

Roll Number:- 2105048

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Date:- 23/08/2023

Lab Assignment No:-7

Aim:-Study of packet sniffer tools TCPDUMP.

Lab Outcome Attained :- LO3

Theory:-

What is TCPDUMP and how to install it?

Tcpdump is a command-line packet analyzer that allows you to capture and analyze network traffic in real-time. It's commonly used for troubleshooting network issues, analyzing network behavior, and diagnosing problems related to network communication. tcpdump captures packets as they travel through a network interface and provides detailed information about each packet, including source and destination addresses, protocol information, payload data, and more.

Linux (Debian/Ubuntu):

Open a terminal and run the following command to install tcpdump: `sudo apt-get update` `sudo apt-get install tcpdump`

Explain various commands in tcpdump to capture different types of packets.

tcpdump provides a wide range of commands and options to capture and analyze different types of packets. Here are some common tcpdump commands and filters to capture specific types of packets:

1. Capture All Traffic on a Specific Interface:

```
sudo tcpdump -i eth0
```

This captures all traffic on the "eth0" network interface.

2. Capture Traffic to or from a Specific IP Address:

```
sudo tcpdump host 192.168.1.100
```

This captures all traffic to or from the IP address "192.168.1.100".

3. Capture Traffic on a Specific Port:

```
sudo tcpdump port 80
```

This captures all traffic on port 80.

4. Capture Traffic Using a Specific Protocol:

```
sudo tcpdump icmp
```

This captures ICMP (ping) traffic.

5. Capture Traffic from a Specific Source IP:

```
sudo tcpdump src 192.168.1.200
```

This captures traffic originating from IP address "192.168.1.200".

6. Capture Traffic to a Specific Destination IP:

```
sudo tcpdump dst 192.168.1.100
```

This captures traffic directed to IP address "192.168.1.100".

7. Capture Traffic on a Specific Port Using a Protocol:

```
sudo tcpdump udp port 53
```

This captures UDP traffic on port 53 (DNS).

8. Capture Traffic Using a Combination of Filters:

```
sudo tcpdump src 192.168.1.100 and port 22
```

This captures traffic originating from IP address "192.168.1.100" and using port 22 (SSH).

9. Capture Traffic with Specific Packet Size:

```
sudo tcpdump greater 1000
```

This captures packets larger than 1000 bytes.

10. Capture Specific Number of Packets:

```
sudo tcpdump -c 10
```

This captures 10 packets and then exits.

