

```
nicolasorozco — ssh norozco6@unix.ucsc.edu — 80x24
(base) nicolasorozco@Nicolass-MacBook-Air-3 ~ % ssh norozco6@unix.ucsc.edu
norozco6@unix.ucsc.edu's password:
Last login: Wed May 29 16:13:56 2024 from eduroam-169-233-222-124.ucsc.edu
=====
*
*           Welcome to the Learning Technologies Timeshare!
*
* Need help? Have a question? Something isn't working? We're here for you!
* Email us at help@ucsc.edu, call us at 459-HELP (459-4357) or open a
* support ticket at https://slughub.ucsc.edu
*
* Welcome to Fall Quarter, UCSC! The big news this quarter is that our
* Linux lab is now running Mint, an Ubuntu variant! Our new Kresge lab
* will also be running Mint when it opens later this quarter. The
* timeshare is still running CentOS and will be migrating to AlmaLinux 8
* during Winter break. We are currently working on longer term plans for
* the timeshare and ways to evolve this service. Stay tuned!
*
*           Have a wonderful Fall Quarter. Stay safe and learn lots! =)
*
=====
You are currently using 0% (292.0 KiB) of your 1.0 GiB quota.
-bash-4.2$
```

1.)

a.) ssh [norozco6@unix.ucsc.edu](ssh://norozco6@unix.ucsc.edu)

b.)ls -a

```
[norozco6@unix1 ~]$ ls -a
.          .local      OldFiles    ex1         file2.txt
..         .login      board.py    ex2         network_log
.bash_history .psql_history calculator.py ex2.out     newFolder
.cache     .python_history cse182      f1.txt     prelab1
.config    .ssh        cse20       f2.txt     public_html
.cshrc     .viminfo    dir2        f3.txt     welcome
.esd_auth  CSE20      eval_pa5    file1.txt
```

c.)

```
nicolasorozco — norozco6@unix1:~ — ssh norozco6@unix.ucsc.edu — 80...  
[norozco6@unix1 ~]$ ls -lt  
total 46  
drwxr-xr-x.  2 norozco6 users  2048 Oct  5 16:21 network_log  
drwx--x--x. 14 norozco6 216229 2048 Oct  4 15:36 OldFiles  
-rw-r--r--.  1 norozco6 users    0 Oct  4 15:36 f1.txt  
-rw-r--r--.  1 norozco6 users    0 Oct  4 15:36 f2.txt  
-rw-r--r--.  1 norozco6 users    0 Oct  4 15:36 f3.txt  
-rw-r--r--.  1 norozco6 users   92 Oct  4 15:36 file1.txt  
-rw-r--r--.  1 norozco6 users  131 Oct  4 15:36 file2.txt  
drwxr-xr-x.  2 norozco6 users  2048 Sep 30 17:57 dir2  
drwxr-xr-x.  2 norozco6 users  2048 Sep 30 17:31 prelab1  
drwxr-xr-x.  7 norozco6 users  2048 May 22 09:25 cse182  
-rw-r--r--.  1 norozco6 users  5246 Dec  3 2021 board.py  
-rw-r--r--.  1 norozco6 users  3338 Dec  2 2021 ex2.out  
-rw-r--r--.  1 norozco6 users   64 Dec  2 2021 ex2  
-rw-r--r--.  1 norozco6 users   20 Dec  2 2021 ex1  
-rw-r--r--.  1 norozco6 users  7129 Dec  2 2021 eval_pa5  
-rw-r--r--.  1 norozco6 users  5875 Nov  4 2021 calculator.py  
drwxr-xr-x.  7 norozco6 users  2048 Oct  8 2021 cse20  
drwxr-xr-x.  3 norozco6 users  2048 Sep 30 2021 CSE20  
drwxr-xr-x.  2 norozco6 users  2048 Sep 29 2021 newFolder  
drwxr-xr-x.  2 norozco6 216229 2048 Apr 23 2021 public_html  
-rw-----.  1 norozco6 216229 224 May  7 2014 welcome  
[norozco6@unix1 ~]$
```

