

COMP3331 WK01 LAB REPORT

z5191546 XIAO XIAOSHAN

Exercise 1:

1. 129.94.242.2 The reason for having serval IP addresses is for DNS side of load balancing and decentralize the requests.

```
z5191546@vx4:/tmp_and/reed/export/reed/3/z5191546$ nslookup cnn.com
Server:      129.94.242.2
Address:     129.94.242.2#53

Non-authoritative answer:
Name:   cnn.com
Address: 151.101.1.67
Name:   cnn.com
Address: 151.101.65.67
Name:   cnn.com
Address: 151.101.129.67
Name:   cnn.com
Address: 151.101.193.67
```

2. Name: localhost. This IP address is a loopback address, which refers to the current computer. It is used to access the network services that are running on the host via loopback network interface.

Exercise 2:

www.unsw.edu.au	yes	N/A
www.getfittest.com.au	no	this website doesn't exist
www.mit.edu	Yes	
www.intel.com.au	yes	
www.tpg.com.au	Yes	
www.hola.hp	No	it's an invalid domain name
www.amazon.com	Yes	
www.tsinghua.edu.cn	yes	
www.kremlin.ru	not reachable by ping command but reachable from web	the host doesn't answer the request.
8.8.8.8	yes	

Exercise 3:

1. a) There are 22 routers between my workstation and www.columbia.edu.
b) Four of them are part of the UNSW network.
c) The 7th and 8th cross the Pacific Ocean since the time results have a huge change.

```

z5191546@vx4:/tmp_and/reed/export/reed/3/z5191546$ 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) 0.094 ms 0.069 ms 0.06
1 ms
 2 129.94.39.17 (129.94.39.17) 0.854 ms 0.855 ms 0.782 ms
 3 libudnex1-v1-3154.gw.unsw.edu.au (149.171.253.34) 1.341 ms ombudnex1-v1-315
4.gw.unsw.edu.au (149.171.253.35) 1.266 ms 1.473 ms
 4 libcr1-po-6.gw.unsw.edu.au (149.171.255.201) 1.138 ms ombcr1-po-6.gw.unsw.e
du.au (149.171.255.169) 1.067 ms 1.081 ms
 5 unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.126 ms unswbr1-te-1-9.gw
.unsw.edu.au (149.171.255.101) 1.159 ms 1.159 ms
 6 138.44.5.0 (138.44.5.0) 1.200 ms 1.295 ms 1.262 ms
 7 et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149) 2.278 ms 2.009 ms
2.031 ms
 8 et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99) 95.070 ms 95.109 ms 95.0
82 ms
 9 et-2-1-0.bdr1.a.sea.aarnet.net.au (113.197.15.201) 146.576 ms 146.550 ms
146.513 ms
10 abilene-1-lo-jmb-706.sttlwa.pacificwave.net (207.231.240.8) 146.707 ms 146
.672 ms 146.781 ms
11 et-4-0-0.4079.rtsw.miss2.net.internet2.edu (162.252.70.0) 157.345 ms 157.4
62 ms 157.307 ms
12 et-4-0-0.4079.rtsw.minn.net.internet2.edu (162.252.70.58) 180.539 ms 180.6
09 ms 180.668 ms
13 et-1-1-5.4079.rtsw.eqch.net.internet2.edu (162.252.70.106) 191.292 ms 188.
349 ms 188.520 ms
14 ae-0.4079.rtsw3.eqch.net.internet2.edu (162.252.70.163) 188.617 ms 188.569
ms 188.550 ms
15 ae-1.4079.rtsw.clev.net.internet2.edu (162.252.70.130) 197.247 ms 197.041
ms 197.032 ms
16 buf-9208-I2-CLEV.nysernet.net (199.109.11.33) 201.361 ms 201.388 ms 201.2
96 ms
17 syr-9208-buf-9208.nysernet.net (199.109.7.193) 204.695 ms 204.727 ms 204.
679 ms
18 nyc-9208-syr-9208.nysernet.net (199.109.7.162) 213.756 ms 213.659 ms 213.
784 ms
19 columbia.nyc-9208.nysernet.net (199.109.4.14) 213.675 ms 213.720 ms 213.7
00 ms
