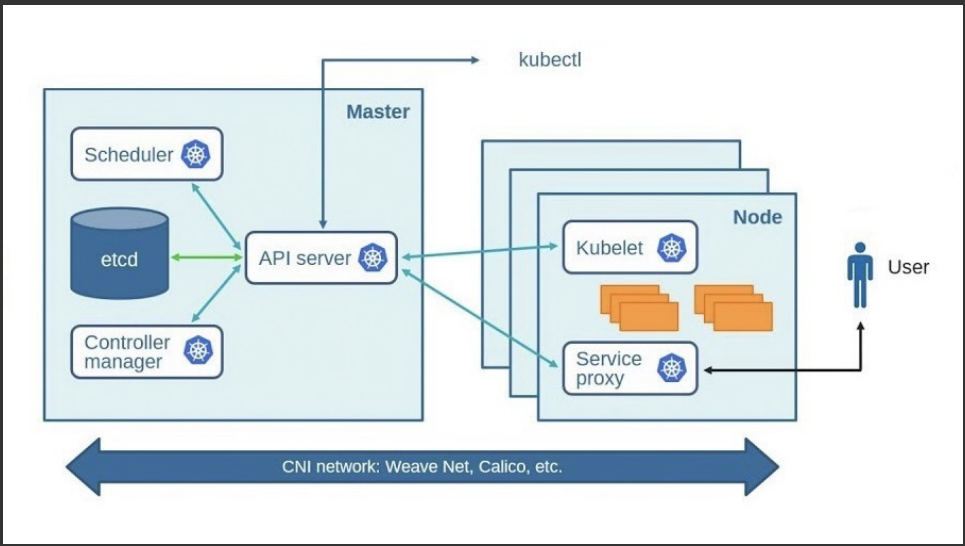
Train with Shubham

Kubernetes (CKA)

- ★ Cluster Architecture
- ★ API Primitives
- ★ Services

★ Cluster Architecture



★ Container Runtime Interface (CRI)

→ You can use docker / rKE as container services for Kubernetes

→ dockershim is the services used to support docker in Kubernetes (Not used Now)

Docker → Tool to run containers

containerd → Docker engine uses containerd which pulls images from registries, manages them and gives it to lower-level runtime (HOST)

CRI-O → Container Runtime interface implements K8s & alternative to containerd.

★ ETCD

↳ Contains all the information related to Nodes, Pods, Configs, Secrets, Accounts, Roles, Bindings, etc.

↳ Key value datastore

↳ ETCD CTL is a cli tool used to interact with ETCD server

★ Kube-apiserver

↳ It is used to authenticate user, validate request, Retrieve data, update ETCD, communicate with other components of cluster.

★ Kube-controller manager

↳ Continuously monitor various components of the cluster and works towards managing / restoring to the desired state.

★ Node controller

↳ communicates with Kube api server and manages nodes. (Every 5 seconds)

↳ Checks again for 40 seconds then marks as "Unreachable"

↳ After 5 minutes it replaces

★ Replication controller

↳ Responsible for monitoring status for replica set.

↳ Ensures that desired no. of pods are available at the required time.

★ Cronjob, deployment controller, Persistent Volume Protection, Binder, etc. [ALL included in Kube controller Manager]

★ Kube scheduler

↳ responsible for scheduling the pods on the nodes

↳ it just decides which Pod to place on which node based on the CPU, RAM, resources on the Node

↳ Kubelet places the nodes after scheduler decides.

↳ Right container/Pod is sent to right ship/Node.

★ Kubelet

↳ is on the worker node and registers the Node with the Pod.

↳ Monitors the status of Pods and reports to the Kube api server.

↳ Need to install kubelet on worker Nodes.

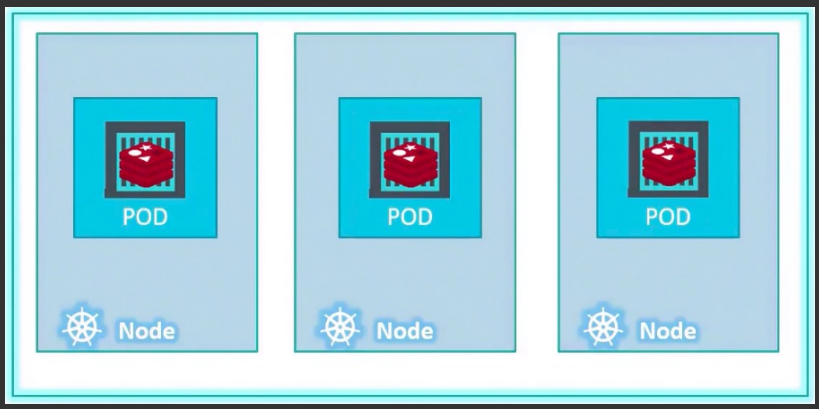
★ Kube Proxy

↳ Pod network allows to connect / communicate Pods for each other by Pod IP.

↳ Kube Proxy runs on each node, using IP Tables rules so that any service can connect to Pods from outside.

★ Pods

↳ Kubernetes doesn't deploy containers directly, it is encapsulated in Pods.



↳ Smallest object you can create in Kubernetes.

