

# Ownership and Permissions 2

## Nicolas Lauzon

### Log as root

#### 1. Add four new users: eng1, eng2, acc1 and acc2 and set their password

```
root@server1:~  
File Edit View Search Terminal Help  
[nlaizon@server1 ~]$ su -  
Password:  
Last login: Mon Mar 25 11:38:48 PDT 2024 on pts/0  
[root@server1 ~]# useradd eng1; passwd eng1  
Changing password for user eng1.  
New password:  
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/systematic  
Retype new password:  
passwd: all authentication tokens updated successfully.  
[root@server1 ~]# useradd eng2; passwd eng2  
Changing password for user eng2.  
New password:  
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/systematic  
Retype new password:  
passwd: all authentication tokens updated successfully.  
[root@server1 ~]#
```

```
root@server1:~  
File Edit View Search Terminal Help  
Retype new password:  
passwd: all authentication tokens updated successfully.  
[root@server1 ~]# useradd eng2; passwd eng2  
Changing password for user eng2.  
New password:  
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/systematic  
Retype new password:  
passwd: all authentication tokens updated successfully.  
[root@server1 ~]# useradd acc1; passwd acc1  
Changing password for user acc1.  
New password:  
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/systematic  
Retype new password:  
passwd: all authentication tokens updated successfully.  
[root@server1 ~]# useradd acc2; passwd acc2  
Changing password for user acc2.  
New password:  
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/systematic  
Retype new password:  
passwd: all authentication tokens updated successfully.  
[root@server1 ~]#
```

```
root@server1:~  
File Edit View Search Terminal Help  
Retype new password:  
passwd: all authentication tokens updated successfully.  
[root@server1 ~]# tail -20 /etc/passwd  
sshd:x:74:74:Privilege-separated SSH:/var/empty/sshd:/sbin/nologin  
avahi:x:70:70:Avahi mDNS/DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin  
postfix:x:89:89::/var/spool/postfix:/sbin/nologin  
ntp:x:38:38::/etc/ntp:/sbin/nologin  
tcpdump:x:72:72::/sbin/nologin  
nlauzon:x:1000:1000:Nicolas Lauzon:/home/nlauzon:/bin/bash  
fred:x:1001:1001::/home/fred:/bin/bash  
joe:x:1002:1002:Joe Smith:/home/joe:/bin/bash  
user1:x:1003:1003::/home/user1:/bin/bash  
user2:x:1004:1004::/home/user2:/bin/bash  
user3:x:1005:1005::/home/user3:/bin/bash  
user4:x:1006:1006::/home/user4:/bin/bash  
kevin:x:1007:1007::/home/kevin:/bin/bash  
maria:x:1009:1011:Maria Clark:/home/maria:/bin/bash  
bob:x:1010:1012::/home/bob:/bin/bash  
andrew:x:1011:1013::/home/andrew:/bin/bash  
eng1:x:1012:1019::/home/eng1:/bin/bash  
eng2:x:1013:1020::/home/eng2:/bin/bash  
acc1:x:1014:1014::/home/acc1:/bin/bash  
acc2:x:1015:1015::/home/acc2:/bin/bash  
[root@server1 ~]#
```

## 2. Create two groups: engineers and accountants

```
root@server1:~  
File Edit View Search Terminal Help  
andrew:x:1011:1013::/home/andrew:/bin/bash  
eng1:x:1012:1019::/home/eng1:/bin/bash  
eng2:x:1013:1020::/home/eng2:/bin/bash  
acc1:x:1014:1014::/home/acc1:/bin/bash  
acc2:x:1015:1015::/home/acc2:/bin/bash  
[root@server1 ~]# groupadd engineers  
[root@server1 ~]# groupadd accountants  
[root@server1 ~]# tail -15 /etc/group  
kevin:x:1007:  
Sales:x:1009:  
Technicians:x:1008:kevin  
maria:x:1011:  
bob:x:1012:  
andrew:x:1013:  
account_group:x:1016:andrew  
group1:x:1017:user1,user2  
group2:x:1018:user3,user4  
eng1:x:1019:  
eng2:x:1020:  
acc1:x:1014:  
acc2:x:1015:  
engineers:x:1021:  
accountants:x:1022:  
[root@server1 ~]#
```

### 3. Add the two users eng1 and eng2 to the group engineers

```
root@server1:~  
File Edit View Search Terminal Help  
eng2:x:1020:  
acc1:x:1014:  
acc2:x:1015:  
engineers:x:1021:  
accountants:x:1022:  
[root@server1 ~]# gpasswd -M eng1,eng2 engineers  
[root@server1 ~]# gpasswd -M acc1,acc2 accountants  
[root@server1 ~]# tail -15 /etc/group  
kevin:x:1007:  
Sales:x:1009:  
Technicians:x:1008:kevin  
maria:x:1011:  
bob:x:1012:  
andrew:x:1013:  
account_group:x:1016:andrew  
group1:x:1017:user1,user2  
group2:x:1018:user3,user4  
eng1:x:1019:  
eng2:x:1020:  
acc1:x:1014:  
acc2:x:1015:  
engineers:x:1021:eng1,eng2  
accountants:x:1022:acc1,acc2  
[root@server1 ~]#
```

### 4. Add the two users acc1 and acc2 to the group accountants

```
root@server1:~  
File Edit View Search Terminal Help  
eng2:x:1020:  
acc1:x:1014:  
acc2:x:1015:  
engineers:x:1021:  
accountants:x:1022:  
[root@server1 ~]# gpasswd -M eng1,eng2 engineers  
[root@server1 ~]# gpasswd -M acc1,acc2 accountants  
[root@server1 ~]# tail -15 /etc/group  
kevin:x:1007:  
Sales:x:1009:  
Technicians:x:1008:kevin  
maria:x:1011:  
bob:x:1012:  
andrew:x:1013:  
account_group:x:1016:andrew  
group1:x:1017:user1,user2  
group2:x:1018:user3,user4  
eng1:x:1019:  
eng2:x:1020:  
acc1:x:1014:  
acc2:x:1015:  
engineers:x:1021:eng1,eng2  
accountants:x:1022:acc1,acc2  
[root@server1 ~]#
```

