National University of Computer and Emerging Sciences

Laboratory Manual

for

Operating Systems Lab

(CL-220)

Course Instructor	Ms. Namra Absar
Lab Instructor(s)	Rasaal Ahmad
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Department of Computer Science

FAST-NU, Lahore, Pakistan

Objectives

- Learn and execute InterProcess Communication using an implementation of named pipes

Named Pipes

- It is an extension of the traditional pipe concept on Unix. A traditional pipe is “unnamed” and lasts only as long as the process.
- A named pipe, however, can last as long as the system is up, beyond the life of the process. It can be deleted if no longer used.
- Usually, a named pipe appears as a file, and generally, processes attach to it for inter-process communication. A FIFO file is a special kind of file on the local storage that allows two or more processes to communicate with each other by reading/writing to/from this file.
- A FIFO special file is entered into the filesystem by calling mkfifo() in C. Once we have created a FIFO special file in this way, any process can open it for reading or writing, in the same way as an ordinary file. However, it has to be open at both ends simultaneously before you can proceed to do any input or output operations on it.
- Reading from or writing to a named pipe occurs just like traditional file reading and writing; except that the data for a named pipe is never written to or read from a file in hard disk but memory.

Lab Questions

Question 1

Create 2 independent programs that perform communication using named pipes. One program will be the server program that will wait for the client to send some data via a named pipe. The data sent by the client is as follows:

Operator operand1 operand2

The operands can be +, -, *, /. The server will then apply the operator on the operands and return the result to the client via a named pipe. The client will then print the result on the screen

For example, if the client passes the following to the server: + 4 10, then the server will calculate 4+10 and return 14 to the client via the pipe. The client will then print it.