📰 lab01.md

Exercise 1: nslookup

1. Which is the IP address of the website www.koala.com.au? In your opinion, what is the reason of having several IP addresses as an output?

Facts

- IP(Internet Protocol) addresses are assigned to each device connected to a computer network that uses IP for communication.
- IP addresses serve two main functions:
  - Host
  - Location addressing

Answer

www.koala.com.au has IP addresses:

- 104.18.61.21
- 172.67.219.46
- 104.18.60.21

Having several IP addresses allow for sites to have different server locations, allowing users to connect to the closest server and reduce ping times and/or prevent connecting to an already congested server.

2. Find out the name of the IP address 127.0.0.1. What is special about this IP address?

The name of the IP address is:

- localhost

What's special about this IP address is that it allows for a network service to run locally (i.e. The server is hosted on the users machine).

Exercise 2: Use ping to test host reachability:

Are the following hosts reachable from your machine by using ping:

www.unsw.edu.au

- reachable (ping)
- reachable (website)

www.getfittest.com.au

- unreachable (ping)
  - unknown host
- unreachable (website)

www.mit.edu

- reachable (ping)
- reachable (website)

www.intel.com.au

- reachable (ping)
- reachable (website)

www.tpg.com.au

- reachable (ping)
- reachable (website)

www.hola.hp

- unreachable (ping)
  - unknown host
- unreachable (website)

www.amazon.com

- reachable (ping)
- reachable (website)

www.tsinghua.edu.cn

- reachable (ping)
- reachable (website)

www.kremlin.ru

- unreachable (ping)
  - firewall
- reachable (website)

8.8.8.8

- reachable (ping)
- unreachable (website)

Exercise 3: Use traceroute to understand network topology

1. How many routers are there between your workstation and www.columbia.edu?

```
z5206205@vx3:~$ traceroute www.columbia.edu
traceroute to www.columbia.edu (128.59.105.24), 30 hops max, 60 byte packets
 1  cserouter1-server.cse.unsw.EDU.AU (129.94.242.251)  0.089 ms  0.059 ms  0.054 ms
 2  129.94.39.17 (129.94.39.17)  0.873 ms  0.844 ms  0.812 ms
 3  ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35)  1.200 ms  1.375 ms  1.558 ms
 4  libcr1-po-5.gw.unsw.edu.au (149.171.255.165)  1.152 ms  1.048 ms libcr1-po-6.gw.unsw.edu.au (149.171.255.201)  1.054 ms
 5  unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101)  1.209 ms  1.207 ms  1.285 ms
 6  138.44.5.0 (138.44.5.0)  1.236 ms  1.250 ms  1.265 ms
 7  et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149)  2.377 ms  2.077 ms  2.061 ms
 8  et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99)  95.003 ms  95.025 ms  95.033 ms
 9  et-2-1-0.bdr1.a.sea.aarnet.net.au (113.197.15.201)  146.902 ms  146.940 ms  146.893 ms
10  abilene-1-lo-jmb-706.sttlwa.pacificwave.net (207.231.240.8)  159.896 ms  159.891 ms  159.981 ms
11  ae-1.4079.rtsw.minn.net.internet2.edu (162.252.70.173)  192.647 ms  192.646 ms  192.624 ms
12  ae-1.4079.rtsw.eqch.net.internet2.edu (162.252.70.106)  201.352 ms  201.227 ms  201.035 ms
13  ae-0.4079.rtsw3.eqch.net.internet2.edu (162.252.70.163)  200.411 ms  201.670 ms  203.175 ms
14  ae-1.4079.rtsw.clev.net.internet2.edu (162.252.70.130)  209.864 ms  209.788 ms  209.710 ms
15  buf-9208-I2-CLEV.nysernet.net (199.109.11.33)  213.320 ms  213.298 ms  213.273 ms
16  syr-9208-buf-9208.nysernet.net (199.109.7.193)  217.214 ms  217.254 ms  217.254 ms
17  nyc111-9204-syr-9208.nysernet.net (199.109.7.94)  226.360 ms  226.564 ms  226.458 ms
18  nyc-9208-nyc111-9204.nysernet.net (199.109.7.165)  226.227 ms  226.217 ms  226.001 ms
19  columbia.nyc-9208.nysernet.net (199.109.4.14)  225.618 ms  225.625 ms  225.659 ms
20  cc-core-1-x-nyser32-gw-1.net.columbia.edu (128.59.255.5)  226.742 ms  226.723 ms  226.726 ms
21  cc-conc-1-x-cc-core-1.net.columbia.edu (128.59.255.21)  270.657 ms  266.700 ms  235.167 ms
22  teachtechaward.org (128.59.105.24)  226.178 ms  225.899 ms  225.891 ms
```

From the image above, there are 22 routers between my workstation and www.columbia.edu.

How many routers along the path are part of the UNSW network?

4

Between which two routers do packets cross the Pacific Ocean?

The 9th and 10th routers are when the packets cross the Pacific Ocean.

2. Run traceroute from your machine to the following destinations:

www.ucla.edu

```
z5206205@vx3:~$ traceroute www.ucla.edu
traceroute to www.ucla.edu (164.67.228.152), 30 hops max, 60 byte packets
 1  cserouter1-server.cse.unsw.EDU.AU (129.94.242.251)  0.102 ms  0.070 ms  0.045 ms
 2  129.94.39.17 (129.94.39.17)  0.839 ms  0.859 ms  0.807 ms
 3  libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34)  3.514 ms ombudnex1-vl-3154.gw.unsw.edu.au (149.
171.253.35)  1.555 ms  1.473 ms
 4  ombcr1-po-5.gw.unsw.edu.au (149.171.255.197)  1.120 ms  1.047 ms libcr1-po-6.gw.unsw.edu.au (149.1
71.255.201)  1.051 ms
 5  unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105)  1.168 ms unswbr1-te-1-9.gw.unsw.edu.au (149.171.
255.101)  1.138 ms unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105)  1.146 ms
 6  138.44.5.0 (138.44.5.0)  1.316 ms  1.307 ms  1.282 ms
 7  et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149)  2.265 ms  2.072 ms  2.063 ms
 8  et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99)  95.110 ms  95.020 ms  95.050 ms
 9  et-2-1-0.bdr1.a.sea.aarnet.net.au (113.197.15.201)  146.958 ms  146.927 ms  146.885 ms
10  cenichpr-1-is-jmb-778.snvaca.pacificwave.net (207.231.245.129)  164.099 ms  164.117 ms  164.164 ms
11  hpr-lax-hpr3--svl-hpr3-100ge.cenic.net (137.164.25.73)  160.493 ms  159.875 ms  160.456 ms
12  * * *
13  bd11f1.anderson--cr001.anderson.ucla.net (169.232.4.6)  161.132 ms bd11f1.anderson--cr00f2.csb1.uc
la.net (169.232.4.4)  162.176 ms bd11f1.anderson--cr001.anderson.ucla.net (169.232.4.6)  161.093 ms
14  cr00f1.anderson--rtr11f4.mathsci.ucla.net (169.232.8.185)  161.340 ms  160.630 ms  161.153 ms
15  * * *
16  * * *
17  * * *
18  * * *
19  * * *
20  * * *
21  * * *
22  * * *
23  * * *
24  * * *
25  * * *
26  * * *
27  * * *
28  * * *
29  * * *
30  * * *
```

