ESE 2025 Week 2 Report
Instructor:
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Introduction:

This report explores and executes the commands from Chapter 3 Derrek Molloy's Exploring BeagleBone 2nd edition.

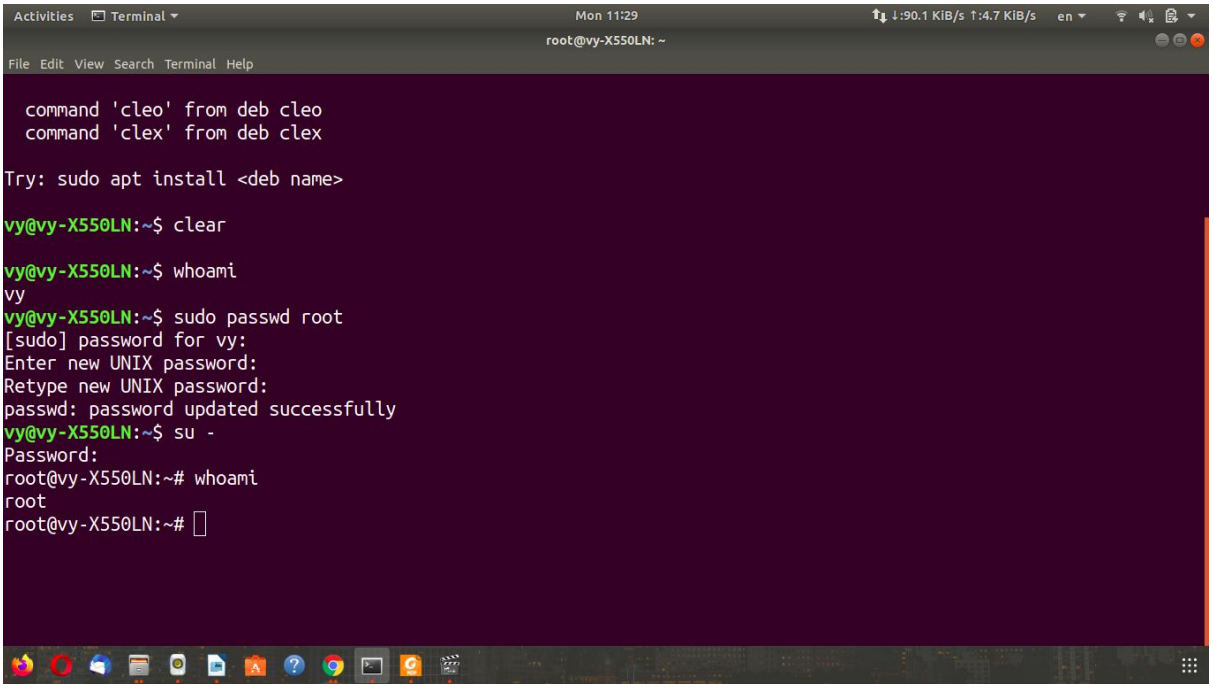
Discussion:

The superuser:

Superuser or root account is the administrator account that highest security access to all commands and files. It is in default disable, but we can enable it by using:

```
$sudo passwd root
```

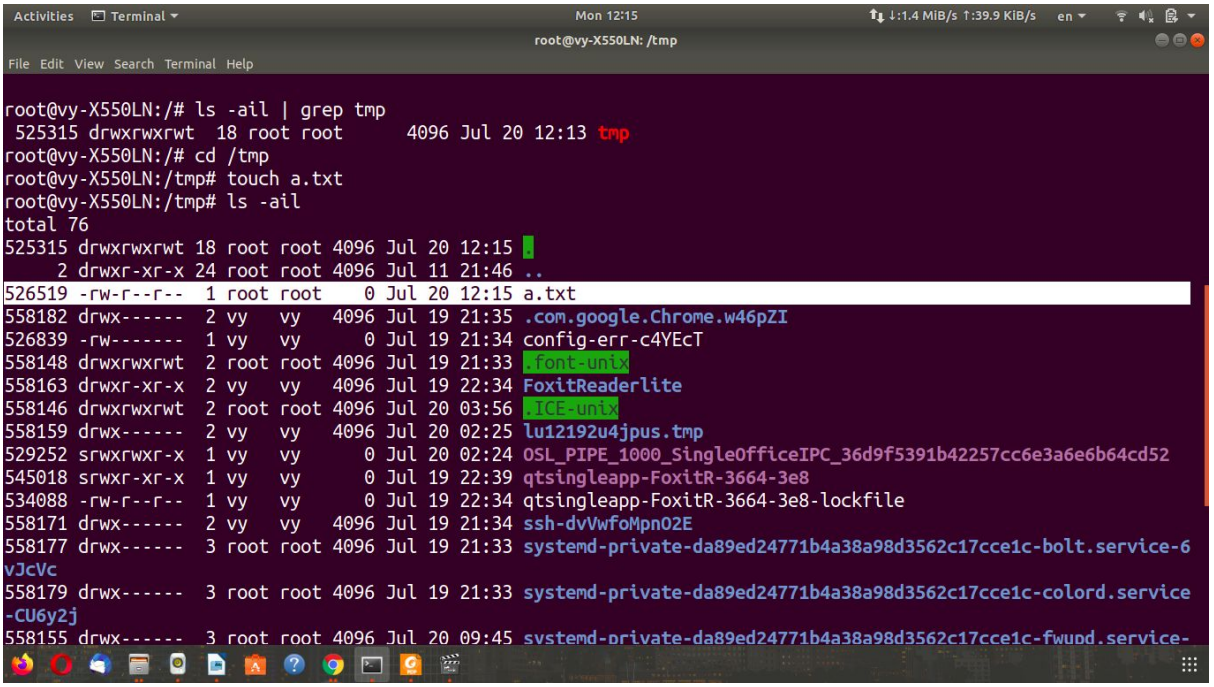
After that we can run a shell with a substitude user by using (su - or su - root).



