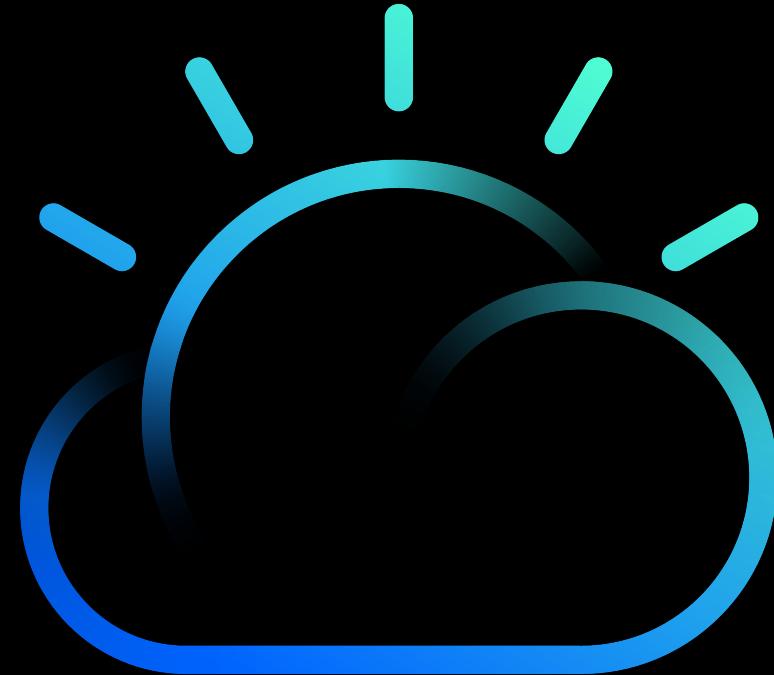
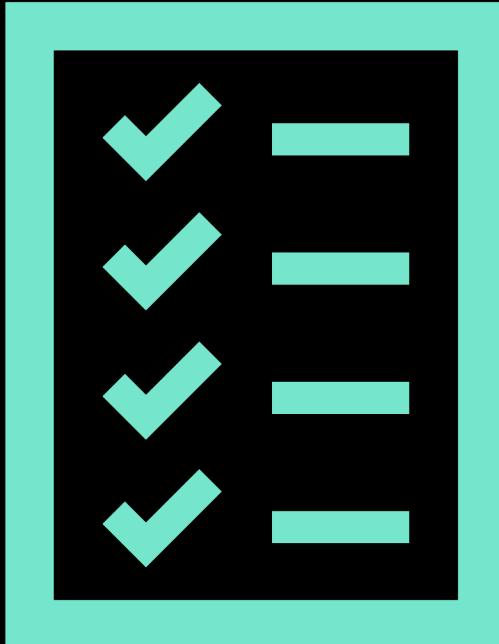


# OpenShift



Ishani Pandey  
Developer Advocate - IBM

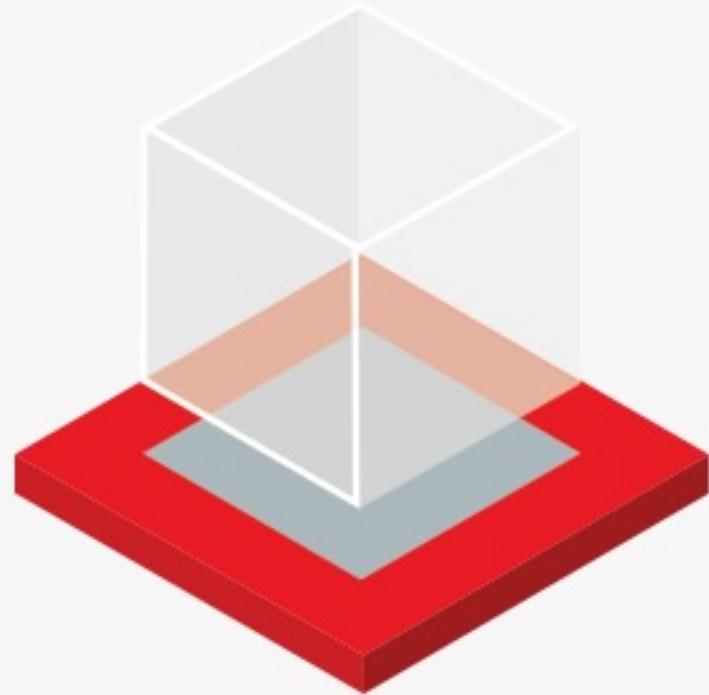
# Agenda



- Red Hat OpenShift
- How OpenShift Works?
- Accessing OpenShift Web Console & CLI
- OpenShift & Kubernetes Core Concepts
- OpenShift Architecture
- Why OpenShift?
- Demo



