

Exercise1 Answer:

1. IP address: 104.18.60.21, 104.18.61.21 and 172.67.219.46

The reason of having several IP addresses is having multiple servers.

```
z5223731@vx4:/tmp_amd/reed/export/reed/1/z5223731/Desktop/comp3331/lab01$ nslookup
up www.koala.com.au
Server:      129.94.242.2
Address:     129.94.242.2#53

Non-authoritative answer:
Name:   www.koala.com.au
Address: 104.18.61.21
Name:   www.koala.com.au
Address: 172.67.219.46
Name:   www.koala.com.au
Address: 104.18.60.21
```

2. name is localhost

```
z5223731@vx4:/tmp_amd/reed/export/reed/1/z5223731/Desktop/comp3331/lab01$ nslookup
up 127.0.0.1
Server:      129.94.242.2
Address:     129.94.242.2#53

1.0.0.127.in-addr.arpa  name = localhost.

z5223731@vx4:/tmp_amd/reed/export/reed/1/z5223731/Desktop/comp3331/lab01$
```

Exercise2 Answer:

1. www.getfittest.com.au and www.hola.hp cannot reachable.

```
z5223731@weber:~/Desktop/comp3331/lab01$ ping -c 1 www.unsw.edu.au
PING cdn.prod65.unsw.adobecqms.net (13.226.107.112) 56(84) bytes of data.
64 bytes from server-13-226-107-112.syd4.r.cloudfront.net (13.226.107.112): icmp_seq=1 ttl=244 time=1.16 ms

--- cdn.prod65.unsw.adobecqms.net ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 1.162/1.162/1.162/0.000 ms
z5223731@weber:~/Desktop/comp3331/lab01$
```

```
z5223731@weber:~/Desktop/comp3331/lab01$ ping -c 1 www.getfittest.com.au
ping: unknown host www.getfittest.com.au
z5223731@weber:~/Desktop/comp3331/lab01$
```

```
z5223731@weber:~/Desktop/comp3331/lab01$ ping -c 1 www.mit.edu
PING e9566.dscb.akamaiedge.net (104.74.47.237) 56(84) bytes of data.
64 bytes from a104-74-47-237.deploy.static.akamaitechnologies.com (104.74.47.237): icmp_seq=1 ttl=56 time=1.18 ms

--- e9566.dscb.akamaiedge.net ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 1.188/1.188/1.188/0.000 ms
z5223731@weber:~/Desktop/comp3331/lab01$
```

```
z5223731@weber:~/Desktop/comp3331/lab01$ ping -c 1 www.intel.com.au
PING e19235.dsca.akamaiedge.net (104.98.21.56) 56(84) bytes of data.
64 bytes from a104-98-21-56.deploy.static.akamaitechnologies.com (104.98.21.56): icmp_seq=1 ttl=56 time=1.20 ms

--- e19235.dsca.akamaiedge.net ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 1.208/1.208/1.208/0.000 ms
z5223731@weber:~/Desktop/comp3331/lab01$
```

```
z5223731@weber:~/Desktop/comp3331/lab01$ ping -c 1 www.tpg.com.au
PING www.tpg.com.au (203.26.27.38) 56(84) bytes of data.
64 bytes from www.tpg.com.au (203.26.27.38): icmp_seq=1 ttl=119 time=1.76 ms

--- www.tpg.com.au ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 1.768/1.768/1.768/0.000 ms
z5223731@weber:~/Desktop/comp3331/lab01$
```

```
rtt min/avg/max/mdev = 1.768/1.768/1.768/0.000 ms
z5223731@weber:~/Desktop/comp3331/lab01$ ping -c 1 www.hola.hp
ping: unknown host www.hola.hp
z5223731@weber:~/Desktop/comp3331/lab01$
```

```
z5223731@weber:~/Desktop/comp3331/lab01$ ping -c 1 www.amazon.com
PING e15316.e22.akamaiedge.net (138.44.25.122) 56(84) bytes of data.
64 bytes from 138.44.25.122: icmp_seq=1 ttl=57 time=1.10 ms

--- e15316.e22.akamaiedge.net ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 1.100/1.100/1.100/0.000 ms
z5223731@weber:~/Desktop/comp3331/lab01$
```

```
z5223731@weber:~/Desktop/comp3331/lab01$ ping -c 1 www.tsinghua.edu.cn
PING www.tsinghua.edu.cn (166.111.4.100) 56(84) bytes of data.
64 bytes from www.tsinghua.edu.cn (166.111.4.100): icmp_seq=1 ttl=42 time=242 ms

--- www.tsinghua.edu.cn ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 242.879/242.879/242.879/0.000 ms
z5223731@weber:~/Desktop/comp3331/lab01$
```

```
z5223731@weber:~/Desktop/comp3331/lab01$ ping -c 1 www.kremlin.ru
PING www.kremlin.ru (95.173.136.72) 56(84) bytes of data.

--- www.kremlin.ru ping statistics ---
1 packets transmitted, 0 received, 100% packet loss, time 0ms
```

```
z5223731@weber:~/Desktop/comp3331/lab01$ ping -c 1 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=115 time=1.29 ms

--- 8.8.8.8 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 1.296/1.296/1.296/0.000 ms
z5223731@weber:~/Desktop/comp3331/lab01$
```

2. The one reason could be these hosts do not exist.

Exercise3 Answer:

1.

```
z5223731@weill:~/Desktop/comp3331/lab01$ 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) 0.151 ms 0.134 ms 0.110 ms
 2 129.94.39.17 (129.94.39.17) 0.865 ms 0.882 ms 0.866 ms
 3 ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35) 1.420 ms libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34) 1.229 ms
 ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35) 1.586 ms
 4 ombcr1-po-5.gw.unsw.edu.au (149.171.255.197) 1.098 ms libcr1-po-6.gw.unsw.edu.au (149.171.255.201) 1.100 ms ombcr1-po-
 6.gw.unsw.edu.au (149.171.255.169) 1.124 ms
 5 unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.166 ms unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.155 ms 1.
 416 ms
 6 138.44.5.0 (138.44.5.0) 6.191 ms 5.527 ms 5.488 ms
 7 et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149) 2.083 ms 1.844 ms 1.925 ms
 8 et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99) 97.328 ms 97.000 ms 96.985 ms
 9 et-2-1-0.bdr1.a.sea.aarnet.net.au (113.197.15.201) 146.668 ms 146.660 ms 146.641 ms
10 abilene-1-lo-jmb-706.sttla.pacificwave.net (207.231.240.8) 146.747 ms 146.761 ms 146.708 ms
11 ae-1.4079.rtsw.minn.net.internet2.edu (162.252.70.173) 179.502 ms 179.277 ms 181.100 ms
12 ae-1.4079.rtsw.eqch.net.internet2.edu (162.252.70.106) 198.760 ms 193.498 ms 193.360 ms
13 ae-0.4079.rtsw3.eqch.net.internet2.edu (162.252.70.163) 187.338 ms 188.743 ms 188.309 ms
14 ae-1.4079.rtsw.clev.net.internet2.edu (162.252.70.130) 193.791 ms 193.122 ms 193.053 ms
15 buf-9208-I2-CLEV.nysernet.net (199.109.11.33) 196.677 ms 196.603 ms 196.583 ms
16 syr-9208-buf-9208.nysernet.net (199.109.7.193) 203.923 ms 199.920 ms 199.871 ms
17 nyc111-9204-syr-9208.nysernet.net (199.109.7.94) 212.889 ms 209.093 ms 208.889 ms
18 nyc-9208-nyc111-9204.nysernet.net (199.109.7.165) 209.024 ms 209.136 ms 209.048 ms
19 columbia.nyc-9208.nysernet.net (199.109.4.14) 208.998 ms 209.048 ms 208.959 ms
20 cc-core-1-x-nyser32-gw-1.net.columbia.edu (128.59.255.5) 209.242 ms 209.407 ms 210.415 ms
21 cc-conc-1-x-cc-core-1.net.columbia.edu (128.59.255.21) 209.368 ms 209.279 ms 209.383 ms
22 www-ltm.cc.columbia.edu (128.59.105.24) 209.336 ms 209.207 ms 210.973 ms
z5223731@weill:~/Desktop/comp3331/lab01$
```

There are 21 routers between my workstation and www.columbia.edu, there are 5 routers which are 1 to 5 along the path of UNSW network, between router 7 and router 8 cross the Pacific Ocean due to RTT between them increase lot.

