University *of* Alexandria
Faculty of Engineering
Electrical Engineering Department
Communications Section

Course Name: Data Communication Networks **Course Code:** EE 486 **Lecturer:** Dr. Bassem Mokhtar
Academic Year: Fourth Year 2017–2018 **Semester:** Spring 2018 **Teaching Assistant:** Eng. Maha Ghanem

Lab One : Simple client-server communication

Following the introductory session to ns-3 you should be able to :

- Identify the main components for networks in ns-3
- Build different types of topologies using ns-3 (point-to-point,bus,wifi)
- Configuring the different parameters for the built network (delay,data rate ,addressing ,…)
- Setting up a client server model for testing the built network
- Be able to use pcap files to determine the sequence of message exchange .

Lab requirements :

1. Create a simple topology of two nodes (Node1, Node2) separated by a point-to-point link.
2. Setup a UdpClient on one Node1 and a UdpServer on Node2. Let it be of a fixed data rate Rate1.
3. Start the client application, and measure end to end throughput whilst varying the latency of the link.
4. Now add another client application to Node1 and a server instance to Node2. What do you need to configure to ensure that there is no conflict?
5. Repeat step 3 with the extra client and server application instances. Show screenshots of pcap traces which indicate that delivery is made to the appropriate server instance.
6. Expand the network where Node1 and Node 2 are no longer separated by a point-to-point link ,but Node1 is connected in a point to point connection to Node3 and Node3 is connected to Node 2 via CSMA bus along with two other nodes.
7. Repeat step 2 – 5 , how would you set up the data rate of the CSMA part and what is it's effect on overall throughput ?.

Deliverables:

- Delivery date on eek starting 22/4/2016
- Groups of 3 only.
- A running instance of your program .
- A report containing the pcap traces for both networks and your comments on the result .