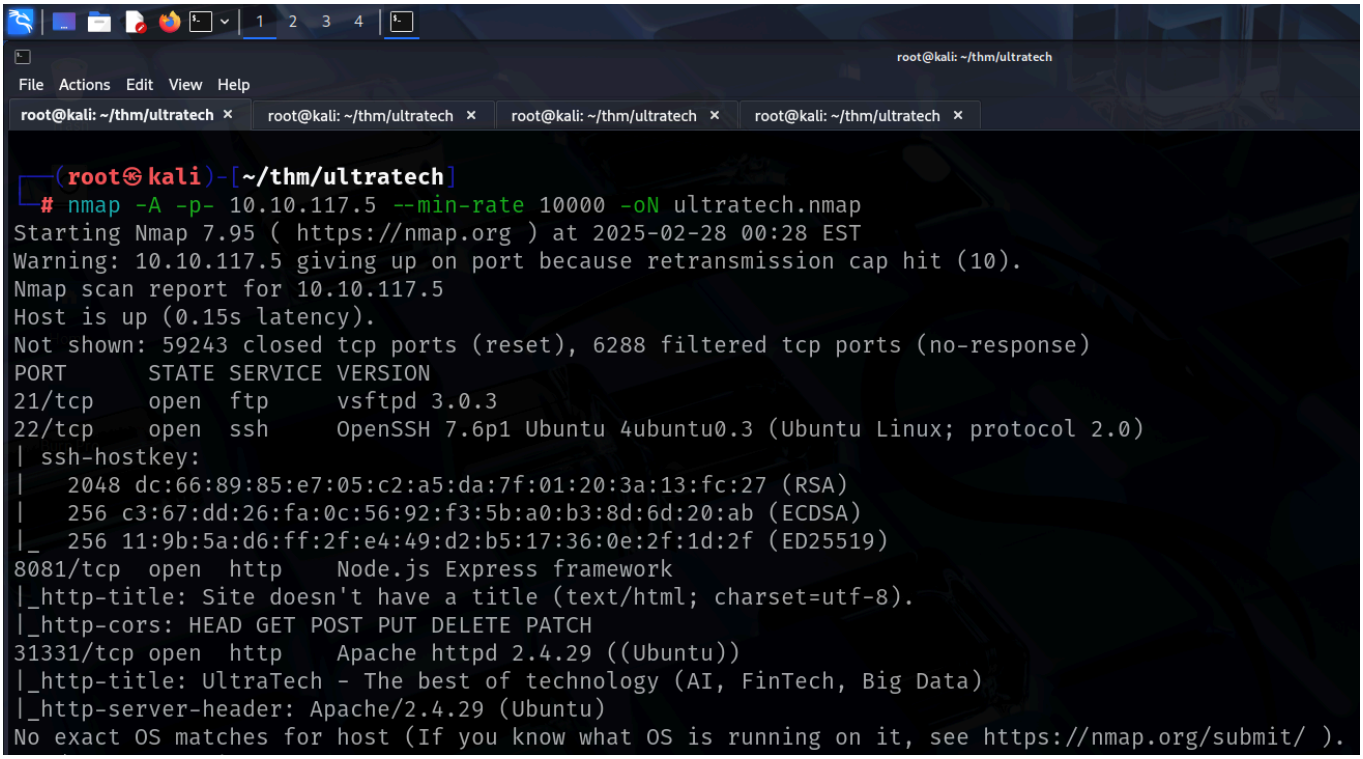
ULTRATECH

Link to the machine: https://tryhackme.com/room/ultratech1

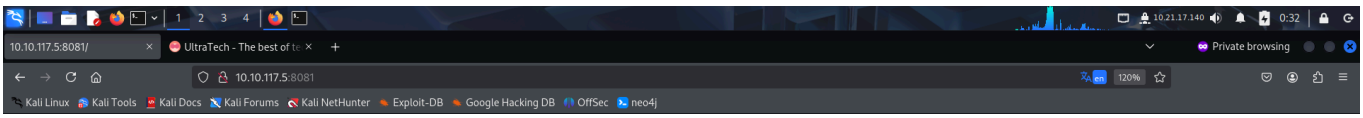
RECONNAISSANCE

I performed an **nmap** aggressive scan on the target to discover open ports and the services running on them.

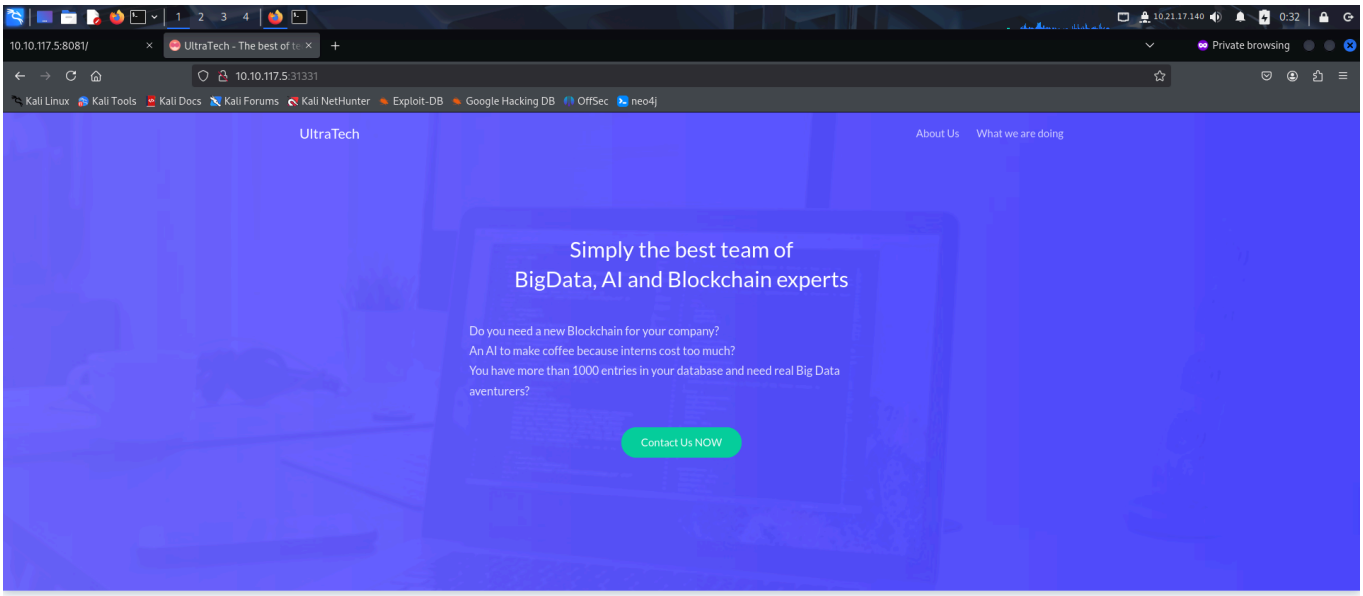


FOOTHOLD

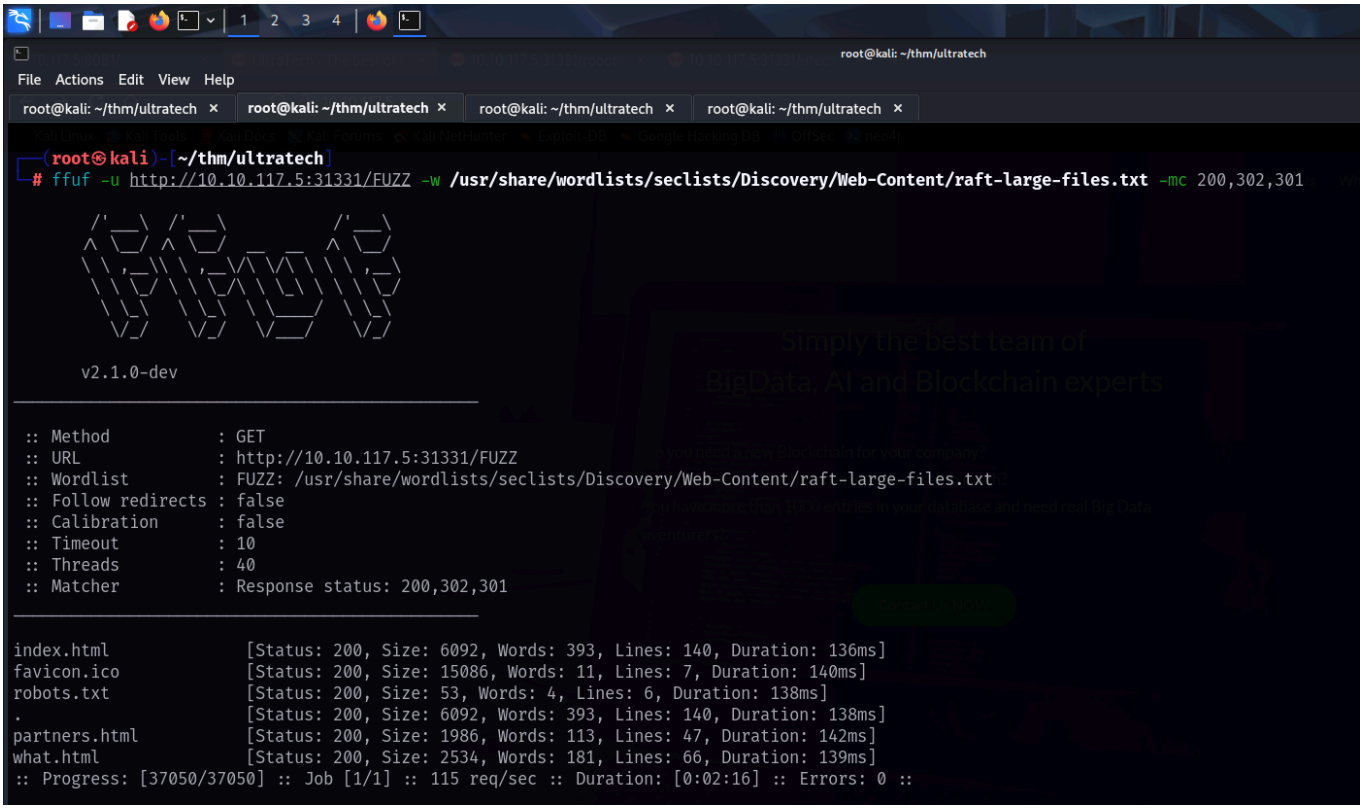
The **nmap** scan revealed http service running on port 8081 and port 31331. To find out more about these services, I accessed them through my browser.



