

OLD DOMINION UNIVERSITY

CYSE 270 LINUX SYSTEM FOR CYBERSECURITY

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# Assignment #12 Basic Network Configurations

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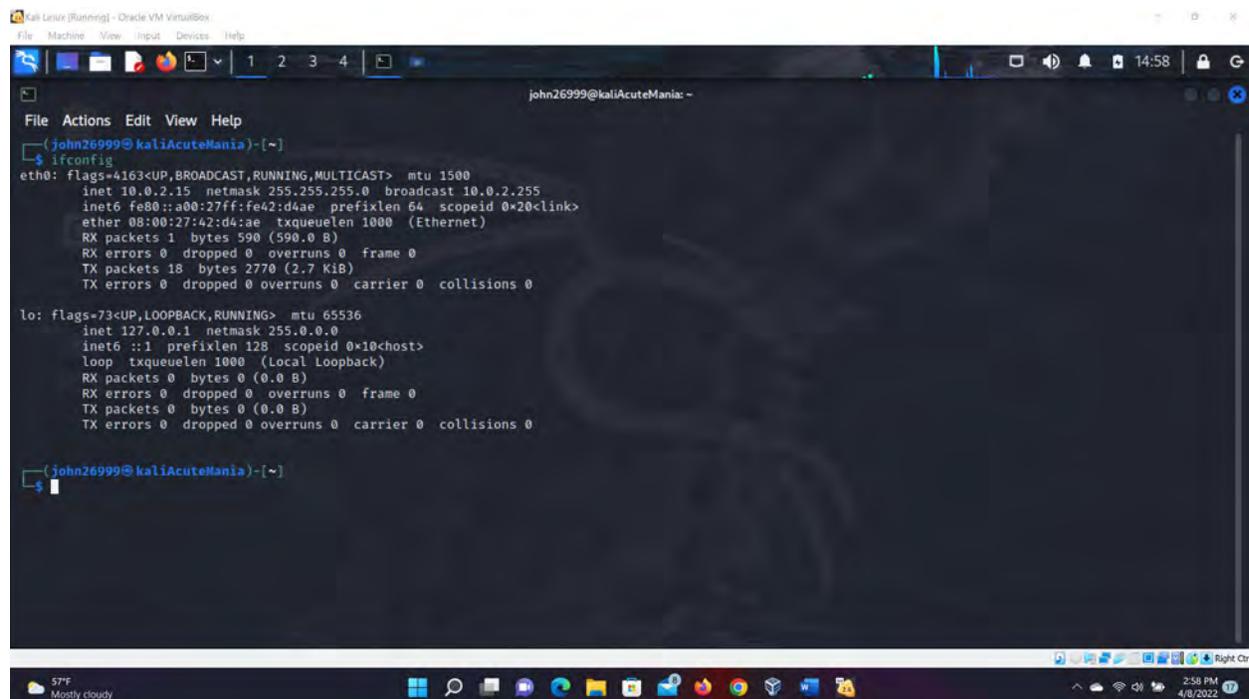
## CYSE 270 Assignment #12 Basic Network Configurations

You can use either **Ubuntu VM** or **Kali Linux VM** to complete the following tasks.

### **Task A: Explore Network Configurations (8 \* 5 = 40 Points)**

Connect your VM in the **NAT** mode

1. Use the correct **ifconfig** command to display the current network configuration. **Highlight** your IP address, MAC address, and the network mask.



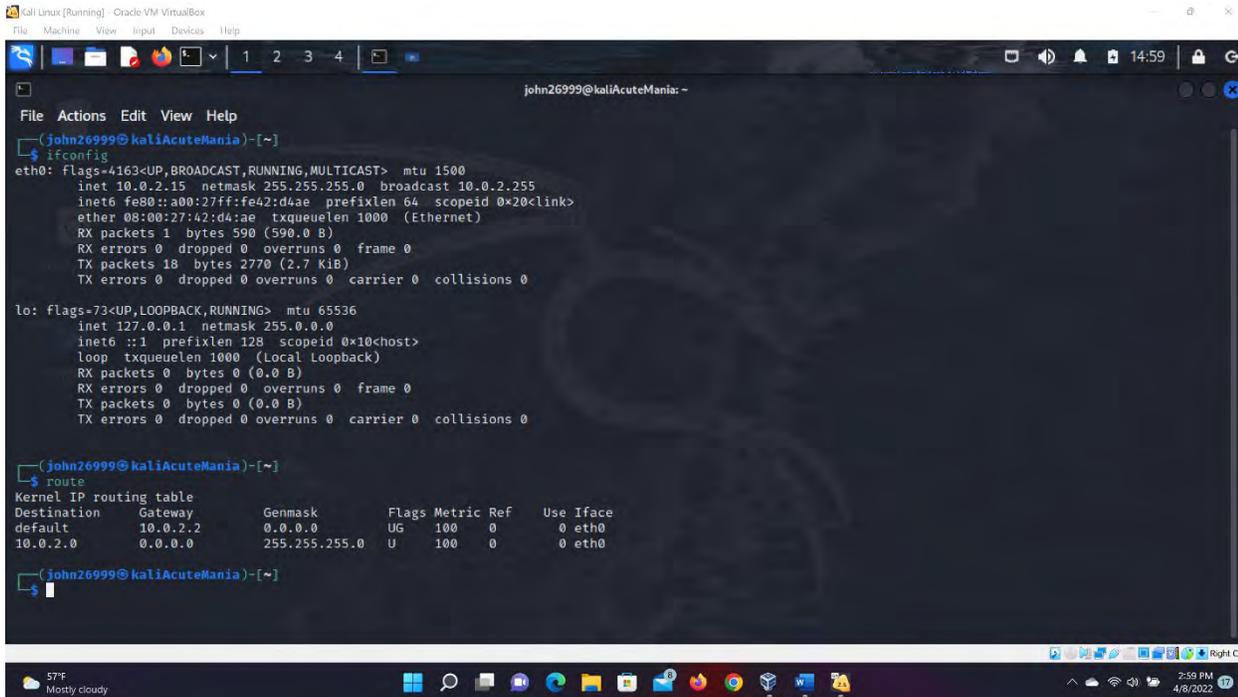
```
john26999@kaliAcuteMania: ~  
└─$ ifconfig  
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255  
    inet6 fe80::a00:27ff:fe42:d4ae prefixlen 64 scopeid 0<link>  
    ether 08:00:27:42:d4:ae txqueuelen 1000 (Ethernet)  
    RX packets 1 bytes 590 (590.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 18 bytes 2770 (2.7 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 0<host>  
    loop txqueuelen 1000 (Local Loopback)  
    RX packets 0 bytes 0 (0.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 0 bytes 0 (0.0 B)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
john26999@kaliAcuteMania: ~  
└─$
```

Figure 1 Screenshots of JWILSO82 Computer screen prior to Step 1.

Above is the screen shot using the command “ifconfig” that displays the information on current network configuration information, ip address, netmask, or broadcast address to a network interface, creating an alias for the network interface, setting up hardware address, and enable or disable network interfaces.

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2. Use the correct **route** command to display the current routing table.



```
john26999@kaliAcuteMania: ~  
File Actions Edit View Help  
john26999@kaliAcuteMania)~  
└─$ ifconfig  
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255  
    inet6 fe80::a00:27ff:fe42:d4ae prefixlen 64 scopeid 0<link>  
    ether 08:00:27:42:d4:ae txqueuelen 1000 (Ethernet)  
    RX packets 1 bytes 590 (590.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 18 bytes 2770 (2.7 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 0<host>  
    loop txqueuelen 1000 (Local Loopback)  
    RX packets 0 bytes 0 (0.0 B)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 0 bytes 0 (0.0 B)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
john26999@kaliAcuteMania)~  
└─$ 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  
  
john26999@kaliAcuteMania)~  
└─$
```

Figure 2 Screenshots of JWILS082 Computer screen prior to Step 2.

Above is the screen shot using the command “route” to display the routing table.

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3. Use the **netstat** command to list current TCP connections.