↳ New Pod is created in case we need to scale our application

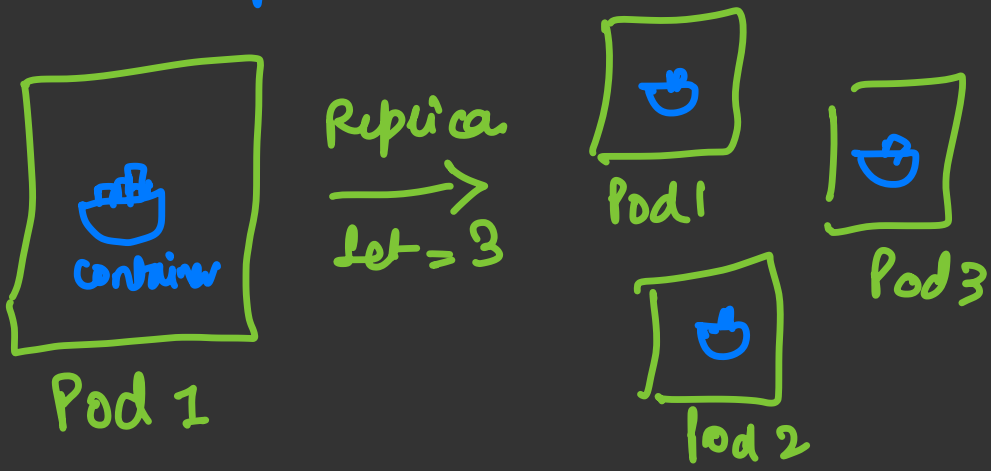
↳ New Node is added to cluster in case further scaling is needed

↳ We can have multi-container Pods as well as a side-car container or Helper container.

★ Replica Sets.

↳ To prevent users from losing access to the app, replication controller gives high availab-ilities

↳ Helps in load Balancing and Scaling.



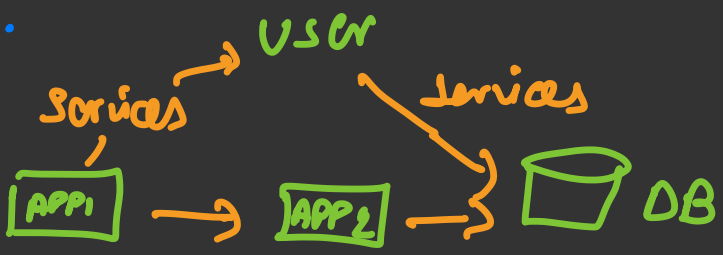
★ Deployment

↳ Pods deploy single instance of an application

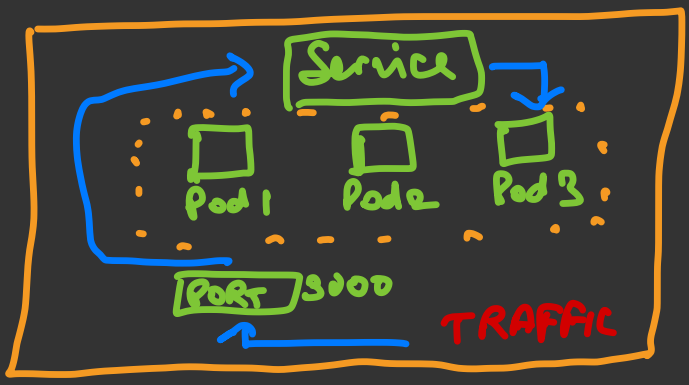
↳ Deployment allows to update the Pods infrastructure with Replicas, rolling updates, etc.

★ Services

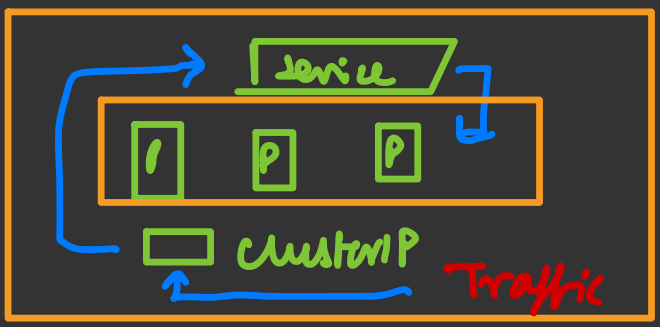
↳ Helps us connect our applications with other applications / databases etc.



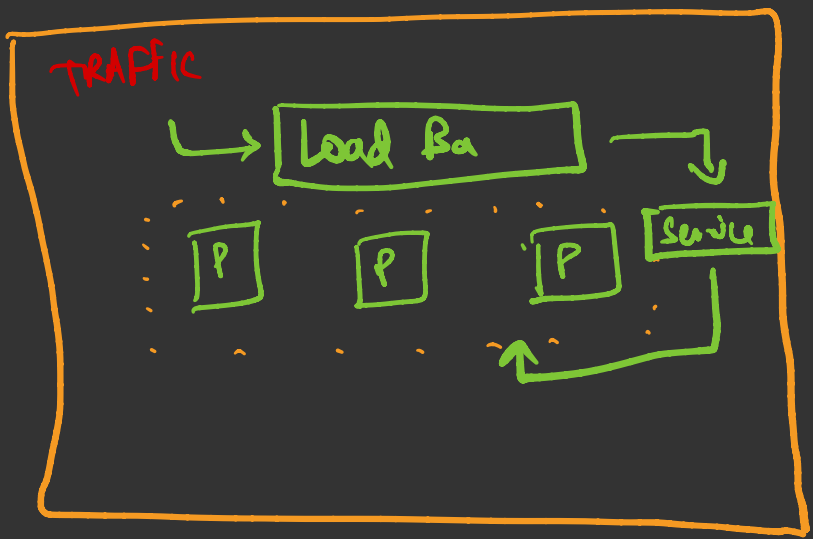
① Node Port



② Cluster IP



③ Load Balancer



Kubectl

↳ A command line tool used to communicate with a Kubernets cluster's control plane.

↳ Kubectl apply

↳ creates the live object for the configuration