20 cc-core-1-x-nyser32-gw-1.net.columbia.edu (128.59.255.5) 213.949 ms 213.92
1 ms 214.005 ms
21 cc-conc-1-x-cc-core-1.net.columbia.edu (128.59.255.21) 213.950 ms 214.159
ms 214.014 ms
22 cuf.columbia.edu (128.59.105.24) 213.876 ms 213.917 ms 213.906 ms
z5191546@vx4:/tmp_and/reed/export/reed/3/z5191546$ █

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2. i) www.ucla.edu

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z5191546@vx1:/tmp_and/reed/export/reed/3/z5191546$ 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) 0.092 ms 0.068 ms 0.07
0 ms
 2 129.94.39.17 (129.94.39.17) 0.820 ms 0.811 ms 0.782 ms
 3 ombudnex1-v1-3154.gw.unsw.edu.au (149.171.253.35) 1.760 ms 1.752 ms libudn
ex1-v1-3154.gw.unsw.edu.au (149.171.253.34) 1.353 ms
 4 ombcr1-po-5.gw.unsw.edu.au (149.171.255.197) 0.977 ms libcr1-po-5.gw.unsw.e
du.au (149.171.255.165) 1.060 ms libcr1-po-6.gw.unsw.edu.au (149.171.255.201)
1.088 ms
 5 unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.084 ms unswbr1-te-2-13.gw
.unsw.edu.au (149.171.255.105) 1.155 ms 1.108 ms
 6 138.44.5.0 (138.44.5.0) 1.192 ms 1.305 ms 1.238 ms
 7 et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149) 2.079 ms 2.210 ms
2.164 ms
 8 et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99) 95.102 ms 95.104 ms 95.1
69 ms
 9 et-2-1-0.bdr1.a.sea.aarnet.net.au (113.197.15.201) 146.478 ms 146.515 ms
146.465 ms
10 cenichpr-1-is-jmb-778.srvaca.pacificwave.net (207.231.245.129) 163.164 ms
163.402 ms 163.350 ms
11 hpr-lax-hpr3--svl-hpr3-100ge.cenic.net (137.164.25.73) 160.002 ms 159.962
ms 159.958 ms
12 * * *
13 bd11f1.anderson--cr001.anderson.ucla.net (169.232.4.6) 160.382 ms 160.421
ms 160.403 ms
14 cr00f1.anderson--dr00f2.csb1.ucla.net (169.232.4.55) 160.464 ms 160.279 ms
cr00f2.csb1--dr00f2.csb1.ucla.net (169.232.4.53) 160.176 ms
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30 * * *
z5191546@vx1:/tmp_and/reed/export/reed/3/z5191546$ █

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ii) www.u-tokyo.ac.jp

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z5191546@vx1:/tmp_and/reed/export/reed/3/z5191546$ 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) 0.117 ms 0.098 ms 0.073 ms
 2 129.94.39.17 (129.94.39.17) 0.793 ms 0.850 ms 0.848 ms
 3 libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34) 1.395 ms ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34) 1.531 ms 1.522 ms
 4 ombcr1-po-5.gw.unsw.edu.au (149.171.255.197) 1.082 ms 1.086 ms ombcr1-po-6.gw.unsw.edu.au (149.171.255.197) 1.105 ms
 5 unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.259 ms unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.101) 1.249 ms unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.105 ms
 6 138.44.5.0 (138.44.5.0) 1.288 ms 1.315 ms 1.272 ms
 7 et-0-3-0.pe1.bkvl.nsw.aarnet.net.au (113.197.15.147) 1.756 ms 1.765 ms 1.745 ms
 8 ge-4-0-0.bb1.a.pao.aarnet.net.au (202.158.194.177) 156.011 ms 156.009 ms 155.991 ms
 9 paloalto0.iiij.net (198.32.176.24) 157.432 ms 157.466 ms 157.497 ms
10 osk004bb00.IIJ.Net (58.138.88.185) 267.377 ms 267.388 ms 267.430 ms
11 osk004ix51.IIJ.Net (58.138.106.130) 268.710 ms 268.703 ms osk004ix51.IIJ.Net (58.138.106.126) 267.016 ms
