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Stockholm, Sweden





Continuous Delivery with Azure Kubernetes Service

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Microsoft Azure MVP

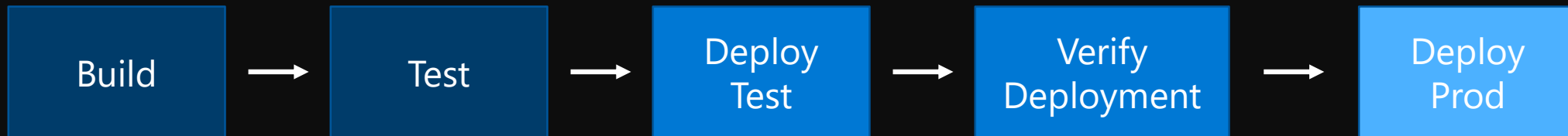
<https://blog.ehn.nu>

@jakobehn

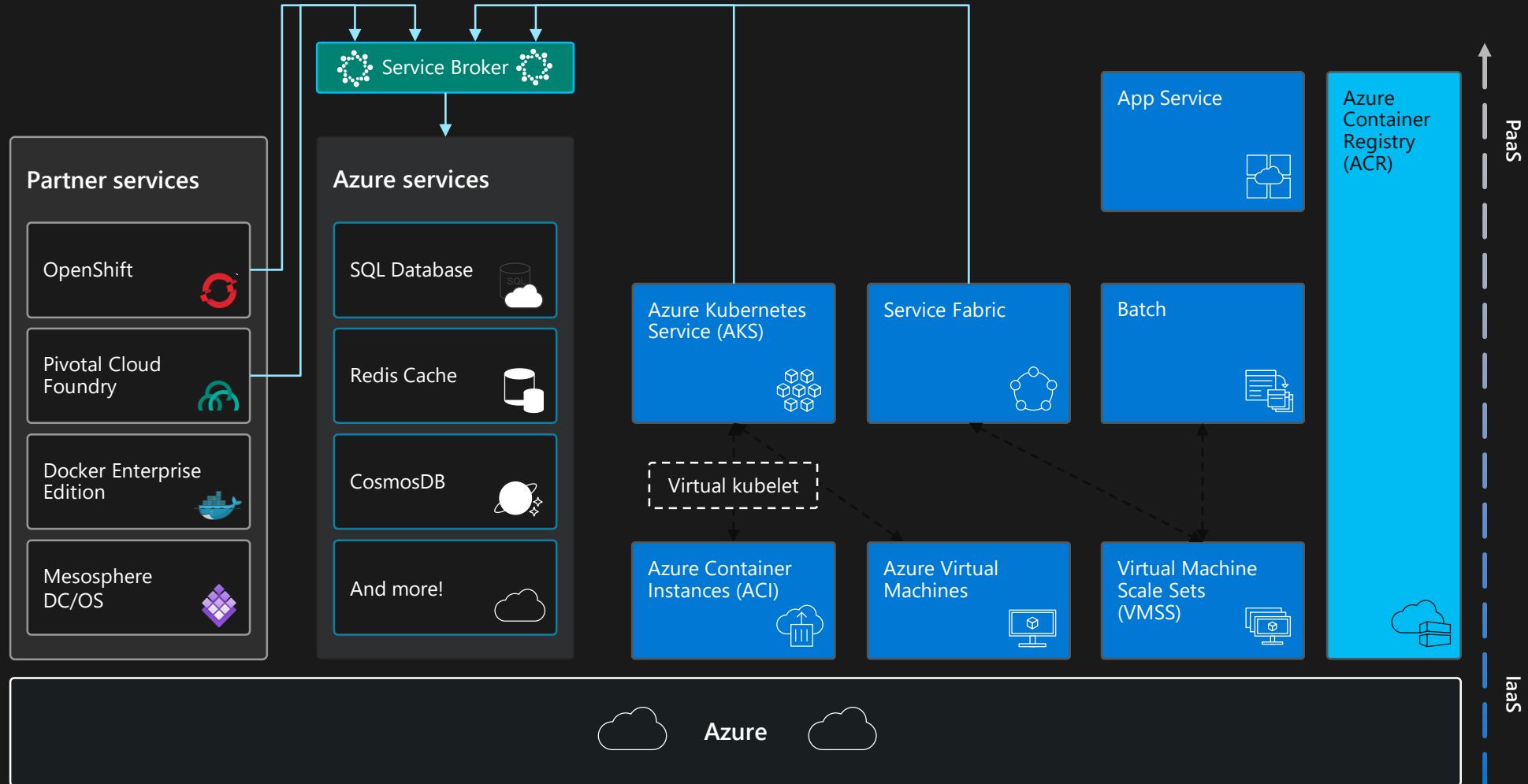


Safe Deployments

- Deployment pipeline for predictable releases
- Zero downtime
 - Rolling upgrades
 - Blue/Green deployments
- Ensure new version is healthy before sending traffic
- Reduce impact
 - Use Canary Releases for incremental deployments

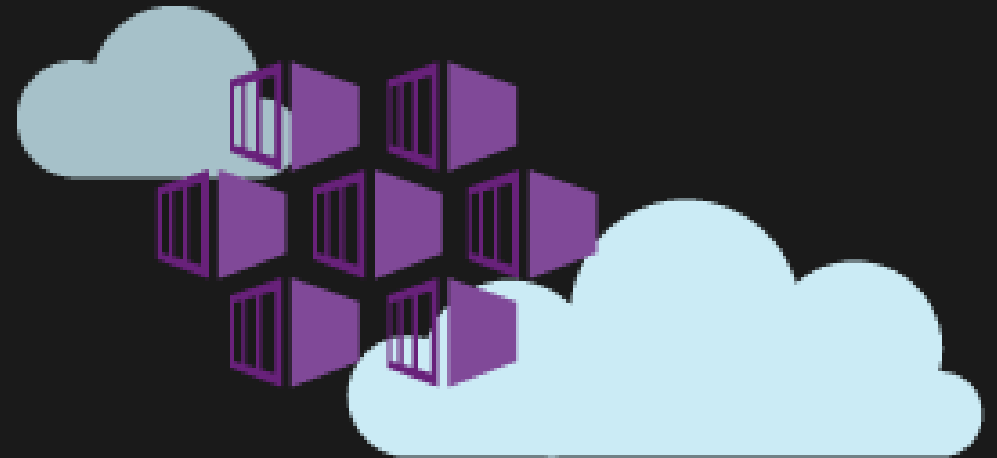


Azure container ecosystem



Azure Kubernetes Service (AKS)

- Managed Kubernetes cluster
- 100% upstream (currently supports $\leq 1.13.5$)
- GA June 2018
- Currently available in 22 regions



