CIT 371 Lab 7: Changing Permissions

This lab can be done with the Web Console or with SSH/PuTTY. See the VM Access Document for more information on accessing your VMs.

Start Coivcenter and your VM, login as Student, open a terminal window and cd to /home/Student.

1. To change permissions of a file or a directory, the command is chmod with the syntax **chmod** ***permissions file(s****)*. There are three ways to specify the permissions which we examine, file(s) can include directories.
   1. One way to specify permissions is to indicate the changes to the existing permissions using + and -. For instance, +r means to add read access and –x means to remove execute access. You must indicate the if the change is meant for owner (u), group (g) or world (o) as in u+w,g-r (add write access to owner, remove read access from group). You can use a to indicate all users as in a+r to add read access to u, g and o. cd to ~Student/DUMMY-DIRECTORY for the all of step 3.
      1. Change permissions of aa8.bCC to remove write access from the group. *What command did you enter?* 
         1. **Chmod g-w aa8.bCC**
      2. Change permissions of file1.txt to remove execute access for everyone. *What command did you enter?* 
         1. **Chmod a-x file1.txt**
      3. You can combine multiple changes by separating each with a comma. Change permissions of file4.txt so that only the user retains any permissions. *What command did you enter?* 
         1. **Chmod g---,o--- file4.txt**
   2. The second way to specify permissions is to establish new permissions for one or more of u, g and o using u=, g= and o= followed by the new permissions. For instance, u=rwx,g=r,o= (gives user rwx, group g and other none), or u=rw,g=,o= (user read/write, group and other none).
      1. Using this approach, change permissions of directory2 so user has all access, group is read-only and other has none. *What command did you enter?*
         1. **Chmod u=rwx,g=r,o=--- directory2**
      2. Using this approach, change dir5 so group has all three types of access, other has read access. *What command did you enter?*
         1. **Chmod g=rwx,o=r dir5**
      3. You can combine both the +/- and = approaches. *Explain how to give file aaa.abc permissions so that user can execute and group and other can write but no other changes are made using the simplest instruction that combines = and +.* 
         1. **chmod u=x,g+w,o+w**
   3. The third approach uses a 3-digit number indicating the new permissions. Here, each digit is one of u, g and o where the digit represents **read (4), write (2) and execute (1**). Any combination of these is added together giving you an integer between 0 and 7. For instance, 764 is read/write/execute for owner, (4+2+1), read/write for group (4+2), read for other (4). To change directory4 to rwxrwxr-x would use 775.
      1. Change permissions of file2.txt to rwxr-xr-- using the 3 digit approach. *What command did you enter?* **Chmod 754 file2.txt**
      2. Change permissions of file4.txt to rw------- using the 3 digit approach. *What command did you enter?* **Chmod 600 file4.txt**
2. Change directory to foxr/HUMOR.
   1. *What 3 digit values do each of these 13 files have?*
      1. **Files 1 and 2 have 640, file 3 is 777, file 4 744, file 5 664, file 6 is 755, file 7 is 644, file 8 is 660, file 9 is 744, file 10 is 745, file 11 is 664, file 12 is 644, and file 13 is 400.**
   2. As Student, *which files* *do you have read access to? Which files do you have write access to? Why should other users (such as Student or zappaf) NOT have write access to these files?*
      1. **I have read access to all of them. I have permission to write all files. Other users would not have access to these files do to restrictions and privileges allowed to said user. Each user can only have so much privilege to each directory and file.**
   3. As zappaf, *which files do you have read access to?* Recall zappaf is a member of cool but Student is not. Type **exit** to return to Student.
      1. **I have access to all of them besides IQ and GENESIS**
3. You might have noticed that the ls command alters the color of the output for different types of entities. File names appear in black font unless they are executable, then they appear in green. Directories appear in blue font. Directories need to be executable for a person to cd into them and readable for a person to ls them. What about directories and writability? Change directory to ~foxr and do an **ls –l**. Notice TEMP is a directory that is outlined in green. Why? It is writable. Change directory into TEMP. As Student, you really shouldn’t be able to write into this directory but you can.
   1. Type **touch a4.txt**. *What happened?* Delete this file. *Did it work? What command did you enter?*
      1. **I was able to create this file. I was also able to delete this file, I used rm a4.txt**
   2. Type **ls –l**. Notice 1.txt is also writable by other. Delete this file. *Did it work?*
      1. **Yes this did work, file was deleted.**
   3. *What permissions would you set files/directories to for each of the following:*
      1. *Anyone can cd into the directory*
         1. **Use the executable permission, chmod 111 files**
      2. *Anyone can view the contents of the directory but not cd into it*
         1. **We would use the read permission, chmod 444 files**
      3. *Anyone can read or execute a file but not write to it*
         1. **We would use read and execute but not write, chmod 555 files**
      4. *Anyone can read or write a file if they are in the group, and read the file others*
         1. **Chmod 064 files**
4. Of the files and directories examined so far, nearly all have the same name for owner and group. How can we change the owner or group of a file or directory? For this, there are two commands, chown and chgrp. The commands format is **chown *newowner file(s)*** and **chgrp *newgroup file(s)*** (where file(s) can also be directories). There is also the single command **chown *newowner:newgroup file(s)*** to change file(s) owner and group in one instruction. In order to issue the command, you must be the current owner or root. Unfortunately, you will not be able to use chown as you would have to have access to the new owner’s account (typically, only root has that access). However, you can change group if the newgroup is one you belong to.
   1. Change directory to foxr/HUMOR if you are not already there. Type **ls –l** and you will see you have no access to ads. Type **less ads** to confirm this. Using **su**, change to **foxr** (password: cit371). Change the group of ads to cool. *What command did you enter?* Type **exit** to return to Student.As Student, you still do not have access because Student is not a member of cool. Test this out with **less ads**. Now su to zappaf (password: cit371). Type **less ads**. This time you do have access. As zappaf, type **chgrp zappaf ads**. *What happens?* Type **exit** and **su foxr** to return to foxr. Change the group back to foxr. *What command did you use? Why does foxr have the ability to change this group back to foxr but not zappaf?* Note: its not because foxr owns the file. Type **exit** to return to Student.
      1. **I used the chgrp cool ads. Changing group of ads operation is denied. I used chgrp foxr ads. Foxr has the abaililty to change this group back and not zappaf because this was the first file to change the permission and so as the root user in foxr only has the ability to change it back, not zappaf.**
   2. cd to /var/spool/mail. This directory stores email messages for all users. Type **ls –l**. *Why do you suppose each file is owned by one user but all belong to the same group?*
      1. **I suppose each file is owned by one user because each user will have email messages to store individually, but they all belong to the same group because it is all going to the mail messages system where they can check and read there messages.**

Shut down your VM if desired and disconnect from the VPN if you are using it. Submit your lab report.