Linux

Why master command line
→
- more control over your machine
  - run commands to change permission, view hidden files, interact with databases, start servers, manage passwords etc
- its faster
- You can automate many task
- It Available everywhere
- It Basically is a requirement
- Needed for cloud computing
- High paying jobs.

PRACTICE INSTED.

Section-2 - Introduction

the world of operating system.
- most os can be groupted into two families.
  - Microsoft NT decendants includes.
    - windows
    - xbox os
    - windows phone/mobile
  - else Unix
    - MacOS
    - Linux
    - Android
    - chrome os en PS4OS.

what is unix?
- os developed by Bell labs in mid 1960s
- Innorations / choices of original unix live on till today
  - idea of multi user os and hierarchial file system.

unix philosophy
- In early days of computers, os were tightly tied to specific h/w. Unix decoupled the two and was easily portable to other h/w.
- unix philosophy emphasizes modular s/w design and the creation of small individual programs that can be combined to perform complex tasks.
- write program that do one thing and do it well
- write programs to work together
- write a program to handle text streams, because that is a universal interface.

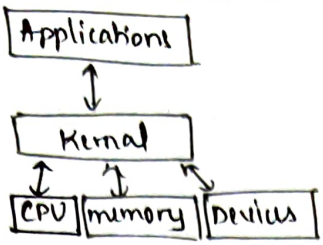
True Unix
- Unix is a trademark of a global consortium called the open group.
- maintain a set of standards called the single unix specification which describes.
  - core commands, features, utilites, and more that define a unix os.
- open group will certify an os as fully unix compliant if it passes, conformance tests

Unix-Like
- Based on UNIX, not certified

Free s/w - Linux.

GNU project
- Goal → creating an os that included everything useful that normally comes with a unix system so that one could get along without any s/w that is not free

the linux Kernel
- Another Dev → Linus Torralds was working on creating his own kernal known as linux
- Kernel → A very important part of os.
- The kernal is the part of an os that facilitates interactions btw hardware and software.

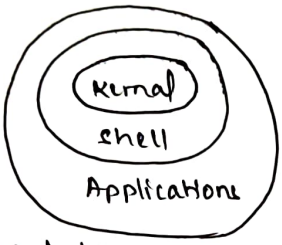


- At that time, many GNU "pieces" were complete, but it lacked a kernal.
- Torralds combined his kernal with the existing GNU components to create a full OS.

Understanding Kernal

- A kernal is a computer program that forms the core of an operating system and manages critical tasks like :-
  - memory management
  - task scheduling
  - managing hdw.
- when a kernel is a critical piece, it IS NOT SAME AS OS.

Ex while a Engine is a critical piece, it is not same as CAR.



Linux → (Kernal)

- Refers both to the kernal created by Torrals and all the software that is part of the Linux ecosystem.

GNU/Linux

Linux Distributions

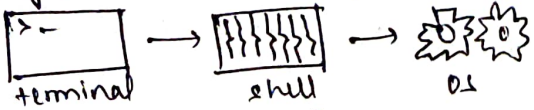
- Linux kernal itself is not a full blown os.
- when people talk about linux based on OS they refer to as linux Distributions.
- typically a linux distribution bundles together the linux kernal, GNU tools, documentation a package manager, a window system and desktop environment
- nearly 1000 linux distros available. some of the most popular ones include Fedora Ubuntu, Debian and slackware.

Shell

- A shell is a software computer interface to an operating system.
- shell exposes the OS's services to human users and other programmers
- the shell takes our commands and gives them to the operating system to perform.

terminal

- A terminal is a program that runs a shell.
- originally terminals were physical devices, but these days we work with software terminal



- we type stuff in terminal.
- terminal passes the commands to SHELL → More than one shell
  - Bash (Focus)
  - Zsh
  - fish
  - Powershell.

Bash

- On most Linux-based systems, the default shell program is Bash
- 'Bash' is an acronym for 'Bourne-Again shell'
  - a refrence to Stephen Bourn, the creator of Bash's direct Ancestor shell, sh
- Bash runs on pretty much every version of Unix and unix like systems.

Command structure Basics :-

step1 → open terminal. (VS-code).

the prompt

- when we open our terminal, we see our prompt it will likely include our username@machine name.
- followed by a ~ and then a dollar sign.
- The prompt is what we see whenever the shell is ready to accept new input
- " " need to close as if not done then this is not considered as a "command".

CASE SENSITIVE (commands are case sensitive).

command-1 - date → prints out the current date and time

command-2 - clear → clears all the existing commands present in the window/prompt

command-3 - ncal (new calandar) → calendar (vertical).

command-4 - horizontal calendar for current month.

Arrow keys

← → ⟷ for moving within the typed command.

↑↓ ⟷ up ⟷ most recent previous command

down ⟷ current or next command

Command structure

syntax

> command - options arguments.

- most commands support multiple OPTIONS that modify their behavior
- we can decide which option to include (if any) when we execute a command.
- similarly many commands accept arguments
  - ↳ things that the command acts up on or uses.

Arguments

- terms "argument" and "parameter" are often used interchangebly to refer to values that we provide to commands.
- the echo command.

command-5 - echo - it takes the argument we provide it and print it out, it echos back to us.

ncal → can take arguments/values to control the specific month and year.
- ncal month
- ncal month year → Args.

- order matters

command 6 - sort - sorts the content of a file

command 7 - rm - removes/deletes a file.

options

- Each command typically supports a host of options that we can choose to use when executing a command. these options modify the behavior of the command in predefined way.
- options ~~by~~ are prefixed by a dash → -h or -3

Syntax

> command -option

Ex > ncal -j (julian days)
> sort -r color.txt
> ncal -h (does not highlight the date)
> ncal -M (starts week with monday).
> ncal -3 (current, previous, next month).

Combining options

We can provide options multiple options at once.
this ex. uses the -3 options to display the previous, current and next month AND the -h option to turn off the highlighting of current date

Ex > ncal -3 -h
> ncal -3 -h -j
> ncal -3 -h -j -M

OR

Another Syntax → shorter with just one dash
> ncal -3hjM

Long form options

All these short one-char options can get confusing
Some options also support equivalent long format options that are usually full words and are prefixed with two dashes instead of just one

Ex > date -u option is used to print the date in co-ordinated universal time (UTC)
> date --universal

Ex > sort -r color.txt
> sort --reverse color.txt

Multiple long form options

To use multiple long form options in a single command, we must write them out seperately with their own dashes (--)
We cannot combine them.
> sort --reverse --unique color.txt

options with parameters

some options requires us to pass in an additional value.

> ncal -A 1
is used to display a certain number of months AFTER a specific date, we need to tell how many months to display
> ncal -B2
> ncal -A2 -B2
> ncal -A2 -B2 June 2007.

command	disc.
clear	clears the prompt
date	displays the current date and time
ncal	vertical calendar
cal	Horizontal calendar
echo	takes Argument and prints it back
sort	sorts the contents of a file
rm	removes / deletes a file