

# Experiment No. 2

## Title

### File and Directory Management and File Permissions in Linux

## Aim

To study and practice Linux commands for file and directory management, understand Linux file and directory permissions, and create and edit files using text editors such as `nano` and `vi`.

## Theory

### Linux File System

Linux follows a hierarchical file system starting from the root directory `/`. All files and directories are arranged in a tree structure, allowing efficient organization and secure access control.

### Files and Directories

- **Files** store data such as text, programs, or scripts.
- **Directories** store files and subdirectories.

### File and Directory Permissions

Linux uses permissions to control access:

- **Read (r)** – Read file contents / list directory
- **Write (w)** – Modify file or directory
- **Execute (x)** – Execute file or access directory

Permissions apply to:

- **Owner**
- **Group**
- **Others**

### Text Editors

- **nano**: Simple and beginner-friendly text editor
- **vi**: Powerful editor with command and insert modes

## Commands Used

Commands	Description
pwd	Display current directory
ls	List files and directories
ls -l	Display detailed file information
cd	Change directory
mkdir	Create directory
rmdir	Remove empty directory
touch	Create empty file
cat	Display file contents
nano	Edit files using nano editor
vi	Edit files using vi editor
chmod	Change file permissions
stat	Display file status

## Procedure / Steps

### Step 1: Login

- Log in to the Linux virtual machine and open the **Terminal**.

Step 2: Display the Current Directory using `pwd` command.

```
srishti_m@kali: ~  
File Actions Edit View Help  
(srishti_m@kali)-[~]  
$ pwd  
/home/srishti_m  
(srishti_m@kali)-[~]  
$
```

Step 3: List Files and Directories using:

- `ls`
- `ls -l`

```
(srishti_m@kali)-[~]  
$ ls  
abc.txt  Desktop  Documents  LinuxLabTest  Music  Pictures  status  Templates  
os       Public   sys        LinuxTestLab  Videos  
(srishti_m@kali)-[~]  
$ ls -l  
total 5032  
-rw-rw-r-- 1 srishti_m srishti_m 0 Feb 10 01:03 abc.txt  
drwxr-xr-x 2 srishti_m srishti_m 4096 Sep 15 11:44 Desktop  
drwxr-xr-x 2 srishti_m srishti_m 4096 Sep 15 11:44 Documents  
drwxr-xr-x 2 srishti_m srishti_m 4096 Feb 8 04:21 Downloads  
drwxrwxr-x 5 srishti_m srishti_m 4096 Feb 17 01:40 LinuxLabTest  
drwxrwxr-x 5 srishti_m srishti_m 4096 Feb 17 01:49 LinuxTestLab  
drwxr-xr-x 2 srishti_m srishti_m 4096 Sep 15 11:44 Music  
-rw-rw-r-- 1 srishti_m srishti_m 2545316 Sep 22 05:28 os  
drwxr-xr-x 2 srishti_m srishti_m 4096 Feb 18 04:06 Pictures  
drwxr-xr-x 2 srishti_m srishti_m 4096 Sep 15 11:44 Public  
-rw-r--r-- 1 srishti_m srishti_m 12708 Feb 18 03:52 status  
-rw-rw-r-- 1 srishti_m srishti_m 2545317 Sep 22 05:28 sys  
drwxr-xr-x 2 srishti_m srishti_m 4096 Sep 15 11:44 Templates  
drwxr-xr-x 2 srishti_m srishti_m 4096 Sep 15 11:44 Videos  
(srishti_m@kali)-[~]  
$
```

Step 4: Create a New Directory

```
mkdir linux_lab  
cd linux_lab
```

- `linux_lab` directory is created and entered.

```
(srishti_m@kali)-[~]  
$ mkdir linux_lab  
(srishti_m@kali)-[~]  
$ cd linux_lab  
(srishti_m@kali)-[~/linux_lab]  
$
```

