



Operating Systems

Lab – 01

Objectives:

1. Installation of virtualization software like VMware or virtual box
2. Creating a virtual machine and installing some Linux distribution on it
3. Installing guest additions, and use of shared folder between host and guest OS
4. Reviewing Linux history and its distributions
5. Exploring Linux File System Hierarchy and it's basic commands
6. Getting help using Linux man pages

Resources:

1. Video Lecture 01: <https://youtu.be/wO0Y1IJlajM?si=qUUOJfBWQR01pk6e>
2. Video Lecture 02: https://youtu.be/G-5NDYFwBH8?si=m_VnbfF-eJt-jiMy
3. Video Lecture 03: https://youtu.be/_YPvqThyM4c?si=R4xbY2z3QBstagjK
4. Video Lecture 04: <https://youtu.be/dUkskLi70nI?si=jGhLKqydENfNYmdj>
5. Installation document: <https://www.dropbox.com/s/biakgmih0eazs9/User%20Manual.pdf?dl=0>

Task 01: Read the installation doc and complete the installation of VMWare and Ubuntu on your systems.

What is a hypervisor and the difference between type 1 and type 2 hypervisors?

Task 02: You can have multiple guest OS on your host OS. Can there be a guest OS inside the Guest OS? If yes then what is the limit of Guest OS you can install in the Guest OS(s)?

Task 03:

- a. What is the format of prompt that appears when you start the shell i.e. if prompt is `arif@Ubuntu:~$`?
- b. What is the difference between these two prompts?
 - o `xxxx@Ubuntu:~$`
 - o `xxxx@Ubuntu:~#`

Task 04: The `/usr/sbin` folder contains the commands that are only executed by admin then tell what will happen if we run any command that are in this folder? Try running a few commands to see results.

Task 05:

- a. What does the `"shutdown 3"` command do?
- b. What is meant by home directory of a user and how it is symbolized?

Task 6: There are two terminals and I want to **write** from one to terminal to another terminal. Can you find out a command that helps me writing something to another terminal? (Hint: take help from `man` and `man -k`)

Task 7: What are man pages and mention all the sections in which man pages are divided.

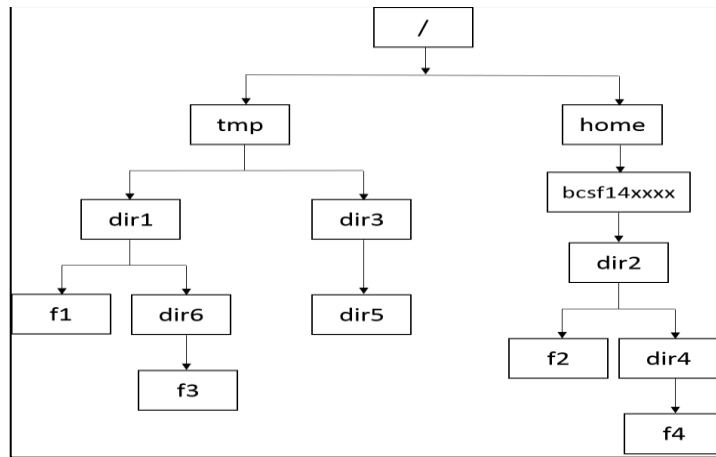
Task 8: Use `cd` (change directory) command to move to the folder `/usr/share/man/man2/` and then use the `ls` (list) command to see how many man pages of different system calls are there?

Task 09:

- a. Write a single command to display the first 12 lines of `/etc/services`.
- b. Write a single command to display only the last line of `/etc/passwd`.
- c. Write a single command to count the number of lines in `/etc/passwd`.

Task 10:

- a. Write a single command to make a backup of `/etc/passwd` file to `cnt.txt`.
- b. Write a single command to display backup file.
- c. Write a single command to display `cnt.txt`, but with all lines in reverse order (the last line first).



Task 11: Use shell commands to create above directory structure and then perform the following operations on them:

- Write down a single command to copy **f2** to **dir5** if your **pwd** is **dir4** (absolute paths only).
- If your **pwd** is **dir6** then write a single command to move **f1** and **f3** to **dir4**.

Task 12: Referring to the figure, your present working directory is **dir2**, now write a single command to create a .tar file named myArchive.tar containing all the files and folders of **dir2**. Create its zip file named myArchive.tar.gz. Now move this zip file to directory **dir1**. (Do this task by staying in **dir2**)

Task 13: Write a command which take a file `"/etc/passwd"` and `"/etc/shadow"` and print first three column of first one and second third column of second one.

Task 14: Use `ls` to find the biggest file in `/etc`.

Task 15: Tell how many arguments are in this line.

```
$ touch '/etc/cron/cron.allow' 'file 42.txt' "file 33.txt"
```

Task 16:

- Write a single command to create an alias called 'city' that echoes your hometown.
- Use your alias to test that it works.

Task 17: Explain the difference between these two commands.

```
$ find /data -name "*.txt"
$ find /data -name *.txt
```

Task 18: Write a single command which reads `/etc/passwd` and prints only those lines which do not contains string "root" in it.

Task 19: Can you tell what will happen if we run `comm` commands on below file? Tell if it has any error. If yes then correct it. Also `man` the `comm` command to get information about its working and three columns in which it separates the lines.

file1:	file2:
only in file1	same line again
in both file1 and file2	in both file1 and file2
same line again	only in file2

Task 20: Run the `cmp` command on above created files and check if the information of changed byte is correct or not? What will be the byte number if I change the word "again" to "agame" in file one line three?

Task 21: run the `diff` command on above files and explain the output. Also `man` the `diff` command to get information about its working and different signs and characters it uses in output.

