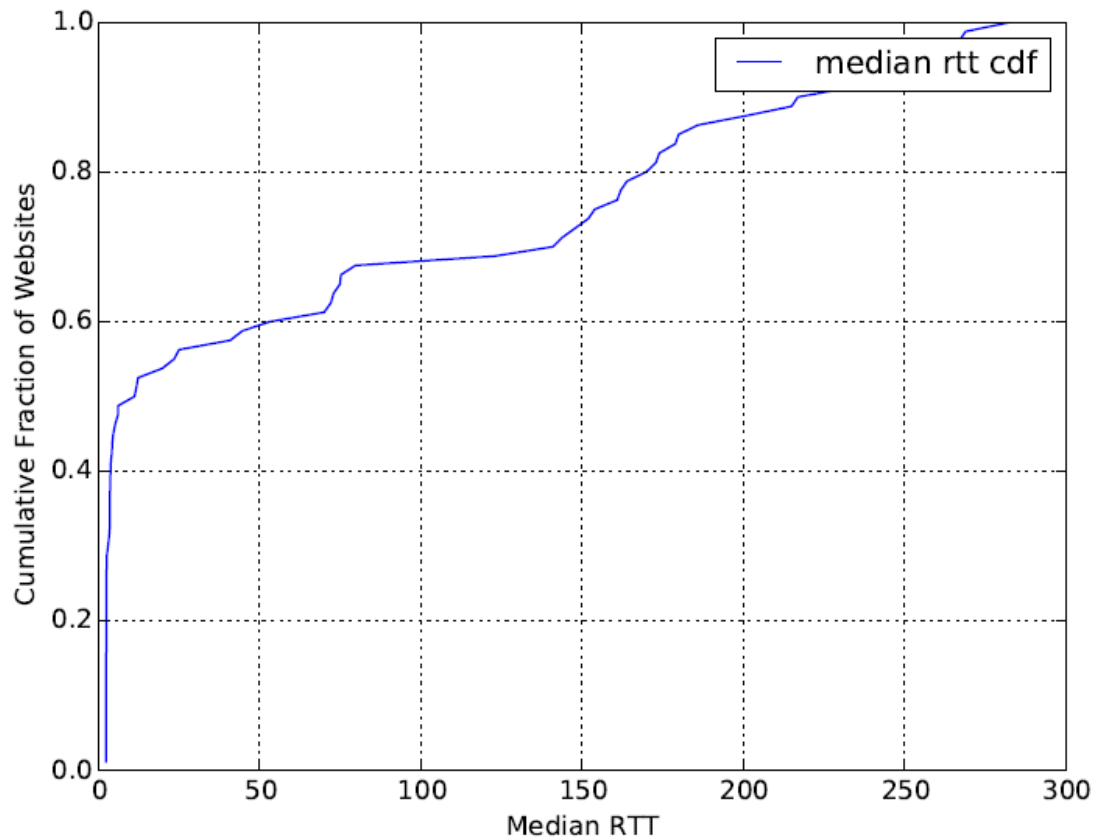
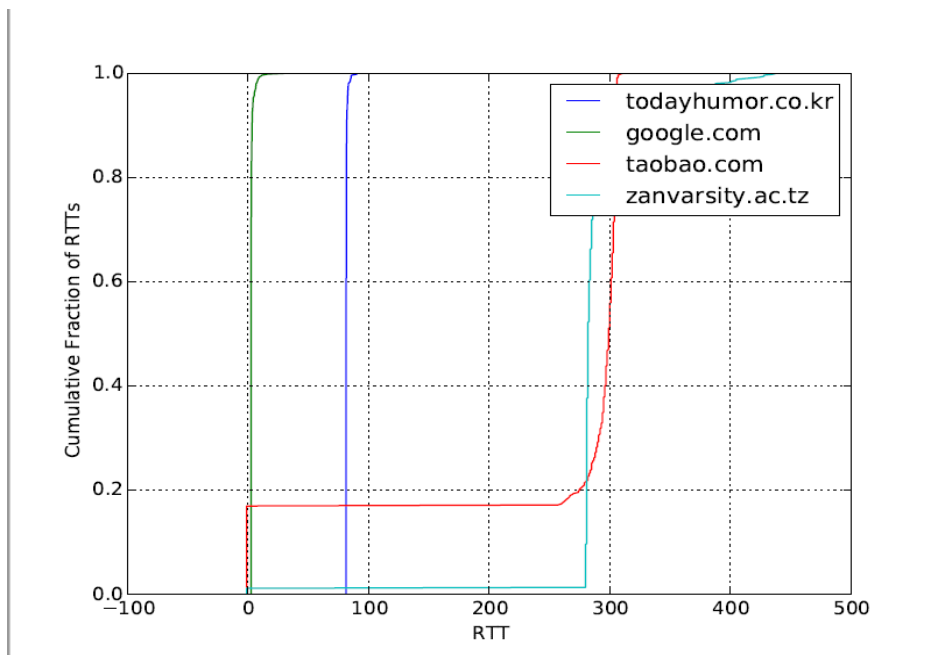