2.

```
z5223731@weill:~/Desktop/comp3331/lab01$ 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) 0.278 ms 0.250 ms 0.231 ms
 2 129.94.39.17 (129.94.39.17) 0.954 ms 0.988 ms 0.958 ms
 3 ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35) 1.952 ms libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34) 1.464 ms
 ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35) 1.897 ms
 4 libcr1-po-6.gw.unsw.edu.au (149.171.255.201) 1.384 ms ombcr1-po-6.gw.unsw.edu.au (149.171.255.169) 1.214 ms libcr1-po-
 5.gw.unsw.edu.au (149.171.255.165) 1.341 ms
 5 unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.424 ms unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.289 ms 1.
 318 ms
 6 138.44.5.0 (138.44.5.0) 1.458 ms 1.346 ms 1.319 ms
 7 et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149) 1.945 ms 1.777 ms 1.812 ms
 8 et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99) 95.218 ms 95.239 ms 95.262 ms
 9 et-2-1-0.bdr1.a.sea.aarnet.net.au (113.197.15.201) 146.702 ms 146.671 ms 146.660 ms
10 cenichpr-1-is-jmb-778.snvaca.pacificwave.net (207.231.245.129) 164.611 ms 164.101 ms 164.003 ms
11 svl-aggr10-hpr-svl-hpr3-100g.cenic.net (137.164.25.106) 164.929 ms 164.849 ms 164.010 ms
12 hpr-lax-aggr10-svl-aggr10-100g.cenic.net (137.164.25.73) 160.510 ms 159.990 ms 160.456 ms
13 * * *
14 bd11f1.anderson-cr001.anderson.ucla.net (169.232.4.6) 161.234 ms bd11f1.anderson-cr00f2.csb1.ucla.net (169.232.4.4)
160.373 ms bd11f1.anderson-cr001.anderson.ucla.net (169.232.4.6) 160.971 ms
15 cr00f1.anderson-rtr11f4.mathsci.ucla.net (169.232.8.185) 160.282 ms cr00f2.csb1-rtr11f4.mathsci.ucla.net (169.232.8.1
81) 161.040 ms 161.184 ms
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30 * * *
z5223731@weill:~/Desktop/comp3331/lab01$ traceroute www.u-tokyo.ac.jp
```

```
z5223731@weill:~/Desktop/comp3331/lab01$ 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) 0.107 ms 0.125 ms 0.092 ms
 2 129.94.39.17 (129.94.39.17) 0.844 ms 0.837 ms 0.847 ms
 3 libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34) 1.315 ms ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35) 1.453 ms
libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34) 1.625 ms
 4 libcr1-po-5.gw.unsw.edu.au (149.171.255.165) 1.117 ms libcr1-po-6.gw.unsw.edu.au (149.171.255.201) 1.144 ms 1.236 ms
 5 unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.123 ms unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.122 ms 1.
140 ms
 6 138.44.5.0 (138.44.5.0) 2.675 ms 2.009 ms 1.997 ms
 7 et-0-3-0.pe1.bkvl.nsw.aarnet.net.au (113.197.15.147) 1.702 ms 1.905 ms 1.845 ms
 8 ge-4-0-0.bb1.a.pao.aarnet.net.au (202.158.194.177) 155.012 ms 154.911 ms 155.007 ms
 9 paloalto0.iij.net (198.32.176.24) 156.468 ms 156.487 ms 156.560 ms
10 osk004bb00.IIJ.Net (58.138.88.185) 269.474 ms osk004bb01.IIJ.Net (58.138.88.189) 269.201 ms 269.201 ms
11 osk004ip57.IIJ.Net (58.138.106.166) 269.109 ms 269.066 ms 269.078 ms
12 210.130.135.130 (210.130.135.130) 274.252 ms 274.268 ms 271.889 ms
13 124.83.228.58 (124.83.228.58) 269.472 ms 269.502 ms 269.239 ms
14 124.83.252.178 (124.83.252.178) 275.138 ms 275.205 ms 275.227 ms
15 158.205.134.26 (158.205.134.26) 275.177 ms 293.596 ms 275.748 ms
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17 * * *
18 * * *
19 * * *
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22 * * *
23 * * *
24 * * *
25 * * *
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27 * * *
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29 * * *
30 * * *
z5223731@weill:~/Desktop/comp3331/lab01$ traceroute www.lancaster.ac.uk

z5223731@weill:~/Desktop/comp3331/lab01$ 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) 0.142 ms 0.112 ms 0.113 ms
 2 129.94.39.17 (129.94.39.17) 0.928 ms 0.932 ms 0.908 ms
 3 ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35) 1.312 ms 1.483 ms libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34)
1.332 ms
 4 libcr1-po-5.gw.unsw.edu.au (149.171.255.165) 18.060 ms 18.054 ms libcr1-po-6.gw.unsw.edu.au (149.171.255.201) 18.174
ms
 5 unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.359 ms 1.151 ms unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.
185 ms
 6 138.44.5.0 (138.44.5.0) 1.543 ms 1.560 ms 1.534 ms
 7 et-2-0-5.bdr1.sing.sin.aarnet.net.au (113.197.15.233) 99.197 ms 98.532 ms 98.408 ms
 8 138.44.226.7 (138.44.226.7) 263.811 ms 263.778 ms 263.781 ms
 9 janet-gw.mx1.lon.uk.geant.net (62.40.124.198) 263.874 ms 263.845 ms 263.721 ms
10 ae29.londpg-sbr2.ja.net (146.97.33.2) 265.174 ms 265.295 ms 265.063 ms
11 ae31.erdiss-sbr2.ja.net (146.97.33.22) 268.785 ms 267.980 ms 268.446 ms
12 ae29.manckh-sbr2.ja.net (146.97.33.42) 276.616 ms 270.092 ms 269.974 ms
13 ae25.manckh-ban1.ja.net (146.97.35.50) 270.058 ms 270.001 ms 270.052 ms
14 lancaster-uni.ja.net (146.97.40.178) 292.747 ms 292.712 ms 292.706 ms
15 * * *
16 * * *
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23 * * *
24 * * *
25 * * *
26 * * *
27 * * *
28 * * *
29 * * *
30 * * *
z5223731@weill:~/Desktop/comp3331/lab01$
```

The path from my machine to these destinations diverge at router 6

The details about router 6:

The host name of this router is AARNET and it stands for Australian Academic and Research Network

The number of hops on each path isn't proportional the physical distance.

3.

