

Name : MOHAMMED TOUSIF
Roll: CB.EN.P2CYS22008

UNDERSTANDING NETWORK TRAFFIC ANALYSIS USING WIRESHARK

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Aim :- To demonstrate the commands of networking and understanding network traffic analysis using wireshark

Tools Required :- Windows OS , CMD with Administrator privilege , Wireshark.

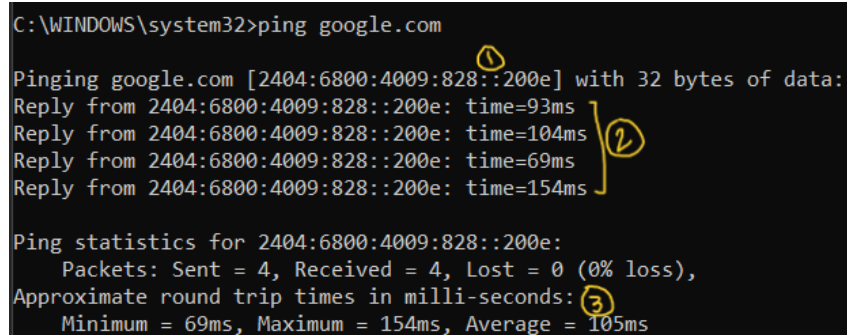
Procedure :-

PING

ping command is used to test the ability of the source computer to reach a specified destination.

The ping command operates by sending Internet Control Message Protocol (ICMP) echo requests messages to the destination and wait for the response.

a. Using ping on google.com and find IP address, TTL values, Round trip time value.



```
C:\WINDOWS\system32>ping google.com

Pinging google.com [2404:6800:4009:828::200e] with 32 bytes of data:
Reply from 2404:6800:4009:828::200e: time=93ms
Reply from 2404:6800:4009:828::200e: time=104ms
Reply from 2404:6800:4009:828::200e: time=69ms
Reply from 2404:6800:4009:828::200e: time=154ms

Ping statistics for 2404:6800:4009:828::200e:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 69ms, Maximum = 154ms, Average = 105ms
```

1. IP address.
2. TTL value
3. Round trip time value

b. Sending 8 packets to check the output over google.com

```
C:\WINDOWS\system32>ping -n 8 google.com

Pinging google.com [2404:6800:4009:828::200e] with 32 bytes of data:
Reply from 2404:6800:4009:828::200e: time=118ms
Reply from 2404:6800:4009:828::200e: time=77ms
Reply from 2404:6800:4009:828::200e: time=80ms
Reply from 2404:6800:4009:828::200e: time=105ms
Reply from 2404:6800:4009:828::200e: time=76ms
Reply from 2404:6800:4009:828::200e: time=87ms
Reply from 2404:6800:4009:828::200e: time=88ms
Reply from 2404:6800:4009:828::200e: time=77ms

Ping statistics for 2404:6800:4009:828::200e:
    Packets: Sent = 8, Received = 8, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 76ms, Maximum = 118ms, Average = 88ms
```

-n option tells the ping command to send n no of requests so that to check the ping status of the desired no of packets.

c. Ping your local host. Explain what the purpose

```
C:\WINDOWS\system32>ping localhost

Pinging Tousif [::1] with 32 bytes of data:
Reply from ::1: time<1ms
Reply from ::1: time<1ms
Reply from ::1: time<1ms
Reply from ::1: time<1ms

Ping statistics for ::1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

ping localhost refers to the local machine currently making the request. localhost is useful for software testing and security purposes independent of a larger network.

TRACERT

Tracert is a network diagnostic tool used to track no of hops taken by a packet from source to destination.

It is used to determine response delays and routing loops present in a network pathway.

It also helps to locate any points of failure encountered in the pathway.

a. Try tracert over google.com

```
C:\WINDOWS\system32>tracert google.com

Tracing route to google.com [2404:6800:4009:830::200e]
over a maximum of 30 hops:

