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**Welcome
To
Network for you
Virtualization**



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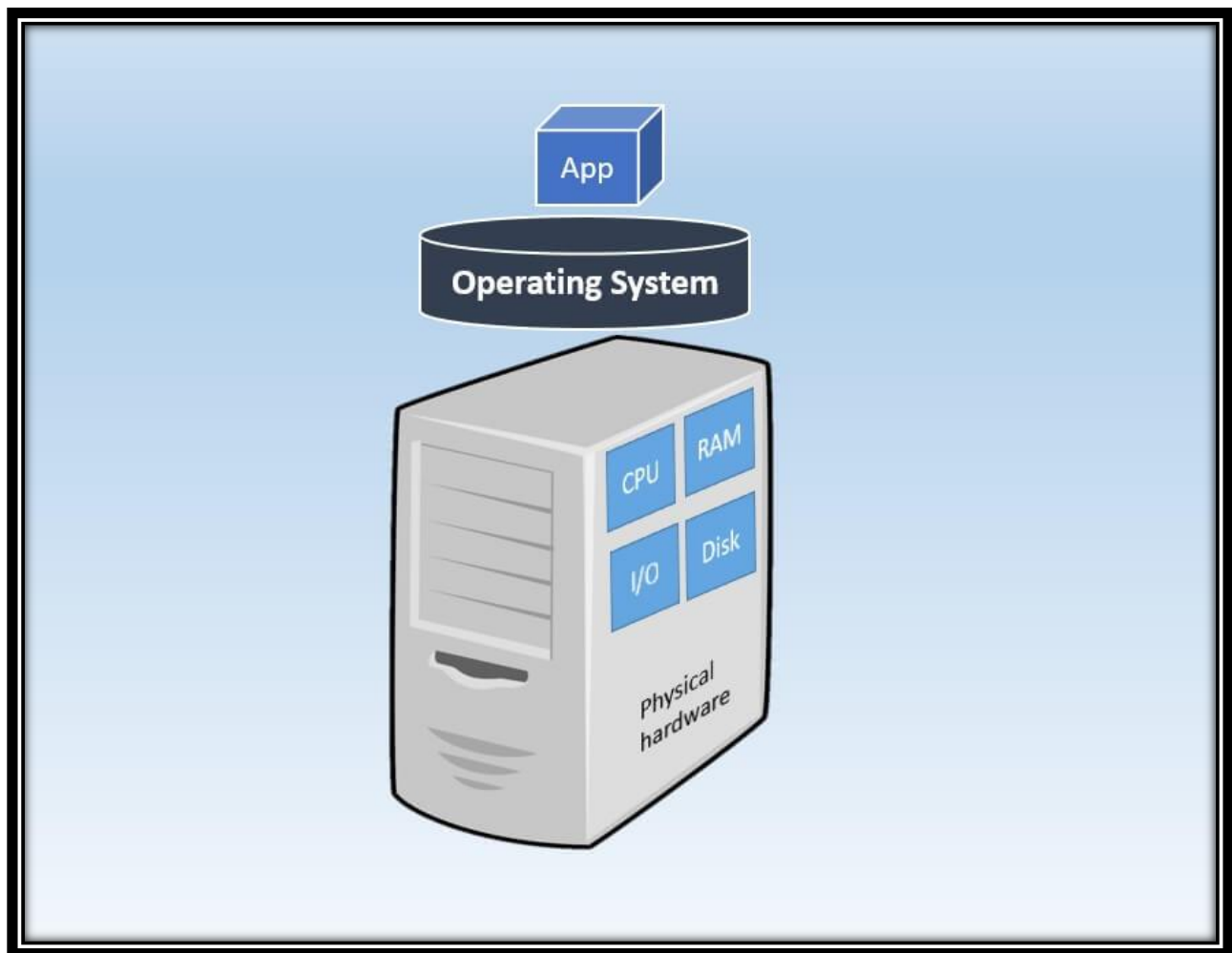
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Let first look Physical server before starting Visualization.

Physical Server:

- A physical server, also known as a 'Bare-metal server,' is a single-tenant computer server.
- It meaning that a specific physical server is designated to a sing user.
- The resources and components of a physical server are not shared multiple users.
- Each physical server includes memory processor, network connection, hard drive and an operating system (OS) for running programs and applications.
- A bare-metal server is large in size due to the powerful processing components that it contains.