12 210.130.135.130 (210.130.135.130) 270.526 ms 270.490 ms 269.877 ms
13 124.83.228.58 (124.83.228.58) 270.454 ms 271.781 ms 270.915 ms
14 124.83.252.178 (124.83.252.178) 274.920 ms 274.716 ms 276.620 ms
15 158.205.134.26 (158.205.134.26) 272.950 ms 273.009 ms 274.785 ms
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z5191546@vx1:/tmp_and/reed/export/reed/3/z5191546$

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iii) www.lancaster.ac.uk

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z5191546@vx1:/tmp_and/reed/export/reed/3/z5191546$ 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) 0.083 ms 0.061 ms 0.069 ms
 2 129.94.39.17 (129.94.39.17) 0.814 ms 0.812 ms 0.828 ms
 3 libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34) 2.297 ms 2.229 ms 2.232 ms
 4 ombcr1-po-5.gw.unsw.edu.au (149.171.255.197) 1.044 ms libcr1-po-5.gw.unsw.edu.au (149.171.255.165) 1.044 ms ombcr1-po-5.gw.unsw.edu.au (149.171.255.197) 1.042 ms
 5 unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.148 ms unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.210 ms 1.131 ms
 6 138.44.5.0 (138.44.5.0) 1.229 ms 1.196 ms 1.210 ms
 7 et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149) 2.039 ms 2.141 ms 2.028 ms
 8 et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99) 94.994 ms 95.037 ms 94.900 ms
 9 et-2-1-0.bdr1.a.sea.aarnet.net.au (113.197.15.201) 146.545 ms 146.539 ms 146.514 ms
10 abilene-1-lo-jmb-706.sttlwa.pacificwave.net (207.231.240.8) 146.626 ms 146.579 ms 146.589 ms
11 et-4-0-0.4079.rtsw.miss2.net.internet2.edu (162.252.70.0) 157.603 ms 157.515 ms 157.302 ms
12 et-4-0-0.4079.rtsw.minn.net.internet2.edu (162.252.70.58) 182.469 ms 182.192 ms 182.269 ms
13 et-1-1-5.4079.rtsw.eqch.net.internet2.edu (162.252.70.106) 188.517 ms 194.780 ms 194.767 ms
14 ae-0.4079.rtsw3.eqch.net.internet2.edu (162.252.70.163) 189.275 ms 188.720 ms 188.670 ms
15 ae-1.4079.rtsw.clev.net.internet2.edu (162.252.70.130) 197.470 ms 197.295 ms 197.555 ms
16 ae-0.4079.rtsw.ashb.net.internet2.edu (162.252.70.128) 296.285 ms 285.441 ms 285.306 ms
17 ae-2.4079.rtsw2.ashb.net.internet2.edu (162.252.70.75) 205.955 ms 206.571 ms 206.686 ms
18 ae-2.4079.rtsw.wash.net.internet2.edu (162.252.70.136) 205.114 ms 205.297 ms 205.166 ms
19 internet2-gw.mx1.lon.uk.geant.net (62.40.124.44) 279.877 ms 279.829 ms 298.089 ms
20 janet-gw.mx1.lon.uk.geant.net (62.40.124.198) 280.023 ms 279.947 ms 279.931 ms
21 ae29.londpg-sbr2.ja.net (146.97.33.2) 280.373 ms 280.487 ms 280.408 ms
22 ae31.erdiss-sbr2.ja.net (146.97.33.22) 284.349 ms 285.726 ms 284.219 ms
23 ae29.manckh-sbr2.ja.net (146.97.33.42) 286.511 ms 286.457 ms 286.173 ms
24 ae24.lanclu-rbr1.ja.net (146.97.38.58) 288.561 ms 288.463 ms 288.426 ms
25 lancaster-university.ja.net (194.81.46.2) 302.359 ms 368.992 ms 368.968 ms
26 * * *
27 ismx-issrx.rtr.lancs.ac.uk (148.88.255.17) 290.433 ms 290.016 ms 289.960 ms
28 iss-servers.iscore01-ismx01.rtr.lancs.ac.uk (148.88.7.137) 294.765 ms 292.169 ms 292.026 ms
29 * * *
30 www.lancs.ac.uk (148.88.65.80) 290.297 ms !X 290.041 ms !X 290.323 ms !X

