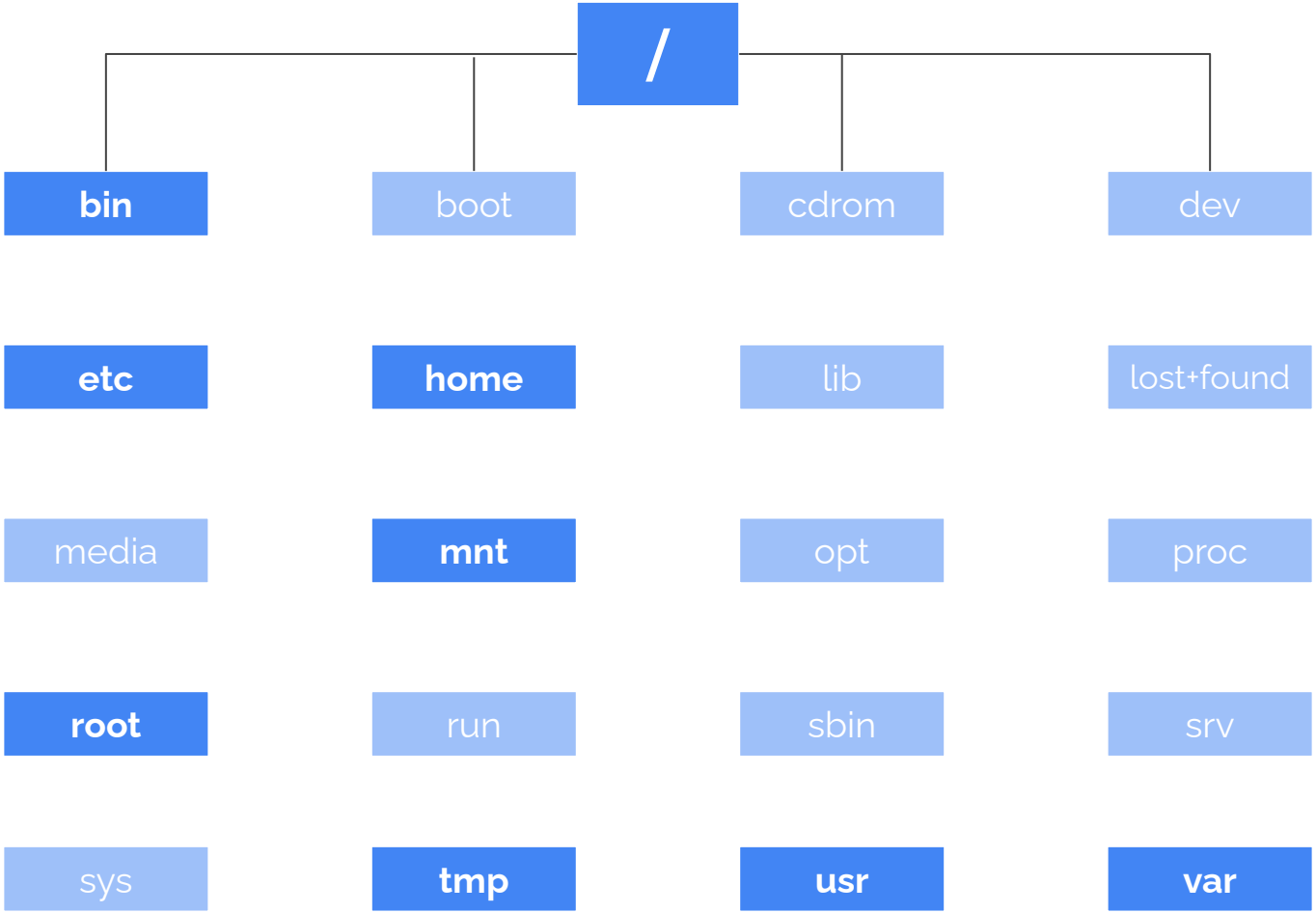
Warmup: What is the name of the beginning of the Linux filesystem?