d.). pwd

e.) mkdir ~/prelab\ 1, /afs/cats.ucsc.edu/n/norozco6/prelab1

f.) cd /

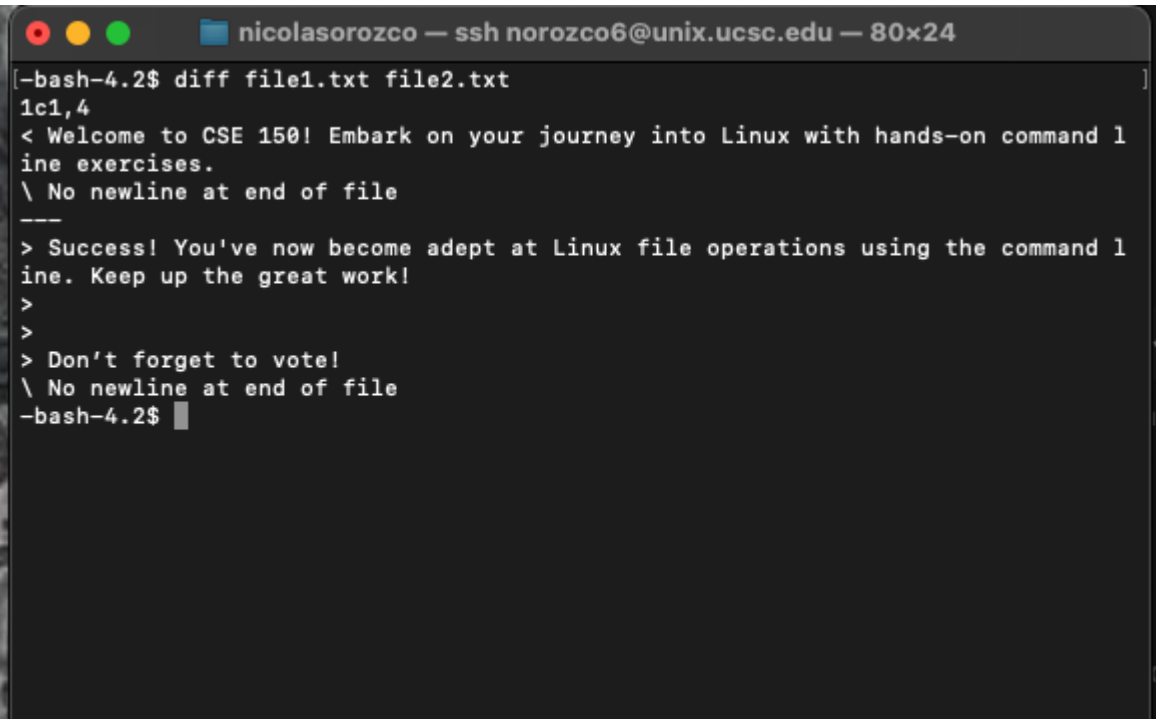
2.)

a.) cat file1.txt file2.txt

```
[norozco6@unix1 ~]$ cat file1.txt file2.txt
Welcome to CSE 150! Embark on your journey into Linux with hands-on command line exercises.
Success! You've now become adept at Linux file operations using the command line. Keep up the great work!

Don't forget to vote!
[norozco6@unix1 ~]$
```

b.)



```
nicolasorozco — ssh norozco6@unix.ucsc.edu — 80x24
[~bash-4.2$ diff file1.txt file2.txt
1c1,4
< Welcome to CSE 150! Embark on your journey into Linux with hands-on command line exercises.
\ No newline at end of file
---
> Success! You've now become adept at Linux file operations using the command line. Keep up the great work!
>
>
> Don't forget to vote!
\ No newline at end of file
~bash-4.2$
```

c.)

```
[~bash-4.2$ cat file1.txt file2.txt > file3.txt
[~bash-4.2$ cat file3.txt
Welcome to CSE 150! Embark on your journey into Linux with hands-on command line exercises.
Success! You've now become adept at Linux file operations using the command line. Keep up the great work!

Don't forget to vote!~bash-4.2$
```

d.) mv file3.txt dir2

e.) rm file.txt, it cannot be recovered as it removes the file's directory entry, telling the file system that the space occupied by the file is now free for new data

