# SECOND TERM ASSESSABLE ACTIVITY

**Computer Systems**
**CFGS DAW**

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## Licencia



## Nomenclatura

A lo largo de este tema se utilizarán distintos símbolos para distinguir elementos importantes dentro del contenido. Estos símbolos son:

 Importante

 Atención

 Interesante

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# SECOND TERM ASSESSABLE ACTIVITY

Read the whole activity before beginning

## 1. INTRODUCTION

Your client *BiCiBiKeR S.L. is* very pleased with your job. They want to hire you again to improve their systems. They need your services to configure two separated networks: one for computers of *Secretary* and other network for computers that are for *Human Resources*.

Also in the network of *Secretary* we want to configure 3 new computers that have arrived and make a network between them.

For this purpose you have to:

- Install Linux in two computers using Virtual Box.
  - Configure those machines in order to access to local network with static IPs in each operating system.
  - Create two users for each operative system: *foreign_XXXX* and *local_XXXX.*
    - where XXXX is *yourfirstsurnameyourfirstlettername,* for instance if you are Rafa Nadal it will be *foreign_nadalr* and *local_nadalr.*
- Also install Linux in one machine using docker. To do it, you have:
  1. to create the image using as base image https://hub.docker.com/_/ubuntu or other Linux docker image that you like.
  2. to create two users for each operative system: *foreign_XXXX* and *local_XXXX*

     where XXXX is *yourfirstsurnameyourfirstlettername,* for instance if you are Rafa Nadal it will be *foreign_nadalr* and *local_nadalr.*
  3. to upload your custom image to https://hub.docker.com/ and share it with us.
  4. In real world, you should to configure each machine with IPs of the designed network, but with Docker machines you have to do several operations to change its subnetwork, but it is not the goal of our course. **For simplicity reasons, you don't have to configure network in your Docker machines and you can use default IPs that are provided.** We will assess this part downloading your image from Dockerhub.
- Discuss and justify what is the better hardware to interconnect three computers: a hub, a switch or a router.

- Explain what is the best network configuration, supposing in the network *Secretary* in the future we want to connect 50 computer and in network *Human resources* in the future we want to connect 64 computers.

- In one of the computers (VirtualBox virtual machines) that have Linux installed , create a folder caller */sharedsamba* and share it using Samba. Configure the other computer to mount remotely that samba resource automatically on start (`/sharedsamba`).
- Create two scripts for Linux using Python that:
  - Check every minute if a Docker machine previously launched is down and notify it using Telegram to a Telegram user.
  - Asks an username and, if several conditions are satisfied, does a zip file with all of his Desktop content and send it to the samba shared resource */sharedsamba*.

# 2. ACTIVITIES

## 2.1 Dossier

You have to deliver a dossier. This document has to include:

- Justify what kind of hardware have chosen for your network and why you have not chosen the other two (hub, switch or router).
- A price comparative about two switches and two routers.
- Choose the best network mask for purposed networks and justify your decision (you have to use sub netting)

## 2.2 Configure operating system, network and server

You have to configure each computer to:

- Install Linux in two computers
  - Access to local network with static IPs in each operating system.
- Install Ubuntu or other Linux image that you want with Docker, do required changes and upload custom image to https://hub.docker.com/
- Install and configure Samba in one of the Linux computers to share a folder called `/sharedsamba`.
- Install and configure other computer to mount the samba file system remotely (*/sharedsamba*).

### 2.3 Scripting

You have to create a two Linux scripts using Python and put it in each computer.

**First Python script has to:**

- Check every minute if a Docker container previously launched is down and notify it using Telegram to a Telegram user.
- The ID container will be passed by parameters.

  You can find information about how to pass parameters from command line here.
- You can check Docker containers running using `docker ps` command.

**Second Python script has to:**

- Check if you are root. If not, it will display an error message.
- If you are root, it has to ask you an username. The program has to check if the directory of that username exists in */home*
  - If not exists, an error message has to be displayed.
  - If it exists you have to check two conditions:
    - **Condition 1**: even number of files `/home/username` and its subdirectories.
    - **Condition 2**: file *nobackup* doesn't exist in `/home/username`.
  - If one or two condition fails: an error message has to be displayed.
  - If both conditions are satisfied: `/home/username` directory has to be compressed in a zip and has to be saved in a file with name *username.date.time.zip* (where *username* is the name of the home, date is the current date and time is the current time) and send to */sharedsamba*

## 3. DELIVERY

You can send the task until Sunday 15th May 2020 at 23:55.

You have to deliver:

- A dossier describing network hardware chosen and the network configuration to make to isolated networks. In this dossier also you have to include an explanation of best network configuration for 50 computer / 64 computers as required.
- A spreadsheet[1] comparing network hardware.

Remember to present final prices, are and without VAT

1 LibreOffice/OpenOffice *.ods* format recommended

- A video demonstrating that your computers work properly and share the resource */sharedsamba.* To do this you have to use the *ping*[2] command
- Link to your Docker image uploaded to Docker Hub.
- Source code of the script with detailed comments.

> It is mandatory that the code is **well commented** explaining what have been the steps implemented

## 4. ASSESSMENT

The activity is individual and non-transferable. To consider it completed, it is not enough just to deliver the dossier. The student must be able **to defend** his/her exercise at the request of the teacher and be able to make small modifications related to it, in order to demonstrate the acquisition of knowledge and avoid any suspicion of copying.

> The copy is punished with the fail of the complete module.

The evaluation is done in *a global way* and takes into account elements such as:

- Correction in the explanations.
- Nice visual presentation of documents.
- A right structure in the generated documents:
  - Index
  - Page break
  - Styles on the page
  - Numeration
  - Header and footer
  - References and functions in spread sheet.

## 5. RECOMMENDATIONS

The assessable activity is designed in order to put into practice the theoretical knowledge. The objective is not to assemble the perfect computers, but to face the practical problem of setting up a computer from scratch.

The fundamental objectives are:

- Select properly network hardware.
- Make a budget.
- Write documentation properly. Remember, you are not talking in a WhatsApp Chat with your friends, you are writing formal documents.

2 *ping* is one of the most basic commands for network management. Investigate its operation

- Install two different operating systems and be able to boot each one.
- Configure operative systems and set them in a network
- Install and configure a simple Samba.
- Improve your skills programming Python in Linux.