File permissions in Linux

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Project description

My organization's research team needs to update file permissions for specific files and directories within the `projects` folder. The current permissions don't align with the required authorization levels. Reviewing and modifying these permissions will help maintain system security. To complete this task, I took the following steps

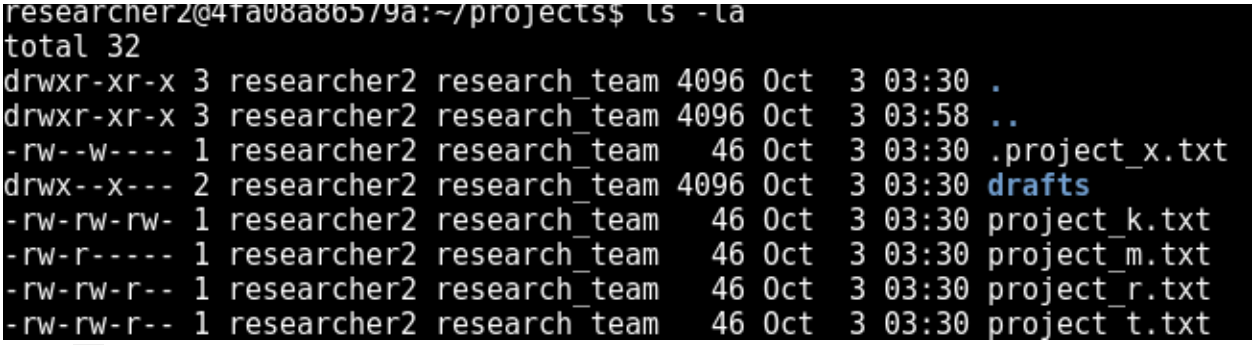
Check file and directory details

First, it was necessary to check the current file permissions using the command `$ ls -la`.

This command shows a 10-character string representing the file permissions. The first character indicates the file type (- for a regular file and d for a directory). The following nine characters represent the permissions for the User, Group, and Others, where r stands for read, w for write, and x for execute.

In the `/home/researcher2/projects` directory, there are five files with the following

names and permissions:



- `project_k.txt`
  - User = read, write,
  - Group = read, write
  - Other = read, write
- `project_m.txt`
  - User = read, write

    - Group = read
    - Other = none
- `project_r.txt`
    - User= read, write
    - Group = read, write
    - Other = read
- `project_t.txt`
    - User = read, write
    - Group = read, write
    - Other = read
- `.project_x.txt`
    - User = read, write
    - Group = write
    - Other = none

There is also one subdirectory inside the `projects` directory named `drafts`. The permissions on `drafts` are:

- User = read, write, execute
- Group = execute
- Other = none

Change file permissions

Now, focusing on the file project_k.txt, which did not follow the least privilege principle for 'others' as required by this project, I identified its permissions and changed them accordingly with the command `chmod`:

```
researcher2@4fa08a86579a:~/projects$ ls -l project_k.txt
-rw-rw-rw- 1 researcher2 research_team 46 Oct  3 03:30 project_k.txt
researcher2@4fa08a86579a:~/projects$ chmod o-w project_k.txt
researcher2@4fa08a86579a:~/projects$ ls -l project_k.txt
-rw-rw-r-- 1 researcher2 research_team 46 Oct  3 03:30 project_k.txt
```

Now, this file is declared as follow:
`project_k.txt`

- User = read, write.
- Group = read, write.
- Others = read.

On the other hand, it was mandatory to establish read and write permissions for the user on the `project_m.txt` file:

```
researcher2@4fa08a86579a:~/projects$ ls -l project_m.txt
-rw-r----- 1 researcher2 research_team 46 Oct  3 03:30 project_m.txt
researcher2@4fa08a86579a:~/projects$ chmod g-r project_m.txt
researcher2@4fa08a86579a:~/projects$ ls -l project_m.txt
-rw------- 1 researcher2 research_team 46 Oct  3 03:30 project_m.txt
researcher2@4fa08a86579a:~/projects$
```

- `project_m.txt`
    - User = read, write
    - Group = none
    - Other = none

Change file permissions on a hidden file

Similarly, following the internal protocol for the hidden file `.project_x.txt`, it was mandatory to grant only read permissions to the user and group, as follows:

```
researcher2@4fa08a86579a:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@4fa08a86579a:~/projects$ ls -l .project_x.txt
-r--r----- 1 researcher2 research_team 46 Oct  3 03:30 .project_x.txt
researcher2@4fa08a86579a:~/projects$
```

- `.project_x.txt`
    - User = read.
    - Group = read.
    - Other = none

Change directory permissions

Finally, instructions were given to change the permissions for the drafts directory. For this purpose, the command `ls -l` was not providing the intended result due to a nuance of the command; thus, it was necessary to use the -d option, i.e., `ls -ld`, in order to obtain the permissions of the folder itself.

```
researcher2@4fa08a86579a:~/projects$ ls -ld drafts
drwx--x--- 2 researcher2 research_team 4096 Oct  3 03:30 drafts
researcher2@4fa08a86579a:~/projects$ chmod g-x drafts
researcher2@4fa08a86579a:~/projects$ ls -ld drafts
drwx------ 2 researcher2 research_team 4096 Oct  3 03:30 drafts
```

Then, as with the other tasks, the permissions were changed as instructed: granting only read, write, and execute permissions to the user researcher2

Summary

This project provided hands-on experience in using basic Bash commands to accomplish the following tasks:

- **Examine file and directory permissions**
- **Change permissions on files**
- **Change permissions on directories**