f.) grep "vote" /afs/cats.ucsc.edu/n/norozco6/file3.txt

3.)

```

[~] -- norozco6@unix1:~/network_log -- ssh norozco6@unix.ucsc.edu -- 117x64
[norozco6@unix1 prelab1]$ ls
[norozco6@unix1 prelab1]$ cd
[norozco6@unix1 ~]$ ls
CSE20  board.py  cse102  dir2  ex1  ex2.out  network_log  prelab1  welcome
01df1es  calculator.py  cse20  eval_pa5  ex2  file2.txt  newFolder  public_html
[norozco6@unix1 ~]$ cd network_log/
[norozco6@unix1 network_log]$ ls
a.png  b.pdf  f1.txt  f2.txt  f3.txt
[norozco6@unix1 network_log]$

[~] -- norozco6@unix1:~/network_log -- ssh norozco6@unix.ucsc.edu -- 117x64
[~] -- norozco6@unix1:~/network_log -- ssh norozco6@unix.ucsc.edu -- 117x64
(base) nicolasorozco@eduroam-169-233-131-233 CSE150 % ls
Lab1  Screenshot 2024-10-01 at 11.31.12 AM.png
Night  Screenshot 2024-10-02 at 9.03.14 AM.png
Screenshot 2024-10-01 at 11.10.23 AM.png
Screenshot 2024-10-01 at 11.12.46 AM.png
Screenshot 2024-10-01 at 11.12.46 AM.png
Screenshot 2024-10-02 at 9.06.39 AM.png
(base) nicolasorozco@eduroam-169-233-131-233 CSE150 %

(base) nicolasorozco@eduroam-169-233-131-233 CSE150 % ls
Lab1  Screenshot 2024-10-01 at 11.31.12 AM.png
Night  Screenshot 2024-10-02 at 9.03.14 AM.png
Screenshot 2024-10-01 at 11.10.23 AM.png
Screenshot 2024-10-01 at 11.12.46 AM.png
Screenshot 2024-10-01 at 11.12.46 AM.png
Screenshot 2024-10-02 at 9.06.39 AM.png
(base) nicolasorozco@eduroam-169-233-131-233 CSE150 % scp norozco6@unix.ucsc.edu:/afs/cats.ucsc.edu/users/n/norozco6/
network_log/*.*.txt .
zsh: no matches found: norozco6@unix.ucsc.edu:/afs/cats.ucsc.edu/users/n/norozco6/network_log/*.*.txt
(base) nicolasorozco@eduroam-169-233-131-233 CSE150 % scp norozco6@unix.ucsc.edu:/afs/cats.ucsc.edu/users/n/norozco6/
network_log/*.*.txt .
zsh: no matches found: norozco6@unix.ucsc.edu:/afs/cats.ucsc.edu/users/n/norozco6/network_log/*.*.txt
(base) nicolasorozco@eduroam-169-233-131-233 CSE150 % scp "norozco6@unix.ucsc.edu:/afs/cats.ucsc.edu/users/n/norozco6/
/network_log/*.*.txt" .
The Unix timeshare uses the BLUE password, which is different than the
password you use for most other systems. If you need to reset your BLUE
password, head over to https://cruzis.ucsc.edu
[norozco6@unix.ucsc.edu ~]$
(base) nicolasorozco@eduroam-169-233-131-233 CSE150 % ls
Lab1  Screenshot 2024-10-02 at 9.03.14 AM.png
Night  Screenshot 2024-10-02 at 9.06.39 AM.png
Screenshot 2024-10-01 at 11.10.23 AM.png
Screenshot 2024-10-01 at 11.12.46 AM.png
Screenshot 2024-10-01 at 11.31.12 AM.png
Screenshot 2024-10-01 at 11.31.12 AM.png
f1.txt
f2.txt
f3.txt
(base) nicolasorozco@eduroam-169-233-131-233 CSE150 %
```

scp "norozco6@unix.ucsc.edu:/afs/cats.ucsc.edu/users/n/norozco6/network_log/*.*.txt" .