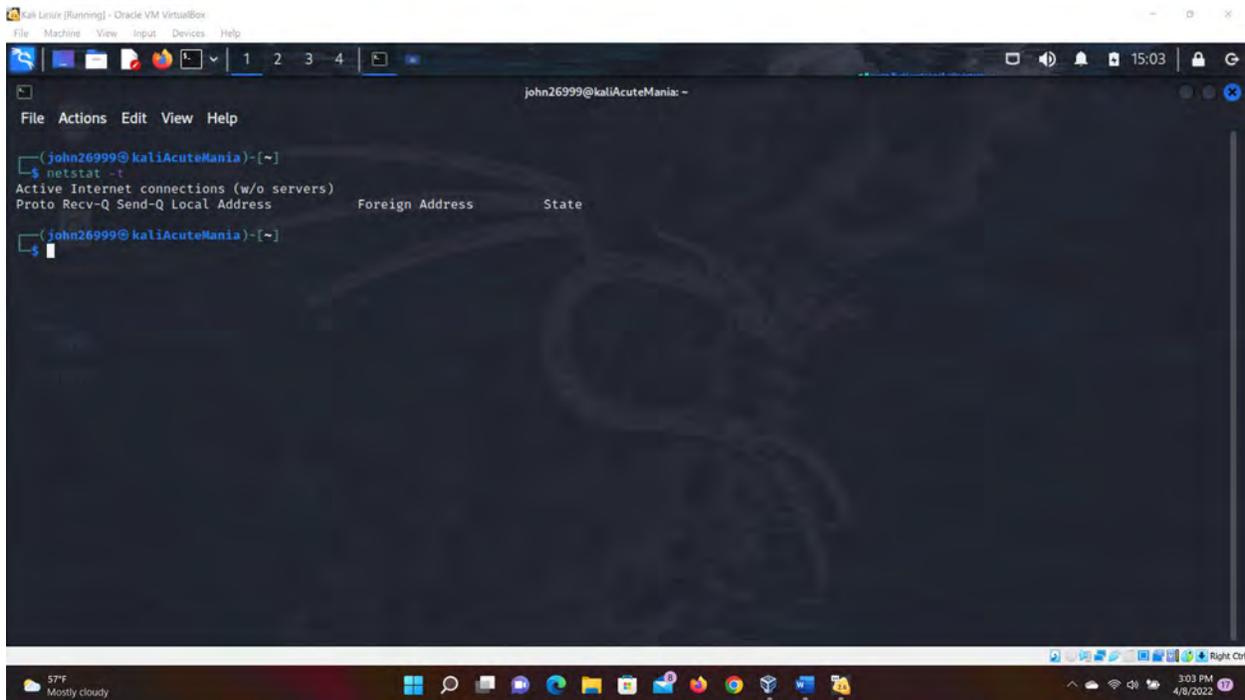
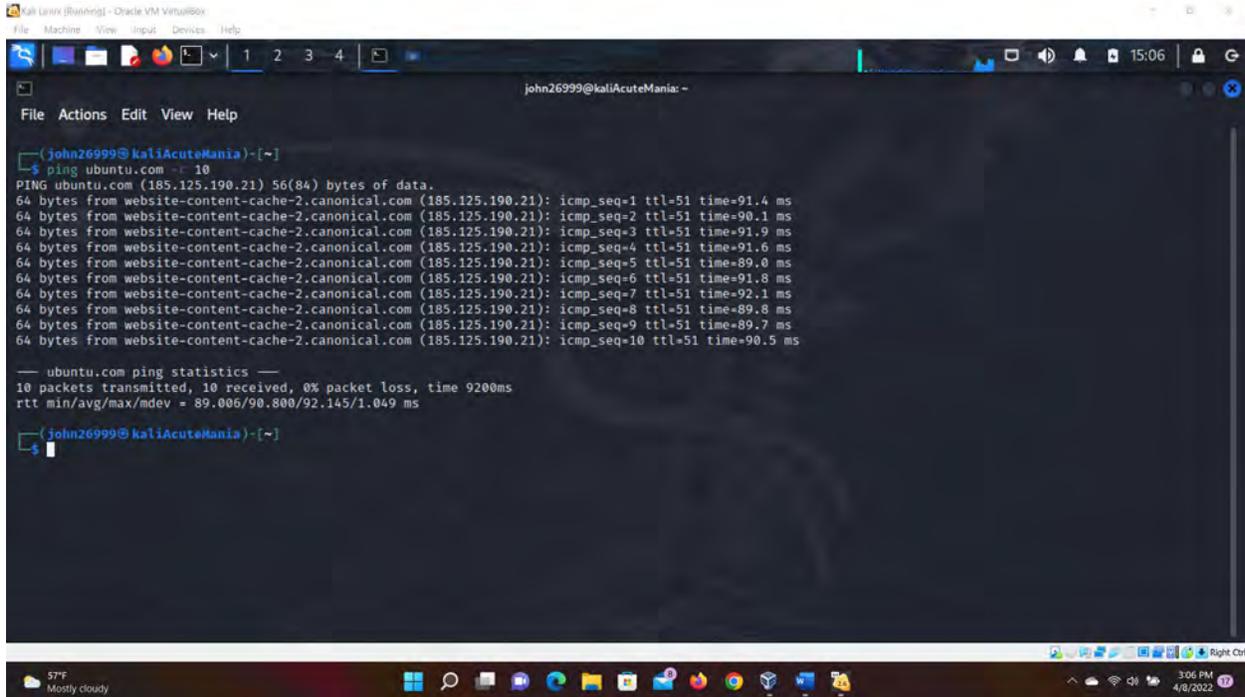


Figure 3 Screenshots of JWILS082 Computer screen prior to Step 3.

Above is the screen shot using the command “netstat -t” that displays the current TCP connections. As you can see I don’t ha any on this computer.

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4. Use the **ping** command to determine if the **ubuntu.com** system is accessible via the network. (Use the correct option to send 10 ping requests only.)



```
(john26999@kaliAcuteMania)-[~]
└─$ ping ubuntu.com -c 10
PING ubuntu.com (185.125.190.21) 56(84) bytes of data:
64 bytes from website-content-cache-2.canonical.com (185.125.190.21): icmp_seq=1 ttl=51 time=91.4 ms
64 bytes from website-content-cache-2.canonical.com (185.125.190.21): icmp_seq=2 ttl=51 time=90.1 ms
64 bytes from website-content-cache-2.canonical.com (185.125.190.21): icmp_seq=3 ttl=51 time=91.9 ms
64 bytes from website-content-cache-2.canonical.com (185.125.190.21): icmp_seq=4 ttl=51 time=91.6 ms
64 bytes from website-content-cache-2.canonical.com (185.125.190.21): icmp_seq=5 ttl=51 time=89.0 ms
64 bytes from website-content-cache-2.canonical.com (185.125.190.21): icmp_seq=6 ttl=51 time=91.8 ms
64 bytes from website-content-cache-2.canonical.com (185.125.190.21): icmp_seq=7 ttl=51 time=92.1 ms
64 bytes from website-content-cache-2.canonical.com (185.125.190.21): icmp_seq=8 ttl=51 time=89.8 ms
64 bytes from website-content-cache-2.canonical.com (185.125.190.21): icmp_seq=9 ttl=51 time=89.7 ms
64 bytes from website-content-cache-2.canonical.com (185.125.190.21): icmp_seq=10 ttl=51 time=90.5 ms

--- ubuntu.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9200ms
rtt min/avg/max/mdev = 89.006/90.800/92.145/1.049 ms

(john26999@kaliAcuteMania)-[~]
└─$
```

Figure 4 Screenshots of JWILS082 Computer screen prior to Step 4.

Above is the screen shot using the command “ping ubuntu.com -c 10” which will ping the nost address 10 times and stop.

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5. Use the **host** command to perform a DNS query on **www.odu.edu**

