Systems Programming

Laboratory 3 A – FIFOs

Learning objectives

FIFOs

in this first part of the laboratory student will look at the working particularities of FIFOs.

1 FIFOs

fifo(7) - Linux manual page (man7.org)

pipe(7) - Linux manual page (man7.org)

mkfifo(3) - Linux manual page (man7.org)

open(2) - Linux manual page (man7.org)

read(2) - Linux manual page (man7.org)

write(2) - Linux manual page (man7.org)

FIFOs are special files that do not store data in disk (as opposed to regular files) but allow synchronous reading and writing by two processes: every data that is written on the FIFO can be immediately read by another process.

In order to create these "special files"it is necessary to use the **mkfifo** function. After the creation of the fifo, regular file management function (open, read, write, fopen, fread, fwrite) can be used. After a process opens a FIFO for reading (open(.... ,)_RDONLY)), he will be blocked on the read function until some other process writes in the FIFO, and he will immediately read the data other process has written to.

Students should read the provided PDF to further understand how FIFOs work:

The Linux Programming Interface – Sections 44.1, 44.2, 44.7 and 44.8

1.1 Exercise 1

Observe the two programs supplied in the **fifo-example** directory, compile both programs, execute each one in different terminals and answer the following questions:

- what does the **mkfifo** function does? (hint: look ate the /tmp directory)
- What happens if the user takes too long to launch on the **fifo-read** after launching the **fifo-write**?

- What happens if the user takes too long to launch on the **fifo-write** after launching the **fifo-read**?
- What happen during the regular execution of the programs? (when the user type a string of a integer in the fifo-writer)
- What happens if the fifo-read is killed? (kill this program with the Ctl-C)?
- What happens if the fifo-write is killed? (kill this program with the Ctl-C)?

1.2 Exercise 2

Open another window and launch a new **fifo-read**. Type strings and integer in the f**ifo-write** and observe what is written be each **fifo-read**. What happens?