Kubernetes Overview

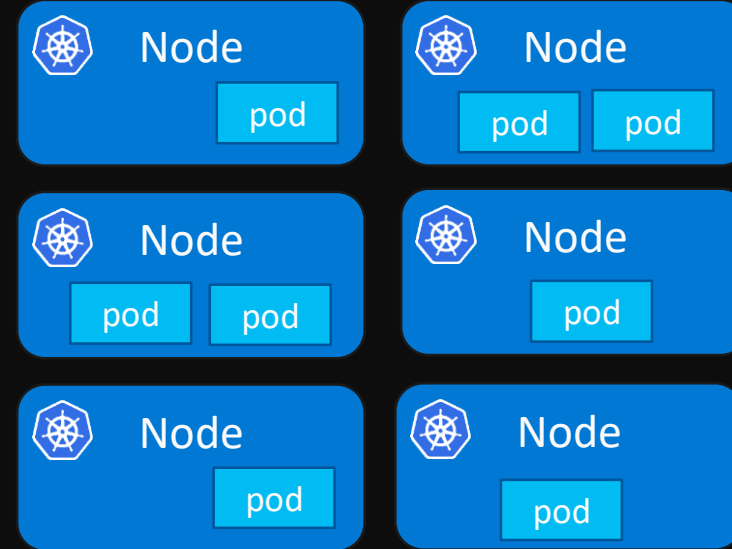
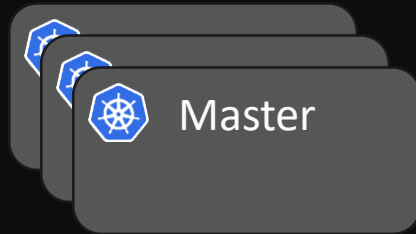


Deployment

kubectl apply



```
apiVersion: apps/v1beta1
kind: Deployment
metadata:
  name: <deployment-name>
spec:
  replicas: 8
  template:
    metadata:
      labels:
        <key>: <value>
    spec:
      containers:
        image: <container-image>
      ports:
        - containerPort: 80
  env:
    - name: <key>
      value: <value>
```



