**DOCKER:**

1. **Before Virtualization**
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Concepts: Before Virtualization, in previous days how the process was and now how Docker is going to be implemented

In Previous years, First when the organization starts,

For example: we are running a JAVA application, entire system will be allocated to it.

If you want to run Tomcat, another system will be allocated to it. So, you won’t use it for any other applications. Etc.

So, now in one system if there is 512 MB RAM, 100GB hard disk if it has, in previous days, they didn’t use it completely properly entirely in whole.

So, if they are using 10 applications, they used to maintain 10 systems, in every system a amount of CPU, memory, etc. is used to be wasted.

This is the disadvantage at that time.

To overcome this,

They started using like only one system, in which there will be java, Tomcat, WebLogic, Maven etc are installed.

So, here we can observe that entire IP address, DNS (Domain naming services) credentials (username, password) of the server is one because it’s a single server. We are sharing all these information of the server to all the people who are using it for their applications because they all are installed on the same server.

For ex. Person X who works on Java, entered into this server accidently he deleted something in Tomcat instead of Java. So, here the problem arises that the other people who are working on Tomcat are not able to access it properly. So, this is the disadvantage. If a Maven Y person needs to restart this server, then all the others are suffering because they all are installed in same server.

With this there is more scope for human errors to happen.

One more thing is, here people need to buy a server with some amount of GB, some amount of hard disk before itself like they need to think, how much they need. So, they used to buy more. Because if they need more they won’t be able to extend it. If anytime, there is a need for extend, then buy one more server physically and install it. Here Security is also less.

So, now to overcome this, they came to Virtualization.

Now presently most of the organizations are opting for Virtualization. Docker is the future.

**Virtualization**: Virtualization is a one physical server which acts as a number of logical services.

Here actually we are sub dividing the server. Depends upon requirements, we can create the server.

So, in this we will decide first itself how much Ram, how much GB we should have, they estimate it. These things are actually done by the management to buy a server.

Now after buying the server we will make that into logical server.

EX: The server we bought has 50 RAM, 275 Hard disk, 20 CPU.

In VM ware, we create number of Linux servers, we do that by dividing RAM, Hard disk, CPU.

**VIOS: -** Virtual Input Output Service.

By using VIOS or Hypervisors (by installing this) we can sub divide the RAM, HD, and CPU according to requirement. We can create n number of servers. In these servers we can install whatever like Ubuntu, Linux, and Windows etc. according to our requirements.

So, here all the servers that are sub divided will have different IP addresses, different Credentials Etc.

All the servers can be restarted accordingly if they want, others won’t be effected. For ex. Java is installed in Windows server, if java person X wants to restart the system, he can do it. Others won’t be effected by this. And he cannot enter into different servers because he don’t have access to other servers as he don’t know the IP add or Credentials of others.

So, now **Why Docker came? What are the disadvantages with Virtualization Concept?**

In Virtualization concept when we subdivide into servers like Ubuntu, java, Linux etc. For each thing I need to install their own respective OS (Operating Systems)

That means, in every server, we need to install software separately. So, in this installing process I am wasting a little bit of Hard disk and memory.

If we check in our laptops, in Local Disk(C), to install some software’s we wasted a little bit of space like CPU, Hard Disk etc. Without those our server won’t work. So, it’s necessary to waste it.

So, in Virtualization concept, in each and every server we are wasting some CPU/HD/Etc.

If we have 10 logical servers in a physical servers, then we r wasting a lot of CPU/HD/Etc. to run software.

We cannot move the software’s from 1 server to another. To move this server either should be in cloud.

If there is any other process also, it will be a lengthy process. We cannot move easily.

To overcome this disadvantage, Docker came in.

**DOCKER:** Docker is a container service.

We can create our own container. Then keep it in a Docker hub (it’s like an account). In this we can upload, download this container wherever we want. This Docker hub is easy to use. We can use containers that are created by others also.

Docker will have containers and images.

When we download an image that was created by others, only it will be in Readable format. We cannot edit it. That means we cannot use it.

If we want to use it, we need to Run that image, when we Run that image now it becomes Container. Then it will have Read and Write permissions. If we want to move this container, again need to upload in Docker hub then we can download it anywhere and use it. Means to install in our server.