www.u-tokyo.ac.jp

```
z5206205@vx3:~$ traceroute www.u-tokyo.ac.jp
traceroute to www.u-tokyo.ac.jp (210.152.243.234), 30 hops max, 60 byte packets
 1  cserouter1-server.cse.unsw.EDU.AU (129.94.242.251)  0.099 ms  0.071 ms  0.050 ms
 2  129.94.39.17 (129.94.39.17)  0.860 ms  0.936 ms  0.926 ms
 3  ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35)  1.337 ms libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34)  1.551 ms  1.409 ms
 4  ombcr1-po-5.gw.unsw.edu.au (149.171.255.197)  1.813 ms libcr1-po-5.gw.unsw.edu.au (149.171.255.165)  23.567 ms ombcr1-po-6.gw.unsw.edu.au (149.171.
255.169)  1.045 ms
 5  unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105)  1.075 ms unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101)  1.154 ms unswbr1-te-2-13.gw.unsw.edu.au
(149.171.255.105)  1.063 ms
 6  138.44.5.0 (138.44.5.0)  1.216 ms  1.363 ms  1.345 ms
 7  et-0-3-0.pe1.bkvl.nsw.aarnet.net.au (113.197.15.147)  1.935 ms  1.804 ms  2.039 ms
 8  ge-4_0_0.bb1.a.pao.aarnet.net.au (202.158.194.177)  155.090 ms  155.044 ms  155.055 ms
 9  paloalto0.iij.net (198.32.176.24)  156.543 ms  156.543 ms  156.582 ms
10  osk004bb00.IIJ.Net (58.138.88.185)  286.910 ms osk004bb01.IIJ.Net (58.138.88.189)  269.159 ms osk004bb00.IIJ.Net (58.138.88.185)  287.329 ms
11  osk004ip57.IIJ.Net (58.138.106.162)  277.987 ms  278.022 ms  277.954 ms
12  210.130.135.130 (210.130.135.130)  287.210 ms  287.137 ms  287.098 ms
13  124.83.228.58 (124.83.228.58)  269.301 ms  278.517 ms  269.447 ms
14  124.83.252.178 (124.83.252.178)  284.346 ms  293.193 ms  293.125 ms
15  158.205.134.26 (158.205.134.26)  275.148 ms  275.732 ms  284.093 ms
16  158.205.121.46 (158.205.121.46)  293.070 ms  284.607 ms  293.040 ms
17  * * *
18  * * *
19  * * *
20  * * *
21  * * *
22  * * *
23  * * *
24  * * *
25  * * *
26  * * *
27  * * *
28  * * *
29  * * *
30  * * *
```

www.lancaster.ac.uk

```
z5206205@vx3:~$ traceroute www.lancaster.ac.uk
traceroute to www.lancaster.ac.uk (148.88.65.80), 30 hops max, 60 byte packets
 1  cserouter1-server.cse.unsw.EDU.AU (129.94.242.251)  0.127 ms  0.085 ms  0.061 ms
 2  129.94.39.17 (129.94.39.17)  0.877 ms  0.865 ms  0.842 ms
 3  ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35)  1.354 ms  1.407 ms libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34)  1.347 ms
 4  libcr1-po-5.gw.unsw.edu.au (149.171.255.165)  1.095 ms ombcr1-po-6.gw.unsw.edu.au (149.171.255.169)  1.089 ms  1.079 ms
 5  unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105)  1.153 ms unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101)  1.194 ms  1.182 ms
 6  138.44.5.0 (138.44.5.0)  1.333 ms  1.318 ms  1.297 ms
 7  et-1-1-0.pe1.rsby.nsw.aarnet.net.au (113.197.15.12)  1.589 ms  3.316 ms  3.350 ms
 8  xe-1-1-0.pe1.eskp.nsw.aarnet.net.au (113.197.15.199)  2.777 ms  2.829 ms  2.814 ms
 9  et-0-3-0.pe1.prka.sa.aarnet.net.au (113.197.15.42)  19.934 ms  20.037 ms  19.923 ms
10  et-0-3-0.pe1.knsg.wa.aarnet.net.au (113.197.15.45)  46.033 ms  46.099 ms  46.125 ms
11  et-2-1-2.bdr2.sing.sin.aarnet.net.au (113.197.15.247)  92.023 ms  92.072 ms  92.020 ms
12  ae1.bdr1.sing.sin.aarnet.net.au (113.197.15.234)  91.759 ms  91.742 ms  91.780 ms
13  138.44.226.7 (138.44.226.7)  255.154 ms  255.033 ms  254.930 ms
14  janet-gw.mx1.lon.uk.geant.net (62.40.124.198)  255.056 ms  255.260 ms  255.207 ms
15  ae29.londpg-sbr2.ja.net (146.97.33.2)  256.121 ms  255.926 ms  255.868 ms
16  ae31.erdiss-sbr2.ja.net (146.97.33.22)  259.326 ms  259.322 ms  259.711 ms
17  ae29.manckh-sbr2.ja.net (146.97.33.42)  261.908 ms  261.805 ms  261.754 ms
18  ae24.lanclu-rbr1.ja.net (146.97.38.58)  263.477 ms  263.547 ms  263.515 ms
19  lancaster-university.ja.net (194.81.46.2)  275.957 ms  275.901 ms  280.778 ms
20  is-border01.bfw01.rtr.lancs.ac.uk (148.88.253.202)  264.003 ms  264.035 ms  264.015 ms
21  bfw01.iss-servers.is-core01.rtr.lancs.ac.uk (148.88.250.98)  269.881 ms  266.683 ms  266.645 ms
22  * * *
23  www.lancs.ac.uk (148.88.65.80)  264.308 ms !X  264.273 ms !X  264.425 ms !X
```

At which router do the paths from your machine to these three destinations diverge? Find out further details about this router.

