

File permissions in Linux

Google Cybersecurity Cohort 2025 Completed by Carla Jacobsen

Project description

I learned about file permissions, including of hidden files in linux using `ls -la`. I fixed the incorrect permissions of files and directories using `chmod`.

Check file and directory details

`ls -la`

```
researcher2@          :~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 20:32 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 20:52 ..
-rw--w---- 1 researcher2 research_team  46 Aug 28 20:32 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 28 20:32 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Aug 28 20:32 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Aug 28 20:32 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 28 20:32 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 28 20:32 project_t.txt
```

Describe the permissions string

Drafts `drwx--x---`

d: Drafts is a directory

User permissions:

The user is researcher2

r: user can read all files and subdirectories in drafts

w: user can create files in drafts

x: user can access drafts and the files located within

Group permissions:

The group is research_team

r: the group can't read files and subdirectories in drafts

w: the group can't create files in drafts

x: the group can access drafts and the files located within

Other permissions:

The others is anyone outside research_team

r: other can't read files and subdirectories in drafts

w: other can't create files in drafts

x: other can't access drafts and the files located within

project_r.txt -rw-rw-r--

-: project_r.txt is a file

User permissions:

The user is researcher2

r: user can read project_r.txt

w: user can modify project_r.txt

x: user can't execute project_r.txt

Group permissions:

The group is research_team

r: the group can modify project_r.txt

w: the group can't create files in drafts

x: the group can't execute project_r.txt

Other permissions:

The others is anyone outside research_team

r: other can read project_r.txt

w: other can't modify project_r.txt

x: other can't execute project_r.txt

Change file permissions

```
ls -la
```

```
ls -la | grep k
```

```
researcher2@ :~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 20:56 .
drwxr-xr-x 3 researcher2 research_team 4096 Aug 28 21:44 ..
-rw--w---- 1 researcher2 research_team  46 Aug 28 20:56 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Aug 28 20:56 drafts
-rw-rw-rw- 1 researcher2 research_team  46 Aug 28 20:56 project_k.txt
-rw-r----- 1 researcher2 research_team  46 Aug 28 20:56 project_m.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 28 20:56 project_r.txt
-rw-rw-r-- 1 researcher2 research_team  46 Aug 28 20:56 project_t.txt
researcher2@ :~/projects$ ls -la | grep k
-rw-rw-rw- 1 researcher2 research_team  46 Aug 28 20:56 project_k.txt
```

`chmod o-w project_k.txt`

```
researcher2@ :~/projects$ chmod o-w project_k.txt
researcher2@ :~/projects$ ls -la | grep k
-rw-rw-r-- 1 researcher2 research_team  46 Aug 28 20:56 project_k.txt
```

Change file permissions on a hidden file

```
researcher2@ :~/projects$ ls -la | grep .project_x.txt
-rw--w---- 1 researcher2 research_team  46 Aug 28 20:56 .project_x.txt
```

`chmod u-w,g=r .project_x.txt`

```
researcher2@ :~/projects$ ls -la | grep .project_x.txt
-r--r----- 1 researcher2 research_team  46 Aug 28 20:56 .project_x.txt
```

Change directory permissions

```
researcher2@ :~/projects$ ls -l | grep drafts
drwx--x--- 2 researcher2 research_team 4096 Aug 28 20:56 drafts
```

`chmod g-x drafts`

```
researcher2@ :~/projects$ chmod g-x drafts/
researcher2@ :~/projects$ ls -l | grep drafts
drwx----- 2 researcher2 research_team 4096 Aug 28 20:56 drafts
```

Summary

Some files and directories had incorrect permissions. I corrected them using `chmod`. This is important because people shouldn't be able to access files and directories they don't need for their job because this is a security risk.