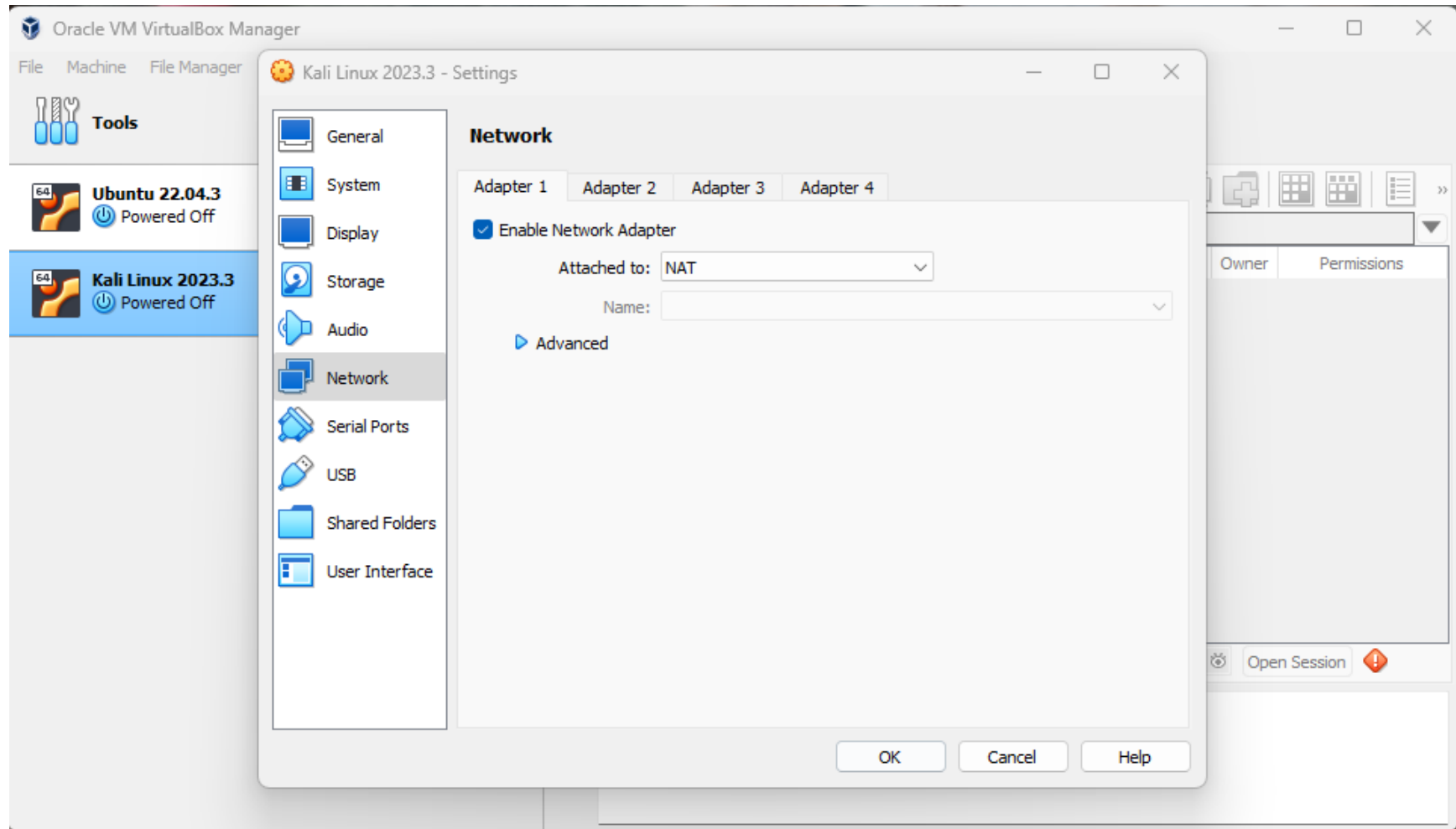


Myrna E. Santiago

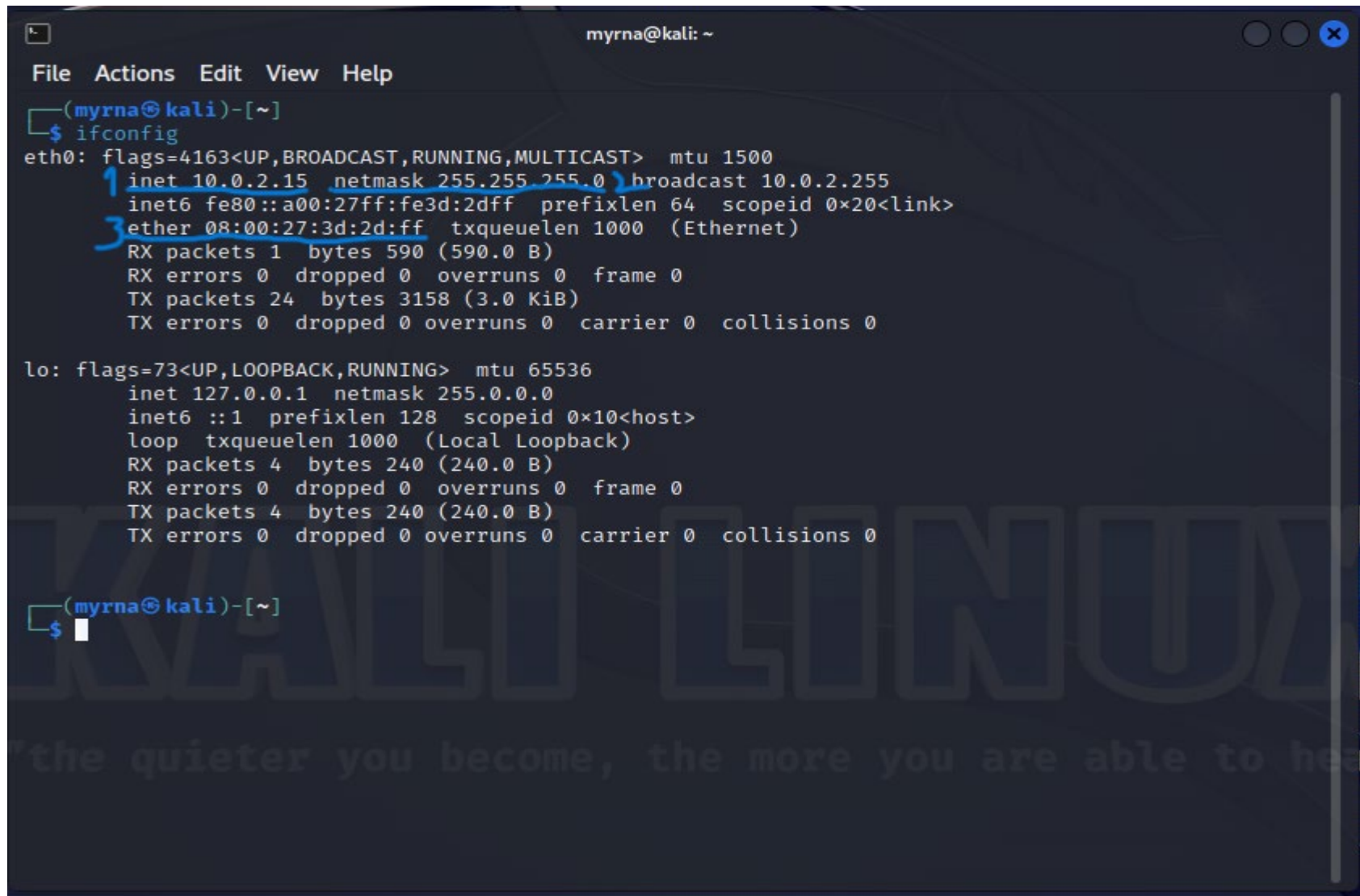
CYSE 270_20306

11/19/2023

Task A: Explore network configuration. Pre-Step: Connect VM in NAT mode.



