Day 23 Revisit (Docker)

- Docker is a DevOps Tool mainly used for containerizing the application.
- Container = Source Code + Related Libraries + Environment to Run
- Virtual Machine vs Docker
- Dual Booting, Hyperviser
- WSL – Windows Sub System for Linux
- Installing Docker [Enable WSL, Hyperviser, Virtualization Platform] – Turn windows feature on or off.
- Downloaded Docker Desktop from official website.
- Docker shares the same kernel across the containers.
- Docker containers are light weight alternative to VM (Virtual Machine)
- Docker Architecture (Docker Client, Docker Engine, Docker Registry)
- Docker Client (CLI [Command Prompt or terminal] & GUI [docker Desktop])
- Docker Engine (Docker Deamon[dockerd], Docker Images, Containers)
- Docker Hub (It's a cloud version to store and mange all the docker images) – Similar to mvnrepository, npmrepository and github
- Pulled docker image from official site (hello-world)
- Images – Class, Container – Running version of image.
- Docker build, run, compose, images, ps, rmi, rm
- Creating docker image from scratch – demo (docker-java)
- Dockerfile – steps to create docker image. FROM, WORKDIR, COPY, RUN, PORT
- Host & Guest OS
- Used MySQL docker image (demo)

Day 24 Agenda

- Introduction to Kubernetes
- Introduction to container orchestration
- Installing Minikube
- Container Orchestration
- Cluster, Control Pane, Nodes & Pods
- Replication & Scaling
- deploying a spring boot application with k8s

Kubernetes – K8S (I18N)

K8S is an open-source system for automating deployment, scaling & managing containerized applications.

K8S – Container Orchestration Tool (One of the DevOps tool)

- Never Outgrow (Scaling)
- Runs Anywhere

POD - This object indicates the processes which are running in the cluster. (Small & simplest unit)

Node

A **node** is nothing but a single host, which is used to run the virtual or physical machines. A node in the Kubernetes cluster is also known as a minion.

Service

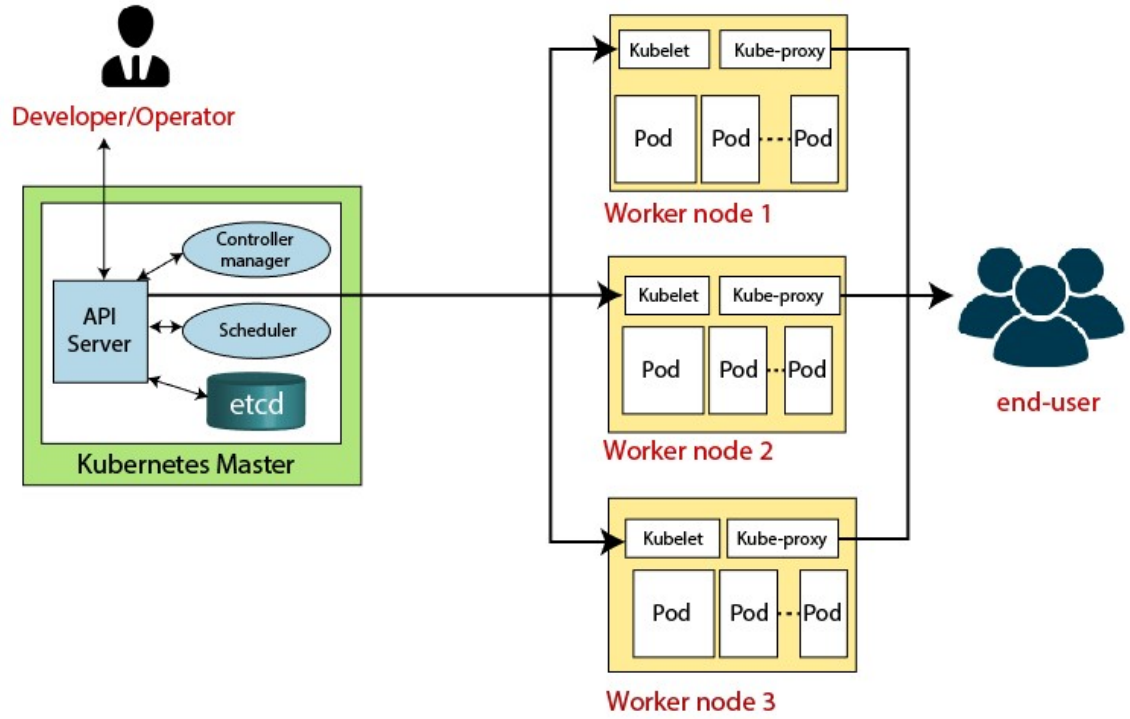
A **service** in a Kubernetes is a logical set of pods, which works together. With the help of services, users can easily manage load balancing configurations.

ReplicaSet

A **ReplicaSet** in the Kubernetes is used to identify the particular number of pod replicas are running at a given time. It replaces the replication controller because it is more powerful and allows a user to use the "set-based" label selector

K8S Arch

- Master Node [Control Plane] (API Server, etcd, scheduler, ctrler mgr)
- Worker Node (slave) – many in number [kubelet, kube proxy (k-proxy), Pods]



Kubernets Architecture

https://kubernetes.io/docs/home/

https://labs.play-with-k8s.com/

https://kubernetes.io/docs/tutorials/kubernetes-basics/

Installing K8S

- Minikube
- Kubeadm (k8s Administrator)
- Kubectl (k8s controller)

Install Kubectl using curl command (kubectl is a cluster mgmt. command line tool)

Kubectl allows you to run commands against Kubernetes clusters. You can use kubectl to deploy applications, inspect and manage cluster resources, and view logs.

```
curl.exe -LO "https://dl.k8s.io/release/v1.28.4/bin/windows/amd64/kubectl.exe"
```

Installing minikube

https://codelabs.developers.google.com/codelabs/cloud-springboot-kubernetes#0

https://levioconsulting.com/insights/dockerize-a-spring-boot-application-with-tomcat/