

Microsoft tech·days

Kistamässan Stockholm
22-24 oktober 2019



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DevOps with Azure Kubernetes Services

Jakob Ehn
@jakobehn

Microsoft Azure MVP

<https://blog.ehn.nu>

@jakobehn

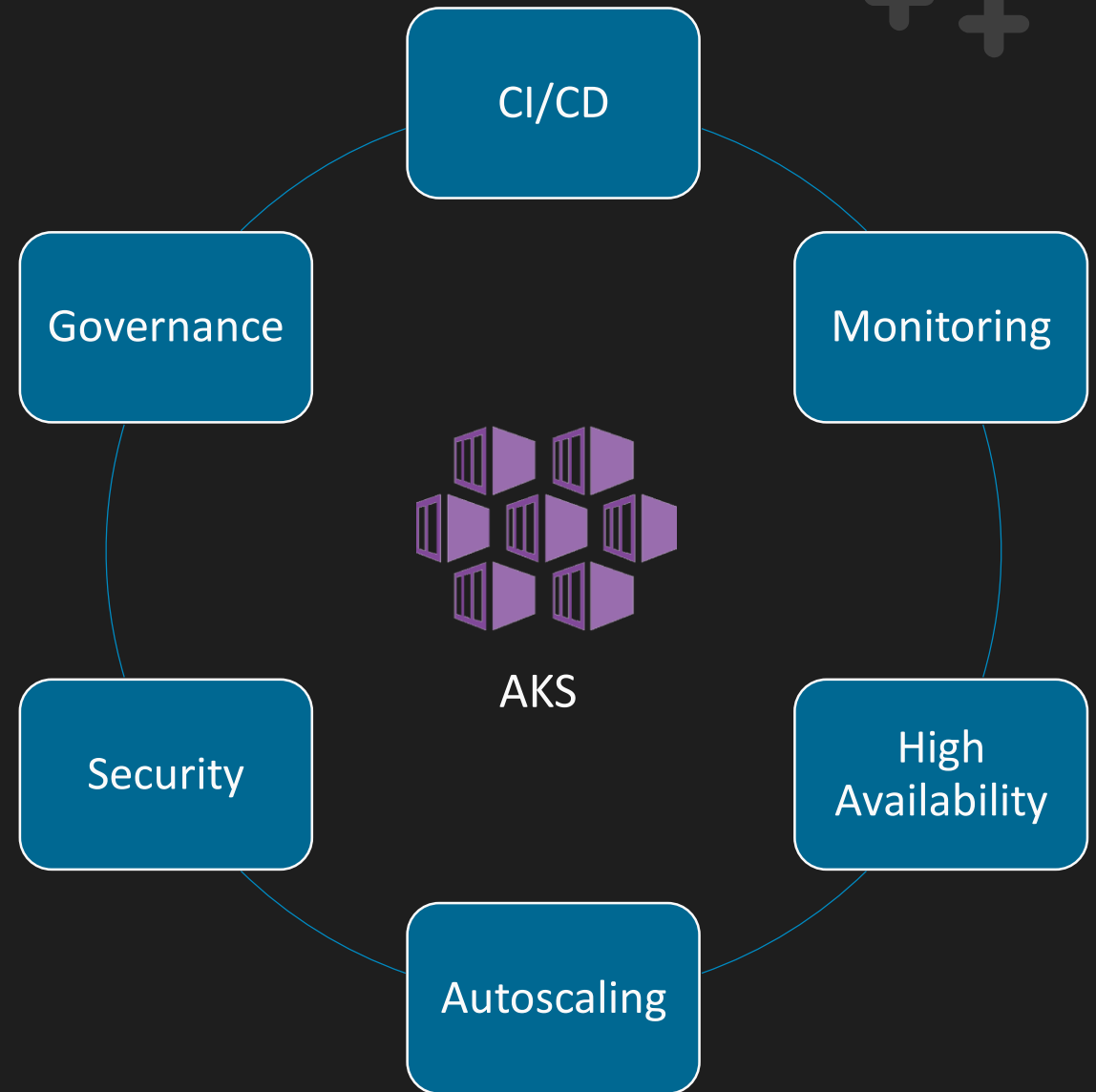




**Together with our customers and Microsoft,
we deliver tomorrow's cloud solutions, today!**

**SO I CREATED
A KUBERNETES CLUSTER**

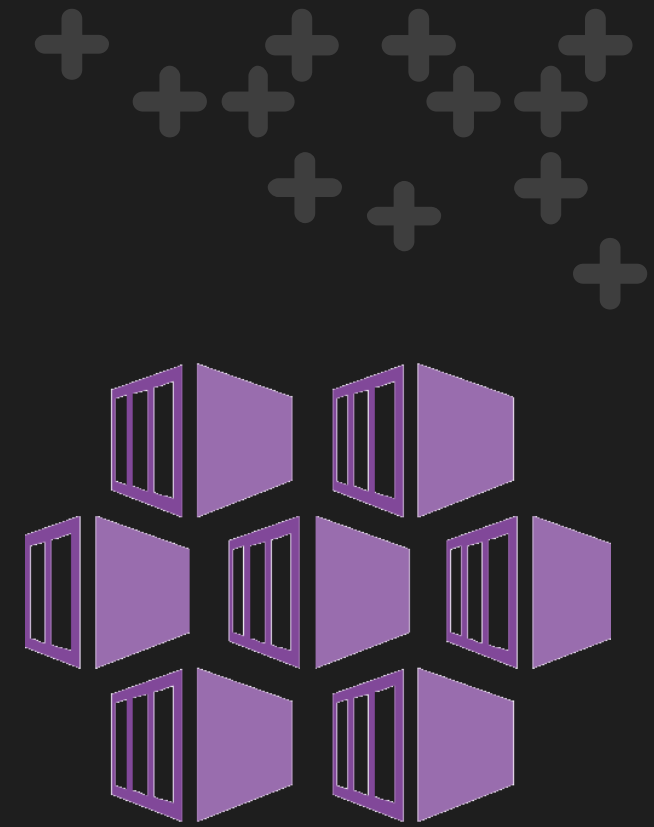
NOW WHAT?



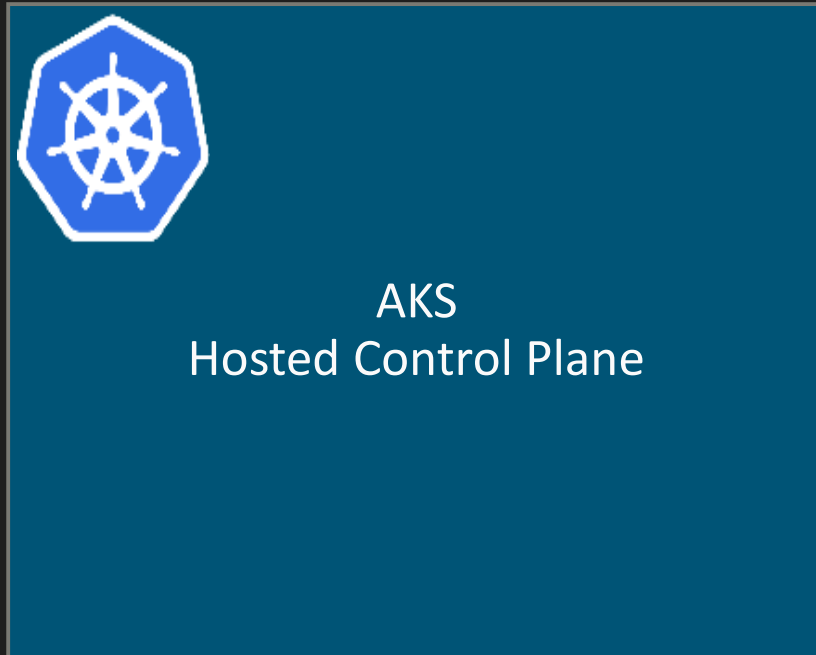
Azure Kubernetes Services (AKS)

- Managed Kubernetes cluster
- 100% upstream (currently supports $\leq 1.14.8$)
- GA June 2018
 - Windows node supports in public preview
- *"one of the fastest growing services in the history of Azure."*

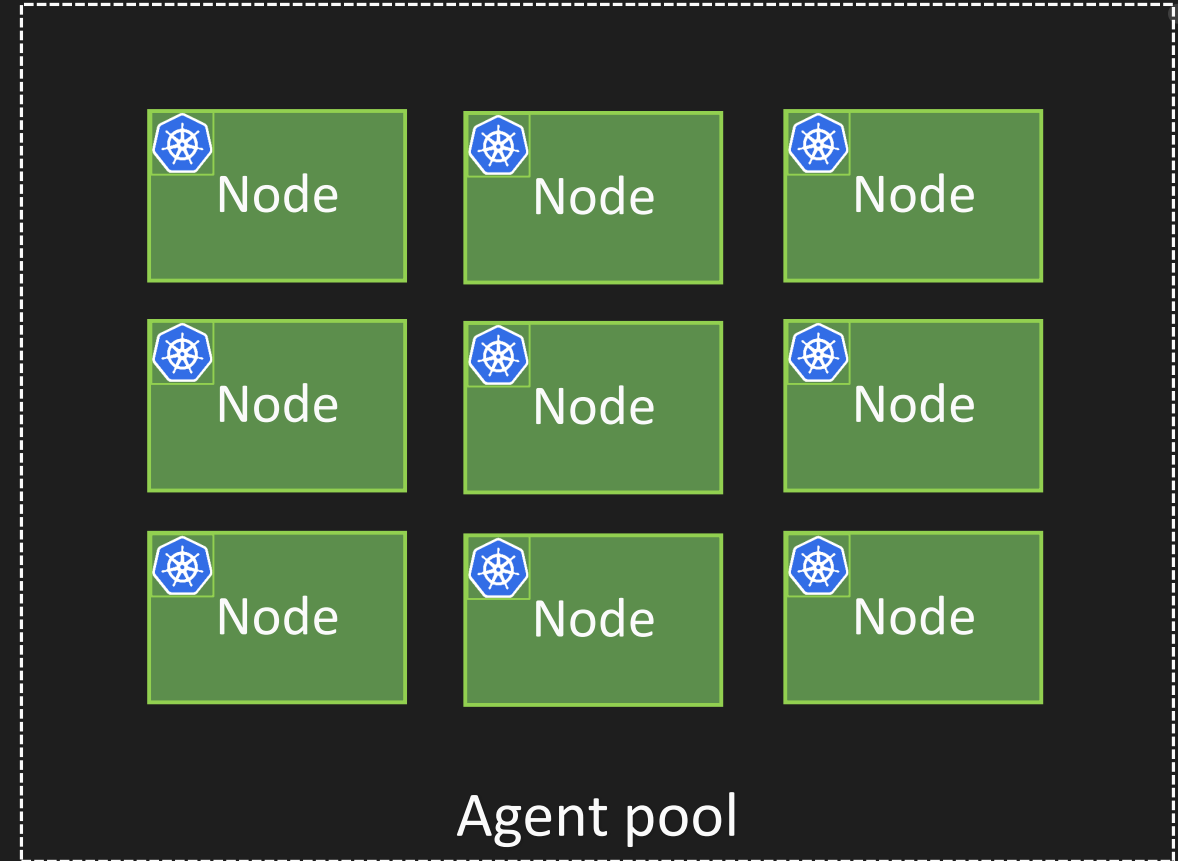
<https://azure.microsoft.com/en-au/blog/bringing-serverless-to-azure-kubernetes-service/>