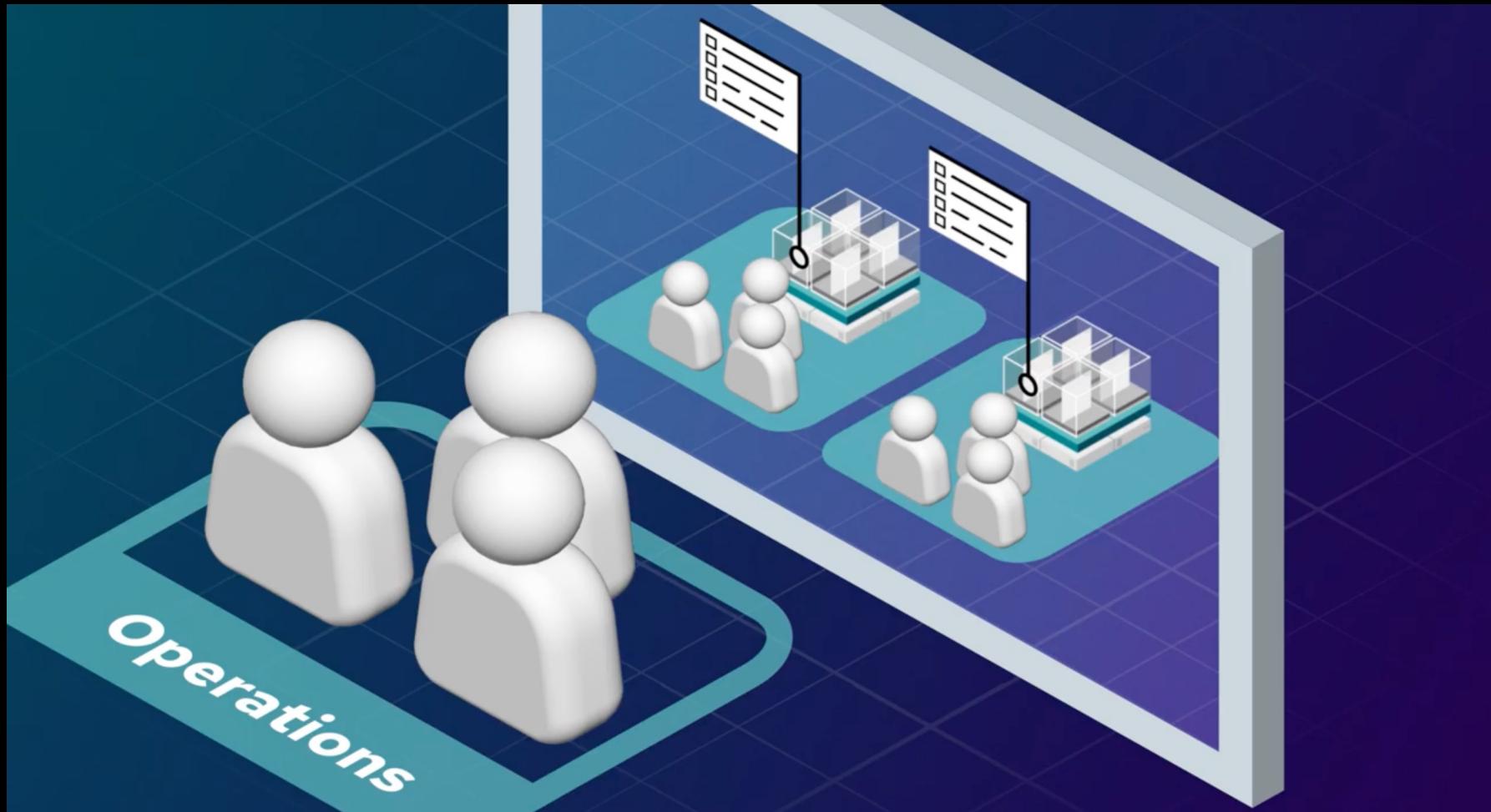
**Red Hat**  
**OpenShift**



OPENSOURCE

KUBERNETES







A graphic illustration set against a dark blue background with a light blue grid. In the center, three white 3D-style human figures are standing on a teal-colored rectangular platform. The platform has the word "Developers" written in white cursive text. Above each developer is a white thought bubble containing a piece of software-related text: "Jenkins" on the left, "Java" in the middle, and "Python" on the right. Small white thought bubbles also float between the main bubbles.

Jenkins

Java

Python

Developers

# Platform as a Service

Build and Run Applications on Containers

# OpenShift is Open Source



# How OpenShift works?



**OpenShift(User Experience, PaaS, Market Place)**



**Kubernetes (Orchestration)**



**Docker (Container API)**



Administrator

Home

Dashboards

Projects

Search

Explore

Events

Operators

Workloads

Serverless

Networking

Storage

Builds

## Projects

[Create Project](#)

Name	Status	Requester	Labels	
PR 172	✓ Active	IAM#ispandey@in.ibm.com	No labels	
PR 173	✓ Active	IAM#ispandey@in.ibm.com	No labels	
PR 174	✓ Active	IAM#ispandey@in.ibm.com	No labels	
PR 175	✓ Active	IAM#ispandey@in.ibm.com	No labels	
PR 17thmay	✓ Active	IAM#ispandey@in.ibm.com	No labels	
PR calico-system	✓ Active	No requester	<code>name=calico-system</code> <code>openshift.io/run-level=0</code>	
PR cp4a	✓ Active	IAM#ispandey@in.ibm.com	No labels	
PR default	✓ Active	No requester	No labels	

Developer

Project: [REDACTED]

+Add

Topology

Builds

Pipelines

Advanced

Project Details

Project Access

Metrics

Search

Events

Dashboard

Overview

YAML

Workloads

Role Bindings

Details

[View all](#)

Name



Requester

IAM#ispandey@in.ibm.com

Labels

No labels

Status

Active



No project messages

Inventory

[1 Deployment](#)

5 Pods

0 PVCs

2 Services

2 Routes

Utilization

1 Hour ▾

Resource

Usage

18:45

19:15

CPU

14.64m

20m

10m

0m

Memory

434.5 MiB

600 MiB

400 MiB

200 MiB

Activity

[View events](#)

Ongoing

There are no ongoing activities.

Recent Events

[Pause](#)

There are no recent events.

# Deployment

1 pod

Name  
github-com

Namespace  
NS

Labels  
app=github-com app.kubernetes.io/component=github-com  
app.kubernetes.io/instance=github-com app.kubernetes.io/name=python  
app.kubernetes.io/part-of=github-com-app app.openshift.io/runtime=python  
app.openshift.io/runtime-version=3.6

Pod Selector  
app=github-com

Node Selector  
No selector

Tolerations  
0 Tolerations

Annotations

Update Strategy  
RollingUpdate

Max Unavailable  
25% of 1 pod

Max Surge  
25% greater than 1 pod

Progress Deadline Seconds  
600 seconds

Min Ready Seconds  
Not Configured

Pods > github-com-59c85c68f9-zjjh2 > Container Details

github-com Running

Container Overview

State  
Running

ID  
cri-o://c69e4d2f7b3f492bb2ae8209ebd40604f63b  
6e699d765f33b0b2c089a012ee82

Restarts  
0

Resource Requests  
-

Resource Limits  
-

Lifecycle Hooks  
-

Readiness Probe  
-

Image Details

Image  
image-registry.openshift-image-registry.svc:5000/in  
osys/github-com@sha256:4ccd22713ec08a792025b  
06e2aed62d0cb9390a06137c997ed77163575ba2db  
3

Image Version/Tag  
-

Command  
-

Args  
-

Pull Policy  
Always Pull

Network

Node  
N 10.113.110.58

Pod IP  
172.30.173.155

# OpenShift CLI

> OC

## OpenShift Client

This client helps you develop, build, deploy, and run your applications on any OpenShift or Kubernetes compatible platform. It also includes the administrative commands for managing a cluster under the 'adm' subcommand.

