Microsoft

Why Kubernetes on Azure

Gabe Monroy, Lead PM, Azure Containers
Alessandro Pilotti, Cloudbase Solutions
Andy Randall, Co-founder, Tigera

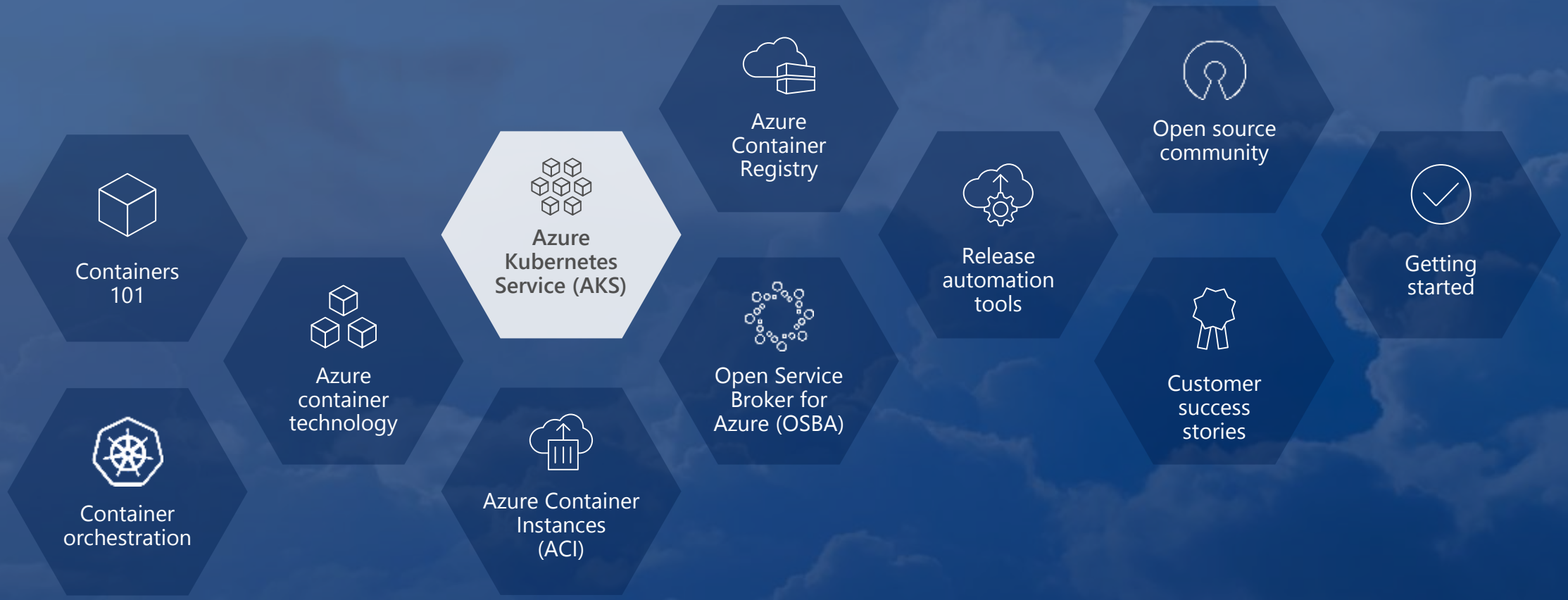
BRK2125

Azure container **momentum**

Kubernetes on Azure usage grew 10x
Kubernetes on Azure customers grew 5x

…over the last 12 months

Azure Kubernetes Service (AKS)



Azure Kubernetes Service (AKS)

Azure Container Instances (ACI)

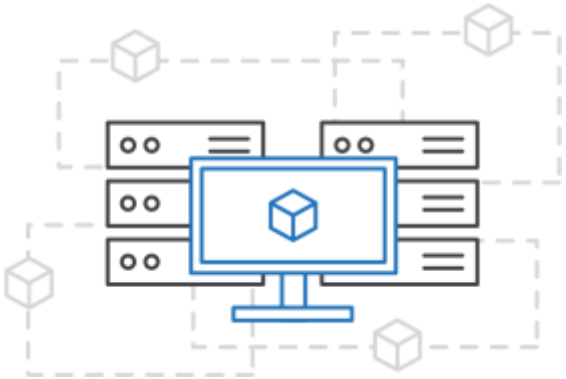
Azure Container Registry

Open Service Broker API (OSBA)

Release Automation Tools

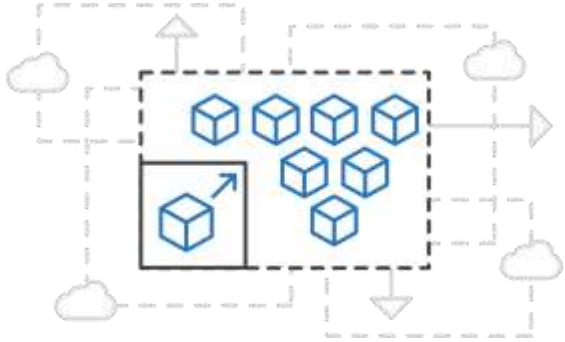
Azure Kubernetes Service (AKS)

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

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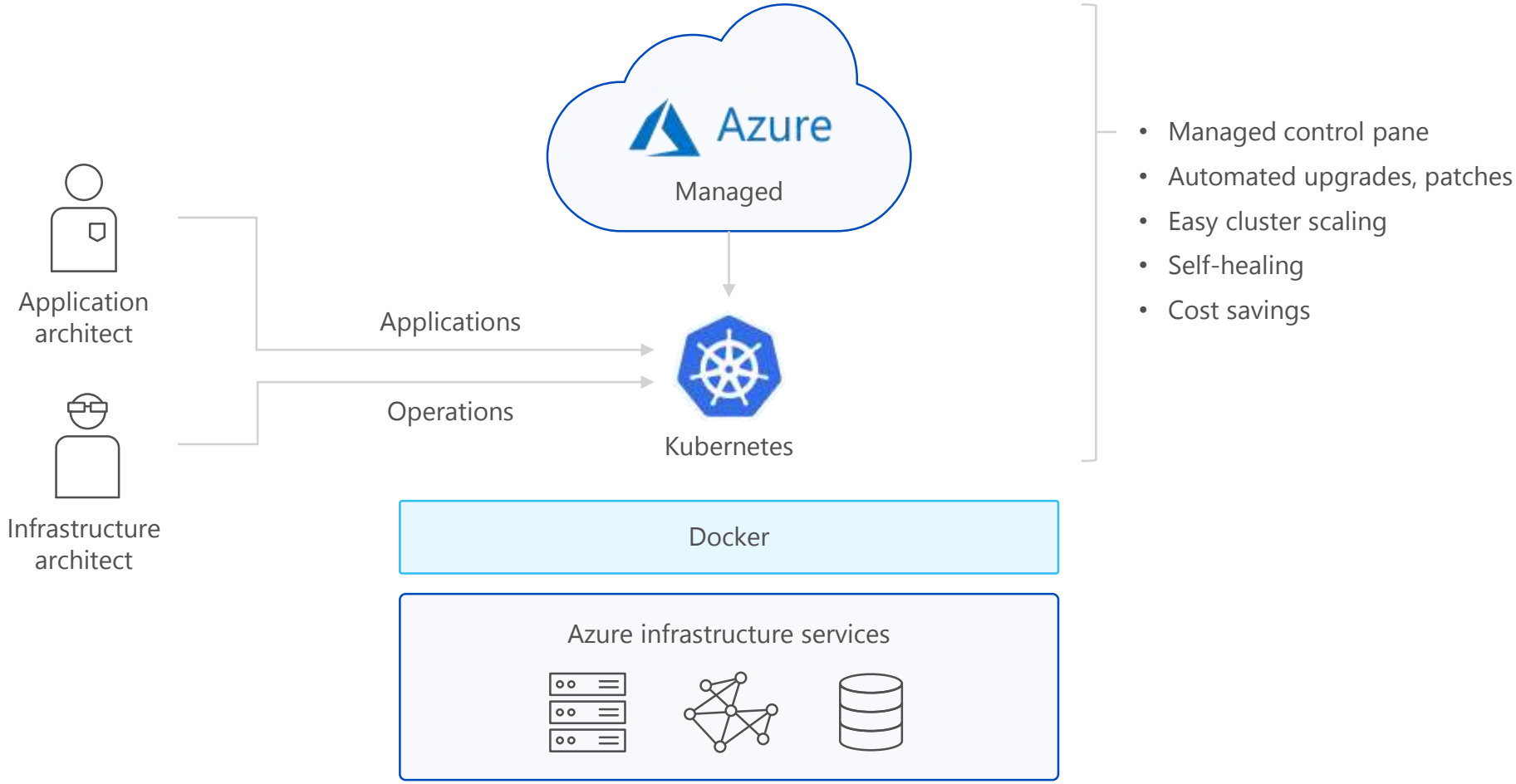
Azure Kubernetes Service (AKS)

A fully managed Kubernetes cluster



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Azure Kubernetes Service (AKS)

Get started easily

```
> az aks create -g myResourceGroup -n myCluster --generate-ssh-keys
\ Running ..

> az aks install-cli
Downloading client to /usr/local/bin/kubectl ..

> az aks get-credentials -g myResourceGroup -n myCluster
Merged "myCluster" as current context ..

> kubectl get nodes
NAME                          STATUS    AGE       VERSION
aks-mycluster-36851231-0      Ready     4m        v1.8.1
aks-mycluster-36851231-1      Ready     4m        v1.8.1
aks-mycluster-36851231-2      Ready     4m        v1.8.1
```

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Azure Kubernetes Service (AKS)

Manage an AKS cluster

```
> az aks list –o table
Name                Location    ResourceGroup     KubernetesRelease  ProvisioningState
------------------  ----------  --------------  -------------------  -------------------
myCluster           westus2     myResourceGroup               1.7.7  Succeeded
```

```
> az aks upgrade -g myResourceGroup -n myCluster –-kubernetes-version 1.8.1
\ Running ..
```

```
> kubectl get nodes
NAME                          STATUS    AGE       VERSION
aks-mycluster-36851231-0      Ready     12m       v1.8.1
aks-mycluster-36851231-1      Ready     8m        v1.8.1
aks-mycluster-36851231-2      Ready     3m        v1.8.1
```

```
> az aks scale -g myResourceGroup -n myCluster --agent-count 10
\ Running ..
```

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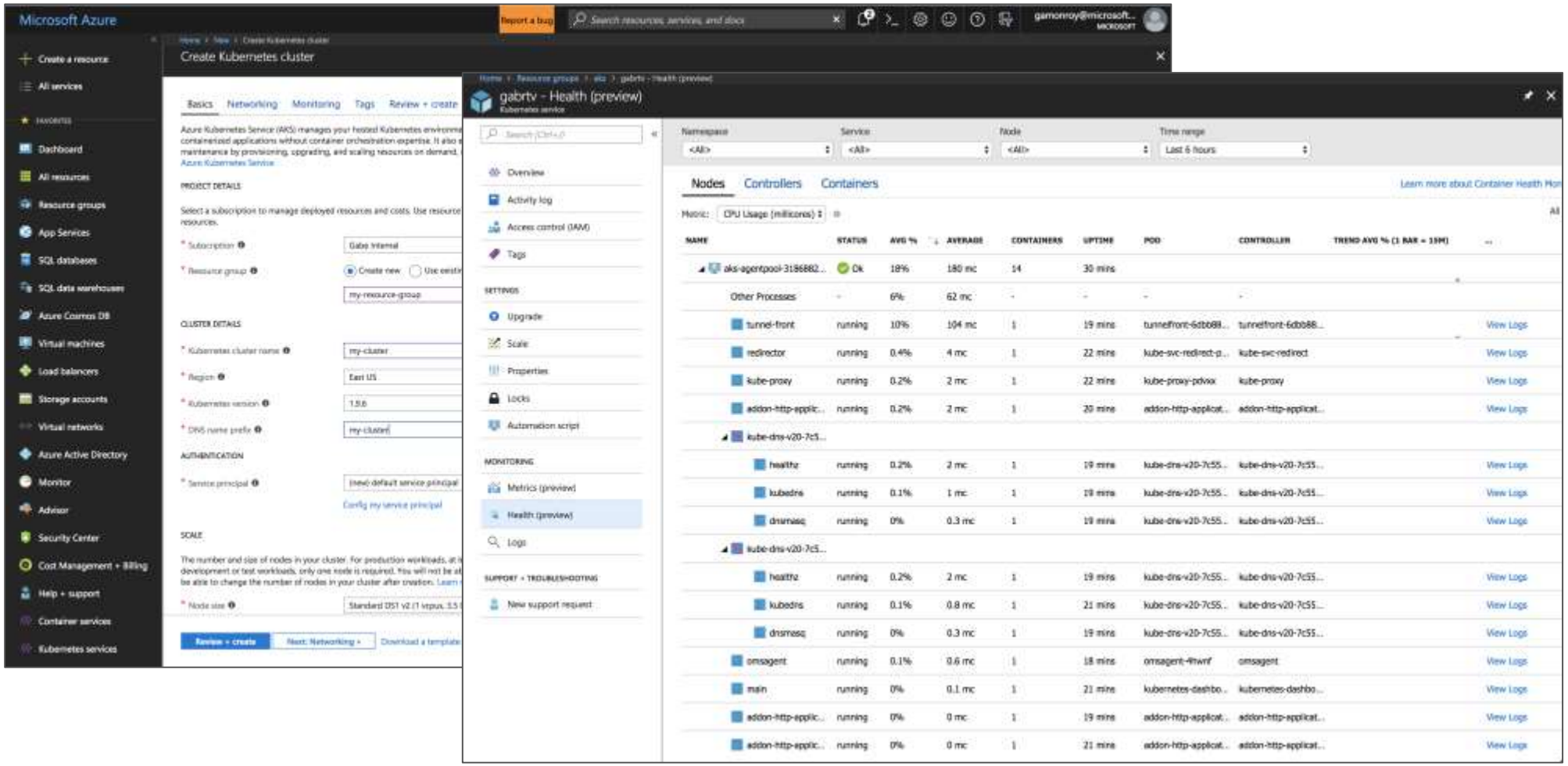
Azure Kubernetes Service (AKS)