  1    3 ms    3 ms    2 ms  2409:4072:8e90:c724::9a
  2    *      *      *      Request timed out.
  3   68 ms   32 ms   38 ms  2405:200:394:eeee:20::52
  4   64 ms   42 ms   34 ms  2405:200:801:4f00::130
  5   76 ms   28 ms   52 ms  2405:200:801:4f00::133
  6   53 ms   38 ms   69 ms  2405:200:801:900::ce2
  7   65 ms   56 ms   66 ms  2001:4860:1:1::d10
  8   75 ms   44 ms   58 ms  2404:6800:8132::1
  9   93 ms   41 ms   56 ms  2001:4860:0:1::55d6
 10   71 ms   39 ms   55 ms  2001:4860:0:133f::a
 11   79 ms   74 ms   79 ms  2001:4860::9:4000:d773
 12   87 ms  106 ms  105 ms  2001:4860::9:4002:d931
 13   90 ms  133 ms   79 ms  2001:4860::1c:4000:d605
 14   81 ms   68 ms   77 ms  2001:4860:0:1::203b
 15  132 ms   98 ms   81 ms  bom12s20-in-x0e.1e100.net [2404:6800:4009:830::200e]

Trace complete.
```

b. Type tracert -d google.com

```
C:\WINDOWS\system32>tracert -d google.com

Tracing route to google.com [2404:6800:4009:830::200e]
over a maximum of 30 hops:

  1    2 ms    2 ms    4 ms  2409:4072:8e90:c724::9a
  2    *      *      *      Request timed out.
  3   53 ms   37 ms   38 ms  2405:200:394:eeee:20::52
  4   62 ms   51 ms   58 ms  2405:200:801:4f00::130
  5   72 ms   38 ms   38 ms  2405:200:801:4f00::133
  6   84 ms   63 ms   46 ms  2405:200:801:900::ce2
  7   82 ms   59 ms   59 ms  2001:4860:1:1::d10
  8  100 ms   34 ms   83 ms  2404:6800:8132::1
  9  101 ms   71 ms   60 ms  2001:4860:0:1::55d6
 10   56 ms   55 ms   53 ms  2001:4860:0:133f::a
 11  108 ms   88 ms   67 ms  2001:4860::9:4000:d773
 12  106 ms   87 ms   88 ms  2001:4860::9:4002:d931
 13  112 ms    *      *      2001:4860::1c:4000:d605
 14 1342 ms 1529 ms  879 ms  2001:4860:0:1::203b
 15  832 ms 1097 ms  974 ms  2404:6800:4009:830::200e

Trace complete.
```

1. How many hops is your machine away from google.com?

15 hops.

2. Wait for a while and execute the same command again. Is the output the same as the first time?

```
C:\WINDOWS\system32>tracert -d google.com

Tracing route to google.com [2404:6800:4009:830::200e]
over a maximum of 30 hops:

  1    3 ms    4 ms    3 ms  2409:4072:8e90:c724::9a
  2    *      *      *      Request timed out.
  3   197 ms   234 ms  204 ms  2405:200:394:eeee:20::52
  4    86 ms    90 ms   84 ms  2405:200:801:4f00::130
  5   162 ms   151 ms   69 ms  2405:200:801:4f00::133
  6   210 ms    99 ms  104 ms  2405:200:801:900::ce2
  7   120 ms    *      69 ms  2001:4860:1:1::d10
  8    49 ms    85 ms   55 ms  2404:6800:8132::1
  9    70 ms    75 ms   90 ms  2001:4860:0:1::55d6
 10   309 ms   246 ms   70 ms  2001:4860:0:133f::a
 11   170 ms   108 ms   94 ms  2001:4860:9:4000:d773
 12   126 ms    82 ms   73 ms  2001:4860:9:4002:d931
 13   269 ms   153 ms  274 ms  2001:4860:1c:4000:d605
 14    76 ms    70 ms   70 ms  2001:4860:0:1::203b
 15   161 ms   106 ms   61 ms  2404:6800:4009:830::200e

