ASSIGNMENT 2

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1) Comparison between hypervisor and docker

A hypervisor is a piece of software that allows multiple operating systems to run on a single physical machine. It creates a layer of abstraction between the hardware and the operating systems, allowing each operating system to think it has its own dedicated hardware resources. Docker, on the other hand, is a containerization platform that allows applications to be packaged with their dependencies and run in isolated environments. It provides a lightweight and portable alternative to traditional virtualization, and allows applications to be run in a consistent environment regardless of the host operating system.

Here are some key differences between hypervisors and Docker:

Hypervisors create virtual machines, while Docker creates containers. Virtual machines are full-fledged operating systems that run on top of a hypervisor, while containers are isolated environments that share the host operating system and use fewer resources than virtual machines.

Hypervisors require more resources than Docker. Because virtual machines require their own operating systems and hardware resources, they tend to be more resource-intensive than containers.

Docker is more portable than hypervisors. Because containers are isolated environments that can be easily moved between host machines, they are more portable than virtual machines, which are tied to the hardware on which they are running.

Overall, while both hypervisors and Docker can be used to run multiple operating systems on a single physical machine, they have some significant differences, and the appropriate choice will depend on the specific needs and requirements of an organization.

Comparison on different functionalities

Functioning Mechanism

Here are some key differences in the functioning mechanisms of hypervisors and Docker:

Hypervisors create virtual machines by abstracting the hardware resources of a physical machine and allocating them to multiple operating systems. Each operating system runs on top of the hypervisor and thinks it has its own dedicated hardware resources.

Docker creates containers by packaging applications with their dependencies and running them in isolated environments. Containers share the host operating system and use fewer resources than virtual machines.

Hypervisors require more resources than Docker. Because virtual machines require their own operating systems and hardware resources, they tend to be more resource-intensive than containers.

Docker is more lightweight and portable than hypervisors. Because containers are isolated environments that can be easily moved between host machines, they are more lightweight and portable than virtual machines, which are tied to the hardware on which they are running.

Overall, hypervisors and Docker have different functioning mechanisms, and the appropriate choice will depend on the specific needs and requirements of an organization.

Number of Application Instances Supported

Hypervisors and Docker have different capabilities when it comes to the number of application instances they can support.

Hypervisors can support multiple operating systems and application instances on a single physical machine. Each operating system runs on top of the hypervisor and can have its own application instances. The number of application instances that can be supported will depend on the hardware resources of the physical machine and the resource requirements of the operating systems and applications.

Docker can also support multiple application instances on a single physical machine, but the applications are run in isolated containers rather than separate operating systems. The number of application instances that can be supported will depend on the hardware resources of the physical machine and the resource requirements of the containers. In general, Docker is more efficient at using resources than hypervisors, so it may be able to support more application instances on a given hardware configuration.

Overall, both hypervisors and Docker can support multiple application instances on a single physical machine, but the specific number of instances that can be supported will depend on the hardware resources and resource requirements of the applications.

