Linux

Linux is an open-source kernel, not a complete operating system. A kernel is the core software that allows applications to interact with the hardware. The Linux Kernel is written in C language and was developed by Linus Torvalds.

An Operating System (OS) = Kernel + Libraries + Tools + Packages.

Linux Distros (Distributions)

Linux comes in different versions called distributions (distros). These are categorized based on their usage:

Desktop	Servers	Embedded Systems	Smartphones
Ubuntu	Ubuntu	Raspberry Pi OS	Android
Mint	CentOS	OpenWRT	

Linux Kernel Repository: https://github.com/torvalds/linux

Major Linux Distros

Ubuntu
Debian
Fedora
Arch Linux
CentOS
OpenSUSE
Red Hat Enterprise Linux (RHEL)
Kali Linux
Linux Mint
Manjaro

Hypervisors (Virtualization)

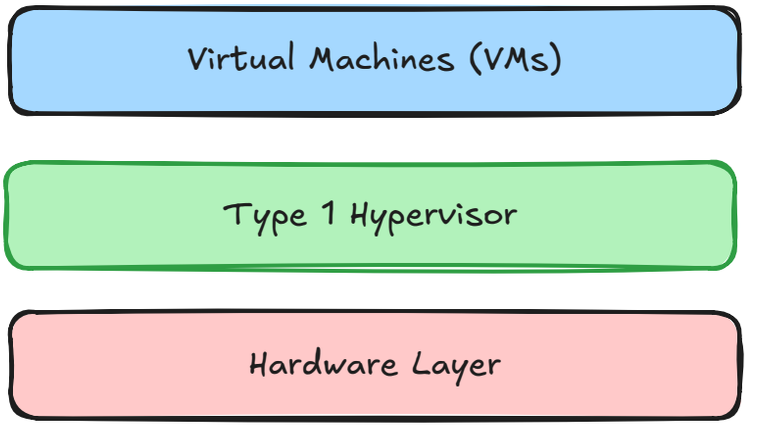
A Hypervisor is software that allows multiple virtual machines (VMs) to run on a single physical machine by logically partitioning hardware resources.

Types of Hypervisors

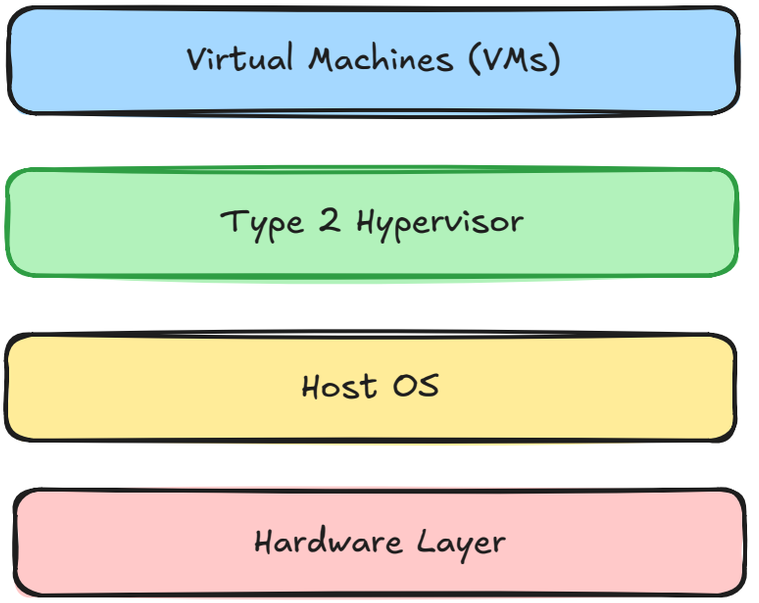
1. Type-1 (Bare Metal): Runs directly on the hardware without an underlying OS.
Example: Xen, VMware ESXi, Microsoft Hyper-V, AWS Nitro

2. Type-2 (Hosted): Runs on top of an operating system.
Example: VirtualBox, VMware Workstation, Parallels

Hypervisor Diagram



Type 1 Hypervisor



Type 2 Hypervisor

Basic Linux Commands

File Operations

Action	Command Example
Create a file	`touch filename.txt`
Read a file	`cat filename.txt`
Write to a file	`echo "Hello" > filename.txt`
Append to a file	`echo "More text" >> filename.txt`
Edit a file	`nano filename.txt` / `vim filename.txt`
Delete a file	`rm filename.txt`
Copy a file	`cp filename.txt newfile.txt`
Move a file	`mv filename.txt /path/to/destination/`
Rename a file	`mv oldname.txt newname.txt`

Folder (Directory) Operations

Action	Command Example
Create a folder	`mkdir foldername`
Remove a folder	`rmdir foldername` *(empty folder only)*
Remove a folder with contents	`rm -r foldername`
Copy a folder	`cp -r foldername newfoldername`
Move a folder	`mv foldername /path/to/destination/`
Rename a folder	`mv oldfolder newfolder`