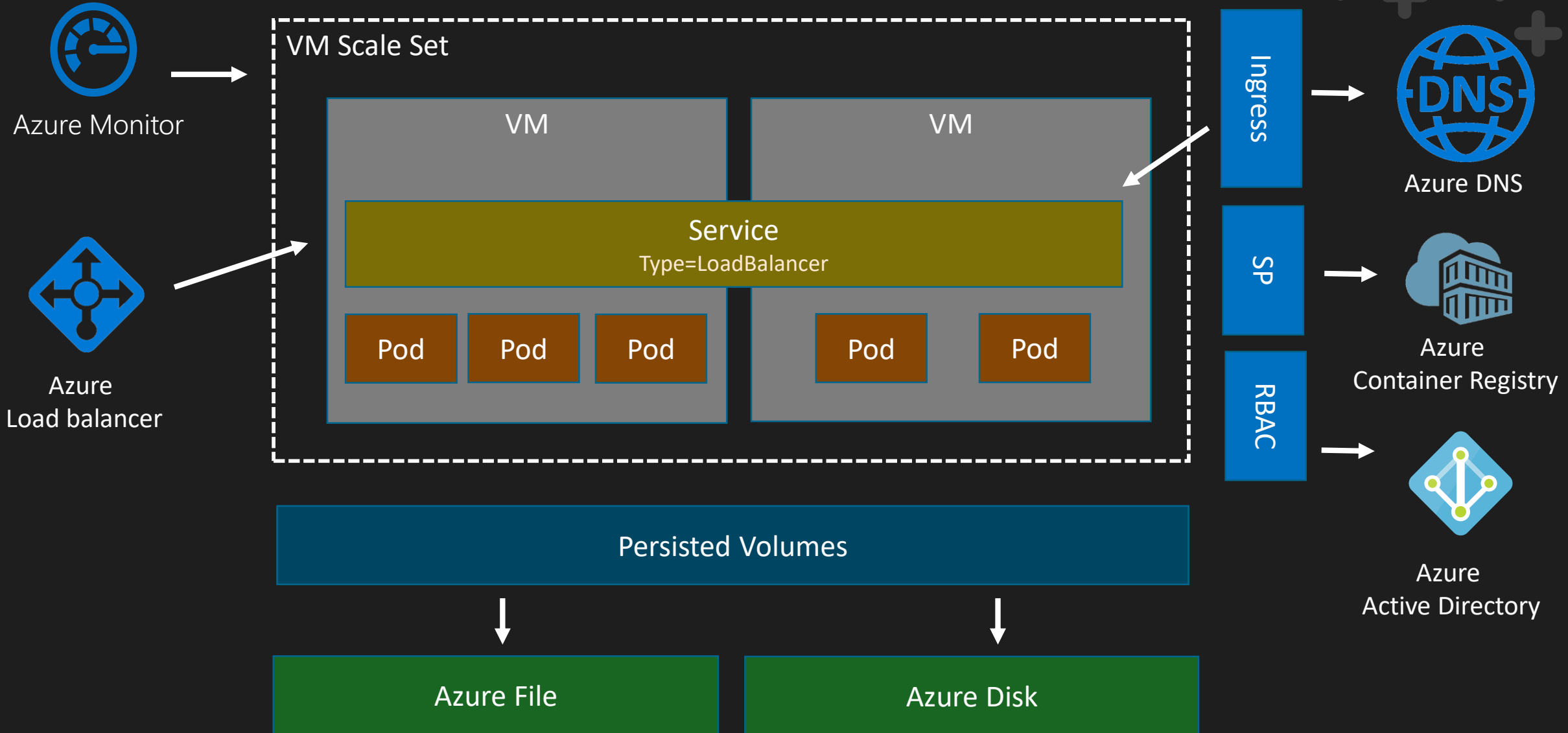
Azure Kubernetes Services

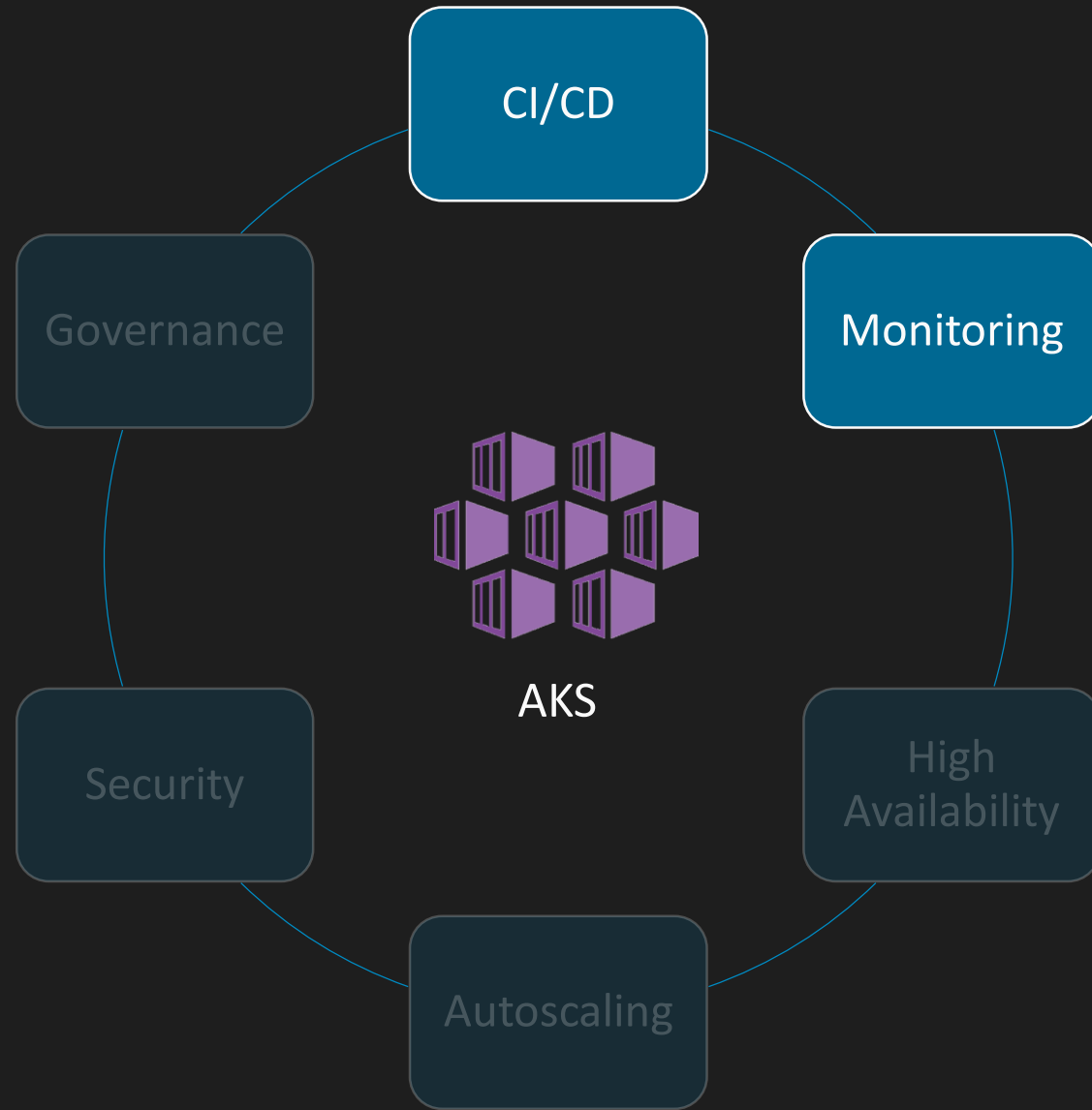


- Automated upgrades and patching
- Cluster (Auto)Scaling
- Self-healing control plane
- Pay for agent nodes only



Kubernetes in Azure

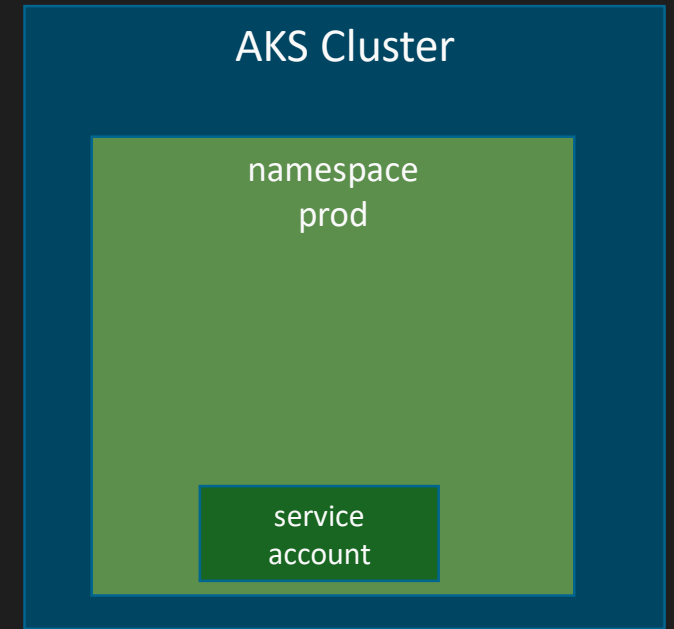
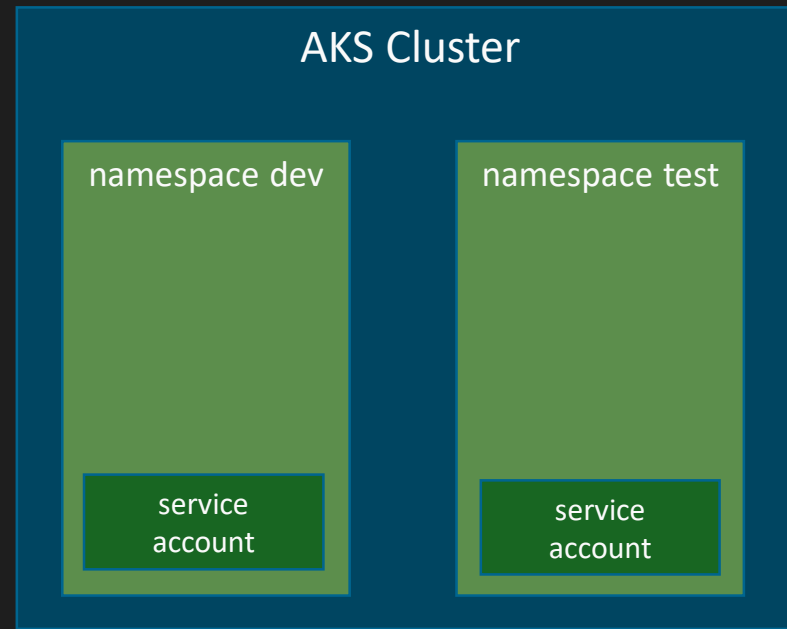




