SOMNOG 8
Somali Network Operators Group
WORKSHOPS AND CONFERENCE
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Inclusive Innovation: Enabling a Trusted and Collaborative Digital Economy in Somalia.

A DECADE OF KNOWLEDGE SHARING
10 YEARS
2015 — 2025

Managing File Permissions

Track 2: **Systems and Services**

Jazeera University Main Campus

Day 1

Learning Objectives

After this session, you will be able to:

- Change permissions and ownership using command-line tools
- Interpret symbolic and numeric permission formats
- Manage default permissions using umask
- Configure special permissions (setuid, setgid, sticky bit)
- View and set Access Control Lists (ACLs)

Understanding Linux File Permissions

Each file has three permission sets:

- User (u)
- Group (g)
- Other (o)

Permissions:

- r - read
- w - write
- x - execute/search (directories)

Example:

- -rwxr-x--- → user=7, group=5, other=0

Changing Permissions with chmod

Symbolic Method

- Format:
  - chmod who what which file
    - Who: u, g, o, a
    - What: +, -, =
    - Which: r, w, x
- Examples:
  - chmod go-rw file1
  - chmod a+x file2

Changing Permissions with chmod

Numeric Method

- Format:
  - Each permission has an octal value:
  - r = 4
  - w = 2
  - x = 1
  - Examples:
  - chmod 750 sampledir → rwx r-x ---

Changing Ownership (chown)

Use chown to change file owner/group.

Examples:

- Change owner: chown student file
- Change group: chown :admins dir
- Owner + group: chown user:group file
- Recursive: chown -R user dir

Special Permissions (suid, sgid, sticky)

setuid (u+s)

- Executable runs with file owner’s privileges.
- Seen as: rws in user field.

setgid (g+s)

- Files created in directory inherit group of the directory.

sticky bit (o+t)

- Only owner (or root) can delete files in directory.
- Used in: /tmp

Setting Special Permissions

Symbolic

- u+s
- g+s
- o+t

Numeric (4th octal digit)

- setuid = 4
- setgid = 2
- sticky = 1

Example:

- chmod 2770 directory

Summary

- You learned how to:
  - ❖ Change file permissions (symbolic & numeric)
  - ❖ Modify user and group ownership
  - ❖ Configure setuid, setgid, sticky bit
  - ❖ Control file creation permissions with umask