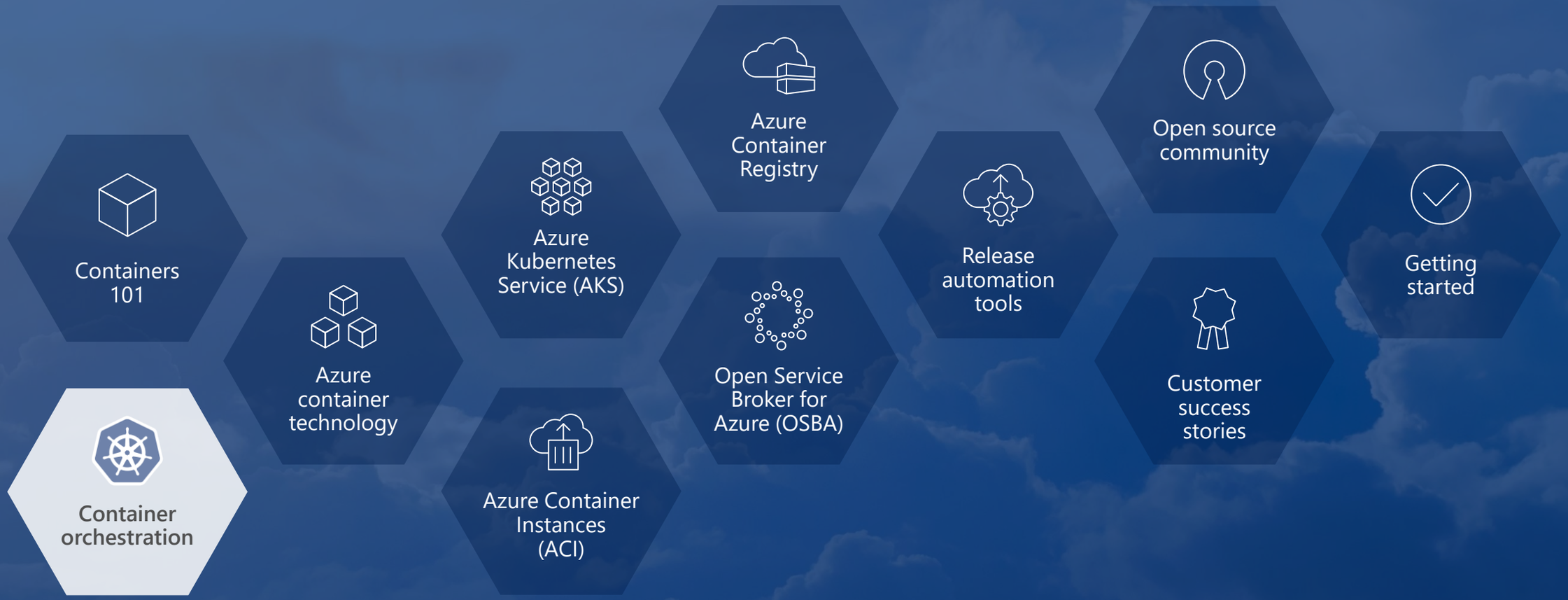
Demo

- Dockerfile Anatomy
- Container Creation (docker build)
- Image Tagging (docker tag)
- Working with Images (docker push & docker pull)

Labs: 1, 2

https://github.com/OSSCanada/aks_partnerworkshop

Container orchestration



"Distributed apps are sufficiently complicated that they need to be flown by the instruments"

The elements of **orchestration**

Scheduling

Affinity/anti-affinity

Health monitoring

Failover

Scaling

Networking

Service discovery

Coordinated app upgrades

Kubernetes: the de-facto orchestrator

Portable

Public, private, hybrid, multi-cloud

Extensible

Modular, pluggable, hookable, composable

Self-healing

Auto-placement, auto-restart, auto-replication, auto-scaling

Kubernetes: empowering you to do more

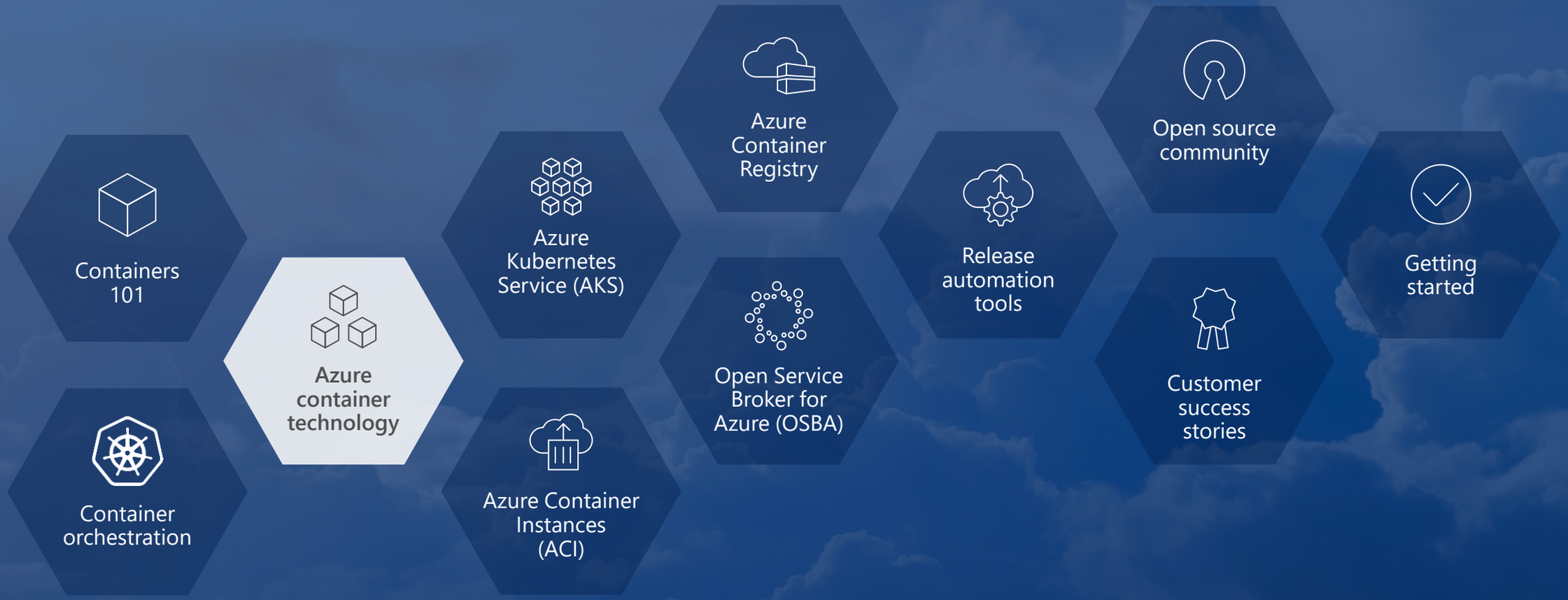
Deploy your applications quickly and predictably

Scale your applications on the fly

Roll out new features seamlessly

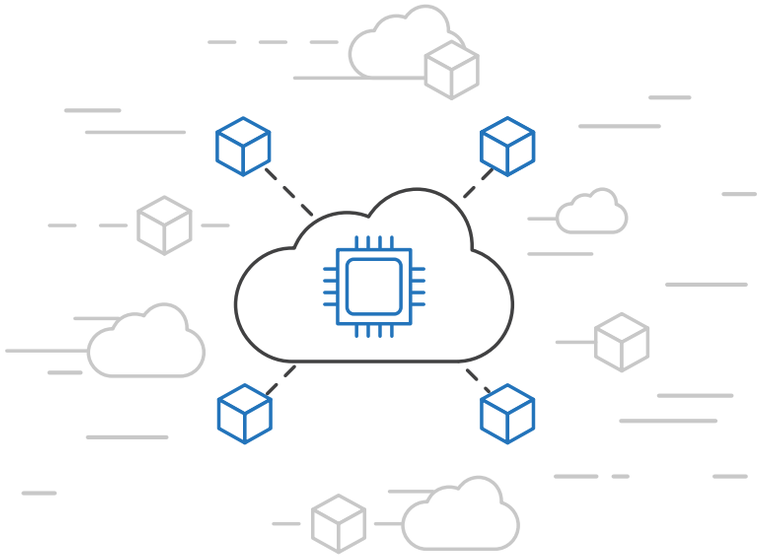
Limit hardware usage to required resources only

Azure container technology

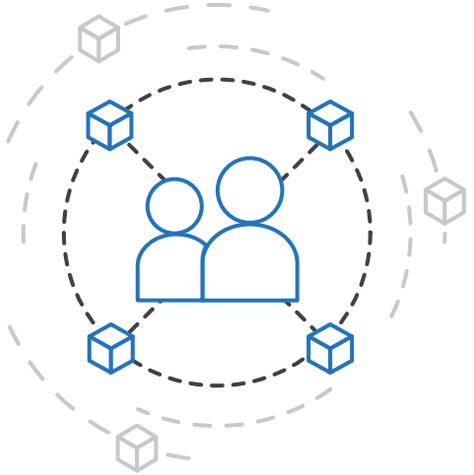


Azure container **strategy**

Embrace containers as ubiquitous

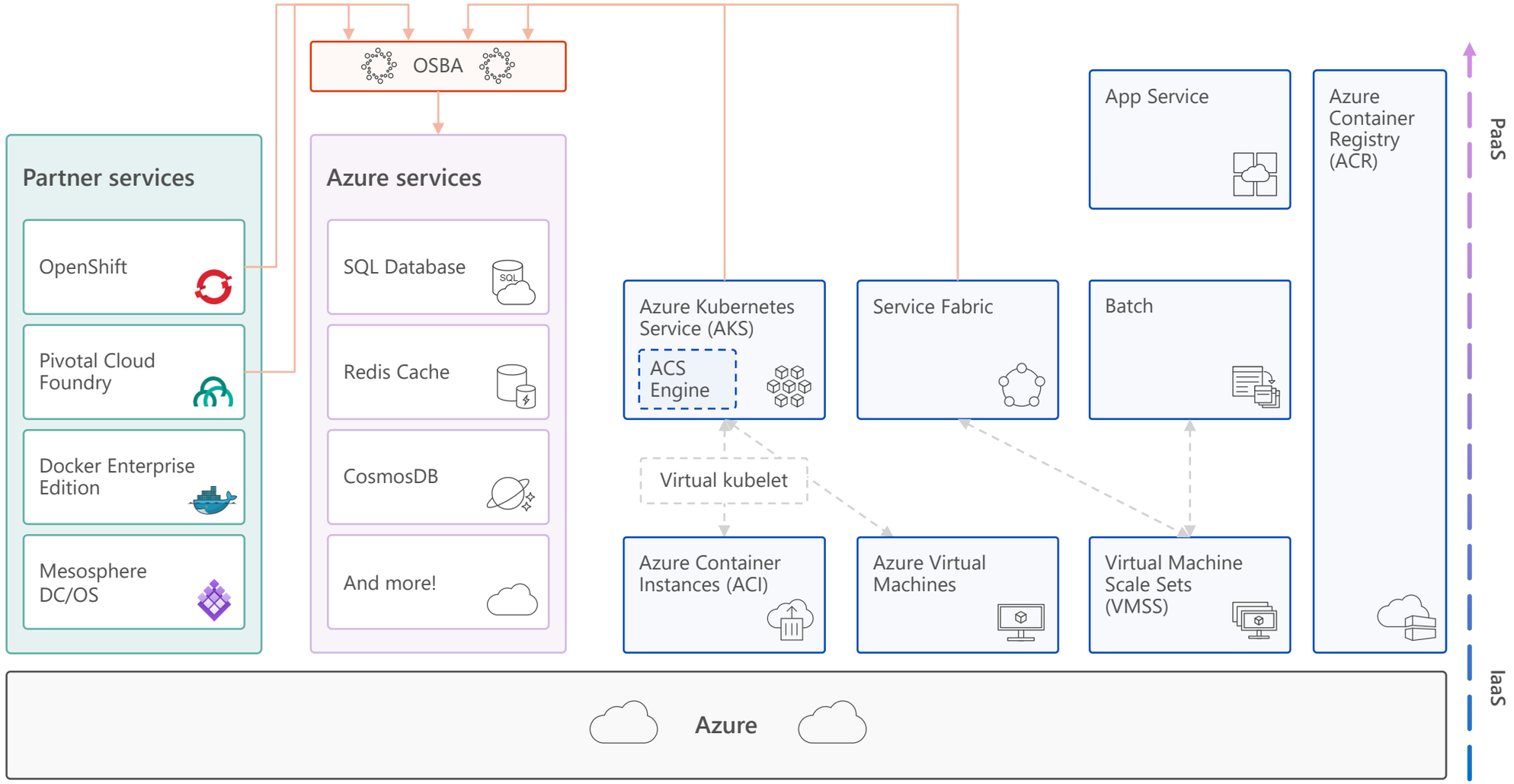


Support containers across the compute portfolio

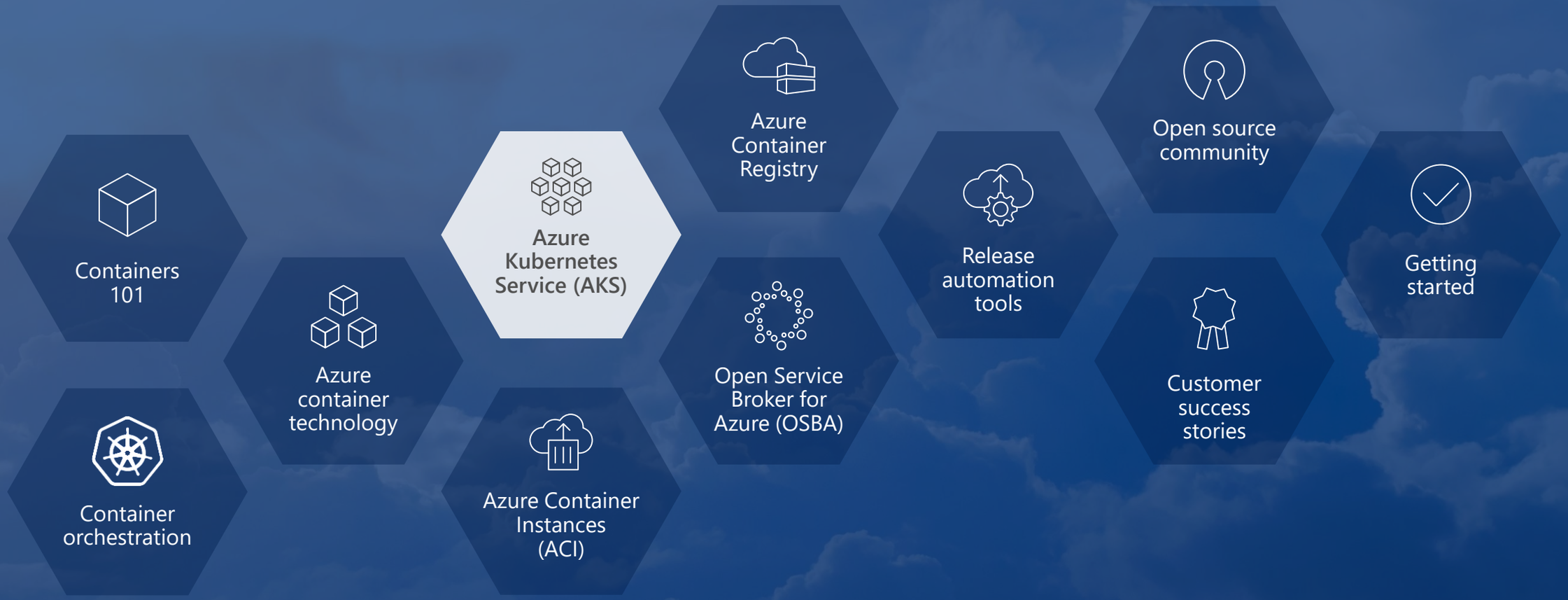


Democratize container technology

Azure container **ecosystem**



Azure Kubernetes Service (AKS)



Azure Kubernetes Service (AKS)

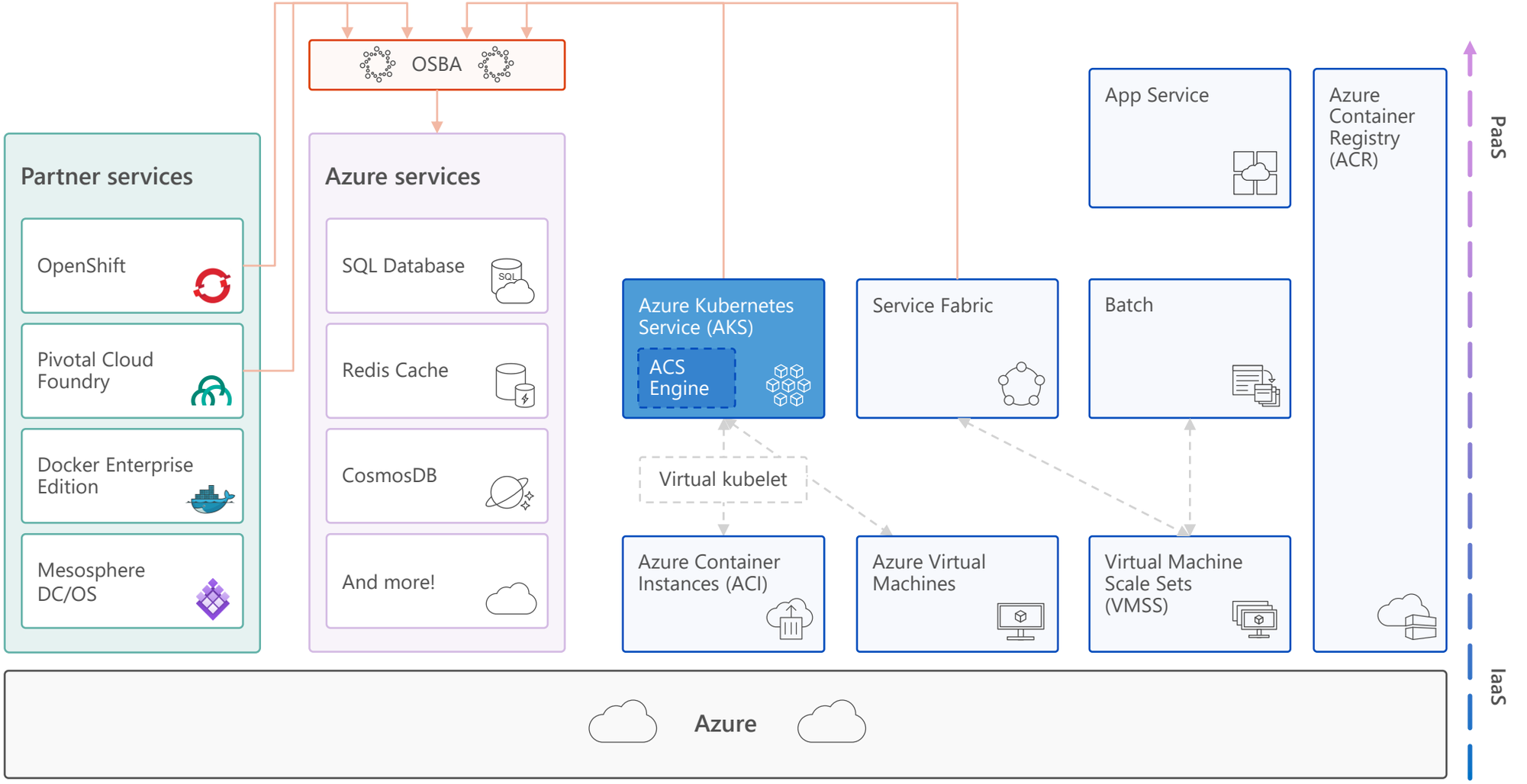
Azure Container Instances (ACI)

