

# COMP9331 Lab Exercise 1

## Exercise 1:

1. The IP address of the website [www.koala.com.au](http://www.koala.com.au) is 104.18.61.21 and 104.18.60.21.

The reason of having several IP addresses is the website may use round-robin DNS, which allow load distribution and load balancing.

2. The name is localhost. This address was used to represent the computer itself but this address does not allow to communicate with other devices as a real IP address does.

## Exercise 2:

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

1. [www.unsw.edu.au](http://www.unsw.edu.au) -- Yes
2. [www.getfittest.com.au](http://www.getfittest.com.au) -- **No**, the reason is “unknown host”, which means the destination server does not exist or can’t find in the DNS.
3. [www.mit.edu](http://www.mit.edu) -- Yes
4. [www.intel.com.au](http://www.intel.com.au) -- Yes
5. [www.tpg.com.au](http://www.tpg.com.au) -- Yes
6. [www.hola.hp](http://www.hola.hp) -- **No**, the reason is “unknown host”, which means the destination server does not exist or can’t find in the DNS. And “hp” is not the top-level domain, so it is impossible to find the IP address of this url.
7. [www.amazon.com](http://www.amazon.com) -- Yes
8. [www.tsinghua.edu.cn](http://www.tsinghua.edu.cn) -- Yes
9. [www.kremlin.ru](http://www.kremlin.ru) -- **No**, out of time. But can get access through the browser. The reason may be for the security.
10. 8.8.8.8 -- Yes

## Exercise 3:

1. There are **22** routers between the workstation and [www.columbia.edu](http://www.columbia.edu).

There are **5** routers are part of the UNSW network.

Between the router **113.197.15.99** and **207.231.240.8** have across the Pacific Ocean.

2. After the router **138.44.5.0**, the paths from my machine to these three destinations diverge. This address is managed by AARNET. The description is “Australian Academic and Research Network” located at “Building 9 Bank Street”.

The number of hops is not on each path proportional the physical distance, because the hop may go to the opposite side of the destination.

3.

The IP addresses are:

<http://www.speedtest.com.sg/tr.php> --202.150.221.170

<https://www.telstra.net/cgi-bin/trace> -- 203.50.5.178

The reverse path went through the **different** routers as the forward path.

There is no common routers between the forward and the reverse path. While there are similar routers name in the path. (eg. 138.44.5.0 and 138.44.5.1) The reason may be the ISP is determining the route of the path based on various metrics, therefore, the forward path is totally different from reverse path.