## 5. Create a directory /share and allow read, write and execute to everyone (rwxrwxrwx)

This question is the combination of questions 10 and 12 in Ch. 8 Lab 1. The directory and the required permissions are already in place at this point, and therefore does not need to be repeated. The commands used in Ch. 8 Lab 1 are nevertheless shown below:

```

root@server1:/
File Edit View Search Terminal Help
group1:x:1017:user1,user2
group2:x:1018:user3,user4
[root@server1 ~]# ls
anaconda-ks.cfg original-ks.cfg
[root@server1 ~]# cd /
[root@server1 /]# ls
bin dev home lib64 mnt proc run srv tmp var
boot etc lib media opt root sbin sys usr
[root@server1 /]# mkdir share
[root@server1 /]# ls -l
total 24
lrwxrwxrwx. 1 root root 7 Feb 5 13:40 bin -> usr/bin
dr-xr-xr-x. 5 root root 4096 Feb 5 14:01 boot
drwxr-xr-x. 20 root root 3320 Mar 25 09:59 dev
drwxr-xr-x. 144 root root 8192 Mar 25 12:19 etc
drwxr-xr-x. 14 root root 160 Mar 18 16:28 home
lrwxrwxrwx. 1 root root 7 Feb 5 13:40 lib -> usr/lib
lrwxrwxrwx. 1 root root 9 Feb 5 13:40 lib64 -> usr/lib64
drwxr-xr-x. 2 root root 6 Apr 10 2018 media
drwxr-xr-x. 2 root root 6 Apr 10 2018 mnt
drwxr-xr-x. 3 root root 16 Feb 5 13:49 opt
dr-xr-xr-x. 229 root root 0 Mar 25 09:59 proc
dr-xr-xr-x. 4 root root 207 Mar 25 11:58 root
drwxr-xr-x. 41 root root 1280 Mar 25 10:03 run

```

```

root@server1:/
File Edit View Search Terminal Help
[root@server1 /]# chmod 777 share
[root@server1 /]# ls -l
total 24
lrwxrwxrwx. 1 root root 7 Feb 5 13:40 bin -> usr/bin
dr-xr-xr-x. 5 root root 4096 Feb 5 14:01 boot
drwxr-xr-x. 20 root root 3320 Mar 25 09:59 dev
drwxr-xr-x. 144 root root 8192 Mar 25 12:19 etc
drwxr-xr-x. 14 root root 160 Mar 18 16:28 home
lrwxrwxrwx. 1 root root 7 Feb 5 13:40 lib -> usr/lib
lrwxrwxrwx. 1 root root 9 Feb 5 13:40 lib64 -> usr/lib64
drwxr-xr-x. 2 root root 6 Apr 10 2018 media
drwxr-xr-x. 2 root root 6 Apr 10 2018 mnt
drwxr-xr-x. 3 root root 16 Feb 5 13:49 opt
dr-xr-xr-x. 229 root root 0 Mar 25 09:59 proc
dr-xr-xr-x. 4 root root 207 Mar 25 11:58 root
drwxr-xr-x. 41 root root 1280 Mar 25 10:03 run
lrwxrwxrwx. 1 root root 8 Feb 5 13:40 sbin -> usr/sbin
drwxrwxrwx. 2 root root 6 Mar 25 12:23 share
drwxr-xr-x. 2 root root 6 Apr 10 2018 srv
dr-xr-xr-x. 13 root root 0 Mar 25 09:59 sys
drwxrwxrwt. 22 root root 4096 Mar 25 12:30 tmp
drwxr-xr-x. 13 root root 155 Feb 5 13:40 usr
drwxr-xr-x. 21 root root 4096 Feb 5 14:02 var
[root@server1 /]#

```

## 6. Create two subdirectories /share/Projects and /share/Bills

```
root@server1:/share
File Edit View Search Terminal Help
[root@server1 ~]# tail -15 /etc/group
kevin:x:1007:
Sales:x:1009:
Technicians:x:1008:kevin
maria:x:1011:
bob:x:1012:
andrew:x:1013:
account_group:x:1016:andrew
group1:x:1017:user1,user2
group2:x:1018:user3,user4
eng1:x:1019:
eng2:x:1020:
acc1:x:1014:
acc2:x:1015:
engineers:x:1021:eng1,eng2
accountants:x:1022:acc1,acc2
[root@server1 ~]# cd /share
[root@server1 share]# mkdir Projects Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Projects
[root@server1 share]#
```

## 7. Change the group owner of the directory Projects to the group engineers

```
root@server1:/share
File Edit View Search Terminal Help
account_group:x:1016:andrew
group1:x:1017:user1,user2
group2:x:1018:user3,user4
eng1:x:1019:
eng2:x:1020:
acc1:x:1014:
acc2:x:1015:
engineers:x:1021:eng1,eng2
accountants:x:1022:acc1,acc2
[root@server1 ~]# cd /share
[root@server1 share]# mkdir Projects Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Projects
[root@server1 share]# chgrp engineers Projects
[root@server1 share]# chgrp accountants Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]#
```

## 8. Change the group owner of the directory Bills to the group accountants

```
root@server1:/share
File Edit View Search Terminal Help
account_group:x:1016:andrew
group1:x:1017:user1,user2
group2:x:1018:user3,user4
eng1:x:1019:
eng2:x:1020:
acc1:x:1014:
acc2:x:1015:
engineers:x:1021:eng1,eng2
accountants:x:1022:acc1,acc2
[root@server1 ~]# cd /share
[root@server1 share]# mkdir Projects Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Projects
[root@server1 share]# chgrp engineers Projects
[root@server1 share]# chgrp accountants Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]#
```

## 9. Change the permissions on the directory Projects to allow read, write and execute for you (root) and the group owner, and no permissions for other users.

```
root@server1:/share
File Edit View Search Terminal Help
engineers:x:1021:eng1,eng2
accountants:x:1022:acc1,acc2
[root@server1 ~]# cd /share
[root@server1 share]# mkdir Projects Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Projects
[root@server1 share]# chgrp engineers Projects
[root@server1 share]# chgrp accountants Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]# chmod 770 Projects
[root@server1 share]# chmod 770 Bills
[root@server1 share]# ls -l
total 0
drwxrwx---. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxrwx---. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]#
```



**10. Change the permissions on the directory Bills to allow read, write and execute for you (root) and the group owner and no permissions for other users.**

