Linux Files & Directories

2 File and Directory Management Commands

How to create a new empty file ?

Linux Files & Directories

2 File and Directory Management Commands

$ touch

How to create a new empty file ?

Linux Files & Directories

2 File and Directory Management Commands

$ touch

```
master@localhost:~/Desktop
File  Edit  View  Search  Terminal  Help
[master@localhost Desktop]$ ls
simpleproject  TestDir2
[master@localhost Desktop]$ touch file1
[master@localhost Desktop]$ ls
file1  simpleproject  TestDir2
[master@localhost Desktop]$
```

Linux Files & Directories

2 File and Directory Management Commands

How to create a new file and add some data?

Linux Files & Directories

2 File and Directory Management Commands

Text Editors

In Linux, **text editors** are programs that allow users to create, view, and modify text files.

- **Command-line** (terminal-based)
  - vim, nano, emacs etc.
- **Graphical** (GUI-based) editors
  - gedit, kate, leafpad etc.

How to create a new file and add some data?

Linux Files & Directories

2 File and Directory Management Commands

$ vim

How to create a new file and add some data?

Command-line based

Linux Files & Directories

2 File and Directory Management Commands

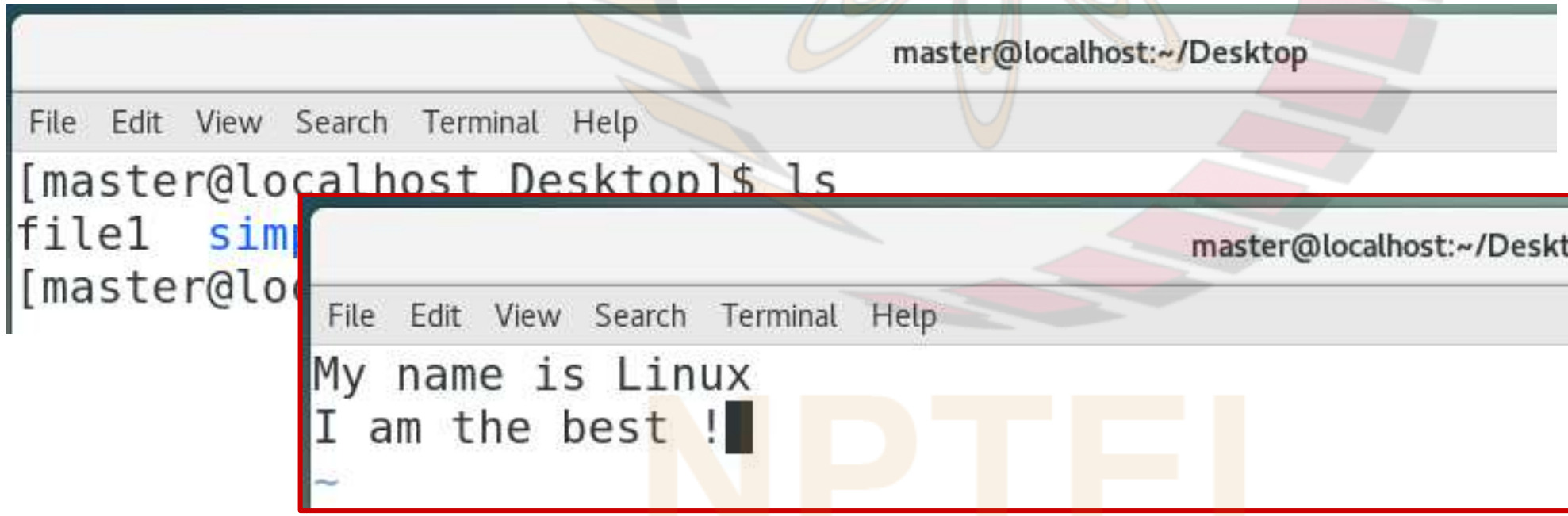
$ vim

```
master@localhost:~/Desktop
File  Edit  View  Search  Terminal  Help
[master@localhost Desktop]$ ls
file1  simpleproject  TestDir2
[master@localhost Desktop]$ vim file2
```

Linux Files & Directories

2 File and Directory Management Commands

$ vim



Linux Files & Directories

2 File and Directory Management Commands

$ vim

```
master@localhost:~/Desktop
File  Edit  View  Search  Terminal  Help
[master@localhost Desktop]$ ls
file1  simpleproject  TestDir2
[master@localhost Desktop]$ vim file2
[master@localhost Desktop]$ ls
file1  file2  simpleproject  TestDir2
[master@localhost Desktop]$ ls -la
total 8
drwxr-xr-x.  4 master master   69 Sep 25 09:49 .
drwx------. 22 master master 4096 Sep 25 09:49 ..
-rw-rw-r--.  1 master master    0 Sep 25 07:35 file1
-rw-rw-r--.  1 master master   33 Sep 25 09:49 file2
drwxr-xr-x.  5 root   root    115 Sep 27  2023 simpleproject
drwxrwxr-x.  3 master master   19 Sep 24 11:27 TestDir2
[master@localhost Desktop]$
```