```

- The paths diverge at the router 113.197.15.99, this router belongs to the AARNet Network Operations Centre.
- Hops to UCLA: 14 hops for 8254.4 miles
Hops to UTOKYO: 15 hops for 4369.9 miles
Hops to LANCASTER 30 hops for 9542.7 miles

As we can see, it takes 15 hops to arrive UTOCKYO, which has the shortest distance from Sydney, but it takes only 14 hops to UCLA, which has almost twice the distance as UTOCKYO. It can be concluded that the numbers of hops on each path is not proportional the physical distance.

3. i) www.speedtest.com.sg
from server to my machine

Traceroute Result:

```

traceroute to 203.121.216.79 (203.121.216.79), 30 hops max, 60 byte packets
 1  ge2-8.r01.sin01.ne.com.sg (202.150.221.169)  0.152 ms  0.144 ms  0.141 ms
 2  10.15.62.210 (10.15.62.210)  0.285 ms  0.322 ms  0.321 ms
 3  4826.sgw.equinox.com (27.111.228.74)  1.230 ms  1.307 ms  1.389 ms
 4  BE-100.cor01.per04.wa.VOCUS.net.au (114.31.206.50)  119.056 ms BE-200.cor01.per02.wa.VOCUS.net.au (114.31.206.9
 5  BE-1.cor03.per02.wa.VOCUS.net.au (114.31.206.44)  143.854 ms BE-102.cor01.syd11.nsw.VOCUS.net.au (114.31.206.12
 6  ten-1-0-0-5.bdr01.per02.wa.VOCUS.net.au (114.31.206.49)  147.691 ms  147.178 ms be-111.bdr01.syd04.nsw.vocus.ne
 7  as45763.cust.bdr03.syd04.nsw.VOCUS.net.au (175.45.107.82)  145.140 ms  152.782 ms  152.945 ms
 8  * be-111.bdr01.syd04.nsw.vocus.net.au (175.45.72.33)  119.118 ms *
 9  as45763.cust.bdr03.syd04.nsw.VOCUS.net.au (175.45.107.82)  153.091 ms  144.481 ms *
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```

Traceroute Completed.

From my machine to server

```

z5191546@vx1:/tmp_and/reed/export/reed/3/z5191546$ 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)  0.074 ms  0.052 ms  0.061 ms
 2  129.94.39.17 (129.94.39.17)  0.793 ms  0.806 ms  0.754 ms
 3  libudnex1-v1-3154.gw.unsw.edu.au (149.171.253.34)  1.684 ms  1.644 ms  1.634 ms
 4  ombcr1-po-6.gw.unsw.edu.au (149.171.255.169)  1.180 ms  1.111 ms  1.094 ms
 5  unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101)  1.110 ms  1.145 ms unswbr1-te-2-13.gw.unsw.edu.au (149.17
1.255.105)  1.045 ms
 6  138.44.5.0 (138.44.5.0)  1.195 ms  1.319 ms  1.292 ms
 7  et-0-3-0.pe1.alxd.nsw.aarnet.net.au (113.197.15.153)  1.618 ms  1.864 ms  1.741 ms
 8  xe-0-2-1-204.pe1.unpa.alxd.aarnet.net.au (113.197.15.183)  24.218 ms  24.193 ms xe-0-0-3.pe1.unpa.ak1.aarn
et.net.au (113.197.15.67)  24.155 ms
 9  et-0-1-0.200.pe1.tkpa.ak1.aarnet.net.au (113.197.15.69)  24.410 ms  24.411 ms  24.447 ms
10  xe-0-2-6.bdr1.a.lax.aarnet.net.au (202.158.194.173)  147.820 ms  147.772 ms  147.775 ms
11  singtel.as7473.any2ix.coresite.com (206.72.210.63)  147.930 ms  147.850 ms  147.832 ms
12  203.208.171.117 (203.208.171.117)  148.101 ms 203.208.172.133 (203.208.172.133)  331.985 ms 203.208.172.16
5 (203.208.172.165)  325.545 ms
13  203.208.171.85 (203.208.171.85)  271.743 ms 203.208.182.77 (203.208.182.77)  265.886 ms 203.208.177.110 (2
03.208.177.110)  328.928 ms
14  203.208.182.253 (203.208.182.253)  321.082 ms * 323.237 ms
15  202-150-221-170.rev.ne.com.sg (202.150.221.170)  237.740 ms 203.208.177.110 (203.208.177.110)  324.170 ms
202-150-221-170.rev.ne.com.sg (202.150.221.170)  233.151 ms
z5191546@vx1:/tmp_and/reed/export/reed/3/z5191546$

```

- ii) www.telstra.net

From server to my machine