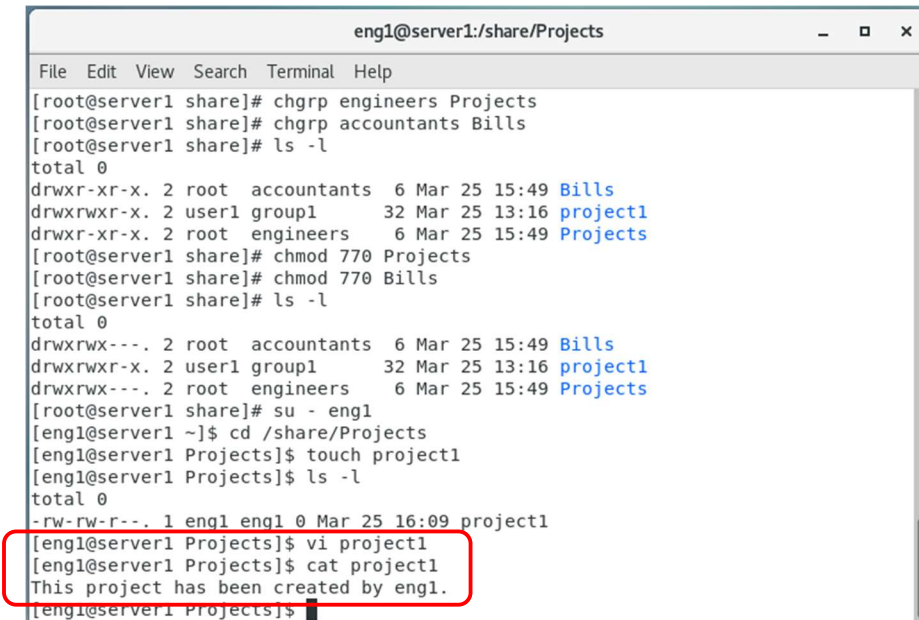
```
root@server1:/share
File Edit View Search Terminal Help
engineers:x:1021:eng1,eng2
accountants:x:1022:acc1,acc2
[root@server1 ~]# cd /share
[root@server1 share]# mkdir Projects Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Projects
[root@server1 share]# chgrp engineers Projects
[root@server1 share]# chgrp accountants Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]# chmod 770 Projects
[root@server1 share]# chmod 770 Bills
[root@server1 share]# ls -l
total 0
drwxrwx---. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxrwx---. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]#
```

**Log as eng1**

**11. Create a new file named project1 in the directory Projects**

```
eng1@server1:/share/Projects
File Edit View Search Terminal Help
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root root 6 Mar 25 15:49 Projects
[root@server1 share]# chgrp engineers Projects
[root@server1 share]# chgrp accountants Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]# chmod 770 Projects
[root@server1 share]# chmod 770 Bills
[root@server1 share]# ls -l
total 0
drwxrwx---. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxrwx---. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]# su - eng1
[eng1@server1 ~]$ cd /share/Projects
[eng1@server1 Projects]$ touch project1
[eng1@server1 Projects]$ ls -l
total 0
-rw-rw-r--. 1 eng1 eng1 0 Mar 25 16:09 project1
[eng1@server1 Projects]$
```

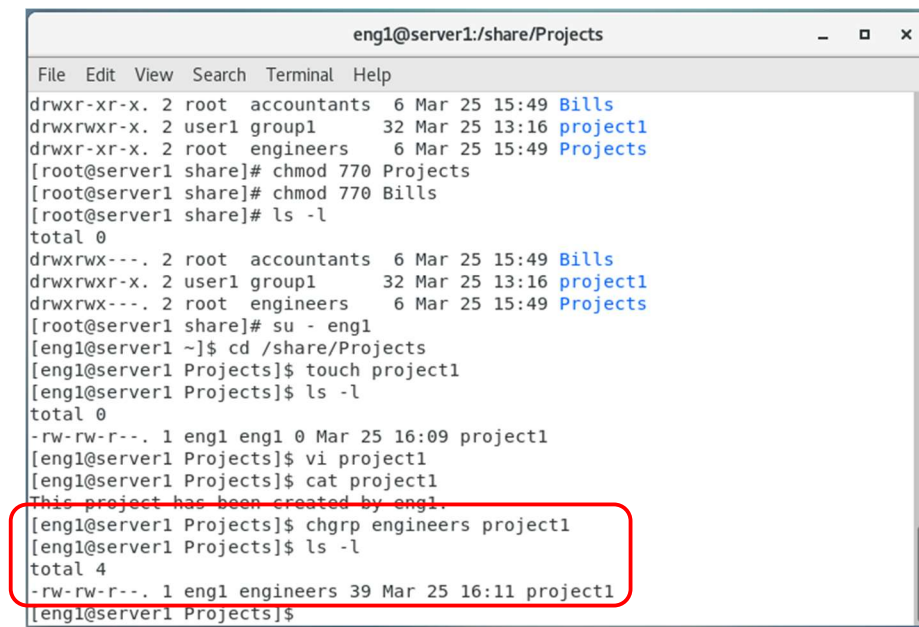
**12. Edit the file project1, add “this project has been created by eng1” then save.**



A terminal window titled 'eng1@server1:/share/Projects' showing a series of commands and their outputs. The user 'root' is initially at the prompt. They run 'chgrp engineers Projects' and 'chgrp accountants Bills'. Then they run 'ls -l' showing a directory listing with files 'Bills', 'project1', and 'Projects'. They then run 'chmod 770 Projects' and 'chmod 770 Bills'. Another 'ls -l' shows the same listing. Then they switch to user 'eng1' with 'su - eng1'. They run 'cd /share/Projects' and 'touch project1'. A subsequent 'ls -l' shows 'project1' as a file owned by 'eng1' and created on Mar 25 16:09. This line is highlighted with a red box. Then they run 'vi project1' and 'cat project1', which outputs 'This project has been created by eng1.' This output is also highlighted with a red box.

```
eng1@server1:/share/Projects
File Edit View Search Terminal Help
[root@server1 share]# chgrp engineers Projects
[root@server1 share]# chgrp accountants Bills
[root@server1 share]# ls -l
total 0
drwxr-xr-x. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]# chmod 770 Projects
[root@server1 share]# chmod 770 Bills
[root@server1 share]# ls -l
total 0
drwxrwx---. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxrwx---. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]# su - eng1
[eng1@server1 ~]$ cd /share/Projects
[eng1@server1 Projects]$ touch project1
[eng1@server1 Projects]$ ls -l
total 0
-rw-rw-r--. 1 eng1 eng1 0 Mar 25 16:09 project1
[eng1@server1 Projects]$ vi project1
[eng1@server1 Projects]$ cat project1
This project has been created by eng1.
[eng1@server1 Projects]$
```

