What is Docker?? Why Docker??

Docker or Docker Engine or Docker Services is a containerization platform that packages our application and all its dependencies together in the form of a docker container to ensure that your application works seamlessly in any environment.

Docker is also an OS level virtualization tool which provides us multiple container on top of any host server.

** Note: Docker provides OS level virtualization means docker will be using all components of the server where it is installed and all the container which is installed on top of docker will use the same kernel of Host machine on top of which Docker is installed, while this is not the same in case of other virtualization tools like VMware or hypervisor, they does the physical virtualization of machine.

What is Container??

container is a running unit of docker images, means first we creates the image of any OS or any application and when we run that image then that running docker image can be said as docker container.

** Any container will must have an OS as the base image, OS can be any either ubuntu, centos, oracle Linux, rhel.

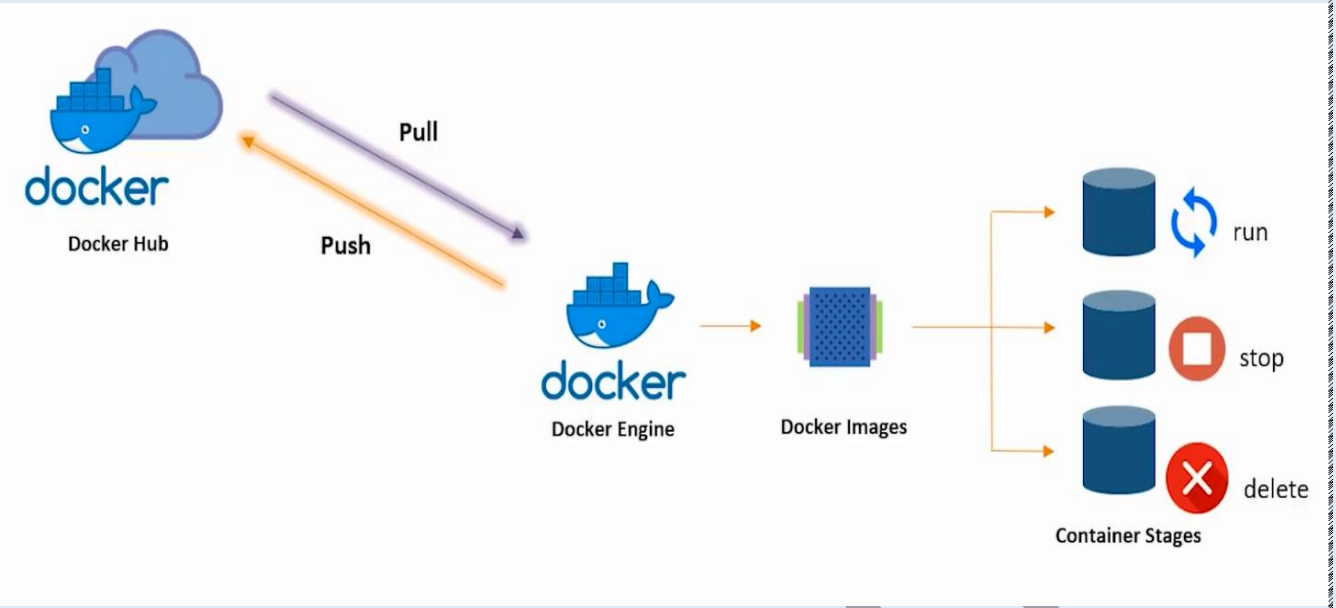
** We can create our own docker image as required but we can't make any changes to the existing docker images as images are always immutable.

** Docker hub is the public repository where all the images are stored, and anyone can pull it from anywhere in the world.

** We can also push our docker image to docker hub, the only requirement is we have to create a account in Docker hub which is as simple as making an Gmail account on google.

** Whenever we run any container, the first step is docker will look for any similar image if existing in the host machine where docker is installed, if the image will exist there then docker will use the same image to run the container, else docker will pull the latest image from docker hub.

** In below image we can see whenever any pull requests come, docker hub provides the latest images of from docker hub to docker engine machine, and then docker engine runs that image to create a container. We can stop the container, start the container, pause the container, unpause the container, delete the container.



So, in simple language we can also say Docker is a tool for Build, Ship and Run, it is not a correct definition but this the workflow of Docker what it does, which we come to know in detail in later part of our discussion. Build the docker images what type of images we require with all the applications installed into it and then ship it wherever it requires and run the same container anywhere on top of any OS irrespective of any dependencies.

Difference between Docker and Hypervisor??

We can simply find out the difference between docker and hypervisor from below images, Hypervisor enables hardware level virtualization whereas docker enables OS level Virtualization.

Docker uses same kernel of OS on top of which it is installed whereas in Hypervisor, every VM (Virtual Machine) will have its own kernel, this is also the reason why docker container takes less then a sec to come up whereas it takes more then 20 mins for a Virtual machine in hypervisor to come up.

In docker we can easily scale up the number of containers which we require in a minute by running a simple command whereas in Hypervisor installed VM it takes minimum 4 hrs to scale around 10-20 VM.

Autoscaling feature is available with us in docker means docker can auto scale its container when a heave load will be there on a particular container while in case of hypervisor Our admin has to increase the resource manually on request of client, which is a big drawback as no companies knows when their traffic can increase suddenly to a high level and they would require high resource availability to maintain the huge traffic.