

Imagine, you are upgrading application from v1 to v2

Upgrade with zero downtime?

Upgrade sequentially, one after the other?

Pause and resume upgrade process?

Rollback upgrade to previous stable release



# Deployments

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## Concept

# Objectives

## Concept

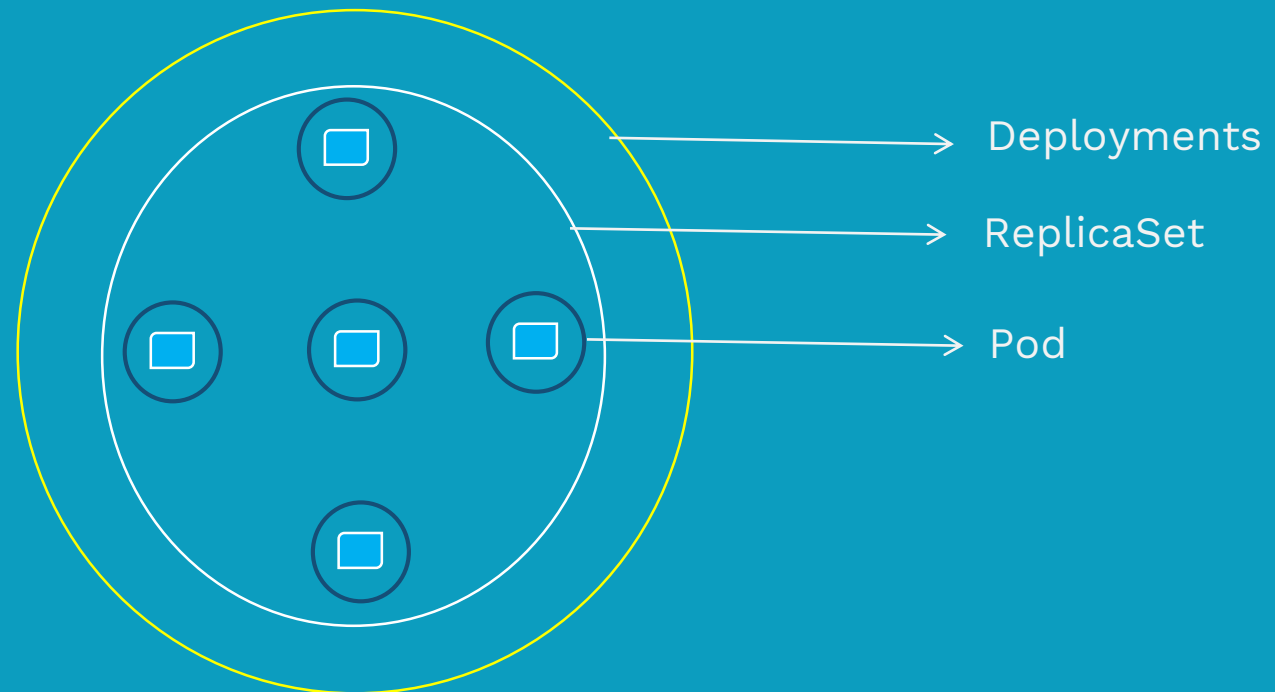
- a. Deployments Overview
- b. Features
- c. Types of Deployment

## Review Demo

- a. Manifest file
- b. Deploy application with Replication Controller
- c. Display and validate
- d. Test use cases
- e. Clean up

# Deployments

## Updates & Rollbacks



# Features


- Multiple Replicas
- Upgrade
- Rollback
- Scale up or down
- Pause and Resume

# Deployment Types

- Recreate
- RollingUpdate (Ramped or Incremental)
- Canary
- Blue / Green


# Review

## Demo

- 
- a. Manifest file
  - b. Deploy app
  - c. Display and validate
  - d. Test – Upgrade
  - e. Test – Rollback
  - f. Test – Scale up & down

# Deployments - Manifest file

```
# Deployment
#controllers/nginx-deploy.yaml
apiVersion: apps/v1
kind: Deployment -----> ①
metadata:
  name: nginx-deploy
  labels:
    app: nginx-app
spec:
  replicas: 3
  selector:
    matchLabels:
      app: nginx-app
  template:
    metadata:
      labels:
        app: nginx-app
    spec:
      containers:
        - name: nginx-container
          image: nginx:1.7.9
          ports:
            - containerPort: 80
```



The diagram illustrates the label matching process between a Deployment's selector and its Pod template. A dashed arrow points from the 'kind: Deployment' line to a circled '1'. A solid arrow points from the 'app: nginx-app' label in the 'matchLabels' section of the 'selector' to a box containing 'app: nginx-app' in the 'labels' section of the 'template'. Another solid arrow points from this box to another 'app: nginx-app' label in the 'labels' section of the 'template'.



