

Lab-report no : 04

Name of the lab-report: File operation and permission.

Objectives:

- 1.What is File Operation and File Permission in Linux Operating System?
- 2.Implementation of File Operation and File Permission.

1.What is File Operation and File Permission in Linux Operating System?

Answer:

File Operations

A file is an abstract data type. For defining a file properly, we need to consider the operations that can be performed on files. The operating system can provide system calls to create, write, read, reposition, delete, and truncate files.

There are six basic file operations within an Operating system. These are:

- ⑩ **Creating a file:** There are two steps necessary for creating a file. First, space in the file system must be found for the file. We discuss how to allocate space for the file. Second, an entry for the new file must be made in the directory.
- ⑩ **Writing a file:** To write to a file, you make a system call specify about both the name of the file along with the information to be written to the file.
- ⑩ **Reading a file:** To read from a file, you use a system call which specifies the name of the file and where within memory the next block of the file should be placed.
- ⑩ **Repositioning inside a file:** The directory is then searched for the suitable entry, and the 'current-file-position' pointer is relocating to a given value. Relocating within a file need not require any actual I/O. This file operation is also termed as 'file seek.'
- ⑩ **Deleting a file:** For deleting a file, you have to search the directory for the specific file. Deleting that file or directory release all file space so that other files can re-use that space.
- ⑩ **Truncating a file:** The user may wish for erasing the contents of a file but keep the attributes same. Rather than deleting the file and then recreate it, this utility allows all attributes to remain unchanged — except the file length — and let the user add or edit the file content.

File permissions

Every file and directory in your UNIX/Linux system has following 3 permissions such as -

- 1) Read
- 2) Write
- 3) Execute permission

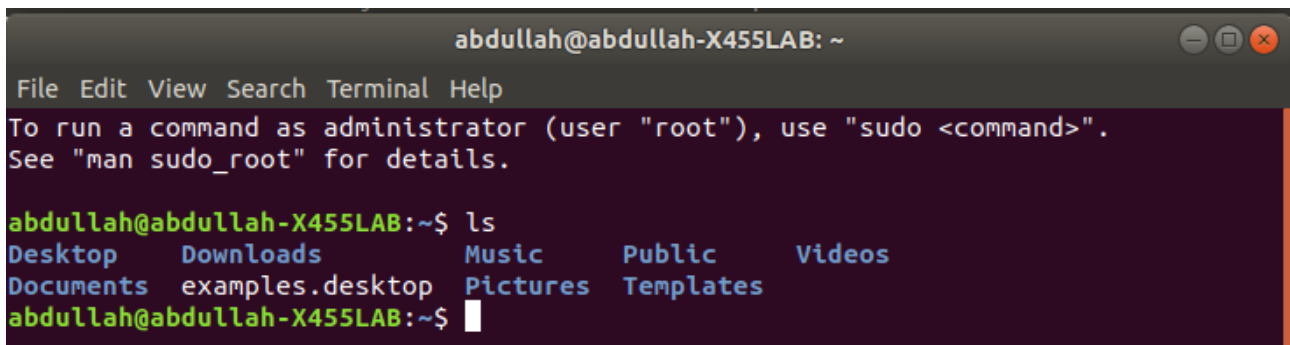
Read (r): this gives permission to merely open a file or folder and view its contents.

Write (w): this gives permission to overwrite, append-to or delete a file or folder.

Execute (x): this gives permission to "run" a file. For example to run a script or a program.

Implementation of File Operation

1. the **ls** -command: It shows the contents of a particular directory – both files and directories.



```
abdullah@abdullah-X455LAB: ~  
File Edit View Search Terminal Help  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
abdullah@abdullah-X455LAB:~$ ls  
Desktop    Downloads    Music        Public        Videos  
Documents  examples.desktop  Pictures    Templates  
abdullah@abdullah-X455LAB:~$
```

2. **ls -R command**: We can all also find child files and directories by providing the recursive option. We will provide the -R option which will list files and folders recursively.

```

File Edit View Search Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

abdullah@abdullah-X455LAB:~$ ls -R
.:
1638      Documents  examples.desktop  Music      Public      Videos
Desktop   Downloads  kill              Pictures    Templates

./Desktop:
xampp-win32-7.2.7-0-VC15-installer.exe

./Documents:
lab-report -02.odt  lab-report-3.odt

./Downloads:

./Music:

./Pictures:

./Public:

./Templates:

./Videos:
abdullah@abdullah-X455LAB:~$

```

3. ls -a command: All operating systems have hidden files to hide them from use. It is not a security-related feature. It related to operation and reliability. We can see that files and folders like .cpan, .npm, .config etc. are listed with the help of -a option.

```

abdullah@abdullah-X455LAB: ~
File Edit View Search Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

abdullah@abdullah-X455LAB:~$ ls -a
.          .bashrc    Downloads  .local     Public
..         .cache     examples.desktop .mozilla   .ssh
1638      .config    .gnupg     Music      Templates
.bash_history Desktop    .ICEauthority Pictures    Videos
.bash_logout Documents  kill        .profile
abdullah@abdullah-X455LAB:~$

