Lab #2
Due: Thursday, February 17th

For this lab, you are asked to use a portable wireless device (Part #1), and a computer with Windows (Part #2). For the reason that not everyone in the class has a portable wireless device and/or a computer running Windows, I suggest you work in groups of two or three. Make sure when you turn in your individual answers, that you indicate who was in your group. Your wireless device can be a smartphone or a laptop. If you have trouble finding someone with whom you can work, please use our webforum to coordinate. If you have an iPhone or a nice portable laptop, please help out those who do not. We apologize that you need these things for the lab, but there is no easy alternative that we could find for OSX users. Also, if you get stuck on a problem, try asking your questions in the webforum.

1. You are a Network Engineer at InternetsLOL!, a highly acclaimed company specializing in network design/testing, and a big enthusiast of LOLcats. Your first task at InternetsLOL! is to solve a few problems they have been encountering:

   (a) Employees connecting to the corporate Wifi network, “WifiLOL!” have been complaining that their Internet speeds are much slower than the computer indicates. To simulate this issue, connect to a wireless network (like CruzNet, or your wireless network at home).
      a. How fast does your computer say your network connection is (should be in Mbps)?

      b. Now use an Internet Speed Test tool (Google can help you find one) - how fast is your Internet connection?

      c. Why are they different?
(b) Milton, an employee, has recently moved cubicles. Milton used to sit in a cubicle with a nice view of the trees, and from his cubicle he had a great connection to “WifiLOL!” Since the move, he no longer is able to connect to “WifiLOL!” which unfortunately is the only network access available to him - in the basement. You have heard him muttering things like “burn” and “building”, and you piece together than he feels “burned” by being relocated so far away in the building that he can’t get onto the network anymore. Your goal is to find the farthest distance “WifiLOL!” reaches, so that you can move Milton’s desk to be within Wifi range.

a. To simulate this issue, find a wireless access point (if you don't have one at home, I suggest that the Simularium (E2-180) has an "insecure" network, and while you can't get at the real access point, you can pretend the door is the access point). How far can you walk away from the access point and still get a signal? If you use the Simularium, say how far from the closed door you can go.

b. Using this information, you find that you can easily move Milton’s desk to be within this range. Filled with joy, you move his desk, but you find he still can’t connect to “WifiLOL!”. You whip out your cell phone to call your Supervisor, but within milliseconds Milton has snatched your phone and wrapped it in aluminum foil. You then notice that Milton has also wrapped aluminum foil around his wireless network card’s antenna. Unsure about why he has done this, you try this for yourself with your phone when you get back to your desk. What happens? (Try it with your phone). Why does it happen? Can you solve Milton’s problem?

2. After a few weeks and many hundreds of service requests coming from Milton, you realize that he loves wrapping his wireless network card’s antenna in aluminum foil. Corporate is tired of wasting your time solving the same problem over and over again, so they instruct you to design a wired network that Milton can connect to. Not wanting to do the design and testing in the basement with Milton (you don’t think you could possibly have another conversation about staplers), you find a network simulator called PacketTracer which allows you to design the network while enjoying peace and quiet at your desk. Since it is almost the end of the workday today, you will begin by familiarizing yourself with the simulator with a simple test network. Knowing full well that you will be using the simulator again in the future (hint hint), you take extra care to make sure you understand the fundamentals in creating today’s test network.
To install PacketTracer, find the “Setup file for PacketTracer” link on the class webpage under Labs (www.soe.ucsc.edu/classes/cmpe080n/Winter11/), and download the PacketTracer software. You can also download the “Tutorial Information” document for further information about PacketTracer, which is linked in the same location. Run the PacketTracer executable you just downloaded, which will give you a program named PacketTracer 5.3. Run PacketTracer, and perform these actions:

(a) Create two nodes (one representing Milton’s computer, and one representing your own “test” computer) by selecting the End Device icon, then select Generic PC (might also say Generic PC-PT).

(b) Connect the two nodes by selecting the Connections icon (lightning bolt), and choose a copper cross-over connection. Click on the nodes (computers) one at a time, and choose that you want to connect them with the FastEthernet port.

(c) For each node, click the node's icon and a box will pop up. Go the Config tab and select FastEthernet. Under IP Configuration, type an IP Address and an appropriate Subnet Mask for the node (go ahead and make it up, but make sure they’re on the same subnet!) Do this for both nodes. (Note that closing the popup window automatically saves your values). Record the IP Addresses and subnet masks here:

   a. Milton’s PC
      i. IP Address: ______._____._____._____
      ii. Subnet Mask: ______._____._____._____

   b. Your “test” PC
      i. IP Address: ______._____._____._____
      ii. Subnet Mask: ______._____._____._____

(d) Now click on the Desktop tab for Milton’s node. Select Command Prompt (this should look familiar). Type in ipconfig /all. What do you get?

(e) Now try pinging your “test” node. Does it work? If it does, what is the average ping time? If it doesn’t, does it give an error? Write it here.