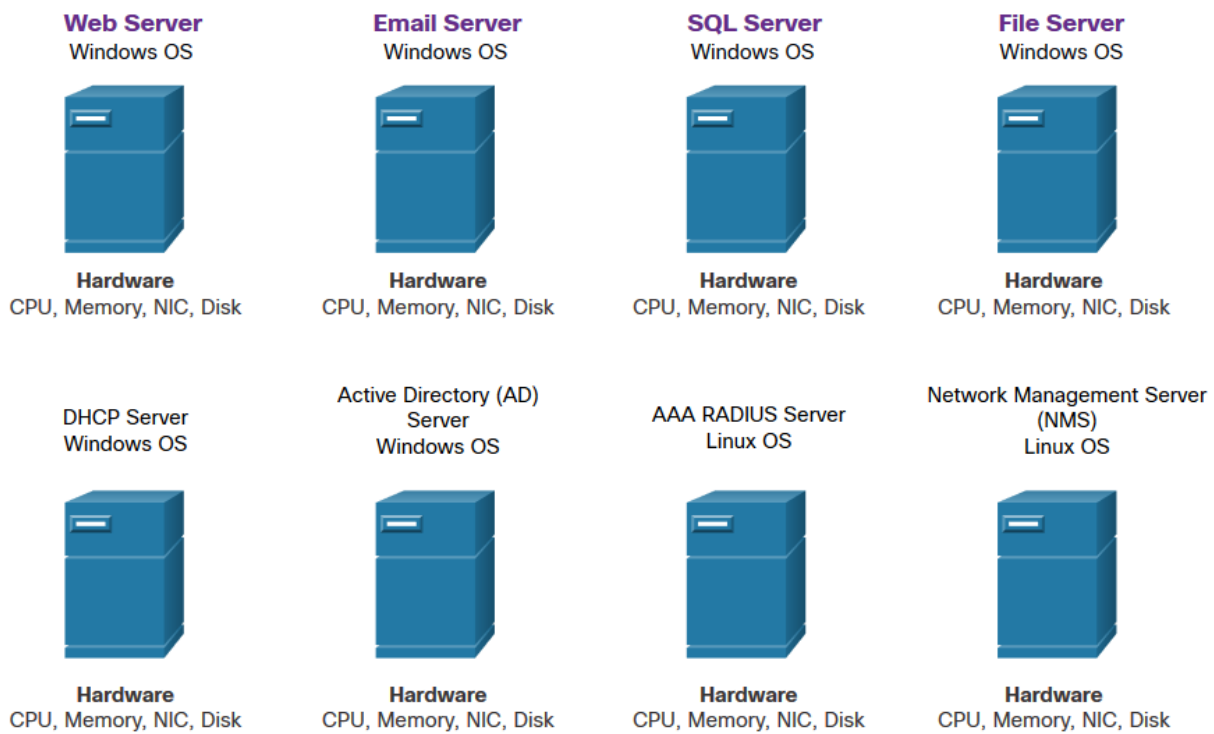


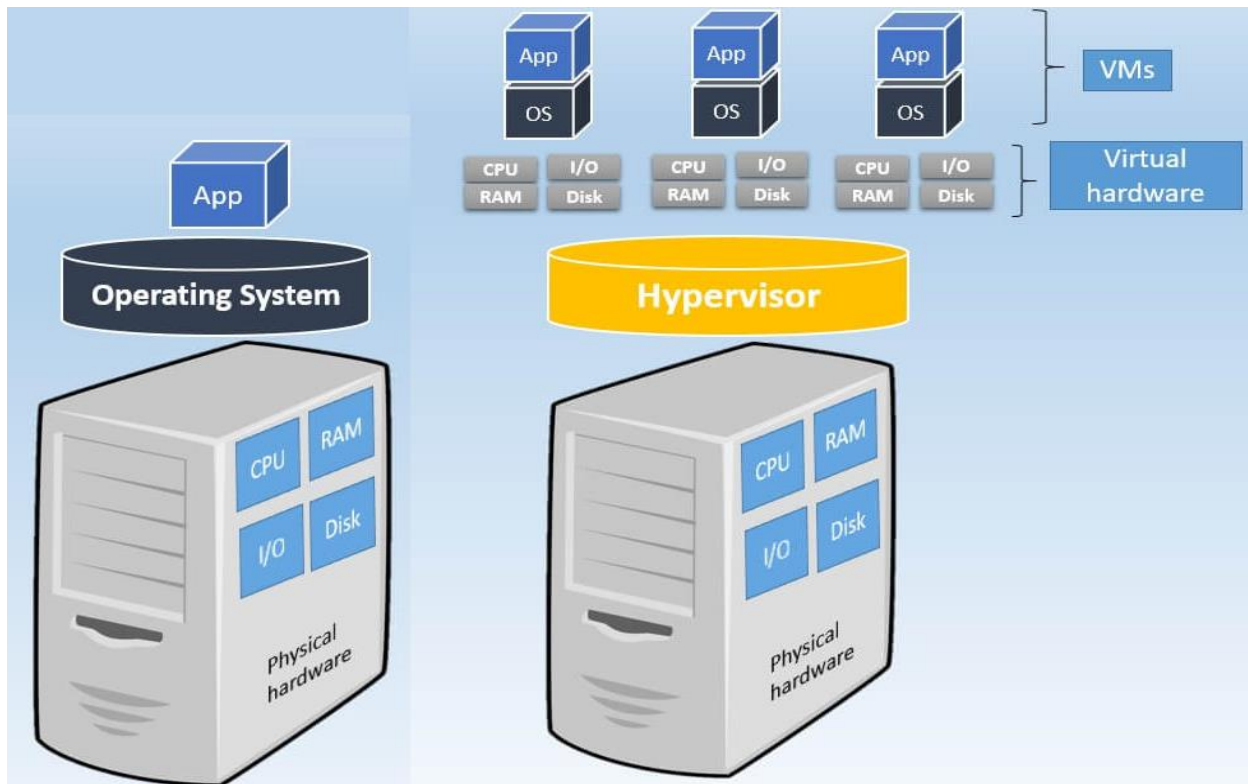
Physical Server:

- o The physical server vs virtual server comparison should start with the definition.
- o Physical server, also known as a 'bare-metal server,' is single-tenant computer server.
- o Meaning that a specific physical server is designated to use & utilize a single user.
- o Resources & components of physical server are not shared between multiple users.
- o Each physical server includes memory, processor, network connection, hard drive.
- o Each Physical server includes operating system for running programs & applications.
- o Bare-metal server is large in size due to powerful processing components that contains.



VM (Virtual Machine):

- o VM is a virtualization term, which stands for Virtual Machine.
- o A virtual machine is pretty identical to a physical server except it's virtual.
- o VM is special piece of software which emulates operation of physical machine.
- o Virtual hardware (CPUs, memory, storage, etc.) which runs on a hypervisor.
