IIK3100 – Etisk hacking og penetrasjonstesting

Practical Assignment

Kandidatnr: 10058

Contents

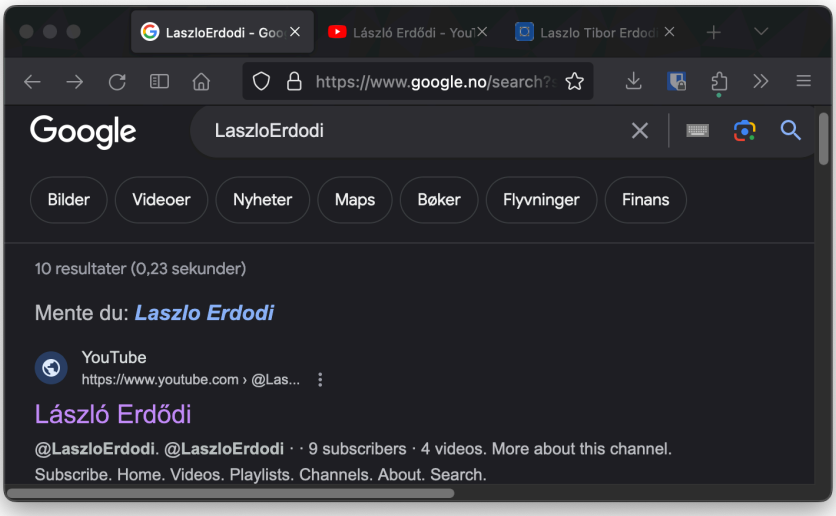
Total points: 510p (finished) + 220p (unfinished)

1 OSINT

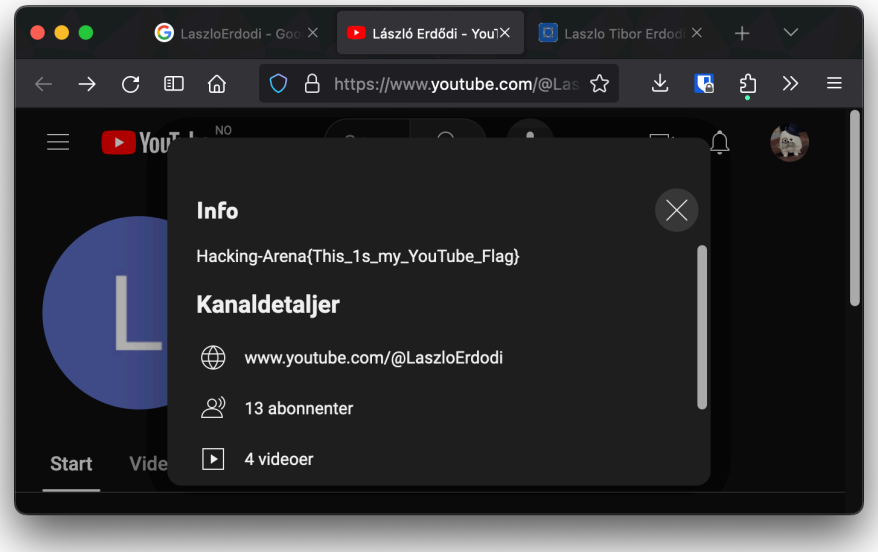
1.1 Me (30p)

Do you really know me? I like going to rock concerts :)
Here's my username: @LaszloErdodi

Solution:
For this task I searched for the username and found a link to a youtube channel:



On the channel I found some recodings of Guns N' Roses concerts, and the flag:

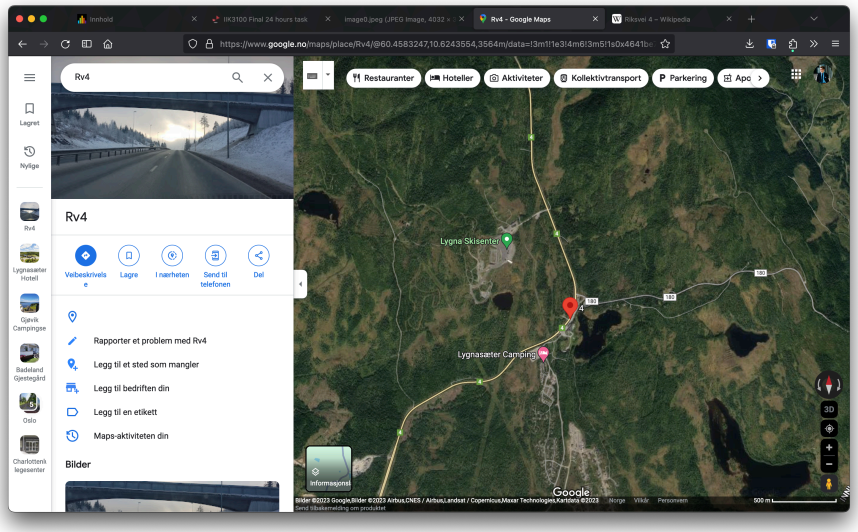


1.2 Hotel (30p)

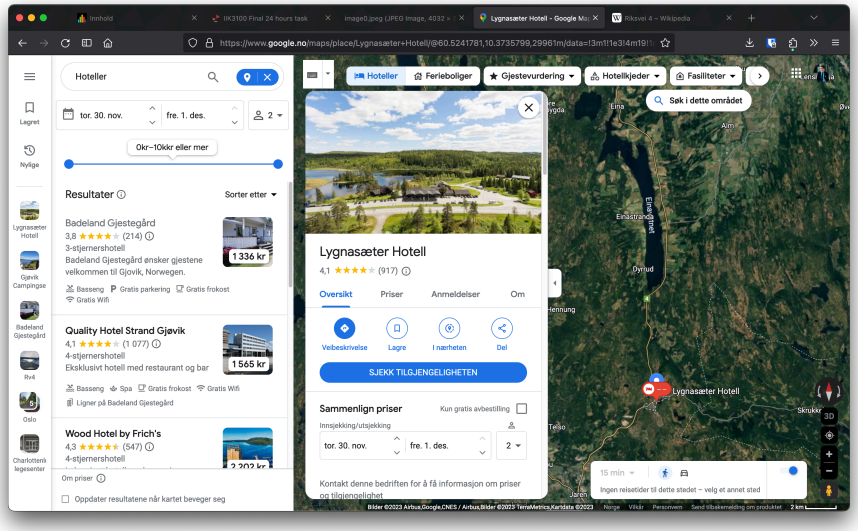
I took this picture a few weeks ago. It was so nice that I almost turned around and checked in to the nearby hotel I just passed. Do you know the name of the Hotel? :) https://hackingarena.com/image0.jpeg

Solution:

For this task I first searched on Google maps for riksvei 4 (Rv4), because the map in the car showed that the road was Rv4.



