**Virtualization**: It is the technique of splitting or adding physical resources into as many as logical resources as we want.

It is a technology that transforms hardware into software. Physical storage means: 2 GB Disk, 2GB disk, 6GB Disk, When combine into 2+2+6= 10GB to form a Logical Storage

**A logical unit number (LUN)** is a unique identifier for designating an individual or collection of physical or virtual storage devices that execute input/output (I/O) commands with a host computer, as defined by the Small System Computer Interface (SCSI) standard.

Cost: **CapEx**(Capital Expenditure- Once paid) and **OpEx**(Operational Expenditure - Salaries, Bills etc)

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| --- | --- | --- | --- |
|  | | | |
| VM | VM | VM | …… |
| Hypervisor | | | |
| Server(64 GB RAM,2TB,32 Core) | | | |

**Hypervisor:** it is a piece of software or firmware that creates and run virtual machine. A Hypervisor is sometimes also called a **virtual machine manager** (VMM)

**Firmware** is software that runs the hardware.

It is software that provides basic machine instructions that allow the hardware to function and communicate with other software running on a device.

**A hypervisor**, also known as a virtual machine monitor or VMM, is software that creates and runs virtual machines (VMs)

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| --- | --- | --- |
| **Type-1 /Bare Metal/ Native/firmware**  Used in Company /enterprise  Install on new hardware from start  System software  Host OS and VM OS called Guest  VMware suite called Vsphere  Wmware ESXi | | **Type-2 / Hosted /software**  (Testing or learning Purpose)  It run on OS is called hosted OS / VM Workstation |
| Vitalization  Operation  Salability  System Independent | Hardware Virtualization  Guest OS run on Hypervisor  better | OS Virtualization  Run as an application on the Host OS  Not easy |
| **Hypervisor** | | |

**VMware vsphere client and vcentre server:**

**Docker**: It is a tool or Engine called Containerization. It is a advance version of virtualization

Container uses the resources of Physical H/w use and release. B/c it doesn’t OS and H/w but it use shared.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| VMWare | | | AWS EC2 | | Docker | | |
|  | | |  | |  | | |
|  | | |  | |  | | |
|  | | |  | |  | | |
| **VM**  **OS/RAM** | **VM**  **OS/RAM** | **…** | **EC2**  **OS/RAM** | **EC2**  **OS/RAM** |  | | |
|  | | |
| Container | Container | Container |
| Docker Engine | | |
| Hypervisor - ESXI | | | Hypervisor -Xen/Nitro | | OS | | |
| Physical H/W | | | Physical H/W | | Physical H/W | | |

* VMware doing hardware level virtualization
* Dockers doing OS level virtualization also called containerization and working on PaaS.
* Container: Running state of image called container or when its running called container.
* Image: When Container stop called image, when sending or receiving image