Azure Portal Experience



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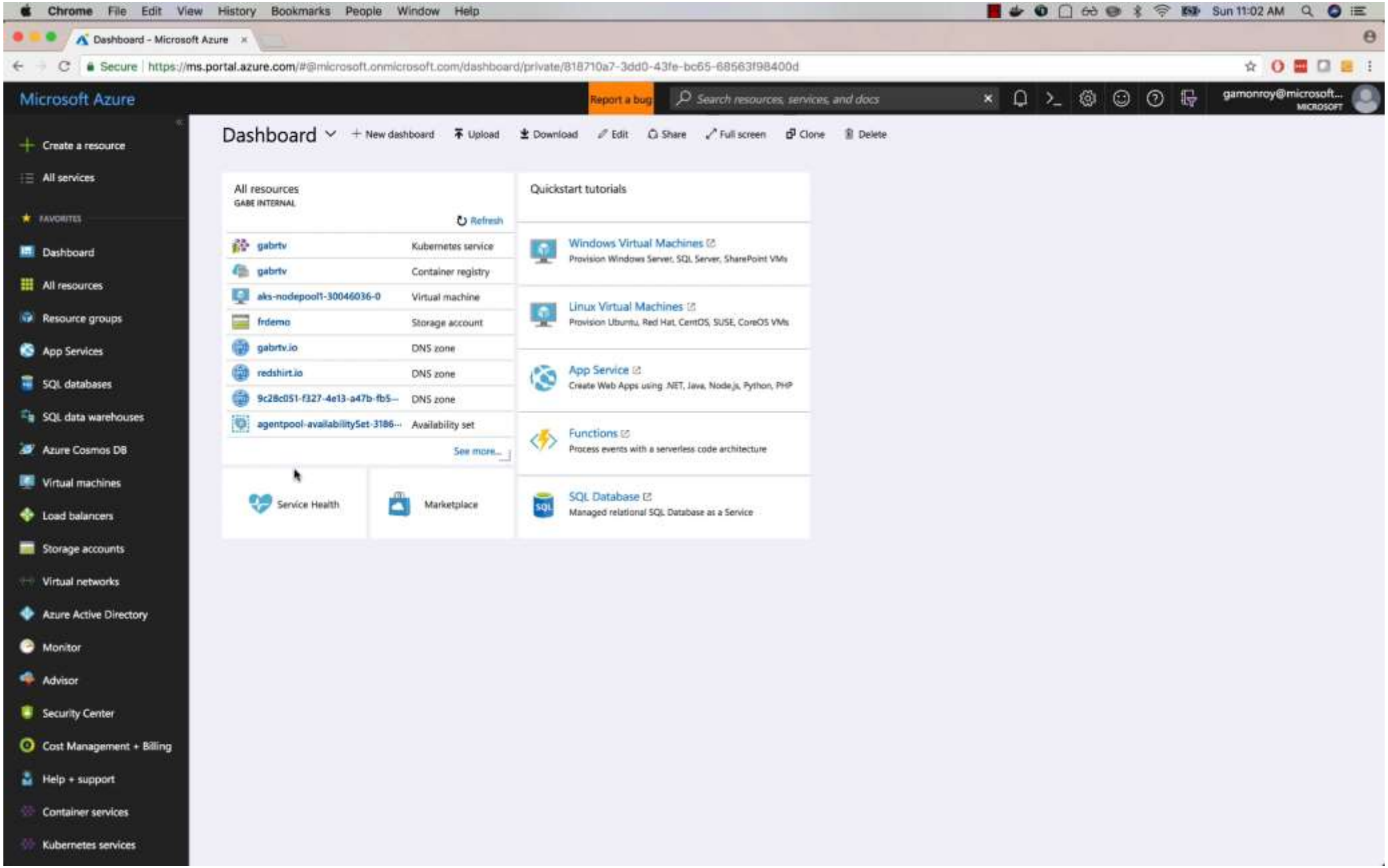
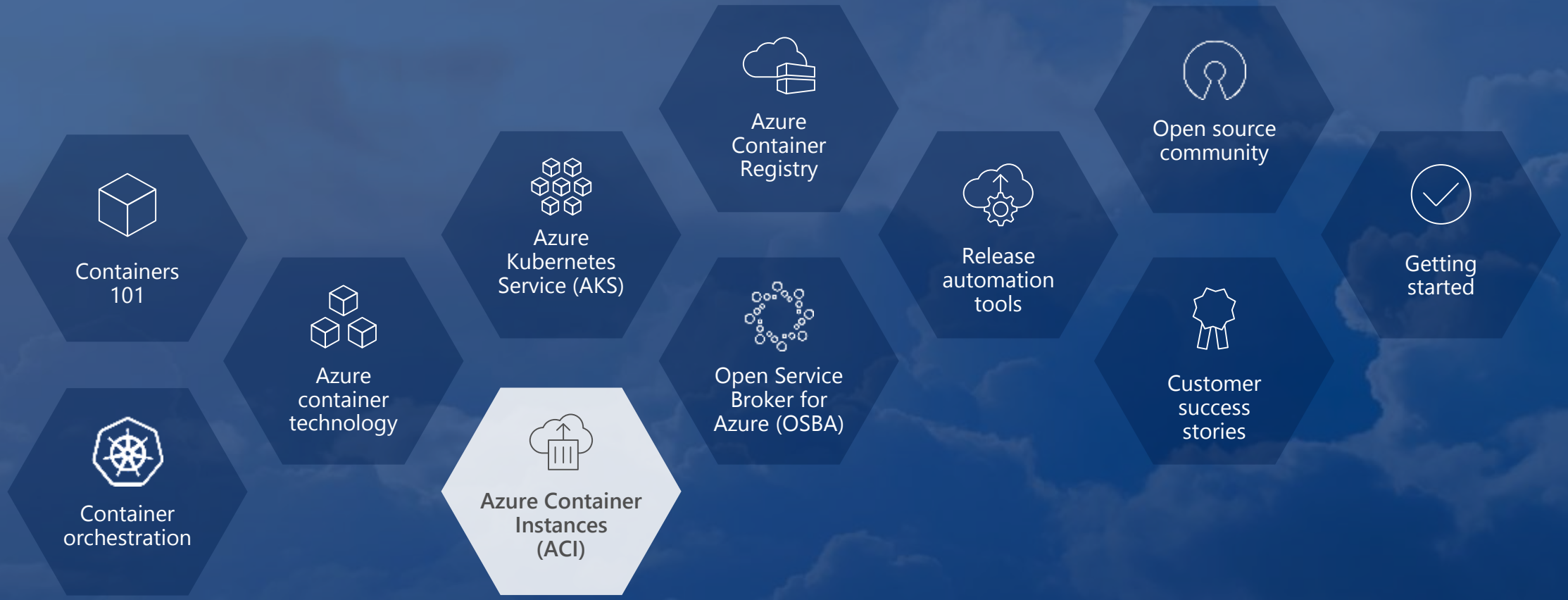


Azure Container Instances (ACI)



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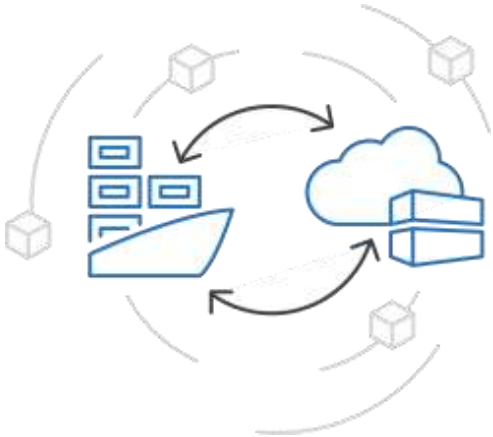
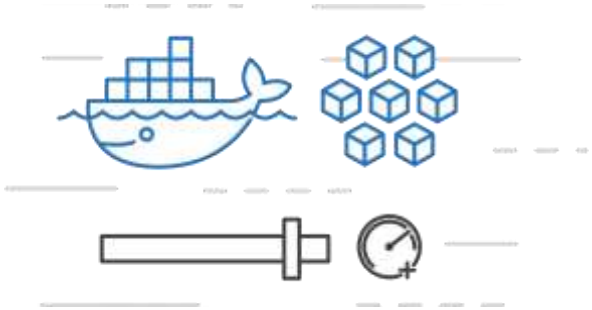
Azure Container Instances (ACI)

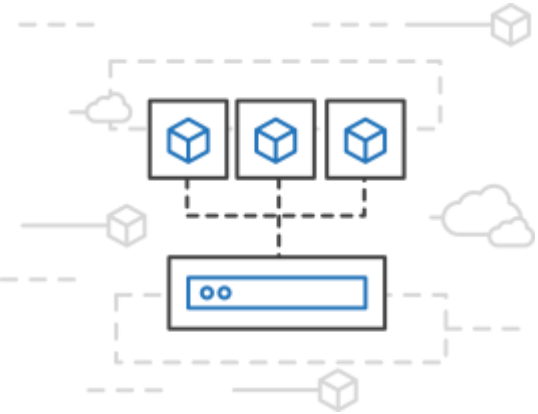
Easily run containers on Azure with a single command



Start using containers right away



Cloud-scale container capacity



Hyper-visor isolation

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Azure Container Instances (ACI)

