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Lecture 2 Introduction to Linux Notes

1. What is an Operating System?

An **operating system** provides all fundamental software feature of a computer. An **OS** enables the use of computer's hardware providing basic tools that makes a computer useful.

2. What is a kernel?

An **OS kernel** is a software component that is responsible for managing *low-level* fetures of the computer, ***managing system hardware, memory allocation, CPU time, and program to program interaction.***

3. Which other parts aside from the kernel identfy an OS?

- Command-Line Shells
- Graphic User Interfaces
- Utility and Productivity Programs
- Libraries

4. What is linux?

Linux is a **Unix-like Operating System** popular in acedemic and bussiness enviroments. Consists of **kernel, libraries, and utilities** making up the **OS**. Popular distributions **Arch, CentOS, Debian, Fedora, openSUSE, Red Hat, Slackware, Ubuntu** among more.

5. What is a linux distribution?

A **Linux distribution** is an operating system made from a software collection that includes the Linux kernel and often a package management

system.

- A Linux Kernel
- Core Unix Tools
- Supplemental Software
- Startup Scripts
- An Installer

6. List at least 4 linux characteristics:

- Open Source
- Security
- User interface
- Flexibility

7. What is Ubuntu?

Ubuntu is a Linux distribution derived from *Debian* and composed mostly of *free and open-source software*. **Ubuntu** is officially released in multiple editions: ***Desktop, Server, and Core for Internet of things devices and robots.***

8. What is Debian?

Debian, also known as **Debian GNU/Linux**, is a *free and open source Linux distribution*, developed by the **Debian** Project, established by Ian Murdock in August, 1993. **Debian** is the basis for many other distributions, such as ***Ubuntu, Linux Mint, Tails, Proxmox, Kali Linux, Pardus and Astra Linux.***

9. List and define the different types of licensing agreements

Types of licensing agreements:

- **open source:** software distributed for a fee or free and source code is distributed with the software.
- **closed source:** software not distributed with source code. User restricted from modifying the code.

10. What is Free Software? Define the 4 freedoms.

Free software is the software distributed with the source code, can or cannot be free or come with a fee.

- **freedom 0**: use software for any purpose
- **freedom 1**: examine the source code and modify it as you see fit
- **freedom 2**: redistribute the software
- **freedom 3**: redistribute your modified software

11. What is virtualization?

Virtualization is creating virtual versions of something. **Virtualization** allows administrators to **divide the hardware** and create multiple computers *inside a single physical computer*. It is an old concept however it has gained popularity due to the availability of *faster, better and cheaper* hardware.

12. List 3 benefits of virtualization

- Reduces cost by decreasing the physical hardware that must be purchased for a network
- Offers the ability to save the state of a machine at given time and roll it back or forward
- Allows running multiple OSs on one machine without dual booting

13. What is a hypervisor? Include definitions of the 2 types

Hypervisor is a software or hardware in charge of creating, managing, and running virtual machines.

- **Type 1**: runs directly on the hardware, basically the operating system for the physical machine, better performance, no host OS involved.
- **Type 2**: an application that runs on the top of an operating system

14. What is the difference between Guest OS and Host OS?

Host OS are running the computer where the hypervisor is installed and **Guest OS** is being virtualized in the virtual machine.

15. What is virtualbox?

Virtualbox is a powerful x86 and **AMD64/Intel64** virtualization product for enterprise as well as home use. It is an **Open Source Software** that is freely available, extremely feature rich, high performance product.