- o VM is a software emulation of a physical server with an operating system.
- o Virtual machine is a file often called hypervisor that acts as physical computer.
- o Server virtualization takes the advantage of idle resources and consolidates.
- o The operating system the virtual machine is installed on is called the **host OS**.
- o the operating system of the virtual machine itself is referred to as the **guest OS**.



Hypervisor:

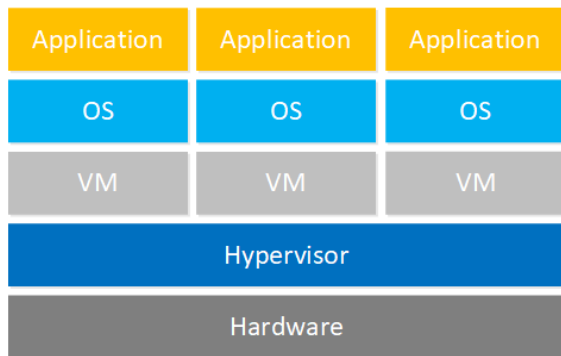
- o The hypervisor is the server virtualization software that runs on the physical server.
- o All virtual hardware which powers guest OS is handled by engine called hypervisor.
- o In the world of Virtualization, the hypervisor is known as virtual machine manager.
- o Allocates physical resources to each of systems & ensures do not interrupt each other.
- o Where create virtual machines & configure how much CPU cores, memory, storage, etc.
- o The Virtualization software that creates VMs and performs the hardware abstraction.
- o Virtualization software to allow multiple VMs to run concurrently is known as hypervisor.