4.)

a.) Each numbered line represents each router the probe jumped to

```
(base) nicolasorozco@eduroam-169-233-148-245 CSE150 % traceroute www.vote.org
traceroute: Warning: www.vote.org has multiple addresses; using 172.66.41.16
traceroute to www.vote.org (172.66.41.16), 64 hops max, 40 byte packets
 1  comm-vss-g-v480 (169.233.255.254) 35.494 ms 44.108 ms 7.077 ms
 2  core-north-g-v195 (128.114.102.145) 4.675 ms 4.675 ms 4.675 ms
 3  core-north-fw1-v202 (128.114.3.108) 3.765 ms 3.809 ms 4.056 ms
 4  border-north-g-v192 (128.114.102.81) 7.642 ms 5.148 ms 5.840 ms
 5  border-south-g-be100 (128.114.1.73) 4.951 ms 6.855 ms 5.168 ms
 6  svl-aggr10--ucsc-100g--01.cenic.net (137.164.3.48) 5.633 ms 6.925 ms 427.377 ms
 7  198.32.251.193 (198.32.251.193) 41.319 ms * 190.340 ms
 8  172.68.188.94 (172.68.188.94) 6.255 ms 6.565 ms
 9  172.66.41.16 (172.66.41.16) 7.662 ms 6.789 ms 5.896 ms
(base) nicolasorozco@eduroam-169-233-148-245 CSE150 %
```

Router Name

Router IP address

9 Hops

b.) First is the router name, Router IP Address, Time it to the probe to reach the router

c.) Initially I expected the 2nd router to take longer as the probe has to travel farther, but however this can be explain due to the congestion in my network, my network in the first router was congested and being heavily used, #2 the router was less congested, therefore faster to reach it

d.) Hop count is the number of routers the probe had to travel to reach the desired destination, being 9

5.) b.) The number of routers on the path didn't change, this is because google has optimized this path for my location therefore it will stick to it as long as none of the routers are down.

5. [10 pts] North America: Run Traceroute between your computer and a destination on this continent (North America) at three different run times: morning, mid-day and night. Make sure that you are in the SAME location - i.e. at home or at school etc. for each of the runs. Record your results in the table below capturing the time to reach the final destination.

- a) Include a **screenshot** of Run #1 (only) and circle all data used to calculate the average RTT to the destination host.

Destination Hostname: <u>dns.google</u>		Location: <u>Mountain View</u> A tool such as IP Location Finder can be used to determine the approximate geographic location of a host.				
		Time to reach final destination				
Run #	Execution Time	RTT 1	RTT 2	RTT 3	Average RTT to final destination	# hops
1 (morning)	<u>9:03am</u>	<u>8.521ms</u>	<u>7.208ms</u>	<u>5.124ms</u>	<u>6.951ms</u>	<u>8</u>
2 (mid-day)	<u>11:33am</u>	<u>175.77ms</u>	<u>14.89ms</u>	<u>11.85ms</u>	<u>67.24ms</u>	<u>8</u>
3 (night)	<u>7:12pm</u>	<u>12.63ms</u>	<u>13.03ms</u>	<u>12.62ms</u>	<u>38.22</u>	<u>8</u>

- b) Did the number of routers in the path change during your 3 different runs? If so, why do you think it changed? If not, why do you think it didn't?

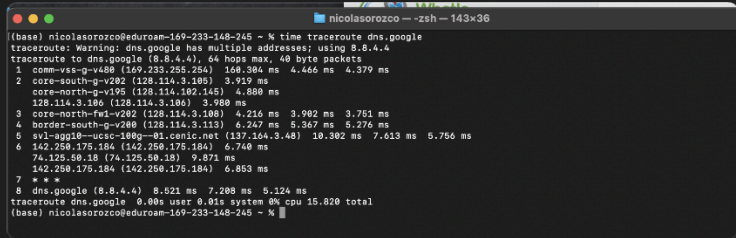
6. [5 pts] Different Continent: Repeat process to a destination on a different continent.

Destination Hostname: <u>102.217.107.0</u>						
Location of host: <u>Ukraine</u>						
		Time to reach final destination				
Run #	Execution Time	RTT 1	RTT 2	RTT 3	Average RTT to final destination	# hops
1 (morning)	<u>9:06am</u>	<u>245.152ms</u>	<u>169.115ms</u>	<u>165.125ms</u>	<u>193.13ms</u>	<u>17</u>
2 (mid-day)	<u>1:42am</u>	<u>621.441ms</u>	<u>503.343ms</u>	<u>578.068ms</u>	<u>567.617ms</u>	<u>17</u>
3 (night)	<u>7:13pm</u>	<u>184.009ms</u>	<u>175.787ms</u>	<u>187.36ms</u>	<u>182.38ms</u>	<u>25</u>

9:03am
11:42am

b.)The number of router on the path didn't change, this due to the fact that google has optimized this path for my location therefore it will stick to it as long as none of the routers are down.

