# DJINN 3

> Welcome to my writeup where I am gonna be pwning the **dJinn3** machine from **proving grounds**. This challenge has two flags, and our goal is to capture both. Let's get started!

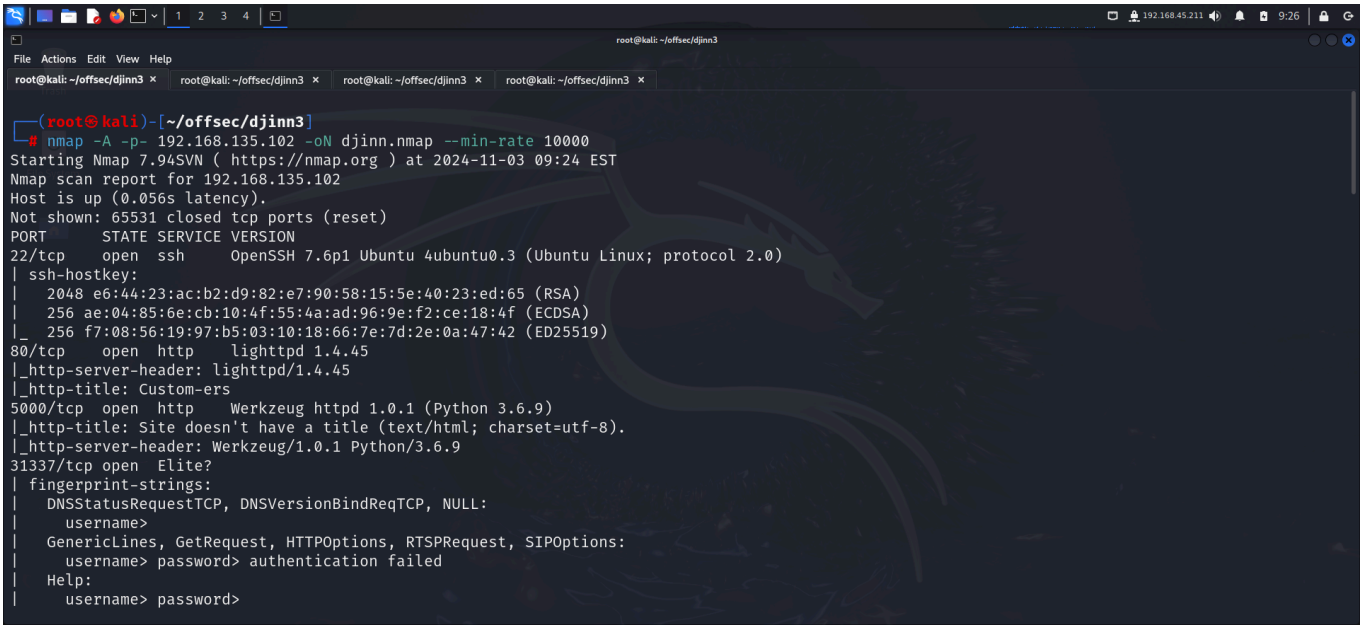
# GETTING STARTED

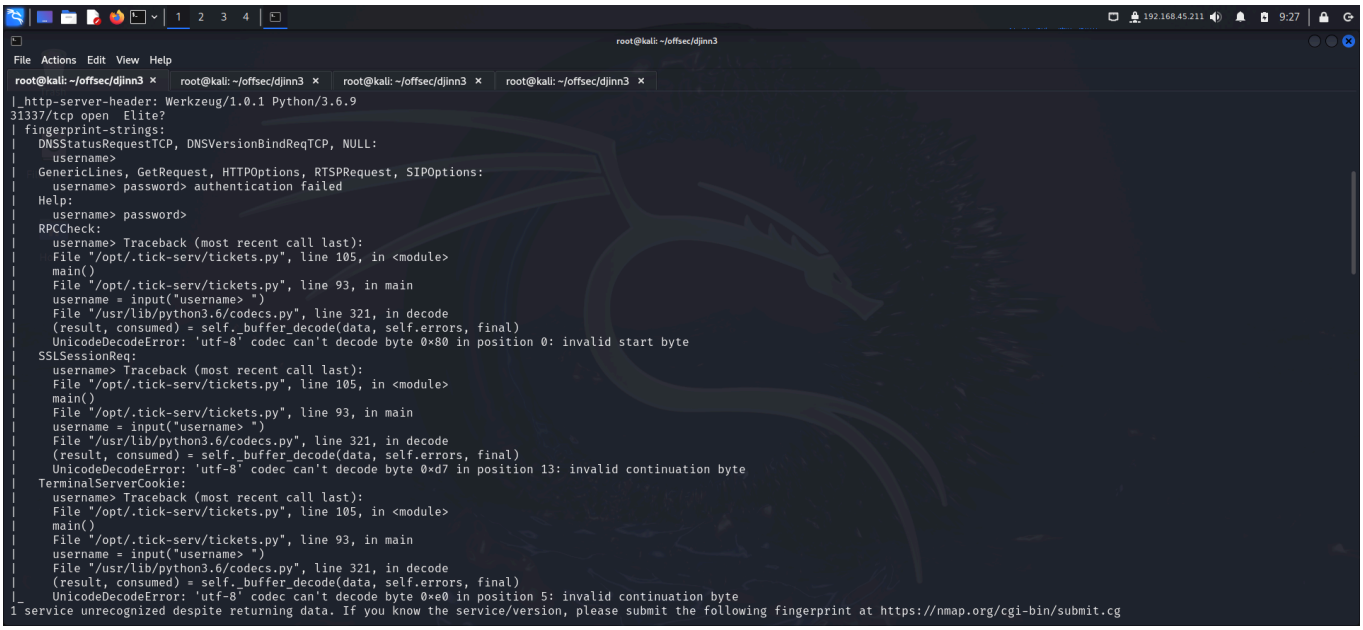
To access the lab, visit [proving grounds] and download the vpn configuration file. Connect to the vpn using `openvpn <file.ovpn>` and start the machine to get an IP.

