Topic Name:

The main aim of this lab session is to provide hands-on experience on

- Explore file structure
- File management commands
- Absolute path and Relative path
- Globbing
- Scripting

File Structure

1. Under the root directory there are many files like

/bin,/boot,/dev,/etc,....

Find out the importance of those files

Example: /etc is for user account details

S.No	Directory	Usage			
1	1	Root directory.			
2	/bin	Binary files .			
3	/boot	Contains all the files required for the Linux Boot Process.			
4	/dev	Special Device Files for all Devices.			
5	/etc	Houses Configuration files for System services and			
		Daemons.			
6	/home	Personal workspace for each user.			
7 /lib Shared library images and kerne		Shared library images and kernel modules that are essential			
		for booting the system and running commands in the root			
		filesystem.			
8 /proc A virtual file system that provides info		A virtual file system that provides information about the			
		system's kernel and processes.			
9 /sbin System administration c		System administration commands and binaries that are			
		primarily used by the system administrator			
10 /tmp A temporary storage loca		A temporary storage location for files and directories that			
		are created and accessed during system runtime			
11	/var	A standard directory that stores variable files, or files that			
		change frequently while the system is running			

2. In Linux, there are three different files

Regular file:

Regular files in Linux are the most common type of file and contain data that can be read and modified.

Directory File:

A directory file in Linux is a type of file that stores other files and directories, and contains the information the system needs to access them

Special file:

Special files, also known as device files, are associated with a computer system's hardware devices or other resources.

Block file:

Used to access and manage storage devices at the block level.

Character file:

Facilitate direct communication between user programs and hardware devices.

Socket file:

A file descriptor that acts as a communication endpoint for processes running on the device.

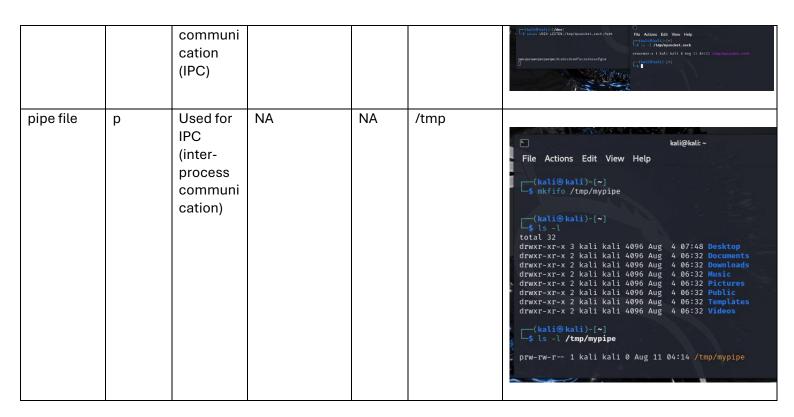
Pipe file:

Unnamed objects created to allow two processes to communicate.

Fill the below table:

File Type	Repres ented by (Hint ls)	Role	How to create	How to check	Location	Screen shot
Regular file	-	Stores data such as text, images, etc.	touch t1	NA	/home/kali/ Desktop/Chi nthan	The ball to the control of the contr
- Tex t file	-	Contains plain text	touch t1.txt	NA	/home/kali/ Desktop/Chi nthan	A state and the second of the
- Co mp res	-	Stores data in a compres	gzip filename	NA	/home/kali/ Desktop/Chi nthan	

	I	 	<u> </u>		1	6 kd km 2042 renos antiki 1 Mass Gekania
se d file		sed format				The first file View on the constitution of the
- Im age	-	Stores image data	NA	NA	/home/kali/ Desktop/Chi nthan	Description of management of the property of
Directory	d	Contains files and other directorie s	mkdir filename	NA	/home/kali/ Desktop/Chi nthan	The fact we will the risk 1 - 4 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5
Block file	b	Represen ts a block device (e.g., disk)	NA	NA	/dev	[sudo] password for kali: crw-rw—+ 1 root audio 14, 2 Aug 11 03:40 midi drwxrwxrwt 2 root root 40 Aug 11 03:40 midi drwxrwxrvt 2 root root 7, 0 Aug 11 04:00 myblock drwxr-xr-x 2 root root 60 Aug 11 03:40 net crw-rw-rw- 1 root root 1, 3 Aug 11 03:40 mull
Character file	С	Represen ts a characte r device (e.g., terminal)	NA	NA	/dev	drwxrwxrwt 2 root root
Socket file	s	Provides interprocess	NA	NA	/tmp	