(Proof of screenshot time)



```
(base) nicolasorozco@eduroam-169-233-148-245 ~ % time traceroute dns.google
traceroute: Warning: dns.google has multiple addresses; using 8.8.4.4
traceroute to dns.google (8.8.4.4), 64 hops max, 40 byte packets
 1 comm-vss-g-v480 (169.233.255.254) 160.304 ms 4.466 ms 4.379 ms
 2 core-south-g-v202 (128.114.3.105) 3.919 ms
 3 core-north-g-v195 (128.114.102.145) 4.880 ms
 4 core-north-fw1-v202 (128.114.3.108) 4.216 ms 3.902 ms 3.751 ms
 5 border-south-g-v200 (128.114.3.113) 6.247 ms 5.367 ms 5.276 ms
 6 svl-agg18-ucsc-100g-01.cenic.net (137.164.3.48) 10.302 ms 7.613 ms 5.756 ms
 7 142.250.175.184 (142.250.175.184) 6.740 ms
 8 142.250.175.184 (142.250.175.184) 6.853 ms
 9 * * *
10 dns.google (8.8.4.4) 8.021 ms 7.208 ms 5.124 ms
traceroute dns.google 0.00s user 0.01s system 0% cpu 15.820 total
(base) nicolasorozco@eduroam-169-233-148-245 ~ %
```

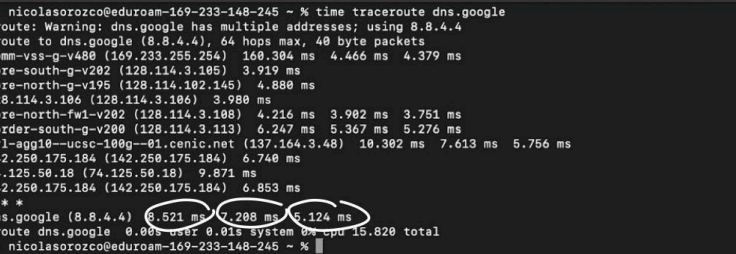
Screenshot

2024-10-...9.03.14 AM

PNG image - 467 KB

Information [Show Less](#)

Created	October 2, 2024 at 9:03 AM
Modified	October 2, 2024 at 9:03 AM
Last opened	Oct 2, 2024 at 1:18 PM
Content created	10/2/24, 9:03 AM
Dimensions	1866×606
Resolution	144×144
Color space	RGB
Color profile	Color LCD



```
(base) nicolasorozco@eduroam-169-233-148-245 ~ % time traceroute dns.google
traceroute: Warning: dns.google has multiple addresses; using 8.8.4.4
traceroute to dns.google (8.8.4.4), 64 hops max, 40 byte packets
 1 comm-vss-g-v480 (169.233.255.254) 160.304 ms 4.466 ms 4.379 ms
 2 core-south-g-v202 (128.114.3.105) 3.919 ms
 3 core-north-g-v195 (128.114.102.145) 4.880 ms
 4 core-north-fw1-v202 (128.114.3.108) 4.216 ms 3.902 ms 3.751 ms
 5 border-south-g-v200 (128.114.3.113) 6.247 ms 5.367 ms 5.276 ms
 6 svl-agg18-ucsc-100g-01.cenic.net (137.164.3.48) 10.302 ms 7.613 ms 5.756 ms
 7 142.250.175.184 (142.250.175.184) 6.740 ms
 8 142.250.175.184 (142.250.175.184) 6.853 ms
 9 * * *
10 dns.google (8.8.4.4) 8.021 ms 7.208 ms 5.124 ms
traceroute dns.google 0.00s user 0.01s system 0% cpu 15.820 total
(base) nicolasorozco@eduroam-169-233-148-245 ~ %
```

Screenshot

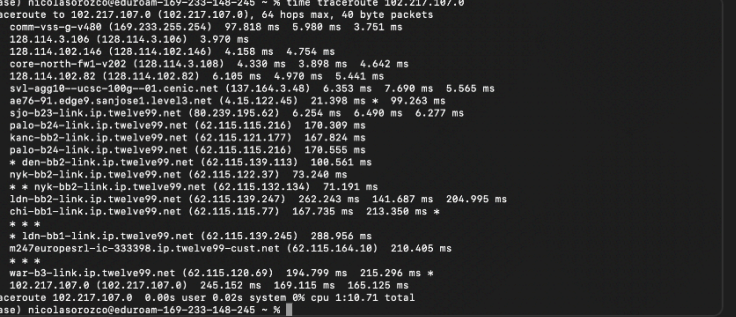
2024-10-...9.06.39 AM

PNG image - 671 KB

Information [Show Less](#)

