Internet Routes and Measure of Round Trip Times

Lab 4

50.005 Computer System Engineering

Due: 01 Apr 08:30 AM (Week 10)

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INFORMATION SYSTEMS TECHNOLOGY AND DESIGN

Overview

In this lab exercise, you will learn how to use `ping` and `traceroute` to measure round trip times and find network routes.

Learning objectives

At the end of this lab exercise, you should be able to:

- Understand how the `ping` and `traceroute` utilities work.
- Use the `ping` utility to measure network round trip times.
- Use the `traceroute` utility to find network routes.
- Observe and understand the effects of varying packet sizes on delays experienced.

Preparation

You will need `ping` and `traceroute` to be installed on your OS. Most **Ubuntu** / **MacOS** installations should already include `ping` by default. You can install `traceroute` by running "`sudo apt-get install traceroute`" from the command line.

Submission

- **The total points for this lab is 35**
- Export this handout and fill in your answers in the blanks denoted in **blue**
- Export as pdf and **ZIP** it (not rar, or any other compression algorithm)
- **Upload** to `@csesubmitbot` telegram bot using the command `/submitlab4`
- **CHECK** your submission by using the command `/checksubmission`
-

Part 1: Measurement of round trip times using ping

The `ping` utility is one of the most widely-used network utilities. It enables you to measure the time that it takes for a packet to travel through the Internet to a remote host and back.

The `ping` utility works by sending a short message, known as an *echo-request*, to a remote host using the Internet Control Message Protocol (ICMP). When a host that supports ICMP receives an echo-request message, it replies by sending an echo-response message back to the originating host.

In the first part of this lab exercise, you will use the `ping` utility to send echo requests to a number of different hosts. In many of the exercises, you will be referring to hosts using their DNS names rather than their IP addresses. For more information about `ping`, you can look up its manual page by running "`man ping`" from the command line.

Round trip times

Use `ping` to send 10 packets to each of the following hosts. Each packet should have a size of 56 bytes, and there should be an interval of 5 seconds between each packet sent.

```
www.csail.mit.edu

www.berkeley.edu

www.usyd.edu.au

www.kyoto-u.ac.jp
```

Note: The size of each packet is 56 bytes by default, but you may observe that the actual size of the packet is larger than 56 bytes. You can look up the manual for `ping` to understand why such a discrepancy exists.

Question 1 [4pt] : For each host, record the percentage of packets sent that resulted in a successful response. Record also the minimum, average, and maximum round trip times for the packets that resulted in a response.

Your answer:

Website	Successful Percentage %	Min RTT	Average RTT	Max RTT
www.csail.mit.edu	100	4.269	6.230	11.203
www.berkeley.edu	100	206.694	207.371	0.361
www.usyd.edu.au	100	216.053	243.137	304.503
www.kyoto-u.ac.jp	100	50.343	120.064	276.762

Question 2 [4pt]: Describe and explain the differences in the minimum round trip time to each of these hosts.

Your answer:

Usyd has the highest minimum round trip time followed by Berkeley then Kyoto then MIT with the lowest minimum round trip time of 4.269. The results above are due to the following factors:

1. **Traffic congestion on the hosts. Despite Kyoto being nearer to Singapore as compared to Usyd, Syd has the highest round trip times as compared to Kyoto and the other universities. When I ping each of the hosts, Usyd could have the highest levels of Traffic when I ping while Kyoto has a lower traffic. More amounts of traffic can bottleneck the connection at each of the local networks. (Network Conditions)**
2. **Server response time of the hosts. The high round trip times from university of Sydney as compared to MIT can be due to the fact that there is traffic bottleneck at Sydney thus, network latency. Hence, the Sydney server can respond less efficiently. Thus, having a relative higher number of round trip times as compared to the rest of the hosts.**
3. **The nature and type of medium of the signal transmission and the nodes.**

Question 3 [4pt]: Repeat the exercise using packet sizes of 56, 512 and 1024 bytes. Record the minimum, average, and maximum round trip times for each of the

packet sizes. Why are the minimum round-trip times to the same hosts different when using 56, 512, and 1024–byte packets?

