Module 2

1-What is virtualization and virtualization type?

Virtualization is a technology that creates a virtual version of physical resources, such as servers, storage, and networks. There are several types of virtualization:

* Server Virtualization: Creates multiple virtual servers on a single physical server.
* Storage Virtualization: Combines multiple physical storage devices into a single virtual storage device.
* Network Virtualization: Creates virtual networks on top of physical networks.
* Desktop Virtualization: Creates virtual desktops for users, allowing them to access their desktops from anywhere.

2-Type of hypervisor and how to manage it?

A hypervisor is a piece of software that creates and manages virtual machines (VMs). There are two types of hypervisors:

* Type 1 Hypervisor (Bare-Metal Hypervisor): Installs directly on the physical server, without requiring an underlying OS. (e.g., VMware ESXi, Microsoft Hyper-V)
* Type 2 Hypervisor (Hosted Hypervisor): Installs on top of an existing OS, which is then used to manage VMs. (e.g., VMware Workstation, Oracle VirtualBox)

hypervisors can be managed using various tools,

* vCenter Server (VMware)
* Hyper-V Manager (Microsoft)
* Virtual Machine Manager (Red Hat)

3-Roles of virtualization in cloud computing?

* Enabling Multi-Tenancy: Multiple VMs can run on a single physical server, increasing resource utilization.
* Improving Scalability: VMs can be easily created, cloned, or deleted as needed.
* Enhancing Flexibility: VMs can be moved between physical servers, making it easier to manage resources.

4-What is container?

A container is a lightweight and portable way to deploy applications, including their dependencies and settings. Containers share the same kernel as the host OS and run as a process, making them more efficient than VMs.

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

* High Availability: Ensures that VMs are always available, even in the event of hardware failure.
* Live Migration: Allows VMs to be moved between physical servers without downtime, ensuring continuous availability.

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

* Block Storage : Stores data in fixed-size blocks, ideal for databases and file systems.
* File Storage : Stores data in files and folders, ideal for shared files and collaboration.
* Object Storage : Stores data as objects, ideal for large amounts of unstructured data.
* Direct-Attached Storage (DAS): Storage devices directly connected to a server.
* Network-Attached Storage (NAS): Storage devices connected to a network, providing file-level access.
* Storage Area Network (SAN): A dedicated network for storage devices, providing block-level access.

7-Describe storage allocation and provisioning.

Thin Provisioning: Allocates storage on an as-needed basis, rather than pre-allocating a large block of storage. This helps to optimize storage utilization and reduce waste.

Thick Provisioning: Allocates the entire amount of storage upfront, even if it's not immediately used. This can be less efficient but provides predictability and guaranteed resources.

Storage Pools: Logical groups of storage resources that can be dynamically allocated to various applications or users. This allows for more flexible and efficient management of storage resources.