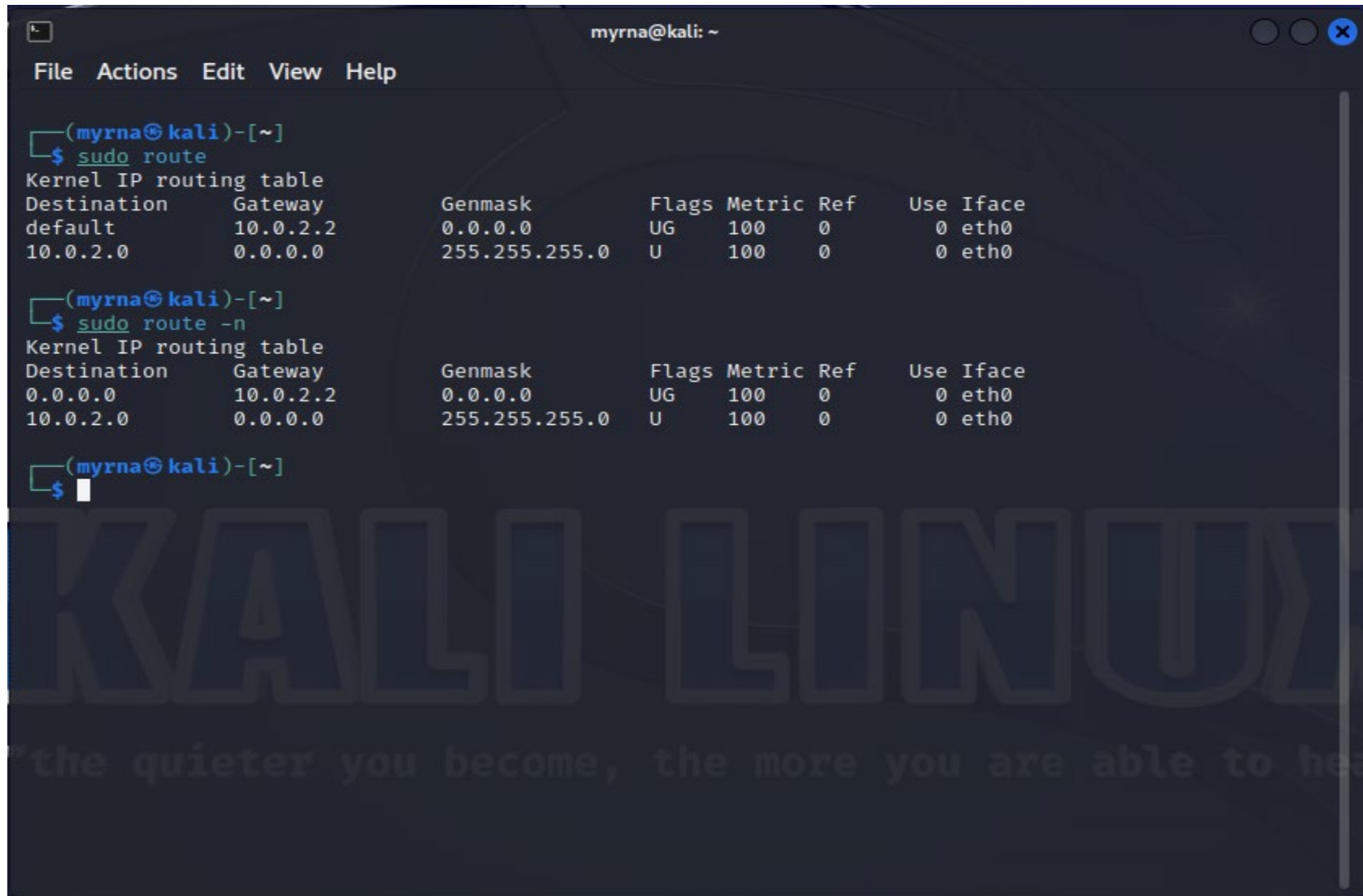
Step 1: Using **ifconfig** we can display the network current configuration. 1. IP address, 2. Network mask, 3. MAC address.



```
myrna@kali: ~  
File Actions Edit View Help  
(myrna@kali)-[~]  
$ ifconfig  
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
  1 inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255  
    inet6 fe80::a00:27ff:fe3d:2dff prefixlen 64 scopeid 0x20<link>  
  3 ether 08:00:27:3d:2d:ff txqueuelen 1000 (Ethernet)  
    RX packets 1 bytes 590 (590.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 24 bytes 3158 (3.0 KiB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
  inet 127.0.0.1 netmask 255.0.0.0  
  inet6 ::1 prefixlen 128 scopeid 0x10<host>  
  loop txqueuelen 1000 (Local Loopback)  
  RX packets 4 bytes 240 (240.0 B)  
  RX errors 0 dropped 0 overruns 0 frame 0  
  TX packets 4 bytes 240 (240.0 B)  
  TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
(myrna@kali)-[~]  
$
```

The terminal window displays the output of the `ifconfig` command. It shows the configuration for the `eth0` (Ethernet) and `lo` (loopback) interfaces. For `eth0`, the IP address is `10.0.2.15`, the netmask is `255.255.255.0`, and the MAC address is `08:00:27:3d:2d:ff`. For `lo`, the IP address is `127.0.0.1` and the netmask is `255.0.0.0`. The output also includes statistics for RX and TX packets, bytes, errors, and collisions.

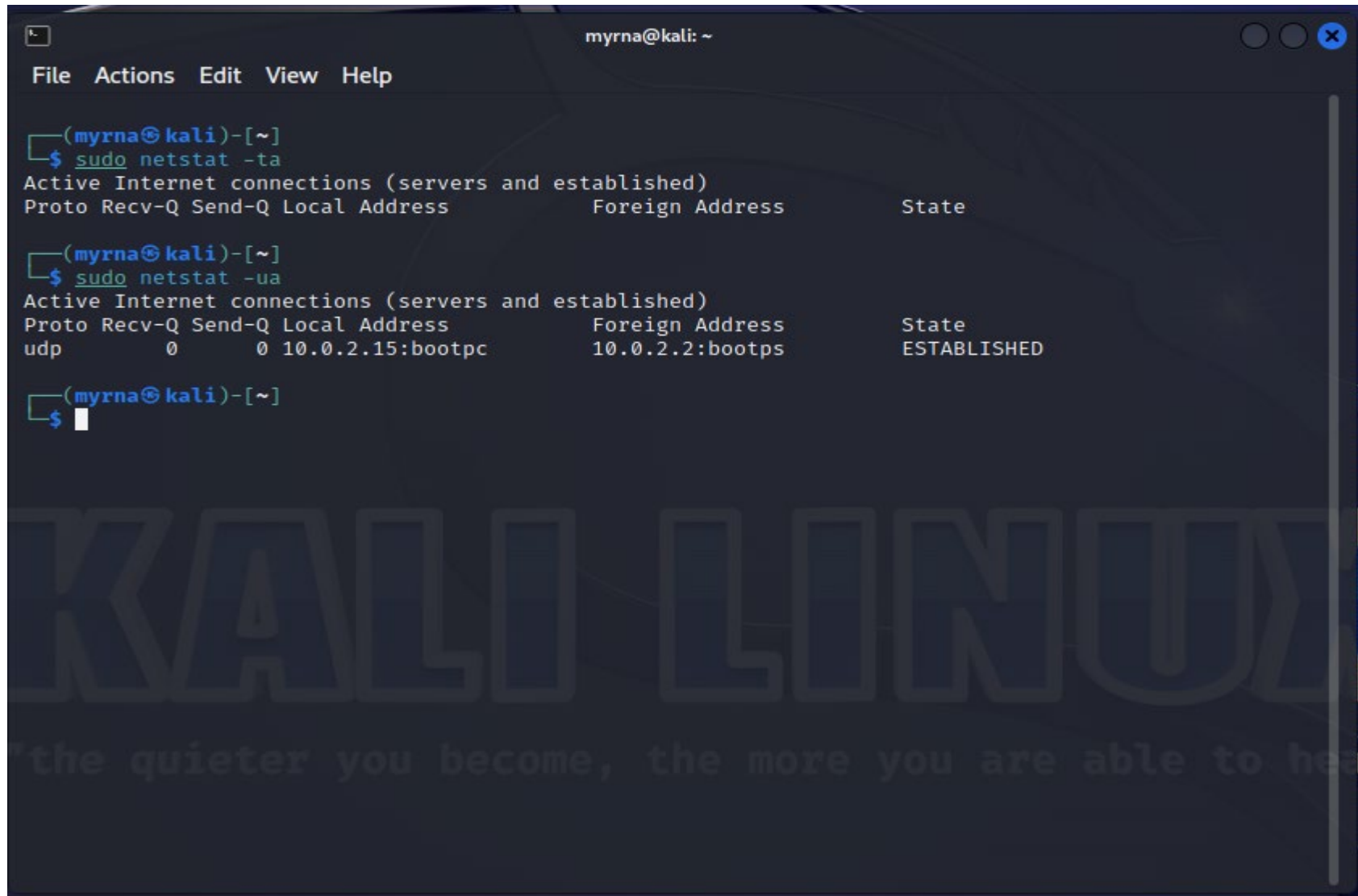
Step 2: Using **sudo route** or **sudo route -n** we can see that it shows the current routing table. The only difference is by using route -n you can see that the default destination to 0.0.0.0 ip v4 address.



