

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

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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

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

7. Lecture notes

1) create account

2) login Xubuntu 10.04
using newly created account
login: s0000..... ENTER
password: ENTER
GUI: startx ENTER

<http://lia.deis.unibo.it/Courses/RTOS>



3) Terminal Emulator

echo ENTER

CTRL+D "END-OF-FILE"

ls
cd Desktop <TAB>

cat

../ <home folder>

Desktop

..... 20150303

naming

1) cd
cd 20150303
cat naming

2) cd
cat 20150303/naming

3) cat ../20150303/naming

ABSOLUTE PATH

pwd /...../
cat /...../2015.....

man (manual)

mv <oldnames> <newnames>

man ls

ls -l

f

less (cat)
Q (for quit)

chmod +x f

executable text file
containing shell instructions:
"script"

<CTRL>+C
nano

get help
^G ... -

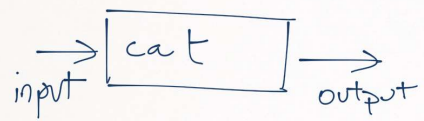
./f

f:

cat naming

naming:

The naming of cats
.....



xr-xr-.....

cat < naming

ls -l | less

ls -l > g