

Exercise 1 :

<http://www.cancercouncil.org.au/>

<http://www.hola.hp/>

This web page is not available.

www.kremlin.ru

can visit, cannot ping and receive the packet

because of security reason, although website receive the packet, it rejects to reponse to ping packet, due to ICMP

other website can visit normally.

Exercise 2:

Question1:

```
z5103407@bongo19:~$ traceroute www.nyu.edu
traceroute to www.nyu.edu (216.165.47.12), 30 hops max, 60 byte packets
 1 cserouter1-trusted.cse.unsw.EDU.AU (129.94.208.251) 0.201 ms 0.172 ms 0.151 ms
 2 129.94.39.17 (129.94.39.17) 1.175 ms 1.143 ms 1.137 ms
 3 libudnex1-vl-3154.gw.unsw.edu.au (149.171.253.34) 1.456 ms 1.971 ms 1.930 ms
 4 ombcr1-po-6.gw.unsw.edu.au (149.171.255.169) 1.317 ms libcr1-po-6.gw.unsw.edu.au (149.171.255.201) 1.278 ms
 5 unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.289 ms unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.289 ms
 6 138.44.5.0 (138.44.5.0) 1.408 ms 1.589 ms 1.568 ms
 7 et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149) 2.294 ms 2.303 ms 2.244 ms
 8 et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99) 95.386 ms 95.324 ms 95.355 ms
 9 et-2-1-0.bdr1.a.sea.aarnet.net.au (113.197.15.201) 146.875 ms 146.918 ms 146.891 ms
10 abilene-1-lo-jmb-706.sttlwa.pacificwave.net (207.231.240.8) 146.656 ms 146.670 ms 146.638 ms
11 et-4-0-0.4079.sdn-sw.miss2.net.internet2.edu (162.252.70.0) 157.196 ms 157.143 ms 157.162 ms
12 et-4-0-0.4079.sdn-sw.minn.net.internet2.edu (162.252.70.58) 180.375 ms 180.393 ms 180.311 ms
13 et-7-0-0.4079.sdn-sw.eqch.net.internet2.edu (162.252.70.106) 188.306 ms 188.387 ms 188.372 ms
14 et-2-3-0.4079.rtsw.clev.net.internet2.edu (162.252.70.130) 197.810 ms 197.067 ms 197.044 ms
15 buf-9208-I2-CLEV.nysernet.net (199.109.11.33) 201.423 ms 201.370 ms 201.314 ms
16 syr-9208-buf-9208.nysernet.net (199.109.7.193) 204.727 ms 204.578 ms 204.568 ms
17 nyc-9208-syr-9208.nysernet.net (199.109.7.162) 210.522 ms 210.627 ms 210.536 ms
18 199.109.5.6 (199.109.5.6) 210.564 ms 210.842 ms 210.678 ms
19 DMZGWA-PTP-EXTGWA.NET.NYU.EDU (128.122.254.65) 211.032 ms 211.047 ms 210.893 ms
20 NYUCWA-PTP-DMZGWA-NGFW.NET.NYU.EDU (128.122.254.108) 210.800 ms 210.834 ms 210.755 ms
21 NYUFW-OUTSIDE-NGFW.NET.NYU.EDU (128.122.254.116) 211.281 ms 211.402 ms 211.320 ms
22 * * *
23 WSQDCGWA-VL902.NET.NYU.EDU (128.122.1.38) 211.791 ms 211.720 ms 211.806 ms
24 * * *
25 * * *
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29 * * *
30 * * *
```

geophysical location



network info

IP Address
138.44.5.0

Base Domain
138.44.5.0

Country
Australia 🇦🇺

Region
Unknown

City
Unknown

Latitude
-27

geophysical location



network information

IP Address
207.231.240.8

Base Domain
pacificwave.net

Country
United States 🇺🇸

Region
CA

City
Los Angeles

routers>=23 (include 1-21,23 and destination)

from IP address, it shows there are 5 routers in UNSW(138.44.5.0 is not in UNSW)

if depends on number of ping's change, between route 7 and 8 is Pacific Ocean. However, the truth is route 9 in AU and route 10 in USA.