- In simple words we can say in Physical server concept we have one server for one application
- As given below.

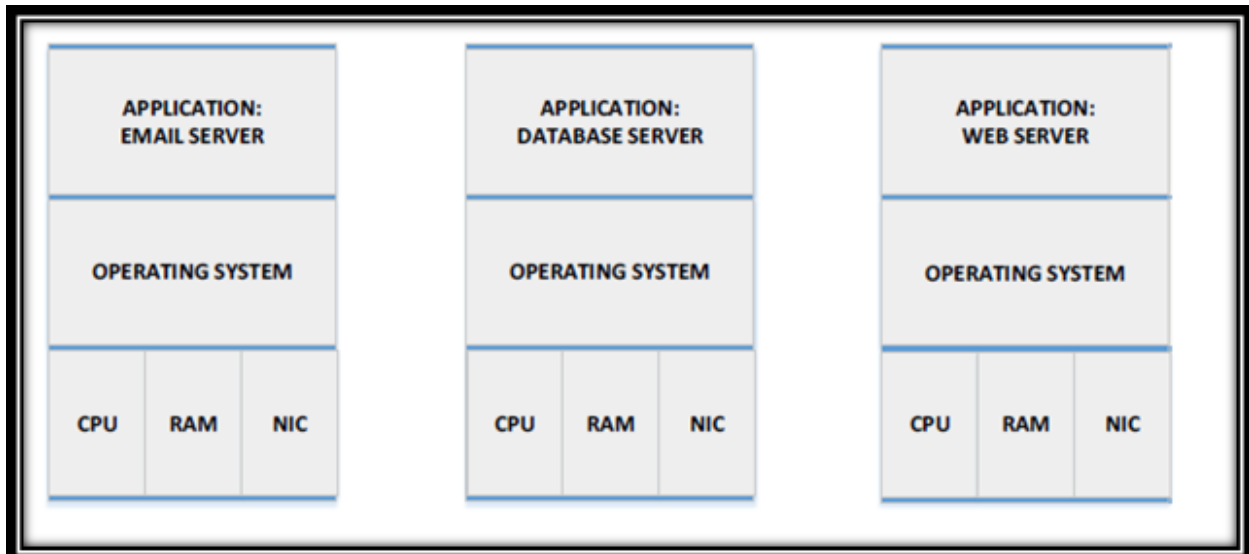
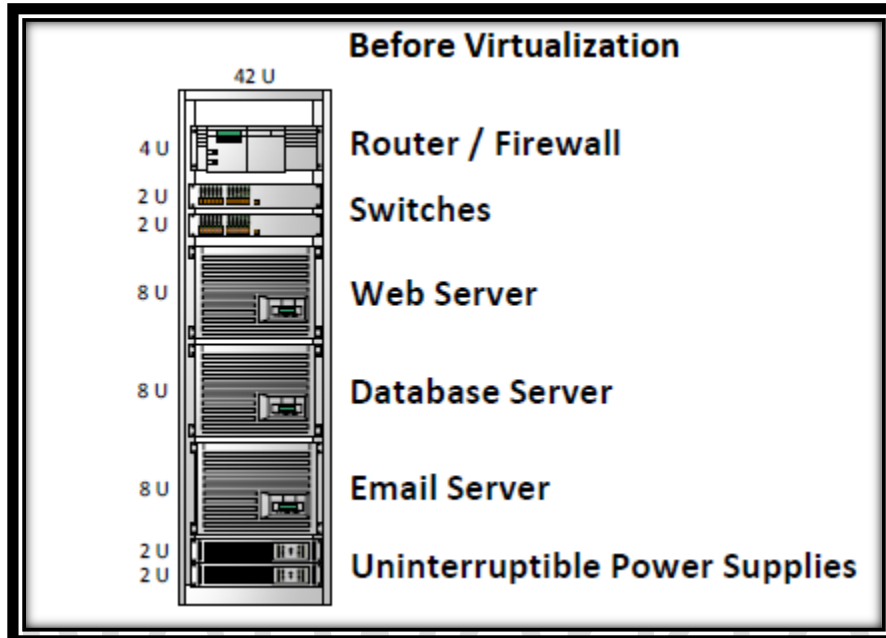
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- Web Server, Email Server, File Server, DHCP Server, SQL Server, NMS Server, Active Directly Server and AAA Radius Server etc.



