Introduction to Kubernetes

FOSSMeet'21

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About Me

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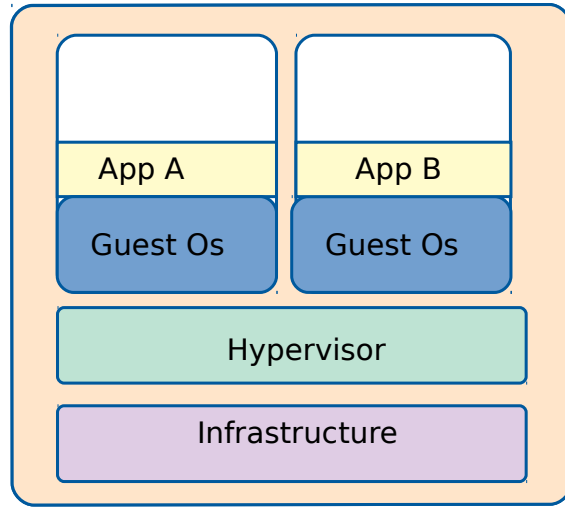@rahulkrishnanra

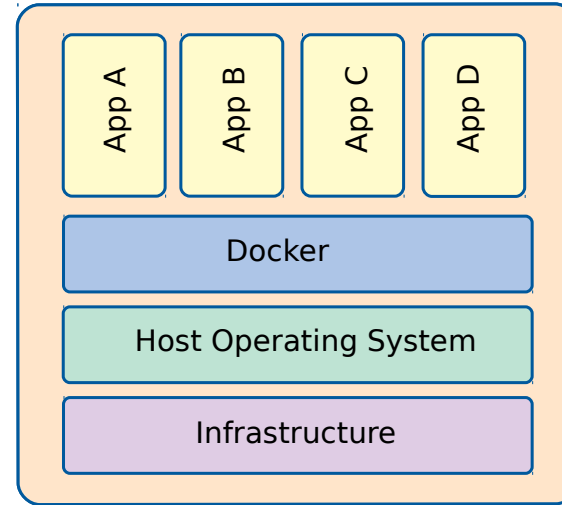https://uk.linkedin.com/in/rahulkrishnanra

What are containers?

versus

Virtual Machine	Containers

Virtual Machine

The hardware is virtualized so multiple operating system can be isolated on the machine

Containers

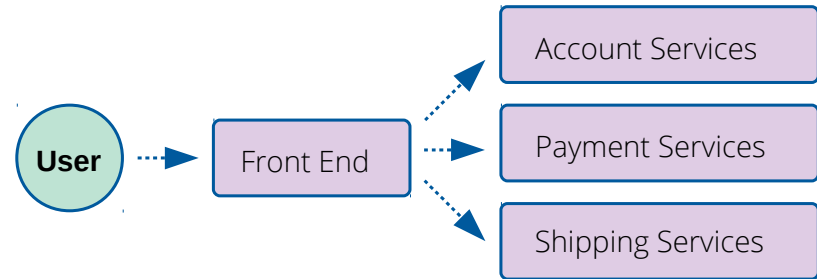Virtualized operating system - libraries and applications are isolated

Virtual Machine stack:
- App A / App B
- Guest Os / Guest Os
- Hypervisor
- Infrastructure

Containers stack:
- App A / App B / App C / App D
- Docker
- Host Operating System
- Infrastructure

