File Properties & File Editing

week of 9/21/2020

Google Form Review!

- Let’s take time to review what we have learned about Linux, the terminal, and some commands!

Review pt.2/Intro

- What command lets us view file properties?
- What commands let us edit files?
- How can you dictate who gets access to what file?
    - That’s today’s topic WOOO

Ownership

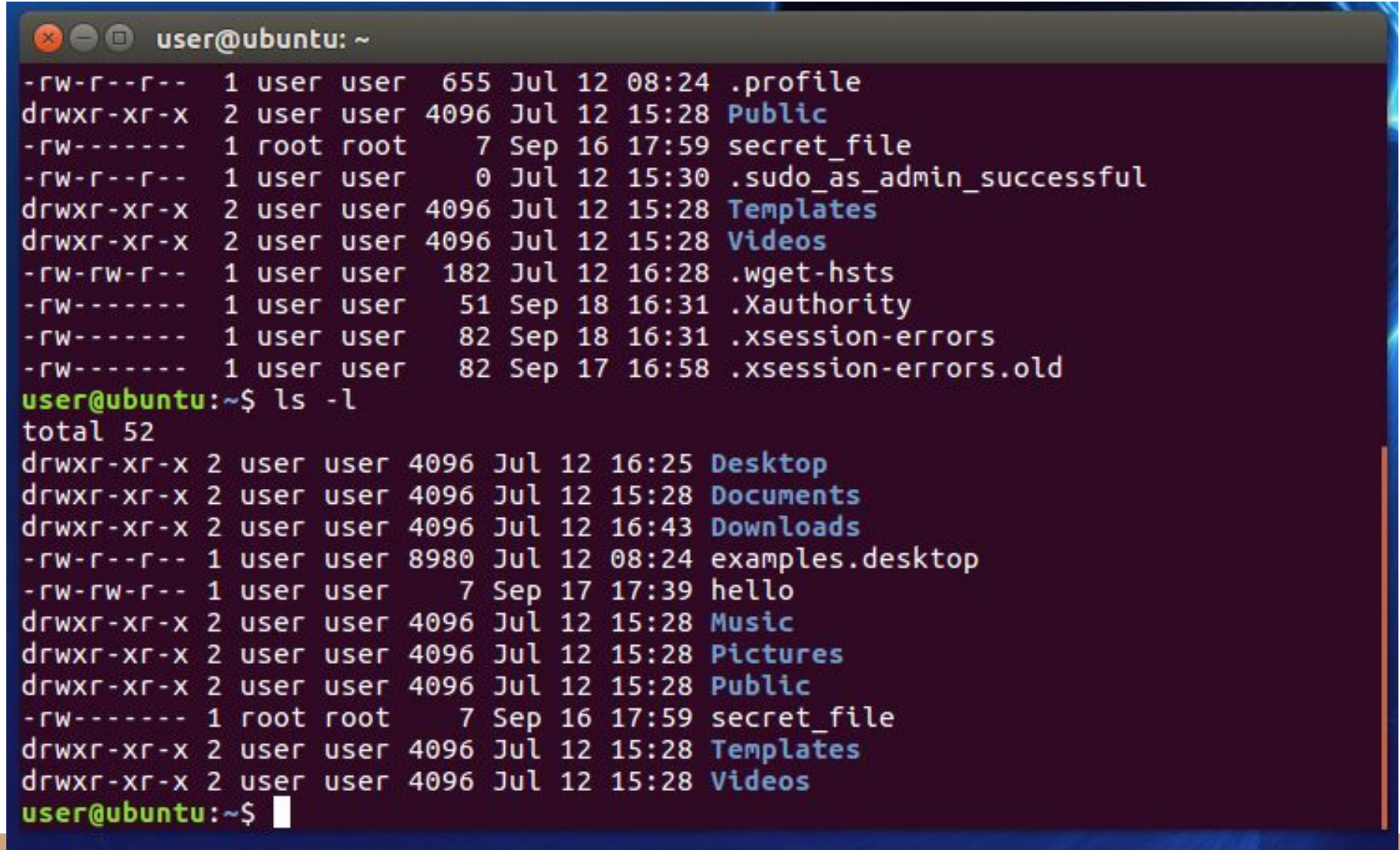
Who owns the file(s)?

