



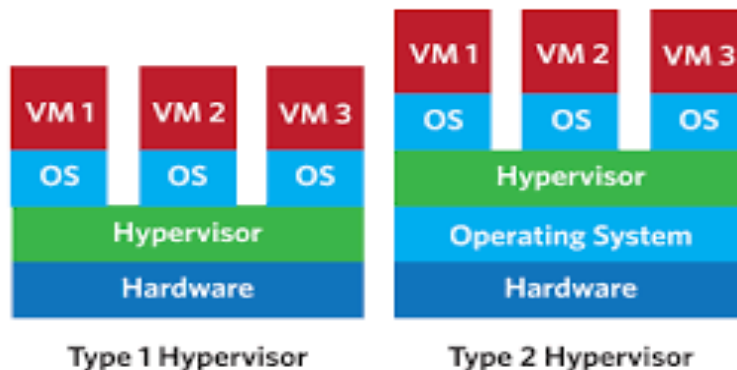
virtualization

## ❖ HYPERVISORS:

- Hypervisors are software or firmware components that can virtualize system resources.
- A hypervisor is a hardware virtualization technique that allows multiple guest operating systems (OS) to run on a single host system at the same time.
- The guest OS shares the hardware of the host computer, have its own processor, memory and other hardware resources.
- A hypervisor is also known as a **virtual machine manager (VMM)**.
- For the most part, cloud computing entails you being able to access a virtual machine for you to be able to do what you need to do anywhere.

## HYPERVISOR TYPES:

- **TYPE-1:**
  - Type 1 hypervisors can run directly on the system hardware.
  - **E.g.:** VMware ESXI, Citrix XenServer, Microsoft Hyper-V, Linux KVM.
- **TYPE-2:**
  - Type 2 hypervisors run on a host operating system that provides virtualization services, such as I/O device support and memory management.
  - **E.g.:** VMware workstation, VMware player, Oracle virtual box.



➤ **VIRTUALIZATION:**

- Virtualization is the process of creating a software-based, or virtual, representation of something, such as virtual applications, servers, storage and networks.
- It is the single most effective way to reduce IT expenses while boosting efficiency and agility for all size businesses.
- Virtualization can increase IT agility, flexibility and scalability while creating significant cost savings.

➤ **VIRTUALIZATION BENEFITS:**

- Reduced capital and operating costs.
- Minimized or eliminated downtime.
- Increased IT productivity, efficiency, agility and responsiveness.
- Faster provisioning of applications and resources.
- Greater business continuity and disaster recovery.
- Simplified data center management.
- Availability of a true Software-Defined Data Center.

➤ **VIRTUALIZATION TYPES:**

- Server Virtualization
- Network Virtualization
- Desktop Virtualization
- Para-virtualization
- Hardware-level virtualization

**SERVER VIRTUALIZATION:**

- Server virtualization is the process of dividing a physical server into multiple unique and isolated virtual servers by means of a software application. Each virtual server can run its own operating systems independently.
- Server virtualization is used to mask server resources from server users. This can include the number and identity of operating systems, processors, and individual physical servers.

### **NETWORK VIRTUALIZATION:**

- By completely reproducing a physical network, network virtualization allows applications to run on a virtual network as if they were running on a physical network but with greater operational benefits and all the hardware independencies of virtualization. (Network virtualization presents logical networking devices and services logical ports, switches, routers, firewall, load balancers, VPNs and more to connected workloads.)

### **DESKTOP VIRTUALIZATION:**

- Deploying desktops as a managed service enables IT organizations to respond faster to changing workplace needs and emerging opportunities. Virtualized desktops and applications can also be quickly and easily delivered to branch offices, outsourced and offshore employees, and mobile workers using iPad and Android tablets.

### **PARA-VIRTUALIZATION:**

- A virtualization approach that exports a modified hardware abstraction which requires operating systems to be explicitly modified and ported to run.
- What is Hardware-level virtualization?
- Here the virtualization layer sits right on top of the hardware exporting the virtual machine abstraction. Because the virtual machine looks like the hardware, all the software written for it will run in the virtual machine.

### **➤ VIRTUALIZATION Vs. CLOUD COMPUTING:**

- Although equally buzz-worthy technologies, virtualization and cloud computing are not interchangeable.
- Virtualization is software that makes computing environments independent of physical infrastructure, while cloud computing is a service that delivers shared computing resources (software and/or data) on demand via the Internet.
- As complementary solutions, organizations can begin by virtualizing their servers and then moving to cloud computing for even greater agility and self-service.

➤ **VIRTUAL MACHINE (VM):**

- A representation of a real machine using software that provides an operating environment which can run or host a guest operating system.

**GUEST OPERATING SYSTEM:**

- An operating system running in a virtual machine environment that would otherwise run directly on a separate physical system.

**KEY PROPERTIES OF VIRTUAL MACHINES:**

**PARTITIONING:**

- Run multiple operating systems on one physical machine.
- Divide system resources between virtual machines.

**ISOLATION:**

- Provide fault and security isolation at the hardware level.
- Preserve performance with advanced resource controls.

**ENCAPSULATION:**

- Save the entire state of a virtual machine to files.
- Move and copy virtual machines as easily as moving and copying files.

**HARDWARE INDEPENDENCE:**

- Provision or migrate any virtual machine to any physical server.