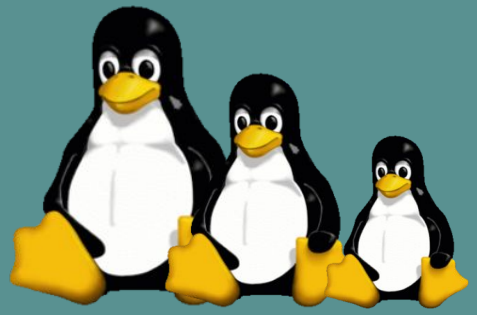
If you do not know then there is always google to help :)

An Introduction to The Linux FIle System

The Linux File System is organized by directories which are similar to folders in other operating systems.



http://www.tldp.org/LDP/intro-linux/html/sect_03_01.html



An Introduction to Linux Commands

What is a command?
In computing, a command is a directive to a computer program given to perform a specific task.

Basic Commands that We Will Be Going Over:

- man Pages, Options
- sudo / su
- ls
- apt-get
- cd
- file manipulation
- adduser / deluser
- chpasswd
- A few more for fun :)

1) Make sure to follow along with the lab activities
2) Instructors will be coming around for help, so please don’t hesitate to raise your hand for assistance :)

Command Syntax

- Linux commands have a case sensitive syntax
- They are very specific and need to be typed in the same way each time to execute them
- The standard Linux Command syntax is

  [command] -[options] <arguments>

  The command name, options and arguments are separated by blank spaces.
- A linux command is an executable program residing on the linux disc.
- For the command ls, ls is the command name and each command name has its own options and arguments that you can find on the man page.

Options:

- Options are commands used to pass parameters to a program
- In simpler words, they further specify what exactly you want displayed and executed for the command you are using
- A command can have several options and you can see them by looking at the man page for the command and searching online as well.
- How to execute them:
- [command name] -[options]

Lab Activity

- One common command that we will be using is ls. ls is a command that has several useful options,
- What are three options of ls that you can use and what are they used for

man

- The man command in Linux is used to display the user manual of any command that we can run on the terminal.
- It provides a detailed view of the command which includes:
- NAME, SYNOPSIS, DESCRIPTION, OPTIONS, EXIT STATUS, RETURN VALUES, ERRORS, FILES, VERSIONS, EXAMPLES, AUTHORS and SEE ALSO
- How to execute:
    - man [command]

Lab Activity

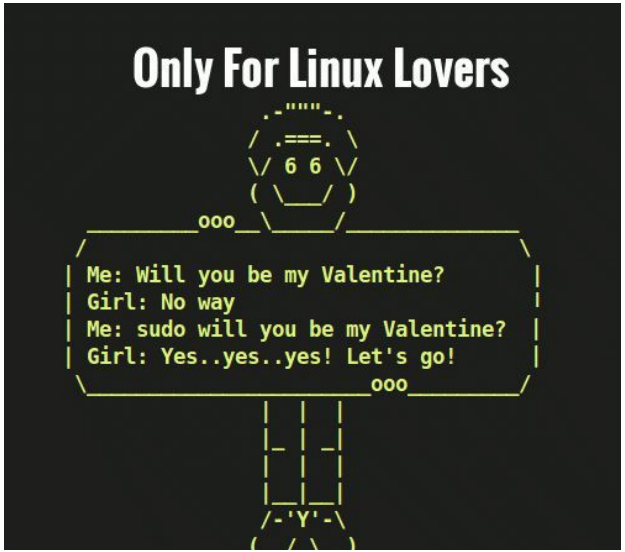
- If you know a linux command already that you have used before then try to display the user manual of that command. What options does the command have?
- If you have not learned a command yet, then try displaying the man page for the command sudo

sudo

- sudo stands for SUPER USER DO
- elevates privileges to root level
- Type sudo before the command
  - Example: sudo apt-get
- Often used when trying to do things that require root privileges such as downloading a package, changing the password of a user, changing certain files on the system.