K8s cluster

AKS – Managed Kubernetes



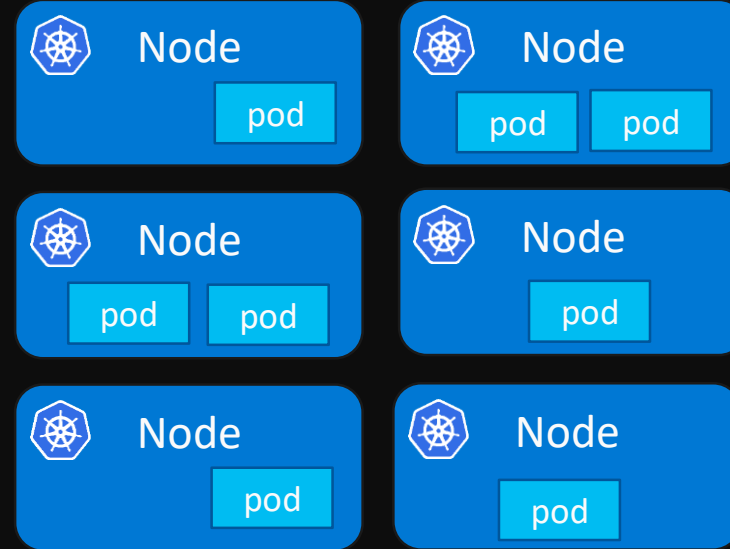
Deployment

kubectl apply



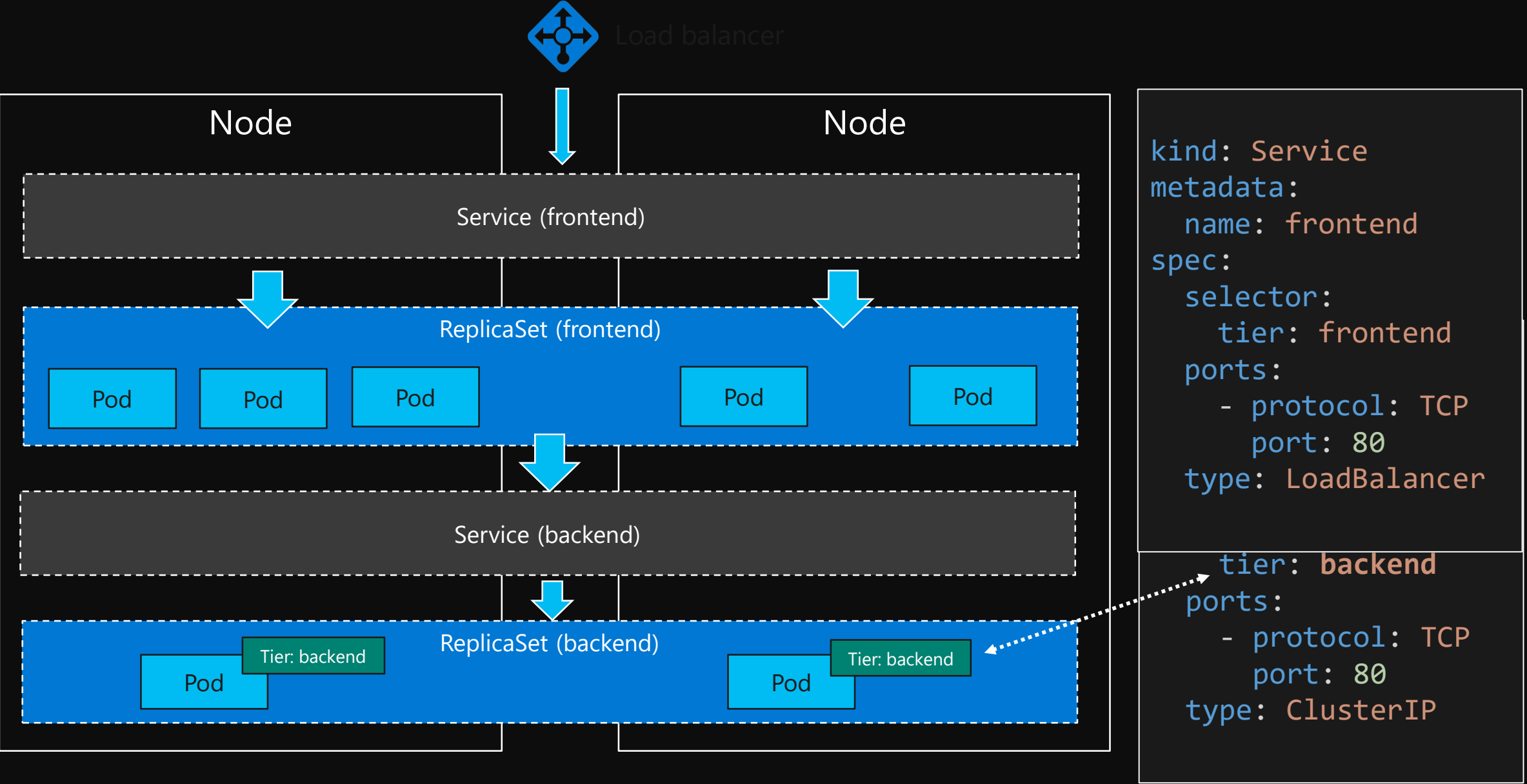
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apiVersion: apps/v1beta1
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spec:
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  template:
    metadata:
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    spec:
      containers:
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        - containerPort: 80
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      value: <value>
```

AKS



K8s cluster

