> Welcome to my writeup where I am gonna be pwning the **Amaterasu** machine from **proving grounds**. This challenge has two flags, and our goal is to capture both. Let's get started!

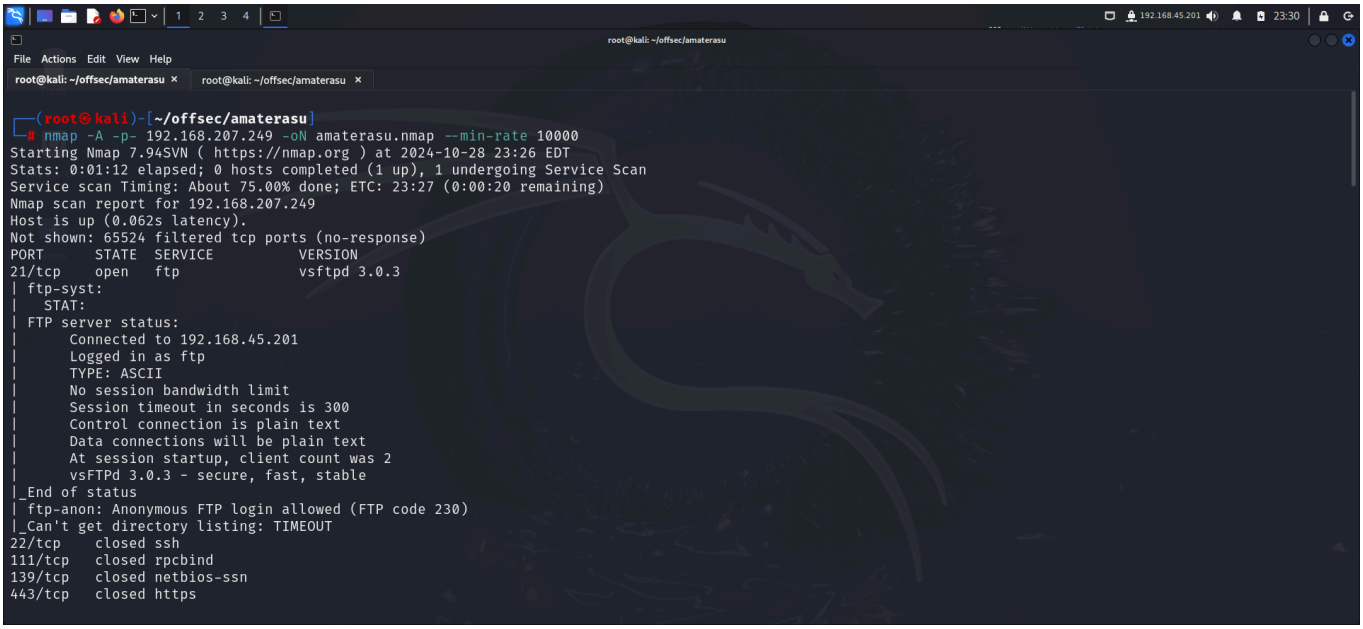
GETTING STARTED

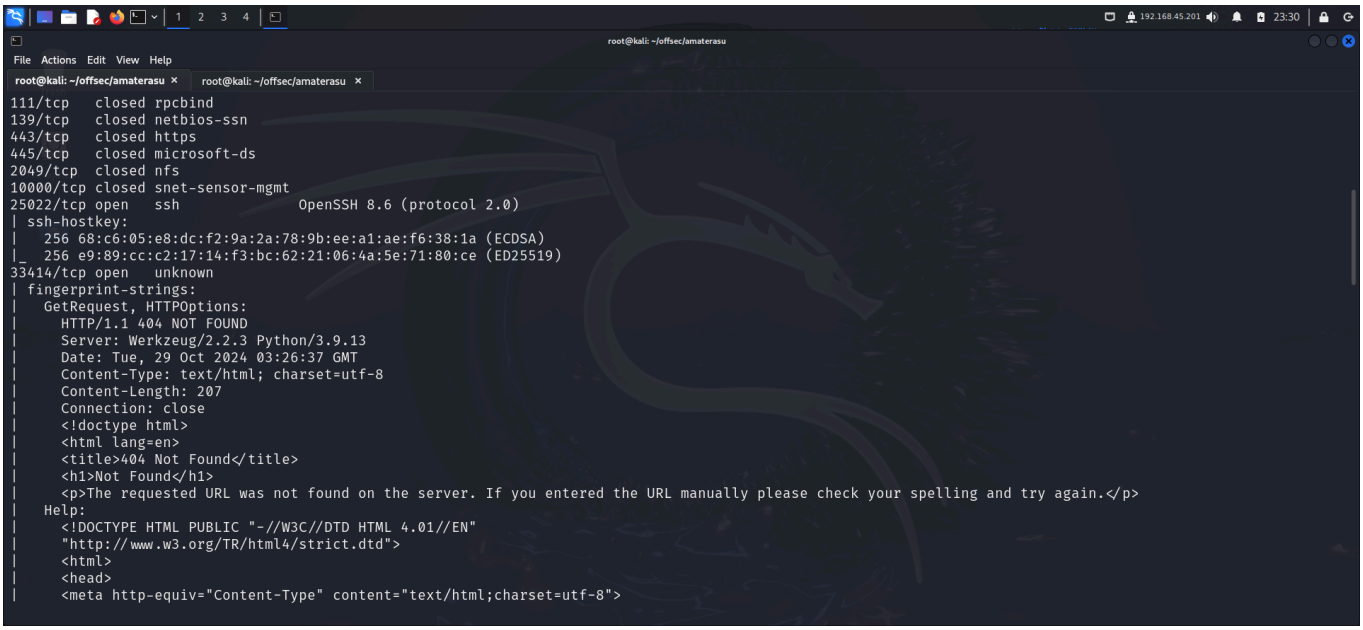
To access the lab, visit proving grounds and download the vpn configuration file. Connect to the vpn using `openvpn <file.ovpn>` and start the machine to get an IP.

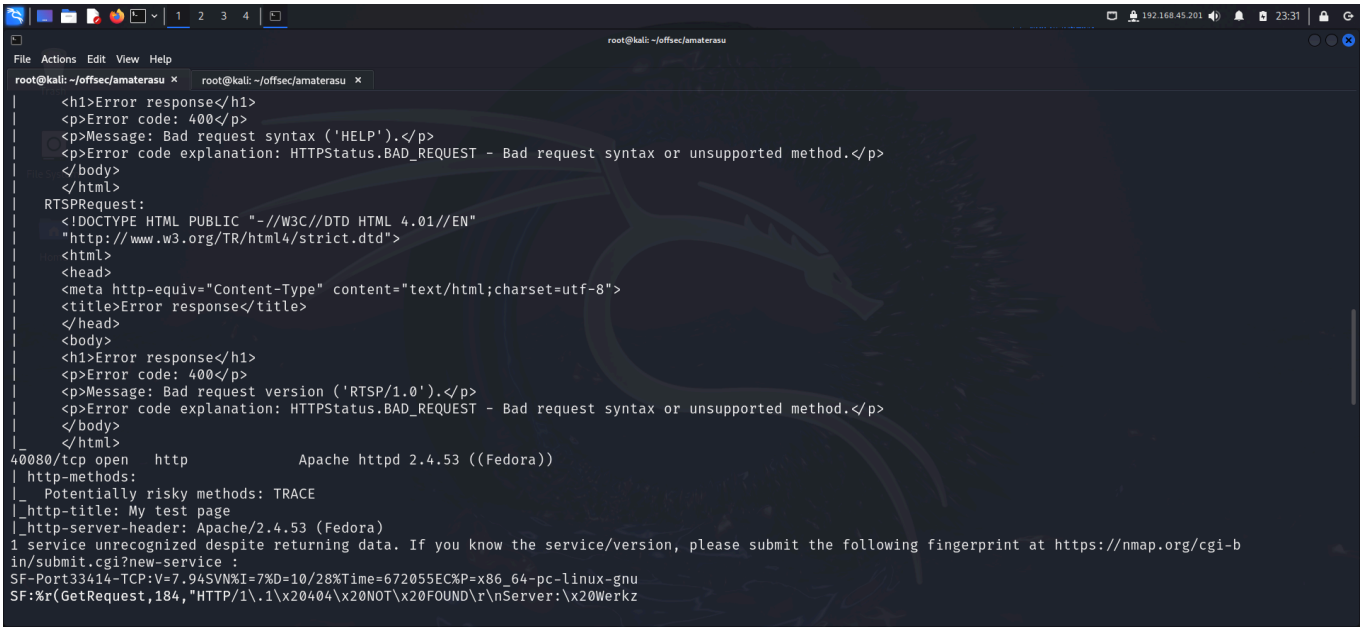
> **Note**
>
> This writeup documents the steps that successfully led to pwnage of the machine. It does not include the dead-end steps encountered during the process (which were numerous). This is just my take on pwning the machine and you are welcome to choose a different path.