Created	October 2, 2024 at 9:06 AM
Modified	October 2, 2024 at 9:06 AM
Last opened	Oct 2, 2024 at 1:18 PM
Content created	10/2/24, 9:06 AM
Dimensions	1684×734
Resolution	144×144
Color space	RGB
Color profile	Color LCD

6.)(Proof of screenshot time)



```
(base) nicolasorozco@eduroam-169-233-148-245 ~ % time traceroute 102.217.107.0
traceroute to 102.217.107.0 (102.217.107.0), 64 hops max, 40 byte packets
 1 comm-vss-g-v480 (169.233.255.254) 97.818 ms 5.980 ms 3.751 ms
 2 128.114.3.106 (128.114.3.106) 3.970 ms
 3 128.114.102.146 (128.114.102.146) 4.158 ms 4.754 ms
 4 core-north-fw1-v202 (128.114.3.108) 4.330 ms 3.898 ms 4.642 ms
 5 128.114.102.82 (128.114.102.82) 6.105 ms 4.970 ms 5.441 ms
 6 svl-agg18-ucsc-100g-01.cenic.net (137.164.3.48) 6.353 ms 7.690 ms 5.565 ms
 7 ae76-71.edge99.sanjose1.level3.net (4.15.122.45) 21.390 ms * 99.263 ms
 8 palo-bb2-link.ip.twelve99.net (62.115.115.216) 170.309 ms
 9 kanc-bb2-link.ip.twelve99.net (62.115.121.177) 167.824 ms
10 palo-bb2-link.ip.twelve99.net (62.115.115.216) 170.565 ms
11 * den-bb2-link.ip.twelve99.net (62.115.139.113) 180.561 ms
12 nyk-bb2-link.ip.twelve99.net (62.115.122.37) 73.240 ms
13 * * *
14 * ldn-bb1-link.ip.twelve99.net (62.115.139.245) 288.956 ms
15 m247europesrl-ic-333398.ip.twelve99-cust.net (62.115.164.10) 210.405 ms
16 * * *
17 war-b3-link.ip.twelve99.net (62.115.120.69) 194.799 ms 215.296 ms *
18 102.217.107.0 (102.217.107.0) 245.152 ms 169.115 ms 165.125 ms
traceroute 102.217.107.0 0.00s user 0.02s system 0% cpu 1:10.71 total
(base) nicolasorozco@eduroam-169-233-148-245 ~ %
```

Screenshot

2024-10-...9.06.39 AM

PNG image - 671 KB

Information [Show Less](#)