> **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

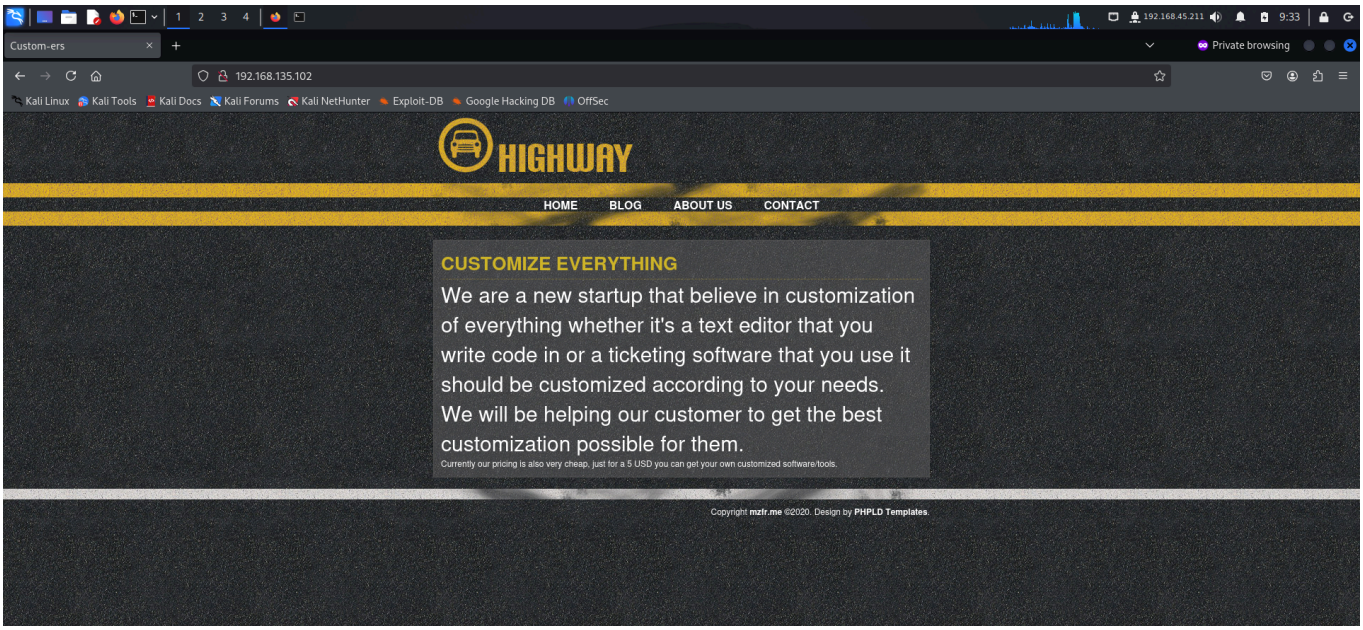
I ran an **nmap** aggressive scan on all ports to find information about the target.



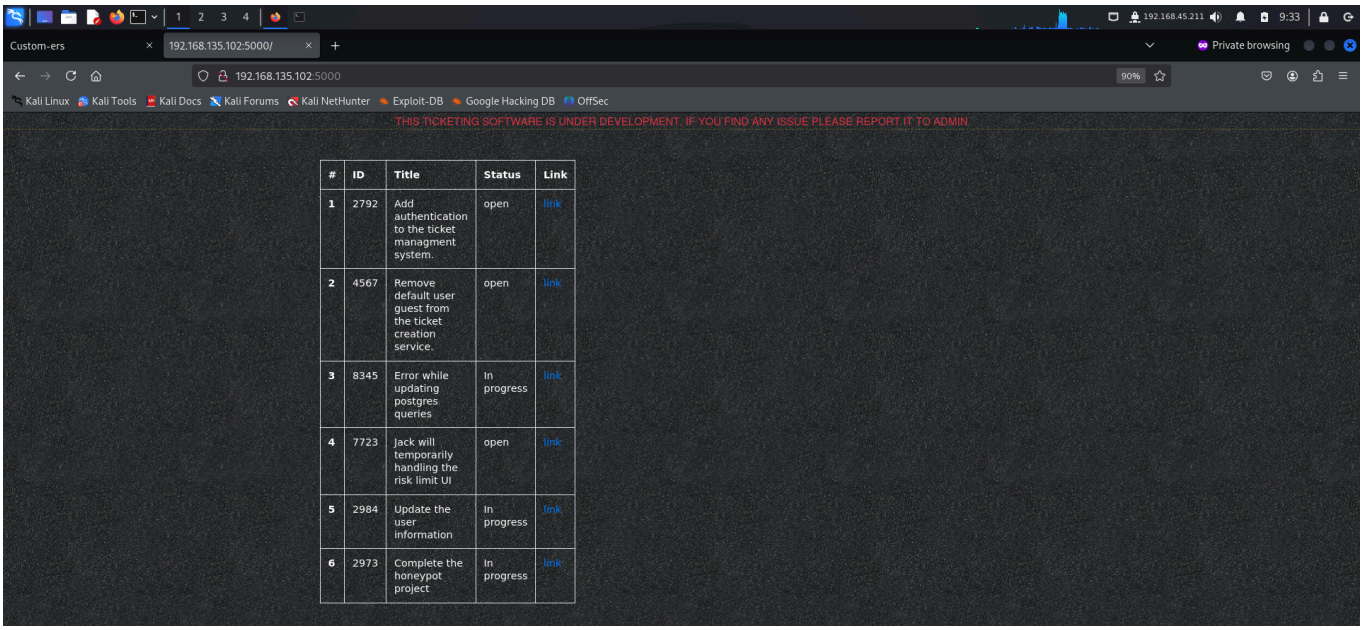



# FOOTHOLD

The **nmap** revealed 4 open ports running different services. I started of with the http server running on port 80 and accessed it on my browser.

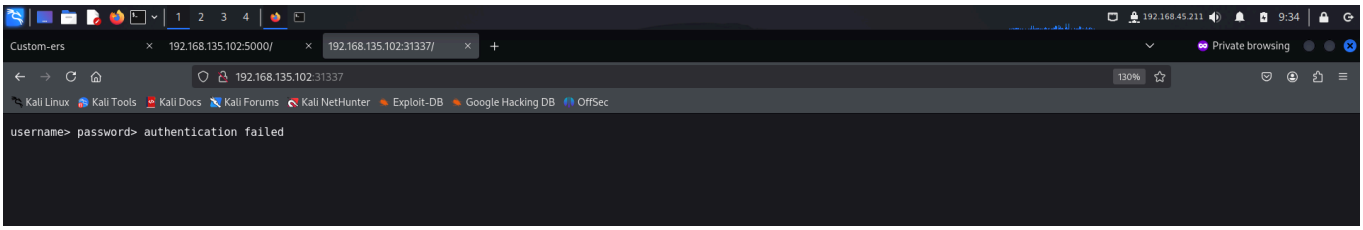


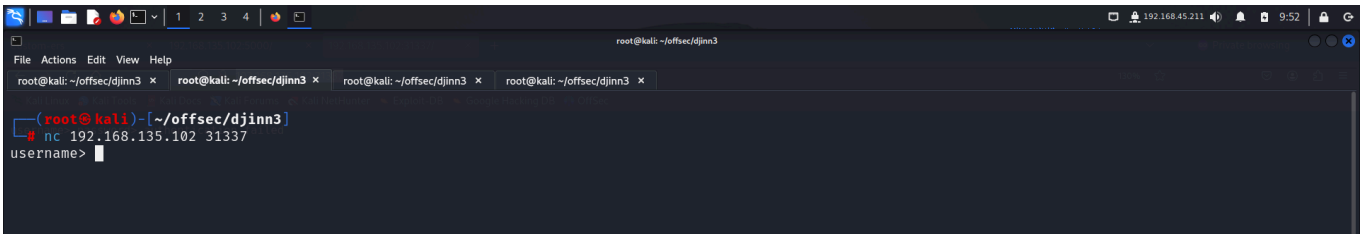

I then accessed the server running on port 5000. This page contained hyperlinks and some interesting information about some ticketing system.




| # | ID | Title | Status | Link |
|---|---|---|---|---|
| 1 | 2792 | Add authentication to the ticket managment system. | open | link |
| 2 | 4567 | Remove default user guest from the ticket creation service. | open | link |
| 3 | 8345 | Error while updating postgres queries | In progress | link |
| 4 | 7723 | Jack will temporarily handling the risk limit UI | open | link |
| 5 | 2984 | Update the user information | In progress | link |
| 6 | 2973 | Complete the honeypot project | In progress | link |

I tried accessing port 31337 on the browser but couldn't do so. So I tried accessing it with **nc**.




