

CS 407

Assignment #1

(to be done individually)

Due on April 18th, 2014 (Friday)

submission instructions coming soon

The goal of this assignment is to get some first hand experience with various wireless systems and compare them to a wired system.

We will provide you with special access to a testbed consisting of a WiMAX cellular base station and two clients. You will run some experiments on this WiMAX system and compare their performance to a WiFi system, and also a wired system.

In each system, you are required to run a ping test and an iperf experiment. Ping is a tool that lets you measure latency between two end points. Iperf is a tool that lets you measure throughput between two endpoints.

For each platform (WiMAX, WiFi, and Ethernet), you should collect trace outputs for the ping and iperf experiments. The ping and iperf experiments should be at least one minute long in each case.

There is a second document that describes how to run these experiments on WiMAX. For WiFi and Ethernet, you can use your own laptop. Most operating systems come with a ping command, but you may need to download iperf (See: <http://iperf.fr/>) if it is not already installed on your computer. For Ethernet experiments, I recommend running this from a CS workstation in the lab.

To run iperf, use the following command (in Linux):

```
iperf -c iperf.wiscnet.net -i 2 -t 60
```

To run ping, use the following command (in Linux):

```
ping -c 60 iperf.wiscnet.net
```

In both cases, there will be output generated, and I would like you to plot the following data:

- (i) Latency vs time of different ping packets. If you have fewer than 60 ping measurements, then some of the ping packets may have been lost. You can identify losses as gaps in the sequence numbers, for example 1, 2, 4, 5, Indicate on your plot which pings were lost, if any.
- (ii) Throughput vs time

Once you have plotted the above for the three different environments, describe what the key differences you observe between WiFi, WiMAX, and Ethernet. Read up on each system and explain why these differences might exist.

In summary, here is what you need to submit in a written (typeset) document.

- Two plots each --- latency vs time and throughput vs time --- for the three technologies.
- Describe what you believe are the key differences between these different technologies that contribute to these differences in the observed performance.

The assignment should be done individually.