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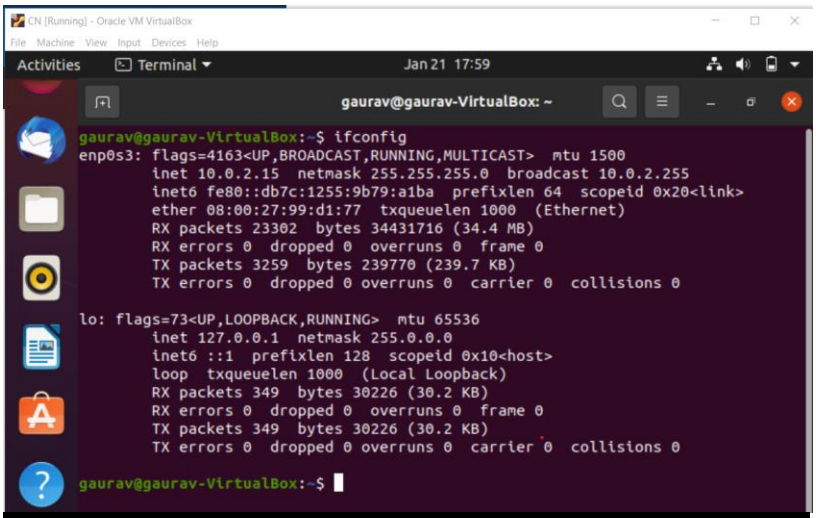
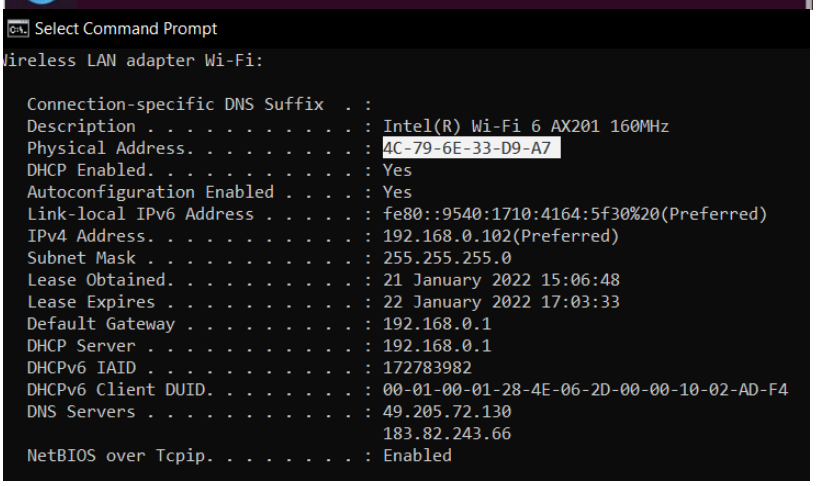
	Date: 19-01-2022	WEEK 1

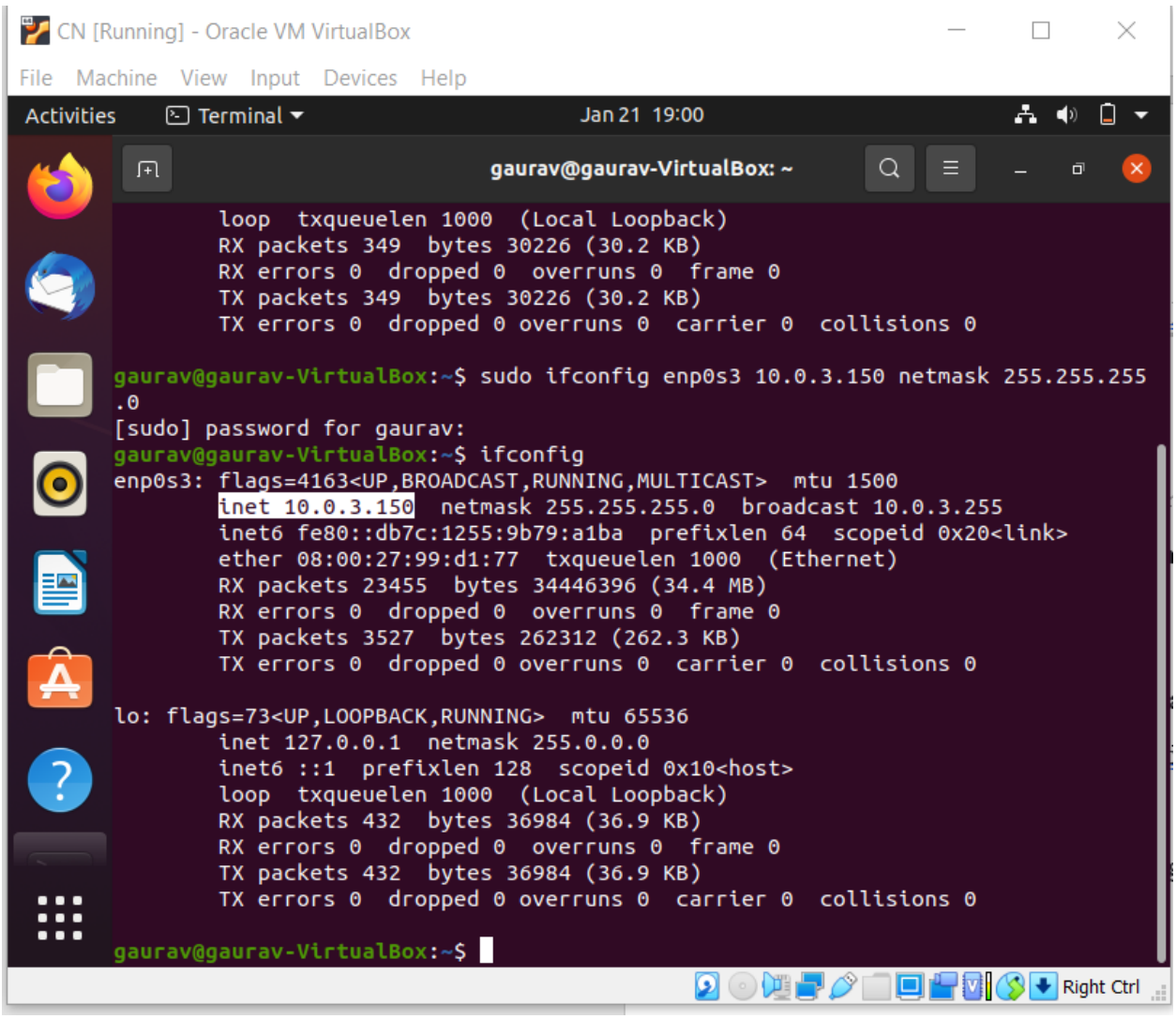
Task 1: Linux Interface Configuration (ifconfig / IP command)