Router 6 (138.44.5.0 - Australian Academic and Research Network) is when the paths diverge.

Is the number of hops on each path proportional the physical distance?

Japan is geographically closer to NSW than the United States.

Japan has 16 hops, whereas the United States has 14 hops.

Hence, the number of hops on each path is not proportional to physical distance.

3. Several servers distributed around the world provide a web interface from which you can perform a traceroute to any other host in the Internet. Run traceroute from both these servers towards your machine and in the reverse direction.

Speedtest

- From
  ```
  traceroute to 129.94.242.116 (129.94.242.116), 30 hops max, 60 byte packets
   1  ge2-8.r01.sin01.ne.com.sg (202.150.221.169)  0.128 ms  0.137 ms  0.141 ms
   2  10.11.34.146 (10.11.34.146)  1.914 ms  1.995 ms  2.267 ms
   3  aarnet.sgix.sg (103.16.102.67)  207.899 ms  207.967 ms  208.037 ms
   4  et-5-1-0.pe1.brwy.nsw.aarnet.net.au (113.197.15.5)  211.066 ms et-7-1-0.pe1.brwy.nsw.aarnet.net.au (113.197.15.13)  207.623 ms
   5  138.44.5.1 (138.44.5.1)  204.020 ms  204.128 ms  204.108 ms
   6  libcr1-te-1-5.gw.unsw.edu.au (149.171.255.102)  204.077 ms  203.811 ms  204.043 ms
   7  libudnex1-po-1.gw.unsw.edu.au (149.171.255.166)  202.547 ms ombudnex1-po-1.gw.unsw.edu.au (149.171.255.202)  211.783 ms libudn
   8  ufw1-ae-1-3154.gw.unsw.edu.au (149.171.253.36)  208.410 ms  208.798 ms  208.449 ms
   9  129.94.39.23 (129.94.39.23)  208.770 ms  208.842 ms  208.799 ms
  10  * * *
  ```

- To

```
z5206205@vx3:~$ traceroute www.speedtest.com.sg
traceroute to www.speedtest.com.sg (202.150.221.170), 30 hops max, 60 byte packets
 1  cserouter1-server.cse.unsw.EDU.AU (129.94.242.251)  0.123 ms  0.082 ms  0.063 ms
 2  129.94.39.17 (129.94.39.17)  0.847 ms  0.836 ms  0.790 ms
 3  libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34)  1.732 ms  1.678 ms  1.721 ms
 4  libcr1-po-6.gw.unsw.edu.au (149.171.255.201)  1.142 ms ombcr1-po-5.gw.unsw.edu.au (149.171.255.197)  1.096 ms ombcr1-po-6.gw.unsw.edu.au (149.171.2
55.169)  1.068 ms
 5  unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101)  1.110 ms  1.103 ms  1.113 ms
 6  138.44.5.0 (138.44.5.0)  1.211 ms  1.354 ms  1.310 ms
 7  et-0-3-0.pe1.alxd.nsw.aarnet.net.au (113.197.15.153)  1.878 ms  1.779 ms  1.687 ms
 8  xe-0-2-7.bdr1.a.lax.aarnet.net.au (202.158.194.173)  147.605 ms  147.550 ms  147.559 ms
 9  singtel.as7473.any2ix.coresite.com (206.72.210.63)  147.598 ms  147.695 ms  147.652 ms
10  203.208.171.117 (203.208.171.117)  151.397 ms  151.351 ms 203.208.171.9 (203.208.171.9)  319.690 ms
11  203.208.177.110 (203.208.177.110)  333.681 ms 203.208.173.73 (203.208.173.73)  251.034 ms 203.208.177.110 (203.208.177.110)  324.349 ms
12  * 203.208.182.253 (203.208.182.253)  331.500 ms *
13  203.208.177.110 (203.208.177.110)  326.744 ms 203.208.182.253 (203.208.182.253)  323.204 ms 202-150-221-170.rev.ne.com.sg (202.150.221.170)  204.85
8 ms
```

Telstra

```
 1  gigabitethernet3-3.exi2.melbourne.telstra.net (203.50.77.53)  0.232 ms  0.205 ms  0.239 ms
 2  bundle-ether3-100.win-core10.melbourne.telstra.net (203.50.80.129)  2.114 ms  1.602 ms  2.242 ms
 3  bundle-ether12.ken-core10.sydney.telstra.net (203.50.11.122)  12.735 ms  12.598 ms  13.861 ms
 4  bundle-ether1.ken-edge903.sydney.telstra.net (203.50.11.173)  12.111 ms  12.097 ms  11.985 ms
 5  aar3533567.lnk.telstra.net (139.130.0.78)  11.611 ms  11.724 ms  11.611 ms
 6  et-7-1-0.pe1.brwy.nsw.aarnet.net.au (113.197.15.13)  13.862 ms  11.848 ms  11.860 ms
 7  138.44.5.1 (138.44.5.1)  11.984 ms  11.978 ms  12.107 ms
 8  ombcr1-te-1-5.gw.unsw.edu.au (149.171.255.106)  11.983 ms  12.101 ms  11.980 ms
 9  ombudnex1-po-2.gw.unsw.edu.au (149.171.255.170)  12.359 ms  12.221 ms  12.233 ms
10  ufw1-ae-1-3154.gw.unsw.edu.au (149.171.253.36)  12.737 ms  12.719 ms  12.735 ms
11  129.94.39.23 (129.94.39.23)  12.859 ms  12.853 ms  12.860 ms
```