A terminal window titled "myrna@kali: ~" with a menu bar (File, Actions, Edit, View, Help). The window shows three commands and their outputs. The first command is `sudo route`, which displays a routing table with a default entry pointing to 10.0.2.2. The second command is `sudo route -n`, which displays a routing table with a default entry pointing to 0.0.0.0. The third command is a prompt with a cursor, and the background features a large "KALI LINUX" watermark and a quote: "the quieter you become, the more you are able to hear".

```
(myrna@kali)-[~]  
$ sudo route  
Kernel IP routing table  
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface  
default          10.0.2.2         0.0.0.0          UG    100    0      0 eth0  
10.0.2.0         0.0.0.0          255.255.255.0    U     100    0      0 eth0  
  
(myrna@kali)-[~]  
$ sudo route -n  
Kernel IP routing table  
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface  
0.0.0.0          10.0.2.2         0.0.0.0          UG    100    0      0 eth0  
10.0.2.0         0.0.0.0          255.255.255.0    U     100    0      0 eth0  
  
(myrna@kali)-[~]  
$
```

Step 3: Using `sudo netstat -ta` to list current TCP connections. (Please note my connection is at my work in another university, I do not have TCP connections at this moment.) By using `sudo netstat -ua` list UDP connections showing my establish connection.

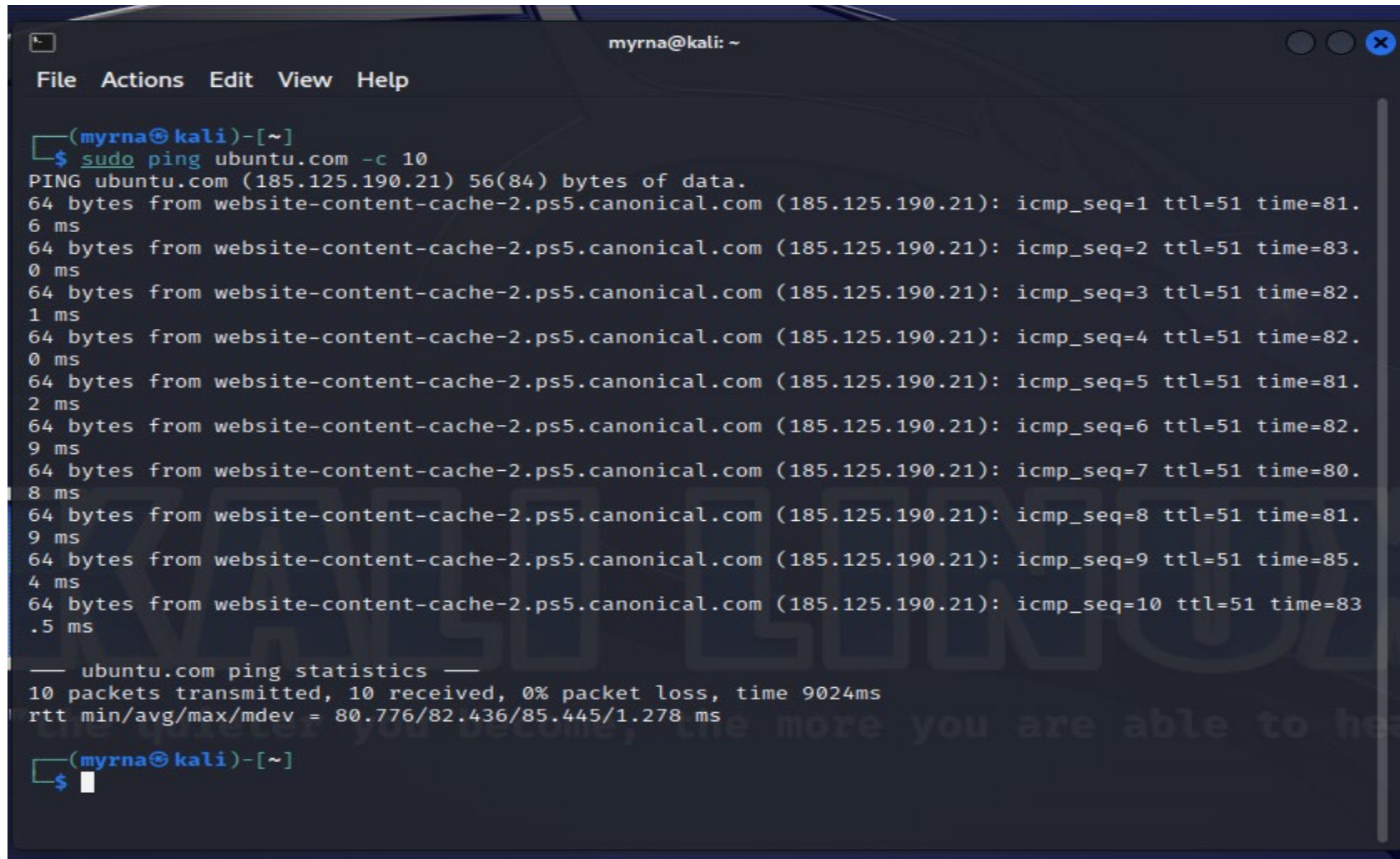


```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
$ sudo netstat -ta  
Active Internet connections (servers and established)  
Proto Recv-Q Send-Q Local Address           Foreign Address         State  
  
(myrna@kali)-[~]  
$ sudo netstat -ua  
Active Internet connections (servers and established)  
Proto Recv-Q Send-Q Local Address           Foreign Address         State  
udp      0      0 10.0.2.15:bootpc        10.0.2.2:bootps        ESTABLISHED  
  
(myrna@kali)-[~]  
$
```