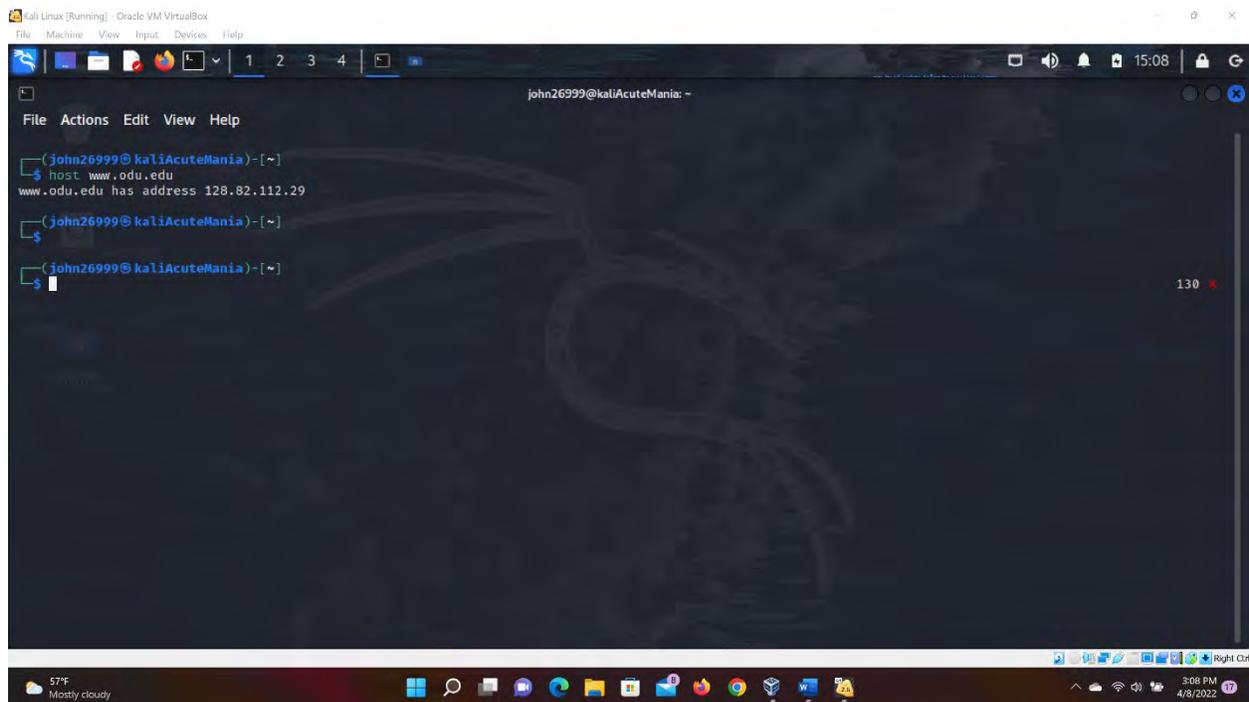


Figure 5 Screenshots of JWILS082 Computer screen prior to Step 5.

Above is the screen shot using the command “host www.odu.edu” that displays the hosts ip address.

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6. Use the **cat** command to display the contents of the file that contains the system's hostname.

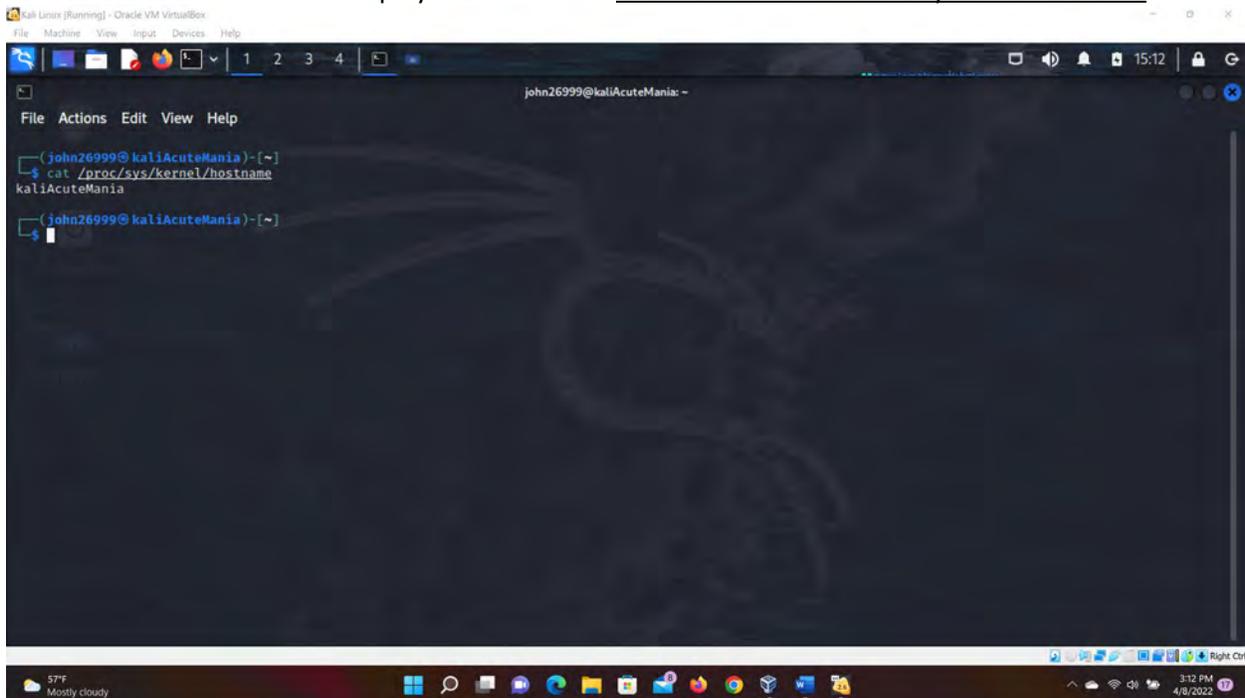


Figure 6 Screenshots of JWILS082 Computer screen prior to Step 6.

Above is the screen shot using the command “cat /proc/sys/kernel/hostname” that displays the file that contains the systems host name.

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7. Use the **cat** command to display the contents of the file that contains the DNS servers for this system.

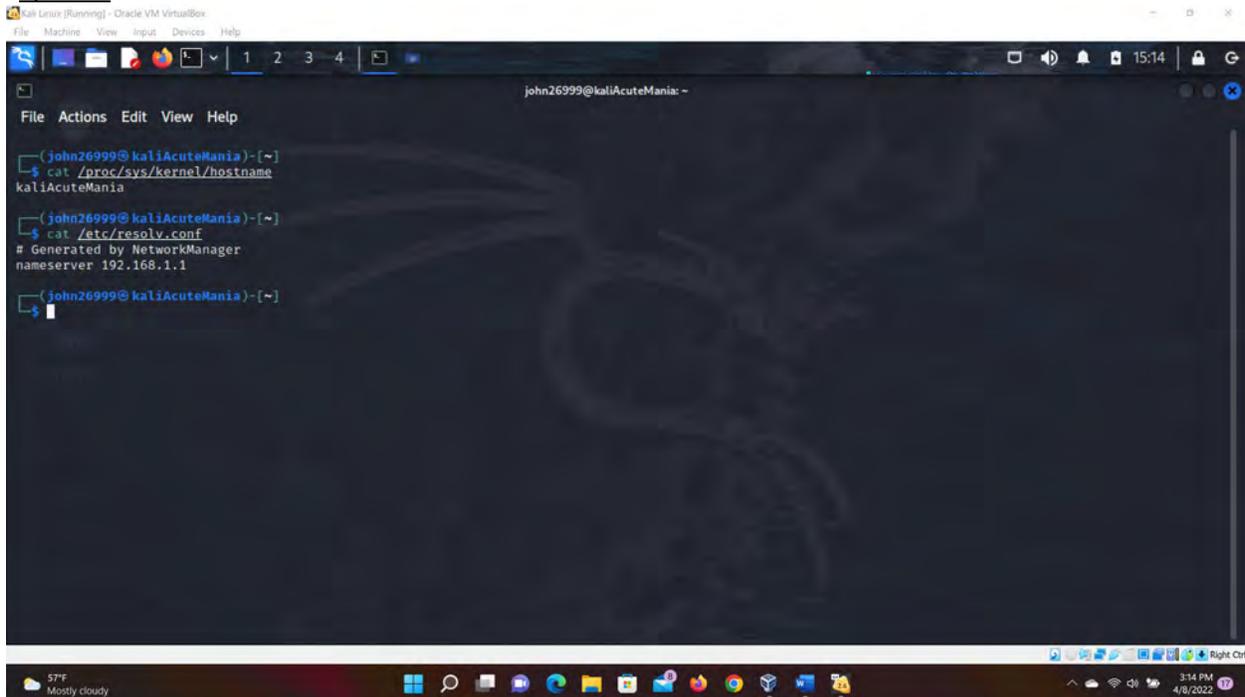
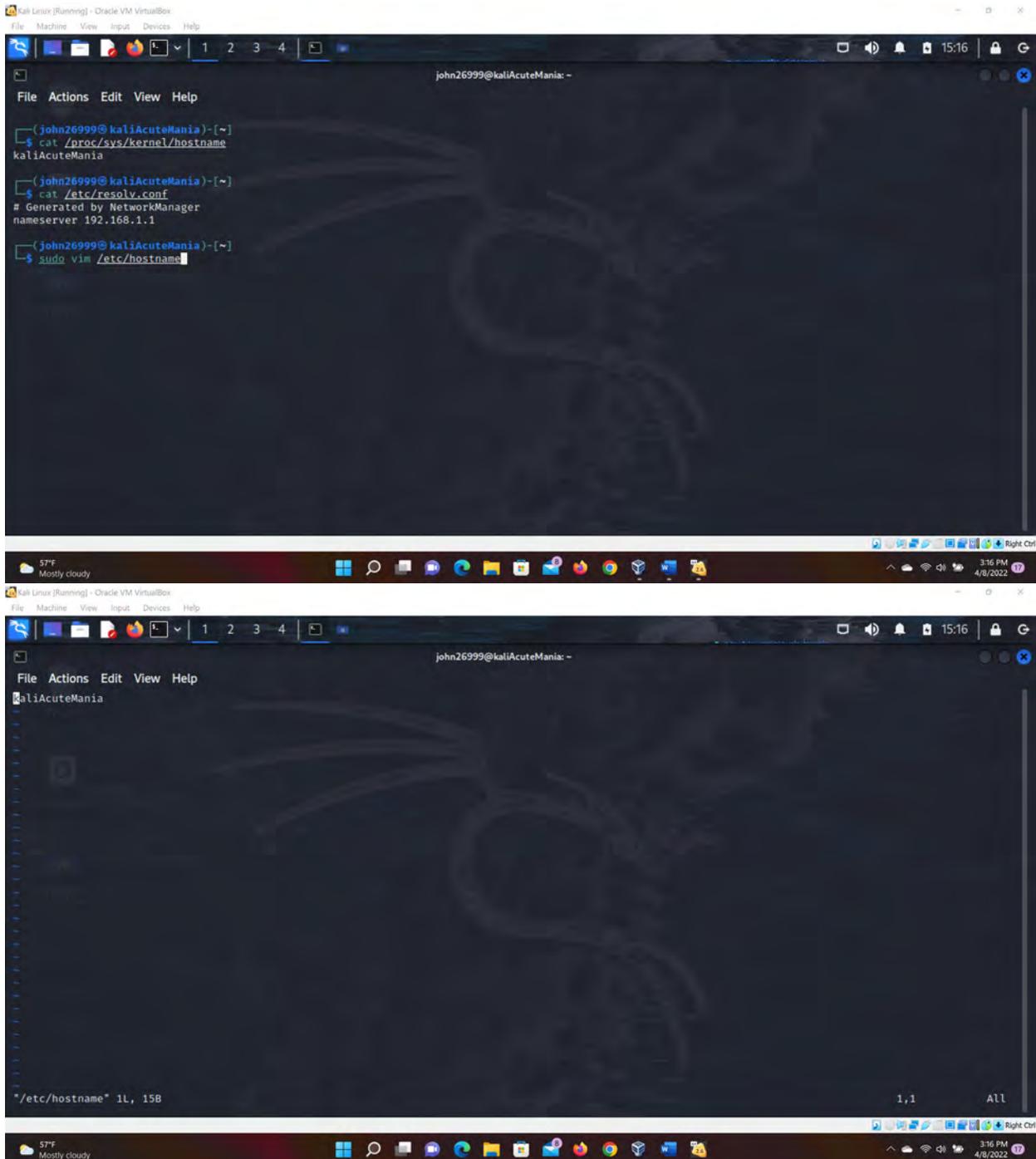