**13. Change the group owner of the file project1 to the group engineers**



A terminal window titled 'eng1@server1:/share/Projects' showing the continuation of the previous steps. The user 'eng1' is at the prompt. They run 'vi project1' and 'cat project1', which outputs 'This project has been created by eng1.' This output is highlighted with a red box. Then they run 'chgrp engineers project1'. A subsequent 'ls -l' shows 'project1' as a file owned by 'eng1' and belonging to the 'engineers' group, created on Mar 25 16:11. This line is highlighted with a red box.

```
eng1@server1:/share/Projects
File Edit View Search Terminal Help
drwxr-xr-x. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxr-xr-x. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]# chmod 770 Projects
[root@server1 share]# chmod 770 Bills
[root@server1 share]# ls -l
total 0
drwxrwx---. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxrwx---. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]# su - eng1
[eng1@server1 ~]$ cd /share/Projects
[eng1@server1 Projects]$ touch project1
[eng1@server1 Projects]$ ls -l
total 0
-rw-rw-r--. 1 eng1 eng1 0 Mar 25 16:09 project1
[eng1@server1 Projects]$ vi project1
[eng1@server1 Projects]$ cat project1
This project has been created by eng1.
[eng1@server1 Projects]$ chgrp engineers project1
[eng1@server1 Projects]$ ls -l
total 4
-rw-rw-r--. 1 eng1 engineers 39 Mar 25 16:11 project1
[eng1@server1 Projects]$
```



**14. Change the permissions on the file project1 to allow read, write and execute for you (eng1) and the group owner, and no permissions for other users.**

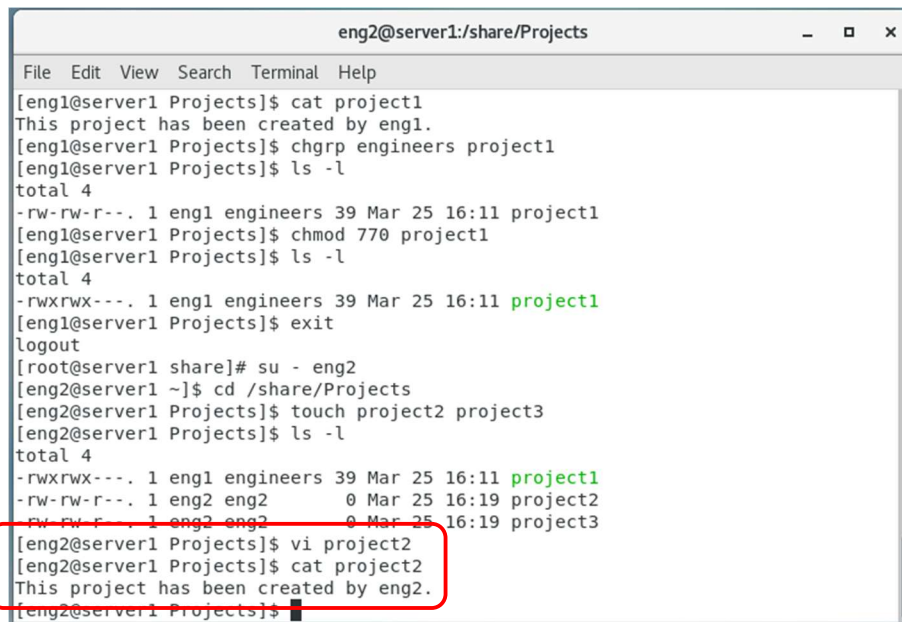
```
eng1@server1:/share/Projects
File Edit View Search Terminal Help
[root@server1 share]# chmod 770 Bills
[root@server1 share]# ls -l
total 0
drwxrwx---. 2 root accountants 6 Mar 25 15:49 Bills
drwxrwxr-x. 2 user1 group1 32 Mar 25 13:16 project1
drwxrwx---. 2 root engineers 6 Mar 25 15:49 Projects
[root@server1 share]# su - eng1
[eng1@server1 ~]$ cd /share/Projects
[eng1@server1 Projects]$ touch project1
[eng1@server1 Projects]$ ls -l
total 0
-rw-rw-r--. 1 eng1 eng1 0 Mar 25 16:09 project1
[eng1@server1 Projects]$ vi project1
[eng1@server1 Projects]$ cat project1
This project has been created by eng1.
[eng1@server1 Projects]$ chgrp engineers project1
[eng1@server1 Projects]$ ls -l
total 4
-rw-rw-r--. 1 eng1 engineers 39 Mar 25 16:11 project1
[eng1@server1 Projects]$ chmod 770 project1
[eng1@server1 Projects]$ ls -l
total 4
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
[eng1@server1 Projects]$
```

**Log as eng2**

**15. Create two new files named project2 and project3 in the directory Projects**

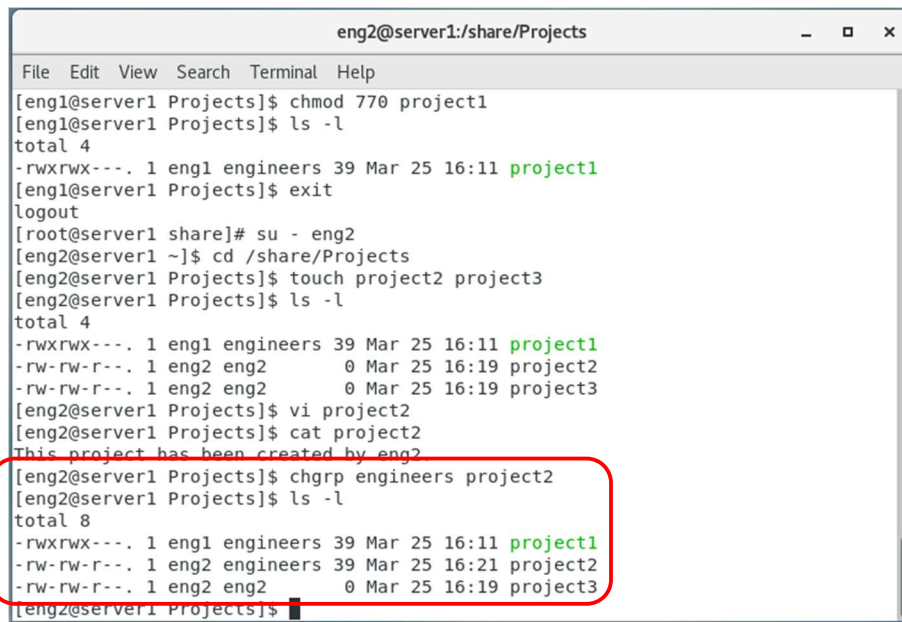
```
eng2@server1:/share/Projects
File Edit View Search Terminal Help
total 0
-rw-rw-r--. 1 eng1 eng1 0 Mar 25 16:09 project1
[eng1@server1 Projects]$ vi project1
[eng1@server1 Projects]$ cat project1
This project has been created by eng1.
[eng1@server1 Projects]$ chgrp engineers project1
[eng1@server1 Projects]$ ls -l
total 4
-rw-rw-r--. 1 eng1 engineers 39 Mar 25 16:11 project1
[eng1@server1 Projects]$ chmod 770 project1
[eng1@server1 Projects]$ ls -l
total 4
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
[eng1@server1 Projects]$ exit
logout
[root@server1 share]# su - eng2
[eng2@server1 ~]$ cd /share/Projects
[eng2@server1 Projects]$ touch project2 project3
[eng2@server1 Projects]$ ls -l
total 4
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rw-rw-r--. 1 eng2 eng2 0 Mar 25 16:19 project2
-rw-rw-r--. 1 eng2 eng2 0 Mar 25 16:19 project3
[eng2@server1 Projects]$
```