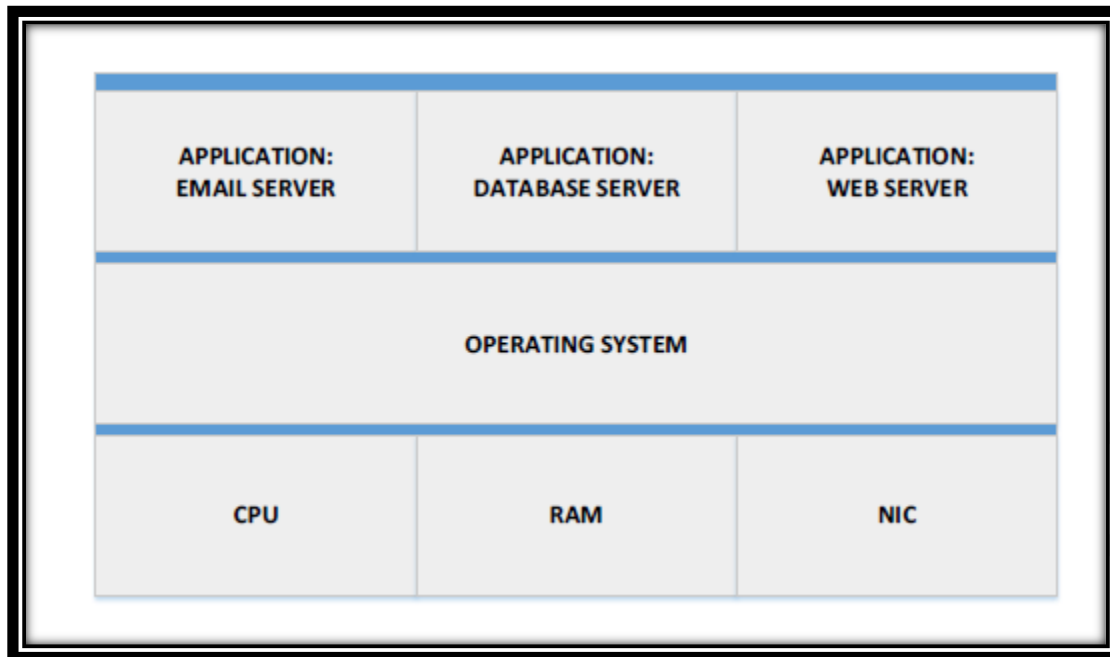
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- Server utilization (CPU, RAM, NIC etc.) around 15%.
- We have to pay for each separate server and they are all using power, space and cooling.
- Putting multiple applications on the same server would improve utilization.
- But it is very bad practice, because if we have a problem with any of our applications they will all be affected.



So we will go for Virtualization.

What is Virtualizations?

Virtualization:

- Virtualization supports running multiple virtual systems on a single physical machine.
- Virtualization provides flexibility and reduces costs.

Server Virtualization:

- We can use some software (Hypervisor) to do virtualization.
- Hypervisor is the server virtualization software that runs on the physical server.
- In the world of Virtualization, the hypervisor is known as virtual machine manager.

