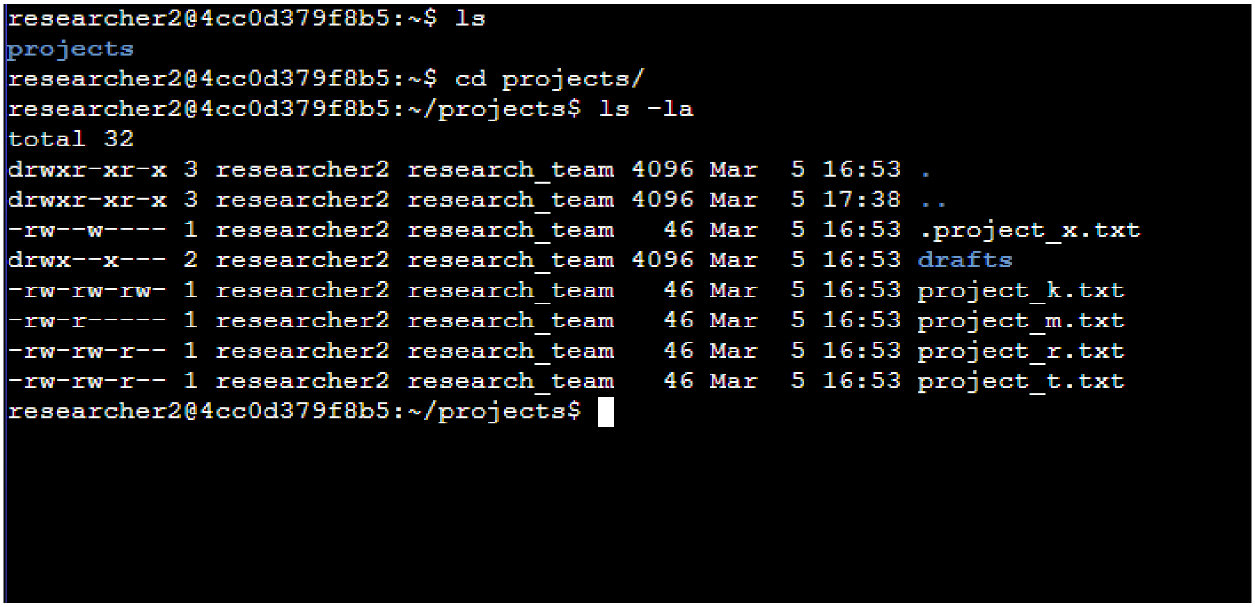
File permissions in Linux

Project description

The research team at my organization needs to update the file permissions for certain files and directories within the projects directory. The permissions do not currently reflect the level of authorization that should be given. Checking and updating these permissions will help keep the organization's system secure and safe. To complete this task I performed the following tasks:

Check file and directory details

The following code demonstrates how I used Linux commands to view directories, navigate to them, and determine the existing permissions set for the specific directory in the file system.



```
researcher2@4cc0d379f8b5:~$ ls
projects
researcher2@4cc0d379f8b5:~$ cd projects/
researcher2@4cc0d379f8b5:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Mar  5 16:53 .
drwxr-xr-x 3 researcher2 research_team 4096 Mar  5 17:38 ..
-rw--w---- 1 researcher2 research_team   46 Mar  5 16:53 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Mar  5 16:53 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Mar  5 16:53 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar  5 16:53 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 16:53 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 16:53 project_t.txt
researcher2@4cc0d379f8b5:~/projects$ 
```

The first line of the screenshot displays the command i entered to see what files and directories I was currently looking at. The third line shows me accessing the projects directory. The fourth line displays the command I entered and the other lines display the output. The code lists all contents of the projects directory. I used the ls command with the -la option to display a detailed listing of the files, directories, and hidden files. The command indicated one hidden file named .project_x.txt, and a directory named drafts, as well as four other files. The 10-character string in the first column represents the permissions set on each file or directory.