# Deployments – Create & Display

```
[srinath@master ~]$ kubectl create -f nginx-deploy.yaml  
deployment.apps/nginx-deployment created
```

```
[srinath@master ~]$ kubectl get deploy -l app=nginx-app
```

NAME	DESIRED	CURRENT	UP-TO-DATE	AVAILABLE	AGE
nginx-deployment	3	3	3	3	1m

```
[srinath@master ~]$ kubectl get rs -l app=nginx-app
```

NAME	DESIRED	CURRENT	READY	AGE
nginx-deployment-c75f4bb64	3	3	3	3m

```
[srinath@master ~]$ kubectl get po -l app=nginx-app
```

NAME	READY	STATUS	RESTARTS	AGE
nginx-deployment-c75f4bb64-h7hph	1/1	Running	0	8m
nginx-deployment-c75f4bb64-pbmj4	1/1	Running	0	8m
nginx-deployment-c75f4bb64-sr4vt	1/1	Running	0	8m

# Deployments – Describe

```
[srinath@master ~]$ kubectl describe deploy nginx-deployment
```

```
Name:                nginx-deployment
Namespace:            default
CreationTimestamp:    Wed, 29 Aug 2018 11:39:31 +0000
Labels:               app=nginx-app
Annotations:          deployment.kubernetes.io/revision=1
Selector:             app=nginx-app
Replicas:             3 desired | 3 updated | 3 total | 3 available | 0 unavailable
StrategyType:         RollingUpdate
MinReadySeconds:      0
RollingUpdateStrategy: 25% max unavailable, 25% max surge
Pod Template:
  Labels:  app=nginx-app
  Containers:
    nginx-container:
      Image:        nginx:1.7.9
      Port:         80/TCP
  ...
  ...
Conditions:
  Type           Status  Reason
  ----           -
  Available      True    MinimumReplicasAvailable
  Progressing    True    NewReplicaSetAvailable
OldReplicaSets:  <none>
NewReplicaSet:   nginx-deployment-c75f4bb64 (3/3 replicas created)
Events:
  Type    Reason             Age    From                      Message
  ----    -
  Normal  ScalingReplicaSet  13m    deployment-controller     Scaled up replica set nginx-deployment-c75f4bb64 to 3
```

# Update

nginx:1.7.9 -> nginx:1.9.1

# Deployments – Update Deployment

```
[srinath@master ~]$ kubectl set image deploy nginx-deployment nginx-container=nginx:1.9.1
deployment.extensions/nginx-deployment image updated
```

```
[srinath@master ~]$ kubectl edit deploy nginx-deployment
deployment.extensions/nginx-deployment image updated
```

```
[srinath@master ~]$ kubectl rollout status deployment/nginx-deployment
Waiting for deployment "nginx-deployment" rollout to finish: 1 old replicas are pending termination...
Waiting for deployment "nginx-deployment" rollout to finish: 1 old replicas are pending termination...
deployment "nginx-deployment" successfully rolled out
```

```
[srinath@master ~]$ kubectl get deploy
```

NAME	DESIRED	CURRENT	UP-TO-DATE	AVAILABLE	AGE
nginx-deployment	3	3	3	3	48m

# Rollback

nginx:1.7.9 -> nginx:1.91

# Deployments – Rollback Deployment

```
[srinath@master ~]$ kubectl set image deploy nginx-deployment nginx-container=nginx:1.91 --record  
deployment.extensions/nginx-deployment image updated
```

```
[srinath@master ~]$ kubectl rollout status deployment/nginx-deployment  
Waiting for deployment "nginx-deployment" rollout to finish: 1 out of 3 new replicas have been updated...
```

```
[srinath@master ~]$ kubectl rollout history deployment/nginx-deployment  
deployments "nginx-deployment"  
REVISION  CHANGE-CAUSE  
1  kubectl create --filename=nginx-deploy.yaml --record=true  
2  kubectl set image deploy nginx-deployment nginx-container=nginx:1.91 --record=true
```

```
[srinath@master ~]$ kubectl rollout undo deployment/nginx-deployment  
deployment.extensions/nginx-deployment
```

```
[srinath@master ~]$ kubectl rollout status deployment/nginx-deployment  
deployment "nginx-deployment" successfully rolled out
```

# Scale up & down

# Deployments – Scaling up

```
[srinath@master ~]$ kubectl scale deployment nginx-deployment --replicas=5
deployment.extensions/nginx-deployment scaled
```

```
[srinath@master ~]$ kubectl get deploy
```

NAME	DESIRED	CURRENT	UP-TO-DATE	AVAILABLE	AGE
nginx-deployment	5	5	5	5	20m

```
[srinath@master ~]$ kubectl get po
```

NAME	READY	STATUS	RESTARTS	AGE
nginx-deployment-c75f4bb64-8dcmw	1/1	Running	0	3m
nginx-deployment-c75f4bb64-8dlb9	1/1	Running	0	21m
nginx-deployment-c75f4bb64-fxlrw	1/1	Running	0	3m
nginx-deployment-c75f4bb64-kxvtx	1/1	Running	0	3m
nginx-deployment-c75f4bb64-r6pjl	1/1	Running	0	3m



# Deployments – Scaling down

```
[srinath@master ~]$ kubectl scale deployment nginx-deployment --replicas=1  
deployment.extensions/nginx-deployment scaled
```

```
[srinath@master ~]$ kubectl get deploy
```

NAME	DESIRED	CURRENT	UP-TO-DATE	AVAILABLE	AGE
nginx-deployment	1	1	1	1	24m

```
[srinath@master ~]$ kubectl get po -l app=nginx-app
```

NAME	READY	STATUS	RESTARTS	AGE
nginx-deployment-c75f4bb64-h7hph	1/1	Running	0	8m

# Deployments – Delete

```
[srinath@master ~]$ kubectl delete -f nginx-deploy.yaml  
deployment.apps "nginx-deployment" deleted
```

```
[srinath@master ~]$ kubectl get po -l app=nginx-app  
No resources found
```

# Summary

## Concept

- a. Deployments Overview
- b. Features
- c. Types of Deployment

## Review Demo

- a. Manifest file
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Coming up...

# Demo Deployments