Azure Container Registry

Open Service Broker API (OSBA)

Release Automation Tools

Azure Kubernetes Service (AKS)



Azure Kubernetes Service (AKS)

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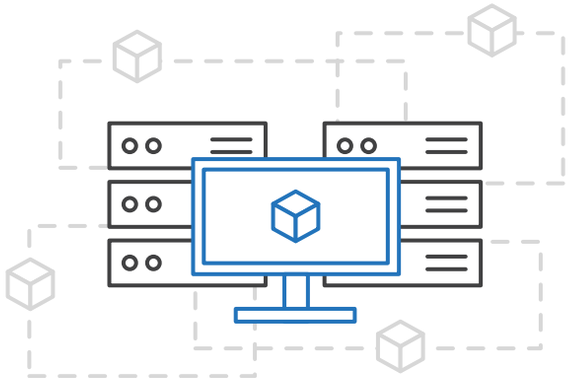
Open Service Broker API (OSBA)

Release Automation Tools

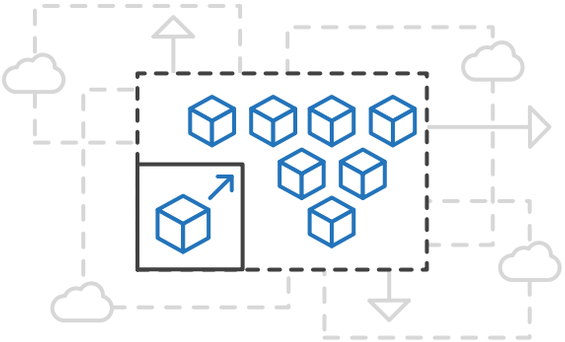
Azure Kubernetes Service (AKS)

Simplify the deployment, management, and operations of Kubernetes



Focus on your containers not the infrastructure

Work how you want with open-source APIs



Scale and run applications with confidence

Azure Kubernetes Service (AKS)

Azure Container Instances (ACI)

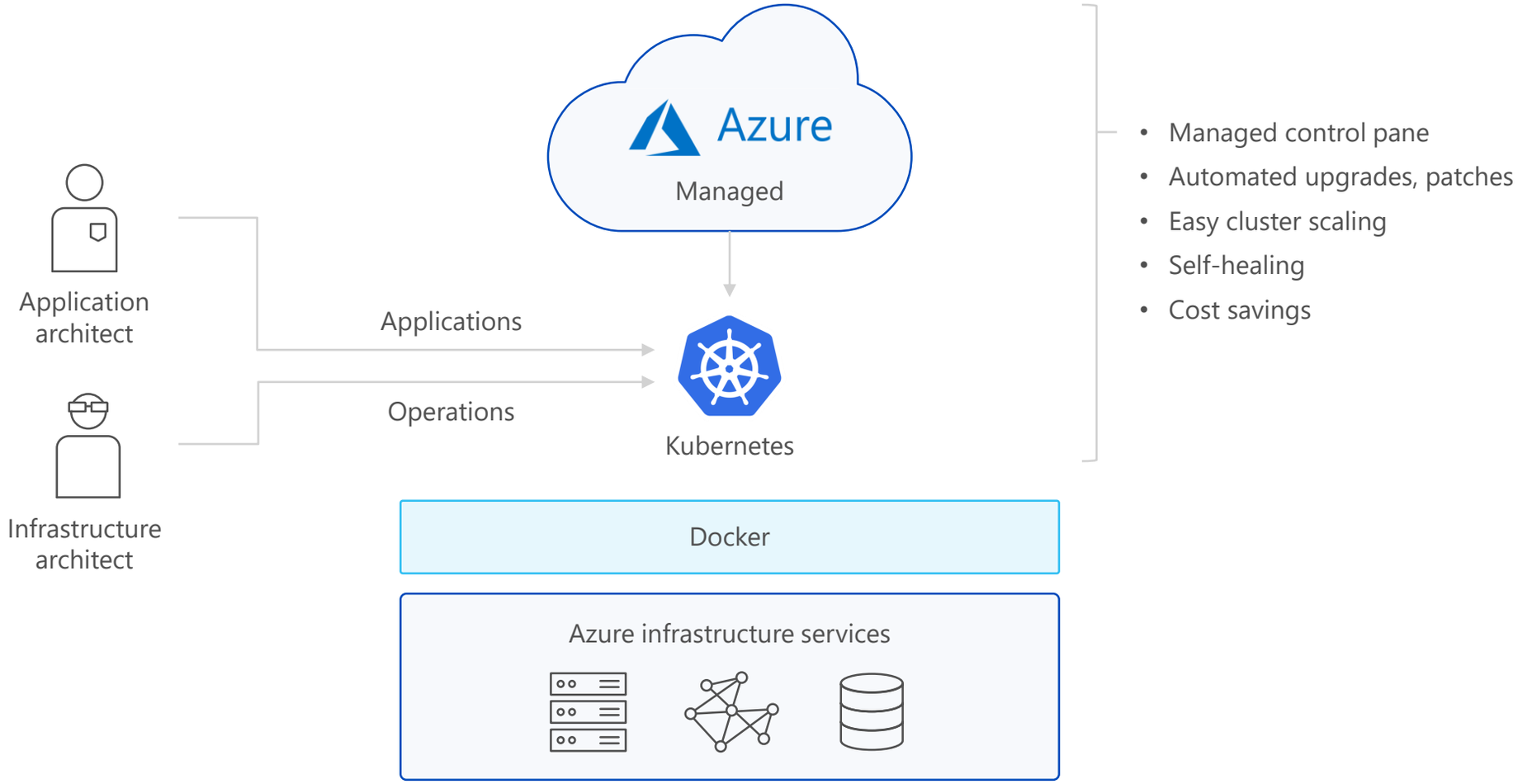
Azure Container Registry

Open Service Broker API (OSBA)

Release Automation Tools

Azure Kubernetes Service (AKS)

A fully managed Kubernetes cluster



Azure Kubernetes Service (AKS)

Azure Container Instances (ACI)

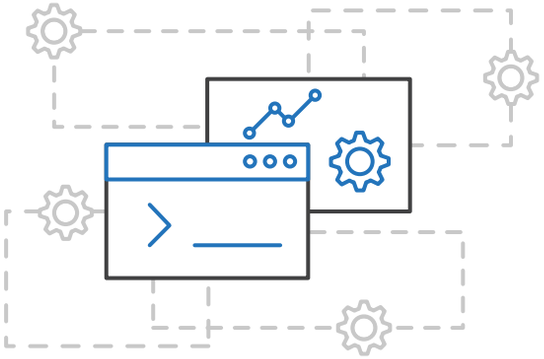
Azure Container Registry

Open Service Broker API (OSBA)

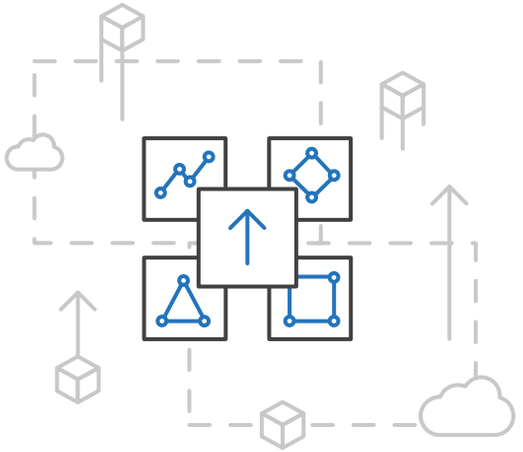
Release Automation Tools

Azure Kubernetes Service (AKS)

Azure Kubernetes Service Engine (ACS-Engine)



A proving ground for new features



Enables custom deployments

Available on GitHub

Demo

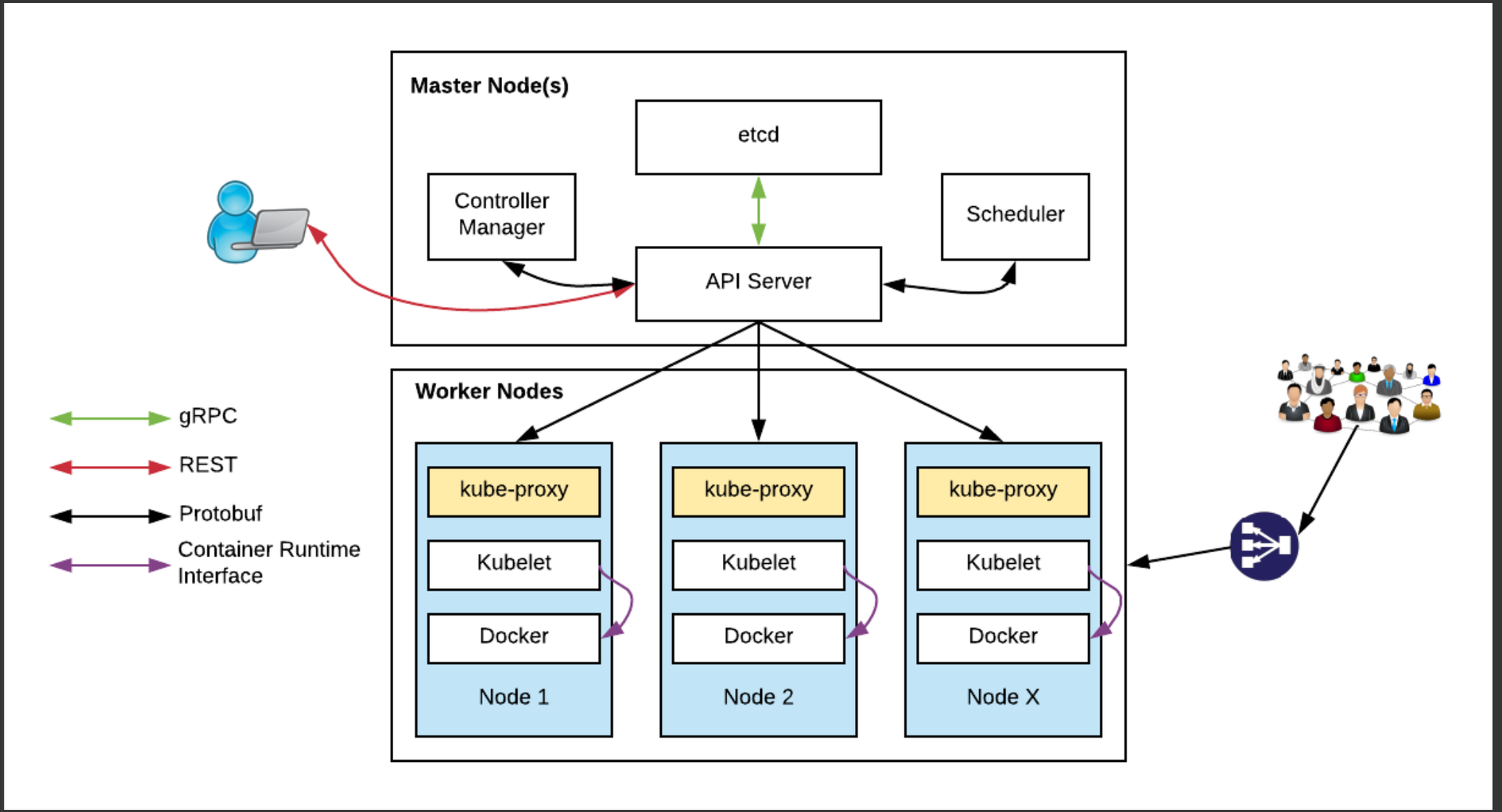
- Cluster Creation
- Get Nodes
- Get Namespaces
- Get Deployments
- Get Pods
- Get Services

Labs: 3, 4, 5

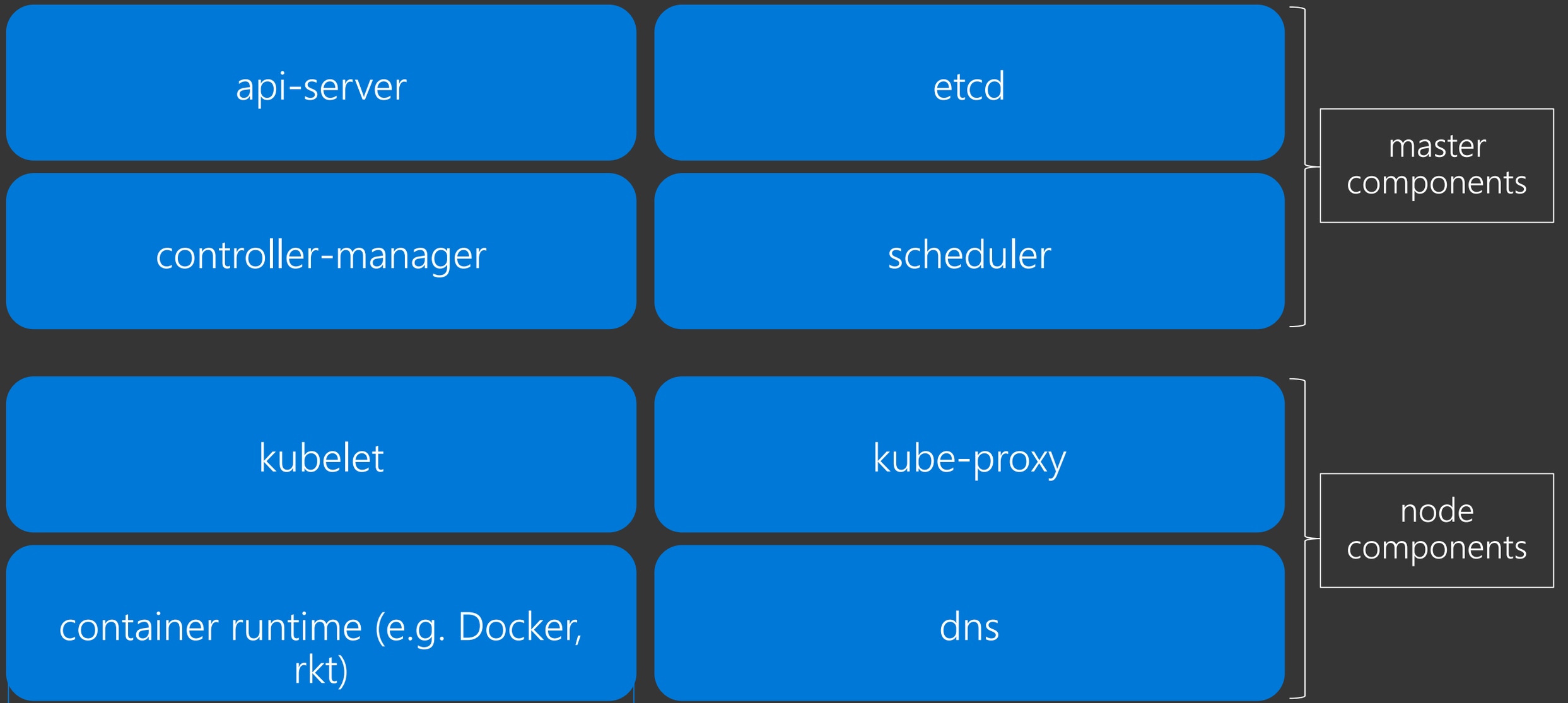
https://github.com/OSSCanada/aks_partnerworkshop

Kubernetes Concepts

Kubernetes Architecture



Kubernetes Architecture Components



kubectl: CLI to run commands against a Kubernetes cluster

- Swiss Army Knife: run deployments, exec into containers, view logs, etc.
- Syntax largely the same as `docker`
- Pronounced “koob sea tee el”…
  - Or “koob cuddle”

Kubernetes Resources

pod	deployment
service	replica set
ingress	daemon set, job
namespace	secret, config-map

Kubernetes Resources

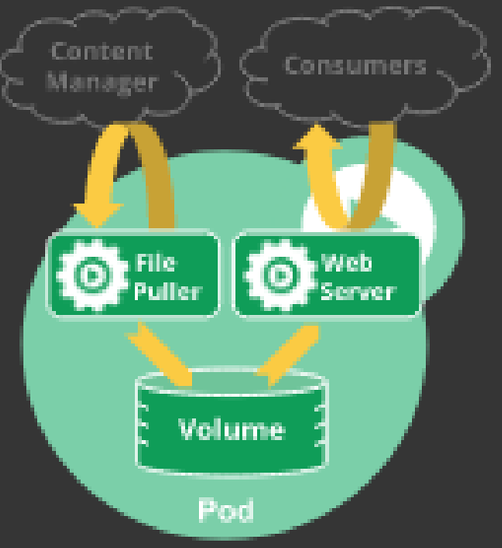
pod

deployment

service

What is a Pod?

- Pod is the basic building block in kubernetes
- Pods are how containers are delivered
- Can be multiple containers (eg - side car)
- Encapsulates container(s), storage, network IP, and options on how to run
- Use Deployment resources to deploy
  - ReplicaSet
  - StatefulSet
  - DaemonSet
  - Job
  - InitContainer



What is a Deployment?

- Provides declarative updates for Pods and Replica Sets
- Deployment describes "desired state"
- Can:
  - Create deployment to rollout ReplicaSet
  - Declare new state for pods (eg – new imageTag)
  - Rollback to earlier state
  - Scale up/down
  - Check rollout history
  - Clean-up

What is a Service?

