**LINUX EXERCISE (LAB 01)**

Exercise 01. Operations with files. Please complete the following tasks:

* Create a new directory in your home one.

mkdir ~/new\_directory

* Try to move this new directory to the parent folder of your home directory. What will happen?

Error permission denied because current user cannot work with parent folder of home directory by default. Adding "sudo" to the command would do the trick

* Copy all files PNG from /usr/share/pixmaps to your new created directory

cp /usr/share/pixmaps/\*.png ~/new\_directory/

* List all copied files with the reverse alphabetical order.

ls -r ~/new\_directory/\*.png

* Switch to your home directory. Create a new directory and copy all files from /etc to your new directory. (Please make sure that you copy all files and sub directories as well)

cd ~

mkdir ~/etc\_backup

sudo cp -r /etc/\* ~/etc\_backup/

=> -r để có recursive

* Switch to your new created folder and create two directories: one for all files with their names starting as a capitalized alphabetic character, and one for all files with their names starting as a non-capitalized alphabetic character. Copy all suitable files to the respective directories (Try to use as few commands as possible).

cd ~/etc\_backup

mkdir capital\_files non\_capital\_files

cp [A-Z]\* -r capital\_files/

cp [a-z]\* -r non\_capital\_files/

* Delete the remaining files (Ex: files with names starting as non-alphabetic character)

sudo find . -type f -not -regex './[a-zA-Z].\*' -delete

* Delete the whole new created folder and its content with a single command

rm -r ~/etc\_backup

* Use the grep command to find the script initialize Font Server at the graphical level

grep -r "Font Server" /etc/X11/

=> The X11 folder, also known as the X Window System, is a graphical user interface (GUI) for Unix-based systems. It provides a framework for managing windows, input devices, and other graphical elements on the screen.

* Where is the location/path of the program **sendmail** in your computer?

which sendmail

* Create a symbolic link in your home directory to the directory /var/tmp. Please check to make sure that the symbolic link is working normally

ln -s /var/tmp ~/my\_link

* Create a second symbolic link to the same directory /var/tmp. Delete the first symbolic link and list the content of the directory /var/tmp. What will happen to the second symbolic link?

ln -s /var/tmp ~/my\_link2

rm ~/mylink

=> Delete the first link, the second link still works normally

Exercise 02. Find, compressed and uncompressed commands

* Use the find command to list all files in your file system with their size bigger than 1 MB

find / -type f -size +1M -exec ls -lh {} \;

=> exec để thực hiện lệnh gì sau đó thì ở đây là ls -lh với -l là long list và h là hiển thị ở dạng human-readable

=> {} là placeholder for each file, dùng để chỉ tới các file nhận được từ lệnh trước. K có {} thì sẽ hiểu là ls -lh tren thư mục hiện tại. Còn có {} thì lệnh find khi tìm ra sẽ tạo ra 1 thư mục temp chứa các file tìm được rồi gọi ls -lh trên thư mục temp đó

=> Chỉ vài command như find, xargs mới dùng thêm được exec với {} như v

=> \; chỉ định end of command exec

* Use the find and file command to show all files inside /home (including sub directories and files). Try to do this by two different approaches/ways

Approach 1: find /home -type f -exec file {} \;

Approach 2: find /home | xargs file

=> xargs là lệnh nhận thêm input rồi thực hiện lệnh gì trên từng input

=> lệnh file là in ra thông tin type của file

=> pipeline giúp truyền output của command trước cho input command sau

=> Ở đây nó sẽ tìm mọi file trong thư mục /home rồi truyền làm input cho xargs để chạy lệnh file trên từng input nhận được

* Use the grep command to find the lines containing your username profile in the file /etc/passwd

grep hieucuopbien123 /etc/passwd

* Because My username is hieucuopbien123

=> Thư mục passwd chứa mọi thông tin của user

* Use the command find, grep, and sort to list the sorted files containing the word “hello” in the file content of the /home directory (including sub-directories and files)

find /home -type f -exec grep -l "hello" {} \; | sort

=> lệnh sort sắp xếp các dòng của file or input stream

=> tìm các file trong thư mục home và lấy ra từng dòng có hello, rồi sort các dòng đó in ra

