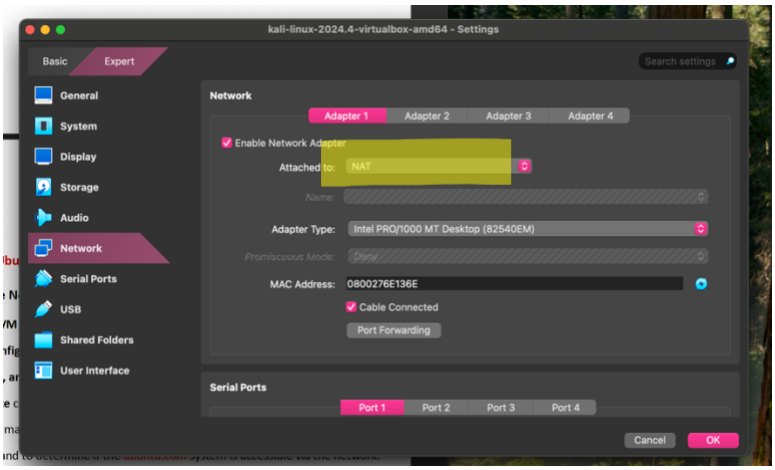
Lab 11 – Basic Network Configurations

Task A: Explore Network Configurations

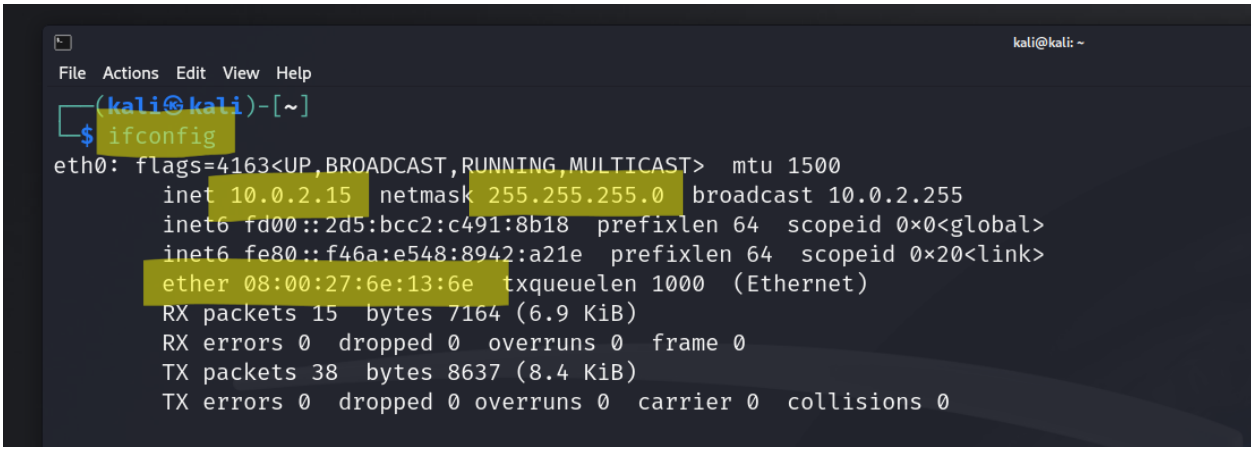
VM attached to NAT



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

Explanation: I use command **ifconfig** to display current network configurations. Highlights are found in screenshot. I use this command to understand how my VM connects to the network.

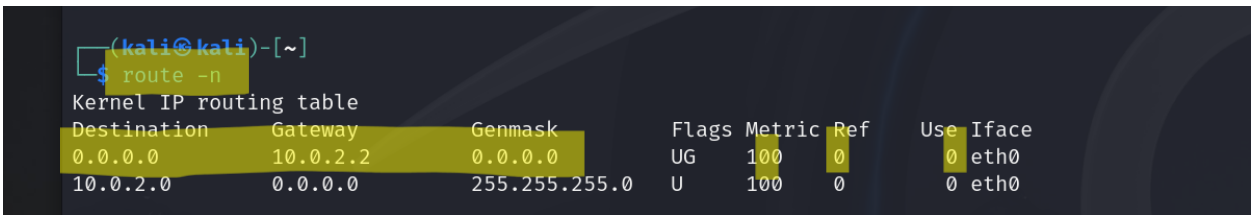
Screenshot:



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

Explanation: I use command **route -n** to see my routing table and identify system's default gateway/network interface.

