Unix permissions on non-files

Many devices show up in file system
e.g. `/dev/tty1` permissions just like for files

Other access controls not represented in file system
e.g. must usually be root to do the following

- Bind any TCP or UDP port number less than 1024
- Change the current process's user or group ID
- Mount or unmount most file systems
- Create device nodes (such as `/dev/tty1`) in the file system
- Change the owner of a file
- Set the time-of-day clock; halt or reboot machine

Example - login run as root

Unix users typically stored in files in `/etc` files `passwd`, `group`, and often `shadow` or `master.passwd`

For each user, files contain

- Textual username (e.g., "`dm`", or "`root`")
- Numeric user ID, and group ID(s)
- One-way hash of user's password: {`salt`; *H*`(salt; passwd)`}
- Other information, such as user's full name, login shell, etc.

For instance `/usr/bin/login` runs as root

- Reads username & password from terminal
- Looks up username in `/etc/passwd`, etc.
- Computes *H*`(salt; typed password)` & checks that it matches
- If matches, sets group ID & user ID corresponding to username
- Execute user's shell with `execve` system call