- From

- To

```
z5206205@vx3:~$ traceroute www.telstra.net
traceroute to www.telstra.net (203.50.5.178), 30 hops max, 60 byte packets
 1  cserouter1-server.cse.unsw.EDU.AU (129.94.242.251)  0.076 ms  0.077 ms  0.060 ms
 2  129.94.39.17 (129.94.39.17)  0.910 ms  0.869 ms  0.833 ms
 3  libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34)  1.751 ms  1.753 ms  1.747 ms
 4  libcr1-po-5.gw.unsw.edu.au (149.171.255.165)  1.116 ms ombcr1-po-5.gw.unsw.edu.au (149.171.255.197)  1.123 ms libcr1-po-5.gw.unsw.edu.au (149.171.2
55.165)  1.125 ms
 5  unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101)  1.456 ms unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105)  1.508 ms  1.461 ms
 6  138.44.5.0 (138.44.5.0)  1.405 ms  1.280 ms  1.282 ms
 7  et-1-1-0.pe1.rsby.nsw.aarnet.net.au (113.197.15.12)  1.538 ms  1.462 ms  1.530 ms
 8  xe-0-0-3.bdr1.rsby.nsw.aarnet.net.au (113.197.15.31)  1.430 ms  1.434 ms  1.396 ms
 9  HundredGigE0-1-0-4.ken-edge903.sydney.telstra.net (139.130.0.77)  2.447 ms  2.518 ms  2.577 ms
10  bundle-ether2.chw-edge903.sydney.telstra.net (203.50.11.175)  2.648 ms bundle-ether17.ken-core10.sydney.telstra.net (203.50.11.172)  2.105 ms  2.14
3 ms
11  bundle-ether10.win-core10.melbourne.telstra.net (203.50.11.123)  13.770 ms bundle-ether17.chw-core10.sydney.telstra.net (203.50.11.176)  3.793 ms
2.760 ms
12  203.50.6.40 (203.50.6.40)  14.866 ms bundle-ether8.exi-core10.melbourne.telstra.net (203.50.11.125)  15.004 ms  15.033 ms
13  bundle-ether2.exi-ncprouter101.melbourne.telstra.net (203.50.11.209)  13.367 ms  13.184 ms  13.321 ms
14  www.telstra.net (203.50.5.178)  12.611 ms  12.742 ms  12.525 ms
```

What are the IP addresses of the two servers that you have chosen. Does the reverse path go through the same routers as the forward path?

- Speedtest: 202.150.221.170
- Telstra: 203.50.5.178

The reverse path doesn't go through the same routers as the forward path.

If you observe common routers between the forward and the reverse path, do you also observe the same IP addresses? Why or why not?

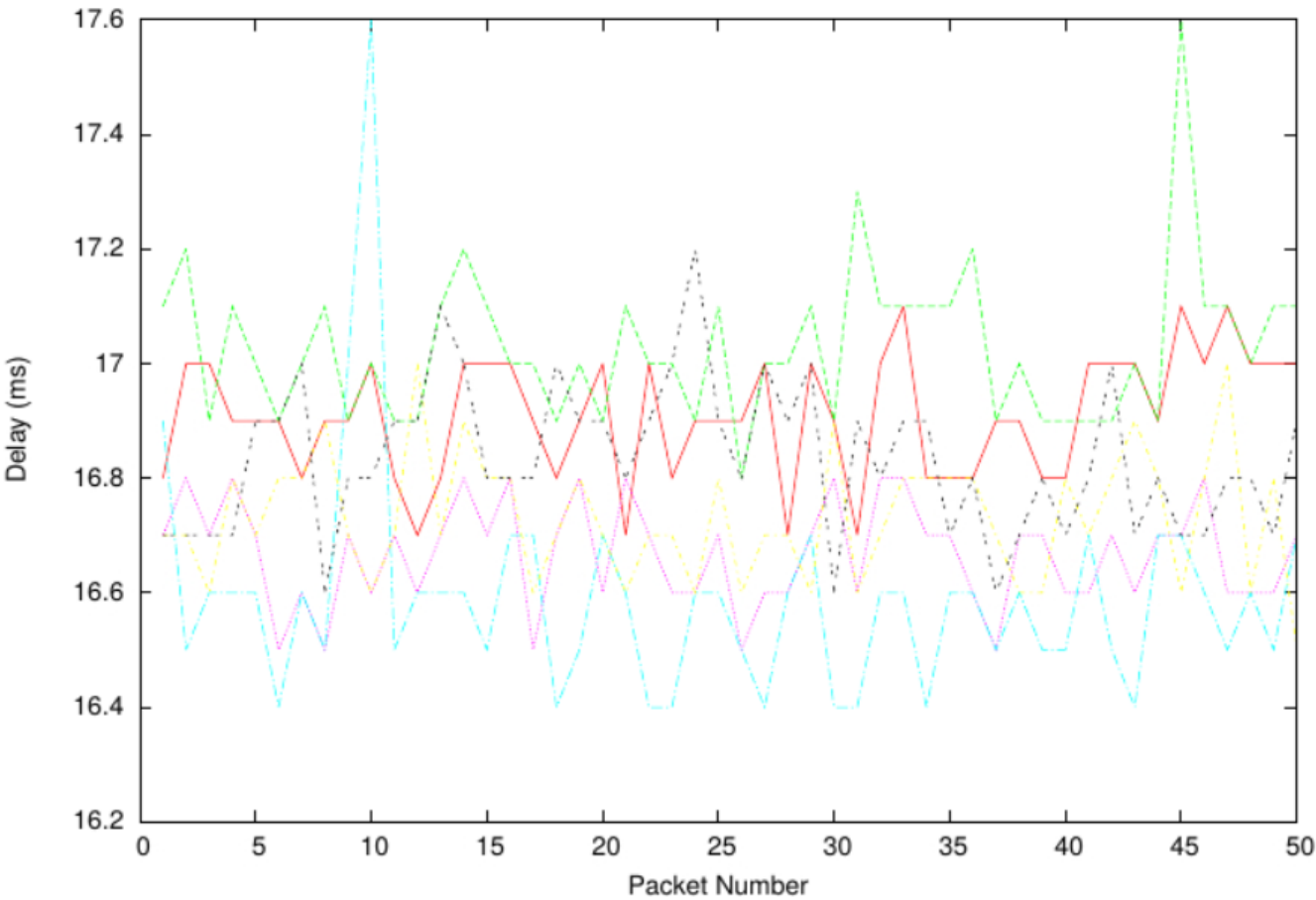The common routers observed do not have the same IP addresses.

