FIRST TERM

Assessable Activity - Solutions

Computer Systems
CFGS DAW

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Nomenclature

Throughout this unit different symbols will be used to distinguish important elements within the content. These symbols are:

 Important

 Attention

 Interesting

First Term: Assessable activity

1. Objective

To design and prepare a folder structure by assigning the necessary permissions.

2. Description

The following people work in a repair company:

- **Jackson**, who is the supervisor
- **Jenny**: plumber
- **Harrison**: plumber
- **Brianna**: electrician
- **Edward**: electrician
- **River**: owner of the company (the Boss)

The boss has bought a new disk for the office computer, and from now on they are going to store the data of the jobs they do there. They will access the disk in the folder `/company`

Inside that folder, they want to have a folder `Jobs` where there will be three sub-folders:

1. `Electricity`, where only electricians can read and write.
2. `Plumbing`, where only plumbers can read and write. This folder will have a sub-folder (which no one can delete) called "`no chop here`". In this folder, electricians will be able to read and write, but plumbers will only be able to see it.
3. `Reforms`, where plumbers and electricians can read and write.

In addition, they want a `Holidays` folder (at the same level as `Jobs`) where each worker can create a file with their requested holidays. Nobody should be able to modify the holidays of others.

Supervisors (and the owner) should be able to see everything.

The files created by an user inside a folder should have the same access of that folder. For example, if a plumber creates a file inside `Plumbing` the other plumbers must be able to edit that file, but not the electricians.

You can assume that there won't be any other users in the system , so you can give read permissions to all users if needed.

You don’t need to protect the folder "`no chop here`" for deletion.

By "read and write", they mean that they should be able to use the folder normally: create and delete folders and files, rename files, etc. but they should not be able to delete the folder.

3. Deliverables

A .odt file, create a template

3.1 Section 1

Explain how would you do to access the disk, assuming it has been just installed in the computer. Indicate, if needed, what orders would you execute and what files would you modify. The size of the disk will be 10Gb. The disk must be mounted on the required location when the machine boots up.

1. Create a GPT partition table (it shouldn't be a MBR partition) It can be done using `gparted`, `fdisk`, or `cfdisk`.
2. Create an ext4 partition, full disk size (it should be ext4)
3. Create the mountpoint with `sudo mkdir /company`
4. Optional: mount the disk with `sudo mount /dev/sdb1 /company`
5. Modify the `/etc/fstab` file to automatically mount the disk. It must be mounted using UUID

```
# New disk
UUID=5dec5576-59a1-4f87-a87e-82505ead7996 /company      ext4    defaults        0       0
```

3.2 Section 2

*List the commands you would need to run to prepare the users' structure. You must create the users and groups **in a non-interactive way** (the commands mustn't require any inputs from the user once executed) The users must have `/bin/bash` as their shell.*

Groups creation

```
sudo groupadd electricians
sudo groupadd plumbers
sudo groupadd company
```

Users creation

```
sudo useradd --create-home --shell /bin/bash --groups plumbers,company jenny
sudo useradd --create-home --shell /bin/bash --groups plumbers,company harrison
sudo useradd --create-home --shell /bin/bash --groups electricians,company brianna
sudo useradd --create-home --shell /bin/bash --groups electricians,company edward
sudo useradd --create-home --shell /bin/bash --groups electricians,plumbers,company jackson
sudo useradd --create-home --shell /bin/bash --groups electricians,plumbers,company river
```

It's better if you create the users with the --groups option. If not, you must run additional commands to add the users to the groups. It can be done through the usage of the command adduser [user] [group] for instance. Can also be achieved through the usage of usermod -aG.

3.3 Section 3

The users must be able to log into the system. Set the password for all of them in a single command with `chpasswd`, using a file containing the passwords information (you can have one line for each user) The password must be `firstlogin` for each user.

Explain the command needed to do it and the contents of the file.

Create a file named, ie, passwords, with this content:

```
jackson:firstlogin
jenny:firstlogin
harrison:firstlogin
brianna:firstlogin
edward:firstlogin
river:firstlogin
```

Then, send the file to chpass to change the passwords:

```
cat passwords | chpasswd
```

Equivalent codes are:

```
cat passwords > chpasswd
chpasswd < cat passwords
```

3.4 Section 4

*Show the orders for creating all the other folders from `/company` **using relative paths**.*

```
mkdir Jobs
mkdir Jobs/Electricity
mkdir Jobs/Plumbing
mkdir "Jobs/Plumbing/no chop here"
mkdir Jobs/Reforms
mkdir Holiday
```

3.5 Section 5

Show the orders for giving the correct permissions to the different folders.

You must explain what are you trying to achieve with each command, and why.

Assign the groups for each folder. We need a group comprising all the company because we can't give permissions to two different groups.

```
chgrp electricians /company/Jobs/Electricity/
chgrp plumbers /company/Jobs/Plumbing/
chgrp electricians "/company/Jobs/Plumbing/no chop here"
chgrp company /company/Jobs/Reforms/
chgrp company /company/Holidays
```

Give write permissions to the groups. The setgid bit is to allow members of the group to modify the files created by another user:

```
chmod g+ws /company/Jobs/Electricity/
chmod g+ws /company/Jobs/Plumbing/
chmod g+ws "/company/Jobs/Plumbing/no chop here"
chmod g+ws /company/Jobs/Reforms/
```

For holidays, we need to use the sticky bit so files be editable only by their own creators:

```
chmod g+w,o+t /company/Holidays
```

3.6 Section 6

Display the output of `tree -pugfd /company` (you will need to have the command `tree` available in your system)

```
[drwxr-xr-x root     company ]  /company
├── [drwxrwxr-t root     company ]  /company/Holidays
├── [drwxr-xr-x root     root    ]  /company/Jobs
│   ├── [drwxrwsr-x root     electricians]  /company/Jobs/Electricity
│   ├── [drwxrwsr-x root     plumbers]  /company/Jobs/Plumbing
│   │   └── [drwxrwxr-x root     electricians]  /company/Jobs/Plumbing/no chop here
│   └── [drwxrwxr-x root     company ]  /company/Jobs/Reforms
└── [drwx------ root     root    ]  /company/lost+found  [error opening dir]
```