Because Linux uses data structures, called inode, to represent file system objects such as files and directories. By performing a listing $ls - ail off the root directory, we can see the tmp directory of inodes.

By creating a temporary file (a.txt), and perform ls -ail, we will see that the current (.) directory has the exact same inode index:

```
$cd - ail | grep tmp
$cd tmp
$touch a.txt
$ls -ail
```



Linking to files and directories

There are two types of links in Linux system: soft links and hard links

- A soft link (or symbolic link) is a file that refers to the location of another file or directory.
- Hard links, conversely, link directly to the inode index, but they cannot be linked to a directory.

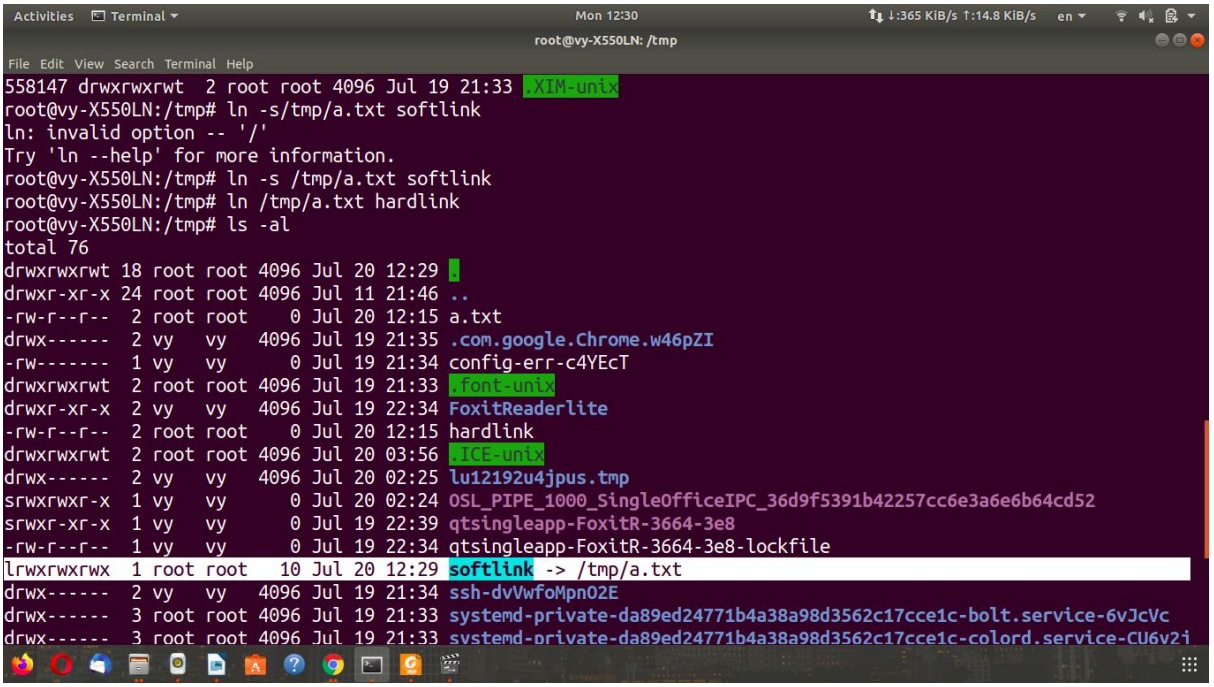
To create a link we can use:

ln /path/to/file.txt linkname

example:

```
$ ln -s /tmp/a.txt softlink
$ln /tmp/a.txt hardlink
$ls -al
```

Where “-s” to add a symbolic link.