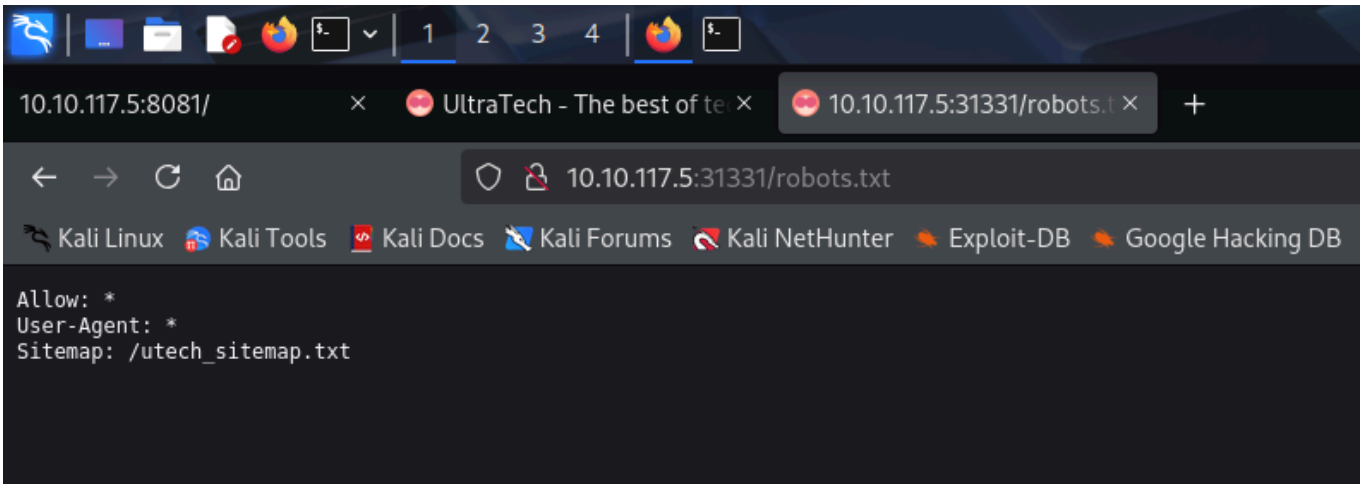
UltraTech API v0.1.3



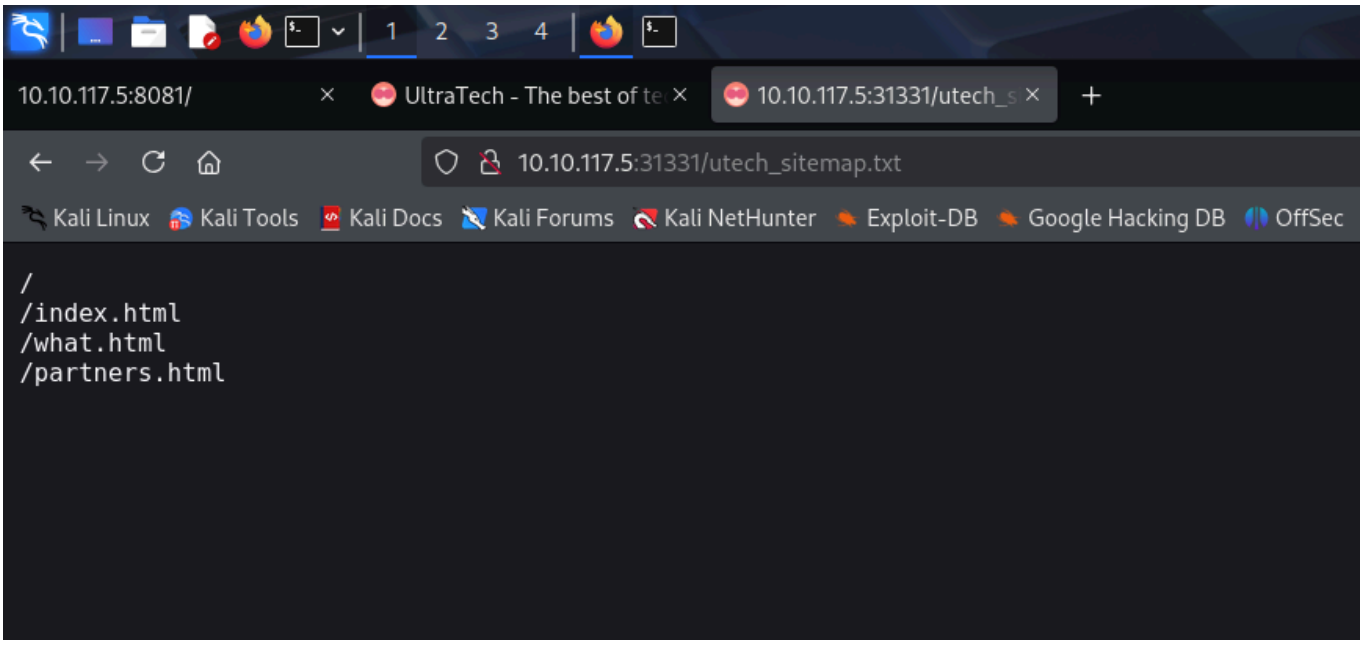
Port 8081 seemed to host an API. This API was probably being used by the service running on port 31331. I performed a directory bruteforce on the web page using **ffuf** and found a bunch of pages.



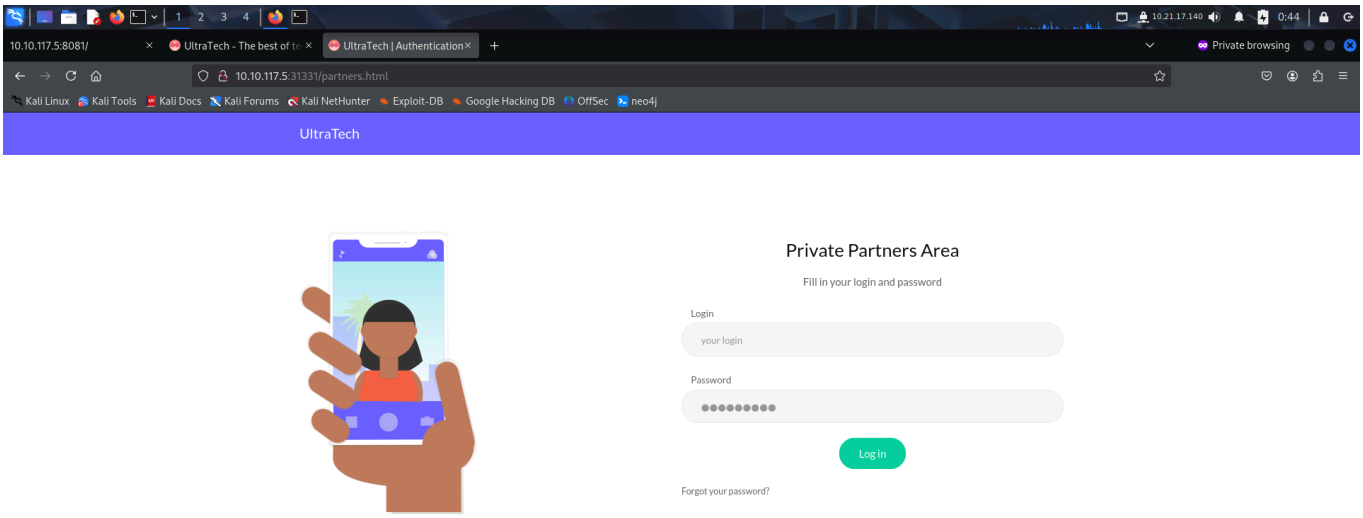
I accessed *robots.txt* and found a link to another page.



