First Steps on Kubernetes

MindSwap - Mindera, 28 Feb

Who Am I?

- Full Cycle Developer
- Tech Lead@Project A
  - Around Mindera for 5 years
- @pontoporponto
  - LinkedIn
  - Twitter
  - GitHub
- 20 years of backend development (mostly!)

Mindera

We use technology to build products we are proud of,
with people we love.

Handbook

What is Kubernetes? (k8s)

...

kubernetes.io

Container Orchestration Tool

Control Plane + Nodes

Declarative Config

Robust & Resilient

Extensible

Managed vs Serviced

Topics Covered

- Pod
- Deployment
  - Probes
  - Replicas
- Service
- Volumes & Secrets
- Related Topics

Setup

- Install kubectl (Homebrew, chocolatey, apt-get, download)
- Configure kubectl autocomplete - Google it, please!
- https://github.com/pontoporponto/k8s-workshop
- ./setup.sh workshop-[NUMBER]
- kubectl get nodes

Pod

1 Pod == 1 Container

kubectl apply -f simple-container-pod.yaml

kubectl get pods

kubectl logs simple-container-workshop

Pod

```yaml
apiVersion: v1
kind: Pod
metadata:
 name: simple-container-workshop
spec:
 containers:
 - name: simple-container
   image: gcr.io/pontoporponto/simple-container:latest
   resources:
     limits:
       cpu: 250m
     requests:
       memory: 250Mi
```

Deployment

Stateless Pods Management

kubectl apply -f simple-service-deployment.yaml

kubectl port-forward simple-service-workshop-XXXXXX 8080

http://localhost:8080/workshop/XX/simple

kubectl describe deployment simple-service-workshop

Deployment

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
 name: simple-service-workshop
spec:
 selector:
   matchLabels:
     app: simple-service
 template:
   metadata:
     labels:
       app: simple-service
   spec:
     containers:
     - name: simple-container
       image: gcr.io/pontoporponto/simple-service:latest
       resources:
         limits:
           memory: 50M
```

Liveness Probe

Readiness Probe

Exec

TCP

HTTP

periodSeconds

timeoutSeconds

failureThreshold

successThreshold

Probes

