Day 7

Docker

How to containerization

how to deploy a container using CI/CD

integration the concept in the devops cycle

Would need proper difference on container and VM

If we want to run more than one container those container are running independently or they are communicating with each other to do some task.

1. Docker Compose
2. Docker swarm
3. Kubernetes

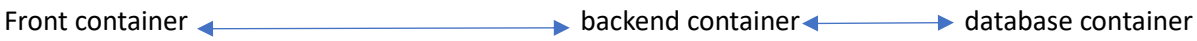
Docker swarm and Kubernetes are known as container management tools.

In Docker compose all container must be run in same machine or node or device.

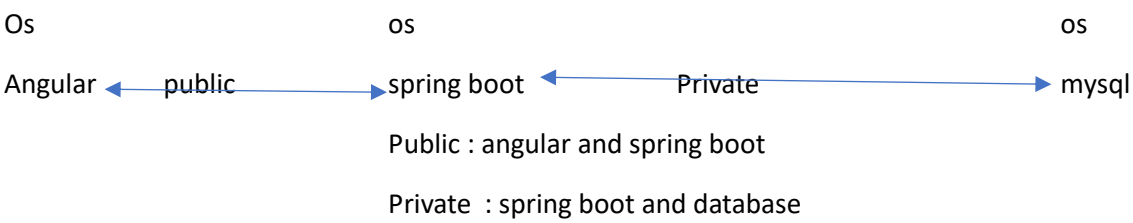
But Docker swarm as well as Kubernetes all container can be run on same machine or different machine or node but those machine or nodes must be in same cluster environment.

We will run another docker compose file to run more than one container and those container are interacting with each other.

Frontend technologies	backend technologies	database
Html, css, js, ts,	java or spring boot	mysql or
Angular or react or	or asp.net	oracle
Any other JavaScript	python or php	or db2
Library	node js with express js	mongo db
		Neo4j



Login page	Rest API	language	check with database.
Sign in or	we will	receive the	
Singup	send the	information	
	Data	from	
	To backend	frontend	
	Technologies	technologies	



Frontend and backend technologies will communicate using http protocol.

OS	OS
Frontend	backend

http://localhost:9090

http://IPAddress:9090

to open mysql database container os

sudo docker exec -it mysql-container bash

after open mysql os

please connect to mysql database using command as

mysql -u root -p

password : root

show databases	this command is use to display all databases names
use mydb;	it is use to switch inside that database or move inside that database.
show tables;	show all tables present in current database.

Orchestration tool : it is responsible to manage the life of container. Scale up, Scale down, availability, health check, heal up, rollback, etc.

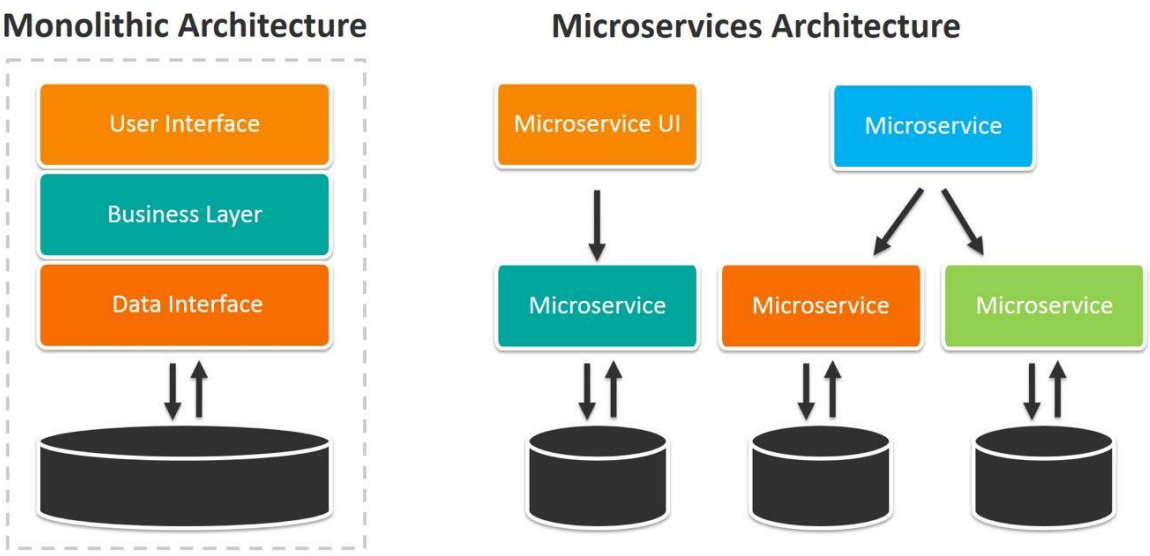
Kubernetes also known as K8S.

Cluster : we need to connected more than one machine or node in one network environment.

Micro service

Add product and display the product

Login module	Team1	java	mysql
Dashboard module	Team2	python	
Product module	Team3		
Order module			
Payment module		.net or asp.net or node js	mongo db
Feedback module	Teamn		



Kubernetes Cluster :

Cluster environment helps to run more than one container in same node or different nodes.

Node : it is a single host which is capable of running on physical or virtual machine with unique IP Address.