- Defines a logical set of pods (your *microservice)*
- Essentially a virtual load balancer in front of pods

Kubernetes manifest: Pod

```
apiVersion: v1
kind: Pod
metadata:
  name: redis-django
  labels:
    app: web
spec:
  containers:
    - name: key-value-store
      image: redis
      ports:
        - containerPort: 6379
    - name: frontend
      image: django
      ports:
        - containerPort: 8000
```

Interact with pods

```
$ kubectl get po --all-namespaces
$ kubectl describe po/my-pod
$ kubectl logs my-pod

# Run bash in container
$ kubectl exec -it my-pod bash
```

Kubernetes manifest: Deployment

```
apiVersion: apps/v1beta1
kind: Deployment
metadata:
  name: smackweb-deploy
spec:
  replicas: 5
  template:
    metadata:
      labels:
        app: smackweb
    spec:
      containers:
      - name: smackweb
        image: chzbrgr71/smackweb
        ports:
        - containerPort: 8080
```

Service Types

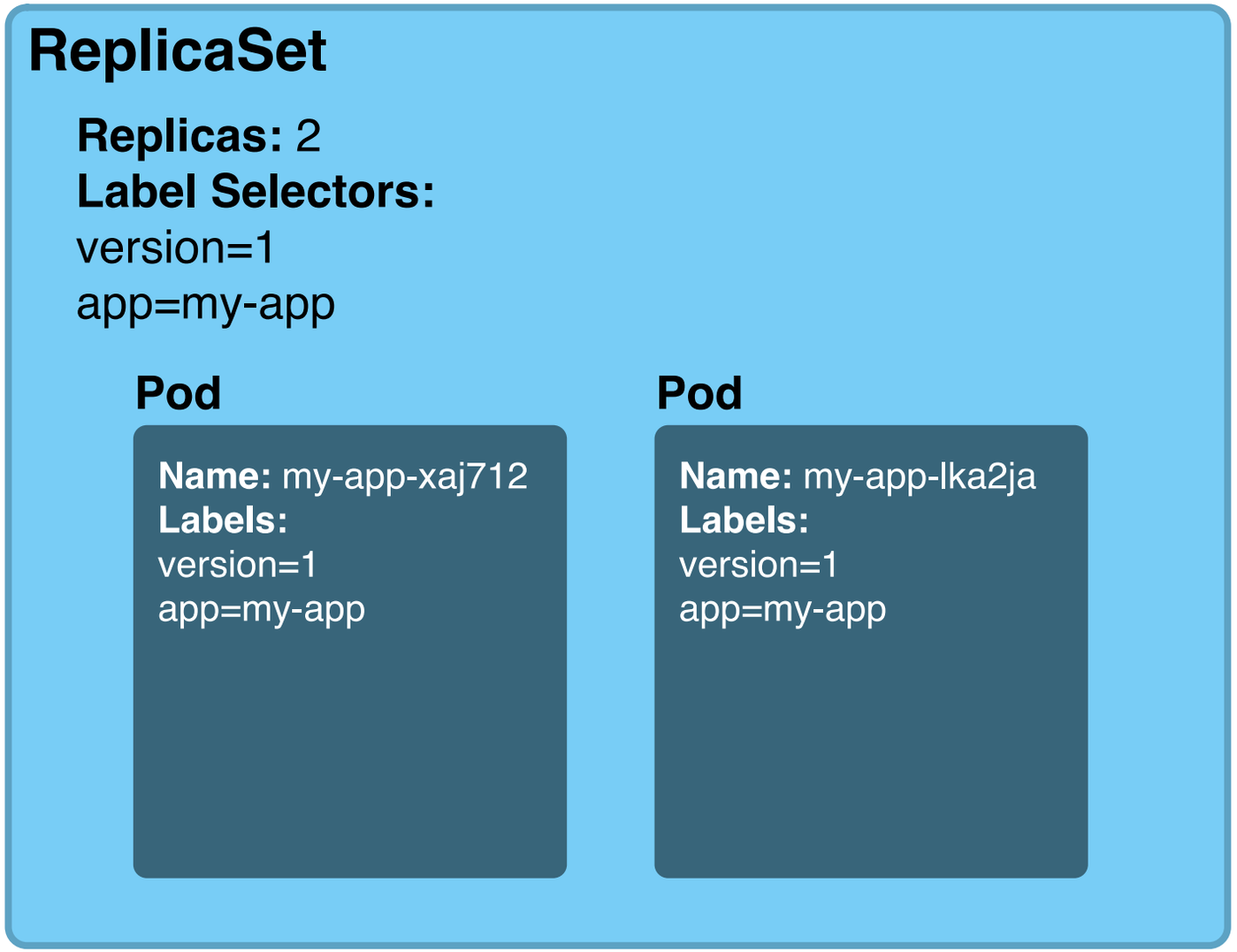
- ClusterIP:
  - Exposes the service on a cluster-internal IP. Choosing this value makes the service only reachable from within the cluster
- NodePort:
  - Exposes the service on each Node's IP at a static port (the NodePort)
  - Connect from outside the cluster by requesting <NodeIP>:<NodePort>
- LoadBalancer:
  - Exposes the service externally using a cloud provider's load balancer

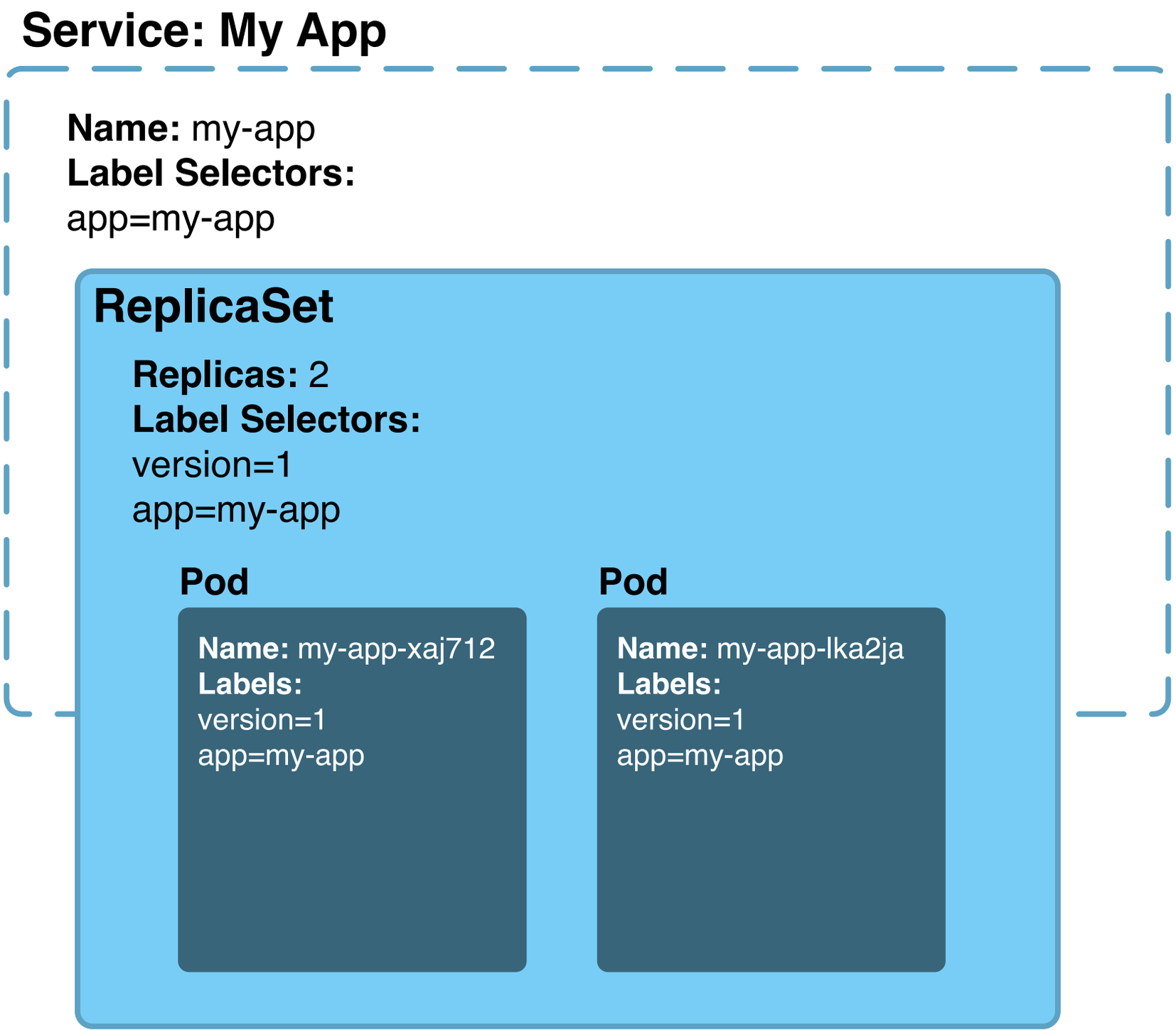
Kubernetes manifest: Service

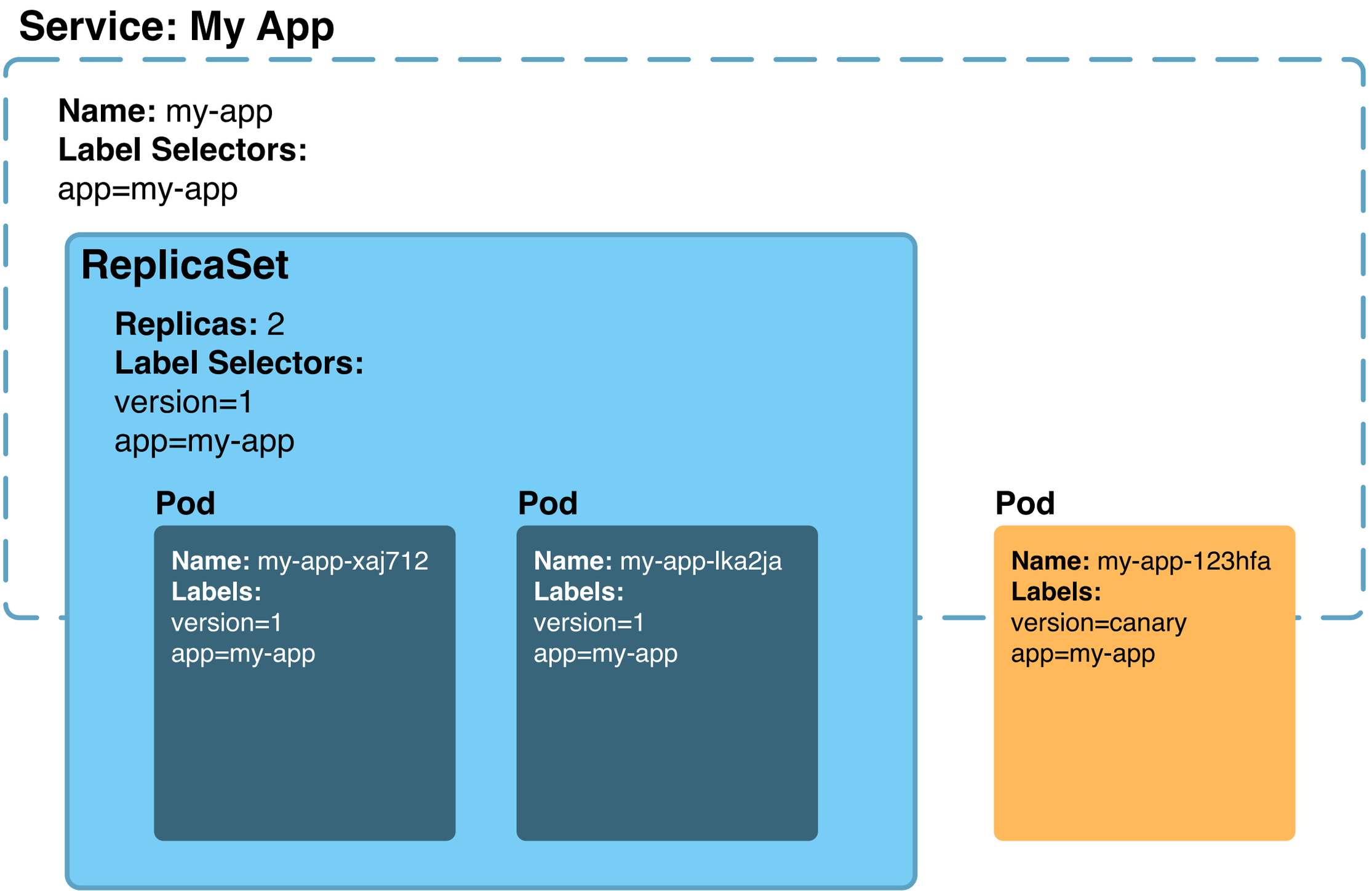
```
apiVersion: v1
kind: Service
metadata:
  name: my-service
spec:
  selector:
    app: MyApp
  type: ClusterIP
  ports:
  - protocol: TCP
    port: 80
    targetPort: 9376
```

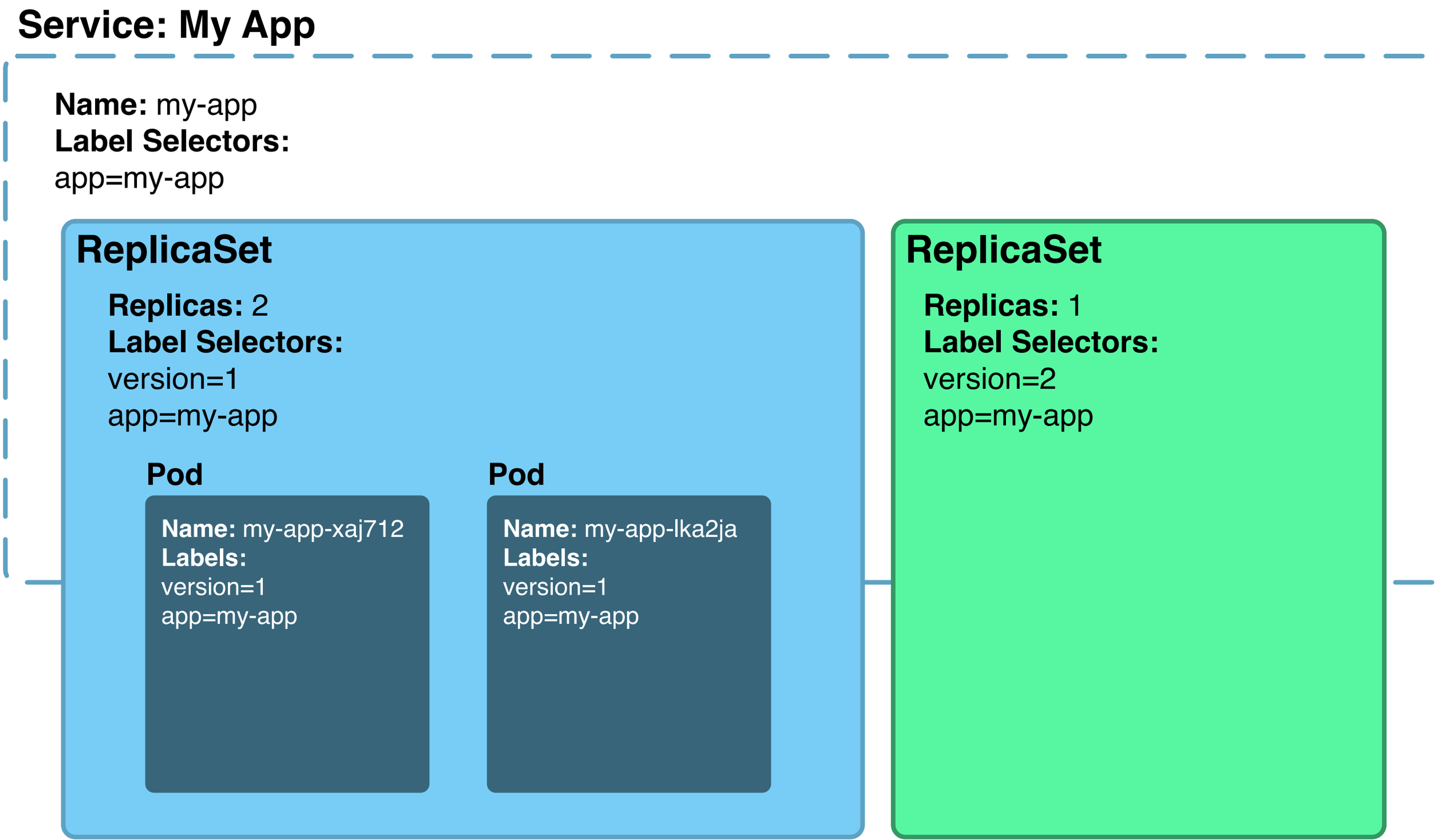
Pod

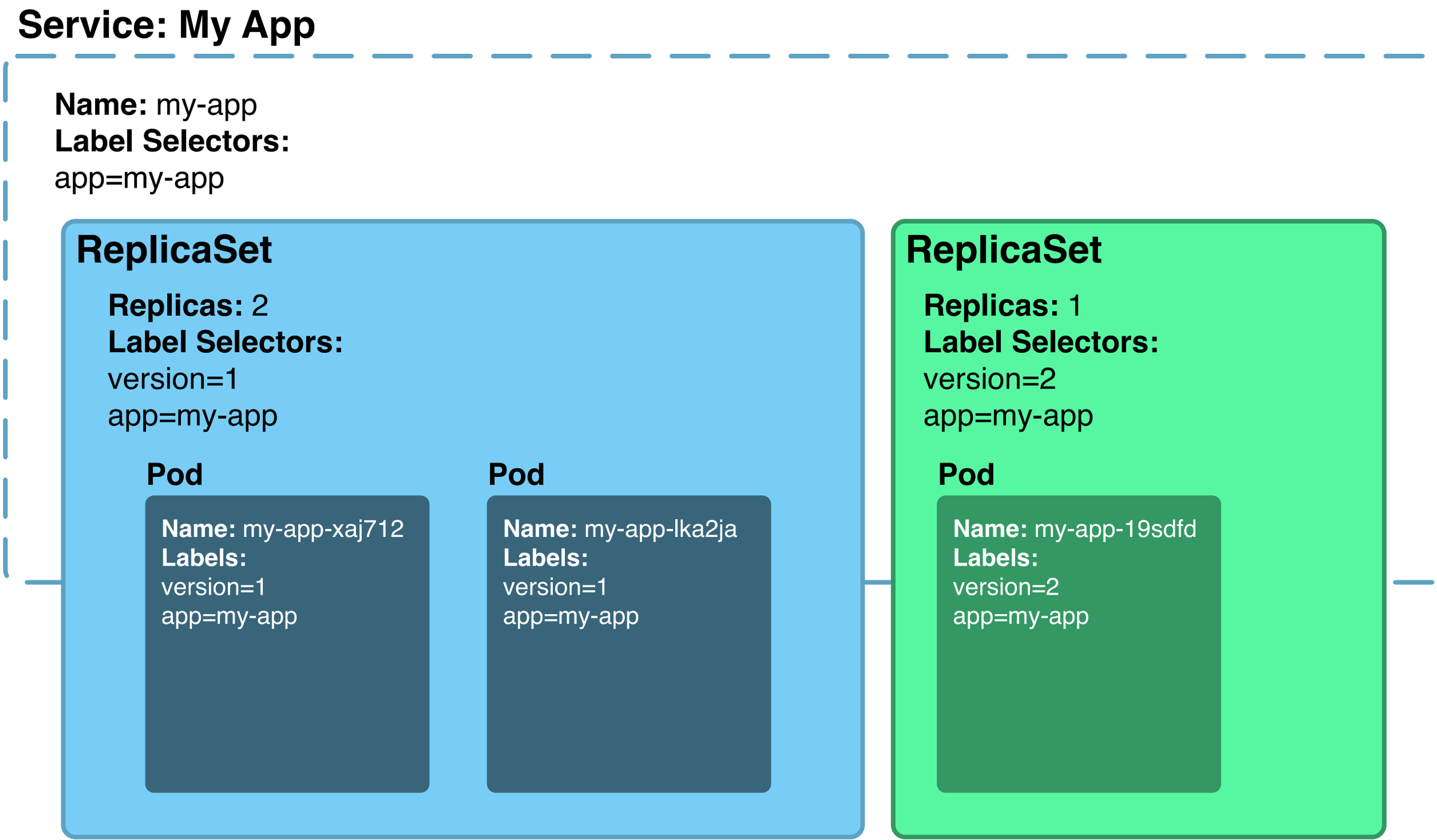
Name: my-app-xaj712
Labels:
version=1
app=my-app