Question 2:

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z5103407@bongo19:~$ traceroute www.lancaster.ac.uk
traceroute to www.lancaster.ac.uk (148.88.2.80), 30 hops max, 60 byte packets
 1  cserouter1-trusted.cse.unsw.edu.au (129.94.208.251) 0.193 ms 0.167 ms 0.149 ms
 2  129.94.39.17 (129.94.39.17) 1.018 ms 1.021 ms 1.034 ms
 3  libudnex1-v1-3154.gw.unsw.edu.au (149.171.253.34) 1.755 ms 1.790 ms 2.041 ms
 4  ombcr1-po-6.gw.unsw.edu.au (149.171.255.169) 1.178 ms libcr1-po-5.gw.unsw.edu.au (149.171.255.165)
 5  unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 5.359 ms 5.305 ms 5.327 ms
 6  138.44.5.0 (138.44.5.0) 1.449 ms 1.366 ms 1.405 ms
 7  et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149) 2.375 ms 2.570 ms 2.568 ms
 8  et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99) 95.314 ms 95.151 ms 95.135 ms
 9  et-2-1-0.bdr1.a.sea.aarnet.net.au (113.197.15.201) 146.394 ms 146.343 ms 146.364 ms
10  abilene-1-lo-jmb-706.sttlwa.pacificwave.net (207.231.240.8) 146.503 ms 146.489 ms 146.461 ms
11  et-4-0-0.4079.sdn-sw.miss2.net.internet2.edu (162.252.70.0) 157.221 ms 157.014 ms 157.153 ms
12  et-4-0-0.4079.sdn-sw.minn.net.internet2.edu (162.252.70.58) 180.421 ms 180.453 ms 180.444 ms
13  et-7-0-0.4079.sdn-sw.eqch.net.internet2.edu (162.252.70.106) 188.243 ms 188.297 ms 188.214 ms
14  et-4-1-0.4079.rtsw.clev.net.internet2.edu (162.252.70.112) 197.071 ms 197.308 ms 197.222 ms
15  et-2-0-0.4079.sdn-sw.ashb.net.internet2.edu (162.252.70.54) 204.767 ms 204.578 ms 204.547 ms
16  et-8-1-0.4079.rtsw.wash.net.internet2.edu (162.252.70.67) 204.822 ms 205.077 ms 204.996 ms
17  internet2-gw.mx1.lon.uk.geant.net (62.40.124.44) 279.660 ms 279.720 ms 279.787 ms
18  janet-gw.mx1.lon.uk.geant.net (62.40.124.198) 279.775 ms 280.168 ms 279.909 ms
19  ae29.londpg-sbr2.ja.net (146.97.33.2) 280.211 ms 280.463 ms 280.419 ms
20  ae31.erdiss-sbr2.ja.net (146.97.33.22) 284.054 ms 284.064 ms 284.230 ms
21  ae29.manckh-sbr1.ja.net (146.97.33.42) 286.032 ms 285.969 ms 285.696 ms
22  cnl.manckh-sbr1.ja.net (146.97.41.54) 288.238 ms 288.153 ms 288.286 ms
23  * * *
24  ismx-issrx.rtr.lancs.ac.uk (148.88.255.17) 290.097 ms 289.969 ms 289.808 ms
25  dc.iss.srv.rtrcloud.lancs.ac.uk (148.88.253.3) 310.092 ms 308.526 ms 308.371 ms
26  www-ha.lancs.ac.uk (148.88.2.80) 289.666 ms 289.688 ms 289.598 ms
```



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z5103407@bongo19:~$ traceroute www.u-tokyo.ac.jp
traceroute to www.u-tokyo.ac.jp (210.152.135.178), 30 hops max, 60 byte packets
 1 cserouter1-trusted.cse.unsw.EDU.AU (129.94.208.251) 0.206 ms 0.178 ms 0.161 ms
 2 129.94.39.17 (129.94.39.17) 1.025 ms 0.984 ms 1.074 ms
 3 libudhex1-vl-3154.gw.unsw.edu.au (149.171.253.34) 6.143 ms 6.119 ms 6.065 ms
 4 libcr1-po-5.gw.unsw.edu.au (149.171.255.165) 1.288 ms 1.346 ms libcr1-po-6.gw.unsw.edu.au (149.171.255.163) 1.341 ms
 5 unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.382 ms 1.412 ms 1.451 ms
 6 138.44.5.0 (138.44.5.0) 1.634 ms 1.627 ms 1.725 ms
 7 et-0-3-0.pe1.bkvl.nsw.aarnet.net.au (113.197.15.147) 2.248 ms 2.687 ms 2.648 ms
 8 ge-4_0_0.bb1.a.pao.aarnet.net.au (202.158.194.177) 156.828 ms 156.846 ms 156.824 ms
 9 palcalto0.iiij.net (198.32.176.24) 158.596 ms 158.649 ms 158.512 ms
10 osk004bb01.IIJ.Net (58.138.88.189) 272.079 ms 272.091 ms osk004bb00.IIJ.Net (58.138.88.185) 291.032 ms
11 osk004ix51.IIJ.Net (58.138.106.126) 291.032 ms 290.985 ms 290.986 ms
12 210.130.135.130 (210.130.135.130) 281.235 ms 281.195 ms 271.832 ms
13 124.83.228.78 (124.83.228.78) 291.642 ms 281.331 ms 290.803 ms
14 124.83.252.250 (124.83.252.250) 287.899 ms 278.178 ms 287.680 ms
15 158.205.134.26 (158.205.134.26) 287.730 ms 287.645 ms 297.284 ms
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29 * * *
30 * * *

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z5103407@bongo19:~$ traceroute www.ucla.edu
traceroute to www.ucla.edu (164.67.228.152), 30 hops max, 60 byte packets
 1 cserouter1-trusted.cse.unsw.EDU.AU (129.94.208.251) 0.214 ms 0.186 ms 0.169 ms
 2 129.94.39.17 (129.94.39.17) 1.189 ms 1.175 ms 1.139 ms
 3 ombudhex1-vl-3154.gw.unsw.edu.au (149.171.253.35) 2.086 ms 2.044 ms 2.046 ms
 4 libcr1-po-6.gw.unsw.edu.au (149.171.255.201) 1.215 ms ombcr1-po-6.gw.unsw.edu.au (149.171.255.163) 1.341 ms
 5 unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.341 ms 1.342 ms unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101) 1.498 ms
 6 138.44.5.0 (138.44.5.0) 1.528 ms 1.421 ms 1.498 ms
 7 et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149) 5.043 ms 4.211 ms 4.325 ms
 8 et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99) 95.334 ms 95.359 ms 95.334 ms
 9 et-2-1-0.bdri.a.sea.aarnet.net.au (113.197.15.201) 146.619 ms 146.596 ms 146.541 ms
10 cenichpr-1-is-jmb-778.snvac.pacificwave.net (207.231.245.129) 163.030 ms 163.397 ms 163.320 ms
11 hpr-lax-hpr3-svl-hpr3-100ge.cenic.net (137.164.25.73) 171.201 ms 171.217 ms 171.206 ms
12 * * *
13 bd11f1.anderson-cr001.anderson.ucla.net (169.232.4.6) 171.401 ms bd11f1.anderson-cr00f2.csbi.ucla.net (169.232.4.55) 172.972 ms
14 cr00f1.anderson-dr00f2.csbi.ucla.net (169.232.4.55) 172.972 ms 171.601 ms cr00f2.csbi-dr00f2.csbi.ucla.net (169.232.4.55) 171.601 ms
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```

at least 7 hops are the same during the path, from 1-7, although some routers have different url, IP address is similar in these url, for example, 113.197.15.147 in www.u-tokyo.ac.jp and 113.197.15.149 in www.ucla.edu, these two IP are in same router, because only the last part of IP is different. The number of hops on each path is not proportional the physical distance, overseas visit will just cover several hops and local visit will cover many hops.

Question 3:

Enter the desired destination host.domain or IPv4 or IPv6 address:

```
1 gigabitethernet3-3.exi2.melbourne.telstra.net (203.50.77.53) 0.346 ms 0.205 ms 0.237
2 bundle-ether3-100.win-core10.melbourne.telstra.net (203.50.80.129) 1.489 ms 1.477 ms
3 bundle-ether12.ken-core10.sydney.telstra.net (203.50.11.122) 12.856 ms 12.100 ms 12.8
4 bundle-ether1.ken-edge901.sydney.telstra.net (203.50.11.95) 11.863 ms 11.974 ms 11.98
5 aarnet6.lnk.telstra.net (139.130.0.78) 13.484 ms 11.726 ms 11.610 ms
6 ge-6-0-0.bb1.a.syd.aarnet.net.au (202.158.202.17) 11.860 ms 11.725 ms 11.735 ms
7 ae9.pe2.brwy.nsw.aarnet.net.au (113.197.15.56) 12.111 ms 11.974 ms 12.109 ms
8 et-3-1-0.pe1.brwy.nsw.aarnet.net.au (113.197.15.146) 12.109 ms 12.098 ms 12.111 ms
9 138.44.5.1 (138.44.5.1) 12.361 ms 12.353 ms 12.360 ms
10 libcr1-te-1-5.gw.unsw.edu.au (149.171.255.102) 12.361 ms 12.349 ms 12.236 ms
11 libudnex1-po-1.gw.unsw.edu.au (149.171.255.166) 12.734 ms 12.725 ms
12 ufw1-ae-1-3154.gw.unsw.edu.au (149.171.253.36) 12.846 ms 12.847 ms 12.859 ms
13 129.94.39.23 (129.94.39.23) 12.986 ms 12.976 ms 12.984 ms
```