Describe the permissions string

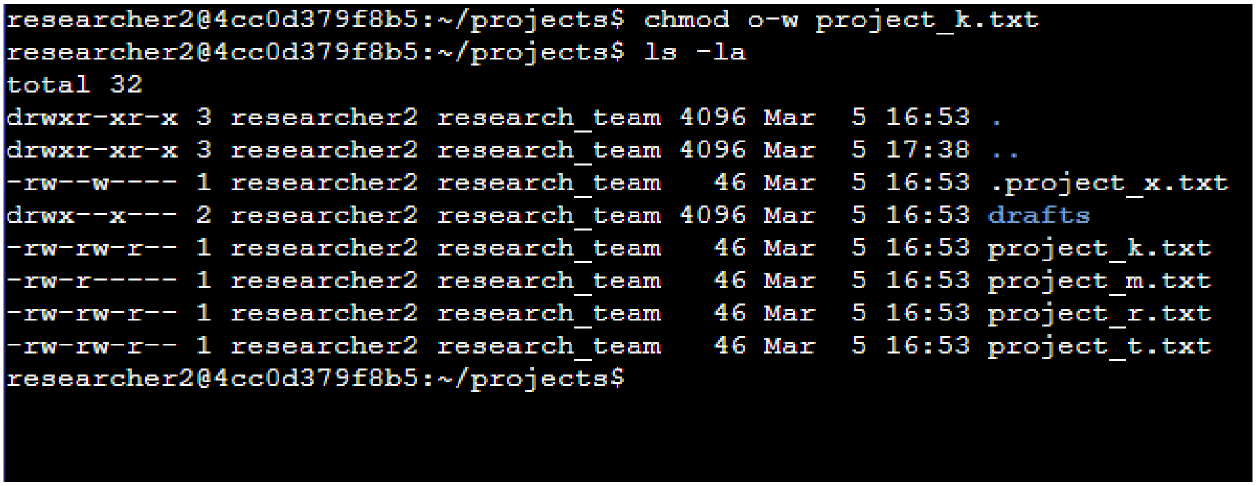
The 10-character string can be deconstructed to determine who is authorized to access the files, and directories and their specific permissions. The character and what they represent are as follows:

- 1st character: This character is either a d or hyphen (-) and indicates whether it is a regular file (-) or a directory d.
- 2nd-4th characters: these characters indicate the read (r), write (w), and execute (x) permissions for the user. When one of these characters is a hyphen (-) instead it indicates that this permission is not granted to the user.
- 5th-7th characters: these characters indicate the read (r), write (w), and execute (x) permissions for the group. When one of these characters is a hyphen (-) instead it indicates that this permission is not granted to the group.
- 8th-10th characters: these characters indicate the read (r), write (w), and execute (x) permissions for other. This owner type is used for all other users apart from the user themselves and the group. When one of these characters is a hyphen (-) instead it indicates that this permission is not granted to other.

Change file permissions

The organization does not allow other to have write access to any of the organizations files and based on the permissions I identified file project_k.txt must have their write access removed for other.

The following code shows how i used Linux commands to do this



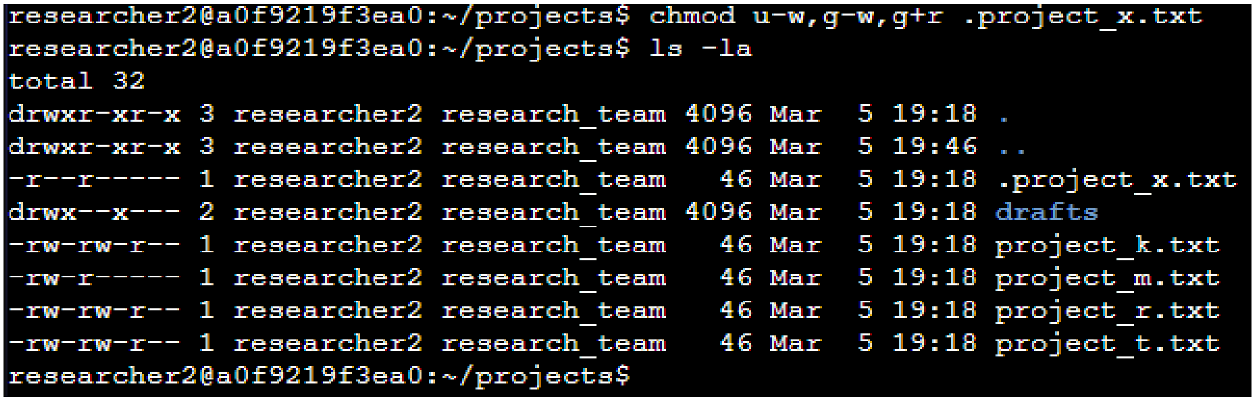
```
researcher2@4cc0d379f8b5:~/projects$ chmod o-w project_k.txt
researcher2@4cc0d379f8b5:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Mar  5 16:53 .
drwxr-xr-x 3 researcher2 research_team 4096 Mar  5 17:38 ..
-rw--w---- 1 researcher2 research_team   46 Mar  5 16:53 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Mar  5 16:53 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 16:53 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar  5 16:53 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 16:53 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 16:53 project_t.txt
researcher2@4cc0d379f8b5:~/projects$
```

The first two lines display the commands I entered, and the other lines show the output of the second command. The first line shows the chmod command which changes permissions on files and directories. The first argument shows what permissions should be changed, and the second argument specifies the file or directory the changes should be made to. In this screen shot I removed write permissions from other for the project_k.txt file. Following this I used ls -la to review the changes I made.