INTERFACE	IPV4	MAC ADDRESS
enp0s3	10.0.2.15	08:00:27:99:d1:77
Wi-fi	192.168.0.10	4C:79:6E:33:D9:A7

Step 2: To assign an IP address to an interface, use the following command. **sudo ifconfig interface_name 10.0.your_section.your_sno netmask 255.255.255.0** (or) **sudo ip addr add 10.0.your_section.your_sno /24 dev interface_name**



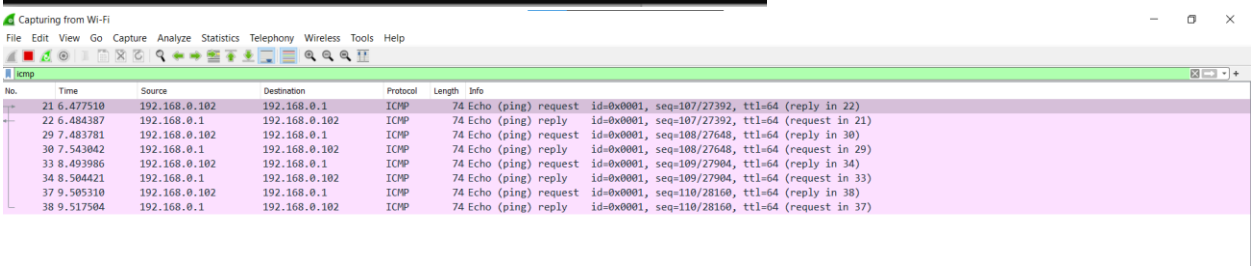
Task 2: Ping PDU (Packet Data Units or Packets) Capture

```
C:\Users\Gaurav>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:
Reply from 192.168.0.1: bytes=32 time=7ms TTL=64
Reply from 192.168.0.1: bytes=32 time=59ms TTL=64
Reply from 192.168.0.1: bytes=32 time=10ms TTL=64
Reply from 192.168.0.1: bytes=32 time=12ms TTL=64

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% los
Approximate round trip times in milli-seconds:
    Minimum = 7ms, Maximum = 59ms, Average = 22ms

C:\Users\Gaurav>
```



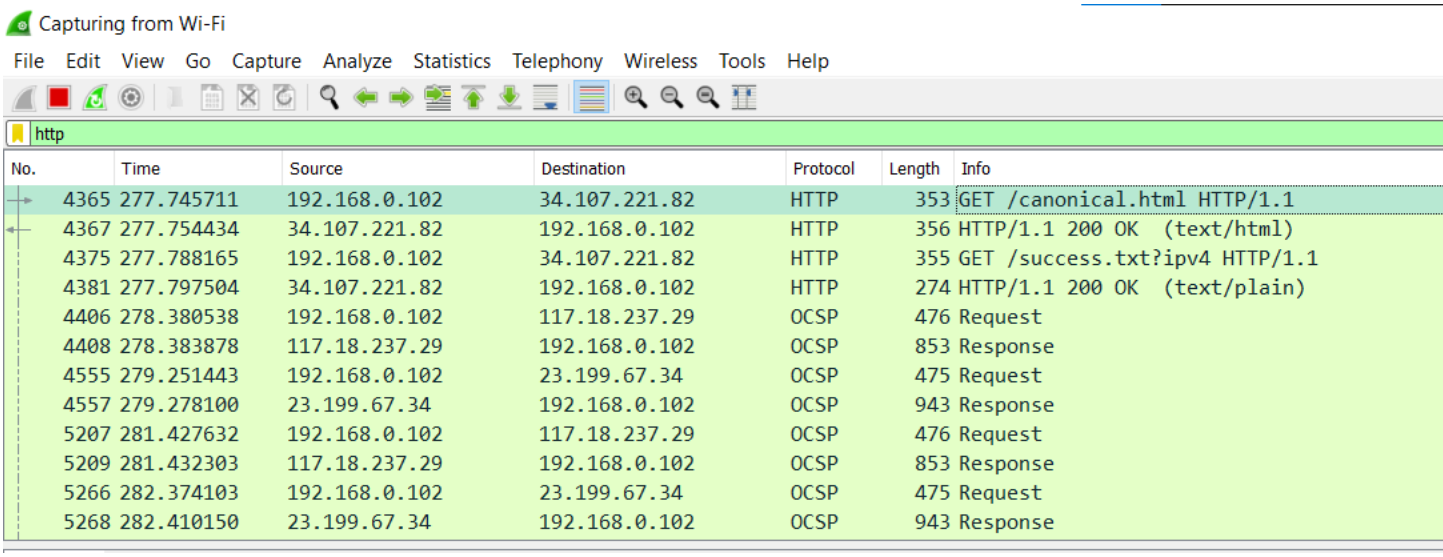
- TTL =64
- Protocol used by ping =ICMP
- Time =22ms(AVERAGE)