```
livenessProbe:
 httpGet:
    path: /workshop/simple
    port: 8080
 periodSeconds: 10
 timeoutSeconds: 5
 failureThreshold: 2
```

kubectl port-forward simple-service-workshop-XXXXXX 8080

http://localhost:8080/workshop/shutdown

http://localhost:8080/workshop/simple

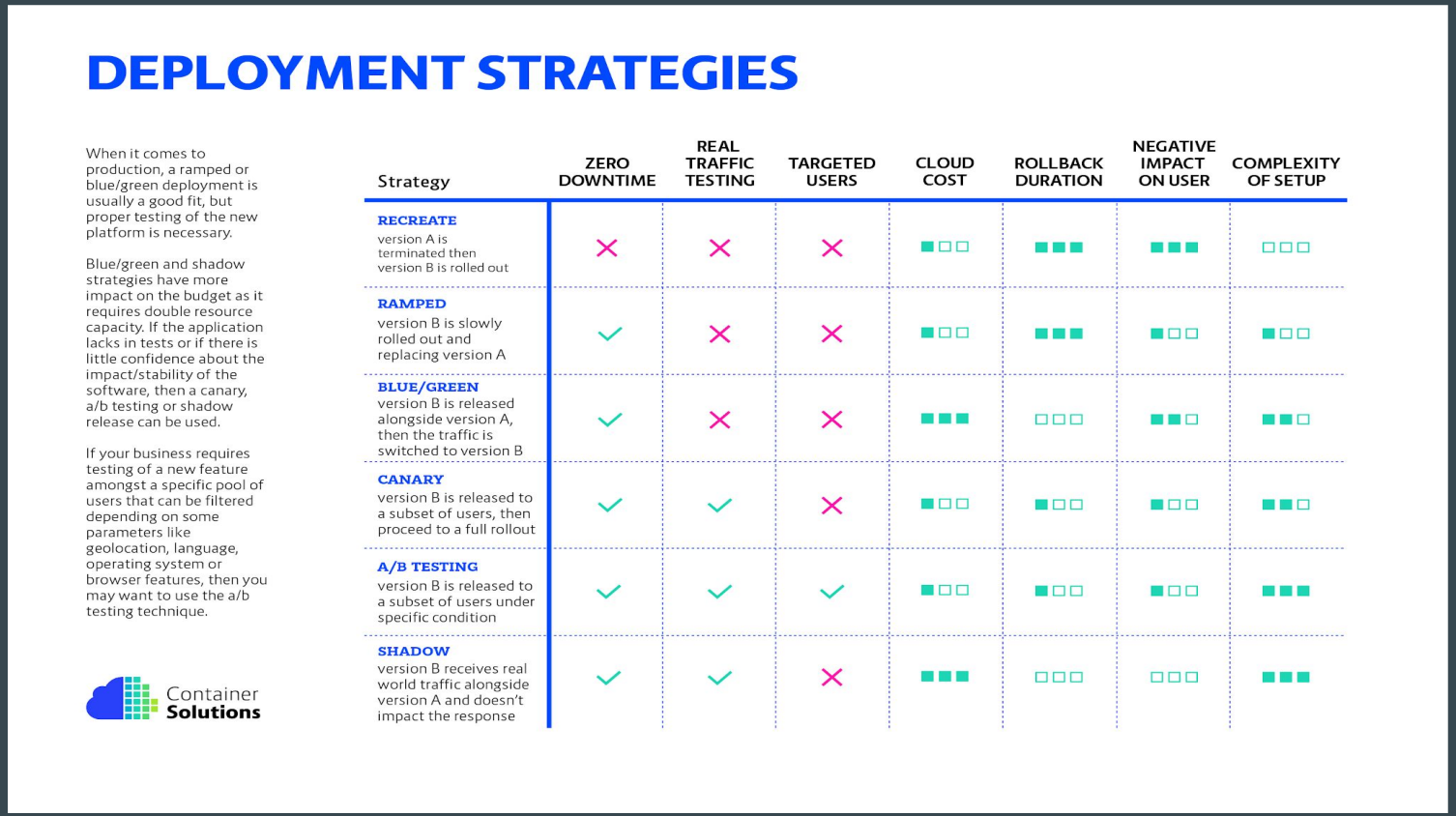
Replicas

kubectl scale deployment simple-service-workshop --replicas=2