I tried some common credentials like admin, user etc but none of them worked. I read the tickets that were present on port 5000 and found something interesting.


**Remove default user guest from the ticket creation service.**

**Status**: open
**ID**: 4567

**Description:**

Remove all the default user that exists on the ticket creation service as it could be a real hazadous to leave any entry point for unexpected guests. Also I would recommend adding an checks for the complexity of the password.

**Sorry for the bright page, we are working on some beautiful CSS**


**Update the user information**

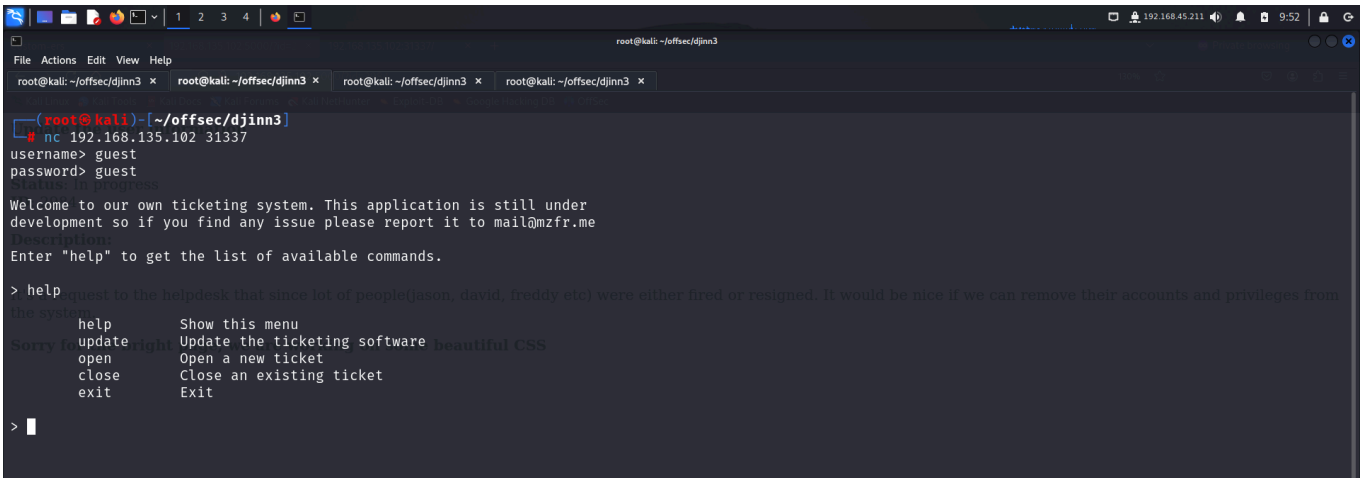
**Status**: In progress
**ID**: 2984

**Description:**

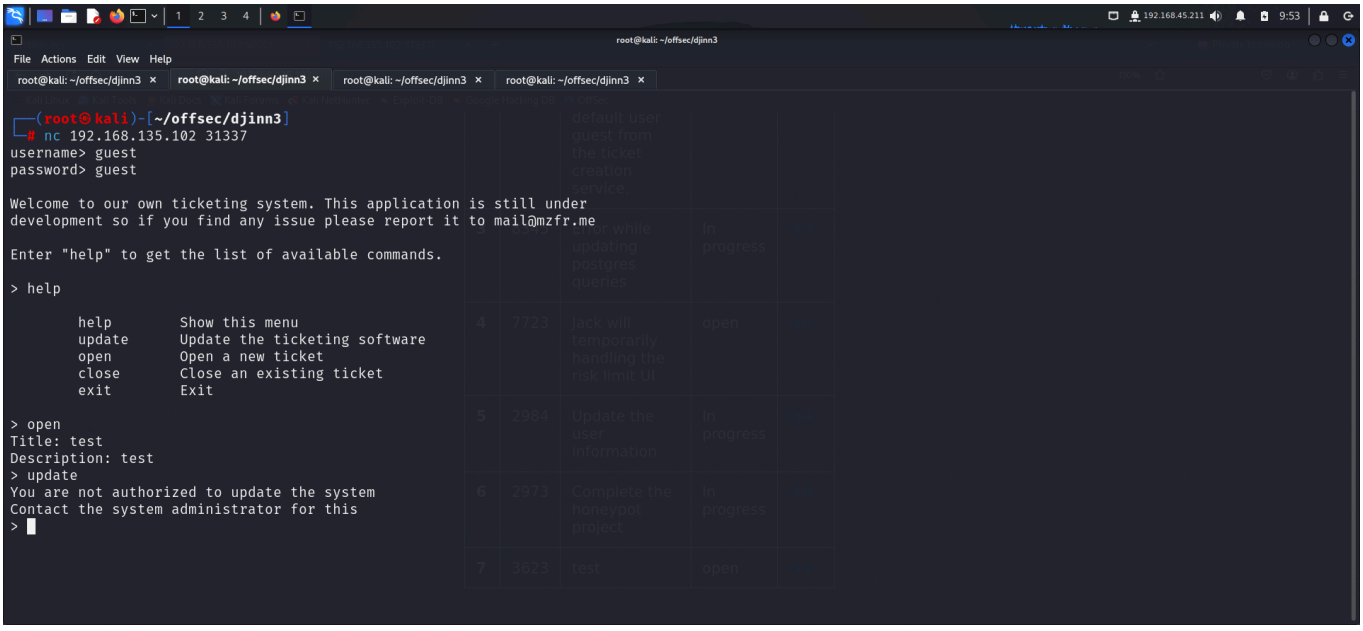
It's a request to the helpdesk that since lot of people(jason, david, freddy etc) were either fired or resigned. It would be nice if we can remove their accounts and privileges from the system.

**Sorry for the bright page, we are working on some beautiful CSS**

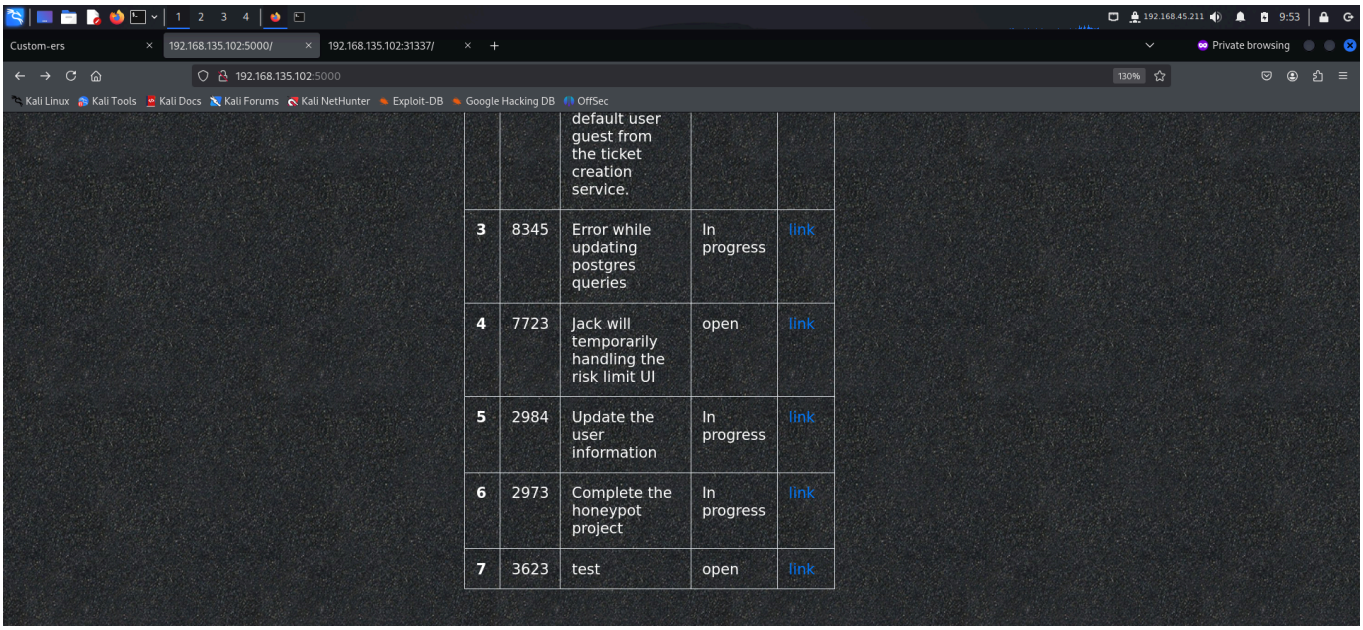
These tickets revealed possible usernames. I tried multiple usernames with common password and ultimately got in using `guest:guest`.