I then searched for hotels along the road, and the first hotel I found was the correct one:



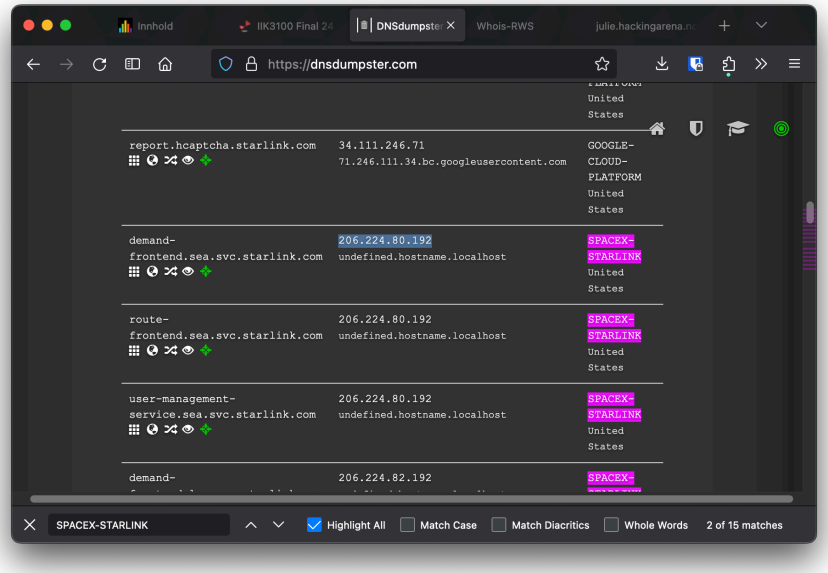
2 Technical information gathering

2.1 Spacex (30p)

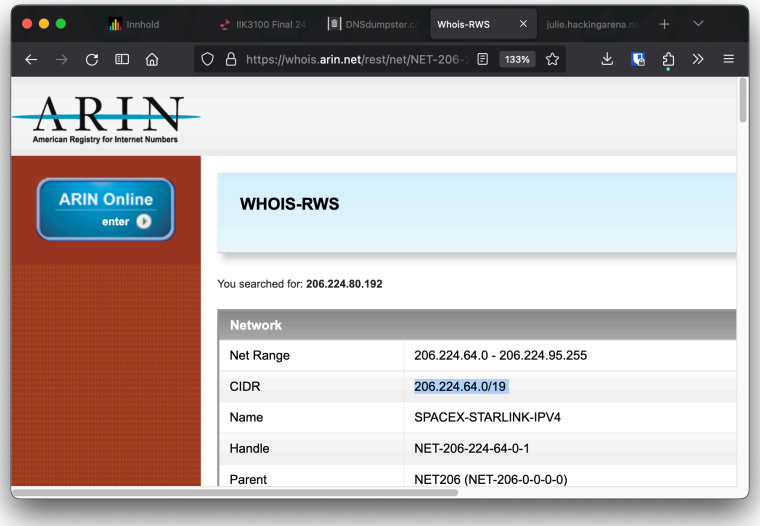
Can you find the main SpaceX - Starlink ipv4 network range? Write it in CIDR format!

Solution:

For this task I looked up starlink.com on dnsdumpster and found an ip hosted from SpaceX - Starlink.



After finding the ip I looked it up on ARIN and found the network range:



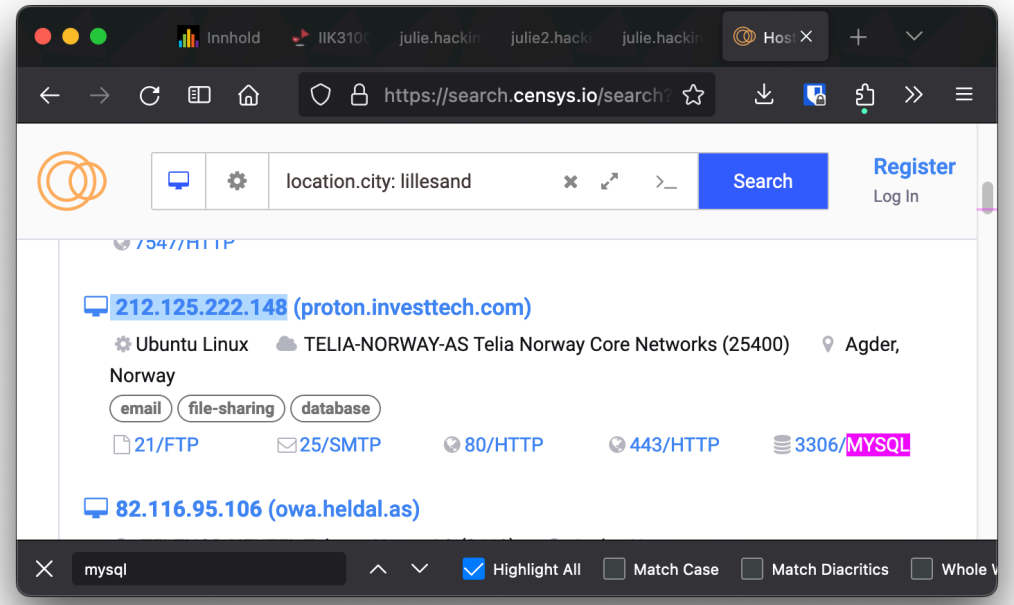
2.2 Mysql in Lillesand (30p)

There are 3 mysql services available in Lillesand, can you find the ip of one of them?

Don't portscan anyone! Use only open source tools!

Solution:

For this task I used search.censys.io to search for mysql services located in Lillesand.



3 Network mapping

3.1 Open ports (40p)

Check the open ports on julie2.hackingarena.no in the range 6000-7000. What is the sum of the open port numbers? If only port 6000 and 6001 are open, the answer is 12001.

