Objective#3: Why do we need Linux?

Open-Source and Free:

Cost-Effective: Free to download and Use

Example: School wants to give a laptop for the students. Installing windows requires the school the pay for the license where installing Linux is free which will help the school save their money

Global Community: If there is any security vulnerability, people (developers/programmers) from different countries and background working continuously to update it with the security patches.

Stability and Reliability:

Long Uptime: Months and Years without restart. The services from the server should be available all the time. Requires an OS that is stable that runs for a longer period without a restart

Seamless Update: Does not require a restart after update. Update happens without disturbing the currently running services.

Security: Linux has built-in features that defines the file permissions (read/write/execute) and also specifies the access control mechanism to restrict the unauthorized users.

An Active community always works for identifying the vulnerabilities and fixing it.

Versatility and Flexibility:

Runs on any device:

For personal computers: Desktops and Laptops

Embedded System: Smart TV Microwave Oven, Switches, Routers.

IoT Devices: Raspberry Pi

Customizable: Users can choose any distribution (Flavor) like ubuntu for beginners, Fedora for Developers and kalilinux for security.

Performance: Efficient use of resources. The Linux OS requires less resources to operate:

Ubuntu OS:2 Ghz processor, 2 GB RAM and 25 GB Storage

Wide Use in Servers and Data Center: Linux OS is a preferred OS used mostly on servers in the data centers as well as cloud platforms such as AWS, Azure and Google Cloud

Development Environment: Provides a powerful environment for the programmers/developers.

Education and Learning: Linux is Open source. The source code is available for learners. By looking at the source code, the learners can easily understand how the processes actually work which improves their technical skills.

Compatibility: Supports multiple processor architecture used by intel and AMD like x86 (32 bit) and x86_64 (64 bit)

Difference between Linux and Windows Operating System:

Linux	Windows
Open Source Source Code View, Modify, Distribute	Closed Source Source code is not available to people Cannot View, Modify, Distribute
Linux is free	Windows –Purchase a license
File names are case sensitive File1.txt FILE1.txt file1.txt Three different files	File names are case in-sensitive File1.txt FILE1.txt file1.txt Same and one file
Use forward slash / for separating the directories /home/user/documents/file.txt	Use back slash \ for separating the directories \users\documents\file.txt

Linux OS Architecture:

Hardware Layer: Physical Components like CPU, RAM and Hard disk

Kernel: Core component of an Operating System

Acts as an intermediary between the user level applications and the hardware.

Shell: Allows users to interact with the kernel

Acts as a bridge between the user and kernel

Utility: Small programs to perform common tasks

cp: copy

mv: move

rm: remove