RECONNAISSANCE

I performed an **nmap** scan to find information about the target.



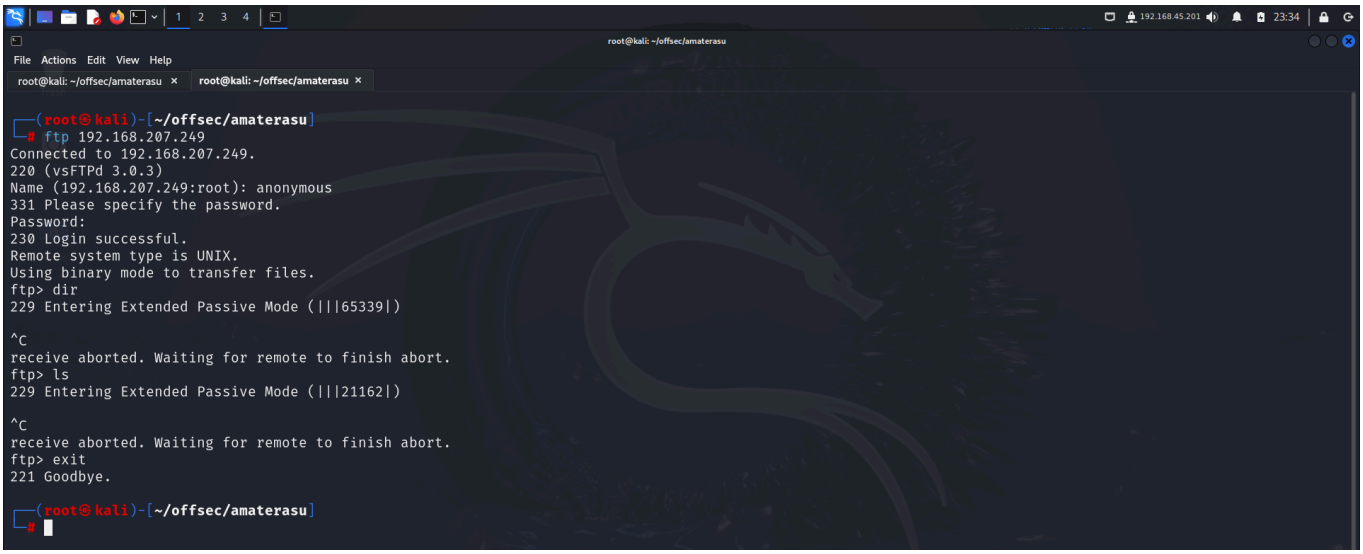




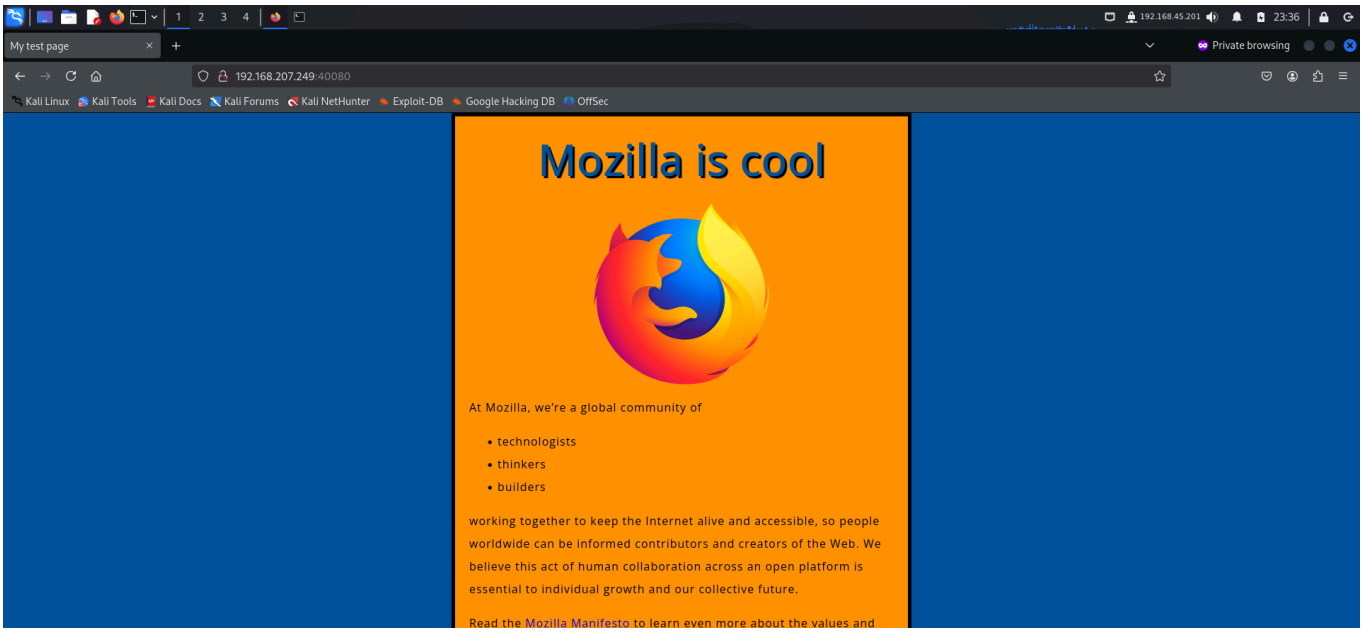
The scan revealed a bunch of open ports and services running on them.

FOOTHOLD

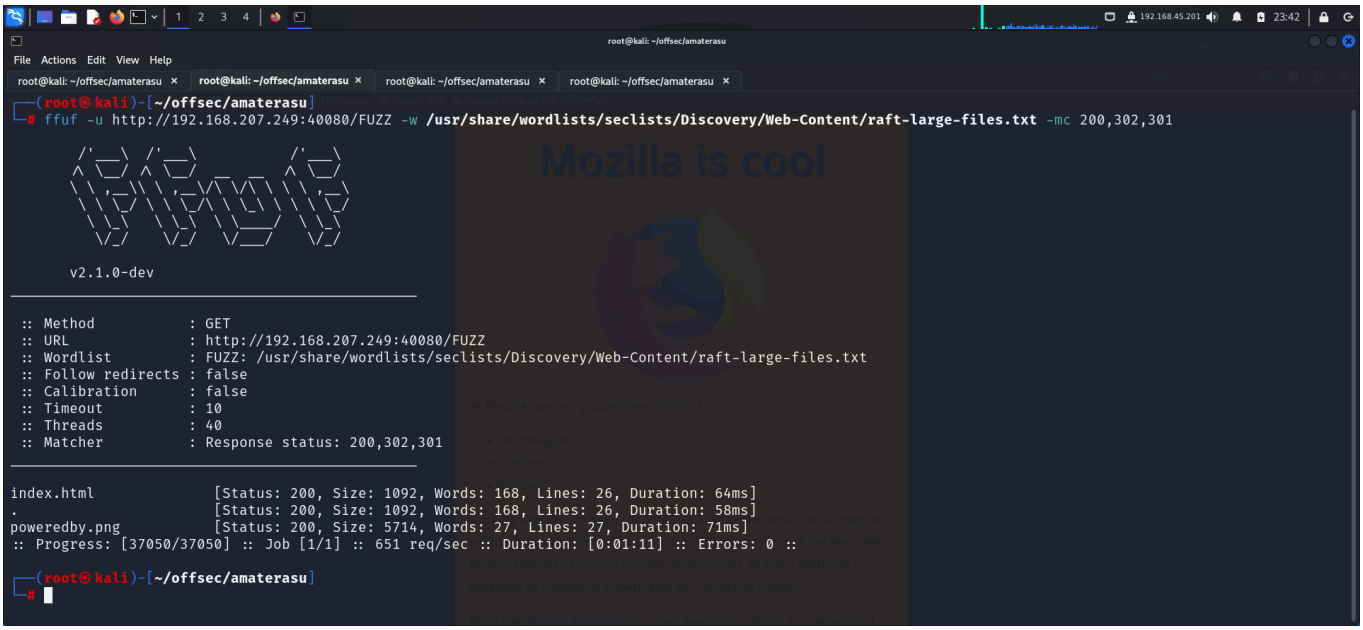
I started off with **ftp**. Since **nmap** scripts identified **anonymous** login on the server, I logged into the server anonymously.