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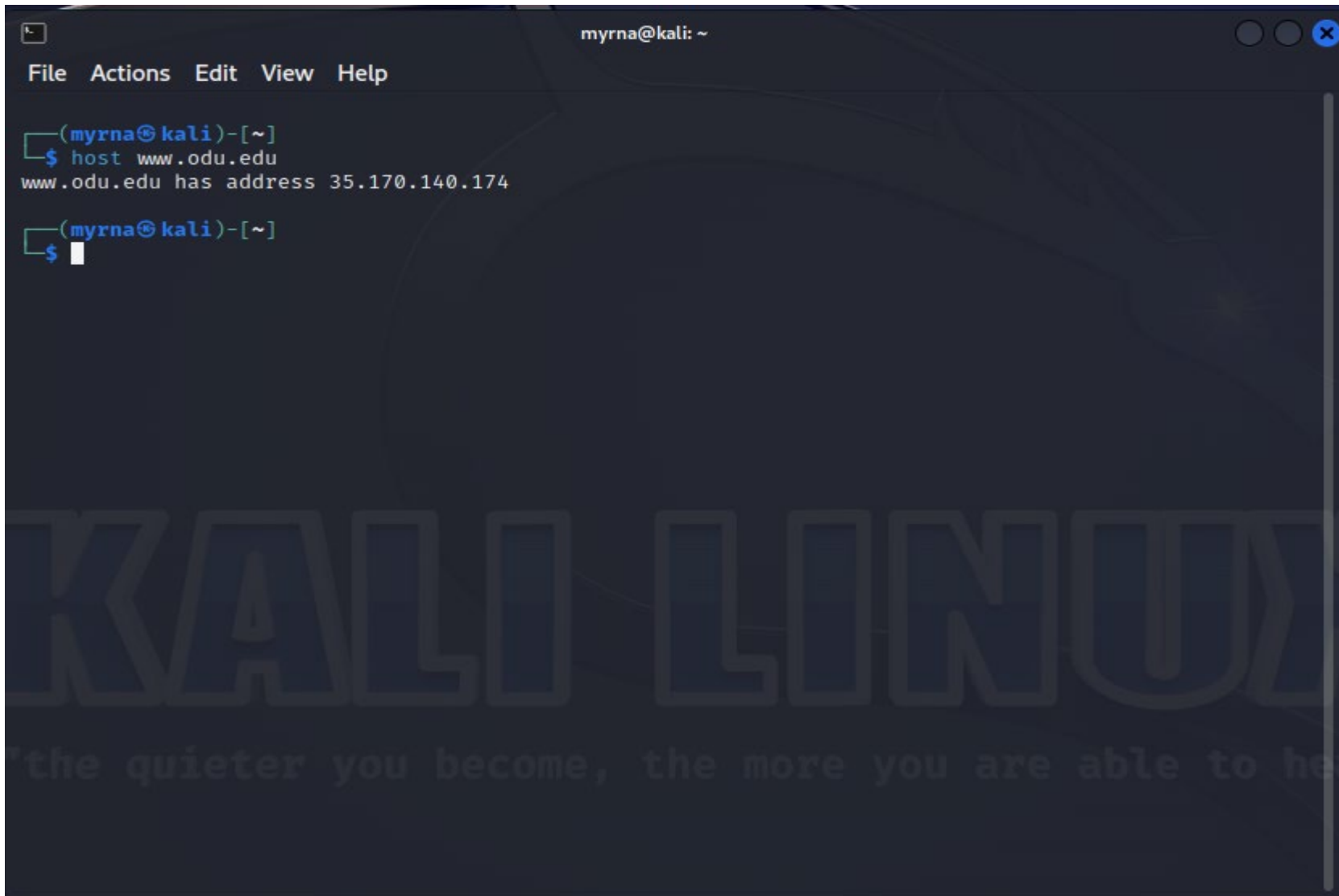
"the quieter you become, the more you are able to hear"

Step 4: Using **ping ubuntu.com -c 10**. By using flag -c 10 we specified 10 ping requests. The connection was well and there was no packet loss.



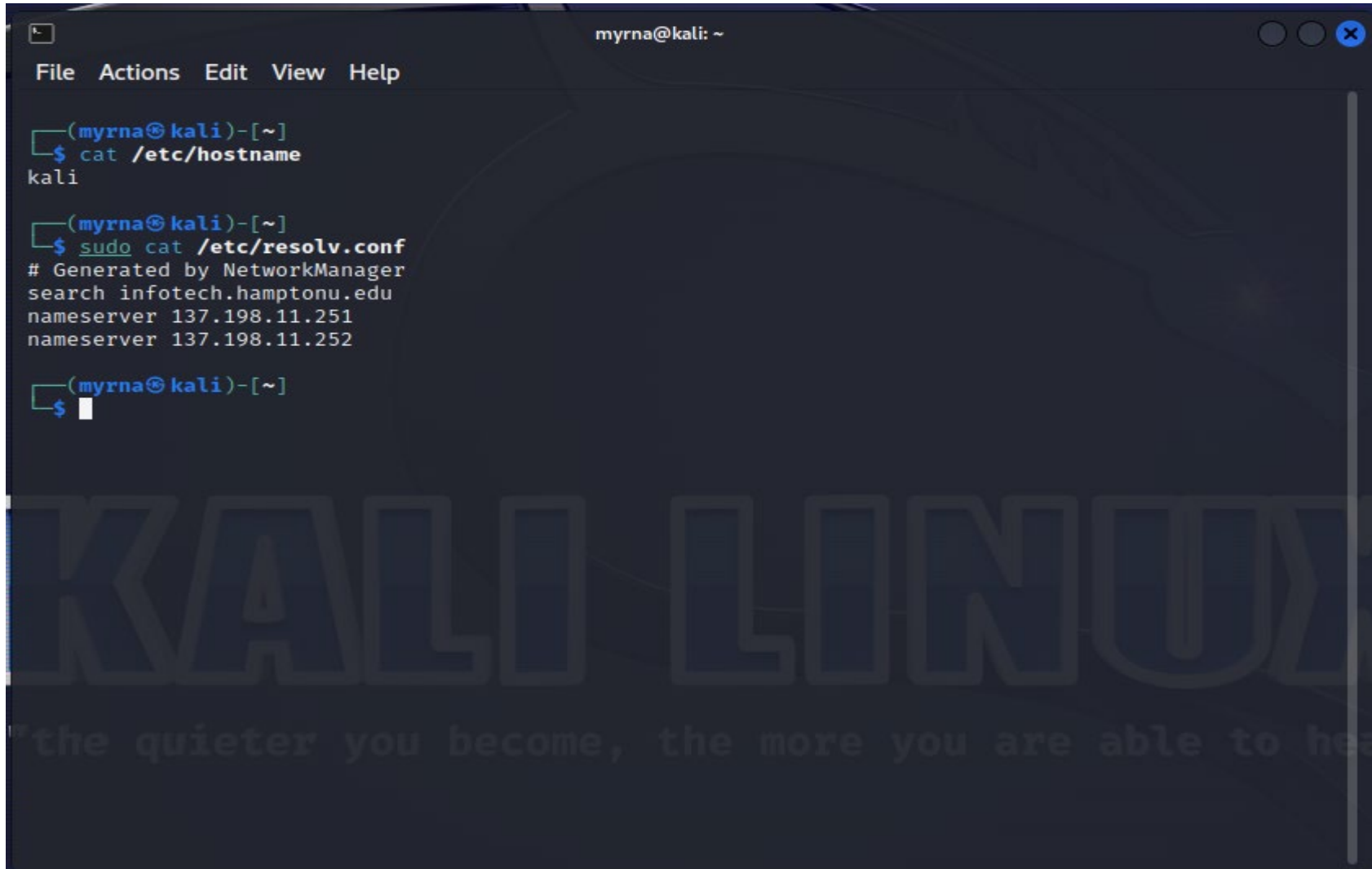
```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
$ sudo ping ubuntu.com -c 10  
PING ubuntu.com (185.125.190.21) 56(84) bytes of data.  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=1 ttl=51 time=81.  
6 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=2 ttl=51 time=83.  
0 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=3 ttl=51 time=82.  
1 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=4 ttl=51 time=82.  
0 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=5 ttl=51 time=81.  
2 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=6 ttl=51 time=82.  
9 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=7 ttl=51 time=80.  
8 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=8 ttl=51 time=81.  
9 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=9 ttl=51 time=85.  
4 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=10 ttl=51 time=83.  
.5 ms  
  
— ubuntu.com ping statistics —  
10 packets transmitted, 10 received, 0% packet loss, time 9024ms  
rtt min/avg/max/mdev = 80.776/82.436/85.445/1.278 ms  
  
(myrna@kali)-[~]  
$
```


Step 5: The command **host** www.odu.edu show us the DNS query for www.odu.edu with address 35.170.140.174.