Kubernetes Concepts



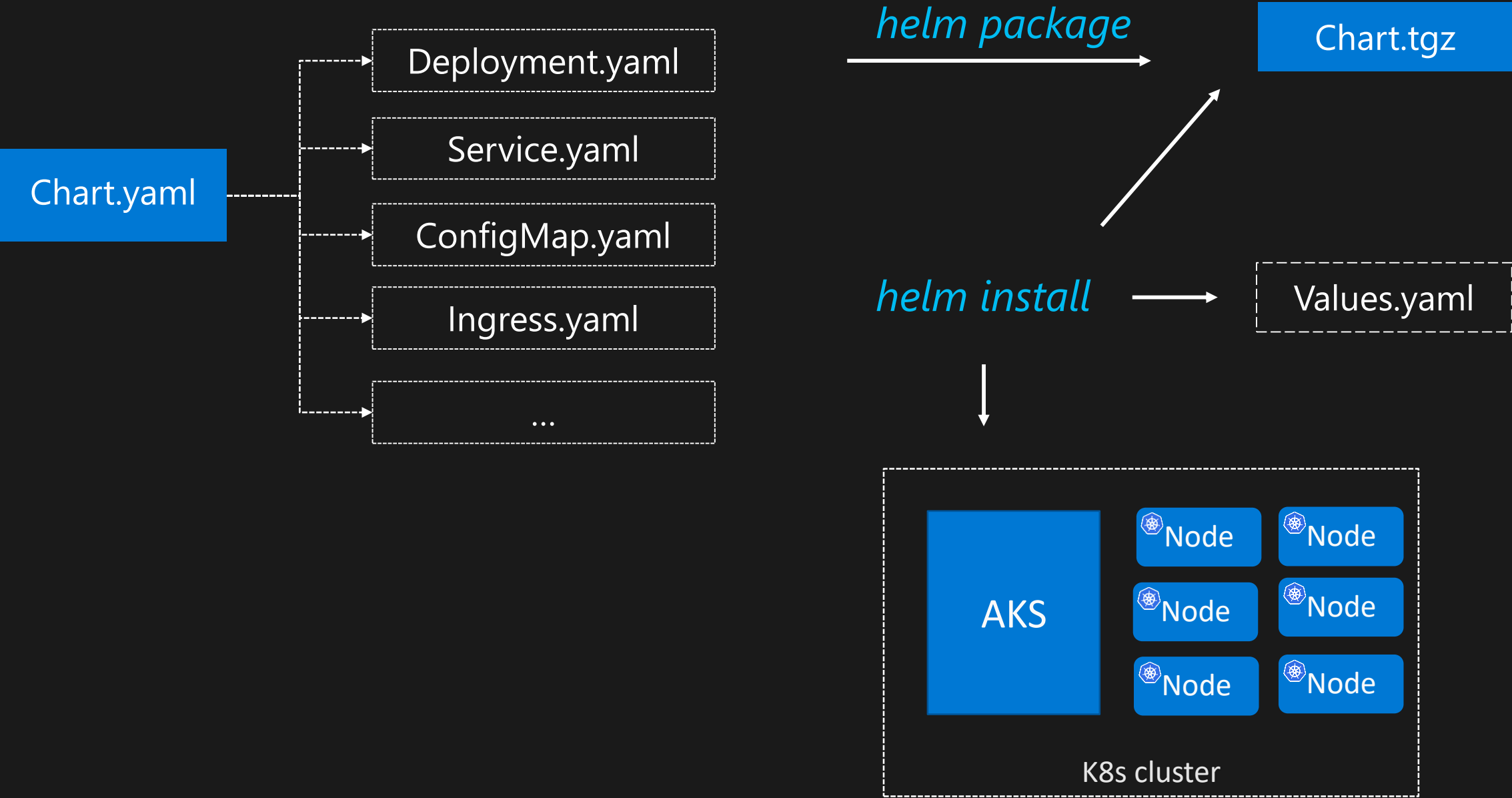
Helm

Package Manager for Kubernetes

- Package multiples resources into charts
- Template engine
- Handles upgrades, rollbacks..
- Distribute charts through Helm repositories



Helm flow

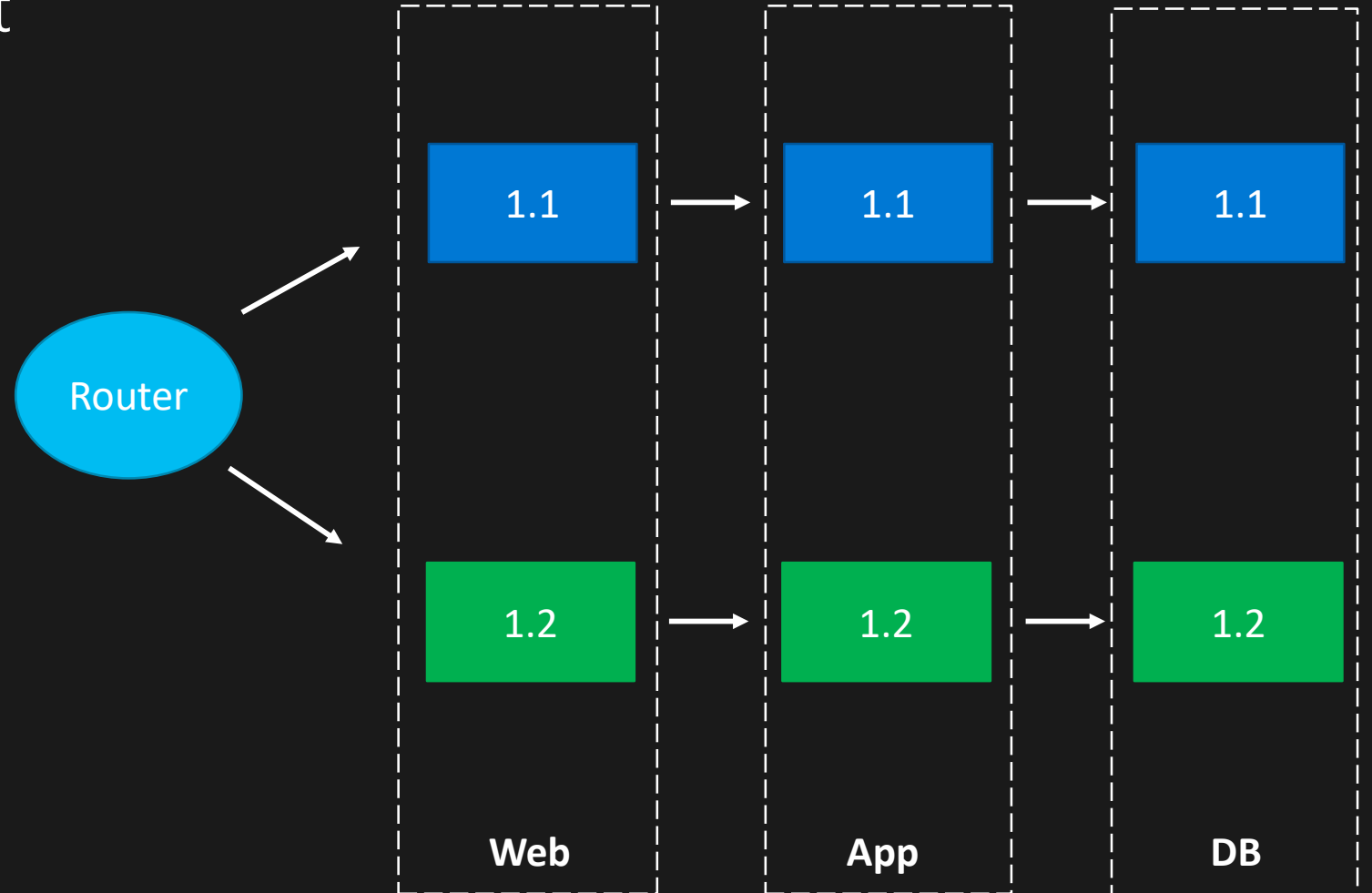


Demo – Deploying with Helm

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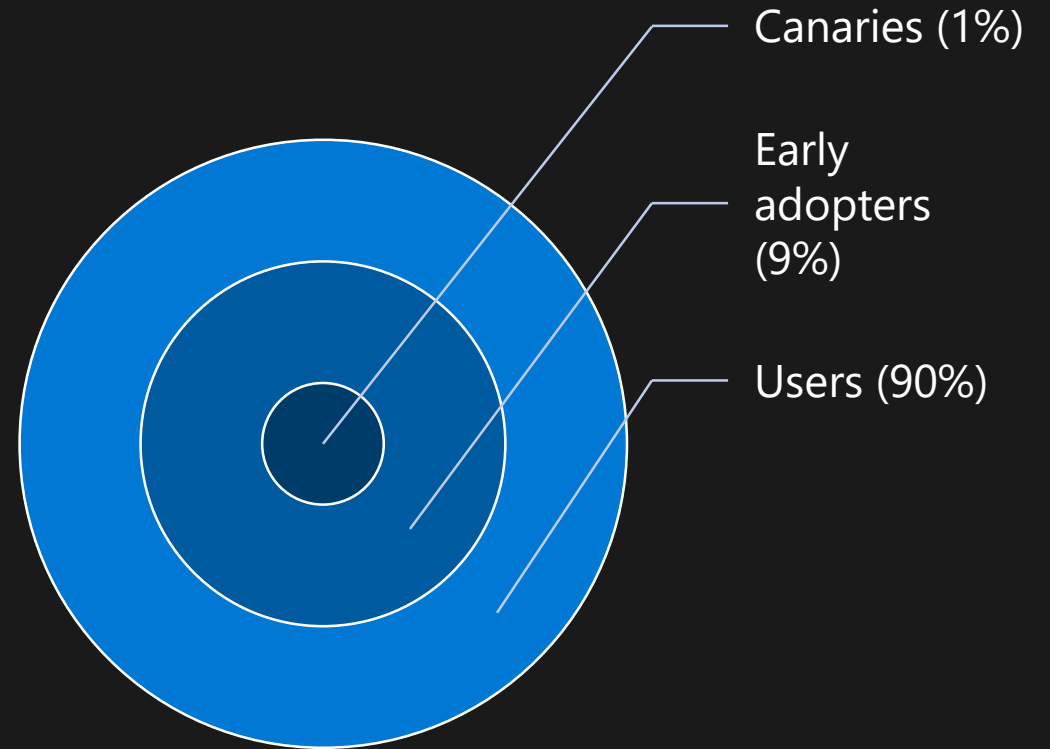
Deployment Patterns for Safe Rollouts

- Blue Green Deployment



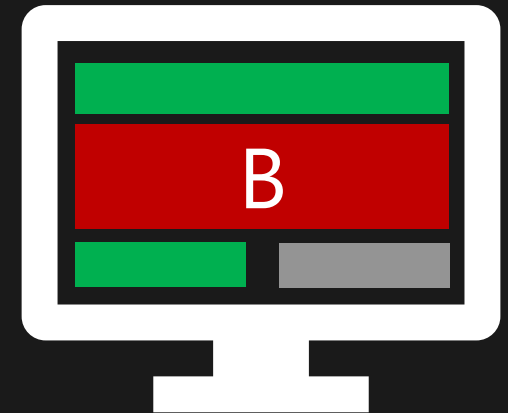
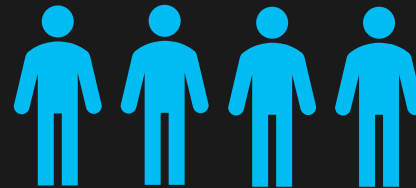
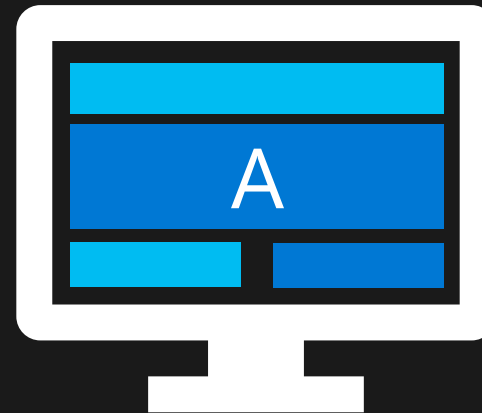
Deployment Patterns for Safe Rollouts