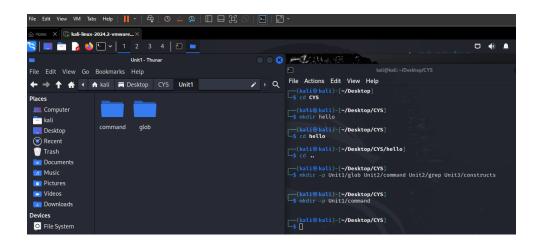
- 3. Globbing
- a. Go back to CYS



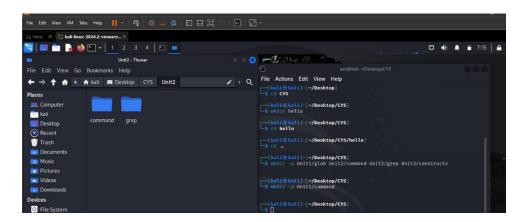
b. Create multiple subdirectories using single command LS

Unit1

command glob

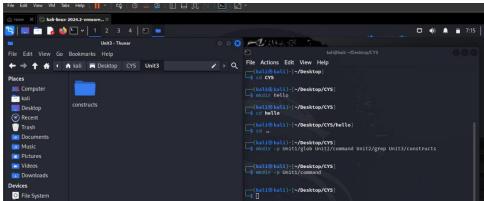


Unit2 command grep



Unit3

Constructs



c. Navigate to unit1/glob



d. Create the following files:

Commands.txt

Commands1.txt

Commands2.txt

page1.html

page2.html

page3.html

file1

file10

file11

file2

File2

File3

file33

fileAB

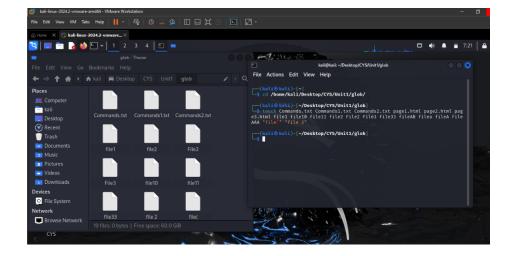
filea

fileA

fileAAA

file(

file2



i. List all files starting with file

ii. List all files starting with File

```
(kali@ kali)-[~]
$ cd /home/kali/Desktop/CYS/Unit1/glob/

(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
$ touch Commands.txt Commands2.txt page1.html page2.html pag
e3.html file1 file10 file11 file2 File2 File3 file33 fileAB filea fileA file
AAA "file(" "file 2"

(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
$ ls file*

'file(' file10 'file 2' file33 fileA fileAB
file1 file11 file2 filea fileAAA

(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
$ ls File*
File2 File3
```

iii. List all files starting with file and ending in a number.

```
(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
$ ls file*[0-9]
file1 file10 file11 'file 2' file2 file33

(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
```

iv. List all files starting with file and ending with a letter

```
(kali® kali)-[~/Desktop/CYS/Unit1/glob]
$ ls file*[a-zA-Z]
filea fileA fileAAA fileAB
```

v. List all files starting with File and having a digit as fifth character.

```
(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
$ ls File????[0-9]*

ls: cannot access 'File????[0-9]*': No such file or directory
```

vi. List all files starting with File and having a digit as fifth character and nothing else.

```
\[ \langle \text{kali \circ kali \circ kali
```

vii. List (with ls) all files starting with a letter and ending in a number.