The screenshot from <http://www.speedtest.com.sg/tr.php>

```
1 gigabitethernet3-3.exi2.melbourne.telstra.net (203.50.77.53) 0.310 ms 0.202 ms 0.243 ms
2 bundle-ether3-100.win-core10.melbourne.telstra.net (203.50.80.129) 2.613 ms 1.604 ms 2.240 ms
3 bundle-ether12.ken-core10.sydney.telstra.net (203.50.11.122) 12.735 ms 12.224 ms 12.737 ms
4 bundle-ether1.ken-edge903.sydney.telstra.net (203.50.11.173) 12.110 ms 12.099 ms 12.235 ms
5 aar3533567.lnk.telstra.net (139.130.0.78) 11.611 ms 11.600 ms 11.736 ms
6 et-7-1-0.pe1.brwy.nsw.aarnet.net.au (113.197.15.13) 20.605 ms 14.346 ms 13.609 ms
7 138.44.5.1 (138.44.5.1) 11.987 ms 11.975 ms 11.986 ms
8 libcr1-te-1-5.gw.unsw.edu.au (149.171.255.102) 12.109 ms 11.973 ms 11.986 ms
9 libudnex1-po-1.gw.unsw.edu.au (149.171.255.166) 12.360 ms 12.224 ms 12.361 ms
10 ufw1-ae-1-3154.gw.unsw.edu.au (149.171.253.36) 12.734 ms 12.725 ms 12.735 ms
11 129.94.39.23 (129.94.39.23) 13.110 ms 12.849 ms 12.861 ms
```

There are other traceroute sites listed [here](#).

The traceroute CGI source can be found via:



The screenshot from <https://www.telstra.net/cgi-bin/trace>

Traceroute Result:

```
traceroute to 129.94.242.2 (129.94.242.2), 30 hops max, 60 byte packets
1 ge2-8.r01.sin01.ne.com.sg (202.150.221.169) 0.161 ms 0.172 ms 0.185 ms
2 10.11.34.146 (10.11.34.146) 0.457 ms 0.560 ms 0.575 ms
3 aarnet.sgix.sg (103.16.102.67) 213.161 ms 213.183 ms 213.207 ms
4 et-7-3-0.pe1.nsw.brwy.aarnet.net.au (113.197.15.232) 209.449 ms 209.626 ms 209.594 ms
5 138.44.5.1 (138.44.5.1) 211.461 ms 211.564 ms 211.504 ms
6 ombcr1-te-1-5.gw.unsw.edu.au (149.171.255.106) 199.722 ms 199.781 ms 199.790 ms
7 libudnex1-po-2.gw.unsw.edu.au (149.171.255.198) 208.760 ms 208.835 ms 208.868 ms
8 ufw1-ae-1-3154.gw.unsw.edu.au (149.171.253.36) 200.413 ms 200.428 ms 200.420 ms
9 129.94.39.23 (129.94.39.23) 209.143 ms 209.021 ms 209.061 ms
10 * * *
11 * * *
12 * * *
13 * * *
14 * * *
15 * * *
16 * * *
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28 * * *
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30 * * *
```

Traceroute Completed.

The screenshot of reversing traceroute www.telstra.net

```
z5223731@weill:~/Desktop/comp3331/lab01$ 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) 0.351 ms 0.410 ms 0.379 ms
 2 129.94.39.17 (129.94.39.17) 1.052 ms 1.024 ms 1.145 ms
 3 ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35) 2.089 ms 2.085 ms 2.080 ms
 4 ombcr1-po-5.gw.unsw.edu.au (149.171.255.197) 1.266 ms libcr1-po-5.gw.unsw.edu.au (149.171.255.165) 1.270 ms 1.286 m
 5
 6 unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.337 ms 1.256 ms 1.334 ms
 7 138.44.5.0 (138.44.5.0) 1.548 ms 1.250 ms 1.743 ms
 8 et-1-1-0.pe1.rsby.nsw.aarnet.net.au (113.197.15.12) 1.775 ms 1.606 ms 1.716 ms
 9 xe-0-0-3.bdr1.rsby.nsw.aarnet.net.au (113.197.15.31) 1.502 ms 1.493 ms 1.489 ms
10 HundredGigE0-1-0-4.ken-edge903.sydney.telstra.net (139.130.0.77) 2.077 ms 2.089 ms 2.164 ms
11 bundle-ether2.chw-edge903.sydney.telstra.net (203.50.11.175) 2.559 ms bundle-ether17.ken-core10.sydney.telstra.net (2
203.50.11.172) 2.305 ms bundle-ether2.chw-edge903.sydney.telstra.net (203.50.11.175) 2.374 ms
12 bundle-ether10.win-core10.melbourne.telstra.net (203.50.11.123) 13.388 ms 13.455 ms 14.116 ms
13 bundle-ether8.exi-core10.melbourne.telstra.net (203.50.11.125) 15.491 ms 15.481 ms 203.50.6.40 (203.50.6.40) 15.990
ms
14 bundle-ether2.exi-ncprouter101.melbourne.telstra.net (203.50.11.209) 15.257 ms 15.081 ms 15.252 ms
15 www.telstra.net (203.50.5.178) 13.762 ms 13.831 ms 13.444 ms
z5223731@weill:~/Desktop/comp3331/lab01$
```

The screenshot of reversing traceroute www.speedtest.com.sg

```
z5223731@weill:~/Desktop/comp3331/lab01$ 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) 0.152 ms 0.128 ms 0.150 ms
 2 129.94.39.17 (129.94.39.17) 0.984 ms 1.113 ms 0.941 ms
 3 libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34) 2.011 ms 1.981 ms 1.965 ms
 4 ombcr1-po-5.gw.unsw.edu.au (149.171.255.197) 1.224 ms libcr1-po-6.gw.unsw.edu.au (149.171.255.201) 1.204 ms ombcr1-p
o-5.gw.unsw.edu.au (149.171.255.197) 1.181 ms
 5 unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.251 ms unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.436 ms u
nswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.206 ms
 6 138.44.5.0 (138.44.5.0) 1.389 ms 1.885 ms 1.856 ms
 7 et-0-3-0.pe1.alxd.nsw.aarnet.net.au (113.197.15.153) 1.677 ms 1.791 ms 1.771 ms
 8 xe-0-2-7.bdr1.a.lax.aarnet.net.au (202.158.194.173) 147.725 ms 147.710 ms 147.691 ms
 9 singtel.as7473.any2ix.coresite.com (206.72.210.63) 147.813 ms 147.794 ms 147.770 ms
10 203.208.173.21 (203.208.173.21) 325.372 ms 203.208.154.45 (203.208.154.45) 328.198 ms 203.208.171.117 (203.208.171.1
17) 148.668 ms
11 203.208.172.145 (203.208.172.145) 245.338 ms 203.208.177.110 (203.208.177.110) 328.652 ms 321.088 ms
12 203.208.182.253 (203.208.182.253) 336.790 ms * 203.208.183.250 (203.208.183.250) 243.290 ms
13 203.208.177.110 (203.208.177.110) 330.135 ms 316.491 ms 316.463 ms
14 * 202-150-221-170.rev.ne.com.sg (202.150.221.170) 201.683 ms *
z5223731@weill:~/Desktop/comp3331/lab01$
```

The IP addresses of two servers I have chosen are 203.50.5.178 and 202.150.221.170
As the screenshot shown above, the reverse path doesn't go through the same routers as the forward path.

