Day 2
FILES AND DIRECTORIES
Common Top Level Directories

Here are the most common top level directories that you need to be aware of and may interact with as a normal user.
/ "Root," the top of the file system hierarchy.
/bin Binaries and other executable programs.
/etc System configuration files.
/home Home directories.
/opt Optional or third party software.
/tmp Temporary space, typically cleared on reboot.
/usr User related programs.
/var Variable data, most notably log files.

What Is the Shell?
● The default interface to Linux
● A program that accepts your commands and executes those commands
● Also called a command line interpreter (CLI)

When we are connecting to Linux system over the network we are typically going to be connecting via SSH, or secure shell

Command Line Interface vs a GUI
● The command line is more powerful.
● There will always be a command line.
● Server distributions do not include GUIs.
● Desktop distributions have GUIs and CLIs.

For example if we want to rename 100 files at a time it takes more time in GUI, but in CLI we could run a command to perform same task in easier way.
sudo apt-get install mmv
• ls
A1.txt A2.txt A3.txt

adding a prefix/suffix to names:

mmv '*' 'prefix#1'
mmv '*' '#1suffix'

removing prefix/suffix:
mmv 'foo-*' '#1'
mmv '*.txt' '#1'

changing a suffix:
mmv '*.bar' '#1.foo'

turning spaces into undersores:
mmv '* *' '#1_#2'

Change filenames to lowercase (#l) completely:
mmv "*" "#l1"
make filenames uppercase (#u):
mmv "*" "#u1"

mmv "index*_type*.txt" "t#2_i#1.txt"
To rename index1_type9.txt to t9_i1.txt

Root, the Superuser

- Root is all powerful.
- Normal accounts can only do a subset of the things root can do.
- Root access is typically restricted to system administrators.
- Root access may be required to to install, start, or stop an application.
- Day to day activities will be performed using a normal account.

We need a root access inorder to install application that resides outside of home directory. Also we may need root access to start or stop that application. Applications that run as services or servers typically need root access to start.
For example we need root access to start web server. However we you don't need special privileges to start Normal applications like browsers..etc

Tilda represents home directory, or current account's home directory.

Basic Linux Commands

Commands in linux are case sensitive. Most of the commands in linux are lowercase.

• ls - Lists directory
• ls -l - Lists directory in a long listing format
• ls -a - Lists all directory including hidden directory
• ls -al - Lists directory and hidden directory in a long listing format
• cd - Changes the current directory.
• pwd - Displays the present working directory.
• cat - Concatenates and displays files. (Just displays and exits)
• vi - Goes to editing mode and displays contents.
• echo - Displays arguments to the screen. (Also displaying Constants and env variables)
• man - Displays the online manual. (Displays the documentation of the command)
Example : man ls
              man pwd
• exit - Exits the shell or your current session.
• clear - Clears the screen.

• which cat - If you want to know the location or the path of the command which you are executing you can use this command
If there are multiple programs found then whichever directory occurs first will be considered.

Navigating Man Pages

Enter Move down one line.
Space Move down one page.
g Move to the top of the page.
G Move to the bottom of the page.
q Quit.

Environmental Variables

• Storage location that has a name and a value
• Typically uppercase

• Access the contents by executing:
• echo $VAR_NAME

VAR_NAME is usually in caps (All letters)

echo $PWD - prints present working directory
echo $OLDPWD - prints previous directory

When we search for environment variable user local bin will be searched first. If the command is found there then it gets executed.
If not found /bin will be searched and if not found these process goes until the command is found in your path. If not found says Command not found.

Start to fish
ls /bin - shows lot of programs which are under bin directory
/bin has commands like

[	chmod	date	echo	hostname	launchctl	ls
	pax	rm	sleep	tcsh	wait4path	
bash	cp	dd	ed	kill	link	mkdir	ps
	rmdir	stty	test	zsh		
cat	csh	df	expr	ksh	ln	mv	pwd
	sh	sync	unlink			

To get help about a program we could use -
git --help
zip --help

We can search man pages
man -k search_term
Ex : man -k calendar

PATH
• An environment variable
• Controls the command search path
• Contains a list of directories

Directory Shortcuts
. This directory
.. The parent directory

cd - Change to the previous directory (Will goto previous directory)

Creating and Removing Directories

mkdir [-p] directory - Create a directory.
rmdir [-p] directory - Remove a directory.
rm -rf directory - Recursively removes directory.

