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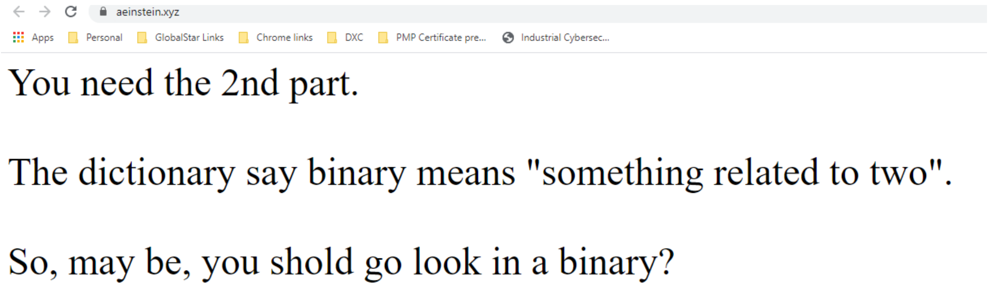
Question-1

Flag Captured: **4621_ctf{not_a11_sh4rks_mak3_y0u_cry_s0me_l3t_y0u_spy}**

Opened the dump.pcapng file in wireshark. Used Find a packet option in Wireshark and searched for the text 'ctf' because we know that the flag format is 4621_ctf. Using this option I found the packet 9745 in which the first part of the flag is found 1 of 2: 4621_ctf{not_a11_sh4rks_mak3_y0u_

To find the second part of the flag. I further investigated the packet 9745. This packet seems to be a response sent by the url http://aeinstein.xyz

The website showed this message,

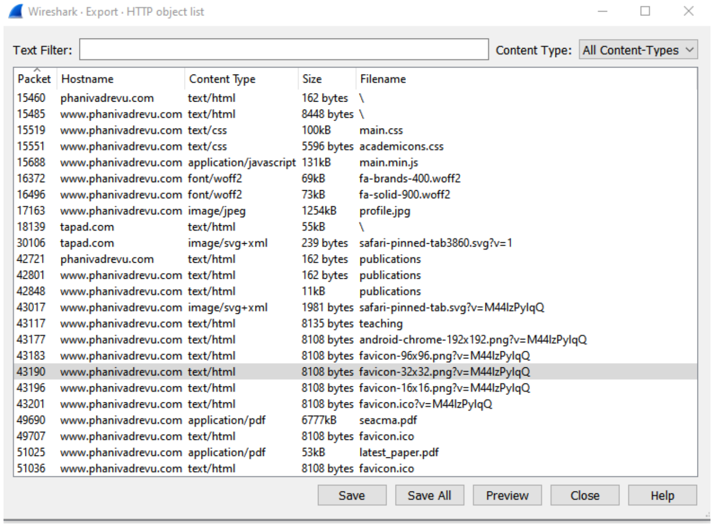


You need the 2nd part.

The dictionary say binary means "something related to two".

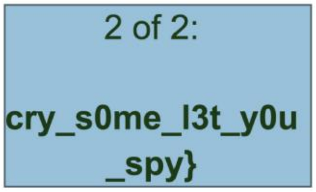
So, may be, you shold go look in a binary?

Which gives a hint to look in the binary. To export all the files transferred in the network traffic Wireshark has an option File → Export Objects → http. This option gave the HTTP Object list.



