Introduction to Virtualization


What is
Virtualization?

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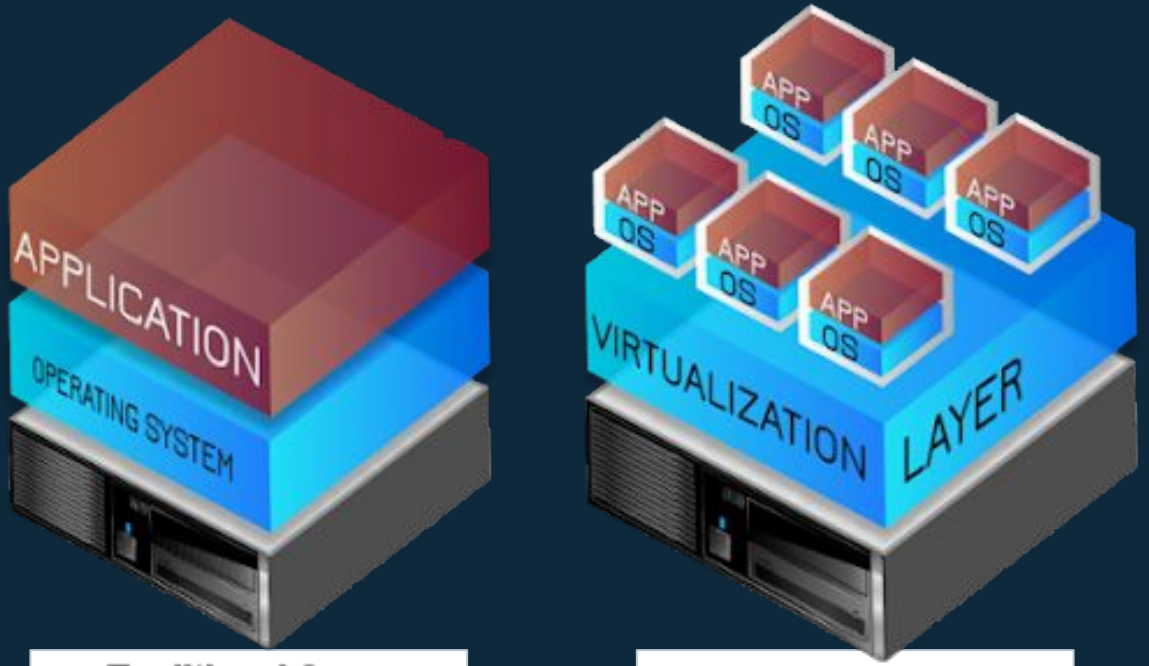
What is virtualization?

Introduction

What is virtualization?

- **Virtualization** is the process of running a virtual instance of a computer system in a layer abstracted from the actual hardware.
- Most commonly, **it refers to running multiple operating systems on a computer system simultaneously.**
- To the applications running on top of the virtualized machine, it can appear **as if they are on their own dedicated machine**
- **The operating system, libraries, and other programs are unique to the guest virtualized system and unconnected to the host operating system which sits below it.**

What is virtualization?



Traditional Server Architecture

Virtualized Server Architecture

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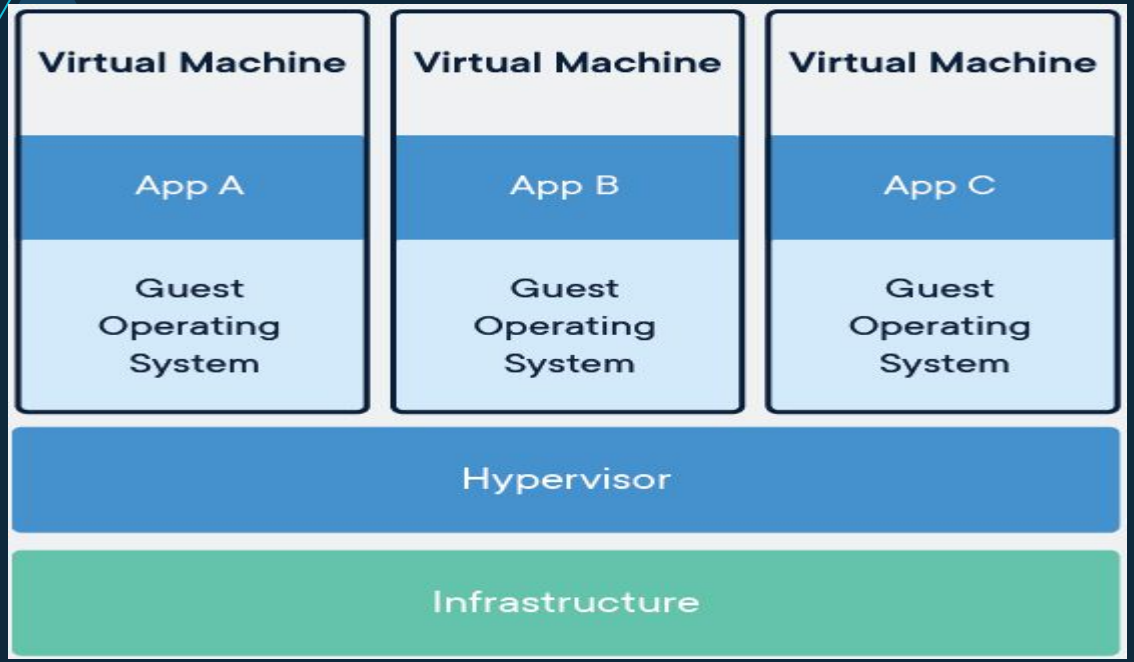
Hypervisors

What is a Hypervisor?