**16. Edit the file project2, add “this project has been created by eng2” then save.**



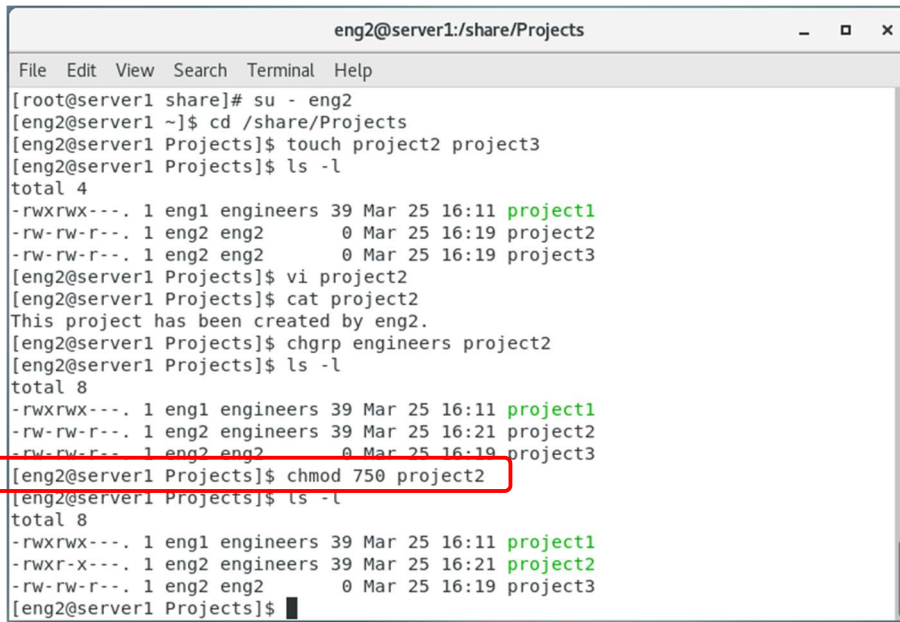
```
eng2@server1:/share/Projects
File Edit View Search Terminal Help
[eng1@server1 Projects]$ cat project1
This project has been created by eng1.
[eng1@server1 Projects]$ chgrp engineers project1
[eng1@server1 Projects]$ ls -l
total 4
-rw-rw-r--. 1 eng1 engineers 39 Mar 25 16:11 project1
[eng1@server1 Projects]$ chmod 770 project1
[eng1@server1 Projects]$ ls -l
total 4
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
[eng1@server1 Projects]$ exit
logout
[root@server1 share]# su - eng2
[eng2@server1 ~]$ cd /share/Projects
[eng2@server1 Projects]$ touch project2 project3
[eng2@server1 Projects]$ ls -l
total 4
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ vi project2
[eng2@server1 Projects]$ cat project2
This project has been created by eng2.
[eng2@server1 Projects]$
```

**17. Change the group owner of the file project2 to the group engineers**



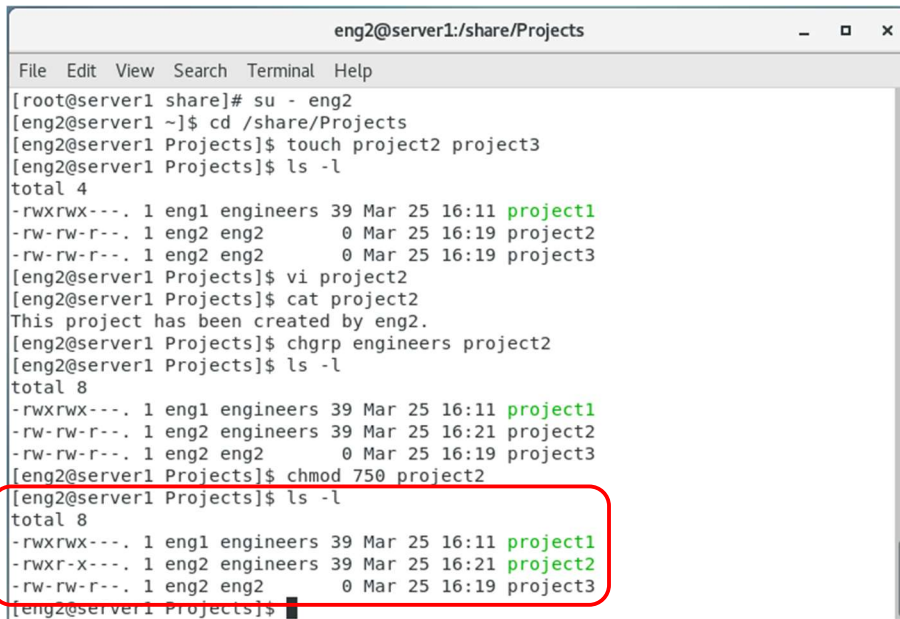
```
eng2@server1:/share/Projects
File Edit View Search Terminal Help
[eng1@server1 Projects]$ chmod 770 project1
[eng1@server1 Projects]$ ls -l
total 4
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
[eng1@server1 Projects]$ exit
logout
[root@server1 share]# su - eng2
[eng2@server1 ~]$ cd /share/Projects
[eng2@server1 Projects]$ touch project2 project3
[eng2@server1 Projects]$ ls -l
total 4
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ vi project2
[eng2@server1 Projects]$ cat project2
This project has been created by eng2
[eng2@server1 Projects]$ chgrp engineers project2
[eng2@server1 Projects]$ ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rw-rw-r--. 1 eng2 engineers 39 Mar 25 16:21 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$
```