11. Capture Packets Using Hexadecimal Filter:

```
sudo tcpdump -X 'tcp[13] & 2 != 0'
```

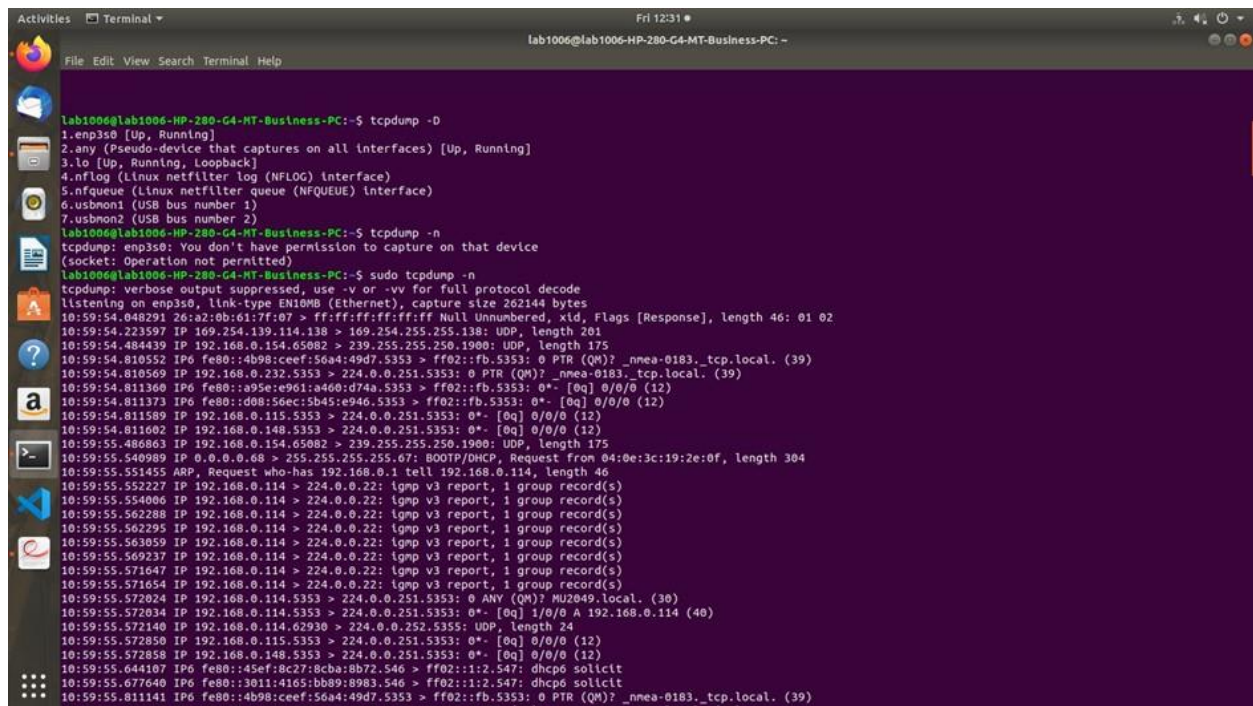
This captures only SYN packets (TCP packets with the SYN flag set).

12. Capture and Save Output to a File:

```
sudo tcpdump -i eth0 -w output.pcap
```

This captures traffic on the "eth0" interface and saves it to the "output.pcap" file.