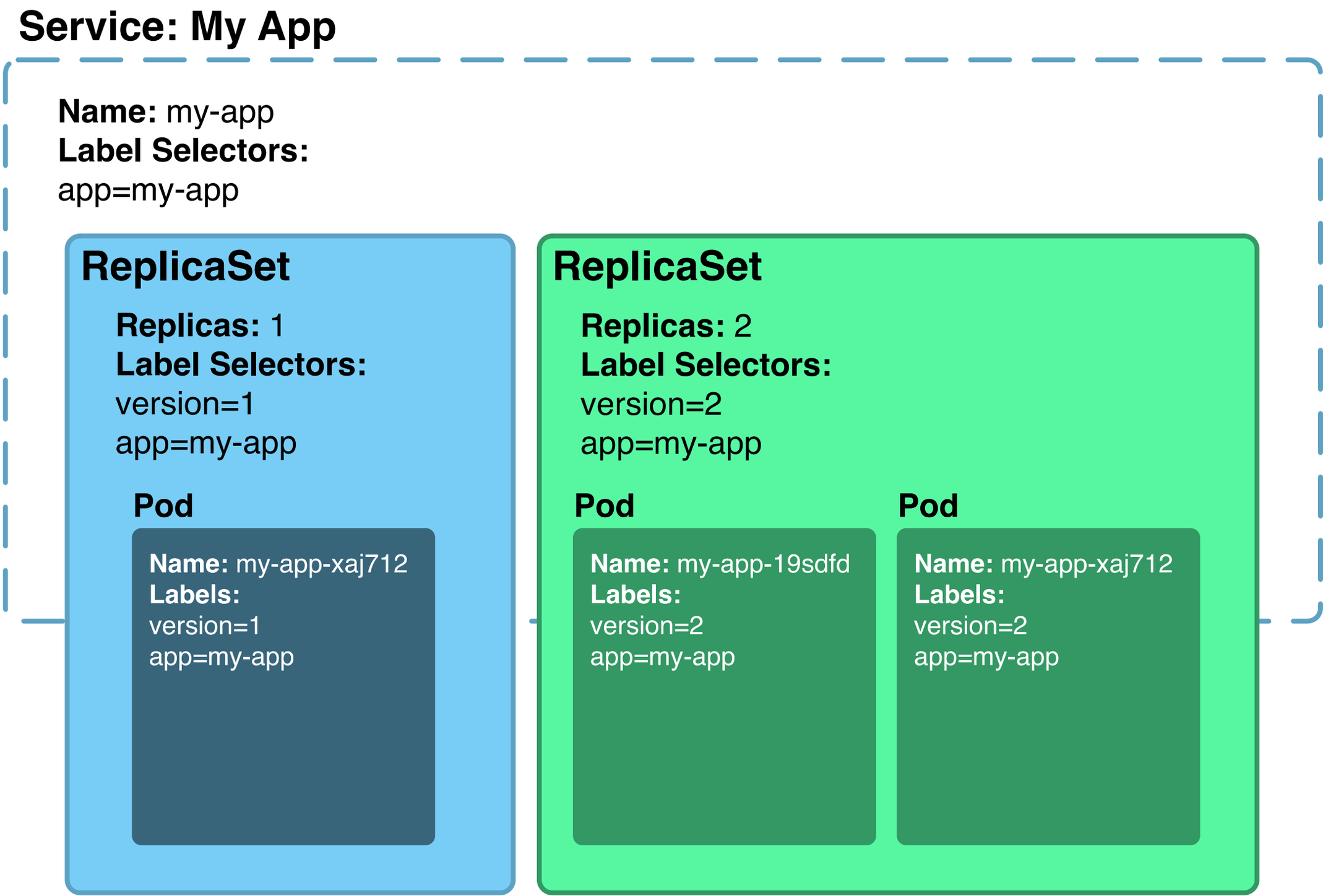

ReplicaSet
Replicas: 2
Label Selectors:
version=1
app=my-app
Pod
Name: my-app-xaj712
Labels:
version=1
app=my-app
Pod
Name: my-app-lka2ja
Labels:
version=1
app=my-app

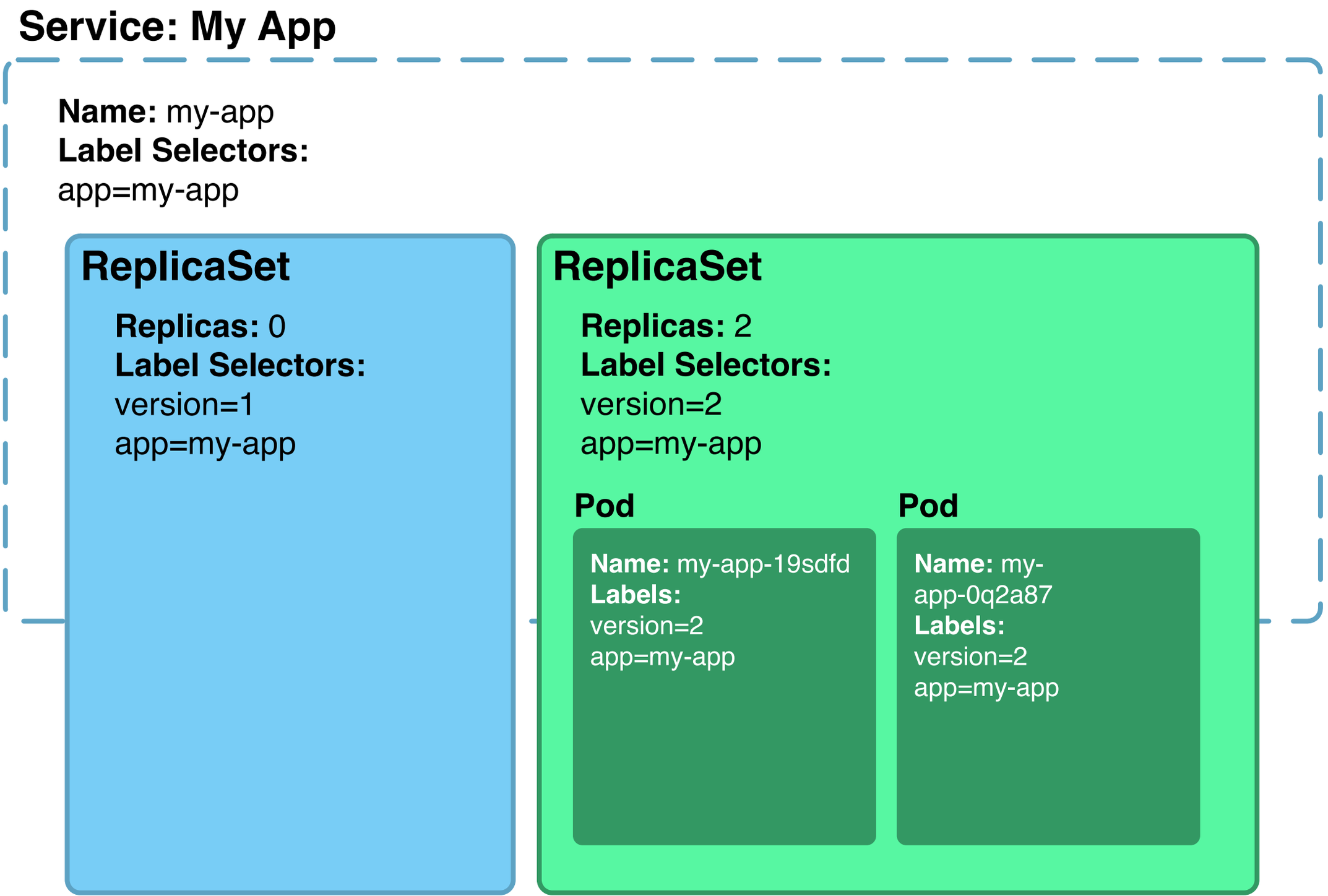

Service: My App
Name: my-app
Label Selectors:
app=my-app
ReplicaSet
Replicas: 2
Label Selectors:
version=1
app=my-app
Pod
Name: my-app-xaj712
Labels:
version=1
app=my-app
Pod
Name: my-app-lka2ja
Labels:
version=1
app=my-app

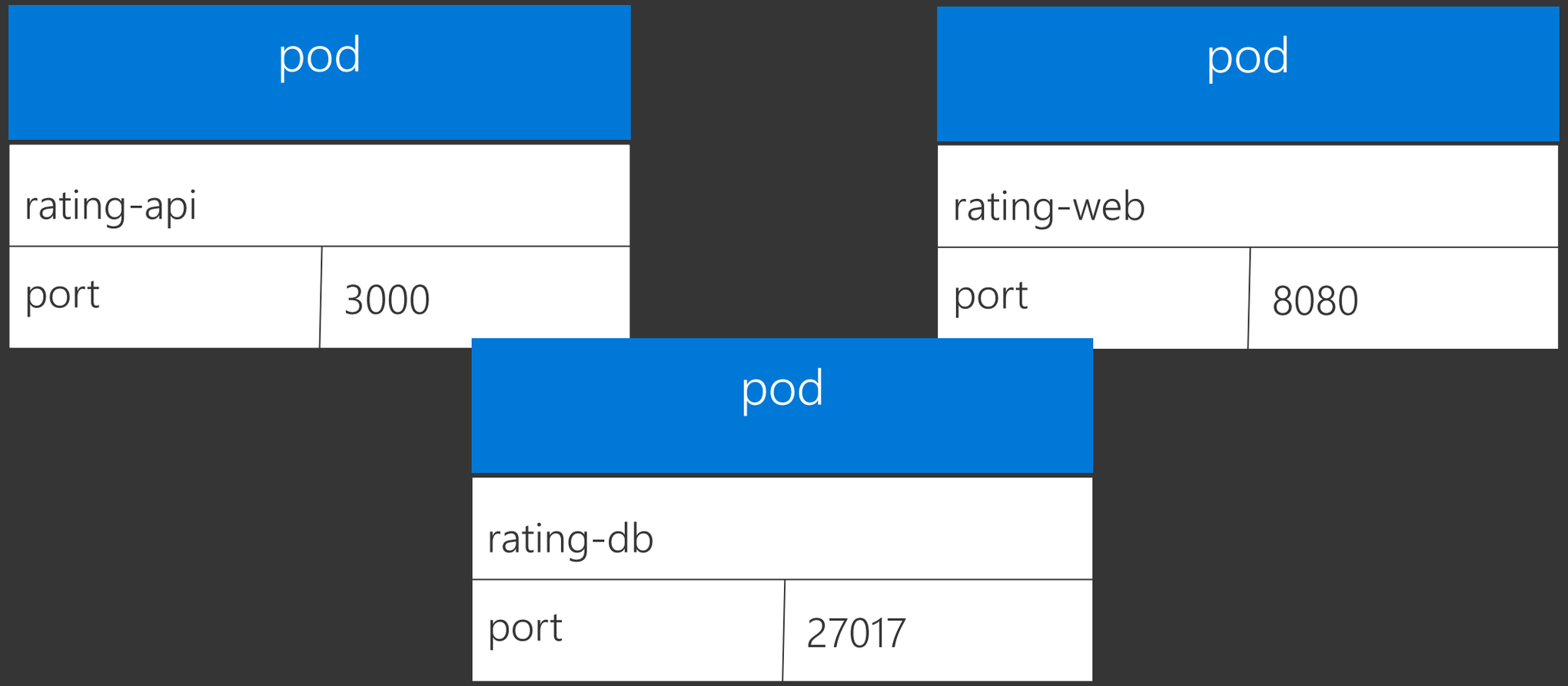

Service: My App
Name: my-app
Label Selectors:
app=my-app
ReplicaSet
Replicas: 2
Label Selectors:
version=1
app=my-app
Pod
Name: my-app-xaj712
Labels:
version=1
app=my-app
Pod
Name: my-app-lka2ja
Labels:
version=1
app=my-app
Pod
Name: my-app-123hfa
Labels:
version=canary
app=my-app

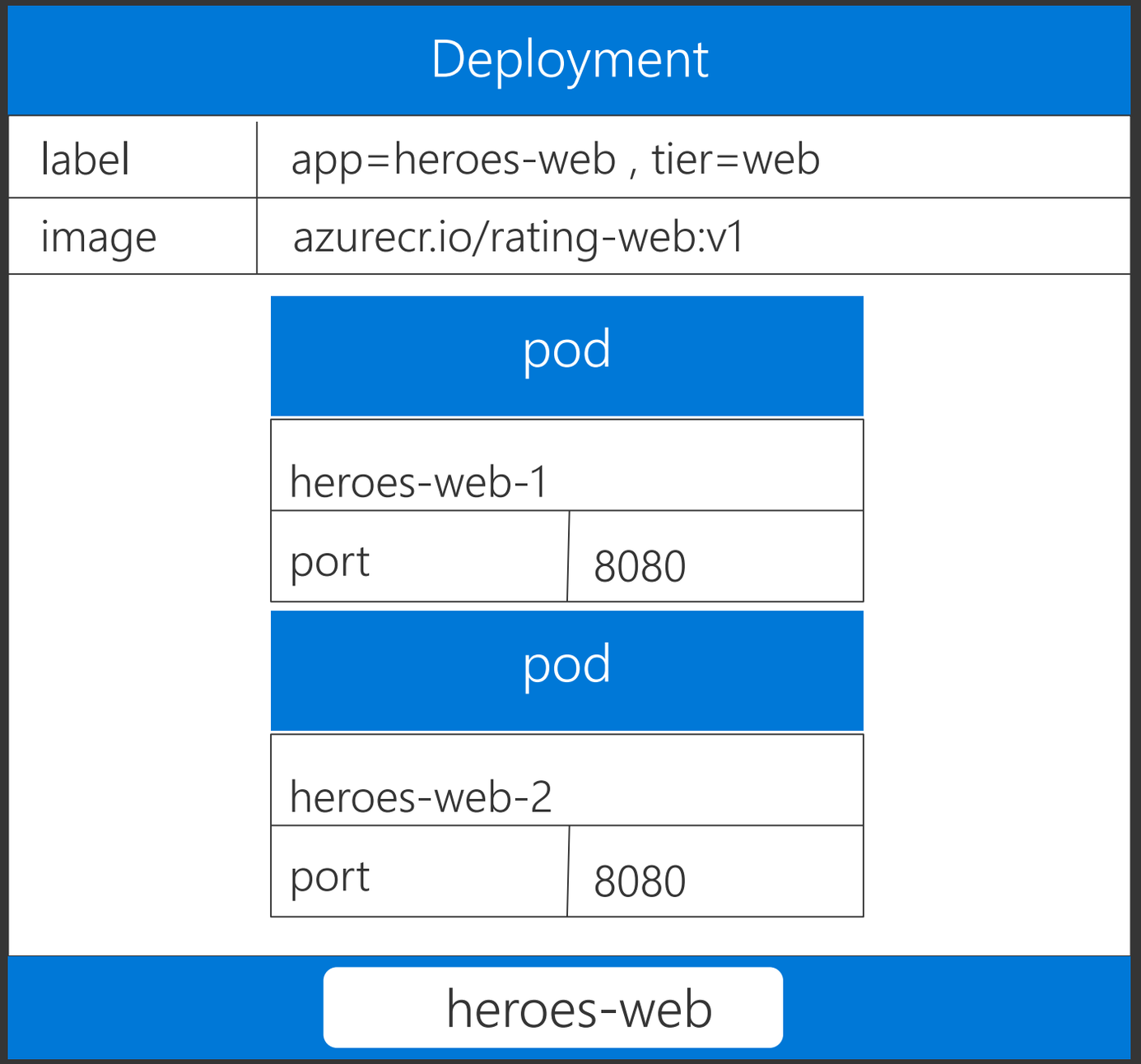

Service: My App
Name: my-app
Label Selectors:
app=my-app
ReplicaSet
Replicas: 2
Label Selectors:
version=1
app=my-app
Pod
Name: my-app-xaj712
Labels:
version=1
app=my-app
Pod
Name: my-app-lka2ja
Labels:
version=1
app=my-app
ReplicaSet
Replicas: 1
Label Selectors:
version=2
app=my-app

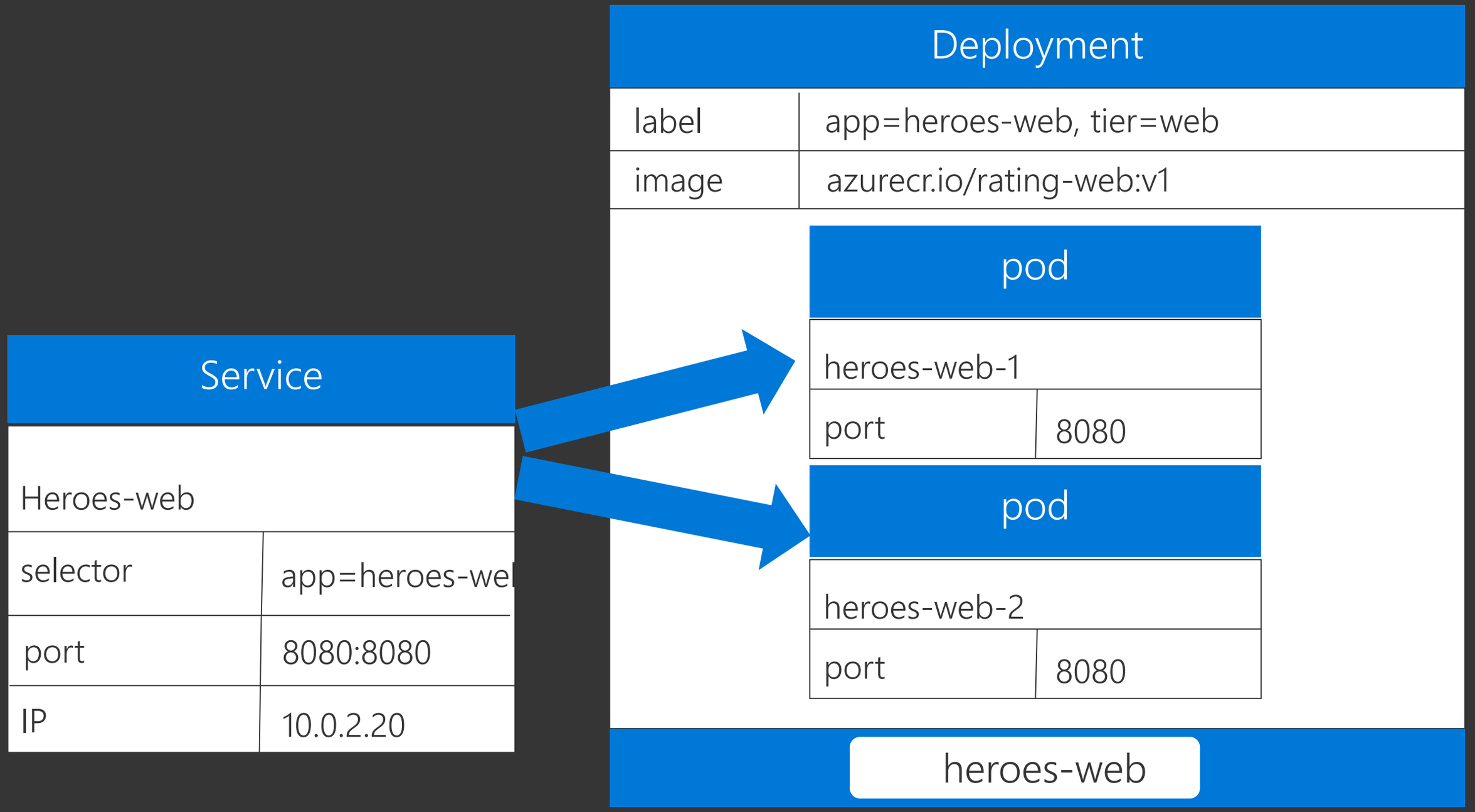

Service: My App
Name: my-app
Label Selectors:
app=my-app
ReplicaSet
Replicas: 2
Label Selectors:
version=1
app=my-app
Pod
Name: my-app-xaj712
Labels:
version=1
app=my-app
Pod
Name: my-app-lka2ja
Labels:
version=1
app=my-app
ReplicaSet
Replicas: 1
Label Selectors:
version=2
app=my-app
Pod
Name: my-app-19sdfd
Labels:
version=2
app=my-app


Service: My App
Name: my-app
Label Selectors:
app=my-app
ReplicaSet
Replicas: 1
Label Selectors:
version=1
app=my-app
Pod
Name: my-app-xaj712
Labels:
version=1
app=my-app
ReplicaSet
Replicas: 2
Label Selectors:
version=2
app=my-app
Pod
Name: my-app-19sdfd
Labels:
version=2
app=my-app
Pod
Name: my-app-xaj712
Labels:
version=2
app=my-app