Details	First Echo Request	First Echo Reply
Frame Number	21	22
Source IP address	192.168.0.102	192.168.0.1
Destination IP address	192.168.0.1	192.168.0.102
ICMP Type Value	8	0
ICMP Code Value	0	0
Source Ethernet Address	4c:79:6e:33:d9:a7	6c:5a:b0:a7:63:fe
Destination Ethernet Address	6c:5a:b0:a7:63:fe	4c:79:6e:33:d9:a7
Internet Protocol Version	4	4
Time To Live (TTL) Value	64	64

Task 3: HTTP PDU Capture

Using Wireshark's Filter feature

Step 1: Launch Wireshark and select 'any' interface. On the Filter toolbar, type-in 'http' and press enter
Step 2: Open Firefox browser, and browse www.flipkart.com



Observations to be made

Step 3: Analyze the first (interaction of host to the web server) and second frame (response of server to the client). By analyzing the filtered frames, complete the table below:

Details	First Echo Request	First Echo Reply
Frame Number	4365	4367
Source Port	52541	80
Destination Port	80	64020
Source IP address	192.168.0.102	34.107.221.82
Destination IP address	34.107.221.82	192.168.0.102
Source Ethernet Address	4c:79:6e:33:d9:a7	6c:5a:b0:a7:63:fe
Destination Ethernet Address	6c:5a:b0:a7:63:fe	4c:79:6e:33:d9:a7

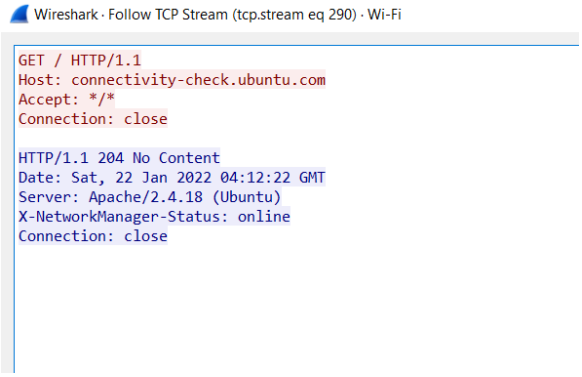
Step 4: Analyze the HTTP request and response and complete the table below.

HTTP Request		HTTP Response	
Get	/canonical.html HTTP/1.1	Server	nginx
Host	detectportal.firefox.com	Content-Type	text/html
User-Agent	Mozilla/5.0	Date	Fri,21 Jan 2022 03:34:40 GMT
Accept-Language	en-US	Location	-
Accept-Encoding	gzip,deflate	Content-Length	356
Connection	keep-alive	Connection	close

Using Wireshark's Follow TCP Stream

Step 1: Make sure the filter is blank. Right-click any packet inside the Packet List Pane, then select 'Follow TCP Stream'. For demo purpose, a packet containing the HTTP GET request "GET / HTTP / 1.1" can be selected.

Step 2: Upon following a TCP stream, screenshot the whole window.