A terminal window titled 'myrna@kali: ~' with a menu bar containing 'File', 'Actions', 'Edit', 'View', and 'Help'. The terminal shows a prompt '(myrna@kali)-[~]' followed by the command '\$ host www.odu.edu'. The output is 'www.odu.edu has address 35.170.140.174'. Below this, the prompt '(myrna@kali)-[~]' is shown again with a '\$' and a cursor. A large, semi-transparent 'KALI LINUX' watermark is visible across the bottom half of the terminal window.

```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
$ host www.odu.edu  
www.odu.edu has address 35.170.140.174  
  
(myrna@kali)-[~]  
$
```

Steps 6&7: 6) Using **cat /etc/hostname** it shows us the content of the file that contains the system's hostname. 7) Using **sudo cat /etc/resolv.conf** display the content of the file that contains the DNS servers for this system.

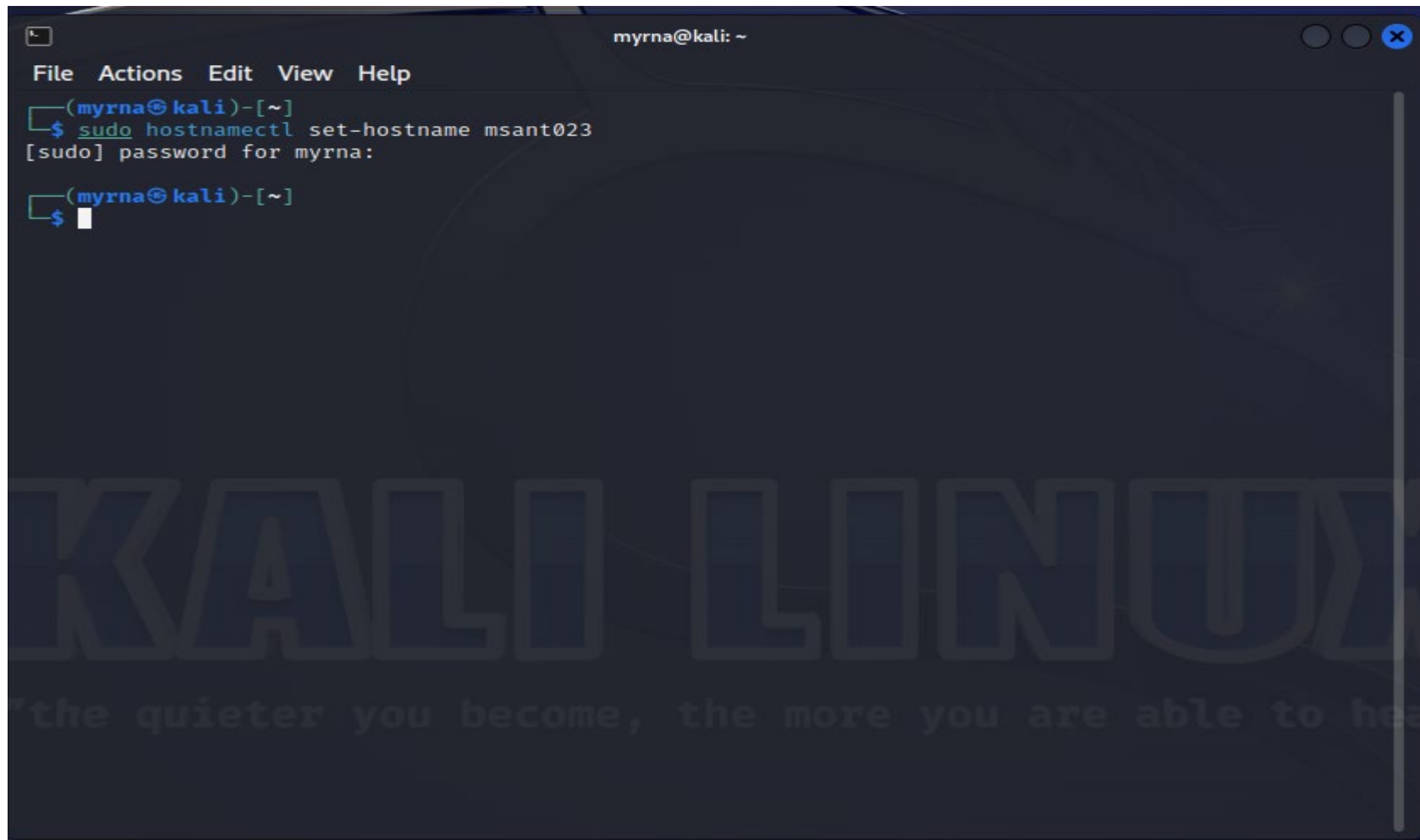


```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
$ cat /etc/hostname  
kali  
  
(myrna@kali)-[~]  
$ sudo cat /etc/resolv.conf  
# Generated by NetworkManager  
search infotech.hamptonu.edu  
nameserver 137.198.11.251  
nameserver 137.198.11.252  
  
(myrna@kali)-[~]  
$
```