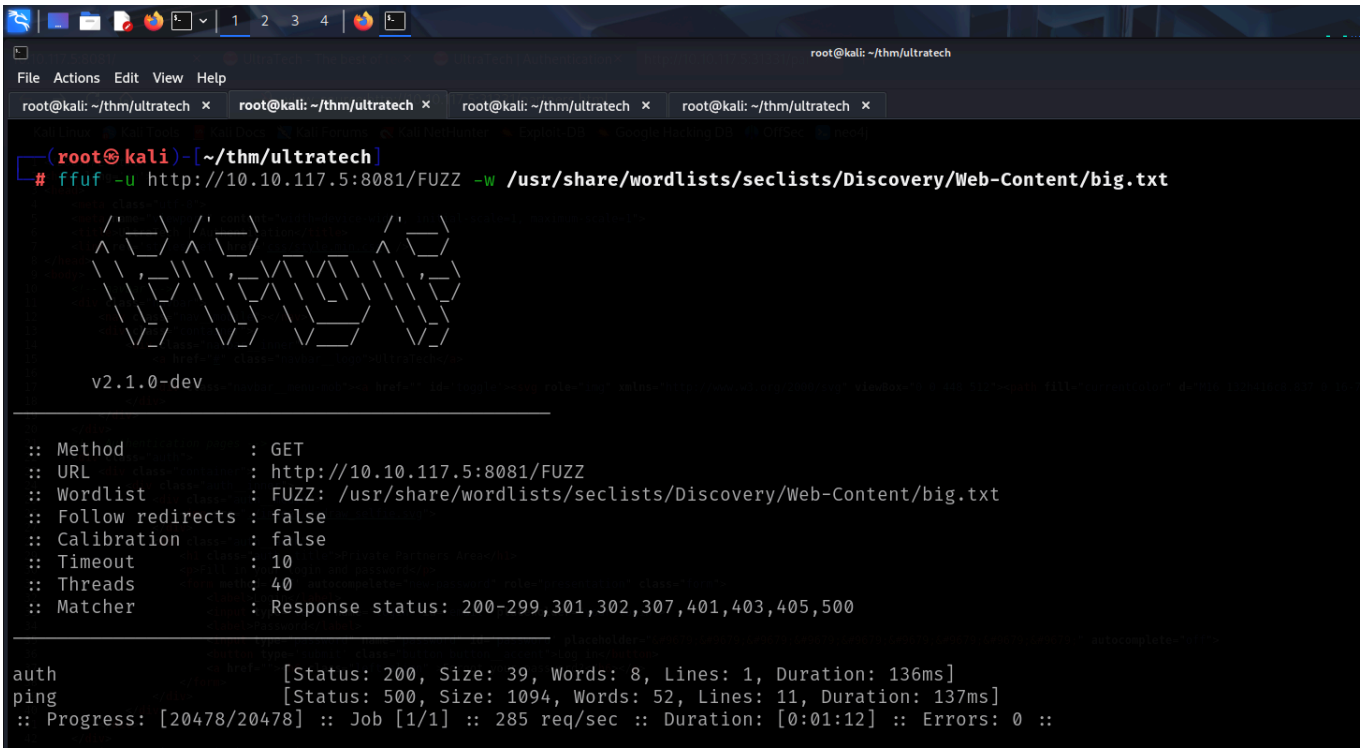
The sitemaps page revealed a few more endpoints.



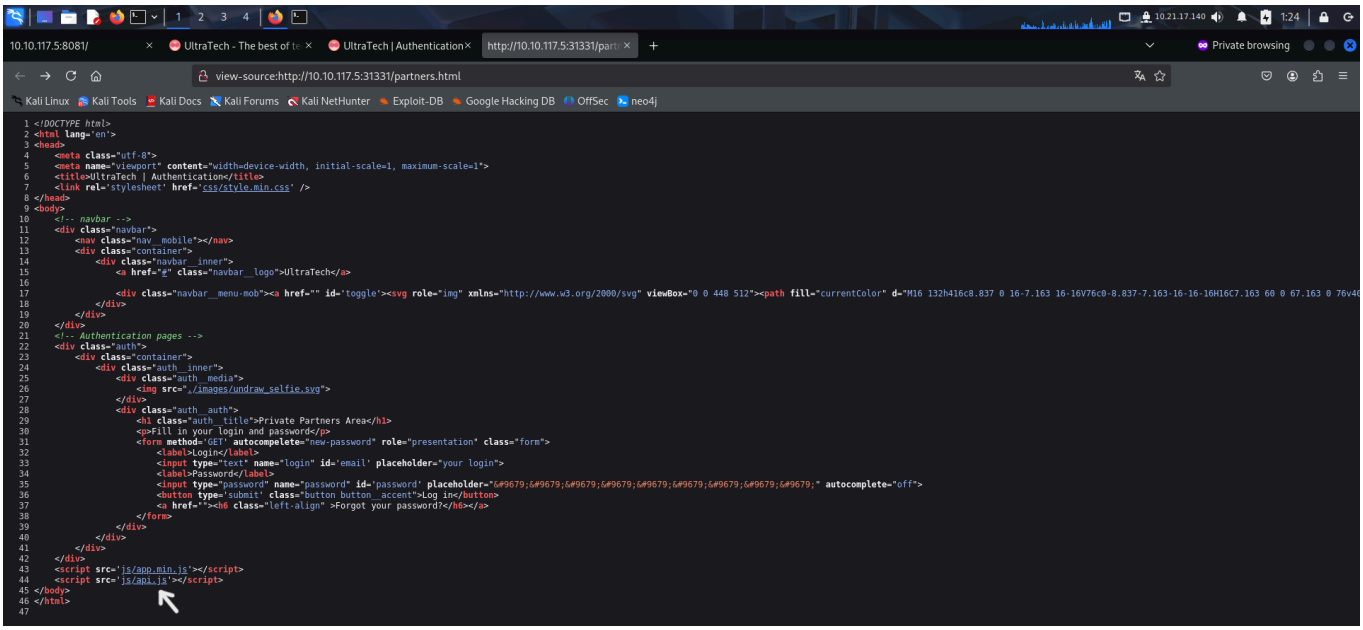
Upon accessing the *partners.html* page, I landed on a login panel.



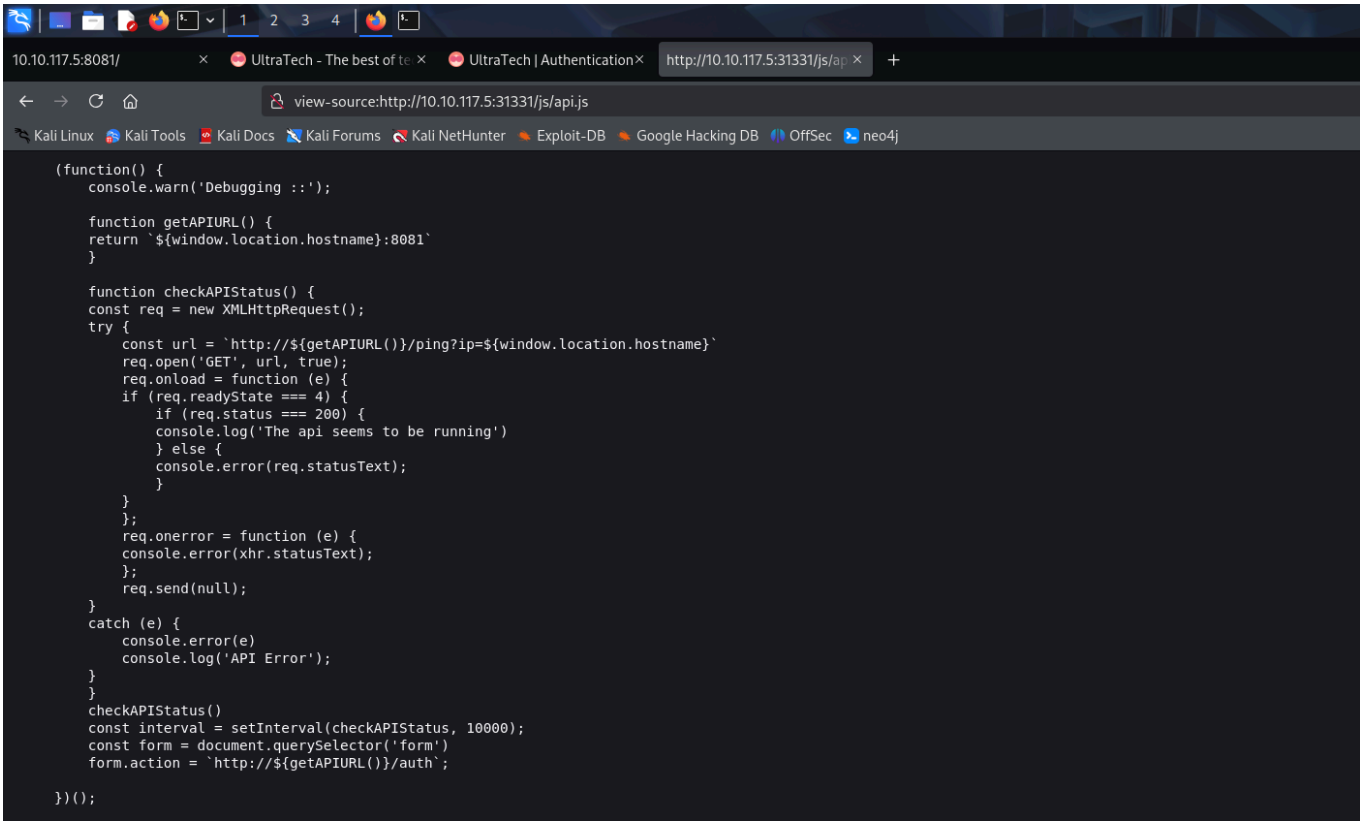
I tried logging in using default credentials but failed. I still had the API service so I performed a directory bruteforce on it to reveal 2 more endpoints.