Screenshot:



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

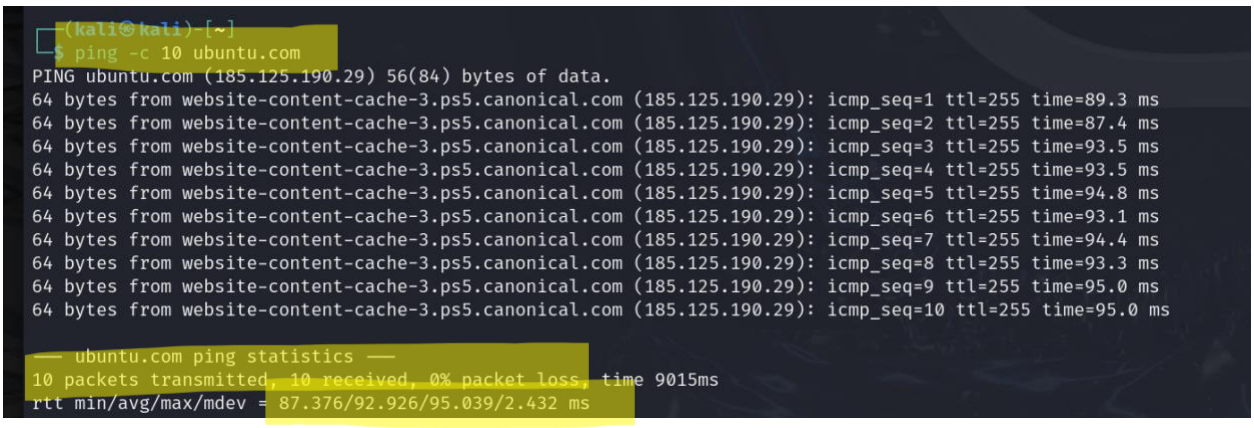
Explanation: I use command **netstat** followed by **-tn** to be able to see active TCP connections and which remote servers my system communicates with. There are no connections because my system is not communicating with any servers at the time I issued the command.

Screenshot:

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.)

Explanation: I use command **ping -c** followed by **10** to check network connectivity. I am sending 10 packets and looking for response time/packet loss.

Screenshot:



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

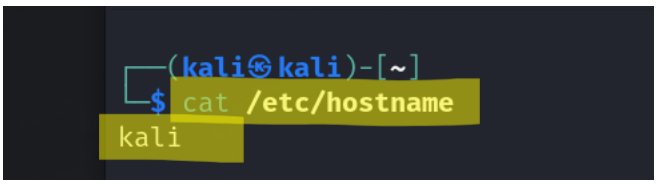
Explanation: I use the command **host** followed by what site I want to search for, in this case it is ODU. I am checking that the domain name goes to its IP address. Which in this case, it does.

Screenshot:

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

Explanation: I use command **cat** followed by what I want to view, in this case it will be /etc/hostname. It is kali, which is what I named my main VM.

Screenshot:



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

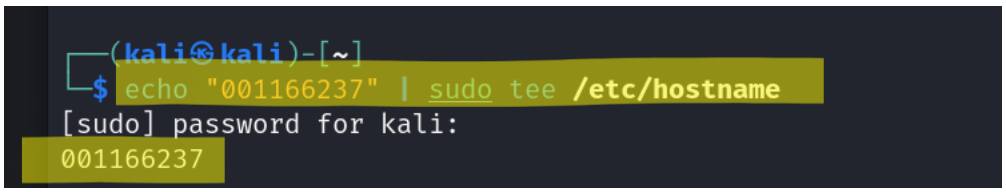
Explanation: I use command **cat** followed by where I want to be and see, in this case it will be /etc/resolv.conf. I want to see the DNS server addresses currently being used in my system. I notice fios and that is my information, so I know I am looking at the right system info.