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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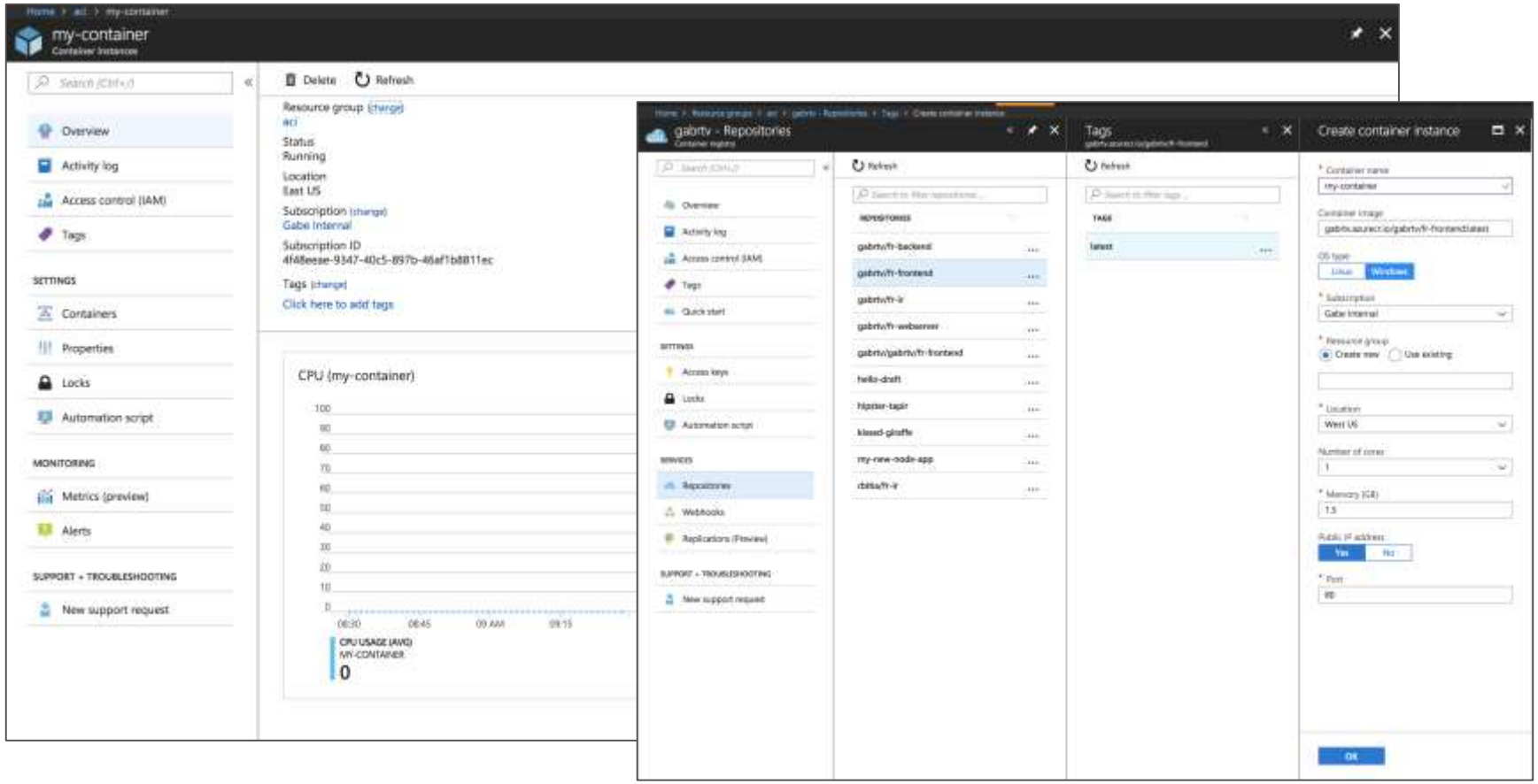
Azure Container Instances (ACI)

Azure Portal Experience



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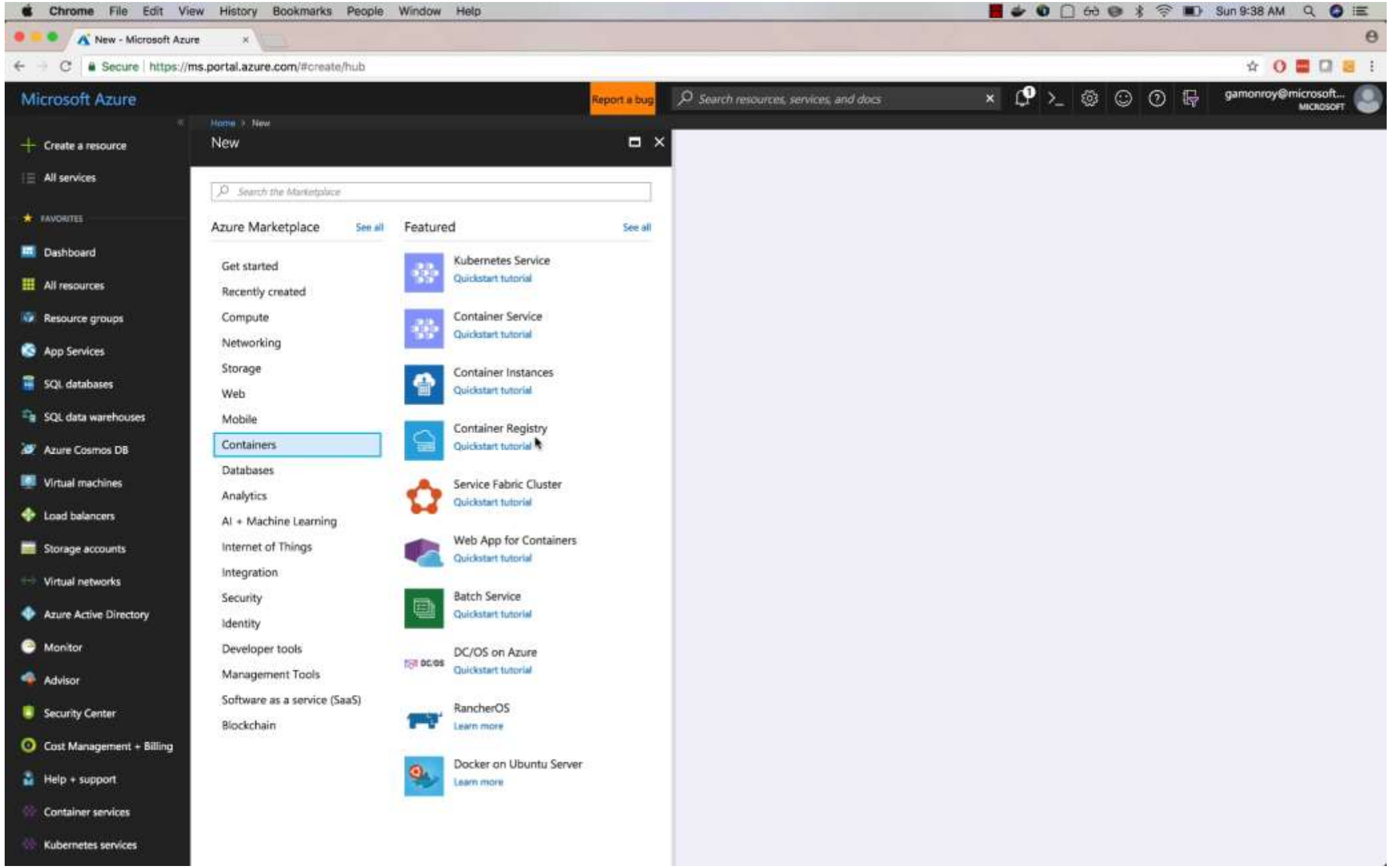

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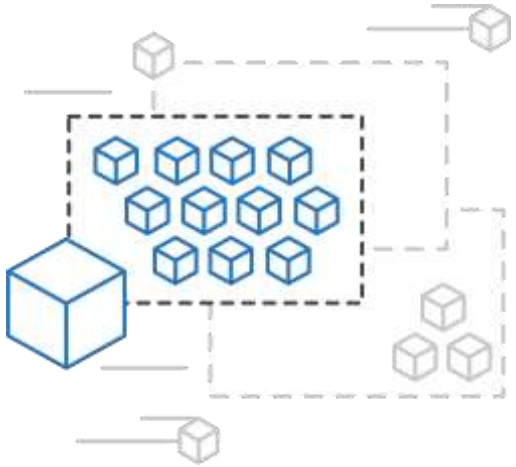
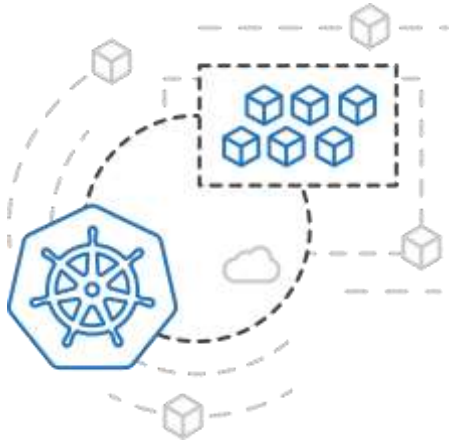
Azure Container Instances (ACI)

Virtual Kubelet

Kubernetes provides rich orchestration capabilities



ACI provides infinite container-based scale



The Virtual Kubelet brings them together

Azure Kubernetes Service (AKS)

Azure Container Instances (ACI)

Azure Container Registry

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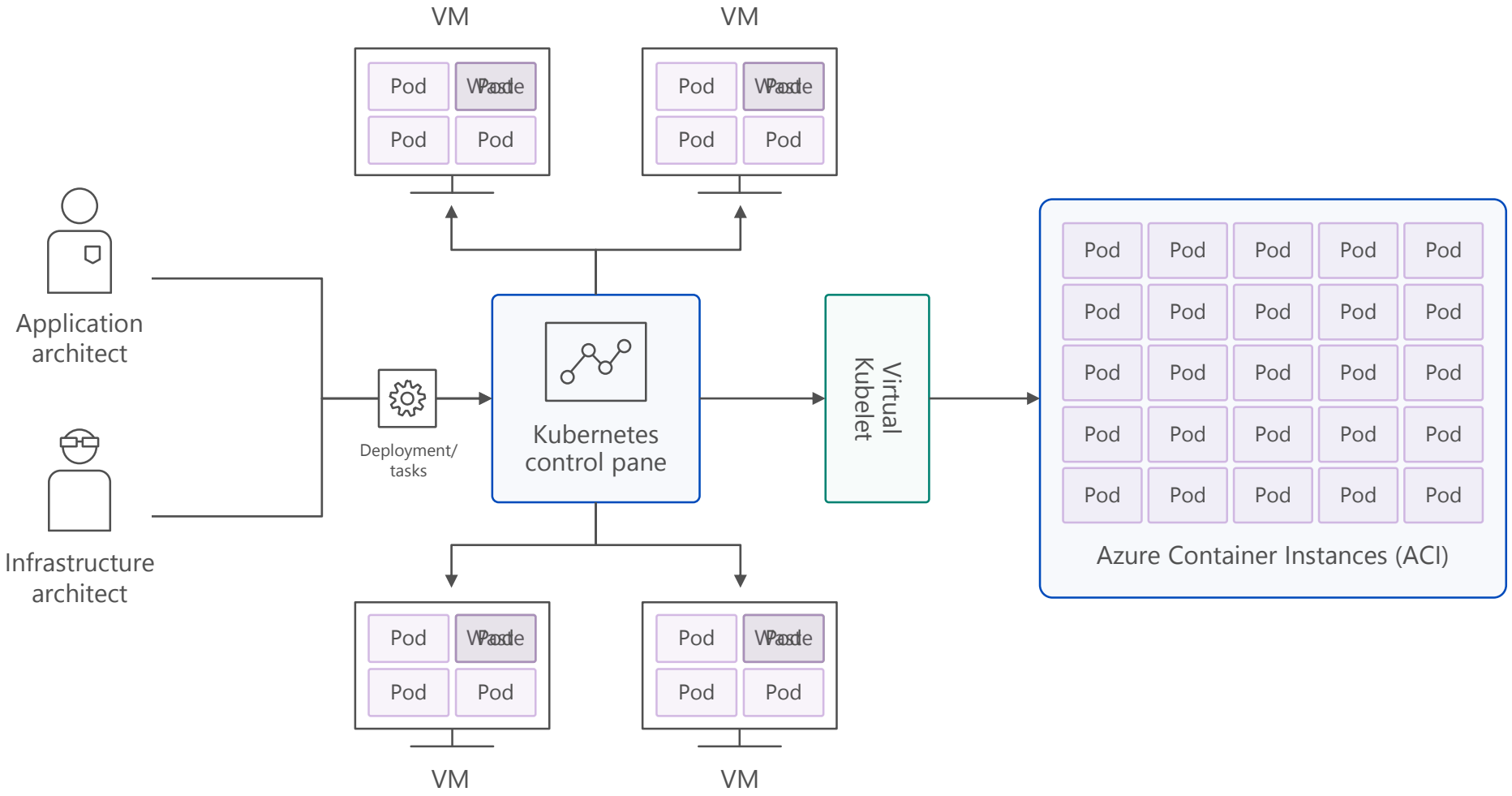
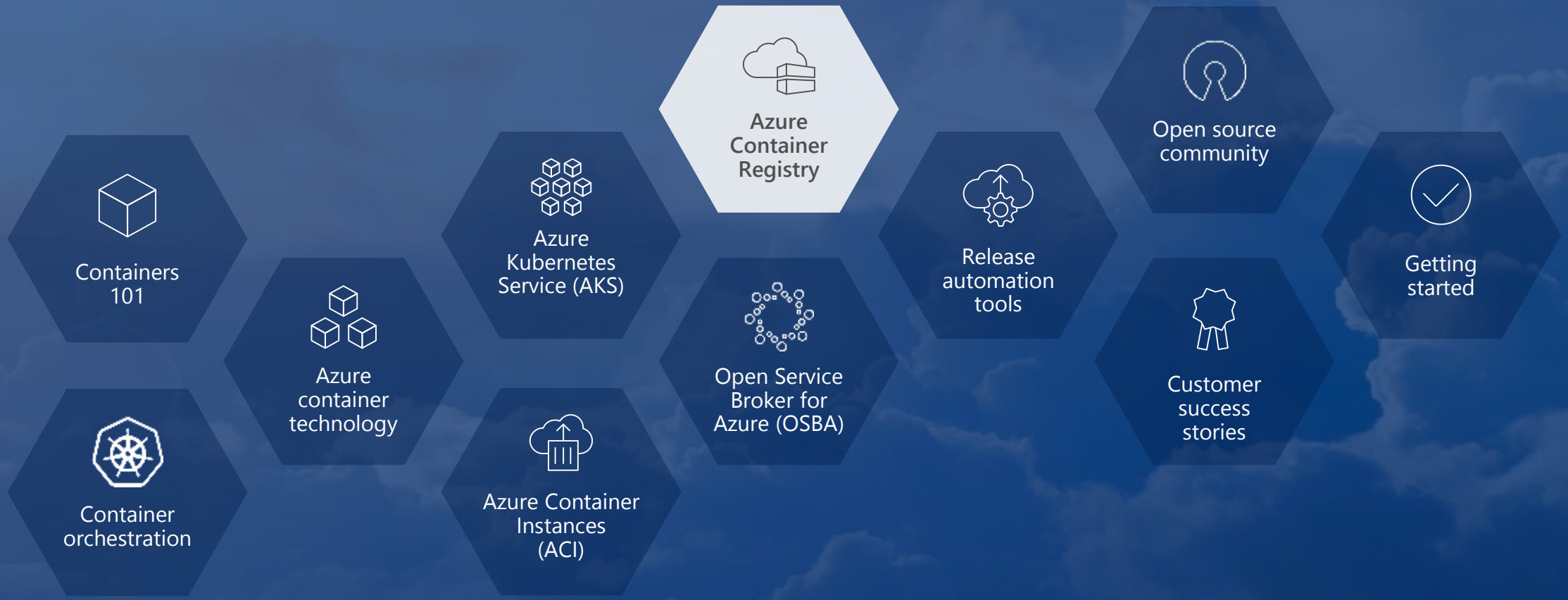
Release Automation Tools