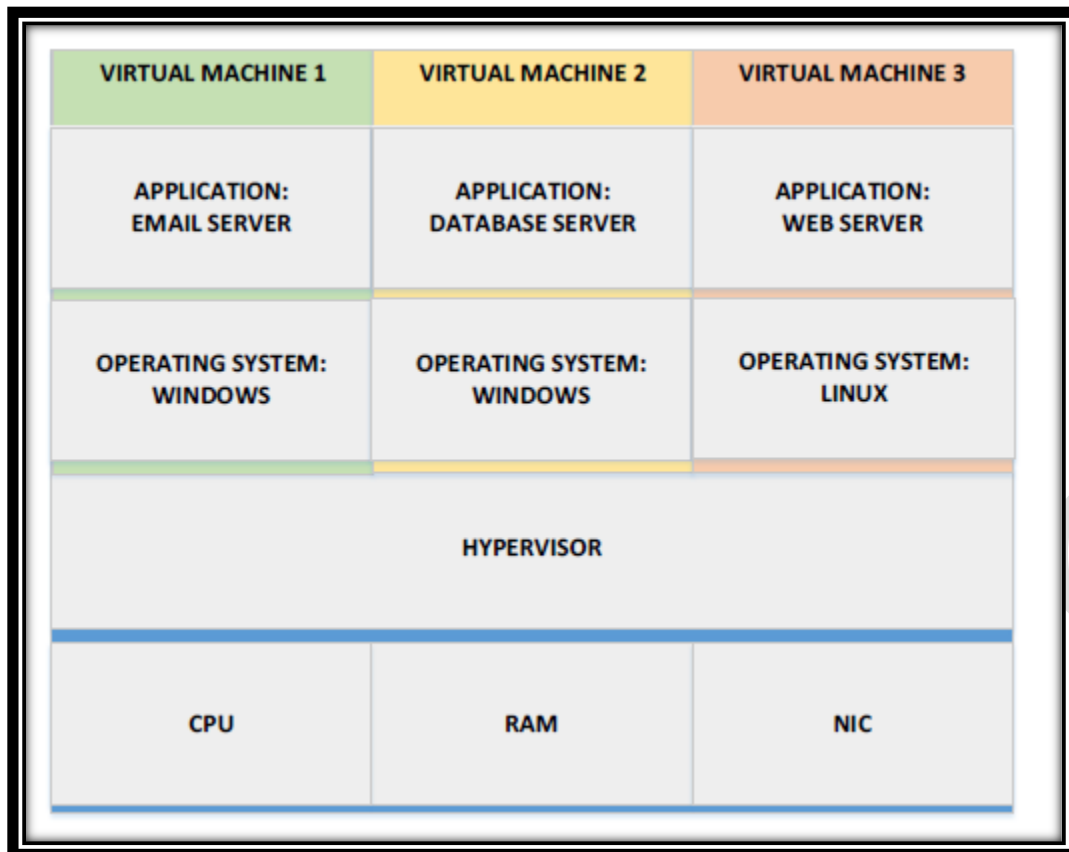
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- Hypervisor allocates physical resources to each of systems & ensures do not interrupt each other.
- With the help of Hypervisor we can create virtual machines & configure how much CPU cores, memory, storage, etc. We want to give that virtual machines.



VM (Virtual Machine):

- VM is a virtualization term, which is stand for Virtual Machine.
- A virtual machine is pretty identical to a physical server except it's virtual.
- VM is special piece of software which emulates operation of physical machine.
- Virtual hardware (CPUs, memory, storages etc.) which run on a hypervisor.
- VM is a software emulation of a physical server with an operating system.



Hypervisor:

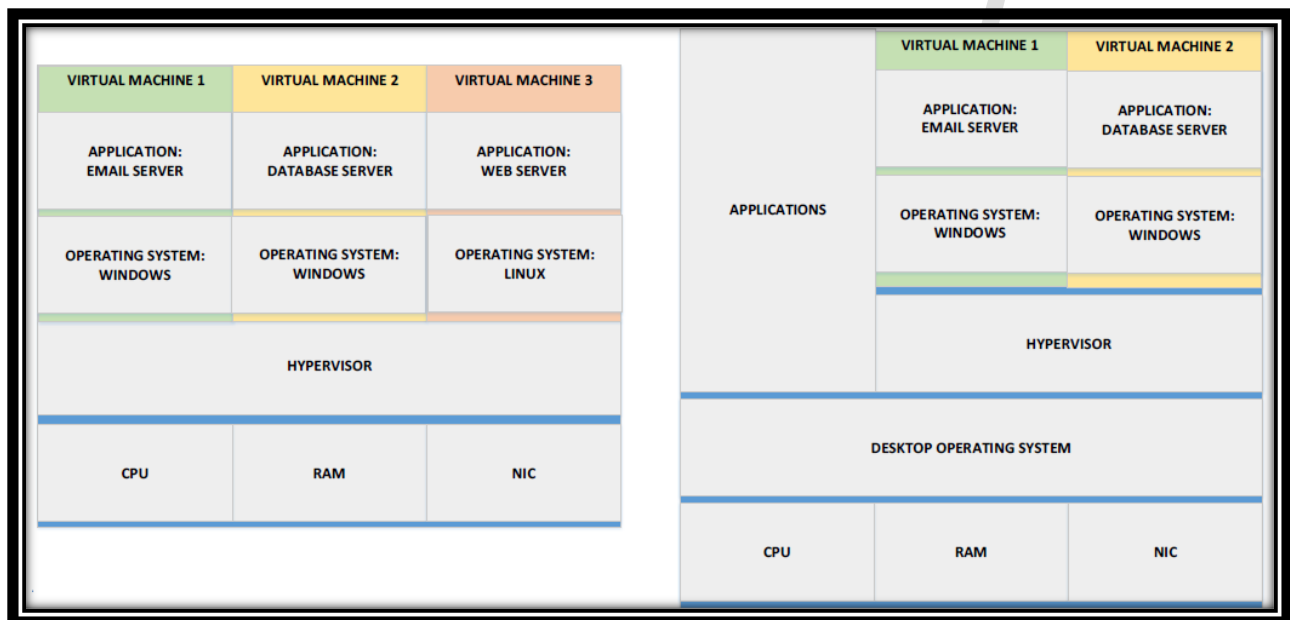
- The hypervisor is the server virtualization software that runs on the physical server.
- We have two type of Hypervisor.
- Type 1 Hypervisor.
- Type 2 Hypervisor.