Screenshot:

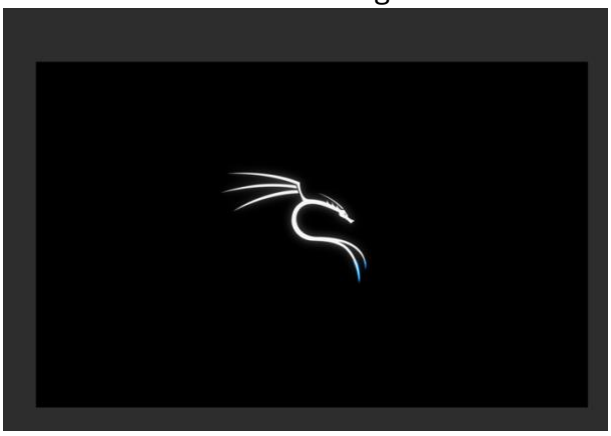
8. Edit the same file you display in the previous step, set the system's hostname to your MIDAS ID permanently. Reboot system and repeat step 6.

Explanation: I use the **echo** command (to write/change) , a pipe, the **tee** command, the **sudo** command, the **reboot** command and lastly the **cat** command to check I changed my system or VM's hostname to my MIDAS ID (001166237) after reboot. I did. Screenshots found on next page.

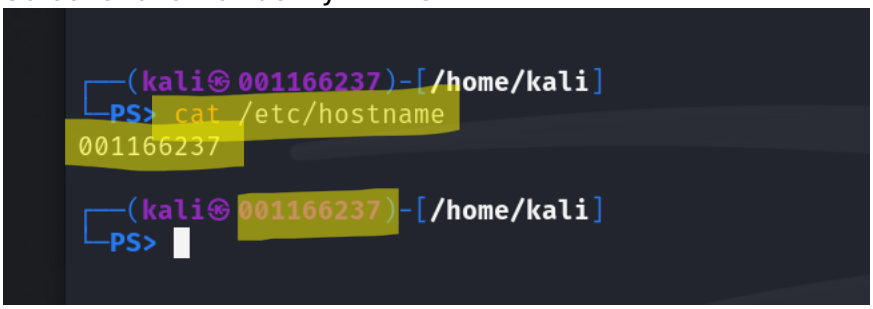
Screenshot:



Screenshot of Kali rebooting:



Screenshot of kali as my MIDAS ID:

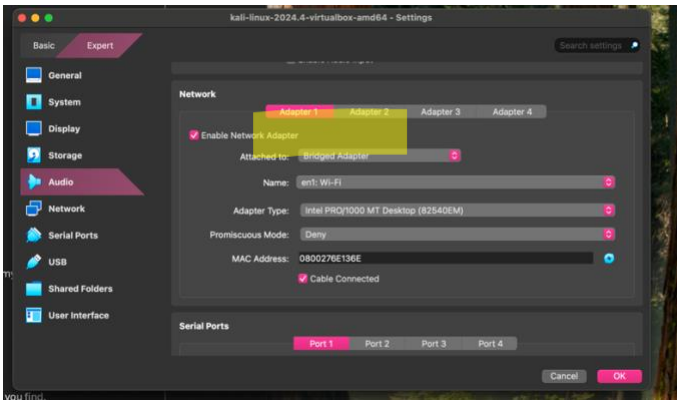


Task B : A Different Network Setting

1. Change the VM network connection from NAT to the bridge mode.

Explanation: I change network adapter from NAY to Bridge in my VM settings. Connecting my VM to a physical network rather than VirtualBox's internal NAT service.