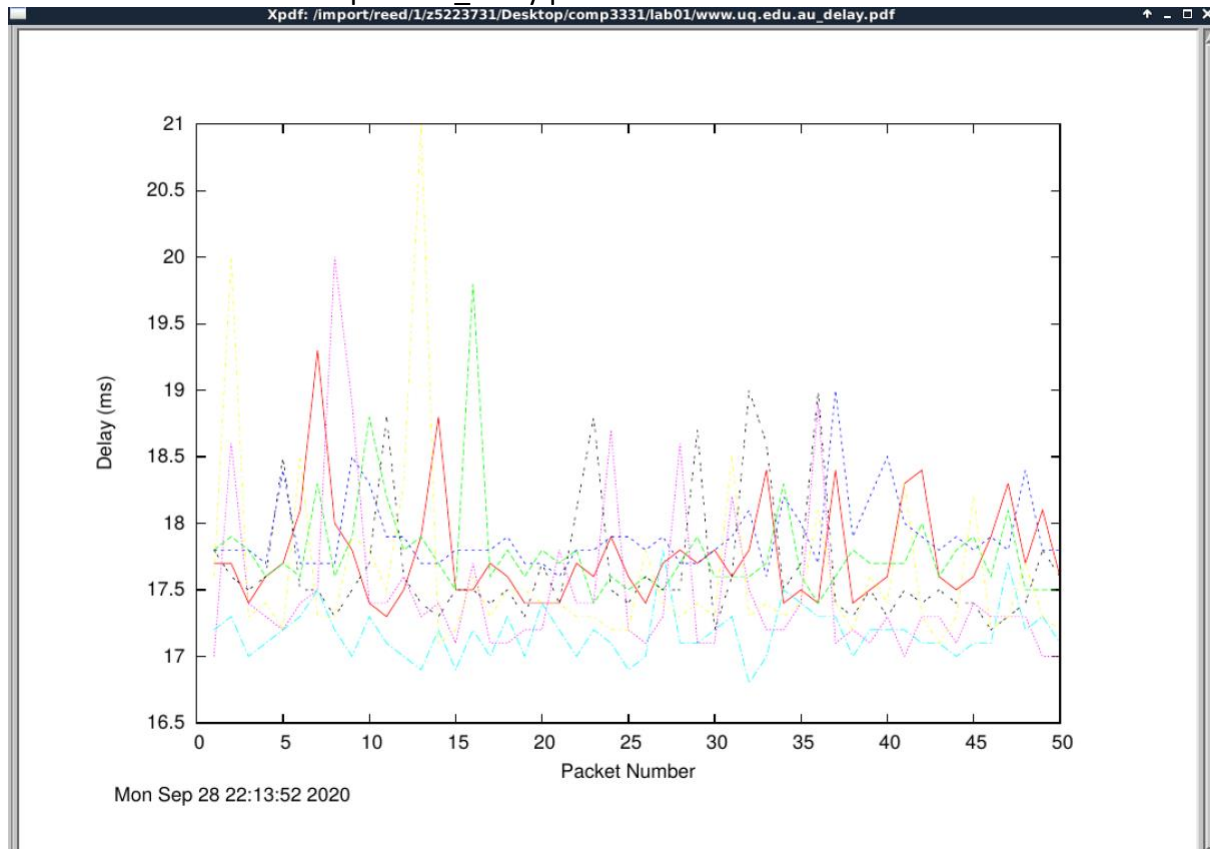
As the screenshot shown above, there aren't common routers and IP addresses between forward and reverse path.

The reason why there aren't common routers and IP addresses is probably there are multiple routers and multiple path between my machine and destination. The router or path the packet are heading to is arbitrary.

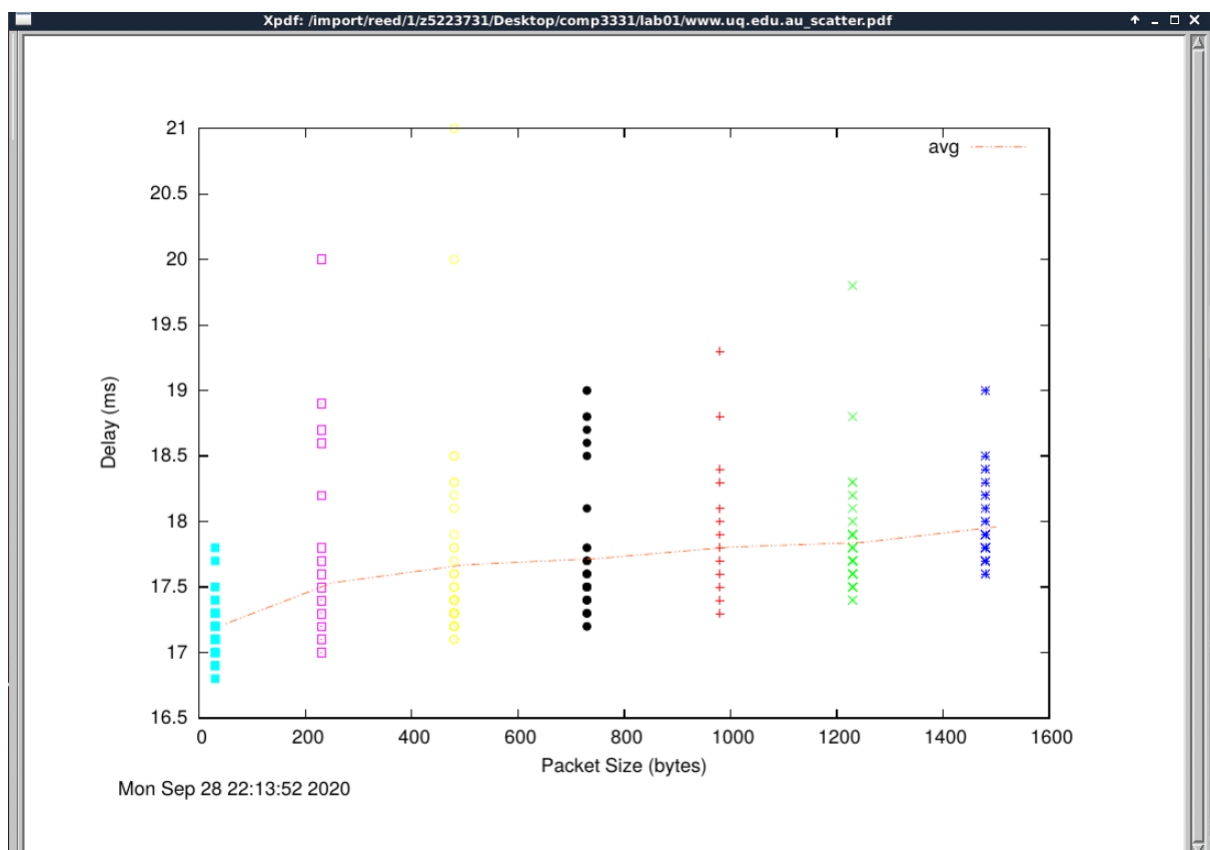
Exercise4 Answer:

1.

