# Users and Groups

**Advanced Embedded Linux Development**

with **Dan Walkes**

**Learning objectives:**

Understand Linux Users and Groups
Understand Linux Permissions

# Linux Users and Groups

- User logs in with a username and password
  - Authentication
- Each user is associated with a User ID (uid)
  - Each process is associated with the UID of the user running the process.
  - /etc/passwd maps usernames uids

# Linux Users and Groups

- UID 0 is the root user
  - Can do almost anything on the system
- Each user belongs to one or more groups, with corresponding Group IDs (gid)
  - /etc/group maps group names to gids

# Linux Permissions

Associates a file with owning user, owning group, and permission bits

| | User (owner) | | | Group | | | Others (everyone) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Read (r) | Write (w) | Execute (x) | Read (r) | Write (w) | Execute (x) | Read (r) | Write (w) | Execute (x) |
| Bit | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Octal Value | 0400 | 0200 | 0100 | 040 | 020 | 010 | 04 | 02 | 01 |

```
dan@DESKTOP-BQMVP69:~/CU/aesd-lectures$ ls -l
total 24
-rw-r--r-- 1 dan dan 1083 Jun 21 15:27 LICENSE
-rw-r--r-- 1 dan dan  149 Jun 21 15:27 README.md
drwxr-xr-x 4 dan dan 4096 Jun 21 17:08 lecture2
drwxr-xr-x 2 dan dan 4096 Jun 21 15:27 lecture5
drwxr-xr-x 2 dan dan 4096 Jun 21 15:27 lecture7
drwxr-xr-x 4 dan dan 4096 Jun 21 15:27 lecture9
```