To create a new application, login to your server and then run new-app:

```
oc login https://mycluster.mycompany.com
oc new-app centos/ruby-22-centos7~https://github.com/openshift/ruby-ex.git
oc logs -f bc/ruby-ex
```

# More Details

```
Usage:
  oc [flags]

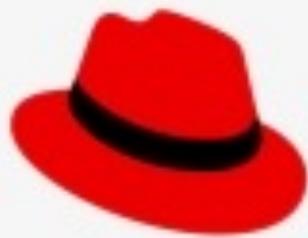
Basic Commands:
  types      An introduction to concepts and types
  login      Log in to a server
  new-project Request a new project
  new-app    Create a new application
  status     Show an overview of the current project
  project    Switch to another project
  projects   Display existing projects
  explain    Documentation of resources
  cluster    Start and stop OpenShift cluster

Build and Deploy Commands:
  rollout    Manage a Kubernetes deployment or OpenShift deployment config
  rollback   Revert part of an application back to a previous deployment
  new-build  Create a new build configuration
  start-build Start a new build
  cancel-build Cancel running, pending, or new builds
  import-image Imports images from a Docker registry
  tag        Tag existing images into image streams

Application Management Commands:
  get        Display one or many resources
  describe  Show details of a specific resource or group of resources
  edit      Edit a resource on the server
  set       Commands that help set specific features on objects
  label     Update the labels on a resource
  annotate  Update the annotations on a resource
  expose    Expose a replicated application as a service or route
  delete   Delete one or more resources
  scale     Change the number of pods in a deployment
  autoscale Autoscale a deployment config, deployment, replication controller, or replica set
  secrets   Manage secrets
  serviceaccounts Manage service accounts in your project

Troubleshooting and Debugging Commands:
  logs      Print the logs for a resource
  rsh       Start a shell session in a pod
  rsync    Copy files between local filesystem and a pod
  port-forward Forward one or more local ports to a pod
  debug    Launch a new instance of a pod for debugging
  exec     Execute a command in a container
  proxy    Run a proxy to the Kubernetes API server
  attach   Attach to a running container
  run      Run a particular image on the cluster
```

# OpenShift & Kubernetes Core Concepts



Red Hat



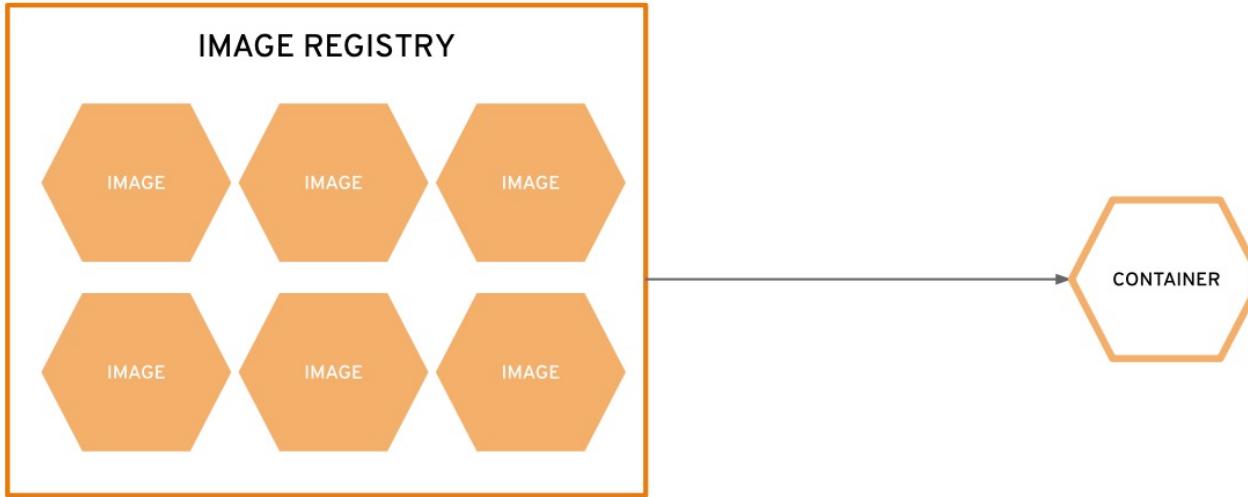
# a container is the smallest compute unit



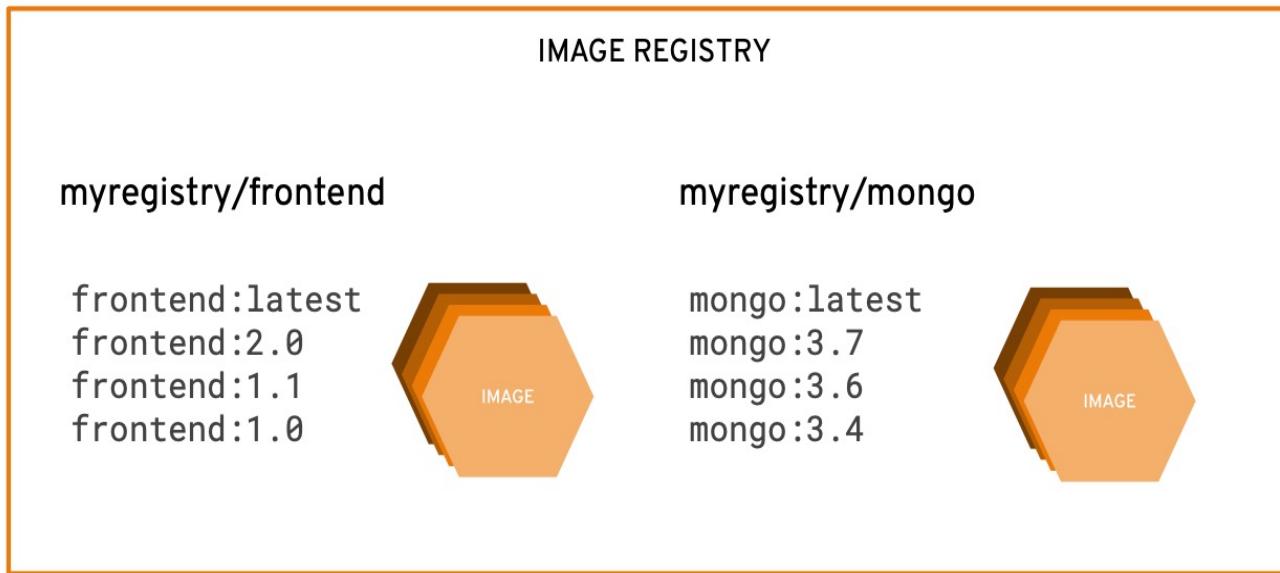
# containers are created from container images



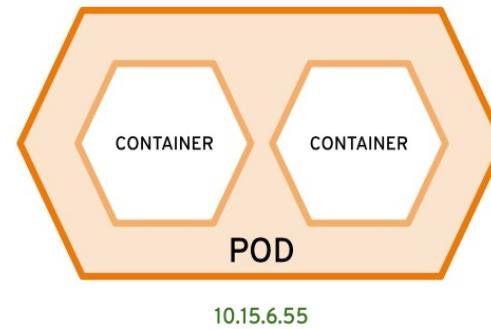
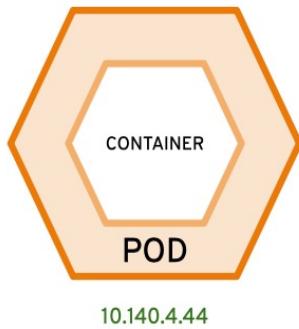
# container images are stored in an image registry



