Day6 - 9/19 Linux

1. Linux Introduction

* Linux is a family of open source Unix-like operating systems based on the Linux kernel, an operating system kernel first released on September 17, 1991, by Linus Torvalds
* Linux is typically packaged in a Linux distribution
* Linus is the most-used OS on publicly available internet servers, and the only OS used on the top 500 fastest supercomputers
* Released under the GNU General Public License (GRL), which means anyone can run, study, share, and modify the software
* Every Linux-based OS involves the Linux kernel -which manages hardware resources – and a set of software packages that make up the rest of the operating system
* Written in: C, Assembly language

1. What’s a command line?

* The command line is your direct access to a computer
* It’s where you ask software to perform hardware actions that point-and-click graphical user interfaces (GUIs) simply cannot ask

1. What does Linux include?

* **Kernel** – the base component of the OS. Without it, the OS doesn’t work. The kernel manages the system’s resources and communicates with the hardware. It’s responsible for memory, process, and file management
* **System user space** – the administrative layer for system level tasks like configuration and software install. This includes the shell, or command line, daemons, processes that run in the background, and the desktop environment, the interface the users interacts with
* **Applications** – A type of software the lets you perform a task. Apps include everything from desktop tools and programming languages to multiuser business suites. Most Linux distributions offer a central database to search for and download additional apps

1. The operating system consists of:

* The bootloader: software in charge of the boot process of your device.
* The kernel: the core of the system and manages the CPU, memory and peripheral devices.
* Daemons: background services.
* Networking: communications systems for sending and retrieving data between systems.
* The shell: comprises a command process that allows manipulation of the device through commands entered into a text interface.
* Graphical Server: the sub-system that shows the graphics on your screen.
* Desktop Environment: this is what the users usually interact with.
* Applications: are programs that perform the user’s tasks such as word processors.

1. Kernel space and Userspace

* **Kernel Space**: the kernel is found in an elevated system state, which includes a protected memory space and full access to the device’s hardware. This system state and memory space is altogether referred to as kernel-space. Within kernel space the core access to the hardware and system services are managed and provided as a service to the rest of the system
* **User Space**: the user’s applications are carried out in the user-space, where they can reach a subset of the machine’s available resources via kernel system calls. By using the core services provided the kernel, a user level application can be created like a game or office productivity software for example

1. Features of Linux Kernel

* Linux supports dynamic loading of kernel modules
* The linux kernel is preemptive
* Linux has a symmetrical multiprocessor support
* Linux is free due to its open software nature
* Linux ignores some standard Unix features that the kernel developers call ‘poorly designed’
* Linux provides an object-oriented device model with device classes, hot-pluggable events, and a user-space device file-system
* The Linux kernel fails to differentiate between threads and normal processes

Resources cited:

<https://www.redhat.com/en/topics/linux/what-is-linux>

https://linuxhint.com/linux-kernel-tutorial-beginners/