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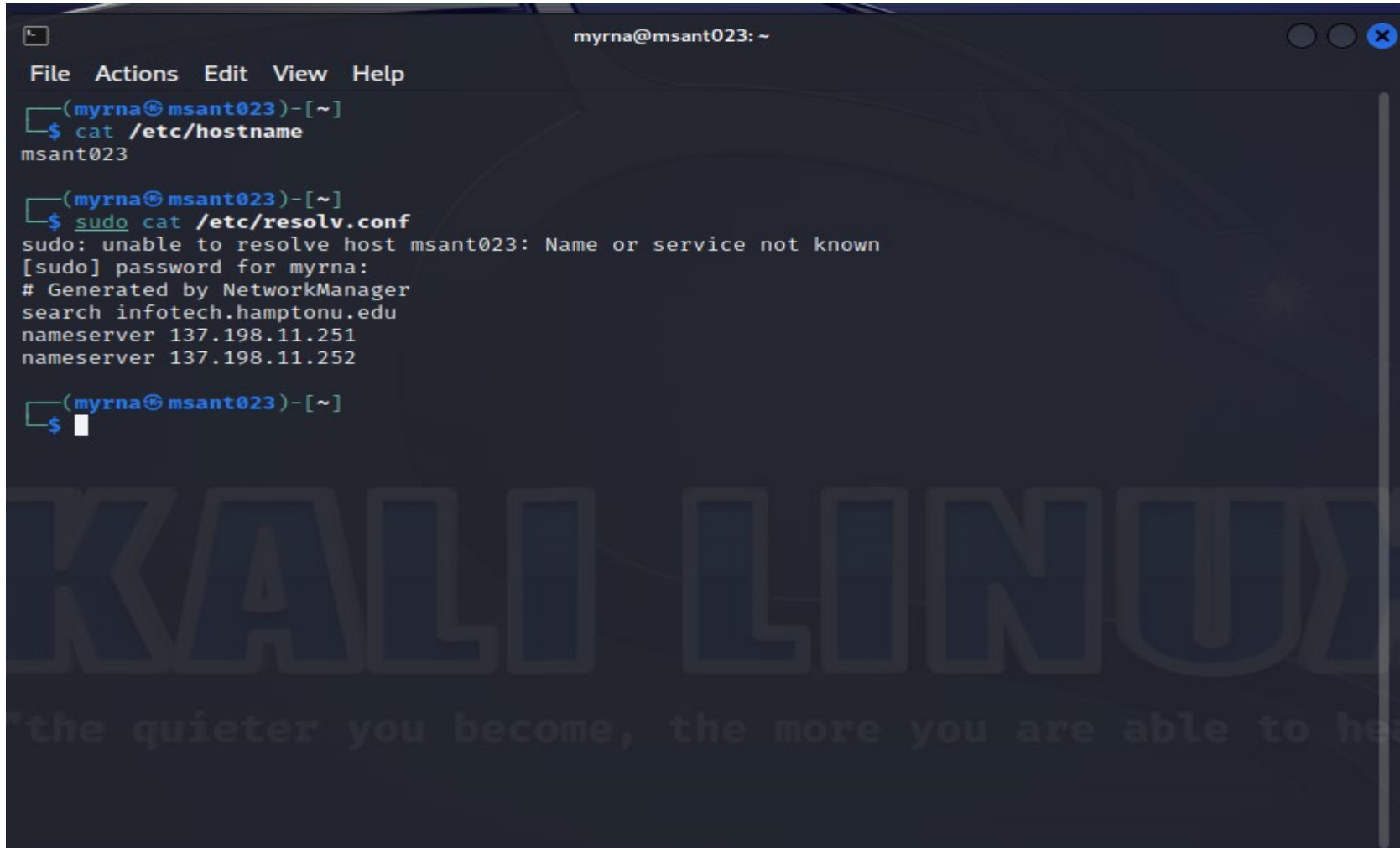
"the quieter you become, the more you are able to hear"

Step 8a: Using **sudo hostnamectl set-hostname msant023**, which will change the hostname permanently.

A terminal window titled "myrna@kali: ~" with a menu bar (File, Actions, Edit, View, Help). The terminal shows the command "sudo hostnamectl set-hostname msant023" being entered. A password prompt "[sudo] password for myrna:" is displayed. The prompt returns to "(myrna@kali)-[~]" with a new command prompt "\$" and a cursor. A large "KALI LINUX" watermark is visible in the background.

```
(myrna@kali)-[~]  
$ sudo hostnamectl set-hostname msant023  
[sudo] password for myrna:  
(myrna@kali)-[~]  
$
```


Step 8b: Restarting the system and using `cat /etc/hostname` shows the permanent change of the first part of step 8.



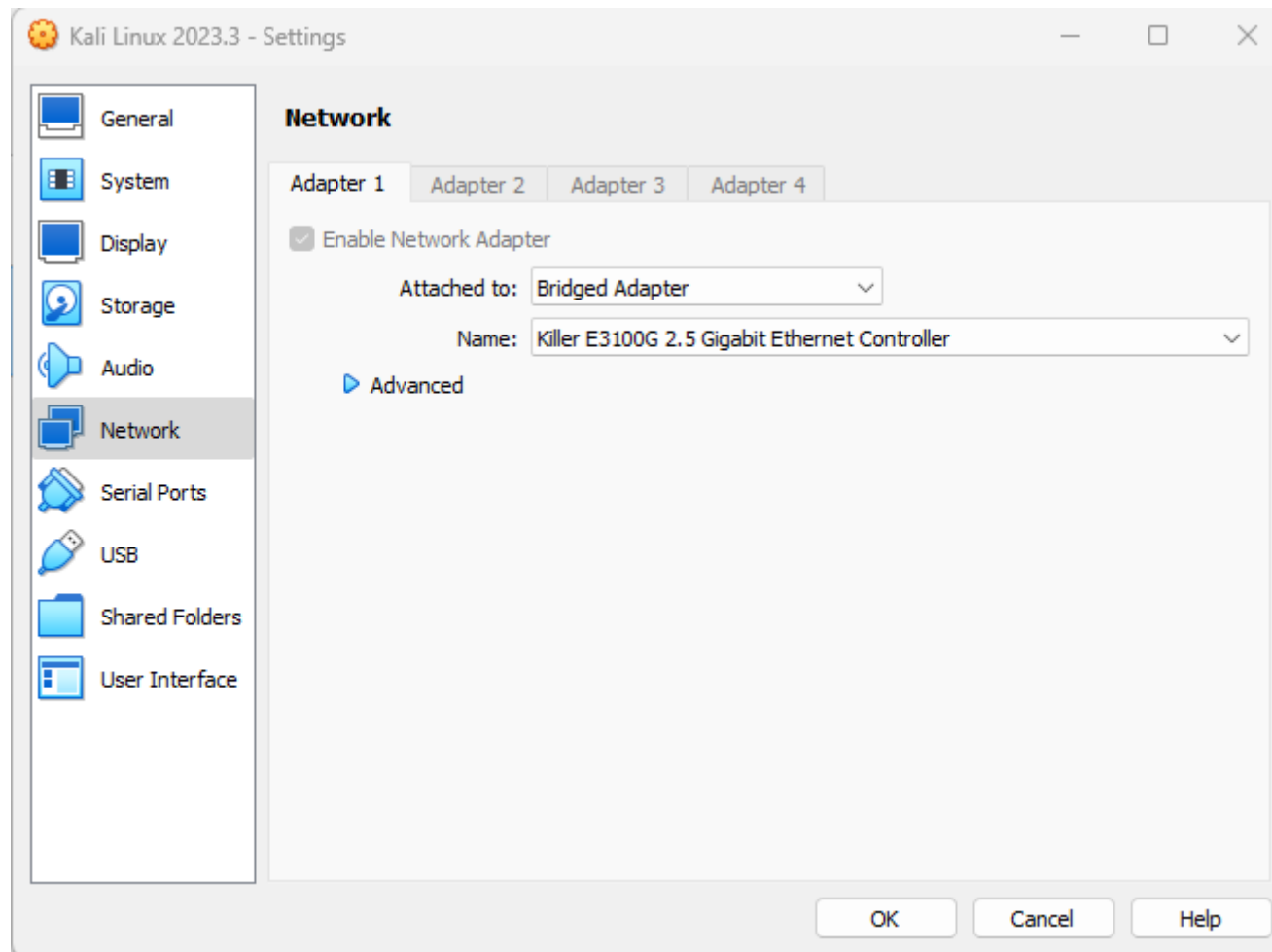
```
myrna@msant023: ~  
File Actions Edit View Help  
(myrna@msant023)-[~]  
$ cat /etc/hostname  
msant023  
  
(myrna@msant023)-[~]  
$ sudo cat /etc/resolv.conf  
sudo: unable to resolve host msant023: Name or service not known  
[sudo] password for myrna:  
# Generated by NetworkManager  
search infotech.hamptonu.edu  
nameserver 137.198.11.251  
nameserver 137.198.11.252  
  
(myrna@msant023)-[~]  
$
```