Trace complete.
```

Time values changed.

No of hops also may change because network may take several routes to the destination. Thus , the values differs everytime.

NETSTAT

- a . Use netstat to display information about the routing table
-r command is used to display routing table information

```
C:\WINDOWS\system32>netstat -r
=====
Interface List
 6...08 8f c3 13 84 3c .....Realtek PCIe GbE Family Controller
15...0a 00 27 00 00 0f .....VirtualBox Host-Only Ethernet Adapter
16...a2 e7 0b 05 8c be .....Microsoft Wi-Fi Direct Virtual Adapter
 8...a0 e7 0b 05 8c bf .....Microsoft Wi-Fi Direct Virtual Adapter #3
 4...00 50 56 c0 00 01 .....VMware Virtual Ethernet Adapter for VMnet1
21...00 50 56 c0 00 08 .....VMware Virtual Ethernet Adapter for VMnet8
17...a0 e7 0b 05 8c be .....Intel(R) Wi-Fi 6 AX201 160MHz
 1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
   Network Destination        Netmask          Gateway       Interface    Metric
   0.0.0.0              0.0.0.0        192.168.43.1  192.168.43.222    55
   127.0.0.0            255.0.0.0           On-link      127.0.0.1       331
   127.0.0.1            255.255.255.255   On-link      127.0.0.1       331
 127.255.255.255        255.255.255.255   On-link      127.0.0.1       331
   192.168.38.0          255.255.255.0     On-link      192.168.38.1     291
   192.168.38.1          255.255.255.255   On-link      192.168.38.1     291
   192.168.38.255        255.255.255.255   On-link      192.168.38.1     291
   192.168.43.0          255.255.255.0     On-link      192.168.43.222   311
   192.168.43.222        255.255.255.255   On-link      192.168.43.222   311
   192.168.43.255        255.255.255.255   On-link      192.168.43.222   311
   192.168.56.0          255.255.255.0     On-link      192.168.56.1     281
   192.168.56.1          255.255.255.255   On-link      192.168.56.1     281
   192.168.56.255        255.255.255.255   On-link      192.168.56.1     281
```

```
IPv6 Route Table
=====
Active Routes:
  If Metric Network Destination      Gateway
  17      71 ::/0                  fe80::82ad:16ff:fece:e68c
  1      331 ::1/128                  On-link
  17      71 2409:4072:8e90:c724::/64 On-link
  17      311 2409:4072:8e90:c724:c9b:caf9:494:56fd/128
                                On-link
  17      311 2409:4072:8e90:c724:917f:7ee5:5056:e141/128
                                On-link
  15      281 fe80::/64                  On-link
  17      311 fe80::/64                  On-link
  4       291 fe80::/64                  On-link
  21      291 fe80::/64                  On-link
  17      311 fe80::917f:7ee5:5056:e141/128
                                On-link
```

b. Use netstat to display about ethernet statistics.

-e is used to display the ethernet statistics.

```
C:\WINDOWS\system32>netstat -e
Interface Statistics


```

	Received	Sent
Bytes	233700960	28405192
Unicast packets	247584	141116
Non-unicast packets	224	4836
Discards	0	0
Errors	0	0
Unknown protocols	0	

```
C:\WINDOWS\system32>
```

NSLOOKUP

Name Server Lookup (NSLOOKUP) is used to get information from DNS server.

It is used to find the IP address that corresponds to a host, or the domain name that corresponds to an IP address.

a. Use nslookup to find out the internet address of the domain amrita.edu

```
C:\WINDOWS\system32>nslookup amrita.edu
Server: prithvi.amritanet.edu
Address: 172.17.18.2

Non-authoritative answer:
Name: amrita.edu
Addresses: 15.197.141.123
          3.33.154.67
```

15.197.141.123 and 3.33.154.67

b. What is the mail exchanger for the domain google.com.