Output Screenshot:-



```
Lab1006@lab1006-HP-280-G4-MT-Business-PC: ~$ sudo tcpdump -D
1.enp3s0 [Up, Running]
2.any (Pseudo-device that captures on all interfaces) [Up, Running]
3.lo [Up, Running, Loopback]
4.nftlog (Linux netfilter log (NFTLOG) interface)
5.nftqueue (Linux netfilter queue (NFTQUEUE) interface)
6.usbmon1 (USB bus number 1)
7.usbmon2 (USB bus number 2)
Lab1006@lab1006-HP-280-G4-MT-Business-PC: ~$ sudo tcpdump -n
tcpdump: enp3s0: You don't have permission to capture on that device
(socket: Operation not permitted)
Lab1006@lab1006-HP-280-G4-MT-Business-PC: ~$ sudo tcpdump -n
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes
10:59:54.048291 26:a2:0b:01:7f:07 > ff:ff:ff:ff:ff:ff Null Unnumbered, xid, Flags [Response], length 46: 01 02
10:59:54.223597 IP 169.254.139.114.138 > 169.254.255.255.138: UDP, length 201
10:59:54.484439 IP 192.168.0.154.65802 > 239.255.255.250.1900: UDP, length 175
10:59:54.810552 IP6 fe80::4b98:ceef:56a4:49d7.5353 > ff02::fb.5353: 0 PTR (QM)? nnea-0183, tcp.local. (39)
10:59:54.810569 IP 192.168.0.232.5353 > 224.0.0.251.5353: 0 PTR (QM)? nnea-0183, tcp.local. (39)
10:59:54.811360 IP6 fe80::a95e:e961:a460:d74a.5353 > ff02::fb.5353: 0* [0q] 0/0/0 (12)
10:59:54.811373 IP6 fe80::d08:56ec:5b45:e946.5353 > ff02::fb.5353: 0* [0q] 0/0/0 (12)
10:59:54.811589 IP 192.168.0.115.5353 > 224.0.0.251.5353: 0* [0q] 0/0/0 (12)
10:59:54.811602 IP 192.168.0.148.5353 > 224.0.0.251.5353: 0* [0q] 0/0/0 (12)
10:59:55.486863 IP 192.168.0.154.65802 > 239.255.255.250.1900: UDP, length 175
10:59:55.540989 IP 0.0.0.0.68 > 255.255.255.255.67: BOOTP/DHCP, Request from 04:0e:3c:19:2e:0f, length 304
10:59:55.551455 ARP, Request who-has 192.168.0.1 tell 192.168.0.114, length 46
10:59:55.552227 IP 192.168.0.114 > 224.0.0.22: igmp v3 report, 1 group record(s)
10:59:55.554006 IP 192.168.0.114 > 224.0.0.22: igmp v3 report, 1 group record(s)
10:59:55.562288 IP 192.168.0.114 > 224.0.0.22: igmp v3 report, 1 group record(s)
10:59:55.562295 IP 192.168.0.114 > 224.0.0.22: igmp v3 report, 1 group record(s)
10:59:55.563059 IP 192.168.0.114 > 224.0.0.22: igmp v3 report, 1 group record(s)
10:59:55.569237 IP 192.168.0.114 > 224.0.0.22: igmp v3 report, 1 group record(s)
10:59:55.571647 IP 192.168.0.114 > 224.0.0.22: igmp v3 report, 1 group record(s)
10:59:55.571654 IP 192.168.0.114 > 224.0.0.22: igmp v3 report, 1 group record(s)
10:59:55.572024 IP 192.168.0.114.5353 > 224.0.0.251.5353: 0 ANY (QM)? MU2049.local. (30)
10:59:55.572034 IP 192.168.0.114.5353 > 224.0.0.251.5353: 0* [0q] 1/0/0 A 192.168.0.114 (40)
10:59:55.572140 IP 192.168.0.114.62930 > 224.0.0.252.5355: UDP, length 24
10:59:55.572850 IP 192.168.0.115.5353 > 224.0.0.251.5353: 0* [0q] 0/0/0 (12)
10:59:55.572858 IP 192.168.0.148.5353 > 224.0.0.251.5353: 0* [0q] 0/0/0 (12)
10:59:55.644107 IP6 fe80::45ef:0c27:8eb8:b072.546 > ff02::12.547: dhcp solicit
10:59:55.677640 IP6 fe80::3011:4165:bb89:8983.546 > ff02::12.547: dhcp solicit
10:59:55.811141 IP6 fe80::4b98:ceef:56a4:49d7.5353 > ff02::fb.5353: 0 PTR (QM)? nnea-0183, tcp.local. (39)
10:59:55.811144 IP 192.168.0.232.5353 > 224.0.0.251.5353: 0 PTR (QM)? nnea-0183, tcp.local. (39)
```

```
Activities Terminal Fri 12:31
lab1006@lab1006-HP-280-G4-MT-Business-PC: -

10:59:55.811146 IP 192.168.0.232.5353 > 224.0.0.251.5353: 0 PTR (QM)? _nmea-0183_tcp.local. (39)
