# Linux

Based on: **Linux - The Complete Linux Guide** by **Bogdan Stashchuk** on Udemy

* to add:
  + Setting up linux environment (docker, VM or windows subsystem)
  + Improve categorization
  + Pckg managers
  + Txt editors
  + Imgs
  + Links
  + Add to github

## top/htop for processes

## STDIN STOUT STERR redirection and piping

* + > echo “Hello World” > file.txt
    - Prints Hello World but in the given file instead of terminal
  + > mkdir (without dir name - results in err) > file.txt
    - Writes the error msg to file instead of terminal
  + Use >> instead of > to append as > is used to overwrite file

## Double tab to show autocomplete options

## Permissions: d/-/i|rwx|rwx|rwx

* + D: dir, -: file, l: link

## Links

* + - * Names pointing to paths or other names
      * Filter for links using grep
        + > ls -l | grep “/->”

-> is included when ls-ing and links are shown

/ is necessary

* + - * Soft vs hard
        + Soft

Just a pointer to another file

Diff sizes - link is smaller

If original file is deleted, link will stay but empty

* + - * + Hard

Point to same **inode (ls -li)**

Same size, mod date, permissions

* + - * + Create links

Soft

> ln -s <existing\_file> <name\_of\_link>

Hard

> ln <existing\_file> <name\_of\_link>

* + 1st user, 2nd group, 3rd all other users
  + Decimal numbers for permissions
    - rwx = 7
      * binary: 111
    - rw- = 6
      * binary: 110
    - r-- =4
      * binary: 100
    - r-x = 5
      * binary: 101
    - -wx = 3
      * binary: 011
    - --x = 1
      * binary: 001
    - --- = 0
      * binary: 000

## Most commonly used dirs in root

* + > etc
    - different config files
  + > bin
    - Executable files
  + > sbin
    - System executables - only by root user
  + > usr
    - User specific files

## Basic commands

### > echo $0

* + - Show shell

### > pwd

* + - Show current dir path

### > cd

* + - Change directory

### > cd ..

* + - * Go up one level

### > cd <path>

### > cd ~

### > cd /

### > rm

* + - to remove files or dir
    - **>** rm -r <dir\_name>
    - rmdir is only to del empty dir

### > touch <file\_name>

* + - Create new empty file
    - If file with same name already exists, content of old file is kept, mod date is updated to current

### > <command> | wc

* + - Word count
    - Ex:

### > ls | wc

* + - * Show counted rows, words, characters

### > nano

* + - Text editor within terminal

### > cp

* + - Copy files
    - > cp <file\_to\_copy> <file\_to\_create>
    - > cp /<location>/<file\_name> <new\_file\_name>
    - > cp -r
      * to copy dir

### > mv

* + - To rename file
    - **>** mv /<path>/<file\_name> <file\_name or new\_file\_name>
      * To move file

### > head

* + - Read first 10 lines
    - > head -n <number>
      * Read given amount of first lines

### > tail

* + - Read last 10 lines
    - > tail -n <number>
      * Read given amount of last lines
    - > tail -f <file\_name>
      * Read last 10 lines but stay within process to see real time updates

### > grep

* + - To filter
    - > ls -l | grep hostname
      * Prints only i contains “hostname”
    - > cat file.txt | grep “keyword”
      * Highlights keyword in text
    - ^<character(s)> - filter only words starting with <character(s)>
    - <character(s)>$ - filter only words ending in <character(s)>

### > find

* + - Search for files and dir
    - > find . -name “\*.txt” -exec ls {} \;
      * Command will search for all .txt files and list them
      * -exec cat {} \; will display content of all .txt files
      * If error add “” around {}

### > xargs

* + - build and execute command lines from standard input

### > tar

* + - Archiving utility

### > gzip, gunzip, zcat

* + - compression/ expansion

### > ls

* + - List items
    - > ls -lS
      * Sort by size
    - ls -l --sort=size
    - ls -l --sort=time
    - ls -l --sort=extension

### > sort

* + - Sort lines of txt files
    - > -r
      * Reverse order
    - > -n
      * For numbers
    - > -u
      * Unique

## Users

### > useradd <username>

* + - Create user
    - -m create home dir (useradd -m <username>)
    - Change default shell type:
      * > nano /etc/default/useradd
      * > edit SHELL=/bin/<shelltype>

### > su <username>

* + - login as user

### > exit

* + - Logout from user

### > passwd

* + - Create pw

### > userdel <username>

* + - Remove user

### > adduser <user\_name>

* + - Adds user, new group, new user with group
    - Prompts for pw creation
    - Prompts to fill in user info

### > chown <user\_to\_give\_ownership> <file\_name>

* + - Change ownership
    - > chown <user\_to\_give\_ownership>:<group\_name> <file\_or\_dir\_name>
      * To also change group
    - > chown -R
      * Also change files within dir recursively

### > chmod <decimal\_rep\_of\_permission> <file\_or\_dir\_name>

* + - Change permissions
    - Decimal numbers for permissions
      * rwx = 7
        + binary: 111
      * rw- = 6
        + binary: 110
      * r-x = 5
        + binary: 101
      * r-- =4
        + binary: 100
      * -wx = 3
        + binary: 011
      * --x = 1
        + binary: 001
      * --- = 0
        + binary: 000
    - > chmod -r/-w/-x <file\_or\_dir\_name>
      * Remove read/ write/ execute permission
    - > chmod +r/+w/+x <file\_or\_dir\_name>
      * Add read/ write/ execute permission
    - > chmod g-r/-w/-x <file\_or\_dir\_name>
      * Remove read/ write/ execute from group

## Executable script

* + > touch script.sh
    - .sh to create shell script file
    - Script example 1:

#!/bin/bash

echo “random string to print”

* + > ./script.sh
    - To run script

### To run without specifying path:

* + - Create a bin dir to store scripts for user
    - Modify $PATH
      * > echo $PATH
    - > mkdir bin
      * In user’s home dir
        + > cd ~
    - > mv script.sh bin/script.sh
    - > export PATH=$PATH:/home/<user\_name>/bin

## Networking

### > ping

* + - Check response
    - ping localhost for local nw

### > ifconfig

* + - Network details

### > nslookup <dns\_name>

* + - Dns lookup
    - Check ip address for given dns

### > whois <dns\_name>

* + - Public details about given dns

### > ssh

* + - Tcp port 22
    - service ssh status
    - service ssh start
    - > ssh -p 22 <username\_to\_connect\_to>@<hostname\_of\_server\_to\_connect\_to>

### > curl

* + - > curl <url>
    - Get html of url
    - Save html
      * > curl <url> > filename.html

### > wget

* + - > wget <url>
    - Download from web

## Environment variable

* + Available during session in shell

### > env

* + Create new env var
    - > export VARIABLE\_NAME=test