Lab Experiments for Linux OS

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Chapter 1

1. [Linux Operating System] A shell script is a sequence of shell commands written in an executable script file. Executing this file instructs the shell to execute all commands in the order of their appearance in the script file. There are several shell scripting tutorials available on the web, e.g. search by entering the keywords *Linux shell script tutorials*. Go through one of these tutorials and then write a shell script that displays various system parameters by using shell commands like *who*, *whoami*, *date*, *hostname*, etc.

Chapter 2

2. [Linux Operating System] ***ps*** is a command that displays information about all processes currently running in your system. Read man page of ***ps*** command. Enter the following commands: (1) ***ps –ef | more*** and (2) ***ps –aux | more***. Both of these will result in displaying a long list of processes. Identify what processes are started when the system is booted, and what processes are started later on. For each process, find out who owns it, what code it is running, and how much CPU/memory it has used.

   Now, store the details of all processes owned by root in a file called *root-processes-1*, and all processes owned by you in a file called *my-processes-1*. Next, restart your system, and create similar files, *root-processes-2* and *my-processes-2*. Compare *root-processes-2* with *root-processes-2,* and *my-processes-1* with *my-processes-1*. Explain the differences between the two.

Chapter 3

3. [Linux Operating System] ***free*** is a command that displays used and available memory in your system. Read man page of ***free*** command. Run the command ***free –o*** several times, running other programs in between, and store the results in a file. Draw a graph as follows: X-axis: MB-used; for the Y-axis, use (i) Memory Used per unit time; (ii) (Memory Used – Memory Buffered – Memory Cached) per unit time; and (3) Swap Used per unit time. Explain the behavior of this graph with respect to memory utilization in the presence of running various applications.

Chapter 4

4. [Linux Operating System] ***df*** is a command that displays the amount of disk space available on the file system containing each file name argument. Read man page of ***df*** command. Run the command ***df*** to find out how many disk blocks are available and how many are in use. Does the sum of these equals the total number

of disk blocks on the disk? If not, explain why there is a difference. Next run the command ***df –i*** to find out how many inodes are available and in use. Now create a new file with just a few characters in it, and again run ***df*** and ***df –i*** commands. Explain the effect of creating this new file. Now increase the size of this new file by entering a large number (> 5000) of characters, and again run ***df*** and ***df –i*** commands. Explain the effect of increasing the size of the new file.

Chapter 9

5. [Linux Operating System] ***umask*** is a command that displays or sets the user's file creation mask. Read man page of ***umask*** command. Run the ***umask*** command to find out the value of permissions for new files. Now change the value of ***umask*** to some other value. Does this change have any effect on the permissions of existing files? How does this change affect the permissions of new files created?

   Encrypted password files are kept in */etc/shadow* or */etc/passwd*, depending on your system. Run the command ***ls –l /etc/shadow*** or ***ls –l /etc/passwd***. Who owns this file? Ordinary users do not have write permission for this file. However, ordinary users can change their password by running ***passwd*** command, effectively writing into this file. Explain how this is accomplished by examining the permissions of the password changing program */usr/bin/passwd*.