- There are more efficient paths to take than the reverse path, hence the different IP addresses.

Exercise 4: Use ping to gain insights into network performance
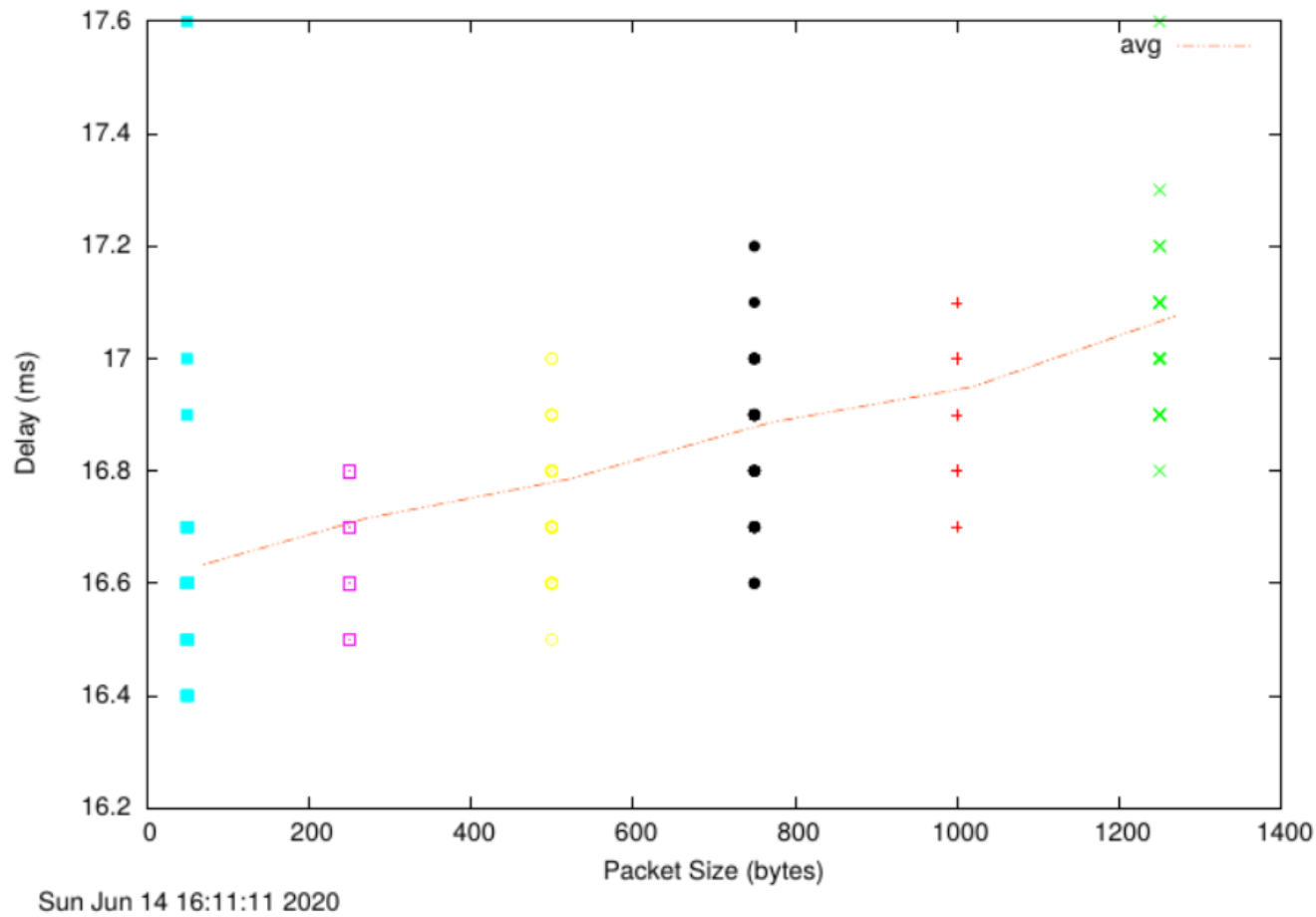
- www.uq.edu.au