Linux Files & Directories

2 File and Directory Management Commands

$ gedit

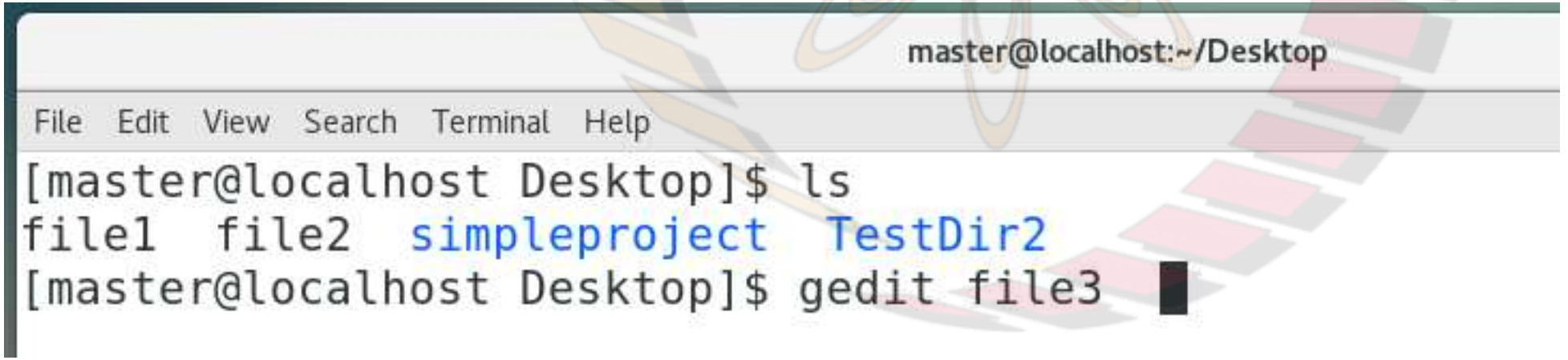
GUI based

How to create a new file and add some data?

Linux Files & Directories

2 File and Directory Management Commands

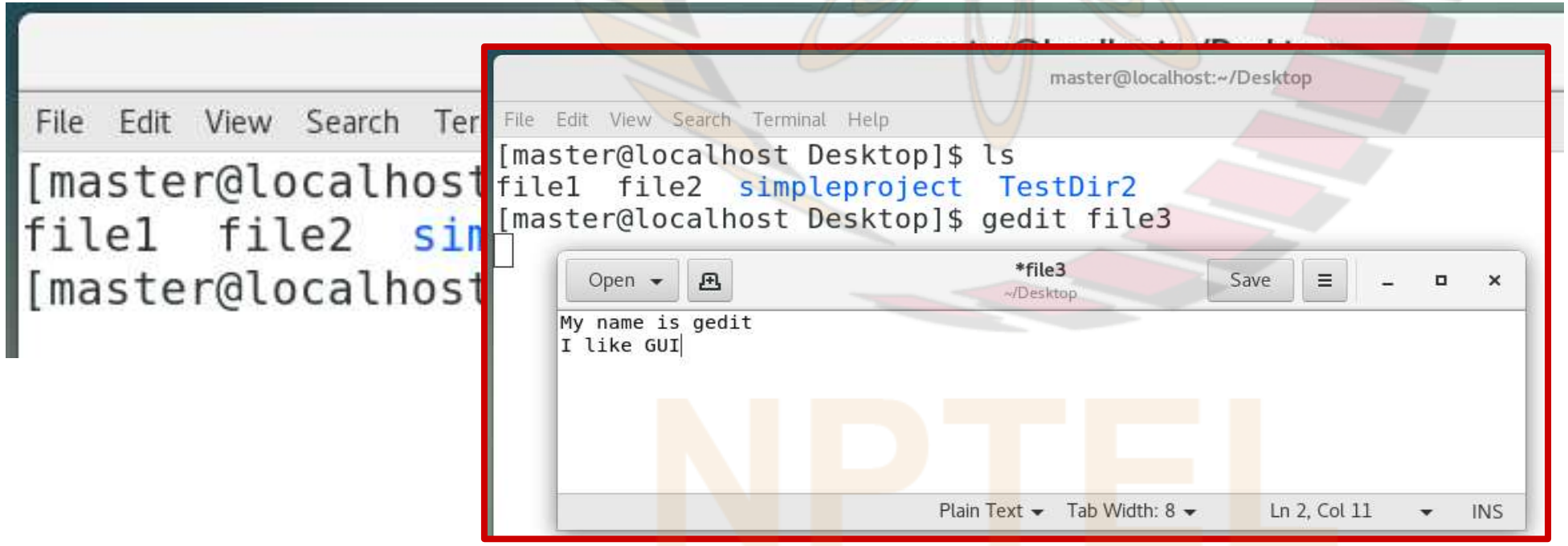
$ gedit



Linux Files & Directories

2 File and Directory Management Commands

$ gedit



Linux Files & Directories

2 File and Directory Management Commands

$ gedit

```
master@localhost:~/Desktop
File  Edit  View  Search  Terminal  Help
[master@localhost Desktop]$ ls
file1  file2  simpleproject  TestDir2
[master@localhost Desktop]$ gedit file3
[master@localhost Desktop]$ ls
file1  file2  file3  simpleproject  TestDir2
[master@localhost Desktop]$ ls -la
total 12
drwxr-xr-x.  4 master master   82 Sep 25 09:56 .
drwx------. 22 master master 4096 Sep 25 09:49 ..
-rw-rw-r--.  1 master master    0 Sep 25 07:35 file1
-rw-rw-r--.  1 master master   33 Sep 25 09:49 file2
-rw-rw-r--.  1 master master   28 Sep 25 09:56 file3
drwxr-xr-x.  5 root   root    115 Sep 27  2023 simpleproject
drwxrwxr-x.  3 master master   19 Sep 24 11:27 TestDir2
[master@localhost Desktop]$
```

Linux Files & Directories

2 File and Directory Management Commands

How to delete a file/dir/subdirectories ?