```

4. cd command: Change to directory . Here after changing directory I go to Documents directo

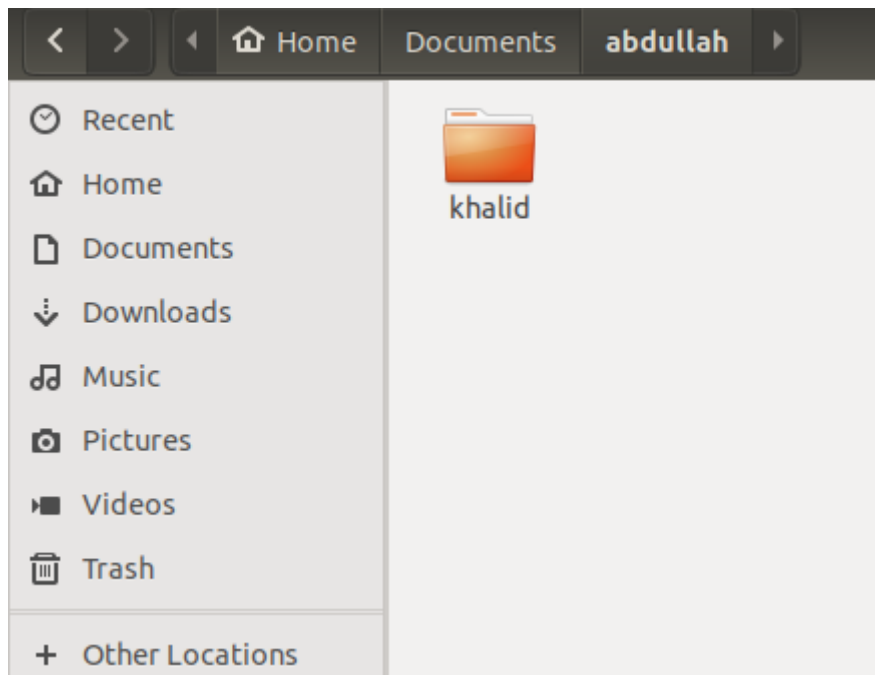
```
abdullah@abdullah-X455LAB: ~/Documents
File Edit View Search Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

abdullah@abdullah-X455LAB:~$ pwd
/home/abdullah
abdullah@abdullah-X455LAB:~$ ls
ab      Documents  examples.desktop  Pictures  Templates
Desktop Downloads  Music             Public    Videos
abdullah@abdullah-X455LAB:~$ cd Documents
abdullah@abdullah-X455LAB:~/Documents$ ls
lab-report -02.odt
Screenshot from 2019-09-03 17-36-41.png
Screenshot from 2019-09-03 17-40-12.png
Screenshot from 2019-09-03 17-45-13.png
Screenshot from 2019-09-03 17-46-23.png
Screenshot from 2019-09-03 17-56-50.png
Screenshot from 2019-09-03 18-06-54.png
Screenshot from 2019-09-03 18-10-26.png
Screenshot from 2019-09-03 18-10-48.png
abdullah@abdullah-X455LAB:~/Documents$ pwd
/home/abdullah/Documents
abdullah@abdullah-X455LAB:~/Documents$
```

5.mkdir command : mkdir command in Linux allows the user to create directories. Here I create the khalid directory.

```
abdullah@abdullah-X455LAB: ~/Documents/abdullah
File Edit View Search Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

abdullah@abdullah-X455LAB:~$ pwd
/home/abdullah
abdullah@abdullah-X455LAB:~$ cd Documents
abdullah@abdullah-X455LAB:~/Documents$ mkdir abdullah
abdullah@abdullah-X455LAB:~/Documents$ cd abdullah
abdullah@abdullah-X455LAB:~/Documents/abdullah$ ls
abdullah@abdullah-X455LAB:~/Documents/abdullah$ mkdir khalid
abdullah@abdullah-X455LAB:~/Documents/abdullah$ ls
khalid
abdullah@abdullah-X455LAB:~/Documents/abdullah$
```



6. **rmdir** command: rmdir command is used to remove empty directories from the filesystem in Linux. The rmdir command removes each and every directory specified in the command line only if these directories are empty. Here I first create a directory hello and then I remove that file by using rmdir.

```
abdullah@abdullah-X455LAB: ~/Documents
File Edit View Search Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

abdullah@abdullah-X455LAB:~$ ls
Desktop  Downloads  Music      Public     Videos
Documents examples.desktop Pictures Templates
abdullah@abdullah-X455LAB:~$ cd Documents
abdullah@abdullah-X455LAB:~/Documents$ ls
abdullah  lab-report -02.odt
abdullah@abdullah-X455LAB:~/Documents$ mkdir hello
abdullah@abdullah-X455LAB:~/Documents$ ls
abdullah  hello  lab-report -02.odt
abdullah@abdullah-X455LAB:~/Documents$ rmdir hello
abdullah@abdullah-X455LAB:~/Documents$ ls
abdullah  lab-report -02.odt
abdullah@abdullah-X455LAB:~/Documents$
```

7. **pwd** command: We can get the current working directory with pwd command.

```
abdullah@abdullah-X455LAB: ~
File Edit View Search Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

abdullah@abdullah-X455LAB:~$ pwd
/home/abdullah
abdullah@abdullah-X455LAB:~$
```

Implementation of File permission

ls -l command

One can view the permissions by checking the file or directory permissions in your favorite GUI File Manager or by reviewing the output of the “ls -l” command while in the terminal and while working in the directory which contains the file or folder.