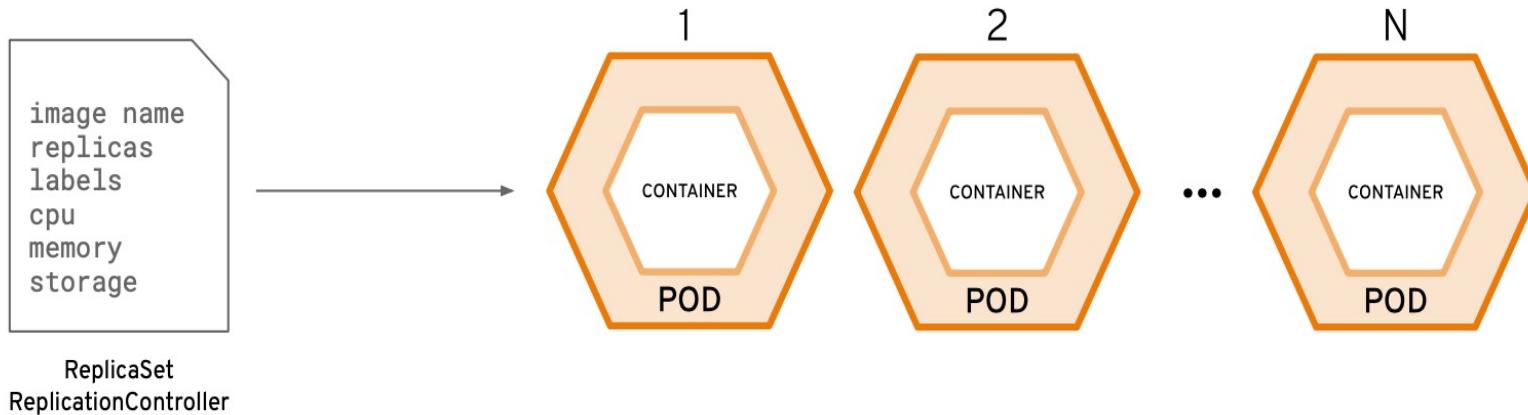
# an image repository contains all versions of an image in the image registry



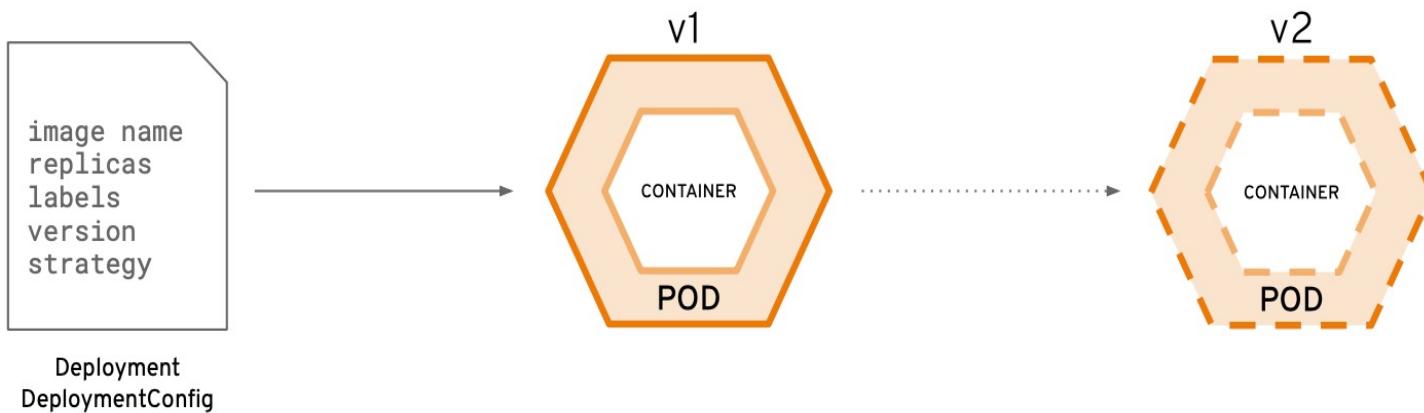
containers are wrapped in pods which are units of deployment and management



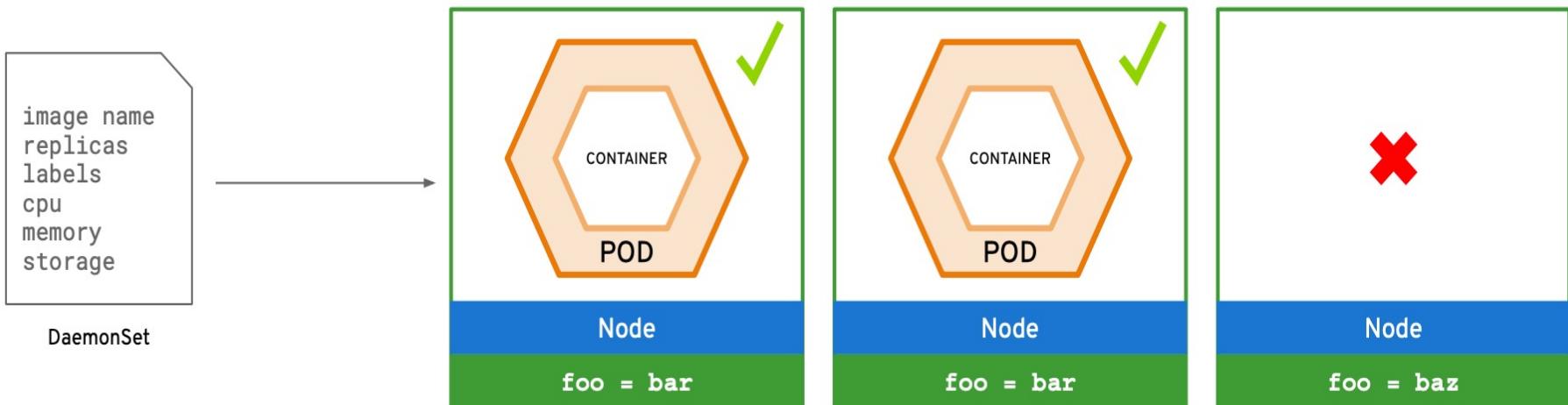
# ReplicationControllers & ReplicaSets ensure a specified number of pods are running at any given time