○ Delay

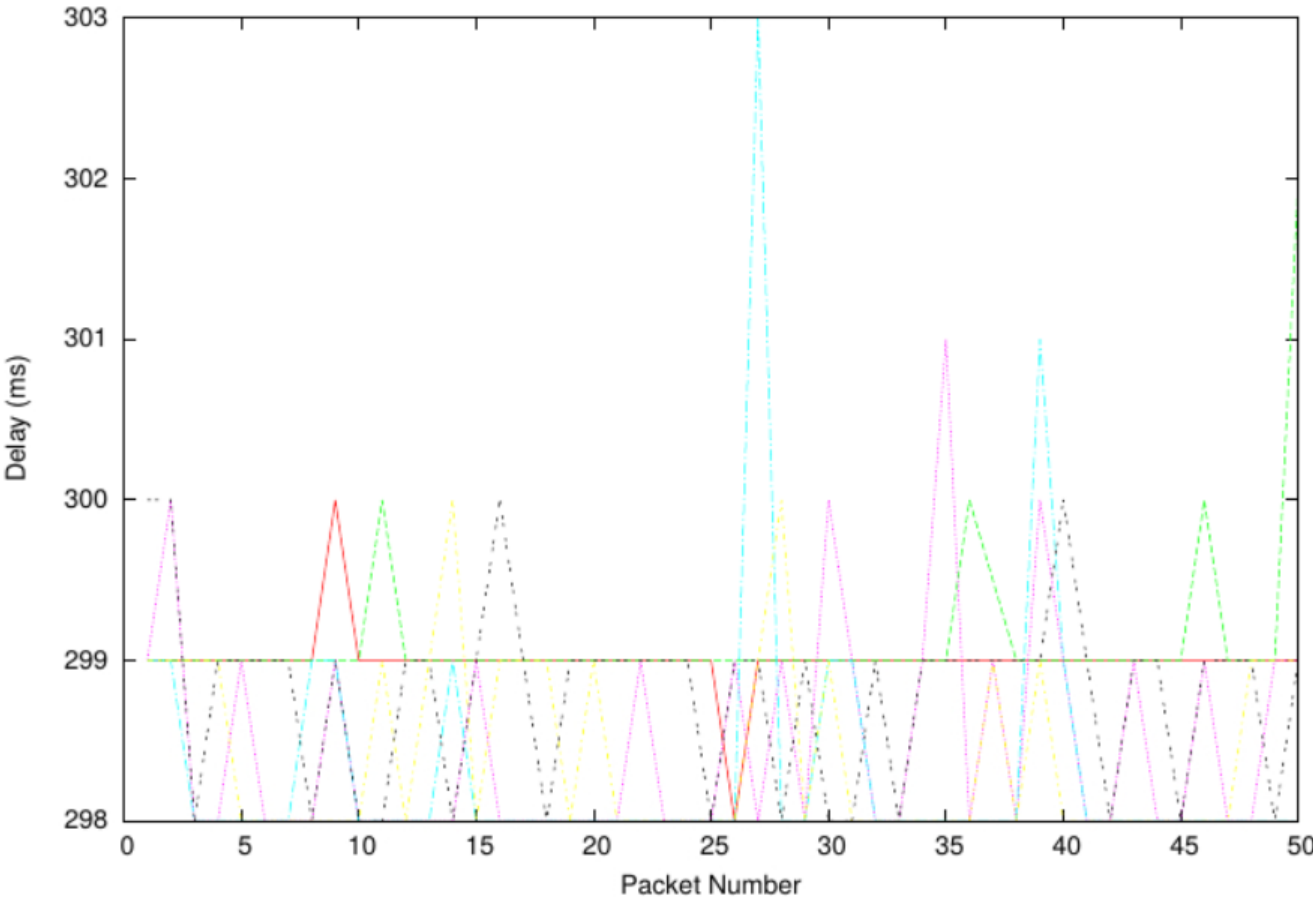Sun Jun 14 16:11:11 2020

○ Scatter

Sun Jun 14 16:11:11 2020

- ○ Average

```
70 16.633 16.441
270 16.715 16.531
520 16.785 16.593
770 16.886 16.633
1020 16.950 16.771
1270 17.076 16.882
```
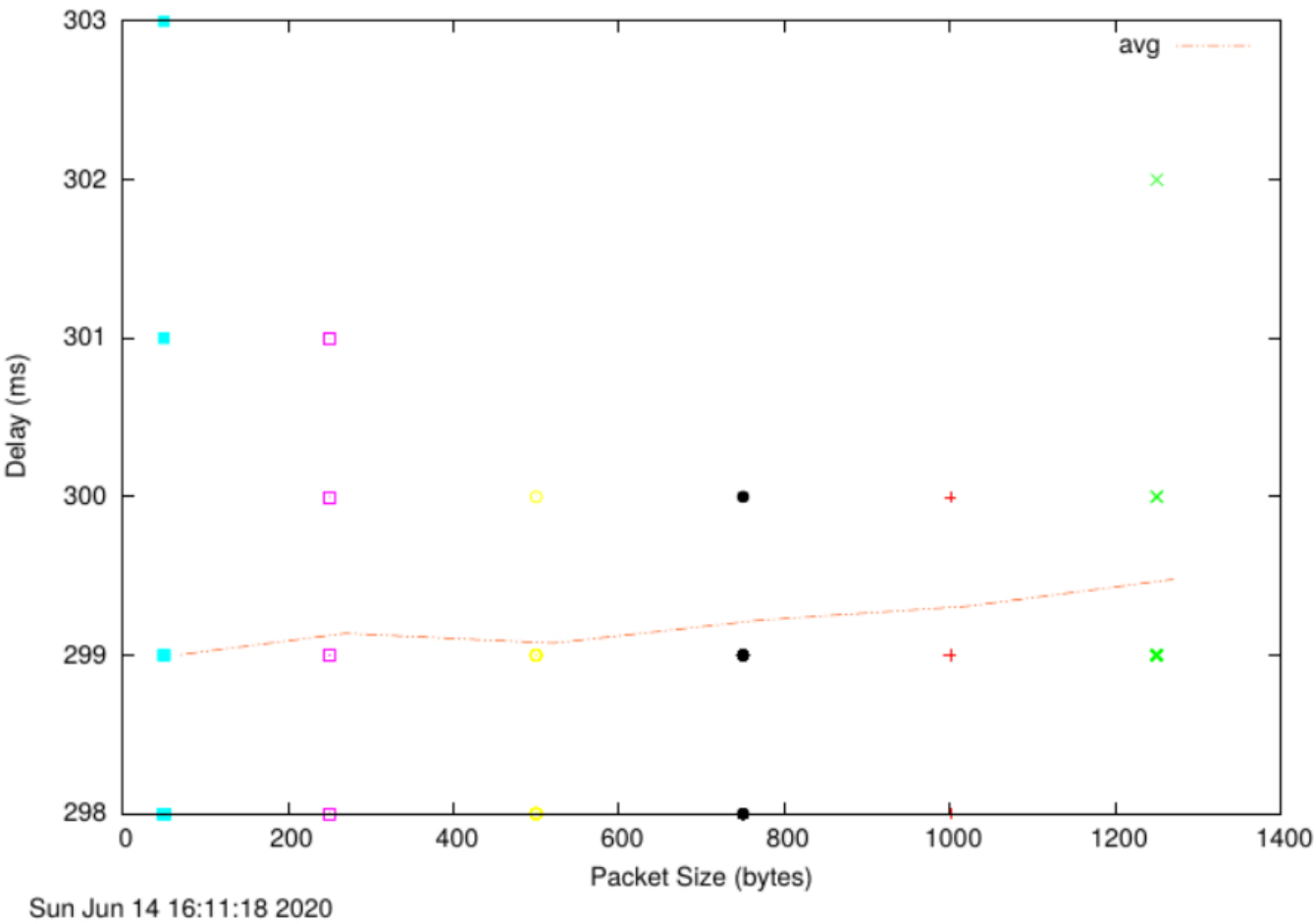
- www.dlsu.edu.ph

