Introduction to Linux

What is Linux?

Linux is a family of open-source operating systems based on the Linux kernel. An operating system manages the hardware resources of a computer and provides a platform for running software applications. Unlike proprietary operating systems like Windows, the source code of Linux is freely available for anyone to study, modify, and distribute.

Benefits of Linux

- **Cost:** Many Linux distributions are completely free, while some enterprise-focused versions have a subscription fee. This makes Linux a cost-effective alternative to Windows, especially for servers.
- **Open Source:** As an open-source system, Linux benefits from the contributions of a large community of developers. This fosters continuous improvement and innovation.
- **Security:** Due to its architecture and permission system, Linux is generally considered more secure than Windows. It has a reduced attack surface because most programs require explicit administrator authorization for installation.
- **Hardware Compatibility:** Linux can run efficiently on older computer hardware, giving new life to outdated systems.
- **Variety:** There are numerous Linux distributions (distros) available, each tailored for specific purposes and user preferences.

Distro**

A distribution (or distro) is a particular variant of Linux that includes the Linux kernel, pre-installed software packages, and a desktop environment. Popular distros for desktops include Ubuntu, Mint, and Fedora.

Key Components of a Linux System

- **Linux Kernel:** The core of the operating system, responsible for managing hardware resources and communication with devices.
- **Command-Line Utilities:** Programs used to interact with the operating system through text-based commands.

- **General Utilities:** Essential tools included in most distros, such as text editors and file management tools.

Summary

Linux is a powerful and versatile operating system with numerous advantages. This course will focus on Ubuntu, a popular and beginner-friendly distro, to teach you the core concepts of Linux. The knowledge gained here can be applied to other Linux distributions as well.

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Benefits of Linux

- Cost
  - Many free options
  - Paid options include support
- Open Source
- Reduced attack surface
  - Windows: Swiss Army Knife
  - Linux: Hammer
- Use older computers

Distributions

- Too many distributions to name here...
- Different distros for different purposes
  - *https://distrowatch.com/*
- Linux is a Unix-like operating environment
- Regardless of the distro, there is always:
  - Linux Kernel (Core, talks to hardware)
  - Default GNU software (Command utilities)
  - General utilities (text editors, etc.)
- We will start with Ubuntu, but you can apply what you learn to other distributions