



Operating Systems Lab

Lab – 12

Objectives:

1. Understanding the concept of Special Permissions in Linux
2. Understanding the Advanced Security Concepts in Linux

Resources:

- Video Lecture 23: <https://www.youtube.com/watch?v=6CJtdvL9P-Y>

Task 1:

- What are the three types of user IDs in Linux, and what are their purposes?
- What are the purposes of the SUID, SGID, and sticky bit in Linux? What is difference between "s" and "S" in permissions of file?
- What happens when the sticky bit is set on a directory?
- Why is the SUID permission considered a potential security risk?
- If the sticky bit is removed from /tmp, what potential issues might arise in a multi-user environment?
- Set up a directory, owned by the group **sports**.
 - I. Members of the **sports** group should be able to **create** files in this directory.
 - II. All files created in this directory should be **group-owned** by the **sports** group.
 - III. Users should be able to **delete** only their own **user-owned** files.
- Verify the permissions on **/usr/bin/passwd**. Remove the **setuid**, then try changing your password as a normal user. Reset the permissions back and try again
- Write a command which can print all the files in system whose **suid**, **sgid** and **sticky bit** on.

Task 2:

- Why is the /etc/shadow file protected with special permissions? What role does the SUID bit play in allowing password changes for regular users?
- What are the advantages of using the SUID bit over running a privileged daemon process to handle tasks like password changes?
- Explain how Access Control Lists (ACLs) differ from traditional UNIX file permissions. What advantages do they offer?
- How does Linux ensure password security in the /etc/shadow file? Why is hashing used instead of storing plain text passwords?
- What role does the "salt" play in password hashing, and how does it enhance security?
- Differentiate between encoding, hashing, and encryption. Provide an example of a use case for each.
- What is the difference between symmetric and asymmetric encryption? Give an example of an algorithm for each type.
- What are the limitations of symmetric encryption, and how does asymmetric encryption address these issues?