Linux Files & Directories

2 File and Directory Management Commands

$ rm

How to delete a file/dir/subdirectories ?

Linux Files & Directories

2 File and Directory Management Commands

$ rm

```
master@localhost:~/Desktop
File  Edit  View  Search  Terminal  Help
[master@localhost Desktop]$ ls
file1  file2  file3  simpleproject  TestDir2
[master@localhost Desktop]$ rm file3
[master@localhost Desktop]$ ls
file1  file2  simpleproject  TestDir2
[master@localhost Desktop]$
```

Linux Files & Directories

2 File and Directory Management Commands

$ rm -r

```
master@localhost:~/Desktop
File  Edit  View  Search  Terminal  Help
[master@localhost Desktop]$ ls
file1  file2  simpleproject  TestDir2
[master@localhost Desktop]$ ls TestDir2
child  file4
[master@localhost Desktop]$ rmdir TestDir2
rmdir: failed to remove 'TestDir2': Directory not empty
[master@localhost Desktop]$
```

Linux Files & Directories

2 File and Directory Management Commands

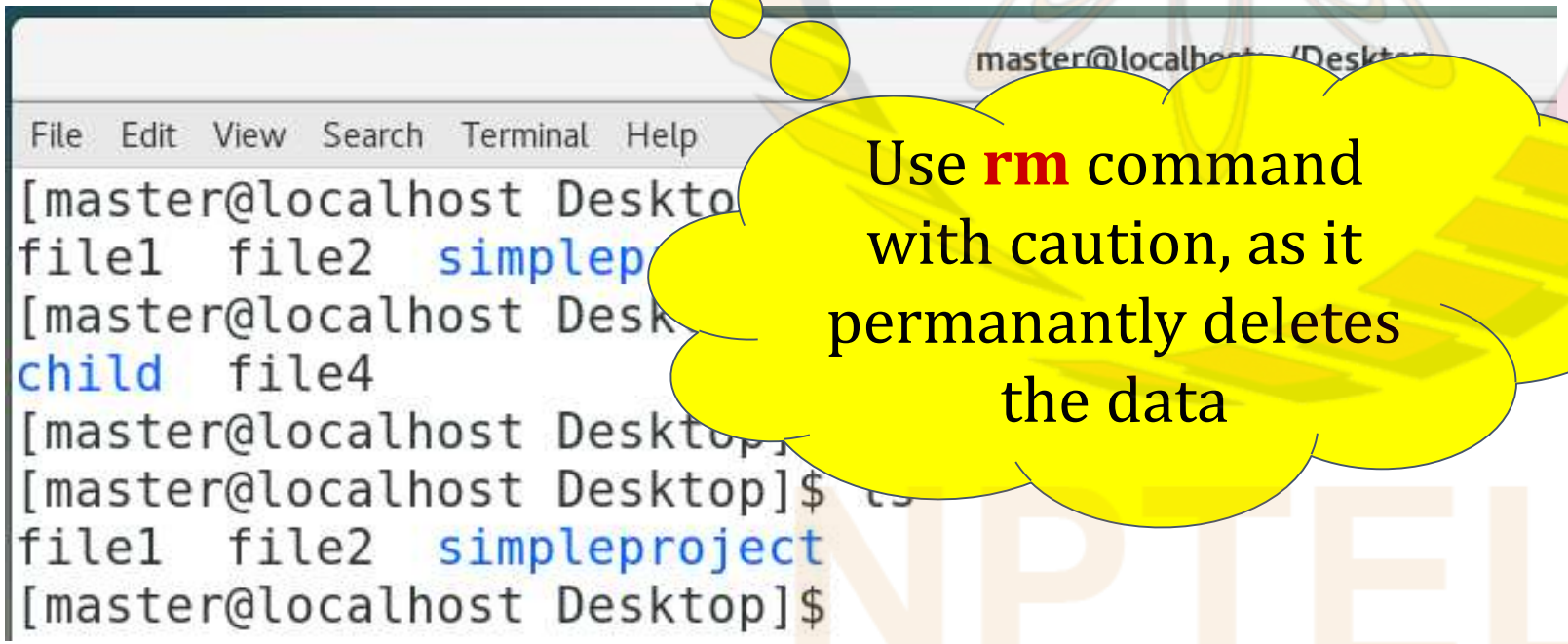
$ rm -r

```
master@localhost:~/Desktop
File  Edit  View  Search  Terminal  Help
[master@localhost Desktop]$ ls
file1  file2  simpleproject  TestDir2
[master@localhost Desktop]$ ls TestDir2
child  file4
[master@localhost Desktop]$ rm -r TestDir2
[master@localhost Desktop]$ ls
file1  file2  simpleproject
[master@localhost Desktop]$
```

Linux Files & Directories

2 File and Directory Management Commands

$ rm -r



Use **rm** command with caution, as it permanantly deletes the data

Linux Files & Directories

2 File and Directory Management Commands

How to display/print the content of a file on terminal?

Linux Files & Directories

2 File and Directory Management Commands

$ cat

How to display/print the content of a file on terminal?