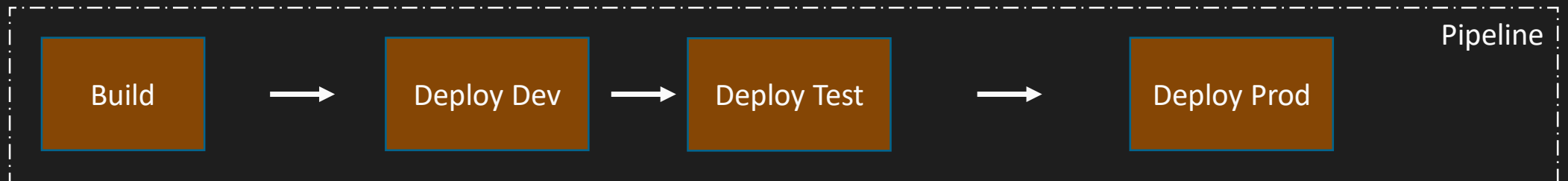
CI/CD with AKS



Azure
Container Registry



Source control



Creating an AKS Cluster - Portal

Create Kubernetes cluster

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

* Subscription 

Visual Studio Enterprise

▼


* Resource group

aks

▼

Create new

CLUSTER DETAILS

* Kubernetes cluster name 

* Region

North Europe

▼

* Kubernetes version 

1.11.3

▼

* DNS name prefix ⓘ

SCALE

The number and size of nodes in your cluster. For production workloads, at least 3 nodes are recommended for resiliency. For development or test workloads, only one node is required. You will not be able to change the node size after cluster creation, but you will be able to change the number of nodes in your cluster after creation. [Learn more about scaling in Azure Kubernetes Service](#)

* Node size

Standard DS2 v2

2 vcpus, 7 GB memory

Change size

* Node count



53

Review + create

[Previous](#)

Next : Authentication >

Creating an AKS Cluster - CLI

```
//Create AKS cluster
```

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

```
\ Running ..
```

```
//Get access credentials for the cluster
```

```
> az aks get-credentials -g myResourceGroup -n myCluster
```

```
Merged "myCluster" as current context ..
```

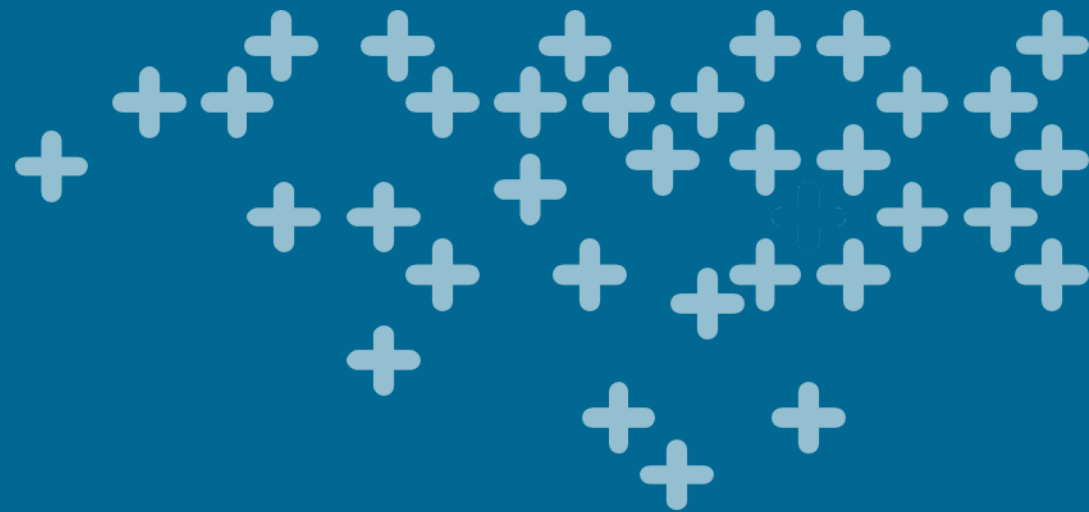
Creating an AKS Cluster – ARM Template

```
{
  "$schema": "https://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
  "contentVersion": "1.0.0.0",
  "parameters": { ...
  },
  "resources": [
    {
      "apiVersion": "2018-03-31",
      "type": "Microsoft.ContainerService/managedClusters",
      "location": "[parameters('location')]",
      "name": "[parameters('resourceName')]",
      "properties": {
        "kubernetesVersion": "[parameters('kubernetesVersion')]",
        "dnsPrefix": "[parameters('dnsPrefix')]",
        "agentPoolProfiles": [
          {
            "name": "agentpool",
            "osDiskSizeGB": "[parameters('osDiskSizeGB')]",
            "count": "[parameters('agentCount')]",
            "vmSize": "[parameters('agentVMSize')]",
            "osType": "[parameters('osType')]",
            "storageProfile": "ManagedDisks"
          }
        ],
        "linuxProfile": {
          "adminUsername": "[parameters('linuxAdminUsername')]",
          "ssh": {
            "publicKeys": [
              {
                "keyData": "[parameters('sshRSAPublicKey')]"
              }
            ]
          }
        }
      }
    }
  ]
}
```

Deploying AKS Infrastructure



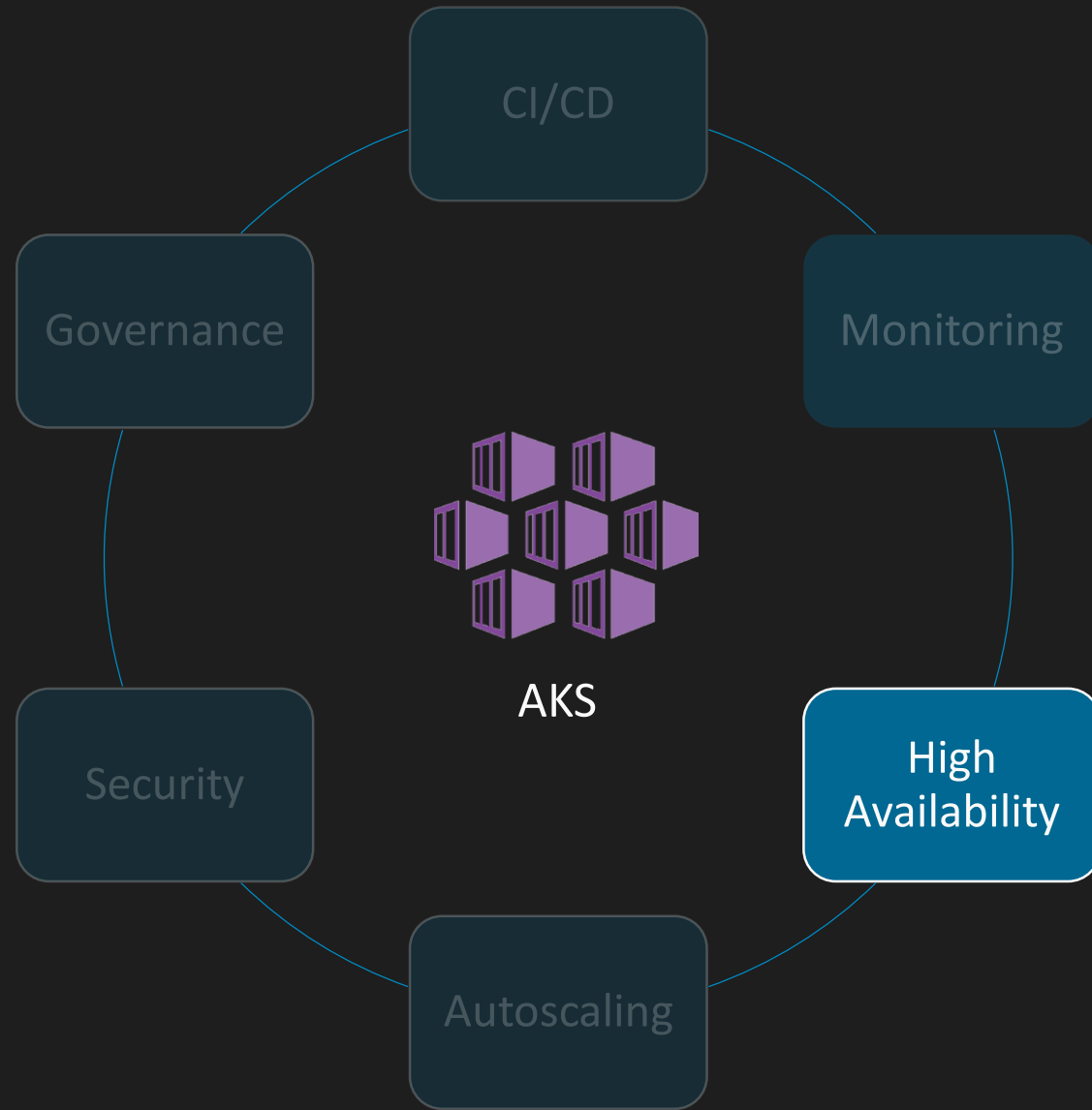
- AKS Cluster
- Virtual Network
- Namespaces
- Service accounts/Permissions
- Helm
- Ingress controller / Cert Manager
- ...



