

CAA2

General Observations

This assignment will be performed by working on the configuration files and commands available to configure and manage the corresponding services, avoiding as much as possible the use of automated tools and graphical user interfaces. These graphical tools can be used to verify the configuration and / or manage the application wherever possible, but not directly to solve the proposed exercises.

*Each question must specify **in detail** the steps taken and configuration changes performed, showing the results (wherever possible) through listings and other outputs **commented** by you and that may be reproduced so that they can be evaluated. Remember that assignments can only be assessed by the information contained in them.*

This assignment is an individual work. It will not be evaluated if parts of it are copied (from any source) or too similar to other students' assignments.

Part 1 (Module 4: The kernel)

Important Notice 1: In all the exercises in this section caution is recommended, especially if you have sensitive data (user accounts, modified configuration files, email accounts, etc...). All data should be saved before any changes. **You should not do these exercises on production machines !**

Important notice 2: The newly installed kernel must be *alternative* or *secondary*. Modify the bootloader (grub or lilo) for testing without removing the original entries for the old kernel so that you can recover the previous configuration.

In this exercise we will work with the system kernel, doing some checks and compiling a new kernel.

1) Determine the version of the kernel currently installed in the system and find out whether a newer version exists. If possible (i.e., working on a testing machine), do an automatical install using the distribution's tools. If this is not possible, indicate the steps that would be necessary to do so. You should take into account the dependences of the modules that are used (pcmcia, alsa, etc...) and the bootloader (Grub or Lilo).

2) Install the source code of the current version of the kernel, or a new one if it exists. Configure the new kernel to *select the available hardware only*. Indicate what is included and whether it will be included in the kernel or loaded as a module. Do not forget to build the necessary modules. Finally, install and boot with the new kernel.

3) Analyse the modules loaded on the new kernel, its main features and its improvements compared to the previous version: size, suitability for the machine's hardware, security features, etc.

4) Analyse *initramfs* in detail: its general functionality, how it is generated and loaded, etc.

Part 2 (Module 5: Local administration)

5) Install a print server, accessible from a local network, where computers with different operating systems may exist.

Develop a script that runs every day at 2:13 AM. This script should calculate the total number of pages printed, the daily totals per user and per configured printer.

6) In this exercise we will create a RAID-1 drive, that is two disk units configured as mirrors. You can use two USB sticks on a physical computer, or two virtual hard disks on a virtual machine. They don't need to be large, a few MB should be enough. For example 128 MB.

Create and format a RAID-1 partition using these two units. Configure the system to automatically mount it into a given location and so that users without administrative rights are allowed to read and write files in the partition.

Start copying a rather large file, stop the machine and remove one of the disks (or disconnect it if you're using a virtual machine). With this we are *simulating* a physical *disk failure*. Boot again and check the accessibility and integrity of data in the remaining device. Document the process of replacing the faulty unit and rebuilding the RAID table.

7) Write a script that allows to backup user files, with the following features:

- Run every day at 4:13 AM.
- Copy only files that are *new* or *have changed* since the last run.
- Do *not* copy files that
 - start with ".", "~", *and/or*
 - end with ".bak" *and/or*
 - are larger than 200 Mbytes
- .
- The copy is made at : server nfs://192.168.0.1/backups

This directory must be mounted only when needed to make the backup and will be unmounted after finishing.

- Regular users won't have permissions to access the backups.

Part 3 (Module 6: Network administration)

1. Configure the network interface from scratch, taking into account the type of hardware connection available (modem, DSL router, cable, LAN, etc.) and the services necessary to provide connectivity. To verify the connection some basic tests should be run to check the connectivity with Internet and the

quality of the connection (for example, analysing the ratio of lost packets).

All changes made to configuration files for devices and services should be documented in this exercise. The use of graphical tools is not allowed, **neither is the automatic configuration via DHCP**.

2. Set up a DHCP server and verify that it works properly, assigning at least the necessary parameters to configure a network card. It is convenient to test the DHCP client from a different machine. If you are behind a DSL router, take into account that it probably has a DHCP server running, which could interfere with this exercise.

Note: assignment 3 will continue with other aspects of network administration.