Microservices in containers

Monolithic Application
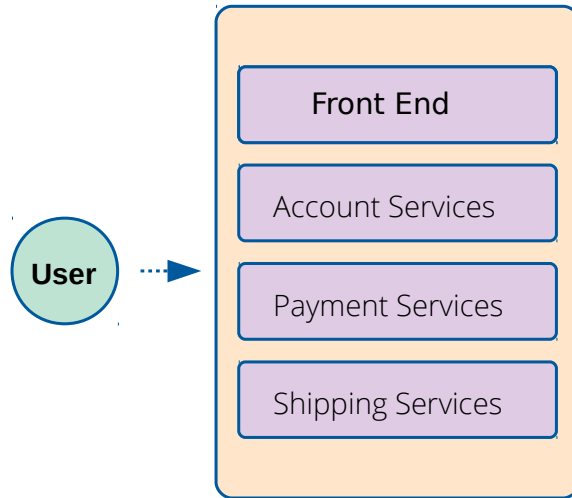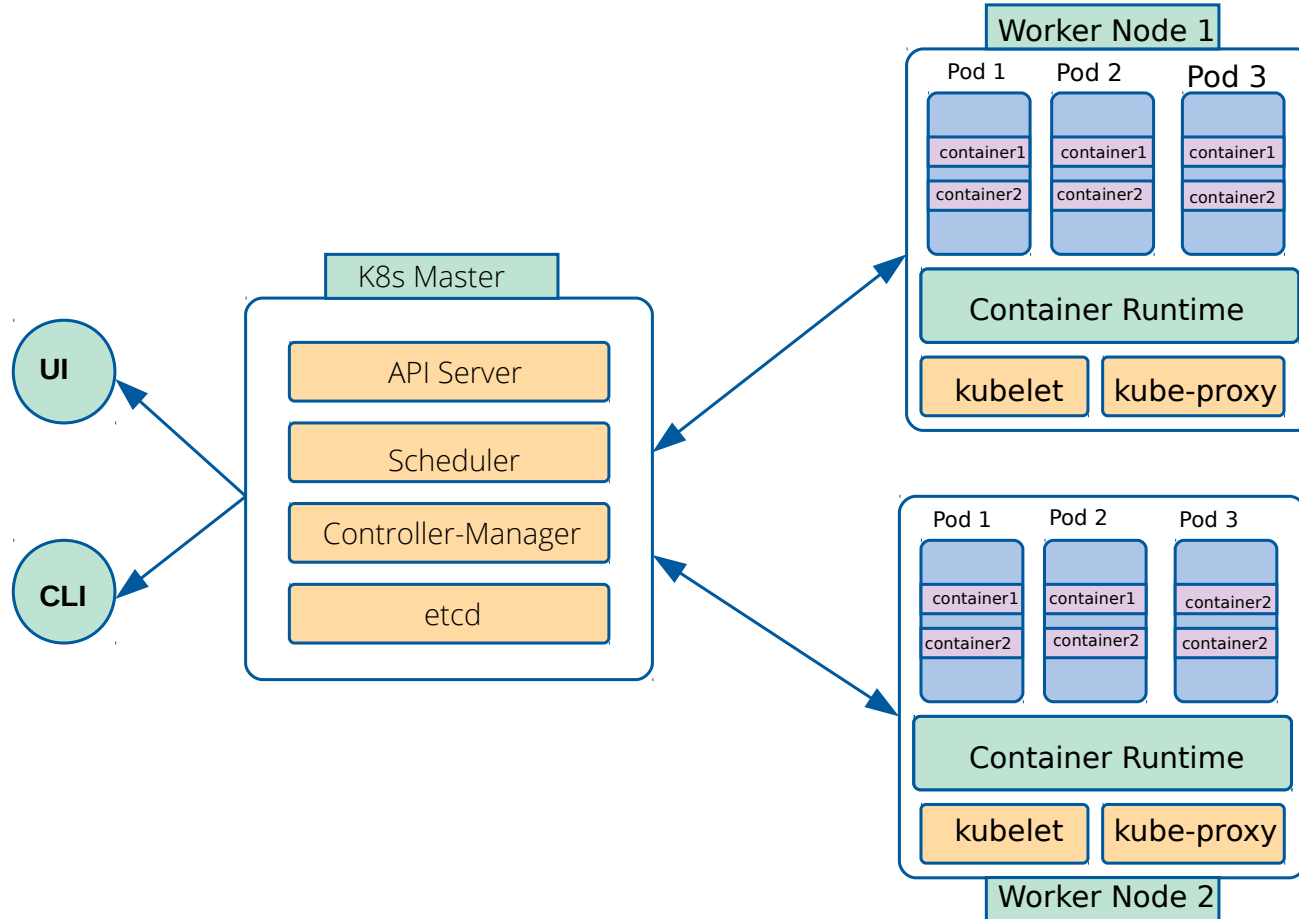

