CMPUT 379
OPERATING SYSTEM CONCEPTS

Assignment #3
Modeling a Software Defined Network using TCP Sockets and FIFOs

Due: Thursday, November 22, 9:00PM

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Objectives

A3sdn:
        To implement a Software Defined Network Model using TCP Sockets and
peer-to-peer program (FIFO) that utilizes signals for examining the progress of
the running processes, using FIFOs/Sockets for communication a locally or on a
different machines via IP address with implementation of I/O multiplexing for
nonblocking I/O. To read from a shared FIFO files, and directing each packets to a
appropriate Switch and to handle communication between switch-switch
communication, and to use TCP sockets for switch-controller communication.
List the status of controller and switches, with packets in appropriate switch with
appropriate IP range.

Acknowledgements:
        Professor Ehab Elmallah lecture slides and examples.
        TA's help duding lab sessions
        https://www.geeksforgeeks.org/socket-programming-cc/
        https://beej.us/guide/bgnet/html/multi/gethostbynameman.html

Design Overview
        The design of my a3sdn, is followed by the description of Assignment page
        following all the required outputs
        and list the status of switch/controller upon user request.

Project Status
        a3sdn have been finished with all the required functions, they are stable,
consistent and correct. I have implemented all the required functions as modular
as possible. List, exit work flawlessly.
I am satisfied with both my programs and their outputs and GUI.
I have hard time with figuring out the sockets communication and its
synchronization, and relaying between switches, as switches need to poll from

multiple FIFO files.

Also I had great difficulty coding with C, as I had to manage dynamic allocated memory and was really hard to debut for errors such as "segmentation fault", I used "gdb" debugger to over come this problems

Testing and Results

I have tested a3sdn by

Running functions by, running example from eClass, and executing program commands such as list and exit
And my program have matched the output of examples correctly

List function have been tested by checking if successfully ran packets have been appended to list and display properly.

Exit function have been tested by exiting a3sdn(swi/cont) and check if the status of controller/switch is synchronized with the up-to-date status and to exit correctly.