Aniket Chavan z5265106

CS3331 LAB1

Note: All relevant outputs can be found in output.txt and their respective pdfs

Exercise 1 –

IP Address: 129.94.242.2

The address can have 2 different ip addresses to be run on 2 different servers to distribute its load and optimise network connections.

127.0.0.1 is the localhost, which is the machine that is being used to execute the command

Exercise 2 –

www.unsw.edu.au: reachable

www.getfittest.com.au: unreachable, by ping or browser, because the site does not have a '.com.au' domain

www.mit.edu: reachable

www.intel.com.au: reachable

www.tpg.com.au: reachable

www.hola.hp: unreachable as it could not resolve host, DNS could not be found

www.amazon.com: reachable

www.tsinghua.edu.cn: reachable

www.kremlin.ru: unreachable, reachable by browser. Firewall blocking pings

8.8.8.8: reachable, valid ip address but inaccessible by browser

Exercise 3 –

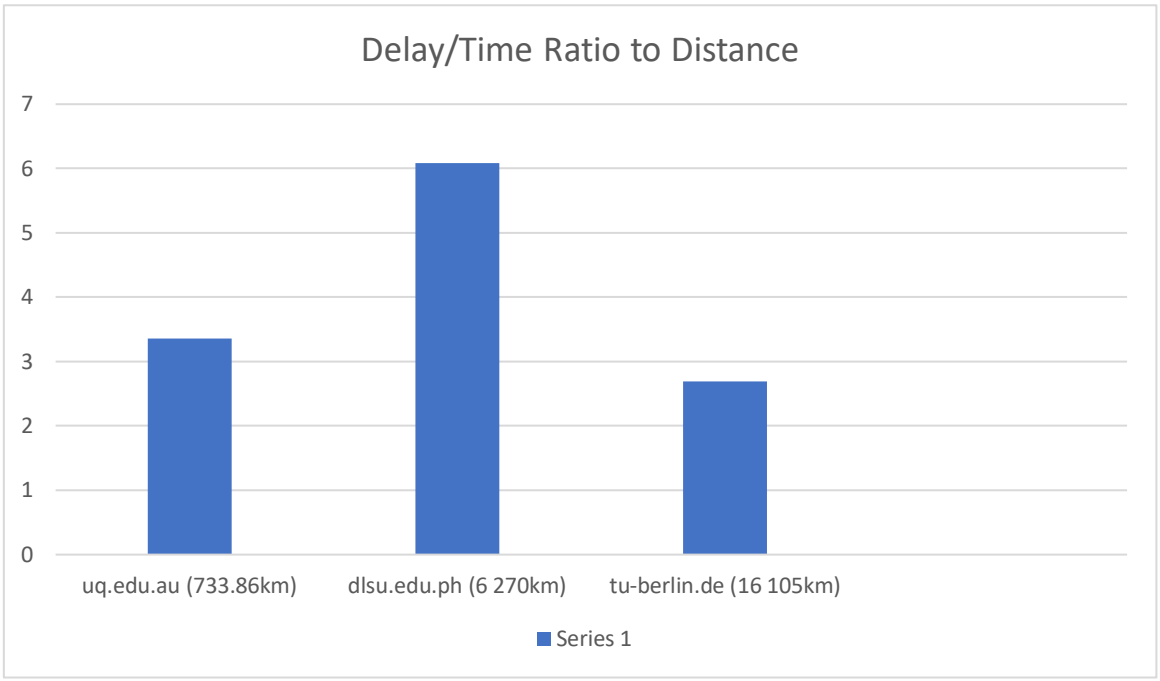
1. 21 routers between workstation and www.columbia.edu. It's likely a packet crosses the Pacific Ocean between 113.197.15.149 and 113.197.15.99 as the packet travel time changes from 2.3ms to 95.26ms.
2. All three traceroute paths diverge at 138.44.5.0. traceroute lengths are not proportional to their real-world distances as Tokyo should therefore have a significantly shorter route than UCLA or Lancaster
3. Usually aren't the exact same routers, some routers that in a group such as bundle-ether13.ken-core10.sydney.telstra.net (203.50.11.94) and bundle-ether1.ken-edge901.sydney.telstra.net (203.50.11.95), which indicates load balancing in these networks but overall similar paths.

