File permissions in Linux

Project description

Task to examine the existing permissions of the file system and determine if the permissions are set up correctly. If they are not set up correctly, then the permissions will have to be updated correctly by adding the correct authorisation where it's missing and removing where it's not needed.

Check file and directory details

Screenshot below shows checking the directory details and the authorisation settings.

```
researcher2@72aecb6914fd:~/projects$ ls -l
total 20
drwx--x--- 2 researcher2 research_team 4096 Mar 21 09:49 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Mar 21 09:49 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar 21 09:49 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 21 09:49 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 21 09:49 project_t.txt
researcher2@72aecb6914fd:~/projects$ ls -la
total 32
drwxr-xr-x 3 researcher2 research_team 4096 Mar 21 09:49 .
drwxr-xr-x 3 researcher2 research_team 4096 Mar 21 10:33 ..
-rw--w---- 1 researcher2 research_team   46 Mar 21 09:49 .project_x.txt
drwx--x--- 2 researcher2 research_team 4096 Mar 21 09:49 drafts
-rw-rw-rw- 1 researcher2 research_team   46 Mar 21 09:49 project_k.txt
-rw-r----- 1 researcher2 research_team   46 Mar 21 09:49 project_m.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 21 09:49 project_r.txt
-rw-rw-r-- 1 researcher2 research_team   46 Mar 21 09:49 project_t.txt
researcher2@72aecb6914fd:~/projects$
```

To check permissions we can use command *ls -l* to show the files in the directory and their current permissions settings.

To check permissions for the hidden files we can use *ls - la* command which will also display any other hidden files and their permissions settings. The screenshot above shows that there is one hidden file and two hidden directories.

Describe the permissions string

For example the file project_t.txt permission string is :
-rw-rw-r-- 1 researcher2 research_team 46 Mar 21 09:49 project_t.txt

The settings can be:
R - read
W - write
E - execute

There are three types of groups we can apply these settings to:
U as User : which is the person who created the file.
G as Group : which is a specifically selected group.
O as Others : Any other users.

Now the string output:
-rw-rw-r-- 1 researcher2 research_team 46 Mar 21 09:49 project_t.txt
The bolt letters above represents the settings which can be divided in to:
-rw -rw r- - as three groups representing User, Group and Others.

-rw-rw-r-- 1 **researcher2 research_team** 46 Mar 21 09:49 project_t.txt
The second highlighted part in bold represents the researcher2 as user who created the file, research team as the group.

Now based on the output **-rw-rw-r--** we can say that the file project_t.txt has its permissions set ups as:
User :
- Can can read
- Can read
- Can write

Group:
- Can can read
- Can read
- Can write

Others:
- Can read
- Can't write
- Can't execute

Change file permissions

Based on the output I discovered that a certain file does not have its permissions set up correctly. The file should be restricted and not be readable or writable by the group or others. The settings are as:

-rw-r----- 1 researcher2 research_team 46 Mar 21 09:49 project_m.txt

Above shows that the file has been set up with read settings enabled for the group.

The command I used to change the permissions for the file project_m.txt is:

researcher2@72aecb6914fd:~/projects$ chmod g-r project_m.txt

The command above uses chmod which is used to change the permissions and then followed by g-r which means group minus read and lastly the name of the file.

After executing the command we can check if the permissions has been updated correctly with these commands :

We use ls -l again:
researcher2@72aecb6914fd:~/projects$ ls -l

Output:
total 20
drwx--x--- 2 researcher2 research_team 4096 Mar 21 09:49 drafts
-rw-rw-rw- 1 researcher2 research_team 46 Mar 21 09:49 project_k.txt
-rw------- 1 researcher2 research_team 46 Mar 21 09:49 project_m.txt
-rw-rw-r-- 1 researcher2 research_team 46 Mar 21 09:49 project_r.txt
-rw-rw-r-- 1 researcher2 research_team 46 Mar 21 09:49 project_t.txt

Change file permissions on a hidden file
Another file called project_x.txt, had its settings wrong was actually an hidden file which should only be read-only for the user and the group but was set up with writing privileges instead :
-rw--w---- 1 researcher2 research_team 46 Mar 21 09:49 .project_x.txt

We can fix this by using the command :

researcher2@72aecb6914fd:~/projects$ chmod u-w,g+r,g-w .project_x.txt

The above has removed the writing privileges and added read only ones.

Change directory permissions

Lastly the directory drafts should only have Read, Write and Execute permissions for the User only.
The output suggest that the group had execute permissions granted:
drwx--x--- 2 researcher2 research_team 4096 Mar 21 09:49 drafts

We can fix this by using command:

researcher2@72aecb6914fd:~/projects$ chmod g-x drafts

The command above removed the executable permission from the group.

Summary

The steps above were used to update the authorisation settings for files and directories.
Two files had their settings set up wrong and one directory which has now been updated to correct state.