- Blue Green Deployment
- Canary Release



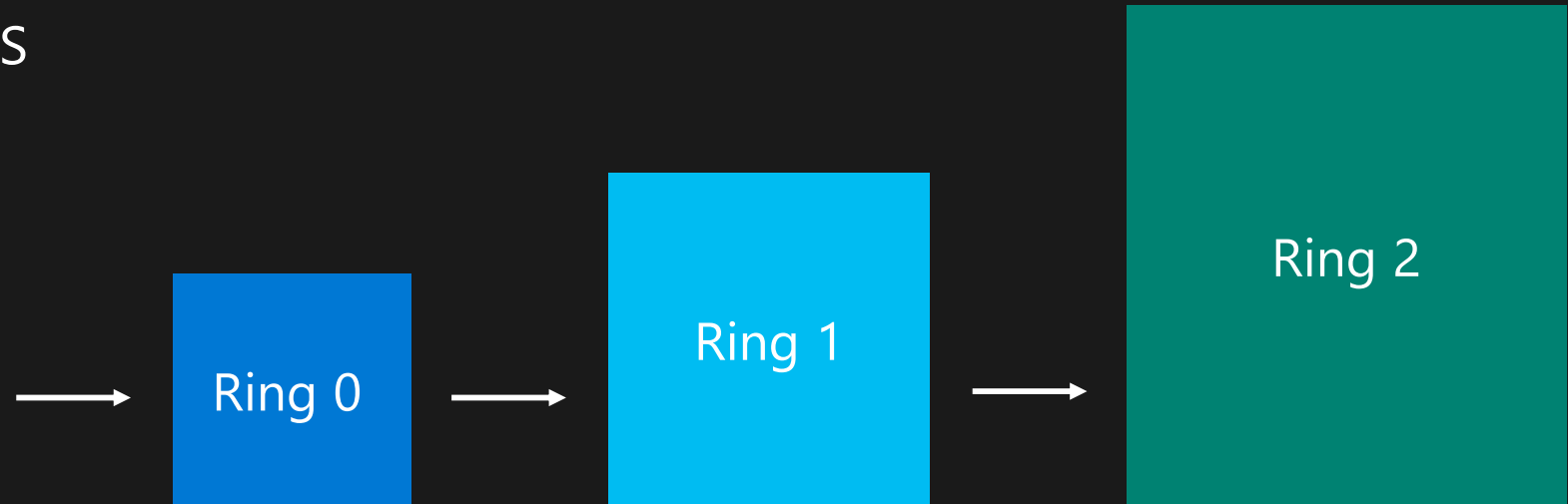
Deployment Patterns for Safe Rollouts

- Blue Green Deployment
- Canary Release
- A/B Testing



Deployment Patterns for Safe Rollouts

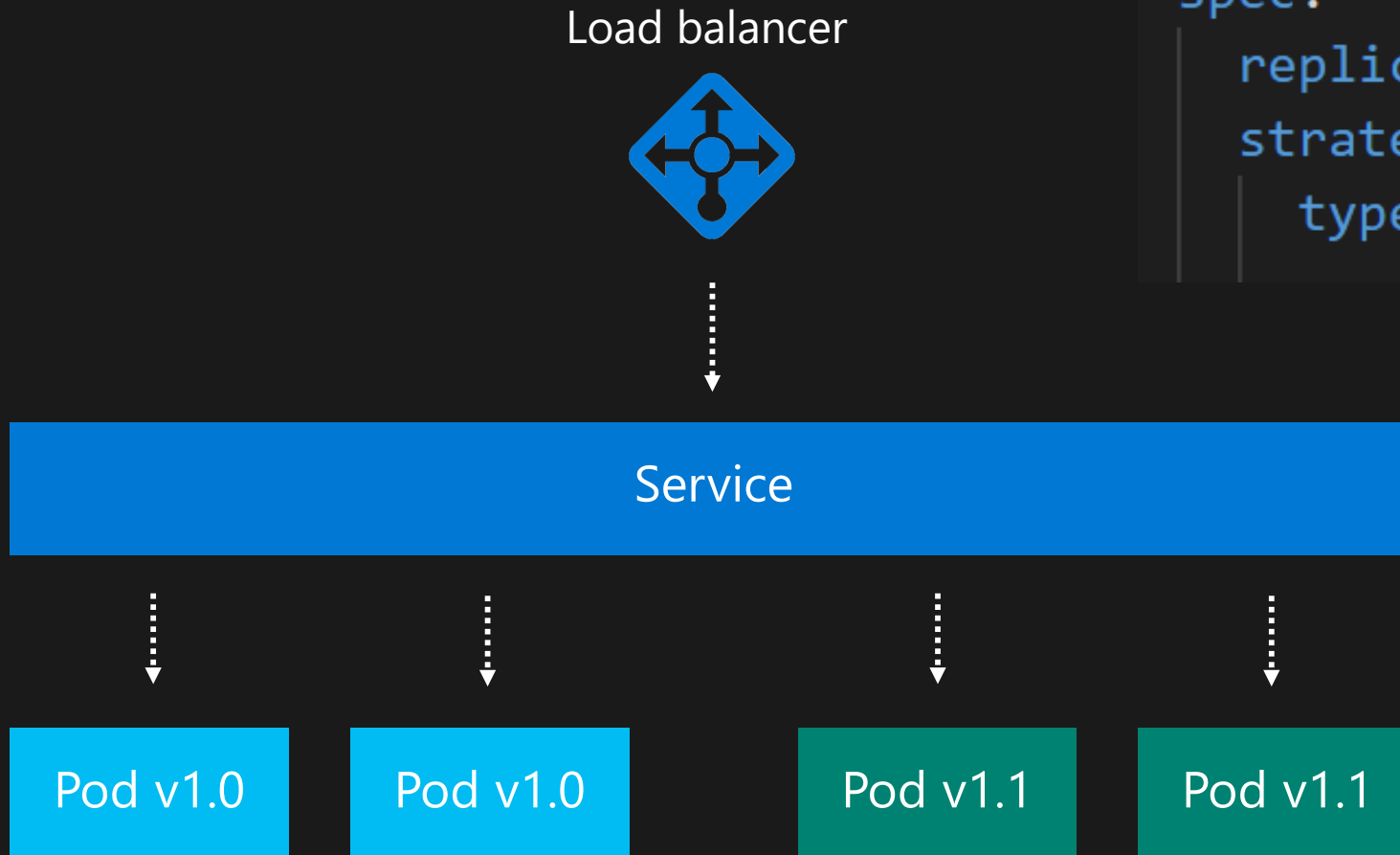
- Blue Green Deployment
- Canary Release
- A/B Testing
- Deployment Rings



Deployments with Kubernetes

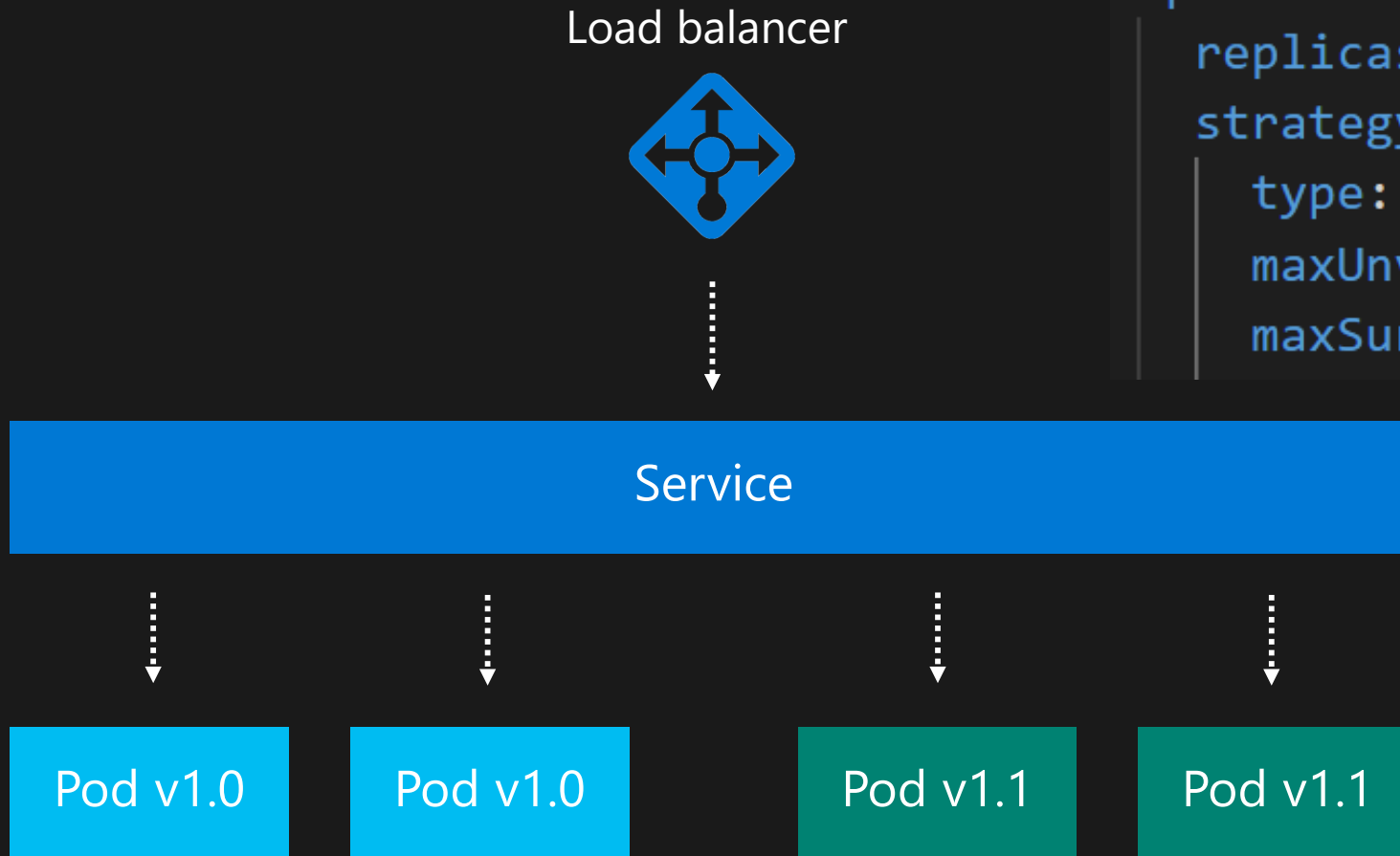
- Two deployments modes in Kubernetes
 - Recreate
 - RollingUpdate
- Probes for signalling health state of a Pod
- Labels used to direct traffic
- Ingress/Service Mesh for more advanced traffic management

Recreate