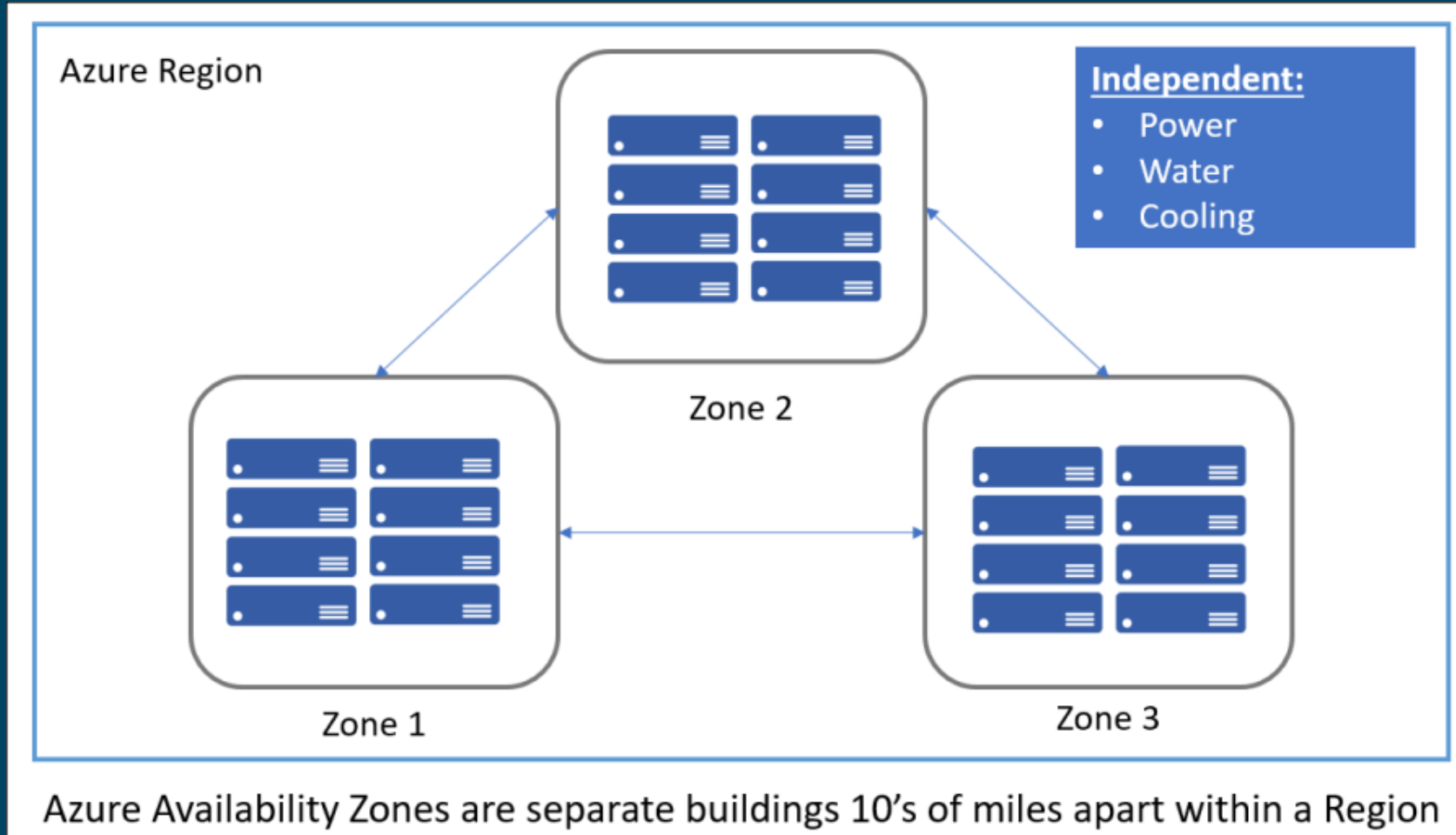
Demo



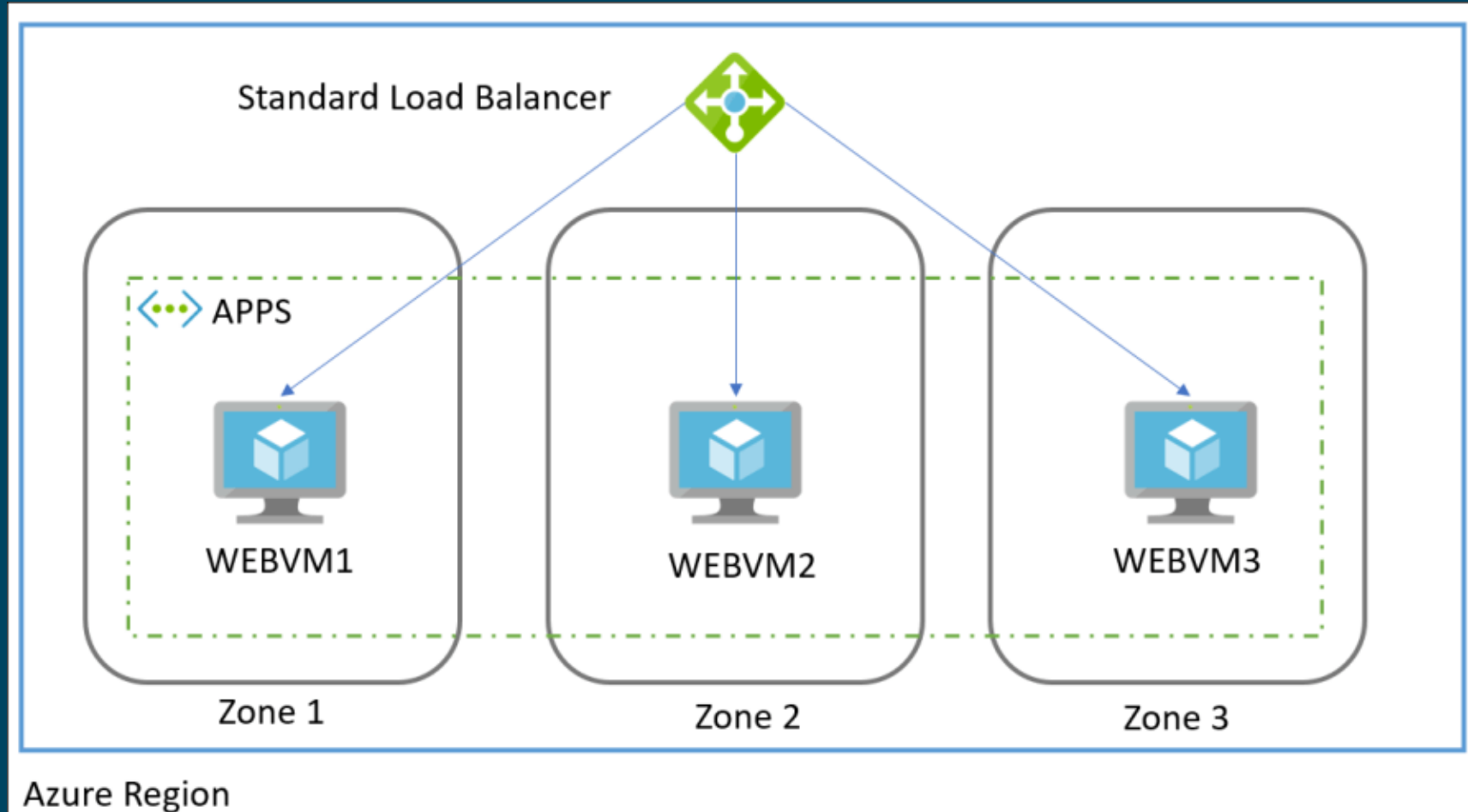
CI / CD
Monitoring



Azure Regions and Availability Zones



Azure Regions and Availability Zones



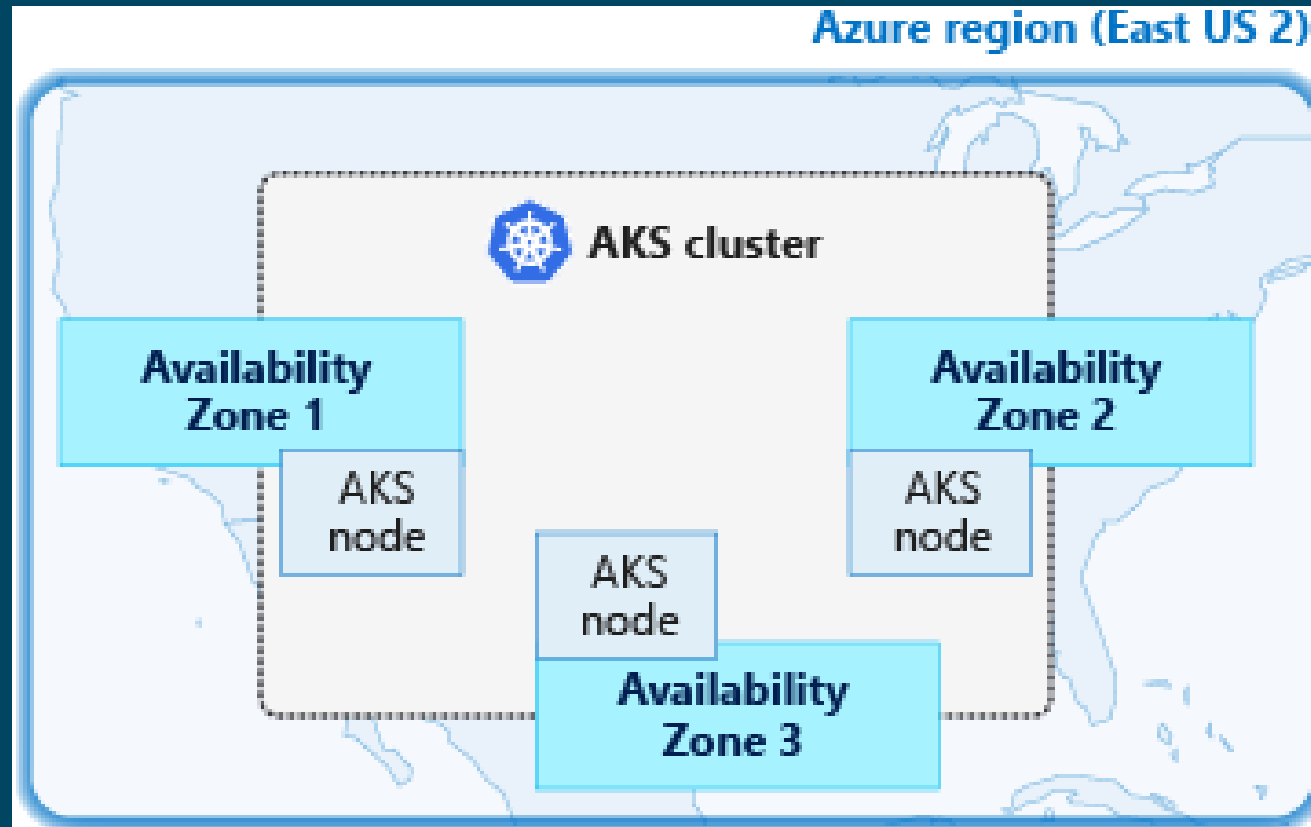
Azure regions

Azure has more global regions than any other cloud provider—offering the scale needed to bring applications closer to users around the world, preserving data residency, and offering comprehensive compliance and resiliency options for customers.