viii. List (with ls) all files that have exactly five characters.

```
(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
$ ls ??????
'file(' file1 file2 File2 File3 filea fileA
```

ix. List (with ls) all files that start with f or F and end with 3 or A.

```
(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
$ ls [fF]*[A3]

File3 file33 fileA fileAAA
```

x. List (with ls) all files that start with f have i or R as second character and end in a number.

```
(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
$ ls f[iR]*[0-9]
file1 file10 file11 'file 2' file2 file33
```

xi. List all files that do not start with the letter F.

```
(kali@ kali)-[~/Desktop/CYS/Unit1/glob]

$\ls [^F]*
Commands1.json 'file(' file11 file33 fileAAA
Commands2.json file1 'file 2' filea fileAB
Commands.json file10 file2 fileA
```

xii. Remove all the *.html

```
(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
$ rm *.html

(kali@ kali)-[~/Desktop/CYS/Unit1/glob]
$ commands1.txt 'file(' file11 File2 filea fileAB Commands2.txt file1 'file 2' File3 fileA Commands.txt file10 file2 file33 fileAAA
```

4. Absolute path and relative path

Use rm, mv, cp, ls with absolute path and relative path as per your choice.

• ls:

Relative Path:

```
(kali® kali)-[~]
$\frac{1}{5} \text{ ls Desktop/CYS/} \text{ chmod.exercises File2 File4 hello new Unit2 work} \text{File1 File3 File5 myfile.txt Unit1 Unit3}
```

Absolute Path:

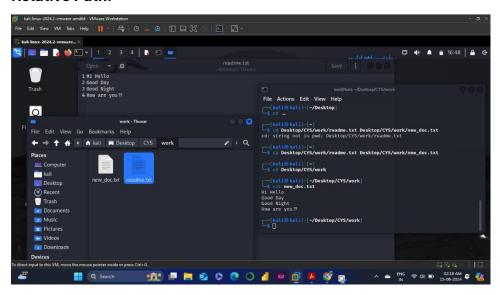
```
(kali⊗ kali)-[~]
-$ ls Desktop/
Chinthan CYS

-(kali⊛ kali)-[~]
-$ cd Desktop

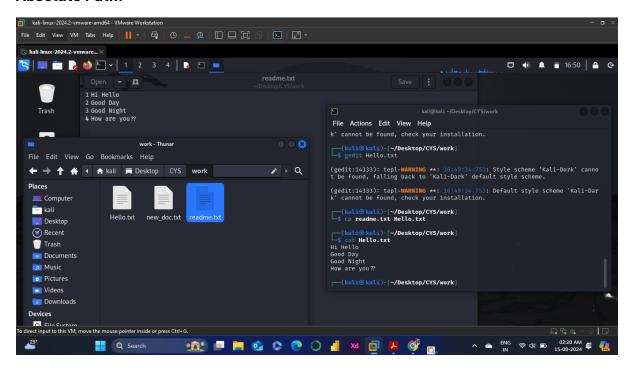
-(kali⊛ kali)-[~/Desktop]
-$ ls CYS/
Chmod.exercises File2 File4 hello new Unit2 work
File1 File3 File5 myfile.txt Unit1 Unit3
```

• cp:

Relative Path:



Absolute Path:



mv

Relative Path:

Absolute Path:

```
(kali@ kali)-[~/Desktop/CYS/work]

Message.txt new_doc.txt readme.txt

[kali@ kali)-[~/Desktop/CYS/work]

(kali@ kali)-[~]

S ls Desktop/CYS/work

Message.txt new_doc.txt readme.txt

[kali@ kali)-[~]

Message.txt new_doc.txt Desktop/CYS/work/Old_text.txt

[kali@ kali)-[~]

S ls Desktop/CYS/work

Message.txt Old_text.txt readme.txt

[kali@ kali)-[~]

[kali@ kali)-[~]

[kali@ kali)-[~]

[kali@ kali]-[~]
```

rm

Absolute path:

```
(kali@ kali)-[~]
$ ls Desktop/CYS/work
Message.txt Old_text.txt readme.txt

(kali@ kali)-[~]
$ rm Desktop/CYS/work/Old_text.txt

(kali@ kali)-[~]
$ ls Desktop/CYS/work
Message.txt readme.txt

(kali@ kali)-[~]
$ [kali@ kali)-[~]
$ [kali@ kali]-[~]
```