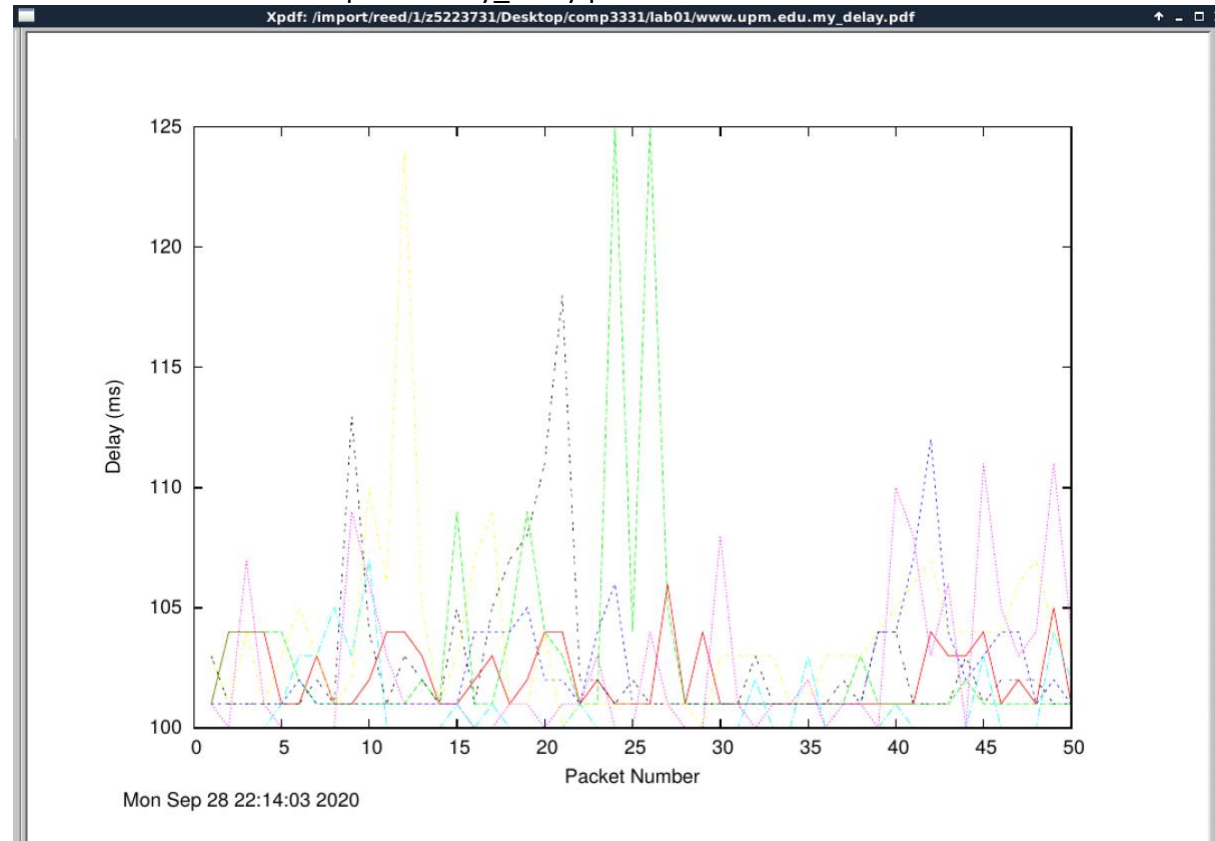
The screenshot of [www.uq.edu.au_delay.pdf](#)



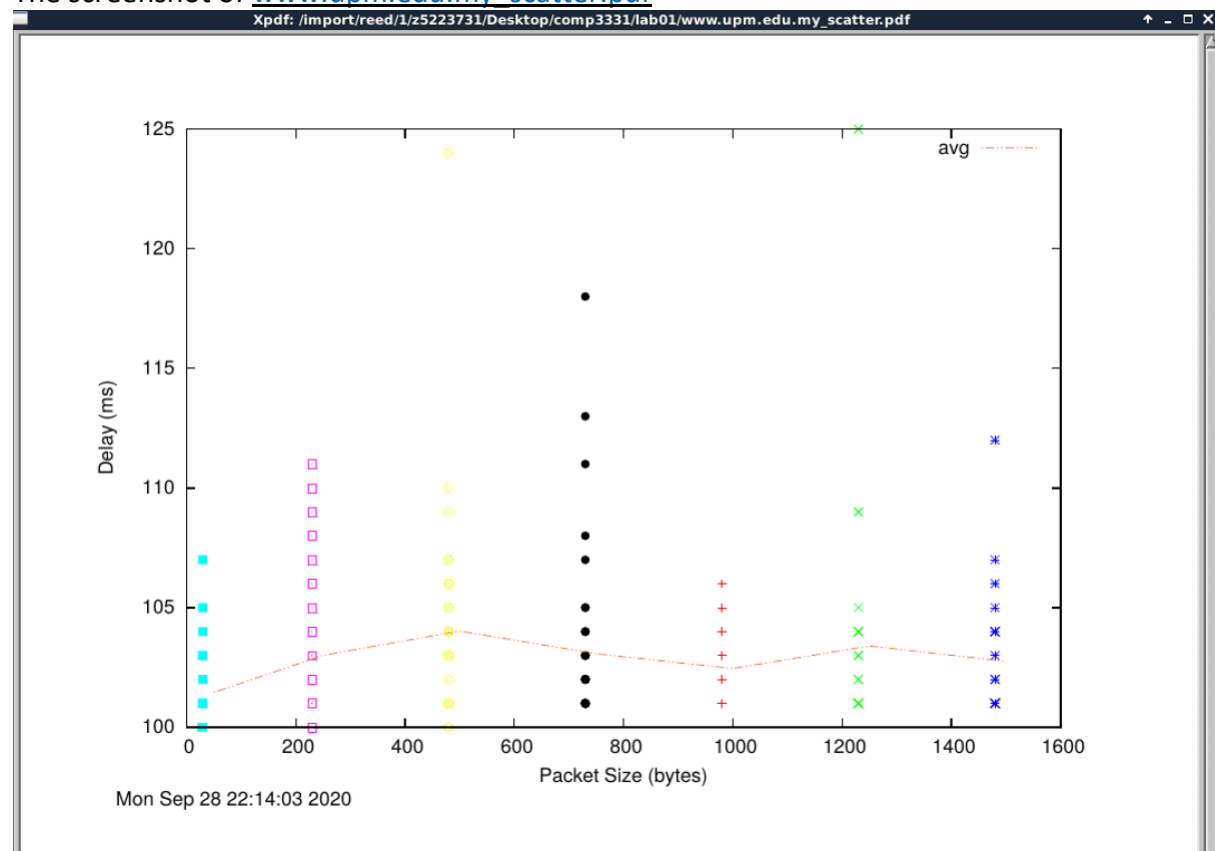
The screenshot of [www.uq.edu.au_scatter.pdf](#)