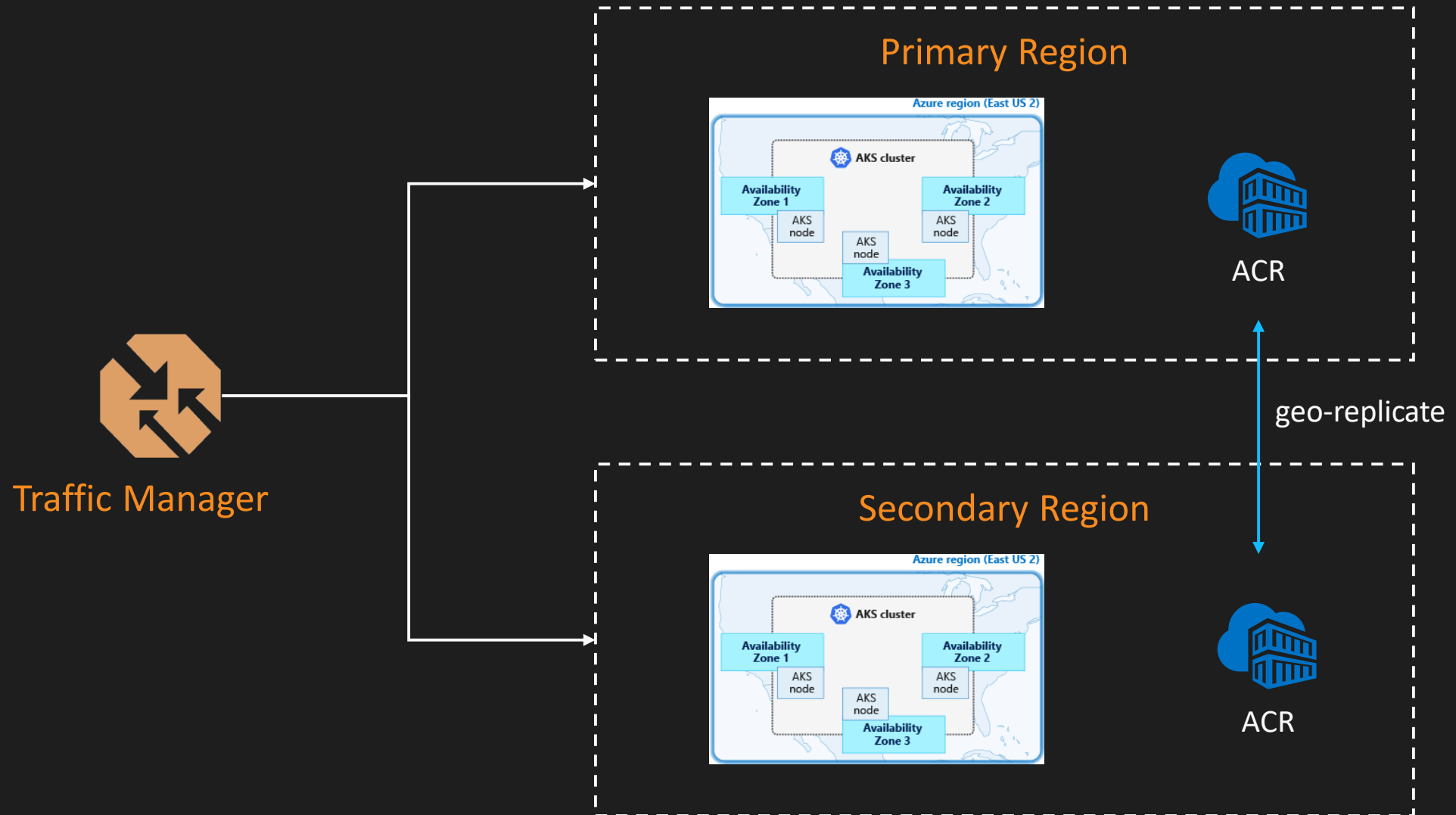
54 regions worldwide **140** available in 140 countries