Linux Files & Directories

2 File and Directory Management Commands

$ cat

```
master@localhost:~/Desktop
File  Edit  View  Search  Terminal  Help
[master@localhost Desktop]$ ls
file1  file2  simpleproject
[master@localhost Desktop]$ cat file2
My name is Linux
I am the best !
[master@localhost Desktop]$
```

Linux Files & Directories

2 File and Directory Management Commands

$ cat

```
master@localhost:~/Desktop
File  Edit  View  Search  Terminal  Help
[master@localhost Desktop]$ ls
file1  file2  file3  simpleproject
[master@localhost Desktop]$ cat file2 file3
My name is Linux
I am the best !
Hello from GNU
I am Open Source !
[master@localhost Desktop]$
```

Concatenation: Join multiple files and display them together

Linux Files & Directories

2 File and Directory Management Commands

$ cat

```
[master@localhost Desktop]$ ls
fil3-bk  file1  file2  file3  simpleproject  Test  test.sh
[master@localhost Desktop]$ cat file2 file3 > file4
[master@localhost Desktop]$ ls
fil3-bk  file1  file2  file3  file4  simpleproject  Test  test.sh
[master@localhost Desktop]$ cat file4
My name is Linux
I am the best !
Hello from GNU
I am Open Source !
[master@localhost Desktop]$
```

Linux Files & Directories

2 File and Directory Management Commands

$ cat

```
[master@localhost Desktop]$ cat file2 file3 > file4
[master@localhost Desktop]$ cat file4
My name is Linux
I am the best !
Hello from GNU
I am Open Source !
[master@localhost Desktop]$ cat file2 file3 >> file4
[master@localhost Desktop]$ cat file4
My name is Linux
I am the best !
Hello from GNU
I am Open Source !
My name is Linux
I am the best !
Hello from GNU
I am Open Source !
[master@localhost Desktop]$
```

Linux Files & Directories

2 File and Directory Management Commands

How to copy files/directories ?

Linux Files & Directories

2 File and Directory Management Commands

$ cp

How to copy files/directories ?

Linux Files & Directories

2 File and Directory Management Commands

$ cp

```
[master@localhost Desktop]$ ls
file1  file2  file3  simpleproject
[master@localhost Desktop]$ cat file3
Hello from GNU
I am Open Source !
[master@localhost Desktop]$ cp file3 file4
[master@localhost Desktop]$ ls
file1  file2  file3  file4  simpleproject
[master@localhost Desktop]$ cat file4
Hello from GNU
I am Open Source !
[master@localhost Desktop]$
```

Linux Files & Directories

2 File and Directory Management Commands

$ cp -r

```
[master@localhost Desktop]$ ls
file1  file2  file3  file4  simpleproject
[master@localhost Desktop]$ ls simpleproject
package.json  public  README.md  src  yarn.lock
[master@localhost Desktop]$ cp -r simpleproject project2
[master@localhost Desktop]$ ls
file1  file2  file3  file4  project2  simpleproject
[master@localhost Desktop]$ ls project2
package.json  public  README.md  src  yarn.lock
[master@localhost Desktop]$
```

Linux File's Permissions and Ownerships

Linux Files Authorization

3 File Permissions and Ownership Commands

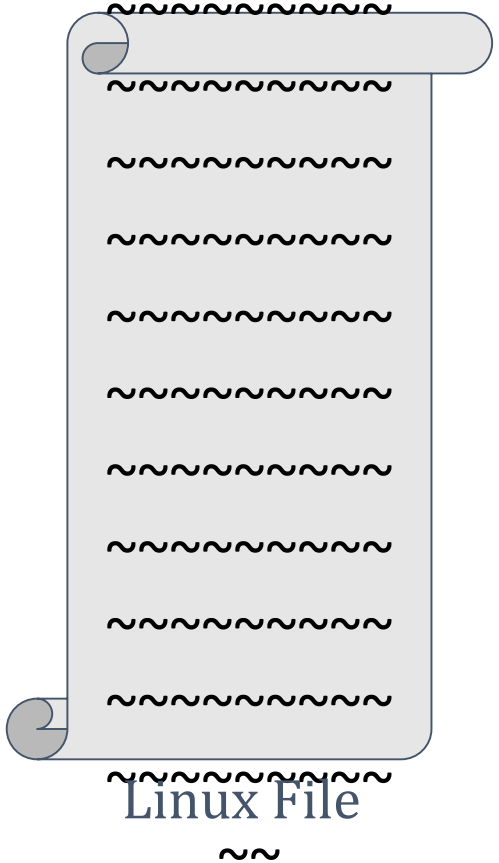
Linux Files Authorization

3 File Permissions and Ownership Commands

- It is a fundamental part of Linux's security and management.
- These commands are used to manage file permissions, ownership, and access control
- In Linux, file permissions and ownership determine who can access and modify files and directories

