

Linux

Linux is a **free and open-source operating system** designed for **security, stability, and performance**.

It supports **multiple users** and **multiple processes** running at the same time, making it suitable for servers, cloud systems, and development environments.

Operating System (OS)

An **Operating System** is system software that acts as an **interface between computer hardware and the user**.

It:

- Manages hardware resources (CPU, memory, storage, I/O)
- Provides an environment for applications to run
- Allows users to interact with the system without understanding machine-level instructions

Without an OS, applications like browsers or editors cannot function.

Kernel

The **kernel** is the **core of the operating system** and operates at the lowest level.

It is responsible for:

- CPU process scheduling
- Memory management
- Device and hardware communication
- Handling system calls

All software ultimately interacts with hardware through the kernel.

Daemons

Daemons are **background processes** that provide essential system services.

Key points:

- Run without direct user interaction
- Start at boot or system login
- Handle tasks like printing, scheduling, networking, and logging

Examples include services for SSH, cron jobs, and system monitoring.

Shell

The **shell** is a program that allows users to **interact with the operating system**.

It:

- Accepts commands from the user
- Executes programs and scripts
- Displays output

Shells can be **command-line based** or **graphical**, but command-line shells are preferred for automation and administration.

Command

A **command** is an instruction given to the shell to perform a specific task, such as file handling, process control, or system inspection.

Terminal

A **terminal** is a **text-based interface** used to access the shell.

It allows users to enter commands and view their output.

The terminal does not execute commands itself—it **passes them to the shell**.