**DEVOPS ASSIGNMENT 2**

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1. **Difference between hypervisor and docker**

Hypervisor:

A hypervisor is a function that abstracts -- isolates -- operating systems (OSes) and applications from the underlying computer hardware. This abstraction enables the underlying [host machine](https://searchservervirtualization.techtarget.com/definition/host-virtual-machine-host-VM) hardware to independently operate one or more [virtual machines](https://searchservervirtualization.techtarget.com/definition/virtual-machine) as guests, enabling multiple guest VMs to effectively share the system's physical compute resources, such as processor cycles, memory space and network bandwidth.

A hypervisor would be used by someone who wants to [consolidate space on a server](https://searchservervirtualization.techtarget.com/tutorial/Server-consolidation-and-virtualization-project-planning-guide) or run multiple isolated applications on a single server. Hypervisors are commonly supported in virtualization software, such as vCenter Server.

Docker:

Docker is one of the most popular container-based platforms attracting the attention of many development teams. More and more companies are switching to Docker due to its reliability, performance, and functionality.

Therefore, it is essential to understand this open-source containerization software and the underlying components powering it.

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| Hypervisor | 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. |
| In a single system, we can use multiple operating systems with the help of Hypervisor. This makes the system to work with multiple users with different methods even for the same program. | Docker does not allow users to create multiple instances of operating systems in the same computer but it makes virtualization by making containers in the same system. |
| More power and resources are required by the systems using hypervisors as different programs are being run on the same system with different operating systems. | Resource requirement is low as containers are working on the same operating system and this makes the system share resources within the containers. |
| Boot time is high for hypervisors as different operating systems are used. It may take some minutes to start the system and users can resume their work only after booting the machine. | Boot time is low for dockers as all the containers work on the same machine. User can start the system in seconds and can start working on the same machine. |
| We cannot test the same application with different parameters in hypervisor as there is no container method available. | If the same application needs to be tested in the system with different instances, we can use containers as different parameters can be given to the application in the same container. |
| Hypervisor works with host OS and guest OS which creates layers that run the hardware. | Docker does not have an OS for itself and thus it creates instances and parameters by sitting on top of OS. |

1. **Difference between container and Virtual machines**

Container:

A Docker [container](https://www.sdxcentral.com/cloud/containers/definitions/what-are-containers-like-docker-linux-containers/) is an [open source](https://www.sdxcentral.com/cloud/open-source/) software development platform. Its main benefit is to package applications in containers, allowing them to be portable to any system running a Linux or Windows [operating system (OS)](https://www.sdxcentral.com/resources/glossary/operating-system-os/).

Virtual Machines:

A virtual machine (VM) is a virtual environment that functions as a virtual computer system with its own CPU, memory, network interface, and storage, created on a physical hardware system (located off- or on-premises). Software called a [hypervisor](https://www.redhat.com/en/topics/virtualization/what-is-a-hypervisor) separates the machine’s resources from the hardware and provisions them appropriately so they can be used by the VM.

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| Virtual Machines | Container |
| VM is piece of software that allows you to install other software inside of it, so you basically control it virtually as opposed to installing the software directly on the computer. | While a container is a software that allows different functionalities of an application independently. |
| Applications running on VM system can run different OS. | While applications running in a container environment share a single OS. |
| VM virtualizes the computer system. | While containers virtualize the operating system only. |
| VM size is very large. | While the size of container is very light; i.e. a few megabytes. |
| VM takes minutes to run, due to large size. | While containers take a few seconds to run. |
| VM is more secure. | While containers are less secure. |
| Examples of VM are: KVM, Xen, VMware. | While examples of containers are:RancherOS, PhotonOS, Containers by Docker. |