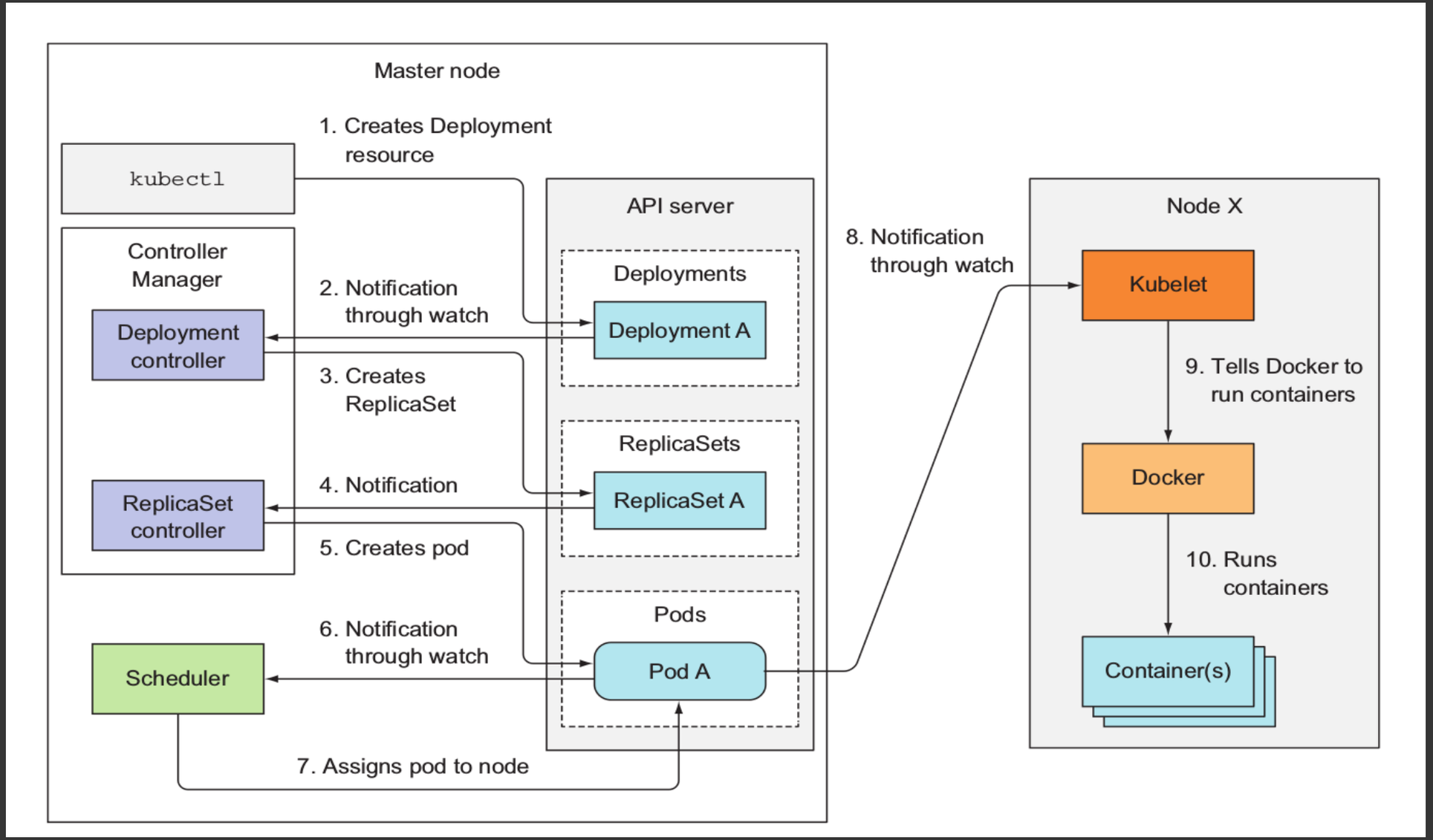

Service: My App
Name: my-app
Label Selectors:
app=my-app
ReplicaSet
Replicas: 0
Label Selectors:
version=1
app=my-app
ReplicaSet
Replicas: 2
Label Selectors:
version=2
app=my-app
Pod
Name: my-app-19sdfd
Labels:
version=2
app=my-app
Pod
Name: my-app-0q2a87
Labels:
version=2
app=my-app


pod
rating-api
port
3000
pod
rating-web
port
8080
pod
rating-db
port
27017


Deployment
label
app=heroes-web , tier=web
image
azurecr.io/rating-web:v1
pod
heroes-web-1
port
8080
pod
heroes-web-2
port
8080
heroes-web


Deployment
label
app=heroes-web, tier=web
image
azurecr.io/rating-web:v1
pod
heroes-web-1
port
8080
pod
heroes-web-2
port
8080
heroes-web
Service
Heroes-web
selector
app=heroes-wel
port
8080:8080
IP
10.0.2.20

Deployment Events

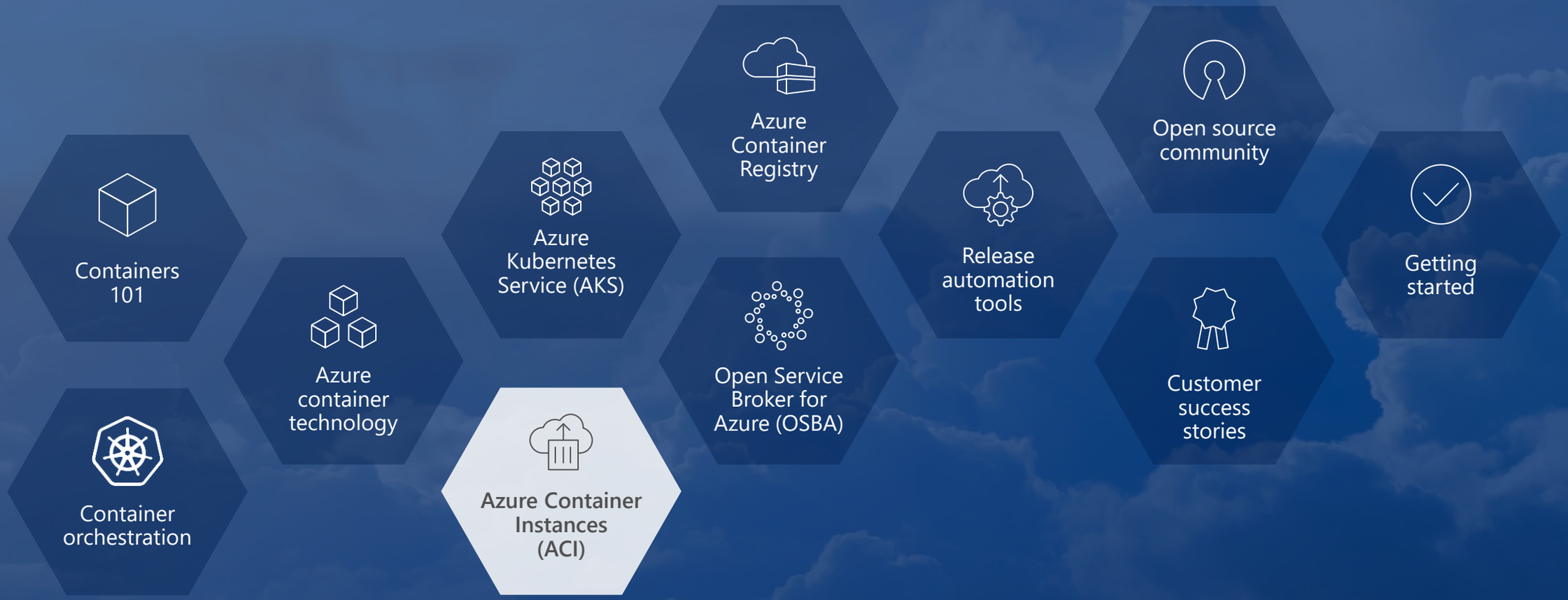


From "Kubernetes in Action" by Manning

Demo

- Create Pod
- Create Deployment
- Add Service to Deployment
- Rolling Update of Deployment

Azure Container Instances (ACI)



Azure Kubernetes Service (AKS)

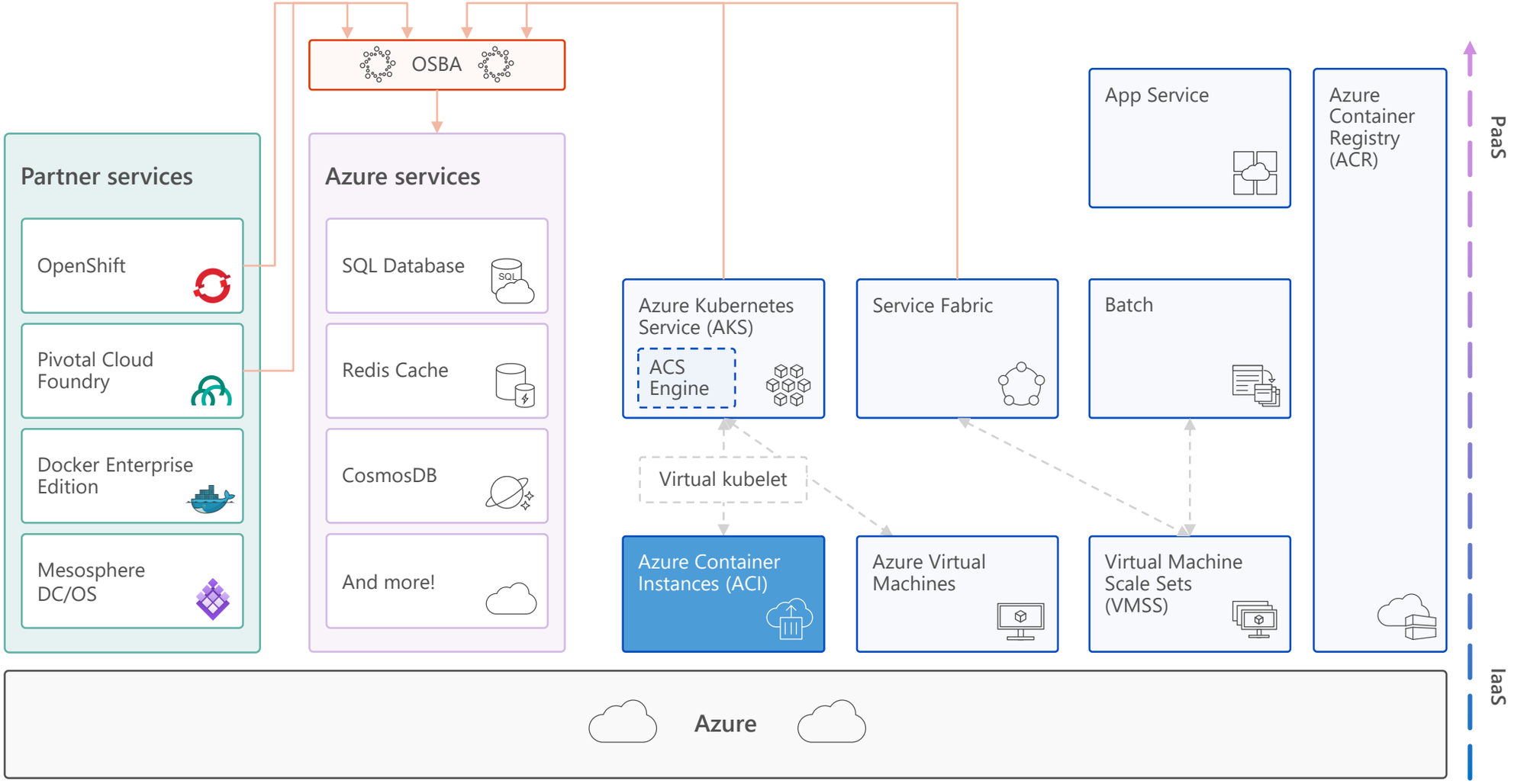
Azure Container Instances (ACI)

Azure Container Registry

Open Service Broker API (OSBA)

Release Automation Tools

Azure Container Instances (ACI)



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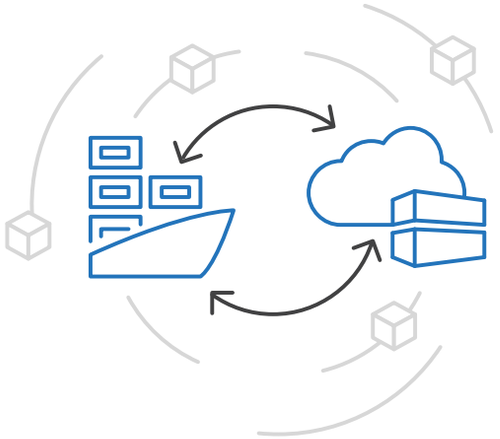
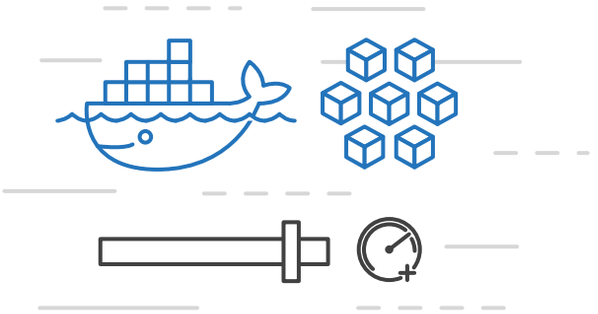
Azure Container Instances (ACI)

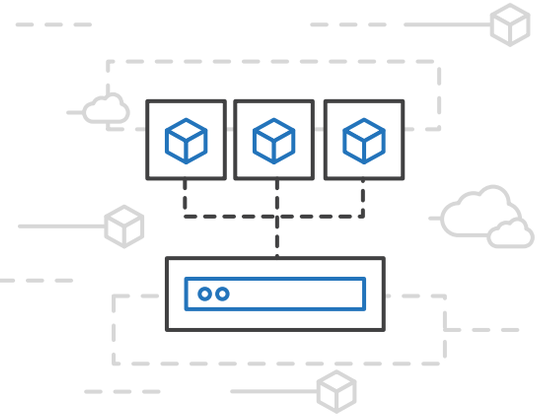
Easily run containers on Azure with a single command