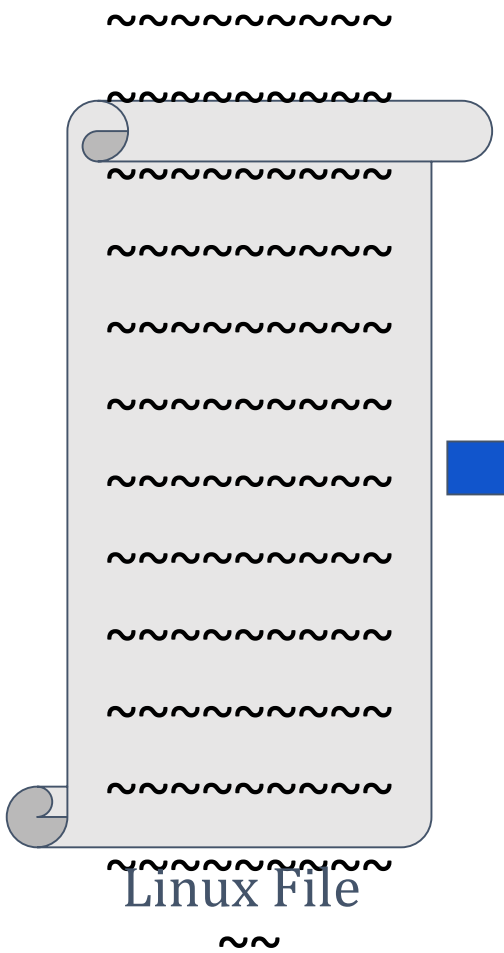
Linux Files Authorization

3 File Permissions and Ownership Commands



Linux Files Authorization

3 File Permissions and Ownership Commands

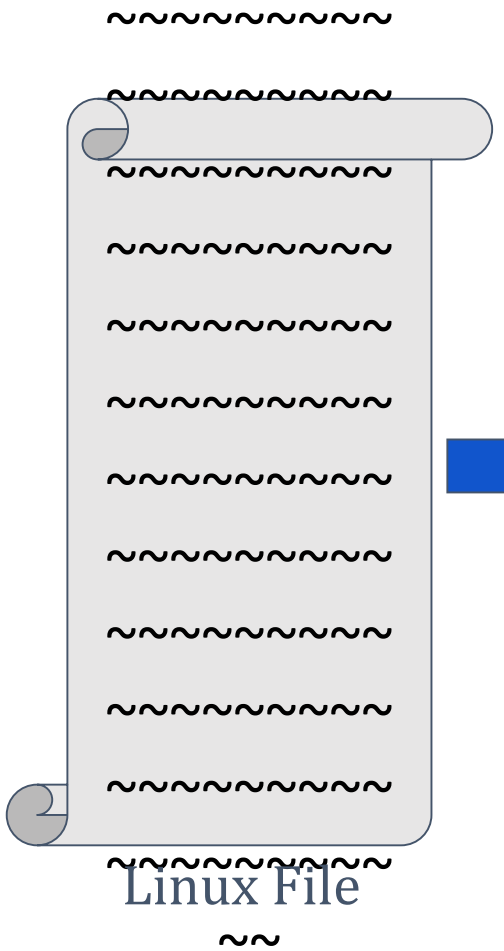


File permissions are defined for **three categories** of **users**:

- **Owner (user)**: The person who owns the file.
- **Group**: A group of users who share access to the file.
- **Others**: Everyone else.

Linux Files Authorization

3 File Permissions and Ownership Commands

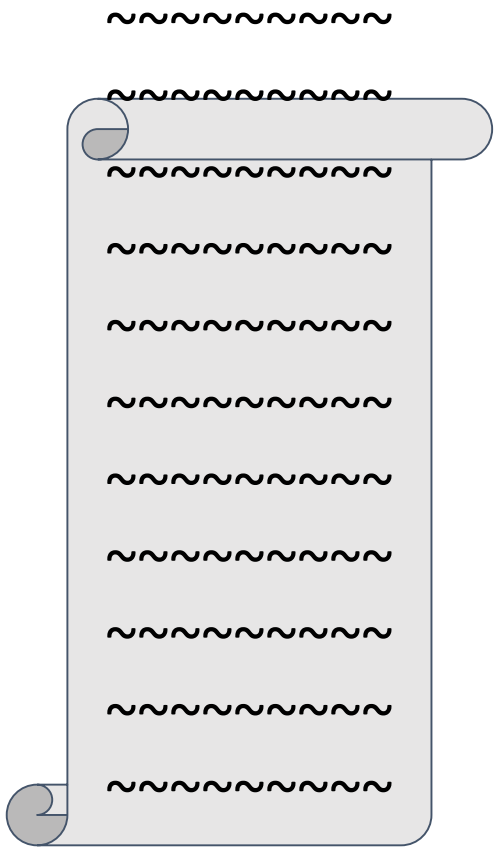


Permissions are divided into three types:

- **Read (r):** Permission to view or read the file's contents.
- **Write (w):** Permission to modify the file or directory.
- **Execute (x):** Permission to execute the file (for scripts and programs) or traverse a directory.

Linux Files Authorization

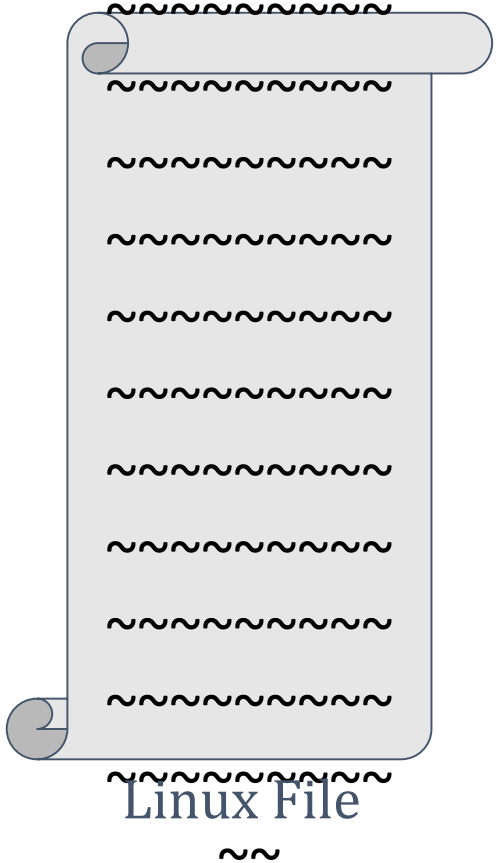
3 File Permissions and Ownership Commands



File Permission Structure: The permission structure is usually displayed in a **10-character** format