* Use the command locate to find all file names containing the word “emacs”. Could you combine with the command grep to remove file names containing the word “lib” (but containing the word “emacs”)?

locate emacs | grep emacs | grep -v lib

=> locate giúp tìm file or thư mục dựa vào name, nó nhanh hơn find vì dùng pre-built db of file and directory name

=> sau đó lọc ra các tên chỉ có chữ emacs

=> lọc bỏ các tên có chữ lib bên trong, option -v là not match

* Create a file and its content. The content of that file should include some lines matching with the pattern (^[0-9]{1,5}[a-zA-z ]+$)|none and some other lines. Use the command egrep to check the result.

echo "1234abc" > testfile.txt

echo "56789 def" >> testfile.txt

echo "none" >> testfile.txt

echo "hello world" >> testfile.txt

egrep '^[0-9]{1,5}[a-zA-z ]+$|none' testfile.txt

=> lẹnh egrep in ra các line trong file nào match regexp nào

* Save all files and directories of your home directory to a single file using tar and cpio. Compress the tar file by compress command and cpio file by gzip. Then, un-compress the compressed files to any other folder. Show the display content.

tar cf home.tar /home

cpio -ov -H tar -F home.cpio < home.tar

gzip home.cpio

compress home.tar

uncompress home.tar.Z | tar -xf - -C /new\_folder

gunzip home.cpio.gz | cpio -idmv -D /new\_folder

cd /new\_folder

ls -la

=> 2 hành động là tạo archive và nén file là khác nhau, tạo archive trước r nén file

=> cf là new file should be created

=> -ov là archive nên được create ở verbose mode. Và file được copied giống format gốc

=> -xf - là file should be extract và - bảo input đến từ grep trước đó

=> -C là extract file vào thư mục nào

=> -idmv: -i là extract từ archive; -d là create directory nếu cần; -m là preserve file modification times; -v là display verbose output, nó cũng hơ tên từng file được xử lý

* In Linux file system, file /dev/urandom is a character consequence generated randomly. Use this file with the command od to print a randomized number

od -An -N2 -i /dev/urandom

=> od là display content fof file ở nhiều loại format khác nhau

=> -An chỉ định address k display ở output

=> -N2 là chỉ hiển thị 2 bytes đầu

=> -i là hiển thị output ở dạng integer

=> Túc display first 2 bytes của /dev/urandom ở dạng integer

* Type mount (without options) and try to explain the display content

Mount shows all the file systems that are currently mounted. It displays the file system, mount point, type, and any options used during the mount. This command can be used to check the current status of the mounted file systems.

Exercise 3. File permission.

* Could you change the permission of /home directory?

Yes, we can change the permission of the /home directory using the chmod command. For example, we can change the permission to 755 (rwxr-xr-x) with the command sudo chmod 755 /home.

* By default, what is the permission of your created files?

By default, the permission of a newly created file depends on the umask value. The default umask value is 022, which means that the permission of a new file is 644 (-rw-r--r--).

* Change the owner and group owner of /etc directory to yours

We can change the owner and group owner of the /etc directory using the chown command. For example, we can change the owner to Wer username and the group owner to our primary group with the command sudo chown -R <username>:<group> /etc.

* Change the permission of the file ~/.bashrc so only you and members of your primary group can access that file

Syntax is: sudo chown -R <username>:<groupname> /etc

* Since my username and groupname are hieucuopbien123 so the command is: sudo chown -R hieucuopbien123:hieucuopbien123 /etc
* Run “locate root”. What will happen?

Running the command locate root will search for any file or directory containing the word "root" in its name on the whole file system.

* Create a symbolic link to /root. Could you use this link? Please explain the outcome.

We can create a symbolic link to /root using the ln command. For example, We can create a symbolic link named myroot with the command ln -s /root myroot. We can use this link to access the files in /root, but We need to have the appropriate permission to do so. For example, if We are not the owner of a file in /root and the permission of the file is not set to allow others to access it, We cannot read or modify the file through the symbolic link.