Start using containers right away



Cloud-scale container capacity



Hyper-visor isolation

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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>
```

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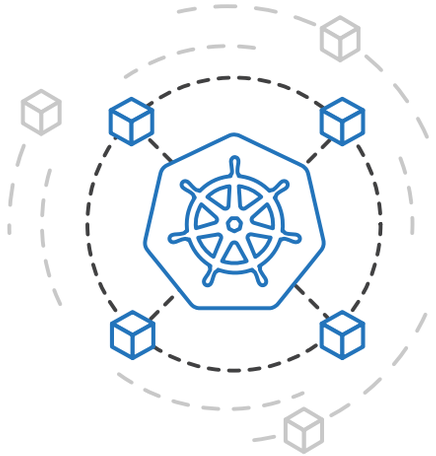
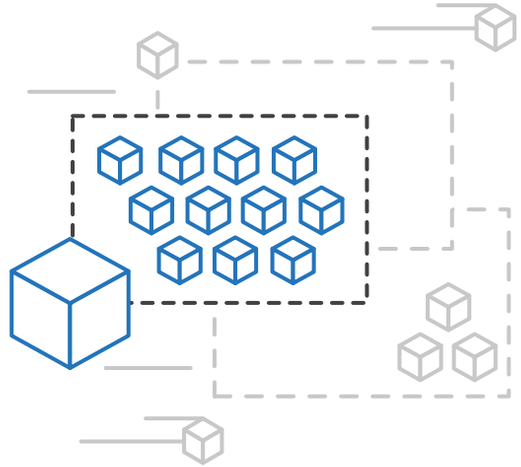
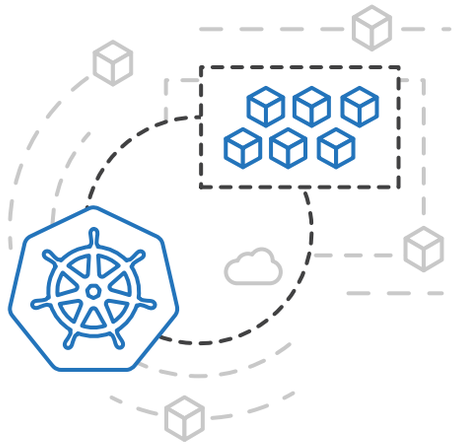
ACI Connector for Kubernetes



Kubernetes provides rich orchestration capabilities



ACI provides infinite container-based scale



The ACI Connector for K8s brings them together

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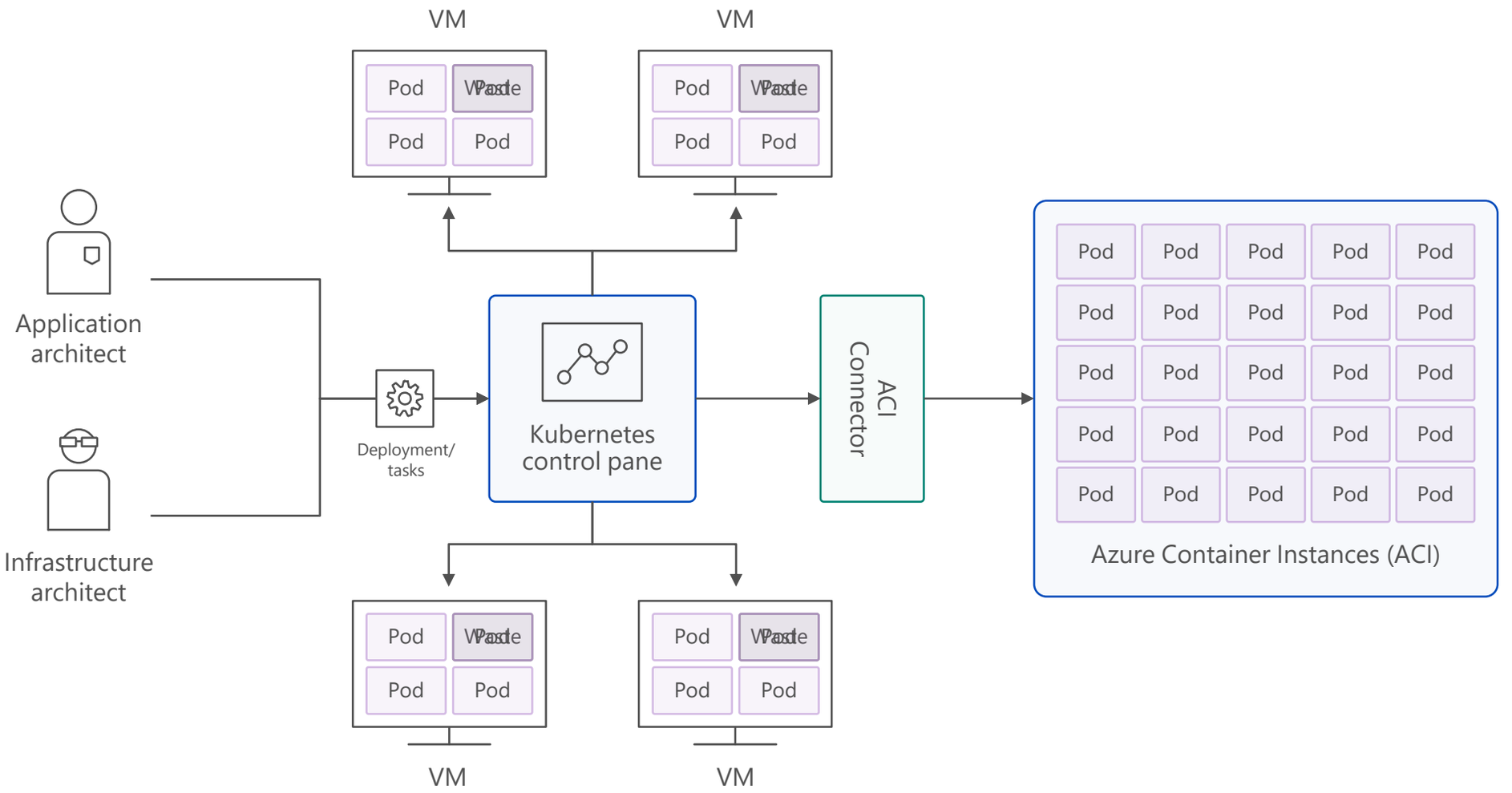
Bursting with the ACI Connector



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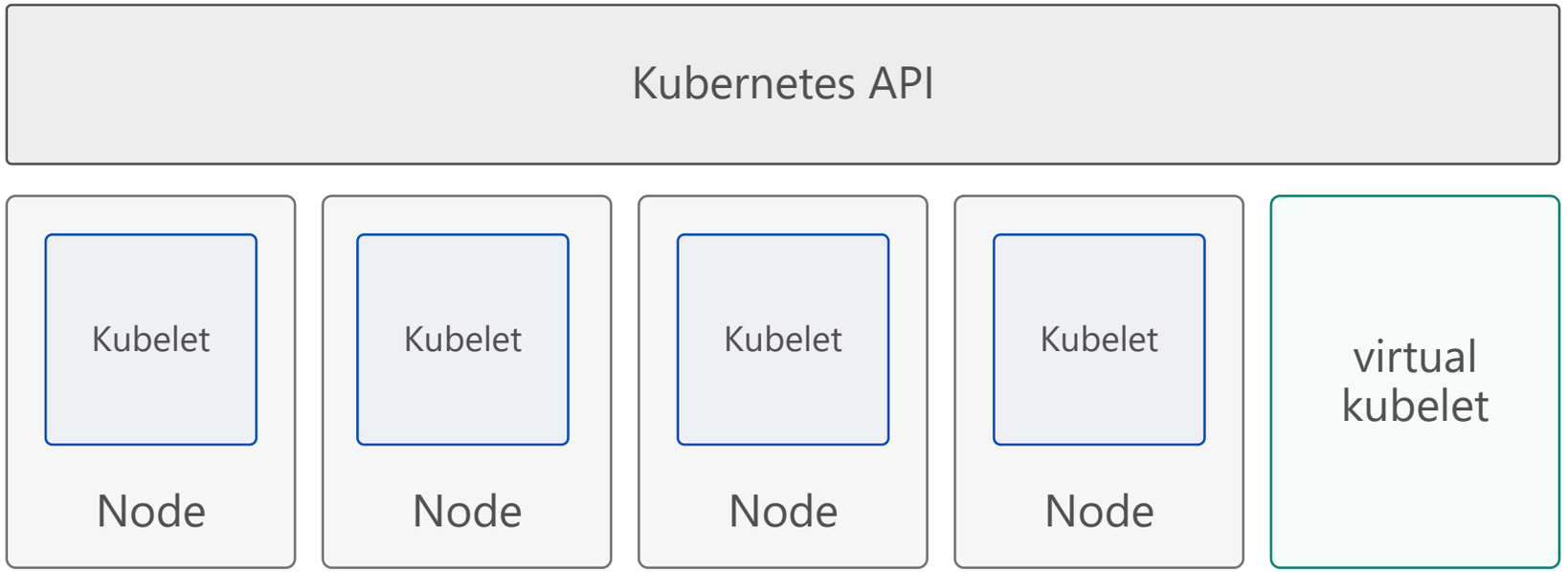
Virtual Kubelet



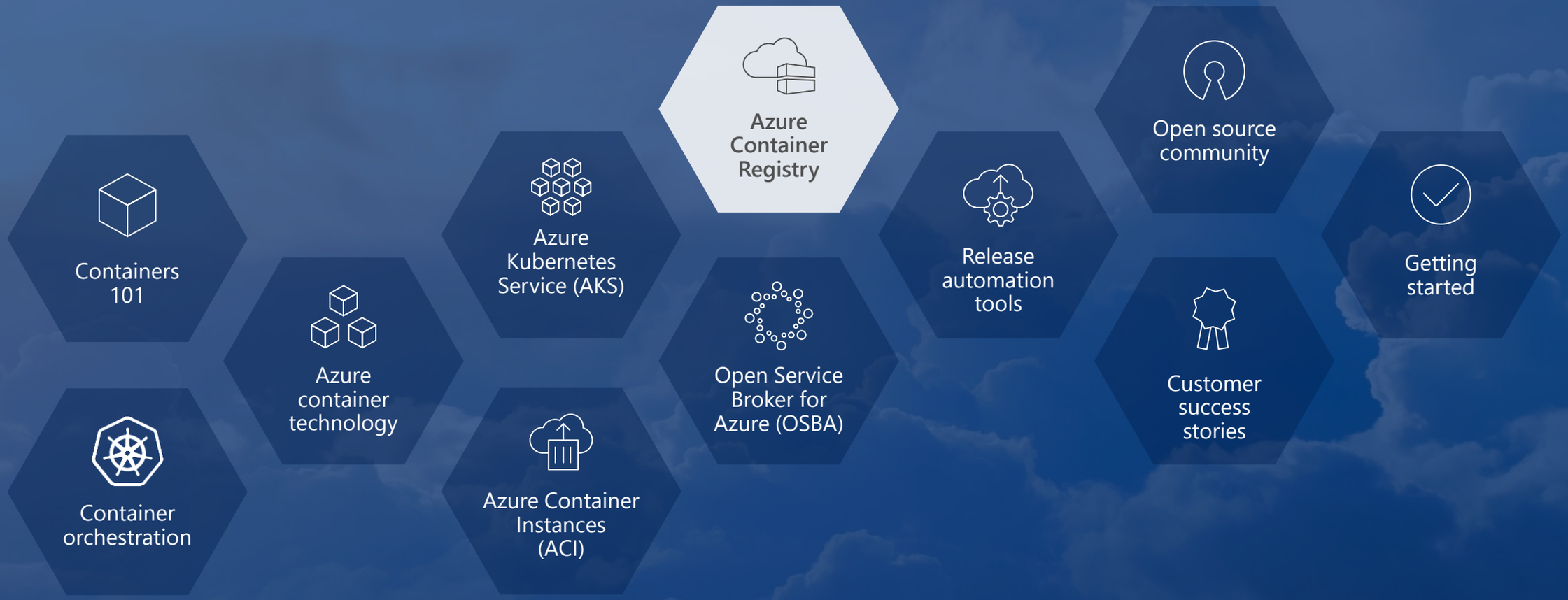
Typical kubelets implement the pod and container operations for each node as usual.

Virtual kubelet registers itself as a “node” and allows developers to program their own behaviors for operations on pods and containers.

Demo

- ACI Deployment

Azure Container Registry



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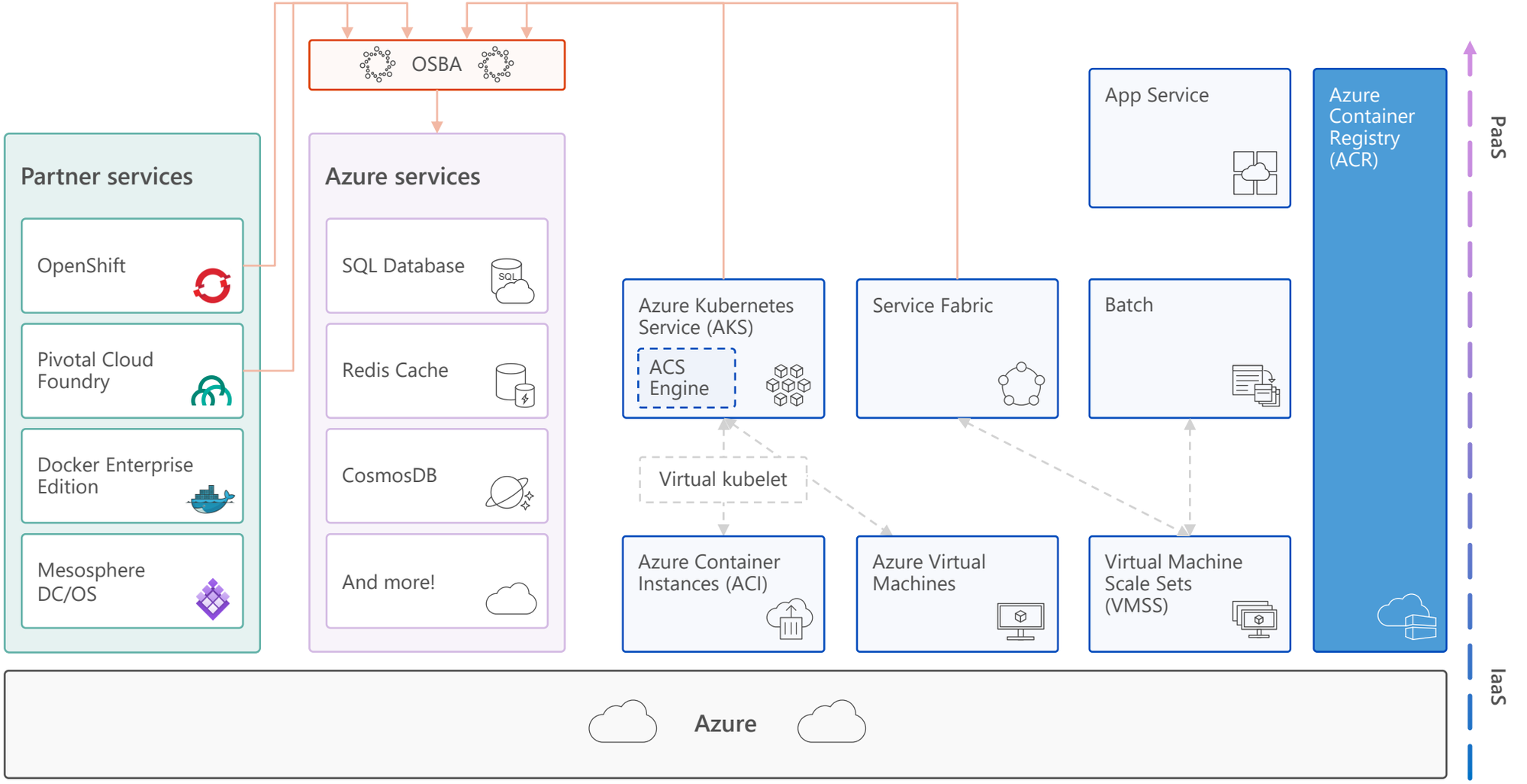

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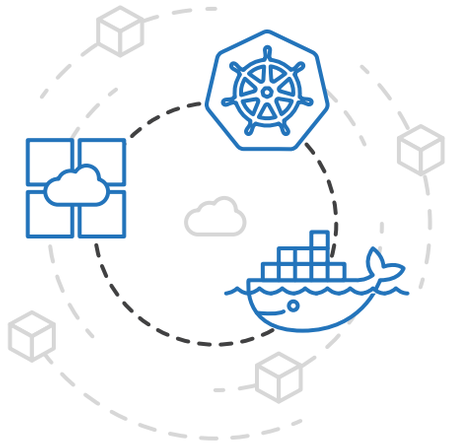
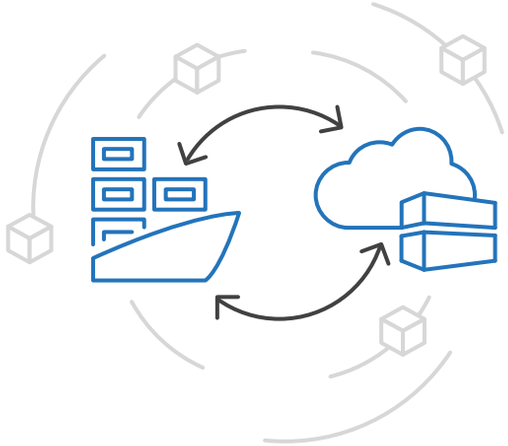
Release Automation Tools

Azure Container Registry

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



Manage images for all types of containers



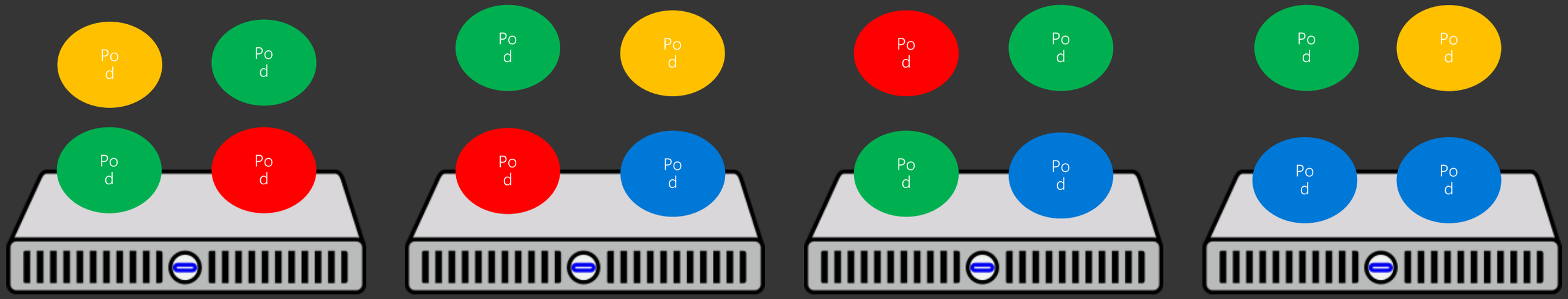
Use familiar, open-source Docker CLI tools

Azure Container Registry geo-replication

Monitoring

Current monitoring is static in nature

Need to monitor for dynamic environments



Application Health and Readiness

- Kubelets on workers use liveness and readiness probes to know when to restart a container or start directing traffic
  - Liveness check: when to restart
  - Readiness check: when to forward Service traffic to a pod

Monitoring: What indicators matter in Kubernetes

- Cluster health: total number of nodes, pods, etc
- Node health: available compute resources, health
- Application health
- Tooling Examples
  - Datadog
  - Prometheus
  - InfluxData
  - Cloud-specific: OMS (Azure), CloudWatch (AWS)

Logging

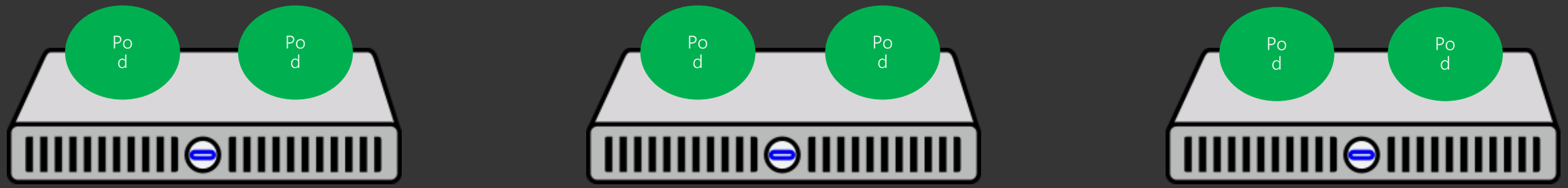
- Pod logs: applications must log to standard out!
- Cluster-wide event logs
- Logging forwarder solutions
  - fluentd
  - logstash
- Log indexers
  - OMS Log Analytics
  - Splunk
  - ELK stack

Scaling Applications

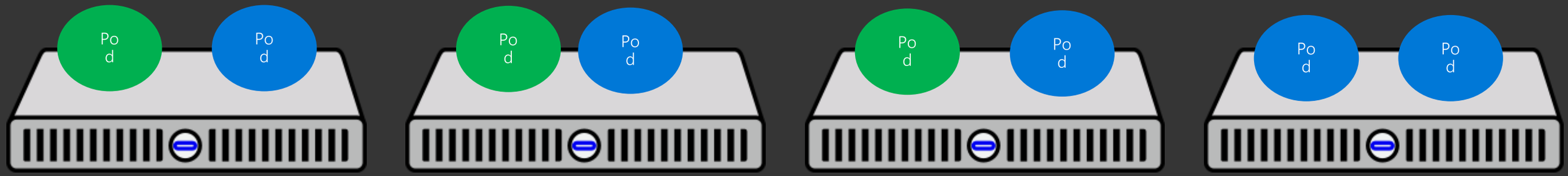
Application Scaling Strategies

- Infrastructure Level
  - Increase/decrease the number of VM's running in the cluster
  - Azure infrastructure function
  - via AKS API/CLI (utilizes Azure Availability Sets)
  - Auto-scaling coming to AKS soon
- Application Level
  - Increase/decrease the number of pods for a given service
  - Handled by the orchestrator or the application itself
  - Kubernetes Horizontal Pod Autoscaling
- These functions should be coordinated

Scaling Pods



Scaling Host



Scaling the ACS Cluster

Azure CLI | Copy | Try It