```
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) 0.148 ms 0.141 ms 0.129
ms
2 129.94.39.17 (129.94.39.17) 1.008 ms 0.986 ms 1.088 ms
3 ombudnex1-vl-3154.gw.unsw.edu.au (149.171.253.35) 4.582 ms libudnex1-vl-3154
.gw.unsw.edu.au (149.171.253.34) 1.675 ms 1.437 ms
4 ombcr1-po-6.gw.unsw.edu.au (149.171.255.169) 1.311 ms libcr1-po-6.gw.unsw.ed
u.au (149.171.255.201) 1.347 ms ombcr1-po-5.gw.unsw.edu.au (149.171.255.197) 1.
357 ms
5 unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105) 1.378 ms 1.362 ms 1.372 m
s
6 138.44.5.0 (138.44.5.0) 1.439 ms 1.528 ms 1.477 ms
7 et-0-3-0.pe1.alxd.nsw.aarnet.net.au (113.197.15.153) 1.631 ms 1.729 ms 1.7
38 ms
8 ae9.bb1.b.syd.aarnet.net.au (113.197.15.65) 7.186 ms 1.985 ms 1.954 ms
9 gigabitethernet1-1.pe1.b.syd.aarnet.net.au (202.158.202.18) 2.071 ms 2.156
ms 2.058 ms
10 gigabitethernet3-11.ken37.sydney.telstra.net (139.130.0.77) 2.775 ms 2.534
ms 2.799 ms
11 bundle-ether13.ken-core10.sydney.telstra.net (203.50.11.94) 3.382 ms 3.968
ms 3.947 ms
12 bundle-ether12.win-core10.melbourne.telstra.net (203.50.11.123) 15.796 ms 1
5.773 ms 14.931 ms
13 gigabitethernet5-0.exi-service2.melbourne.telstra.net (203.50.80.132) 13.510
ms 13.615 ms 13.444 ms
14 * * *
15 * * *
16 * * *
```

cannot traceroute <http://www.speedtest.com.sg>,

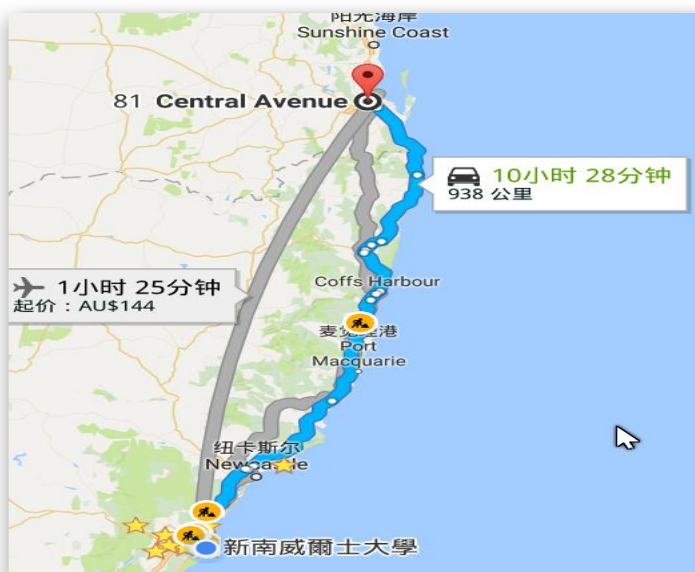
instead of this ,use school's ip address and traceroute www.telstra.net , it shows that the path is reversed.

Exercise 3:

1.

www.uq.edu.au

proportion= $(16.692/10^3)/[(938*1000/(3*10^8))*2] = 2.669$



www.nus.edu.sg

proportion= $(145.480/10^3)/[(6.47*10^6/(3*10^8))*2] = 3.39$



www.tu-berlin.de

proportion= $(303.057/10^3)/\{[1.64 \cdot 10^7/(3 \cdot 10^8)] \cdot 2\} = 2.743$



2.

from delay.pdf, it shows the delay to the destinations is constant.

from scatter.pdf, when packet size over 1200 that the line will have obvious change.

3.

Due to the ppt in lectures, nodal processing delay and queuing delay will depend on packet size. When packet size is large, it will cause pressure during these duration and then affect delay.