Figure 7 Screenshots of JWILS082 Computer screen prior to Step 7.

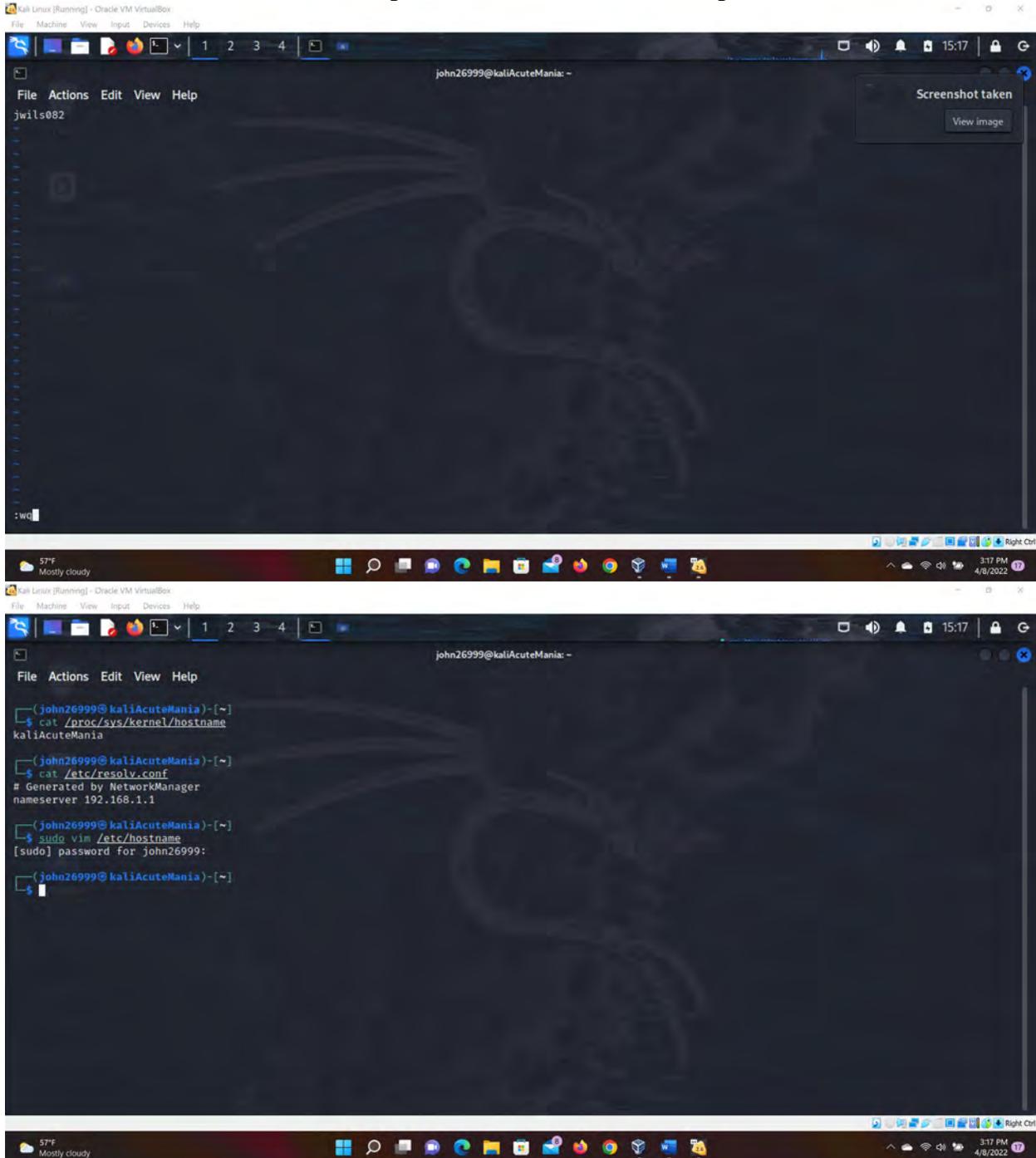
Above is the screen shot using the command “cat /etc/resolv.conf” that displays the DNS server for the computer system.

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8. Edit the same file you display in the previous step, set the system's hostname to your MIDASID permanently. Reboot system and **repeat step 6**.



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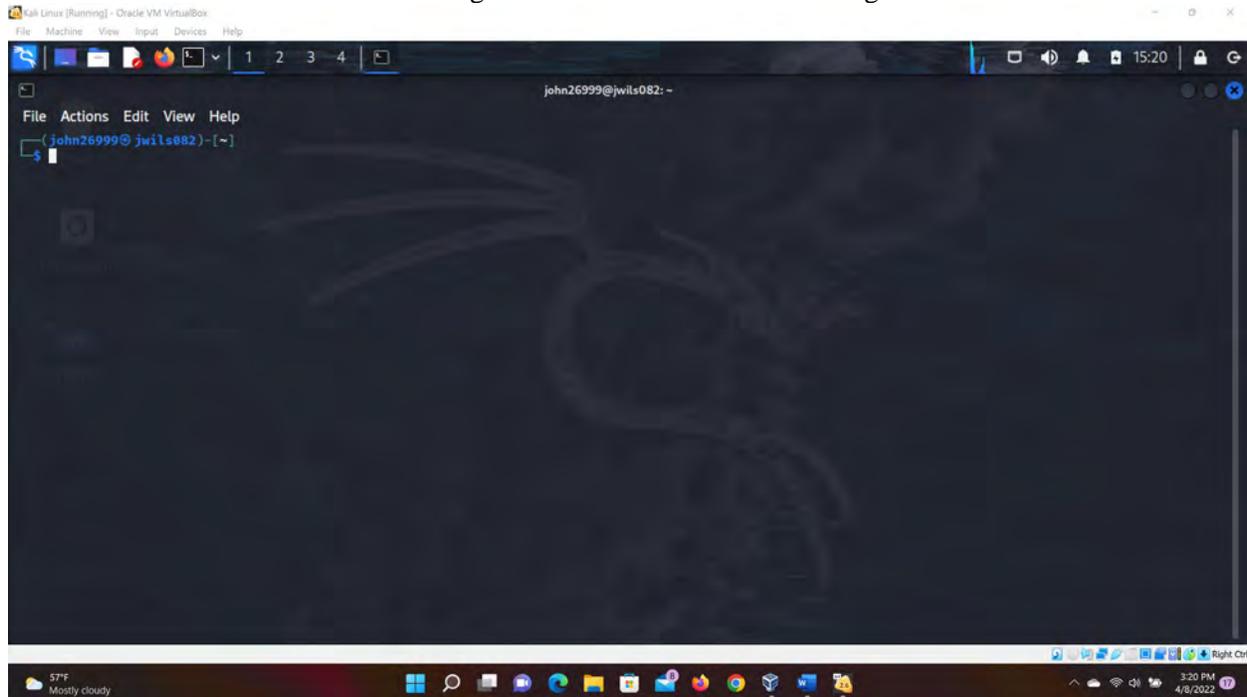


Figure 8 Screenshots of JWILS082 Computer screen prior to Step 8.