Task 4: Capturing packets with tcpdump

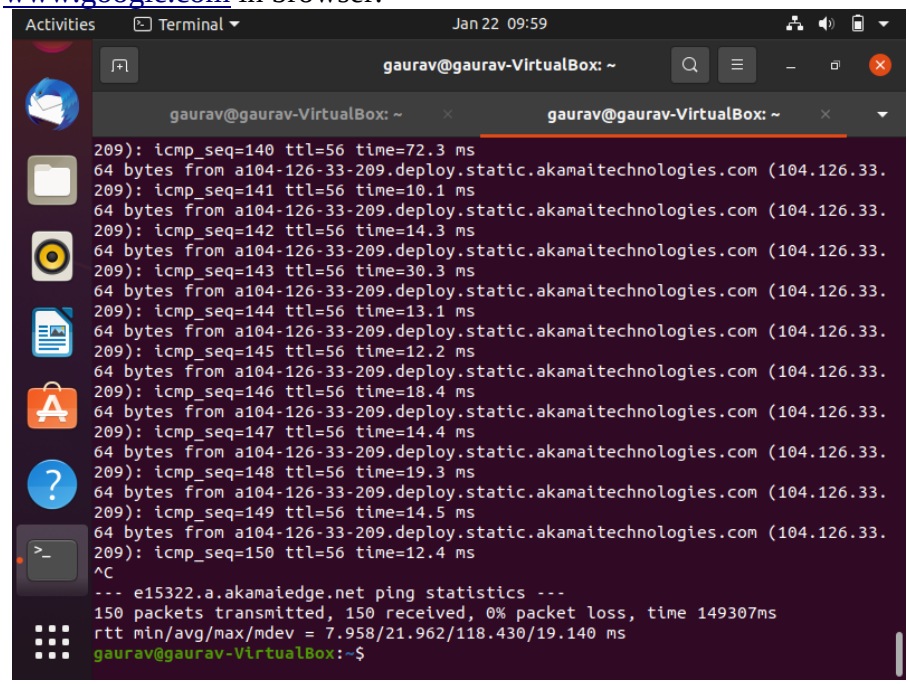
Step 1: Use the command **tcpdump -D** to see which interfaces are available for capture.

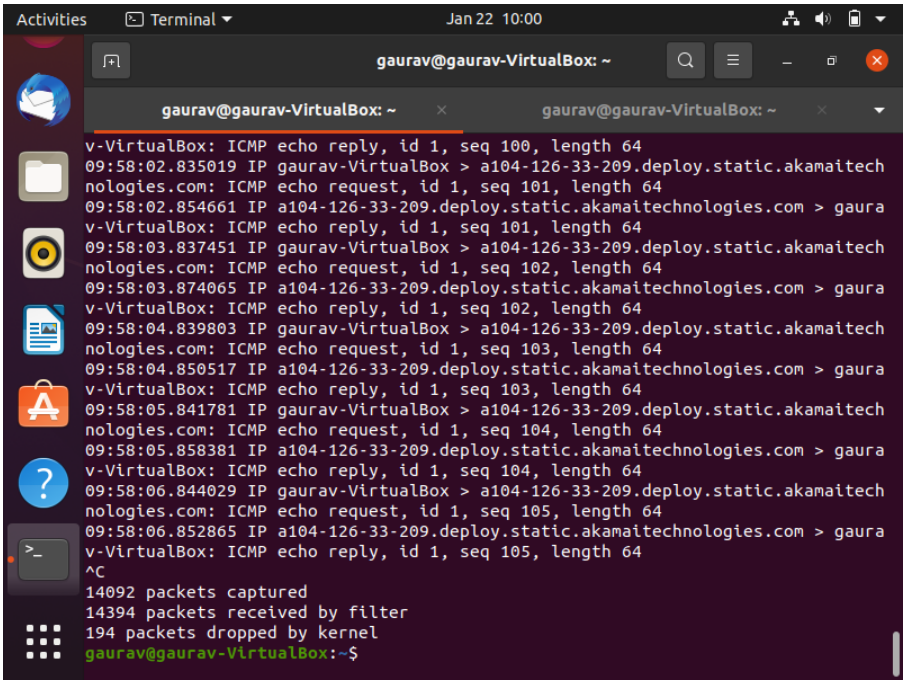
sudo tcpdump -D

Step 2: Capture all packets in any interface by running this command:

sudo tcpdump -i any

Note: Perform some pinging operation while giving above command. Also type www.google.com in browser.