Created	October 2, 2024 at 9:06 AM
Modified	October 2, 2024 at 9:06 AM
Last opened	Oct 2, 2024 at 1:18 PM
Content created	10/2/24, 9:06 AM
Dimensions	1684×734
Resolution	144×144
Color space	RGB
Color profile	Color LCD

```

(base) nicolasorozco@eduroam-169-233-148-245 ~ % time traceroute 102.217.107.0
traceroute to 102.217.107.0 (102.217.107.0), 64 hops max, 40 byte packets
 1  comm-vss-g-v480 (169.233.255.254)  97.818 ms  5.980 ms  3.751 ms
 2  128.114.3.106 (128.114.3.106)  3.970 ms
   128.114.102.146 (128.114.102.146)  4.158 ms  4.754 ms
 3  core-north-fw1-v202 (128.114.3.108)  4.330 ms  3.898 ms  4.642 ms
 4  128.114.102.82 (128.114.102.82)  6.105 ms  4.970 ms  5.441 ms
 5  svl-aggr10--ucsc-100g--01.cenic.net (137.164.3.48)  6.353 ms  7.690 ms  5.565 ms
 6  ae76-91.edge9.sanjoze1.level3.net (4.15.122.45)  21.398 ms * 99.263 ms
 7  sjo-b23-link.ip.twelve99.net (80.239.195.62)  6.254 ms  6.490 ms  6.277 ms
 8  palo-b24-link.ip.twelve99.net (62.115.115.216)  170.309 ms
   kanc-bb2-link.ip.twelve99.net (62.115.121.177)  167.824 ms
   palo-b24-link.ip.twelve99.net (62.115.115.216)  170.555 ms
 9  * den-bb2-link.ip.twelve99.net (62.115.139.113)  100.561 ms
   nyk-bb2-link.ip.twelve99.net (62.115.122.37)  73.240 ms
10  * * nyk-bb2-link.ip.twelve99.net (62.115.132.134)  71.191 ms
11  ldn-bb2-link.ip.twelve99.net (62.115.139.247)  262.243 ms  141.687 ms  204.995 ms
12  chi-bb1-link.ip.twelve99.net (62.115.115.77)  167.735 ms  213.350 ms *
13  * * *
14  * ldn-bb1-link.ip.twelve99.net (62.115.139.245)  288.956 ms
   m247europesrl-ic-333398.ip.twelve99-cust.net (62.115.164.10)  210.405 ms
15  * * *
16  war-b3-link.ip.twelve99.net (62.115.120.69)  194.799 ms  215.296 ms *
17  102.217.107.0 (102.217.107.0)  245.152 ms  169.115 ms  165.125 ms
traceroute 102.217.107.0  0.00s user 0.02s system 0% cpu 1:10.71 total
(base) nicolasorozco@eduroam-169-233-148-245 ~ %

```

Handwritten annotations on the image:

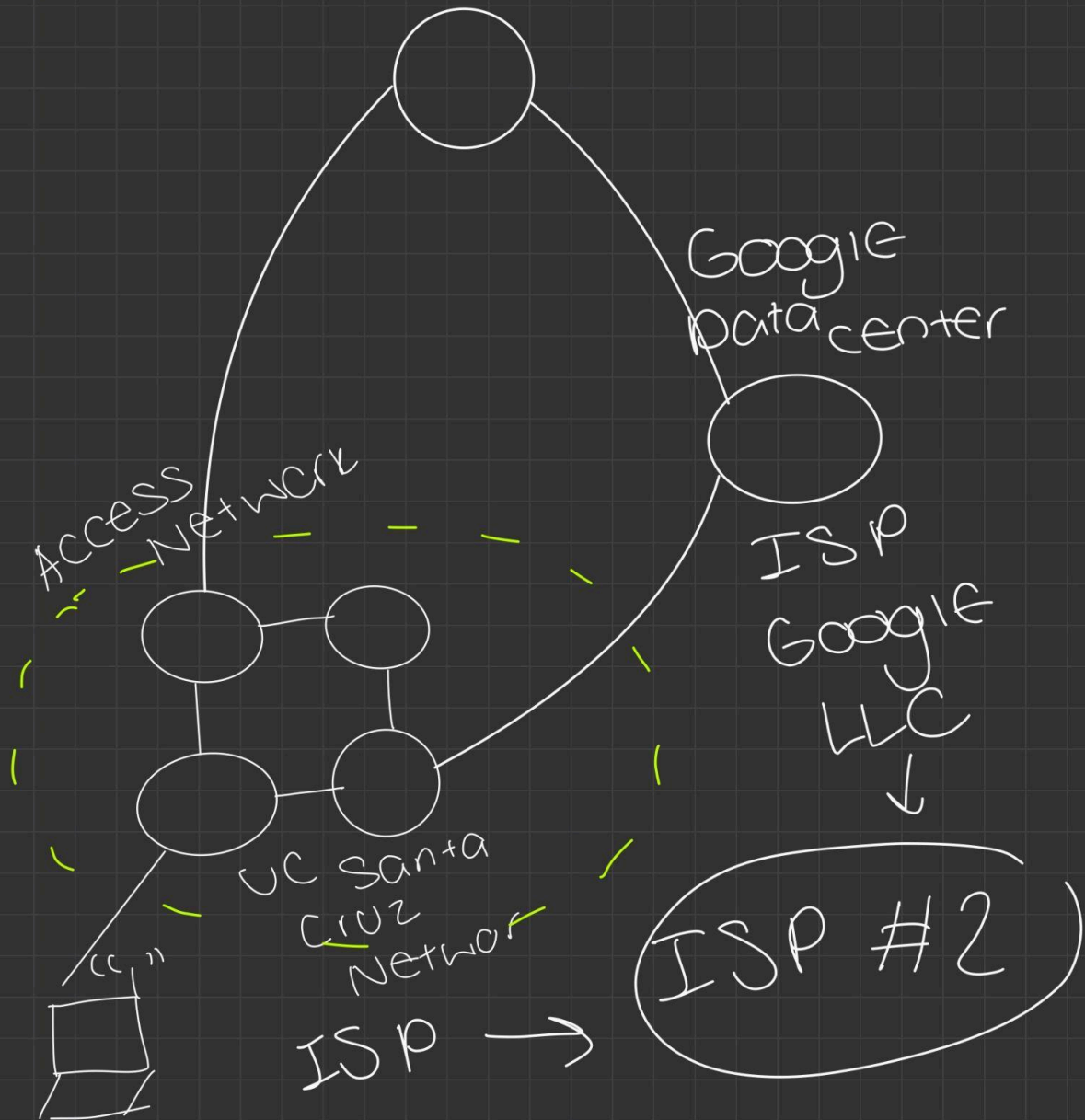
- A green circle labeled 'a.' is drawn around the final three hops (17) of the traceroute.
- A green circle labeled 'b' is drawn around the hop for `ldn-bb2-link.ip.twelve99.net` (line 11).
- Handwritten text in green: "Belgium (increased delay)" with an arrow pointing to hop 11.
- Handwritten text in green: "Probe lost" with an arrow pointing to the asterisks on line 13.
- Handwritten text in green: "Ukraine" with an arrow pointing to the final destination hop (17).