mkdir dir1 - Creates a directory called dir1
mkdir dir1/dir2/dir3 - No Such file directory (Because dir2 doesn't exist)
mkdir -p dir1/dir2/dir3 - Should specify -p parent
rmdir dir1 - Directory not empty
rm -rf dir1 - Once we delete directories/Files will be removed recursively
and permanently

Listing Files

$ ls -l
-rw-rw-r-- 1 jason users 10400 Sep 27 08:52 sales.data
Permissions -rw-rw-r--
Number of links 1
Owner name jason
Group name users
Number of bytes in the file 10400
Last modification time Sep 27 08:52
File name sales.data

Listing All Files, Including Hidden Files

• Hidden files begin with a period.
• Sometimes called "dot files."
• Hidden files are not displayed by default.
• To show hidden files with ls, use ls -a.
• Command options can be combined.
• ls -l -a is the same as ls -la and ls -al.

Listing Files by Type

Use ls -F to reveal file types.
/ Directory
@ Link
* Executable

Symbolic Links

• A link is a points to the actual file or directory.
• Use the link as if it were the file.
• A link can be used to create a shortcut.
• Use for long file or directory names.
• Use to indicate the current version of software.

Listing Files by Time and in Reverse

ls -t List files by time. (Most recent first)
ls -r Reverse order.
ls -latr Long listing including all files reverse sorted by time.

Listing Files Recursively

ls -R Lists files recursively

The tree Command

Similar to ls -R, but creates visual output.
tree List everything in a tree format
tree -d List directories only.
tree -C Colorize output.
Note : tree is on a lot of distributions, it may not be installed by default.

List Directories, Not Contents

ls -d List directory name, not contents.

Listing Files with Color

ls --color Colorize the output.

Note : Its better to create files/directories without spaces, you can use -,_, CamelCase (make any letter Caps)

Working with Spaces in Names

• Just say no to spaces!
• Alternatives:
• Hyphens (-)
• Underscores (_)
• CamelCase

Working with Spaces in Names

• Encapsulate the entire file name in quotes.
• Use a backslash (\) to escape spaces.

ls Options

-a List all files, including hidden files.
--color List files with colorized output.
-d List directory names, not contents.
-l Use the long listing format.
-r Reverse the order.
-R List files recursively.
-t Sort by time, most recent first.

```
ls -l
Nagarajs-MacBook-Air-3:~ nagarajskharvi$ ls -l
total 4648
   0 drwx------@   3 nagarajskharvi  staff      96 May 18 11:50 Applications
   8 -rw-r--r--@   1 nagarajskharvi  staff     905 Aug 17 12:22
CertExchangeNagarajShrinivasKharvi.p7c
   0 drwx------+ 122 nagarajskharvi  staff    3904 Sep 26 08:53 Desktop
   0 drwx------+  36 nagarajskharvi  staff    1152 Oct  4 18:47 Documents
   0 drwx------+ 402 nagarajskharvi  staff   12864 Oct  2 15:11 Downloads
  32 -rw-r--r--@   1 nagarajskharvi  staff   16265 Jul 13 10:55 IP.pdf

    ………
```

ls -l | wc -l Counts number of files and directory (Lines including total number of files : 38)
ls | wc -l Counts number of files and directory (37)

Note: If you want to display known file you can do
ls -l "Filename.extension"
ls -l Linux\ Cheat\ Sheet.rtf OR include them in single quotes/double quotes
ls -l 'Linux Cheat Sheet.rtf'
-rw-r--r--@ 1 nagarajskharvi staff 10841 May 17 11:36 Linux Cheat Sheet.rtf

If You want to display files or directory starts with or ends with you can give a command
ls -al *.sh - List files/directories ends with .sh
ls -al a* - List files/directories starts with a

Nagarajs-MacBook-Air-3:Downloads nagarajskharvi$ ls a*.pdf   -> List files starts with a and end with .pdf
appointed.pdf   appointment-form (2).pdf   appointment-form (4).pdf
appointment-form.pdf.   appointment-form (1).pdf   appointment-form (3).pdf.   appointment-form (5).pdf
Nagarajs-MacBook-Air-3:Downloads nagarajskharvi$ ls a*m.pdf   -> List files starts with a and end with m.pdf
appointment-form.pdf
Nagarajs-MacBook-Air-3:Downloads nagarajskharvi$ ls a*m*.pdf   -> List files starts with a and contains m and end with .pdf
appointment-form (1).pdf   appointment-form (2).pdf   appointment-form (3).pdf.   appointment-form (4).pdf.   appointment-form (5).pdf.   appointment-form.pdf