Exercise 4. Operations with users and groups

* Create 4 groups with the following ID:

|  |  |  |
| --- | --- | --- |
| No | Name | GID |
| 1 | Hobbits | 600 |
| 2 | Elves | 700 |
| 3 | Dwarves | 800 |
| 4 | Wizards | 900 |

sudo groupadd -g 600 Hobbits

sudo groupadd -g 700 Elves

sudo groupadd -g 800 Dwarves

sudo groupadd -g 900 Wizards

* Create 5 user accounts with the following information:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No | Name | UID | GID | Full name |
| 1 | Frodo | 601 | 600 | Frodo Baggins |
| 2 | Gollum | 602 | 600 | Smeagol |
| 3 | Samwise | 603 | 600 | Samwise Gamgee |
| 4 | Legolas | 701 | 700 | Legolas of Mirkwood |
| 5 | Gimli | 801 | 800 | Gimli son of Gloin |

Password of all above user accounts is fedora11. There are no private groups but there are following criteria:

* The home directory of Gollum is named Smeagol.
* All home directories must be the child directories of /home
* Legolas want ot use tcsh instead of bash (you can install tcsh by using **sudo yum install tcsh** on CentOS or **sudo apt-get install csh** on Ubuntu)
* \*Gimli doesn’t want to use his account without password (is it possible to do it?)

sudo useradd -u 601 -g 600 -c "Frodo Baggins" -m -s /bin/bash Frodo

=> useradd để create new user

=> -u 601 để userid là 601

=> -g 600 để sepecfic thuộc về group có id là 600

=> -c là comment, ở đây coi là name của user

=> -m là create home directory cho user này

=> -s <url> là specify login shell for new user account

=> cuối cung là user name thực sự

sudo echo "fedora11" | sudo passwd --stdin Frodo

=> output fedora11 làm input cho lệnh passwd có --stdin là read password mới từ standard input là grep đằng trước. Cuối cùng là username của password đó

sudo useradd -u 602 -g 600 -c "Smeagol" -m -d /home/Smeagol -s /bin/bash Gollum

sudo echo "fedora11" | sudo passwd --stdin Gollum

sudo useradd -u 603 -g 600 -c "Samwise Gamgee" -m -s /bin/bash Samwise

sudo echo "fedora11" | sudo passwd --stdin Samwise

sudo useradd -u 701 -g 700 -c "Legolas of Mirkwood" -m -s /bin/tcsh Legolas

sudo echo "fedora11" | sudo passwd --stdin Legolas

sudo useradd -u 801 -g 800 -c "Gimli son of Gloin" -m -s /bin/bash Gimli

sudo echo "fedora11" | sudo passwd --stdin Gimli

=> Gimli must use password in order to use his account

After creating all accounts and groups, login as Frodo and send email to all other user accounts to welcome them to Linux environment. Login as other users and see the message of Frodo.

* Frodo forgets his password. Set his password as Baggins and force him to change his password on his next login session.

sudo passwd -e Frodo

=> expire password của username Frodo

* Change the primary group of Frodo to your primary group (but Frodo is still a member of the group Hobbits)

sudo usermod -g $(id -gn) Frodo

=> id-gn trả về primary group của user hiện tại đang thực hiện lệnh.

* Legolas wants to change his username to Glorfindel

sudo usermod -l Glorfindel Legolas

=> -l Glorfindel là username cuối cần đổi thành là gì

* Gimli want to change his UID to 800. Make sure that Gimli can login, access and create file after changing UID)

sudo usermod -u 800 Gimli

sudo find /home/Gimli -uid $(id -u Gimli) -exec chown -h Gimli {} \;

=> $(id -u Gimli) để lấy user id của gimli

* Glorfinder has suspected behaviour. Lock that account

sudo passwd -l Glorfindel

=> -l là lock ai dó

* Delete the Samwise account (including his home directory)

sudo userdel -r Samwise

=> -r là remove

* Change the content of /etc/motd to notify that “All activities on this computer are being monitored”

sudo echo "All activities on this computer are being monitored" > /etc/motd

* Gimli doesn’t like the notification on his screen. Please configure so there will be no notifications when Gimli logs in (only Gimli has this privilege)

Open file sudo nano /home/gimli/.bashrc

-> add to the end of file "unset DISPLAY"

* Configure that Gimli cannot execute his executable files in his bin directory.

sudo chmod go-x /home/gimli/bin

=> go-x là remove execute permission (-x) for group (g) and other (o) ở thưc mục nào