10:59:55.811627 IPo fe80::a95e:e961:a400:d74a.5353 > ff02::fb.5353: 0* [0q] 0/0/0 (12)
10:59:55.811783 IP 192.168.0.115.5353 > 224.0.0.251.5353: 0* [0q] 0/0/0 (12)
10:59:55.811942 IPo fe80::d08:56ec:5b45:e946.5353 > ff02::fb.5353: 0* [0q] 0/0/0 (12)
10:59:55.812212 IP 192.168.0.148.5353 > 224.0.0.251.5353: 0* [0q] 0/0/0 (12)
^C
33 packets captured
33 packets received by filter
0 packets dropped by kernel
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ sudo tcpdump -v -n
Command 'sudp' not found, did you mean:
  command 'ssdp' from snap ssdp (0.0.1)
  command 'sudp' from deb sudo
  command 'sudp' from deb sudo-ldap
  command 'sfdp' from deb graphviz
  command 'sup' from deb sup
See 'snap info <snapname>' for additional versions.
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ sudo tcpdump -v -n
tcpdump: listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes
11:01:45.107922 IP (tos 0x0, ttl 1, id 32932, offset 0, flags [none], proto UDP (17), length 203)
  192.168.0.194.65406 > 239.255.255.250.1900: UDP, length 175
11:01:45.431136 ARP, Ethernet (len 6), IPv4 (len 4), Request who-has 192.168.0.240 tell 192.168.0.107, length 46
11:01:45.560252 ARP, Ethernet (len 6), IPv4 (len 4), Request who-has 192.168.0.141 tell 192.168.0.190, length 46
11:01:45.590670 ARP, Ethernet (len 6), IPv4 (len 4), Request who-has 192.168.0.164 tell 192.168.0.107, length 46
11:01:45.738253 IP (tos 0x0, ttl 1, id 52371, offset 0, flags [none], proto UDP (17), length 204)
  192.168.0.190.54153 > 239.255.255.250.1900: UDP, length 176
11:01:46.086093 IP (tos 0x0, ttl 1, id 29968, offset 0, flags [none], proto UDP (17), length 203)
  192.168.0.166.65144 > 239.255.255.250.1900: UDP, length 175
11:01:46.097290 ARP, Ethernet (len 6), IPv4 (len 4), Request who-has 192.168.0.240 tell 192.168.0.107, length 46
11:01:46.108753 IP (tos 0x0, ttl 1, id 32933, offset 0, flags [none], proto UDP (17), length 203)
  192.168.0.194.65406 > 239.255.255.250.1900: UDP, length 175
11:01:46.524893 IPo (hlen 1, next-header UDP (17) payload length: 103) fe80::98b4:47fb:4996:5056.546 > ff02::1:2.547: [udp sum ok] dhcp6 solicit (xid=c0f377 (elapsed-tl
me 6303) (Client-ID huaddr/time type 1 tline 744492727 040e3c19208f) (IA_NA IAID:50597436 T1:0 T2:0) (Client-FQDN) (vendor-class) (option-request DNS-search-list DNS-ser
ver vendor-specific-info Client-FQDN))
11:01:46.566009 ARP, Ethernet (len 6), IPv4 (len 4), Request who-has 192.168.0.141 tell 192.168.0.190, length 46
11:01:47.046800 00:0e:1e:15:44:53 > 34:db:fd:77:e4:01, ethertype Unknown (0xa0a0), length 60:
  0x0000: 0003 0101 0101 0101 0101 0101 0101 0101 .....
  0x0010: 0101 0101 0101 0101 0101 0101 0101 0101 .....
  0x0020: 0101 0101 0101 0101 0101 0101 0101 0101 .....
11:01:47.004578 ARP, Ethernet (len 6), IPv4 (len 4), Request who-has 192.168.0.240 tell 192.168.0.107, length 46
11:01:47.006305 IP (tos 0x0, ttl 1, id 29969, offset 0, flags [none], proto UDP (17), length 203)
  192.168.0.166.65144 > 239.255.255.250.1900: UDP, length 175
```

```
Activities Terminal Fri 12:31
lab1006@lab1006-HP-280-G4-MT-Business-PC: -

192.168.0.115.5353 > 224.0.0.251.5353: 0* [0q] 0/0/0 (12)
11:06:48.559410 04:0e:3c:19:2d:d2 > 33:33:00:00:00:fb, ethertype IPv6 (0x86dd), length 74: (hlen 1, next-header UDP (17) payload length: 20) fe80::d08:56ec:5b45:e946.53
53 > ff02::fb.5353: [udp sum ok] 0* [0q] 0/0/0 (12)