```

 1  gigabitethernet3-3.exil.melbourne.telstra.net (203.50.77.49)  98.854 ms  1.768 ms  1.114 ms
 2  bundle-ether3-100.exi-core10.melbourne.telstra.net (203.50.80.1)  0.989 ms  1.665 ms  2.115 ms
 3  bundle-ether1.lon-edge902.melbourne.telstra.net (203.50.11.112)  1.241 ms  0.791 ms  0.867 ms
 4  voc1255684.lnk.telstra.net (139.130.110.30)  1.242 ms  1.291 ms  0.992 ms
 5  BE-150.cor02.mel11.vic.VOCUS.net.au (114.31.196.56)  12.235 ms
 6  be200.lsr01.melb.vic.vocus.network (103.1.77.32)  12.785 ms
 7  be802.lsr01.dody.nsw.vocus.network (103.1.76.148)  12.411 ms  12.412 ms  12.485 ms
 8  be-220.cor02.syd04.nsw.vocus.net.au (103.1.77.17)  11.861 ms  11.786 ms  11.860 ms
 9  bundle-110.bdr01.syd04.nsw.vocus.net.au (175.45.72.31)  11.988 ms
10  as45763.cust.bdr03.syd04.nsw.VOCUS.net.au (175.45.107.82)  26.228 ms  26.029 ms  20.979 ms

```


From my machine to server