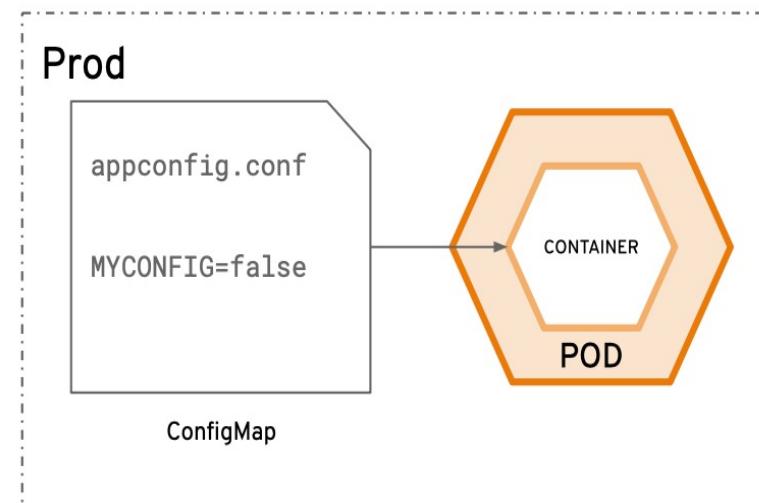
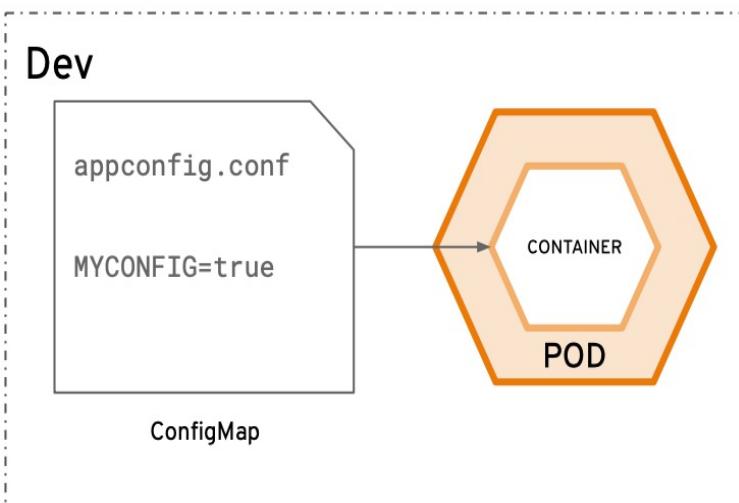
# Deployments and DeploymentConfigurations define how to roll out new versions of Pods



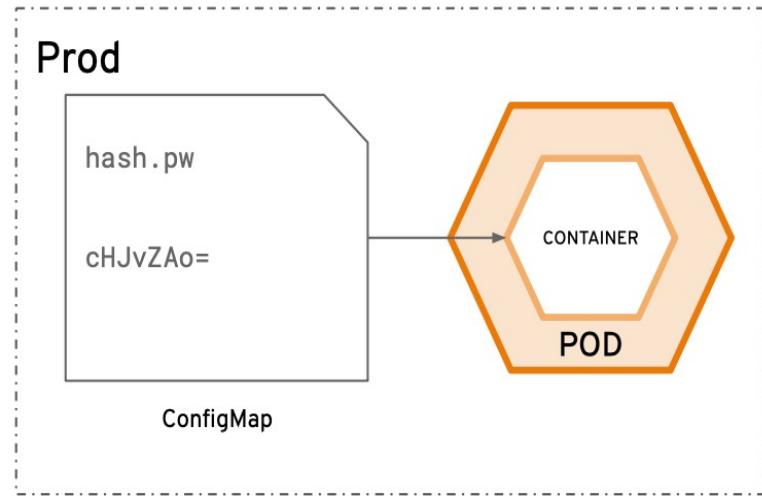
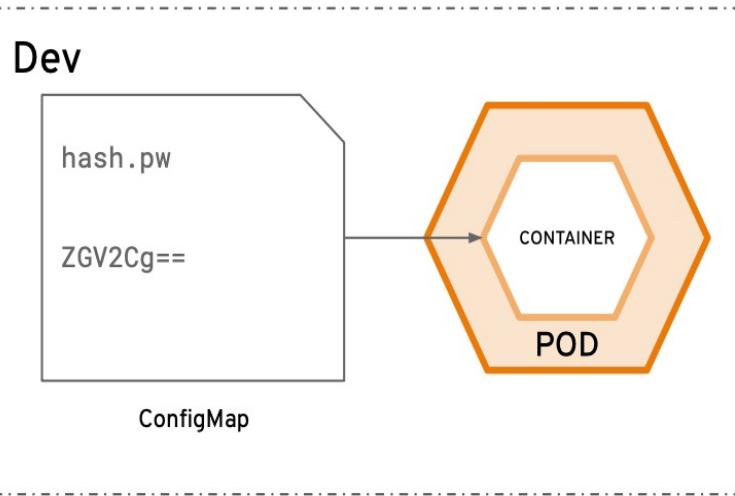
a daemonset ensures that all  
(or some) nodes run a copy of a  
pod