Linux Files Authorization

3 File Permissions and Ownership Commands

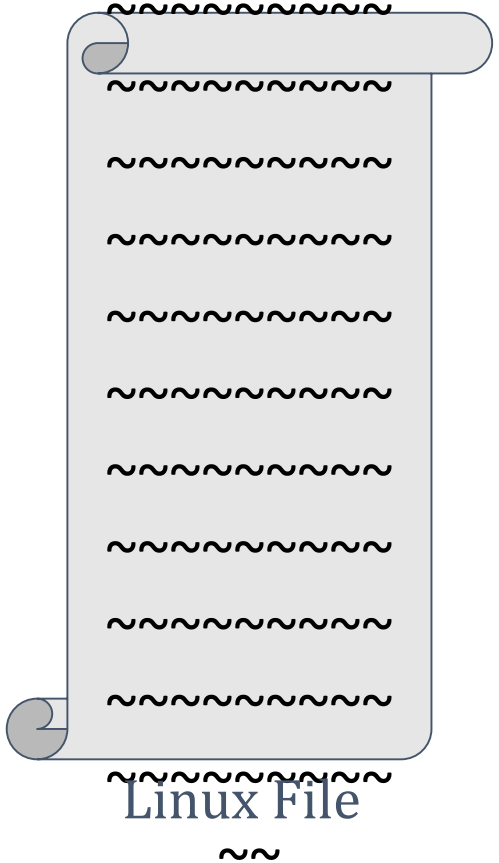


File Permission Structure: The permission structure is usually displayed in a **10-character** format

```
-  rwx  r-x  r--
```

Linux Files Authorization

3 File Permissions and Ownership Commands

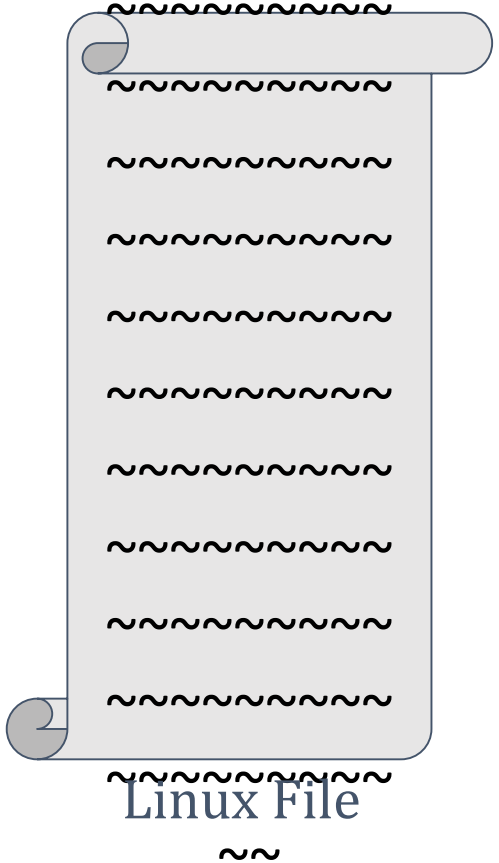


File Permission Structure: The permission structure is usually displayed in a **10-character** format

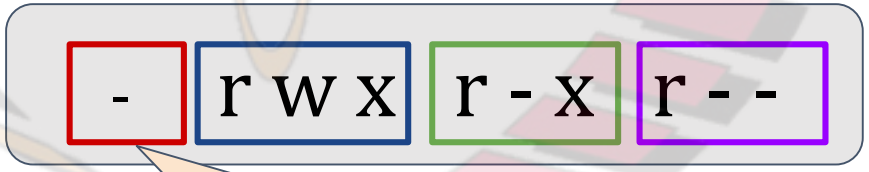
-	r w x	r - x	r - -

Linux Files Authorization

3 File Permissions and Ownership Commands



File Permission Structure: The permission structure is usually displayed in a **10-character** format



