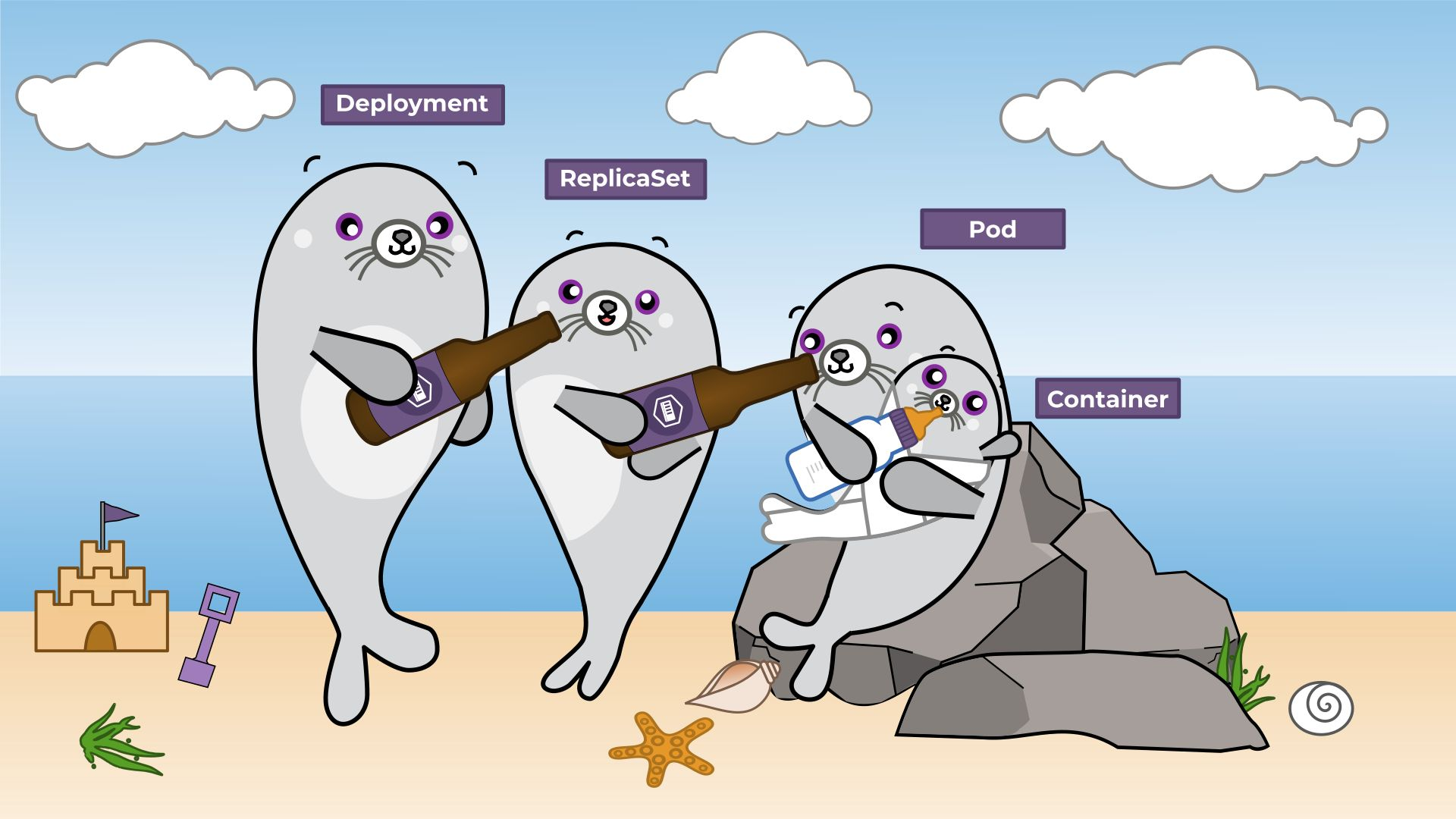
Kubernetes Terminology

K8s Terms We Must Know as DevOps Engineer

By DevOps Molvi


Deployment
ReplicaSet
Pod
Container

01 Cluster

Kubernetes Cluster

A set of nodes managed by Kubernetes. A cluster consists of master and worker nodes. A node is a Linux server.

02

Node

Node

A node in Kubernetes is a physical or virtual machine that provides the computing power to run workloads. If a node fails, it's automatically removed from the cluster and other nodes take over.

03

Pod

Pod

It is the smallest unit of execution in the Kubernetes system. It is made up of one or more containers. A pod is a collection of containers that work together to serve a common purpose.

04

Namespace

Namespace

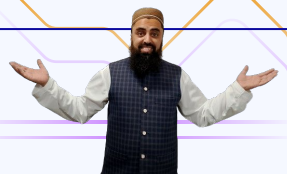
A Namespace is an isolated environment in a cluster. The resources belonging to different namespaces cannot directly interact with one another.

05

Deployment

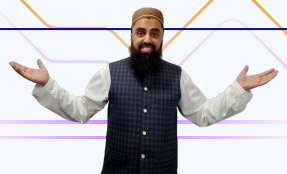
Deployment

A Deployment manages a set of Pods to run an application workload. The Deployment is a way to automate the process of creating and managing multiple replicas of the application, making it easier to manage, update, and scale our application without worrying about the underlying infrastructure.