This looked like an API that allowed us to work with the tickets that were present on port 5000.

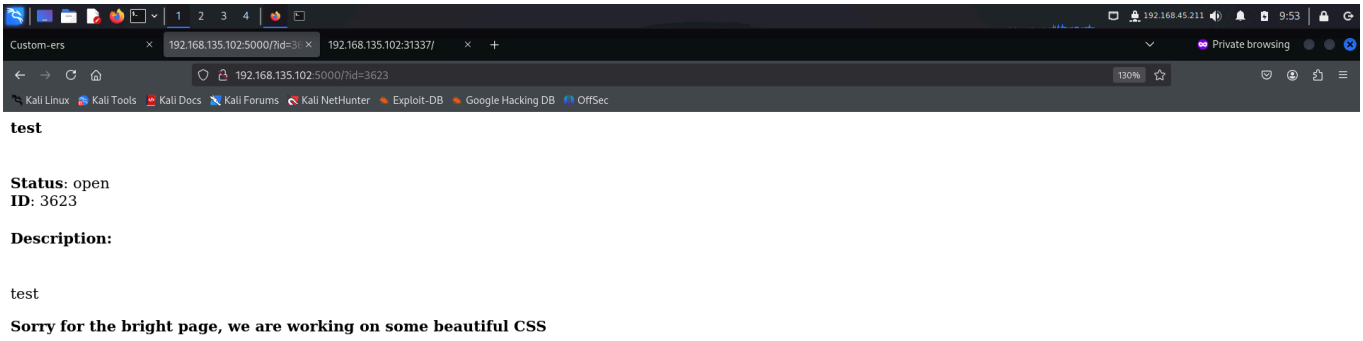



I tried adding a ticket and found it on the server hosted on port 5000.



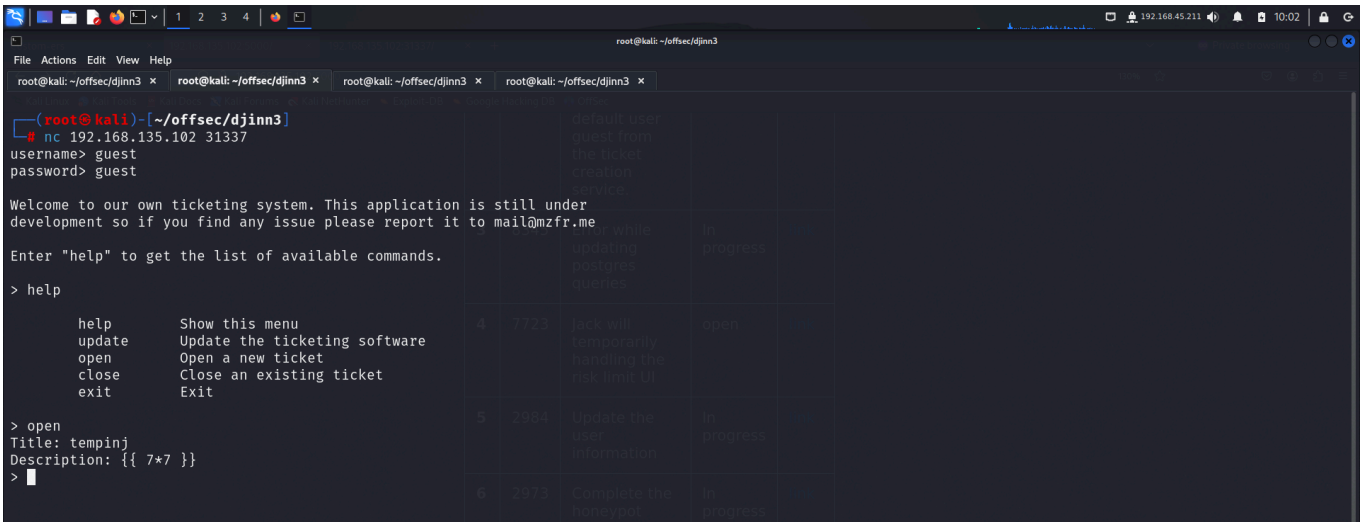

| | | | | |
|---|---|---|---|---|
| | | default user guest from the ticket creation service. | | |
| **3** | 8345 | Error while updating postgres queries | In progress | link |
| **4** | 7723 | Jack will temporarily handling the risk limit UI | open | link |
| **5** | 2984 | Update the user information | In progress | link |
| **6** | 2973 | Complete the honeypot project | In progress | link |
| **7** | 3623 | test | open | link |

Even the structure of remained the same throughout.




From this, I was able to assume that the api sent the title and description to the backend which then inserted them in a template. Also, the **nmap** scan revealed port 5000 was running **werkzeug** which is a module used with **flask**. **Flask** servers are infamous for being vulnerable to **SSTI** (Server Side Template Injections).

So I added a simple command to check if the application indeed was vulnerable.