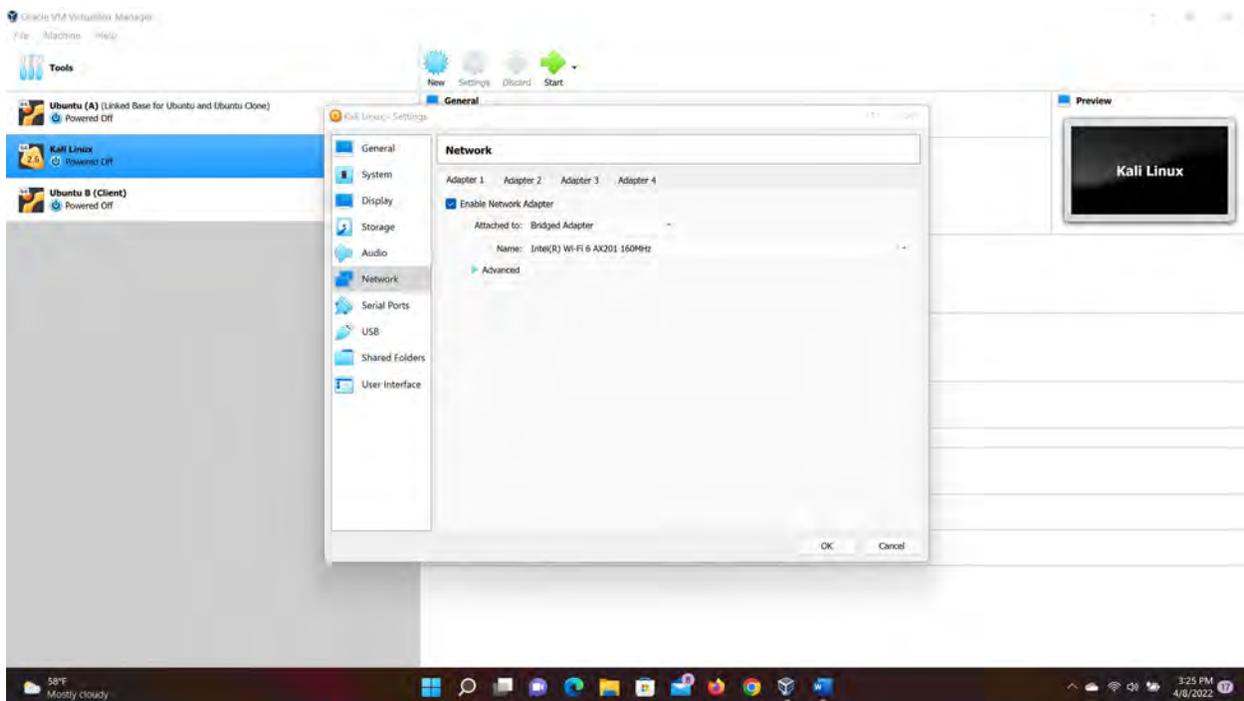
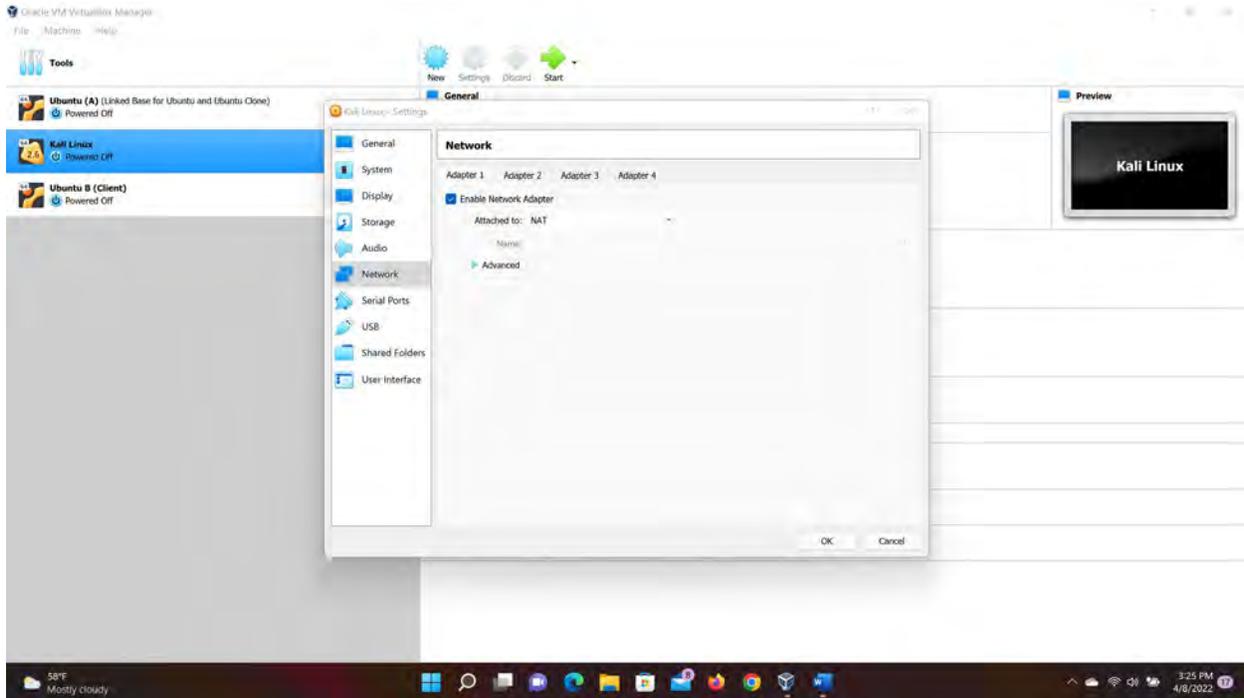
Above are the screen shots 1-4 using the command “sudo vim /etc/hostname” which will allow the user to change the systems hostname from the original hostname to the MIDAS hostname.

The fifth screenshot is proving the hostname change was affective.

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**Task B: A Different Network Setting (3 \* 20 = 60 Points)**

1. **Change the VM network** connection from NAT to **bridged adapter** mode (you will lose your Internet connection if you are connected to the ODU campus Wi-Fi network, but that is okay).