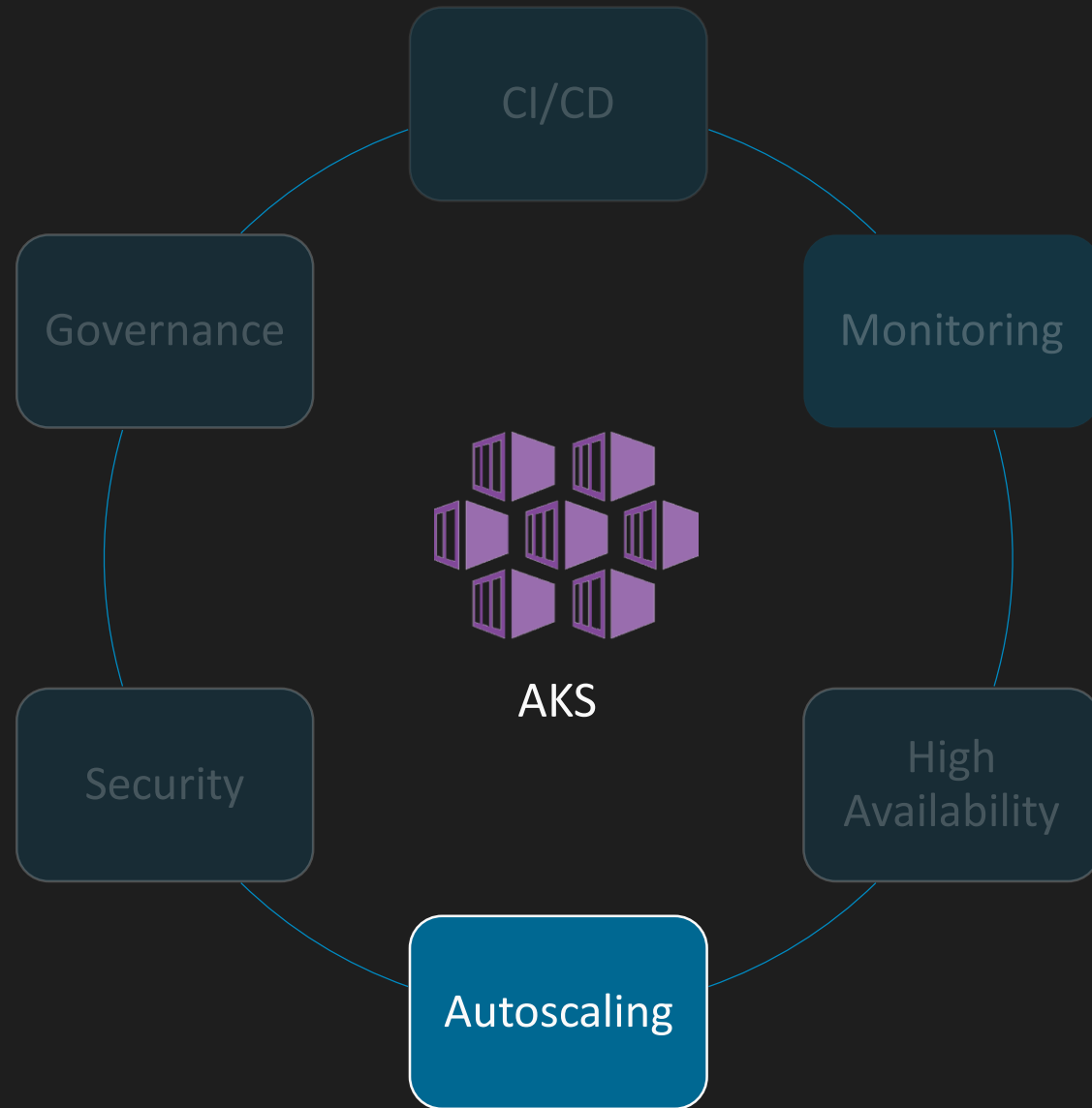


Cluster Availability and Failover

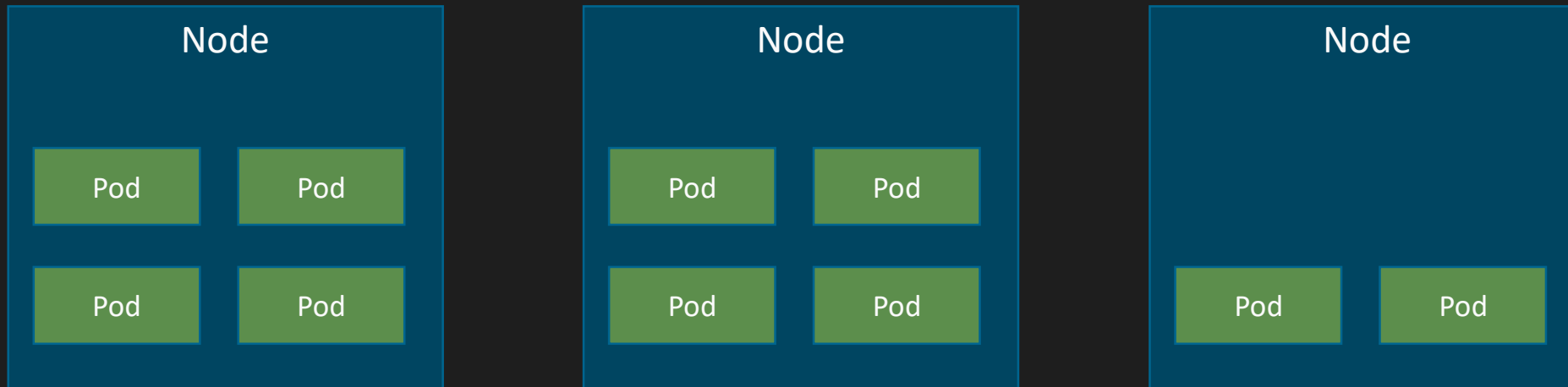


Cluster Availability and Failover





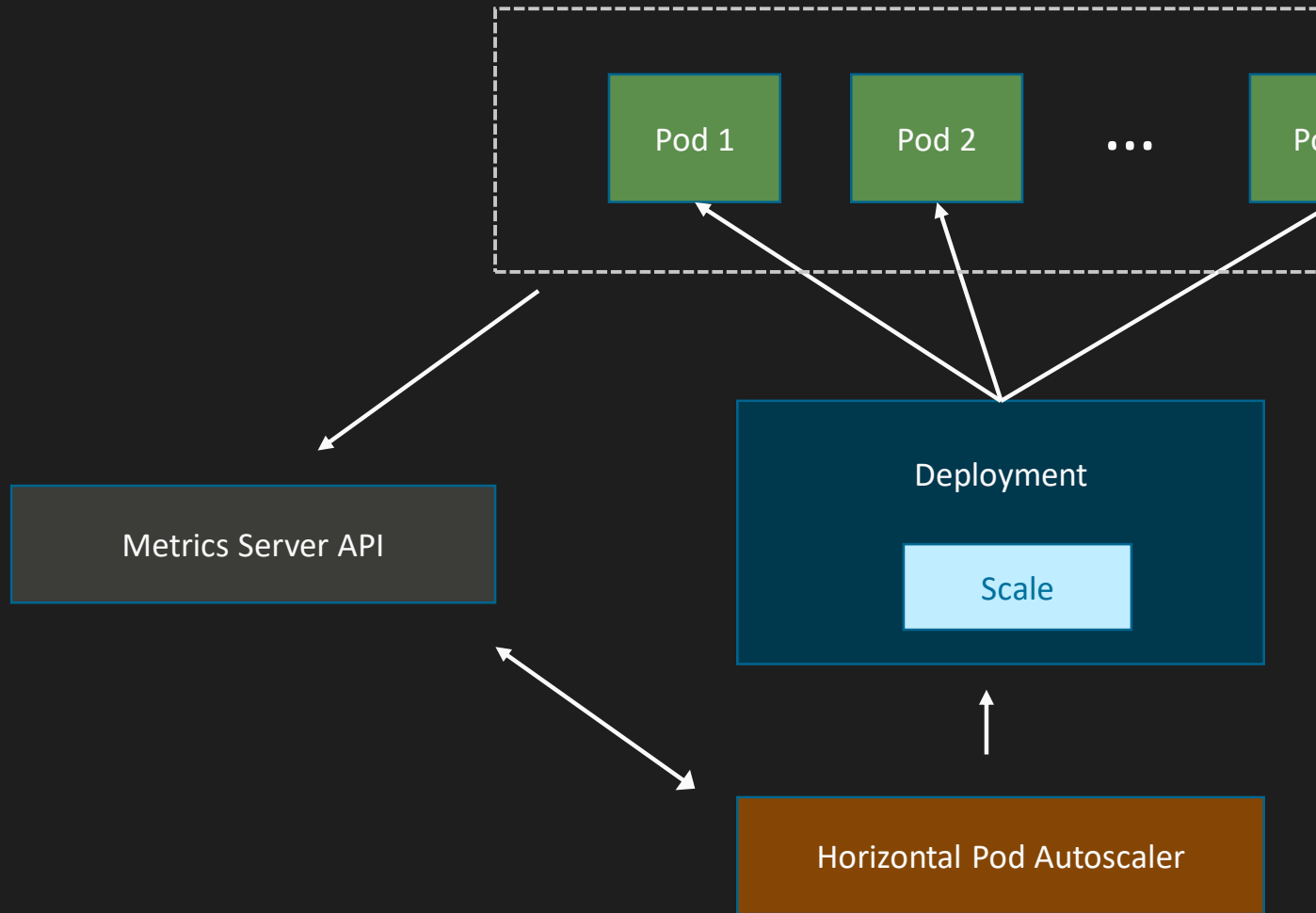
Scaling with AKS



Horizontal Pod Autoscaling (HPA)

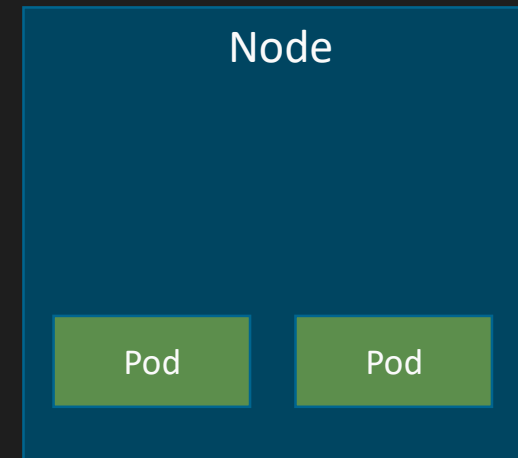
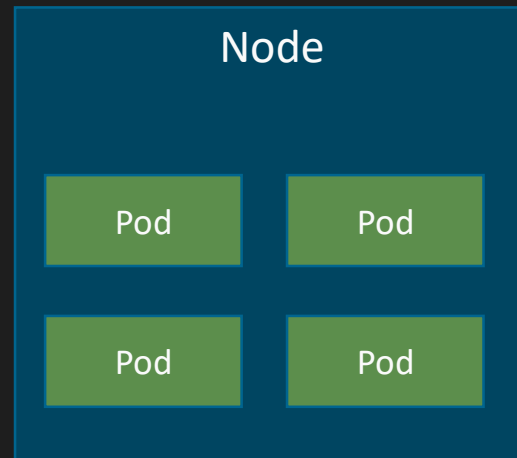
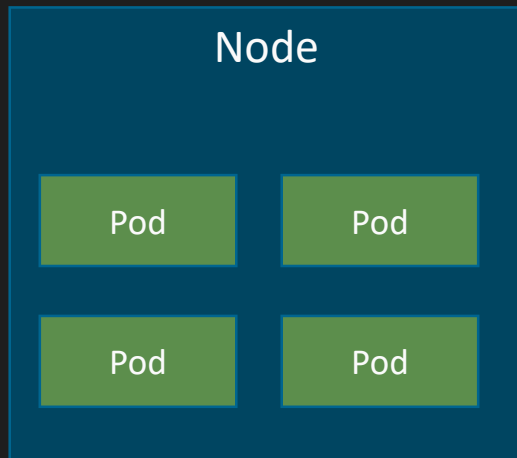
Cluster Autoscaler

Horizontal Pod Autoscaler



```
app: qbox
tier: frontend
spec:
  containers:
  - name: frontend
    image: qbox.web:1.0
    ports:
    - containerPort: 80
    resources:
      requests:
        cpu: 250m
      limits:
        cpu: 500m
```

Serverless scaling with AKS



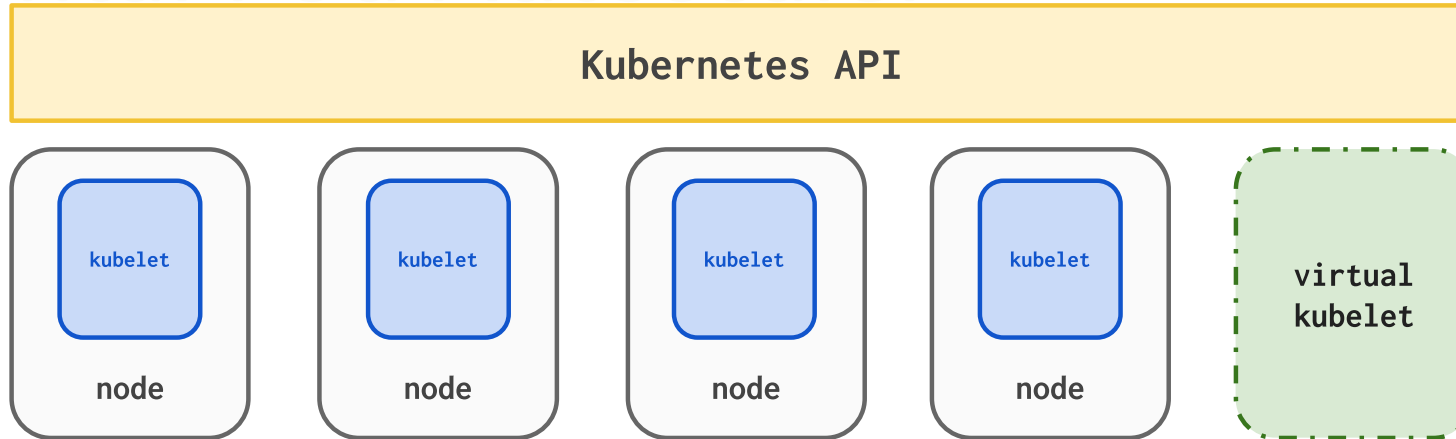
Horizontal Pod Autoscaling (HPA)

Cluster Autoscaler

Virtual Nodes

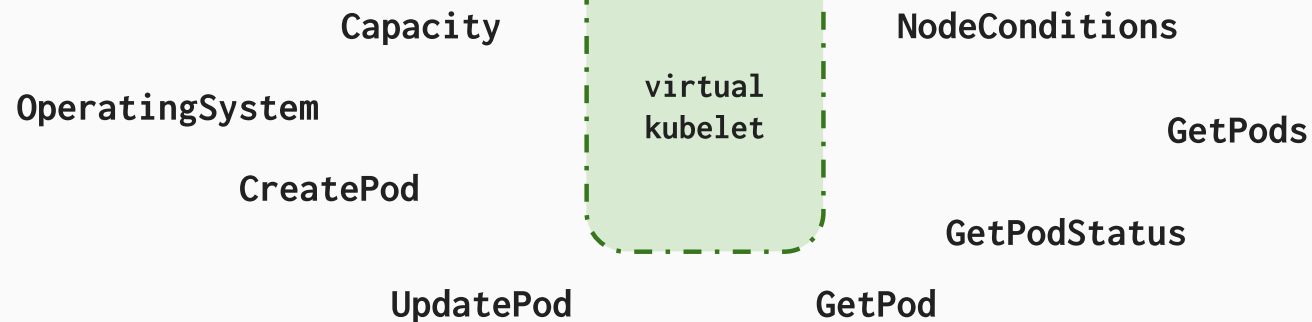


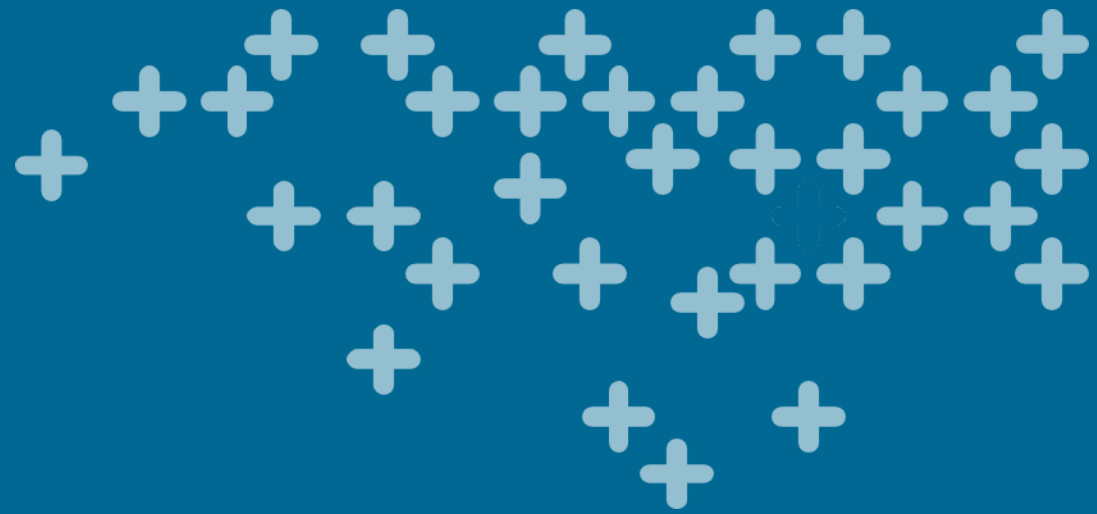
Virtual Node Architecture



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

Virtual kubelet registers itself as a “node” and allows developers to deploy pods and containers with their own APIs.

