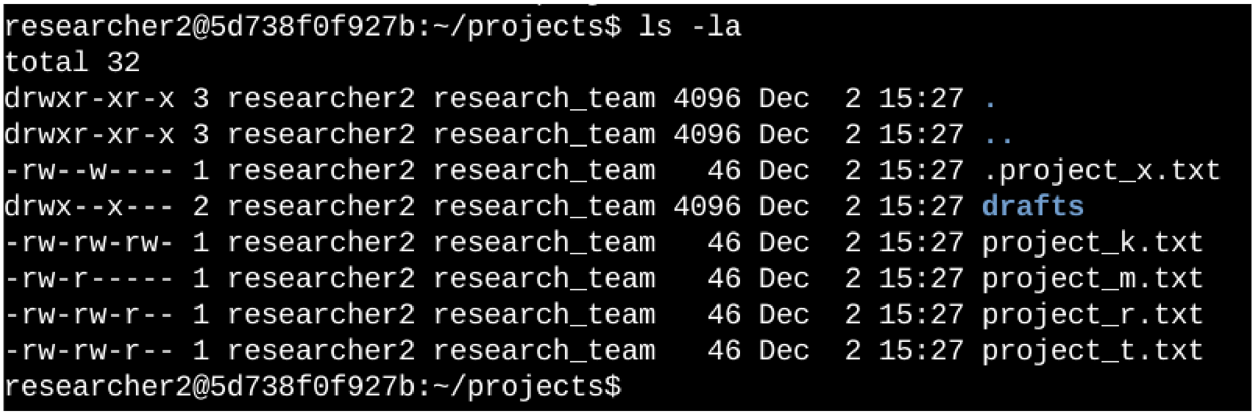
File permissions in Linux

Project description

The research team needs to update the file permissions for certain files and directories within the projects directory. The permissions do not show the level of authorization that should be given. I need to check and update these by:

Checking file and directory details

The following code demonstrates how I used Linux commands to determine the existing permissions set for a specific directory in the file system.



```
researcher2@5d738f0f927b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 ..
-rw--w---- 1 researcher2 research_team   46 Dec  2 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec  2 15:27 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Dec  2 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Dec  2 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec  2 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec  2 15:27 project_t.txt
researcher2@5d738f0f927b:~/projects$
```

The first line of the screenshot displays the command you entered, and the remaining lines display the output. The ls command with the -la option was used to list all contents of the projects directory, including hidden files. The output of the command indicates that there is one directory named drafts, one hidden file named .project_x.txt, and five other project files. The 10-character string in the first column represents the permissions set on each file or directory.

Describe the permissions string

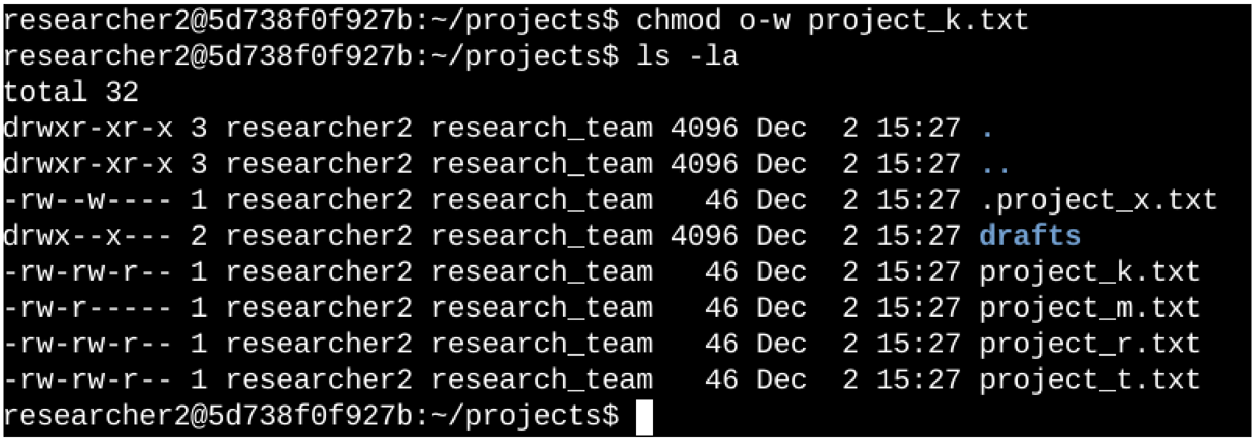
The 10-character string in the first column of the ls output is a representation of the permissions set on each file or directory. The first character indicates the file type, with d representing a directory and - representing a regular file. The next nine characters are divided into three groups of three, representing the permissions for the user, the group, and others, respectively. Each group of three characters represents the read, write, and execute permissions for the corresponding owner type. A hyphen (-) in place of a permission character indicates that the permission is not granted.

