

Linux – lab 3

Your lab reports with notes from previous laborations and lecture notes could be of great help during the laboration.

You will have to restart the virtual machine a few times. Make sure to do a proper reboot from within the Ubuntu environment. If you shut down the machine the non persistent disks will reset and you will have to start over! Username/password is ide.

Preparation - read about the following commands and files.

ssh _____

nfs-kernel-server _____

/etc/exports _____

1. As you try to boot the system there will be a problem. The system will not boot. Let us analyze this problem and try to solve it.
 - a. The error is “Error 15: File not found.” This means there was a file missing in the start up. Press a key to continue.
 - b. You are now shown the boot selector. There are now two options to continue from here. Either you could try to start the OS in recovery mode and hopefully get it to work – and then from this mode analyze and correct the errors. But if you think there might be a problem with the actual boot settings you could actually analyze and edit them directly.
 - c. The problematic boot option is the selected one, press e to enter the editor. Since we know there is a file missing there could really just be two different errors here. Either the kernel command is pointing to wrong kernel file or the initrd points to wrong bootstrap file.
 - d. In this example a sloppy system administrator has miss-spelled the kernel name. Instead of /boot/vmlinuz... it says /boot/vmlinyz... Since the miss-spelled kernel cannot be found it will result in an “File not found error”.
 - e. To correct this error you select the erroneous line (see instructions at the bottom of the screen). Press e to open the line editor. You can now move around on the line using the arrow keys (go far left). Correct the error and press enter.
 - f. Now the boot parameters are temporarily fixed, so we have to fix this permanently after we log on. To boot we simply press b.
2. Wait for the system to start up.
3. We should now permanently fix the boot problem.
 - a. Open up a terminal. Navigate to the folder /boot/grub. Using any text editor open up the file menu.lst and correct the error. Save the file.
 - b. Reboot the system using the command reboot and make sure everything works fine. Wait for the system to start up.
4. Set up the network. See the document “How-to-network”.
5. We are now going to add the web server Apache 2 and look into how to configure it.
 - a. Install the packet apache2 using apt-get.

- b. Check the installation by opening up Firefox and entering the URL <http://localhost> . If everything works you will be presented with a page stating “It works!”.
- c. We are now going to check where we can put our own files so they show up on the web server. Navigate to the folder `/etc/apache2/sites-available`. Using a text editor, `cat` or `more`, open up the file `default`. This configuration file contains the settings we are looking for. The keyword `DocumentRoot` indicates where the root of the web server will be located in your file structure. This means, where will the web server look if you ask for the page <http://localhost/file.html>.

`DocumentRoot` is set to _____

- d. We are now going to check where the scripts are going to be stored so they can be used by the web server. Look around in the file `default` for the keyword `ScriptAlias`. The second argument specifies where scripts should be stored.

`ScriptAlias` is set to _____

- e. If you had to change these values, be aware that a web server restart would be necessary to reload the configuration files! The command to restart the web server would be `/etc/init.d/apache2 restart`.
 - f. Navigate to the folder given by `DocumentRoot`. If you are correct you will find a file named `index.html`. Open up this file in a text editor and replace the text “It works!” with something of your choice. Save the file and reload the page in the web browser by pressing `F5` or `CTRL-R`.
 - g. Navigate to the folder given by `ScriptAlias`. This folder will be empty. Create a file named `script` using `touch`. Change the access rights to executable for everyone using `chmod`. Open up the file and write the following:


```
#!/bin/sh
echo "Content-Type: text/html"
echo
echo "<h1>Script-test!</h1>"
```

 Save the file.
 - h. Change the url in the web browser to <http://localhost/cgi-bin/script>. If it works you should be shown the text `Script-test!`. If not, start checking that you typed the script correctly.
6. We are now going to hand out parts of our file structure over the network, also referred to as handing out net shares or net disks.

- a. Install the packet `nfs-kernel-server` using `apt-get`.
- b. The configuration file for the nfs server is `/etc/exports`. Open it up in a text editor. We will now change the configuration to hand out our whole home folder with all the user folders. As can be seen in the top example in the file `exports`, the minimal configuration to hand out a nfs share is to specify which folder we are going to hand out and which computers that will be allowed to use it. We want to hand out `/home` to everyone. Add the following line:


```
/home *(ro)
```

 This means that the folder `/home` is to be shared to everyone (*) as read only (ro).
- c. Since we now made a change to the configuration file we need to restart the `nfs-kernel-server`. This is done by running the following command:


```
/etc/init.d/nfs-kernel-server restart
```

- d. Using `showmount -e` we now can check what shares are handed out. Make sure `/home` are handed out to everyone.
 - e. Group up with another group and give them your IP (`ifconfig`). Ask them to mount your nfs share according to the instructions in lab 2. Create a special file in your home folder with a nice message for them to find and read.
7. We are now going to try remote administration in different forms.
- a. Install the packet `ssh` using `apt-get`.
 - b. The lab assistant has set up a machine with a specific IP-number for you to connect to. Ask the lab assistant for the IP and the username/password.
 - c. Log on to the remote machine using `ssh user@IP`. When logged on, create a file with your name in it in the logged on users home directory (`cd`). If you are first, name the file 1, if you are second 2, etc. Log out using the command `exit`.
 - d. Log on to the remote machine using `ssh -X user@IP`. You have now set up a tunnel for graphical content. Start the program `xclock` to check that you actually get graphical information. Log out using `exit`.
 - e. The remote machine has its remote desktop turned on for viewing.
 - f. To connect to the remote desktop we need to install the packet `vncviewer` using `apt-get`.
 - g. Connect to the remote machine using the command:
`vncviewer IP:0`
 - h. To shut down the remote desktop, simply close the window.

OPTIONAL ASSIGNMENT !!! OPTIONAL ASSIGNMENT

- 8. Install the packet `postgresql` (the `postgresql-server`).
 - 9. Configure the `postgresql-server`.
 - a. Switch to the postgres user `sudo su - postgres`
 - b. Init the database
 - i. `psql -U postgres -c "CREATE DATABASE testdb" -d templatel`
 - c. Start the internal database connection using
 - i. `psql -U postgres -d testdb`
 - ii. From this console you can issue SQL commands directly to the database.
 - d. Create a table
 - i. `CREATE TABLE workers (
 name varchar(40),
 salary int
);`
 - e. Add data to the table
 - i. `INSERT INTO workers VALUES ('Kalle Andersson',1234);`
 - ii. `INSERT INTO workers...`
 - f. Test it using `SELECT * FROM workers;`
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