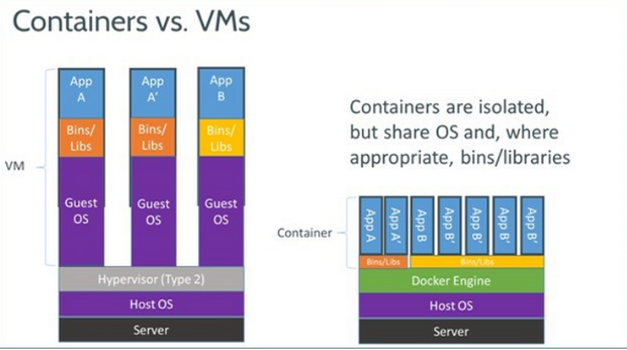
Docker is in the form of container service .Containers will have images and applications that we installed. Docker provides the multiple layers. Images are portable (upload and down load accordingly wherever we want).

**How Docker works:**

On base OS, for Ex. Linux, we will install Docker. On top of it we can install any containers like Jenkins, Linux, Etc.

So, here Base OS is compulsory. In Docker we can download n number of images. Only bin files and library files will occupy some space in Hard disk. The remaining HD by depending on this base OS that containers like Jenkins, Linux will work. Here there is no need to install separate software’s. Everything will operate on the basis of Base OS.

**Difference between VMs and Containers:-**



Installation:

Open [www.googgle.com](http://www.googgle.com)

Type Docker toolbox, click on Docker Toolbox|Docker

Now a window opens as Docker Toolbox If we are using Mac or if we are using windows press Download button accordingly.

Now Download Windows dhi button click only clicks on Run, it will download.

Then we get 3 icons on desktop as

1. Docker Quickstart Terminal 
2. Kitematic(Alpha) 
3. Oracle VM virtual box 

Now open only on Docker Quickstart terminal

Now press on Oracle VM virtual box, but don’t do anything in here

We will work only in Docker Quickstart terminal.

To see version: - $ docker –version

Here, in this server we can create n number of containers

Docker Process: 1. Download images

2. Convert that downloaded image into container

In Linux server

To know Docker version command : docker –v

To display the images: docker images

Then it will show



To know the details of docker image: docker search hello-world

Hello world is the docker image name

Command prompt lo docker hub lo vunna all images related to hello world will display



Depending upon stars we can use it.More start ratings we can use

To download that image into our local machine: docker pull hello-world

Now hello-world image will downloaded into our local machine

To check whether the image is downloaded or not: docker images

Here we can see that name in the Repository.



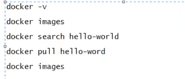
Tag is latest version or not

Created lo time like 2 weeks ago: means in docker hub, that repository was modified 2 weeks ago

Docker image will have only Read access.

Only when we run, it will become a container

Up to now we used only these commands:



To delete any repository

Docker rmi centos

Centos is a repository--- Don’t use this command at all it will delete it, again wanted to use , we have to install again

If we want to download a centos image:

Docker search centos //centos is an image, it will show all centos related images//

//depending upon the rating we will pull the image into our local system//

Docker pull centos // now the centos image is downloaded into my docker//

// it will show as download complete//

Docker images // now we can see that centos is listed in here// // we are still in Linux server//

Docker run –it centos // will enter into centos server directly// // Centos server will up//

// here any Linux commands like ll, ls won’t work because we entered into Centos server//

Hostname // this will show centos container id//

Yum install git // to install git//

// after it is installed//

Git // will show all the git commands//

Exit //t to leave centos server and enter into Linux server//// the container will also stopped//

Cd/opt

Ll// show the directories in our Linux server//

//when we run the image, container is created//

Docker images // we can see the image but it is only in Readable//

Docker ps // to see the running containers list//

Docker ps –a //to see all containers running and exited containers//

Docker run itd centos // container starts by not entering into the container ex: centos//

// here it is interactive terminal, d is detached mode//// container will start and displays container id but will be in Linux server//

Docker ps // to see the running containers list//

Docker ps –a //to see all containers running and exited containers//

Docker attach cid // cid is the container id//// now we will be in that specific up and run container//

Exit or control+d // to exit from that container [ here container is stopped// and back to Linux server//

Ctrl + p+ q// to keep container up but we should come out of that container//

Docker ps // to see the running containers list//

Docker stop cid// to stop that container//

Docker start cid// to start the container again//

//From 1 image, we can create n number of containers//

Docker attach cid //To enter into that container //

Docker images// to see images //

Docker rmi image name// rmi is remove image//

Docker rmi –f image name // -f is force//// delete the image forcefully//

Docker rm cid//To delete container //

//Even image delete ayinaa kuda container can be in up//

We can enter into that container

//Up and run lo container can be delete by using –f forcefully command//