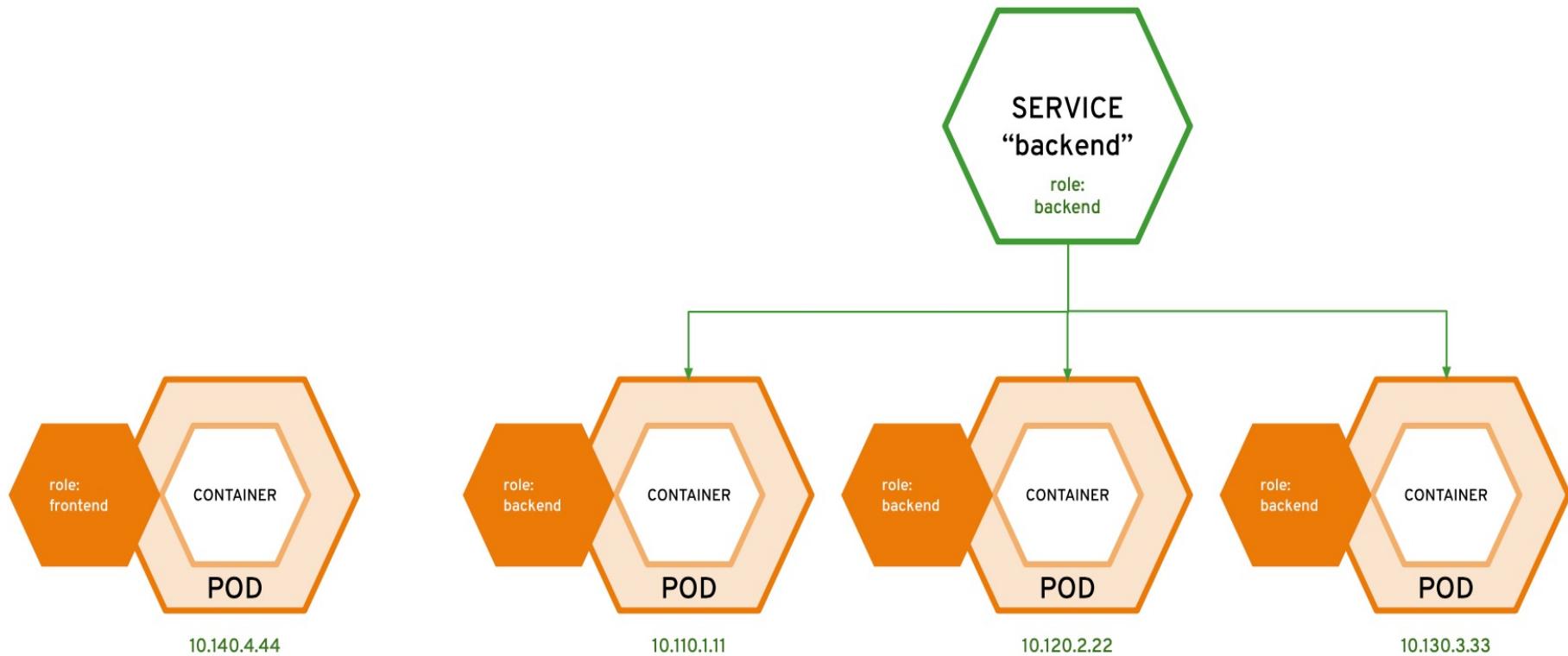
# configmaps allow you to decouple configuration artifacts from image content



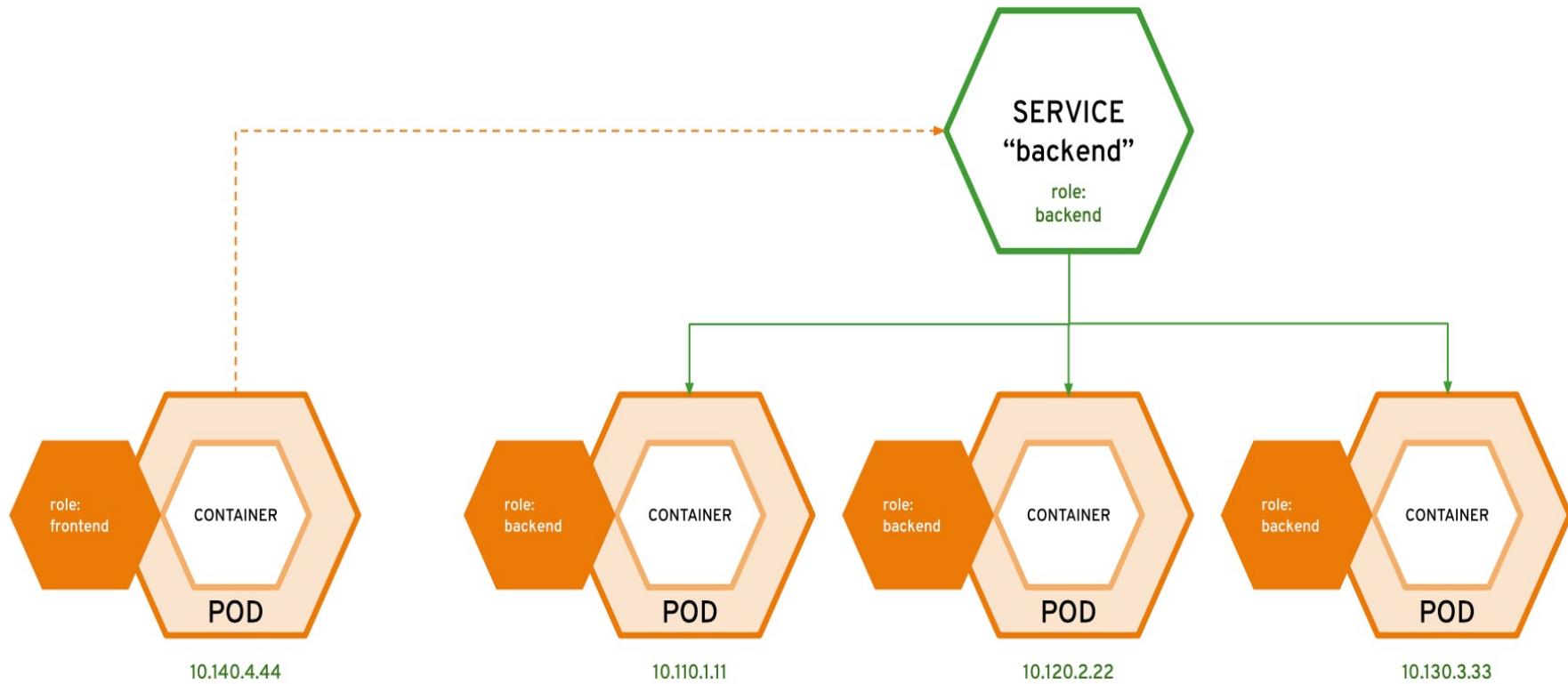
secrets provide a mechanism to hold sensitive information such as passwords