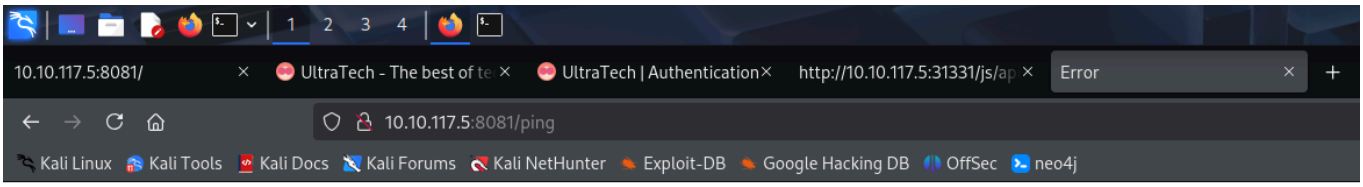
The source code of the login panel also contained an interesting file called *api.js*.



This file contained the logic behind the authentication process of the login panel. It first pinged the API service to check its availability through the `/ping` endpoint. It then authenticated the credentials through the `/auth` endpoint.

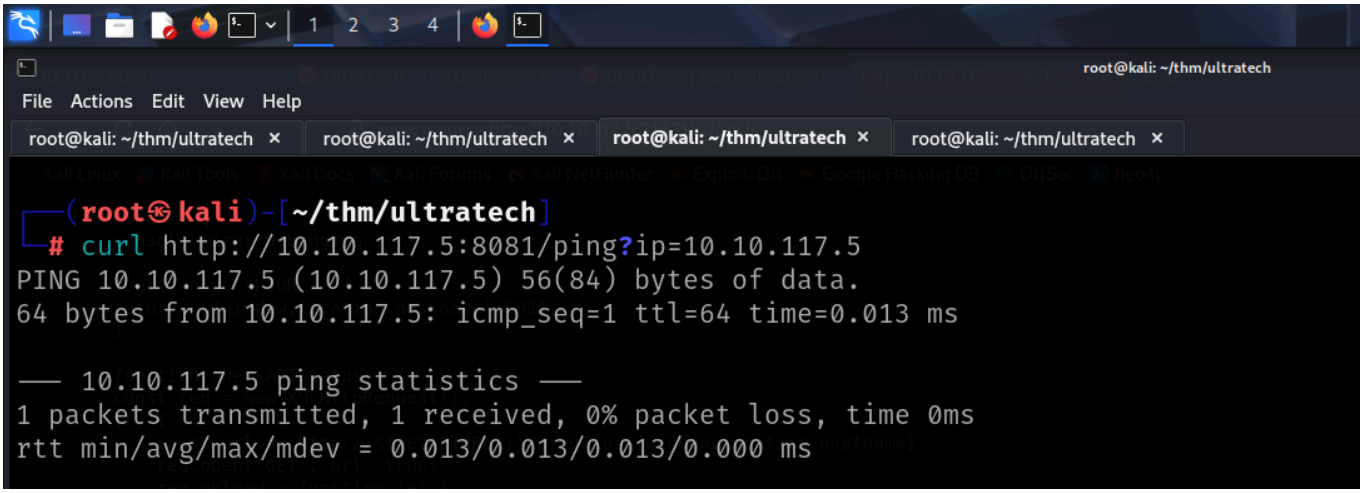


I tried accessing the `/ping` endpoint to get some more information. This just revealed the path where the web application was running.

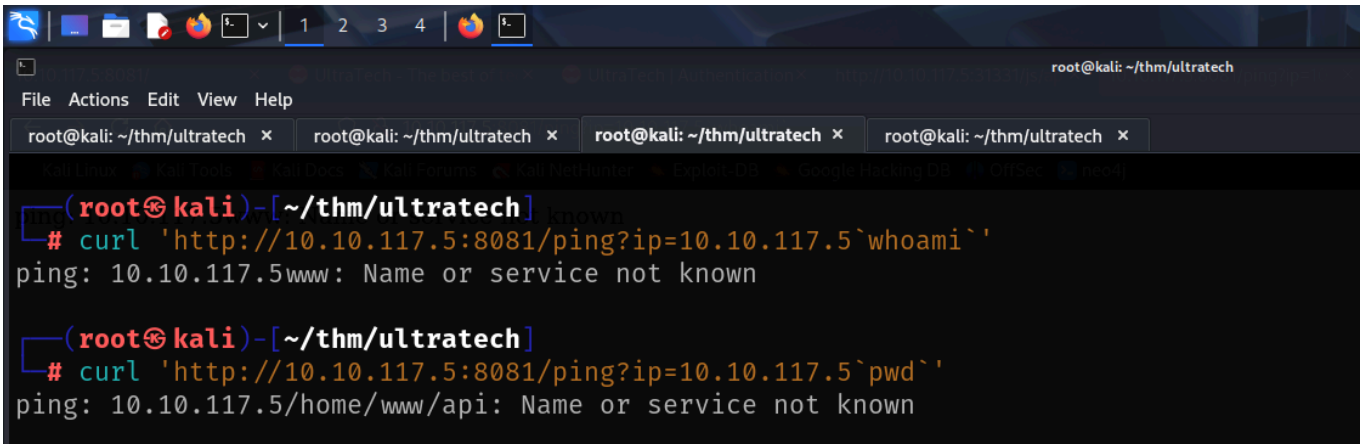



```
TypeError: Cannot read property 'replace' of undefined
    at app.get (/home/www/api/index.js:45:29)
    at Layer.handle [as handle_request] (/home/www/api/node_modules/express/lib/router/layer.js:95:5)
    at next (/home/www/api/node_modules/express/lib/router/route.js:137:13)
    at Route.dispatch (/home/www/api/node_modules/express/lib/router/route.js:112:3)
    at Layer.handle [as handle_request] (/home/www/api/node_modules/express/lib/router/layer.js:95:5)
    at /home/www/api/node_modules/express/lib/router/index.js:281:22
    at Function.process_params (/home/www/api/node_modules/express/lib/router/index.js:335:12)
    at next (/home/www/api/node_modules/express/lib/router/index.js:275:10)
    at cors (/home/www/api/node_modules/cors/lib/index.js:188:7)
    at /home/www/api/node_modules/cors/lib/index.js:224:17
```

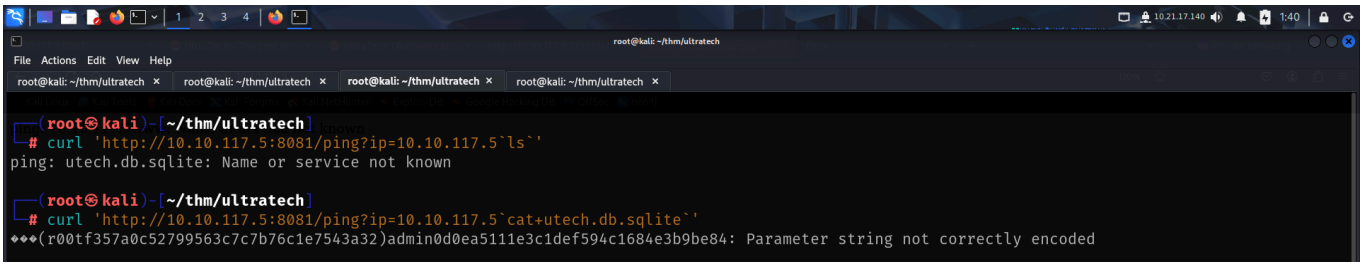
Then, following the code from *api.js*, I made a request to the */ping* endpoint to ping the server.