```
C:\WINDOWS\system32>nslookup -q=mx google.com
Server: prithvi.amritanet.edu
Address: 172.17.18.2

Non-authoritative answer:
google.com      MX preference = 10, mail exchanger = smtp.google.com

smtp.google.com internet address = 142.250.4.27
smtp.google.com internet address = 142.250.4.26
smtp.google.com internet address = 74.125.200.27
smtp.google.com internet address = 74.125.200.26
smtp.google.com internet address = 142.251.12.26
smtp.google.com AAAA IPv6 address = 2404:6800:4003:c00::1b
smtp.google.com AAAA IPv6 address = 2404:6800:4003:c11::1a
smtp.google.com AAAA IPv6 address = 2404:6800:4003:c00::1a
smtp.google.com AAAA IPv6 address = 2404:6800:4003:c06::1a
```

smtp.google.com

c. What is the name server for amrita.edu

```
C:\WINDOWS\system32>nslookup -type=ns amrita.edu
Server: prithvi.amritanet.edu
Address: 172.17.18.2

Non-authoritative answer:
amrita.edu      nameserver = ns3.amrita.edu
amrita.edu      nameserver = ns4.amrita.edu
amrita.edu      nameserver = ns2.amrita.edu
amrita.edu      nameserver = ns1.amrita.edu

ns3.amrita.edu  internet address = 103.10.24.200
ns4.amrita.edu  internet address = 10.10.10.4
ns2.amrita.edu  internet address = 117.193.77.232
ns1.amrita.edu  internet address = 10.10.10.4
```

ARP & RARP

ARP stands for Address Resolution Protocol. It is a protocol that connects IP address to a fixed physical machine address which is known as Media Access Control (MAC) address.

RARP stands for Reverse Address Resolution Protocol. It retrieves logical address for a computer from the server.

a. Use arp command to find the gateway address and host systems hardware address.

```
C:\Users\TOUSIF>arp -a

Interface: 192.168.38.1 --- 0x4
    Internet Address      Physical Address      Type
    192.168.38.254        00-50-56-ee-4a-2d     dynamic
    192.168.38.255        ff-ff-ff-ff-ff-ff     static
    224.0.0.22            01-00-5e-00-00-16     static
    224.0.0.251          01-00-5e-00-00-fb     static
    224.0.0.252          01-00-5e-00-00-fc     static
    239.255.255.250      01-00-5e-7f-ff-fa     static
    255.255.255.255      ff-ff-ff-ff-ff-ff     static

Interface: 192.168.56.1 --- 0xf
    Internet Address      Physical Address      Type
    192.168.56.255        ff-ff-ff-ff-ff-ff     static
    224.0.0.22            01-00-5e-00-00-16     static
    224.0.0.251          01-00-5e-00-00-fb     static
    224.0.0.252          01-00-5e-00-00-fc     static
    239.255.255.250      01-00-5e-7f-ff-fa     static

Interface: 10.11.133.22 --- 0x11
    Internet Address      Physical Address      Type
    10.11.128.1          00-00-5e-00-01-fe     dynamic
    10.11.128.11         44-31-92-56-07-97     dynamic
```

The gateway address 192.168.38.254 and the host systems hardware address is 00-50-56-ee-4a-2d.

b. How do you find the arp entries for a particular interface?

-N flag is used to find arp entries for a particular interface.


```
C:\Users\TOUSIF>arp -aN 192.168.38.1

Interface: 192.168.38.1 --- 0x4
    Internet Address      Physical Address      Type
192.168.38.254           00-50-56-ee-4a-2d     dynamic
192.168.38.255           ff-ff-ff-ff-ff-ff     static
224.0.0.22               01-00-5e-00-00-16     static
224.0.0.251              01-00-5e-00-00-fb     static
224.0.0.252              01-00-5e-00-00-fc     static
239.255.255.250          01-00-5e-7f-ff-fa     static
255.255.255.255          ff-ff-ff-ff-ff-ff     static

C:\Users\TOUSIF>
```

c. How do delete an arp entry?

-d is used to delete an arp entry.

