I.   What is an operating system?
- Manages hardware and resources
- Allow interaction with hardware

What is Unix?

- Family of operating systems
- Some popular Unix-based Oss: Oracle Solaris, FreeBSD, HP-UX, IBM AIX, Apple macOS

What is Linux?

- Family of Unix-like OS, usually specific distribution
- Original developed as an effort to create a free, open source Unix OS
- Features:
  - Free and open source
  - Most secure
  - Multi-user
  - Multitasking
  - Portable
- Usecases:
  - Smartphone like android systems
  - Supercomputers
  - Data centers and cloud services
  - PCs

II.   Linux Distributions
  I.   Definition
- Specific flavor of Linux OS
- Also referred to as Distro
- Linux kernel is the core component
- Hundreds of Linux distros
  II.   Linux distro differences
- System utilities: include a unique set of default utilities that are part of operating systems
- Has own GUI
- Support specific set of commands
- Provide differing levels of support:
  - Developed by Community or maintained enterprise
  - LTS vs rolling release
- Linux distros:
  - Debian
  - Ubuntu: Debian-based, dev and mana by canonical
  - Red hat linux: Stable reliable, fully open source, mana by red hat

- o Fedora
- o SUSE Enterprise

III. Linux architecture

    5 distinct layers

1. UI:
- o Allow user to interact with machine
- o GUI
- o Tasks: using web browser to send mails, listen to music, …

2. Application:
- o System daemon: compiler, programming languages
- o Shells
- o User apps: browsers, text editors,…
- o Tools

3. Operating system: Controls the jobs and programs vital to health and stability
   Functions:
   + Assign software to users
   + Helps detect errors and prevent failures
   + Perform files management

4. Kernel: Bridge between apps and hardware

   Key jobs:

   + Memory management

   + Process management

   + Device drivers

   + Security

5. Hardware: Consist physical or electronic devices on PC
   Includes:
   + CPU: executing most calculations.
   + RAM: hold the temporary information applications need to run
   + Storage
   + Screen
   + USB

IV. Linux filesystem
- Collections of files
- Begins at root directory (/)
- Tree structure
- /bin: exists directly below root directory
- /usr: contains user programs

- /home: personal file
- /boot
- /media

Linux filesystem

/bin
/usr
/sbin
/etc
/dev
/proc
/var
/tmp

/

/home
/boot
/media
/lib
/opt
/mnt
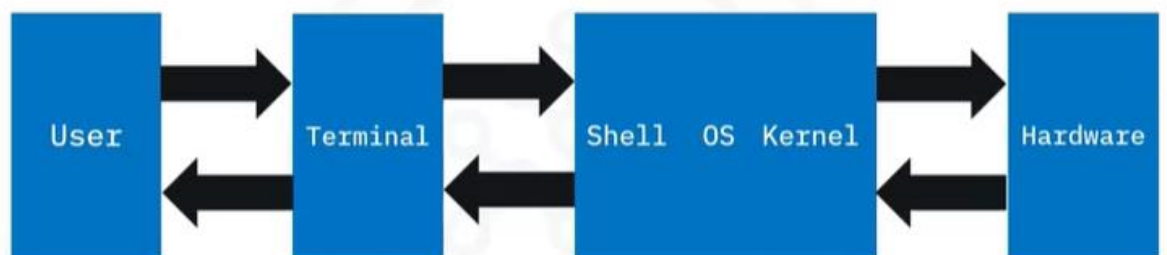/srv
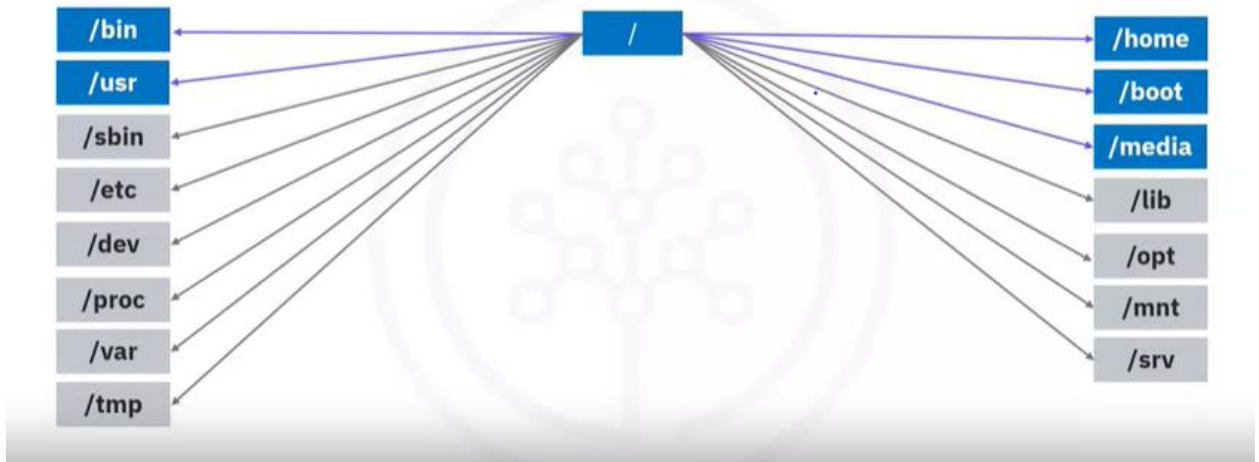
III.   Linux Terminal Overview
   I.   Linux shell
   - The shell is an OS-level application that interprets command
   - Shells: bash, zsh
   II.   Terminal
   - Application used to interact with the shell
   - Enter commands and receive output from them
   - How cmd run?

User → Terminal → Shell OS Kernel → Hardware

   - Notation:
     + ~ Home directory
     + / Root directory
     + .. Parent directory

+ . current directory

+ ls to list all the contents of a directory

+ pwd to print the path name to a present working directory

IV.   Creating and Editing text files

    I.   Popular text editors:

- Command – line:

+ GNU nano

      Nano < filename>

      Ctrl + Alphabet

+ vi

+ Vim

      Start by type: vim

      2 modes: Insert, Command

      Type I -> Insert mode and Esc to exit Insert mode

      Enter: sav example.txt to create a file and write the buffer to the file, w to write in the file, q to quit vim session, q! quit w/o saving

- GUI – based:

+ gedit:

- Cmd for Gui:

+ emacs

V.   Installing Software and Updates

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