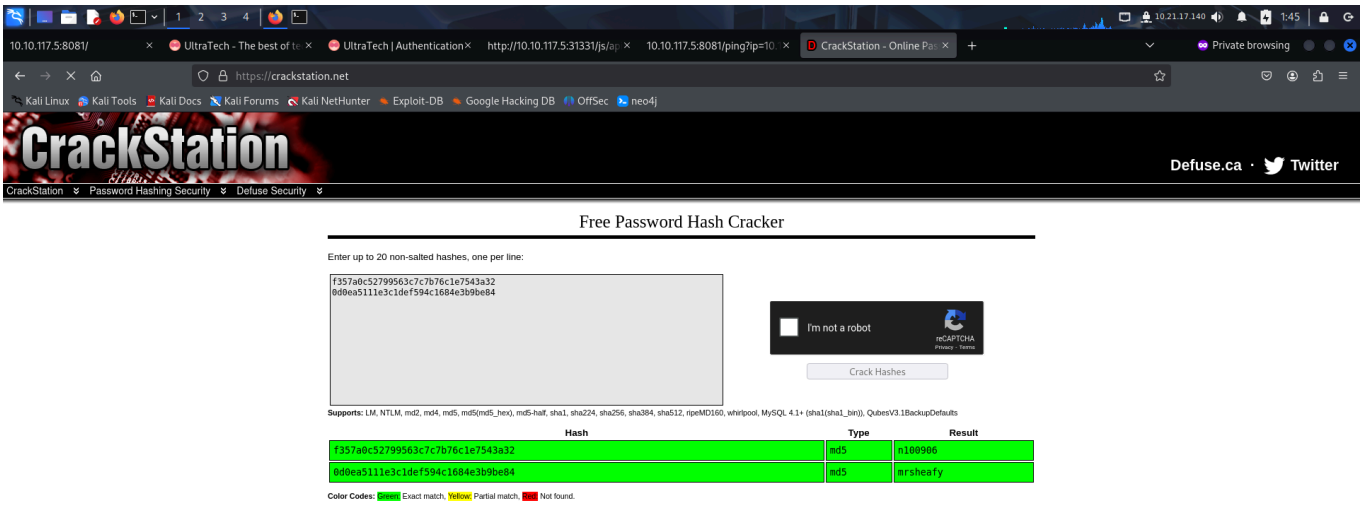
The output made it seem as an os command execution in the backend, so I tried chaining another command to the request.

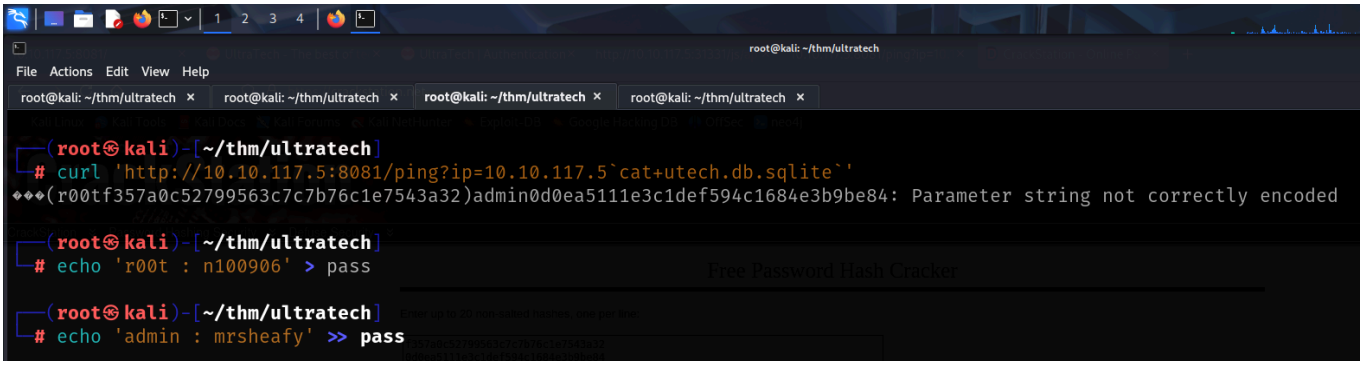


Hence I was able to execute commands on the server. I found an **sqlite** file containing credentials of 2 users, `r00t` and `admin`.

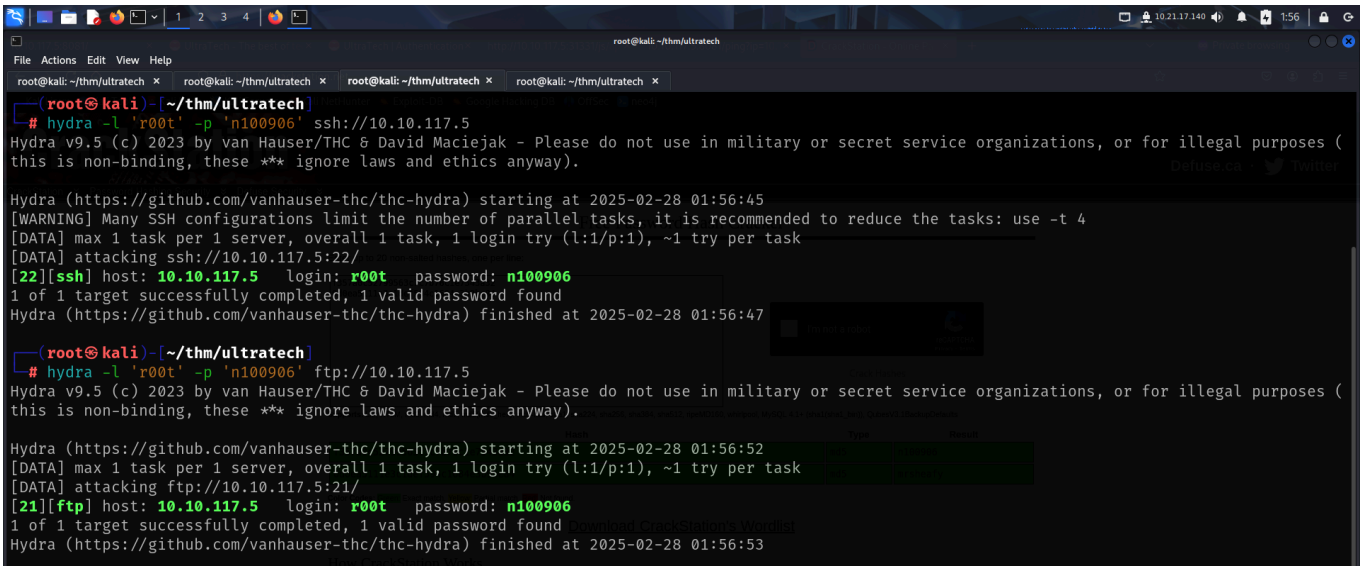


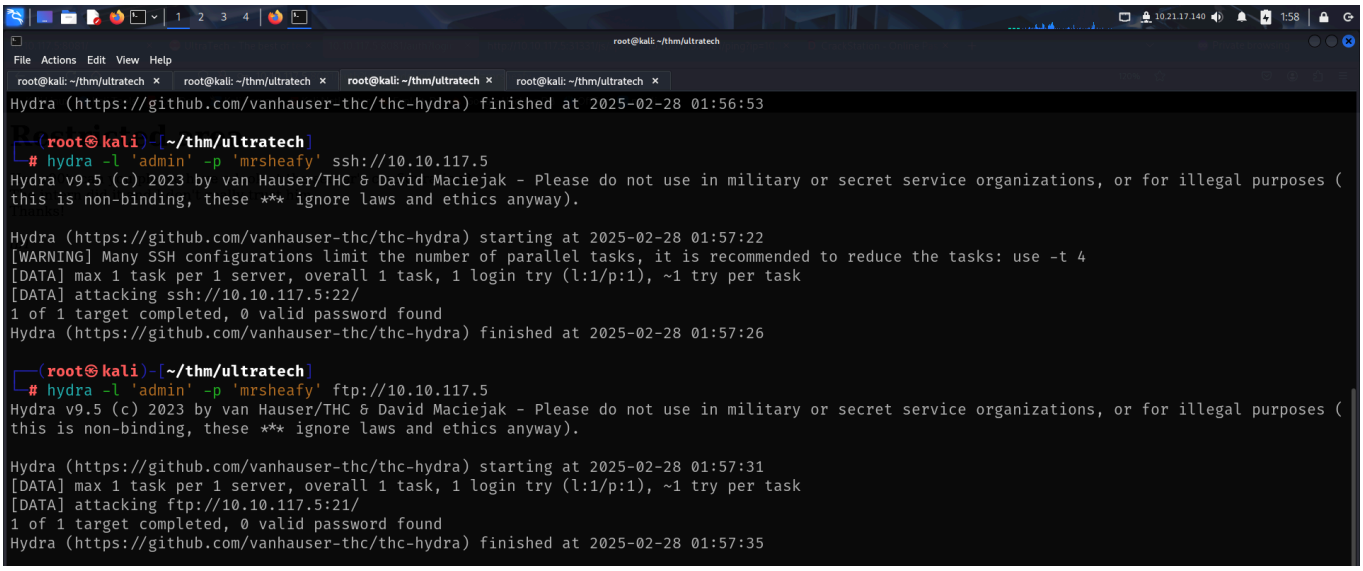
I cracked the hash using **crackstation** and saved them for later use.



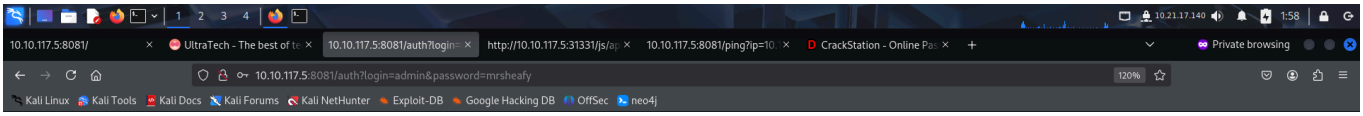


I then verified if the credentials were valid for other services running on the target: **ftp** and **ssh**.