Microservices Application

Need of container Orchestrator

- Container orchestartion automated the deployment, management,

  Scaling, and networking of containers

- Framework for managing containers and microservices architecture at scale

Stepping into Kubernetes

- Open source container orchestartion tool

- Orginally developed and designed by Google

- Google donated the kubernetes project to CNCF

- Builds upon 15 years of running production workloads at Google

- Eliminates many of the manual process involved in deploying and

  Scaling containerized applications

Kubernetes Architecture

UI

CLI

K8s Master

API Server

Scheduler

Controller-Manager

etcd

Worker Node 1

Pod 1

container1

container2

Pod 2

container1

container2

Pod 3

container1

container2

Container Runtime

kubelet

kube-proxy

Pod 1

container1

container2

Pod 2

container1

container2

Pod 3

container2

container2

Container Runtime

kubelet

kube-proxy

Worker Node 2

POD in k8s

- Smallest deployable units

- Unit of replication in Kubernetes

- Pod is a group of one or more containers

- Pods are ephemeral

- Primary primitive for running containerized workload

- May contain one or more containers
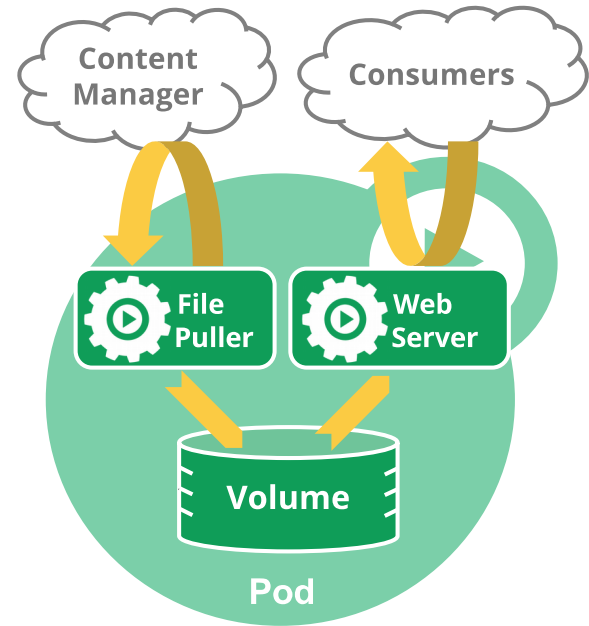
K8s Deployment

