Maintaining Applications with Deployments

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Course Overview

Using Controllers to Deploy Applications and Deployment Basics

Maintaining Applications with Deployments

Deploying and Maintaining Applications with DaemonSets and Jobs

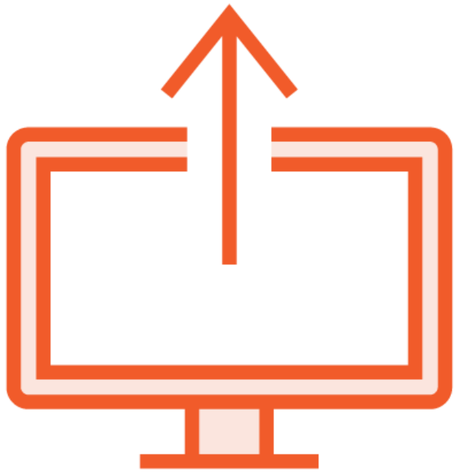
Overview

Configuring and Managing Application State with `Deployments`

- Updating `Deployments`
- Controlling Rollouts
- Scaling Applications

Managing Application State with Deployments

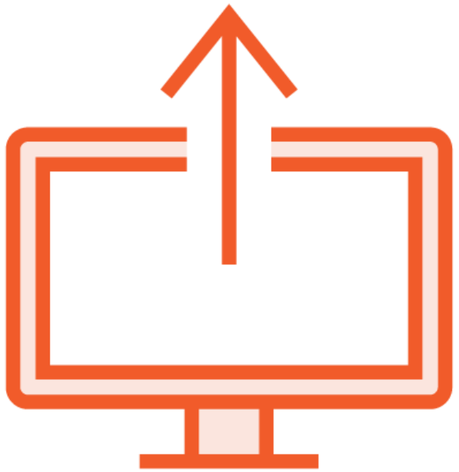
Creating



Updating

Scaling

Updating a Deployment

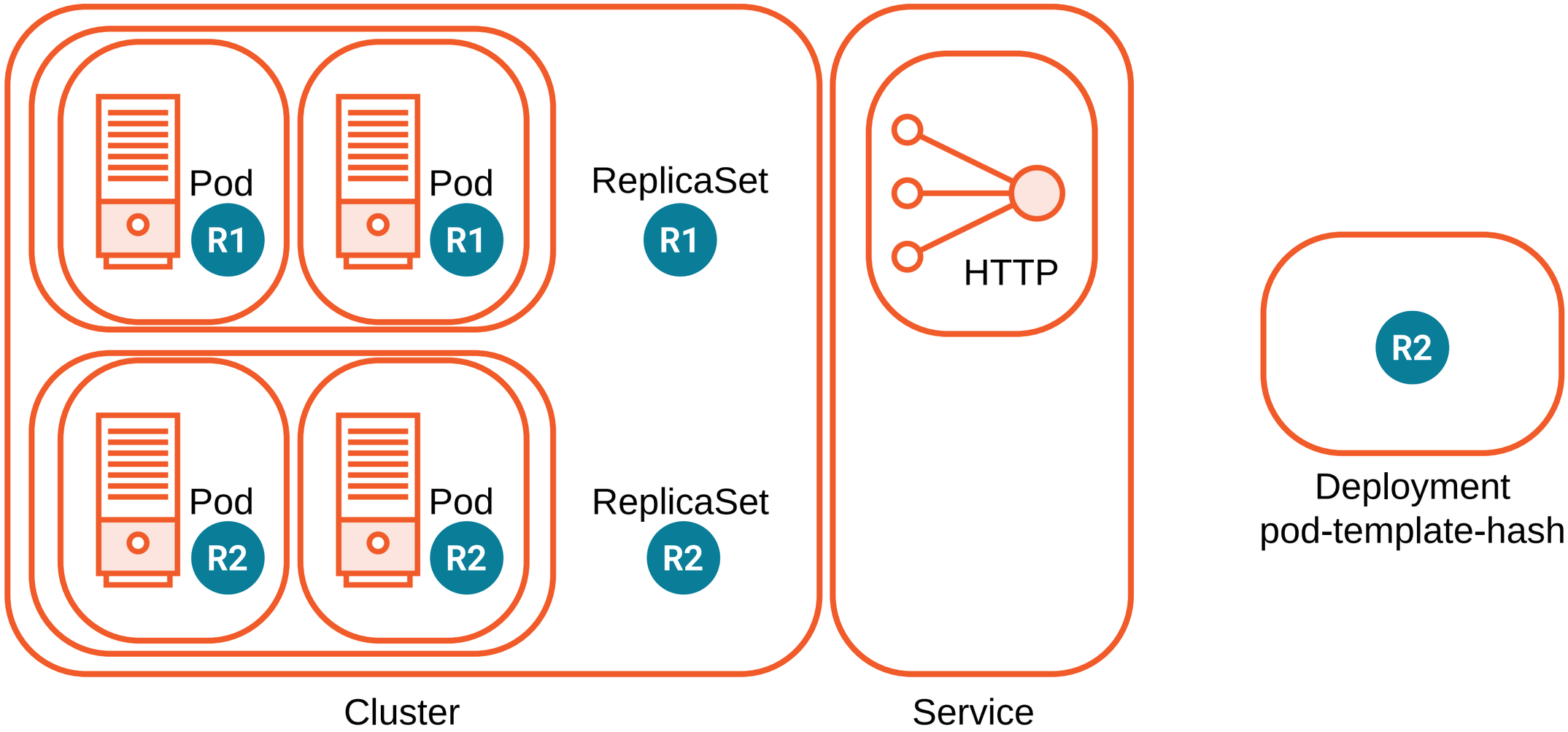


Rolling out a new container image

Triggered by changing the Pod Template

Other fields can be changed without triggering an update

Controller Operations - Deployment Updates



Updating a Deployment Object

```
kubectl set image deployment hello-world hello-world=hello-app:2.0
```

```
kubectl set image deployment hello-world hello-world=hello-app:2.0 --record
```

```
kubectl edit deployment hello-world
```

```
kubectl apply -f hello-world-deployment.yaml --record
```

Checking Deployment Status

```
kubectl rollout status deployment [name]

kubectl describe deployment [name]