Step 5: Create Files using : `-touch file1.txt file2.txt`

```
(srishti_m@kali)-[~/linux_lab]
$ touch file1.txt file2.txt

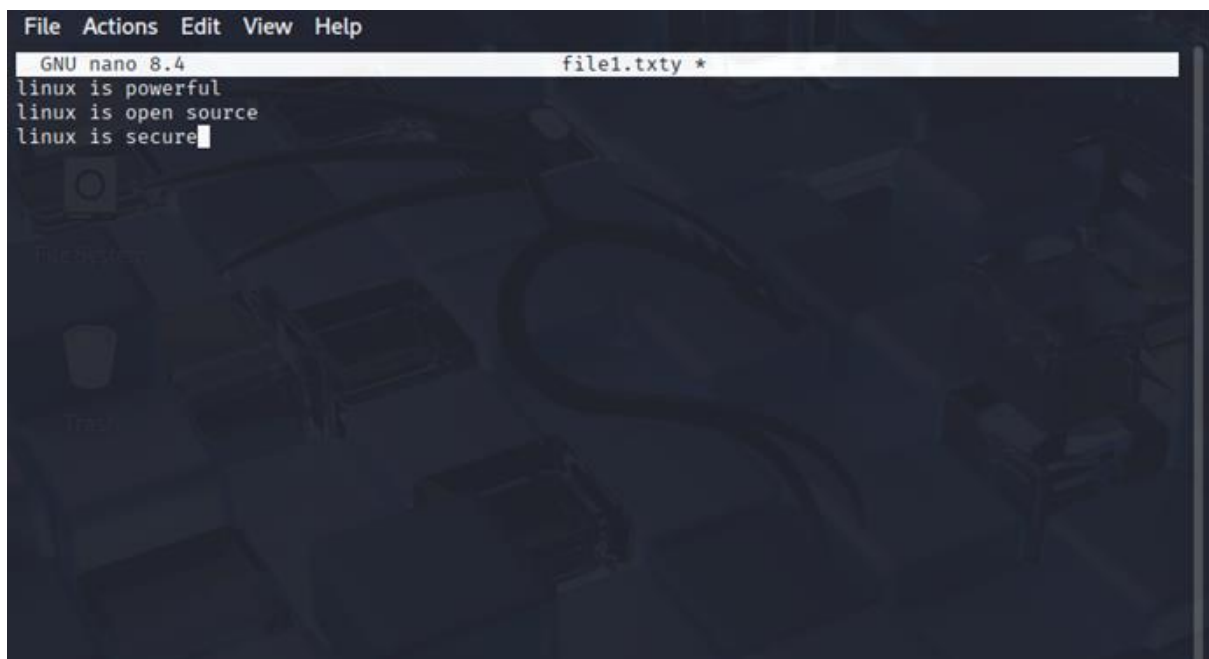
(srishti_m@kali)-[~/linux_lab]
$
```

Step 6: Edit File Using : `nano file1.txt`

- Type some text
- Press **Ctrl + O** → Enter (save)
- Press **Ctrl + X** (exit)

```
(srishti_m@kali)-[~/linux_lab]
$ nano file1.txt

(srishti_m@kali)-[~/linux_lab]
$
```