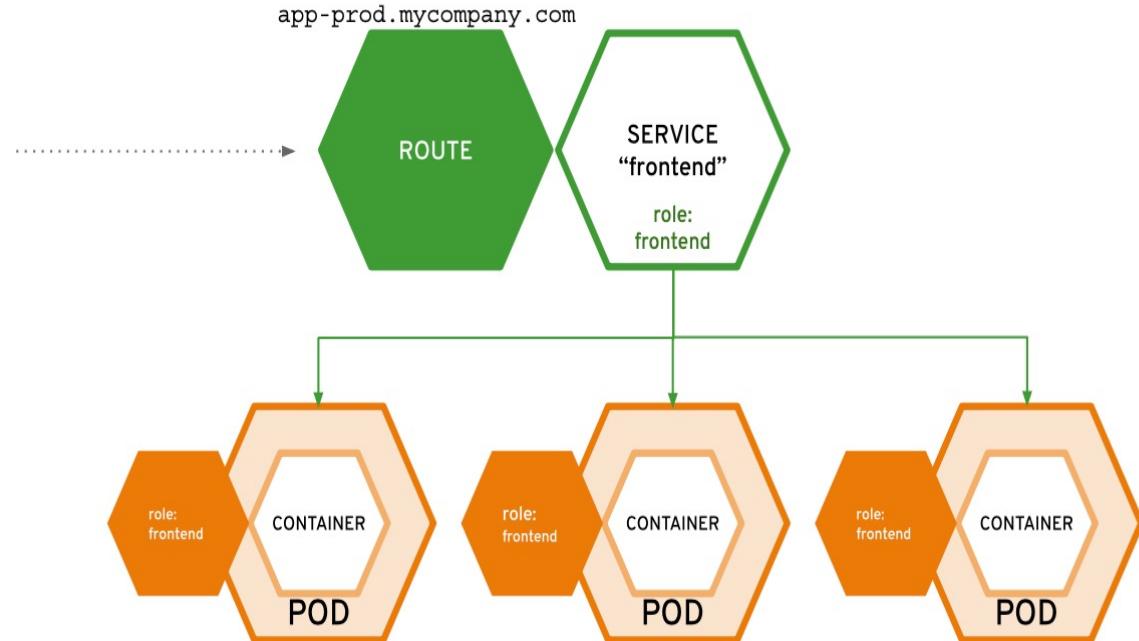
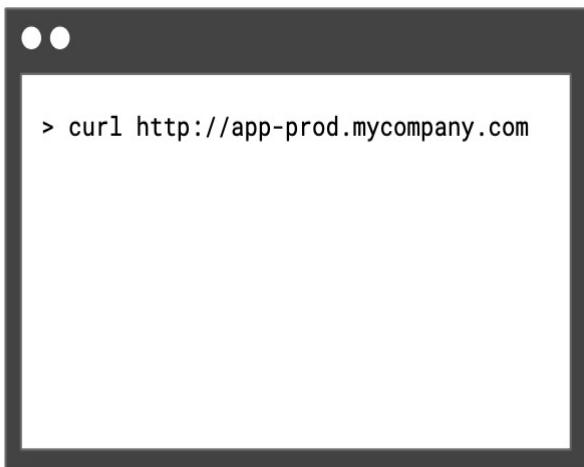
# services provide internal load-balancing and service discovery across pods



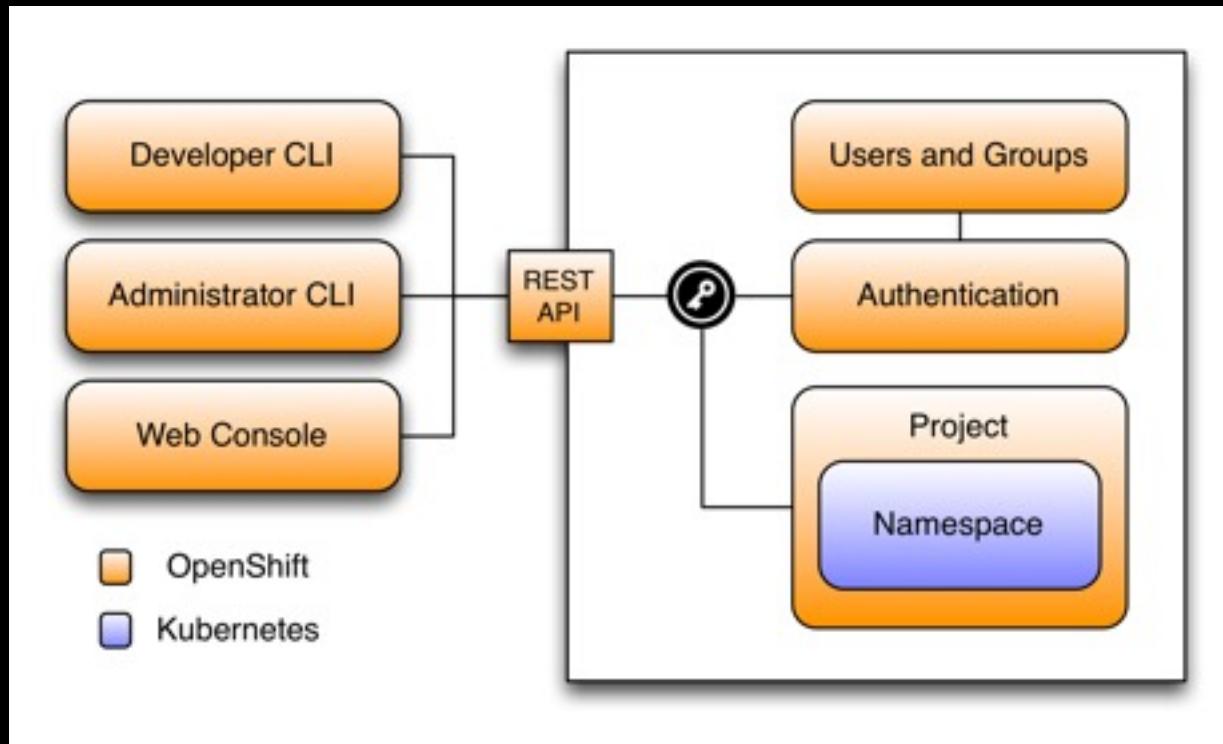
# apps can talk to each other via services