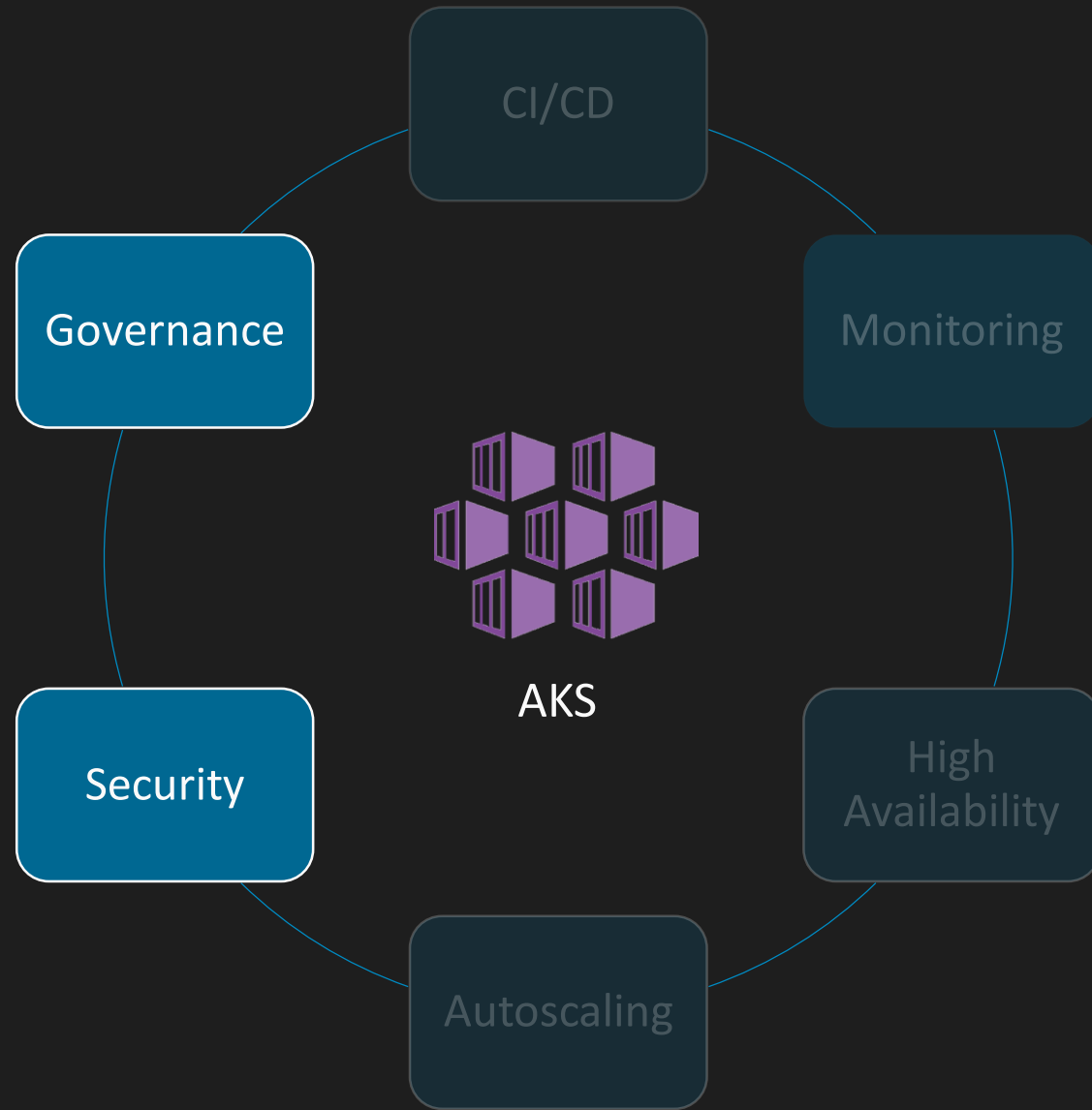




Demo



High Availability
Autoscaling with AKS

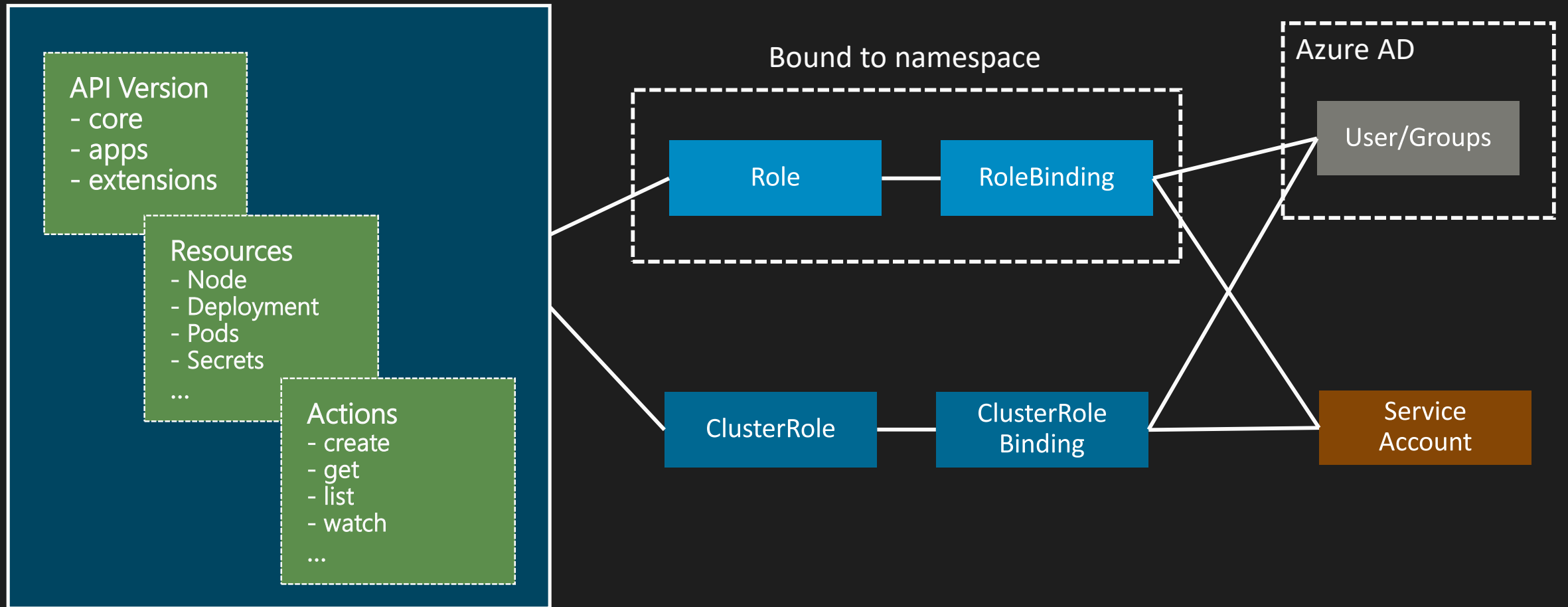


AKS Security and Governance



- AKS supports RBAC
- Integrates with Azure Active Directory
- Network policies for restricting traffic
- Azure Policy integration for enforcing compliancy

Kubernetes RBAC



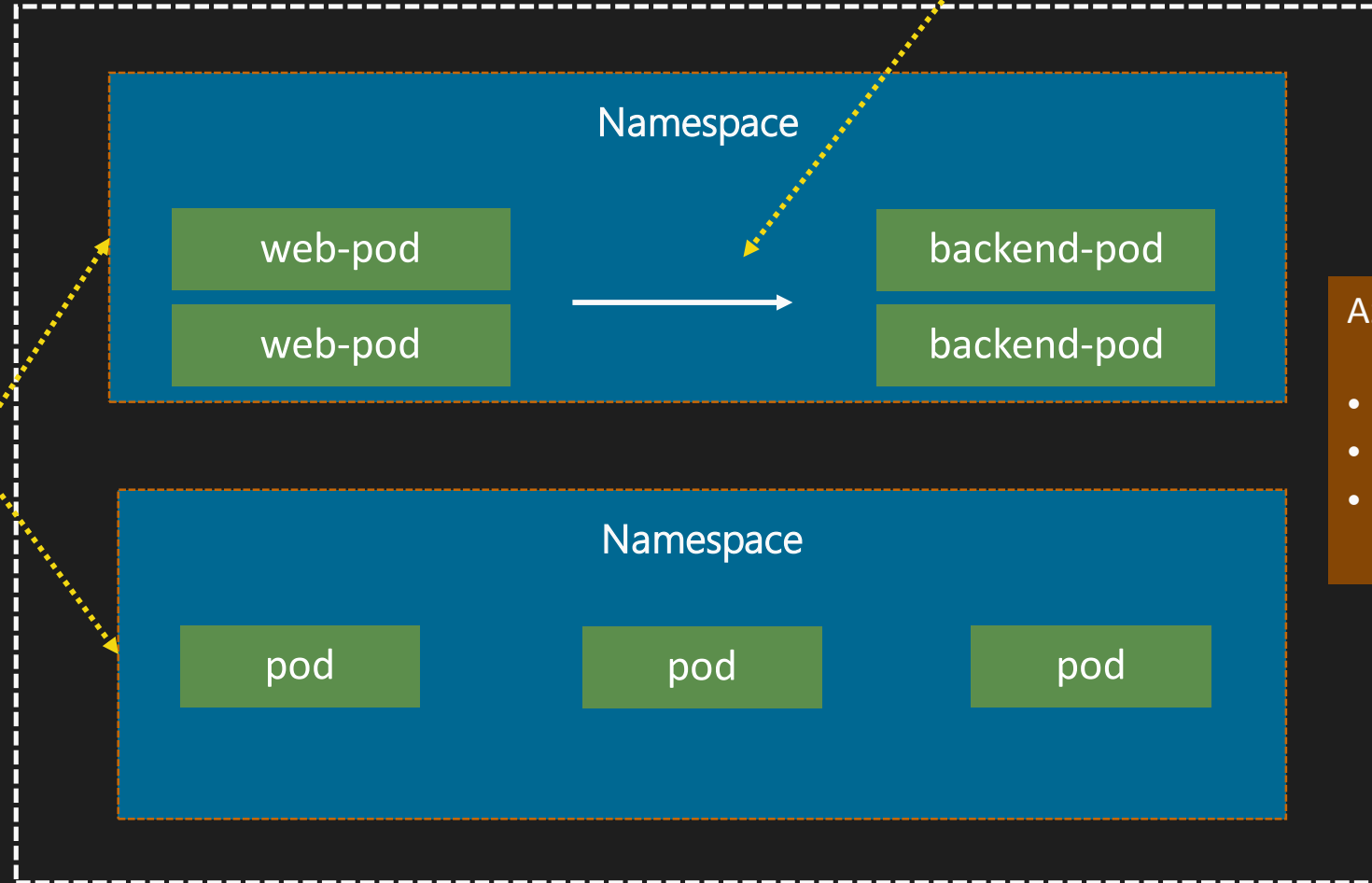
AKS Governance

Network Policy:

