

CPSC 2800 – Linux Hands-on Lab #7 on Linux Utilities

Project 7-1

In this project you use the *df* command to determine usage of the file systems on your hard drive. Log into user account for this and the following projects.

To use the *df* command to check file system usage:

1. Log in as root by typing **su**, and type password **123456**.
2. Or type **sudo df** and then type password **123456**, and press **Enter**. Record your output: _____
3. You can specify a file system as an argument. The statistics for that file system alone appear on the screen. Type **df /dev/sda1** (or another partitioned disk appropriate to your system), and press **Enter**. You see the disk statistics for that volume only. Record your observation: _____
4. The **-h** option causes the numbers to print in human-readable form. Instead of displaying raw numbers for size, amount of disk space used, and amount of space available, the statistics are printed in kilobyte, megabyte, or gigabyte format. Type **df -h** and then press **Enter**. Record your observation: _____
5. If you want to log in to user account again, type **login user**, and type password **123456**.
6. Type **clear** and press **Enter** to clear the screen.

Project 7-2

When you want to see directory, subdirectory, and file size information, use the *du* command. In this project you use the *du* command to learn about your disk use.

To report on disk use:

1. To receive a report on disk usage starting at your home directory, type **du | more**, and then press **Enter**. Record your output: _____
2. The output shows the number of blocks used in each subdirectory. Type **q** to exit the more command.
3. To view a similar report on disk usage by the number of bytes instead of by 512-byte blocks, start at your home directory, type **du -b | more**, and then press **Enter**.
4. Type **q** to exit the more command.
5. Like the *df* command, the *du* command supports the **-h** option to display statistics in human-readable format. Type **du -h | more** and then press **Enter**.
6. Type **clear** and press **Enter**.

Project 7-3

In this project, you use the *find* command to search for and delete all occurrences of *a.out* and *core*. The steps that follow assume you have a source directory in your home directory. The test files, *a.out* and

core, are quickly created using the touch command, which, when followed by the file names, creates empty files. The tilde (~) ensures that these files go into your home and source directories. You should already have a source directory for this project. If not, create a source directory under your home directory before you start.

To remove garbage files:

1. Create some garbage files, core and a.out, and place them in your home directory and in the source subdirectory under your home directory. First type **touch ~/core; touch ~/a.out** and press **Enter** to create the files in your home directory. Next type **touch ~/source/core; touch ~/source/a.out** and press **Enter**.
2. Verify that you are in your home directory, type **find . "(" -name a.out -o -name core ")"** and then press **Enter**. You should see a listing of the four files you created in step 1, the core and a.out files in the home directory and in the source directory under the home directory.
3. Remove the garbage files by typing **find . "(" -name a.out -o -name core ")" -exec rm {} \;** and then pressing **Enter**.
4. Check that the files have been removed by repeating the find command you entered in step 2. If the files have been removed, there is no output. Screen shot your work: _____

Project 7-4

Sometimes, your system might respond slowly or seem to have delays. In these conditions, it is useful to employ the *top* command to monitor CPU use by processes and other system information, as you learn in this project.

To use the *top* utility:

1. Display the CPU activity by typing **top** and then pressing **Enter**. Record your screen: _____

2. The processes are shown in the order of the amount of CPU time they use. After looking at the display for a short time, press **q** to exit from the top utility.
3. Run the top utility again. Notice that the far-left column of information, labeled PID. This column lists the process id of each process shown. Record PID of top command: _____
4. Press **k** to initiate the kill command. The top utility asks to enter the PID to kill. Enter the PID of the top command. Press **Enter** to kill the process (You might have to press Enter a second time to return to a command prompt.) Type clear and press Enter to clear the lines from the screen. The top utility is no longer running.
5. Run the top utility in secure mode by typing **top -s** and press **Enter**.
6. Press **k** to initiate kill command. Because top is running in secure mode, it displays the message "can't kill in secure mode". Record your screen: _____
7. Press **q** to exit the top utility.
8. Type **clear** and press **Enter** to clear the lines from the screen.

Project 7-5

Plan to periodically monitor memory use in your computer, particularly if the computer seems to run slowly when you use specific programs. In this project, you use the *free* command to monitor memory.

To use the *free* command:

1. Type **free** and press **Enter**. The command displays the amount of total, used, and free memory. It also displays the amount of shared memory, buffer memory, and cached memory. In addition, the amount of total, used, and free swap memory is shown. By default, all amounts are shown in kilobytes.
2. Type **free -m** and press **Enter** to see the free command's output in megabytes. _____
3. Type **free -t** and press **Enter** to see memory use totals: _____

Project 7-6

There are times when you might want to send the results of the top and free utilities to a computer support person for help. In this project, you save the results from these utilities to different files and then print the files.