```
az aks scale --name myK8sCluster --resource-group myResourceGroup --agent-count 1
```

Demo

- Scale existing Deployment

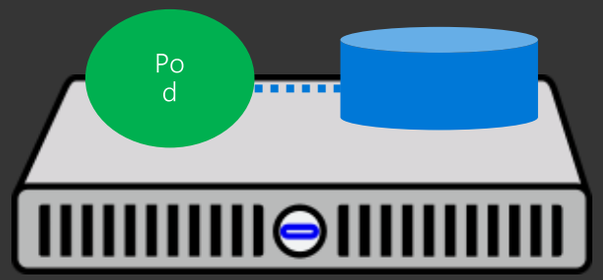
Labs: 6, 7

https://github.com/OSSCanada/aks_partnerworkshop

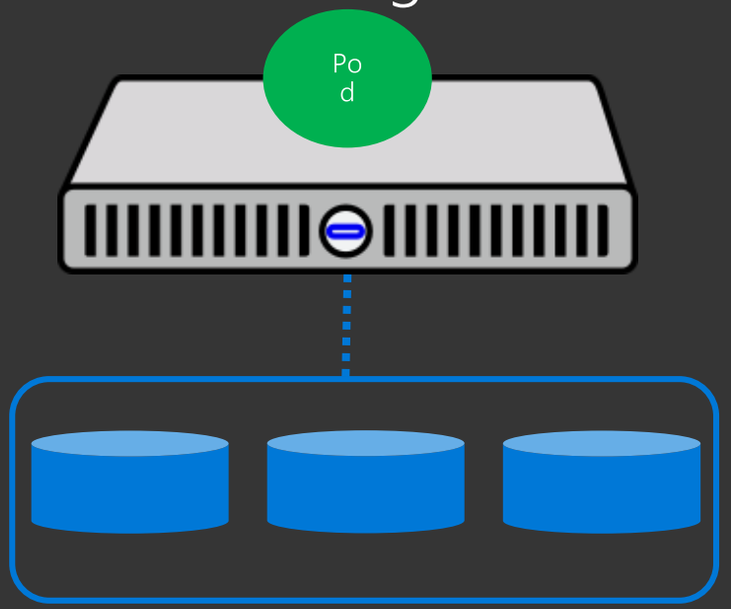
Managing Storage and State

Managing State For Containers

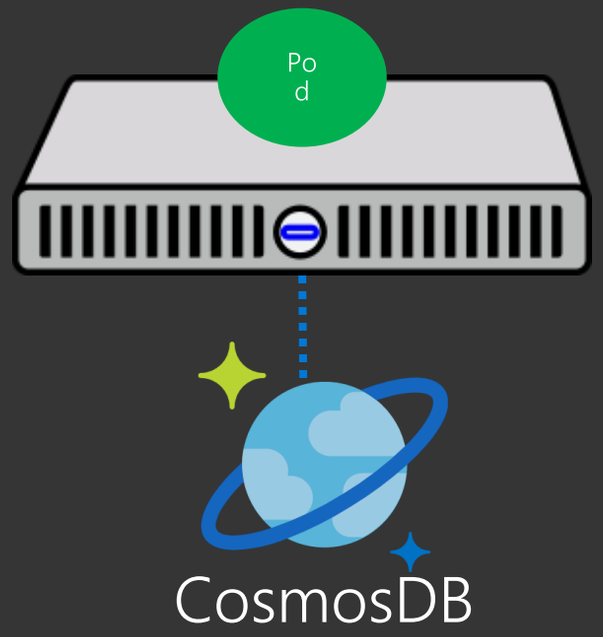
Local Storage



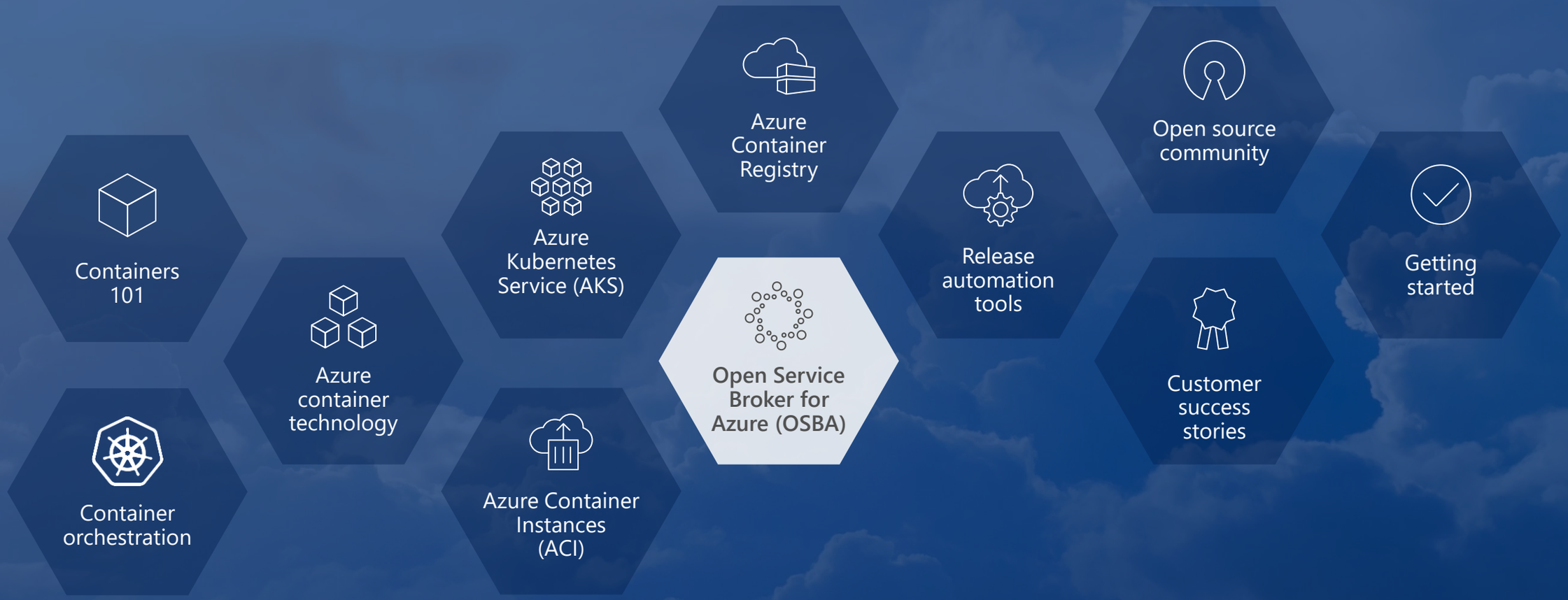
Remote Storage



Azure Data Service



Open Service Broker for Azure



Azure Kubernetes Service (AKS)

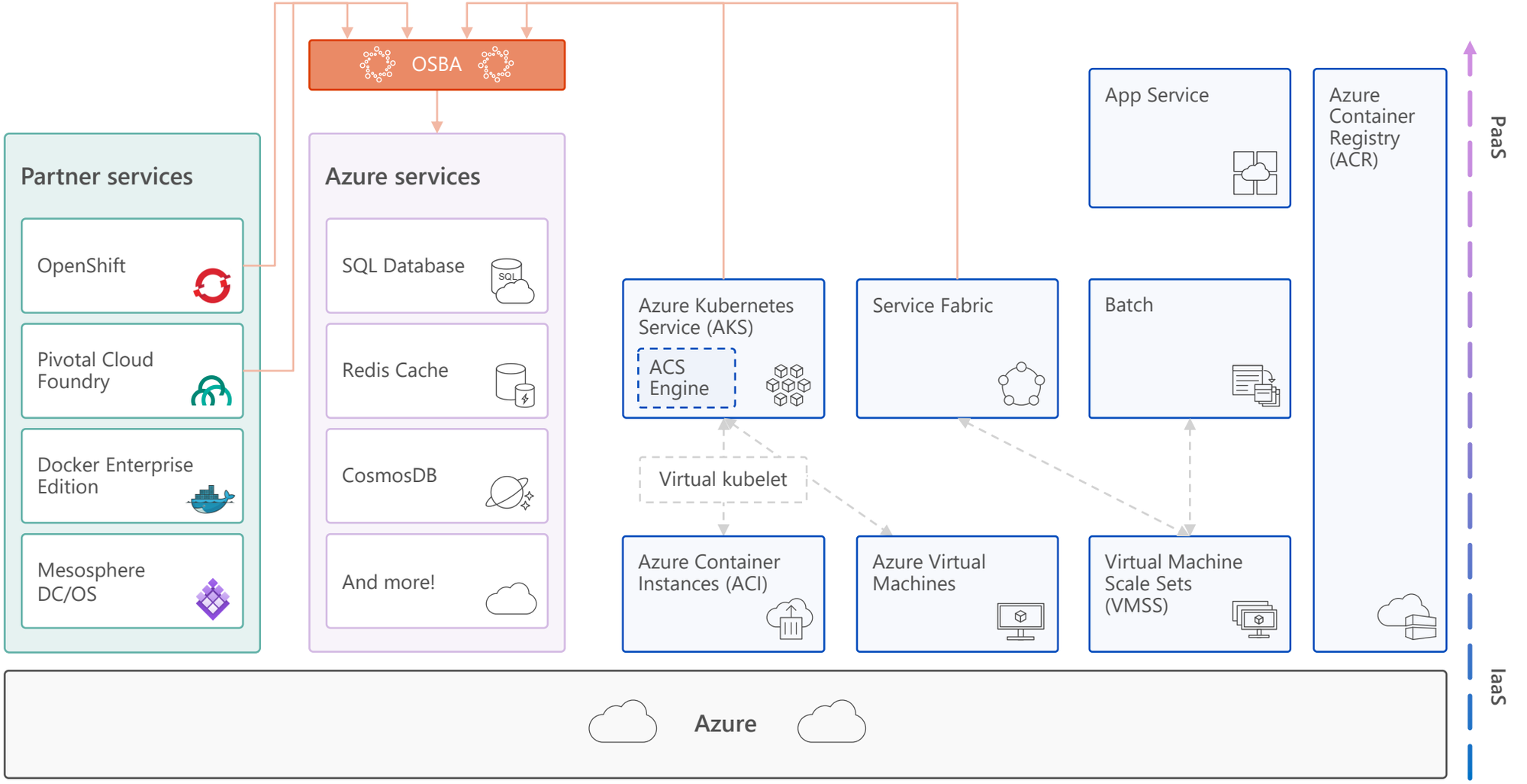
Azure Container Instances (ACI)

Azure Container Registry

Open Service Broker API (OSBA)

Release Automation Tools

Open Service Broker for Azure (OSBA)



Azure Kubernetes Service (AKS)

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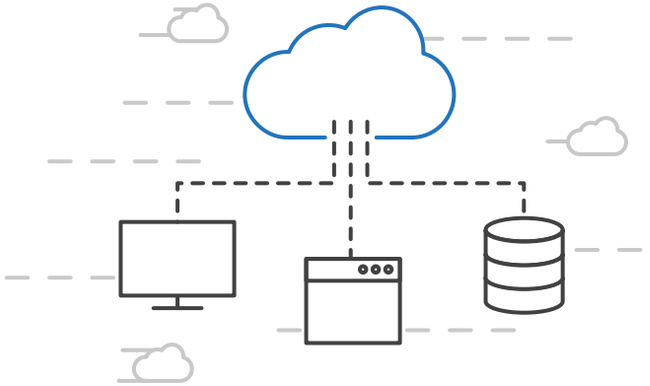
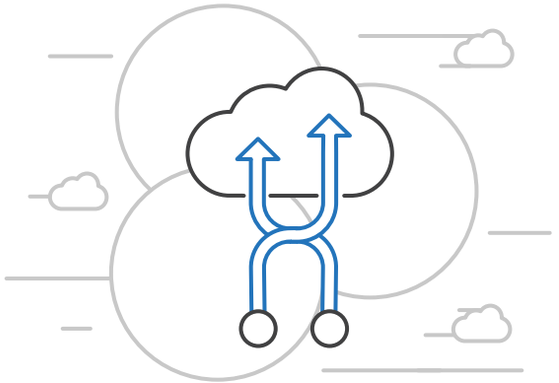
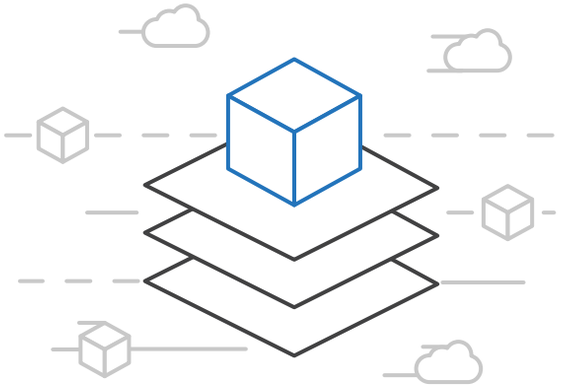
Connecting containers to Azure services and platforms



A standardized way to connect with Azure services



Simple and flexible service integration



Compatible across numerous platforms

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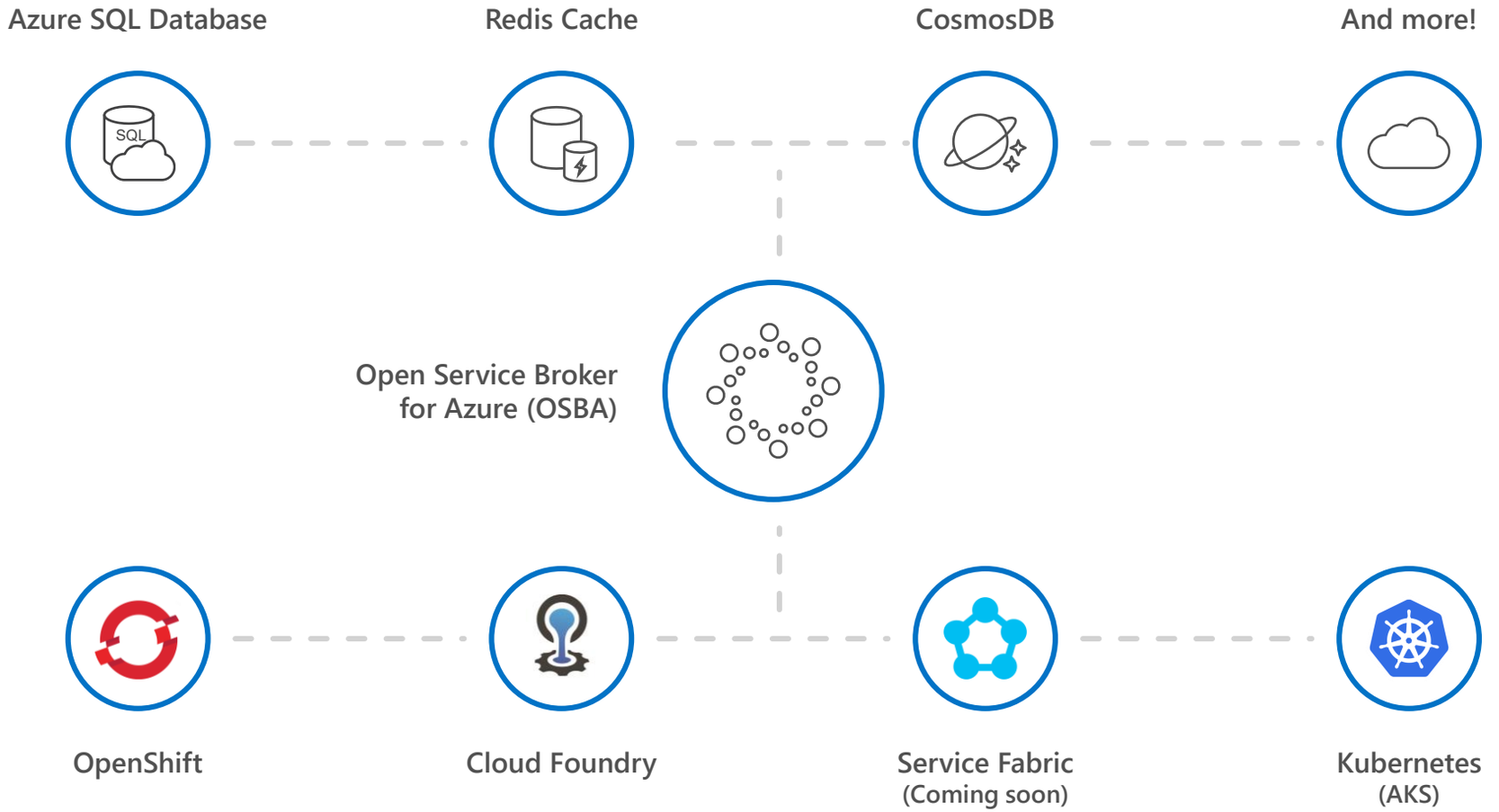
An implementation of the Open Service Broker API



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Getting started with ease

```
$ helm repo add azure Azure/helm-charts

$ helm install azure/service-broker

$ helm install azure/wordpress
```

Upgrading Kubernetes in AKS

Azure CLI | Copy | Try It

```
az aks get-versions --name myK8sCluster --resource-group myResourceGroup --output table
```

Azure CLI | Copy | Try It