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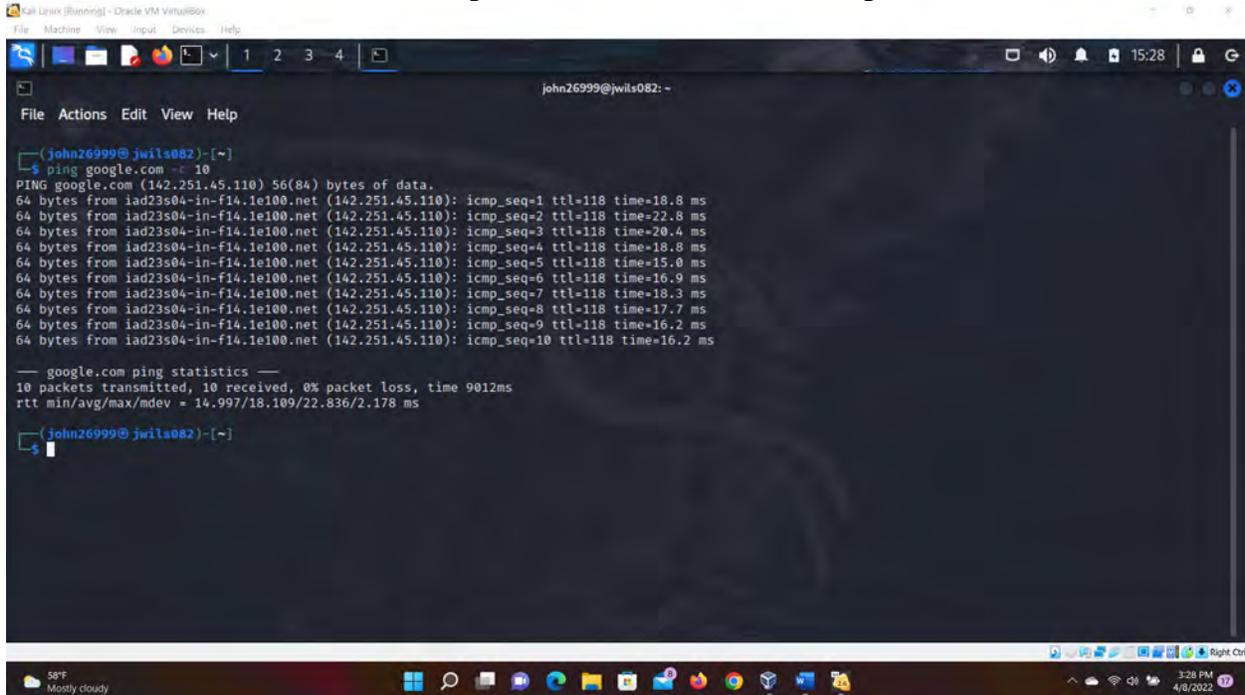
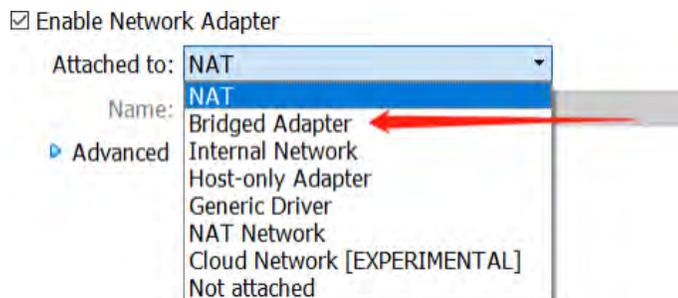


Figure 1 Screenshots of JWILS082 Computer screen of Step 1.

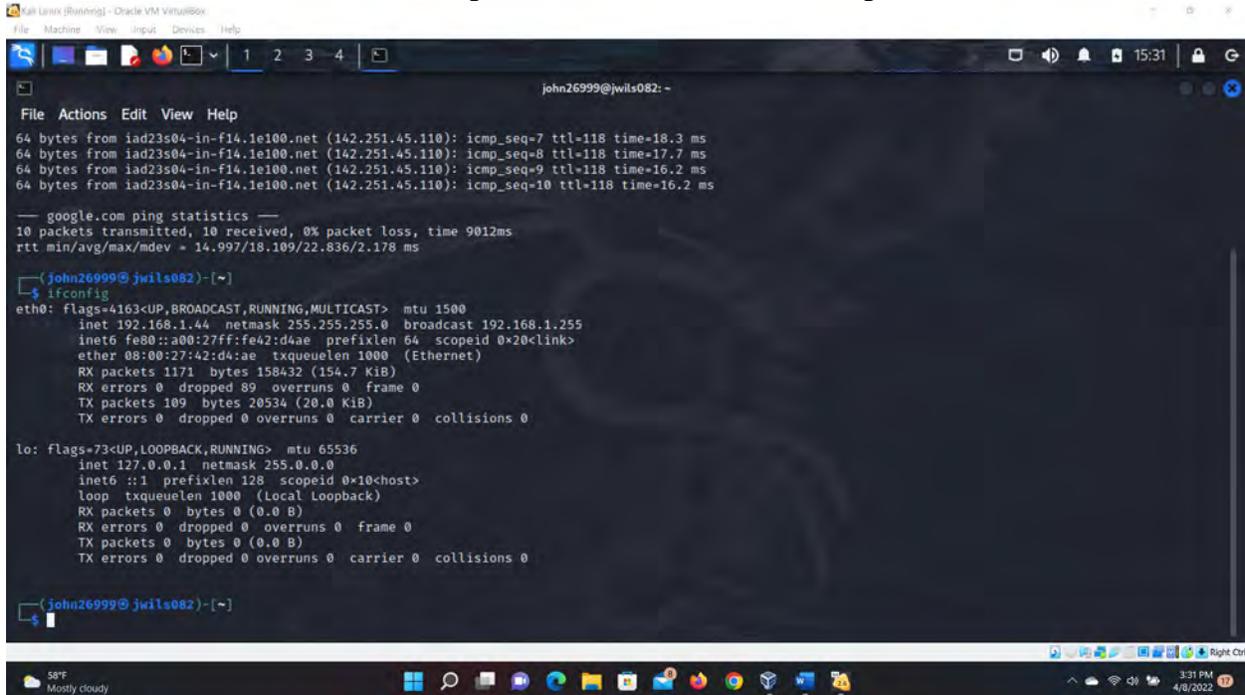
Above is the screen shot changing the network adaptor from NAT to bridged adaptor.

The third screenshot is checking to see if I have connectivity to the outside network and it is affirmed

2. **Restart** your VM, then **repeat Steps 1 – 7 in Task A.**
3. **Highlight the differences** at the end of each step and discuss what do you find.



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```
Kali Linux [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
john26999@jwils082: ~
File Actions Edit View Help
64 bytes from iad23s04-in-f14.1e100.net (142.251.45.110): icmp_seq=7 ttl=118 time=18.3 ms
64 bytes from iad23s04-in-f14.1e100.net (142.251.45.110): icmp_seq=8 ttl=118 time=17.7 ms
64 bytes from iad23s04-in-f14.1e100.net (142.251.45.110): icmp_seq=9 ttl=118 time=16.2 ms
64 bytes from iad23s04-in-f14.1e100.net (142.251.45.110): icmp_seq=10 ttl=118 time=16.2 ms

--- google.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9012ms
rtt min/avg/max/mdev = 14.997/18.109/22.836/2.178 ms

(john26999@jwils082)-[~]
$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.1.44 netmask 255.255.255.0 broadcast 192.168.1.255
    inet6 fe80::a00:27ff:fe42:d4ae prefixlen 64 scopeid 0<20<link>
    ether 08:00:27:42:d4:ae txqueuelen 1000 (Ethernet)
    RX packets 1171 bytes 158432 (154.7 KiB)
    RX errors 0 dropped 89 overruns 0 frame 0
    TX packets 109 bytes 20534 (20.0 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

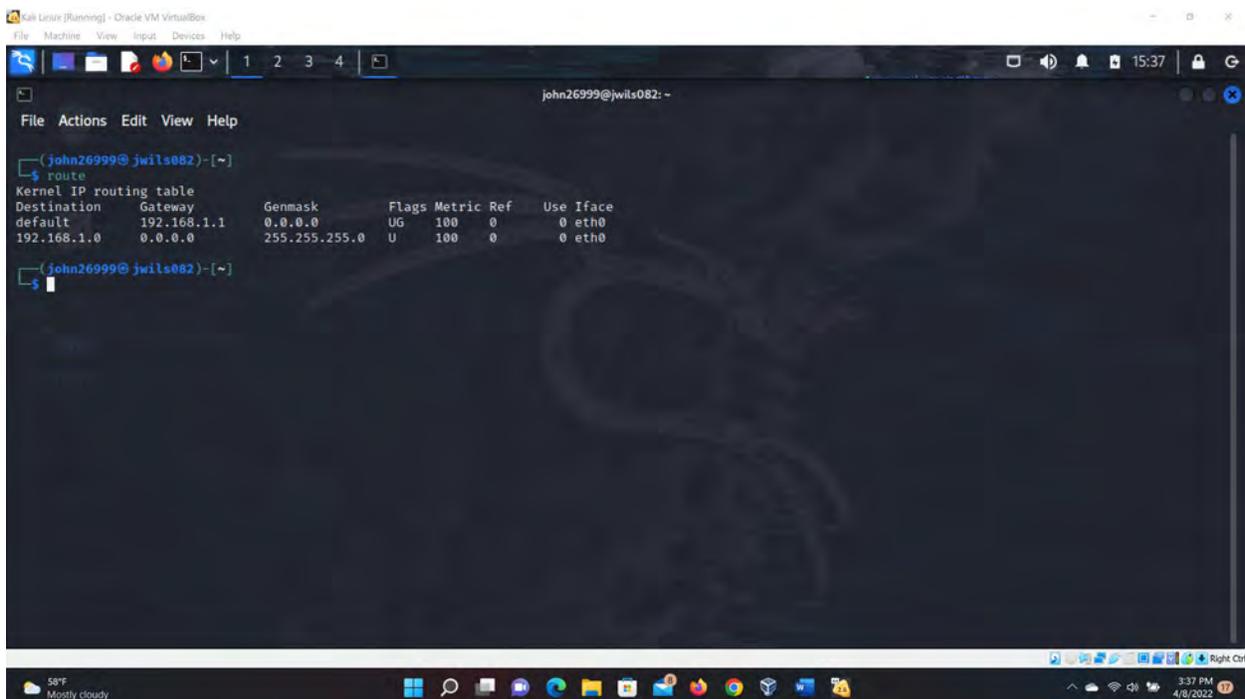
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0<10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

(john26999@jwils082)-[~]
$
```

Figure 2 Screenshots of JWILS082 Computer screen prior to Step 3.a.

Above is the screen shot using the command “ifconfig” that displays the information on current network configuration information, ip address, netmask, or broadcast address to a network interface, creating an alias for the network interface, setting up hardware address, and enable or disable network interfaces.

The difference are with the IP addresses, broadcast address are not the same. The NAT one has the ip address listed as 10.0.2.15 and the broadcast listed as 10.0.2.255. the bridged adapter has the IP address listed as 192.168.1.44 and the broadcast listed as 192.168.1.255.