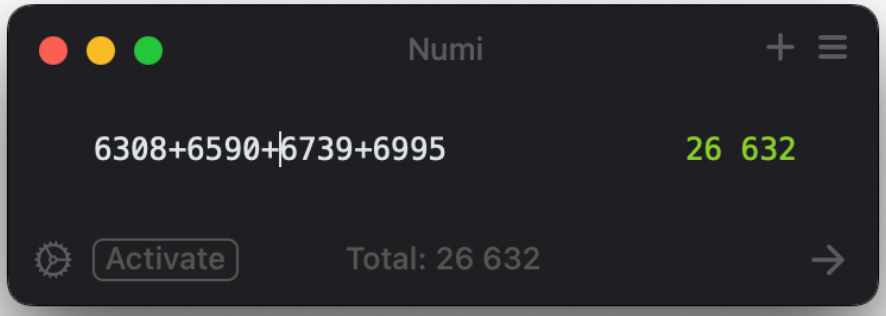
Solution:
Using nmap I started a port scan using TCP connect on the range 6000 to 7000, and found four open ports.

```
❯ nmap -sT -p6000-7000 julie2.hackingarena.no
Starting Nmap 7.94 ( https://nmap.org ) at 2023-11-24 10:19 CET
Nmap scan report for julie2.hackingarena.no (129.241.150.68)
Host is up (0.0091s latency).
Not shown: 997 closed tcp ports (conn-refused)
PORT     STATE SERVICE
6308/tcp open  unknown
6590/tcp open  unknown
6739/tcp open  unknown
6995/tcp open  unknown

Nmap done: 1 IP address (1 host up) scanned in 6.30 seconds

  / ~/Doc/emner-ntnu/II/practical-assignment / main !2 ?1
❯
```

Then adding the ports together I got the answer 26632.



4 Hash cracking

4.1 Hash 1 (20p)

I do believe I'll be a tail fin hero on Norwegian in 50 years :) I travelled on a plane a few years ago, when I had to create my password, so I used the name on the tail. Here's the hash: 4b57b34a1855d0d9137d36023156717c What was my password?

Solution:
I first gathered a list of the names of the people who are on the tail fin of Norwegian's planes.

Then using hashcat I cracked the hash using the wordlist I created from the list of names.

```
❯ hashcat -a0 -m0 "4b57b34a1855d0d9137d36023156717c" tailFinHero.txt --show
4b57b34a1855d0d9137d36023156717c:Sonja Henie

 / ~/Doc/emner-ntnu/II/practical-assignment / main !2 ?1
❯
```

The password was `Sonja Henie`.

4.2 Hash 2 (20p)

My last idea of inventing a brilliant hashing did not work. Many of you could crack it. But I don't give up, here's the new idea: I convert my password to hexa then I hash it, e.g:

Julie → 4A756C6965 → 19225f5d4e8beefd1bb5374a4a1b92f1

Here's my hash: 49c6a1526a77b34a64e2feaa7dffccd1

Solution:
I solved this task using a python script. First I imported the `rockyou` wordlist. Then I created a function that hashes a password using the same method as the hash in the task. Then I created a function that iterates over the passwords in the wordlist and compares the hashes, and if they match it returns the password.

```python
import hashlib
from itertools import product
from string import ascii_lowercase, ascii_uppercase

to_be_cracked = "49c6a1526a77b34a64e2feaa7dffccd1"
passwd_list = open("rockyou.txt", "r", encoding="latin-1").readlines()

def hash(password: str) -> str:
    passwd = password.encode('utf-8')  # encode to utf-8
    hexa = passwd.hex().upper()  # convert to hexadecimal and uppercase
    hashed = hashlib.md5(hexa.encode('utf-8')).hexdigest() # hash the hexadecimal
    return hashed

def crack(h: str) -> str:
    for passwd in passwd_list: # iterate over the passwords
        passwd = passwd.strip() # remove whitespaces
        if hash(passwd) == h: # compare the hashes
            return passwd # return the password

print(crack(to_be_cracked)) # print the cracked password
```

The password was `Shine`.

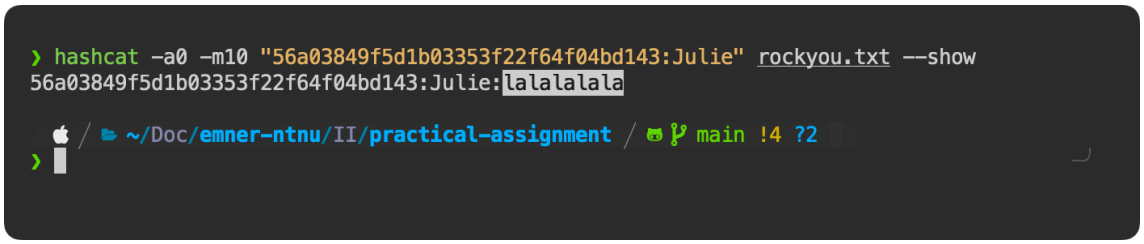
4.3 Hash 3 (30p)

I managed to dump the users table :)

id, user, pwd, salt 1, admin, 610a2ee688cda9e724885e23cd2cfdee, key 33, sam, 56a03849f5d1b03353f22f6
Julie

Can you tell me what is Sam's password. I know him a bit, he's crazy about Take that and the song Julie. How lucky he is, his salt is also Julie.

Solution:
To solve this tash I used hashcat with the hash mode for md5($pass.$salt) and the rockyou wordlist. Running the command
`hashcat -a0 -m10 "56a03849f5d1b03353f22f64f04bd143:Julie" rockyou.txt` resulted in the following output:



The password was `lalalalala`.