Your answer:

Website	Packet Size	Successful Percentage %	Min RTT	Average RTT	Max RTT
www.csail.mit.edu	56	100	4.493	9.305	11.485
	512	100	5.429	9.251	12.987
	1024	0.0	-	-	-
www.berkeley.edu	56	100	205.053	221.602	283.476
	512	100	208.654	253.993	309.963
	1024	0.0	-	-	-
www.usyd.edu.au	56	100	216.336	254.698	314.209
	512	100	217.197	252.219	325.087
	1024	100	216.961	262.825	321.376
www.kyoto-u.ac.jp	56	100	48.992	49.798	53.551
	512	100	50.083	53.553	57.312
	1024	0.0	-	-	-

The difference could be due to the minimum number of nodes and the physical distance of the host relative to Singapore. The minimum round trip values may be affected by larger packet sizes with more round trip times but not very significantly unless it is 1024 bytes where all the ping packets are lost and no response is received from the specific hosts. In general, larger packet sizes for 56 bytes and 512 bytes do not make a big difference in round trip times due to TCP optimisation to buffer small packets before sending them over. The local ISP can set the host zone or the receiving zone to drop packets of the certain size so as to prevent DDOs or malicious floods at either ends.

Unanswered pings

Use `ping` to send 100 packets to the following host. Each packet should have a size of 56 bytes, and there should be an interval of 5 seconds between each packet sent.

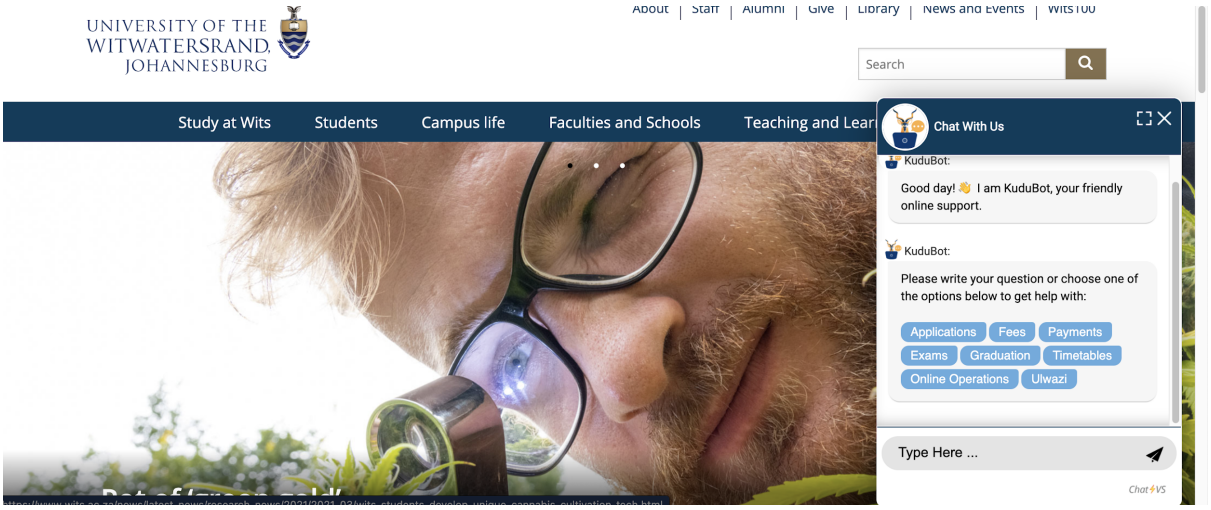
```
www.wits.ac.za
```

Question 4 [8pt]: Record the **percentage** of the packets sent that resulted in a **successful response** for each host. What are some possible **reasons** why you may not have received a response? (Be sure to check the host in a web browser).

Your answer:

0.0% for `www.wits.ac.za`.

We can access the website even.



```
agement.  It should be used primarily for manual fault isolation.
Request timeout for icmp_seq 80
Request timeout for icmp_seq 81
Request timeout for icmp_seq 82
Request timeout for icmp_seq 83
Request timeout for icmp_seq 84
Request timeout for icmp_seq 85
Request timeout for icmp_seq 86
Request timeout for icmp_seq 87
Request timeout for icmp_seq 88
Request timeout for icmp_seq 89
Request timeout for icmp_seq 90
Request timeout for icmp_seq 91
Request timeout for icmp_seq 92
Request timeout for icmp_seq 93
Request timeout for icmp_seq 94
Request timeout for icmp_seq 95
Request timeout for icmp_seq 96
Request timeout for icmp_seq 97
Request timeout for icmp_seq 98

--- ccms.wits.ac.za ping statistics ---
100 packets transmitted, 0 packets received, 100.0% packet loss
```