```
C:\WINDOWS\system32>arp -d 192.168.53.134

C:\WINDOWS\system32>
```

d. How do you add an arp entry in arp cache?

-s is used to add an arp entry in arp cache

```
C:\WINDOWS\system32>arp -s 192.168.53.134 00-50-57-ea-a0-c1

C:\WINDOWS\system32>
```

TCPDUMP

a . Using tcpdump, get the information about the general incoming network traffic with names.

sudo tcpdump

```
tousif@TousifVM:~$ sudo tcpdump
[sudo] password for tousif:
tcpdump: verbose output suppressed, use -v[v]... for full protocol decode
listening on ens33, link-type EN10MB (Ethernet), snapshot length 262144 bytes
19:38:14.228409 IP 192.168.59.1.60067 > 239.255.255.250.1900: UDP, length 175
19:38:14.242208 IP TousifVM.60563 > _gateway.domain: 26693+ [1au] PTR? 250.255.255.239.in-addr.arpa. (57)
19:38:14.293217 IP _gateway.domain > TousifVM.60563: 26693 NXDomain 0/0/1 (57)
19:38:14.293377 IP TousifVM.60563 > _gateway.domain: 26693+ PTR? 250.255.255.239.in-addr.arpa. (46)
19:38:14.297661 IP _gateway.domain > TousifVM.60563: 26693 NXDomain 0/0/0 (46)
19:38:14.298301 IP TousifVM.40249 > _gateway.domain: 45155+ [1au] PTR? 1.59.168.192.in-addr.arpa. (54)
19:38:14.301875 IP _gateway.domain > TousifVM.40249: 45155 NXDomain 0/1/1 (89)
19:38:14.301923 IP TousifVM.40249 > _gateway.domain: 45155+ PTR? 1.59.168.192.in-addr.arpa. (43)
19:38:14.304598 IP _gateway.domain > TousifVM.40249: 45155 NXDomain 0/1/0 (78)
19:38:14.334628 IP TousifVM.42029 > _gateway.domain: 64177+ [1au] PTR? 2.59.168.192.in-addr.arpa. (54)
19:38:14.339470 IP _gateway.domain > TousifVM.42029: 64177 NXDomain 0/1/1 (89)
19:38:14.339548 IP TousifVM.42029 > _gateway.domain: 64177+ PTR? 2.59.168.192.in-addr.arpa. (43)
19:38:14.342233 IP _gateway.domain > TousifVM.42029: 64177 NXDomain 0/1/0 (78)
19:38:14.342584 IP TousifVM.56623 > _gateway.domain: 57689+ [1au] PTR? 128.59.168.192.in-addr.arpa. (56)
19:38:14.345046 IP _gateway.domain > TousifVM.56623: 57689 NXDomain 0/1/1 (91)
19:38:14.345096 IP TousifVM.56623 > _gateway.domain: 57689+ PTR? 128.59.168.192.in-addr.arpa. (45)
19:38:14.348392 IP _gateway.domain > TousifVM.56623: 57689 NXDomain 0/1/0 (80)
19:38:15.230899 IP 192.168.59.1.60067 > 239.255.255.250.1900: UDP, length 175
19:38:16.029663 IP6 TousifVM > ip6-allrouters: ICMP6, router solicitation, length 8
```

b. Using tcpdump, get the information about the general incoming network traffic with ip address on specific interface