Type 1 Hypervisor:

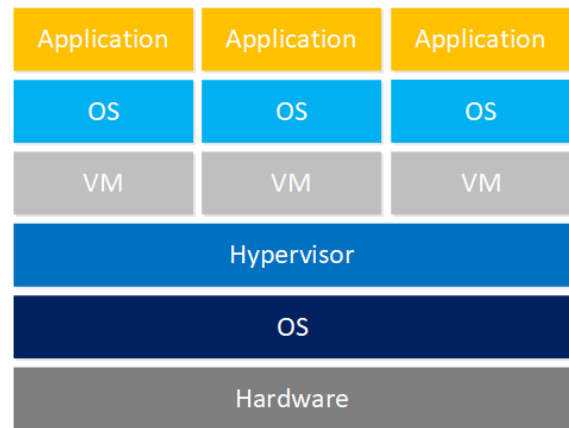
- o Type one (1) Hypervisor is type of hypervisor runs directly on the system hardware.
- o Type one (1) Hypervisor is commonly referred to as “bare metal” or “native” as well.
- o Examples are VMware vSphere, Microsoft Hyper-V, Citrix XenServer, & Red Hat (KVM).

Type 2 Hypervisor:

- o This hypervisor runs on top of an operating system like MS Windows, MacOS, or Linux.
- o Type two (2) Hypervisor is the type of hypervisor that is typically used by client devices.
- o This type of hypervisor for example, VMware Fusion, VMware requires a host OS to run.
- o We usually use a type two (2) hypervisor on desktops or the laptops system to run VMs.
- o Two popular hypervisors are Oracle VM VirtualBox and VMware Workstation in windows.