Cluster : it is a collection of host or serve or nodes or machine that helps you to aggregate the availability.

Kubernetes cluster:

Kubeadm : kubeadm is a tool provided by Kubernetes which help to provide Kubernetes cluster environment.

Kubeadmn provide master node as well as we can make more than one worker node.

Master node : it is responsible for managing Kubernetes cluster environments.

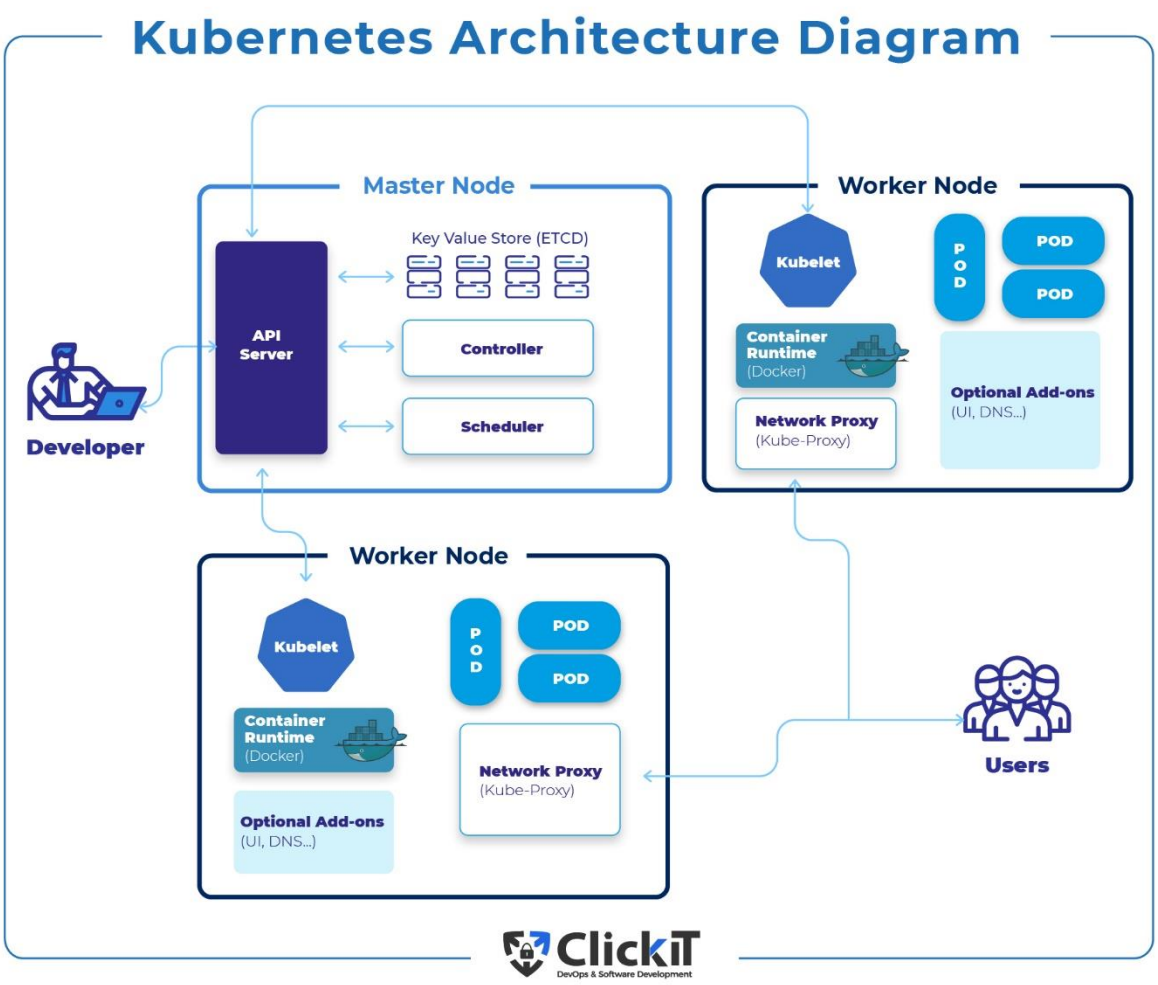
Worker node : we need to connect master node to do some operation in Kubernetes cluster environment.

Node EC2 instance to run master node

Then we can create more than one instance to connect master node. And to communicate to master node Kubernetes provided kubectl tools which help to deploy the container in Kubernetes cluster environments.

There are lot off other tools present in market which provide Kubernetes Cluster environment.

1. minikube : it is an open source tool which provide single cluster Kubernetes environments.
2. Kubeadm
3. Kind
4. EKS : Amazon
5. AKS : azure


Kubernetes Architecture Diagram
Master Node
Key Value Store (ETCD)
API Server
Controller
Scheduler
Developer
Worker Node
Kubelet
POD
POD
POD
Container Runtime (Docker)
Network Proxy (Kube-Proxy)
Optional Add-ons (UI, DNS...)
Worker Node
Kubelet
POD
POD
POD
Container Runtime (Docker)
Network Proxy (Kube-Proxy)
Optional Add-ons (UI, DNS...)
Users
ClickIT
DevOps & Software Development