Day 5

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

Docker : Docker is an Advanced OS Virtualization software platform that makes it easy to create, deploy and run the application in Docker Container.

Virtualization : Virtualization is the means of employing software (such as hypervisor) to create virtual OS machine to run database, application or tools.

Software

System software : OS

Application software

M1	M2	M3
Window	Unix/Linux	Mac etc

Run the application

One machine

We can run multi OS

Window Linux Mac

VMWare software

VMWare software helps to run the different OS.

Window OS

We can install VMware software

In VMWare software we can run different OS using iso images.

Using VMware software we can create Virtualization

Virtualization is an abstract version of OS.

Limitation of Virtual box or VMWare software.

Base machine window

32 GB RAM 16 GB RAM

1 tb hard disk

VMWare software

Guest OS	Guest OS
Linux	Mac
8GB	8GB

But if we want to run 10 OS.

Using Docker we can create containerization application.

Virtualization Vs Containerization

Using VMWare or virtual box we can run more than on OS.

Virtualization is use to create abstraction version of OS.

Containerization is use to create abstract version of an application.

Docker container is responsible to run the application in abstract version with help of Docker engine.

docker --version	it is use to check the version of docker
docker info	this command provide local machine docker details
docker pull imageName	this command is use to pull image.
docker images	this command is use to display all images present in local machine.
docker run imageName/imageId :	this command use to run the image using image name or image id

docker image is responsible to run the application ie it can be java, python, node js, server, database, c or C++

without docker if we want to run any application we need runtime environment in our local machine or software.

docker pull imageName : First docker check that image in local machine. If image is ready then it will pull else it will pull form Docker hub repository.

Docker hub is like a git hub which provide repository which help to publish as well as pull any other images ie pre defined or user defined.

docker pull abc

by default docker configured with default remote repository ie Docker hub.

So we can configure Docker with private cloud repository to publish our own image within organization.

docker pull hello-world

docker run hello-world   once we run this image. Application run or up in background.

Please create own docker hub account ie signup docker pull busybox

to run the application in our application docker software must be installed.

Docker software provided docker engine to run the image using container.

To interact with Docker engine we need to tool

Ie command prompt or GUI

Docker Daemon : it is background service responsible to run more than one images, container, service, layer etc

Dockerfile : A Dockerfile is blue print or set of instruction which help to create the image.

.java, .py, .c

Docker Image : docker image are the source code for the Container.

Or

The file system and configuration of our application which are used to create and run the container.

Docker Container : Running instance of Docker image Container turn up the actual application.

Now we will create more than one image to run the application

1. First image to display echo message.

So first create the image

Create Dockerfile using command as touch Dockerfile

```
vi Dockerfile
```

Dockerfile

```
FROM busybox
CMD ["echo","Welcome to Docker simple message created by Akash"]
```

Esc

:wq!

Below command is use to create the image

```
docker build -t my-busybox . -f Dockerfile
docker images
docker run my-busybox
```

2. Running python program

mypython.py

```
a=10;
b=20;
sum=a+b;
print("sum of two number is ",sum);
```

then create Dockerfile

```
FROM python:3
COPY mypython.py .
CMD ["python","./mymypthon.py"]
```

esc

:wq!

docker build -t my-pytnon . -f Dockerfile

-t tag

My-python : name of the mage anything as of now my-python

. docker file location ie current location

-f : file

Dockerfile : filename

docker run mypython

3. Create image to run the Simple Java Program
   Predefined java image is

   FROM openjdk:11 hint

docker ps

docker container ps it is use to check all running containers

echo message

python

java

all these three application running in console. After output display application get terminated.

That purpose container up and stop.

Once we created web application using html, css, javascript or angular or react js we need server to deploy the application

Apache tomcat

Web logic

Jboss

IIS server

Nginx server

All server they run on default port number

Tomcat : run on default 8080.

Nginx default port number is 80.

Jenkin also run on default port number 8080.

Create image and run web application image using nginx server

create index.html file

index.html

```
<html>

    <head>
    </head>
    <body>
        <h2>WElcome to simple web app created by akash</h2>
    </body>

</html>
```

Dockerfile

```
FROM nginx
COPY index.html /usr/share/nginx/html
```

```
docker build -t my-web . -f Dockerfile
```

then check dockere images

```
docker run -d -p 80:80 my-web
```

```
docker ps                    to check running container
```

open browser http://localhost:80