  - ○ Delay

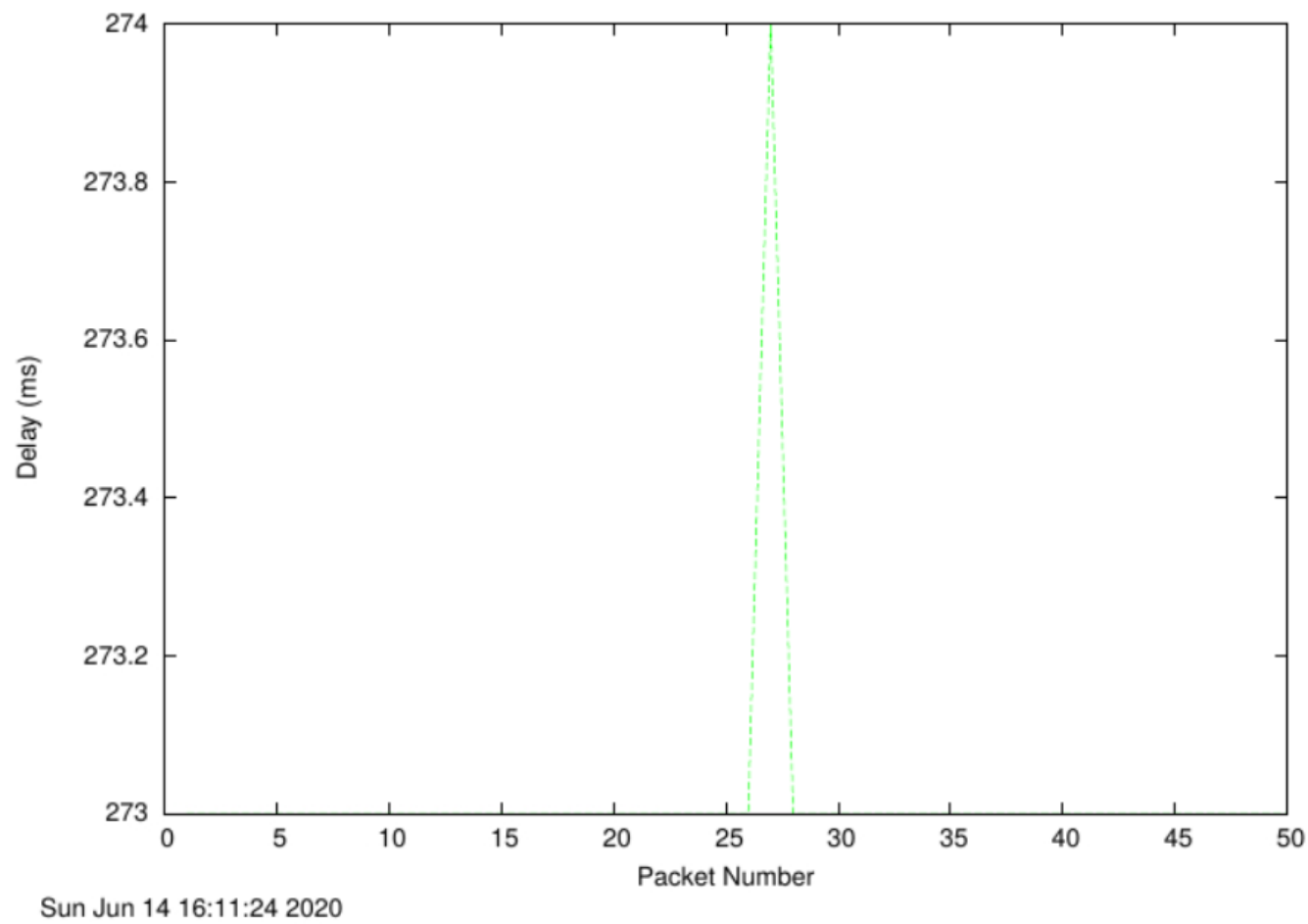Sun Jun 14 16:11:18 2020
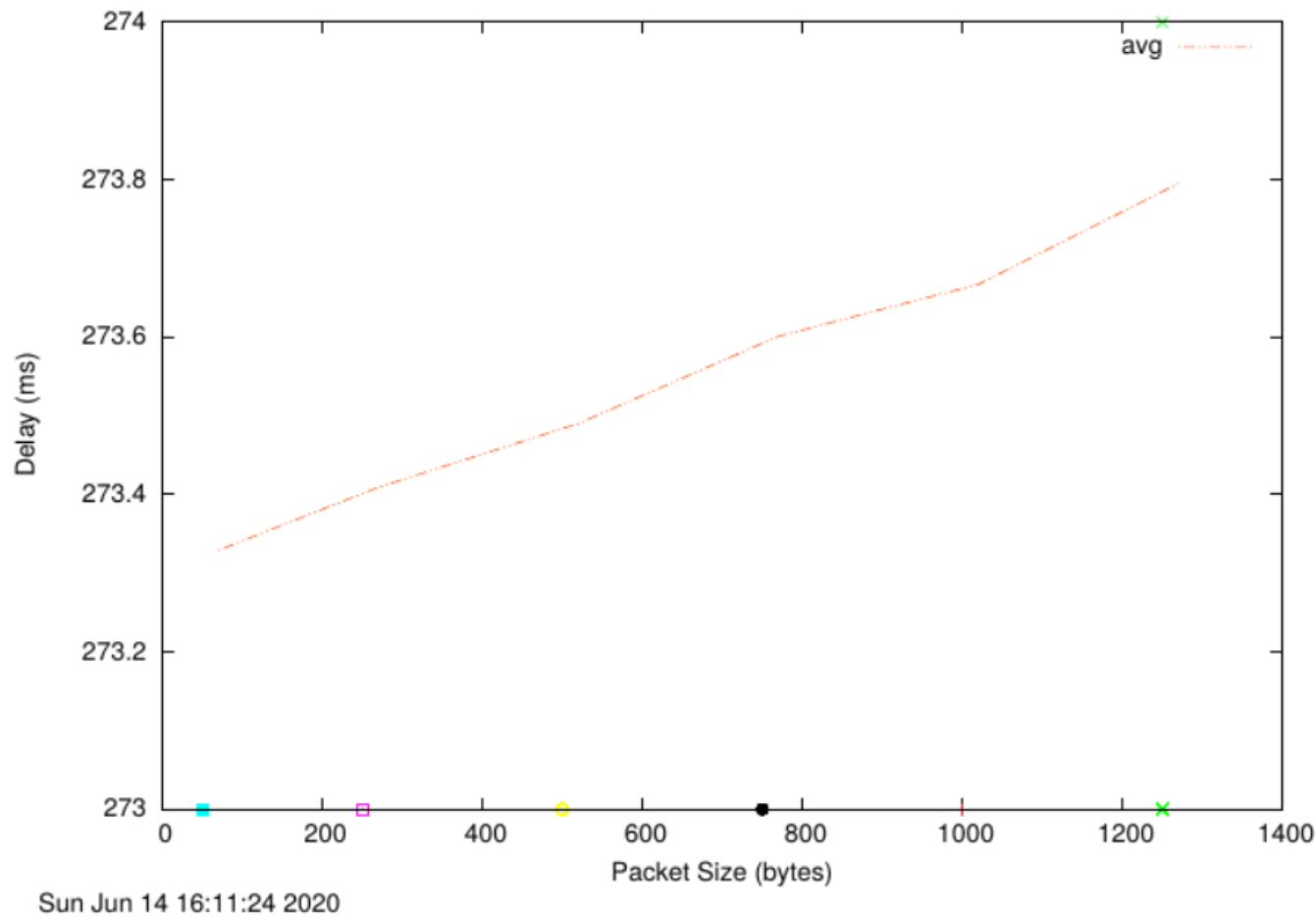
- Scatter