- There are two kinds of owners, a user and a group
- Each have their own specified field established in permissions
- Displayed in the 3rd and 4th fields of ls -l

File Permissions

file permissions: level of access to files certain users and groups may have

- groups: category of users
  - user: the current user
  - group: certain groups (examples include sudo, admin, personal user groups, etc.)
  - other: other people (other users, public)
- levels: category of access to files
  - read(r): able to view (self-explanatory)
  - write(w): able to edit files
  - execute(x): able to run files (scripts, config files, etc.)
- Shown in 1st field on ls -l


user@ubuntu: ~
-rw-r--r-- 1 user user 655 Jul 12 08:24 .profile
drwxr-xr-x 2 user user 4096 Jul 12 15:28 Public
-rw------- 1 root root 7 Sep 16 17:59 secret_file
-rw-r--r-- 1 user user 0 Jul 12 15:30 .sudo_as_admin_successful
drwxr-xr-x 2 user user 4096 Jul 12 15:28 Templates
drwxr-xr-x 2 user user 4096 Jul 12 15:28 Videos
-rw-rw-r-- 1 user user 182 Jul 12 16:28 .wget-hsts
-rw------- 1 user user 51 Sep 18 16:31 .Xauthority
-rw------- 1 user user 82 Sep 18 16:31 .xsession-errors
-rw------- 1 user user 82 Sep 17 16:58 .xsession-errors.old
user@ubuntu:~$ ls -l
total 52
drwxr-xr-x 2 user user 4096 Jul 12 16:25 Desktop
drwxr-xr-x 2 user user 4096 Jul 12 15:28 Documents
drwxr-xr-x 2 user user 4096 Jul 12 16:43 Downloads
-rw-r--r-- 1 user user 8980 Jul 12 08:24 examples.desktop
-rw-rw-r-- 1 user user 7 Sep 17 17:39 hello
drwxr-xr-x 2 user user 4096 Jul 12 15:28 Music
drwxr-xr-x 2 user user 4096 Jul 12 15:28 Pictures
drwxr-xr-x 2 user user 4096 Jul 12 15:28 Public
-rw------- 1 root root 7 Sep 16 17:59 secret_file
drwxr-xr-x 2 user user 4096 Jul 12 15:28 Templates
drwxr-xr-x 2 user user 4096 Jul 12 15:28 Videos
user@ubuntu:~$

How to actually change these properties

chmod [u/g/o]+/-[r/w/x] <filename> OR chmod [###] <filename>: modify the permissions

- Can use a combination of the perms/perm groups for ugo format

chown <new_owner> <filename>: changes ownership of a file

chgrp <new_group> <filename>: changes group ownership of a file

chmod [###] whAt is tHiS soRcEry

- chmod [###] <filename> uses **b i n a r y (**0101101) in place of the parameters (like u+w, g-rw, etc)
- quick binary lesson
  - base 2 numeral system (only uses 0,1) compared to decimal system (0-9)
  - similar to how each digit in a number means a power of 10, each binary digit represents a power of 2
    - 135(decimal) = 1 hundred (10^2) 3 tens (10^1) and 5 ones (10^0)
    - 110(binary) = 1 four (2^2), 1 two (2^1), 0 one (2^0)
  - binary (0,1) represents bits; computer looks at bits and determines if a permission is enabled or not (light switch, true/false)
    - 1: permission is enabled
    - 0: permission is disabled

How is this related to permissions?

- each digit corresponds with one of the user groups (users, groups, other)
- 3 digits (rwx) can be represented by bits (1s or 0s) and represented as a decimal number (guess what number?)
  - 777: enables all permissions for all groups of users (u+rwx, g+rwx, o+rwx)
  - 664: enables read & write for users, groups and ONLY read for others (u+rw, g+rw, o+r)
- try to break down these commands to see who gets what permission!
  - chmod 553 hello.txt
  - chmod 704 /etc/passwd
  - chmod 771 script1.sh
- Which one do you think is the most secure?
  - Think about it for next week's lecture