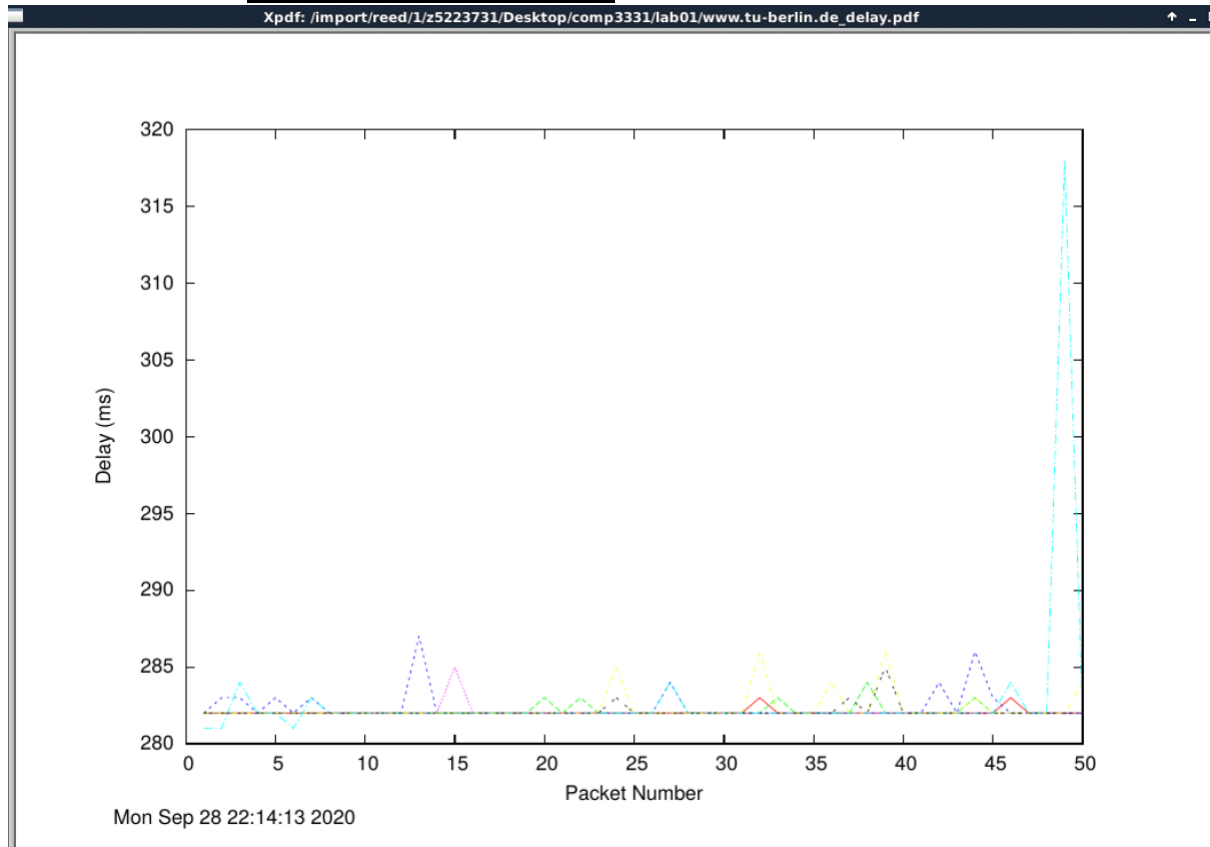
The screenshot of [www.upm.edu.my_delay.pdf](#)



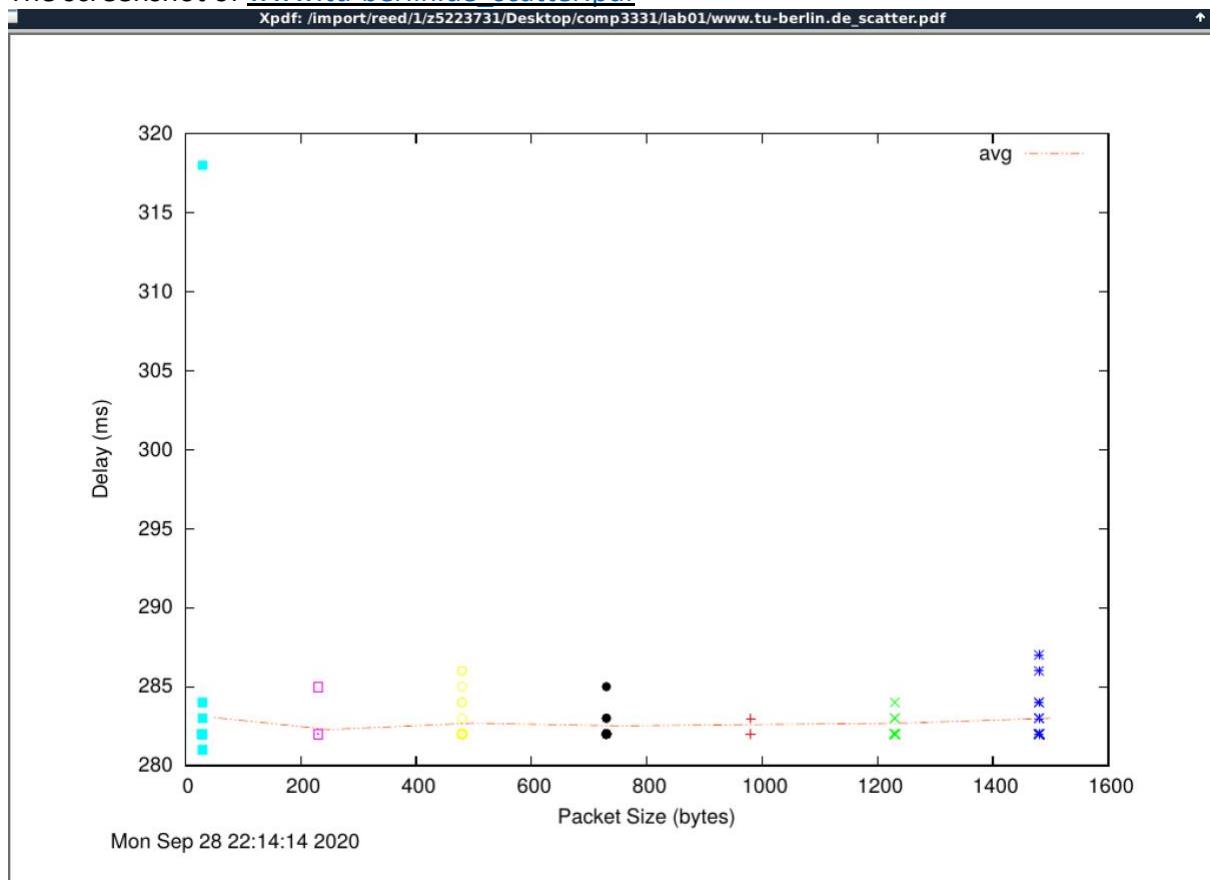
The screenshot of [www.upm.edu.my_scatter.pdf](#)



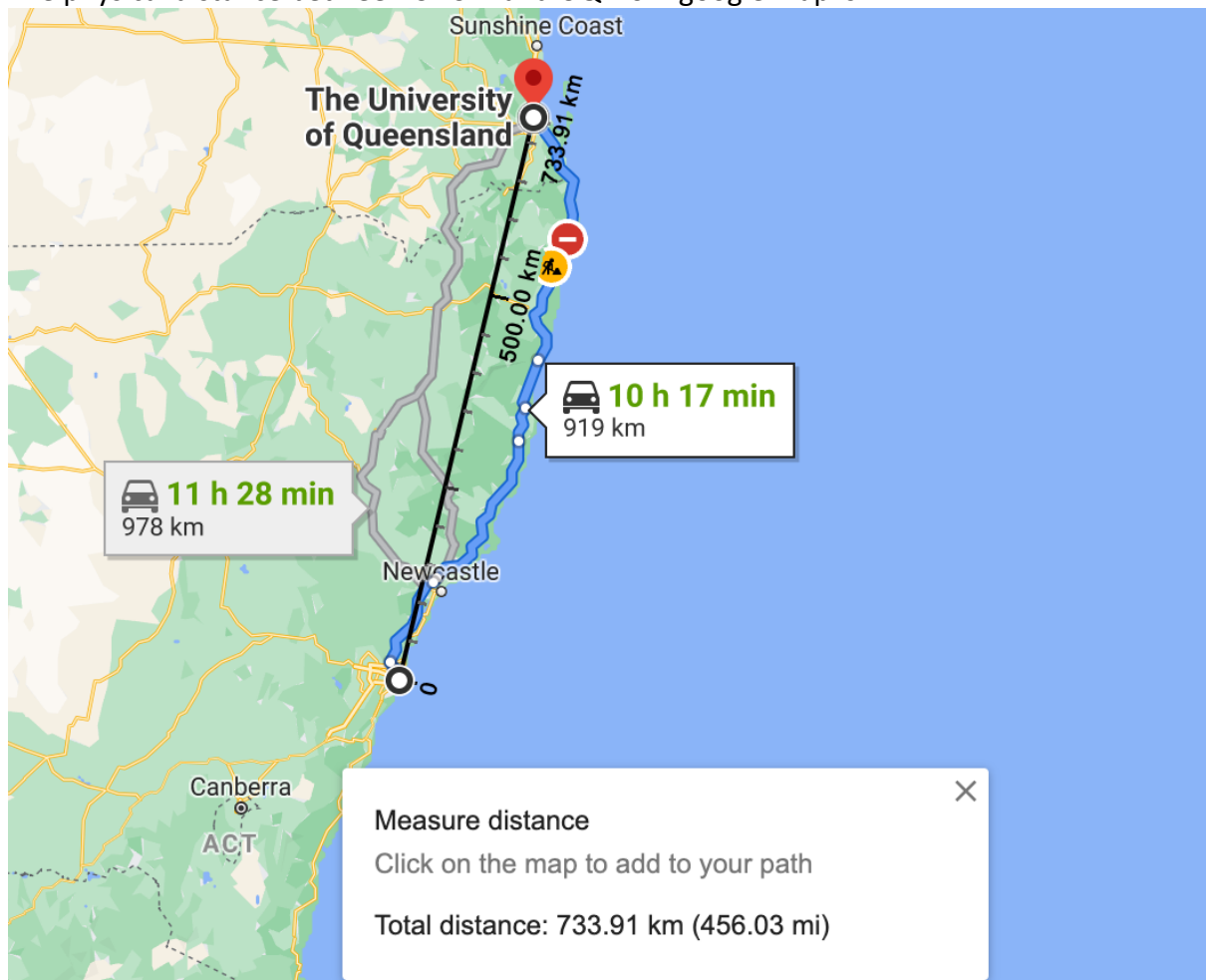
The screenshot of www.tu-berlin.de_delay.pdf



