Computer Networks 159.334

Exercises
A. L. C. Barczak/2013

These exercises are part of the preparation for the assignments. There is no marking, and you don't need to deliver the answers for this page.

In order to complete this exercise you need to use command line. To access command line in Linux, open a terminal, or type 'cmd' to start it on Windows

PART 1 – Find your lab machine's IP address, host name and physical addresses.
1) Find the *IP address* of your computer: `ipconfig /all`
   or ping to the hostname   `ping IT_____`
   Note: in Linux the equivalent command is `ifconfig`.

2) Try to complete the following fields, based on the answer from question 1:
IP address: _____._____._____._____
Physical address: __:__:__:__:__:__
Mask: _____._____._____._____

3) Find which TCP ports are being used by your computer:
   ```
   netstat -a (Windows)
   netstat -a | grep TCP (Linux or Mac)
   ```

4) Open a Browser (Firefox) on Massey's URL. Can you identify which *port*(s) is(are) being used by that application? Open two browsers and connect both to the same server (same URLs). Observe which ports are opened, and how they relate to both browser's processes.

PART 2 – In the second part you will work with client/server programs. Download client1*.c and server1*.c from Stream. **Compile** the programs separately, either using an IDE or the command line.

You should now have *two executable files*, e.g., `client.exe` and `server.exe`. (or other names if using Linux or Mac). These two executable files can be used directly from command line.
Open two *terminal sessions* and:
1) Start the server in one terminal   `serverLinux.exe 1234`
2) Start the client in the other   `clientLinux.exe <your IP address> 1234`
   (your IP address can be substituted by 127.0.0.1)
3) In the client application type a message like "hello" and observe the server responding.
4) Open a third terminal. Using `netstat` try to identify the connection opened by the client.
5) On the third terminal start a second client. Try to establish the connection. What happens?
6) Close the terminal where the first client is working. What happens with the second client? Can it communicate now?
7) Try to start another server on a different terminal. What happens? Do you get an error message?

   For the following part you have to liaise with your neighbour:
8) Find the IP address of your neighbour.
9) Run the server* program on both machines.
10) Start one client in each computer, using the IP address of the neighbour instead of your own IP address. You should now be able to type in and exchange messages between the machines.