```
apiVersion: apps/v1
kind: Deployment
metadata:
 name: simple-service-workshop
spec:
 selector:
   matchLabels:
     app: simple-service
 replicas: 2
 template:
   metadata:
     labels:
       app: simple-service
   spec:
     containers:
     - name: simple-container
       image: gcr.io/pontoporponto/simple-service:latest
```

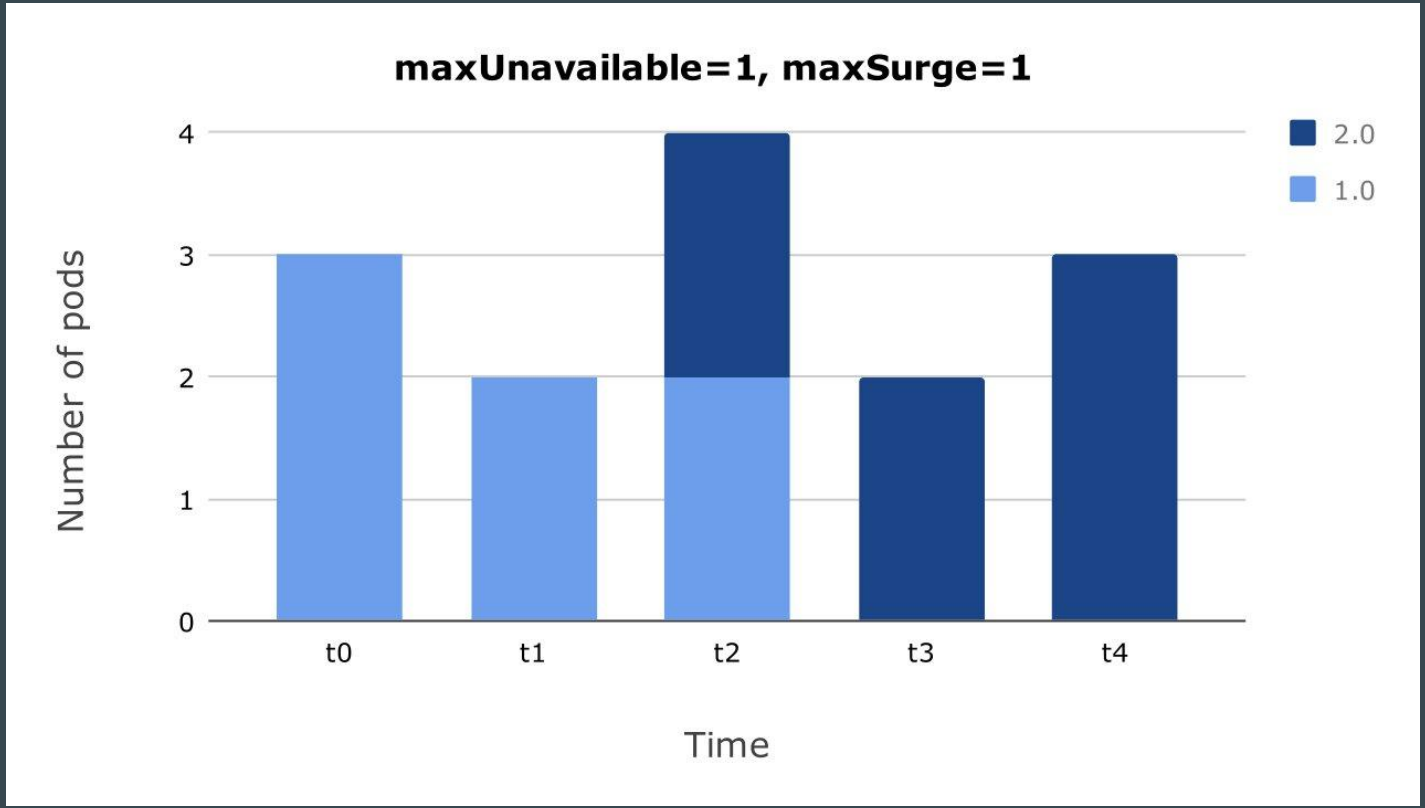
Deployment Strategies

Source: https://github.com/ContainerSolutions/k8s-deployment-strategies



Deployment Strategies

Source: https://www.exoscale.com/syslog/kubernetes-zero-downtime-deployment/



Service

kubectl apply -f simple-service-service.yaml

kubectl exec -it simple-container-workshop sh

curl -X GET http://service-endpoint/workshop/XX/simple

Service

```
apiVersion: v1
kind: Service
metadata:
 name: service-endpoint
spec:
 type: ClusterIP
 selector:
   app: simple-service
 ports:
  - port: 80
    name: workshop
    targetPort: 8080
```

Service

```
type: NodePort
###########
###########
nodePort: 320XX
```

http://34.95.72.197/workshop/XX/simple

Volumes - Secrets

kubectl create secret generic custom-configuration --from-file=placeholder.txt=placeholder.txt

kubectl get secrets custom-configuration -o yaml

kubectl apply -f simple-service-deployment-secret.yaml

kubectl exec -it simple-service-workshop-XXXX sh

more config/placeholder.txt

Helm

Service Mesh

GitOps

Developer Platforms

Serverless

Certification (CKAD)

Feedback