Summary

Session No-1

- OpenShift is a product from a company called RedHat
- OpenShift as a product can be used by the developer's team & operational or admin team
- OpenShift developer track includes DO188 & Do288 certification & admin track includes Do280 certification
- Based on the idea or the requirement the developer of the company will create the web app & the minimum requirement to run the program is we need the operating system
- It is impossible to run the program without the operating system& for the operating system we need physical hardware (RAM, CPU & HD)
- Running the web app on the top of the operating system is called deploy, run, or execute.
- Between the web app & operating system, we need run time which is a kind of program that is running the web app on the OS
- There are four different ways for getting the environment or operating system
    - Bare metal
    - Virtualization
    - Cloud computing
    - Containerization
- Every time we come up with a different version of a web app, mostly we need a new operating system environment
- Installing the operating system is also called provisioning

- For installing the operating system with virtualization, it takes around 10 min to 30 min which is pure wastage of time & it will slow down the speed of innovation
- In containerization, if we want to launch the Operating system environment it takes less than 1 sec
- Different products or tools for containerization are Docker, Podman, Rocket & CRI-O
- If we launch the OS in bare metal, it is called OS, in virtualization, it is called a virtual machine, in cloud computing, it is called instances & in containerization, it is called containers
- For implementing containerization, we use an operating system & on top of it we install a container engine for launching the containers
- Physical hardware, operating system & container engine is also called the container host
- The minimum requirement to launch the container is we need a container host
- The number of containers we can launch is dependent on the physical hardware of the container host
- If the container host goes down the entire web app goes down here our container host is a single point of failure
- Instead of using a single container host, we can use multiple container hosts for launching our web app
- Increasing resources or host is called scaling
- Instead of human beings, we run one program whose duty is to keep on monitoring or tracking all the container hosts & any fault happens in any of the hosts then launch the containers on another host it is called scheduling. This architecture is called a cluster

- In the cluster, we have one manager or controller node and multiple workers or slave nodes where we launch the containers
- Some of the products available for setting container cluster is Mesos, Swarm & Kubernetes
- The admin team or the user team are mostly the users of the cluster & they give the instruction to the controller node
- The scheduling of the container is done by the controller node
- In Kubernetes Kube scheduler program decides in which node to launch the container
- The Kubernetes master node will manage the nodes but it will not add a new node when it is required
- OpenShift will manage the Kubernetes cluster & if no resources are available, it will automatically launch the node & connect it to the cluster
- OpenShift has lots of connectors for the public cloud, private cloud & virtualization
- If we want to launch the container it is managed or launched by Kubernetes & for managing Kubernetes, we use OpenShift

Link for sandbox:
https://developers.redhat.com/developer-sandbox