1. **The website probably disabled the ping requests to be sent to the server and back (upon checking the host in the web browser).**
2. **Sending packets in intervals prints a timeout. Hence, the response from the server to respond can be inferred that the ping is unable to locate the location in the specified time of 5 seconds or processing the the ping requests such that it takes 5 seconds to process.**
3. **Packet arrival in the input link exceeds the output link capacity at the host destination. Hence, the packets can be dropped or lost along the way.**
4. **There could also be many routers along the way when the signal is sent over. Some or one of These routers could block the signal when the signal is sent to the host destination.**

Part 2: Understanding Internet routes using traceroute

The `traceroute` utility is another useful network utility. It enables you to trace the route taken by a packet from your machine to a remote host.

Here is an example of the output produced when `traceroute` is used to trace the route taken by a packet to `www.mit.edu`.

```
traceroute to www.mit.edu (118.215.81.86), 30 hops max, 60 byte pack-
ets

 1  192.168.9.2 (192.168.9.2)  0.221 ms  0.193 ms  0.107 ms
 2  10.12.0.1 (10.12.0.1)  3.363 ms  2.555 ms  3.253 ms
 3  172.16.1.106 (172.16.1.106)  3.072 ms  3.416 ms  3.418 ms
 4  172.16.1.210 (172.16.1.210)  4.977 ms  4.712 ms  4.921 ms
 5  192.168.22.27 (192.168.22.27)  4.806 ms  6.521 ms  6.451 ms
 6  103.24.77.1 (103.24.77.1)  7.172 ms  3.590 ms  3.187 ms
 7  201.210-193-8.qala.com.sg (210.193.8.201)  4.312 ms  9.056 ms 7.870 ms
 8  137.203-211-158.unknown.qala.com.sg (203.211.158.137) 8.904 ms 6.690 ms  6.555 ms
 9  213.203-211-158.unknown.qala.com.sg (203.211.158.213) 7.710 ms 5.423 ms  5.193 ms
10  203.116.10.125 (203.116.10.125)  6.783 ms  6.705 ms  6.440 ms
```

Each line in the output begins with a host on the route from your computer to `www.mit.edu`, followed by the round-trip times for 3 packets sent to that host. For more information about `traceroute`, you can look up its manual page by running "`man traceroute`" from the com- mand line.

Question 5 [5pt]: Explain how `traceroute` discovers a path to a remote host. (*Hint:* The `traceroute` manual will be helpful for answering this question.)

Your answer:

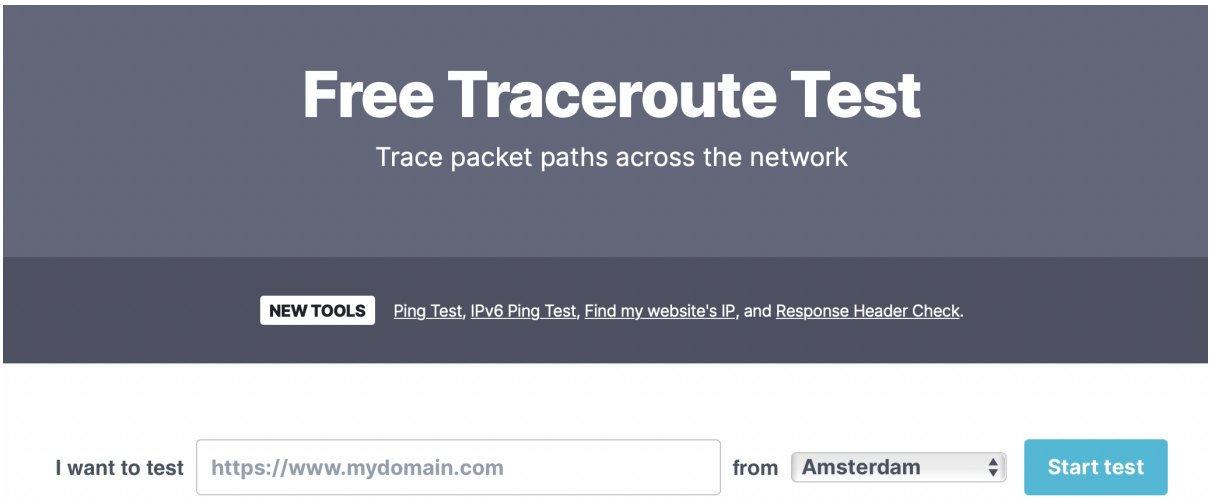
Traceroute program launches small size packets known as the UDP probe packets with a short time to live, meaning that these small packets exist for a short while in the medium then listen for a time exceeded reply from the gateway. By attaining "port unreachable" or hitting a maximum, the host is reached. By sending three probes at each ttl setting, if the probe answers come from different gateways, the address of each responding probe is printed. If there is no response within the 5 second interval, it means that the packets cannot be sent over. This carries on for each packet