```
apiVersion: apps/v1beta1
kind: Deployment
metadata:
  name: frontend
spec:
  replicas: 2
  strategy:
    type: Recreate
```

Rolling Upgrade



```
apiVersion: apps/v1beta1
kind: Deployment
metadata:
  name: frontend
spec:
  replicas: 2
  strategy:
    type: RollingUpgrade
    maxUnavailable: 0
    maxSurge: 1
```

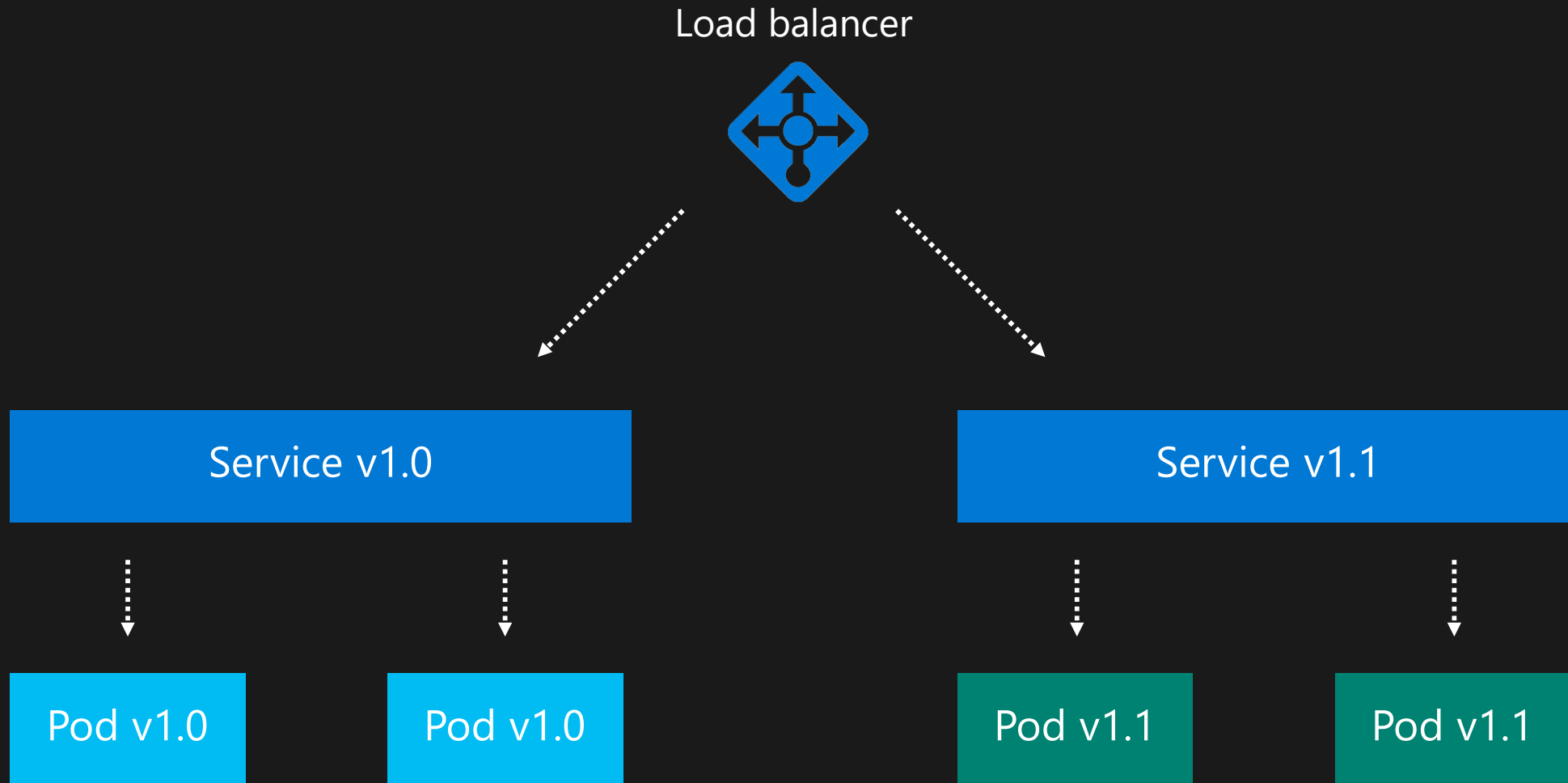
Kubernetes Health Checks

