

File permissions in Linux

Project description

As a security analyst, I'm tasked with making sure the correct permissions are in place for all users, groups, and others.

Check file and directory details

← Activity: Manage authorization

740 pts 25th

Task 1. Check file and directory details

In this task, you must explore the permissions of the `projects` directory and the files it contains. The lab starts with `/home/researcher2` as the current working directory. This is because you're changing permissions for files and directories belonging to the `researcher2` user.

1. Navigate to the `projects` directory.
2. List the contents and permissions of the `projects` directory.

The permissions of the files in the `projects` directory are as follows:

```
total 20
drwx--x--- 2 researcher2 research_team 4096 Jan 24 18:43 drafts
-rw-rw-rw- 1 researcher2 research_team 46 Jan 24 18:43 project_k.txt
-rw-r----- 1 researcher2 research_team 46 Jan 24 18:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_t.txt
```

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First, a security analyst should check to see what permissions are in place for everyone. When using Linux, `ls -l` will allow the user to see everyone's permissions in a directory.

Describe the permissions string

Current file permissions

This document displays the file structure of the `/home/researcher2/projects` directory and the permissions of the files and subdirectory it contains.

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

Permission strings are used to describe who can view and make changes to what material. When reading linux, the 10 strings of letter/dashes will represent what level of authority a user has. The first string will be the directory. The 2-4th strings will represent the users. 5th-7th is in charge of the groups. Lastly, the 8th-10th describe others' permissions.

Change file permissions

← Activity: Manage authorization

```
researcher2@47124792c083:~$ cd projects
researcher2@47124792c083:~/projects$ ls -l
total 20
drwx-x--- 2 researcher2 research team 4096 Jan 24 18:43 drafts
-rw-rw---- 1 researcher2 research team 46 Jan 24 18:43 project_k.txt
-rw-r----- 1 researcher2 research team 46 Jan 24 18:43 project_m.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_r.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_t.txt
researcher2@47124792c083:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research team 4096 Jan 24 18:43 .
drwxr-xr-x 3 researcher2 research team 4096 Jan 24 19:48 ..
-rw-rw---- 1 researcher2 research team 46 Jan 24 18:43 .project_x.txt
drwx-x--- 2 researcher2 research team 4096 Jan 24 18:43 drafts
-rw-rw-rw- 1 researcher2 research team 46 Jan 24 18:43 project_k.txt
-rw-r----- 1 researcher2 research team 46 Jan 24 18:43 project_m.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_r.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_t.txt
researcher2@47124792c083:~/projects$ chmod o-w project_k.txt
researcher2@47124792c083:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research team 4096 Jan 24 18:43 .
drwxr-xr-x 3 researcher2 research team 4096 Jan 24 19:48 ..
-rw-rw---- 1 researcher2 research team 46 Jan 24 18:43 .project_x.txt
drwx-x--- 2 researcher2 research team 4096 Jan 24 18:43 drafts
-rw-rw-rw- 1 researcher2 research team 46 Jan 24 18:43 project_k.txt
-rw-r----- 1 researcher2 research team 46 Jan 24 18:43 project_m.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_r.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_t.txt
researcher2@47124792c083:~/projects$
```

3. The file `project_m.txt` is a restricted file and should not be readable or writable by the group or other; only the user should have these permissions on this file. List the contents and permissions of the current directory and check if the group has read or write permissions.

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What are the group permissions on the `project_m.txt` file?

☐ Read, write, and execute

☒ Read only

☐ Read and write

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4. Use the `chmod` command to change permissions of the `project_m.txt` file so that the group doesn't have read or write permissions.

Click **Check my progress** to verify that you have completed this task correctly.

Changing the permissions for a file/directory requires the use of `chmod` in linux and then adding or subtracting the level of access the user requires.