```

Deployment Status

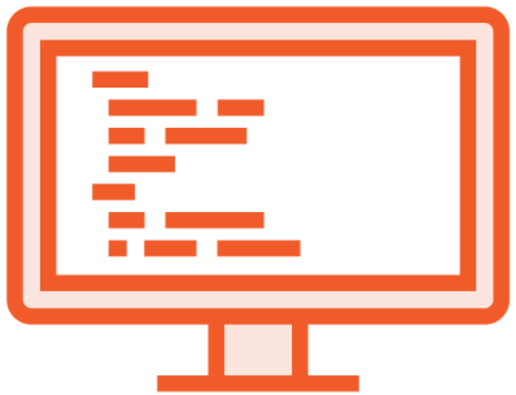
- Complete - all update work is finished
- Progressing - update in flight
- Failed - update could not complete

Demo

Updating a `Deployment`

Checking `Deployment` Rollout Status

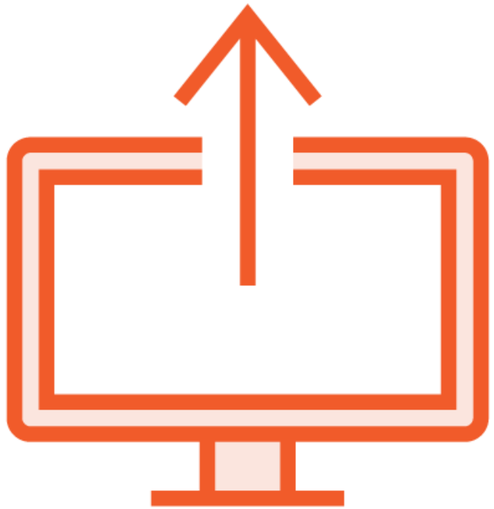
Using Deployments to Change State



Control rollouts of a new version of your application

- Update Strategy
- Pause to make corrections
- Rollback to an earlier version
- Restart a Deployment

Controlling Rollouts With Update Strategy



Controls Pods rollout

`RollingUpdate` (Default)

A new `ReplicaSet` starts scaling up and the old `ReplicaSet` starts scaling down

`Recreate`

Terminates all Pods in the current `ReplicaSet` set prior to scaling up the new `ReplicaSet`

Used when applications don’t support running different versions concurrently

Controlling the RollingUpdate Strategy

`maxUnavailable`	`maxSurge`
Ensures only a certain number of Pods are unavailable being updated	Ensure that only a certain number of Pods are created above the desired number of Pods

Successfully Controlling Deployment Rollouts

Update Strategy in a Deployment Spec

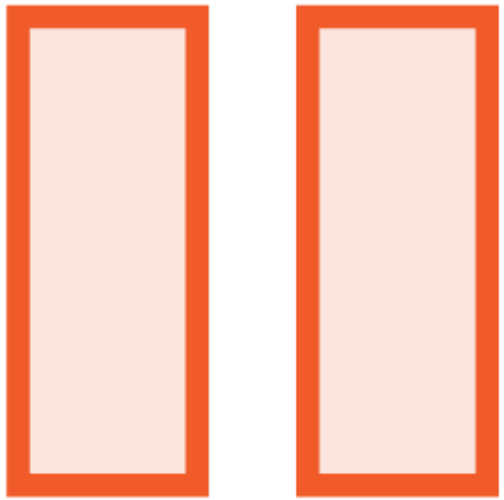
Readiness Probes in your Pod Template Spec