I wasn't able to enter any commands on the **ftp** server so I switched to the **http** server running on port **40080**.

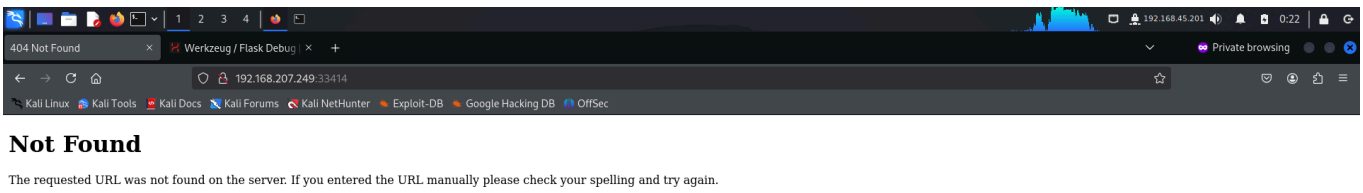


The page didn't contain anything interesting so I used **ffuf** to bruteforce hidden directories.



I identified a **png** image and downloaded it. I analyzed it with **binwalk**.

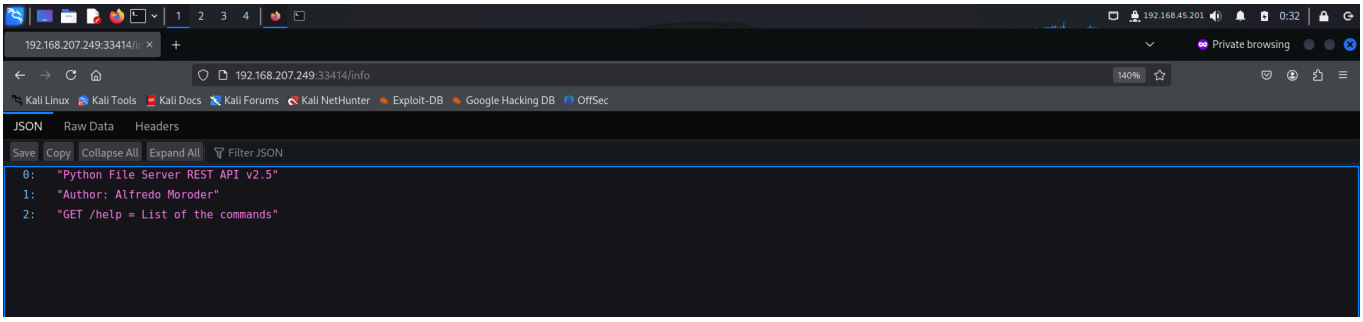
I tried extracting the **zip** data using `binwalk -e poweredby.png --run-as=root` however found nothing useful. Hence I moved onto the **http** server hosted on port **33414**.

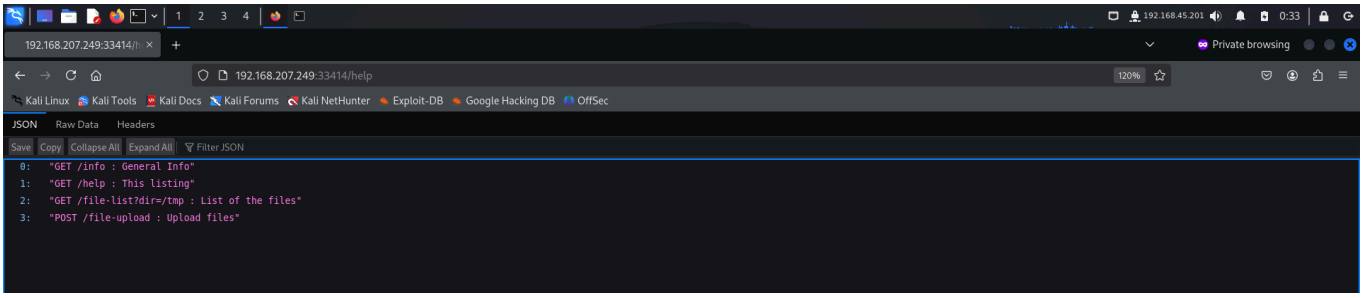


The homepage did not reveal anything so I performed a directory bruteforce using **ffuf** to find hidden directories and files.

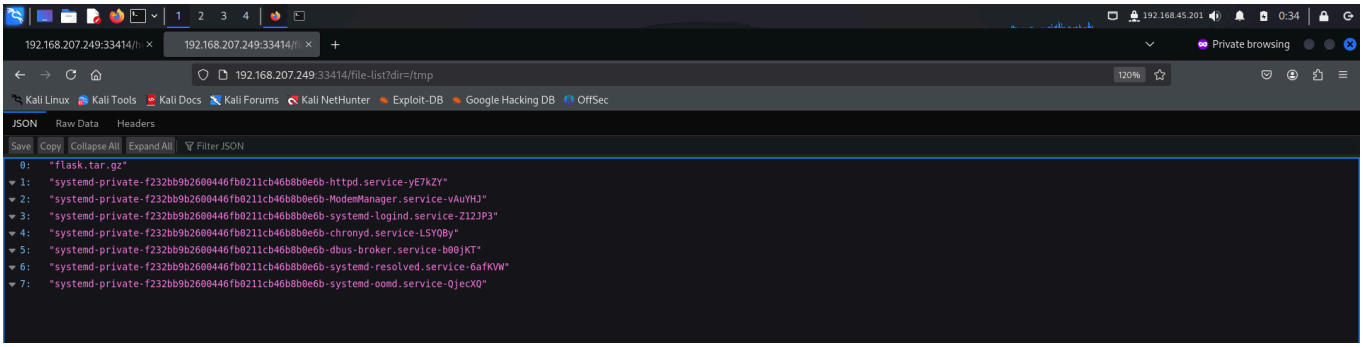
```
┌──(root㉿kali)-[~/offsec/amaterasu]
└─# ffuf -u http://192.168.207.249:33414/FUZZ -w /usr/share/wordlists/seclists/Discovery/Web-Content/common.txt

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

       v2.1.0-dev
________________________________________________

 :: Method           : GET
 :: URL              : http://192.168.207.249:33414/FUZZ
 :: Wordlist         : FUZZ: /usr/share/wordlists/seclists/Discovery/Web-Content/common.txt
 :: Follow redirects : false
 :: Calibration      : false
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200-299,301,302,307,401,403,405,500
________________________________________________

help                    [Status: 200, Size: 137, Words: 19, Lines: 2, Duration: 72ms]
info                    [Status: 200, Size: 98, Words: 14, Lines: 2, Duration: 65ms]
:: Progress: [4734/4734] :: Job [1/1] :: 251 req/sec :: Duration: [0:00:18] :: Errors: 0 ::

┌──(root㉿kali)-[~/offsec/amaterasu]
└─#
```

I accessed the discovered paths and found endpoints to perform various operations.