Change file permissions on a hidden file

```
drwxr-xr-x 3 researcher2 research team 4096 Jan 24 18:43 .
drwxr-xr-x 3 researcher2 research team 4096 Jan 24 19:48 ..
-rw-rw---- 1 researcher2 research team 46 Jan 24 18:43 .project_x.txt
drwx-x--- 2 researcher2 research team 4096 Jan 24 18:43 drafts
-rw-rw-rw- 1 researcher2 research team 46 Jan 24 18:43 project_k.txt
-rw-r----- 1 researcher2 research team 46 Jan 24 18:43 project_m.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_r.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_t.txt
researcher2@47124792c083:~/projects$ chmod g-r project_m.txt
researcher2@47124792c083:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research team 4096 Jan 24 18:43 .
drwxr-xr-x 3 researcher2 research team 4096 Jan 24 19:48 ..
-rw-rw---- 1 researcher2 research team 46 Jan 24 18:43 .project_x.txt
drwx-x--- 2 researcher2 research team 4096 Jan 24 18:43 drafts
-rw-rw-rw- 1 researcher2 research team 46 Jan 24 18:43 project_k.txt
-rw-r----- 1 researcher2 research team 46 Jan 24 18:43 project_m.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_r.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_t.txt
researcher2@47124792c083:~/projects$ chmod u-w,g-w,gtr .project_x.txt
researcher2@47124792c083:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research team 4096 Jan 24 18:43 .
drwxr-xr-x 3 researcher2 research team 4096 Jan 24 19:48 ..
-r--r--r-- 1 researcher2 research team 46 Jan 24 18:43 .project_x.txt
drwx-x--- 2 researcher2 research team 4096 Jan 24 18:43 drafts
-rw-rw-rw- 1 researcher2 research team 46 Jan 24 18:43 project_k.txt
-rw-r----- 1 researcher2 research team 46 Jan 24 18:43 project_m.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_r.txt
-rw-rw-r-- 1 researcher2 research team 46 Jan 24 18:43 project_t.txt
researcher2@47124792c083:~/projects$
```

2. Change the permissions of the file `.project_x.txt` so that both the user and the group can read, but not write to, the file.

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Note: Be sure to start the name of a hidden file with a period (`.`).

Click **Check my progress** to verify that you have completed this task correctly.

Change file permissions on a hidden file

☒ Check my progress

You have completed this task and changed the permissions of files.

When a file is hidden, it can be found in Linux with the `ls -la` command. Using the prior commands to add or remove permissions is the same when working with hidden files. Only difference would be adding a period before the hidden file. For example, `chmod u-w,g-w,gtr .project_x.txt`.

Change directory permissions

```
drwxr-xr-x 3 researcher2 research_team 4096 Jan 24 18:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan 24 19:48 ..
-rw-r--r-- 1 researcher2 research_team 46 Jan 24 18:43 .project_x.txt
drwx-x--x 2 researcher2 research_team 4096 Jan 24 18:43 drafts
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_k.txt
-rw-r--r-- 1 researcher2 research_team 46 Jan 24 18:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_t.txt
researcher2@47124792c083:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@47124792c083:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan 24 18:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan 24 19:48 ..
-r--r--r-- 1 researcher2 research_team 46 Jan 24 18:43 .project_x.txt
drwx-x--x 2 researcher2 research_team 4096 Jan 24 18:43 drafts
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_k.txt
-rw-r--r-- 1 researcher2 research_team 46 Jan 24 18:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_t.txt
researcher2@47124792c083:~/projects$ chmod g-x drafts
researcher2@47124792c083:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Jan 24 18:43 .
drwxr-xr-x 3 researcher2 research_team 4096 Jan 24 19:48 ..
-r--r--r-- 1 researcher2 research_team 46 Jan 24 18:43 .project_x.txt
drwx----- 2 researcher2 research_team 4096 Jan 24 18:43 drafts
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_k.txt
-rw-r--r-- 1 researcher2 research_team 46 Jan 24 18:43 project_m.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_r.txt
-rw-rw-r-- 1 researcher2 research_team 46 Jan 24 18:43 project_t.txt
researcher2@47124792c083:~/projects$
```

☐ No

Submit

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2. Remove the execute permission for the group from the `drafts` directory.

Click **Check my progress** to verify that you have completed this task correctly.

Change directory permissions

☒ Yes ☐ No

Check my progress

You have completed this task and changed the permissions on the `drafts` directory.

Changing the directory permissions utilizes the same format except.

Summary

The company needed to make sure *researcher2* had the appropriate permissions for each file. Checking the work after each addition and removal of permissions is advised to make sure it's done correctly. Properly set up permissions leads to good least privileges principles in cybersecurity.