

Virtual machines:

A virtual machine, commonly shortened to just **VM**, is no different than any other physical computer like a laptop, smart phone, or server.

Definition

A virtual machine is a virtual representation, or emulation, of a physical computer.

They are often referred to as a guest while the physical machine they run on is referred to as the host.

Virtualization makes it possible to create multiple virtual machines, each with their own operating system (OS) and applications, on a single physical machine.

Question 1 :- Working mechanism of Virtual Machine.

The fundamental idea behind a virtual machine is to abstract the hardware of single computer (the CPU, memory, disk drives, network interface cards and so forth) into several different execution environments, thereby creating the illusion that each separate execution environment is running its own private computer.

- **Hypervisor** makes virtualization feasible.

Hypervisor is simply a piece of software that runs above the physical server or host.

There are two main types of hypervisor.

- Type 1 Hypervisor and
- Type 2 Hypervisor
- Hypervisor pool the resources from the physical server and allocate them to our virtual environments.

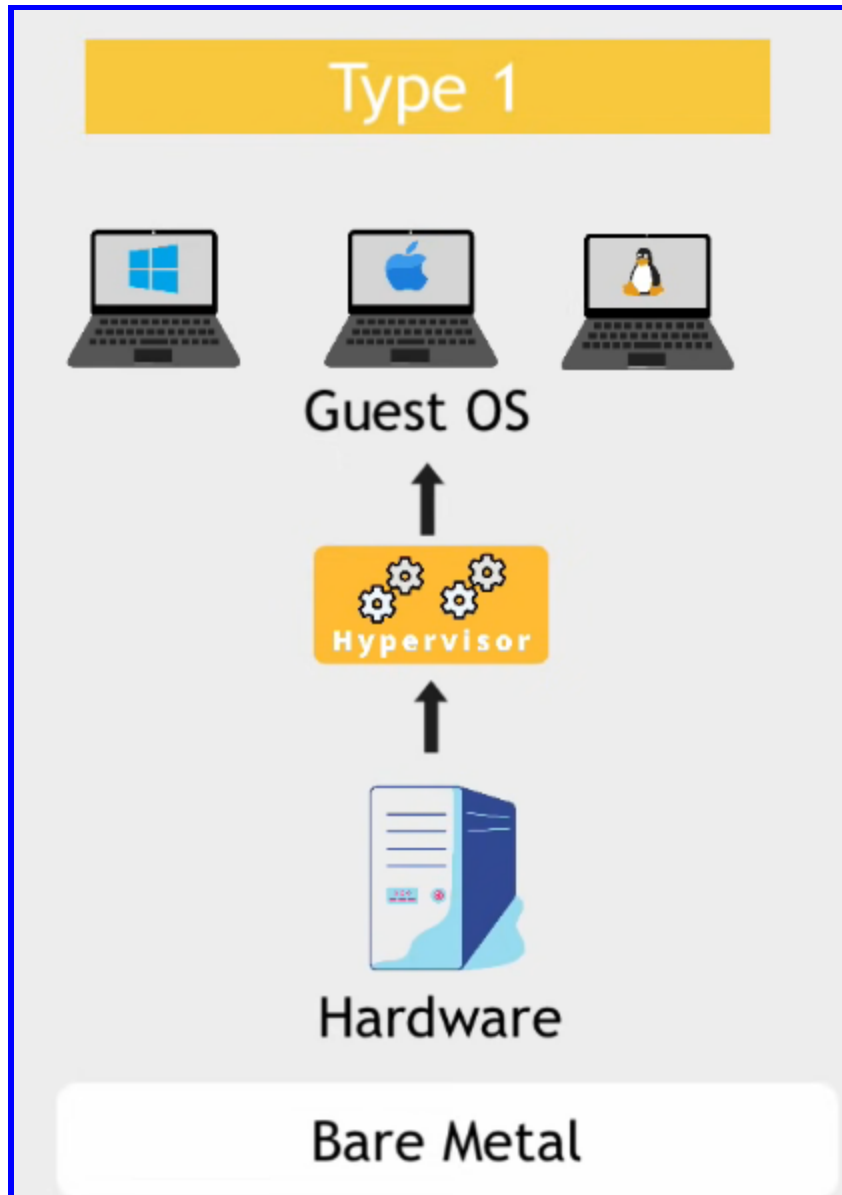
Type 1 hypervisors are hypervisors that are directly installed on the top of any physical server. Also called **bare metal hypervisor**.