- 18. Change the permissions on the file project2 to allow read, write and execute for you (eng2) and read and execute for the group owner, and no permissions for other users.**



```
eng2@server1:/share/Projects
File Edit View Search Terminal Help
[root@server1 share]# su - eng2
[eng2@server1 ~]$ cd /share/Projects
[eng2@server1 Projects]$ touch project2 project3
[eng2@server1 Projects]$ ls -l
total 4
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ vi project2
[eng2@server1 Projects]$ cat project2
This project has been created by eng2.
[eng2@server1 Projects]$ chgrp engineers project2
[eng2@server1 Projects]$ ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rw-rw-r--. 1 eng2 engineers 39 Mar 25 16:21 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ chmod 750 project2
[eng2@server1 Projects]$ ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng2 engineers 39 Mar 25 16:21 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$
```

- 19. Verify the permissions assigned to project1 and project2 and project3**



```
eng2@server1:/share/Projects
File Edit View Search Terminal Help
[root@server1 share]# su - eng2
[eng2@server1 ~]$ cd /share/Projects
[eng2@server1 Projects]$ touch project2 project3
[eng2@server1 Projects]$ ls -l
total 4
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ vi project2
[eng2@server1 Projects]$ cat project2
This project has been created by eng2.
[eng2@server1 Projects]$ chgrp engineers project2
[eng2@server1 Projects]$ ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rw-rw-r--. 1 eng2 engineers 39 Mar 25 16:21 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ chmod 750 project2
[eng2@server1 Projects]$ ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng2 engineers 39 Mar 25 16:21 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$
```

## 20. Assign the same permissions for project3 as the permissions assigned to project2

```

eng2@server1:/share/Projects
File Edit View Search Terminal Help
-rw-rw-r--. 1 eng2 eng2    0 Mar 25 16:19 project2
-rw-rw-r--. 1 eng2 eng2    0 Mar 25 16:19 project3
[eng2@server1 Projects]$ vi project2
[eng2@server1 Projects]$ cat project2
This project has been created by eng2.
[eng2@server1 Projects]$ chgrp engineers project2
[eng2@server1 Projects]$ ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rw-rw-r--. 1 eng2 engineers 39 Mar 25 16:21 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ chmod 750 project2
[eng2@server1 Projects]$ ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng2 engineers 39 Mar 25 16:21 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ chmod --reference=project2 project3
[eng2@server1 Projects]$ ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng2 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$

```

## Log as root

## 21. Change user ownership of the file project2 to eng1

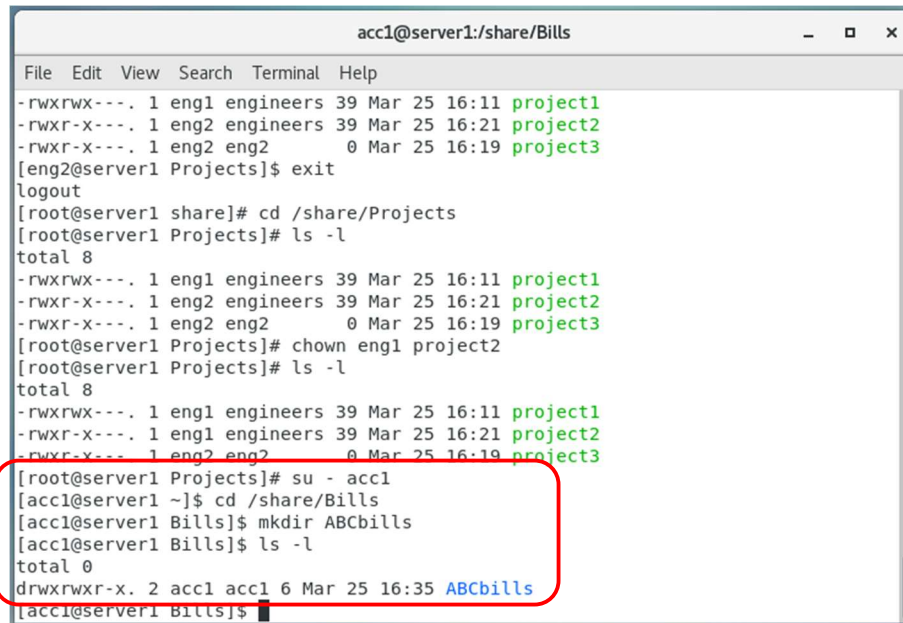
```

root@server1:/share/Projects
File Edit View Search Terminal Help
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng2 engineers 39 Mar 25 16:21 project2
-rw-rw-r--. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ chmod --reference=project2 project3
[eng2@server1 Projects]$ ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng2 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ exit
logout
[root@server1 share]# cd /share/Projects
[root@server1 Projects]# ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng2 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2      0 Mar 25 16:19 project3
[root@server1 Projects]# chown eng1 project2
[root@server1 Projects]# ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng1 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2      0 Mar 25 16:19 project3
[root@server1 Projects]#

```

## Log as acc1

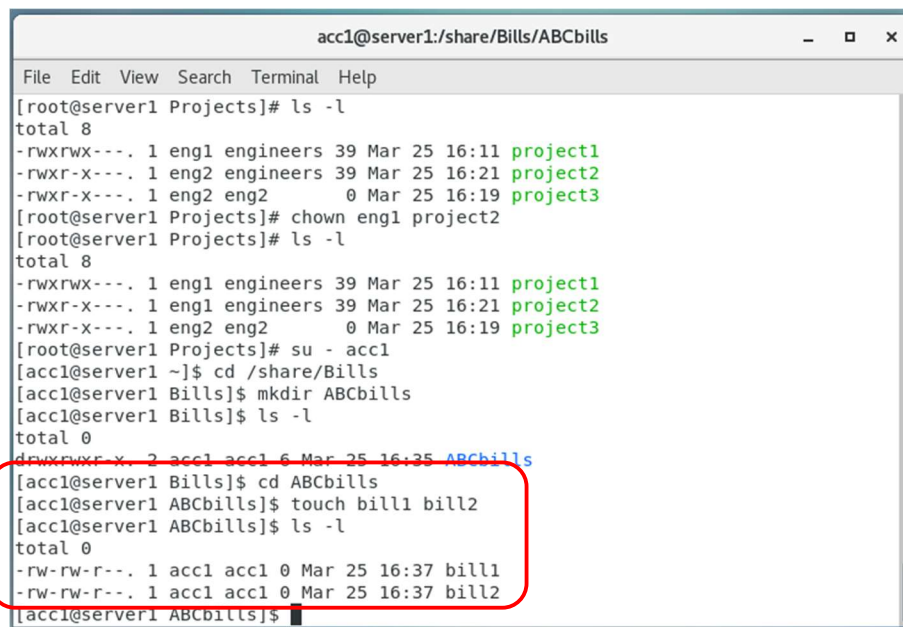
### 22. Create a new subdirectory named ABCbills in the directory Bills (/share/Bills/ABCbills)



