**LINUX EXERCISE (LAB 02)**

**How to submit your assignment**

Check the requirements of the previous lab

Exercise 1. Basic operations

* Run the top command while undertake other tasks

top &

Còn có lệnh top -> ctrl + Z để stop foreground process bằng cách gửi signal SIGSTOP để pause execution lại và bỏ khỏi CPU -> bg để chạy tiếp các task đang stop sang background, ở đây là lệnh top nhảy sang bg(tương tự có lệnh fg)

* Run ps command

ps

Còn có ps -ef với e là mọi process, -f là dạng full list

Còn có ps aux với a là all process, u là display more detail, x là display all processes bất chấp nó controll terminal hay không

* Read the manual of ps to know how to list all running processes. Try it yourself.

ps --help

* Run “find /.” What will happen? Stop the command

Running the command find / will search the entire filesystem starting from the root directory, which can take a long time and consume a significant amount of resources.

Ctrl + C to stop

* In the graphical mode, run the xclock program as a foreground process. Switch it to a background process. Stop the program by the kill command.

xclock => to run xclock program as foreground process

ctrl + z

bg => move process to background

ps -ef | grep xclock => tìm PID của process

kill <PID of xclock>

* Run xcalc as a background process. Which information will appear on your terminal?

When running the xcalc program as a background process, the program's output will be sent to the terminal, showing information such as the program's PID.

* What does “kill -9 -1” command do?

The command kill -9 -1 will send the SIGKILL signal to all processes except for the init process (PID 1).

* Open two different terminals and use the write command to send a message from a terminal to another one

write [username] [terminal]

For example, to send a message to the user "johndoe" on terminal tty1, we can use the following command:

write johndoe tty1

* Run the dmesg command. What will appear on your screen? How to view the content of each page?

The dmesg command displays the kernel ring buffer, which contains information about system events and errors.

To view the content of each page: dmesg | less

* Show the running period (how long) of ls command to show all files of a directory.

time ls -l

* Based on your processes in /proc (UID), how to find the running processes

id -u -> to see my UID

ps -u <my uid>

* How long has your OS run? Show it.

uptime

* Which terminal (TTY) is yours?

tty

* Name two commands use mode SUID. Explain why these commands need this mode

Two common commands that use the SUID bit are passwd and sudo.

passwd needs this mode to allow non-root users to change their password, while sudo needs it to allow non-root users to run commands with root privileges.

* Name the most resource-consumed commands in your system (use the most CPU and RAM)

top

-> See the CPU% and MEM% in the table would so the most resource-consumed commands

Exercise 2. Basic operations for networking

* Use command lines to show the networking information of your computer: IP Address, routing table, name server.

ipconfig => show ip address

netstat -r => show routing table

cat /etc/resolv.conf => display name server configuration

* Assume that we don’t have DNS service. How could we access other computers without IP addresses?

It would be very difficult. Maybe we can use a tool like network scanner to scan for other devices on the network and retrieve their IP addresses. Plus that IP addresses can change frequently and are not easy to remember.

Nếu chỉ biết MAC address cũng k ổn vì tầng datalink chỉ cho biết connect khi ở local network. Nếu máy đích ở ngoài global thì buộc phải có ip address

* Làm thế nào để lưu thông tin lâu dài về proxy cho trình duyệt web dạng văn bản như là “links”?

Tạo file proxy.txt

Nhập thông tin proxy theo cú pháp : **protocol://username:password@proxy-server:port**

Lưu và đóng file

Chạy : links -http-proxy <url tới file proxy.txt> [http://example.com](http://example.com/)

* Which name server does resolve the domain name redhat.com?

cachingdns1.vnpt.vn

* Send email to your local computer (send emails between accounts of your computer). Try to send/receive using two different methods. How could you know whether sent emails have been received or not? (You need to install **mailutils** if not installed)

sudo apt-get install mailutils

mail -s "<Title of mail>" <receiver name>@localhost

Enter body of mail -> CTRL + D to exit editor

To check if we have received any email. We run: mail => it will show list of any mail that send to our account

Exercise 3. Exchange of information between computers (Report should record the necessary steps to perform the request)

* From your computer, display a graphics application (such as xclock) on the screen of the computer next to it. (Accounts need to be set up). Use a secure connection.

Make sure both computer installed and are running SSH

On the computer we want to run the graphic application, we enable X11 forwarding in the file /etc/ssh/sshd\_config : X11Forwarding yes -> and then retart SSH service : sudo service ssh restart

On the computer we want to connect, open terminal and type : ssh -X <user name in remote computer>@<remote\_computer\_ip\_address>

Run xclock on first computer, the graphics app should show on the second computer

* Set up an SSH key so that you can connect to the computer next to it without entering a password.

Generate SSH key pair in local computer : ssh-keygen -t rsa

Copy public key to remote copmuter : ssh-copy-id <my user name on remote computer>@<remote\_computer\_ip\_address>

Login withour password : ssh username@remote\_computer\_ip\_address

* Create a backup copy of the home directory at /var/tmp on the computer next to it (considered as a backup server) using scp. Save and compress before transmitting data. Connect to the computer next to it using ssh, unpack the backup, and transmit it back to your computer using sftp..

Connect to remote computer like in the second question

Compress : tar czf home\_backup.tar.gz /home/user

Transfer to remote computer: scp home\_backup.tar.gz username@remote\_computer\_ip\_address:/var/tmp

Remote computer can unpack the file : tar xzf /var/tmp/home\_backup.tar.gz -C /var/tmp

Disconnect remote computer with : exit

Connect to remote computer again using sftp : sftp username@remote\_computer\_ip\_address

Navigate to folder contain file : cd /var/tmp

Transfer backup file : get home\_backup.tar.gz