Sun Jun 14 16:11:18 2020

- ○ Average

```
70  299.004 298.516
270 299.138 298.690
520 299.076 298.721
770 299.221 298.884
1020 299.309 298.972
1270 299.479 299.029
```

- www.tu-berlin.de

  - ○ Delay

Sun Jun 14 16:11:24 2020

- Scatter

Sun Jun 14 16:11:24 2020

- ○ Average

```
70 273.329 273.199
270 273.409 273.293
520 273.490 273.372
770 273.601 273.473
1020 273.667 273.544
1270 273.795 273.629
```

1.

- Distances:

```
UNSW->UQ: 733880 m (456.01 mi)
UNSW->DLSU: 6248510 m (3,882.64 mi)
UNSW->TU: 16105090 m (10,007.24 mi)
```

- Speed of light:

```
300000000 m/s
```

- Shortest possible time:

```
UNSW->UQ: 733800/300000000 = 0.00245 s
UNSW->DLSU: 6248510/300000000 = 0.02083 s
UNSW->TU: 16105090/300000000 = 0.05368 s
```
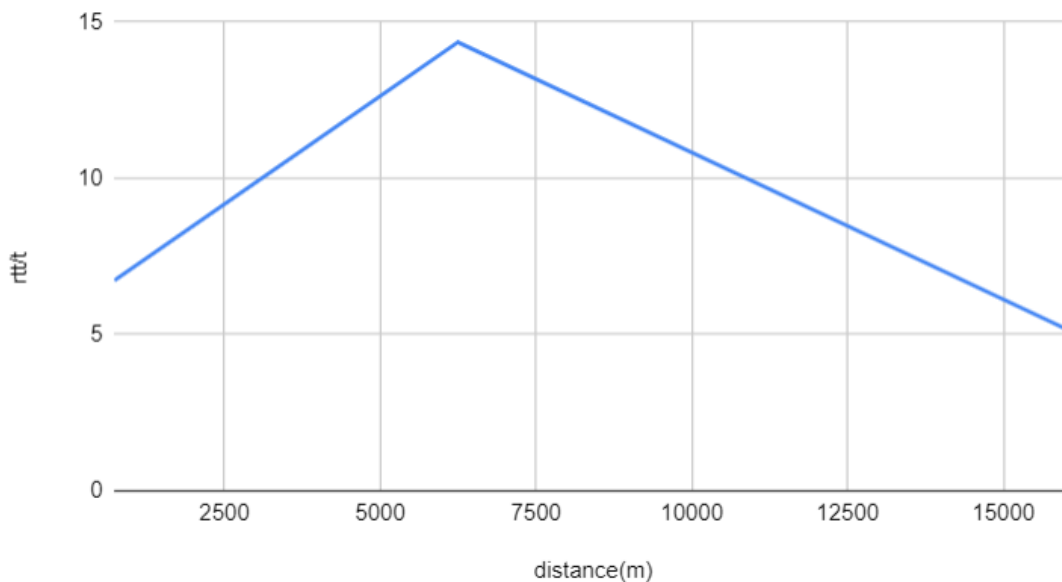
- RTT

```
UNSW->UQ: 16.5ms
UNSW->DLSU: 299ms
UNSW->TU: 273ms
```

- RTT/T

```
UNSW->UQ: 16.5ms / 0.00245*1000 ms = 6.73
UNSW->DLSU: 299ms / 0.02083*1000 ms = 14.35
UNSW->TU: 273ms / 0.05368*1000 ms = 5.09
```

- RTT/T vs Distance

rtt/t vs. distance(m)

Can you think of at least two reasons why the y-axis values that you plot are greater than 2?

The best case scenario for rtt/t is 2, as light travels to and from. The speed can't be greater than the speed of light because:

- Routers must also take time to analyze the header of the packet.
- Firewall configurations

Hence, the y-axis values are greater than 2.

2. Is the delay to the destinations constant or does it vary over time? Explain why.

Varies over time due to propagation, processing and queuing delays.

3. Explore where the website for www.epfl.ch is hosted. Is it in Switzerland?

Yes

4. The measured delay (i.e., the delay you can see in the graphs) is composed of propagation delay, transmission delay, processing delay and queuing delay. Which of

these delays depend on the packet size and which do not?

Only transmisson delay is dependant on packet size, the rest aren't.