

Lecture 2 Introduction to Linux Notes

What is an Operating System?

An operating system (OS) is software that manages computer hardware and software resources and provides common services for computer programs.

What is a kernel?

The kernel is the core component of an operating system, responsible for managing system resources and communication between hardware and software.

Which other parts aside from the kernel identify an OS?

Aside from the kernel, an OS includes system libraries, user interfaces, system utilities, and application programming interfaces (APIs).

What is Linux?

Linux is a family of open-source Unix-like operating systems based on the Linux kernel, known for its stability and flexibility.

What is a Linux distribution?

A Linux distribution (distro) is a packaged version of the Linux operating system that includes the Linux kernel, system libraries, and additional software tailored for specific needs or users.

List at least 4 Linux characteristics:

Open Source: Source code is freely available for modification and redistribution. Multitasking: Supports multiple processes running simultaneously. Portability: Can run on various hardware platforms. Security: Strong user permission model and regular updates enhance security.

What is Ubuntu?

Ubuntu is a popular Linux distribution based on Debian, designed for ease of use, with a focus on user-friendliness and community support.

What is Debian?

Debian is a stable and versatile Linux distribution known for its robustness and extensive software repositories, often serving as the basis for other distributions like Ubuntu.

List and define the different types of licensing agreements:

Proprietary License: Software is owned by an individual or company; users cannot modify or distribute it.
Open Source License: Allows users to view, modify, and distribute the source code (e.g., GPL, MIT).
Freeware License: Software is free to use but not open source; users cannot modify or share it.

What is Free Software?

Define the 4 freedoms. Free software is software that respects users' freedom. The four freedoms are:
Freedom to run the program: Users can run the software for any purpose. Freedom to study and change the program: Users can examine and modify the source code. Freedom to redistribute copies: Users can share the software with others. Freedom to distribute modified versions: Users can share their modifications with others.

What is virtualization?

Virtualization is the creation of virtual (rather than actual) versions of computing resources, such as servers, storage devices, or network resources.

List 3 benefits of virtualization:

Resource Efficiency: Better utilization of hardware resources. Isolation: Virtual machines run independently, reducing the risk of system conflicts. Scalability: Easily add or remove virtual machines as needed.

What is a hypervisor?

Include definitions of the 2 types. A hypervisor is software that creates and manages virtual machines. The two types are:

Type 1 Hypervisor (Bare-Metal): Runs directly on the hardware (e.g., VMware ESXi, Microsoft Hyper-V). Type 2 Hypervisor (Hosted): Runs on top of an existing operating system (e.g., VMware Workstation, Oracle VirtualBox).

What is the difference between Guest OS and Host OS?

Host OS: The operating system that runs on the physical hardware and manages the hypervisor.

Guest OS: The operating system that runs within a virtual machine created by the hypervisor.

What is VirtualBox?

VirtualBox is an open-source virtualization software that allows users to run multiple operating systems on a single physical machine. It supports various guest operating systems and provides features like snapshots and shared folders.