Route asymmetries

In this exercise, you will run traceroute in two opposite directions. First, you will run traceroute on a remote host to see the route taken to your network. You will also run traceroute from your computer to see the route taken to that host.

Step 1: Find out your computer's public IP address. (Hint: You can use a website like http://www.whatismypublicip.com/, or search for "what is my ip" using Google's search engine.)

Step 2: Visit https://www.uptrends.com/tools/traceroute in your web browser. Enter your computer's public IP address, select the "from Location" and click "Start Test" to start a traceroute to your computer. Follow the steps shown below for at least three locations namely: New York, Amsterdam, Tokyo.



Step 3: After `traceroute` finishes running, you should be able to view the route taken from `specified location` to your network. Record the IP address of the first hop, which will be used in the next step.

Hop	Time	Time	Time	Host name	IP address
1	<1	<1	<1	gateway.as64425.com	5.182.210.1
2	-	-	-		
3	1	1	1		212.119.24.97
4	2	1	1	ae-10.r25.amstnl02.nl.bb.gin.ntt.net	129.250.2.90
5	12	12	12	ae-6.r20.parsfr04.fr.bb.gin.ntt.net	129.250.4.138
6	14	15	17	ae-2.r21.parsfr04.fr.bb.gin.ntt.net	129.250.3.46
7	90	87	86	ae-13.r24.asbnva02.us.bb.gin.ntt.net	129.250.6.6
8	149	149	149	ae-2.r24.snjsca04.us.bb.gin.ntt.net	129.250.6.237
9	-	-	-		
10	149	149	149	ae-2.r00.mlpsca01.us.bb.gin.ntt.net	129.250.4.101
11	148	148	148		129.250.24.196
12	155	155	155		129.250.130.254
13	148	148	148		198.107.143.162
14	-	-	-		

Step 4: On your computer, run `traceroute` using the IP address recorded in the previous step as the remote destination.

`$ traceroute <ip address from step 3>`

Question 6 [5pt]: Record the output of `traceroute` when run in both directions above. **Paste it as screenshots at the end of this document.**

Question 6 is on the next page.

Question 7 [5pt]: Describe anything unusual you might observe about the output. Are the same routers traversed in both directions? If no, why might this be the case?

Your answer:

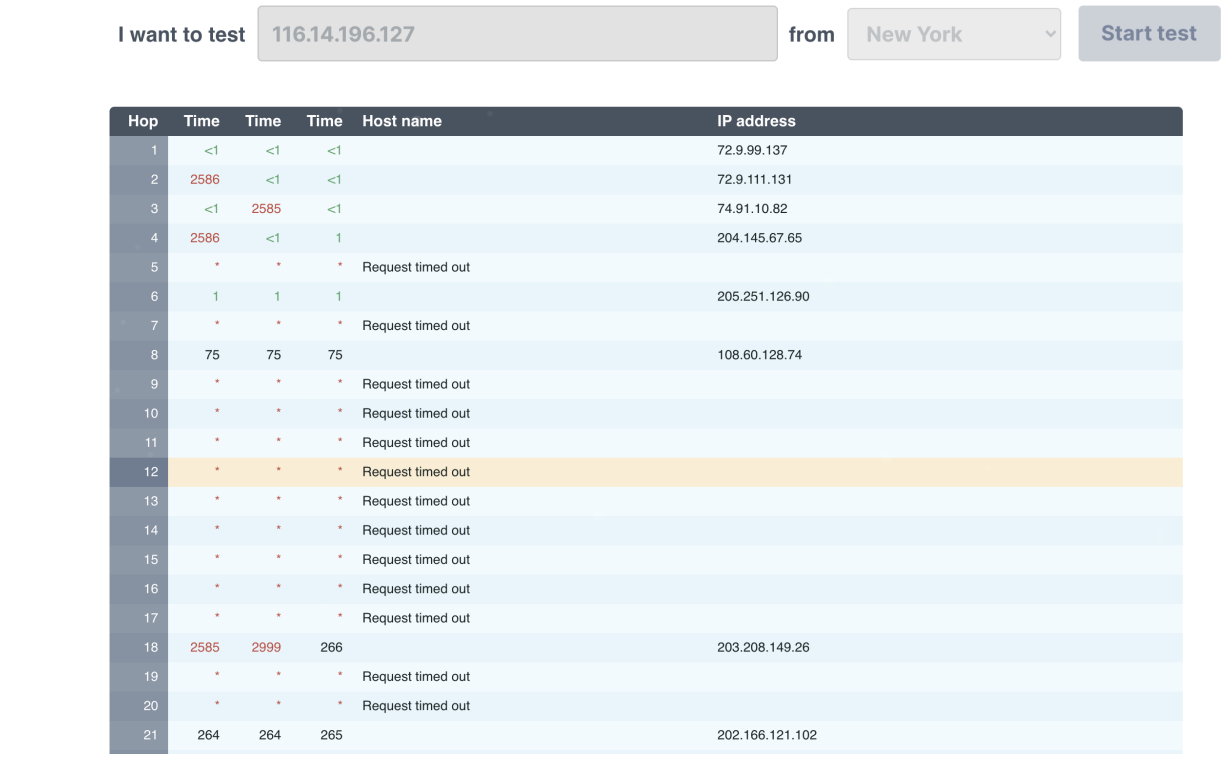
Unusual thing is that IP addresses of the hops made are in 2 different directions. The full route can only be seen when nmap scans with traceroute options was utilised. No, different routers are traversed in both directions. Packets are routed through different networks based on traffic congestion or routing table.

Screenshots for qn 6

12 Dover Rise

- New York

From:



Hop	Time	Time	Time	Host name	IP address
1	<1	<1	<1		72.9.99.137
2	2586	<1	<1		72.9.111.131
3	<1	2585	<1		74.91.10.82
4	2586	<1	1		204.145.67.65
5	*	*	*	Request timed out	
6	1	1	1		205.251.126.90
7	*	*	*	Request timed out	
8	75	75	75		108.60.128.74
9	*	*	*	Request timed out	
10	*	*	*	Request timed out	
11	*	*	*	Request timed out	
12	*	*	*	Request timed out	
13	*	*	*	Request timed out	
14	*	*	*	Request timed out	
15	*	*	*	Request timed out	
16	*	*	*	Request timed out	
17	*	*	*	Request timed out	
18	2585	2999	266		203.208.149.26
19	*	*	*	Request timed out	
20	*	*	*	Request timed out	
21	264	264	265		202.166.121.102
22	*	*	*	Request timed out	
23	*	*	*	Request timed out	
24	269	269	269		116.14.196.127