5 Get in touch with services

5.1 5th challenge (80p)

Ladies and gentlemen, this is the 5th challenge.
A little bit of everything...
julie.hackingarena.no port 21000-21500

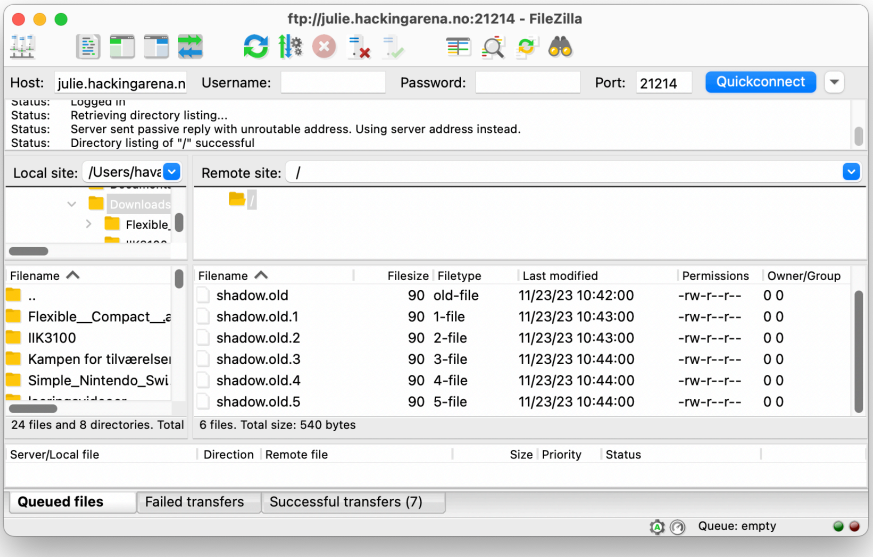
Solution:
First I ran a nmap port scan on the ports 21000-21500, and found a service running on port 21214. I also connected to the service using netcat and found that it was an FTP server.

```
❯ nmap -sT -p21000-21500 julie.hackingarena.no
Starting Nmap 7.94 ( https://nmap.org ) at 2023-11-24 11:39 CET
Nmap scan report for julie.hackingarena.no (129.241.150.81)
Host is up (0.045s latency).
Not shown: 500 closed tcp ports (conn-refused)
PORT      STATE SERVICE
21214/tcp open  unknown

Nmap done: 1 IP address (1 host up) scanned in 2.97 seconds
❯ ncat julie.hackingarena.no 21214
220 (vsFTPd 3.0.3)
^C

 / ~/Doc/emner-ntnu/II/practical-assignment / main !2 ?1
❯
```

I then connected to the FTP server annonymously with filezilla and found six files named `shadow.old`.



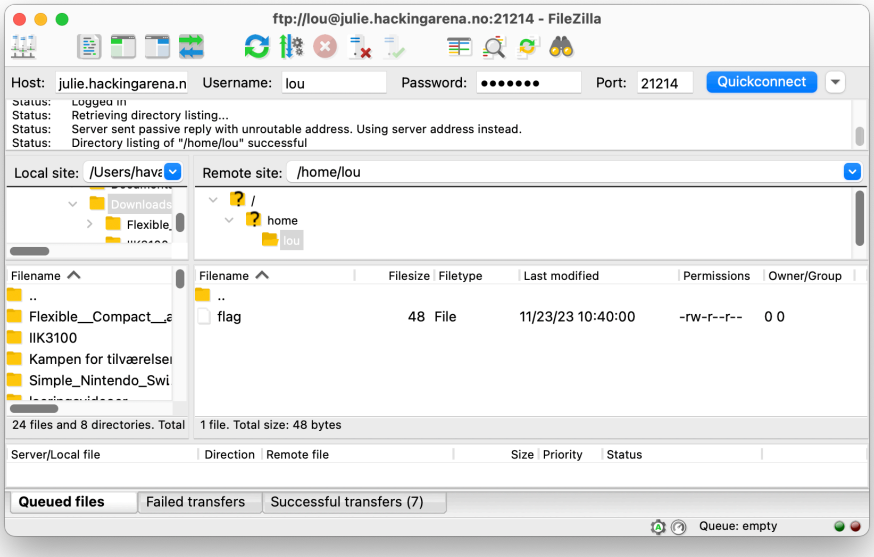
Opening the files revealed what looked like some hashed login credentials. I used https://www.dcode.fr/md5-hash to crack the hashes and found the following credentials:

```
> shadow.old
lou:Mary
> shadow.old.1
lou:Sandra
> shadow.old.2
lou:Tina
> shadow.old.3
lou:Rita
> shadow.old.4
lou:Monica
> shadow.old.5
lou:Mary
```

Given the six names and the intro text to the task I connected that this was a reference to the song *Mambo No. 5* by Lou Bega. Looking at the chorus of the song I found one of the names that was not used in the hashes, `Jessica`.

```
[Chorus]
A little bit of Monica in my life
A little bit of Erica by my side
A little bit of Rita's all I need
A little bit of Tina's what I see
A little bit of Sandra in the sun
A little bit of Mary all night long
A little bit of Jessica, here I am
A little bit of you makes me your man (Ha!)
```

I then logged in to the FTP server with the username `lou` and the password `Jessica` and found the flag file.



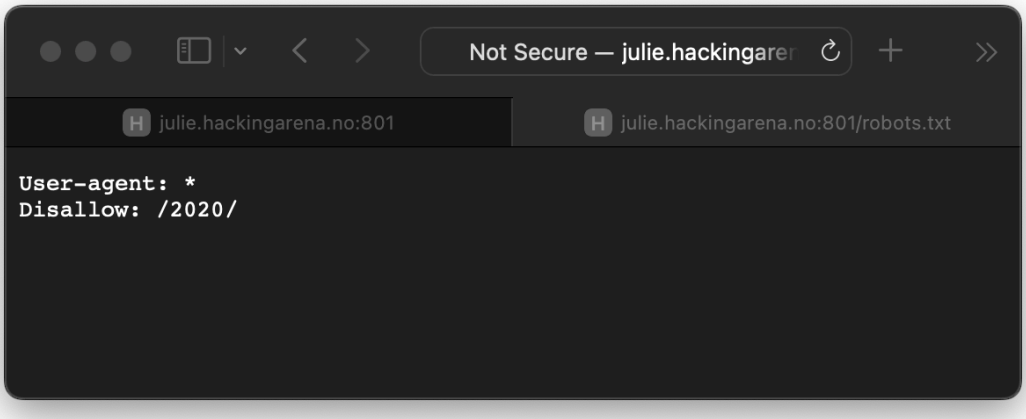
The flag was `Hacking-Arena{Everybody_in_come_on_let's_flag}}`.

