

## Assignment #5 – ‘Access Control Policies’

### Initial commands:-

```
mkdir shared_folder  
docker run --name acp -d -t -v "$(pwd)"/shared_folder:/shared_folder ubuntu:20.04
```

### Starting and login to the container:-

```
docker start acp {needed if we want to log in again into the docker}  
sudo docker exec -it acp bash
```

### Install acl package:-

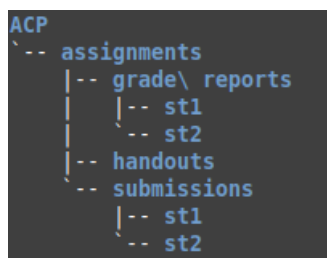
```
apt-get update  
apt-get install acl
```

### Making Directory structure:-

```
mkdir ACP  
cd ACP  
mkdir assignments  
cd assignments/  
mkdir 'handouts' 'submissions' 'grade reports'  
mkdir submissions/st1 submissions/st2  
mkdir grade\reports/st1 grade\reports/st2
```

### Viewing directory structure using tree command:-

```
sudo apt-get install tree {not required, just a useful command to view directory/Testing}  
tree ACP/
```



```
ACP  
|-- assignments  
|   |-- grade\ reports  
|   |   |-- st1  
|   |   |-- st2  
|   |-- handouts  
|   |-- submissions  
|       |-- st1  
|       |-- st2
```

### Creating groups:-

```
groupadd -g 20001 instructors  
groupadd -g 21001 tas  
groupadd -g 22001 students
```

### Creating Users:-

```
useradd -g instructors -u 10001 alice  
useradd -g tas -u 11001 bob  
useradd -g tas -u 11002 charlie  
useradd -g students -u 12001 st1  
useradd -g students -u 12002 st2
```

**Confirming the users being made:-**

```
cut -d: -f1 /etc/passwd
```

**Setting permissions for assignments directory:-**

```
setfacl -m g:instructors:rx /ACP/assignments/  
setfacl -m g:tas:r /ACP/assignments/  
setfacl -m g:students:rx /ACP/assignments/
```

If the TA user account is removed from the TA group, it will lose any permissions when accessing the file system. this will ensure that anyone else is not able to access the directory.

```
setfacl -m o::r /ACP/assignments/
```

**Setting the permissions to the handout's directory:-**

Only instructors and TAs are allowed to write the assignment handouts, and all instructors, TAs, and students can read the assignment handouts.

```
setfacl -m g:instructors:rwX /ACP/assignments/handouts  
setfacl -m g:tas:rwX /ACP/assignments/handouts  
setfacl -m g:students:rx /ACP/assignments/handouts  
setfacl -m o::r /ACP/assignments/handouts
```

**Setting the permissions to the submission's directory:-**

Instructors and TAs can read students' assignment submissions. A student can read his or her own assignment submissions but not other students' submissions. A student can write (update) his or her own assignment submission but not other students' assignment submissions. Instructors and TAs are not allowed to write to students' assignment submissions.

```
Setfacl -m g:instructors:rx /ACP/assignments/submissions  
setfacl -m g:tas:rx /ACP/assignments/submissions  
setfacl -m g:students:rx /ACP/assignments/submissions  
setfacl -m o::r /ACP/assignments/submissions
```

**#Not allowing students to access each other's directory:-**

```
setfacl -m u:st1:rwX /ACP/assignments/submissions/st1  
setfacl -m u:st1:--- /ACP/assignments/submissions/st2  
setfacl -m u:st2:--- /ACP/assignments/submissions/st1  
setfacl -m u:st2:rwX /ACP/assignments/submissions/st2
```

**Setting the permissions to grade reports directory:-**

Instructors can read and write the grade reports. TAs can read the grade reports but not write any grade reports. A student is allowed to read his or her own grade report but not other students' grade reports. A student is not allowed to write any grade reports.

```
setfacl -m g:instructors:rwX /ACP/assignments/grade\reports  
setfacl -m g:tas:rx /ACP/assignments/grade\reports  
setfacl -m g:students:rx /ACP/assignments/grade\reports  
setfacl -m o::r /ACP/assignments/grade\reports
```

### # Only the instructor can write into the student's directory:-

```
setfacl -m g:instructors:rwx /ACP/assignments/grade\reports/st1
setfacl -m g:instructors:rwx /ACP/assignments/grade\reports/st2
```

### # Not allowing students to access each other's directory:-

```
setfacl -m u:st1:rx /ACP/assignments/grade\reports/st1
setfacl -m u:st2:--- /ACP/assignments/grade\reports/st1

setfacl -m u:st1:--- /ACP/assignments/grade\reports/st2
setfacl -m u:st2:rx /ACP/assignments/grade\reports/st2
```

### Code.

- i. A well-explained process is available in a markdown file. Click [here](#) to access the file or navigate to [https://github.com/AYUSHs799/IITGN\\_CS431/blob/main/Assignment\\_5%20Access\\_Control\\_Policies/Process.md](https://github.com/AYUSHs799/IITGN_CS431/blob/main/Assignment_5%20Access_Control_Policies/Process.md).
- ii. Link to the folder containing all the files : (In case any of the link changes) [https://github.com/AYUSHs799/IITGN\\_CS431](https://github.com/AYUSHs799/IITGN_CS431)

### References.

- i. <https://www.tecmint.com/secure-files-using-acls-in-linux/>
- ii. <https://www.ibm.com/docs/en/zos/2.3.0?topic=scd-setfacl-set-remove-change-access-control-lists-acls>
- iii. <https://www.geeksforgeeks.org/access-control-lists-acl-linux/>
- iv. [https://access.redhat.com/documentation/en-us/red\\_hat\\_enterprise\\_linux/7/html/system\\_administrators\\_guide/ch-access\\_control\\_lists](https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/7/html/system_administrators_guide/ch-access_control_lists)