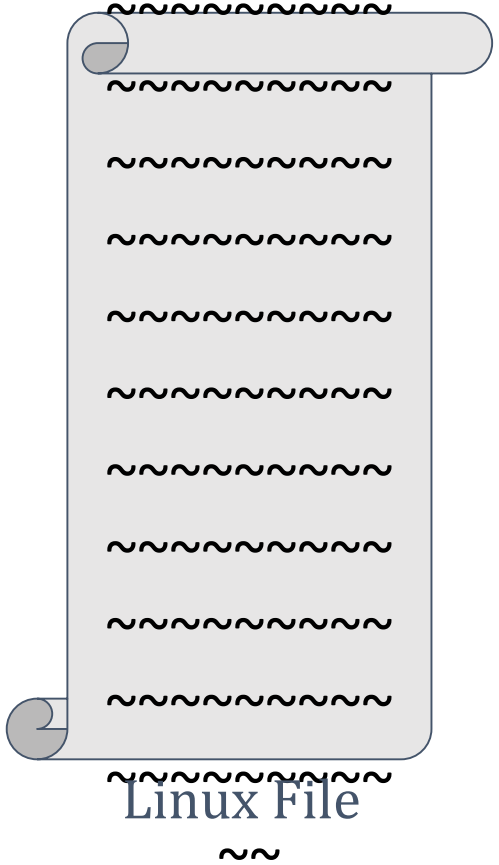
The first character shows the **type**

- : for a regular file

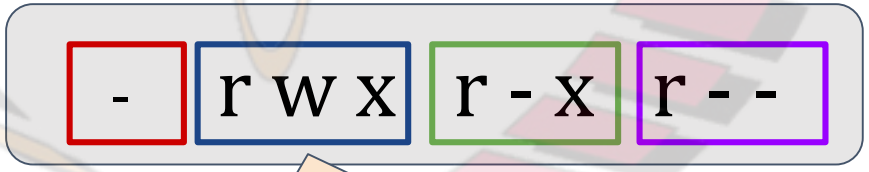
d : for a directory

Linux Files Authorization

3 File Permissions and Ownership Commands



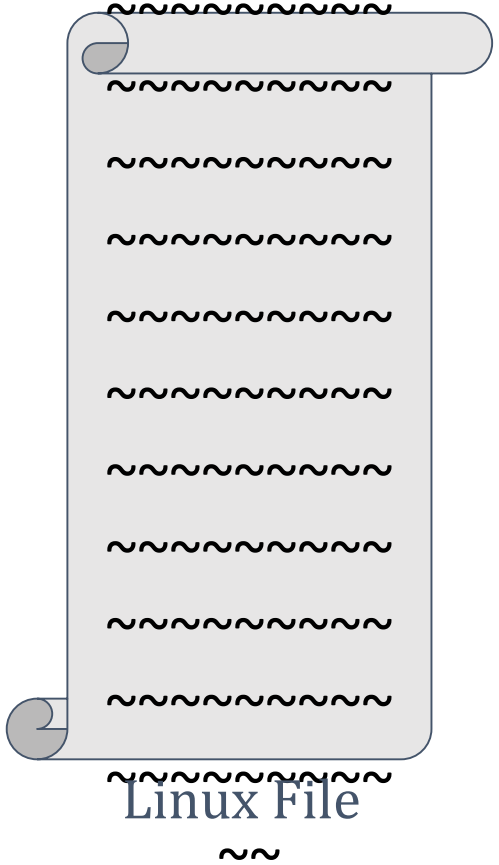
File Permission Structure: The permission structure is usually displayed in a **10-character** format



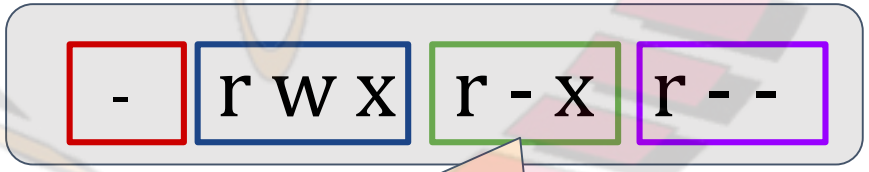
The next three characters (rwx) are the permissions for the **owner**

Linux Files Authorization

3 File Permissions and Ownership Commands



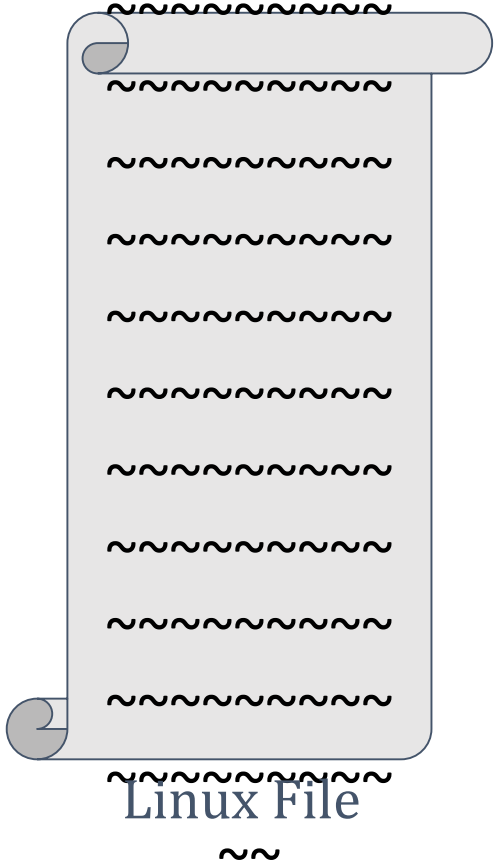
File Permission Structure: The permission structure is usually displayed in a **10-character** format



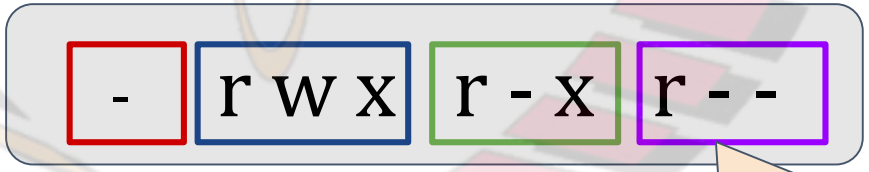
The next three characters (r-x) are the permissions for the **group**

Linux Files Authorization

3 File Permissions and Ownership Commands



File Permission Structure: The permission structure is usually displayed in a **10-character** format



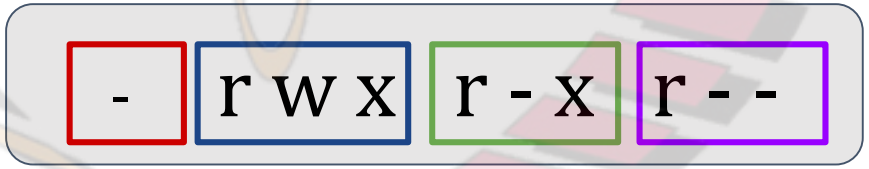
The next three characters (r - -) are the permissions for the **others**

Linux Files Authorization

3 File Permissions and Ownership Commands

Linux File

File Permission Structure: The permission structure is usually displayed in a **10-character** format




```
[master@localhost TestDir]$ ls -la
total 12
drwxrwxr-x.  3 master master   45 Sep 26 07:28 .
drwx------. 23 master master 4096 Sep 26 06:25 ..
drwxrwxr-x.  2 master master   20 Sep 26 06:25 dir1
-rwxrwxr-x.  1 master master   25 Sep 26 06:25 exe.sh
-rw-rw-r--.  1 master master   35 Sep 26 06:24 file1
[master@localhost TestDir]$
```

Linux Files Authorization

3 File Permissions and Ownership Commands

How to change the permission of a file ?