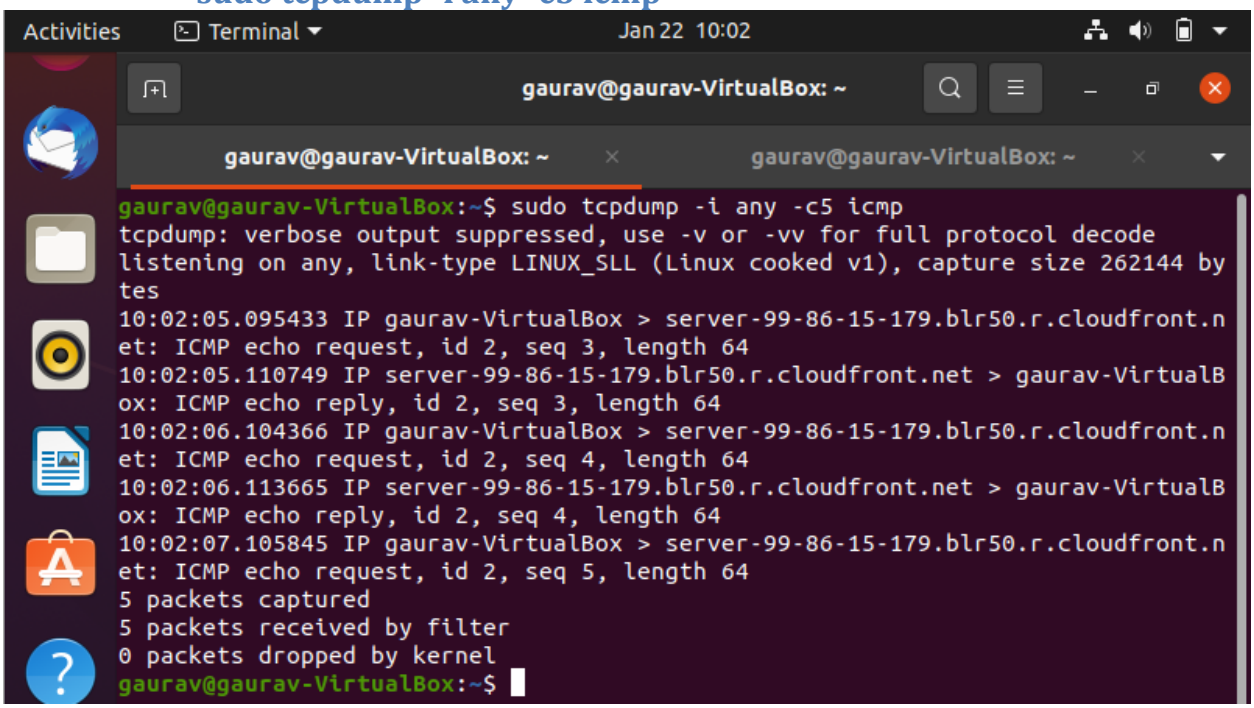


Observation

Step 3: Understand the output format.

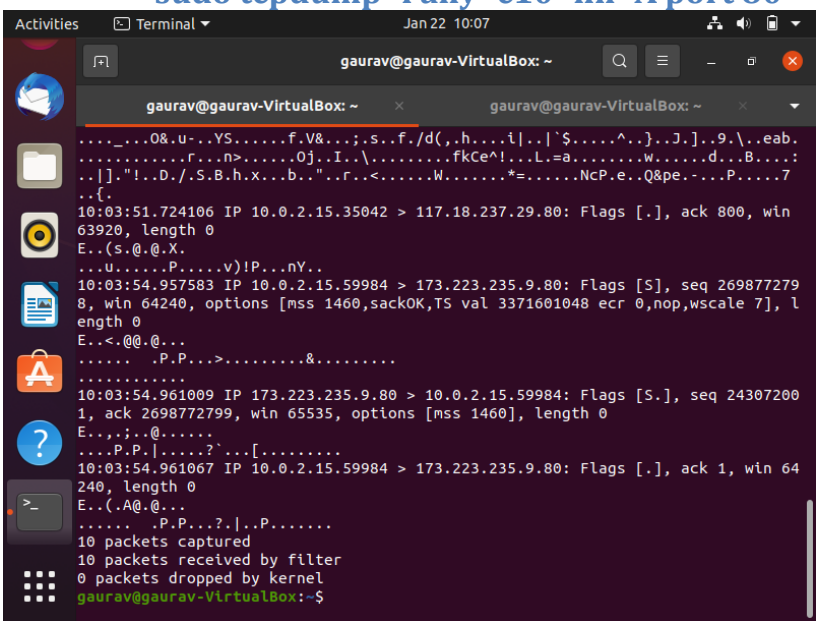
Step 4: To filter packets based on protocol, specifying the protocol in the command line. For example, capture ICMP packets only by using this command:

sudo tcpdump -i any -c5 icmp



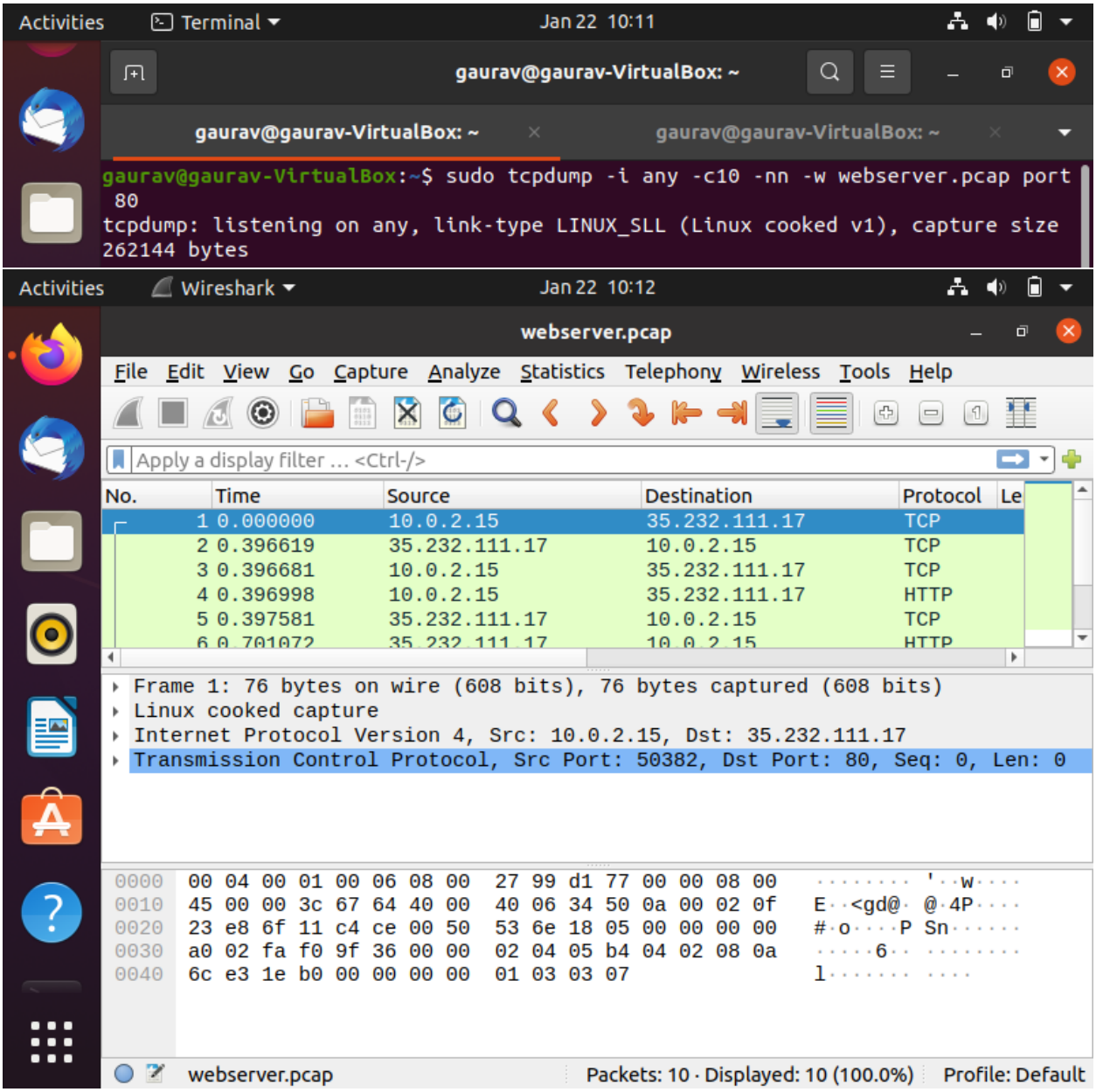
Step 5: Check the packet content. For example, inspect the HTTP content of a web request like this:

sudo tcpdump -i any -c10 -nn -A port 80



Step 6: To save packets to a file instead of displaying them on screen, use the option -w:

sudo tcpdump -i any -c10 -nn -w webserver.pcap port 80

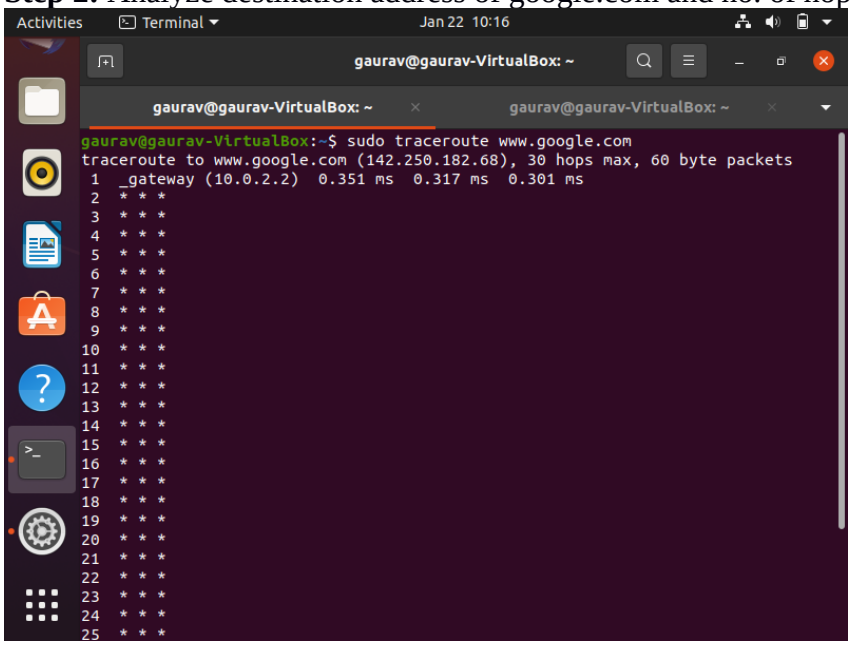


Task 5: Perform Traceroute checks

Step 1: Run the traceroute using the following command.

