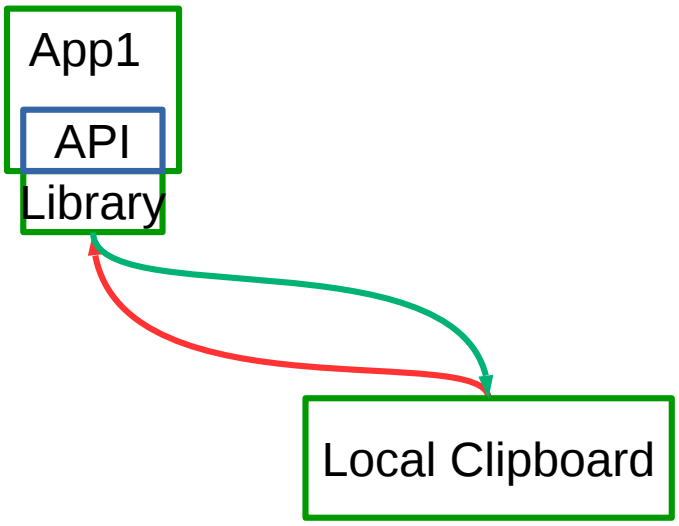
System Programming
5th Laboratory (3, 4 and 6 of April 2018)

The objective of this laboratory is to exercise communication using FIFOs and start the implementation of the project

Objectives

in this laboratory students will start implementing the project API and the first prototype version of the server.
In this laboratory only applications interacts with the server one at a time, and that communication is performed using two FIFOs:



One FIFO (called INBOUND_FIFO) will serve for the application to send requests, while the second FIFO (called OUTBOUND_FIFO) will be used for the clipboard to send the responses.

Clipboard

The clipboard will be a simple application that starts by creating the two FIFOs on the process current directory and start an infinite loop that reads requests from the INBOUND_FIFO and writes responses to the OUTBOUND_FIFO.
The clipboard should have 10 regions as defined in the Project assignment.

API

Students should implement the following function described in the project assignment:

int clipboard_connect(char * clipboard_dir)

This version of the function opens the two FIFOs (named INBOUND_FIFO and OUTBOUND_FIFO) and returns the file descriptor of one of them.

int clipboard_copy(int clipboard_id, int region, void *buf, size_t count)

This function receives the value returned by c**lipboard_connect** and uses it to send/copy data to clipboard.

int clipboard_paste(int clipboard_id, int region, void *buf, size_t count)

This function receives the value returned by **clipboard_connect** and uses it to retrieve/paste data from the clipboard.

API implementation

In order to ease the implementation of these three function it is necessary to define a suitable protocol.

In the **clipboard_copy** and **clipboard_paste** functions the application must send/receive a set of messages that should be formatted in a well defined form.
Both the application(API) and the clipboard should agree on the order and format of those messages.
To define them, students can use defined C structures.

Test application

The test application should read from the keyboard a string and an integer. The string will be copies to the clipboard (an later pasted) and the integer corresponds to the region.

Supplied code

The supplied code contains the skeleton for the:

- clipboard.c – with the creation of the FIFOs wand the loop
- library.c – with the function clipboard connect already implemented
- app_teste.c – with the call for the clipboard_connect already in place