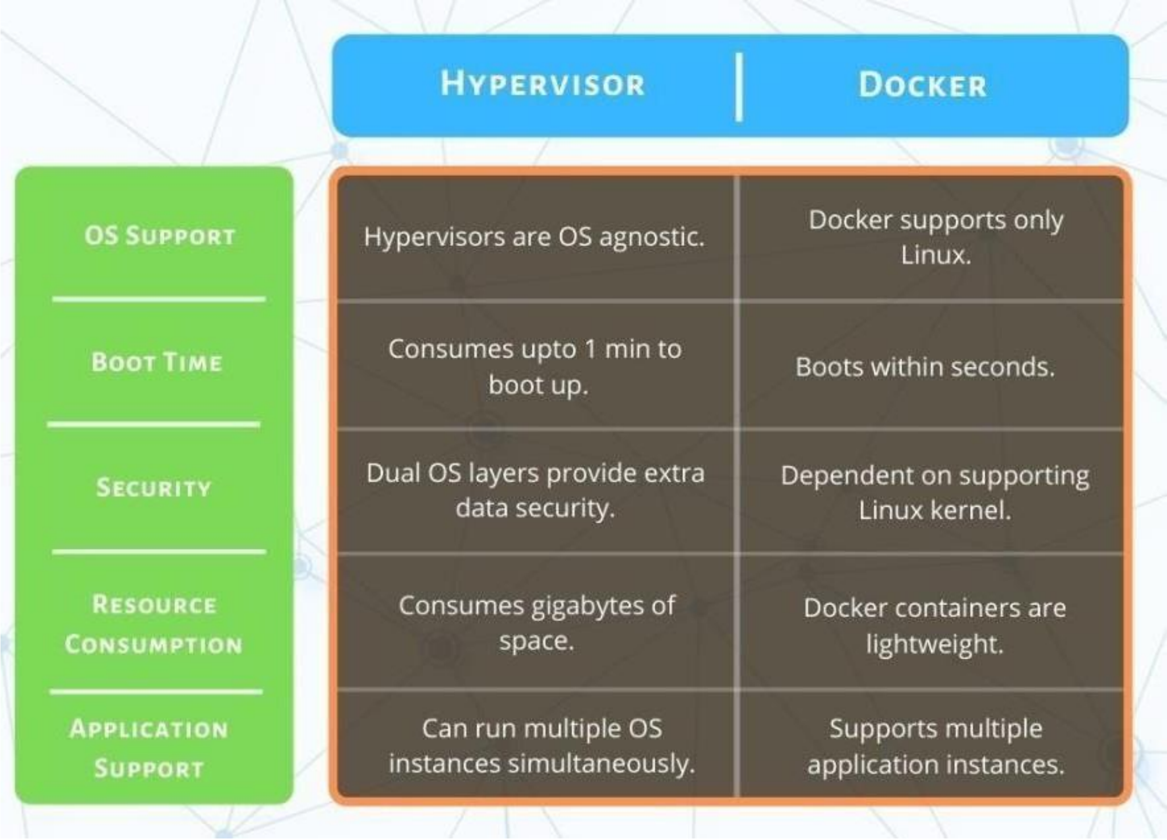
Memory Requirement

Hypervisors and Docker have different memory requirements.

Hypervisors require a certain amount of memory to run the hypervisor software and manage the virtual machines. In addition, each virtual machine requires its own operating system and will have its own memory requirements. The total memory requirement will depend on the number of virtual machines and the memory requirements of the operating systems and applications running on them.

Docker requires less memory than hypervisors, as it does not require a separate operating system for each application. Instead, containers share the host operating system and use fewer resources than virtual machines. The total memory requirement will depend on the number of containers and the memory requirements of the applications running in them.

Overall, hypervisors tend to have higher memory requirements than Docker, as they require a separate operating system for each application instance. Docker is more efficient at using resources and may have lower memory requirements for a given workload.



	HYPERVISOR	DOCKER
OS SUPPORT	Hypervisors are OS agnostic.	Docker supports only Linux.
BOOT TIME	Consumes upto 1 min to boot up.	Boots within seconds.
SECURITY	Dual OS layers provide extra data security.	Dependent on supporting Linux kernel.
RESOURCE CONSUMPTION	Consumes gigabytes of space.	Docker containers are lightweight.
APPLICATION SUPPORT	Can run multiple OS instances simultaneously.	Supports multiple application instances.

Boot time

Hypervisors and Docker have different boot times.

Hypervisors require a certain amount of time to boot the hypervisor software and create the virtual machines. The boot time will depend on the hardware resources of the physical machine and the size and complexity of the hypervisor software.

Docker containers can be started more quickly than virtual machines, as they do not require a separate operating system to be booted. The boot time for a Docker container will depend on the size and complexity of the application running in the container, as well as the hardware resources of the physical machine.

Overall, Docker containers tend to have faster boot times than virtual machines, as they do not require a separate operating system to be booted. However, the specific boot times will depend on the hardware resources and the size and complexity of the applications.

2) Comparison between Containers and Virtual machines

Containers and virtual machines are both technologies that allow multiple applications or operating systems to run on a single physical machine. However, they have some key differences in terms of how they isolate applications and use hardware resources.

Containers are lightweight and portable isolated environments that share the host operating system and use fewer resources than virtual machines. They are typically used to package and deploy applications with their dependencies, and can be easily moved between host machines.

Virtual machines are full-fledged operating systems that run on top of a hypervisor. They have their own dedicated hardware resources and can run any operating system and application that is compatible with the hardware.

Containers are more efficient at using hardware resources than virtual machines. Because they share the host operating system and do not require their own dedicated hardware resources, they tend to be more lightweight and require fewer resources than virtual machines.

Virtual machines offer more isolation and security than containers. Because they have their own dedicated hardware resources and operate as independent operating systems, virtual machines offer a higher level of isolation and security than containers.