RHEL9

Session 9 – 26th Nov 2022 Summary

➢ As a human being to interact to OS, we have to run a program, for this we require user. The user can access only two things that is files and directories.

➢ To set-up permissions for users on files and directories is called as user permissions. The permissions is only meant for non-root users.

➢ The three kinds of permissions(modes)on a file are
- Read(r):- open
- Write(w):- edit(add, remove)
- Execute(x):- run a command or program

➢ The command used to see the details about the file "/etc/passwd" is "**ls –l /etc/passwd**"

-l → long list

- rw - r - - r - - → "-"at the start represent that it is a **file**

```
[vimal@localhost tmp]$ ls -l  /etc/passwd
-rw-r--r--. 1 root root 2846 Nov 20 15:27 /etc/passwd
[vimal@localhost tmp]$
```

➢ The three kinds of permissions on a directory are
- Read(r):- ls(list)
- Write(w):- touch, rm(create or remove a file)
- Execute(x):- cd (go into the directory)

➢ The command used to see the details about the directory "/etc/" is "**ls –l –d /etc/**"

d rwx r-x r-x → if "**d**" at the start represents it is a **directory**

```
[vimal@localhost ~]$ cd /etc/
[vimal@localhost etc]$ ls -l -d  /etc/
drwxr-xr-x. 134 root root 8192 Nov 26 13:51
[vimal@localhost etc]$
```
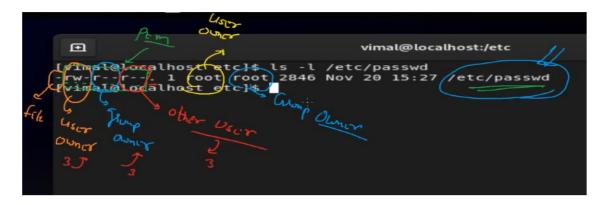
➤ The **other users** are not allowed to go into the folder **/root/**

```
[vimal@localhost etc]$ ls -l -d  /root/
dr-xr-x---.  18 root root 4096 Nov 20 15:22 /root/
[vimal@localhost etc]$ cd /root/
bash: cd: /root/: Permission denied
[vimal@localhost etc]$
```

➤ The other user has **no write permission**, thus this user **cannot create a file**

```
[vimal@localhost etc]$ ls -ld /etc/
drwxr-xr-x. 134 root root 8192 Nov 26 13:51 /etc/
[vimal@localhost etc]$ touch ht
touch: cannot touch 'ht': Permission denied
[vimal@localhost etc]$ █
```

➤ The three types of categories in permission field are
  ▪ User owner(u)
  ▪ Group owner(g)
  ▪ Other user(o)

➤ Whenever a file or directory created by the user, the user is the owner of file or directory

```
[vimal@localhost ~]$ touch    lw.txt
[vimal@localhost ~]$ mkdir dir1
[vimal@localhost ~]$ whoami
vimal
[vimal@localhost ~]$ ls -l
total 0
drwxr-xr-x. 2 vimal vimal 6 Oct   8 16:43 Desktop
drwxrwxr-x. 2 vimal vimal 6 Nov  26 14:28 dir1
drwxr-xr-x. 2 vimal vimal 6 Oct   8 16:43 Documents
drwxr-xr-x. 2 vimal vimal 6 Oct   8 16:43 Downloads
-rw-rw-r--. 1 vimal vimal 0 Nov  26 14:28 lw.txt
drwxr-xr-x. 2 vimal vimal 6 Oct   8 16:43 Music
drwxr-xr-x. 2 vimal vimal 6 Oct   8 16:43 Pictures
drwxr-xr-x. 2 vimal vimal 6 Oct   8 16:43 Public
drwxr-xr-x. 2 vimal vimal 6 Oct   8 16:43 Templates
drwxr-xr-x. 2 vimal vimal 6 Oct   8 16:43 Videos
[vimal@localhost ~]$
```

➤ The **permission** (mode) of the folder **/root/** can be changed only by the **root user,** here the other (o) user is added (+) with execute(x) permission. The command used is "**chmod o+x /root/**"

```
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# ls -l -d /root/
dr-xr-x---. 18 root root 4096 Nov 20 15:22 /root/
[root@localhost ~]# chmod    o+x    /root/
[root@localhost ~]# ls -l -d /root/
dr-xr-x--x. 18 root root 4096 Nov 20 15:22 /root/
[root@localhost ~]#
```

```
[vimal@localhost ~]$ whoami
vimal
[vimal@localhost ~]$ ls -l -d    /root/
dr-xr-x--x. 18 root root 4096 Nov 20 15:22 /root/
[vimal@localhost ~]$ cd /root/
[vimal@localhost root]$ █
```

➤ The **other** user has **no read** permission to the folder **/root/**

```
[vimal@localhost ~]$ cd /root/
[vimal@localhost root]$ ls
ls: cannot open directory '.': Permission denied
[vimal@localhost root]$
```

➤ The command used to add(+) read permission to other(o) user is "**chmod o+r /root**"

```
[root@localhost ~]# chmod   o+r    /root
[root@localhost ~]# ls -l -d /root/
dr-xr-xr-x. 18 root root 4096 Nov 20 15:22 /root/
[root@localhost ~]#
```

```
[vimal@localhost root]$
[vimal@localhost root]$ ls
aaa                 code        Downloads  Music     Templates  vimal.txt
anaconda-ks.cfg  Desktop     hhhh       Pictures  Videos     yy.txt
a.txt               Documents   mal        Public    vimal.jpg
[vimal@localhost root]$ █
```