```
tousif@TousifVM:~$ sudo tcpdump -i ens33
tcpdump: verbose output suppressed, use -v[v]... for full protocol decode
listening on ens33, link-type EN10MB (Ethernet), snapshot length 262144 bytes
19:43:04.220333 IP TousifVM.37947 > _gateway.domain: 49845+ [1au] A? ntp.ubuntu.com. (43)
19:43:04.220813 IP TousifVM.44323 > _gateway.domain: 61188+ [1au] AAAA? ntp.ubuntu.com. (43)
19:43:04.223701 IP TousifVM.56794 > _gateway.domain: 50891+ [1au] PTR? 2.59.168.192.in-addr.arpa. (54)
19:43:04.227245 IP _gateway.domain > TousifVM.56794: 50891 NXDomain 0/1/1 (89)
19:43:04.227374 IP TousifVM.56794 > _gateway.domain: 50891+ PTR? 2.59.168.192.in-addr.arpa. (43)
19:43:04.230434 IP _gateway.domain > TousifVM.56794: 50891 NXDomain 0/1/0 (78)
19:43:04.230875 IP TousifVM.47925 > _gateway.domain: 24762+ [1au] PTR? 128.59.168.192.in-addr.arpa. (56)
19:43:04.233606 IP _gateway.domain > TousifVM.47925: 24762 NXDomain 0/1/1 (91)
19:43:04.233715 IP TousifVM.47925 > _gateway.domain: 24762+ PTR? 128.59.168.192.in-addr.arpa. (45)
19:43:04.238701 IP _gateway.domain > TousifVM.47925: 24762 NXDomain 0/1/0 (80)
19:43:04.284368 IP _gateway.domain > TousifVM.44323: 61188 3/0/1 AAAA 2620:2d:4000:1::40, AAAA 2620:2d:4000:1::40
19:43:04.284410 IP _gateway.domain > TousifVM.37947: 49845 5/0/1 A 185.125.190.57, A 91.189.94.4, A 185.125.190.57
19:43:04.284821 IP TousifVM.54771 > prod-ntp-4.ntp4.ps5.canonical.com.ntp: NTPv4, Client, length 48
```

WIRESHARK

Using Evidence.pcapng as evidence

1. You, as a SOC analyst noted that someone try to send information (PING) to unknown IP address and you are suspecting some malicious information might transferred in it. Analyze the log file.

a. Find the data transferred.

As stated, found PING data of ICMP protocol.

icmp						
No	Time	Source	Destination	Protocol	Length	Info
20016	2017/271 14:48:26.517449	192.168.31.89	192.168.31.16	ICMP	50	Echo (ping) request id=0x0000, seq=0/0, ttl=64 (reply in 20017)
20017	2017/271 14:48:26.517483	192.168.31.16	192.168.31.89	ICMP	50	Echo (ping) reply id=0x0000, seq=0/0, ttl=128 (request in 20016)

> Internet Protocol Version 4, Src: 192.168.31.89, Dst: 192.168.31.16		0000	74 c6 3b f2 eb db 74 c6 3b f2 eb db 08 00 45 00	t;...t; ;.....E.
Internet Control Message Protocol		0010	00 24 00 01 00 00 40 01 bb 1e c0 a8 1f 59 c0 a8	..\$....@.Y..
Type: 8 (Echo (ping) request)		0020	1f 10 08 00 cf c6 00 00 00 00 70 61 73 73 21 40pass!@
Code: 0		0030	23 24	#\$
Checksum: 0xcfc6 [correct]				
[Checksum Status: Good]				
Identifier (BE): 0 (0x0000)				
Identifier (LE): 0 (0x0000)				
Sequence Number (BE): 0 (0x0000)				
Sequence Number (LE): 0 (0x0000)				
[Response frame: 20017]				
Data (8 bytes)				
Data: 7061737321402324				
[Length: 8]				

The data is : **pass!@#\$**

b. Find the source and destination IP of that log.

Source	Destination	Protocol	Length	Info
192.168.31.89	192.168.31.16	ICMP	50	Echo (ping) request

Source IP : **192.168.31.89**

Destination IP : **192.168.31.16**

c. Find the Data length (Bytes) and verify the checksum status on destination

Data length : **8 bytes**

Checksum status : **Good**