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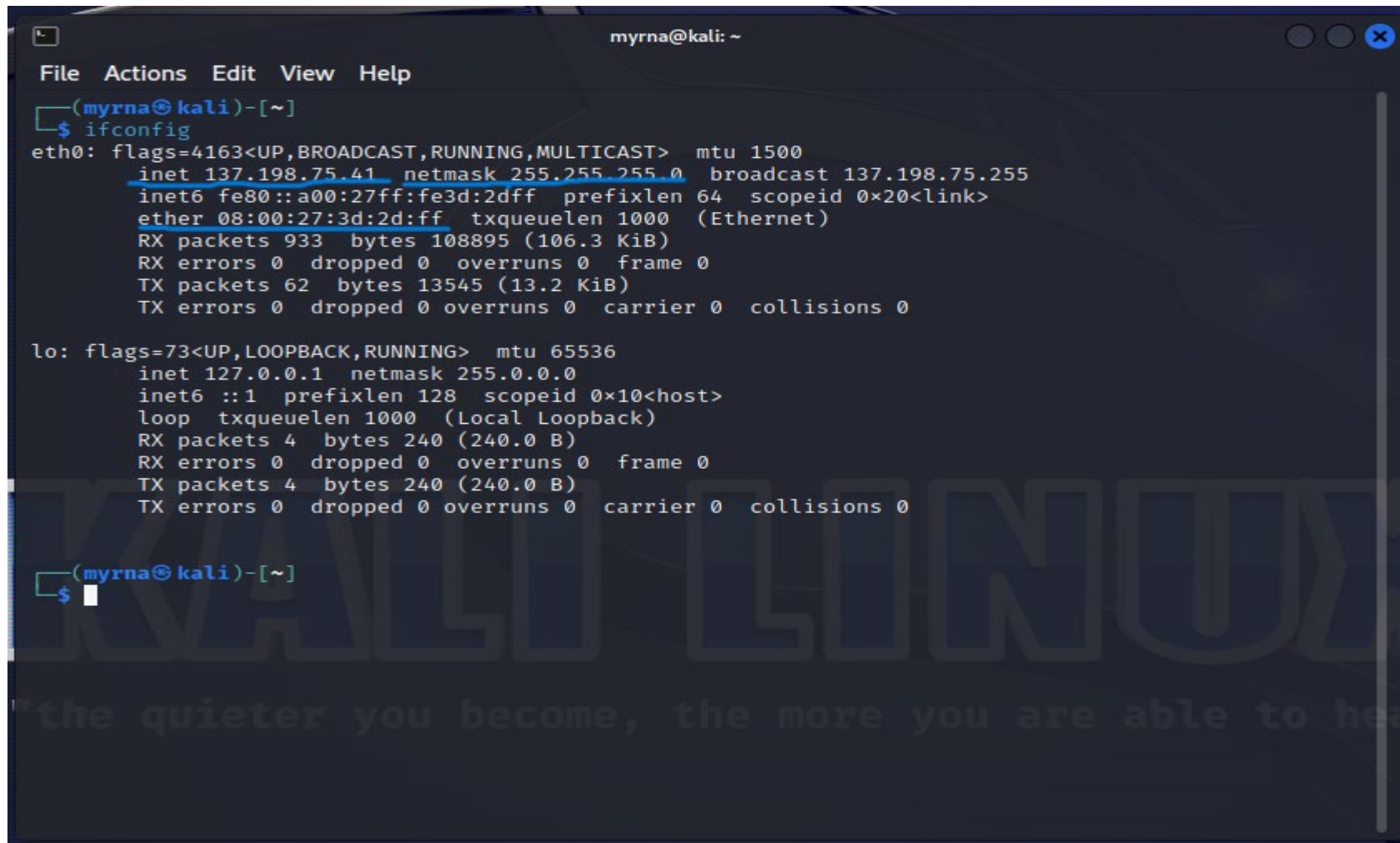
"the quieter you become, the more you are able to hear"

Task B: Different Network Setting

Step 1: Change NAT to Bridged Adapter.



Step 2a: The IP address change from 10.0.2.15 to 137.198.75.41, while netmask and MAC addresses stay the same.

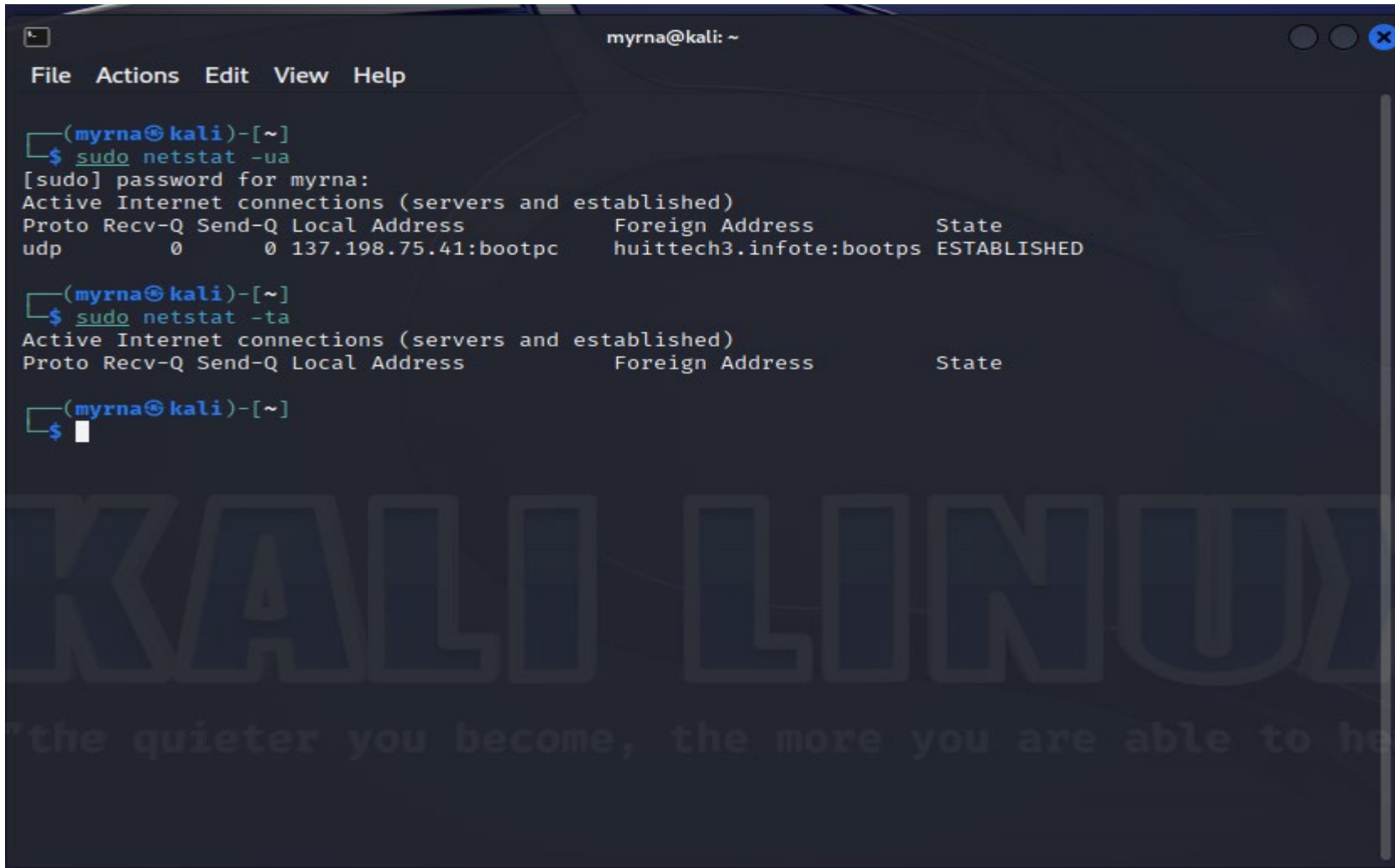


```
myrna@kali: ~  
File Actions Edit View Help  
(myrna@kali)-[~]  
$ ifconfig  
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 137.198.75.41 netmask 255.255.255.0 broadcast 137.198.75.255  
    inet6 fe80::a00:27ff:fe3d:2dff prefixlen 64 scopeid 0x20<link>  
    ether 08:00:27:3d:2d:ff txqueuelen 1000 (Ethernet)  
    RX packets 933 bytes 108895 (106.3 KiB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 62 bytes 13545 (13.2 KiB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536  
    inet 127.0.0.1 netmask 255.0.0.0  
    inet6 ::1 prefixlen 128 scopeid 0x10<host>  
    loop txqueuelen 1000 (Local Loopback)  
    RX packets 4 bytes 240 (240.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 4 bytes 240 (240.0 B)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
(myrna@kali)-[~]  
$
```