11:06:48.559669 04:0e:3c:19:2d:d2 > 01:00:5e:00:00:fb, ethertype IPv4 (0x0800), length 60: (tos 0x0, ttl 1, id 17398, offset 0, flags [none], proto UDP (17), length 40)
  192.168.0.148.5353 > 224.0.0.251.5353: 0* [0q] 0/0/0 (12)
11:06:48.859888 a4:ae:12:84:80:ea > ff:ff:ff:ff:ff:ff, ethertype ARP (0x0806), length 60: Ethernet (len 6), IPv4 (len 4), Request who-has 192.168.0.134 tell 192.168.0.1
85, length 46
11:06:49.156505 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 218: (tos 0x0, ttl 1, id 620, offset 0, flags [none], proto UDP (17), length 204)
  192.44.44.202.60046 > 239.255.255.250.1900: UDP, length 176
11:06:49.943390 04:0e:3c:1a:60:2f > ff:ff:ff:ff:ff:ff, ethertype ARP (0x0806), length 60: Ethernet (len 6), IPv4 (len 4), Request who-has 192.168.0.141 tell 192.168.0.1
90, length 46
11:06:50.170534 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 218: (tos 0x0, ttl 1, id 621, offset 0, flags [none], proto UDP (17), length 204)
  192.44.44.202.60046 > 239.255.255.250.1900: UDP, length 176
11:06:50.567535 04:0e:3c:1a:60:2f > ff:ff:ff:ff:ff:ff, ethertype ARP (0x0806), length 60: Ethernet (len 6), IPv4 (len 4), Request who-has 192.168.0.141 tell 192.168.0.1
90, length 46
11:06:50.584752 04:0e:3c:1b:d1:42 > ac:15:a2:b9:9e:29, ethertype IPv4 (0x0800), length 105: (tos 0x0, ttl 64, id 15809, offset 0, flags [DF], proto TCP (6), length 91)
  192.168.0.213.51252 > 185.199.108.154.443: Flags [P.], cksum 0xe82c (incorrect -> 0xc33f), seq 1873020008:1873020047, ack 1011178678, win 4607, options [nop,nop,T
val 3555857482 ecr 1680001507], length 39
11:06:50.601299 ac:15:a2:b9:9e:29 > 04:0e:3c:1b:d1:42, ethertype IPv4 (0x0800), length 66: (tos 0x34, ttl 55, id 60381, offset 0, flags [DF], proto TCP (6), length 52)
  185.199.108.154.443 > 192.168.0.213.51252: Flags [.], cksum 0xbab0 (correct), ack 39, win 284, options [nop,nop,Tval 1680000306 ecr 3555857482], length 0
11:06:50.601323 ac:15:a2:b9:9e:29 > 04:0e:3c:1b:d1:42, ethertype IPv4 (0x0800), length 105: (tos 0x34, ttl 55, id 60382, offset 0, flags [DF], proto TCP (6), length 91)
  185.199.108.154.443 > 192.168.0.213.51252: Flags [P.], cksum 0x5056 (correct), seq 1:40, ack 39, win 284, options [nop,nop,Tval 1680000306 ecr 3555857482], length
39
11:06:50.601400 04:0e:3c:1b:d1:42 > ac:15:a2:b9:9e:29, ethertype IPv4 (0x0800), length 66: (tos 0x0, ttl 64, id 15810, offset 0, flags [DF], proto TCP (6), length 52)
  192.168.0.213.51252 > 185.199.108.154.443: Flags [.], cksum 0xe805 (incorrect -> 0xa995), ack 40, win 4607, options [nop,nop,Tval 3555857499 ecr 1680000306], leng
th 0
11:06:50.675239 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 428: (tos 0x0, ttl 2, id 37639, offset 0, flags [DF], proto UDP (17), length 414)
  192.168.0.1.60033 > 239.255.255.250.1900: UDP, length 386
11:06:50.675463 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 437: (tos 0x0, ttl 2, id 37640, offset 0, flags [DF], proto UDP (17), length 423)
  192.168.0.1.60033 > 239.255.255.250.1900: UDP, length 395
11:06:50.675567 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 500: (tos 0x0, ttl 2, id 37641, offset 0, flags [DF], proto UDP (17), length 486)
  192.168.0.1.60033 > 239.255.255.250.1900: UDP, length 458
11:06:50.675836 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 496: (tos 0x0, ttl 2, id 37642, offset 0, flags [DF], proto UDP (17), length 482)
