

VE482 — Introduction to Operating Systems

Lab 1

Manuel — UM-JI (Fall 2019)

Goals of the lab

- Disassemble a computer
- Recognize the common computer hardware
- Understand how a computer works

1 Hardware overview

Some components might be missing, in such a case figure out their expected location.

In the computer locate:

- The motherboard
- A Hard Disk Drive
- An Optical disk drive
- The PC power supply
- A PCI card

On the motherboard locate:

- The RAM
- A SATA socket
- A PCI/PCI-e slot
- The CPU
- The North and South bridges
- The battery
- The BIOS

Answer the following questions:

- Where is the CPU hidden, and why?
- What are the North and South bridges?
- How are the North and South bridges connected together?
- What is the BIOS?
- Take out the CPU, rotate it and try to plug it back in a different position, is that working?
- Explain what overclocking is?
- What are pins on a PCI/PCI-e card and what are they used for?
- Before PCI-e became a common standard many graphics cards were using Accelerated Graphics Port (AGP), explain why.

2 Basic shell

In this part only refer to the man-pages in order to answer the questions.

- Use the `mkdir`, `touch`, `mv`, `cp`, and `ls` commands to:
 - Create a file named `test`.
 - Move `test` to `dir/test.txt`, where `dir` is a new directory.

- Copy `dir/test.txt` to `dir/test_copy.txt`.
 - List all the files contained in `dir`.
- Use the `grep` command to:
 - List all the files from `/etc` containing the pattern `127.0.0.1`.
 - Only print the lines containing your username and root in the file `/etc/passwd` (only one `grep` should be used)
- Use the `find` command to:
 - List all the files from `/etc` that have been accessed less than 24 hours ago.
 - List all the files from `/etc` whose name contains the pattern “netw”.
- In the `bash` man-page read the part related to redirections. Explain the following signs `>`, `>>`, `<<<`, `>&1`, and `2>&1 >`. What is the use of the `tee` command.
- Explain the behaviour of the `xargs` command and of the `|` sign.
- What are the `head` and `tail` commands? How to “live display” a file as new lines are appended?
- How to monitor the system using `ps`, `top`, `free`, `vmstat`?