The `r00t` credentials worked however the `admin` credentials failed. I then logged into the web application as admin and found a message.

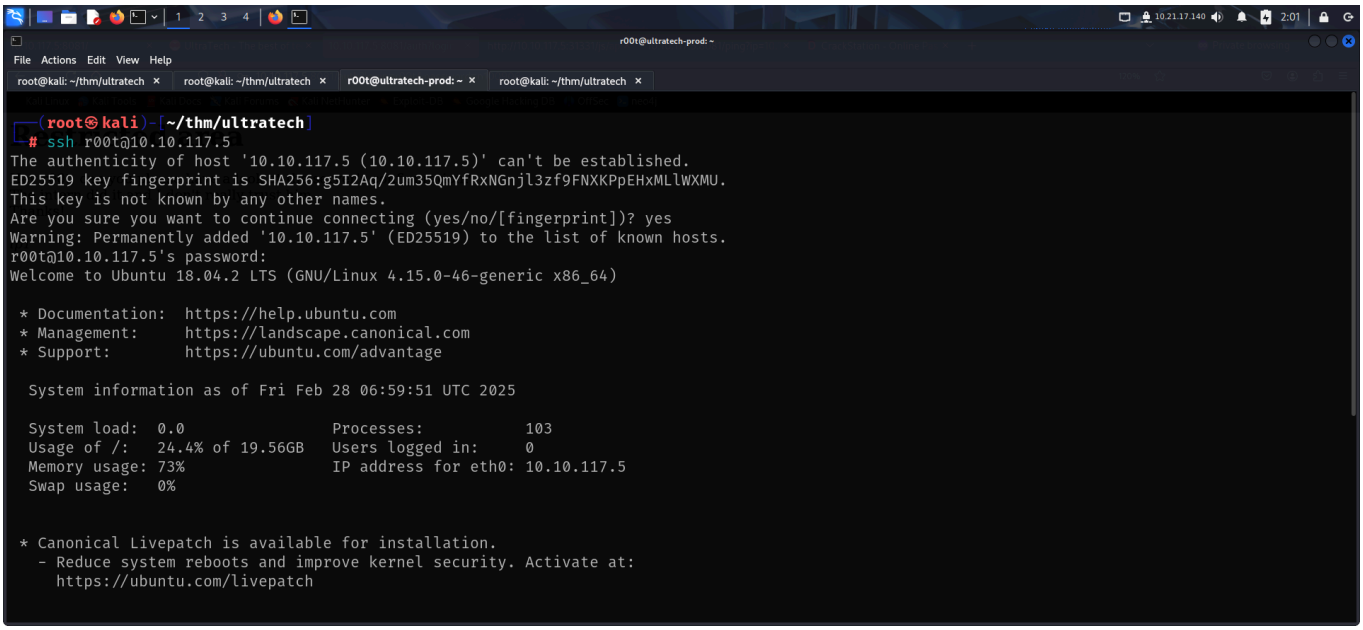


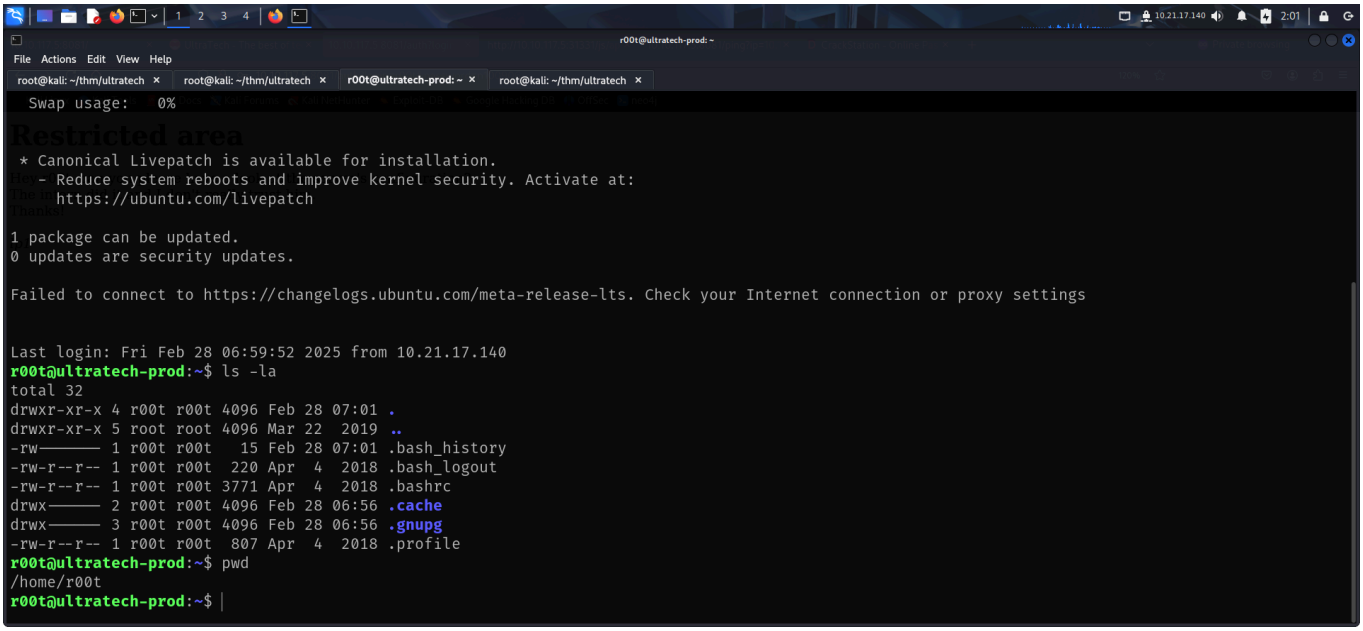
Restricted area

Hey r00t, can you please have a look at the server's configuration?
The intern did it and I don't really trust him.
Thanks!

lp1

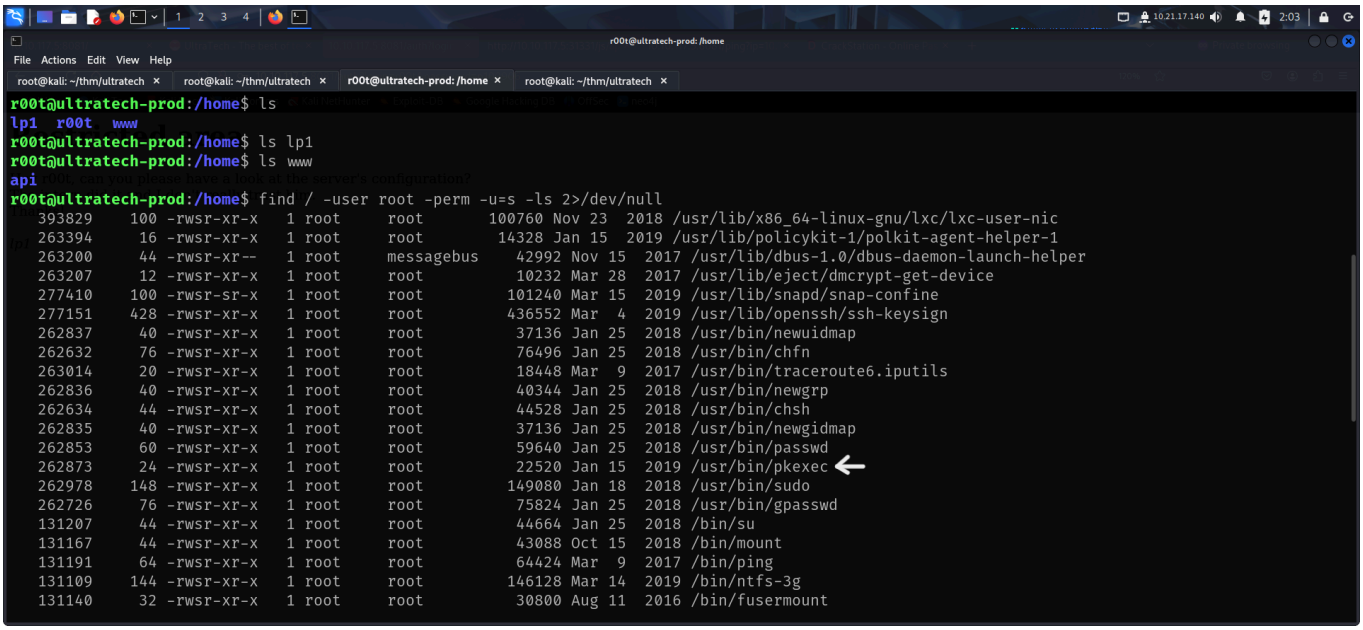
Then I got shell access on the target machine using **ssh**.