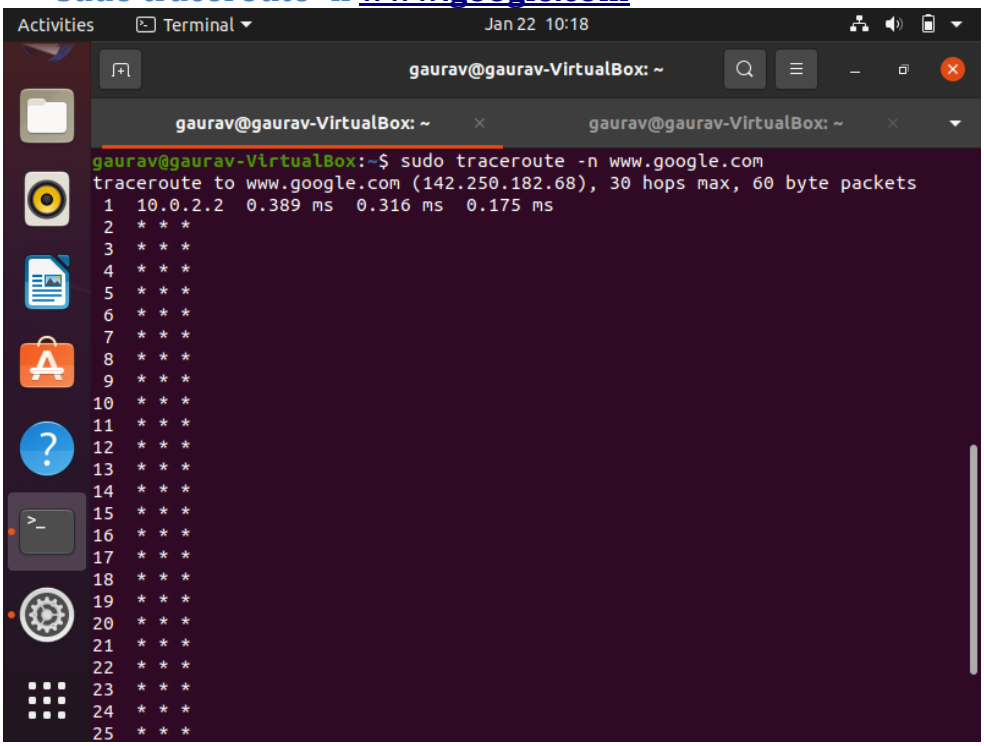
sudo traceroute www.google.com

Step 2: Analyze destination address of google.com and no. of hops



Step 3: To speed up the process, you can disable the mapping of IP addresses with hostnames by using the *-n* option

sudo traceroute -n www.google.com

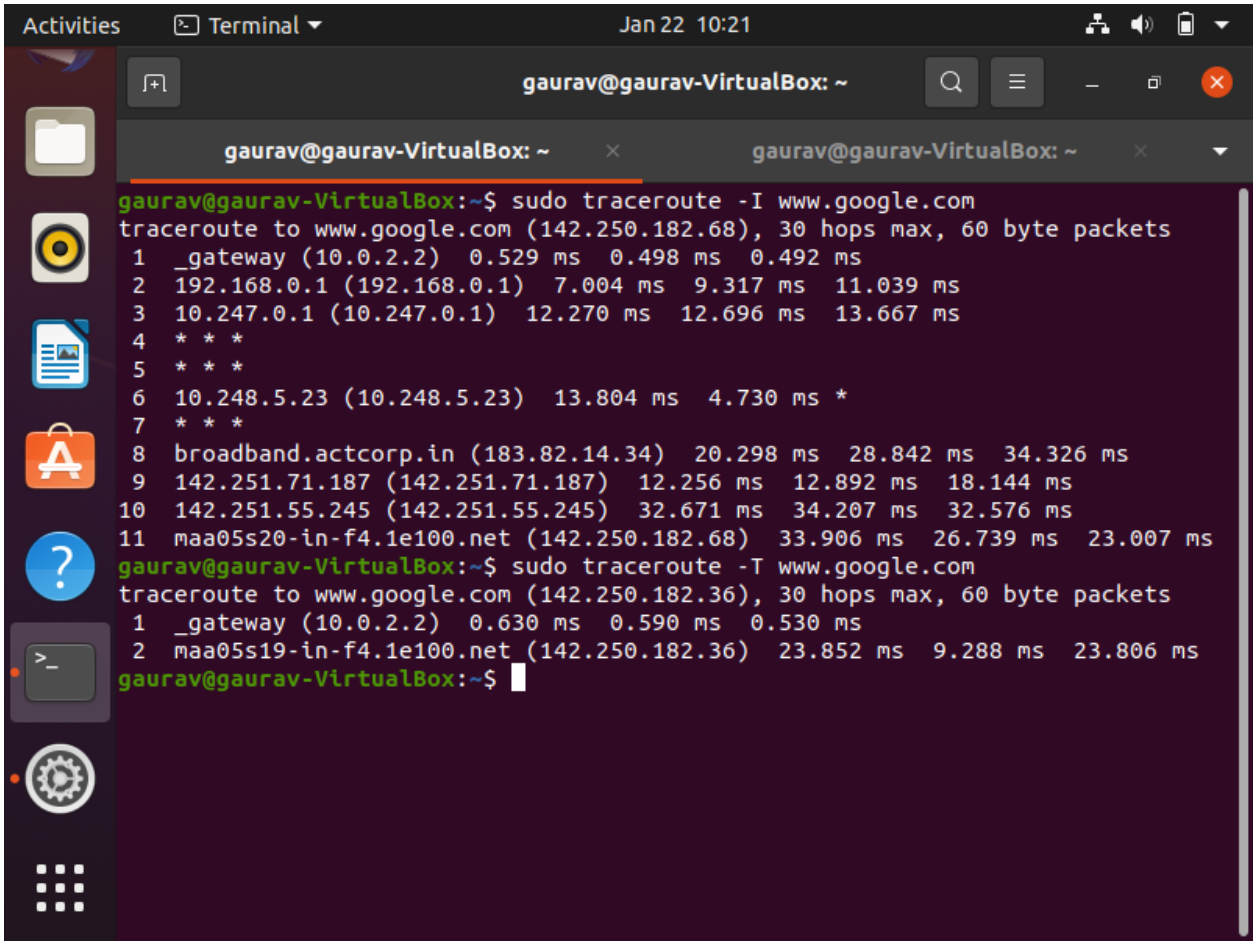


Step 4: The -I option is necessary so that the traceroute uses ICMP.

sudo traceroute -I www.google.com

Step 5: By default, traceroute uses icmp (ping) packets. If you'd rather test a TCP connection to gather data more relevant to web server, you can use the -T flag.

sudo traceroute -T www.google.com



Task 6: Explore an entire network for information (Nmap)

Step 1: You can scan a host using its host name or IP address, for instance.