Update Strategy

```
apiVersion: apps/v1
kind: Deployment
...
spec:
  replicas: 20
  strategy:
    type: RollingUpdate
    rollingUpdate:
      maxUnavailable: 20%
      maxSurge: 5
...
```

```
template:
...
    spec:
      containers:
...
        readinessProbe:
          httpGet:
            path: /index.html
            port: 8080
          initialDelaySeconds: 10
          periodSeconds: 10
```

Pausing and Resuming a Deployment



Changes to the `Deployment` while paused are not rolled out

Batch changes together, then resume the rollout

The current state of the Deployment is maintained until it's resumed

Starts up a new `ReplicaSet` with the new changes

```
  kubectl rollout pause deployment \
my-deployment
```

```
  kubectl rollout resume deployment \
my-deployment
```

Rolling Back a Deployment

Rollout history

- `CHANGE-CAUSE` Annotation `Deployment`

Revision History

- `revisionHistoryLimit` defaults to 10
- Number of `ReplicaSets` retained in history
- Used for rolling back
- Can be set to 0 for immediate cleanup

Rolling Back a Deployment (con’t)

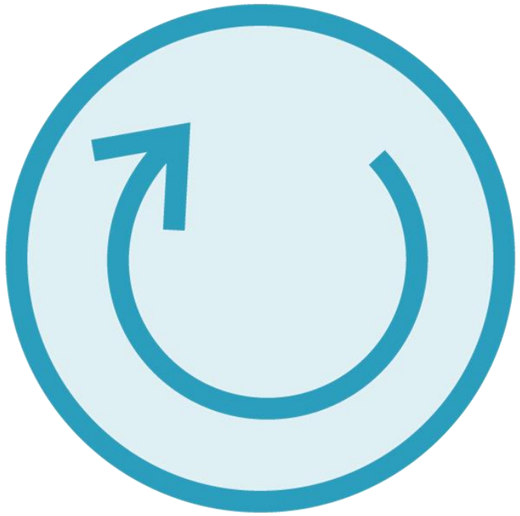
```
kubectl rollout history deployment \
hello-world

kubectl rollout history deployment \
hello-world --revision=1

kubectl rollout undo deployment
hello-world

kubectl rollout undo deployment \
hello-world --to-revision=1
```

Restarting a Deployment



Effectively restarts all the Pods

But no Pod is ever “recreated”

New ReplicaSet with the same Pod Spec

Uses Deployment’s Update Strategy

- `RollingUpdate`
- `Recreate`

```
kubectl rollout restart \
  deployment hello-world
```

Demo

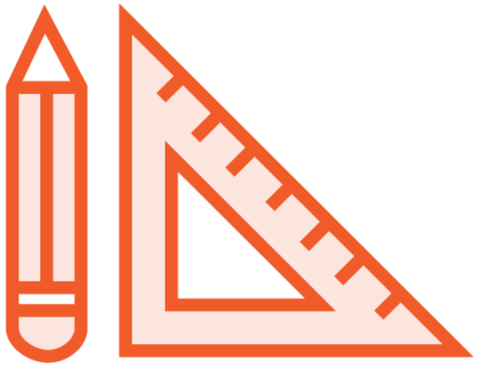
Rolling Back a `Deployment`

Controlling the rate of a Rollout

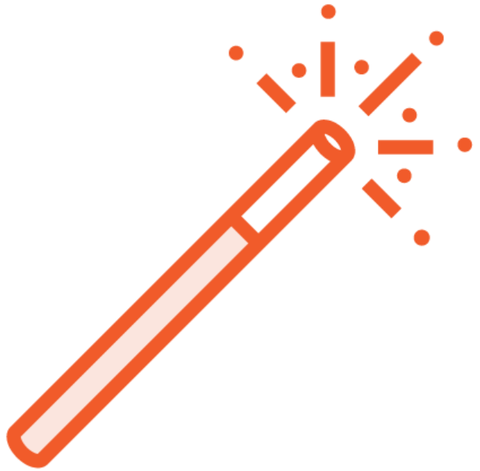
Using Readiness Probes to Control Rollout

Restarting a Deployment

Scaling Deployments



Manual



Horizontal Pod Autoscaler

```
kubectl scale deployment hello-world --replicas=10
kubectl apply -f deployment.yaml
```

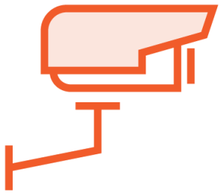
Demo

Scaling a `Deployment`

Deployment Tips

Control your rollouts with an Update Strategy appropriate for your application

Use Readiness Probes for your application



Use the `--record` option to leave a trail of your work for others

Review

Configuring and Managing Application State with `Deployments`

- Using `Deployments` to Change State
- Controlling Rollouts
- Scaling Applications

What’s Next!

Deploying and Maintaining Applications with DaemonSets and Jobs