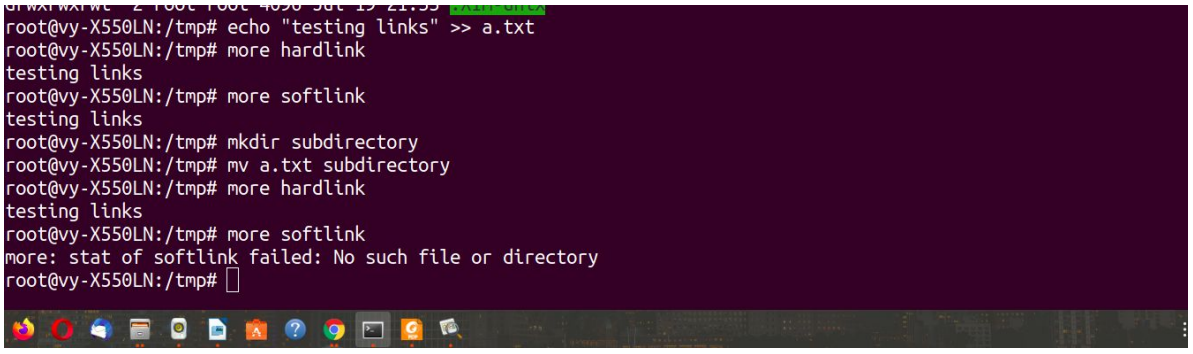


There is a number 2 in front of a.txt file. This is the number of hard links that are associate with the file.

To check the difference between a soft link and a hard link. First, we put some content in the text file. Then display the soft link and hard link. After that we create a subdirectory, move the text file to it, and repeat the display:

```
root@vy-X550LN:/tmp# echo "testing links" >> a.txt
root@vy-X550LN:/tmp# more hardlink
root@vy-X550LN:/tmp# more softlink
root@vy-X550LN:/tmp# mkdir subdirectory
root@vy-X550LN:/tmp# mv a.txt subdirectory
root@vy-X550LN:/tmp# more hardlink
root@vy-X550LN:/tmp# more softlink
root@vy-X550LN:/tmp# clear
```

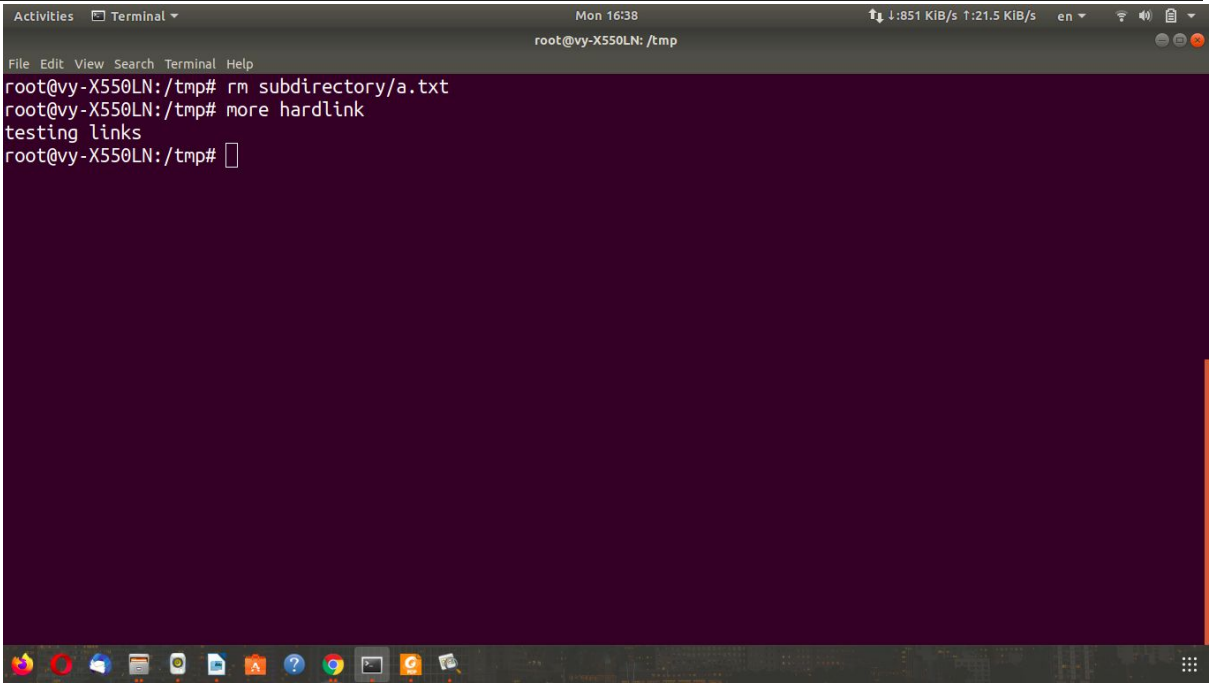
Result:



