Hypervisor: A Short Note

A **hypervisor** is a software layer that allows multiple operating systems to run simultaneously on a single physical machine by creating and managing **virtual machines (VMs)**. It virtualizes hardware resources such as CPU, memory, and storage, enabling each VM to operate independently and securely.

Types of Hypervisors:

1. **Type 1 (Bare-Metal):** Runs directly on the hardware, offering high performance and efficiency. Examples: **VMware ESXi**, **Xen**, **Hyper-V**.
2. **Type 2 (Hosted):** Runs on top of a host operating system. Examples: **VirtualBox**, **VMware Workstation**.

Key Features:

- **Resource Allocation:** Manages system resources efficiently between VMs.
- **Isolation:** Ensures VMs operate independently and securely without interference.
- **Virtualization:** Emulates hardware for each VM, allowing different OSes to run concurrently.

Use Cases:

- **Server consolidation** in data centers.
- **Cloud computing** platforms.
- **Development** and **testing** multiple OS environments.

Hypervisors are essential for optimizing resource use and supporting virtualization in modern computing systems.