In summary, the 10-character string in the first column of the ls output provides a concise and informative representation of the permissions set on each file or directory.

Change file permissions

The organization determined that others shouldn't have write access to any of their files. So, I referred to the file permissions that I previously returned. I determined project_k.txt must have the write access removed for other..

The following code demonstrates how I used Linux commands to do this:



```
researcher2@5d738f0f927b:~/projects$ chmod o-w project_k.txt
researcher2@5d738f0f927b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 ..
-rw--w---- 1 researcher2 research_team   46 Dec  2 15:27 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec  2 15:27 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Dec  2 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Dec  2 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec  2 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec  2 15:27 project_t.txt
researcher2@5d738f0f927b:~/projects$ 
```

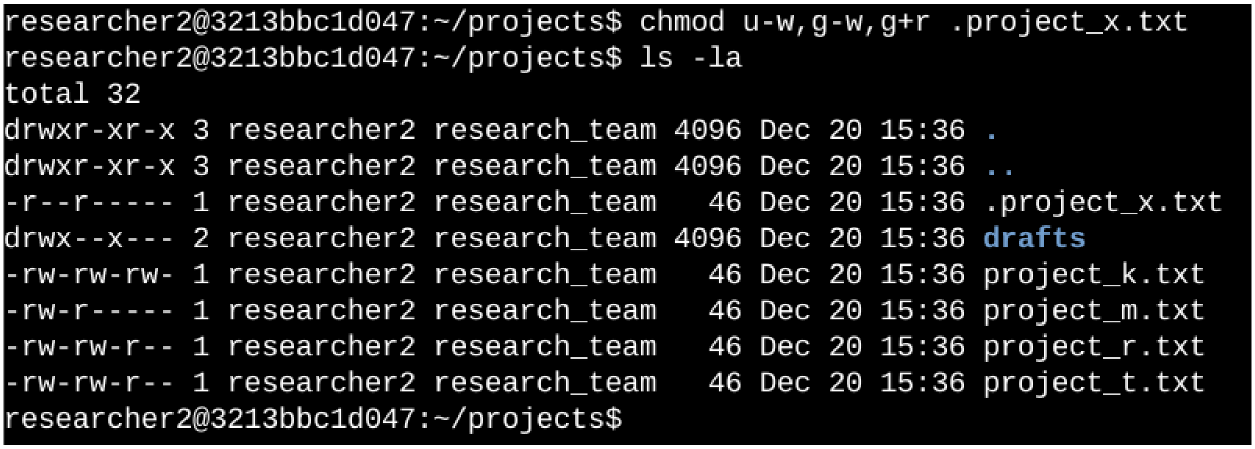
The first two lines of the screenshot show the commands I entered. The first command gives the user write permission to the project_k.txt file, and the second command lists the contents of the current directory in a long format, including permissions. The chmod command changes the permissions on files and directories. The first argument to the chmod command indicates what permissions should be changed, and the second argument specifies the file or directory whose permissions should be changed. In this example, the write permission is being added for the user, and the project_k.txt file is being targeted. The output of the ls

-la command shows that the permissions of the project_k.txt file have been changed from -rw-r--r-- to -rw-rw-r--, indicating that the user and group now have write permission to the file.

Change file permissions on a hidden file

The research team recently archived project_x.txt. They do not want anyone to have write access to this project, but the user and group should have read access.

