Page :
Date :

Day - 2 (Avinash Pandey)

Working of Kubernetes

→ we create manifest (.yml)

→ Apply this to cluster (to master) to bring into desired state.

→ Pods run on node, which is contrd by master

Role of Master- node

→ K8S Cluster Contains containers running or Baise metel / vm instance cloud instance / all mix.

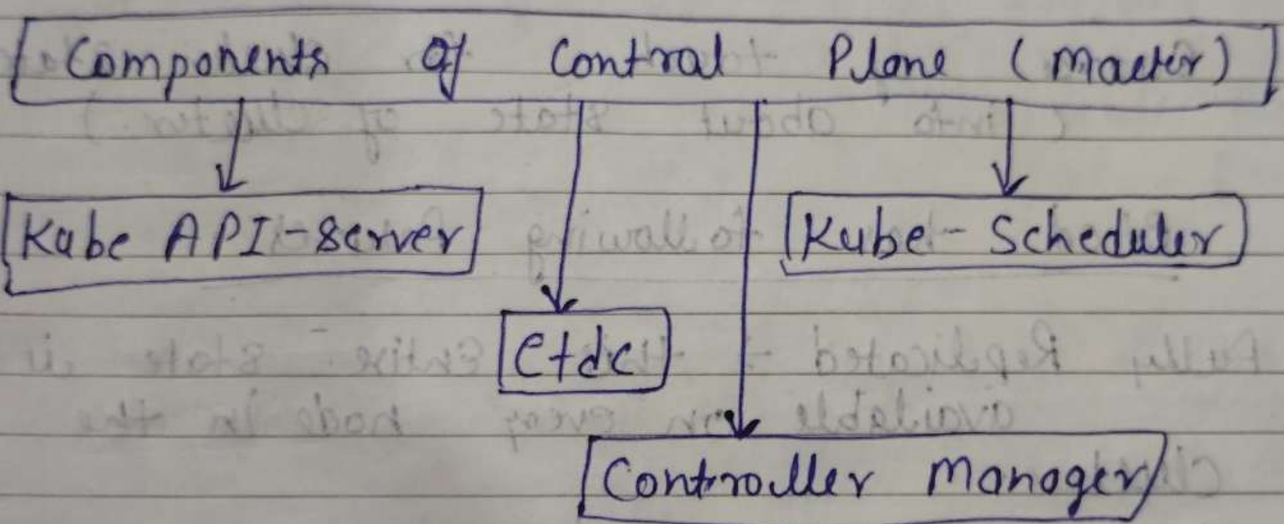
→ K8S desigates one or more of these as master and all other as workers.

→ The Master is now going to run set of K8S process these process will ensure smoth functioning of Cluster these process are Called "Control Plane"

(Avinash Pandey)

→ Can be multi-master for high avaibility.

→ Master runs control plane to run Cluster smoothly.



1 Kube API-Server

→ This API-Server intect directlly with User (ie - apply yml or Json manifest to Kube API-Server)

→ The API-Server is meant to scale automatically as per load.

→ This is ~~fround~~ front-end of control-plane.

Page :
Date

(Avinash Pandey)

2 etcd

→ Store matadata and status of cluster

→ it is consistent and high-available Store (Key-value Store)

→ Source of touch for cluster-state (into about state of cluster.)

etcd has following feteires

① Fully Replicated → the Entire state is available on every node in the cluster.

② Secure → impliments automatic TLS with optional client - certificate authentication.

③ fast → Benchmarked at 10,000 writes per second.

3 Kube - scheduler (action)

→ When user make requet for the creation & management of Pods, Kube-scheduler is going to take action on thee requet.

(Avinash Panda)

→ Handles Pod Creation and Management

→ Kube-Scheduler mach/allign any node to create and run pods.

→ A Scheduler watches for newly created Pods that have no node alligned for every pods that the scheduler discovers, the scheduler become responsible for finding best node for that pod to run on.

→ Scheduler gets the info for hardware Configuration form Configuratio files and Schedules the pods on nodes accordingly.

4 Controller Manager

→ Make sure actual state of cluster match to desired state.

→ Two posible choices for Controller Manger.

① If K8S on cloud then it will be Cloud - Controller - Manager

②. if K8S run on non cloud then it wi be Kube - Controller - Managers.

(Avinash Pandy)

Components on Master that runs controller

Node Controller → For checking the cloud provider to determine if a node has been detected in the cloud after its stop responding.

Router Controller → Responsible for setting up n/w routers on your cloud.

Service Controller → Responsible for load balancer on your cloud against service of type load balancer.

Vollume Controller → For Creating, attaching and monitering volums and interecting with the cloud provider to orchestrate volume.

Page:

Date: (Avinash Pandi)

Nodes (Kublet and Container Engine

Node is going to run 3 imp peace of software/process.

Kublet

→ Agent running on the node

→ Listen to Kubernets master (eg - pod creation request)

→ Use port 10255

→ Send sucess / fail ports to master.

Container Engine

→ Works with Kublet (Avinash Ravider)

- Pulling images
- Start / stop Containers
- Exposing Containers on ports specified in manifest.

Kub Proxy

Avinash Pandy

→ Assign ip to each pods.

→ It is required to asign ip address to pods (dynamic)

→ Kube - Proxy run on eatch node & this make sure that eatch pod will get its own unique IP address

these 3 Components Collectly Consist nodes.

POD

→ Smallest unit of Kubernetes.

→ POD is a group of one or more Container that are deployed together on the same host.

→ A Cluster is a group of nodes

→ A Cluster is atleast one worker node and master node.

→ In Kubernets the Control unit is Pod not Containers.

→ Consist of one or more tightly coupled Containers.

→ Pod run on node, which is control by master.

→ Kubernettes Known about Pods (do not Known about the individual Containers

→ Can not start Containers without a POD

→ <u>One POD usally contains one containers.</u>

|POD| (Avinash Pandey)

Multi Containers Pods

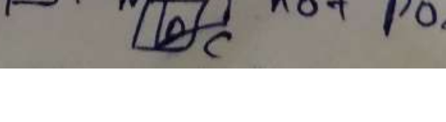
→ Share acess to memory space

→ Connect to eatch other using local host <Container port>

→ Share acess to same volume

→ Containers within Pod are deployed in an all-or-nothing manner.

→ Entire Pod is hosted on the same node (Scheduler will decide about witch node)



Avinash Randy

PoD Limitations

→ No auto - scalling - auto healing

→ PoD crashes
Sqls
↓

Higher level Kubernetes Object.

Replication → auto-scalling and auto-healing

Deployment → versioning and Rollback

Service → static (Non-ephemeral) IP and
NW

Volume → Non - ephemeral Storage

Importent

Kubectl → sigle cloud
Kubeadm → on premise
Kubefed → Federated
} Start command.

Avinash Randy