A terminal window titled 'acc1@server1:/share/Bills' showing a series of commands and their outputs. The user 'eng2' logs out, and the user 'root' navigates to '/share/Projects'. After listing the directory, 'root' changes ownership of 'project2' to 'eng1'. Then, 'root' switches to the user 'acc1'. The user 'acc1' navigates to '/share/Bills' and creates a new directory 'ABCbills'. The final 'ls -l' command shows the new directory with permissions 'drwxrwxr-x', owned by 'acc1', and created on 'Mar 25 16:35'. The new directory entry is highlighted with a red box.

```
acc1@server1:/share/Bills
File Edit View Search Terminal Help
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng2 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2      0 Mar 25 16:19 project3
[eng2@server1 Projects]$ exit
logout
[root@server1 share]# cd /share/Projects
[root@server1 Projects]# ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng2 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2      0 Mar 25 16:19 project3
[root@server1 Projects]# chown eng1 project2
[root@server1 Projects]# ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng1 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2      0 Mar 25 16:19 project3
[root@server1 Projects]# su - acc1
[acc1@server1 ~]$ cd /share/Bills
[acc1@server1 Bills]$ mkdir ABCbills
[acc1@server1 Bills]$ ls -l
total 0
drwxrwxr-x. 2 acc1 acc1 6 Mar 25 16:35 ABCbills
[acc1@server1 Bills]$
```

### 23. Create two files named bill1 and bill2 under the subdirectory ABCbills



A terminal window titled 'acc1@server1:/share/Bills/ABCbills' showing the user 'acc1' navigating to the 'ABCbills' directory and creating two files, 'bill1' and 'bill2', using the 'touch' command. The final 'ls -l' command shows the two files with permissions '-rw-rw-r--', owned by 'acc1', and created on 'Mar 25 16:37'. The file entries are highlighted with a red box.

```
acc1@server1:/share/Bills/ABCbills
File Edit View Search Terminal Help
[root@server1 Projects]# ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng2 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2      0 Mar 25 16:19 project3
[root@server1 Projects]# chown eng1 project2
[root@server1 Projects]# ls -l
total 8
-rwxrwx---. 1 eng1 engineers 39 Mar 25 16:11 project1
-rwxr-x---. 1 eng1 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2      0 Mar 25 16:19 project3
[root@server1 Projects]# su - acc1
[acc1@server1 ~]$ cd /share/Bills
[acc1@server1 Bills]$ mkdir ABCbills
[acc1@server1 Bills]$ ls -l
total 0
drwxrwxr-x. 2 acc1 acc1 6 Mar 25 16:35 ABCbills
[acc1@server1 Bills]$ cd ABCbills
[acc1@server1 ABCbills]$ touch bill1 bill2
[acc1@server1 ABCbills]$ ls -l
total 0
-rw-rw-r--. 1 acc1 acc1 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc1 acc1 0 Mar 25 16:37 bill2
[acc1@server1 ABCbills]$
```

### 24. Verify the permissions setting for the subdirectory ABCbills and the files inside

As can be seen in the screenshots in questions 22 and 23, the permission setting for the subdirectory ABCbills are `rw-rwxr-x`, while those of the files `bill1` and `bill2` are both `rw-rw-r--`.



## 25. Change the group owner of the subdirectory ABCbills and the files within it to the group accountants

```
acc1@server1:/share/Bills
File Edit View Search Terminal Help
-rwxr-x---. 1 eng1 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2 0 Mar 25 16:19 project3
[root@server1 Projects]# su - acc1
[acc1@server1 ~]$ cd /share/Bills
[acc1@server1 Bills]$ mkdir ABCbills
[acc1@server1 Bills]$ ls -l
total 0
drwxrwxr-x. 2 acc1 acc1 6 Mar 25 16:35 ABCbills
[acc1@server1 Bills]$ cd ABCbills
[acc1@server1 ABCbills]$ touch bill1 bill2
[acc1@server1 ABCbills]$ ls -l
total 0
-rw-rw-r--. 1 acc1 acc1 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc1 acc1 0 Mar 25 16:37 bill2
[acc1@server1 ABCbills]$ cd ..
[acc1@server1 Bills]$ chgrp -R accountants ABCbills
[acc1@server1 Bills]$ ls -l
total 0
drwxrwxr-x. 2 acc1 accountants 32 Mar 25 16:37 ABCbills
[acc1@server1 Bills]$ ls -l ABCbills
total 0
-rw-rw-r--. 1 acc1 accountants 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc1 accountants 0 Mar 25 16:37 bill2
[acc1@server1 Bills]$
```