```
spec:
  containers:
  - name: frontend
    image: quizbox.azurecr.io/quizbox.web:1.0
    ports:
    - containerPort: 80
    readinessProbe:
      httpGet:
        path: /api/health
        port: 80
        initialDelaySeconds: 2
        periodSeconds: 3
    livenessProbe:
      httpGet:
        path: /api/health
        port: 80
        periodSeconds: 10
```

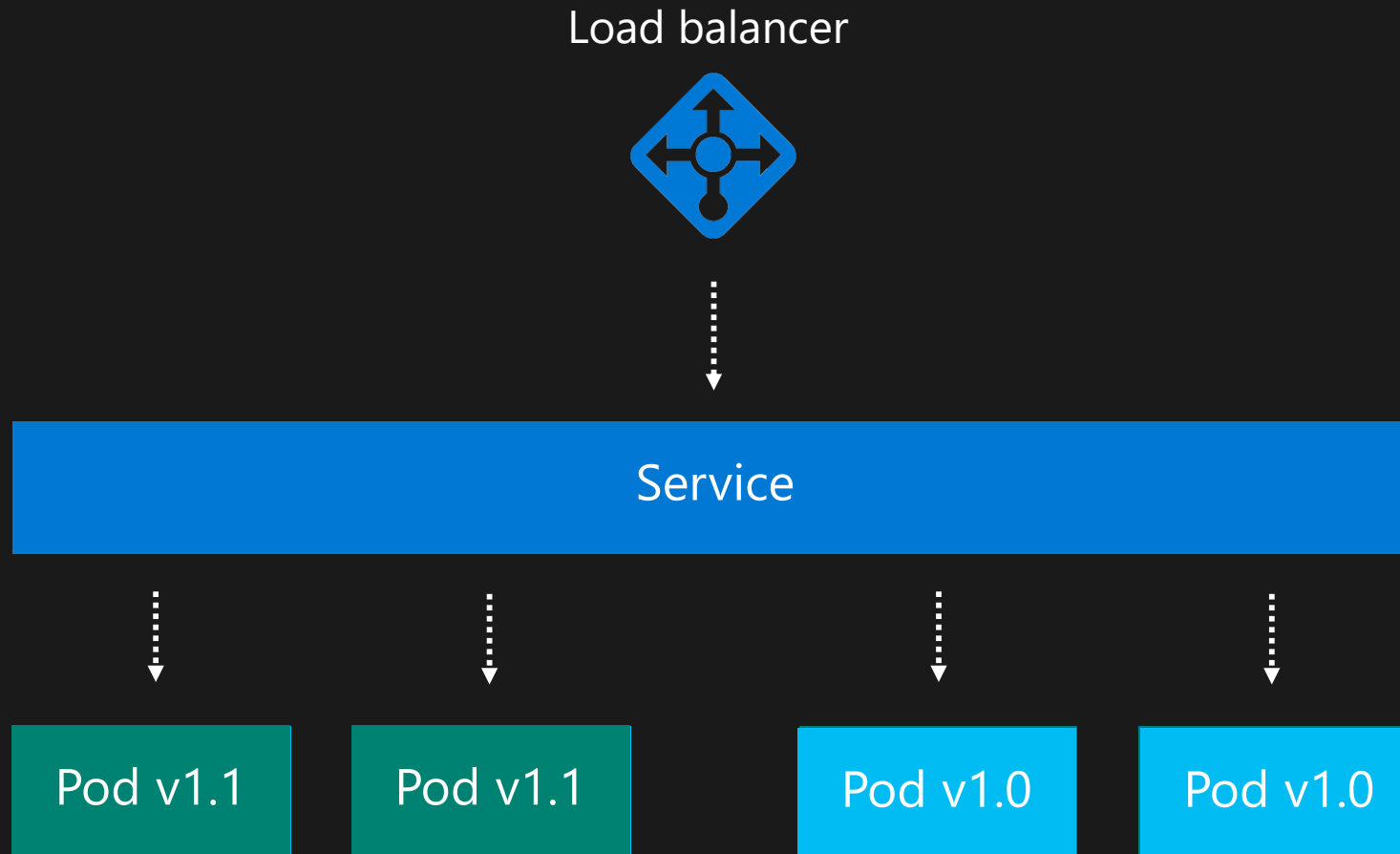
Pod v1.0

Are you alive?
[/api/health/](#)

Blue Green Deployments



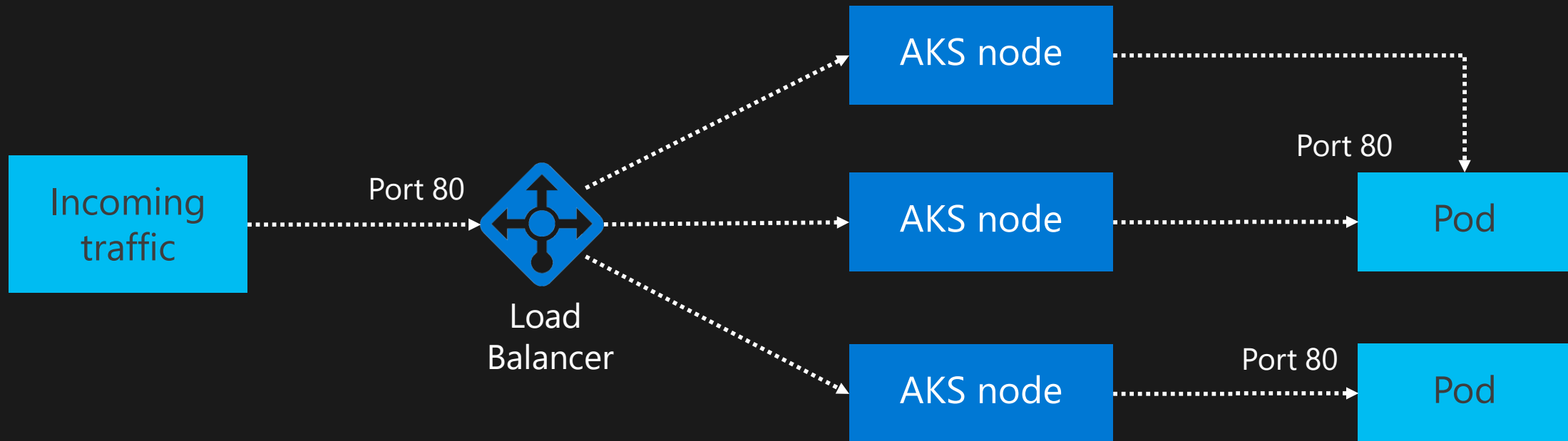
Canary Release



Demo – Safe Deployments with Kubernetes

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Exposing services



Ingress