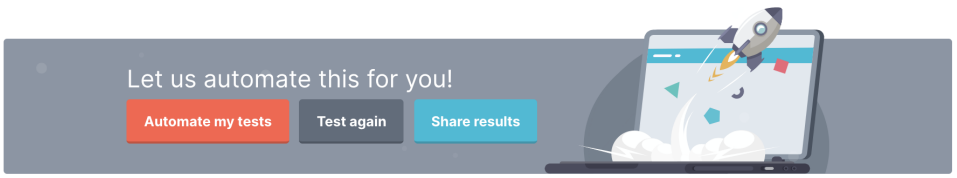
To:

```
traceroute 72.9.99.137          took 18m 14s  at 05:29:19
traceroute to 72.9.99.137 (72.9.99.137), 64 hops max, 52 byte packets
 1  singtel-acplus (192.168.1.254)  8.547 ms  1.407 ms  1.349 ms
 2  bb116-14-199-254.singnet.com.sg (116.14.199.254)  3.847 ms  5.847 ms  5.077 ms
 3  202.166.123.130 (202.166.123.130)  9.527 ms  5.055 ms  5.370 ms
 4  202.166.123.129 (202.166.123.129)  4.018 ms  4.219 ms  8.524 ms
 5  ae8-0.qt-cr03.singnet.com.sg (202.166.121.101)  3.844 ms  5.297 ms  4.720 ms
 6  ae13-0.tp-cr03.singnet.com.sg (202.166.120.109)  4.792 ms  4.693 ms  3.995 ms
 7  ae4-0.tp-er03.singnet.com.sg (202.166.123.70)  4.611 ms  4.517 ms  4.308 ms
 8  203.208.145.233 (203.208.145.233)  4.964 ms
    203.208.191.113 (203.208.191.113)  4.846 ms
    203.208.145.233 (203.208.145.233)  4.710 ms
 9  203.208.182.249 (203.208.182.249)  5.049 ms
    203.208.172.210 (203.208.172.210)  191.545 ms
    203.208.171.186 (203.208.171.186)  174.850 ms
10  203.208.158.46 (203.208.158.46)  181.408 ms
    203.208.151.218 (203.208.151.218)  183.315 ms
    palo-b24-link.ip.twelve99.net (62.115.8.200)  188.295 ms
11  sjo-b23-link.ip.twelve99.net (62.115.115.217)  198.768 ms  188.291 ms
    203.208.172.234 (203.208.172.234)  182.810 ms
12  203.208.172.234 (203.208.172.234)  172.607 ms
    ntt-ic323771-sjo-b21.ip.twelve99-cust.net (62.115.12.53)  175.216 ms
    palo-b24-link.ip.twelve99.net (62.115.8.200)  189.221 ms
13  ae-10.r24.snjsca04.us.bb.gin.ntt.net (129.250.3.26)  186.389 ms
    sjo-b23-link.ip.twelve99.net (62.115.115.217)  183.408 ms  180.202 ms
14  * ntt-ic323771-sjo-b21.ip.twelve99-cust.net (62.115.12.53)  187.874 ms  176.674 ms
15  ae-2.r00.lsanca07.us.bb.gin.ntt.net (129.250.3.238)  200.619 ms
    ae-10.r24.snjsca04.us.bb.gin.ntt.net (129.250.3.26)  186.475 ms
    ntt-ic323771-sjo-b21.ip.twelve99-cust.net (62.115.12.53)  173.364 ms
16  ae-10.r24.snjsca04.us.bb.gin.ntt.net (129.250.3.26)  188.934 ms
    ce-0-1-0-0.r00.lsanca07.us.ce.gin.ntt.net (157.238.179.90)  206.184 ms  205.714 ms
17  ae-3.r25.lsanca07.us.bb.gin.ntt.net (129.250.4.151)  190.129 ms
    ae-2.r00.lsanca07.us.bb.gin.ntt.net (129.250.3.238)  191.614 ms
    ae3-4.cr2.lax2.atlanticmetro.net (173.205.176.41)  208.067 ms
18  ae-2.r00.lsanca07.us.bb.gin.ntt.net (129.250.3.238)  191.129 ms
    ce-0-1-0-0.r00.lsanca07.us.ce.gin.ntt.net (157.238.179.90)  196.201 ms
    ae-2.r00.lsanca07.us.bb.gin.ntt.net (129.250.3.238)  190.272 ms
19  ce-0-1-0-0.r00.lsanca07.us.ce.gin.ntt.net (157.238.179.90)  191.854 ms
    xe-0-1-6-990.cr1.dfw2.atlanticmetro.net (208.78.31.242)  208.739 ms
    ce-0-1-0-0.r00.lsanca07.us.ce.gin.ntt.net (157.238.179.90)  193.119 ms
20  ae3-4.cr2.lax2.atlanticmetro.net (173.205.176.41)  193.642 ms  193.097 ms
    ae1-8.cr1.lga6.atlanticmetro.net (69.9.33.142)  354.729 ms
21  et-0-0-3-4.cr1.lga3.atlanticmetro.net (205.251.126.98)  309.720 ms  268.357 ms  310.003 ms
22  xe-0-1-6-990.cr1.dfw2.atlanticmetro.net (208.78.31.242)  206.733 ms
    xe-0-1-2-0.cr2.lga12.atlanticmetro.net (108.60.138.53)  266.187 ms  251.916 ms
23  e2-3.cr2.si1.atlanticmetro.net (108.60.147.110)  278.516 ms  282.073 ms
    et-0-0-3-4.cr1.lga3.atlanticmetro.net (205.251.126.98)  257.453 ms
24  coreit.dmarc.lga11.atlanticmetro.net (74.91.10.84)  267.544 ms
    et-0-0-3-4.cr1.lga3.atlanticmetro.net (205.251.126.98)  251.891 ms  360.117 ms
25  e2-3.cr2.si1.atlanticmetro.net (108.60.147.110)  307.086 ms
    xe-0-1-2-0.cr2.lga12.atlanticmetro.net (108.60.138.53)  305.838 ms  305.671 ms
26  e2-3.cr2.si1.atlanticmetro.net (108.60.147.110)  268.029 ms
    coreit.dmarc.lga11.atlanticmetro.net (74.91.10.84)  271.489 ms *
27  * coreit.dmarc.lga11.atlanticmetro.net (74.91.10.84)  298.648 ms *
28  * * *
29  * * *
```

