CS4150 Computer Networks Lab

111701024   *Lab 8*
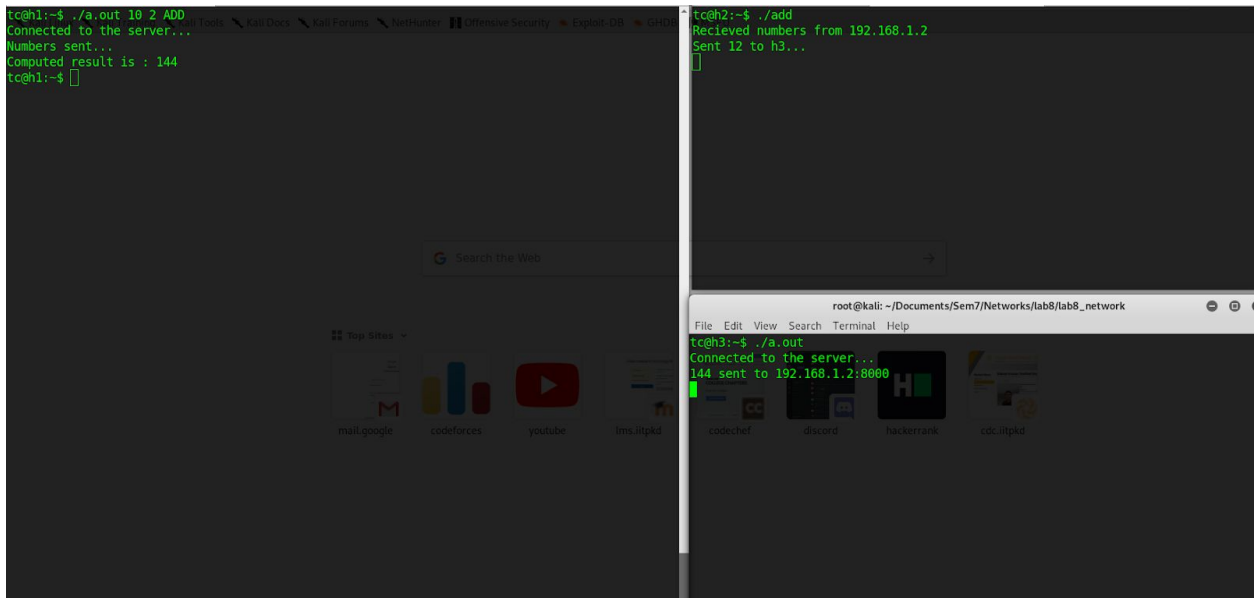
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1. **Problem 1**

   a. The program `compute.cpp` (runs at h1) takes two integers as arguments as well as the operator as the third argument. It sends the integers along with the operand to appropriate servers at h2 using TCP. It receives back the squared result from h3 through TCP. The program runs a TCP server at 8000 port to receive from h3. The server port information is also send along with the integers

   b. All the four operators server keeps running at h2 at respective ports. A server receives the two integers from h1, performs operation and sends the result to a UDP server at h3. These servers also send h1's ip address (can be found while accepting the TCP connection) as well as port number to h3.

   c. The program `square.cpp` runs a UDP server at h3 runs on 9000 port. It receives a number, squares it and sends it h1 using TCP connection. H1's ip address and port number is already known to h3 from the message received from h2.

   d. **Sample Outputs:**

2. Problem 2

a. In this problem, programs at h1 and h3 are the same. Programs at h2 are modified.

b. The program `inetd.cpp` runs instead of the four operator servers. It creates TCP sockets for each of the servers and listens to each one of them using `select()` function. Whenever a request comes for any of the four servers, it accepts the connection, forks and then execs the respective server. It also duplicates the connection file descriptor to STDIN and passes the h1's ip address using command line argument to the operator server.

c. All four operators server reads the message from the STDIN and sends the result value as a message to h3 using UDP (same message as in problem 1).

d. **Sample Outputs:**