Microsoft Azure

- **Virtual Machine (VMs);**

- A VM is a software-based emulation of a physical computer. Each VM runs its own operating system (OS) and applications.
- VMs are created and managed by a hypervisor, which sits on top of the host OS or hardware.

- **Containers:**

- Containers are a lightweight form of virtualization that encapsulate an application and its dependencies in a single package.
- Containers share the host OS kernel but have isolated user spaces, which makes them more efficient.

- **Subnet Masking:**

- Subnet masking is a technique used in IP networking to divide an IP address into a network and host identifier. It is essential for efficient IP address management and improving network security.

IP Addresses;

- **An IP address consists of two parts:**

- **Network Portion:** Identifies the network to which the device belongs.
- **Host Portion:** Identifies the specific device within that network

- **TCP/IP (Transmission Control Protocol/Internet Protocol):**

- TCP/IP (Transmission Control Protocol/Internet Protocol) is the fundamental suite of communication protocols used for the internet and other similar networks. Here's a brief overview of its key components and functions:

- **TCP (Transmission Control Protocol)**

- **Purpose:** Ensures reliable, ordered, and error-checked delivery of data between applications running on hosts on an IP network.

- **Features:**

Connection-oriented: Establishes a connection before transmitting data.

Error recovery: Detects and corrects errors.

Flow control: Manages data flow to prevent congestion.

Segmentation: Breaks large messages into smaller segments.

- **IP (Internet Protocol)**

- **Purpose:** Routes packets of data from the source host to the destination host across network boundaries

- **Features:**

- **Connectionless:** Does not establish a connection before sending data

- **Routing:** Determines the best path for data packets. - **Addressing**: Assigns unique addresses to devices (IPv4 or IPv6 addresses).

- **IPv4 (Internet Protocol Version 4)**

IPv4 (Internet Protocol Version 4) is the fourth version of the Internet Protocol (IP) and the first major version to be widely deployed. It is one of the core protocols of standards-based internetworking methods in the Internet and other packet-switched networks.

- **OS layers;**

Operating systems typically consist of multiple layers, each responsible for different aspects of system functionality. While the exact number and organization of layers can vary depending on the operating system, here is a general overview of the common layers found in most modern operating systems:

1. **Power Unit**
2. **Mother Board**
3. **Kernels**
4. **Operating System**
5. **Virtual Machines/Containers**

- **Arpanet;**

ARPANET (Advanced Research Projects Agency Network) was one of the earliest packet-switched networks and the precursor to the modern internet. It was developed by the Advanced Research Projects Agency (ARPA), an agency of the United States Department of Defence, in the late 1960s.

- **Objective:** The main goal was to create a communication network that could withstand potential disruptions, including nuclear attacks, by decentralizing communication nodes.