Hypervisors

- The software used for virtualization is called **hypervisor**.
- **It is a software that makes virtualization possible!**
- There are 2 types of hypervisors.
  - **Hypervisor type 1**
  - **Hypervisor type 2.**
- There are many different hypervisor vendors available.
- **Most provide trial periods to test out their services before you buy them.**

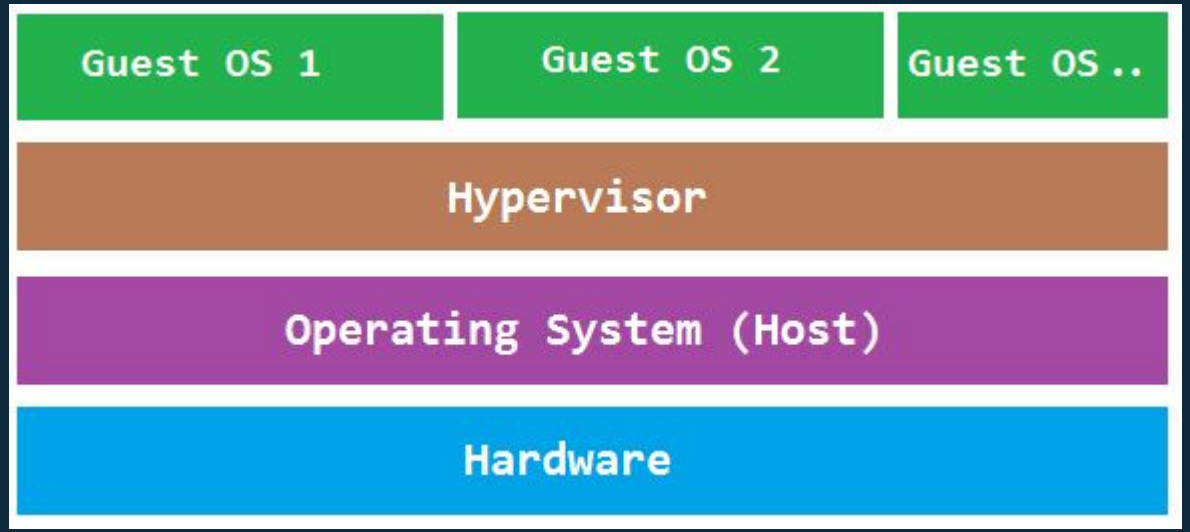
Hypervisor type 1



This is a layer of software we install directly on top of a physical server and its underlying hardware.

There is no software or any operating system in between, hence the name **bare-metal hypervisor.**

Hypervisor type 2



Here, there is an operating system in between the Hypervisor and the underlying Hardware

Questions:

1. Which hypervisor did we install on our system to do virtualization?
2. Can you determine its type?

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Hypervisor vendors

The most popular hypervisor vendors

Hypervisor vendors

These are the most common hypervisor vendors:

Type 1 hypervisor vendors

- VMware vSphere with ESX/ESXi
- KVM (Kernel-Based Virtual Machine)
- Microsoft Hyper-V
- Oracle VM
- Citrix Hypervisor (formerly known as Xen Server)

Type 2 hypervisor vendors

- Oracle VM VirtualBox
- VMware Workstation Pro/VMware Fusion
- Windows Virtual PC
- Parallels Desktop

Hypervisor vendors

KVM

Xen™

Microsoft Hyper-V

QEMU

VMware vSphere

CITRIX XenServer

How to choose a Hypervisor

Type 1 VS Type 2

Type 1 vs type 2

- Choosing the right type of hypervisor strictly **depends on your individual needs.**
- **The first thing you need to keep in mind is the size of the virtual environment you intend to run.**
- For **personal use and smaller deployments**, you can go for one of the **type 2 hypervisors.**
- If budget is not an issue, **VMware** will provide every feature you need. Otherwise, **Oracle VM VirtualBox** is an hypervisor that will provide most of the functionalities generally needed.

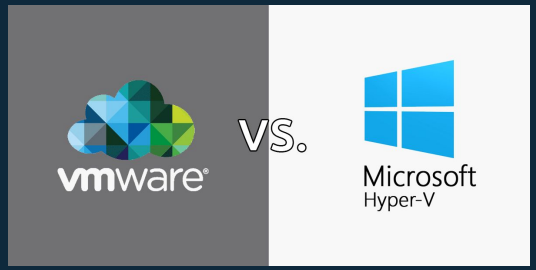
Type 1 vs type 2

Enterprise Environments

- Even though type 1 hypervisors are the way to go, you do need to take into consideration many factors before making a decision.
- The critical factor is usually the **licensing cost.**
- This is where you need to pay extra attention since **licensing may be per server, per CPU or sometimes even per core.**

Type 1 vs type 2

- In the current market, there is a battle going on between **VMware vSphere** and **Microsoft Hyper-V**.
- While **Hyper-V** was falling behind a few years ago, it has now become a valid choice, even for larger deployments.



- The same argument can be made for **KVM.**

Type 1 vs type 2

- Many vendors offer multiple products and layers of licenses to accommodate any organization.
- You may want to create a list of the requirements. Such as:
  - **How many VMs you need,**
  - **Maximum allowed resources per VM,**
  - **Nodes per cluster, specific functionalities,**
  - **And then check which of these products best fits your needs.**

Note: trial periods can be very useful when testing for which hypervisor to choose.

This virtualization server architecture was again improved, and this gave birth to DOCKER

Let's see what is Docker and how it works in the next lesson!

This might be difficult to understand at first but as always you can make some research to improve your knowledge.

If you get stuck somewhere, always feel free to post your questions in the group.

See you guys in the next lesson!

Thanks!

Any questions?

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