```
Kali Linux [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
john26999@jwils082: ~
File Actions Edit View Help

(john26999@jwils082)-[~]
$ route
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
default 192.168.1.1 0.0.0.0 UG 100 0 0 eth0
192.168.1.0 0.0.0.0 255.255.255.0 U 100 0 0 eth0

(john26999@jwils082)-[~]
$
```

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Figure 3 Screenshots of JWILS082 Computer screen prior to Step 3.b.

Above is the screen shot using the command “route” to display the routing table.

The difference are with the IP addresses. The NAT one has the ip address listed as 10.0.2.2. The bridged adapter has the IP address listed as 192.168.1.1.

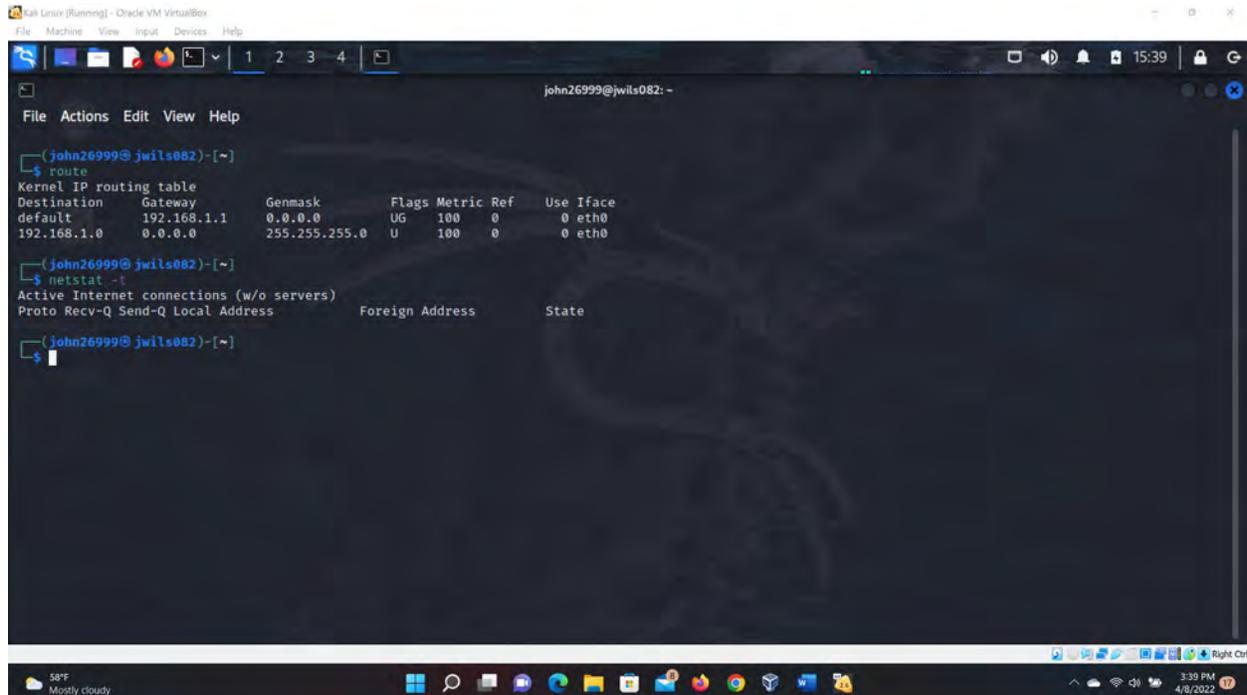


Figure 4 Screenshots of JWILS082 Computer screen prior to Step 3.c.

Above is the screen shot using the command “netstat -t” that displays the current TCP connections. As you can see I don’t ha any on this computer.

There was not difference between these two.

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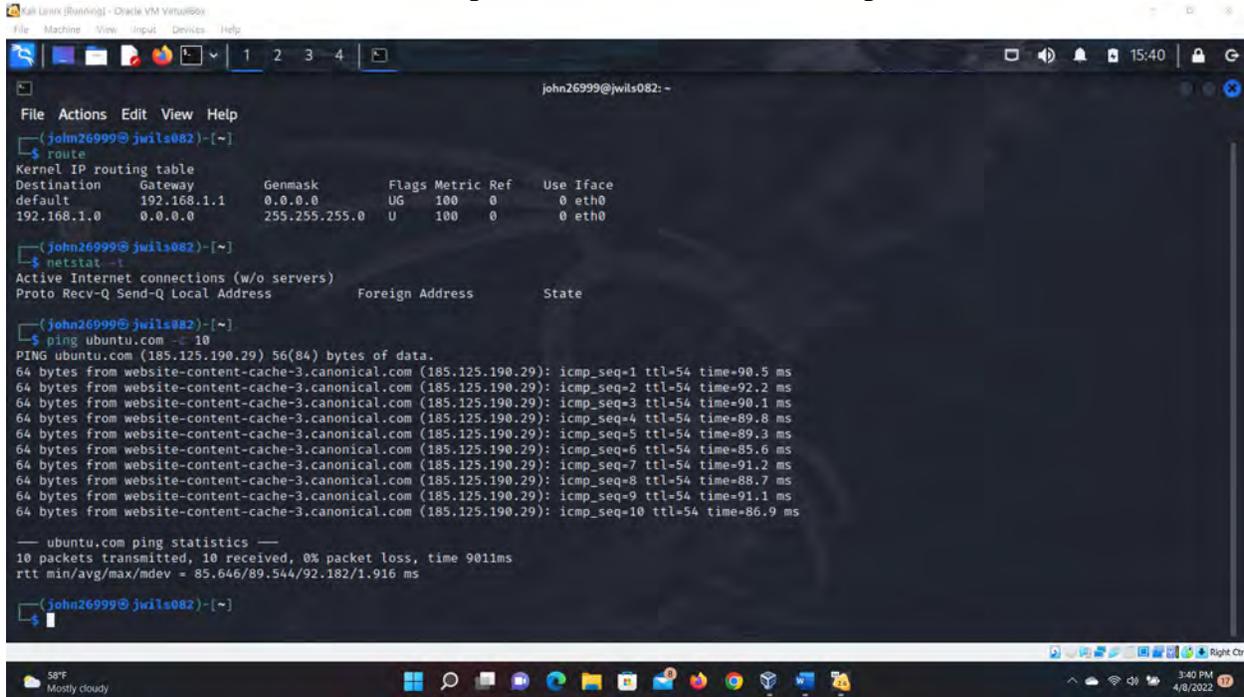


Figure 5 Screenshots of JWILS082 Computer screen prior to Step 3.d.

Above is the screen shot using the command “ping ubuntu.com -c 10” which will ping the nost address 10 times and stop.

There were no differences between the two as they both pinged ubuntu.com with no problems.

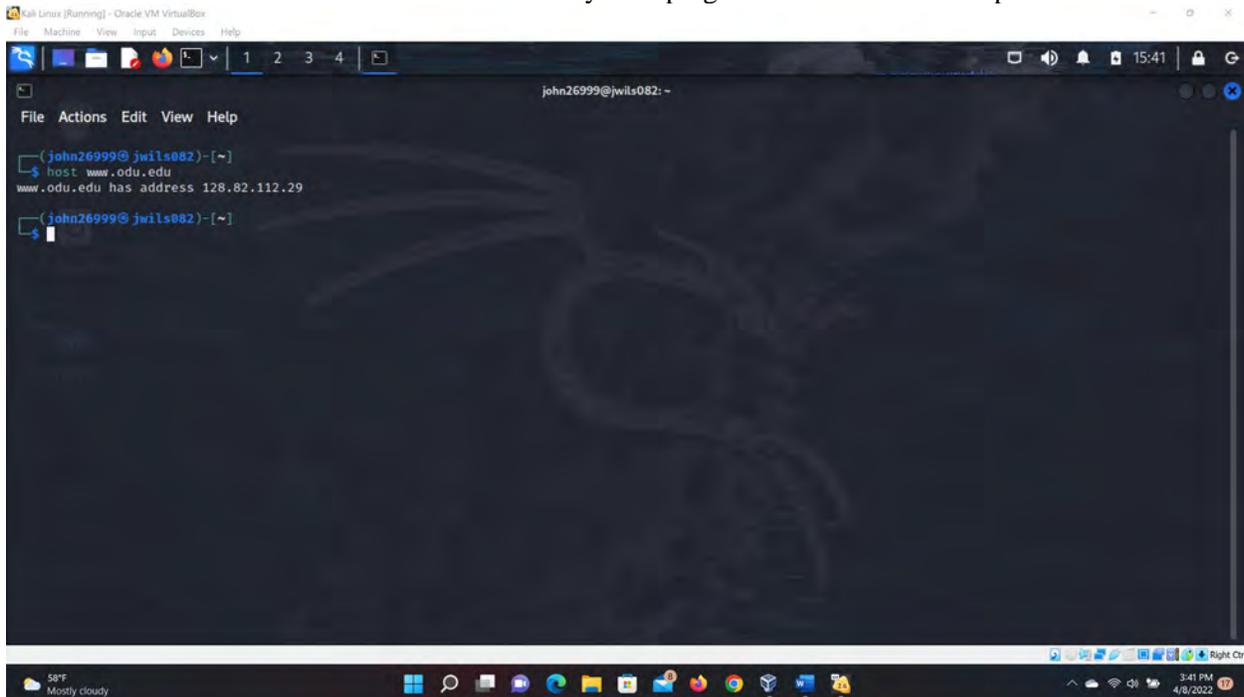


Figure 6 Screenshots of JWILS082 Computer screen prior to Step 3.e