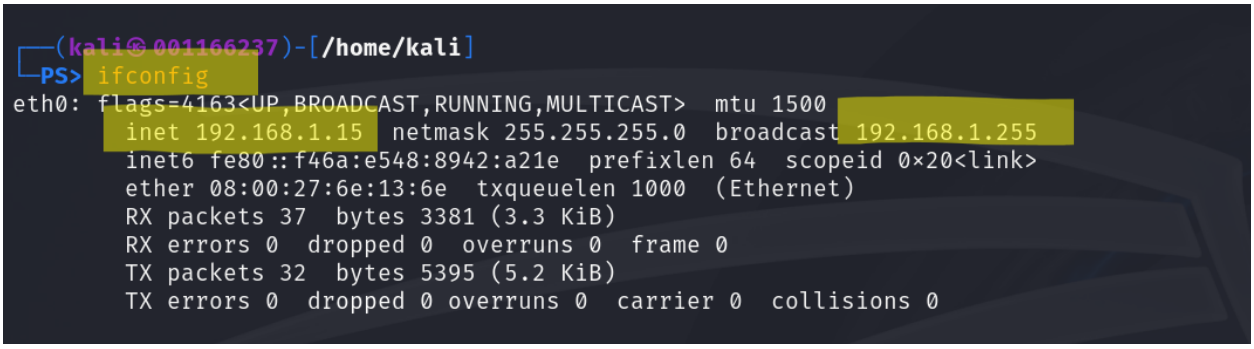
Screenshot:



2. Reboot your system, then repeat Steps 1 – 7 in Task A.

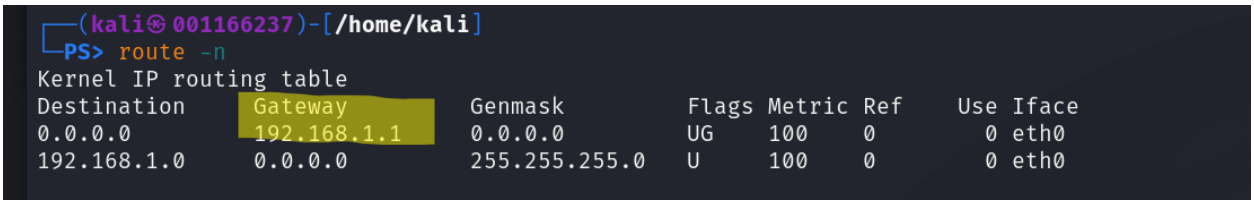
Explanation: I use command **ifconfig** and notice the IP address changed compared to the above when in NAT mode, the VM is now connected directly to a physical network. My broadcast and INET are different co pared to the above when my VM was in NAT mode.

Screenshot:

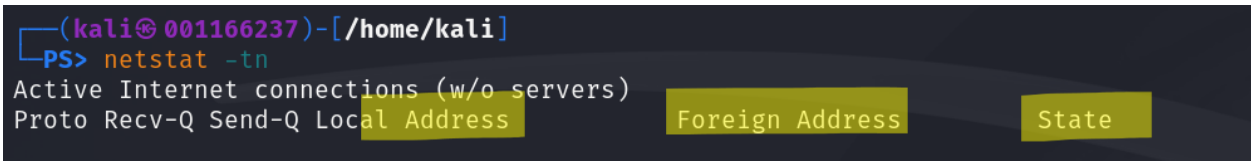


Further Explanation: I use command **route -n** to see routing change, and the default gateway address is different compared to when my VM was in NAT mode.

Screenshot:

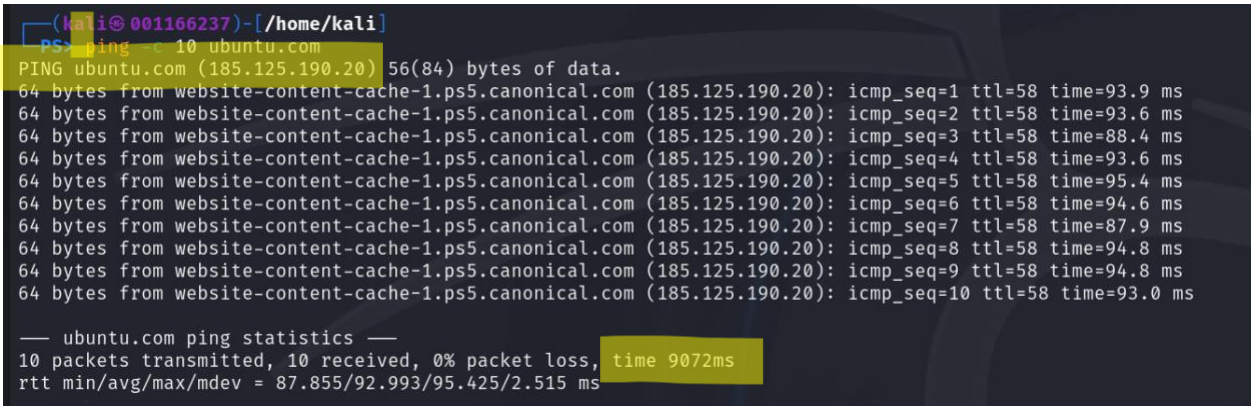


Further Explanation: I use command **netstat -tn** to look for TCP connection. Nothing changed, as expected.
Screenshot:



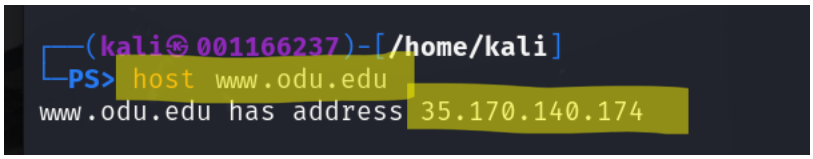
Further Explanation: I use command **ping** followed by **-c** to define how many packets I want to send. I am testing internet access in Bridge mode and comparing results with the above when my VM was in NAT mode. Packet transmit time was longer. I also notice the IP is different. In NAT mode my VM gets internal IP from VB but in Bridged mode my VM gets and IP from my router. Screenshot found on next page.

Screenshot:



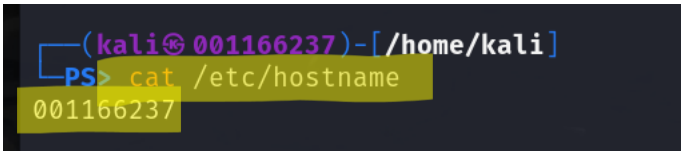
Further Explanation: I use command **host** followed by what site, in this case I want ODU. I am looking to verify DNS resolution in Bridged mode to compare IP address changes. There is not, and I move on.

Screenshot:



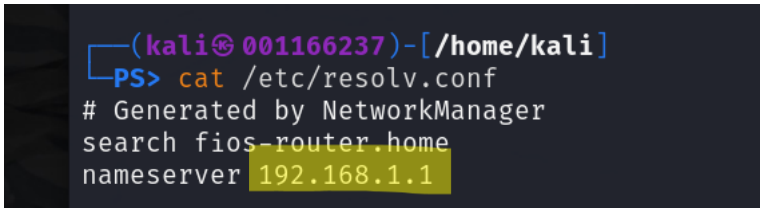
Further Explanation: I use command **cat** followed by where and what I want to looki into to pull up the host name. I want to verify there is no change. It outputs 001166237 which is my MIDAS ID and I set this in the previous lab steps above.

Screenshot:



Further Explanation: I use the command **cat** followed by /etc/resolv.conf to output my VM's DNS configuration. I am looking for differences between NAT and Bridge mode. There is a difference in my VM nameserver.

Screenshot:



3. Highlight the differences at the end of each step and discuss what do you find.

Summary:

Switching from NAT to Bridge mode there were differences in Network behavior. In NAT mode IP's were assigned from private VB managed ranges, example 10.0.2.... In Bridged mode IP's match my physical network's subnet, example 192.168.....
The default gateway and DNS server has differences, meaning shifting from VB's virtual network to my router network configuration. TCP connection behavior did not change. Bridge mode allows for VM to operate like a real device in my network whereas Nat mode is isolated within VB's managed routing.