6 Web hacking

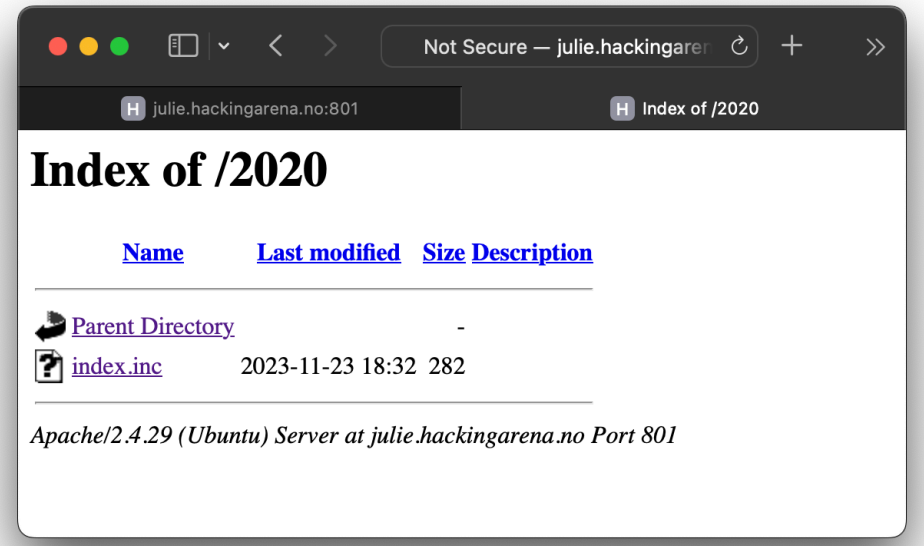
6.1 Unicorn 1 (Unfinished) (100p)

http://julie.hackingarena.no:801

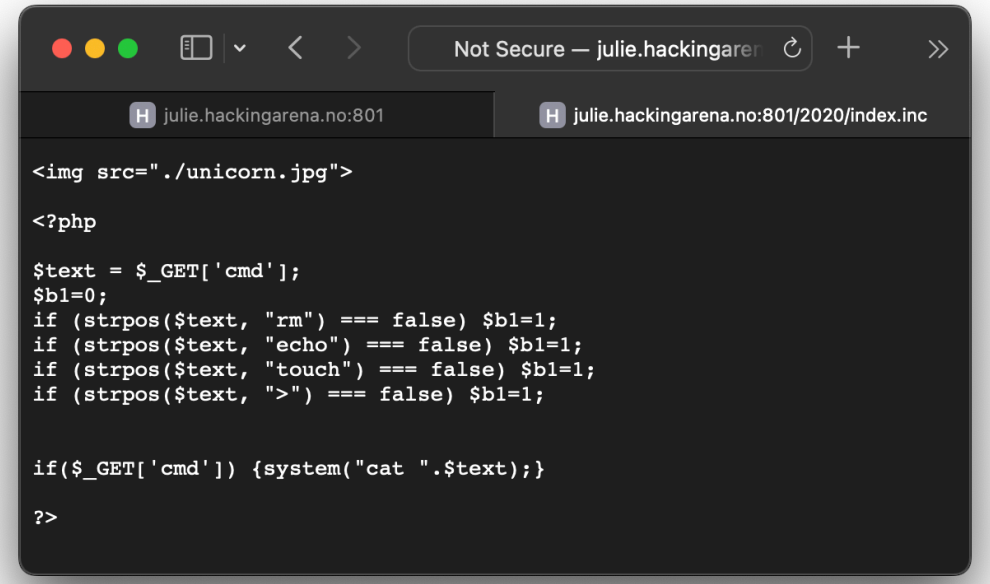
Solution:
Beginning this task was quite difficult. But I eventually managed to find the `robots.txt` file and the `2020` directory.



In the `2020` directory I found a file called `index.inc`.



It contained the following code:

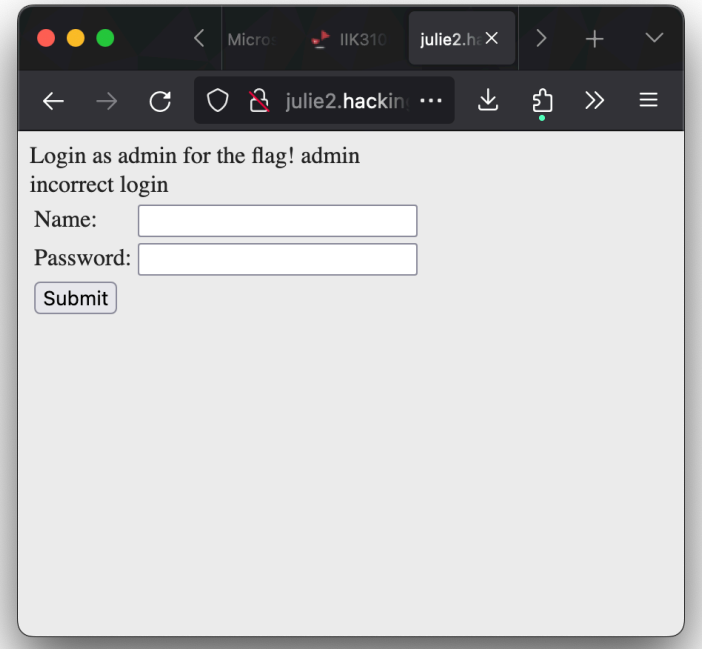


At this point I figured that the next step was to locate the flag file, but when searching known directories I couldn't find it. I figured that since everything passed to `cmd` was being added as arguments to `cat` all that was needed was the location of the flag file. But using commands like `ls -la` and `find / -name flag` didn't work either.