```
z5191546@vx1:/tmp_amd/reed/export/reed/3/z5191546$ 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) 0.070 ms 0.058 ms 0.052 ms
 2 129.94.39.17 (129.94.39.17) 0.863 ms 0.843 ms 0.801 ms
 3 libudnex1-v1-3154.gw.unsw.edu.au (149.171.253.34) 2.547 ms ombudnex1-v1-3154.gw.unsw.edu.au (149.171.253.
35) 1.512 ms libudnex1-v1-3154.gw.unsw.edu.au (149.171.253.34) 2.476 ms
 4 ombcr1-po-6.gw.unsw.edu.au (149.171.255.169) 1.100 ms 1.105 ms libcr1-po-6.gw.unsw.edu.au (149.171.255.2
01) 1.053 ms
 5 unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.130 ms 1.134 ms 1.117 ms
 6 138.44.5.0 (138.44.5.0) 1.264 ms 1.292 ms 1.289 ms
 7 et-0-3-0.pe1.alxd.nsw.aarnet.net.au (113.197.15.153) 2.121 ms 1.429 ms 1.427 ms
 8 ae9.bb1.b.syd.aarnet.net.au (113.197.15.65) 1.808 ms 1.860 ms 1.779 ms
 9 gigabitethernet1-1.pe1.b.syd.aarnet.net.au (202.158.202.18) 1.903 ms 1.855 ms 1.872 ms
10 gigabitethernet3-11.ken37.sydney.telstra.net (139.130.0.77) 2.417 ms 2.459 ms 2.523 ms
11 bundle-ether2.chw-edge901.sydney.telstra.net (203.50.11.103) 2.390 ms bundle-ether13.ken-core10.sydney.te
lstra.net (203.50.11.94) 4.123 ms bundle-ether2.chw-edge901.sydney.telstra.net (203.50.11.103) 2.500 ms
12 bundle-ether13.chw-core10.sydney.telstra.net (203.50.11.98) 3.901 ms bundle-ether10.win-core10.melbourne.
telstra.net (203.50.11.123) 14.701 ms bundle-ether13.chw-core10.sydney.telstra.net (203.50.11.98) 3.007 ms