The screenshot of www.tu-berlin.de_scatter.pdf

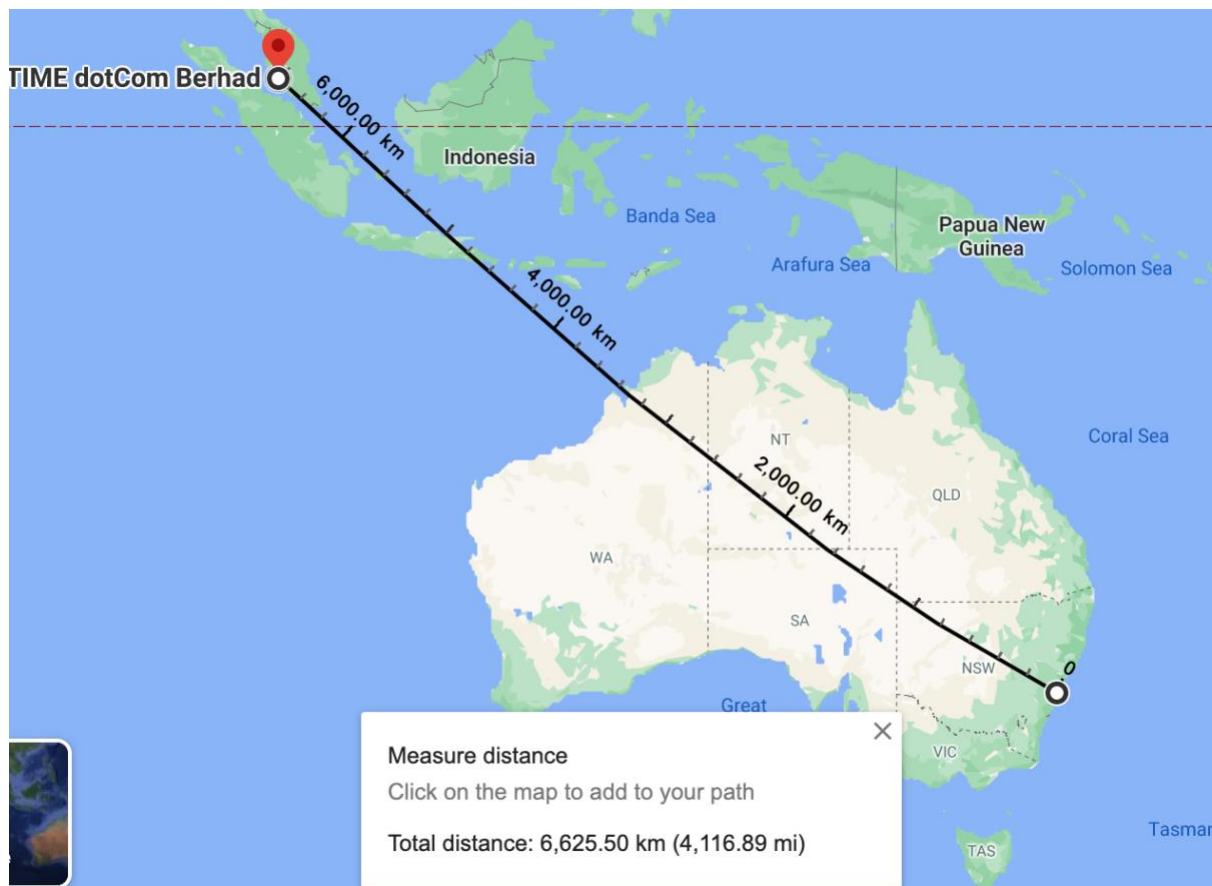


The physical distance between UNSW and UQ from google map is



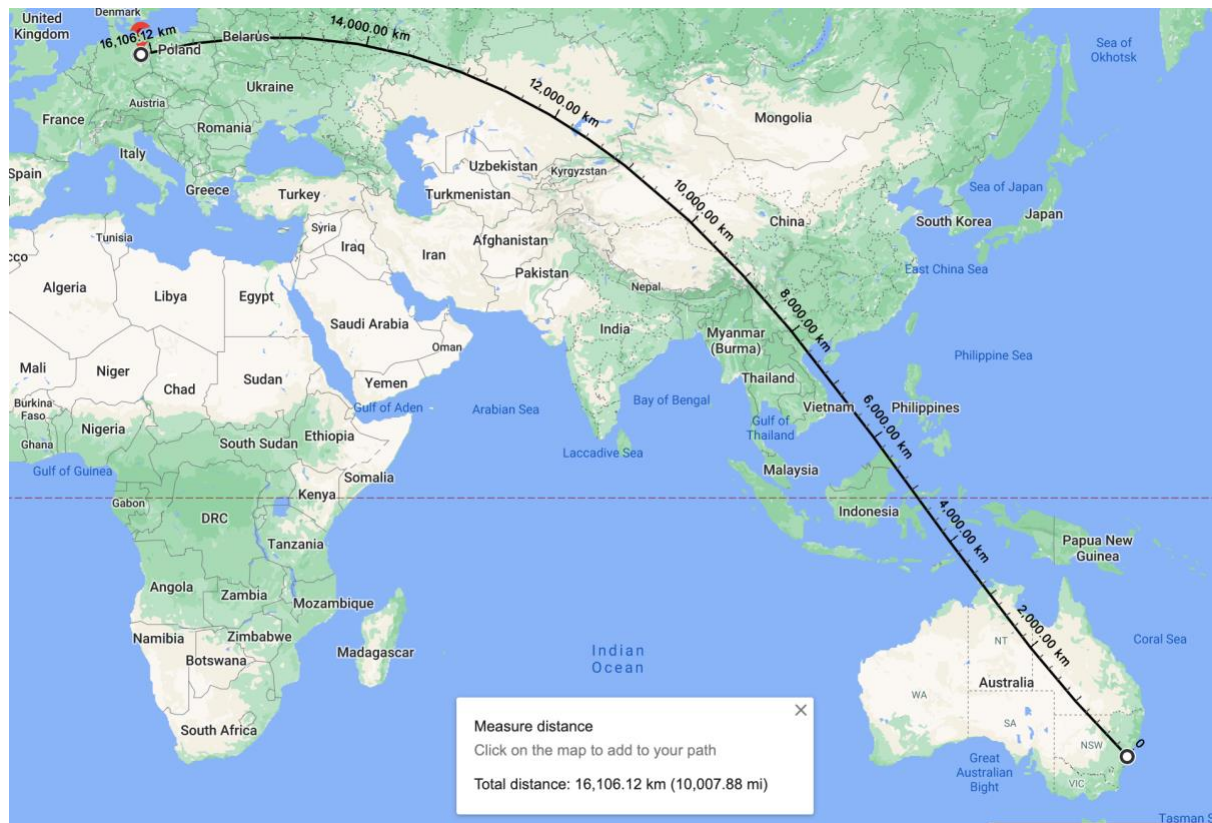
Hence the shortest possible time T is $733910/(3 \times 10^8) = 2.44636666 \text{ ms}$