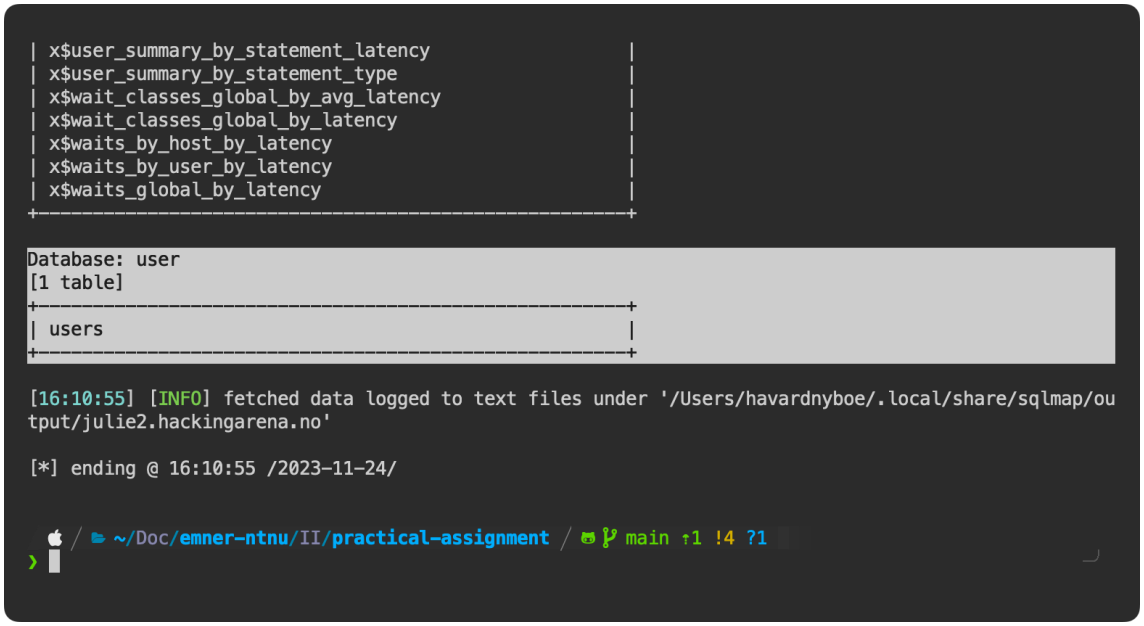
6.2 Tricky login (100p)

Well, this is a tricky login here:
http://julie2.hackingarena.no:803

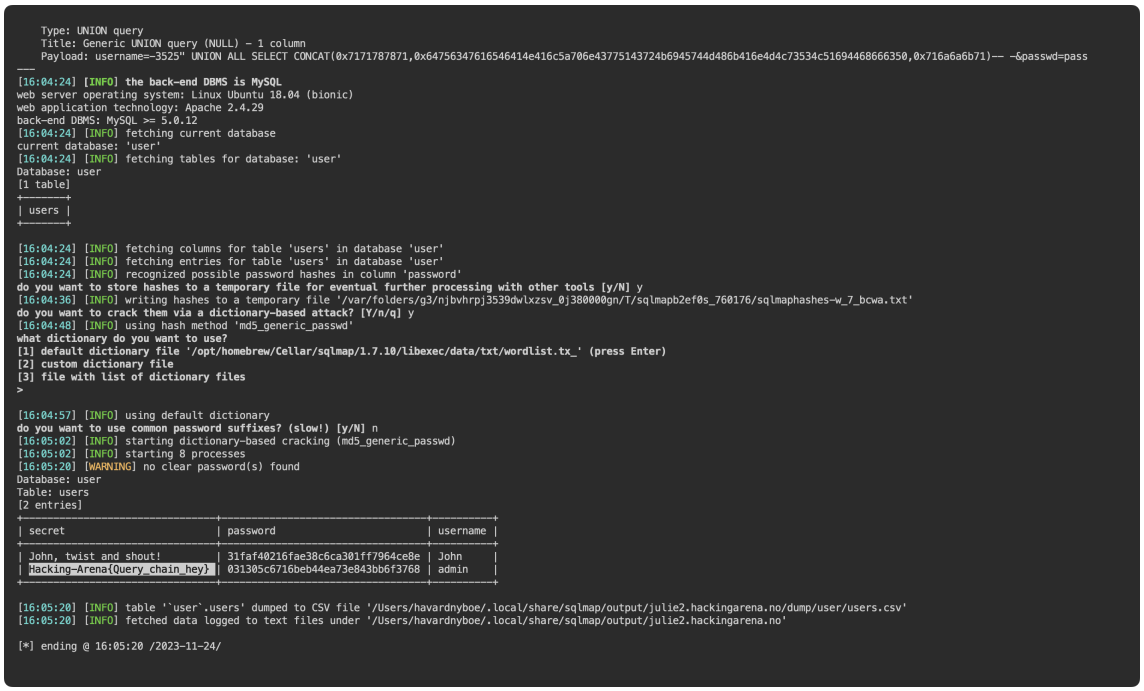
Solution:
When trying to login with the username `admin` and a random password I noticed that I got a output on the site. This indicated that the site might be vulnerable to an SQL injection.



Using sqlmap i tried to check for vulnerabilities with the command
`sqlmap -u "http://julie2.hackingarena.no:803" --data="username=admin&passwd=pass"`
but that didn't result in anything. So I tried to increase the level of the test with the command
`sqlmap -u "http://julie2.hackingarena.no:803" --data="username=admin&passwd=pass" --level=2` and that resulted in finding a vulnerability in the username field. I then ran the command
`sqlmap -u "http://julie2.hackingarena.no:803" --current-db --data="username=admin" --tables` to find the name of the database and the tables in it. This resulted in the following output:



Assuming the users were stored in the database `user` and the table `users` I ran the command `sqlmap -u "http://julie2.hackingarena.no:803" --current-db --data="username=admin" --tables -D user -T users --dump` to dump the users in the table `users` in the database `user`. After that I got a prompt asking if I wanted to crack the hashes of the passwords for the users. I proceeded with that and using the default dictionary file from sqlmap I got the following output:



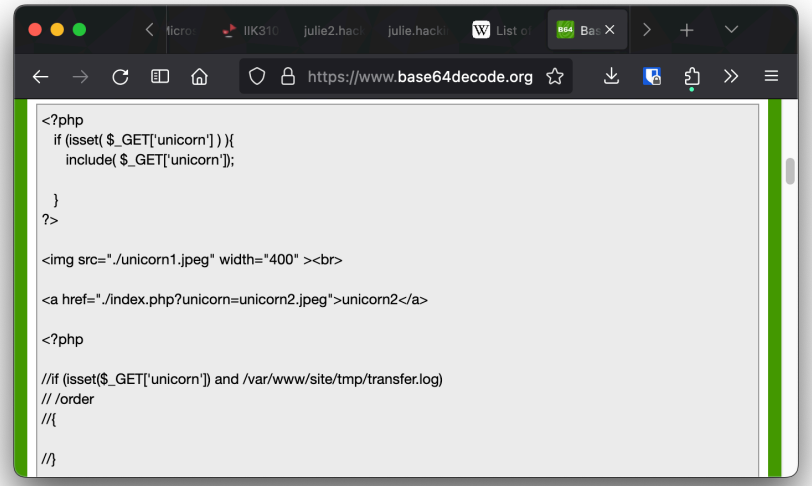
The flag was the password for the user `admin`, which was `Hacking-Arena{Query_chain_hey}`.