Azure Container Instances (ACI)

Bursting with the Virtual Kubelet



Azure Container Registry



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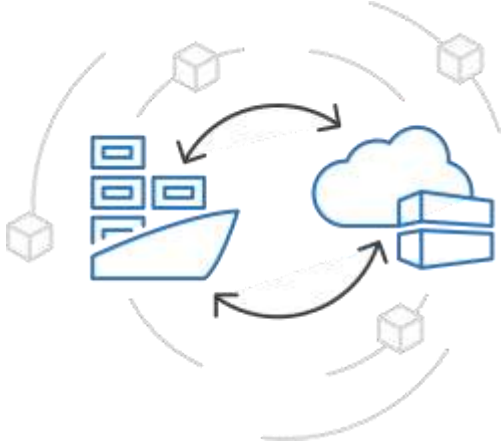
Release Automation Tools

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

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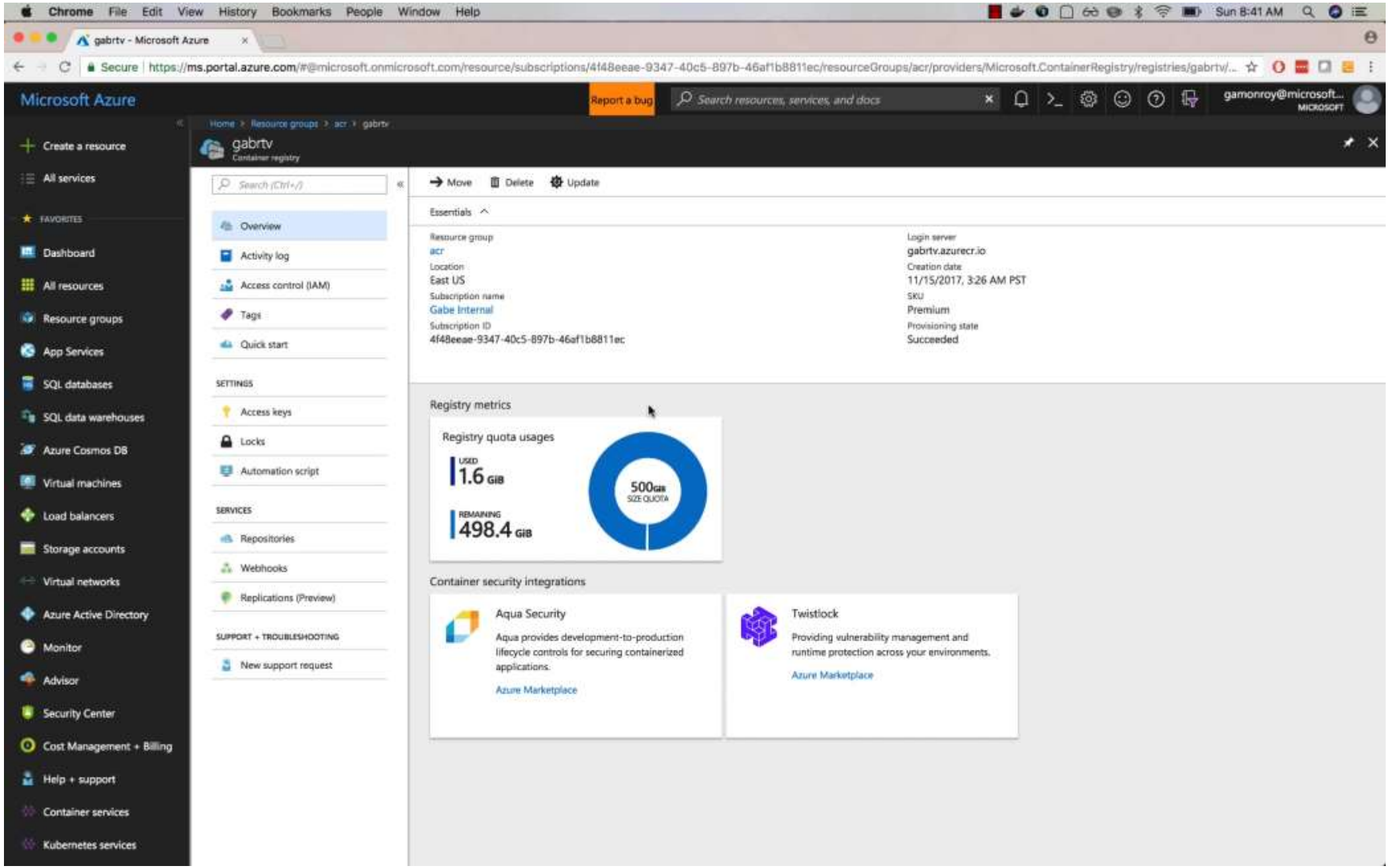
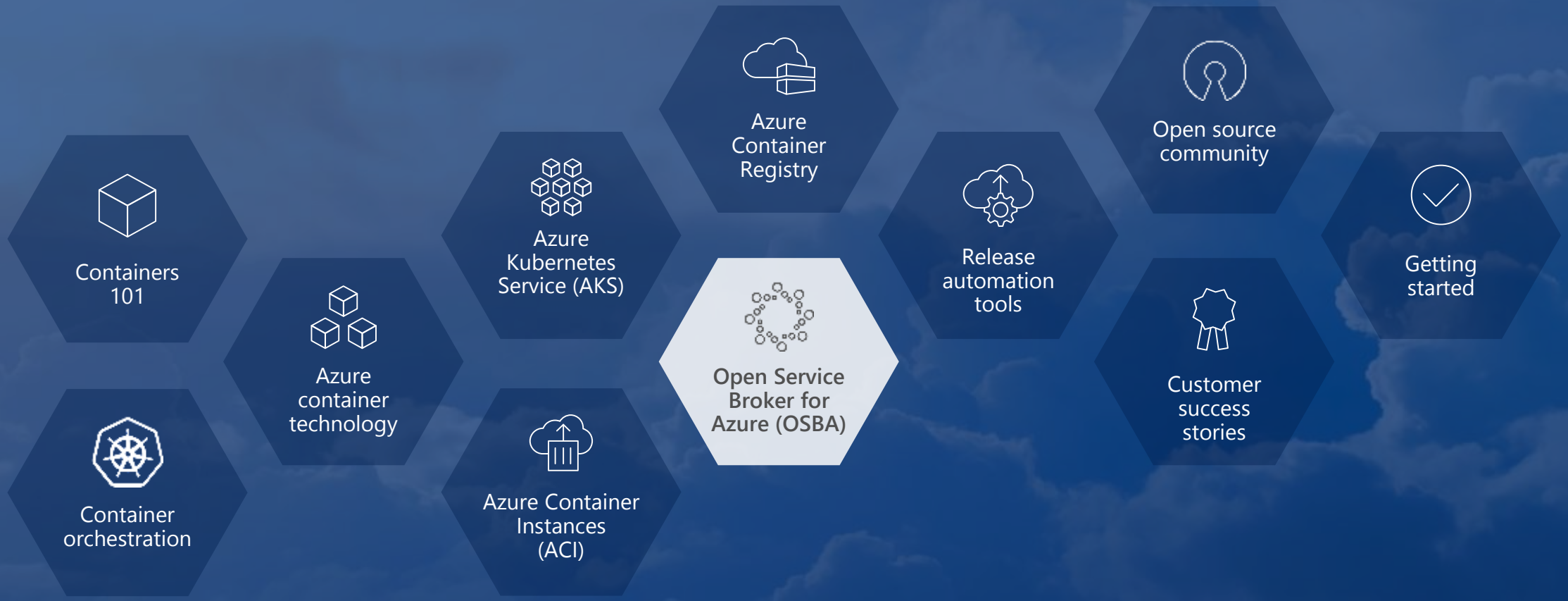


Open Service Broker for Azure



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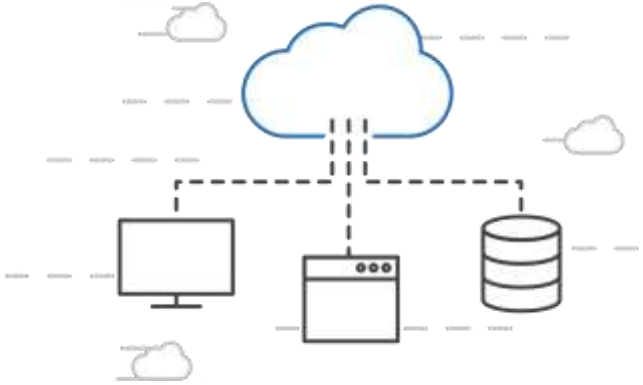
Release Automation Tools

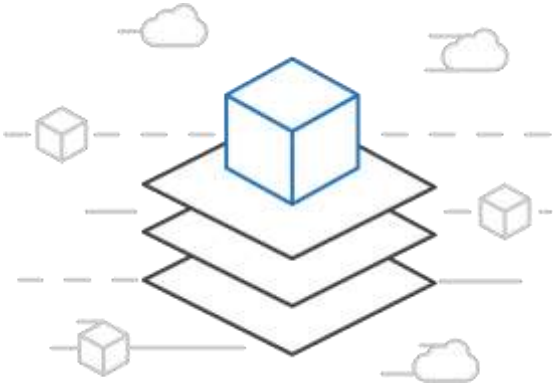
Open Service Broker for Azure (OSBA)

