Week Report 1

Summary of Presentation: Introduction to Linux

Operating system: provides the software features of a computer.These features relay on the Os's kernel.

Kernel:

- software component that manage low-level features on PC's.Ex,memory allocation,CPU time,etc.
- Glue that holds PC's together.
- Not interchangeable.

How does kernel + OS work?

- Access to a website by using any browser.
- The browser communicates with the website by using network functions provided by the kernel.
- The Kernel allocates memory and CPU time to the web browser.
- The Web browser may rely on plug-ins to display media.

Linux Kernel

- created in 1991 by Linus Torvalds.
- Linux kernel runs on everything.

Architecture of Linux

- Applications: Web browser,word processor,etc.
- Graphical Desktop Environment.
- Daemos/shells
- Linux Kernel
- Hardware

Software component

- Command-Line Shells(CLI): work by typing command in a shell.
- Graphical User Interfaces(GUI):rely on icons,menus,and mouse pointer.Linux uses X Window System GUI combined with desktop environment program suites.
- Utility and Productivity Programas:Text editors,document procesors,and browser.
- Libraries:Collection of programming functions.

Linux

- Unix-like Os.
- The Os consist in a Kernel,libraries,and utilities.
- Available in many distributions.The most popular are :Arch,CentOs,Debian,etc.
- reasons to learn Linux:

    - it's open source.
    - Free of charge.
    - It's scalable.
    - Many Server application are run on Linux.
    - Nonprofit and business rely on Linux.

- Linux can be instaled

    - As the only Os in the Pc.
    - Dual Boot:Side by side another Os.
    - Virtualization:Via virtualbox,VMware,etc.
    - Windows Subsystem for Linux.

System Requirements

- Physical installation Requirement:

    - 2GHZ dual core processor ,
    - 4Gb system memory,
    - 25 GB of free hard drive space,internet access and either DVD drive or USB.

- Virtual Machine installation requirements:

    - 2GHZ dual core processor ,
    - 8 Gb system memory,
    - 50 GB of free hard drive space,internet access.

Unix-like /Unix-based operating system.

- Work and behave similar to Unix Os.
- Support multiple users,strict segregation between kernel and user processes,preemptive multitasking,and a hierarchical file system.
- Everything is a file.
- GNU toolchain :uses by default on GNU/Linux .
- Single Unix Specification and POSIX standards:common command and behavior in the Unix-like Os.

History of Unix

- it is a multitasking, multiuser operating system .
- Unix was born from the Multics Os,which was an experimental Os for GE-645 mainframe, developed in the 196o's by the Massachusetts Institute of Technology, Bell Labs, and General Electric.
- The Multics Os fail,so Dennis Ritchie, Douglas McIlroy, and Joe Ossanna, Thompson decided to redo its on a much smaller scale. Thus in 1969, the idea of the Unix was born.
- Unix development started in 1969 at Bell laboratories.
- in 1970 ,this Os was named UNICS, Uniplexed Information, and Computing System could eventually support multiple simultaneous users ,but later on it was shortened to Unix.

Linux vs Mac OS

- Mac Os commercial Unix-based Os with its own user interface.
- Share similarities.

- Mac Os and many Linux distribution have the same Unix serve programs and Shell,bash.
- Mac Os designe its own user interface.
- Linux uses Xorg with a Desktop Environment.
- Os x and mobile limited to apple hardware.Linux runs on almost all processor architectures.

Linux Vs Windows

- Licensing: - Linux: Open source. - Windows:Proprietary commercial OS
- Cost: - Linux: free of charge
- Hardware Compatibility: - Windows: Most hardware provide Windows drivers. - Linux: Some are provide by manufactures, but most by the community.
- Software Availability: - Most desktop app are written for Windows.Some can be run in Windows and Linux
- User Interfaces: - Windows:Unique user interface. - Linux: Variety to chose.
- Configurability: - Linux:more configurable . - Windows:limits by the licenses permits.
- Security: - Both are secure.
- **Note :** Desktop environment is dominated by Windows and Server market by Linux.

