File permissions in Linux

Project description

The Bash command line in Linux can be used to perform different functions like making a directory, removing a directory, assigning and changing permissions. There are 3 types of owners (in the context of changing and assigning permissions):
1. User
2. Group
3. Other (anyother person with access to a file or directory outside the user or group.

Some terminologies to note, in terms of permissions,
r (read) : can read all files in the directory
w (write) : allows modification of content on a file. New files can be created in a directory.
x (execute) : files can be executed if it is anexecutable file. Has access to the directory

Check file and directory details

Ls : Lists the files and/or directory in a directories/ subdirectory
Ls -L: Displays permission to files and directories
Ls -a: Displays hidden files. (Hidden files starts with s dot (.) before their name
Ls -la: Displays permissions to files & directories including hidden files

*I'm writing the "L" in capital letter so it can be differentiated from an "i" but usually it's writing in small leter

Describe the permissions string

File permissions are represented with ten character strings. Using drwxrwxrwx as an example.
d rwx rwx rwx.
d: shows that the file is a directory, if it's a file it's replaced with a hyphen (-)
The first rwx: Shows the permission of the owner type; user
The second rwx: Shows the permission of the owner type; group
The third rwx: Shows the permission of the owner type; other.

If an owner doesn't have access to read, write or execute a file or directory, it's replaces with a hyphen (-)eg d r--rw-r– or - r--rwx— (showing it's a text file)

Change file permissions

To change file permission we use the command "*chmode*" (change mode), This command takes two arguments:

1. The permissions/access to change among the users.
2. The file or directory you want to change permissions for

u: user
g: group
o: other
r: read
w: write
x: execute

Example:
chmod g+w,o-r access.txt

Change file permissions on a hidden file

Changing file permission for this file: `.project_x.txt.`
so only the user and group should be able to read the file.

Current file permission:

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

To change permissions:

chmod u=r,g=r `.project_x.txt`

When you use the equal sign (=) it overwrites the existing permission with new permission

Change directory permissions

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

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

The files and directories in the projects directory belong to the **`researcher2`** user. Only **`researcher2`** should be allowed to access the **`drafts`** directory and its contents. Use a Linux command to modify the permissions accordingly
To change permissions: chmod g-x `drafts`

Summary

Using the commands can be helpful to limit access to files on a need to know basis (principle of least privilege).