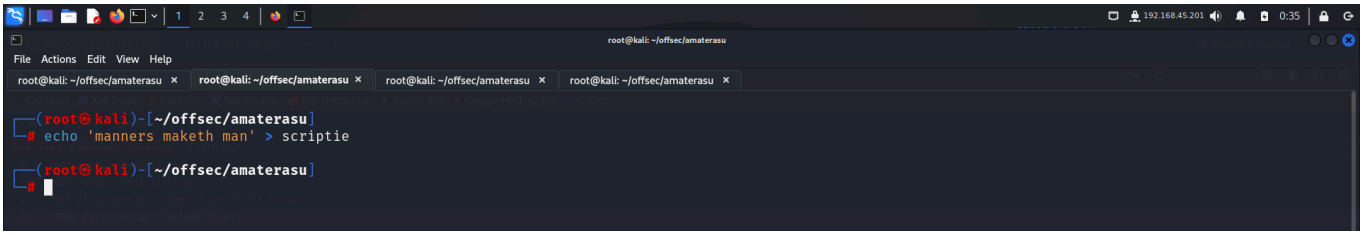


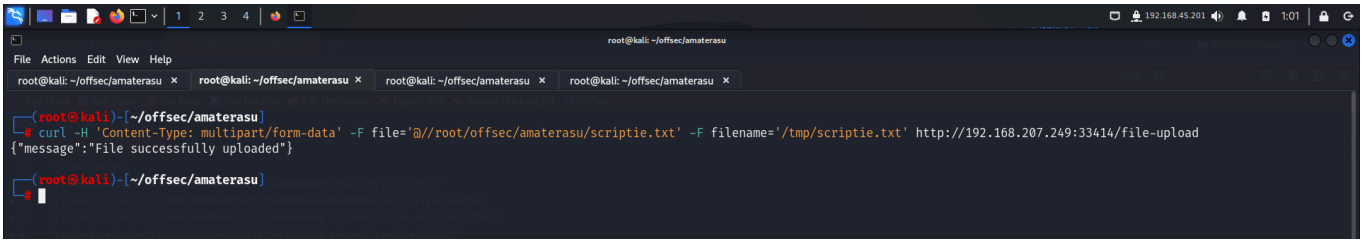


The `file-list?dir=/tmp` endpoint allowed me to view the contents of the `/tmp` directory.

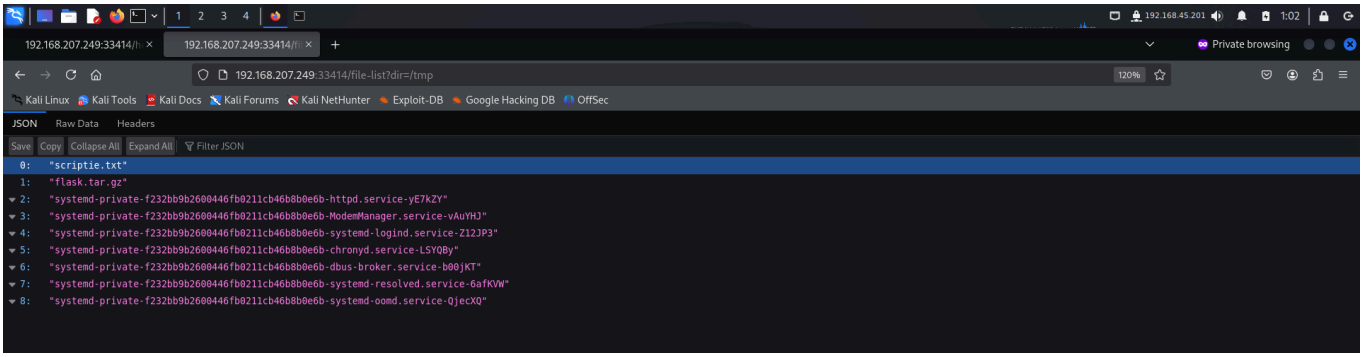


The `/file-upload` endpoint allowed us to upload files. So I created a file and tried uploading using **curl**.

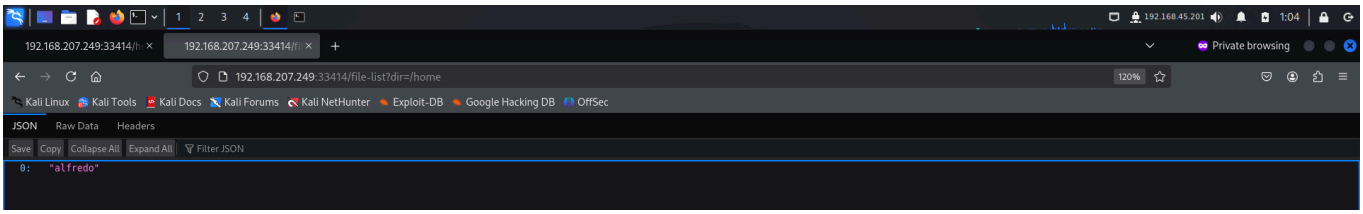


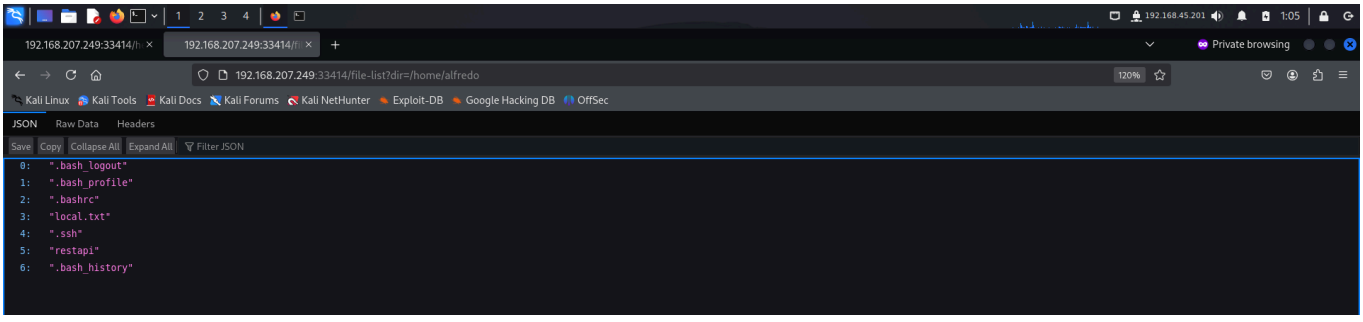


I navigated to the `file-list` endpoint and found my uploaded file.

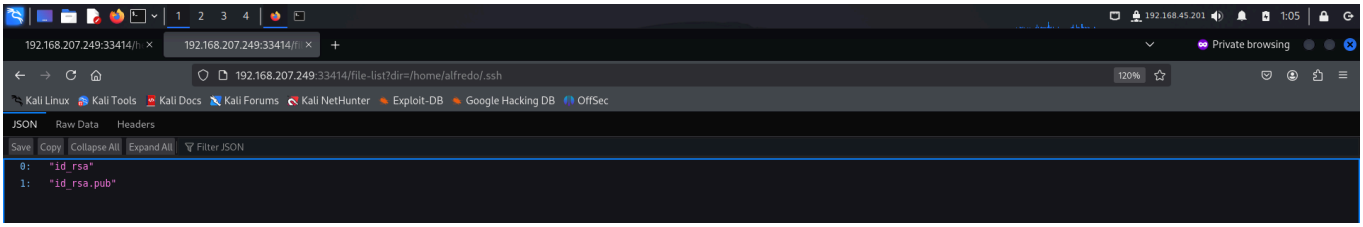


Since the `/file-list` endpoint used the parameter `dir` to select a folder to view, I used it to view the contents inside `/home` directory.