Deployment

A Deployment manages a set of Pods to run an application workload. The Deployment is a way to automate the process of creating and managing multiple replicas of the application, making it easier to manage, update, and scale our application without worrying about the underlying infrastructure.



06

Service

Service

A service groups pods and exposes them for external traffic as a single entity in Kubernetes. Services are commonly used to expose Pods to external or internal traffic.

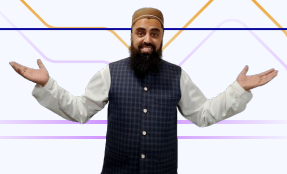
```
apiVersion: v1
kind: Service
metadata:
  name: web
spec:
  selector:
    app: node-app
  ports:
  - protocol: TCP
    port: 80
    targetPort: 80
```

07

ReplicaSet

ReplicaSet

A group of identical pods running for a specific workload is a ReplicaSet. A ReplicaSet's purpose is to keep a specified number of identical pods running at all times. This helps to ensure that an application is available and reliable, even if some parts of it fail.



```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: web
spec:
  replicas: 3
  selector:
    matchLabels:
      app: node-app
  template:
    metadata:
      labels:
        app: node-app
    spec:
      containers:
      - name: my-node-app
        image: nginx:latest
        ports:
        - containerPort: 80
```

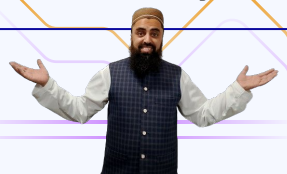
08

ConfigMap

ConfigMap

A ConfigMap is a type of native API object designed to store environment-specific configuration data and share it with Pods. A ConfigMap is a Kubernetes object used to store non-confidential data in key-value pairs.
ConfigMaps can be created using kubectl commands or YAML files.

```
apiVersion: v1
kind: ConfigMap
metadata:
name: example-configmap
data:
key1: value1
key2: value2
```



09

Ingress

Ingress

Ingress means how external users access the applications or services. K8s Ingress is the mechanism used to present services and applications externally from within a cluster. It can be a website, a blog that is accessed on a web browser.

```
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: devopsmolviblog
  labels:
    app.kubernetes.io/component: "frontend"
spec:
  ingressClassName: nginx
  tls:
    - hosts:
      - devopsmolvi.com
```

10 DaemonSet

DaemonSet

A DaemonSet ensures that all (or some) Nodes run a copy of a Pod. As nodes are added to the cluster, Pods are added to them. DaemonSet is a Kubernetes feature that lets you run a Kubernetes pod on all cluster nodes that meet certain criteria. Every time a new node is added to a cluster, the pod is added to it, and when a node is removed from the cluster, the pod is removed. When a DaemonSet is deleted, Kubernetes removes all the pods created by it.

11

NodePort

NodePort

A NodePort is a Kubernetes service that allows external clients to access applications by opening a port on every node in a cluster. This service Opens a port on every node in a cluster, and forwards traffic to the service.

Port Range:
Typically 30000–32767, but customizable

In short, NodePorts are a basic way to expose services to external traffic.

12

Secret

Secret

In Kubernetes, a Secret is an object that stores sensitive information, such as passwords, OAuth tokens, and SSH keys.

13

RBAC

RBAC

Role-Based Access Control (RBAC) is a security feature in Kubernetes that controls access to resources based on the roles of users and service accounts. RBAC defines permissions that specify what users and service accounts can do with resources, such as creating, updating, and deleting.

RBAC helps secure your environment and reduce the risk of unauthorized access.

14

Annotation

Annotation

Annotation is just like a label.

Since we know, a label attaches metadata to the Kubernetes objects, Annotations simply considered as the advanced form of labels with more features. Annotations can contain more characters than labels, and can be structured or unstructured.

15

ClusterIP

ClusterIP

In Kubernetes, a ClusterIP is a fixed internal IP address that's used to facilitate communication within a cluster.

ClusterIP assigns an IP address from a reserved pool to a pod or replica. It defines one or more ports to listen on, and uses target ports to forward TCP/UDP traffic to containers.

```
NAME              TYPE        CLUSTER-IP       EXTERNAL-IP   PORT(S)    AGE
web-service   ClusterIP   10.96.1.15       <none>        80/TCP     2m
```

16

Loadbalancer

Loadbalancer

Distributes the requests across multiple nodes within a cluster.

17

StatefulSet

StatefulSet

A StatefulSet is a set of pods with a unique, persistent hostname and ID. StatefulSets are designed to run stateful applications in Kubernetes with dedicated persistent storage.

When pods run as part of a StatefulSet, Kubernetes keeps state data in the persistent storage volumes of the StatefulSet, even if the pods shut down.

Kubernetes Terms

Cluster

Set of nodes

Node

A Linux Server

Pod

Collection of Containers

Namespace

The isolated workspace for resources.

Deployment

Create & Modify Pods

Service

Multiple Pods acting as a single resource.

Kubernetes Terms

ReplicaSet

Stable set of pods

DaemonSet

Runs copy of pods on each node.

StatefulSet

Manages a group of Pods

ConfigMap

Stores non-sensitive data.

Ingress

External Access to the Services.

Secret

A password or token

Kubernetes Terms

NodePort

Allows external accessibility of apps.

RBAC

Users and service account permissions.

Annotation

To label objects.

ClusterIP

Cluster's internal IP address

Loadbalancer

Equal traffic distribution.

Thanks

Don’t forget to subscribe DevOps Molvi on YouTube :)