

RTOS, Spring 2015 – Lab #1: Getting acquainted with Linux

Objective: to gain access to the basic functionalities of Linux machines in Lab2.

1. Create your new account.

- A) Power up your station.
- B) From “Select the operating system to boot” menu, select “Create New Account.”
- C) Follow instructions.

Note: to create a lab account, you can also follow the instructions here:
<http://lab2.deis.unibo.it/node/3> (in Italian)

2. Explore Xubuntu’s GUI

- A) Restart (CTRL+ALT+DEL).
- B) From the menu, select “Linux Xubuntu 14.04 LTS” then login using the account you just created.
- C) After login, open Xubuntu’s GUI by entering **startx** (Note: to leave the system at the end of the lab session, log out and then power off.) If prompted, **use default configuration**.
- D) Explore menu on top left
- E) Explore dashboard: Web Browser, File System, App Finder, Terminal Emulator
- F) Open File System manager and create “20150303” folder on your home folder
- G) Open Web Browser, access <http://lia.deis.unibo.it/Courses/RTOS> and download sample text file. Save text file to the folder you just created.
- H) Open Application Finder and find “Eclipse”

3. Practice with command-line interface

- A) Open a new **terminal** window (Terminal Emulator, “**shell**”)
- B) Try the following commands: **echo, pwd, ls, cd, cat, less, man, nano, chmod, sleep, ps**
- C) Try commands with options: **ls -al** (see **man**)
- D) Explore the file system using **ls** and **cd**. Notice difference between **relative and absolute paths**. For example, check the content of Desktop, /bin, /usr/bin, /mount, /usr, /home
- E) Try pipelining commands: **ls /usr/bin | less**
- F) Try redirecting input/output: **less < naming; ls /usr/bin > output**
- G) Try background / foreground execution: **sleep 5 &**
- H) Use **nano** and **chmod** to create a shell script that contains the line
ls /usr/bin > output
and to make the script executable.

4. Explore programming environment: Eclipse luna + CDT

- A) Start up Eclipse. If prompted to select/create workspace, say OK
- B) Create new “Hello World” project
(New → C Project → Hello World Ansi C Project).
Select Linux GCC compiler, give name to project (es, Lab1) then “Finish”
- C) Replace the content of the source file the program below.

Save (CTRL+S). Build all (CTRL+B) and execute (menu “Run”).

Note: you can install all this software on your computer at home. It’s free. Check VirtualBox.org, Xubuntu.org, Eclipse.org

```
#include <stdio.h>
#include <sys/types.h>
#include <unistd.h>
int value = 5;
int main()
{
    pid_t pid;
    pid = fork();
    if (pid == 0) { /* child process */
        value += 15; printf("CHILD: value = %d\n",value); // LINE A
        return 0;
    }
    else if (pid > 0) { /* parent process */
        printf ("PARENT: value = %d\n",value); // LINE B
        wait(NULL); return 0;
    }
}
```

5. Self assessment

- How can I log out from Xubuntu?
- Where in the file system are the files I downloaded or created?
- How can I open Eclipse?
- What is the output of shell command **ls**?
- How can I find out what are all the options of command **ls**?
- How can I understand what is my current folder?
- How can I move to another folder?
- Can I edit a text file?
- Can a text file contain a shell command?
- How can I execute a text file?
- What is the meaning of symbols **>** and **|** in Terminal Emulator?
- How can I produce an executable file out of a C program?
- I wrote a program in Eclipse. Now how can I execute it?

6. Exercise

Create a shell script that executes the program created in (4.) and saves its output to a file called “out” located in your Desktop