Change file permissions on a hidden file

My organization's research team has recently archived the file .project_x.txt which is why it is a hidden file. They do not want anyone to have write permissions for it, but the user and group should have read access to the file.

The following code demonstrates how I used linux commands to change permissions



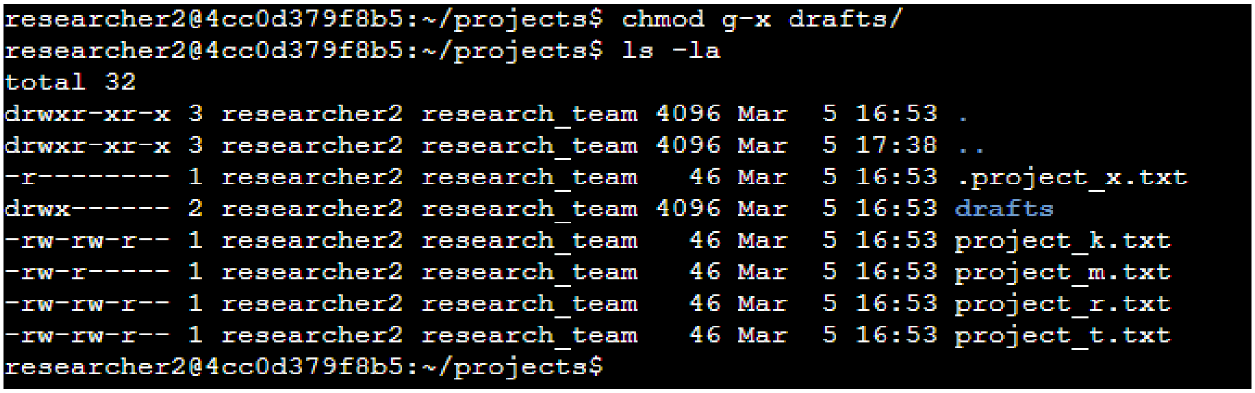
```
researcher2@a0f9219f3ea0:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@a0f9219f3ea0:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Mar  5 19:18 .
drwxr-xr-x 3 researcher2 research_team 4096 Mar  5 19:46 ..
-r--r----- 1 researcher2 research_team   46 Mar  5 19:18 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Mar  5 19:18 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 19:18 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar  5 19:18 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 19:18 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 19:18 project_t.txt
researcher2@a0f9219f3ea0:~/projects$
```

The first two lines of code show the commands i entered, and the other lines display the output of the second command. File .project_x.txt is a hidden file indicated by the period (.) I removed write permissions from the user and group, and added read permissions to the group. I removed write permissions from the user with u-w followed by the write permission from the group with g-w, finally adding read permissions to the group with g+r.

Change directory permissions

My organization only wants researcher2 to have full access to the drafts directory. This means that no one other than researcher2 should be able to have any form of access to the directory.

The following code demonstrates how I used Linux commands to change permissions.



```
researcher2@4cc0d379f8b5:~/projects$ chmod g-x drafts/
researcher2@4cc0d379f8b5:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Mar  5 16:53 .
drwxr-xr-x 3 researcher2 research_team 4096 Mar  5 17:38 ..
-r-------- 1 researcher2 research_team   46 Mar  5 16:53 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Mar  5 16:53 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 16:53 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar  5 16:53 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 16:53 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar  5 16:53 project_t.txt
researcher2@4cc0d379f8b5:~/projects$
```

The first two lines of commands display what I entered, and the other lines display the output of the second command line. I determined that the group had execute permissions previously, so I used the chmod command to remove them. Researcher2 already had execute permissions, so I did not need to add them myself.

Summary

I changed multiple permissions to match the level of authorization my organization wanted for directories and files within the projects directory. The first step was using the command ls -la to determine the current permissions set for the directory. This informed my decisions in the following steps. I then went on to use the chmod command multiple times to change the permissions on the directories and files to match what my organization wanted.