CP1402/CP5631 - Hands-On Activity: Latency Around the World

1. Open a Command Prompt window and run tracert on a website whose servers are located on a different continent from you, across one ocean. If you're located in the Midwest or Eastern United States, for example, you can run the command tracert london.edu (London Business School). If you are on the West Coast, however, you might get more useful results for this step by targeting a server across the Pacific Ocean, such as tracert www.tiu.ac.jp (Tokyo International University). What command did you use?

I used traceroute command in macbook. the follow picture is command result.

```
Jennifers-MacBook-Pro:~ Jennifer$ traceroute london.edu
traceroute to london.edu (20.117.145.205), 64 hops max, 52 byte packets
 1  192.168.0.1 (192.168.0.1)  1.524 ms  1.511 ms  1.870 ms
 2  * * *
 3  103-6-148-37.myrepublic.com.sg (103.6.148.37)  2.586 ms  3.224 ms  2.885 ms
 4  103-6-148-13.myrepublic.com.sg (103.6.148.13)  2.455 ms  4.085 ms  3.354 ms
 5  8075.sgw.equinix.com (27.111.228.57)  3.944 ms  3.485 ms  3.584 ms
 6  ae26-0.ear01.sin30.ntwk.msn.net (104.44.239.145)  3.286 ms  3.640 ms  3.991 ms
 7  be-21-0.ibr02.sin30.ntwk.msn.net (104.44.33.129)  154.538 ms  153.179 ms
    be-20-0.ibr01.sin30.ntwk.msn.net (104.44.33.123)  155.249 ms
 8  be-18-0.ibr02.mrs20.ntwk.msn.net (104.44.28.209)  157.482 ms  262.095 ms
    be-19-0.ibr01.mrs20.ntwk.msn.net (104.44.28.185)  171.058 ms
 9  be-31-0.ibr02.par21.ntwk.msn.net (104.44.29.132)  155.633 ms  154.590 ms  153.946 ms
10  be-11-0.ibr01.lon24.ntwk.msn.net (104.44.29.15)  158.885 ms
    be-1-0.ibr02.par30.ntwk.msn.net (104.44.7.215)  152.660 ms
    be-5-0.ibr02.lon24.ntwk.msn.net (104.44.29.35)  156.378 ms
11  ae124-0.icr03.lon24.ntwk.msn.net (104.44.32.27)  151.641 ms
    ae120-0.icr01.lon24.ntwk.msn.net (104.44.21.114)  158.165 ms
    be-1-0.ibr02.lon22.ntwk.msn.net (104.44.16.57)  155.915 ms
12  ae104-0.icr03.lon22.ntwk.msn.net (104.44.32.11)  153.931 ms *  160.121 ms
13  * * *
```

2. Examine the output and find the point in the route when messages started jumping across the ocean. By what percentage does the RTT increase after the jump compared with before it? You can see an example in Figure 5-51

The first rounter in this picture is before across the pacific ocean
The second rounter in this picture is after across the pacific ocean.

169.437/90.293x100=187% in this case,the data would yield a 187% increase.

```
Jennifers-MacBook-Pro:~ Jennifer$ traceroute stanford.edu
traceroute to stanford.edu (171.67.215.200), 64 hops max, 52 byte packets
 1  192.168.0.1 (192.168.0.1)  2.053 ms  1.089 ms  1.813 ms
 2  * * *
 3  103-6-148-37.myrepublic.com.sg (103.6.148.37)  5.654 ms  3.549 ms  2.966 ms
 4  * * hurricane-electric.sgix.sg (103.16.102.81)  4.569 ms
 5  100ge16-2.core1.tyo1.he.net (184.105.64.254)  70.506 ms  75.825 ms  90.293 ms
 6  * * *
 7  * * *
 8  * * port-channel8.core2.pao1.he.net (184.104.193.25)  169.437 ms
 9  stanford-university.100gigabitethernet5-1.core1.pao1.he.net (184.105.177.238)  168.304 ms  171.557 ms  169.727 ms
10  woa-west-rtr-vl2.sunet (171.64.255.132)  167.386 ms  168.580 ms  167.640 ms
11  * * *
12  web.stanford.edu (171.67.215.200)  171.234 ms  168.711 ms  171.532 ms
Jennifers-MacBook-Pro:~ Jennifer$  8  * * port-channel8.core2.pao1.he.net
```

3. Choose a website whose servers are on a continent even farther away from you. For example, if you are in Australia, you could trace the route to the University of Delhi in India

at the address www.du.ac.in. What command did you use? How many hops did it take until the route crossed an ocean? What other anomalies do you notice about this global route?

Command: tracert ox.ac.uk
Over a maximum of 30 hops.

```
C:\Windows\system32>tracert ox.ac.uk

Tracing route to ox.ac.uk [151.101.194.216]
over a maximum of 30 hops:

  1   303 ms   215 ms   289 ms  10.32.240.1
  2   361 ms   247 ms   252 ms  64.15.31.249
  3   215 ms   220 ms   214 ms  0.ge-9-0-6.ar10.ord6.scnet.net [167.88.151.51]
  4   221 ms   224 ms   223 ms  42.ae11.cr2.ord6.scnet.net [216.246.115.46]
  5   227 ms   216 ms   215 ms  42.ae9.cr2.ord1.scnet.net [216.246.115.101]
  6   219 ms   218 ms   291 ms  be-105-200-pe11.350ecermak.il.ibone.comcast.net [50.208.232.229]
  7   264 ms   261 ms   219 ms  50.208.233.86
  8   336 ms   304 ms   219 ms  151.101.194.216

Trace complete.
```

4. Choose one more website as close to directly across the globe from you as possible. Australia locations might want to use the University at Buffalo at www.buffalo.edu. What command did you use? How many hops are in the route? Did the route go east or west around the world from your location? How can you tell?