```
Type: 8 (Echo (ping) request)
Code: 0
Checksum: 0xcfc6 [correct]
[Checksum Status: Good]
Identifier (BE): 0 (0x0000)
Identifier (LE): 0 (0x0000)
Sequence Number (BE): 0 (0x0000)
Sequence Number (LE): 0 (0x0000)
[Response frame: 20017]
v Data (8 bytes)
  Data: 7061737321402324
  [Length: 8]
```

2. Now you have found that some kind of file is been downloaded by insider in unencrypted web traffic.

HTTP protocol is used to download the files. Thus , looking for HTTP files.

http						
No.	Time	Source	Destination	Protocol	Length	Info
21175	2017/287	16:34:48.63788...	192.168.31.113	192.168.31.67	HTTP	209 GET /1.jpg HTTP/1.1
21259	2017/287	16:34:48.87179...	192.168.31.67	192.168.31.113	HTTP	22234 HTTP/1.1 200 OK (JPEG JFIF image)

a. Find the name and type of file.

Info	
9	GET /1.jpg HTTP/1.1
4	HTTP/1.1 200 OK (JPEG JFIF image)

Name : **1.jpg**

Type : **JPEG JFIF image**

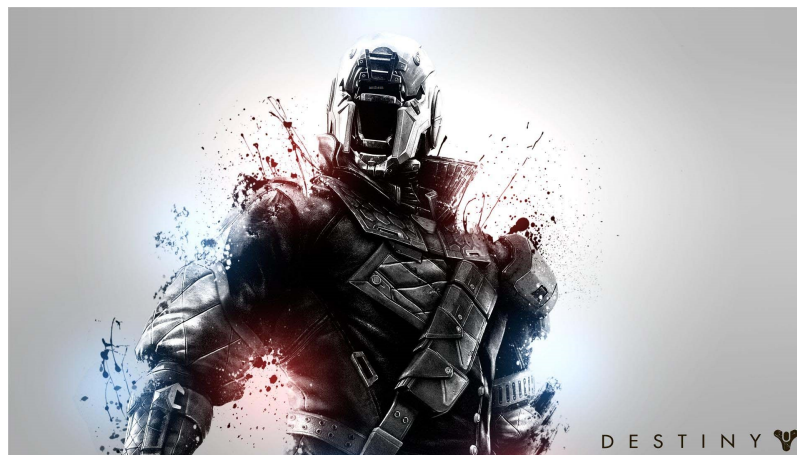
b. Export that file from that web traffic, then analyze the file for any secret information.

Wireshark · Export · HTTP object list

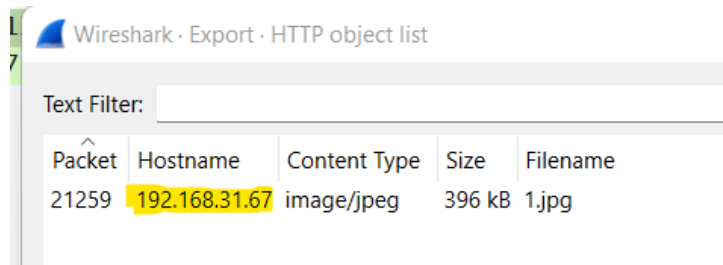
Text Filter:

Packet	Hostname	Content Type	Size	Filename
21259	192.168.31.67	image/jpeg	396 kB	1.jpg

The file :-



c. Find the hostname in which the file is stored.



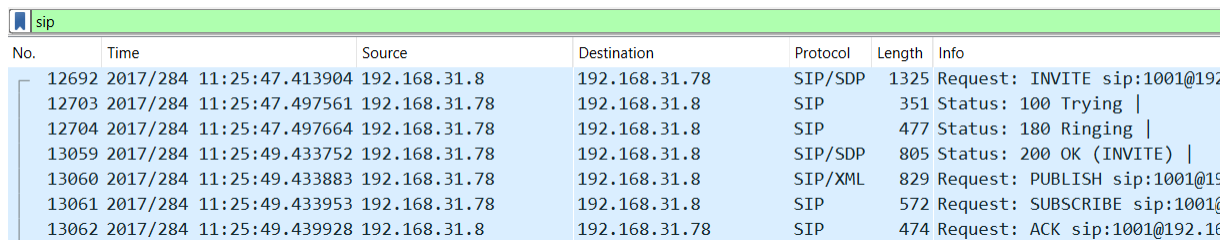
Wireshark - Export - HTTP object list

Text Filter:

Packet	Hostname	Content Type	Size	Filename
21259	192.168.31.67	image/jpeg	396 kB	1.jpg

3. Based upon their activities, auditing team has started investigation against them and found that the insider passed some sensitive information via call to someone. The traffic is been captured.

As we are looking for call data. SIP (Session Initiation Protocol) will be filtered.



Wireshark packet list filtered by sip

No.	Time	Source	Destination	Protocol	Length	Info
12692	2017/284 11:25:47.413904	192.168.31.8	192.168.31.78	SIP/SDP	1325	Request: INVITE sip:1001@192.168.31.78
12703	2017/284 11:25:47.497561	192.168.31.78	192.168.31.8	SIP	351	Status: 100 Trying
12704	2017/284 11:25:47.497664	192.168.31.78	192.168.31.8	SIP	477	Status: 180 Ringing
13059	2017/284 11:25:49.433752	192.168.31.78	192.168.31.8	SIP/SDP	805	Status: 200 OK (INVITE)
13060	2017/284 11:25:49.433883	192.168.31.78	192.168.31.8	SIP/XML	829	Request: PUBLISH sip:1001@192.168.31.78
13061	2017/284 11:25:49.433953	192.168.31.78	192.168.31.8	SIP	572	Request: SUBSCRIBE sip:1001@192.168.31.78
13062	2017/284 11:25:49.439928	192.168.31.8	192.168.31.78	SIP	474	Request: ACK sip:1001@192.168.31.78

a. Analyze the traffic and find those conversations and extract the sensitive information in it.

b. Find the call-ID when the status of the call is ringing.

