

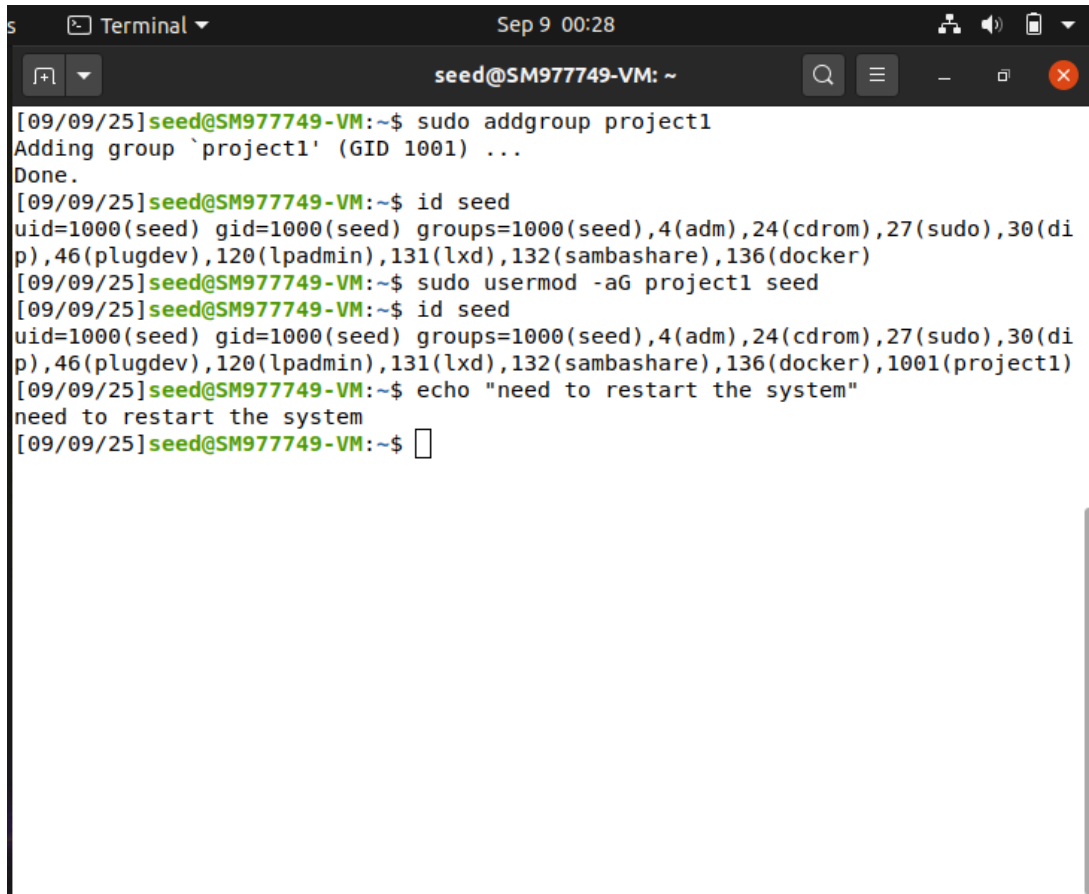
# Computer Security Lab 02

Srinivas Mekala - SM977749

## 1) Creating Group

I've created a group using the "addgroup" command. I had to use "sudo" to run the command because groups are handled by the root user and being logged in as the user "seed" does not give me permissions to work with the groups other than my own group.

- Then I added myself (i.e seed) to the group using usermod command which again needs the sudo permissions for the same reason mentioned above.

A terminal window titled "Terminal" with a timestamp of "Sep 9 00:28". The prompt is "seed@SM977749-VM: ~". The user enters "sudo addgroup project1", and the output is "Adding group 'project1' (GID 1001) ... Done.". Then the user enters "id seed", and the output shows the user's groups including "project1". Next, the user enters "sudo usermod -aG project1 seed", and the output shows the updated groups including "project1". Finally, the user enters "echo 'need to restart the system'", and the output is "need to restart the system". The terminal ends with a prompt "seed@SM977749-VM: ~\$".

```
[09/09/25]seed@SM977749-VM:~$ sudo addgroup project1
Adding group `project1' (GID 1001) ...
Done.
[09/09/25]seed@SM977749-VM:~$ id seed
uid=1000(seed) gid=1000(seed) groups=1000(seed),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),120(lpadmin),131(lxd),132(sambashare),136(docker)
[09/09/25]seed@SM977749-VM:~$ sudo usermod -aG project1 seed
[09/09/25]seed@SM977749-VM:~$ id seed
uid=1000(seed) gid=1000(seed) groups=1000(seed),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),120(lpadmin),131(lxd),132(sambashare),136(docker),1001(project1)
[09/09/25]seed@SM977749-VM:~$ echo "need to restart the system"
need to restart the system
[09/09/25]seed@SM977749-VM:~$
```

## 2) Creating user1

In this step, I've created a new user named "user1" using the "adduser" command which requires superuser permissions because similar to the groups, the users of the system are also managed only by the superuser.