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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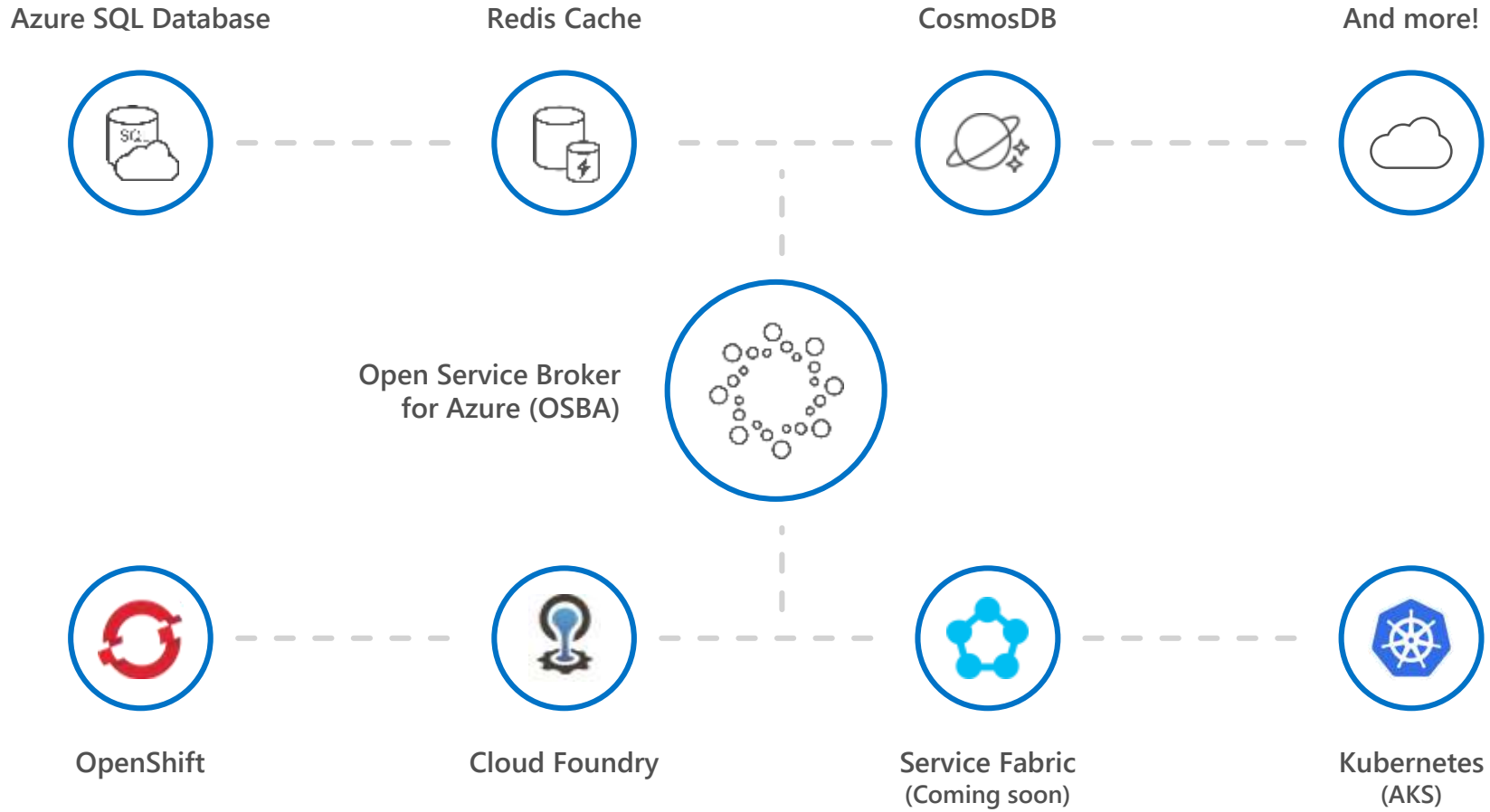
Open Service Broker for Azure (OSBA)

An implementation of the Open Service Broker API



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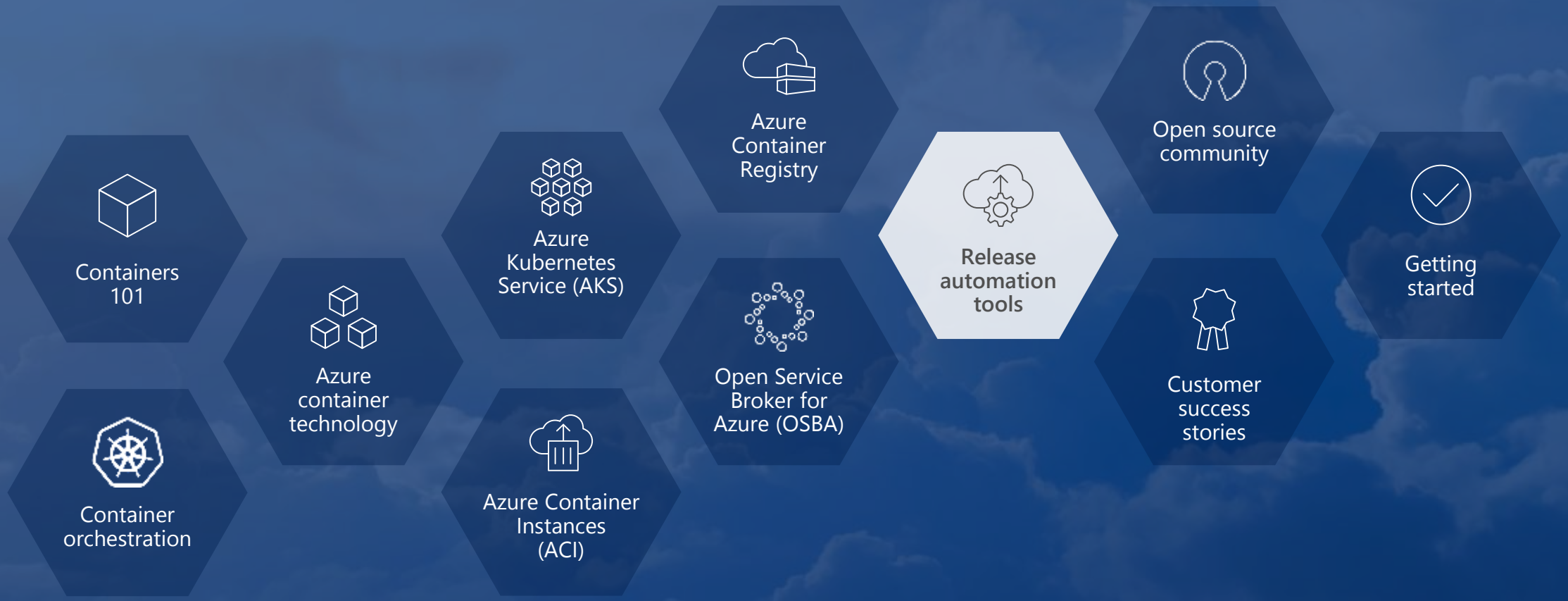
Open Service Broker for Azure (OSBA)

Getting started with ease

```
> helm repo add azure
      https://kubernetescharts.blob.core.windows.net/azure

> helm install azure/wordpress
```

Release automation tools



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Release Automation Tools

Release automation tools

Simplifying the Kubernetes experience

HELM

The package manager for Kubernetes

DRAFT

Streamlined Kubernetes development

BRIGADE

Event-driven scripting for Kubernetes

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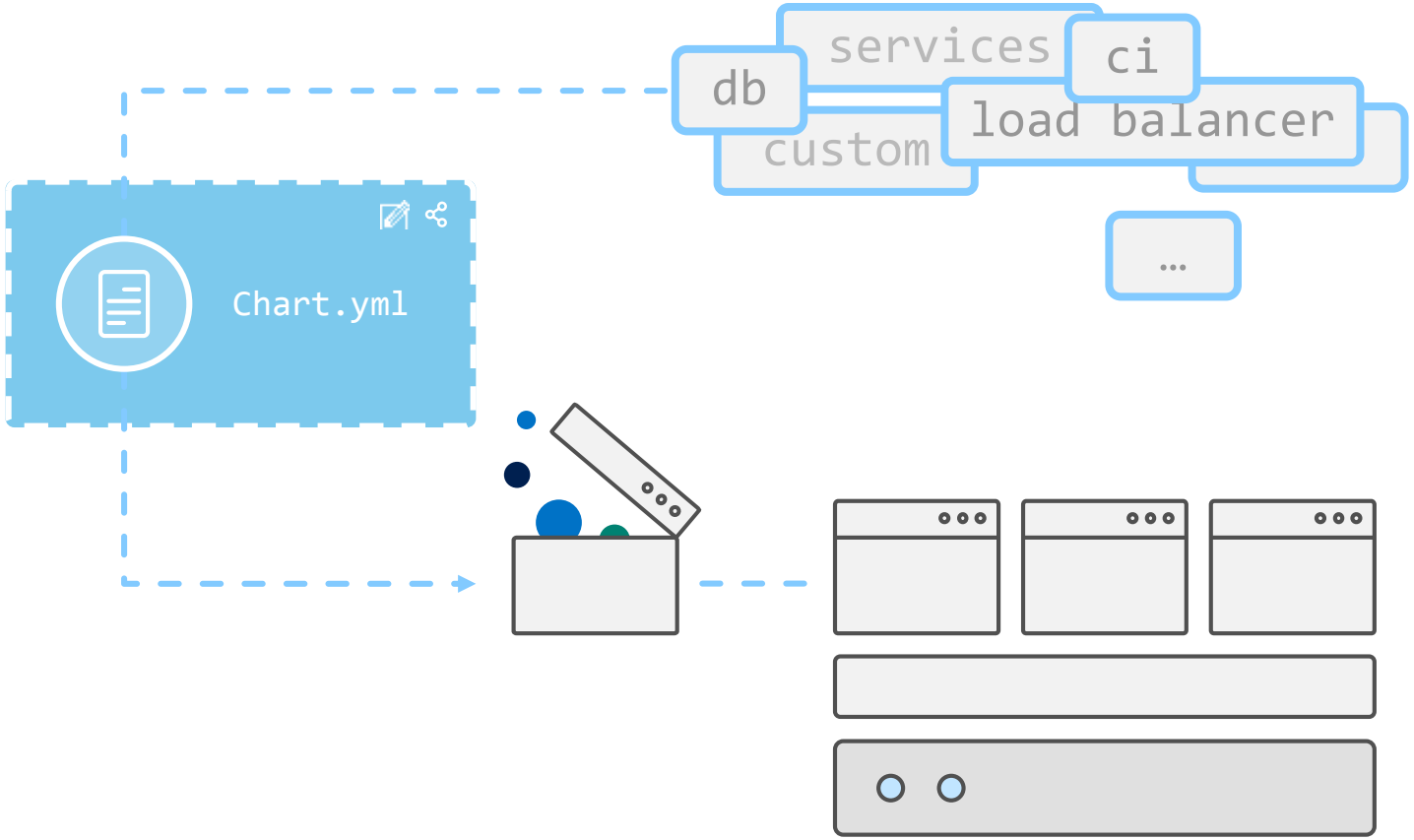
Release Automation Tools

Helm

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



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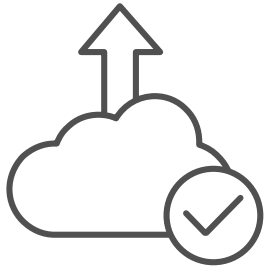
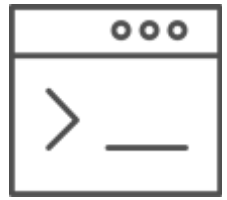
Draft

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

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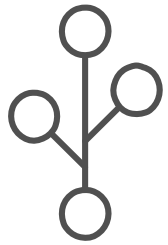
Release Automation Tools

Brigade

Run scriptable, automated tasks in the cloud — as part of your Kubernetes cluster



Simple, powerful pipes

Each project gets a `brigade.js` config file, which is where you can write dynamic, interwoven pipelines and tasks for your Kubernetes cluster

Runs inside your cluster

By running Brigade as a service inside your Kubernetes cluster, you can harness the power of millions of available Docker images

