

# Linux permissions

- Permissions in linux are based on three types of permission (read, write, execute) for three different categories of user (user, group, other)
- Permissions can be granted (+) or denied (-) for each of the nine combinations of permission type and user category
- As a general safety precaution, deny access to any category that doesn't explicitly need it (you certainly don't want people to add/edit/delete in your account!)

# User categories, permission types

- Of the three categories of user, “user” means the owner, “group” means anyone in a group with the user, and other means everyone else
- Of the three categories of permission, “read” means the ability to look at or copy a file or directory’s content, “write” means the ability to change said content, “execute” means the ability to run an executable file or cd into/through a directory

# Seeing current permissions

- The command “**ls -l filename**” lists the permission settings for the file (for a directory it also lists the settings for each item in the directory)
- The permissions in the resulting output are the 10-character block looking something like “-rwxr-xr--”
- The first character will be d for directory or – otherwise
- The next three characters are the user permissions, read first (r or -) then write (w or -) then execute (x or -) with – meaning that permission is denied
- The next three characters are the rwx permissions for group, and the final three characters are the rwx permissions for other

# Changing permissions: chmod

- The chmod command can be used to grant (+) or deny (-) permissions for a file/directory by specifying the user categories and permission types, e.g.

`chmod ugo+r filename # give everyone read access`

`chmod go-wx filename # deny write/execute for group/ other`

- Again, it is generally recommended you give each category of user the absolute minimum permissions necessary in each category (i.e. deny by default)

# chmod with numeric values

- Chmod can also take numeric arguments, e.g.  
    chmod 640 filename
- For each trio of permissions, you can think of the rwx sequence as being three bits, 0 for deny, 1 for granted, thus 6 corresponds to rw-, 4 to r--, 0 to ---, 3 would be -wx, etc etc