CPSC2800: Linux Hands-on Lab #3 Explore Linux file system and file security

Project 3-1

Linux support many different file systems that can be mounted using the mount command. In this project, you use the mount command to determine what file systems are available in your version of Linux.

To view available file systems:

1. At the command prompt, type **man mount** and press **Enter**. Continue pressing the **spacebar**, as necessary, to view the documentation for the *–t* parameter for the mount command. (If you are using terminal window, you might need to press **q** to exit the next display mode, when you are finished.)
2. What file systems can be mounted? _____
3. Next, type **mount** and press **Enter** to determine what file systems are actually mounted. What file systems do you see mounted on your system?

   _____

Project 3-2

The PS1 variable contains the configuration parameters for how your command-prompt line appears. You view the contents of the PS1 variable and then you configure the PS1 variable.

To view the PS1 variable's contents and then to configure the variable:

1. Type **echo $PS1** and press **Enter.**
2. You see the contents of the PS1 variable as _____
3. To change your prompt to display the date and time, type **PS1='\d \t>'** and press **Enter**. Type the command with no spaces between the characters. What does your prompt look like now? _

   _____
4. To change your prompt to display the current working directory, type **PS1='\w>'** and press **Enter**. What does your prompt look like now? _____

   _____(The \w formatting character displays the ~ to represent the user's home directory)
5. The change your prompt to display the full path of the current working directory, you must use another environment variable, PWD. The PWD variable contains the full pathname of the current working directory. To display the PWD variable in the prompt, type **PS1='$PWD>'** and press **Enter**. (Notice that you must place the $ in front of the environment variable name to extract its contents.) what does your prompt look like now? _____

   _____
6. If you are using a terminal window, close and open a new terminal window session, or log out the log back in and then access the command line, how does your prompt change from what you saw in step 5? _____

Project 3-3

In this project, you use the pwd command to view working directory.

To display your current path:

1. Type **pwd** and press **Enter**.
2. What is your current directory path? _____

Project 3-4

For this project, you practice more with changing the PS1 variable, and you use the *cd* command.

To use the *cd* command:

1. First, change your prompt so that you can view the directory path. At the $ command prompt, type **PS1='$PWD>'** and press **Enter.**
2. Type **cd /var/mail** and press **Enter**. This moves you to the /var/spool/mail subdirectory. What is your prompt now? _____
3. Type **cd** and press **Enter**. The change directory command (cd) without arguments returns you to your home directory. What is your prompt now? _____
4. Log out and log back in to reset your prompt.

Project 3-5

Comparing the use of absolute versus relative paths can be handy for understanding how each works. In this project, you use both types of path addressing to navigate through a file system.

To navigate directories:

1. If you are not in your home directory, type cd and press Enter.
2. The parent directory of your home directory is /home. /home is an absolute path name. Type **cd /home** and press **Enter**. The system takes you to the /home directory.
3. Type **cd** plus your user name, such as *user* and press **Enter**. This step uses relative path addressing to return to your home directory.

Project 3-6

Navigating a file system using the dot and dot dot option can save you typing time. You will practice using both conventions. Make certain you are logged in to user account and not as root.

To use dot and dot dot to change your working directory:

1. If you are not in your home directory, type **cd** and press **Enter.**
2. Type **cd .** and press **Enter**. Because the . (dot) references your current directory, the system did not change your working location.
3. Type **cd ..** and press **Enter**. The system takes you to the parent directory, which is /home.

4. Type **cd ..** and press **Enter**. They system takes you to the root file system directory (/).
5. Type **cd** and press **Enter**. The system takes you to your home directory.

Project 3-7

The *ls* command is one of the most useful commands. You start by using *ls* to view your working directory. Next, you use *ls* with an argument to view a file and then a directory. For a more complete listing of information about the contents of a directory, you use the –l option, and finally you use the –a option to include hidden files in a directory listing.

To see a list of files and directories in your current working directory:

1. Type ls and press Enter. Write down a list of file and directory names you see: _____

To see a listing for a specific file or directory:

1. If you are not in your home directory, type **cd** and press **Enter**.
2. Type **ls notes** and press **Enter**. Write down your observation: _____
3. To see the contents of a directory other than your current working directory, give the directory name as an option to the ls command. For example, to see the contents of the /var directory, type **ls /var** and press **Enter**. Write down what you observe: _____

To use the ls command with the –l option:

1. Type **ls –l /dev** and press **Enter**. You will observe a listing of block special and character special files in the /dev directory. Notice in the first column of information that the block special files begin with a "b". What designates a character special file? _____
2. Type **ls –l /** and press **Enter** to view the contents of the root file system directory. Write down your observation: _____

To list hidden files in your home directory:

1. Type **clear** and press **Enter** to clear the screen.
2. Type **–ls –a** after the command prompt, and press **Enter**. Write down observation: _____

Project 3-8

Wildcards are handy to know when you want to find or work on files that have a specific sequence of characters or when you are searching to find a file and are not certain of the correct spelling of that file name. You will use the * and ? wildcard with the *ls* command.