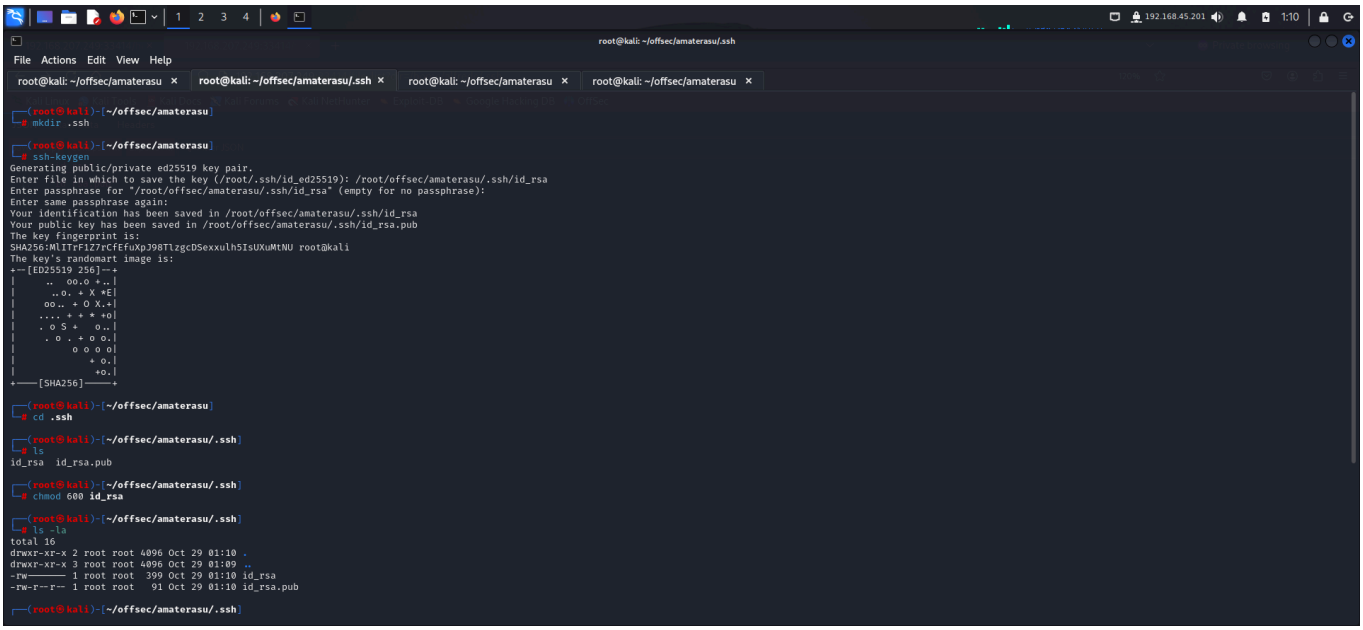




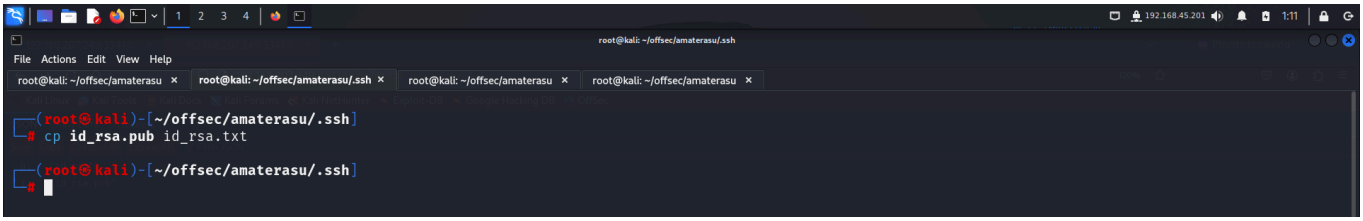
Inside **Alfred's** home directory, I found the **.ssh** folder so I looked into it. I also found that the first flag was located here.



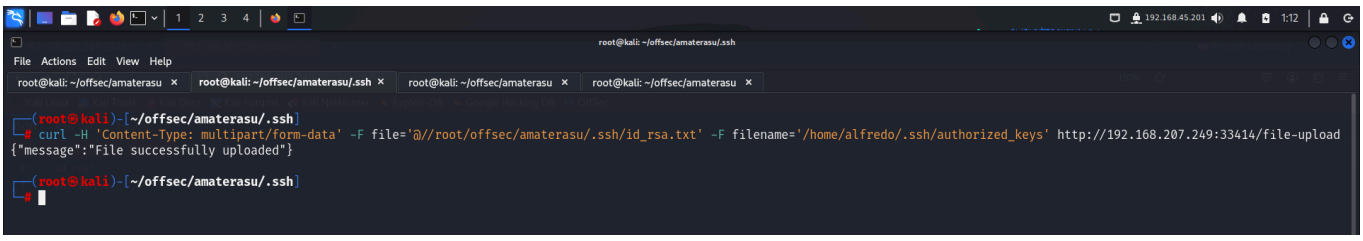
The **.ssh** file contained **alfred's** public and private key. I could upload my public key to this folder and save them as **authorized_keys**. This would allow me to log in using my private key.

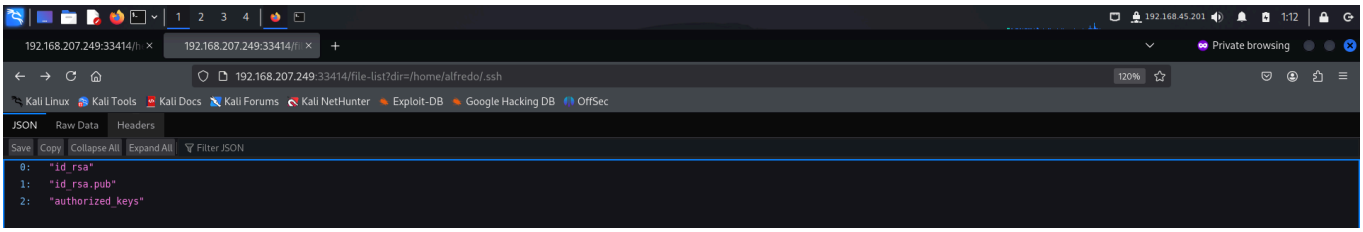


Since the **api** only allowed certain file extensions, I renamed my file to `id_rsa.txt`

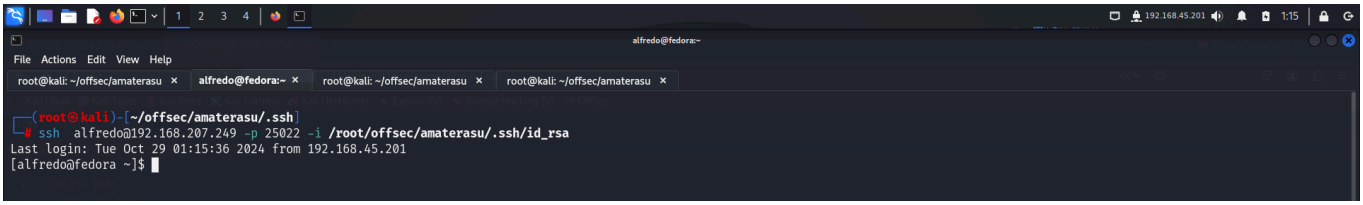


Finally I uploaded the file and saved them as *authorized_keys*

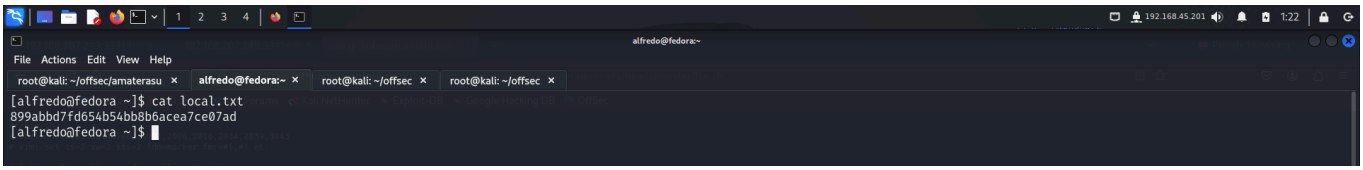




I the logged in using my private key on the using **ssh** service that was running on port **25022**

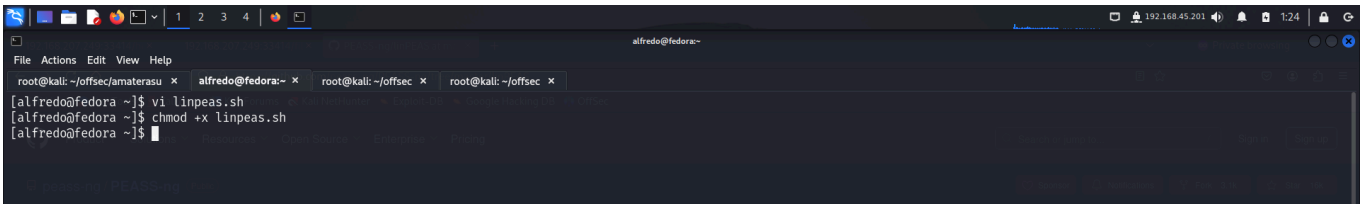


Upon logging in, I captured the first flag from the home directory.

