

## Project assignment 1. (Groups of two, using two laptops).

### Step 0.

Find out the IP Addresses of your computers (you might use the `ip config` command).

Check the connectivity using the PING command.

Prepare a BIG file – e.g. a high resolution image?

### Step 1.

Write a simple application allowing the file transfer using

a/ datagram sockets (with and without enabled checksum!).

Compare the speed of packet transmissions. Check the packet loss rate.

b/ Byte stream sockets. Be sure that the sending application process knows that all the data have been received. Explain how you do it.

c/ extend the Datagram socket based mechanism by means to assure that the whole file is successfully transmitted and correctly put together. .

### Step 2.

Compare the time needed to transmit your data in all cases defined above. Repeat the experiments

a/ positioning both the computers close to each other on the campus

b/ running one of the campus and another form an “open access point” outside the campus.

c/ choose a placement of the receiving laptop to have a rather weak wireless connectivity

### Step 3.

a/ For the set up as in Step 3a/ and 3c/, send (via datagram sockets) a long stream of packets – say 200 bytes of payload roughly every 50 msec? (send for at least 10 seconds!)

Measure the delay differences of individual packets. Compute the variance, and histogram.

b/ Use the packet pair method to determine the Bottleneck capacity of the communication path.

Repeat the experiment several times.

### Step 4.

Send the stream of data with mean sending rate 1 packet /5 second, and vary the time distances.

Use a random number generator with uniform distribution of inter-packet space between 0- 10 seconds.

a/ Create a program receiving datagram stream and generating a signal (say a blink?) consuming for that one data packet.(

b/ Create a data structure (buffering) supporting the “smoothing “ of the “blinks” so that they appear equidistantly every 5 seconds