## PART 1

1. 20% of websites do not respond to pings at all. 34% of websites have at least one failed ping.
- 



2. todayhumor.co.kr: {median rtt: 81.6, drop rate: 0.0, max rtt: 90.9}  
google.com: {median rtt: 2.74, drop rate 0.0, max rtt: 34.9}  
taobao.com: {median rtt: 301.0, drop rate: 0.17, max rtt: 311.0}  
zanvarsity.ac.tz: {median rtt: 282.0, drop rate: 0.012, max rtt: 438.0}



- multiplier for google.com: 14.49  
multiplier for zanvarsity.ac.tz: 5.278

Ping time is not equal to the speed of light time because routers will slow down transfer speeds by taking time to process the packet and deciding where it should go.  
Also, another reason is that the speed of light gets slower when you go through wires (as compared through a vacuum)

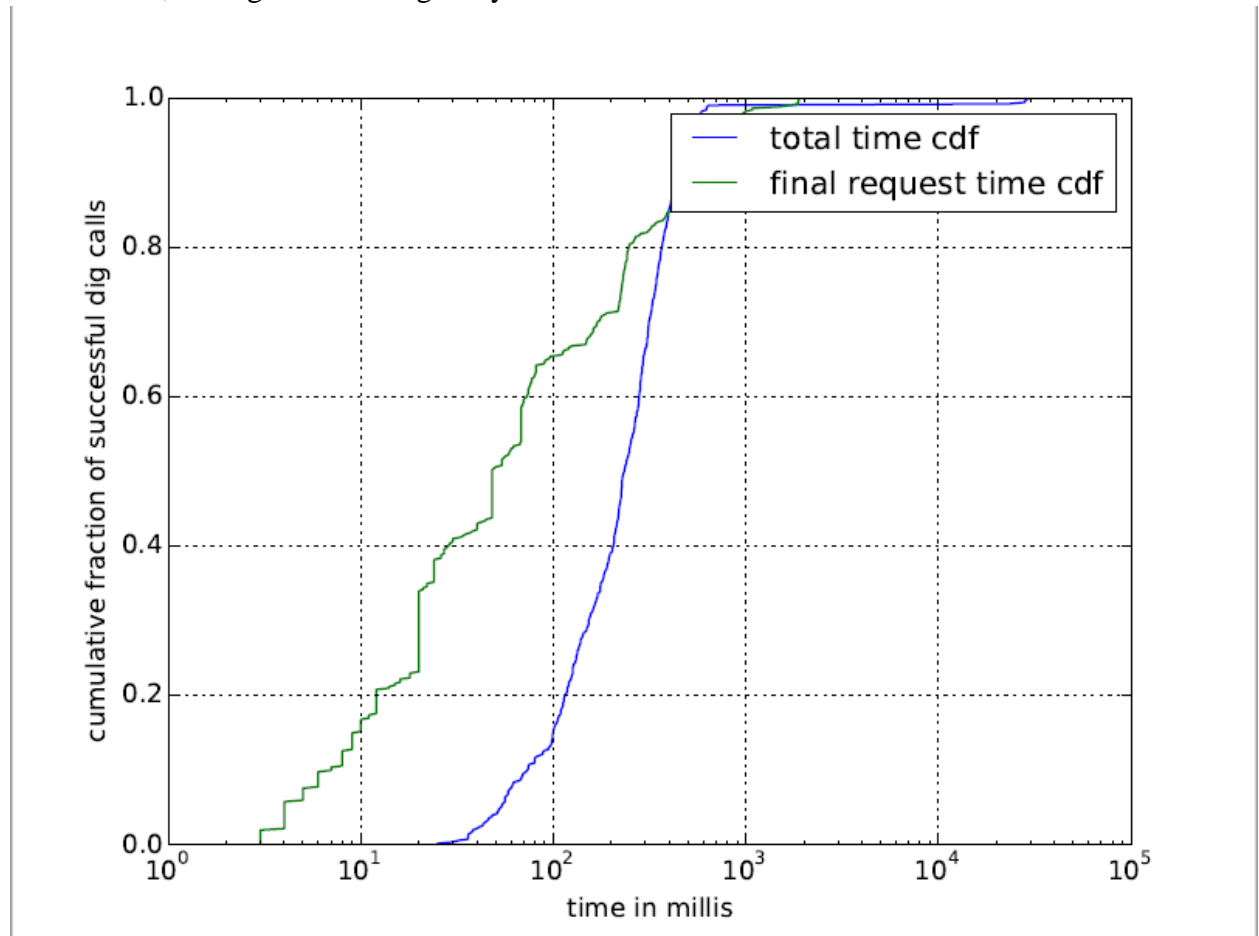
## Part 2

- Berkeley is connected to these ASes: 2152  
On average, zanvarsity.ac.tz traverses the most ASes. [www.berkeley.edu](http://www.berkeley.edu) traverses the least.  
All of the websites are load balanced.  
None of the routes are stable over multiple runs. Google.com has 4 unique routes, facebook.com has 5 unique routes, [www.berkeley.edu](http://www.berkeley.edu) has 2 unique routes, allspice.lcs.mit.edu has 4 unique routes, todayhumor.co.kr has 5 unique routes, [www.city.kobe.lg.jp](http://www.city.kobe.lg.jp) has 5 unique routes, www.vutbr.cz has 3 unique roots, and zanvarsity.ac.tz has 5 unique routes.  
An advantage of having stable routes is latency reduction, since it reduces the number of entries there are in the routing table
- From my computer to tpr-route-server.saix.net: 15 hops, route-server.ip-plus.net: 16 hops, route-views.oregon-ix.net: 10 hops, hops, route-views.on.bb.telus.com: 13 hops  
To my computer from tpr-route-server.saix.net: 14 hops, route-server.ip-plus.net: 13 hops route-views.oregon-ix.net: 10 hops, route-views.on.bb.telus.com: 18 hops  
None of the routes are symmetric

The route from point a to point b might have converged (based on shortest latency), whereas the routing algorithm has not converged the route from point b to point a all the way.

### Part 3

- a. Average root TTL: 39967.9, average TLD TTL: 172800, average other name TTL: 124745.215, average terminating entry TTL: 7955.1



- b.
- c. 8 answers changed in the first trial. 14 names gave different answers at some point in the two trials.
- d. Using 175.103.48.7, there were 8 answers changed in the first trial, and 33 names gave different answers at some point in the two trials
- e. It returned a different IP address because those IP addresses work better for the specific server queried.
- f. The DNS resolution times would have been much quicker, since you already know where you need to go through the local cache.