Exercise 4 –

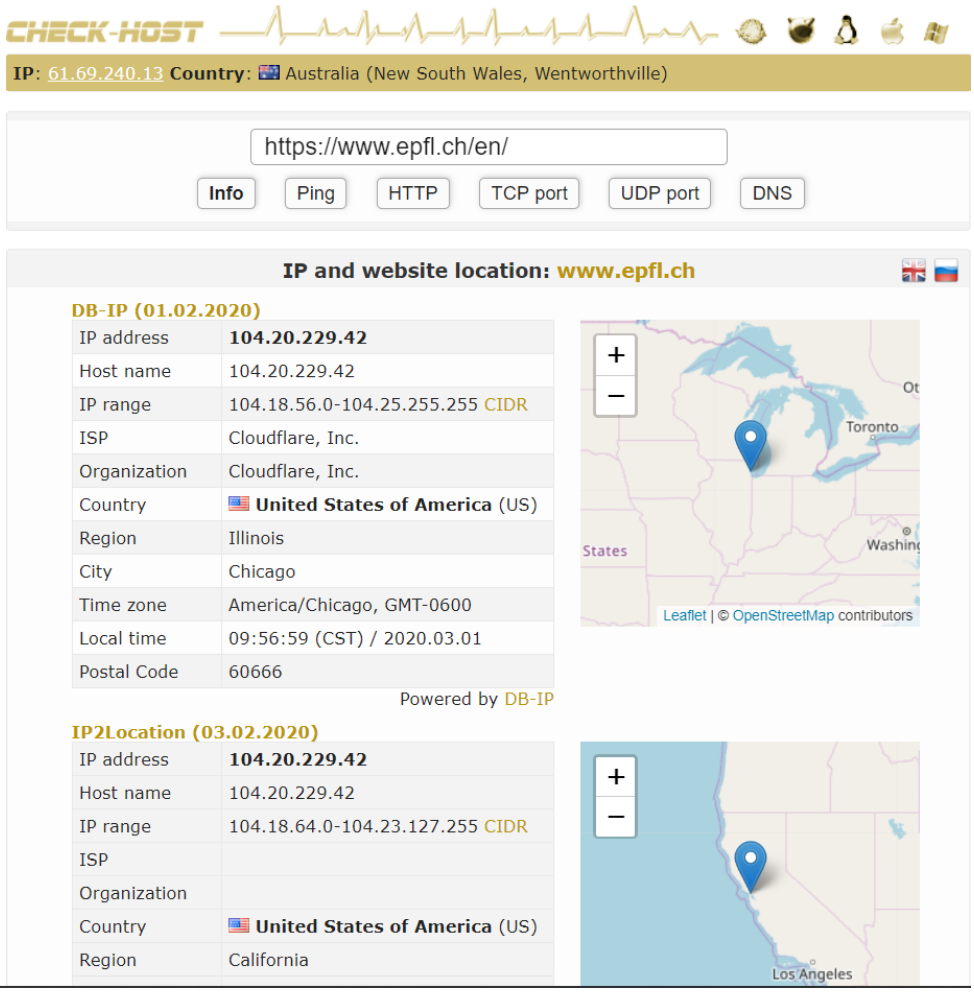
1. $Round\ Trip\ Time = ((\frac{distance}{3\times10^8\times1000}) \times 1000) \times 2$
   First, we change speed of light from m/s -> km/s, then find time taken for light to travel the distance. We then change it from seconds to milliseconds and finally multiply by 2 for going to the location and back.
   T is the shortest one-way time for the packet travel, while RTT is the return time which has to at least be 2T, giving values over 2. Interferences and disturbances in the packet transfers can also contribute to this.

Location	Distance (km)	Round Trip Time (ms)	Min. Delay (ms)	Ratio (Delay/Time)
uq.edu.au	733.86	4.9	16.479	3.363
dlsu.edu.ph	6,270	41.8	254.442	6.087
tu-berlin.de	16,105	107	287.549	2.687

Aniket Chavan z5265106



2. Delays all look to be quite constant (staying within +=0.5ms range) however there is a queuing delay to consider which is what introduces change in the delay times, as the different queue lengths for the server will give differing times.
3. Using check-host.net, https://www.epfl.ch/en/ seems to be hosted somewhere in America.



4. Transmission delay depends on packet size because it's the time taken for a packet of a specific size to be transmitted. Propagation, Processing and Queuing delays do not depend on packet size. Propagation delay is calculated by length of physical link divided by propagation speed while processing delay is just error-checks the packet and processes the header. Queuing delay is the packet waiting to be transmitted.