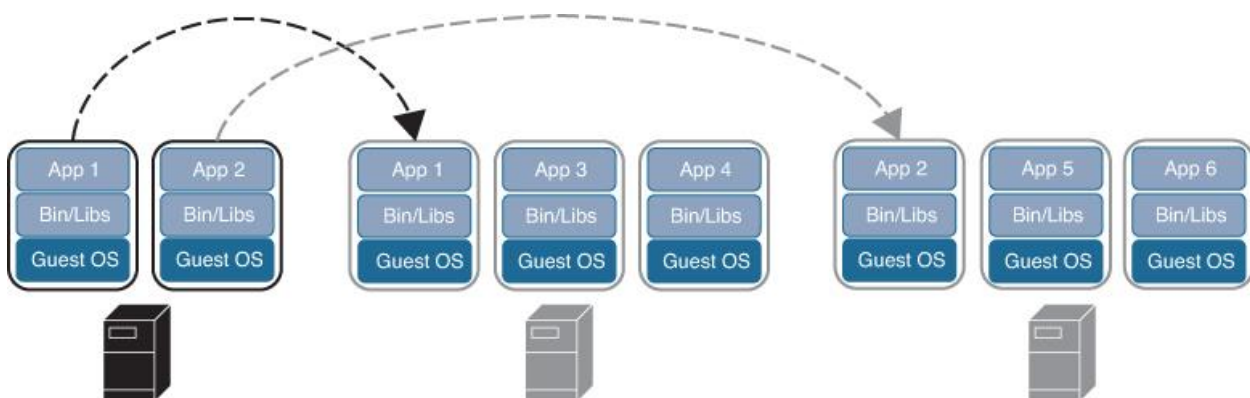
Type 1

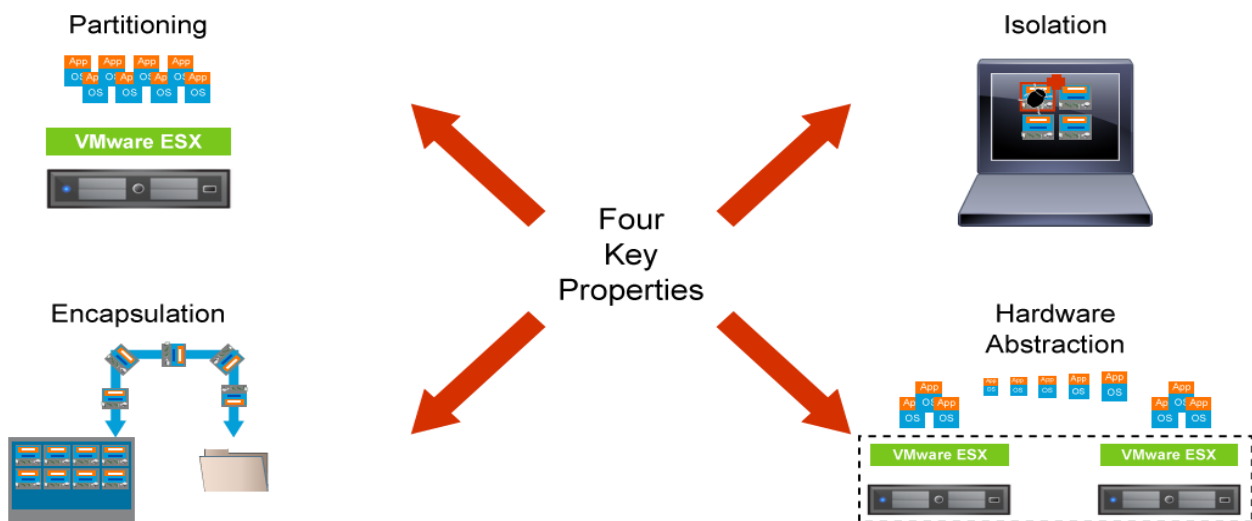
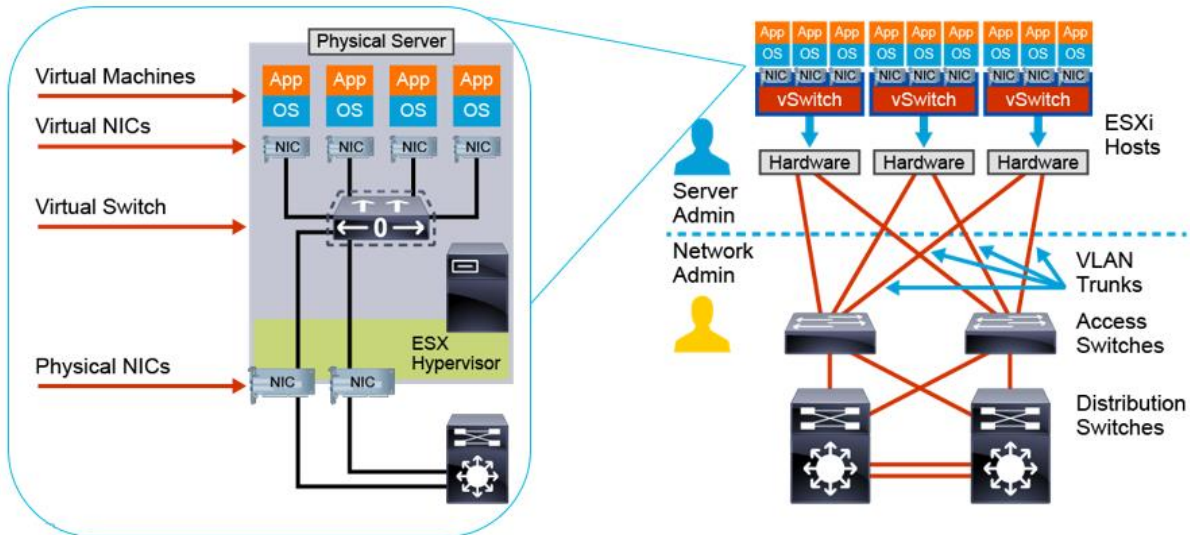
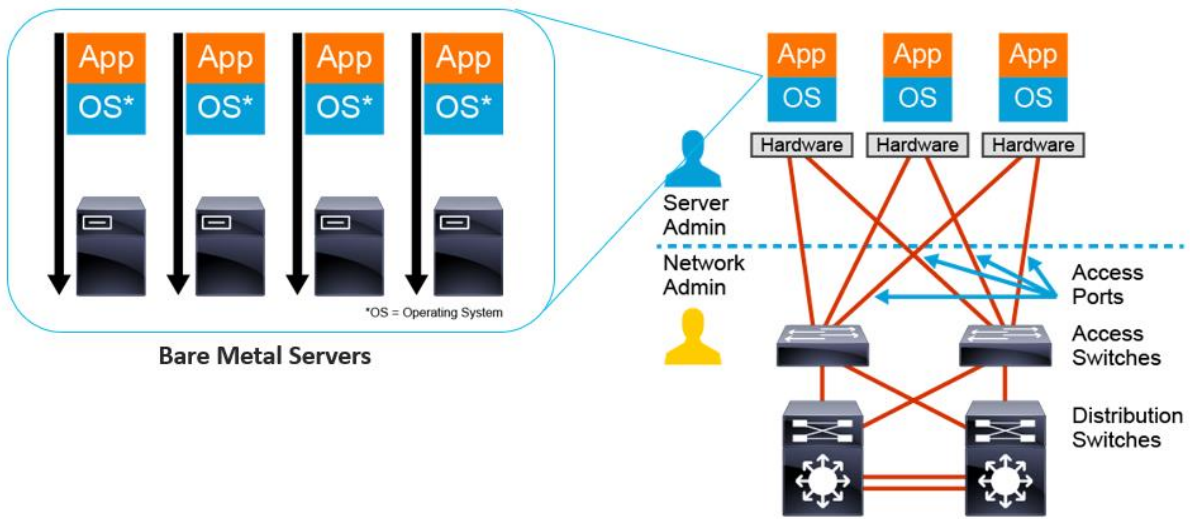