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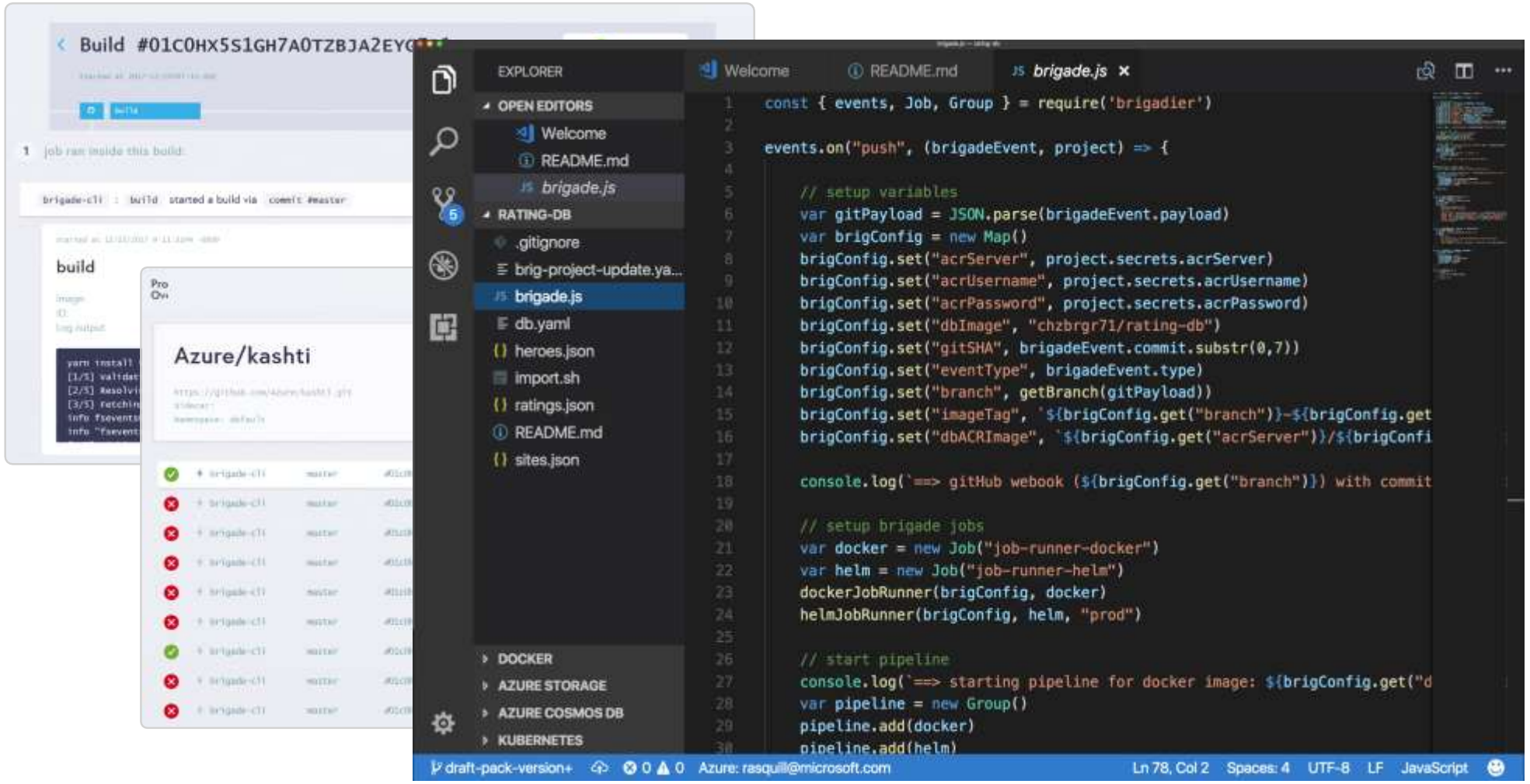
Brigade

Brigade in action



Microsoft

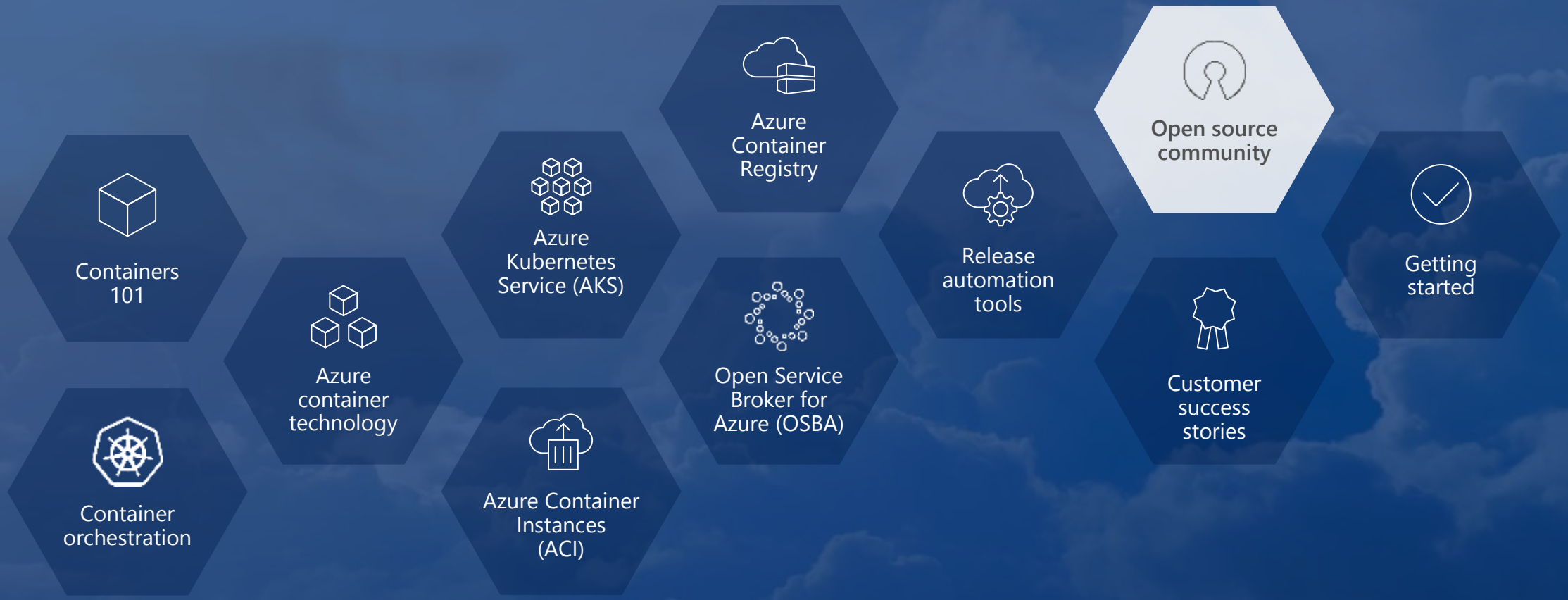
Bringing Draft to Visual Studio

Alessandro Pilotti, Cloudbase Solutions

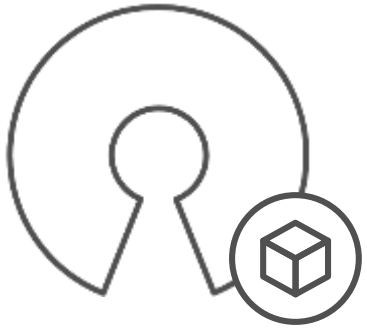
@cloudbase.it | https://cloudbase.it
https://github.com/cloudbase/VSKubernetes

BRK2125

Open source community



Community culture



Open source container code contributions

Numerous open source project builds

Open source community leadership

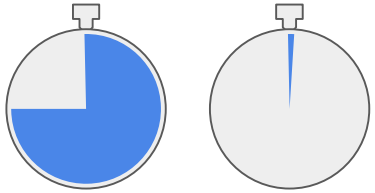
Microsoft

Microsoft and Tigera: Collaborating to Secure Container Networking

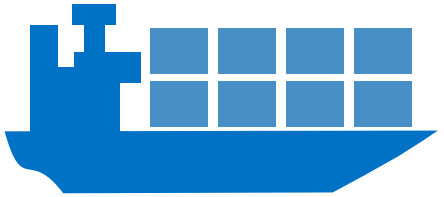
Andy Randall
Co-founder, VP Partners & Customer Success
Tigera

BRK2125

Implications of Dynamically Orchestrated Containers

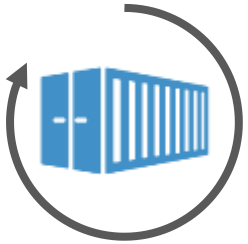


900x
start time



10x
workloads

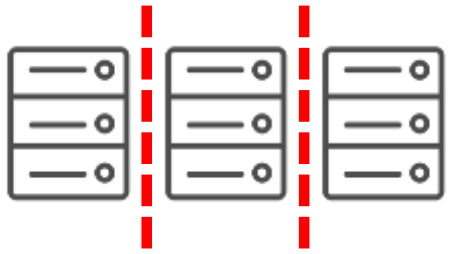
25x shorter
lifetime



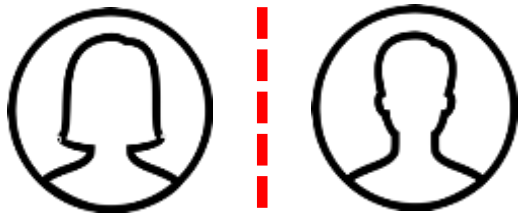
250x
network churn

10x
attack surface area

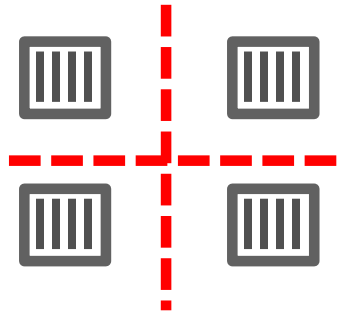
Motivation for Network Policy



Stage/tier separation



Tenant/namespace isolation



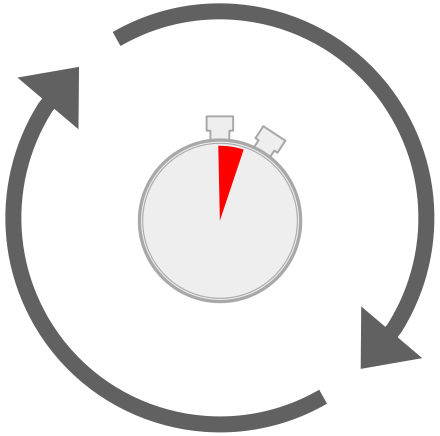
Micro-segmentation

Compliance

Kubernetes Network Policy

Label-based

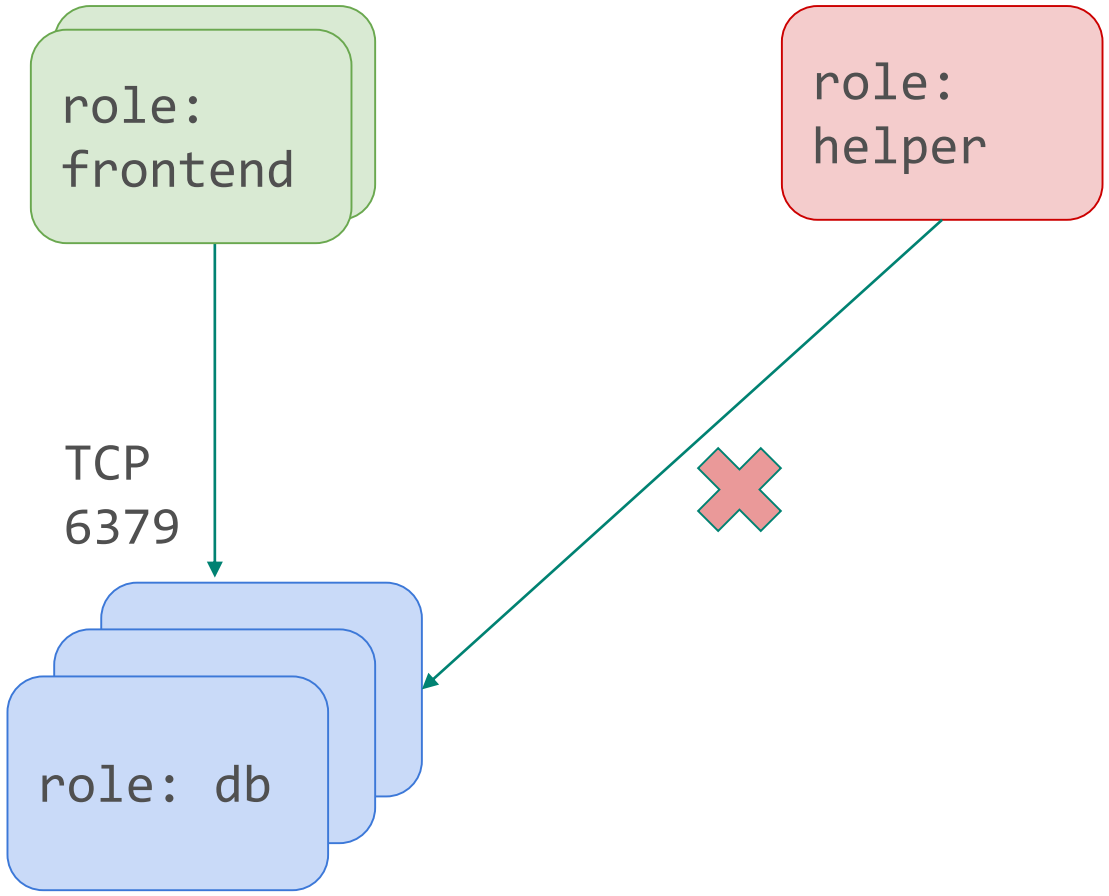
Declarative



Dynamic

Kubernetes Network Policy Example

```
apiVersion: networking.k8s.io/v1
kind: NetworkPolicy
metadata:
  name: my-network-policy
  namespace: my-namespace
spec:
  podSelector:
    matchLabels:
      role: db
  ingress:
  - from:
    - podSelector:
        matchLabels:
          role: frontend
    ports:
    - protocol: TCP
      port: 6379
```