Step 2b: Destination 2 change to 137.198.75.0 from 10.0.2.0 and gateway in 1 change from 10.0.2.2 to 137.198.75.

```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
$ sudo route -n  
[sudo] password for myrna:  
Kernel IP routing table  
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface  
0.0.0.0          137.198.75.1    0.0.0.0          UG    100    0      0 eth0  
137.198.75.0     0.0.0.0         255.255.255.0    U     100    0      0 eth0  
  
(myrna@kali)-[~]  
$ sudo route  
Kernel IP routing table  
Destination      Gateway          Genmask          Flags Metric Ref    Use Iface  
default          137.198.75.1    0.0.0.0          UG    100    0      0 eth0  
137.198.75.0     0.0.0.0         255.255.255.0    U     100    0      0 eth0  
  
(myrna@kali)-[~]  
$
```

Steps 2c: Both times connections are UDP. But local address for Task A is local address 10.0.2.15:bootpc and foreign address 10.0.2.2:bootps. With the Bridge Adapter, local address changes to 137.198.75.41:bootpc and foreign address is HUITtech3.infote:bootps.



```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
$ sudo netstat -ua  
[sudo] password for myrna:  
Active Internet connections (servers and established)  
Proto Recv-Q Send-Q Local Address           Foreign Address         State  
udp        0      0 137.198.75.41:bootpc    huittech3.infote:bootps ESTABLISHED  
  
(myrna@kali)-[~]  
$ sudo netstat -ta  
Active Internet connections (servers and established)  
Proto Recv-Q Send-Q Local Address           Foreign Address         State  
  
(myrna@kali)-[~]  
$
```

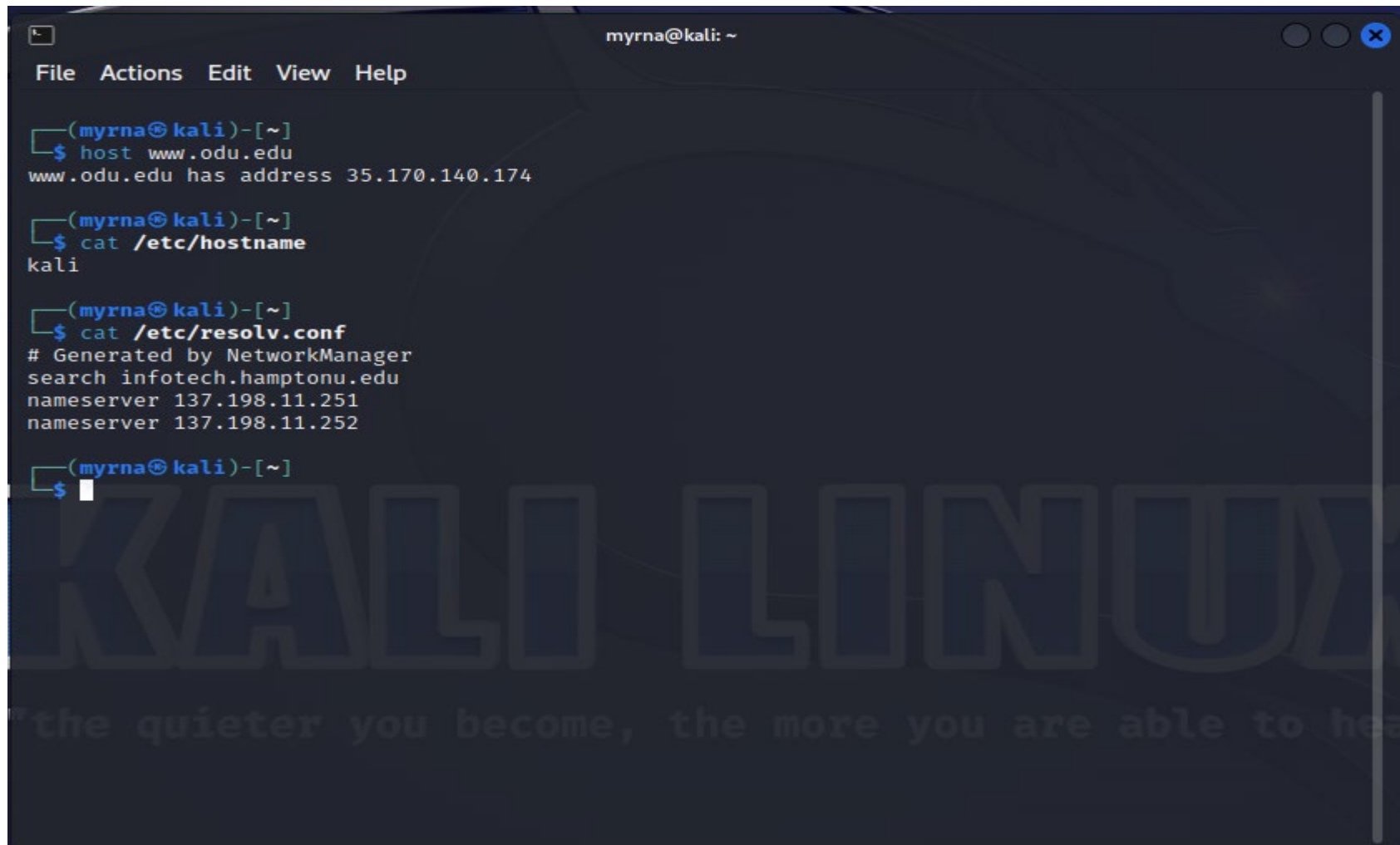
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"the quieter you become, the more you are able to hear"

Step 2d: This information remained the same in both tasks.

```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
$ sudo ping ubuntu.com -c 10  
PING ubuntu.com (185.125.190.21) 56(84) bytes of data.  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=1 ttl=52 time=81.  
8 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=2 ttl=52 time=81.  
7 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=3 ttl=52 time=81.  
5 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=4 ttl=52 time=81.  
4 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=5 ttl=52 time=82.  
6 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=6 ttl=52 time=82.  
4 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=7 ttl=52 time=82.  
3 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=8 ttl=52 time=82.  
7 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=9 ttl=52 time=82.  
0 ms  
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icmp_seq=10 ttl=52 time=87.  
.6 ms  
  
— ubuntu.com ping statistics —  
10 packets transmitted, 10 received, 0% packet loss, time 10514ms  
rtt min/avg/max/mdev = 81.398/82.592/87.569/1.715 ms  
  
(myrna@kali)-[~]  
$
```


Step 2e-g: Steps 5 to 7 remained the same.



```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
$ host www.odu.edu  
www.odu.edu has address 35.170.140.174  
  
(myrna@kali)-[~]  
$ cat /etc/hostname  
kali  
  
(myrna@kali)-[~]  
$ cat /etc/resolv.conf  
# Generated by NetworkManager  
search infotech.hamptonu.edu  
nameserver 137.198.11.251  
nameserver 137.198.11.252  
  
(myrna@kali)-[~]  
$
```

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"the quieter you become, the more you are able to hear"