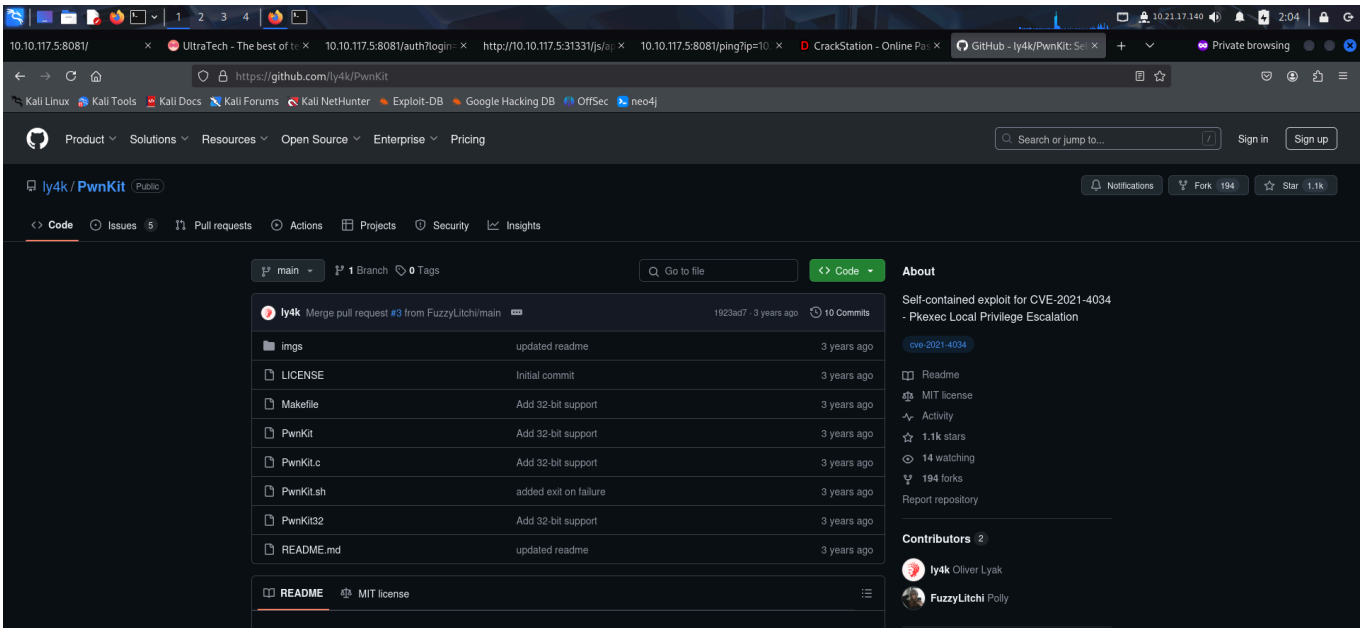


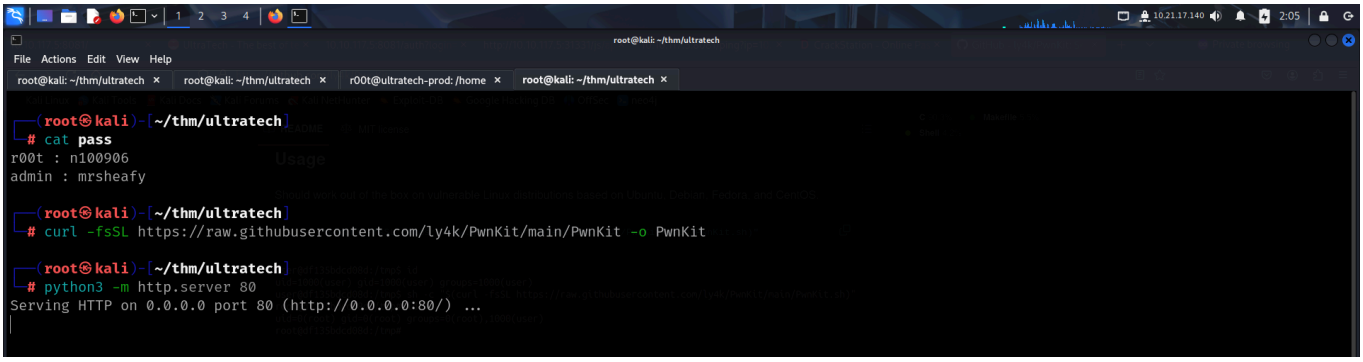
PRIVILEGE ESCALATION

Upon access, I looked for files under different user directories in the */home* directory but found nothing interesting. I then looked for programs running with **suid** bit and found **pkexec**. **Pkexec** is used by **Pollkit** to execute commands and was found to be vulnerably few years back. Since the machine was old, this version was likely vulnerable.

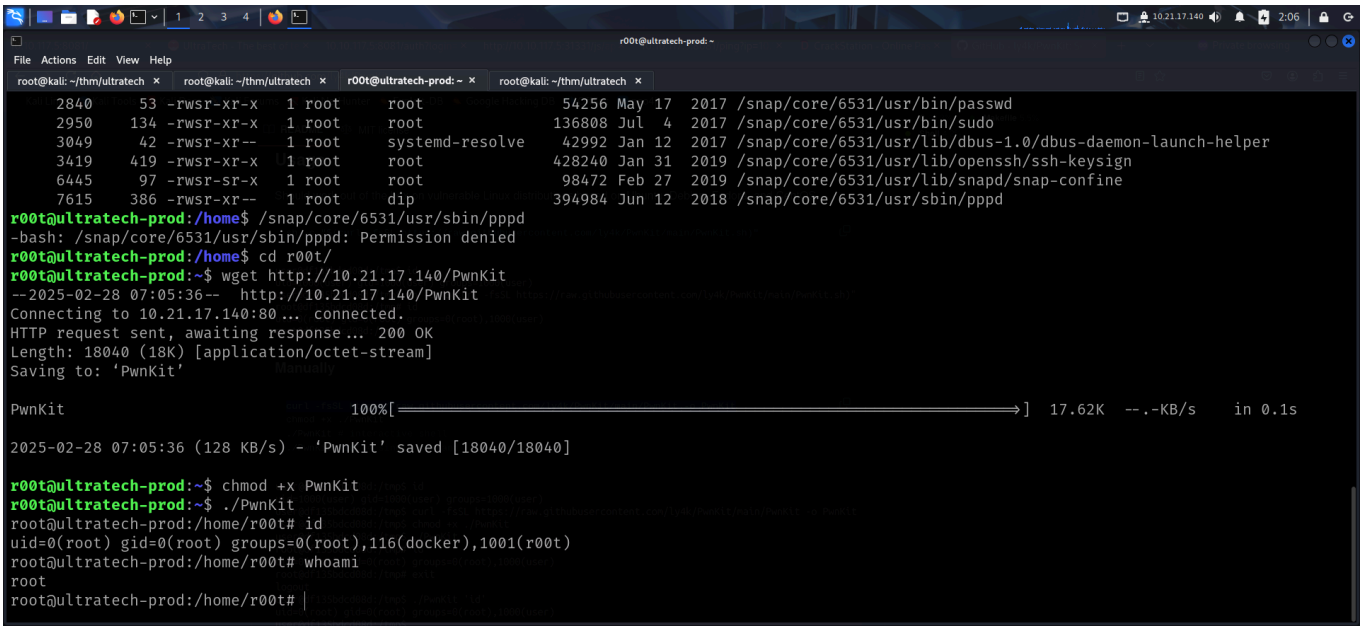


I navigated to the **PwnKit** exploit page on github and downloaded it on my local system.