Distribution

- A Distribution in Linux is a complete Linux system with the following elements:
    - A Linux Kernel
    - Core Unix tools
    - Supplemental Software: server app.
    - Startup Scripts
    - An installer

The main distributions are:

- Debian
    - Ubuntu
        - Pop Os
- Redhat
    - Fedora
        - Alma Linux
- **Note**:
    - some Linux distribution include propietary components and are for sale only.
    - some are either short releases cycle or a long release cycle.
    - each require different level of skill.

Ubuntu

- Frees Linux distribution.
- Customizable.

- Releases cycles: - Regular or Non-LTS: every 6 months /supported 9 moths. - LTS(Long-Term Support):every two even years /supported 5 years.
- Suitable for desktop and server use.
- Included: LibreOffice,Firefox,etc
- Distribution based on Ubuntu:Linux Lite,Linux Mint.

Debian

- All-volunteer organization that developed free software began in 1993 by Ian Murdock.
- Known as Grandfather of linux ditributions.
- user friendly version of Debian.
- Distribution based on Debian:Kali Linux,Linux Mint.

Type of Licensing Agreement:

- Open source: distributed for free or fee with source code.
- Closed source: user can not modify the code. - Freeware:free,but without the source code. - Shareware: free on trial basis. -Free software: Free of charge with source code.

Free Software Foundation

- FSF was founded by Richard Stallman 1985.
- defines four specific freedom:
    - use the software for any purpose.
    - examine the source code and modify it.
    - redistribute.
    - redistribute your modified soft.

Open source initiative (OSI)

- Founded in 1998 by Bruce Perens and Eric S. Raymond.
- OSI and FSF differ in a requirement of the GPL.
- Open source must: distribute source code availability,permission to drive works,respect for source Code integrity,etc
- Some of the way in that open sources make money is by providing: services support,dual licensing,bounties,etc.

Final Project Research Questions and answers

Default Project 1- What is Linux? Linux is an open-source operating system created by Linus Torvalds in the early 1990s. The term Linux applies to the Os or the Linux Kernel. The Linux kernel is the heart of the operating system, whose principal function is to be an intermediary between the software and the hardware. Besides the Kernel, it contains libraries, web browsers, and other programs. This Os is very popular as a web server. However, it is used, as well, in many other areas such as network Os, cloud Os, and software development.

2- What is a Linux distribution?

Linux distribution or distros refers to an operating system that is developed from the Linux Kernel. There are different versions of Linux. Each one is involved in a specific area. For example, some distros are created for server or desktop use. Linux distributions can be commercial backed by corporations and non-commercial assisted by a community of volunteers.

Linux most popular distributions:

- UBuntu
- Linux mint
- Debian
- Fedora
- Red hat enterprise
- CentOS
- OpenSUSE
- Arch Linux

3- What is Ubuntu? The word Ubuntu means “humanity to others” and “I am what I am because of who we all are.” Ubuntu is one of the most popular Linux distributions developed by Canonical and founded by Mark Shuttleworth. Ubuntu Linux is created based on another distribution called Debian. Debian was an open-source, which was very popular at that time. However, it represents difficulty to install. So, Shuttleworth took Debian and changed that. Shuttleworth created its Os with the Debian foundation, which he named Ubuntu. Throughout time, Ubuntu has become very popular for its user-friendliness. For example, it has many desktop environments like KDE, LXQT, MATE, GNOME, and Xfce. Giving the user the flexibility to choose the one they like more. Additionally, Ubuntu is a very secure Os. Ubuntu is an open-source where thousands of people work to fix issues and security loopholes. Finally, the Os has its store called Ubuntu software which provides you with a lot of apps to try.

4-What are the system requirements for installing Ubuntu 20.04:

System Requirements for Ubuntu 20.04:

- 2 GHz dual-core processor.
- 4 GiB RAM (but 1 GiB can work).
- 25 GB of hard-drive space
- VGA capable of 1024×768 screen resolution
- Either of the two: a CD/DVD drive or a USB port for the installer media Optionally, Internet access is helpful.