7.)

a.) Yes my results are what I expected as the intra-continent has to travel less distance and the intercontinental has to travel more space therefore having to travel more router and introducing more delay

b.) For my end system to google dns server, the 2nd row was different in the RTT values this is due to the increase demand on the server side as more clients/users are active in the mid-day

Sacramento



The screenshot shows a terminal window with a dark background. The title bar indicates 'Lab1 - zsh - 96x29'. The terminal content is as follows:

```
(base) nicolasorozco@eduroam-169-233-131-233 Lab1 % traceroute google.com
traceroute to google.com (142.250.189.174), 64 hops max, 40 byte packets
 1  com-vsi-g-v480 (169.233.255.254)  14.281 ms  4.724 ms  4.595 ms
 2  128.114.3.186 (128.114.3.186)  4.561 ms
    core-south-g-v282 (128.114.3.185)  4.926 ms
 3  128.114.182.146 (128.114.182.146)  4.789 ms
    campus-north-fw1-v195 (128.114.182.148)  4.469 ms  4.242 ms  4.248 ms
 4  border-south-g-v280 (128.114.3.113)  5.916 ms  5.682 ms  6.140 ms
 5  svi-agg10--ucsc-100g--01.cnic.net (137.164.3.48)  6.698 ms  6.556 ms  6.492 ms
 6  142.250.175.184 (142.250.175.184)  7.627 ms
    74.125.50.18 (74.125.50.18)  9.591 ms
    142.250.175.184 (142.250.175.184)  7.599 ms
 7  * * *
 8  142.251.70.104 (142.251.70.104)  15.465 ms
    100.170.235.208 (100.170.235.208)  7.925 ms
    142.251.224.32 (142.251.224.32)  7.662 ms
 9  172.253.50.216 (172.253.50.216)  7.395 ms
    192.178.46.196 (192.178.46.196)  6.385 ms
    172.253.64.168 (172.253.64.168)  7.840 ms
10  sfo03s24-in-f14.1e100.net (142.250.189.174)  6.926 ms  6.128 ms
    192.178.185.113 (192.178.185.113)  7.009 ms
(base) nicolasorozco@eduroam-169-233-131-233 Lab1 %
```

Below the terminal window, there is a smaller window titled 'nicolasorozco - norozco6@unix1:~/network_log - ssh norozco6@unix.u...'. It shows the output of a python script:

```
[norozco6@unix1 network_log]$ python3 pythonscript.py
Enter a server name:
google.com
10 hops to google.com
[norozco6@unix1 network_log]$
```

9.) The difference in output is my script contains less information regarding on the hops it went to, and it took 20 seconds longer due to the wait time.