

Linux File Permissions

Ownership:

Every file and directory in Linux is tied to an owner and a group. The owner is usually the user who created the file, while the group comprises users with similar access privileges.

Permission Types:

- **Read (r)** – View file contents or list directory
- **Write (w)** – Modify file contents or create/delete files in a directory
- **Execute (x)** – Run a file as a program or enter a directory

Permission Levels:

Permissions are set for three user classes: owner, group, and others.

- **Owner (u)**: The user who owns the file.
- **Group (g)**: Users belonging to the same group as the file.
- **Others (o)**: All remaining users on the system.

Viewing File Permissions

To view the file permission, use the **ls** command with **-l** option:

```
(kali@kali) ~/Desktop
$ ls -l filename
```

Replace the filename with the file and folder like this:

```
(kali@kali) ~/Desktop
$ ls -l 445.txt
```

Running **ls -l** yields an outputs like this:

```
-rw-rw-r-- 1 kali kali 1648 Mar 10 15:03 445.txt
```

Output explanation:

1. File Type and permissions: -rw-rw-r—

The first characters indicates the file type (-for a regular file or d for directory). The next nine characters represent permissions for owner, group, and others.

2. Number of Links: 1

Shows the number of the hard links to the file.

3. Owner: kali

Specifies the user who owns the file.

4. Group: kali

Indicates the group associated with the file.

5. File Size: 1648

Displays the size of the file in bytes.

6. Last Modified: Mar 10 15:03

Indicates the date and time when the file was last modified.

7. File/Directory Name: 445.txt

Specifies the name of the file or directory.

Setting File Permission:

To set file permissions, use the **chmod** command:

Chmod who=(-,+)permissions file

Here:

- 'Who' represents the users whose permissions you want to change.
- 'permissions' denotes the permissions you want to assign.
- 'file' specifies the file or directory whose permission you want to modify.

For example:

```
chmod u+r 445.txt
```

this command grants the user (owner) of "445.txt" read permission

Changing Ownership

chown kali:kali 445.txt – Changes the file owner and group

Example:

```
chmod 750 445.txt
```

- Owner: rw- (6)
- Group: r-x (5)
- Others: --- (0)