13 bundle-ether8.exi-core10.melbourne.telstra.net (203.50.11.125) 16.033 ms 203.50.6.40 (203.50.6.40) 15.76
0 ms 15.755 ms
14 bundle-ether2.exi-nprouter101.melbourne.telstra.net (203.50.11.209) 17.606 ms 15.255 ms 14.787 ms
15 www.telstra.net (203.50.5.178) 14.286 ms 14.198 ms 14.163 ms
z5191546@vx1:/tmp_amd/reed/export/reed/3/z5191546$
```

I choose www.speedtest.com.sg and www.telstra.net.

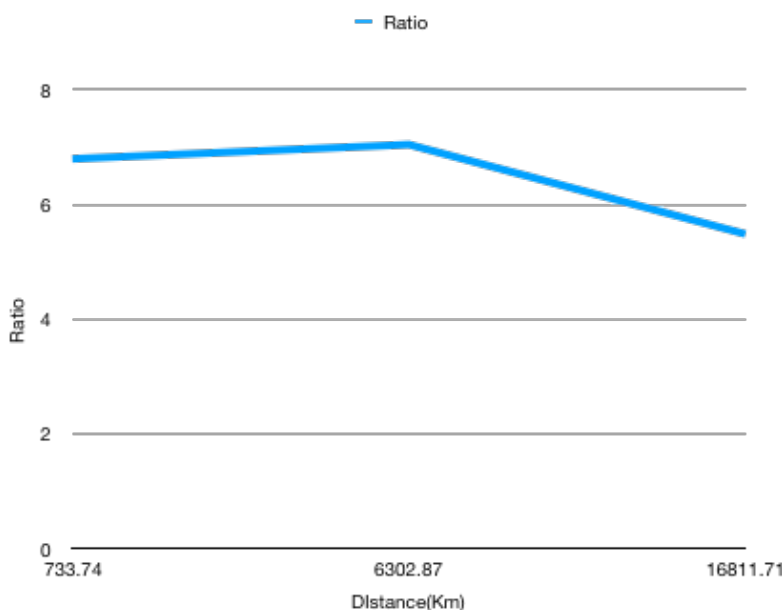
- The reverse path does not go through the same routers as the forward path.
- This is likely because the best path from server to home is not the same as the best path from home to server.

Exercise 4:

- Assume that packet moves at the speed 3×10^8 m/s

(Approximate) physical distance from UNSW	Shortest possible time - T	Minimum delay
University of Queensland: 733.74km	$2.4458 \times 10^{-3} \text{s} = 2.45 \text{ms}$	16.679ms
DBS Band – Singapore: 6307.87km	$2.1026 \times 10^{-2} \text{s} = 21 \text{ms}$	148.149ms
Technical University of Berlin: 16811.71km	$5.6039 \times 10^{-2} \text{s} = 56 \text{ms}$	307.307ms

(All output graphs in the Appendix)



Reasons for the y-axis values in the plot are greater than 2:

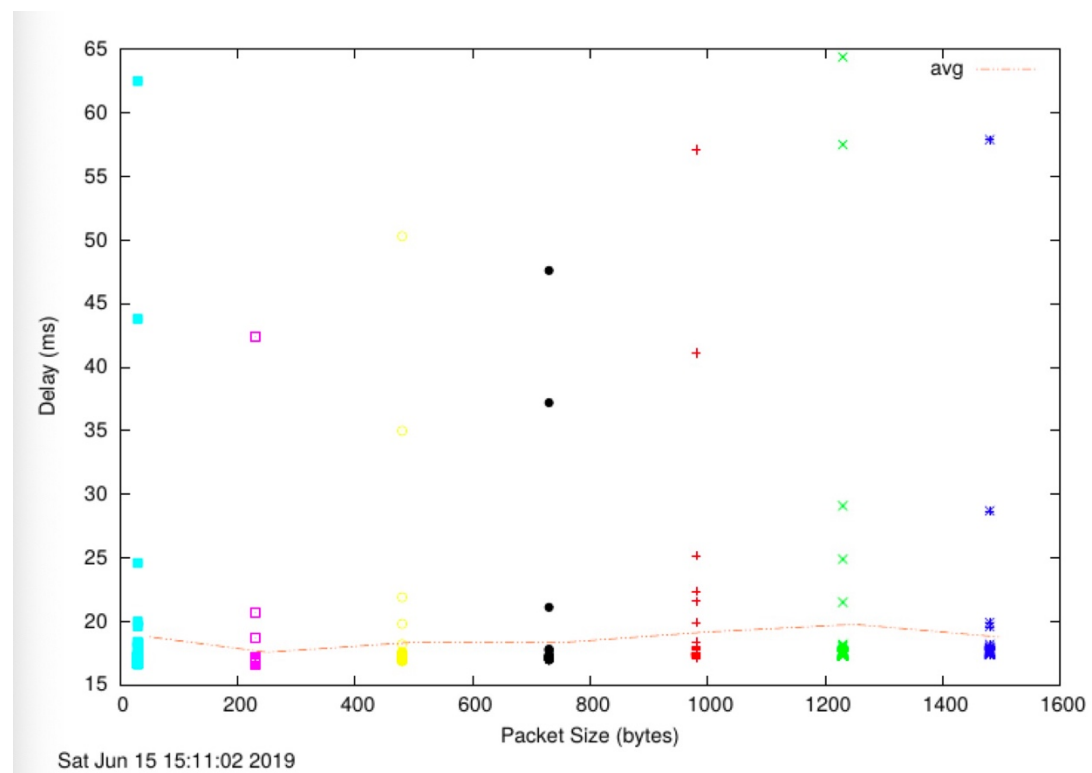
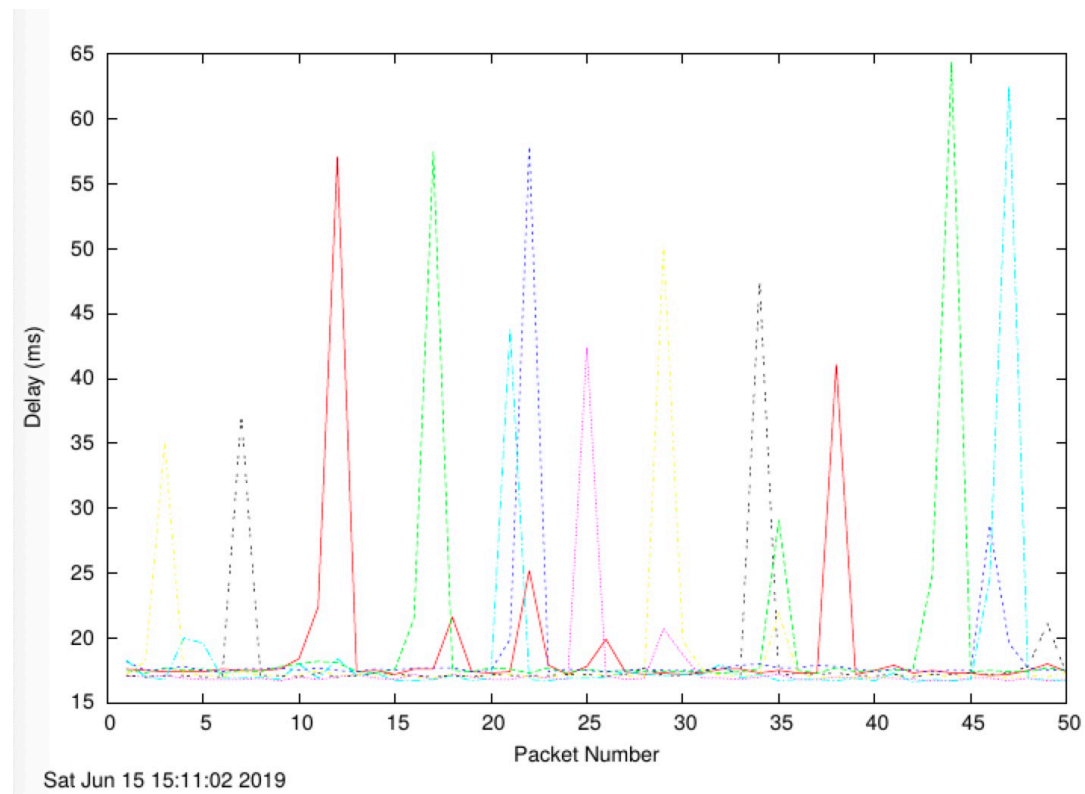