The permission in the command line is displayed as: **_rwxrwxrwx 1 owner:group**

```
abdullah@abdullah-X455LAB: ~
File Edit View Search Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

abdullah@abdullah-X455LAB:~$ ls -l
total 44
-rw-r--r-- 1 abdullah abdullah 0 ৯:১৮ 17:30 1638
drwxr-xr-x 2 abdullah abdullah 4096 ৯:৩৩ 23:40 Desktop
drwxr-xr-x 2 abdullah abdullah 4096 ৯:৫৩ 13:53 Documents
drwxr-xr-x 2 abdullah abdullah 4096 ৯:৫৩ 10:12 Downloads
-rw-r--r-- 1 abdullah abdullah 8980 ৯:৫৩ 23:27 examples.desktop
-rw-r--r-- 1 abdullah abdullah 0 ৯:১৮ 17:30 kill
drwxr-xr-x 2 abdullah abdullah 4096 ৯:৫৩ 2 05:37 Music
drwxr-xr-x 2 abdullah abdullah 4096 ৯:৫৩ 2 05:37 Pictures
drwxr-xr-x 2 abdullah abdullah 4096 ৯:৫৩ 2 05:37 Public
drwxr-xr-x 2 abdullah abdullah 4096 ৯:৫৩ 2 05:37 Templates
drwxr-xr-x 2 abdullah abdullah 4096 ৯:৫৩ 2 05:37 Videos
abdullah@abdullah-X455LAB:~$
```

ls -al command: command to view all files in a list:

```
File Edit View Search Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

abdullah@abdullah-X455LAB:~$ ls -al
total 100
drwxr-xr-x 16 abdullah abdullah 4096 আটকো 2 13:49 .
drwxr-xr-x  3 root      root      4096 আটকো 1 23:27 ..
-rw-r--r--  1 abdullah abdullah    0 সপ্টে 18 17:30 1638
-rw-----  1 abdullah abdullah 1271 আটকো 2 14:08 .bash_history
-rw-r--r--  1 abdullah abdullah  220 আটকো 1 23:27 .bash_logout
-rw-r--r--  1 abdullah abdullah 3771 আটকো 1 23:27 .bashrc
drwx----- 17 abdullah abdullah 4096 সপ্টে 17 21:05 .cache
drwxr-xr-x 15 abdullah abdullah 4096 সপ্টে  3 18:01 .config
drwxr-xr-x  2 abdullah abdullah 4096 সপ্টে  3 23:40 Desktop
drwxr-xr-x  2 abdullah abdullah 4096 আটকো 2 14:01 Documents
drwxr-xr-x  2 abdullah abdullah 4096 আটকো 2 10:12 Downloads
-rw-r--r--  1 abdullah abdullah 8980 আটকো 1 23:27 examples.desktop
drwx-----  2 abdullah abdullah 4096 সপ্টে  3 17:24 .gnupg
-rw-----  1 abdullah abdullah 6802 আটকো 2 13:49 .ICEauthority
-rw-r--r--  1 abdullah abdullah    0 সপ্টে 18 17:30 kill
drwxr-xr-x  3 abdullah abdullah 4096 আটকো 2 05:37 .local
drwx-----  4 abdullah abdullah 4096 আটকো 21 08:50 .mozilla
drwxr-xr-x  2 abdullah abdullah 4096 আটকো 2 05:37 Music
drwxr-xr-x  2 abdullah abdullah 4096 আটকো 2 05:37 Pictures
-rw-r--r--  1 abdullah abdullah  675 আটকো 1 23:27 .profile
drwxr-xr-x  2 abdullah abdullah 4096 আটকো 2 05:37 Public
drwx-----  2 abdullah abdullah 4096 সপ্টে  3 17:24 .ssh
drwxr-xr-x  2 abdullah abdullah 4096 আটকো 2 05:37 Templates
drwxr-xr-x  2 abdullah abdullah 4096 আটকো 2 05:37 Videos
abdullah@abdullah-X455LAB:~$
```

The Permission Groups used are:

- u – Owner
- g – Group
- o – Others
- a – All users

The potential Assignment Operators are + (plus) and – (minus); these are used to tell the system whether to add or remove the specific permissions.

The Permission Types that are used are:

- Ⓡ r – Read
- Ⓦ w – Write
- Ⓧ x – Execute

So for an example, lets say I have a file named file1 that currently has the permissions set to _rw_rw_rw, which means that the owner, group and all users have read and write permission. Now we want to remove the read and write permissions from the all users group.

To make this modification you would invoke the command: *chmod a-rw file1*

To add the permissions above you would invoke the command: **chmod a+rw file1**