**tempinj**

**Status**: open
**ID**: 1672

**Description:**

49

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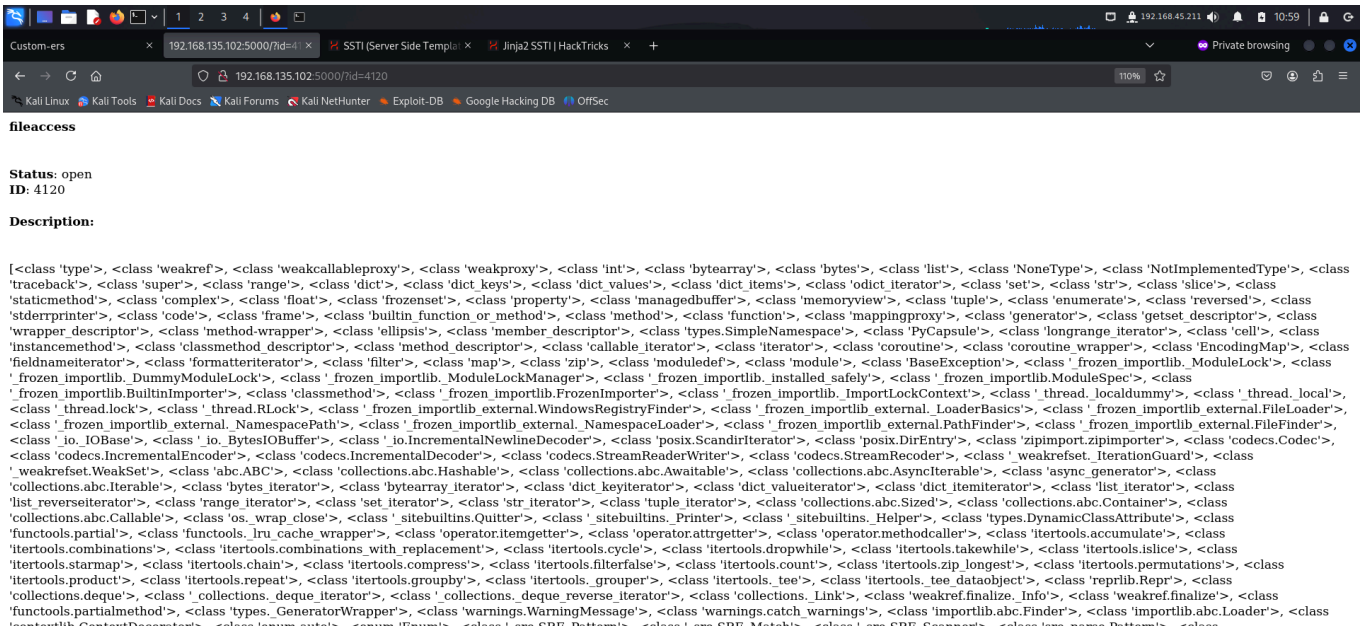
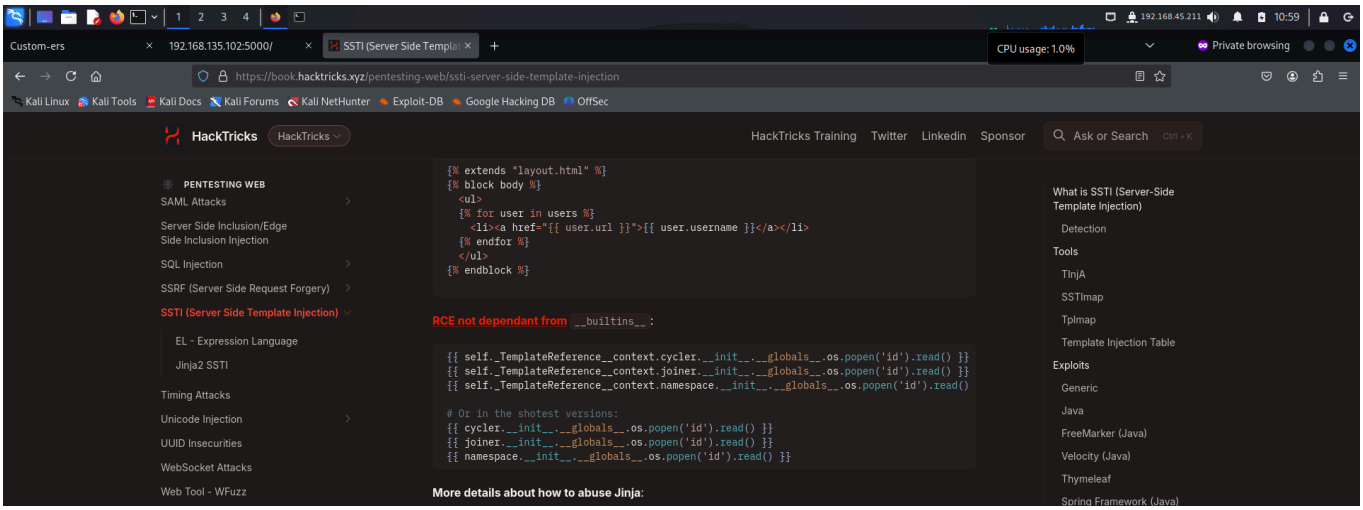
The server had executed the command that I had sent confirming the presence of **SSTI** vulnerability. Since flask by default uses **jinja2**, I tried a payload specific to that template engine to see if it works.




It worked. So I went to **hacktricks** to look for ways to get RCE and found this payload.




I tried executing the payload first to see if it worked. If it did, I could attempt to get a reverse shell.


**demo**

**Status**: open
**ID**: 5481

**Description:**

uid=33(www-data) gid=33(www-data) groups=33(www-data)