```
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
  name: qbox-ingress
spec:
  rules:
    - host: myapp.com
      http:
        paths:
          - path: /blog
            backend:
              serviceName: blogservice
              servicePort: 80
          - path: /store
            backend:
              serviceName: storeservice
              servicePort: 80
```

Incoming
traffic

Port 80

Pod

Port 80

Pod

Port 80

Pod

Port 80

Pod

Ingress controllers



Nginx Ingress Controller



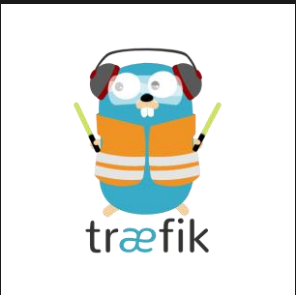
Contour ingress controller



Ambassador API Gateway



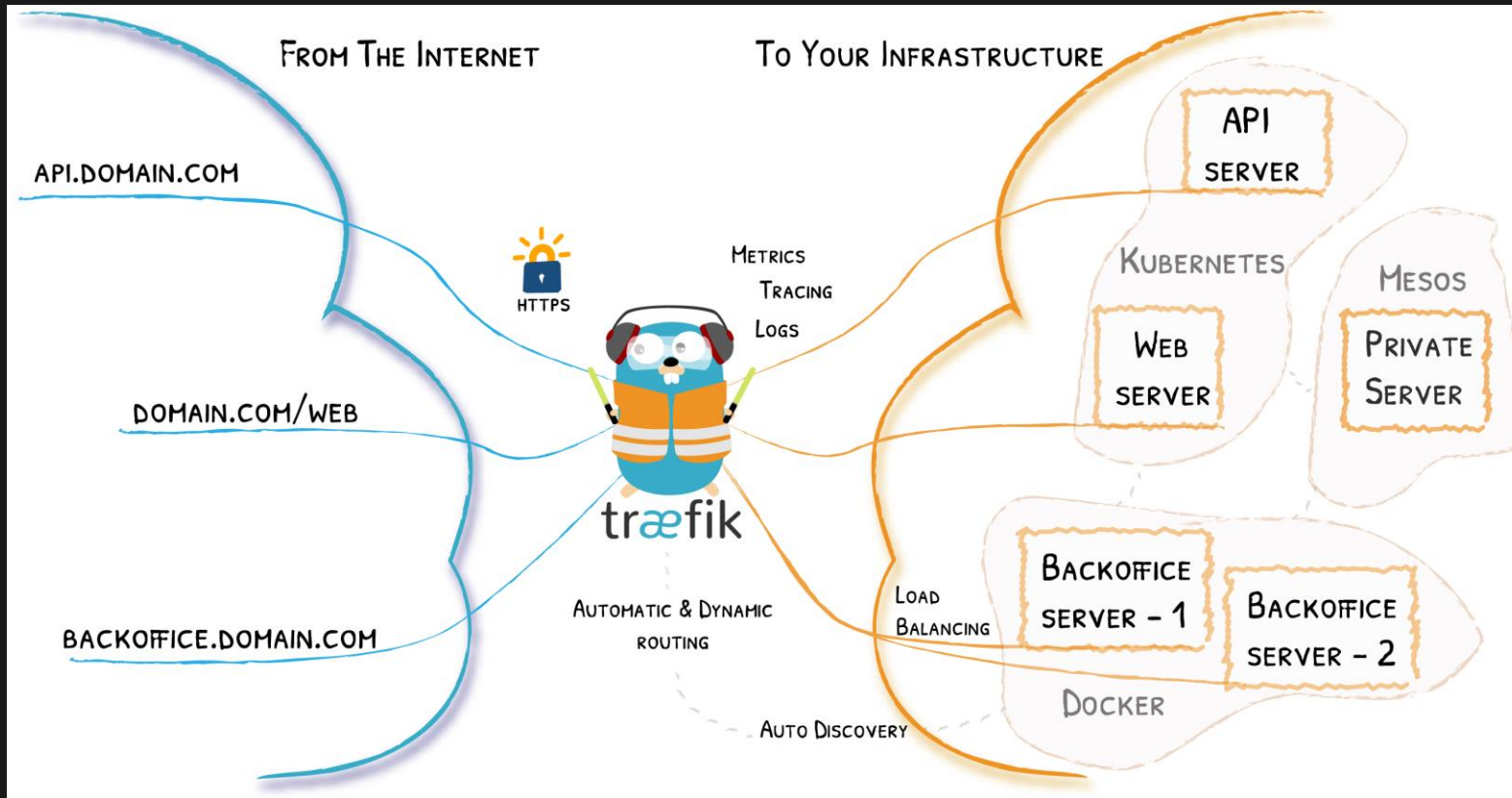
K8s ingress controller for Kong



Traefik

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Traefik



- HTTPS through Let's Encrypt
- Hot reloading
- Circuit breakers, retry..
- Supports multiple load balancers
- Docker, Kubernetes, Rancher, Amazon....

Demo – Canary releases using Traefik

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Thank You