Step 7: Edit File Using : `vi file2.txt`

```
(srishti_m@kali)-[~]
$ mkdir linux_lab2

(srishti_m@kali)-[~]
$ cd linux_lab2

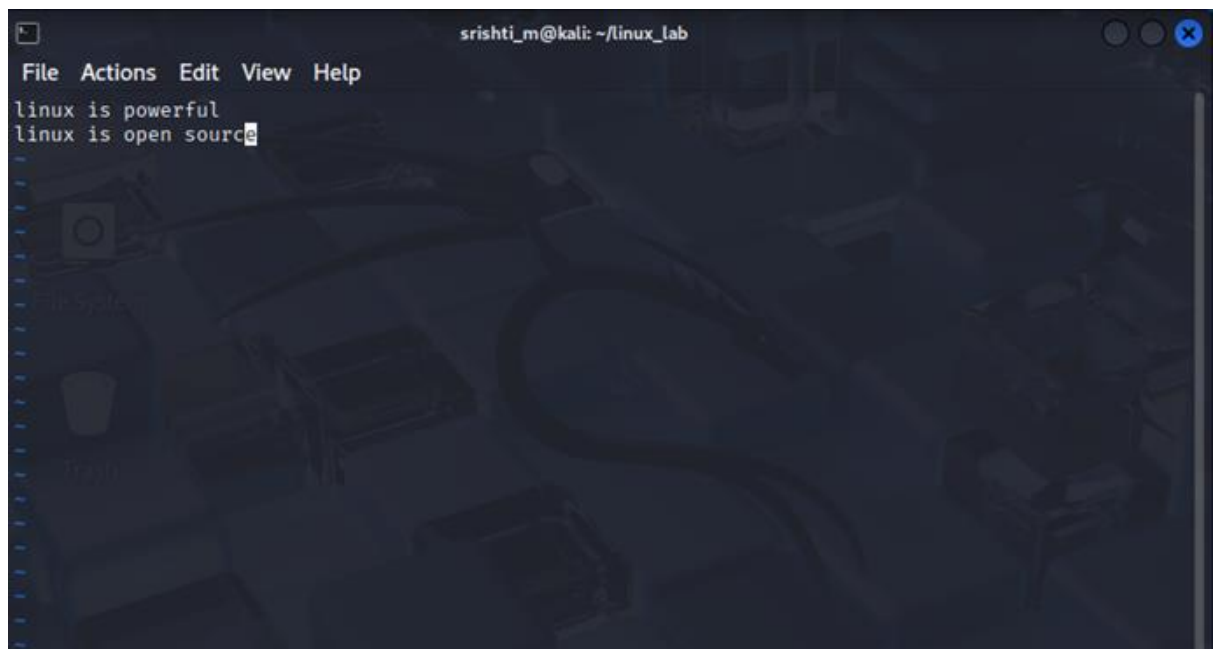
(srishti_m@kali)-[~/linux_lab2]
$ touch file1.txt file2.txt

(srishti_m@kali)-[~/linux_lab2]
$ nano file1.txt

(srishti_m@kali)-[~/linux_lab2]
$ vi file2.txt
```

Then,

- Press **i** to enter insert mode
- Type text
- Press **Esc**
- Type **:wq**
- Press Enter



Step 8: Display File Content Using:

➤ `cat file1.txt`

```
(srishti_m@kali)-[~/linux_lab2]
$ cat file1.txt

(srishti_m@kali)-[~/linux_lab2]
$
```

### Step 9: Check File Permissions

➤ `ls -l`

```
(srishti_m@kali)-[~/linux_lab2]
$ cat file1.txt

(srishti_m@kali)-[~/linux_lab2]
$ ls -l
total 8
-rw-rw-r-- 1 srishti_m srishti_m 0 Feb 20 02:59 file1.txt
-rw-rw-r-- 1 srishti_m srishti_m 55 Feb 20 03:01 file1.txtn
-rw-rw-r-- 1 srishti_m srishti_m 51 Feb 20 03:07 file2.txt

(srishti_m@kali)-[~/linux_lab2]
$
```

### Step 10: Change File Permissions using:

➤ `chmod 755 file1.txt`

```
(srishti_m@kali)-[~/linux_lab2]
$ ls -l
total 8
-rw-rw-r-- 1 srishti_m srishti_m 0 Feb 20 02:59 file1.txt
-rw-rw-r-- 1 srishti_m srishti_m 55 Feb 20 03:01 file1.txtn
-rw-rw-r-- 1 srishti_m srishti_m 51 Feb 20 03:07 file2.txt

(srishti_m@kali)-[~/linux_lab2]
$ chmod 755 file1.txt
```

### Step 11: Verify Updated Permissions Using:

- `ls -l file1.txt`
- we will observe permission format: `-rw-r--r--`

```
(srishti_m@kali)-[~/linux_lab2]
$ chmod 755 file1.txt

(srishti_m@kali)-[~/linux_lab2]
$ ls -l file1.txt
-rwxr-xr-x 1 srishti_m srishti_m 0 Feb 20 02:59 file1.txt

(srishti_m@kali)-[~/linux_lab2]
$
```

## Outcomes

- ✓ Successful creation of directories and files
- ✓ Files edited using `nano` and `vi`
- ✓ File contents displayed using `cat`
- ✓ File permissions viewed and modified using `chmod`

## Result

- ❖ Thus, file and directory management commands were successfully executed in Linux. The student learned to create, edit, and manage files and directories, understand file permissions, and use text editors such as `nano` and `vi`.