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chmod

How to change the permission of a file ?

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chmod

Permissions can be set using **symbolic** or **numeric (octal)** notation.

symbolic

Using Symbolic Notation:

- `r` = read, `w` = write, `x` = execute
- `u` = user (owner), `g` = group, `o` = others, `a` = all

- chmod u+x file.txt # Adds execute permission for the **owner/user**
- chmod g-w file.txt # Removes write permission from the **group**
- chmod a+r file.txt # Gives read permission to **all**

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chmod

Permissions can be set using **symbolic** or **numeric (octal)** notation.

Numeric

Using Numeric (Octal) Notation:

- `4` = read, `2` = write, `1` = execute
- Combine the values for each category of users (owner, group, others).

- chmod 755 file.txt # rwxr-xr-x (**owner:** read, write, execute; **group:** read, execute; **others:** read, execute)
- chmod 644 file.txt # rw-r--r-- (**owner:** read, write; **group:** read; **others:** read)

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chmod

```
[master@localhost Desktop]$ ls -l
total 4
-rw-rw-r--. 1 master master   0 Sep 25 07:35 file1
-rw-rw-r--. 1 master master  33 Sep 25 09:49 file2
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$ chmod +x file2
[master@localhost Desktop]$ ls -l
total 4
-rw-rw-r--. 1 master master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master master  33 Sep 25 09:49 file2
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$
```

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chmod

```
[master@localhost Desktop]$ ls -l
total 4
-rw-rw-r--. 1 master master   0 Sep 25 07:35 file1
-rw-rw-r--. 1 master master  33 Sep 25 09:49 file2
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$ chmod +x file2
[master@localhost Desktop]$ ls -l
total 4
-rw-rw-r--. 1 master master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master master  33 Sep 25 09:49 file2
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$
```

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chmod

```
[master@localhost Desktop]$ ls -l
total 4
-rw-rw-r--. 1 master master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master master  33 Sep 25 09:49 file2
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$ chmod 777 file1
[master@localhost Desktop]$ ls -l
total 4
-rwxrwxrwx. 1 master master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master master  33 Sep 25 09:49 file2
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$
```

Linux Files Authorization

3 File Permissions and Ownership Commands

How to change the owner of a file ?

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chown

How to change the owner of a file ?

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chown

```
[master@localhost Desktop]$ ls -l
total 4
-rwxrwxrwx. 1 master master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master master  33 Sep 25 09:49 file2
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$ touch file3
[master@localhost Desktop]$ ls -l
total 4
-rwxrwxrwx. 1 master master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master master  33 Sep 25 09:49 file2
-rw-rw-r--. 1 master master   0 Oct  1 06:08 file3
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$
```

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chown

```
[master@localhost Desktop]$ ls -l
total 4
-rwxrwxrwx. 1 master master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master master  33 Sep 25 09:49 file2
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$ touch file3
[master@localhost Desktop]$ ls -l
total 4
-rwxrwxrwx. 1 master master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master master  33 Sep 25 09:49 file2
-rw-rw-r--. 1 master master   0 Oct  1 06:08 file3
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$
```

The user who creates file, is the default owner of the file

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chown

Syntax

chown <owner>:<group> <file>

```
[master@localhost Desktop]$ ls -l
total 4
-rwxrwxrwx. 1 master master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master master  33 Sep 25 09:49 file2
-rw-rw-r--. 1 master master   0 Oct  1 06:08 file3
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[master@localhost Desktop]$
```

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chown

Syntax

chown <owner>:<group> <file>

```
[master@localhost Desktop]$ ls -l
total 4
-rwxrwxrwx. 1 master master   0 Se
-rwxrwxr-x. 1 master master  33 Se
-rw-rw-r--. 1 master master   0 Oc
drwxr-xr-x. 5 root   root   115 Se
[master@localhost Desktop]$
```

```
[master@localhost Desktop]$ groups
master wheel shadow
[master@localhost Desktop]$
```

Linux Files Authorization

3 File Permissions and Ownership Commands

$ chown

```
File  Edit  View  Search  Terminal  Help
[root@localhost Desktop]# ls -l
total 4
-rwxrwxrwx. 1 master master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master master  33 Sep 25 09:49 file2
-rw-rw-r--. 1 master master   0 Oct  1 06:08 file3
drwxr-xr-x. 5 root   root   115 Sep 27  2023 simpleproject
[root@localhost Desktop]# chown minion1:shadow file3
[root@localhost Desktop]# ls -l
total 4
-rwxrwxrwx. 1 master  master   0 Sep 25 07:35 file1
-rwxrwxr-x. 1 master  master  33 Sep 25 09:49 file2
-rw-rw-r--. 1 minion1 shadow   0 Oct  1 06:08 file3
drwxr-xr-x. 5 root    root   115 Sep 27  2023 simpleproject
[root@localhost Desktop]#
```