ASSIGNMENT 2

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4NI19IS046 'A' Section

1) Comparison between hypervisor and docker

Hypervisors can be made to work on software and hardware where it works on the operating system or on the CPU and storage services of the system. Dockers work only on the software of the operating system and not on the hardware side. It takes the host kernel and works on the principle of virtualization.

A virtual machine monitor, or hypervisor, is software that builds and manages virtual machines (VMs). Through virtual resource sharing, a hypervisor enables a single host computer to handle a number of guest virtual machines (VMs).

Comparison on different functionalities

Functioning Mechanism

Hypervisors are of two types – the bare metal works directly on the hardware while type two hypervisor works on top of the operating system.

Docker, on the other hand, works on the host kernel itself. Hence, it does not allow the user to create multiple instances of operating systems. Instead, they create containers that act as virtual application environments for the user to work on.

**Number of Application Instances Supported**

A hypervisor allows the users to generate multiple instances of complete operating systems.

Dockers can run multiple applications or multiple instances of a single application. It does this with containers.

Memory Requirement

Hypervisors enable users to run multiple instances of complete operating systems. This makes them resource hungry. They need dedicated resources for any particular instance among the shared hardware which the hypervisor allocates during boot.

Dockers, however, do not have any such requirements. One can create as many containers as needed.Based on the application requirement and availability of processing power, the Docker provides it to the containers.

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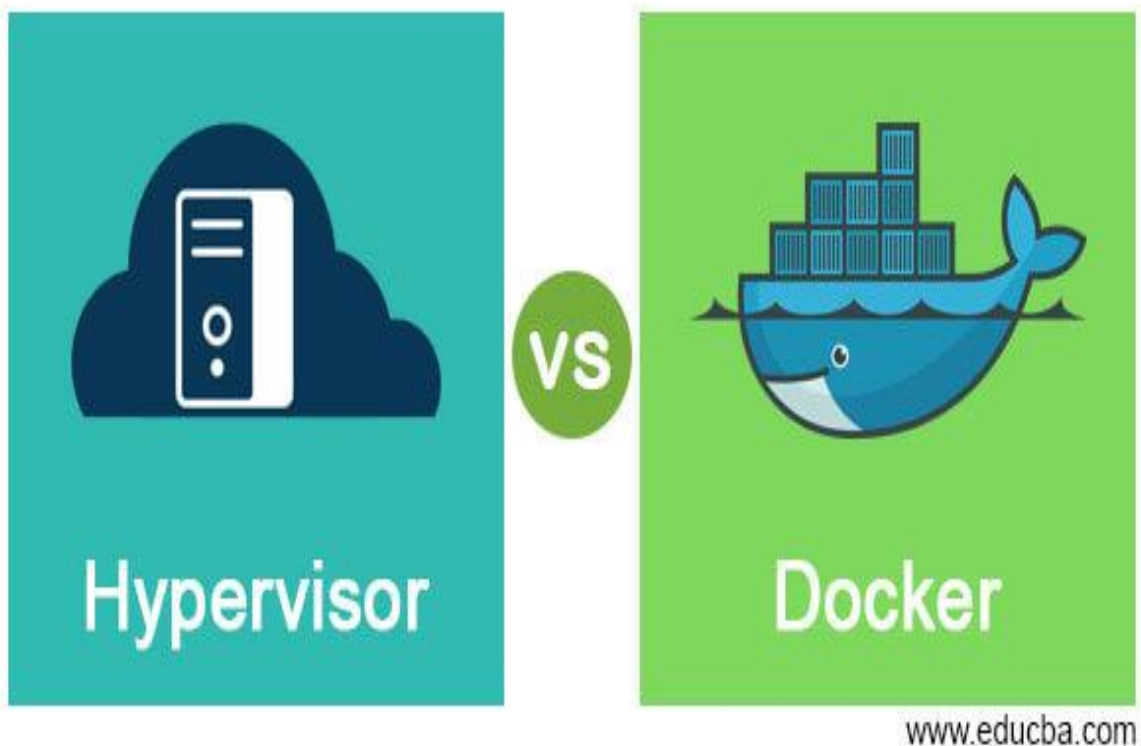
Boot time

As Dockers do not require such resource allocations for creating containers, they can be created quickly to get started.

One of the primary reasons why the use of Dockers and containers is gaining traction is their capability to get started in seconds.

A hypervisor might consume up to a minute to boot the OS and get up and running.

Docker can create containers in seconds, and users can get started in no time.

2) Comparison between Containers and Virtual machines

Container:

It sits on the top of a physical server and its host operating system. They share a common operating system that requires care and feeding for bug fixes and patches. They are more agile and have high portability than virtual machines.

Virtual Machine:

It runs on top of an emulating software called the hypervisor which sit between the hardware and the virtual machine. The hypervisor is the key to enable virtualization. It manages the sharing of physical resources into virtual machines. Each virtual machine runs its own guest operating system. They are less agile and have low portability than containers.

Containers	Virtual Machines (VM)
A container is a piece of software that allows separate aspects of a programme to operate independently.	A virtual machine (VM) is a piece of software that allows you to install other software inside of it, allowing you to operate it virtually rather than installing the programme directly on the computer.
Applications running in a container environment share a single OS.	Applications running on VM system can run different OS.
Containers virtualize the operating system only.	VM virtualizes the computer system.
Containers take a few seconds to run.	VM takes minutes to run, due to large size.
Containers are useful when we are required to maximise the running applications using minimal servers.	VM's are useful when we require all of OS resources to run various applications.

Size of container is very light, i.e. a few megabytes.	VM size is very large.
Examples of containers are: Rancher OS, Photon OS, Containers by Docker.	Examples of VM are: KVM, Xen, VMware.