6.3 Order a Unicorn (100p)

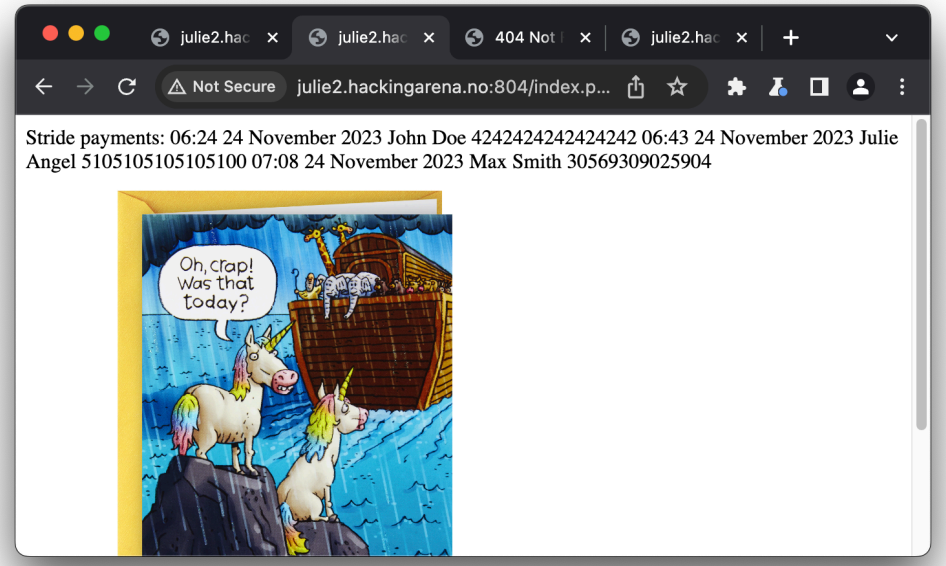
Do you want to order a Unicorn?
Well, let's try it: http://julie2.hackingarena.no:804

Solution:
First I used the php filter `php://filter/convert.base64-encode/resource=index.php` to get the base64 encoded source code of the index.php file.

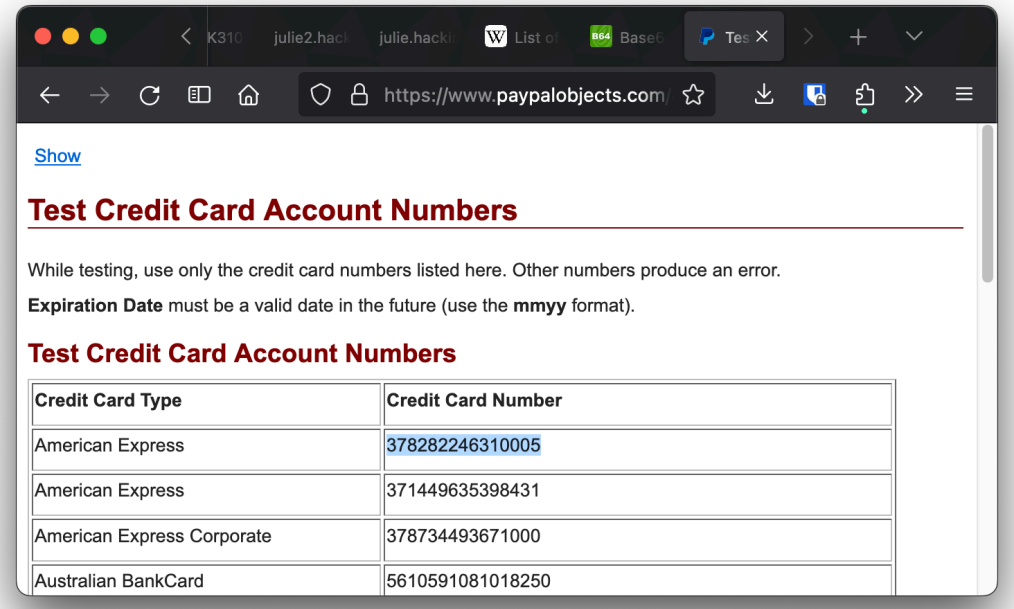
Then I decoded it and found the following code:



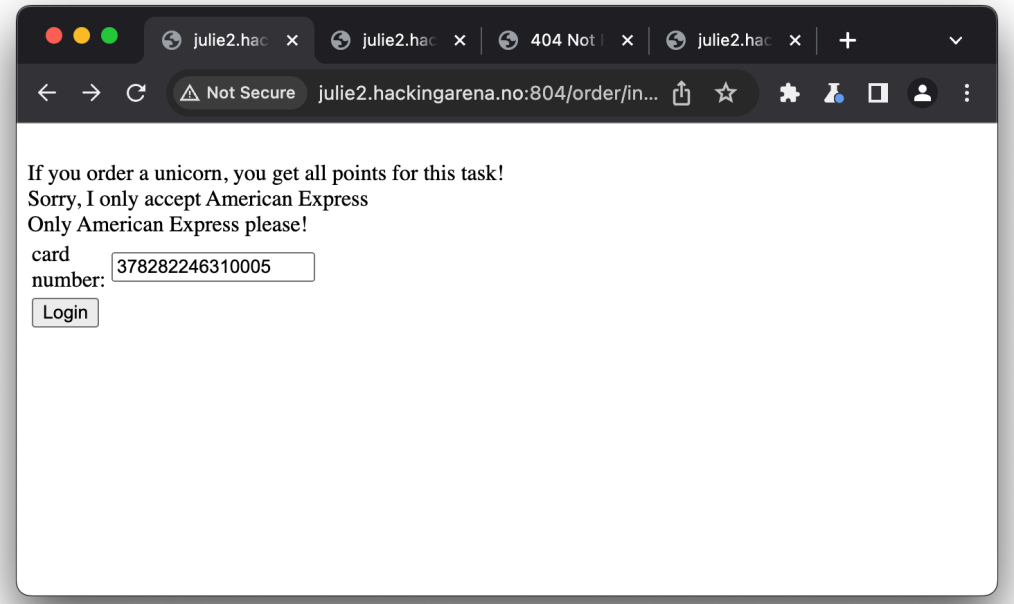
I then looked at the `/var/www/site/tmp/transfer.log` that was revealed by the source code and found the following stride payment records:



