Assignment Two Report

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Objectives:
To simulation a simple SDN network that allow peer to peer communication. The assignment intends to give experience in developing peer to peer program; handle the signal; communication between different process (FIFO), I/O multiplexing for nonblocking I/O. After this assignment I know how to use these concepts in real problem which is more interest then just the theorem.

Design Overview:
To run this program, you need compile the file at beginning by "make all", it will help you clean up the old file and compile an executable file. Pay attention, this program will assume the FIFO needed is already existed.

You need "a2sdn cont nSwitch" or "a2sdn swi trafficFile [null|swj] [null|swk] IPlow-IPhigh" to run the program. The main function will use these arguments to run the controller or switch. The body function of controller is called controller, and the body function for switch is executeSwitch. Both functions will set up counter and open FIFO they need for. For switch, it will also open the file to read. Then both functions go into an infinite loop.

In the loop, they will poll for user input and FIFO. In each iteration, the switch will read one line of the file and analyze it. For keyboard Poll, I monitor STDIN_FILENO and read first letter when they are inputs, the else part of the line will be dropped. If the input is 'list' then call print function for switch or controller, if 'exit' then print information then return. I also use the poll function for monitor the FIFO, the action for controller is ack and add, both done in body function. For other ports, switchaction function will help to determine which action should chose.

For switch, it will analyze one line in one iteration. If it does not find a solution, it will send a query packet to controller and loop for the result since the add packet controller return will affect rest of line. The controller will use controllerrule to decide what action and action value.

Projects Statue
All functions are working. The biggest problem for me is I used read function unconsciously and in the problem of printf buffer output (will not put in stdout till meet \n or buffer is full), this 2 problem fix together and I used a lot of time to find where if problem is since both have same expression with no things output.

Testing and Results

I tested all 3 case on the eclass and the result is correct. I also create my own test case with 3 switches and the program passed the test. Also for testing, I create FIFO to do it.