To work with wildcards:

1. To practice using wildcards, you first must care a set of files with similar names. Use the cat command to create files files:
    a. first_name: a file containing your first name
    b. middle_name: a file containing your middle name
    c. last_name: a file containing your last name
    d. full_name1.txt: a file containing your full name
    e. full_name22.txt: another file containing your full name
    for example, type **cat > first_name**, press **Enter**, type your first name, press **Enter**, and press **Ctrl+d.**
2. type **ls *name** and press **Enter**. Write down files you see and explain why: _____
_____
3. Type **ls full_name?.txt** and press **Enter**. Write down your observation and explain why: _____
_____
4. Type **ls *.txt** and press **Enter**. Write down your observation and explain why: _____
_____

Project 3-9

Assume that you work for a company that is developing a telephone database and you are creating directories for the Mail and Receiving Departments, which are referenced in the company's budget and accounting systems as departments 4540 and 4550. After you create the directories, you begin creating files of department phone numbers to store in those directories. You use mkdir (make directory) command to create new directories, and then use the cat command to create the phone files. Also, don't delete the files you create because you use them in other projects.

To create new directories and phone files:

1. Type **cd** and press **Enter** to make certain you are in your home directory.
2. Type **mkdir dept_4540** and press **Enter** to make a new directory called dept_4540.
3. Type **ls** and press **Enter**. Which directory do you see in the listing? _____
4. Type **cd dept_4540** and press **Enter** to change to the new directory. Now, you can use the cat command to create a file called phones1. The phones file contains fields for area code, phone prefix, phone number, last name, and first name. A colon (:) separates each field.
5. Type these commands, pressing Enter at the end of each line:
    cat > phones1
    219:432:4567:Harrison:Joel

219:432:4587:Mitchell:Barvara
219:432:4589:Olson:Timothy

6. Press **Ctrl+d**.
7. Type **cat phones1** and press **Enter** to view and verify the contents of the file you created.
8. Type **cd** and press **Enter** to return to your /home directory.
9. Type **mkdir dept_4550** and press **Enter** to make a new directory called dept_4550.
10. Type **ls** and press **Enter**. Which directory do you see in the listing? _____
11. Type **cd dept_4550** and press **Enter** to change to the new directory. Now you can use the cat command to create the file phones2, which contains the same fields as the phones1 file.
12. Type these commands, pressing Enter at the end of each line:
    cat > phones2
    219:432:4591:Moore:Sarah
    219:432:4522:Polk:John
    219:432:4501:Robinson:Lisa
13. Press **Ctrl+d**
14. Type **cat phones2** and press **Enter** to view and verify the contents of phones2 file.
15. Type **clear** and press **Enter** to clear the screen for the next project.

Project 3-10

After you create the phones files, you need to create a new central directory called corp_db for general access to the information, and you copy the phones1 file into the new directory. Next, using > you merge phones1 and phones2 into one file, called corp_phones in your new directory. Note that you can use the tilde (~) to represent the location of your home directory.

To copy the phones1 file into a new directory, corp_db:

1. Type **cd** and press **Enter** to return to your home directory.
2. Type **mkdir copr_db** and press **Enter** to make a new directory.
3. Type **cd corp_db** and press **Enter** to change to the new directory.
4. To copy the phones1 file from the dept_4540 directory to the current directory, type **cp ~/dept_4540/phones1 .** and press **Enter**.
5. To copy the phones2 file from the dept_4550 directory to the current directory, type **cp ~dept_4550/phones2 .** and press **Enter**.
6. Type **ls** and press **Enter**. Write down your observation: _____

Project 3-11

To concatenate the phones1 and phones2 files into one file:

1. Type **cat phones1 phones2 > corp_phones** and press **Enter** to add the contents of the two phone files to one new file called corp_phones.
2. Type **clear** and press **Enter** to clear the screen.

3. Type **more copr_phones** and press **Enter** to view the new file's contents. Write down your observation: _____

Assume you want all users to have access to the corp_phones file. You first grant access to your home directory. Next, you allow access to the corp_db directory, and then set the permission for everyone to read the corp_phones file. You use the chmod command with the x argument to grant access to directories.

To change file and directory permissions:

1. Make certain that you are in your home directory (type **cd** and press **Enter**).
2. Type **chmod go+x ~** and press **Enter** to allow access to your home directory.
   This command means that "make your home directory (~) accessible (+x) to the group (g) and others (o)".
3. Type **chmod ugo+x ~/corp_db** and press **Enter** to allow access to the corp_db directory.
   This command means "make the corp_db directory accessible (+x) for the owner (u), group (g), and others (o)."
4. Type **chomd o+w ~/corp_db/*** and press **Enter** to set permissions so that other can write to the files in the corp_db directory (owner and group already have write permission by default).
   This command means "make all files in the corp_db directory so that others (o) can write (+w) to them."
5. Type **ls –l ~/corp_db** to check the permissions you have set. Record your observation: _____

Include your experiences and answers to all the underlying parts in your report. Include the following at the beginning of your report.

- Name: _____
- UTC ID: _____
- Course Number and Name: _____
- Semester: _____
- Lab Name and Number: _____
- I spent _____hours and _____minutes to finish this hands-on lab.
- I have _____ (percent) finish this lab.
- I expect _____ (A, B, C, or F) of this lab.
- This lab helps me to master Linux Operating System and its file system. Choose a number to indicate how much the lab is helpful.

  1 2 3 4 5
  (less helpful) (more helpful)