- Amsterdam

from :

I want to test 116.14.196.127 from Amsterdam Start test



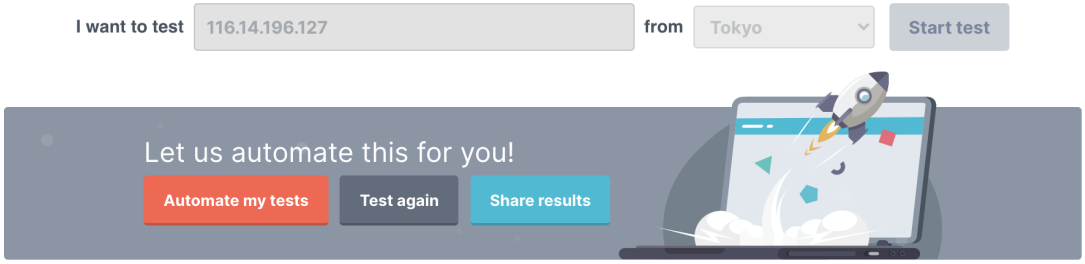
Hop	Time	Time	Time	Host name	IP address
1	<1	<1	<1		5.182.210.1
2	1	1	<1		87.245.246.38
3	6	6	6		87.245.233.99
4	6	6	6		195.66.225.10
5	6	6	6		203.208.178.222
6	167	167	168		203.208.153.97
7	167	167	167		203.208.172.214
8	165	165	165		203.208.146.82
9	165	165	165		202.166.120.222
10	165	164	165		202.166.121.102
11	166	165	166		202.166.123.130
12	*	*	*	Request timed out	
13	167	166	167		116.14.196.127

To:

```
 ~  traceroute   5.182.210.1    INT ✘  took 5m 35s ⌛  at 05:36:05 
traceroute to 5.182.210.1 (5.182.210.1), 64 hops max, 52 byte packets
 1  singtel-acplus (192.168.1.254)  1.748 ms  1.628 ms  1.754 ms
 2  bb116-14-199-254.singnet.com.sg (116.14.199.254)  5.053 ms  3.923 ms  5.057 ms
 3  202.166.123.130 (202.166.123.130)  4.627 ms  4.565 ms  4.480 ms
 4  202.166.123.129 (202.166.123.129)  5.937 ms  3.537 ms  3.573 ms
 5  ae8-0.qt-cr03.singnet.com.sg (202.166.121.101)  3.950 ms  4.280 ms  4.294 ms
 6  ae13-0.tp-cr03.singnet.com.sg (202.166.120.109)  4.024 ms  6.861 ms  18.927 ms
 7  ae4-0.tp-er03.singnet.com.sg (202.166.123.70)  4.353 ms  4.598 ms  4.320 ms
 8  203.208.191.197 (203.208.191.197)  6.211 ms
    203.208.145.233 (203.208.145.233)  7.140 ms
    203.208.191.113 (203.208.191.113)  6.082 ms
 9  203.208.166.202 (203.208.166.202)  162.866 ms  162.333 ms  162.642 ms
10  linx-224.retn.net (195.66.224.193)  163.057 ms  163.758 ms  163.583 ms
11  ae0-2.rt.ir9.ams.nl.retn.net (87.245.232.123)  168.884 ms  168.409 ms  173.153 ms
12  * * *
13  * * *
14  * * *
```

- Tokyo

From:



Hop	Time	Time	Time	Host name	IP address
1	<1	<1	<1		31.204.145.130
2	44	44	44		109.200.218.221
3	48	48	48		123.255.90.77
4	79	79	79		203.208.171.230
5	87	82	86		203.208.172.214
6	175	175	175		203.208.146.82
7	174	175	174		202.166.120.222
8	190	190	190		202.166.121.102
9	176	176	175		202.166.123.130
10	*	*	*	Request timed out	
11	179	178	178		116.14.196.127

To:

```
 traceroute 31.204.145.130                                    INT ✘  took 53s ⌛  at 05:37:37 ⊙
traceroute to 31.204.145.130 (31.204.145.130), 64 hops max, 52 byte packets
 1  singtel-acplus (192.168.1.254)  1.961 ms  1.647 ms  1.293 ms
 2  bb116-14-199-254.singnet.com.sg (116.14.199.254)  3.619 ms  4.284 ms  4.037 ms
 3  202.166.123.130 (202.166.123.130)  4.518 ms  4.144 ms  4.438 ms
 4  202.166.123.129 (202.166.123.129)  3.985 ms  3.649 ms  3.415 ms
 5  ae8-0.qt-cr03.singnet.com.sg (202.166.121.101)  4.046 ms  3.886 ms  3.881 ms
 6  ae13-0.tp-cr03.singnet.com.sg (202.166.120.109)  4.258 ms  4.359 ms  4.383 ms
 7  ae4-0.tp-er03.singnet.com.sg (202.166.123.70)  20.909 ms  4.743 ms  5.389 ms
 8  203.208.191.197 (203.208.191.197)  4.835 ms  4.787 ms  4.799 ms
 9  203.208.171.186 (203.208.171.186)  175.553 ms
    203.208.182.249 (203.208.182.249)  5.103 ms  5.309 ms
10  203.208.172.226 (203.208.172.226)  177.574 ms
    203.208.172.233 (203.208.172.233)  188.108 ms
    203.208.183.133 (203.208.183.133)  4.833 ms
11  ix-xe-0-1-2-0.tcore2.pdi-paloalto.as6453.net (66.198.144.41)  197.916 ms
    203.208.172.234 (203.208.172.234)  175.971 ms
    203.208.158.178 (203.208.158.178)  173.953 ms
12  if-ae-2-2.tcore1.pdi-paloalto.as6453.net (66.198.127.1)  179.666 ms
    203.208.172.234 (203.208.172.234)  172.921 ms
    203.208.172.233 (203.208.172.233)  175.624 ms
13  ix-xe-0-1-2-0.tcore2.pdi-paloalto.as6453.net (66.198.144.41)  187.762 ms
    if-ae-7-2.tcore2.sv1-santaclara.as6453.net (209.58.86.73)  194.510 ms  194.517 ms
14  if-ae-2-2.tcore1.pdi-paloalto.as6453.net (66.198.127.1)  184.339 ms
    if-ae-0-2.tcore1.sv1-santaclara.as6453.net (63.243.251.1)  194.662 ms
    if-ae-2-2.tcore1.pdi-paloalto.as6453.net (66.198.127.1)  184.969 ms
15  if-ae-2-2.tcore1.pdi-paloalto.as6453.net (66.198.127.1)  181.462 ms  182.592 ms  183.414 ms
16  if-ae-24-2.tcore2.tv2-tokyo.as6453.net (180.87.181.72)  194.844 ms
    if-ae-7-2.tcore2.sv1-santaclara.as6453.net (209.58.86.73)  180.523 ms
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    if-ae-24-2.tcore2.tv2-tokyo.as6453.net (180.87.181.72)  184.131 ms
17  180.87.181.147 (180.87.181.147)  180.858 ms
    if-ae-0-2.tcore1.sv1-santaclara.as6453.net (63.243.251.1)  180.474 ms
    if-et-5-2.hcore1.kv8-chiba.as6453.net (209.58.86.143)  193.488 ms
18  if-et-1-2.hcore2.kv8-chiba.as6453.net (120.29.211.3)  187.182 ms
    if-et-6-2.hcore1.kv8-chiba.as6453.net (63.243.250.57)  181.147 ms *
19  180.87.181.147 (180.87.181.147)  192.640 ms
    if-ae-24-2.tcore2.tv2-tokyo.as6453.net (180.87.181.72)  187.795 ms *
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