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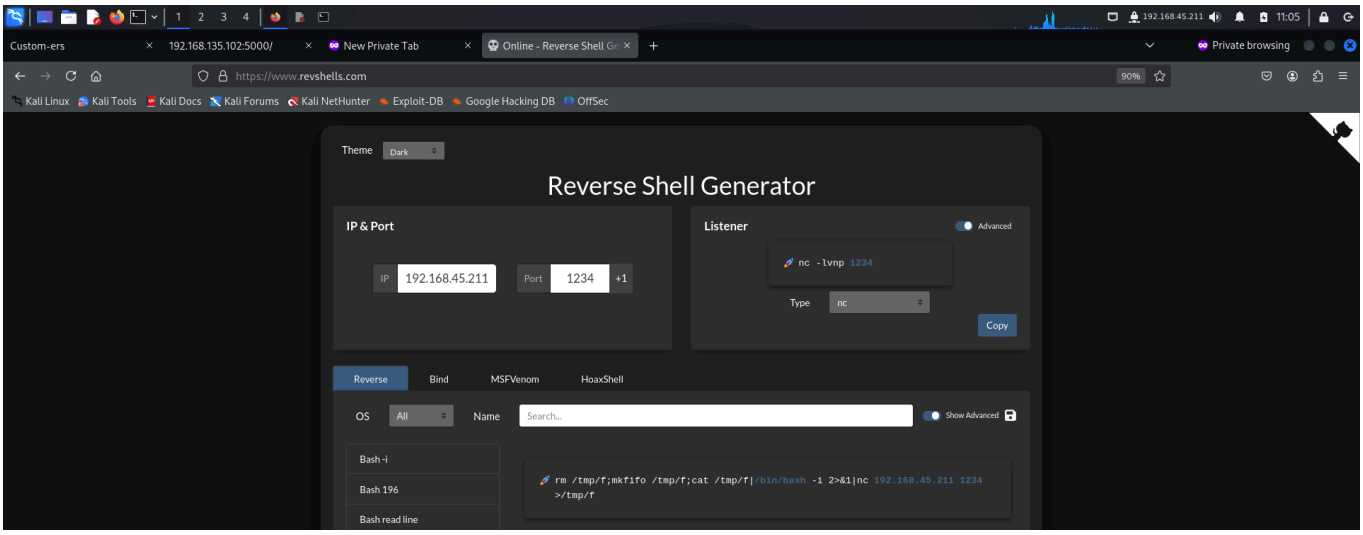
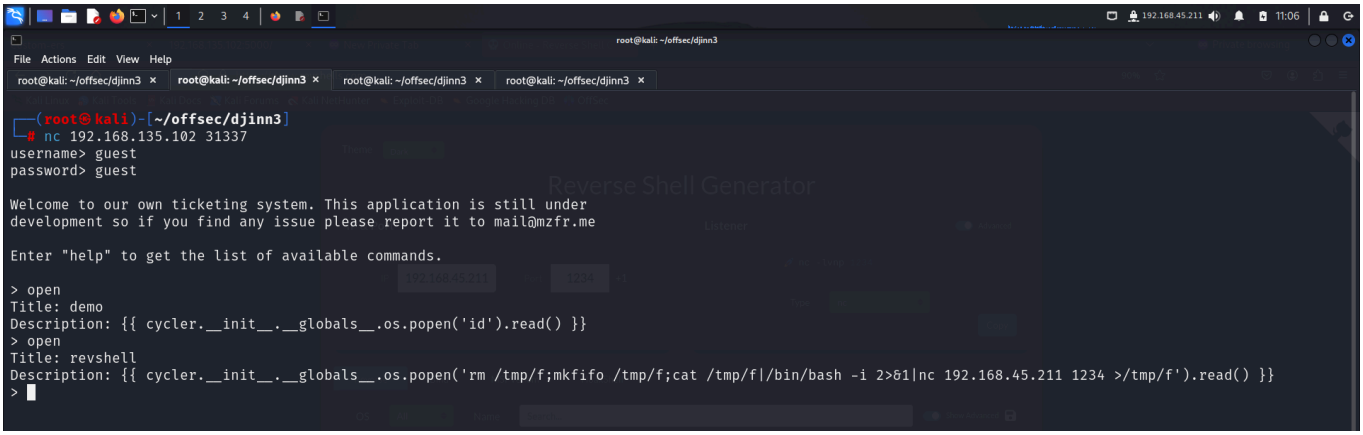
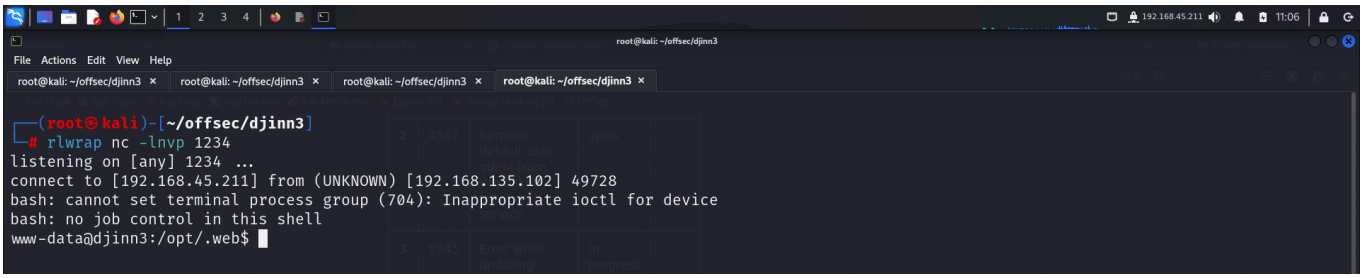
The payload was able to execute commands on the server. Hence I could try getting a reverse shell.
I went to **revshells** and copied the **nc mkfifo** payload.



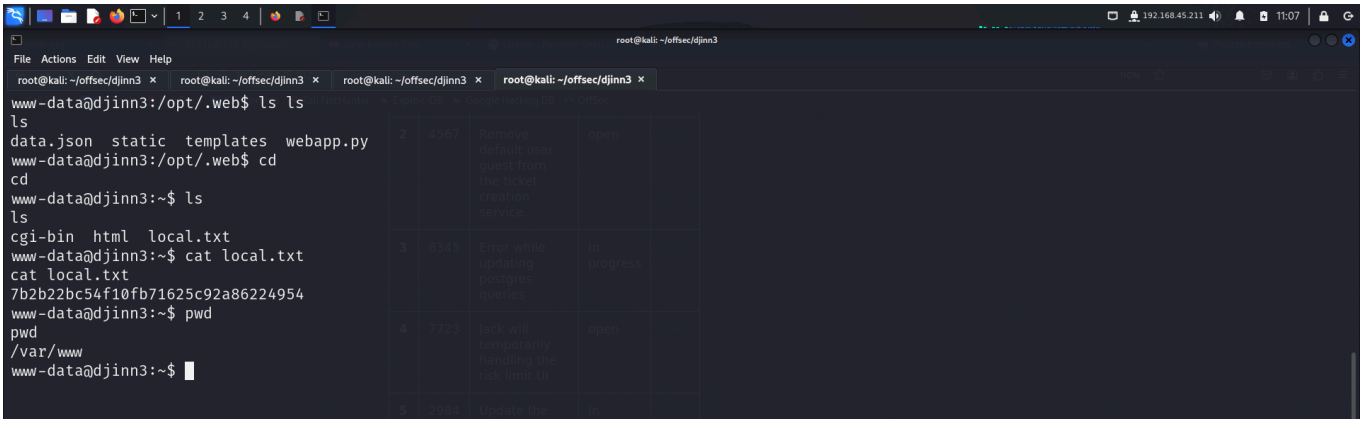

I opened another ticket with my reverse shell payload and started a listener on another terminal.




Upon visiting the page, I got a reverse shell.

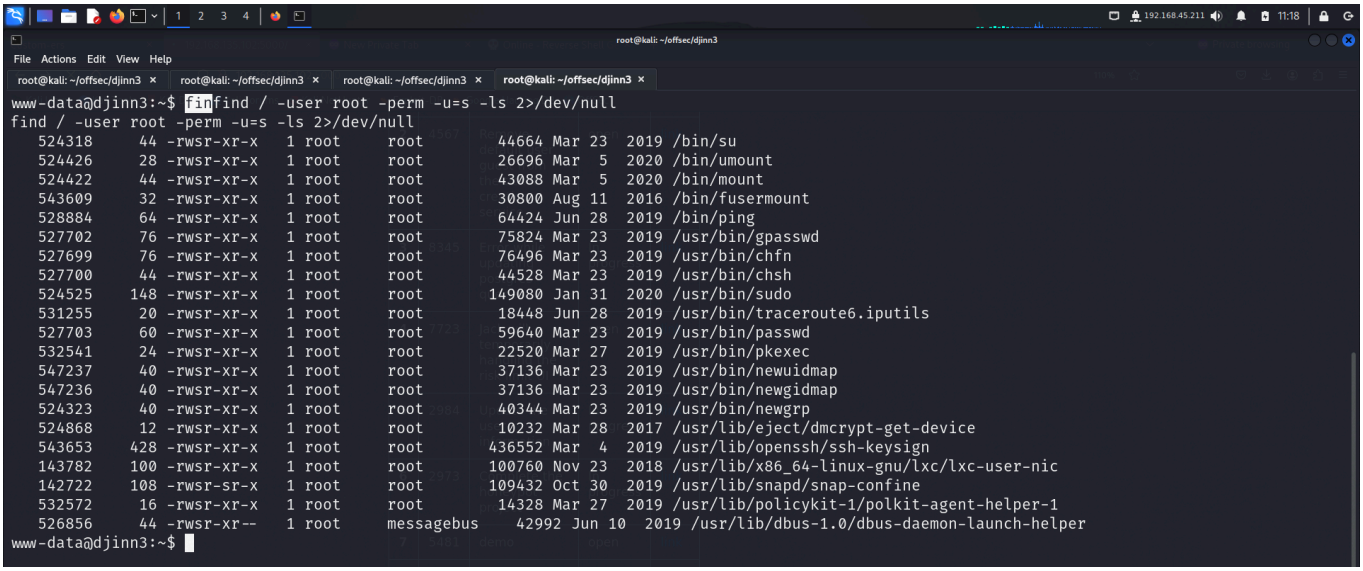



I then found the first flag inside `/var/www`.

