

CPE 460 Laboratory 6: IPC Using Named Pipes and Shared Memory

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Spring 2017

1 Purpose

Understand and use both named pipes and shared memory for inter-process communication.

2 Introduction

Shared memory is a fundamental IPC mechanism in which two (or more) processes share a single chunk of memory to communicate randomly. Using a designated area of shared memory, the data can be made directly accessible to both processes without having to use the system services.

3 Exercise

Write a program that consists of three process P_1 , P_2 and P_3 , where P_1 , P_2 , and P_3 are **unrelated processes**. P_1 reads five integers from the standard input, and saves them into the `data` array in an instance of the struct below.

```
struct record{
    int data[5];
    int sum;
    double average;
}
```

Then, P_1 sends its instance of `struct record` to P_2 . In turn, P_2 reads the struct instance, finds the sum of five integers and saves it into `sum` field of the passed struct. Then, P_2 passes the updated struct instance to P_3 . Upon receiving the struct instance, P_3 divides the `sum` by 5 and saves the result into `average` field. Again P_3 passes the updated struct instance to P_1 . Finally, P_1 receives the updated struct instance, and prints its content to the standard output.

Implement the above system using:

- Named pipes.
- Shared memory.