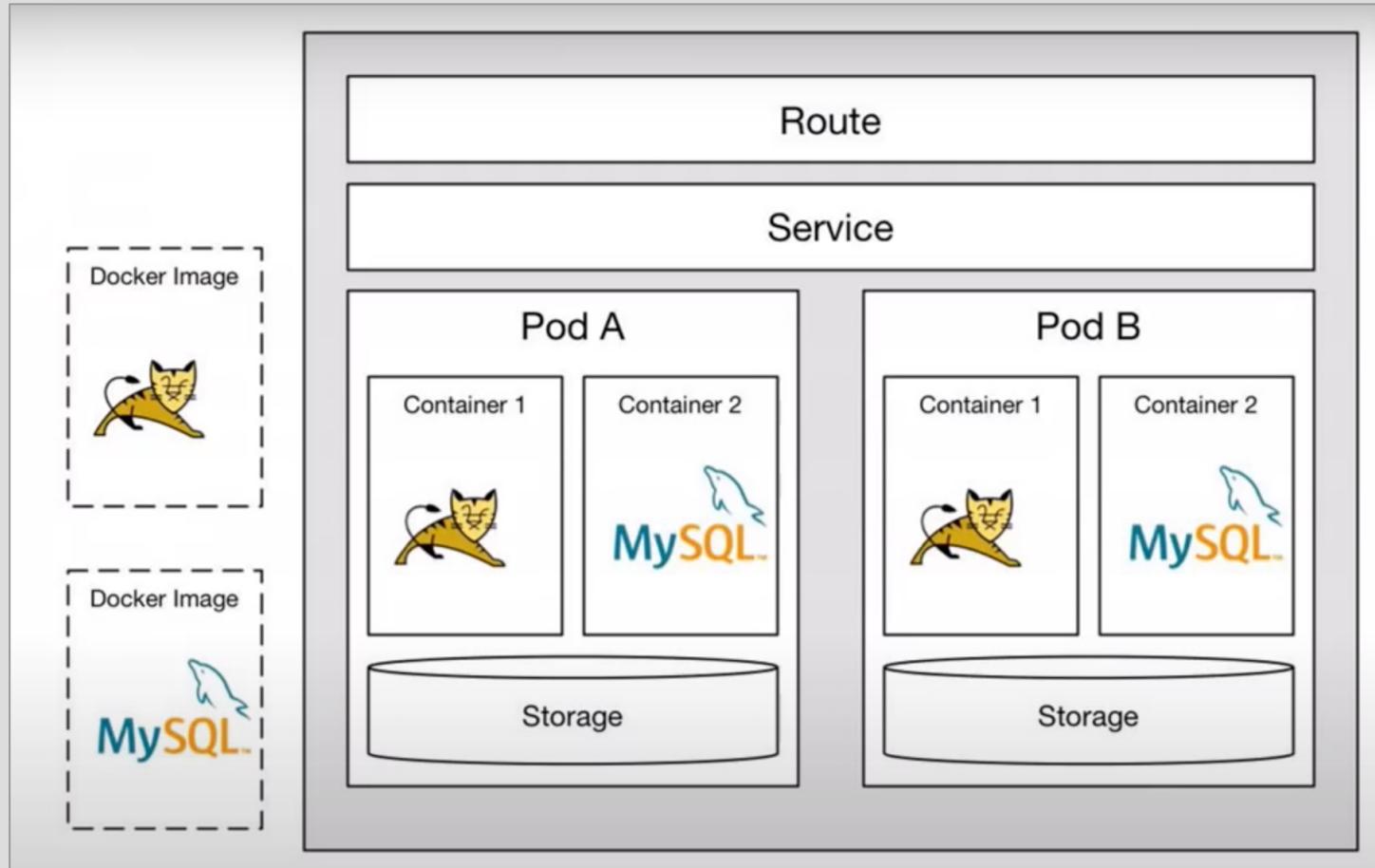
# routes make services accessible to clients outside the environment via real-world urls

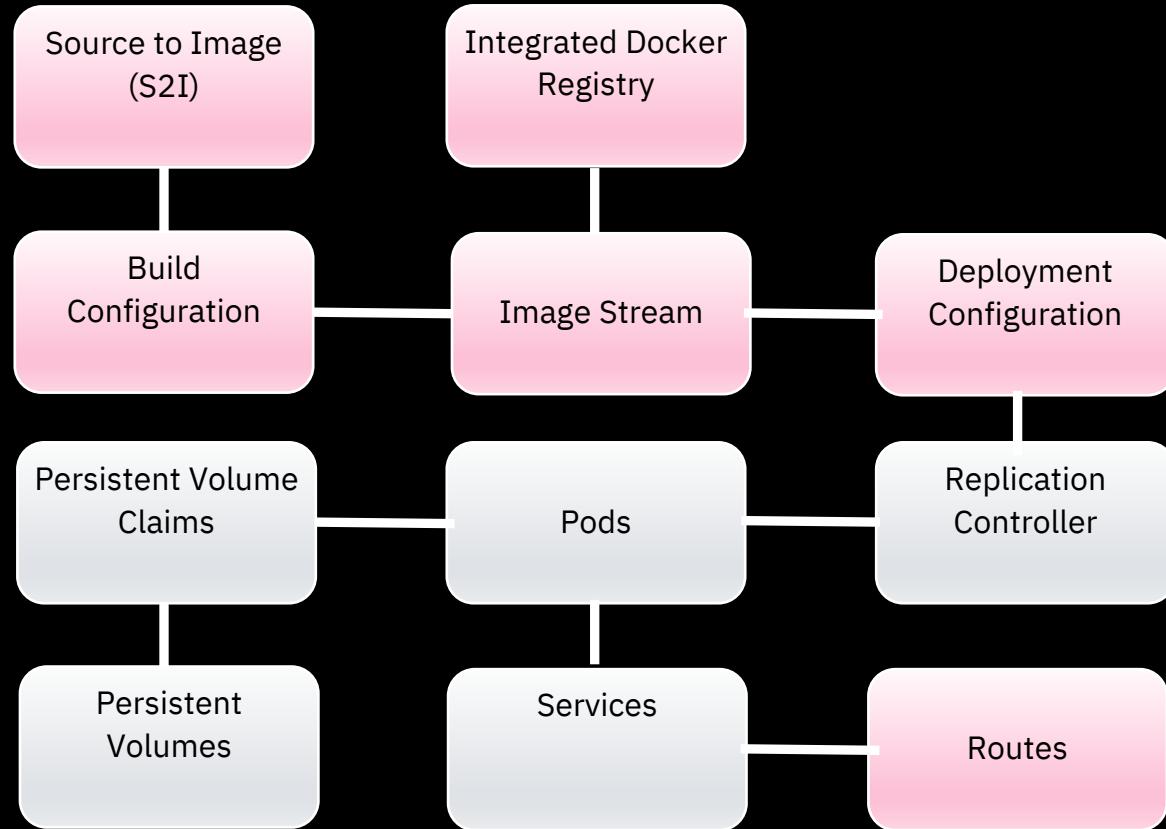


# Kubernetes Resources and OpenShift Projects



# OpenShift Architecture

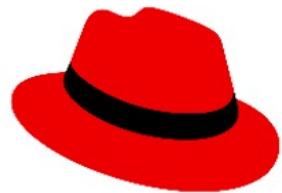




OPENSIFT



KUBERNETES



**Red Hat**



**Why OpenShift?**

# OpenShift Allows Us To Simplify Delivering Business Value

- DeploymentConfig
  - Including Triggers
- BuildConfig
  - CI/CD Pipelines are a first-class citizen
- Routes
  - Enterprise grade Software Defined Networking
- Operators
  - Cloud-agnostic cloud services
- Container Registry
- Role-Based Access Control
- Monitoring
- and more ...

# Demo time

Environments provided by Openshift to learn from :

- 1) Interactive Learning Portal <https://learn.openshift.com/introduction/>
- 2) Openshift Playgrounds by OpenShift  
<https://www.katacoda.com/openshift/courses/playgrounds>