Only allow traffic from web to backend

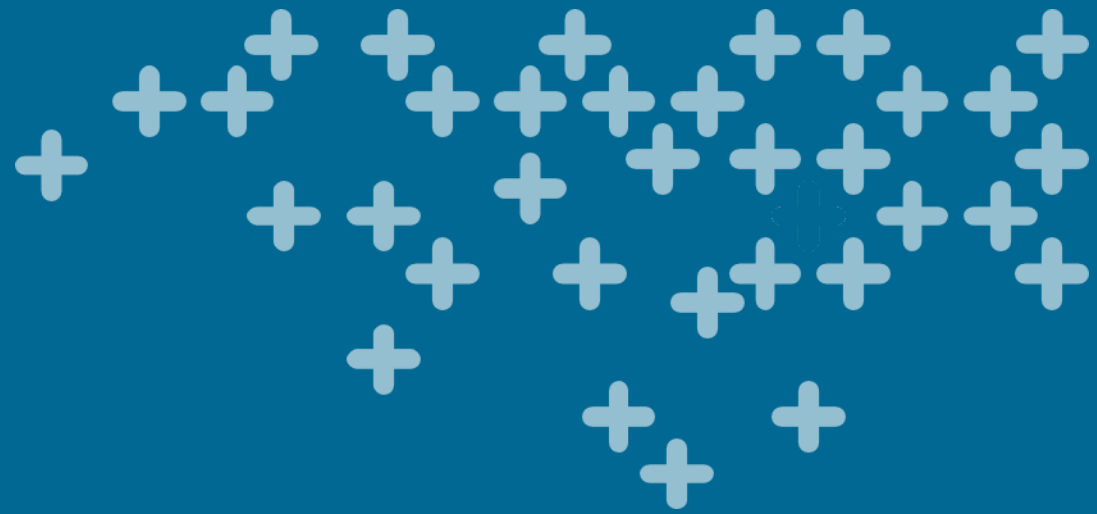
Network Policy:

Don't allow traffic between namespaces



Azure Policies:

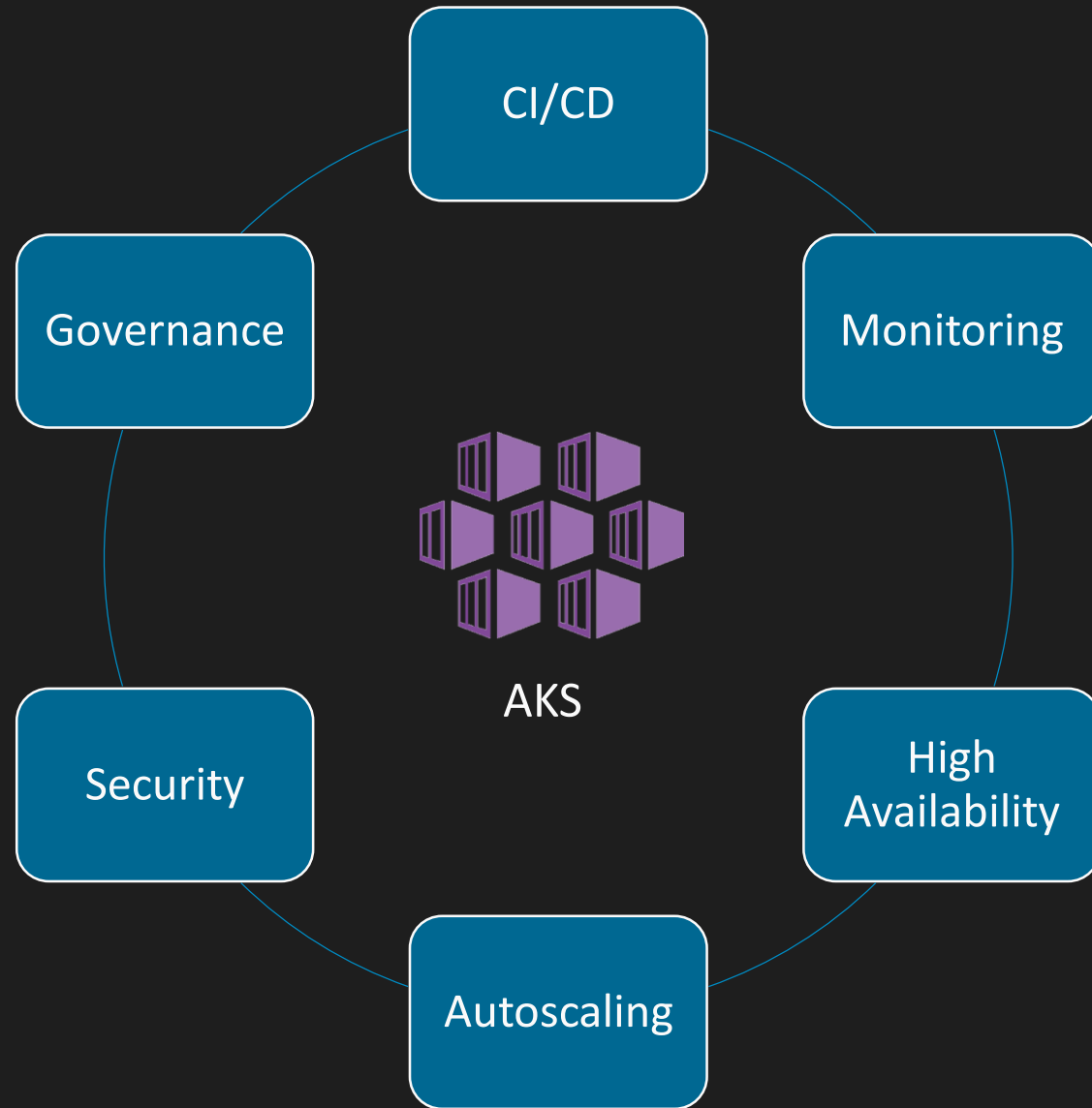
- *Enforce labels on pods*
- *Enforce HTTPS ingress*
- *Ensure only allowed container images*

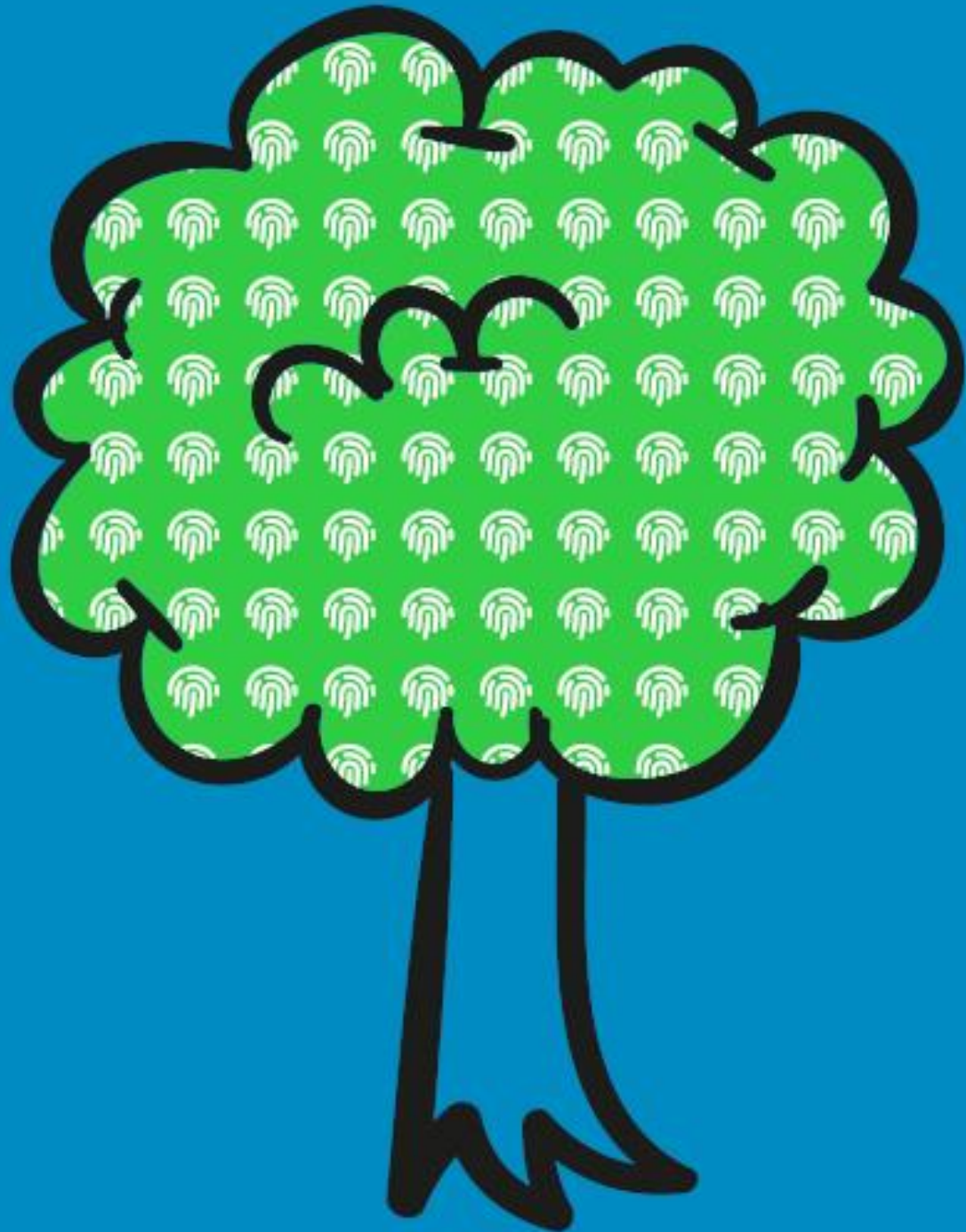


Demo



Securing AKS



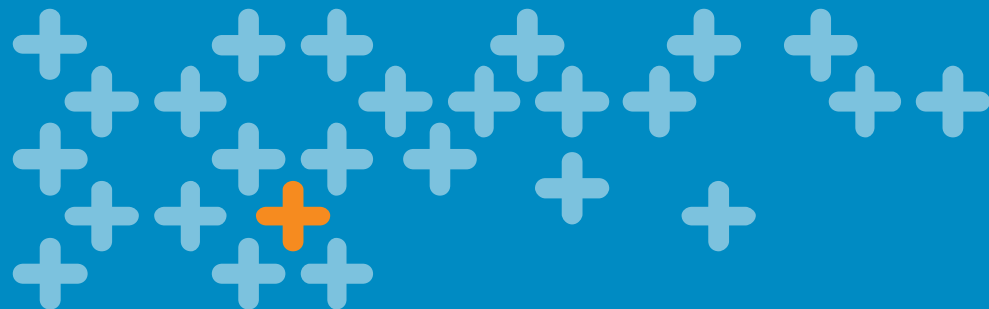


Make a mark and
make an impact!



Please take the opportunity to
evaluate this session in the app

Thank you!



Thank you!

Jakob Ehn

@jakobehn

jakob.ehn@activesolution.se

<https://blog.ehn.nu>