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



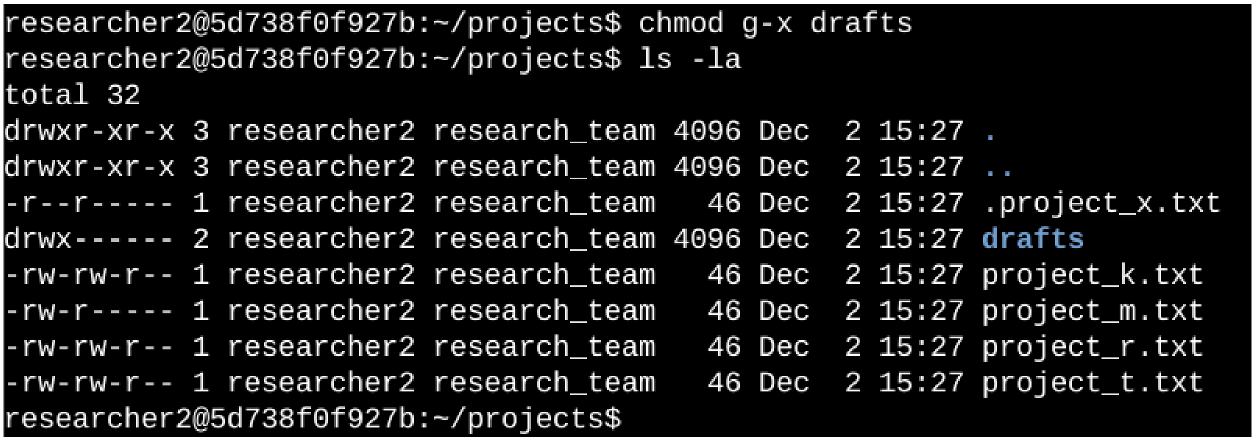
```
researcher2@3213bbc1d047:~/projects$ chmod u-w,g-w,g+r .project_x.txt
researcher2@3213bbc1d047:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec 20 15:36 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec 20 15:36 ..
-r--r----- 1 researcher2 research_team   46 Dec 20 15:36 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Dec 20 15:36 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Dec 20 15:36 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Dec 20 15:36 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 20 15:36 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec 20 15:36 project_t.txt
researcher2@3213bbc1d047:~/projects$
```

The first two lines of the screenshot show the commands I entered. The first command removes write permissions from the user and group, and adds read permissions to the group for the .project_x.txt file. The second command lists the contents of the current directory in a long format, including permissions. I know that .project_x.txt is a hidden file because it starts with a period (.). The chmod command changes the permissions on files and directories. The first argument to the chmod command indicates what permissions should be changed. In this example, the first argument is u-w,g-w,g+r, which means that the write permission is being removed from the user and group, and the read permission is being added to the group. The second argument to the chmod command specifies the file or directory whose permissions should be changed. In this example, the second argument is .project_x.txt, which means that the permissions of the .project_x.txt file are being changed. The output of the ls -la command shows that the permissions of the .project_x.txt file have been changed from -rw------- to -r--r-----, indicating that the user has read permission, the group has read permission, and others have no permissions.

Change directory permissions

My organization only wants the researcher2 user to have access to the drafts directory and its contents. This means that no one other than researcher2 should have execute permissions.

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



```
researcher2@5d738f0f927b:~/projects$ chmod g-x drafts
researcher2@5d738f0f927b:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 .
drwxr-xr-x 3 researcher2 research_team 4096 Dec  2 15:27 ..
-r--r----- 1 researcher2 research_team   46 Dec  2 15:27 .project_x.txt
drwx------ 2 researcher2 research_team 4096 Dec  2 15:27 drafts
-rw-rw-r-- 1 researcher2 research_team   46 Dec  2 15:27 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Dec  2 15:27 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec  2 15:27 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Dec  2 15:27 project_t.txt
researcher2@5d738f0f927b:~/projects$
```

The first two lines of the screenshot display the commands I entered and the other lines display the output of the second command. I previously determined that the group had execute permissions, so I used the chmod command to remove them. The researcher2 user already had execute permissions, so they didn't need to be added.

Summary

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