Type 1 Hypervisor:

- Type 1 Hypervisor is type of hypervisor runs directly on the system hardware.
- Type 1 Hypervisor is commonly referred to as “ Bare Metal”
- Examples are VM ware , Microsoft Hyper-V, Red Hat KVM, Oracle VM Server

Type 2 Hypervisor:

- Type 2 Hypervisor runs on top of an Operating system like MS windows, Mac OS or Linux.
- Type 2 Hypervisor is the type of hypervisor that is typically used by client devices.
- Examples for Type 2 Hypervisor are VMware workstation, Player, Virtual Box, QEMU, Parallels.
- We usually use a type 2 hypervisor on desktops or laptops system to run VMs.
- Two popular hypervisors are Oracle VMWare Workstation and VM Virtual Box in windows.



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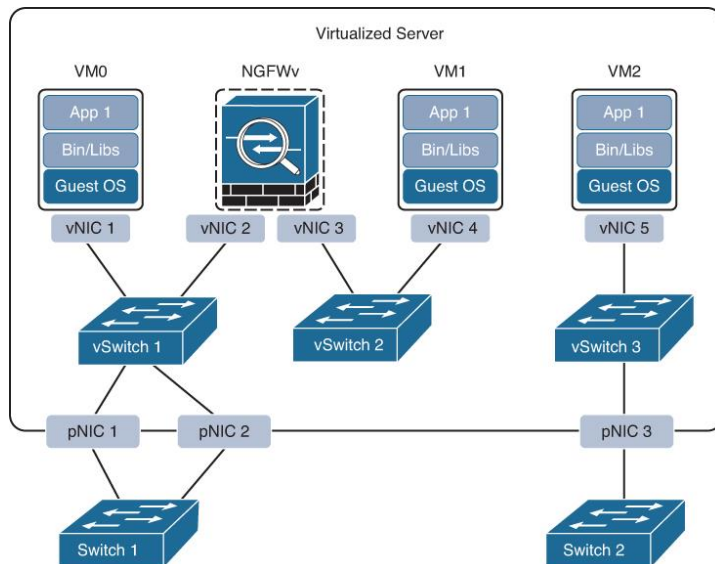


Virtual Switching:

- A virtual switch (vSwitch) is a software-based Layer 2 switch that operates like a physical Ethernet switch.
- A vSwitch enables VMs to communicate with each other within a virtualized server and with external physical networks through the physical network interface cards (pNICs).