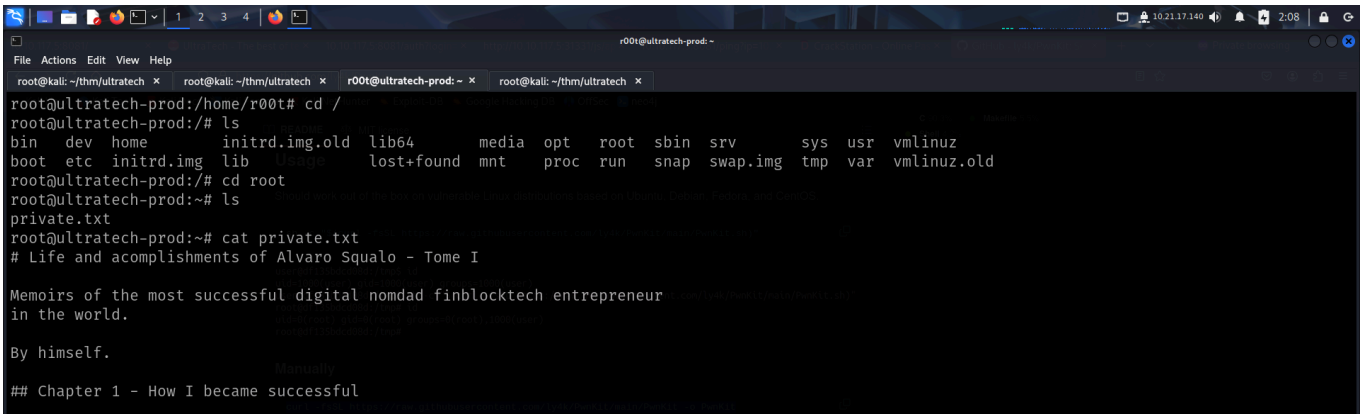




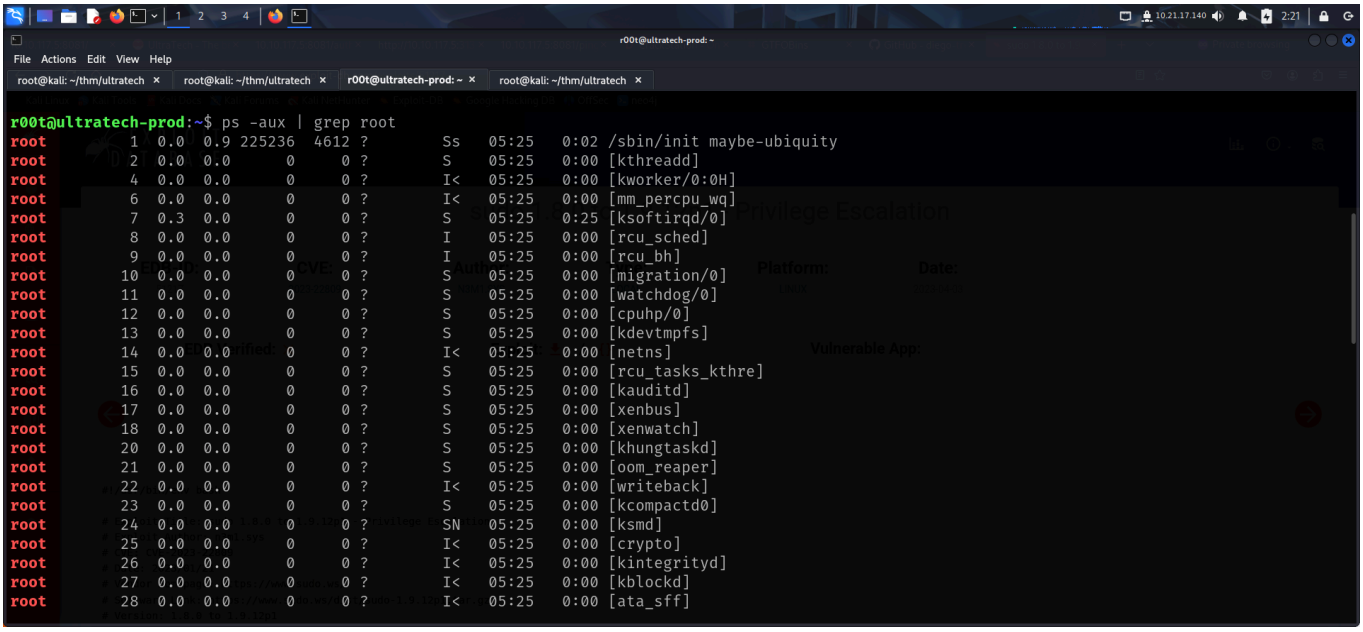
I then downloaded the exploit from my local system onto the target system and provided execution rights to it. Upon executing the exploit, I got root access.

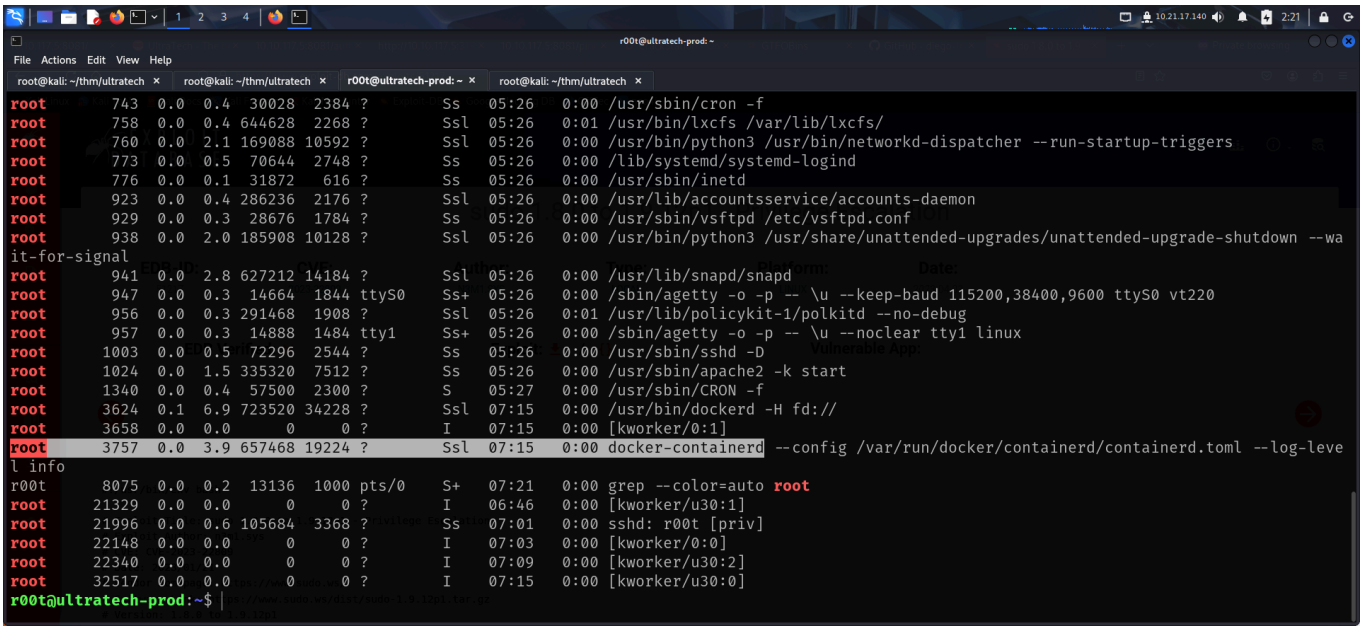


I navigated to the */root* directory and found a message inside **private.txt**.



An alternate way to escalate privileges was by viewing processed running as root. Using **ps**, I listed all process and filtered the ones running as root. Here I found **docker**.

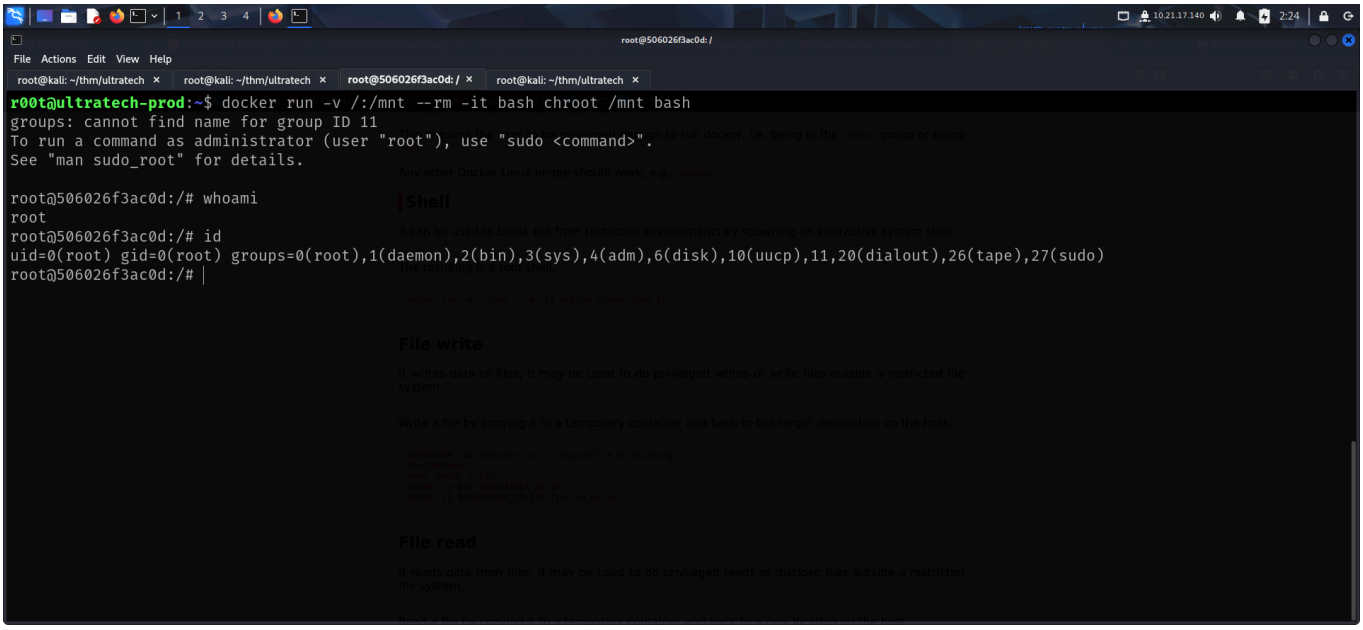




I visited https://gtfobins.github.io/gtfobins/docker/ and found a way to break the shell restrictions and get root access. I however, modified the command a bit and used this to get root access:

```
docker run -v /:/mnt --rm -it bash chroot /mnt bash
```

- This command uses the `bash` image (or a more typical Debian-based image, assuming the default image has bash installed).
- The `bash` shell is invoked inside the `chroot` environment.



SUMMARY

Here's a high level summary of how I pwned **UltraTech**:

- I abused the os command execution functionality and injected my own command to get user credentials.
- I used the credentials to get shell access on the target.
- I was able to get root access by 2 different methods:
  - Exploiting suid bit on **pkexec** using **PwnKit**.
  - Exploiting **docker** running as root.

That's it from my side! Until next time.