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Above is the screen shot using the command “host www.odu.edu” that displays the hosts ip address.

There was no differences between them.

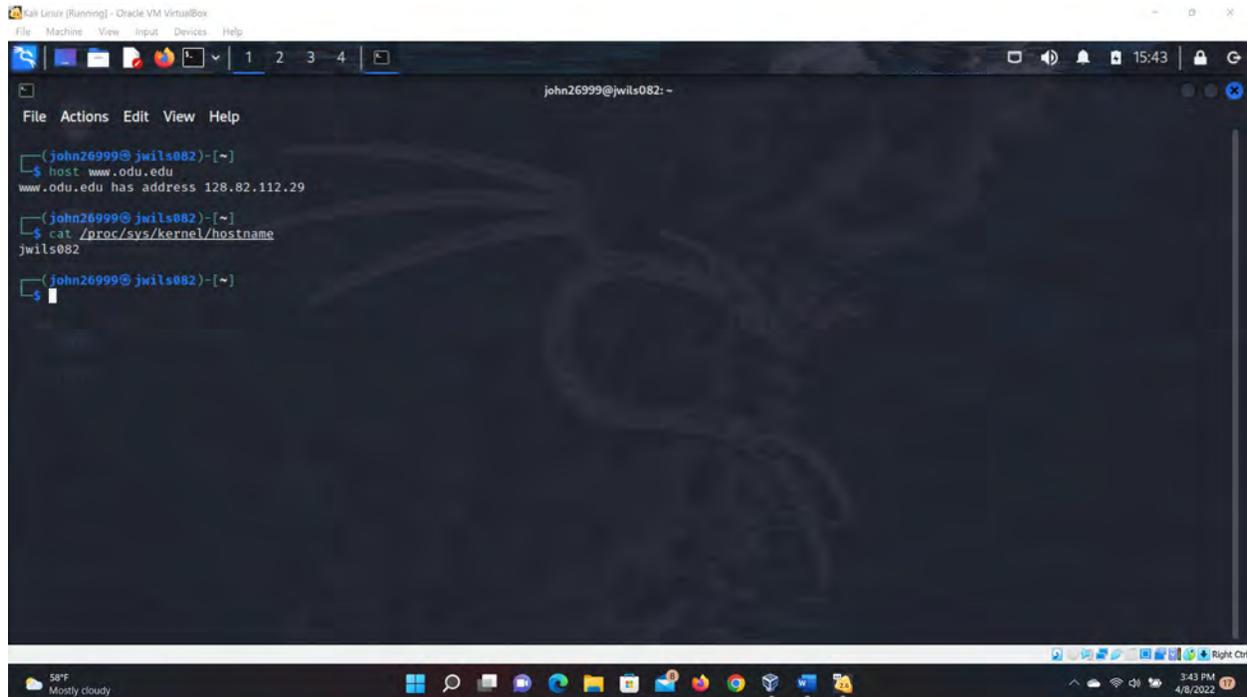
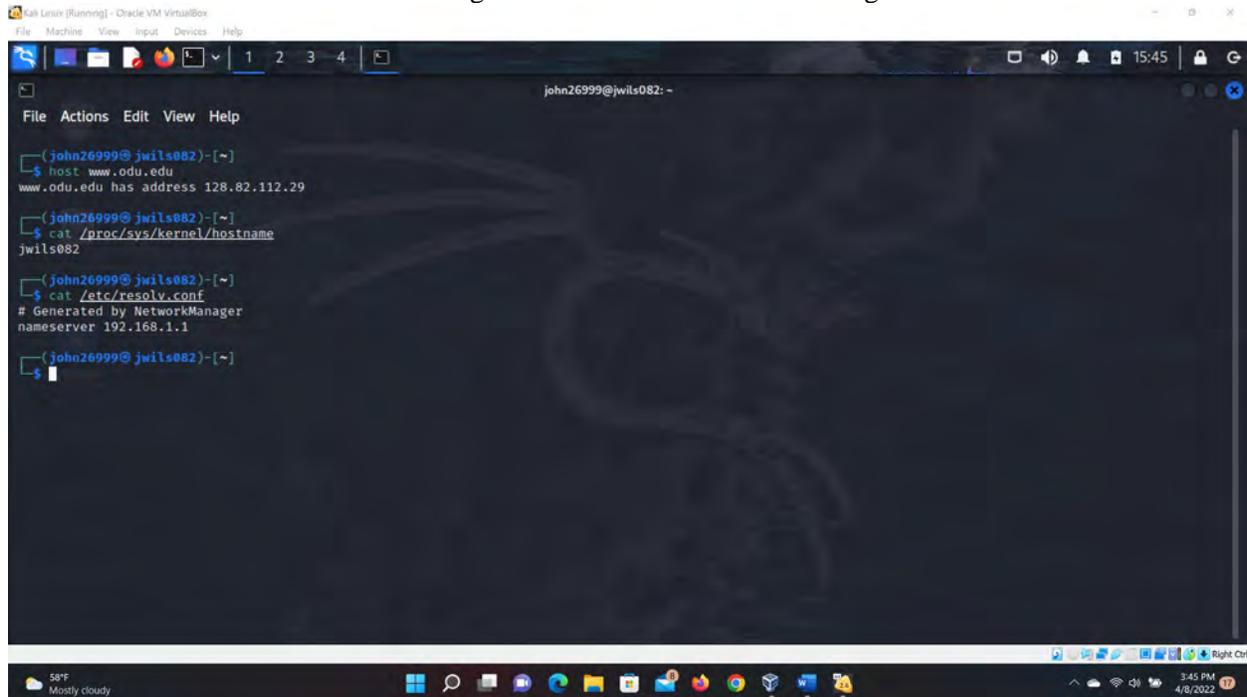


Figure 7 Screenshots of JWILS082 Computer screen prior to Step 3.f

Above is the screen shot using the command “cat /proc/sys/kernel/hostname” that displays the file that contains the systems host name.

The differences between them were the hostnames that chaged from kaliAcuteMania to jwils082.

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```
Kali Linux [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
1 2 3 4
john26999@jwils082: ~
File Actions Edit View Help
(john26999@jwils082)-[~]
└─$ host www.odu.edu
www.odu.edu has address 128.82.112.29
(john26999@jwils082)-[~]
└─$ cat /proc/sys/kernel/hostname
jwils082
(john26999@jwils082)-[~]
└─$ cat /etc/resolv.conf
# Generated by NetworkManager
nameserver 192.168.1.1
(john26999@jwils082)-[~]
└─$
```

Figure 8 Screenshots of JWILS082 Computer screen prior to Step 3.g.

Above is the screen shot using the command “cat /etc/resolv.conf” that displays the DNS server for the computer system.

There were no changes between the two that I noticed.

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**References**

*15 Useful "ifconfig" Commands to Configure Network in Linux. (n.d.).*

Www.tecmint.com. <https://www.tecmint.com/ifconfig-command-examples/>