Introduction to Linux

Linux is an open-source operating system widely used in cloud servers, DevOps pipelines, security, and enterprise environments. It was created by Linus Torvalds in 1991. Its stability and security make it the backbone of almost every modern infrastructure. Major tech companies like Google, AWS, Meta, Netflix, Tesla, and NASA rely heavily on Linux systems.

What is an Operating System (OS)?

An operating system manages computer hardware and provides a layer between users and the machine. It controls memory, CPU, storage, networking, permissions, and applications. Examples: Windows, Linux, macOS, Android.

What is the Linux Kernel?

The kernel is the core component of Linux. It communicates directly with your computer hardware. It handles CPU usage, RAM allocation, device management, file systems, and security. Linux distributions like Ubuntu, Fedora, CentOS, Arch Linux are built around this kernel.

Linux Distributions

A Linux distribution (distro) is a complete OS made from: • Linux Kernel • System tools • Package managers • Desktop environment • Utilities Popular distros include: Ubuntu, Kali Linux, Debian, CentOS, Fedora, RedHat, Arch, Pop!_OS.

Linux File System Structure

Linux uses a hierarchical filesystem where everything begins from '/' (root). Important directories: • /home – user files • /etc – system configuration • /var – logs and variable data • /usr – installed applications • /tmp – temporary files • /root – admin home Linux treats everything as a file: folders, processes, even hardware devices.

Basic Command-Line Navigation

• pwd – shows current directory • ls – lists files • ls -l, ls -a – detailed listing • cd – move between folders • cd /, cd ~, cd .. – root, home, back • less, cat, head, tail –

view files Commands are essential because Linux servers do not use GUI; everything is performed through the terminal.

Why Linux is Critical for Cloud & DevOps

Most cloud platforms (AWS, Google Cloud, Azure) use Linux-based servers. DevOps tools like Docker, Kubernetes, Jenkins, Ansible, Terraform require strong Linux knowledge. Without command-line skills, deploying applications becomes impossible.

Hands■On Practice Completed on Day 1

• Learned OS vs Kernel vs Linux differences • Understood Linux file system • Navigated directories using cd, ls, pwd • Viewed and inspected files • Explored root structure of Linux • Practiced essential commands This foundation is necessary before moving to Bash scripting, permissions, and advanced server management.