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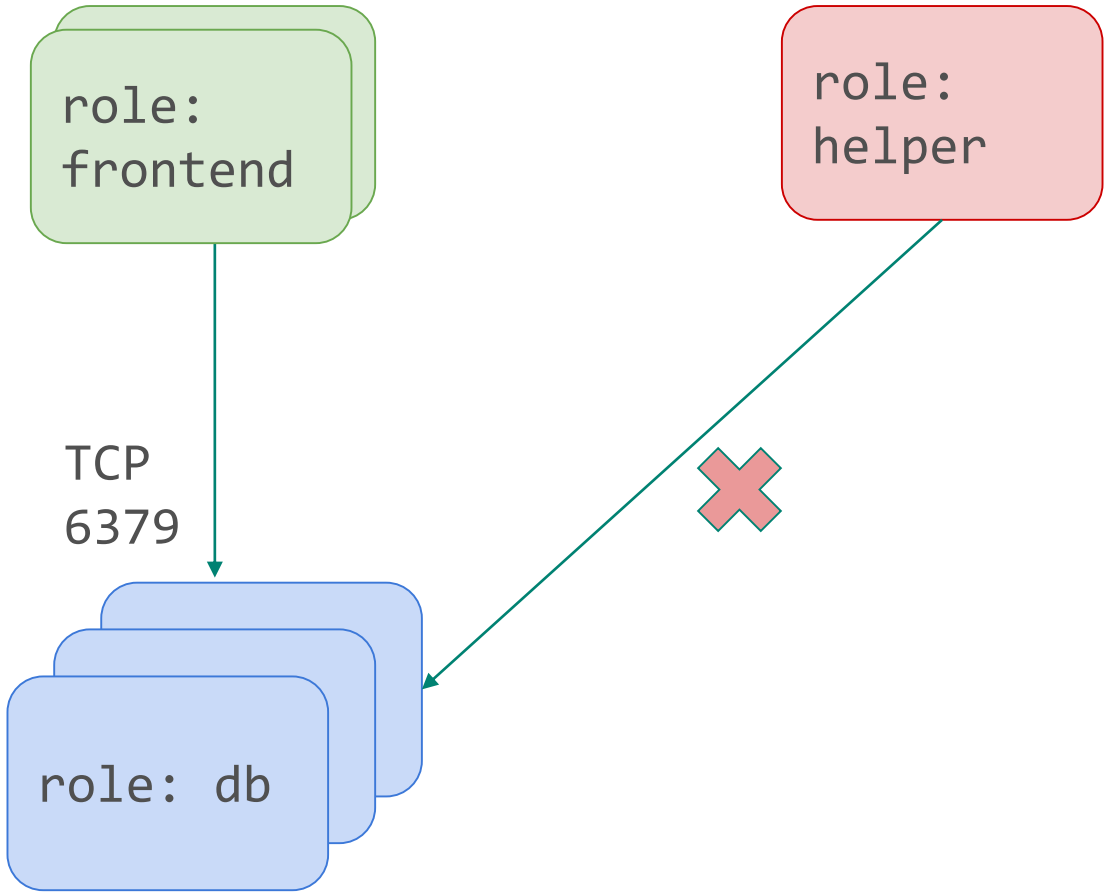

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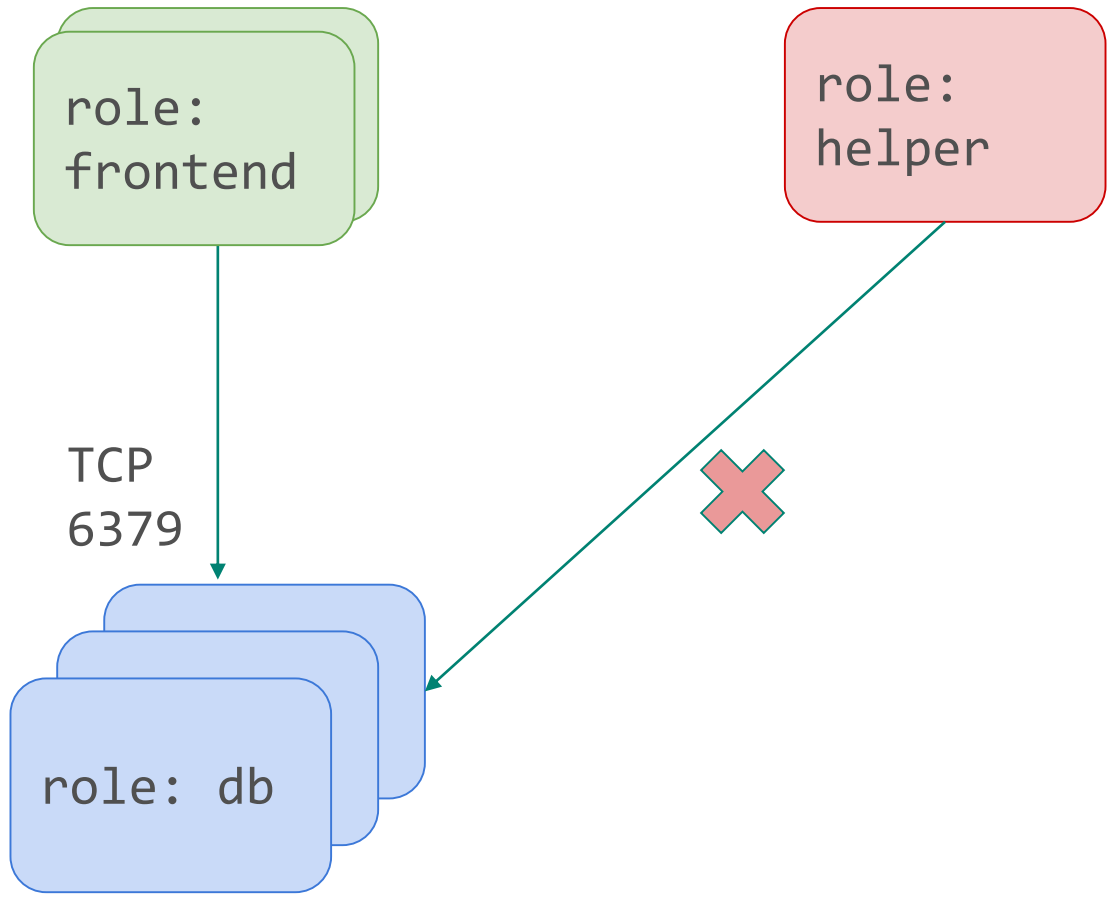

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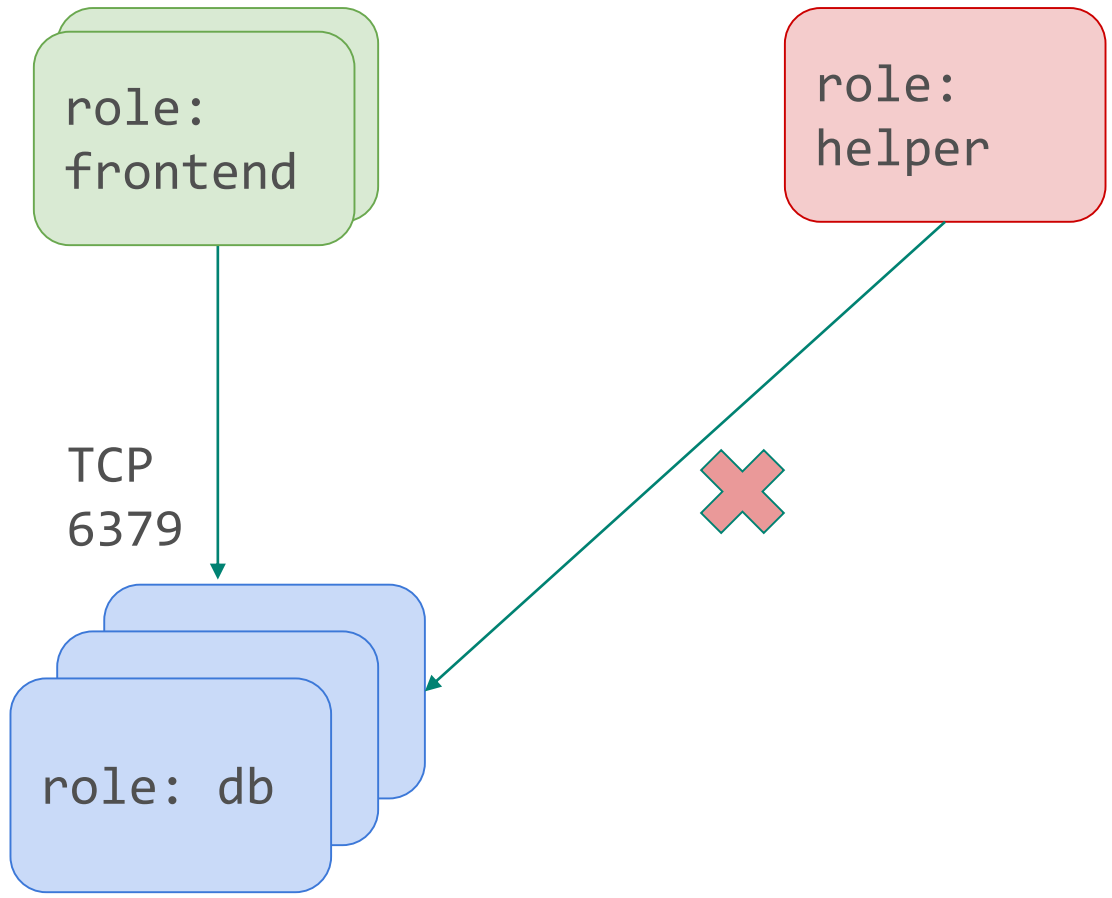

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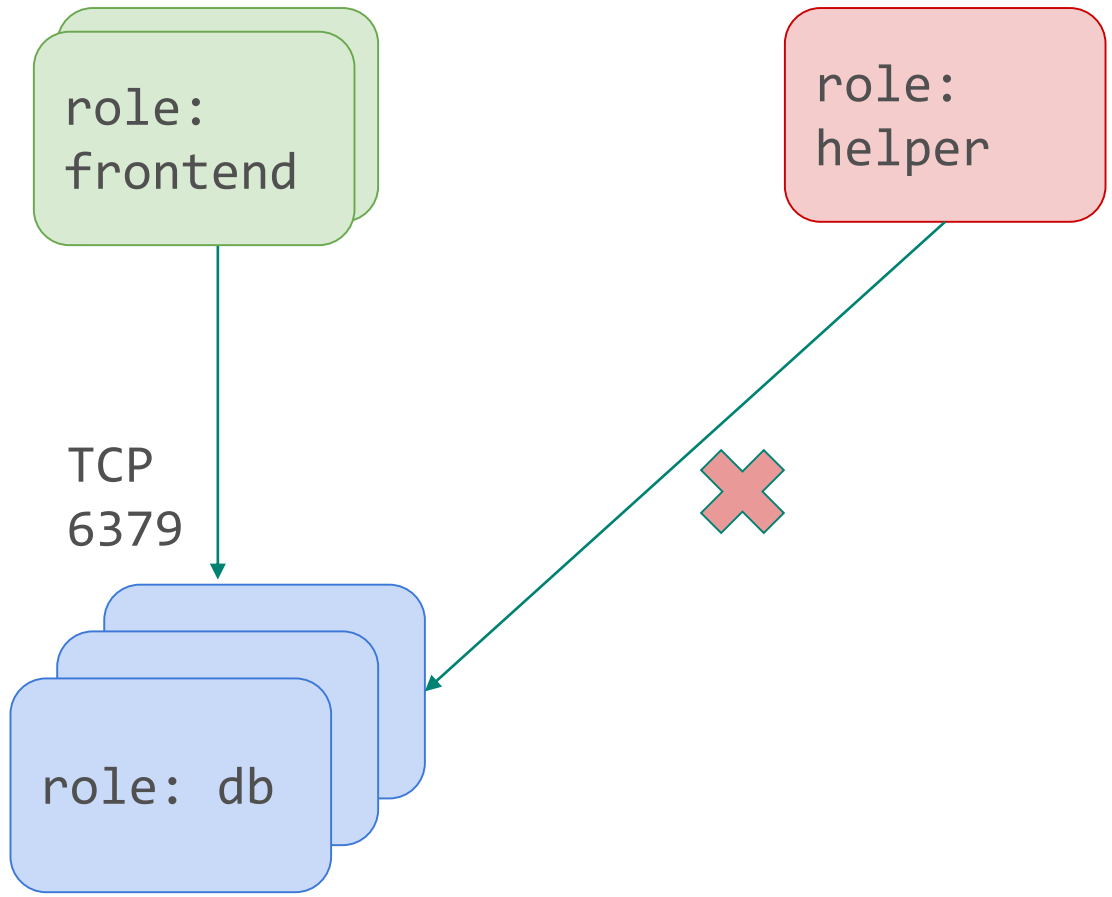


