CS M117

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Lab 2: Data Transmission over 802.11b Wireless LAN

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**Observations**

We did two experiments:

1. We measured TCP and UDP throughput based on distance and signal noise.
2. We measured TCP and UDP throughput based on microwave interference.

Part1:

Is the decrease in UDP throughput linear with decrease in SNR? If not, why not?

With a decrease in SNR, we had a decrease in UDP. This is consistent with what is to be expected.

Is the decrease in TCP throughput linear with decrease in SNR? If not, why not?

With a decrease in SNR, we did not get a linear decreasing TCP throughput. This may be caused by signal interference from others recording data, as well as us connecting to the wrong ip when sending our packets. This may have also caused some problems with the previous question, but we may have been lucky for that experiment.

Compare TCP throughput with the UDP throughput. Did UDP throughput decrease faster or slower than the TCP throughput and why?

Since we didn’t have accurate results, it is difficult to say which decreased at a faster rate.

Part2:

What do you expect to happen to the UDP throughput with the Microwave Oven on compared to when the Microwave Oven is off?

I expect the UDP throughput to decrease when the microwave is on compared to off.

What do you expect to happen to the TCP throughput with the Microwave Oven on compared to when the Microwave Oven is off?

Similar to the UDP throughput, I expect the TCP throughput to decrease when the microwave is on compared to off.

Now, compare the UDP and TCP throughput measurements in the presence of Microwave noise. Does one have a higher throughput than the other?

UDP had a higher throughput than TCP.

Is that what you expected? If not, try to explain why?

This is what I expected because TCP requires more RTT’s for its ACKs, which would cause a bigger delay and more possible interference or dropped packets from the microwave.

How do you expect the TCP and UDP throughput will vary with the different Microwave Oven power level settings and why?

I would expect that at higher power level settings, there would be less than the lower power ones, because I think that the higher power level settings should have a more concentrated frequency. A concentrated frequency would mean less noise at surrounding areas.

Do your measurements match with what you expected to see?

My measurements do match what I see.

If not, try to explain why?

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| **#** | **Main goals** | **Results with error** |
| **1** | To give students the basic knowledge of various factors affecting data throughput in a wireless channel | This lab showed me all the noises that can change the affecting data throughput. |
| **2** | To expose students to the effect of sporadic losses on TCP throughput | During microwave “power on”, I observed some TCP and UDP data loss. |
| **3** | To familiarize students with basic performance measurement tools (Iperf) in computer networks | Because of presence of other students the measurements were not exactly what we expected. |