The physical distance between UNSW and TIME dotCom Berhad from google map is

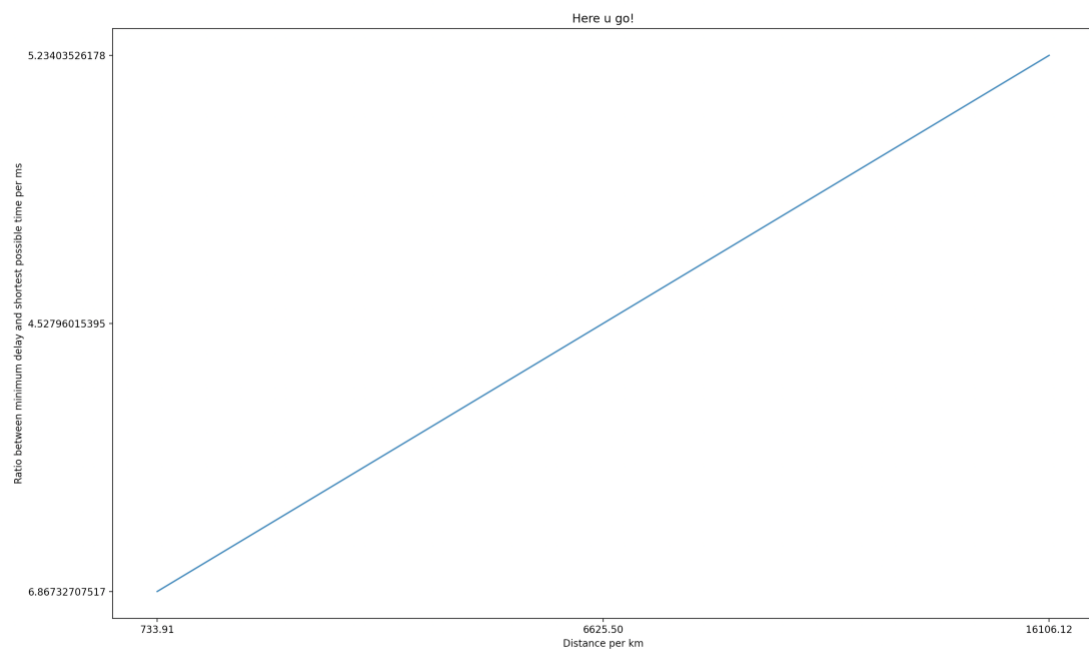


Hence the shortest possible time T is $6625500/(3 \times 10^8) = 22.085 \text{ ms}$

The physical distance between UNSW and Berlin Institute of Technology from google map is



Hence the shortest possible time T is $16106120/(3 \times 10^8) = 53.68706666$ ms



The two reasons are transmission delay and queuing delay

2.

It can vary over time due to the queuing delay.

3.


It is in USA and Canada

```
z5223731@weill:~/Desktop$ nslookup www.epfl.ch
Server:      129.94.242.2
Address:     129.94.242.2#53


Non-authoritative answer:
www.epfl.ch    canonical name = www.epfl.ch.cdn.cloudflare.net.
Name:   www.epfl.ch.cdn.cloudflare.net
Address: 104.20.229.42
Name:   www.epfl.ch.cdn.cloudflare.net
Address: 172.67.2.106
Name:   www.epfl.ch.cdn.cloudflare.net
Address: 104.20.228.42

z5223731@weill:~/Desktop$ █
```


Geolocation data from [IP2Location](#) (Product: DB6, updated on 2020-9-1)

IP Address	Country	Region	City
104.20.229.42	United States of America 	California	San Francisco
ISP	Organization	Latitude	Longitude
CloudFlare Inc.	Not Available	37.7757	-122.3952


Geolocation data from [ipinfo.io](#) (Product: API, real-time)

IP Address	Country	Region	City
104.20.229.42	United States 	New York	New York City
ISP	Organization	Latitude	Longitude
Cloudflare, Inc.	Cloudflare, Inc. (cloudflare.com)	40.7143	-74.0060


Geolocation data from [DB-IP](#) (Product: Full, 2020-9-1)

IP Address	Country	Region	City
104.20.229.42	Canada 	Quebec	Montreal
ISP	Organization	Latitude	Longitude
Cloudflare, Inc.	Cloudflare, Inc.	45.5017	-73.5673


Geolocation data from [ipdata.co](#) (Product: API, real-time)

IP Address	Country	Region	City
104.20.229.42	United States 	Not Available	Not Available
ISP	Organization	Latitude	Longitude
Cloudflare, Inc.	Not Available	37.751	-97.822


Geolocation data from [IP2Location](#) (Product: DB6, updated on 2020-9-1)

IP Address	Country	Region	City
172.67.2.106	United States of America 	California	San Francisco
ISP	Organization	Latitude	Longitude
CloudFlare Inc.	Not Available	37.7757	-122.3952


Geolocation data from [ipinfo.io](#) (Product: API, real-time)

IP Address	Country	Region	City
172.67.2.106	United States 	New York	New York City
ISP	Organization	Latitude	Longitude
Cloudflare, Inc.	Cloudflare, Inc. (cloudflare.com)	40.7143	-74.0060


Geolocation data from [DB-IP](#) (Product: Full, 2020-9-1)

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Geolocation data from [ipdata.co](#) (Product: API, real-time)

IP Address	Country	Region	City
172.67.2.106	United States 	Not Available	Not Available
ISP	Organization	Latitude	Longitude
Not Available	Not Available	37.751	-97.822


Geolocation data from [IP2Location](#) (Product: DB6, updated on 2020-9-1)

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104.20.228.42	United States of America 	California	San Francisco
ISP	Organization	Latitude	Longitude
CloudFlare Inc.	Not Available	37.7757	-122.3952


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IP Address	Country	Region	City
104.20.228.42	United States 	New York	New York City
ISP	Organization	Latitude	Longitude
Cloudflare, Inc.	Cloudflare, Inc. (cloudflare.com)	40.7143	-74.0060

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IP Address	Country	Region	City
104.20.228.42	Canada 	Quebec	Montreal
ISP	Organization	Latitude	Longitude
Cloudflare, Inc.	Cloudflare, Inc.	45.5017	-73.5673

Geolocation data from [ipdata.co](#) (Product: API, real-time)

IP Address	Country	Region	City
104.20.228.42	United States 	Not Available	Not Available
ISP	Organization	Latitude	Longitude
Cloudflare, Inc.	Not Available	37.751	-97.822

4.

Transmission and processing delay depend on the packet size.
Queuing and propagation delay do not.