```
az aks upgrade --name myK8sCluster --resource-group myResourceGroup --kubernetes-version 1.8.1
```

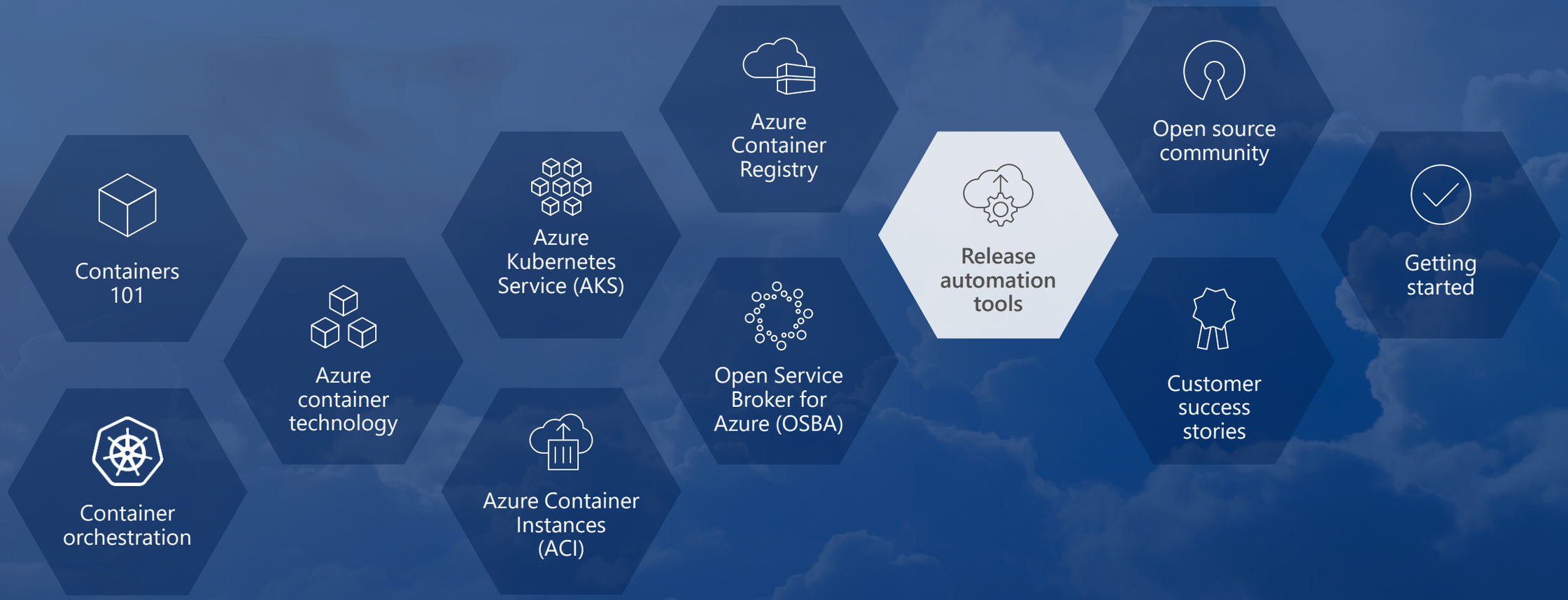
Demo

- Container Persistence with Azure Disk
- Version Upgrade Options

Labs: 8, 9, 10

https://github.com/OSSCanada/aks_partnerworkshop

Release automation tools



Azure Kubernetes Service (AKS)

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Release Automation Tools

Release automation tools

Simplifying the Kubernetes experience

DRAFT

Streamlined Kubernetes development

HELM

The package manager for Kubernetes

BRIGADE

Event-driven scripting for Kubernetes

KASHTI

Visualization dashboard for Brigade

Azure Kubernetes Service (AKS)

Azure Container Instances (ACI)

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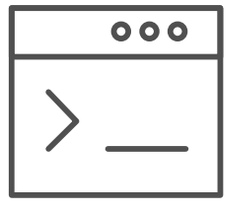
Release Automation Tools

Draft

Simple app development and deployment – into any Kubernetes cluster

Simplified development

Using two simple commands, developers can now begin hacking on container-based applications without requiring Docker or even installing Kubernetes themselves



Language support

Draft detects which language your app is written in, and then uses packs to generate a Dockerfile and Helm Chart with the best practices for that language

Azure Kubernetes Service (AKS)

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Release Automation Tools

Helm

The best way to find, share, and use software built for Kubernetes

Manage complexity

Charts can describe complex apps; provide repeatable app installs, and serve as a single point of authority

Easy updates

Take the pain out of updates with in-place upgrades and custom hooks

Simple sharing

Charts are easy to version, share, and host on public or private servers

Rollbacks

Use `helm rollout` to roll back to an older version of a release with ease

Azure Kubernetes Service (AKS)

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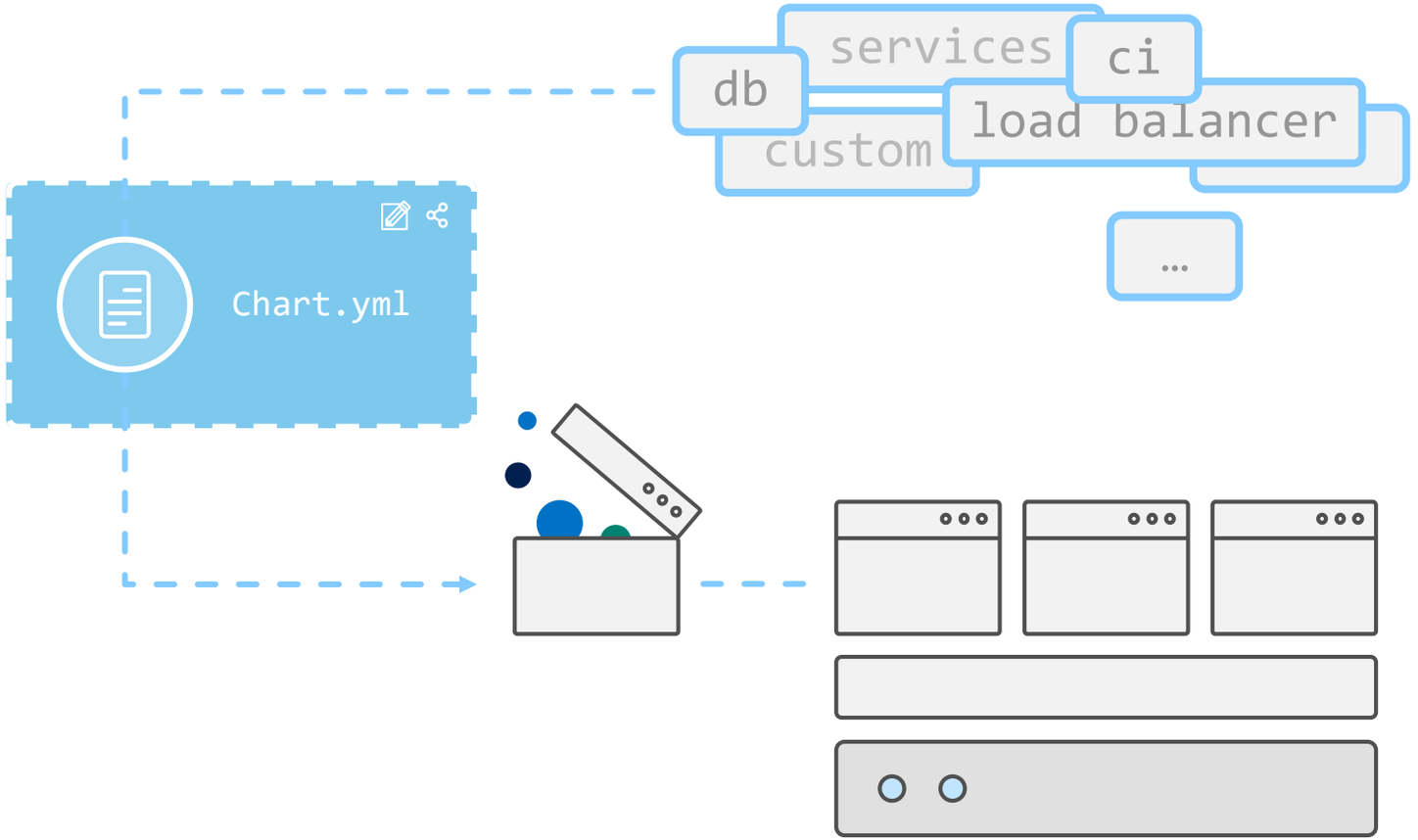
Open Service Broker API (OSBA)

Release Automation Tools

Helm

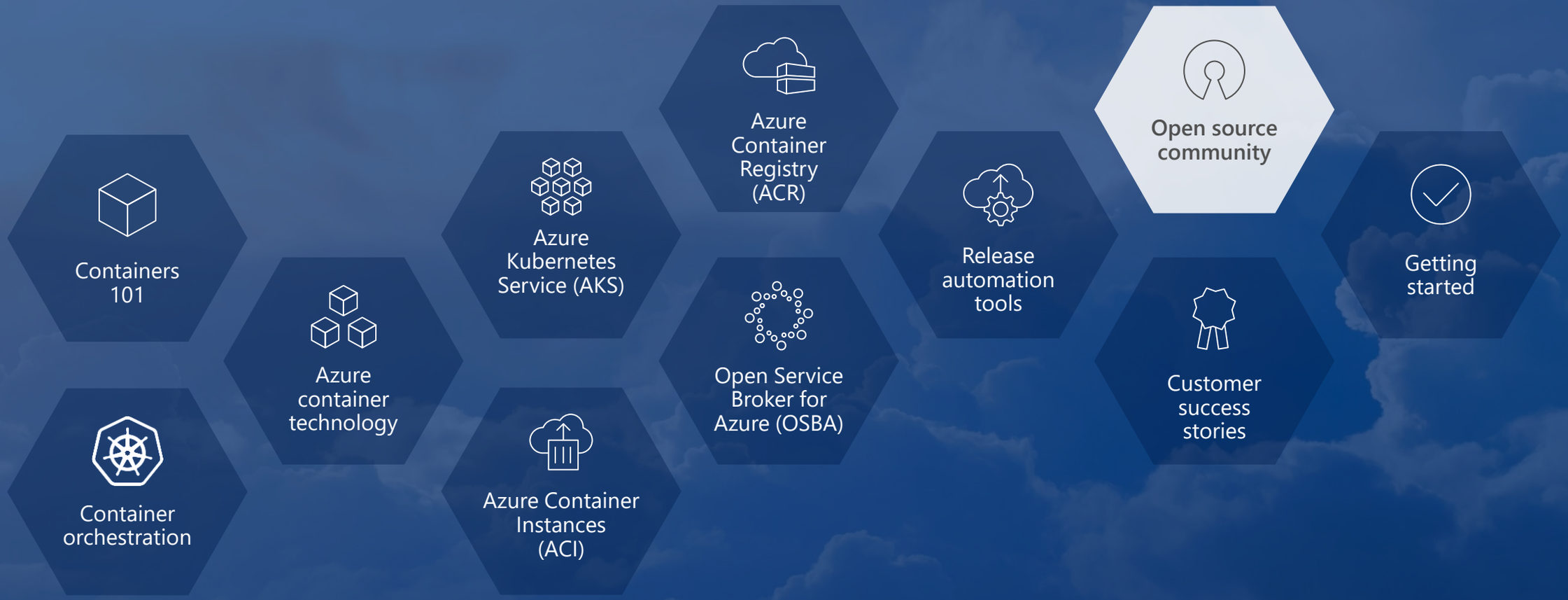
Helm Charts helps you define, install, and upgrade even the most complex Kubernetes application



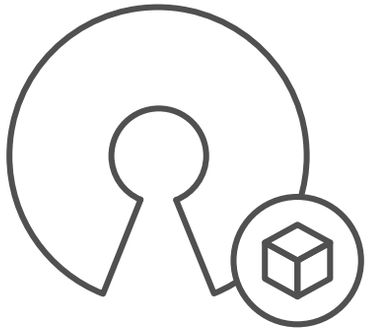
Demo

- Install via Helm
- Development using Draft

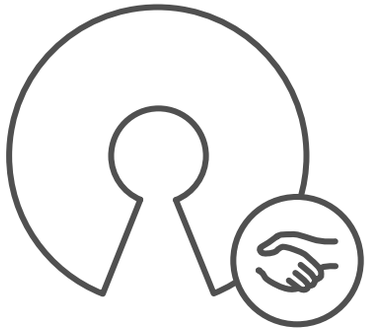
Open source community



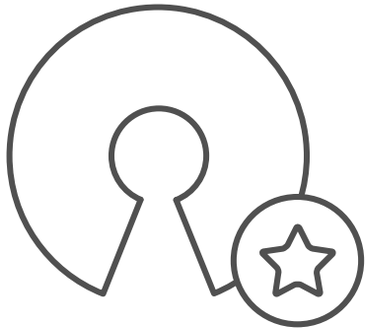
Community culture



Open source container code contributions



Numerous open source project builds



Open source community leadership

Open Source @ Microsoft

Ross Gardler

Apache Foundation

Principal Program Manager

Jessie Frazelle

Docker / Linux

Principal Cloud Developer Advocate

Brendan Burns

Kubernetes

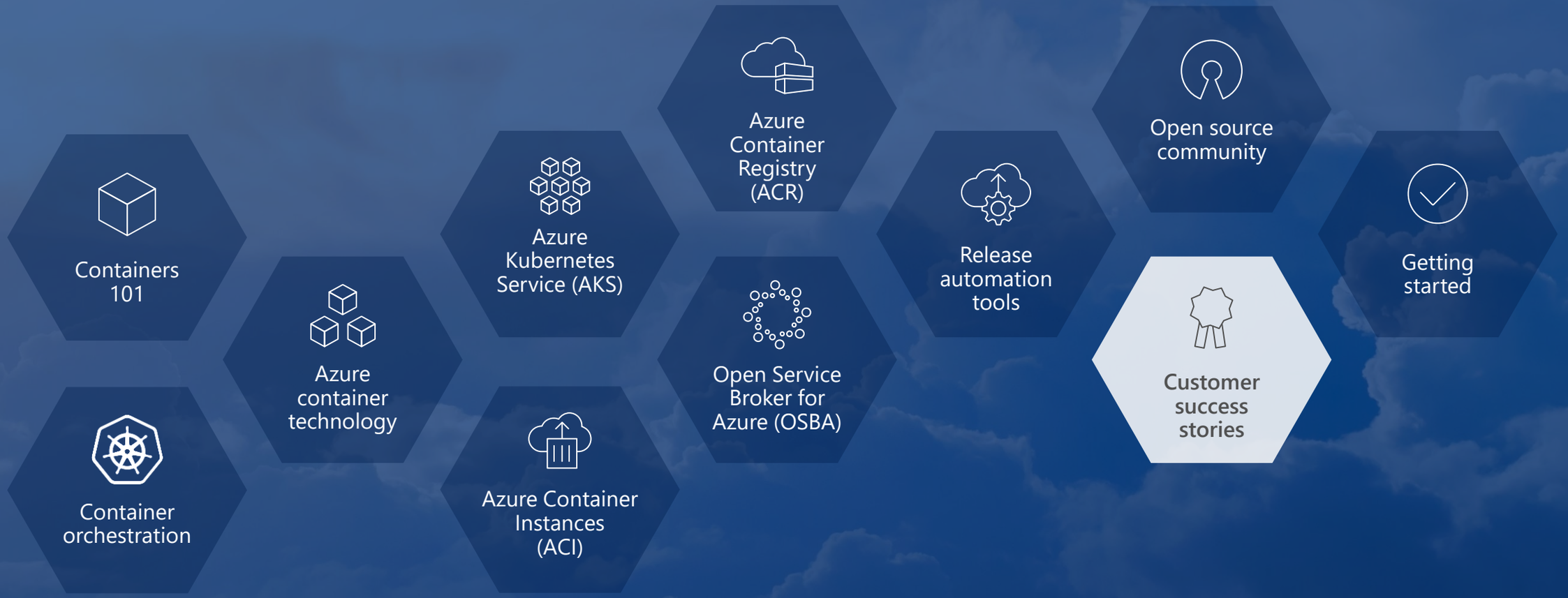
Distinguished Engineer

Gabe Monroy

Deis / CNCF

Principal Program Manager

Customer success stories



Rapidly growing software company attracts customers with seamless cloud demo experience

Headquartered in Freiburg, Germany, Jedox develops enterprise performance management software for businesses around the globe. Jedox chose Microsoft Azure to help it scale and grow. The company needed a more lightweight compute unit than virtual machines to power its website demos and provide a good customer experience. Jedox deployed Azure Container Instances to spin up customer demos on demand, improve provisioning speed, build confidence in the cloud, and lower IT costs.

Products and Services

Microsoft Azure
Microsoft Azure Container Instances

Organization Size

170 employees

Industry

Professional Services

Country

Germany

Altair Engineering democratizes HPC access using the cloud

Altair Engineering makes computer-aided engineering software used to create stronger, better, more innovative products, from bicycles to space shuttles. To make its HyperWorks and Inspire applications available to more engineers, Altair delivers them through its Unlimited platform running in Microsoft Azure. In Azure, these solutions have access to affordable high-performance computing (HPC) resources, which enables low-cost collaboration among large engineering teams and opens up new markets for Altair.

Altair

Products and Services

Microsoft Azure
Microsoft Azure Container Service
Microsoft Azure Virtual Machines

Organization Size

2,000 Employees

Industry

Manufacturing

Country

United States

Energy company electrifies pace of innovation and expansion

Ambit Energy provides electricity and natural-gas services in deregulated markets around the world. It uses technology as a competitive differentiator, employing microservices, DevOps, and continuous deployment to speed software development. To stand up infrastructure just as quickly, Ambit uses Microsoft Azure services such as Azure Container Service, together with infrastructure as code and open source technologies, to completely automate infrastructure provisioning. By implementing Azure, Ambit can move dramatically faster to enhance its services and enter new markets. Infrastructure redundancy is flexible and worry-free. And costs are 22 percent lower, which helps Ambit compete in the crowded electricity market. Because Ambit's cloud journey is gradual, it appreciates the fact that Azure is a great hybrid-cloud enabler, connecting easily to Ambit datacenters.

AMBIT ENERGY

Products and services

Microsoft Azure Container Service

Organization size

1,000 employees

Industry

Power and utilities

Country

United States

Business need

Optimize operational efficiency

Siemens Health leverages technology to connect medical devices to the cloud through AKS

Digitization and networking between healthcare providers and software development companies are essential to value-based care. Moving from the development of value-added services into becoming more of a platform provider, it became important for Siemens to adopt a microservices approach to application delivery. To that end, Siemens adopted Azure Container Service (AKS) to run their microservices-based apps. AKS puts Siemens in a position not only to deploy business logic in Docker containers—including the orchestration—but also enables them to use an applicant gateway and API management to manage exposure, control, and to meter the access continuously. With their cloud-based development approach, Siemens has driven newfound product development agility. This project is already having a positive impact within the healthcare industry.

SIEMENS

Products and services

Microsoft Azure Container Service

Organization size

100,000+ employees

Industry

Healthcare

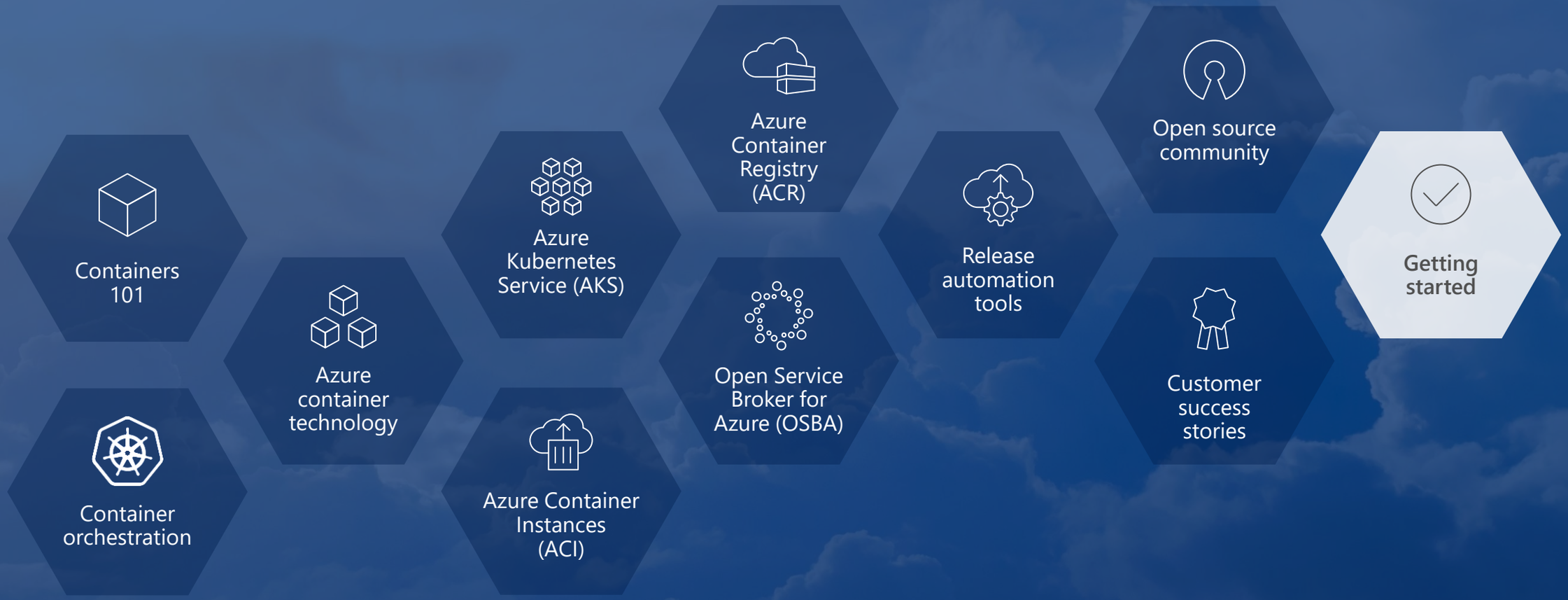
Country

Germany

Business need

Faster application development

Getting started



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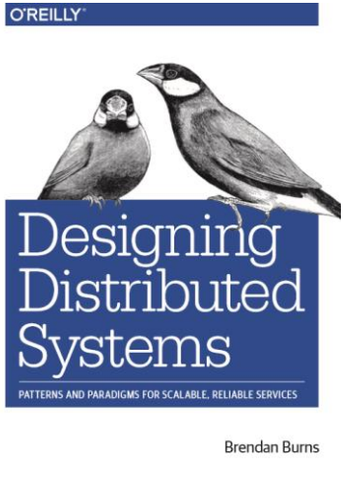

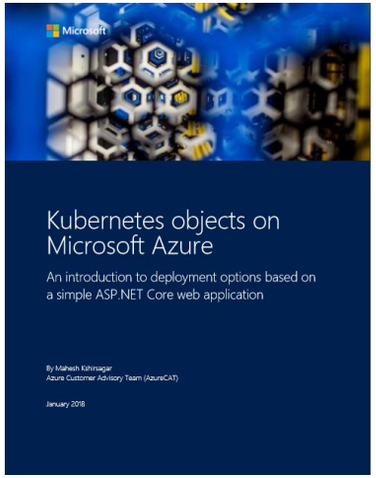

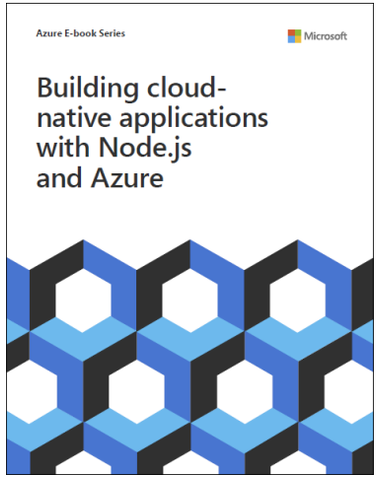

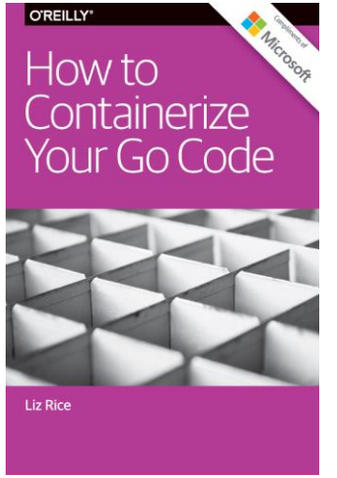

Reminder about Day2 Tomorrow

- Break into Partner Teams & Bring Your Own App
  - Web/API + Database
- Challenge-Based
  - Challenge-based with Proctor Sign-off
- No Step-by-Step, but Proctor Support
  - Here to help you with your App

Questions?