3 * Linux systems and shell scripting

This is an assessed lab. You must write up and submit your answers to this lab for assessment as part of your logbook.

Before you begin this lab, you will need to have completed the following Linux Tutorials: Basic Linux; vi and File permissions.

Learning objectives

The aims of this lab are to:

- Practice the Linux skills and concepts covered in the first few Linux Tutorials
- Introduce shell scripting and user management on Linux

By the end of this lab session, you should be able to:

- Navigate the UNIX file system
- Create and execute UNIX shell scripts
- Create and manage new UNIX users and groups
- Modify file and directory permissions and ownerships

Log in to the Slackware machine as root.

Shell scripting

Exercise 3.1 Creating an executable bash script

1. Using vi (or another terminal text editor such as emacs), create a script called **test.sh** in your home directory with the following contents:

```
#!/bin/bash
clear
echo "Hello World"
```

   Make sure the script is executable, then run it by executing: ./test.sh

2. A student, when completing the above question, executed the following command:

   chmod 777 test.sh (equivalent to executing chmod a+rwx test.sh)

   Explain why giving 777 permissions to a file is a bad idea.

System administration

New users may be created using the following commands:

```
useradd -d /home/bob bob  # creates user bob and sets home directory to /home/bob
mkdir /home/bob           # creates the directory bob in /home
chown bob /home/bob       # changes the owner of /home/bob from root to bob
chgrp bob /home/bob       # changes the group of /home/bob from root to bob
```

Note: chown bob:bob /home/bob can be used to change the owner and group to bob without having to use a separate chgrp command.

Passwords to user accounts can be changed by using: passwd *username*. If *username* is not given, the password for the currently logged in user is changed.

Exercise 3.2 Creating new users

Create two new user accounts:

- username: bob, password: bob
- username: smith, password: smith

Exercise 3.3 Creating a shared executable script

1. Create a publically readable and writeable directory with the path **/home/ncs** with the appropriate directory permissions.
2. Create a bash script in this directory called **hello.sh** which should print a message saying "Hello World".
3. Execute this script.
4. Note down the owner/group ownerships and the file permissions of this script.

Exercise 3.4 Accessing files from different user accounts

a) Press [Ctrl] + [Alt] + [F2] and log in as bob.

1. Navigate to the directory **/home/ncs**. What do you see in this directory?
2. Execute ./hello.sh. Does it succeed? Why (not)?
3. Create a script called **bob.sh**, which should print the message "Hello this is Bob" when executed.
4. Execute ./bob.sh and explain the result you get.

b) Press [Ctrl] + [Alt] + [F3] and log in as smith.

1. Navigate to the directory **/home/ncs**. What do you see in this directory?
2. Execute ./hello.sh and ./bob.sh. Explain the results you get.

Exercise 3.5 Optional exercises

These exercises require you to read up on additional material.

1. Create a group called **sysadmins**, and add bob and smith as members. Change the group owner of **/home/ncs**, **/home/ncs/hello.sh** and **/home/ncs/bob.sh** to this group. Can both bob and smith execute both scripts now?
2. **Disable** smith's user account. **Do not delete smith's account or files.**

If you finish this lab early, you should use the remaining time to complete the Linux Tutorials (if you haven't already done so).