**Cloud computing**

Module -2

1-What is virtualization and virtualization type?

🡪**Virtualization** is the creation of virtual versions of physical resources like servers, storage, or networks.

**Types of virtualization**:

1. **Hardware (Full) Virtualization** – Uses a hypervisor to run multiple OS on one machine.
2. **OS-level Virtualization** – Uses containers to run apps in isolated environments.
3. **Storage Virtualization** – Combines multiple storage devices into one.
4. **Network Virtualization** – Combines hardware and software network resources.

2-Type of hypervisor and how to manage it?

🡪**Types of Hypervisors**:

1. **Type 1 (Bare-metal)** – Runs directly on hardware (e.g., VMware ESXi, Microsoft Hyper-V).
2. **Type 2 (Hosted)** – Runs on a host OS (e.g., VirtualBox, VMware Workstation).

**Management Tools**:

* **Type 1**: Managed using tools like **vCenter** (for ESXi), **Hyper-V Manager**, or **web interfaces**.
* **Type 2**: Managed through the **host OS GUI** (like VirtualBox interface).

3-Roles of virtualization in cloud computing?

🡪 **Resource Optimization** – Efficient use of hardware by running multiple VMs.

 **Scalability** – Easily scale resources up or down.

 **Isolation** – Separate environments for security and stability.

 **Cost Reduction** – Less physical hardware needed.

 **Disaster Recovery** – Easy backup and restore of virtual machines.

4-What is container?

🡪A **container** is a lightweight, standalone unit that packages an application with its dependencies and runs it in an isolated environment, sharing the host OS kernel.

Example: **Docker** is a popular container platform.

5-What is high availability and live migration in virtualization?

🡪**High Availability (HA):**  
A system design that ensures continuous operation with minimal downtime, even if hardware or software fails.

**Live Migration:**  
Moving a running virtual machine from one host to another **without downtime**.

6-Storage configuration –describe block storage, file storage and object storage---DAS NAS and SAN

🡪**Storage Types (Short Answer):**

* **Block Storage**: Raw storage blocks, fast, used for VMs/databases.
* **File Storage**: Stores files in folders, easy to share (e.g., NFS, SMB).
* **Object Storage**: Stores data as objects with metadata, scalable (e.g., S3).

**DAS**: Direct to server, fast but not networked.  
**NAS**: File sharing over network.  
**SAN**: High-speed block storage over network.

7-Describe storage allocation and provisioning. Storage Allocation

🡪**Storage Allocation:**  
Assigning specific storage space to users, apps, or VMs from a storage pool.

**Provisioning:**  
Process of setting up and managing that storage.  
Types:

* **Thick Provisioning**: Full space is allocated upfront.
* **Thin Provisioning**: Allocates space as data grows, saving storage.