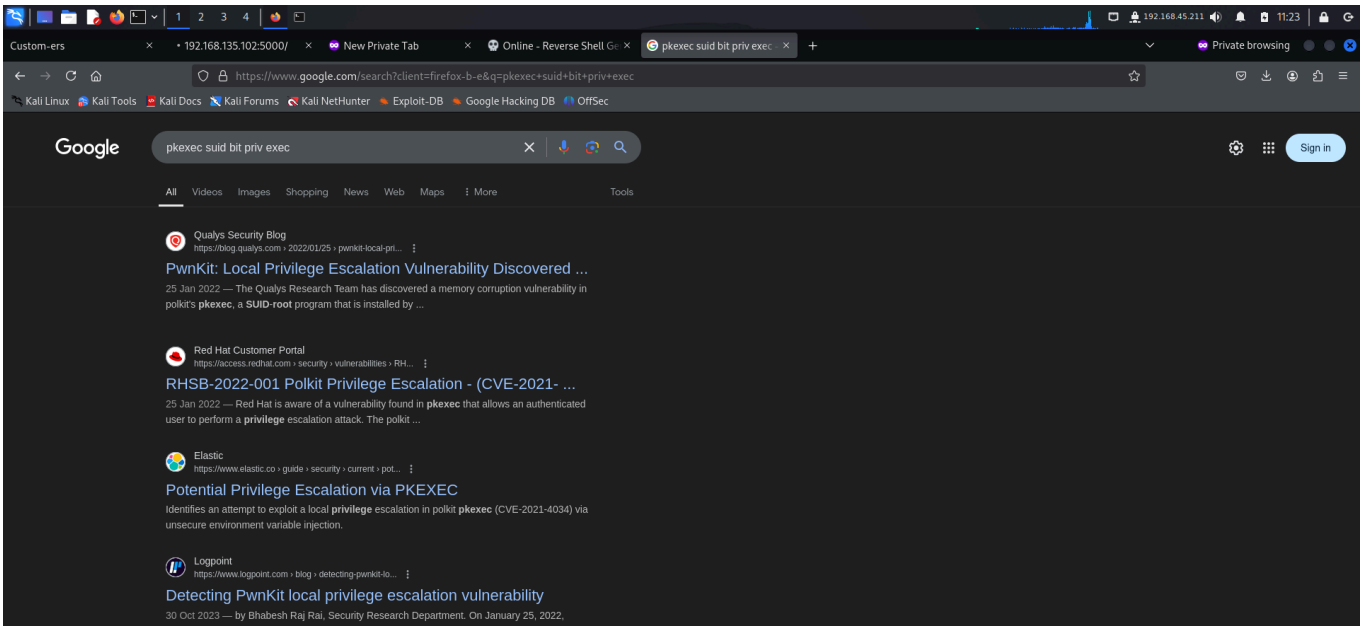


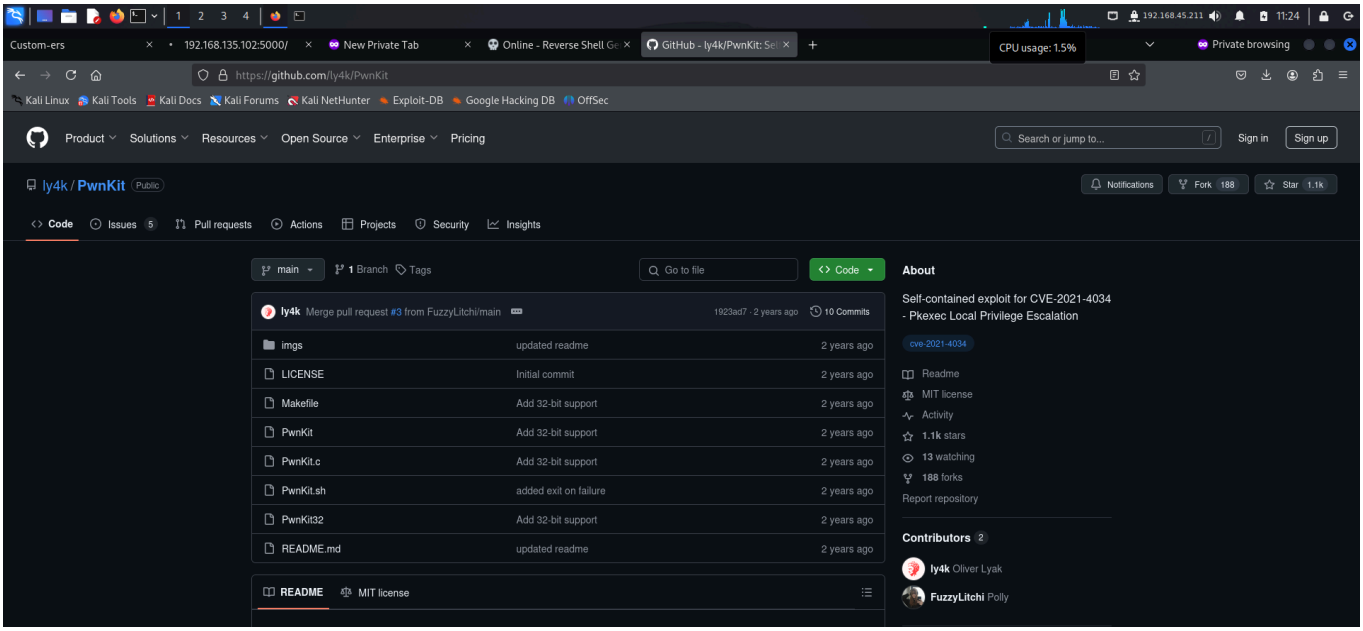

# PRIVILEGE ESCALATION

I looked for binaries with uncommon suid bit sets and found **pkexec**

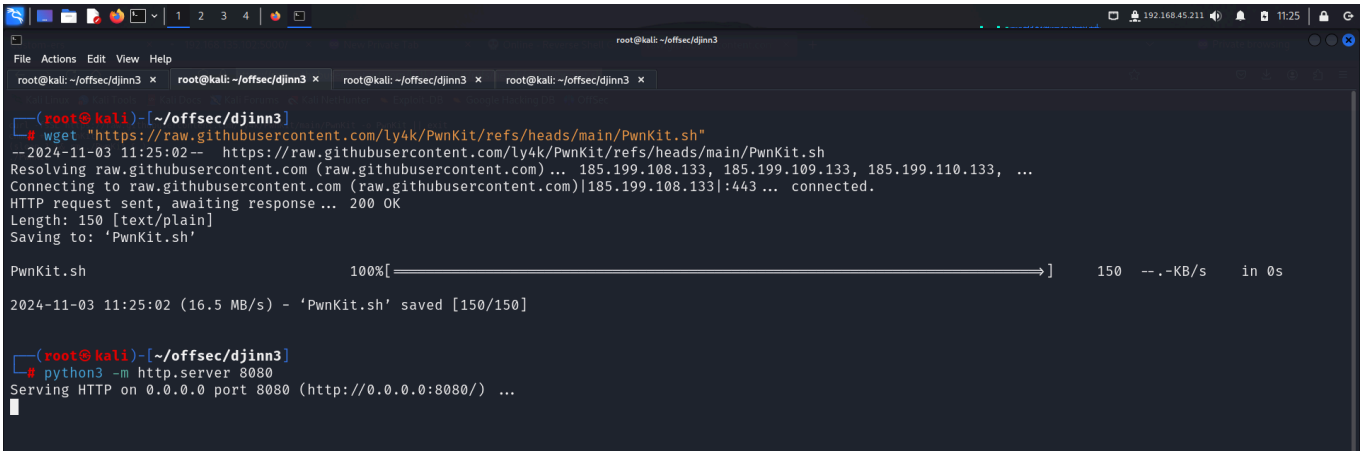



When **pkexec** has an **suid bit set**, we can try to escalate our privilege using the PwnKit method. I googled for the exploit and found the github repo.