  192.168.0.1.60033 > 239.255.255.250.1900: UDP, length 454
11:06:50.675997 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 476: (tos 0x0, ttl 2, id 37643, offset 0, flags [DF], proto UDP (17), length 462)
  192.168.0.1.60033 > 239.255.255.250.1900: UDP, length 434
11:06:50.676187 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 508: (tos 0x0, ttl 2, id 37644, offset 0, flags [DF], proto UDP (17), length 494)
  192.168.0.1.60033 > 239.255.255.250.1900: UDP, length 466
11:06:50.676299 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 490: (tos 0x0, ttl 2, id 37645, offset 0, flags [DF], proto UDP (17), length 476)
  192.168.0.1.60033 > 239.255.255.250.1900: UDP, length 448
11:06:50.676493 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 492: (tos 0x0, ttl 2, id 37646, offset 0, flags [DF], proto UDP (17), length 478)
  192.168.0.1.60033 > 239.255.255.250.1900: UDP, length 450
11:06:50.676669 ac:15:a2:b9:9e:29 > 01:00:5e:7f:ff:fa, ethertype IPv4 (0x0800), length 492: (tos 0x0, ttl 2, id 37647, offset 0, flags [DF], proto UDP (17), length 478)
  192.168.0.1.60033 > 239.255.255.250.1900: UDP, length 450
11:06:50.696063 04:0e:3c:1a:5c:1f > 33:33:00:00:00:fb, ethertype IPv6 (0x86dd), length 102: (flowlabel 0x061d2, hlen 255, next-header UDP (17) payload length: 48) fe80::
```



```
Activities Terminal Fri 12:31 Lab1006@lab1006-HP-280-G4-MT-Business-PC:~  
11:28:39.941579 IP 32.121.122.34.bc.googleusercontent.com.http > lab1006-HP-280-G4-MT-Business-PC.49386: Flags [F.], seq 149, ack 88, win 506, options [nop,nop,TS val 1  
089565010 ecr 3444134909], length 0  
11:28:39.941608 IP lab1006-HP-280-G4-MT-Business-PC.49386 > 32.121.122.34.bc.googleusercontent.com.http: Flags [F.], ack 150, win 501, options [nop,nop,TS val 3444134909  
ecr 1089565010], length 0  
11:28:40.183186 IP 32.121.122.34.bc.googleusercontent.com.http > lab1006-HP-280-G4-MT-Business-PC.49386: Flags [F.], ack 89, win 506, options [nop,nop,TS val 1089565258  
ecr 3444134908], length 0  
^C  
12 packets captured  
12 packets received by filter  
0 packets dropped by kernel  
Lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ sudo tcpdump udp and src port 53  
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode  
listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes  
11:33:37.241511 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.57215: 10986 9/3/1 A 34.122.121.32, A 35.224.170.84, A 185.125.190.18, A 35.232.111.17, A 91.189.9  
1.48, A 185.125.190.49, A 185.125.190.17, A 91.189.91.49, A 185.125.190.48 (266)  
11:33:37.241594 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.32907: 3486 6/3/1 AAAA 2001:67c:1562::23, AAAA 2620:2d:4000:1::23, AAAA 2620:2d:4000:1::2b, AAAA 2  
620:2d:4000:1::22, AAAA 2001:67c:1562::24, AAAA 2620:2d:4000:1::2a (290)  
11:34:04.686194 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.53528: 54238 4/4/1 A 108.158.61.90, A 108.158.61.4, A 108.158.61.10, A 108.158.61.13 (258)  
11:34:04.709453 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.59252: 37080 8/4/1 AAAA 2600:9000:237b:c200:1a:5235:f980:93a1, AAAA 2600:9000:237b:c000:1a:5235:f9  
80:93a1, AAAA 2600:9000:237b:d000:1a:5235:f980:93a1, AAAA 2600:9000:237b:d400:1a:5235:f980:93a1, AAAA 2600:9000:237b:7800:1a:5235:f980:93a1, AAAA 2600:9000:237b:7e00:1a:  
5235:f980:93a1, AAAA 2600:9000:237b:c000:1a:5235:f980:93a1, AAAA 2600:9000:237b:2800:1a:5235:f980:93a1 (416)  