a) The RTT is the length of time it takes for a data packet to be sent plus the length of time it takes for receiving a response. RTT would at least be twice as big as T since T is the shortest time it takes to reach the destination. Moreover, the delay consists of processing, queueing, propagation and transmission, the other three delay cannot always be zero. Therefore, the y-axis would be always greater than 2.

b) The wire in the real world cannot be the same as the shortest path of two places.

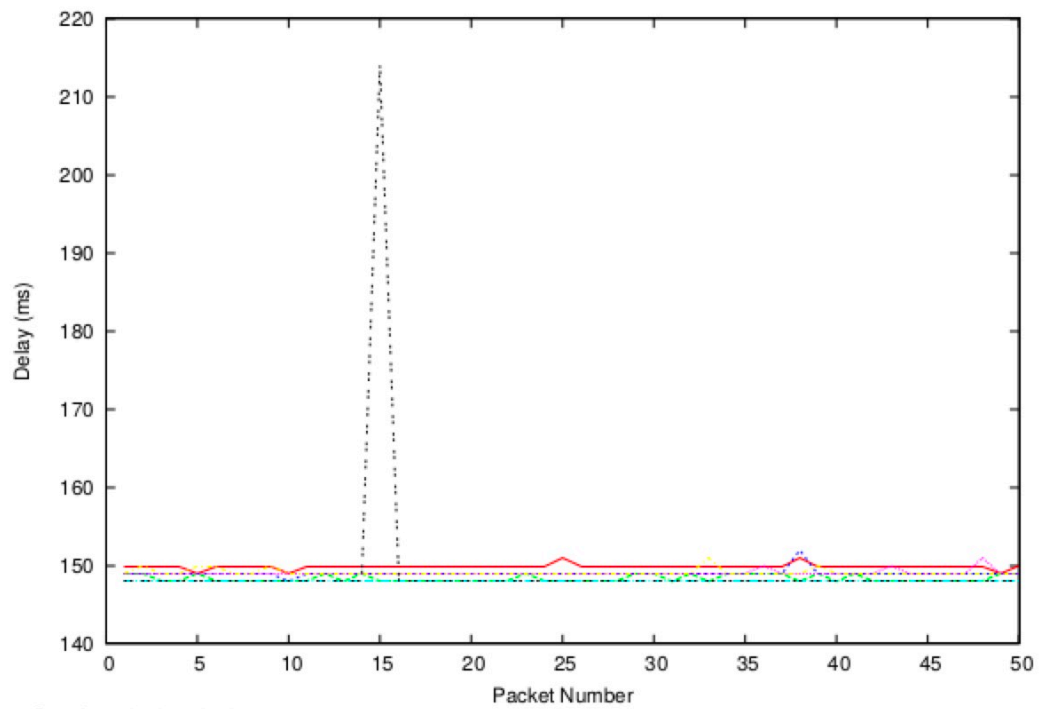
2. Delay to the destinations seems to be vary over time, since there is a different queueing delay when the packet goes through the same router each time.
4. Using ping command for the website www.epfl.ch can find that the average RTT is around 1.3ms, which means it cannot be hosted in Switzerland, if the website is hosted in Switzerland, the RTT should be much larger than 1.3ms
5. Transmission delay depends on packet size, because it is the amount of time required to push all the data into the wire, it is proportional to the size of the data. Propagation, processing and queueing delay is not depending on packet size. Specifically, propagation delay depends on the speed of light, queueing delay depends on how many packets are there in the system, processing delay depends on the errors in the packet.

Appendix

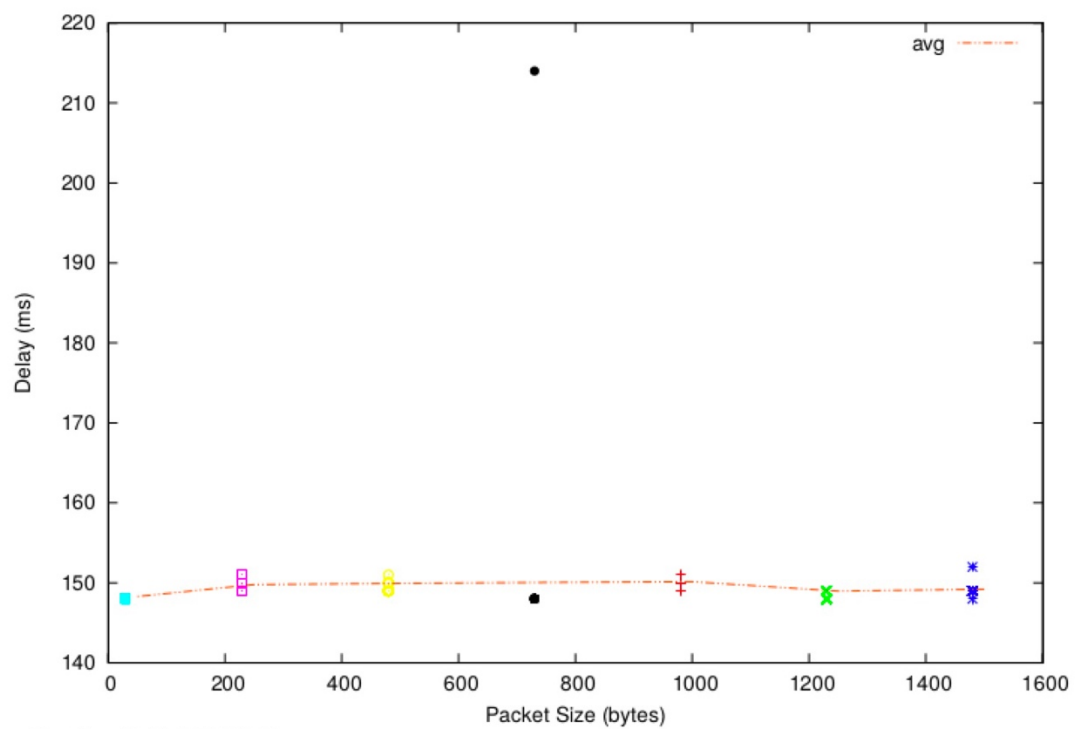
1. www.uq.edu.au



2. dbs.com.sg



Sun Jun 16 11:47:25 2019



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3. www.tu-berlin.de