The most popular vSwitches include the following:

- Cisco Nexus 1000VE Series Virtual Switch
- Cisco Application Virtual Switch (AVS)
- Open vSwitch (OVS)
- IBM DVS 5000v
- vSphere Switch



- Virtual machines connect to a network much in the same way physical ones do.
- The difference is that the VMs use virtual network adapters and virtual switches to establish connections with physical networks.
- If you have used VMs running on VMware Workstation, you may be familiar with three default virtual networks. Each of them uses a different virtual switch:

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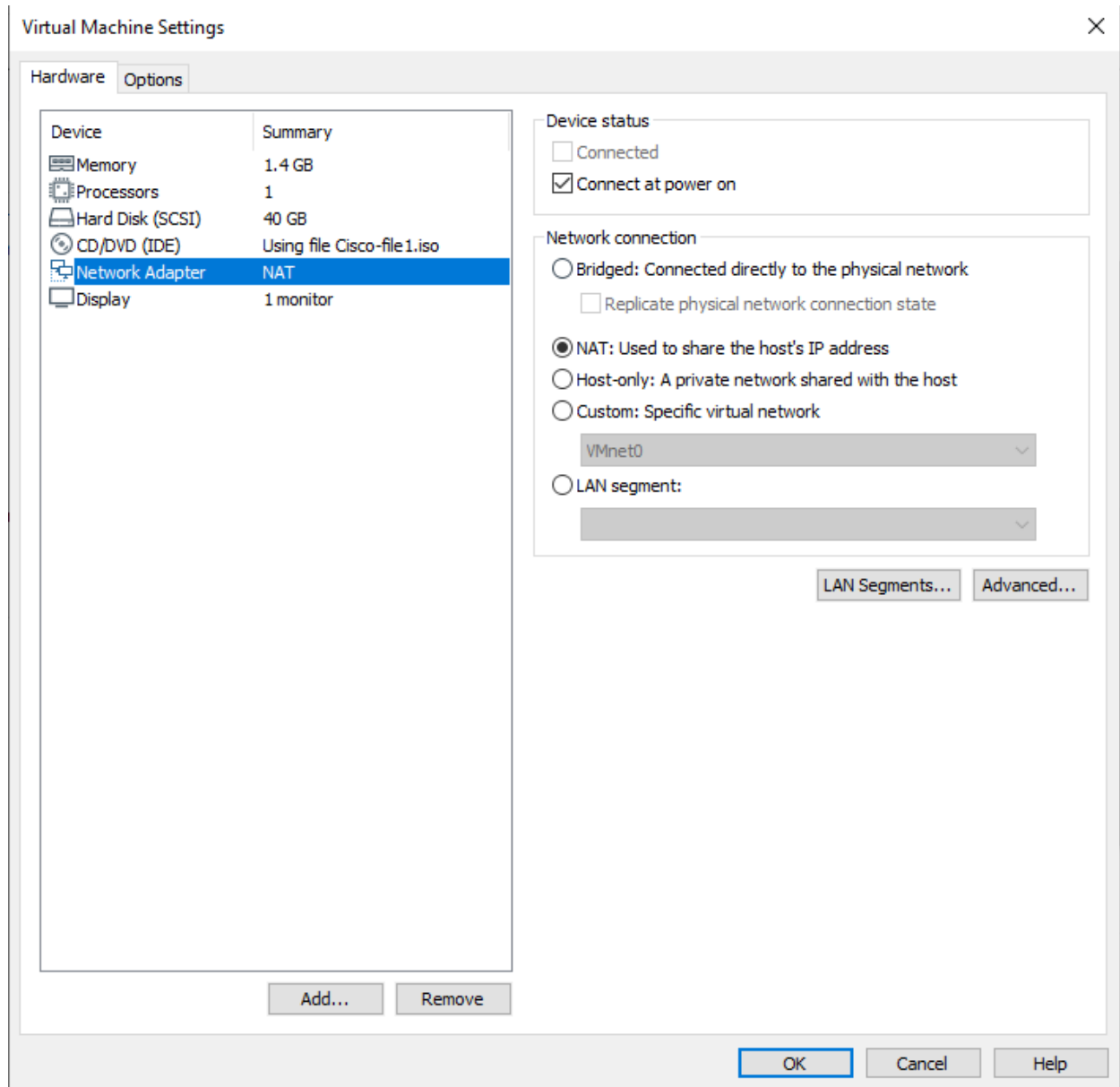
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VMnet0 Bridged network – allows connection of a VM’s virtual network adapter to the same network as the physical host’s network adapter.

VMnet1 Host Only network – allows connection to a host only, by using a different subnet.

VMnet8 NAT network – uses a separate subnet behind the NAT, and allows connection of the VM’s virtual adapter through the NAT to the same network as the physical host’s adapter.



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