Command: tracert ucm.es
Over a maximum of 30 hops.
the route go east around the world.
216.246.115.46 North America.
213.242.114.122 Spain Europe

```
C:\Windows\system32>tracert ucm.es

Tracing route to ucm.es [147.96.1.15]
over a maximum of 30 hops:

  1   223 ms   215 ms   240 ms  10.32.240.1
  2     *      271 ms     *     64.15.31.249
  3   295 ms   305 ms   310 ms  0.ge-9-0-6.ar10.ord6.scnet.net [167.88.151.51]
  4   314 ms   296 ms   288 ms  42.ae11.cr2.ord6.scnet.net [216.246.115.46]
  5   315 ms   303 ms   297 ms  ce-1-3-1.a05.chcgil09.us.bb.gin.ntt.net [168.143.228.236]
  6   280 ms   221 ms   302 ms  ae-0.lumen.chcgil09.us.bb.gin.ntt.net [129.250.8.174]
  7   439 ms   406 ms   408 ms  ae1.3102.edge1.madrid1.level3.net [4.69.140.2]
  8   441 ms   328 ms   335 ms  serveisweb.bar2.barcelona1.level3.net [213.242.114.122]
  9   331 ms   350 ms   326 ms  redimadrid-principal-router.red.rediris.es [130.206.212.106]
 10     *        *        *     Request timed out.
 11     *        *        *     Request timed out.
 12     *
```

5. Scott Base in Antarctica runs several webcams from various research locations. Run a trace to the Scott Base website at https://www.antarcticanz.govt.nz/. What's the closest router to Scott Base's

web server that your trace reached? If you can't tell from the command output where the last response came from, go to https://www.iplocation.net/ in your browser. Enter the final IP address to determine that router's location.

The closest router is located at 120.138.31.131, Auckland, New Zealand.

```
C:\Windows\system32>tracert antarcticanz.govt.nz

Tracing route to antarcticanz.govt.nz [120.138.19.149]
over a maximum of 30 hops:

  1   226 ms   255 ms   215 ms  10.32.240.1
  2   313 ms   308 ms     *     64.15.31.249
  3   235 ms   215 ms   290 ms  0.ge-9-0-6.ar10.ord6.scnet.net [167.88.151.51]
  4   291 ms   304 ms   301 ms  41.ae11.cr1.ord6.scnet.net [216.246.115.4]
  5   216 ms   300 ms   294 ms  ae0-122.cr10-chi1.ip4.gtt.net [208.116.128.53]
  6   392 ms   301 ms   303 ms  ae11.cr4-lax2.ip4.gtt.net [89.149.140.77]
  7   259 ms   260 ms   321 ms  ip4.gtt.net [173.205.42.34]
  8   520 ms   506 ms     *     be100.bdr04.lax01.ca.us.vocus.network [114.31.199.37]
  9   420 ms   417 ms   382 ms  be200.bdr01.akl03.akl.nz.vocus.network [114.31.199.73]
 10   424 ms   405 ms   405 ms  as9790.bdr01.akl03.akl.nz.vocus.network [175.45.102.238]
 11   438 ms   406 ms   381 ms  202.180.65.0
 12   533 ms   509 ms   506 ms  default-rdns.vocus.co.nz [202.180.65.1]
 13   512 ms   510 ms   511 ms  rdns.120.138.31.131.sth.nz [120.138.31.131]
 14   539 ms   509 ms   510 ms  rdns.120.138.19.149.sth.nz [120.138.19.149]

Trace complete.
```

6. Think about other locations around the world that might be reached through an interesting route. Find a website hosted in that location and trace the route to it. Which website did you target? Where is it located? What are some locations along the route of your trace?

website: www.ox.ac.uk
location: stanford university US

103.6.148.37 Singapore
184.105.64.254 California Oakland US
184.105.213.117 Canada ?
184.104.193.25 US
184.105.177.238 US
171.64.255.132 Menlo Park CA USA

```
traceroute: unknown host standford.edu
Jennifers-MacBook-Pro:~ Jennifer$ traceroute stanford.edu
traceroute to stanford.edu (171.67.215.200), 64 hops max, 52 byte packets
 1  192.168.0.1 (192.168.0.1)  1.463 ms  1.183 ms  0.904 ms
 2  * * *
 3  103-6-148-37.myrepublic.com.sg (103.6.148.37)  4.680 ms  3.748 ms  2.554 ms
 4  * hurricane-electric.sgix.sg (103.16.102.81)  3.894 ms  5.521 ms
 5  100ge16-2.core1.tyo1.he.net (184.105.64.254)  69.697 ms  80.176 ms  70.749 ms
 6  * * port-channel11.core2.sea1.he.net (184.105.213.117)  153.543 ms
 7  * * *
 8  * * port-channel8.core2.pao1.he.net (184.104.193.25)  171.767 ms
 9  stanford-university.100gigabitethernet5-1.core1.pao1.he.net (184.105.177.238)  169.662 ms  170.670 ms  181.248 ms
10  woa-west-rtr-vl2.sunet (171.64.255.132)  167.569 ms  170.672 ms  168.435 ms
11  * * *
12  web.stanford.edu (171.67.215.200)  169.342 ms  168.273 ms  169.257 ms
```

7. Try the ping command on several of these same IP addresses. Did it work? Why do you think this is the case?

Yes it work. because ping command is to test if a networked device is reachable.The ping command sends a request over the network to a specific device.