^C  
4 packets captured  
4 packets received by filter  
0 packets dropped by kernel  
Lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ sudo tcpdump portrange 1-80  
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode  
listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes  
11:35:13.653873 IP 0.0.0.0.bootpc > 255.255.255.255.bootps: BOOTP/DHCP, Request from 04:0e:3c:1a:5c:74 (oui Unknown), length 300  
11:35:17.801654 IP 0.0.0.0.bootpc > 255.255.255.255.bootps: BOOTP/DHCP, Request from 04:0e:3c:1a:5c:74 (oui Unknown), length 300  
11:35:22.173999 IP 0.0.0.0.bootpc > 255.255.255.255.bootps: BOOTP/DHCP, Request from 04:0e:3c:1a:5c:74 (oui Unknown), length 300  
11:35:30.078393 IP 0.0.0.0.bootpc > 255.255.255.255.bootps: BOOTP/DHCP, Request from 04:0e:3c:1a:5c:74 (oui Unknown), length 300  
11:35:38.922635 IP 0.0.0.0.bootpc > 255.255.255.255.bootps: BOOTP/DHCP, Request from 1c:6f:65:ae:9b:2a (oui Unknown), length 300  
11:35:41.918550 IP lab1006-HP-280-G4-MT-Business-PC.36586 > _gateway.domain: 53847 [1au] A? encrypted-tbn0.gstatic.com. (55)  
11:35:41.918818 IP lab1006-HP-280-G4-MT-Business-PC.35381 > _gateway.domain: 12276 [1au] AAAA? encrypted-tbn0.gstatic.com. (55)  
11:35:41.919046 IP lab1006-HP-280-G4-MT-Business-PC.36586 > _gateway.domain: 53847 1/0/1 A 142.250.192.78 (71)  
11:35:41.938280 IP lab1006-HP-280-G4-MT-Business-PC.56668 > _gateway.domain: 933 [1au] A? www.google.com. (43)  
11:35:41.938421 IP lab1006-HP-280-G4-MT-Business-PC.59077 > _gateway.domain: 26727 [1au] AAAA? www.google.com. (43)  
11:35:41.939510 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.56668: 933 1/0/1 A 172.217.27.196 (59)  
11:35:41.939601 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.59077: 26727 1/0/1 AAAA 2404:6800:4009:800::2004 (71)  
11:35:41.980589 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.35381: 12276 1/0/1 AAAA 2404:6800:4009:822::200e (83)  
11:35:42.677951 IP lab1006-HP-280-G4-MT-Business-PC.37545 > _gateway.domain: 56141 [1au] A? www.gstatic.com. (44)  
11:35:42.678020 IP lab1006-HP-280-G4-MT-Business-PC.41726 > _gateway.domain: 30891 [1au] AAAA? www.gstatic.com. (44)  
11:35:42.679288 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.41726: 30891 1/0/1 AAAA 2404:6800:4009:82b::2003 (72)  
11:35:42.679329 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.37545: 56141 1/0/1 A 142.250.192.131 (60)  
11:35:42.684322 IP lab1006-HP-280-G4-MT-Business-PC.55375 > _gateway.domain: 35292 2/0/1 CNAME plus.l.google.com., A 142.251.42.78 (81)
```

```
Activities Terminal Fri 12:31 Lab1006@lab1006-HP-280-G4-MT-Business-PC:~  
11:35:42.744434 IP lab1006-HP-280-G4-MT-Business-PC.55375 > _gateway.domain: 35292 [1au] A? apis.google.com. (44)  
11:35:42.744508 IP lab1006-HP-280-G4-MT-Business-PC.47736 > _gateway.domain: 45730 [1au] AAAA? apis.google.com. (44)  
11:35:42.745602 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.55375: 35292 2/0/1 CNAME plus.l.google.com., A 142.251.42.78 (81)  
11:35:42.745668 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.47736: 45730 2/0/1 CNAME plus.l.google.com., AAAA 2404:6800:4009:831::200e (93)  
11:35:42.845172 IP lab1006-HP-280-G4-MT-Business-PC.55210 > _gateway.domain: 48143 [1au] A? adservice.google.com. (46)  
11:35:42.845258 IP lab1006-HP-280-G4-MT-Business-PC.51043 > _gateway.domain: 27592 [1au] AAAA? adservice.google.com. (49)  