Lab Activity

- Try to elevate to root level from standard user by typing sudo su
- What changes on your screen?



su

- This command logs in as any user in your current terminal session
- You would use the command as su then a space and then the user you want to log in as
  - For example: su alex
- To login as root u need to use sudo su because su by itself attempts to log into the root account, but root privileges are needed for this to work

Lab Activity

- Try to login as a different standard user on your machine
- What changed in your terminal?

apt

- An extremely useful command used to manage packages on your system
- How to use it: type apt-get with a space then the command and then the package name
  - apt [command] [package]
- Commands used with apt-get:
  - install - installs a package
  - update - gets a list of packages to update your system
  - upgrade - the command that actually updates your system (yeah ik its weird, just go w it)
  - autoremove - removes packages and unneeded dependencies
  - purge - just deletes packages

Lab Activity

- Install the package libpam-cracklib on your computer
- Install the package nmap on your computer
- Delete the package nmap on your computer

Path: What is a path?

A path is a unique location to a file or a folder in a file system of an OS. There are two kinds of paths in linux, an absolute path and a relative path.

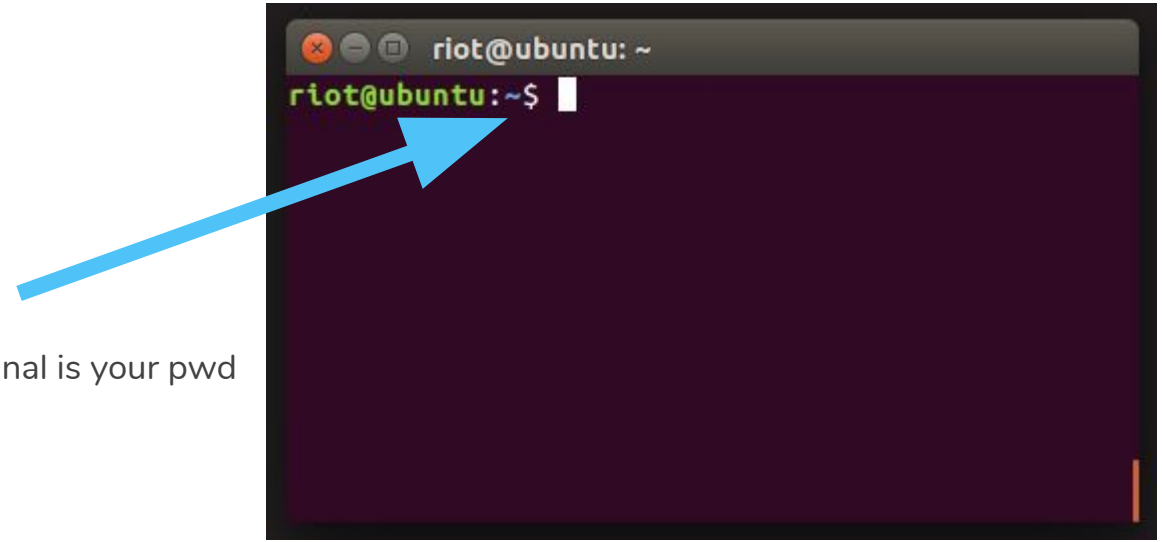
Relative vs Absolute Paths

- An absolute path is a complete path of the location of a file or directory, starting from the root (/) directory.
- For example:
  - /etc
  - /home/jenna/Desktop
  - /var/cache

- A relative path is the path related your present working directory (pwd)
- It is the path starting from the directory you are located in
- Suppose I am located in /var/log and I want to change directory to /var/log/kernel. I can use relative path to change my directory to kernel

pwd

- pwd stands for “present working directory”
  - prints the directory you are currently in
- kinda obsolete in Ubuntu because it shows you your pwd
  - not always tho



The blue text in the terminal is your pwd

cd

- cd stands for “change directory”
  - Pretty self explanatory, it changes the directory that you are in
- A couple of ways to use this command
  - Change directories using absolute path
    - cd /home/Desktop
  - Change directories using relative path
    - cd Desktop
  - Go up one directory to the parent directory
    - cd ..
  - Switch back to the directory you were working in earlier
    - cd -
  - And more:
  - https://www.tecmint.com/cd-command-in-linux/

Lab Activity

- Try to go to the /etc directory
- From there directly go into your user’s Desktop directory
- Then go back one directory to the parent directory

ls

- lists contents of current directory
- If you just type ls then it will list the contents of the directory you are in
- If you type ls then the absolute path or relative path to a certain directory then it will list the contents of that directory
  - For example: ls /home
  - lists contents of /home
- Common ls options that we use:
  - a - show hidden files
  - l - long listing format (shows timestamp, owner, permissions, size,etc)
  - R - searches recursively

Lab Activity

- Try to execute these commands
  - ls
  - ls -l
  - ls -la
  - ls -lar
- What changed on your screen as you executed each one?