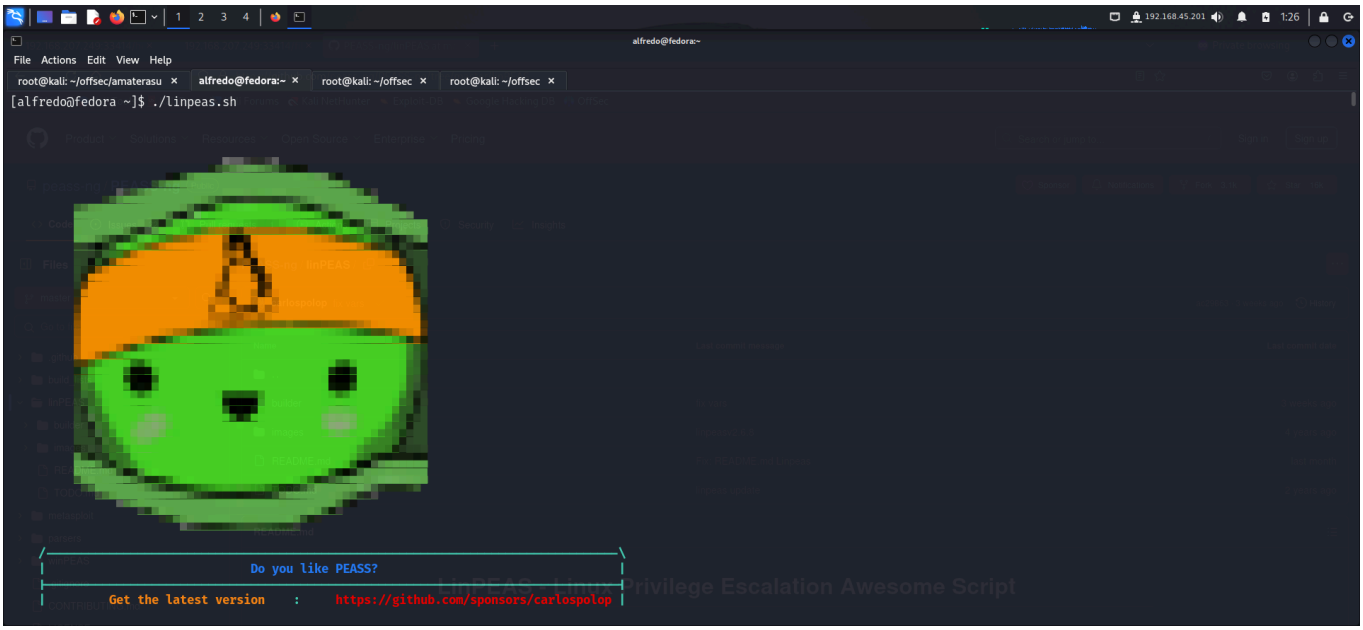


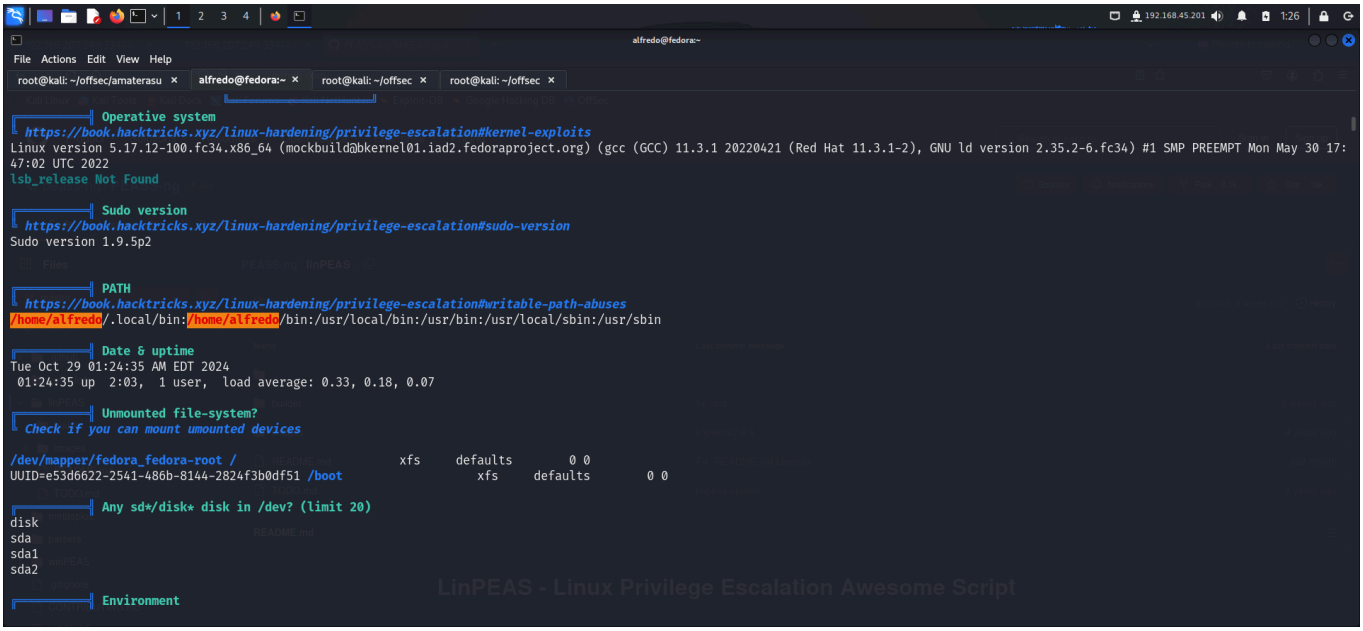
PRIVILEGE ESCALATION

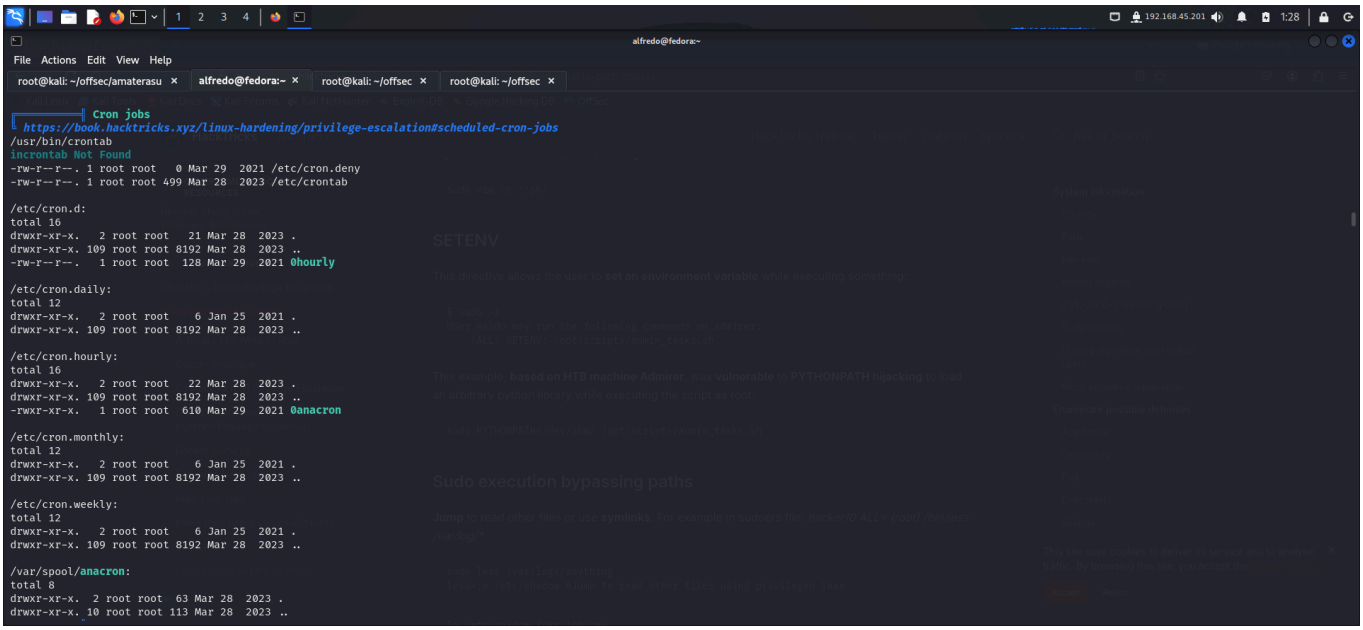
I copied the **linpeas** script to identify vulnerabilities that could be used to escalate my privilege.