11:35:42.846395 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.55210: 48143 1/0/1 A 142.250.192.98 (65)  
11:35:42.846733 IP lab1006-HP-280-G4-MT-Business-PC.39669 > _gateway.domain: 31162 [1au] A? safebrowsing.googleapis.com. (56)  
11:35:42.846788 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.48992 > _gateway.domain: 63325 [1au] AAAA? safebrowsing.googleapis.com. (56)  
11:35:42.847885 IP lab1006-HP-280-G4-MT-Business-PC.48992 > _gateway.domain: 63325 1/0/1 AAAA 2404:6800:4009:823::200a (84)  
11:35:42.847898 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.39669: 31162 1/0/1 A 142.250.183.106 (72)  
11:35:42.850258 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.51043: 27592 1/0/1 AAAA 2404:6800:4009:820::2002 (77)  
11:35:43.014836 IP lab1006-HP-280-G4-MT-Business-PC.43491 > _gateway.domain: 41945 [1au] A? adservice.google.co.in. (51)  
11:35:43.014910 IP lab1006-HP-280-G4-MT-Business-PC.35711 > _gateway.domain: 33071 [1au] AAAA? adservice.google.co.in. (51)  
11:35:43.015190 IP lab1006-HP-280-G4-MT-Business-PC.54633 > _gateway.domain: 59138 [1au] A? googleads.g.doubleclick.net. (56)  
11:35:43.015251 IP lab1006-HP-280-G4-MT-Business-PC.34413 > _gateway.domain: 1087 [1au] AAAA? googleads.g.doubleclick.net. (56)  
11:35:43.016017 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.43491: 41945 2/0/1 CNAME pagead46.l.doubleclick.net., A 142.250.192.34 (107)  
11:35:43.016055 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.35711: 33071 2/0/1 CNAME pagead46.l.doubleclick.net., AAAA 2404:6800:4009:823::2002 (119)  
11:35:43.016261 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.54633: 59138 1/0/1 A 142.250.199.130 (72)  
11:35:43.039580 IP _gateway.domain > lab1006-HP-280-G4-MT-Business-PC.34413: 1087 1/0/1 AAAA 2404:6800:4009:82c::2002 (84)  
11:35:45.136757 IP 0.0.0.0.bootpc > 255.255.255.255.bootps: BOOTP/DHCP, Request from 04:0e:3c:1a:5c:74 (oui Unknown), length 300  
^C  
38 packets captured  
38 packets received by filter  
0 packets dropped by kernel  
Lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ sudo tcpdump port 80 -w capture_1  
tcpdump: listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes  
^C86 packets captured  
86 packets received by filter  
0 packets dropped by kernel  
Lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ sudo tcpdump -nnvv src 10.5.2.3 and dst port 3389  
tcpdump: listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes  
^C  
0 packets captured  
0 packets received by filter  
0 packets dropped by kernel  
Lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ sudo tcpdump -nnvv src 103.246.224.160 and dst port 3389  
tcpdump: listening on enp3s0, link-type EN10MB (Ethernet), capture size 262144 bytes  
^C  
0 packets captured  
0 packets received by filter  
0 packets dropped by kernel  
Lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ tcpdump 'tcp[13] & 32!=0'  
tcpdump: enp3s0: You don't have permission to capture on that device  
(socket: Operation not permitted)
```


Conclusion:-

Learnt about how TCPDump can be used in practical life and how can it be used to capture , dissect , interpret network packets , offering various insights about network behavior , troubleshooting and security assessment . Also explored various commands related to TCPDump