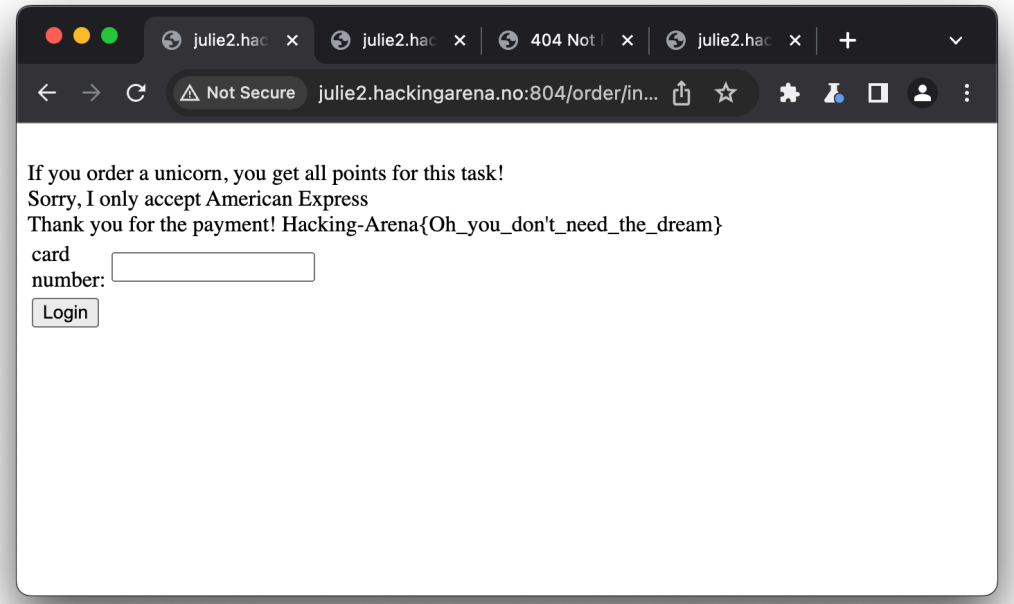
I then when to the `/order` page and tried to order a unicorn with the card numbers from the stride payment records. But since none of them worked I started looking for example card numbers online and found a list from paypal test credit cards.



I then tried to order a unicorn with the card number 378282246310005...



...and got the flag.



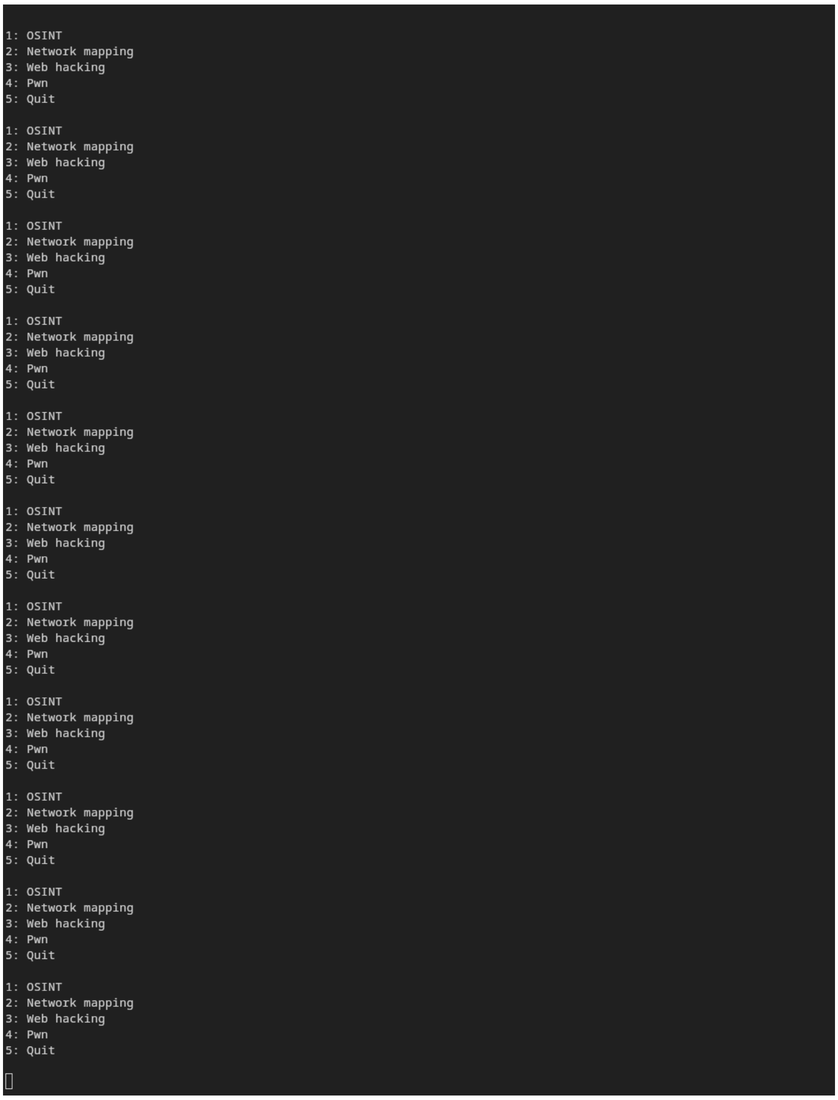
7 Pwn

7.1 Secrethint (Unfinished) (120p)

Can you exploit the stack overflow?

`nc julie.hackingarena.no 821`

Solution:
Beginning this task was quite difficult since the binary could not be run on my computer as I was using and M1 Apple Silicon ARM processor. So I had to switch to a different computer to run the binary. While running the binary I didn't manage to get the program to return a segmenation fault, or any other error for that matter. But when providing a non-integer input I got the program to start what seemed like an infinite print loop.



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