Relative path:

```
(kali@ kali)-[~/Desktop/CYS/work]

$ rm Message.txt

(kali@ kali)-[~/Desktop/CYS/work]

$ ls
readme.txt

(kali@ kali)-[~/Desktop/CYS/work]
```

5. Wildcards (Pattern Matching)

Notation	Use	Example	Screenshot
*	To match zero or more characters in file names, paths or commands	ls file*	<pre>(kali@ kali)-[~]</pre>
?	match exactly one single character in file names, paths or commands.	ls ????? (For 5 Characters)	(kali⊕ kali)-[~/Desktop/CYS/Unit1/glob] \$ ls ?????? 'file(' file1 file2 File2 File3 filea fileA
[]	Allows for flexible and specific pattern matching by defining sets or raanges	Ls file*[0-9] (File ending with digits only)	<pre>fite2 Fite3 (kali@ kali)-[~/Desktop/CYS/Unit1/glob] \$ ls file*[0-9] file1 file10 file11 'file 2' file2 file33 (kali@ kali)-[~/Desktop/CYS/Unit1/glob]</pre>

	[!] Or	Matches any character that is not a	ls [^F]* (Fetches	<pre>(kali@ kali) - [~/Desktop/CYS/Unit1/glob]\$ ls [^F]* Commands1.json 'file(' file11 file33 fileAAA</pre>
		member of	files which	Commands2.json file1 'file 2' filea fileAB Commands.json file10 file2 fileA
	[^]	the set characters	is not starting with 'F')	
1	[}	Creating or	mkdir	e Edit View Go Bookmarks Help
		manipulating multiple files	file{15}	→ ↑ ★ I h kali Desktop CYS
		or		ces Computer Computer
		directories with varying		akali File1 File2 File3 File4 File5 hello
		names and		Recent Trash
		numbers.		Documents Unit1 Unit2 Unit3 Music Pictures Videos Downloads

More on Character class

Notation	Use	Example	Screenshot
[:alnum:]	Matches any alphanumeric character (letters and digits).	[0-9A-Za-z]	<pre>(kali@ kali)-[~/Desktop/CYS/Unit1/glob]</pre>
[:alpha:]	Matches any alphabetic character (letters only).	[A-Za-z]	<pre>[kali@kali)-[~/Desktop/CYS/Unit1/glob] \$ ls file[A-Za-z] filea fileA</pre>
[:digit:]	Matches any digit (0-9).	[0-9]	<pre>(kali@ kali)-[~/Desktop/CYS/Unit1/glob] file1 file2</pre>
[:lower:]	Matches any lowercase letter (a-z)	[a-z]	<pre>(kali@kali)-[~/Desktop/CYS/Unit1/glob]</pre>
[:upper:]	Matches any uppercase letter (A-Z).	[A-Z]	<pre>(kali@ kali)-[~/Desktop/CYS/Unit1/glob]</pre>

4. change permission

a) Change the permission set of /work/readme.txt so that only the user (owner) can read,write, and execute it. Use absolute mode.

```
(kali@ kali)-[~/Desktop]
$ chmod 700 CYS/work/readme.txt
```

b) Change the permission set of /work/readme.txt so that any user can read it, the group can read/write to it and the user (owner) can read/write/execute it. Use absolute mode.