File Manipulation

- Create a file:
  - touch filename
- Open a file to edit inside terminal:
  - nano filename
- Open a file to edit inside a graphical text editor:
  - gedit filename
- Print the contents of a file out into the terminal
  - cat filename
- Delete a file:
  - rm filename

File Manipulation

- Copy a file:
  - cp file_to_copy name_of_copy
- Move a file:
  - mv file_source file_destination
- Make a directory:
  - mkdir directory_name
- Delete an empty directory:
  - rmdir directory_name

File Manipulation

To delete a directory with stuff in it:

```
rm -r -f directory_name
```

NOTE: This command is dangerous because you could delete your entire filesystem since Linux stores everything in one directory. DO NOT TRY TO DO THIS OR YOU WILL FACE CONSEQUENCES!!!!!!!!

nano

- Linux has various text editors such as gedit, nano, vi, etc
- Nano is a commonly used one that is simple and used within the command line
- A few ways to use nano to create text files:
  - Nano
    - - creates a new unnamed file
  - nano file.txt
    - - creates a new file called file.txt if one doesn't exist
    - If one does exist then you will be able to open it and use it
  - nano /home/hello
    - - creates file in /home if it doesn't exist

- Ctrl+O - save a file, will prompt to enter new name or keep current name
- Ctrl+X - exit (same as ctrl+O but exits after)
- Ctrl+K - cut a line of text
- Ctrl+U - paste line of text
- Ctrl+W - find text in file
- Ctrl+C - cancel
- Ctrl+6 - cut a portion of text; press Ctrl+6 at beginning and end of segment (move cursor with arrow keys), then run Ctrl+K to cut just that portion of text instead of the whole line, Ctrl+U to paste

Lab Activity

- Use cd to get to your desktop (remember absolute vs relative paths!)
- Create a new text file with touch named hello
- Use nano to add text to it and exit
- Use cat to check if your text is saved
- Create a new directory named bingbong in your desktop
- Use mv to move the file into the new directory
- cd into the new directory then use cp to create a copy of hello named hello2
- Use mv to rename hello to goodbye
- rm both files then rmdir the directory

Adduser/Deluser

- To add and delete users from your system
- Useradd with a space and then the username of the user you want to add
  - useradd gabe
- userdel with a space and then the username of the user you want to delete
  - userdel joseph

Lab Activity

- Add these users in your computer: ava, ally, andrew, gabe, joseph, and anya
- Then delete these users: ava, ally, andrew

passwd

- The passwd command is used to change the password of a user account
- You can change your own password using this command and with root privileges (using sudo) you can change the passwords of other users
- How to use it
  - passwd [option] [username]
  - Then you will be asked to enter and reenter the new password
  - Note: On linux, you can’t see the letters you type when you type a password

Lab Activity

- ❖ Change your own password using passwd
- ❖ Create user ally
- ❖ Change the password of ally using the passwd command

chpasswd

- chpasswd is similar to passwd but it allows you to change multiple users' passwords at the same time
- How to use it
  - Type chpasswd and click enter
  - Then for each whose password you want to change enter
  - [username]:[password] for each line
  - Then press ctrl + d to exit and execute the command

Lab Activity

- ❖ Create user amy, kay, and john
- ❖ Change the passwords of all three using the chpasswd command

Try These commands Out for Fun!

What does each one do?

- cmatrix
- lolcat
- oneko
- cowsay
- Download them if needed using apt-get command

There are so many more commands

You will obviously learn more commands as you learn how to configure and use linux. The more hands on practice you have, the more commands you will use.

Here are some websites to explore more:

- http://tldp.org/LDP/abs/html/basic.html
- http://ss64.com/bash/
- http://askubuntu.com/
- http://help.ubuntu.com/

Kahoot!

Enter the link on the board to join the game!
https://create.kahoot.it/share/intro-to-linux-basic-commands-and-file-system-week-2/cd11bb0f-5b51-4a7f-9b2b-542dcb7b5b0d