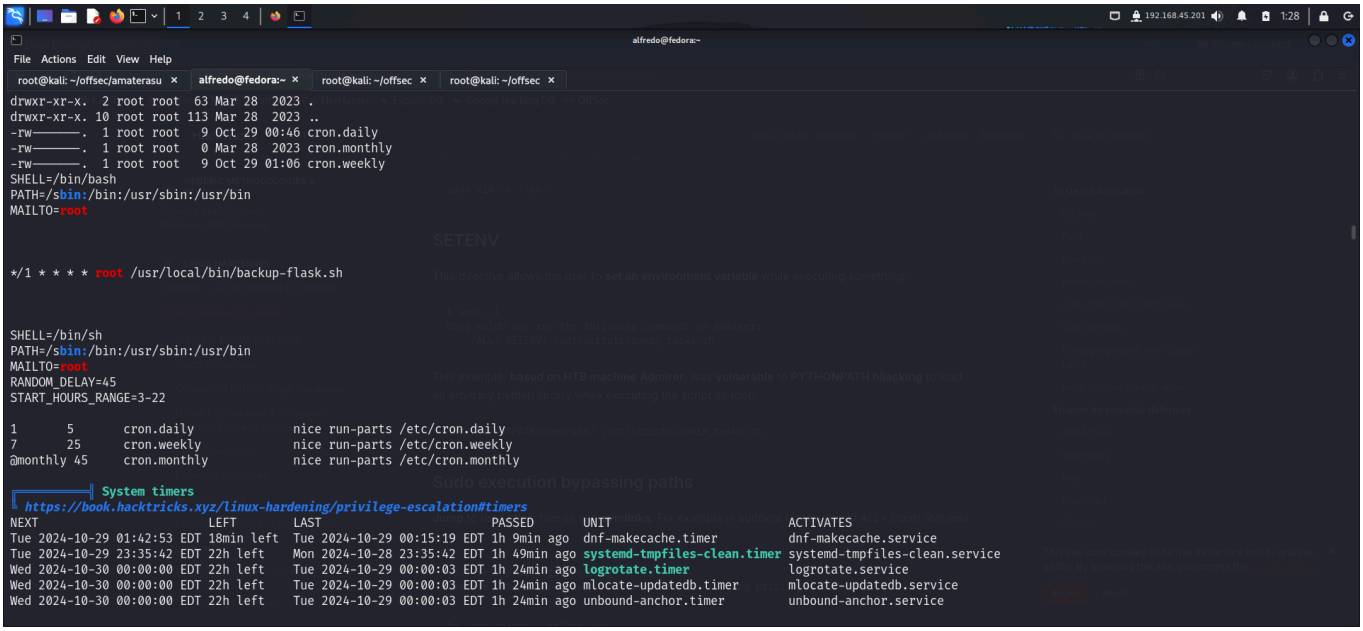


I ran the script.

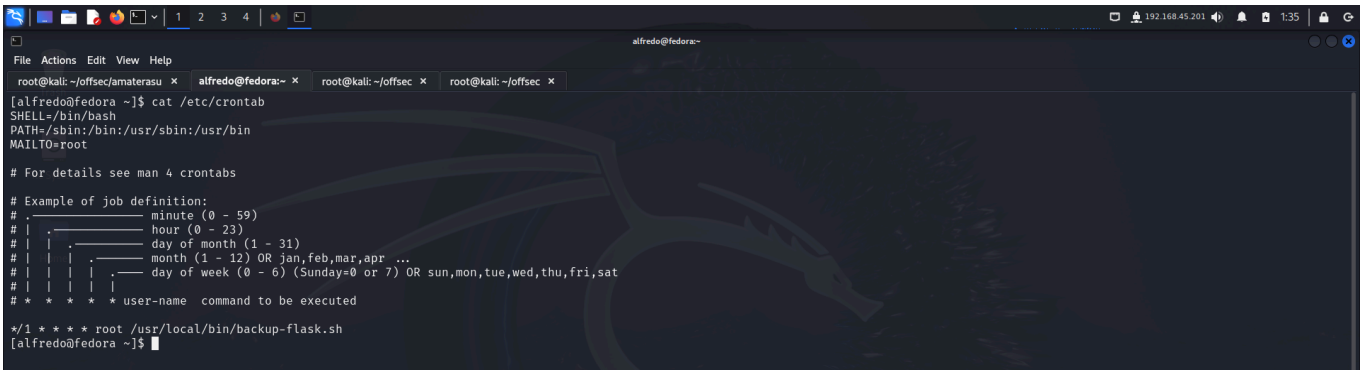

alfredo@fedora:~
File Actions Edit View Help
root@kali: ~/offsec/amaterasu
alfredo@fedora:~
root@kali: ~/offsec
root@kali: ~/offsec
[alfredo@fedora ~]$ ./linpeas.sh
Do you like PEASS?
Get the latest version : https://github.com/sponsors/carlospolop


alfredo@fedora:~
File Actions Edit View Help
root@kali: ~/offsec/amaterasu
alfredo@fedora:~
root@kali: ~/offsec
root@kali: ~/offsec
Operative system
https://book.hacktricks.xyz/linux-hardening/privilege-escalation#kernel-exploits
Linux version 5.17.12-100.fc34.x86_64 (mockbuild@bkernel01.iad2.fedoraproject.org) (gcc (GCC) 11.3.1 20220421 (Red Hat 11.3.1-2), GNU ld version 2.35.2-6.fc34) #1 SMP PREEMPT Mon May 30 17:47:02 UTC 2022
lsb_release Not Found
Sudo version
https://book.hacktricks.xyz/linux-hardening/privilege-escalation#sudo-version
Sudo version 1.9.5p2
PATH
https://book.hacktricks.xyz/linux-hardening/privilege-escalation#writable-path-abuses
/home/alfredo/.local/bin:/home/alfredo/bin:/usr/local/bin:/usr/bin:/usr/local/sbin:/usr/sbin
Date & uptime
Tue Oct 29 01:24:35 AM EDT 2024
01:24:35 up 2:03, 1 user, load average: 0.33, 0.18, 0.07
Unmounted file-system?
Check if you can mount umounted devices
/dev/mapper/fedora_fedora-root / xfs defaults 0 0
UUID=e53d6622-2541-486b-8144-2824f3b0df51 /boot xfs defaults 0 0
Any sd*/disk* disk in /dev? (limit 20)
disk
sda
sda1
sda2
Environment