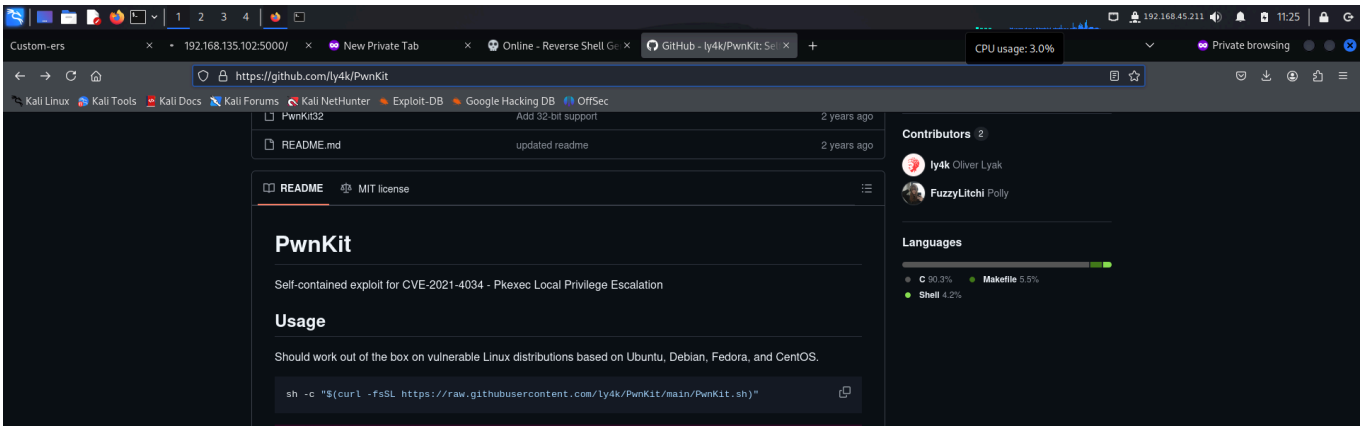


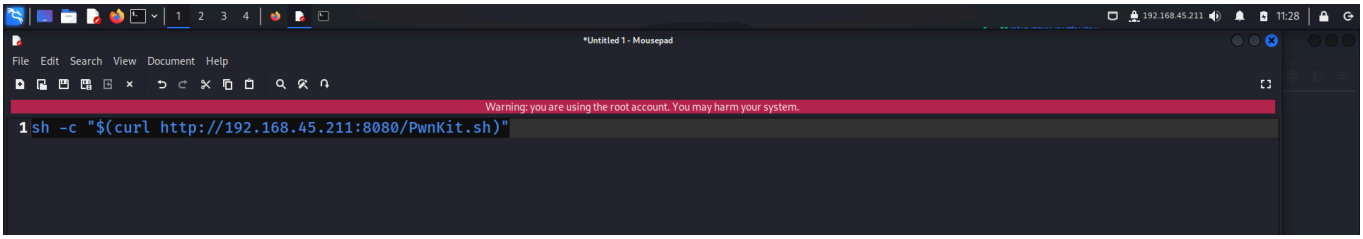



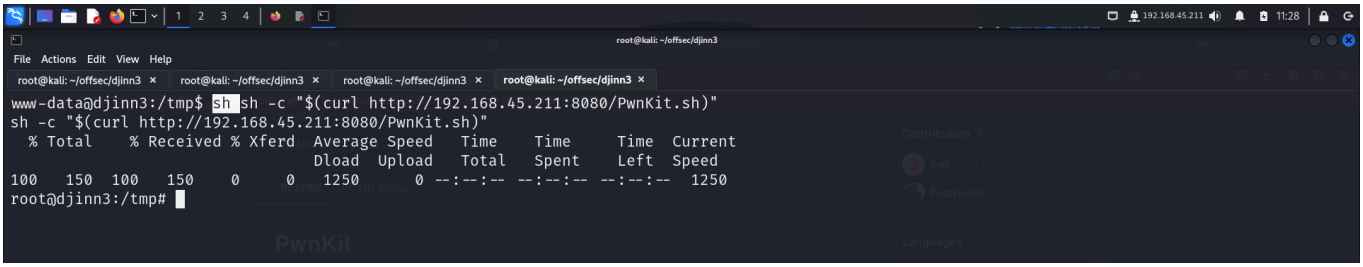

I downloaded the script on my local machine and then started a python server so that I could transfer it to the target.



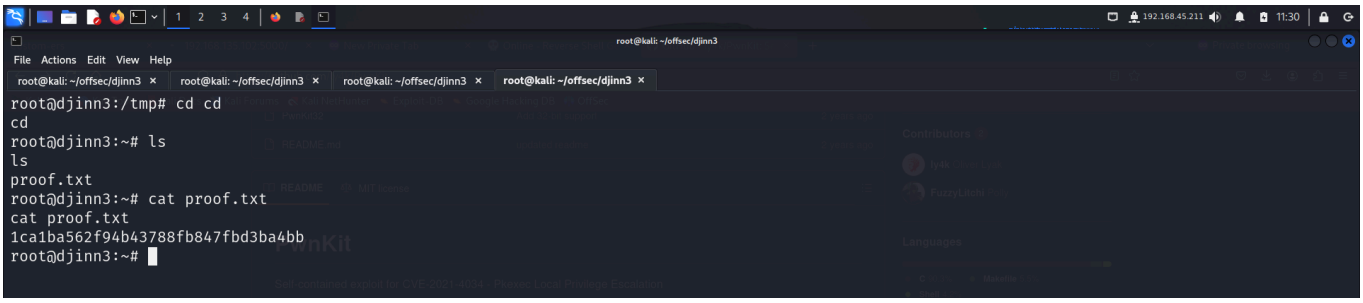
I followed the instructions that were provided on the **github** repo.




After getting the root shell, I captured the final flag from the `/root` directory.




# CONCLUSION

Here's a short summary of how I pwned **djinn3**:

- I discovered an **SSTI** vulnerability on the server running on port 5000 and used the api hosted on port 31337 to get a reverse shell.
- I then captured the first flag from the `/var/www` directory.
- I looked for binaries with uncommon **suid bits** and found pkexec.

- I googled for exploits and found the **Pwnkit** repo on github.
- I followed the instructions given in the repo to got root access.
- Finally I captured the root flag from the `/root` directory.

That's it from my side! Until next time :)