République Algérienne Démocratique et Populaire
Ministère de l'Enseignement Supérieur
et de la Recherche Scientifique
ECOLE SUPÉRIEURE EN INFORMATIQUE
8 Mai 1945 - Sidi-Bel-Abbès

الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي
المدرسة العليا للإعلام الآلي
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Cyber Security - Computer Science and Network Security

LAB SHEET 3 – Access Control & ACLs on Linux

Before you start

1. **Create users and groups**

Run the following commands as root or with sudo:

```
sudo useradd alice
sudo useradd bob
sudo useradd carol
sudo useradd dave

sudo groupadd dev
sudo groupadd design
sudo groupadd audit

sudo usermod-aG dev bob
sudo usermod-aG design carol
sudo usermod-aG audit dave
```

- **Screenshot 1:** Show the list of created users and groups (cat /etc/passwd, cat /etc/group).

General instructions

All files and folders must be created under the personal directory: /home/[firstname_lastname]/ (example: /home/bendella_mohammed/). After each exercise, take a screenshot showing your commands and results. Written answers must be clear and justified.

Exercise 1 – Basic permission manipulation

1. Create a file named report.txt in your personal directory.
2. Show its permissions with ls -l.
3. Give full rights to the owner, read-only for the group, and no rights for others.
4. Verify with ls -l.

- **Screenshot 2:** Result of each command.
- **Questions:**
  - What is the numeric value corresponding to these rights?
  - Is the principle of least privilege respected? Why?

Exercise 2 – Directory management

1. Create a directory named tp_acl/ in /home/[first_last]/.
2. Set the following permissions on this directory:
- Owner: read, write, execute
- Group: read and execute
- Others: no permissions
3. Verify permissions with ls -ld.

Screenshot 3: output of ls -ld tp_acl/

Question: What is the difference between the execute right on a file and on a directory?

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Exercise 3 – Change owner and group

1. Change the owner of the file report.txt to alice.
2. Change the group of this file to dev.
3. Verify the result.

Screenshot 4: output of ls -l report.txt
Question: What is the difference between chown and chgrp?

Exercise 4 – ACL: fine-grained access control

1. Ensure the acl package is installed:

sudo apt install acl -y

2. On the directory tp_acl, apply these ACLs:
- bob: read + write
- carol: read-only
- dave: read-only without execute

3. Display the ACLs:

Screenshot 5: Output of displayed ACLs
Question: What is the difference between an ACL and classic Unix permissions?

Exercise 5 – ACL inheritance (default ACLs)

1. Add default ACLs so that all new files created inside tp_acl/ automatically inherit the above ACLs (in ex 4):

2. Create a file test_inherit.txt inside that folder and check its ACLs.

Screenshot 6: getfacl test_inherit.txt
Question: What happens if a user creates a new file in this directory?

Exercise 6 – Practical case (collaboration)

Context:
A shared project must be hosted in /home/[first_last]/project_acl/.
Rules:
- alice: full rights (owner)
- bob: read + write
- carol: read only
- dave: read without execute
- New files -> automatic inheritance

Tasks:
1. Create the folder and apply the appropriate ACLs.
2. Configure the mask so that execution is forbidden for everyone except alice.
3. Verify the ACLs.
Screenshot 7: getfacl output

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Submission requirements

Your submission must include in **a PDF FILE**:

1. Written answers to the questions.

2. All screenshots numbered as indicated (Screenshots 1–7).

3. The exact commands you executed.