Hypervisor controls the hardware resources instead of interacting with the host OS.

One physical server with a bare metal hypervisor installed on hardware and multiple virtual machines running on that hypervisor, all sharing the same hardware resources

Eg: vmware, ESXi, microsoft's hyper-v

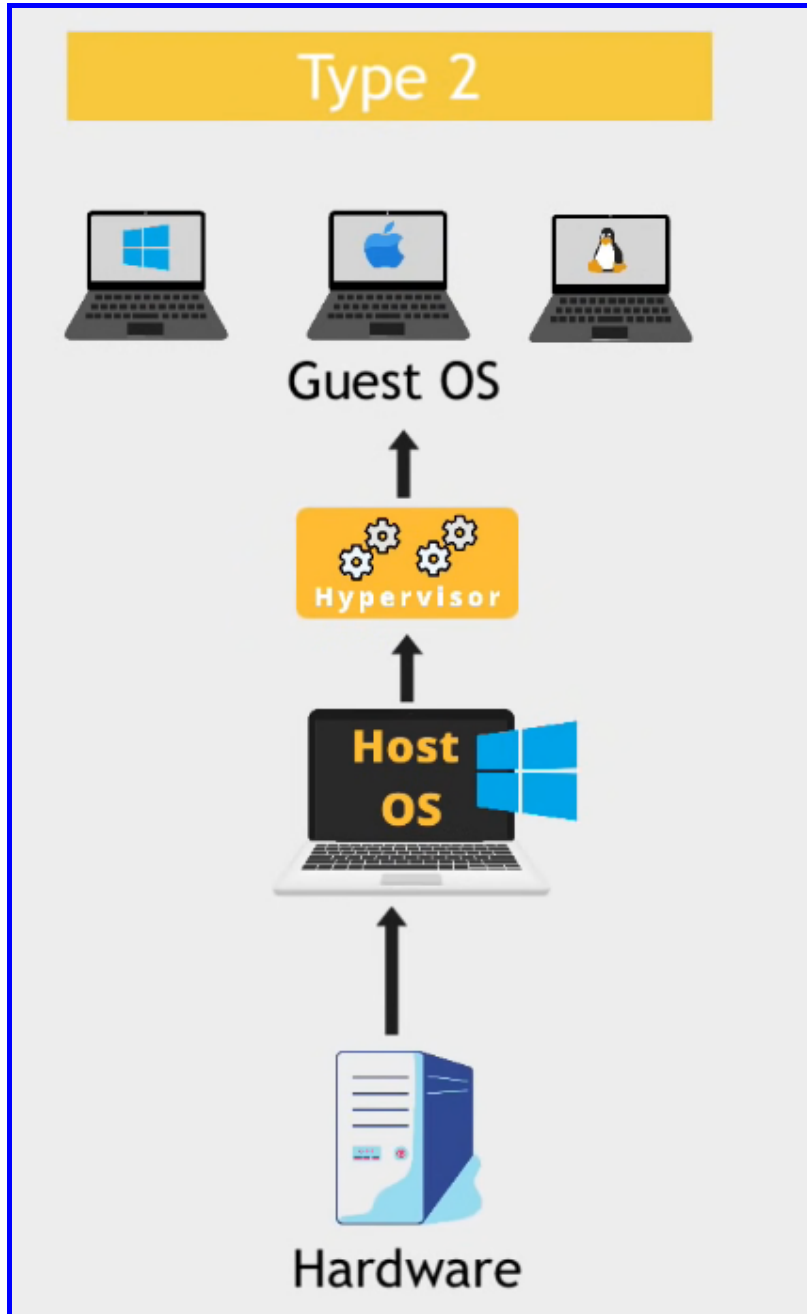
Type one Hypervisor is used by big companies and big cloud platforms to create and run their infrastructure. Eg. AWS, Digital ocean, etc



In **Type 2 hypervisors** there is a layer of host OS sits between the physical server and hypervisor. They are also called **Hosted hypervisors**.

Guest OS borrows hardware from the Host OS.

Mostly used for end-user virtualization(PC)



- Once a hypervisor is installed we can build virtual environments or virtual machines. We can run multiple VMs on a hypervisor.
- Hypervisor manages the resources that are allocated to these virtual environments from the physical server.

We can run different OS(Windows, Linux, MAC OS) on different VMs.

- Hardware resources are shared, you can only give resources you actually have.

This is the core virtualization as a process.