```
From: "1002" <sip:1002@192.168.31.8>;tag=as1d95fb93
To: <sip:1001@192.168.31.78:57332;rinstance=fc3bc219541e9861>;
Contact: <sip:1002@192.168.31.8:5060>
Call-ID: 01caab9b53b12efe00d3493a67ff695d@192.168.31.8:5060
CSeq: 102 INVITE
User-Agent: FPBX-2.11.0(11.13.0)
```

4. On further investigation, you have a suspect on some wireless device communications. List out the Bluetooth devices communications from this traffic and find the details about native Bluetooth adapter.

bluetooth						
Packet list		Narrow & Wide		Case sensitive		Display filter
No.	Time	Source	Destination	Protocol	Length	Info
→ 20020	2017/284	11:48:30.619695 host	controller	HCI_CMD	4	Sent Reset
← 20021	2017/284	11:48:32.624144 controller	host	HCI_EVT	7	Rcvd Command Complete (Reset)
20022	2017/284	11:48:32.624213 host	controller	HCI_CMD	4	Sent Read Local Supported Features
20023	2017/284	11:48:32.626822 controller	host	HCI_EVT	15	Rcvd Command Complete (Read Local Supported Features)
20024	2017/284	11:48:32.626873 host	controller	HCI_CMD	4	Sent Read Local Version Information
20025	2017/284	11:48:32.629429 controller	host	HCI_EVT	15	Rcvd Command Complete (Read Local Version Information)
20026	2017/284	11:48:32.629493 host	controller	HCI_CMD	4	Sent Read BD ADDR
20027	2017/284	11:48:32.632327 controller	host	HCI_EVT	13	Rcvd Command Complete (Read BD ADDR)
20028	2017/284	11:48:32.632398 host	controller	HCI_CMD	4	Sent Read Buffer Size
20029	2017/284	11:48:32.634779 controller	host	HCI_EVT	14	Rcvd Command Complete (Read Buffer Size)

Result :- Thus , network traffic analysis using wireshark is successfully done.