- Pods are usually managed by one more

  layer of abstraction

- Declare how many replicas of a pod should be

  running at a time

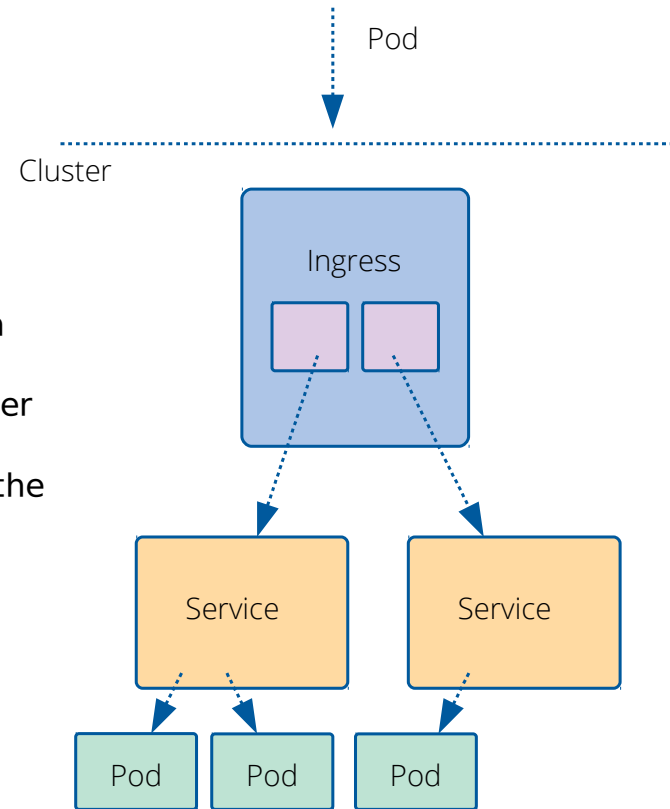- Declare the desired state of the system
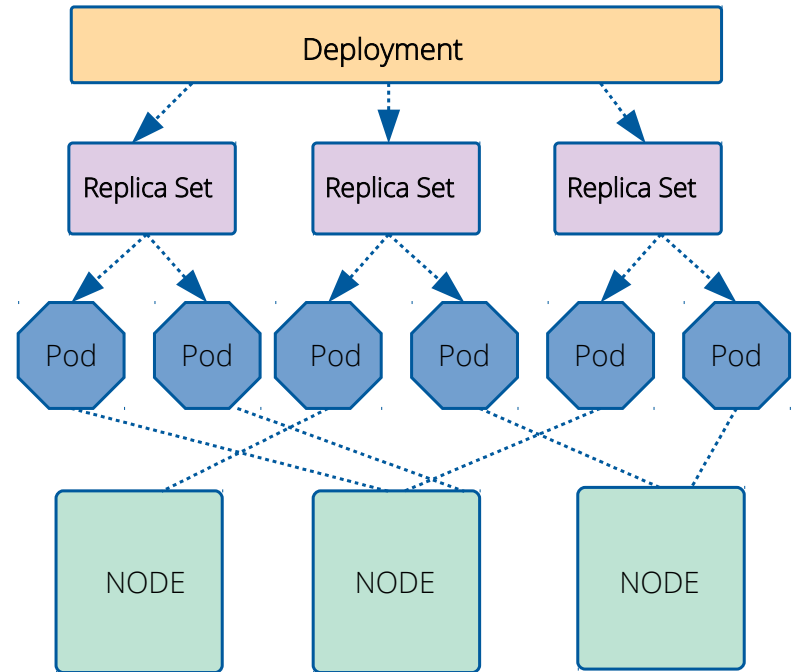
Service in k8s

- Service routes traffic across a set of Pods

- Discovery and routing among dependent Pods

- Services match a set of Pods using Labels and

  Selectors

- An abstraction which defines a logical set of Pods and a

  policy by which to access them

Service A

app=A

app=A

app=A

Ingress

Pod
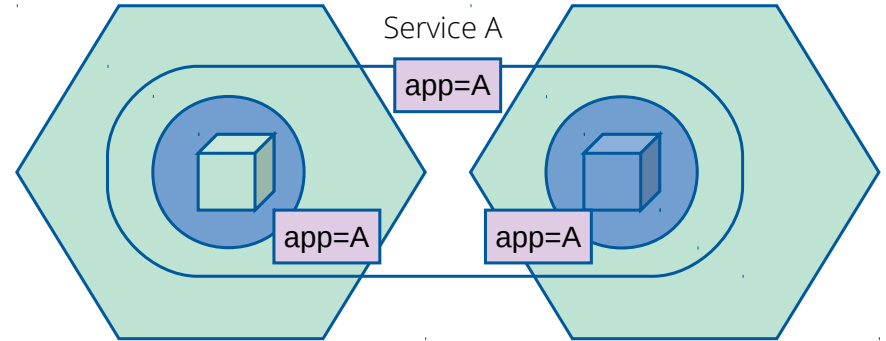
Cluster

Ingress

- Ingress exposes HTTP and HTTPS routes from

  Outside the cluster to services within the cluster

- Ingress Controller is responsible for fulfilling the

  ingress

Service

Service

Pod

Pod

Pod

{ Demo }