Users and Permissions: Takeaways

Syntax

- Identifying users and their groups
  - `whoami`
  - `id`
  - `groups`
- See `file`'s metadata: `stat file`
- Changing permissions:
  - Symbolic notation: `chmod [ugoa][+-][rwx] files`.
    - Adding execution permission to the owner on `file`: `chmod u+x file`.
    - Removing writing permission to the primary group on `file`: `chmod g-w file`.
    - Setting read and execution permissions to others on `file`: `chmod o=rx file`
    - Changing several permissions simultaneously on `file`: `chmod u+w,g-x,o-r file`.
  - Octal notation: `chmod ddd` where `d` represents a digit between `0` and `7`.
    - `---`: `0` (no permissions)
    - `--x`: `1` (execute only permission)
    - `-w-`: `2` (write only permissions)
    - `-wx`: `3` (write and execute permissions)
    - `r--`: `4` (read only permissions)
    - `r-x`: `5` (read and execute permissions)
    - `rw-`: `6` (read and write permissions)
    - `rwx`: `7` (read, write, and execute permissions)
- Changing ownership on `file`: `chown [new_owner][:new_group] file`
  - Changing both the ownership and the group of `file1`: `sudo chown new_owner:new_group file`.
  - Changing the ownership of `file` while maintaining its group: `sudo chown new_owner file`.
  - Changing the group of `file` while maintaining its ownership: `sudo chown :new_group file`.
- Running command with superuser privileges: `sudo command`

Concepts

- Operating systems implement the concept of users.
- In Unix-like systems, everything is a file.
- Files have owners and group owners.

- Permissions are limits to the actions that users can perform.
- Permissions are a property of both files and users.
- To facilitate managing permissions, there is also the concept of group (of users). Groups also have permissions.
- Some users (like the superuser) have permissions to do everything.
- Users can elevate their priveleges to that of the superuser. Extra care is needed when using this power.
- In *nix systems, users can elevate their privileges with `sudo` .

Resources

- The origin of "Everything is a file".
- The setuid and setgid permission bits.
- Difference between symbolic link and shortcut
- Identifying file types in Linux
- POSIX standards on `chmod`
- The Uppercase X in `chmod`
- Effective user and real user
- Changing default permissions on file creation