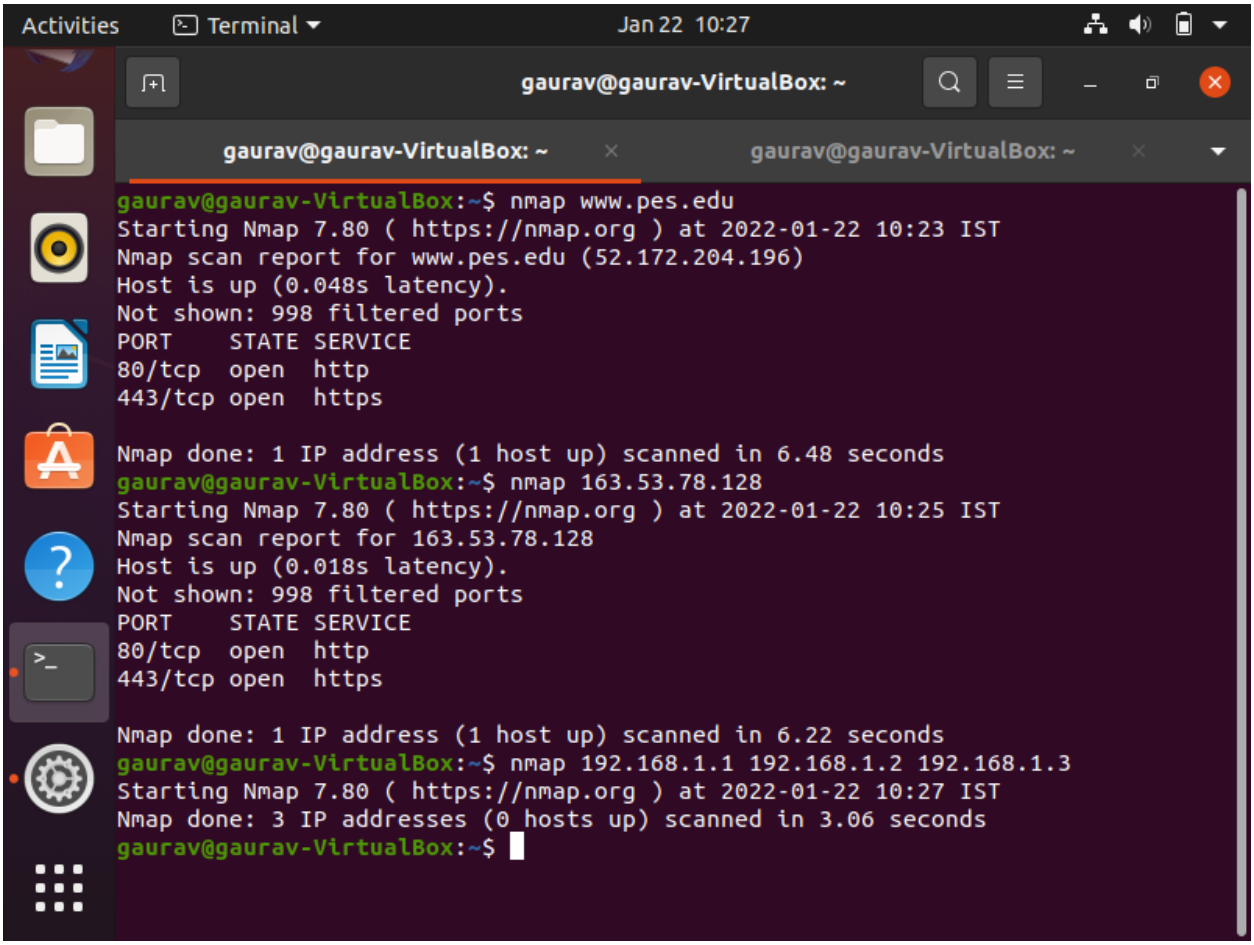
nmap www.pes.edu

Step 2: Alternatively, use an IP address to scan.

nmap 163.53.78.128

Step 3: Scan multiple IP address or subnet (IPv4)

nmap 192.168.1.1 192.168.1.2 192.168.1.3



<u>Questions on above observations:</u>

1) Is your browser running HTTP version 1.0 or 1.1? What version of HTTP is the server?
2) When was the HTML file that you are retrieving last modified at the server?
3) How to tell ping to exit after a specified number of ECHO_REQUEST packets?
4) How will you identify remote host apps and OS?

Answers on above observations:

1)Browser is running a HTTP version 1.1 and server is also of the same version

2)After much observation,it has been observed that the Last modified date has been not specified.

3)By using the command ping -c <number > <website>

4)By using nmap