Linux Administration

File permissions

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File permissions

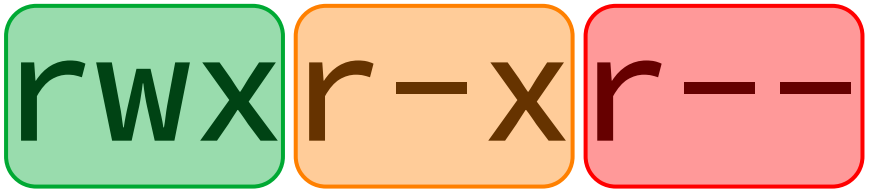
- There is three main permissions that could be set on a file or a directory:
  - read
  - write
  - execute [1]
- For each file or directory, permissions are defined for the user, the group and others (those who are not part the two first entities).

1: this permission is also used to grant or limit access into a directory

Checking permissions

- Permissions on files and directories are displayed with the *ls -l* command.
- You can also use the *stat* command against a file, and read the “Access” line.

File permissions details



User permissions
r = read
w = write
x = execution

Group permissions
r = read
- = no write
x = execution

Others permissions
r = read
- = no write
- = no execution

File permissions: symbolic mode

- The chmod command can be used to define permissions for each entity:
  - *chmod u+rw <file>* grant read and write permissions to the user
  - *chmod g-w <file>* revoke the write permission for the group
  - *chmod o-r <file>* revoke the read permission for other users (not the user, not the group)

File permissions: octal mode

- In octal mode, each permission is given a value
  - read = 4
  - write = 2
  - execute = 1
  - no permission = 0
- Then you need to set the values for all three entities:
  - *chmod 644 <file>* = user (rw-) group (r--) others (r--)
  - *chmod 700 <file>* = user (rwx) group (---) others (---)

File ownership

- In order to change the user ownership and group ownership of a file, you can use the chown and chgrp commands:
  - *chown <user> <file>*
  - *chgrp <group> <file>*
- You can change the owner and group in one command: *chown <user>:<group> <file>*

Special permissions: setuid and setgid

- The setuid permission will allow a command or a script to run under the identity of the user.
- Use the *chmod u+s <file>* command to define this permission.
- The setgid permission work in a similar way based on the group.
- This can be set with the *chmod g+s <file>* command.

setgid on directories

- When used on a directory, the setgid permission will allow ownership inheritance for any new content in that directory.

Special permission: sticky bit

- The sticky bit is a protection limiting a file to be deleted only by the file owner, the directory owner or root.
- Use *chmod +t <directory>* to set that permission.