c) Change the permission set of /bin/bash so that only the user (owner) can read/write/ execute, group, and any user can execute it. However, whenever anyone executes it, it should run with the privileges of the owner user. Use absolute mode.

```
(kali@kali)-[~/Desktop]
$ chmod 751 /bin/bash
chmod: changing permissions of '/bin/bash': Operation not permitted
```

d) Change the permission set of /work/readme.txt so that only the user (owner) can read, write, and execute it. Use relative mode.

```
(kali@ kali)-[~/Desktop]
$ chmod u+rwx CYS/work/readme.txt
```

e) Change the permission set of /work/readme.txt so that any user can read it, the group can read/write to it and the user (owner) can read/write/execute it. Use relative mode.

```
(kali@kali)-[~/Desktop]
$ chmod u+rwx,g+rw,o+r CYS/work/readme.txt
```

f) Change the permission set of /work/readme.txt so that only the user (owner) can read/write/ execute, group, and any user can execute it. However, whenever anyone executes it, it should run with the privileges of the group. Use absolute mode.

```
(kali⊕ kali)-[~/Desktop]
-$ chmod 751 CYS/work/readme.txt
chmod g+s CYS/work/readme.txt
```

g) Change the permission set of /work/readme.txt so that only the owner can rename or delete this file while maintaining the existing permissions. Use absolute mode.

```
(kali® kali)-[~/Desktop/CYS/work]
readme.txt

(kali® kali)-[~/Desktop/CYS/work]
$ chmod 3711 readme.txt

(kali® kali)-[~/Desktop/CYS/work]
$ 1
total 4
-rwx-s-t 1 kali kali 43 Aug 14 16:46 readme.txt

(kali® kali)-[~/Desktop/CYS/work]
$ (kali® kali)-[~/Desktop/CYS/work]
```

h) What are the default permissions for the new file?

```
File Actions Edit View Help

(kali@ kali)-[~/Desktop/CYS]

touch myfile.txt

(kali@ kali)-[~/Desktop/CYS]

s ls -l myfile.txt

-rw-rw-r-- 1 kali kali 0 Aug 12 11:05 myfile.txt

(kali@ kali)-[~/Desktop/CYS]
```

i) What was the command to view the file permissions?

ls -l <filename>

```
File Actions Edit View Help

(kali® kali)-[~/Desktop/CYS]

touch myfile.txt

(kali® kali)-[~/Desktop/CYS]

s l myfile.txt

-rw-rw-r-- 1 kali kali 0 Aug 12 11:05 myfile.txt

(kali® kali)-[~/Desktop/CYS]
```

j) Change chmod.exercises permissions to -r--r--r—

k) Change the file permissions to Read only for the owner, group and all other users.

l) What was the command for changing the file permissions to -r--r--?

m) Change chmod.exercises permissions to -rw-r-----

```
(kali@ kali)-[~/work]
$ chmod 640 chmod.exercises

(kali@ kali)-[~/work]
$ chmod 640 chmod.exercises

(kali@ kali)-[~/work]
$ ls -l chmod.exercises
-rw-r 1 kali kali 0 Aug 12 11:09 chmod.exercises
```

n) Change the file permissions to match the following:

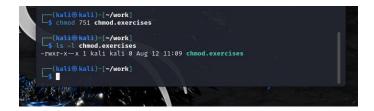
a. owner: Read and Write

b. group: Read

c. other: no permissions (None)

o) What was the command for changing the file permissions to -rw-r----?

p) Change chmod.exercises permissions to -rwxr-x—x



q) Change the file permissions to match the following:

a. owner: Read, Write and Execute

b. group: Read and Execute

c. other: Execute

```
-(kali@ kali)-[~/work]
-$ chmod 751 example.txt
-(kali@ kali)-[~/work]
-$ is -1 example.txt
-rwxr-x-x 1 kali kali 0 Aug 12 11:12 example.txt
-[kali@ kali)-[~/work]
-$ [
```

r) What was the command for changing the file permissions to -rwxr-x--x?

```
(kali⊗ kali)-[~/work]
$ chmod 751 example.txt

(kali⊗ kali)-[~/work]
$ ls -l example.txt

-rwxr-x--x 1 kali kali 0 Aug 12 11:12 example.txt
```

Evaluation:

Marks: 10 (Deadline: 4 - Originality: 3 - Completeness: 3)

Deadline: 15.08.2024

In life there are no shortcuts. All things are connected. For success there is no fast lane. Work hard. Focus your energy, practice, remain honest, Truthful, loyal and committed.

-unknown