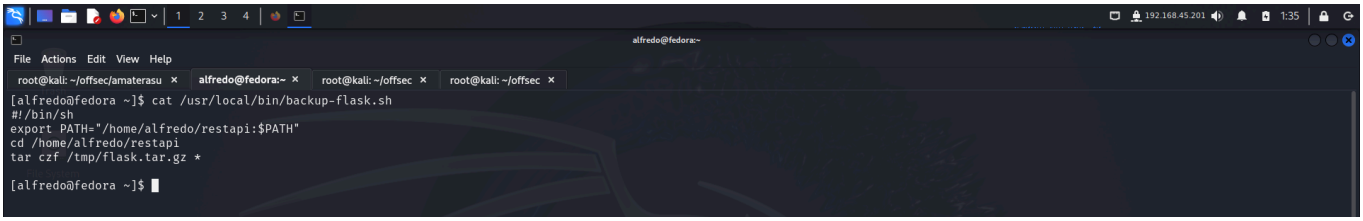


This identified a cron job that was running every minute



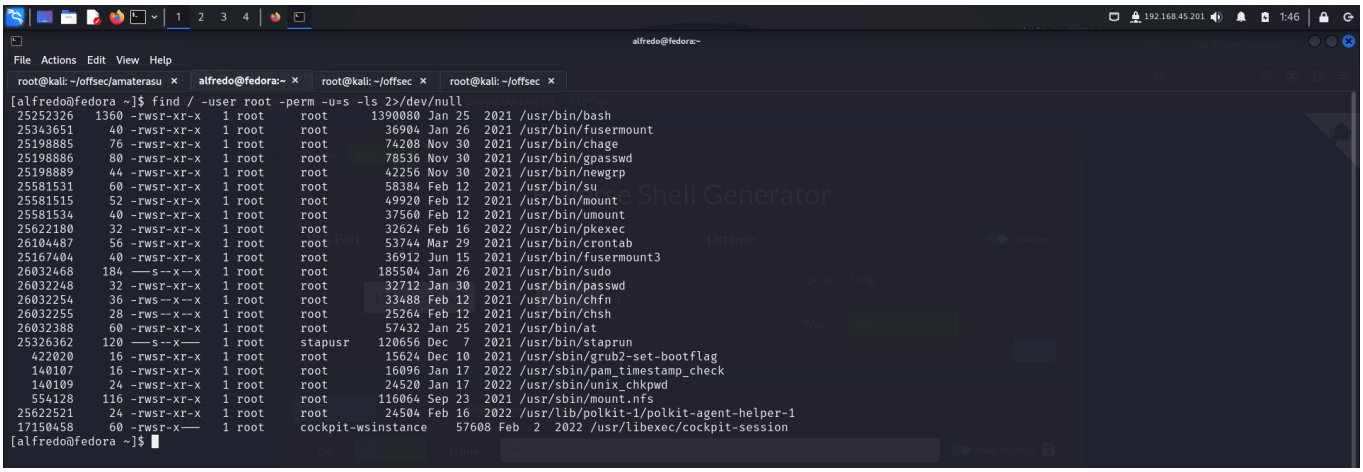
I viewed the script that it was running. This script:

1. Adds `/home/alfredo/restapi` to the `PATH` so that any executables in that directory are easily accessible.
2. Changes the working directory to `/home/alfredo/restapi`.
3. Creates a compressed archive of all files in this directory and stores it in `/tmp` as `flask.tar.gz`.

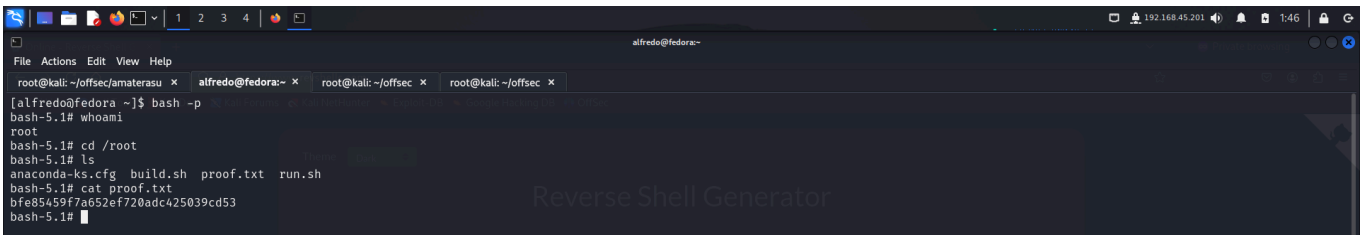


I viewed inside the `/restapi` folder and found 2 python files and a folder to store compiled python files. I created a bash script that added an **suid** bit to **/bin/bash** binrary. I added execution permission to this file using **chmod** and copied it inside the `/restapi` folder.

After a minute I verified if my script was executed and found the **suid** bit on the `/bash` binary.



Finally I executed **bash** in privileged mode and captured the final flag from the `/root` directory.

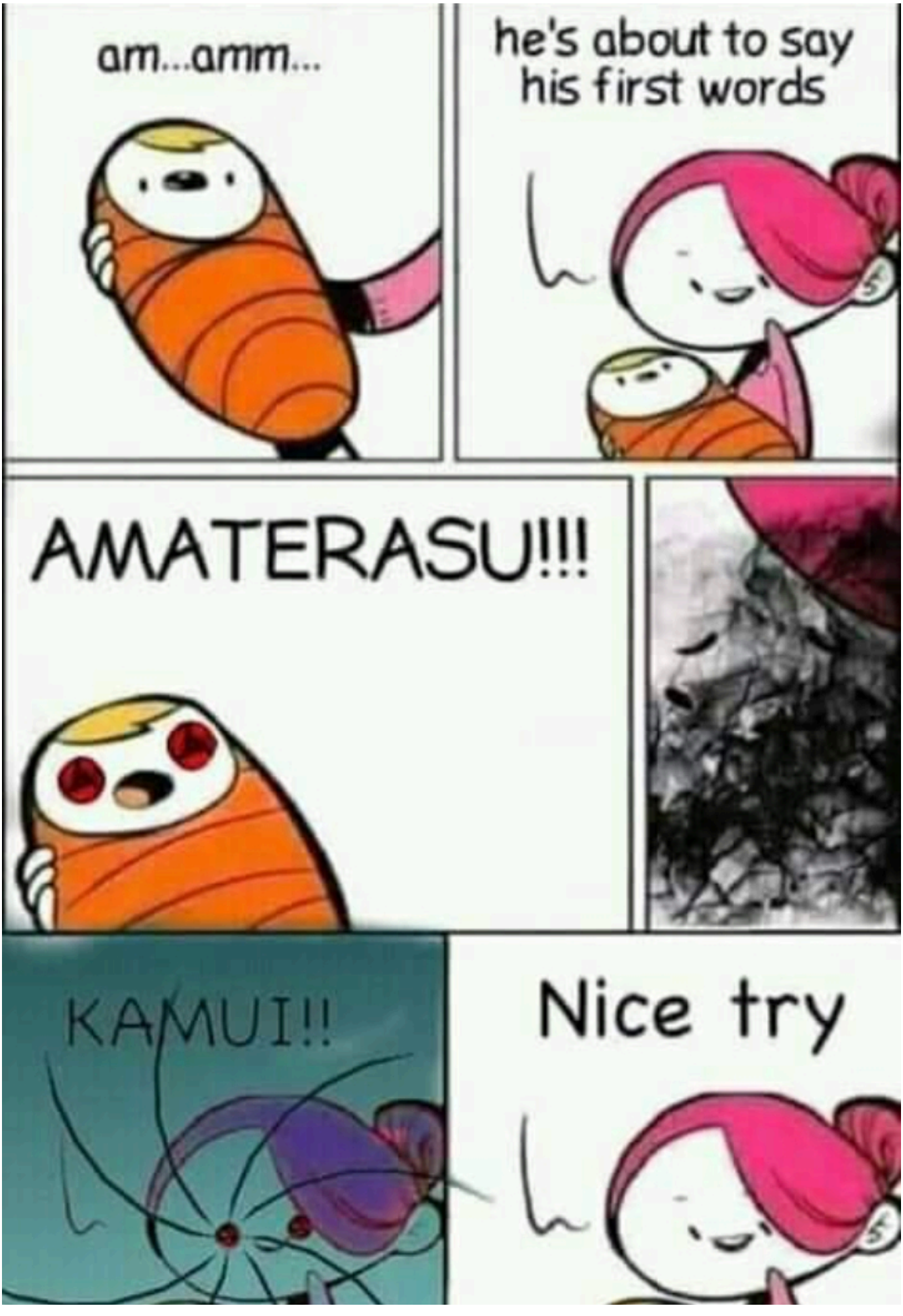


CONCLUSION

Here's a summary of how I pwnd **Amaterasu**:

- I fuzzed web directories to find a directory with api endpoints that allowed my to upload files and view contents of directories.
- I uploaded my **public key** as **authorized_keys** in the **.ssh** file and logged in using my **private** key.
- I captured the first flag from **alfred's** home directory.
- I ran **linpeas** to discover a **cronjob** that ran every minute.
- I added an executable bash script that added an **suid** bit to the `/bin/bash` binary and waited for the cron to execute my script.
- I then executed **bash** in privileged mode and captured the final flag from the `/root` directory.

That's it from my side!
Happy hacking 🎉


am...amm...
he's about to say his first words
AMATERASU!!!
KAMUI!!
Nice try


ifunny.co