**File Permission on Linux**

**10 mins**

**Step 1: Creating a Directory Structure**

1. Open the shell terminal.
2. Make sure you are in your home directory (*/home/username*)

**cd ~**

**pwd**

1. Create a directory called Work:

**mkdir Work**

1. Navigate to the Work directory:

**cd Work**

1. Inside Work, create two directories Docs and Scripts:

**mkdir Docs Scripts**

**Step 2: Creating Files**

1. Navigate to the Docs directory:

cd Docs

1. Create two text files named doc1.txt and doc2.txt:

touch doc1.txt doc2.txt

nano / vim

1. Check if all the dir and files have been created correctly

Your output should be similar to this:

**A black screen with white text

Description automatically generated**

**Step 3: Using chmod (Symbolic) (ugoa+-=rwx)**

1. Use a command line to show the permissions for all directories and files under “Work” directory. The output should be as follow:

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tree -p Work

1. Navigate to /Work/Docs directory

**cd ~/Work/Docs**

**cd Docs**

1. Set the following permissions for doc1.txt using symbolic notation:
   * Owner: Read, write, and execute. (u=rwx or u+rwx)
   * Group: Read and write. (g=rw)
   * Others: No permissions. (o= or o-rwx)

chmod u=rwx,g=rw,o= doc1.txt

1. Verify the permissions:

**ls -l doc1.txt**

1. Modify the permissions for doc2.txt using symbolic notation:
   * Add execute permission for the group. (g+x)
   * No one can ***modify*** the document (a-w)

**chmod g+x,a-w doc2.txt**

1. Verify the permissions:

ls -l doc2.txt

**Step 4: Using chmod (Numeric) (421=7)**

**read 4, write 2, eXecute 1 -- Binary <-> Octal**

1. Set the following permissions for doc1.txt using numeric notation:
   * Owner: Full permissions (4+2+1 = 7)
   * Group: Read (4) and execute (1). (4+1 = 5)
   * Others: No permissions. (0)

chmod 750 doc1.txt

1. Verify the permissions:

ls -l doc1.txt

1. Navigate back to the “Work” directory (one level up), and then change the permissions for Docs directory to:
   * Owner: Full permission (4+2+1 = 7)
   * Group: Can only create and delete files(w 2), and access its files and subfolders (x 1). (2+1=3)
   * Others: Can only list the content of the directory.(r 4)

cd ..

chmod 734 Docs

1. Verify the permissions:

ls -l Docs

**Step 5: Setting Default Permissions with umask**

1. Set a umask so that newly created files have the following permissions:
   * Owner: Read and write. (4 + 2 = 6, 7 - 6 = 1)
   * Group: Read only (4, 7 – 4 = 3)
   * Others: No permissions. (7 – 0 = 7)

umask 137

1. Create a new file doc3.txt and:

touch doc3.txt

1. check doc3.txt permissions

ls -l

**Step 6: Checking and Cleaning Up**

1. The permission under your Work directory should be as follow:

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Description automatically generated

tree -p ~/Work

1. Remove the entire Work directory and its contents at from your home directory using relative path:

rm -r Work