

Homework 1

*Assigned: August 26**Due: September 2*

Background: Read about the `traceroute` utility, that allows one to trace the sequence of routers between two hosts in the Internet. A relatively high level description can be found at:

<http://www.seas.upenn.edu/~ross/book/overview/traceroute.htm>

A somewhat more technical description can be found by using the Unix manual pages, accessed using the command `man traceroute`.

1. Perform a traceroute between a host at Georgia Tech and `www.amazon.com`. Repeat the traceroute on two different days and once at night. Comment on the results. (For example, do the routes vary in the different experiments? Is the delay lower at night? What Internet service providers appear to be used?)
2. Explain why the times can *decrease* as you go from hop i to hop $i + 1$.
3. Explain precisely what the benefits are of using the `-n` option. (Don't simply repeat the explanation on the man page. Give a bit more detail, based on what you know about nameservers.)
4. Perform a traceroute between a host at Georgia Tech and a location in Europe. Can you identify the long (transoceanic) links?
5. Exercise 21.2 in Comer: Consider a modified version of the traceroute program that sends an ICMP *echo request* in each datagram instead of a UDP datagram. What are the possible reply messages traceroute could receive? (Note that you will need to read part of Chapter 21 to answer this question.)