➤ The **other** user has **no write** permission to the folder **/root/**

```
[vimal@localhost root]$ touch  hi
touch: cannot touch 'hi': Permission denied
[vimal@localhost root]$ rm yy.txt
rm:  remove write-protected regular file 'yy.txt'? y
rm: cannot remove 'yy.txt': Permission denied
[vimal@localhost root]$
```

➤ The command used to add(+) write permission to other(o) user is "**chmod o+w /root**"

```
[root@localhost ~]# chmod  o+w   /root/
[root@localhost ~]# ls -l -d /root/
dr-xr-xrwx. 18 root root 4096 Nov 20 15:22 /root/
[root@localhost ~]#
```

```
[vimal@localhost root]$ touch hi
[vimal@localhost root]$ rm yy.txt
rm: remove write-protected regular file 'yy.txt'? y
[vimal@localhost root]$ ls
aaa                 code        Downloads  mal       Public      vimal.jpg
anaconda-ks.cfg  Desktop     hhhh       Music     Templates   vimal.txt
a.txt               Documents  hi         Pictures  Videos
```

➤ The **other** user has **no execute** permission to the file "**/usr/bin/date**", so the user is **denied to run** the date command

```
[root@localhost ~]# chmod  o-x  /usr/bin/date
[root@localhost ~]# ls -l /usr/bin/date
-rwxr-xr--. 1 root root 107008 Aug 10  2021 /usr/bin/date
```

```
[vimal@localhost root]$ ls -l /usr/bin/date
-rwxr-xr--. 1 root root 107008 Aug 10  2021 /usr/bin/date
[vimal@localhost root]$ date
bash: /usr/bin/date: Permission denied
[vimal@localhost root]$
```

➢ The "su" command with "-" will switch to the user and lands to users home directory

```
[root@localhost ~]# su -    vimal
[vimal@localhost ~]$ whoami
vimal
[vimal@localhost ~]$
[vimal@localhost ~]$ pwd
/home/vimal
[vimal@localhost ~]$
```

➢ Create a directory /code, the **root** is the **owner** of this directory, the command to **change the ownership** to user "**vimal**" of the directory /code is "**chown vimal /code**"

```
[root@localhost ~]# mkdir   /code
[root@localhost ~]# ls -ld /code
drwxr-xr-x. 2 root root 6 Nov 26 14:58 /code
[root@localhost ~]# whoami
root
[root@localhost ~]#
```

```
[root@localhost ~]# chown  vimal   /code
[root@localhost ~]# ls -ld /code
drwxr-xr-x. 2 vimal root 6 Nov 26 14:58 /code
[root@localhost ~]#
```

➢ The **three users** "yash", "sarah" and "raj" are created using "**useradd**" command

```
[root@localhost ~]# useradd   yash
[root@localhost ~]# useradd   sarah
[root@localhost ~]# useradd   raj
```

➢ The command to create the group "**lwgroup**" is "**groupadd lwgroup**"

```
[root@localhost ~]# groupadd  lwgroup
[root@localhost ~]# cat /etc/group
```

```
raj:x:1239:
yash:x:1240:
sarah:x:1241:
lwgroup:x:1242:
```

➢ The **"/etc/group"** file has **four fields**
  ▪ First field- **group name**
  ▪ Second field- **group password**(x), that links to the file "/etc/gshadow" file
  ▪ Third field- **GID**(group identifier)
  ▪ Fourth field- **members**
➢ The command to add the user "yash" to the group "lwgroup" is "**usermod –G lwgroup yash**", similarly we can add other users "sarah" and "raj" to the group "lwgroup"

```
[root@localhost ~]# usermod    -G lwgroup    yash
[root@localhost ~]#
```

```
raj:x:1239:
yash:x:1240:
sarah:x:1241:
lwgroup:x:1242:yash,sarah,raj
```

➢ The reason to create group is that, we can assign same permissions to multiple users
➢ The command to **change the group ownership** of folder "/code" is "**chgrp lwgroup**"

```
[root@localhost ~]# ls -ld /code/
drwxr-xr-x. 2 vimal root 6 Nov 26 14:58 /code/
[root@localhost ~]# chgrp  lwgroup   /code/
[root@localhost ~]# ls -ld /code/
drwxr-xr-x. 2 vimal lwgroup 6 Nov 26 14:58 /code/
[root@localhost ~]#
```

➤ The command used to change the permission(mode) of the group(g), that is **add**(+) "**rwx**" to the group "lwgroup" is

```
[root@localhost ~]# chmod   g+rwx  /code
[root@localhost ~]# ls -ld /code/
drwxrwxr-x. 2 vimal lwgroup 6 Nov 26 14:58 /code/
```

➤ To change the permission (mode) of the user (u) group (g) and others (o), it can be specified in one command. The permissions can also be represented by number that is for read (4), write(2) and execute(1)

```
[vimal@localhost ~]$ chmod   u+rx,g+rwx,o-rwx   /code
[vimal@localhost ~]$ ls -ld /code/
dr-xrwx---. 2 vimal lwgroup 29 Nov 26 15:25 /code/
[vimal@localhost ~]$
[vimal@localhost ~]$ chmod  570  /code/
```