When the a.txt file is moved, the soft link breaks but the hard link works correctly. Therefore, symbolic links are not updated when the linked file is moved, but hard-links always refer to the source, even if moved or removed.

Now trying to remove the file completely and test the hard link:

```
$rm subdirectory/a.txt
$more hardlink
```



Creating a new user account on the BBB

To creating a new user account on BBB, we can follow these steps:

1. The creation of a new user account called “userName” on the BBB
2. The retroactive addition of the account to the user’s group
3. The reset of the password for the new user account
4. Verification that the account is working correctly

After login into BB as an administrator

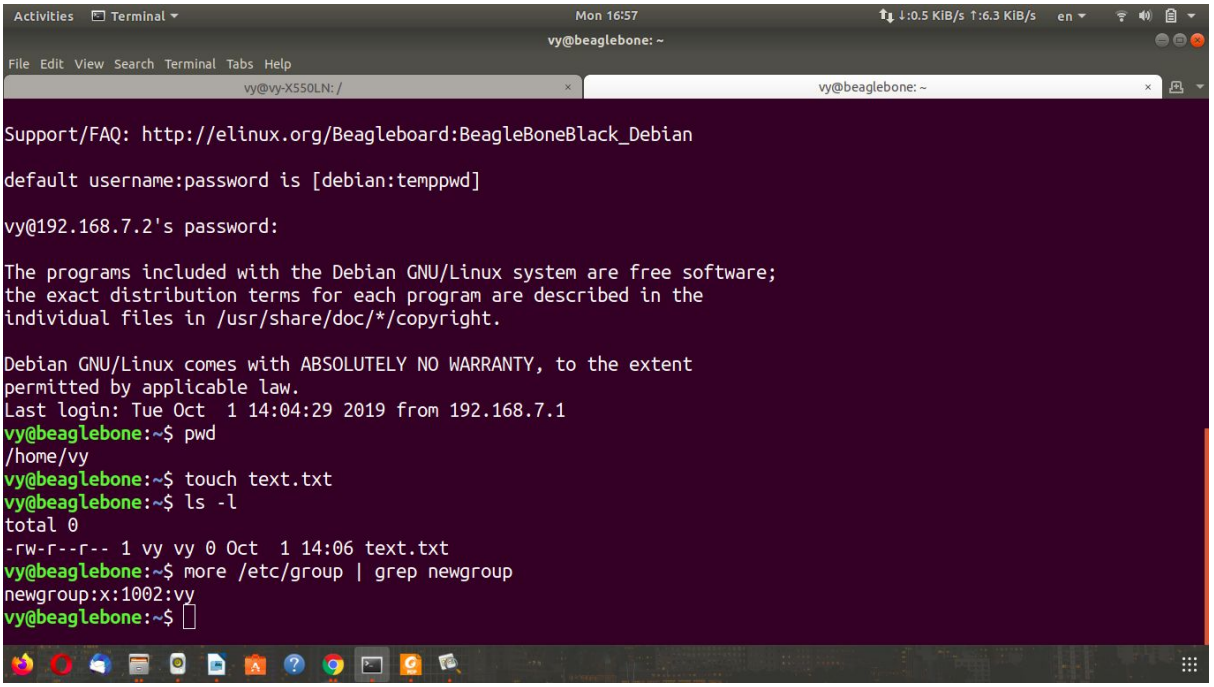
```
$ssh 192.168.7.2 -l debian
$su -
```

We can start to add a new user by following:

```
$adduser vy
$group add newgroup
$adduser vy newgroup
```

Then we can test by login into BB again with vy account

```
$pwd
$touch text.txt
$ls -l
$more /etc/group | grep newgroup
```



After trying the commands, the correct way to close the BB is using

```
$sudo shutdown -h now
```

Summary:

There are just some of the commands that are useful from chapter 3 of the book.
Recommend to explore further to understand how to manage file system in Linux