Type 2

Advantages of VM:

- o If physical server needs memory upgrade, VMs migrated to other with no downtime.
- o VM is that we are familiar physical servers, easy to understand, it's server, but virtual.
- o Use all management & security tools we know to manage our physical or virtual servers.
- o Multiple OS environments exist simultaneously on same machine, isolated from each other.
- o VM is easy maintenance, application provisioning, availability and convenient recovery.
- o Another advantage of Virtualization technology is that it provides high availability.
- o For example, if a server fails, the VMs can be spun up on other servers in the network.
- o Biggest point for VM, is that, it is offer the greatest amount of deployment flexibility.
- o Use of virtualization normally includes redundancy to protect from single point of failure.
- o Services running on VMs are virtual and dynamically installed or uninstalled, as needed.
- o Advantage of virtualization is Less equipment; less energy and Less space is required.





Virtual Switching:

- o Virtual machines connect to a network much in the same way physical ones do.
- o The difference is VMs use virtual network adapters & virtual switches to connect.
- o Virtual Machines use virtual network adapter to connect with physical networks.
- o VM-Workstation use three default virtual networks, each is different virtual switch.
- o ESXi virtualization hosts also have virtual switches, but their settings are different.
- o VSwitch is a software program a logical switching that emulates switch Layer 2.
- o Virtual Switch is software-based Layer 2 switch that operates like a physical switch.
- o A VSwitch enables VMs to communicate with each other within a virtualized server.
- o And with external physical networks through physical network interface cards (pNICs).
- o A VSwitch does not learn the MAC addresses of transit traffic from the external network.
- o It is used for ensuring connections between virtual machines and the physical networks.