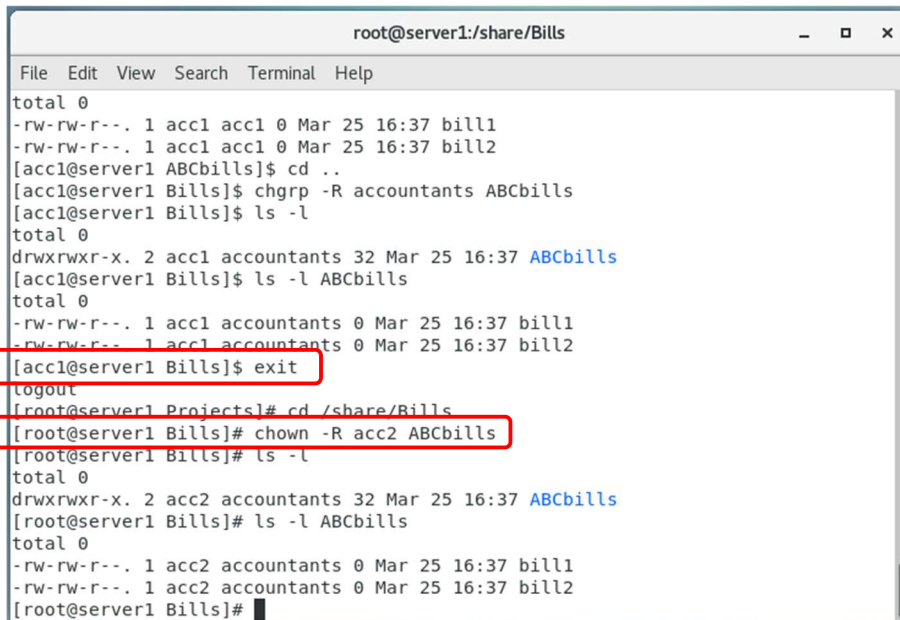
## 26. Verify the new group owner for the subdirectory ABCbills and the files inside

```
acc1@server1:/share/Bills
File Edit View Search Terminal Help
-rwxr-x---. 1 eng1 engineers 39 Mar 25 16:21 project2
-rwxr-x---. 1 eng2 eng2 0 Mar 25 16:19 project3
[root@server1 Projects]# su - acc1
[acc1@server1 ~]$ cd /share/Bills
[acc1@server1 Bills]$ mkdir ABCbills
[acc1@server1 Bills]$ ls -l
total 0
drwxrwxr-x. 2 acc1 acc1 6 Mar 25 16:35 ABCbills
[acc1@server1 Bills]$ cd ABCbills
[acc1@server1 ABCbills]$ touch bill1 bill2
[acc1@server1 ABCbills]$ ls -l
total 0
-rw-rw-r--. 1 acc1 acc1 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc1 acc1 0 Mar 25 16:37 bill2
[acc1@server1 ABCbills]$ cd ..
[acc1@server1 Bills]$ chgrp -R accountants ABCbills
[acc1@server1 Bills]$ ls -l
total 0
drwxrwxr-x. 2 acc1 accountants 32 Mar 25 16:37 ABCbills
[acc1@server1 Bills]$ ls -l ABCbills
total 0
-rw-rw-r--. 1 acc1 accountants 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc1 accountants 0 Mar 25 16:37 bill2
[acc1@server1 Bills]$
```



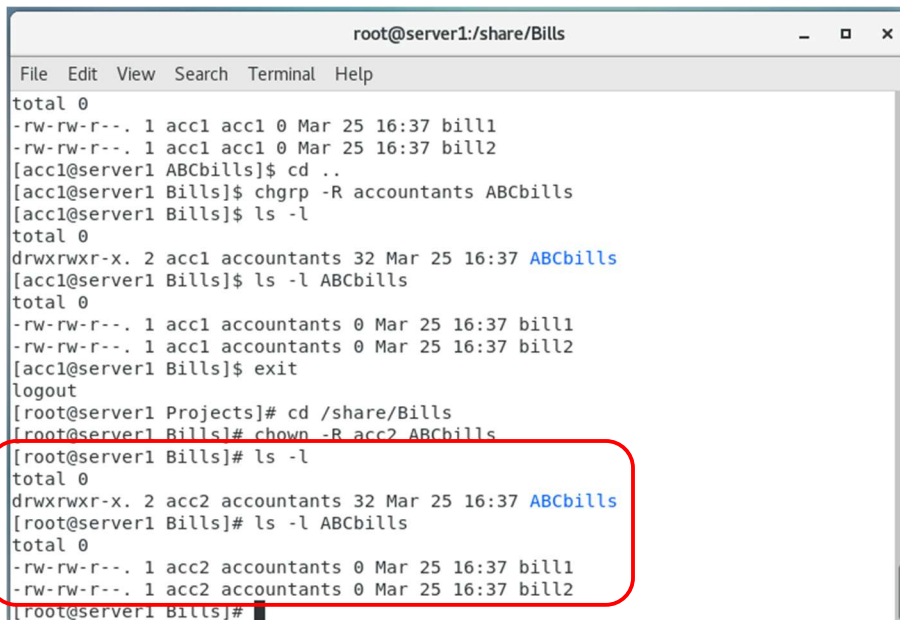
## Log as root

### 27. Change the user ownership of the subdirectory ABCbills and the files within it to acc2.



```
root@server1:/share/Bills
File Edit View Search Terminal Help
total 0
-rw-rw-r--. 1 acc1 acc1 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc1 acc1 0 Mar 25 16:37 bill2
[acc1@server1 ABCbills]$ cd ..
[acc1@server1 Bills]$ chgrp -R accountants ABCbills
[acc1@server1 Bills]$ ls -l
total 0
drwxrwxr-x. 2 acc1 accountants 32 Mar 25 16:37 ABCbills
[acc1@server1 Bills]$ ls -l ABCbills
total 0
-rw-rw-r--. 1 acc1 accountants 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc1 accountants 0 Mar 25 16:37 bill2
[acc1@server1 Bills]$ exit
logout
[root@server1 Projects]# cd /share/Bills
[root@server1 Bills]# chown -R acc2 ABCbills
[root@server1 Bills]# ls -l
total 0
drwxrwxr-x. 2 acc2 accountants 32 Mar 25 16:37 ABCbills
[root@server1 Bills]# ls -l ABCbills
total 0
-rw-rw-r--. 1 acc2 accountants 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc2 accountants 0 Mar 25 16:37 bill2
[root@server1 Bills]#
```

### 28. Verify the new user owner for the subdirectory ABCbills and the files inside



```
root@server1:/share/Bills
File Edit View Search Terminal Help
total 0
-rw-rw-r--. 1 acc1 acc1 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc1 acc1 0 Mar 25 16:37 bill2
[acc1@server1 ABCbills]$ cd ..
[acc1@server1 Bills]$ chgrp -R accountants ABCbills
[acc1@server1 Bills]$ ls -l
total 0
drwxrwxr-x. 2 acc1 accountants 32 Mar 25 16:37 ABCbills
[acc1@server1 Bills]$ ls -l ABCbills
total 0
-rw-rw-r--. 1 acc1 accountants 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc1 accountants 0 Mar 25 16:37 bill2
[acc1@server1 Bills]$ exit
logout
[root@server1 Projects]# cd /share/Bills
[root@server1 Bills]# chown -R acc2 ABCbills
[root@server1 Bills]# ls -l
total 0
drwxrwxr-x. 2 acc2 accountants 32 Mar 25 16:37 ABCbills
[root@server1 Bills]# ls -l ABCbills
total 0
-rw-rw-r--. 1 acc2 accountants 0 Mar 25 16:37 bill1
-rw-rw-r--. 1 acc2 accountants 0 Mar 25 16:37 bill2
[root@server1 Bills]#
```