#### Notes:

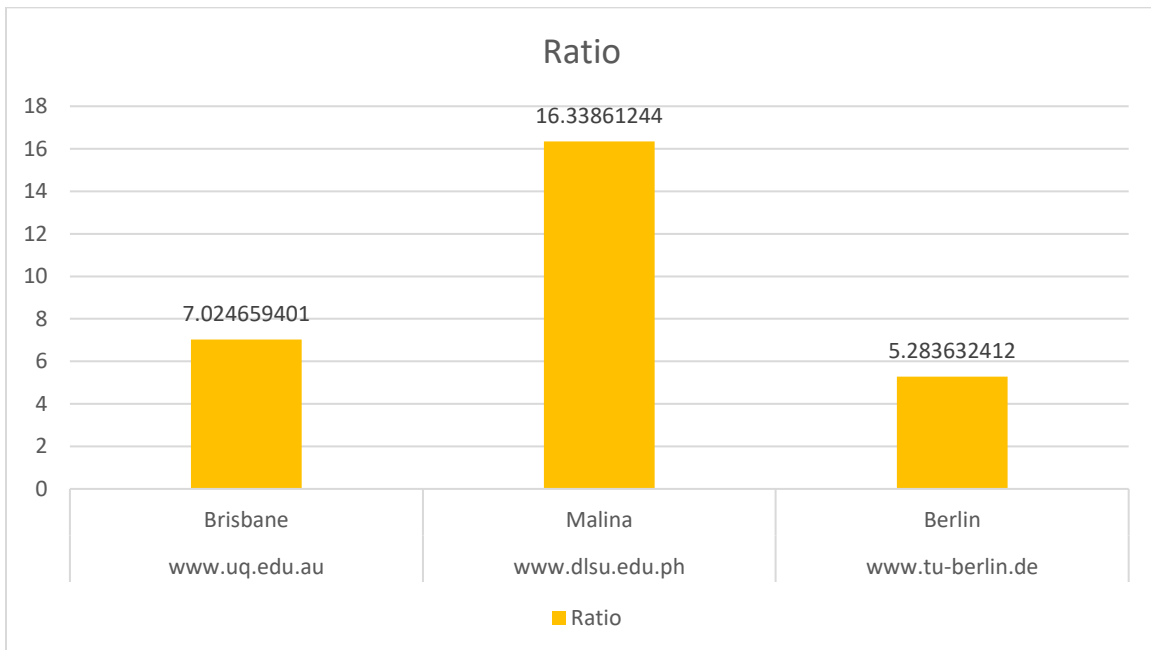
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tracert to www.columbia.edu (128.59.105.24), 30 hops max, 60 byte packets
 1  cserouter1-server.cse.unsw.edu.au (129.94.242.251)  0.072 ms  0.071 ms  0.057 ms
 2  129.94.39.17 (129.94.39.17)  0.859 ms  0.846 ms  0.849 ms
 3  ombudnxi-v1-3154.gw.unsw.edu.au (149.171.253.35)  1.908 ms  1.917 ms  libudnxi-v1-3154.gw.unsw.edu.au (149.171.253.34)  1.684 ms
 4  libcr1-po-6.gw.unsw.edu.au (149.171.255.201)  1.009 ms  libcr1-po-5.gw.unsw.edu.au (149.171.255.165)  1.086 ms  ombcr1-po-5.gw.unsw.edu.au (149.171.255.197)  1.122 ms
 5  unswbr1-te-2-13.gw.unsw.edu.au (149.171.255.105)  1.125 ms  unswbr1-te-1-9.gw.unsw.edu.au (149.171.255.101)  1.165 ms  1.181 ms
 6  138.44.5.0 (138.44.5.0)  1.305 ms  1.321 ms  1.317 ms
 7  et-1-3-0.pe1.sxt.bkvl.nsw.aarnet.net.au (113.197.15.149)  2.107 ms  2.136 ms  2.212 ms
 8  et-0-0-0.pe1.a.hnl.aarnet.net.au (113.197.15.99)  95.160 ms  95.044 ms  95.022 ms
 9  et-2-1-0.bdr1.a.sea.aarnet.net.au (113.197.15.201)  146.613 ms  146.625 ms  146.593 ms
10  abilene-1-lo-jmb-706.stlwa.pacificwave.net (207.231.240.8)  146.562 ms  146.548 ms  146.496 ms
11  et-4-0-0.4079.rtsw.miss2.net.internet2.edu (162.252.70.0)  157.462 ms  157.561 ms  157.444 ms
12  et-4-0-0.4079.rtsw.minn.net.internet2.edu (162.252.70.58)  180.680 ms  180.397 ms  180.516 ms
13  et-1-1-5.4079.rtsw.eqch.net.internet2.edu (162.252.70.106)  188.580 ms  188.628 ms  188.550 ms
14  ae-0.4079.rtsw3.eqch.net.internet2.edu (162.252.70.163)  188.831 ms  188.616 ms  188.555 ms
15  ae-1.4079.rtsw.clev.net.internet2.edu (162.252.70.130)  197.046 ms  197.068 ms  196.988 ms
16  buf-9208-I2-CLEV.nysernet.net (199.109.11.33)  201.380 ms  201.388 ms  201.333 ms
17  syr-9208-buf-9208.nysernet.net (199.109.7.193)  204.462 ms  204.656 ms  204.454 ms
18  nyc111-9204-syr-9208.nysernet.net (199.109.7.94)  213.820 ms  213.847 ms  213.753 ms
19  nyc-9208-nyc111-9204.nysernet.net (199.109.7.165)  213.894 ms  213.999 ms  213.889 ms
20  columbia.nyc-9208.nysernet.net (199.109.4.14)  213.794 ms  213.877 ms  213.971 ms
21  cc-core-1-x-nyser32-gw-1.net.columbia.edu (128.59.255.5)  214.066 ms  215.245 ms  214.099 ms
22  cc-conc-1-x-cc-core-1.net.columbia.edu (128.59.255.21)  226.758 ms  223.632 ms  214.192 ms
23  exeas.org (128.59.105.24)  213.957 ms  214.126 ms  214.009 ms
```

Pic1: The result of “tracert [www.columbia.edu](http://www.columbia.edu)”.

## Exercise 4:

1.

Website	City	Physical distance(km)	T(s)	min_rtt(ms)	Ratio
<a href="http://www.uq.edu.au">www.uq.edu.au</a>	Brisbane	734	0.002446667	17.187	7.0246594
<a href="http://www.dlsu.edu.ph">www.dlsu.edu.ph</a>	Malina	6270	0.0209	341.477	16.3386124
<a href="http://www.tu-berlin.de">www.tu-berlin.de</a>	Berlin	16105	0.053683333	283.643	5.28363241



The reasons make the routers greater than 2:

- 1) The actual distance of the cable between the routers is longer than the straight distance;
- 2) There are delays during the transmission;
- 3) There are delays if the router is busy;
- 4) The condition of the cable is not good, which may effect the information transmission.

2. The delay vary over time, due to:

- 1) There may have Network fluctuation during pinging;

2) The size of packet is not constant, which will affect the time of transmission. The bigger the packet, the more time required.

3. Yes, it's in Switzerland. The IP address of [www.epfl.ch](http://www.epfl.ch) is 217.26.54.10. According to Yougetsignal(2019), This IP Address located at **Zurich, Switzerland**.

4.

According to Stackexchange(2019) and Wikipedia(2019),

- **Propagation delay** is “the amount of time it takes for the head of the signal to travel from the sender to the receiver”[2], so it is **not depends** on the packet size.
- **Transmission delay** is “the amount of time required to push all the packet's bits into the wire. In other words, this is the **delay** caused by the data-rate of the link”[3], so it **is depends** on the packet size.
- **Processing delay** is “the time it takes routers to **process** the packet header”.
- **Queuing delay** is “the sum of the delays encountered by a packet between the time of insertion into the network and the time of delivery to the address”; therefore, it will affect by the busyness of the network, which means it **is not depends** on the packet size.

## List of references

1. Yougetsignal 2019, accessed 26 September 2019,  
<<https://www.yougetsignal.com/tools/network-location/>>
2. Wikipedia.org 2019, assessed 26 September 2019,  
< [https://en.wikipedia.org/wiki/Transmission\\_delay](https://en.wikipedia.org/wiki/Transmission_delay)>  
< [https://en.wikipedia.org/wiki/Propagation\\_delay](https://en.wikipedia.org/wiki/Propagation_delay)>  
< [https://en.wikipedia.org/wiki/Queuing\\_delay](https://en.wikipedia.org/wiki/Queuing_delay)>
3. Stackexchange 2019, accessed 26 September 2019  
<<https://cs.stackexchange.com/questions/54433/what-is-the-difference-between-transmission-delay-queuing-delay-and-processing>>