To save and print the displays generated by the top and free utilities:

1. Redirect the output of the top utility to a file in your current directory by typing **top > topdata** and then press **Enter**.
2. Wait about 10 seconds, and then press **q** to exit the top utility. Type **more topdata** and press **Enter** to confirm you have written the information to the topdata file. Type **q** to exit the more display of the file contents.
3. Redirect the output of the free utility to a file in your current directory by typing **free > freedata** and then pressing **Enter**. Type **more freedata** and press **Enter** to verify the contents of the freedata file. Record your output: _____
4. Type clear and press Enter to clear the screen.

Project 7-7

In Linux/Unix, you can run programs in the background. In this project, you practice running the top program *in the background*.

To run a program in the background:

1. Experiment with running a program in the background by running the top program in the background. Type **top&** and press **Enter**.
After you enter the command, the system reports the process id or PID (id that identifies the process) used by the program that you started in the background. Write down our PID: _____

The top utility is running, but because it runs in the background, you see no other output.

2. Continue to run the top utility in the background.

Project 7-8

In this project, you learn how to use the `ps` command to view processes on your system.

To use `ps` command:

1. Type `ps` and press **Enter**. The output of the `ps` command includes this information about each process you are running:

- PID
- Name of the station where the process started
- Amount of time the process has been running
- Name of the process

Notice that top utility might still be running in the background, or you might see a message at the end of the `ps` display that top has stopped running.

2. To see a list of all processes running on the system, type `ps -a | more`, and press **Enter**.
3. Press the **spacebar** until the command finishes its output.
4. Notice that with the command options you've used so far, it is difficult to tell the status of a process, such as whether or not it has finished. Type `ps l` (that is, a lower-case of letter l and not a one), and press **Enter** to see the long display. The WCHAN column shows the status of a process, such as "finish."
5. Now consider that you want to know who is running a particular process, by user name. Type `ps -a u | more` and press **Enter**. Record your screen: _____
 _____ Press the **spacebar** to scroll through the listing. Notice that many processes are being run by root as well as by your account.

Project 7-9

Sometimes, you need to stop a process, such as one running in the background or one that you no longer want to use. In this project, you use the `kill` command to stop a process.

To stop a process using the `kill` command:

1. In this step, you terminate the top utility that you started before and that might still be running in the background. (If you received a message that it stopped, continue anyway for practice.) Type `ps` and press **Enter**. Look at the list of processes to find the top utility's PID.
2. Type one of these commands (both perform the same operation): `kill <process id>` and press **Enter**, or `kill %top` and press **Enter**.
3. Type `ps l` and press **Enter** to see a list of the processes and to check the status of the top process. Record your output: _____

Project 7-10

In you often work with plain-text documents, it is helpful to know about the *ispell* command for spell checking. You practice using *ispell* in this project.

To use *ispell*:

1. Use the **vi** or other editor create a file called **document1**.
 2. Enter the following text, with misspellings:
This is a document that describes our newest and fastest machinnery. Take the time to lern how to use each piece of equipment.
 3. Save the file and exit the editor.
 4. (Type **sudo apt-get install ispell** and *password* to install *ispell* if you do not have it.)
 5. Scan the file for spelling errors by typing **ispell document1** and then press **Enter**.
 6. To correct the word “machinnery”, look at the options at the bottom of the screen, and find the one that says “machinery.” Type the number of that option to correct the misspelling, or you can select the r (Replace) option, retype the word after the With: Prompt, and press Enter. Notice that the word is then corrected in the text.
 7. Do the same for “lern.”
 8. The program exists and returns you to the command line. Type **cat documnet1** and press **Enter**. The misspelled words have been corrected. Record your screen: _____
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Project 7-11

In this project, you create two files and use the *cmp* command to compare the differences.

To compare two files with the *cmp* command:

1. Use the **vi** or other editor to create the file file1, containing this text:
This is file 1.
It is a practice file.
It belongs to me.
 2. Save the file and exit the editor.
 3. Use the editor to crate the file file2, containing the text:
This is file 2.
It is a practice file.
It belongs to you.
 4. Save the file and exit the editor.
 5. At the command line, type **cmp file1 file2**, and press **Enter**. Your screen looks like: _____
 6. This results means that the two files differ, with the first point of differences at the 14th character in both files.
 7. Type **clear** and press **Enter** to clear the screen.
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