- Then I added user1 to the project1 group same as I added myself (user seed) to the group using "sudo" (superuser permissions)
- I checked by "id" command to see if the user was added to project1 group.

```
[09/09/25]seed@SM977749-VM:~$ sudo adduser user1
Adding user `user1' ...
Adding new group `user1' (1002) ...
Adding new user `user1' (1001) with group `user1' ...
The home directory `/home/user1' already exists. Not
copying from `/etc/skel'.
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for user1
Enter the new value, or press ENTER for the default
    Full Name []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] y
[09/09/25]seed@SM977749-VM:~$ id user1
uid=1001(user1) gid=1002(user1) groups=1002(user1)
[09/09/25]seed@SM977749-VM:~$
```

```
seed@SM977749-VM: ~
[09/09/25]seed@SM977749-VM:~$ usermod -aG project1 use
r1
usermod: Permission denied.
usermod: cannot lock /etc/passwd; try again later.
[09/09/25]seed@SM977749-VM:~$ sudo usermod -aG project
1 user1
[09/09/25]seed@SM977749-VM:~$ id user1
uid=1001(user1) gid=1002(user1) groups=1002(user1),100
1(project1)
[09/09/25]seed@SM977749-VM:~$
```

### 3) Create /home/project1 directory

- I changed my directory to /home and tried creating a directory named “project1”
- But as a user, I only have access to my userspace which is /home/seed to create or change anything, so I got a permission denied error.
- As the superuser has access to /home directory, I used “sudo” to get the temporary superuser permission to create the directory. Yes, now /home/project1 has been created
- Now, as discussed in the above tasks, I had to use “sudo” to make changes to the directory which is not under my control. So, I used “chown” and “chgrp” with “sudo” permissions to add user seed as the owner and project1 as the group respectively to the project1/ directory
- Now, as I (seed) have become the owner of the directory, I do not need “sudo” permissions to change anything about the directory.
- So, without “sudo” I ran `chmod 770 project1` to change the permission set of the directory to let owner and group have all permissions and others have no access to it.

```
seed@SM977749-VM: /home
[09/09/25]seed@SM977749-VM:~$ cd ..
[09/09/25]seed@SM977749-VM:/home$ mkdir project1
mkdir: cannot create directory 'project1': Permission
denied
[09/09/25]seed@SM977749-VM:/home$ sudo mkdir project1
[09/09/25]seed@SM977749-VM:/home$ sudo chown seed proj
ect1/
[09/09/25]seed@SM977749-VM:/home$ sudo chgrp project1
project1
[09/09/25]seed@SM977749-VM:/home$ chmod 770 project1/
[09/09/25]seed@SM977749-VM:/home$ ls -l
total 12
drwxrwx---  2 seed  project1 4096 Sep  9 23:05 project
1
drwxr-xr-x 19 seed  seed      4096 Sep  9 22:53 seed
drwxr-xr-x  2 user1 user1    4096 Sep  9 23:01 user1
[09/09/25]seed@SM977749-VM:/home$
```

#### 4) UMask

- Setting umask to 0027 will mask the write permissions of the group and all permissions of other users. Thus the permissions of any file created will have -rw-r----- by default.

```
Terminal
Sep 9 23:09
seed@SM977749-VM: /home

[09/09/25] seed@SM977749-VM: /home$ umask
0002
[09/09/25] seed@SM977749-VM: /home$ umask 0027
[09/09/25] seed@SM977749-VM: /home$ umask
0027
[09/09/25] seed@SM977749-VM: /home$
```

#### 5) Download progit.pdf

- I ran the given wget command to download the progit.pdf file to the project1/ directory.

```
Terminal
Sep 9 23:09
seed@SM977749-VM: /home

Connecting to release-assets.githubusercontent.com (re
lease-assets.githubusercontent.com)|185.199.111.133|:4
43... connected.
WARNING: cannot verify release-assets.githubuserconten
t.com's certificate, issued by 'CN=Sectigo RSA Domain
Validation Secure Server CA,0=Sectigo Limited,L=Salfor
d,ST=Greater Manchester,C=GB':
  Unable to locally verify the issuer's authority.
HTTP request sent, awaiting response... 200 OK
Length: 18803458 (18M) [application/octet-stream]
Saving to: '/home/project1/progit.pdf'

progit.pdf      100% 17.93M 32.5MB/s   in 0.6s

2025-09-09 23:09:49 (32.5 MB/s) - '/home/project1/prog
it.pdf' saved [18803458/18803458]

[09/09/25] seed@SM977749-VM: /home$ ls project1/
progit.pdf
[09/09/25] seed@SM977749-VM: /home$
```

## 6) Switch to user1

- I switched to user1 using “su” command.
- I tried running the cp command to copy the /home/project1/progit.pdf file to /home/user1 but it denied my action, saying I don’t have permission to do so.
- I think this is because the owner and group of the progit.pdf file are somehow set to seed and user1 cannot do anything with other user files.
- Even the directory project1/ has the group project1, as the file is created by the user seed, I think the full permissions are given to seed. That is why user1 cannot copy that file.