Calico, by Tigera, is the Industry's Gold-Standard Network Policy Technology

Free & open source
100's of contributors

Broad adoption
Large community

Proven reliability and performance

Enterprise Solutions from Tigera

Microsoft and Tigera Collaboration

Microsoft + TIGERA

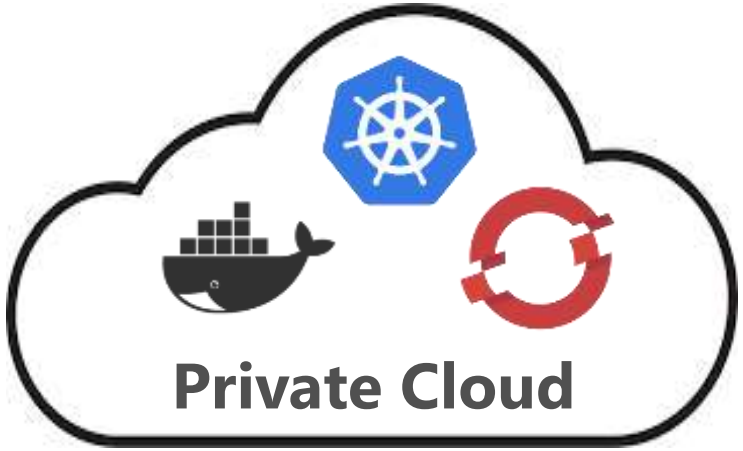
Calico + Azure CNI in ACS Engine

Sample Helm Charts

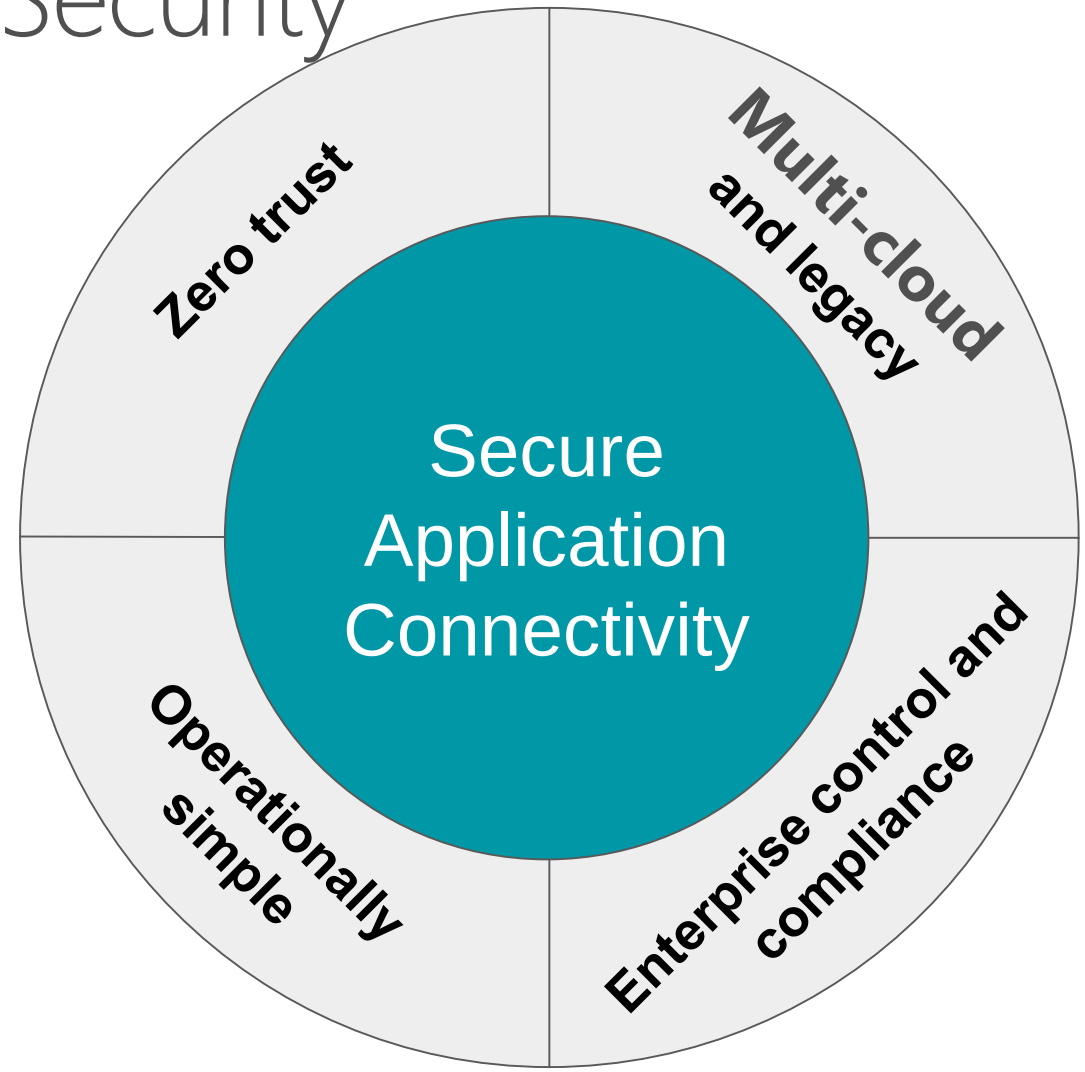
Network Policy for AKS

Calico for Windows

Apply Your Calico Policies Wherever You Deploy Your Code



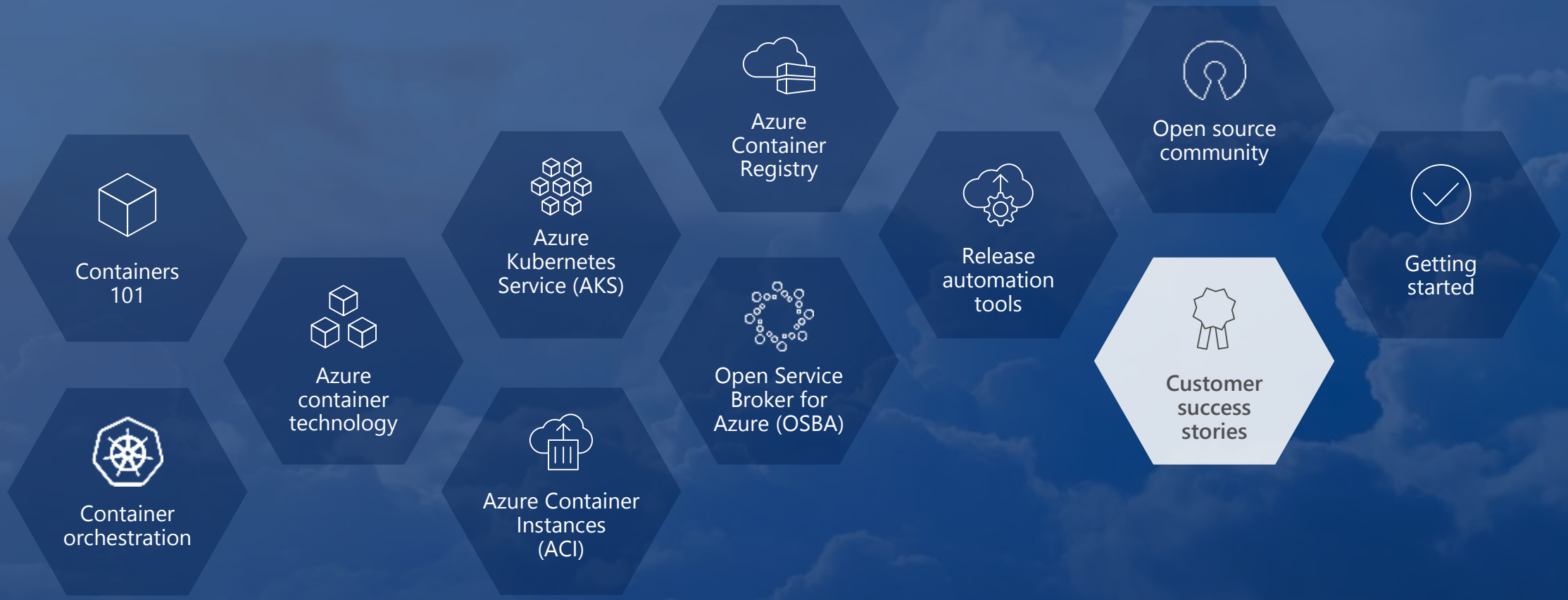
Tigera CNX: Enterprise Grade Cloud Network Security



Builds on Calico to address enterprise security & compliance requirements

- Hierarchical, RBAC-controlled policies
- Multi-layer policy enforcement
- Monitoring
- Auditing
- Troubleshooting
- Policy violation alerting
- Multi-cluster federation
- Graphical UI
- REST API

Customer success stories



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 Kubernetes 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 Kubernetes 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 Kubernetes 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 Kubernetes Service

Organization size

100,000+ employees

Industry

Healthcare

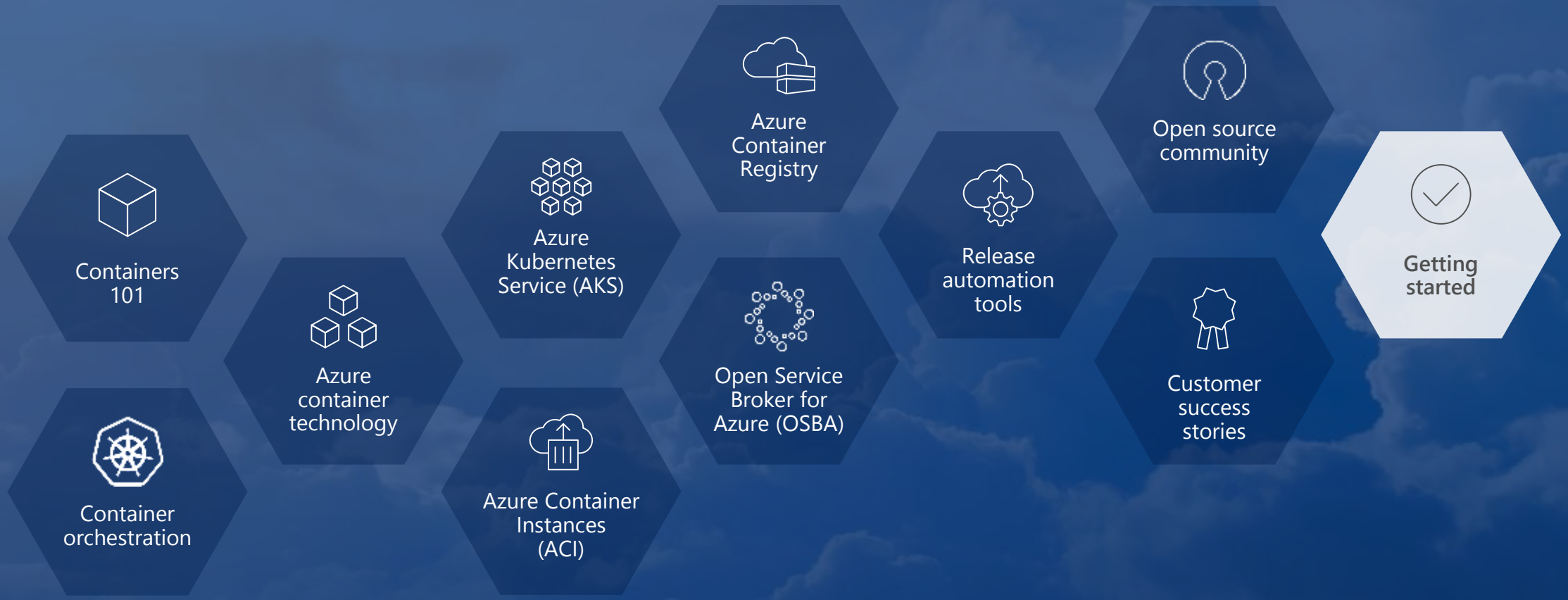
Country

Germany

Business need

Faster application development

Getting started



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aka.ms/kubernetes-build-2018

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DJI Spark Drone

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Make sure you are scanned into your session and complete your session eval to be eligible to win.

Seven winners each day!

Winners will be notified via email.

Pick up your prize before leaving!

Prizes can be claimed at the info counter located on WSCC level 4, Galleria level.

Monday: pick up 2:15pm–6:30pm.

Tuesday: pick up 7:00am–6:00pm.

Wednesday: pick up 7:00am–5:30pm.

Microsoft