A terminal window titled 'user1@VM: /home' with standard window controls. The terminal shows a sequence of commands and their outputs. First, the user 'seed' runs 'ls -l project1/' showing file details for 'progit.pdf'. Then, they run 'su user1' and enter a password. Finally, they run 'cp /home/project1/progit.pdf /home/user1/' which results in a 'Permission denied' error.

```
[09/10/25]seed@SM977749-VM:/home$ ls -l project1/
total 18364
-rw-r----- 1 seed seed 18803458 Jul 25 18:31 progit.pdf
[09/10/25]seed@SM977749-VM:/home$ su user1
Password:
user1@VM:/home$ cp /home/project1/progit.pdf /home/user1/
cp: cannot open '/home/project1/progit.pdf' for reading: Permission denied
user1@VM:/home$
```

## 7) Making progit.pdf accessible to user1

- I switched back to seed and changed the group of the progit.pdf to project1.
- Why? Because, user1 is also a part of project1 group. So, it'll make it accessible to user1.
- Now, I again switched back to user1 and tried copying progit.pdf to /home/user1
- The action succeeded now and the file is copied to /home/user1

```
[09/10/25]seed@SM977749-VM:.../project1$ ls -l
total 18364
-rw-r----- 1 seed seed 18803458 Jul 25 18:31 progit.pdf
[09/10/25]seed@SM977749-VM:.../project1$ chgrp project
1 progit.pdf
[09/10/25]seed@SM977749-VM:.../project1$ ls -l
total 18364
-rw-r----- 1 seed project1 18803458 Jul 25 18:31 progi
t.pdf
[09/10/25]seed@SM977749-VM:.../project1$ su user1
Password:
user1@VM:/home/project1$ cp ./progit.pdf /home/user1/
user1@VM:/home/project1$ ls /home/user1/
progit.pdf
user1@VM:/home/project1$ echo yay
yay
```



## 8) Ensuring future files in /home/project1 to be accessible to members in project1

- I got to know that my assumptions about the ownership of the files I did in step 6 are correct. User only will have the permissions to the files they created and other users don't.
- But in a collaborative space like project1, this is not convenient.
- After going through documentation and blogs on the internet, I got to know about something called a “**sgid bit**” which is Set Group ID bit.
- It is a special permission which can be applied to both files and directories.
- If it is set on a directory, any file created in the directory will have their group ownership set to that of the directory owner.

```
seed@SM977749-VM: /home
[09/10/25]seed@SM977749-VM:/home$ chmod 2770 project1/
[09/10/25]seed@SM977749-VM:/home$ ls -l | grep project
1
drwxrws--- 2 seed project1 4096 Sep 10 12:44 project
1
[09/10/25]seed@SM977749-VM:/home$ rm project1/progit.p
df
[09/10/25]seed@SM977749-VM:/home$ wget -P /home/projec
t1 --no-check-certificate https://github.com/progit/pr
ogit2/releases/download/2.1.448/progit.pdf

HTTP request sent, awaiting response... 200 OK
Length: 18803458 (18M) [application/octet-stream]
Saving to: '/home/project1/progit.pdf'

progit.pdf      100% 17.93M 11.3MB/s   in 1.6s

2025-09-10 12:46:38 (11.3 MB/s) - '/home/project1/prog
it.pdf' saved [18803458/18803458]

[09/10/25]seed@SM977749-VM:/home$ ls -l
total 12
drwxrws--- 2 seed project1 4096 Sep 10 12:46 project
1
drwxr-xr-x 19 seed seed 4096 Sep 10 12:04 seed
drwxr-xr-x 2 user1 user1 4096 Sep 10 12:42 user1
[09/10/25]seed@SM977749-VM:/home$ ls -l project1/
total 18364
-rw-r----- 1 seed project1 18803458 Jul 25 18:31 prog
it.pdf
```

```
[09/10/25] seed@SM977749-VM:/home$ su user1
Password:
user1@VM:/home$ cp /home/project1/progit.pdf /home/user1/
user1@VM:/home$ ls /home/user1/
progit.pdf
user1@VM:/home$ ls -l
```