Packet	Hostname	Content Type	Size	Filename
15460	phanivadrevu.com	text/html	162 bytes	\
15485	www.phanivadrevu.com	text/html	8448 bytes	\
15519	www.phanivadrevu.com	text/css	100kB	main.css
15551	www.phanivadrevu.com	text/css	5596 bytes	academicons.css
15688	www.phanivadrevu.com	application/javascript	131kB	main.min.js
16372	www.phanivadrevu.com	font/woff2	69kB	fa-brands-400.woff2
16496	www.phanivadrevu.com	font/woff2	73kB	fa-solid-900.woff2
17163	www.phanivadrevu.com	image/jpeg	1254kB	profile.jpg
18139	tapad.com	text/html	55kB	\
30106	tapad.com	image/svg+xml	239 bytes	safari-pinned-tab3860.svg?v=1
42721	phanivadrevu.com	text/html	162 bytes	publications
42801	www.phanivadrevu.com	text/html	162 bytes	publications
42848	www.phanivadrevu.com	text/html	11kB	publications
43017	www.phanivadrevu.com	image/svg+xml	1981 bytes	safari-pinned-tab.svg?v=M44lzPylqQ
43117	www.phanivadrevu.com	text/html	8135 bytes	teaching
43177	www.phanivadrevu.com	text/html	8108 bytes	android-chrome-192x192.png?v=M44lzPylqQ
43183	www.phanivadrevu.com	text/html	8108 bytes	favicon-96x96.png?v=M44lzPylqQ
43190	www.phanivadrevu.com	text/html	8108 bytes	favicon-32x32.png?v=M44lzPylqQ
43196	www.phanivadrevu.com	text/html	8108 bytes	favicon-16x16.png?v=M44lzPylqQ
43201	www.phanivadrevu.com	text/html	8108 bytes	favicon.ico?v=M44lzPylqQ
49690	www.phanivadrevu.com	application/pdf	6777kB	seacma.pdf
49707	www.phanivadrevu.com	text/html	8108 bytes	favicon.ico
51025	www.phanivadrevu.com	application/pdf	53kB	latest_paper.pdf
51036	www.phanivadrevu.com	text/html	8108 bytes	favicon.ico

I saved all the Files and was able to find the second part of the flag in the pdf file latest_paper.pdf



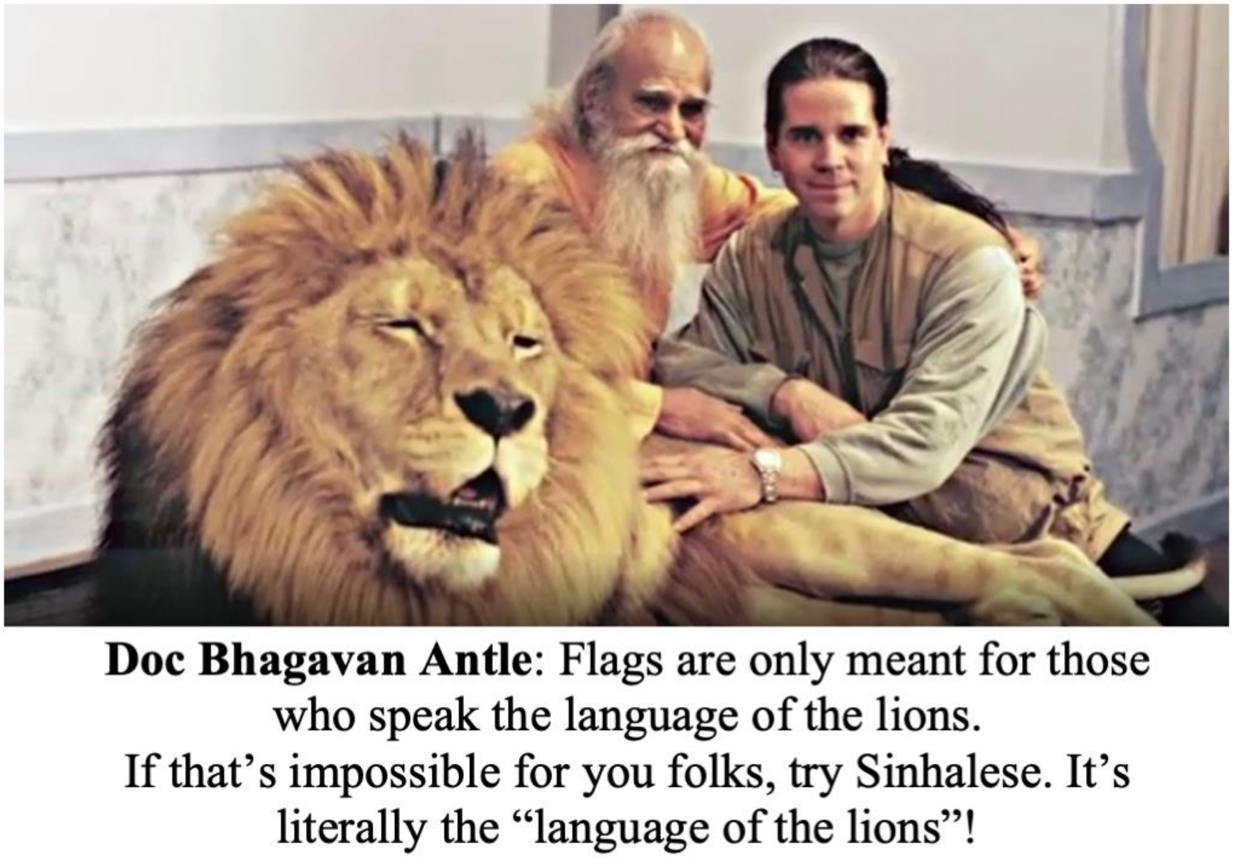
2 of 2:

cry_s0me_l3t_y0u
_spy}

Question-2

Flag Captured: **4621_ctf{tiger_king_is_the_new_thing}**

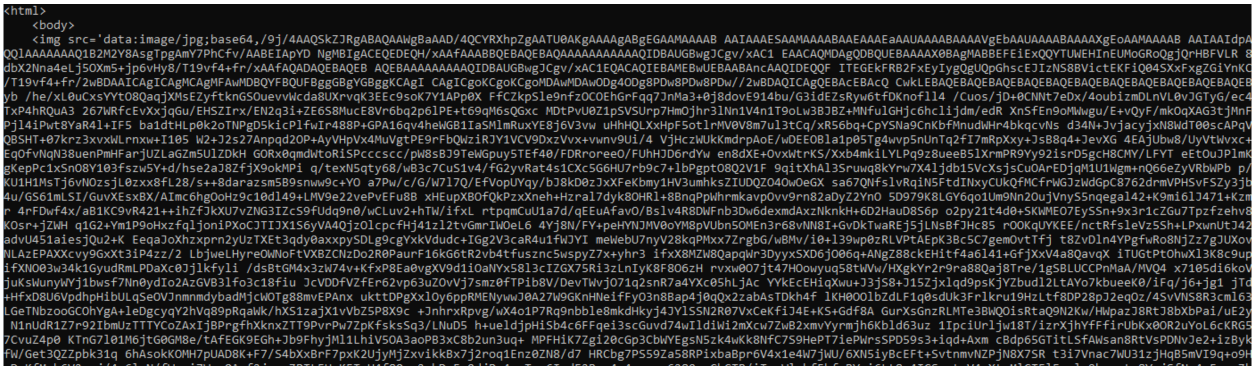
This is a website header changing CTF challenge. The website given http://a3-q2.unoprivateers.xyz/ showed the below picture



Doc Bhagavan Antle: Flags are only meant for those who speak the language of the lions.
If that's impossible for you folks, try Sinhalese. It's literally the "language of the lions"!

This website just had a picture saying speak language of lions which is the language of Sinhalese. So I tried sending a curl request by changing the header Accept-Language: si.

Curl -H "Accept-Language: si" http://a3-q2.unoprivateers.xyz/



```
<html>
    <body>
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QQlAAAAAAAQ1B2M2Y8AsgTpgAmY7PhCfv/AABEIApYD NgMBIgACEQEDEQH/xAAfAAABBQEBAQEBAQAAAAAAAAAAAQIDBAUGBwgJCgv/xAC1 EAACAQMDAgQDBQUEBAAAAX0BAgMABBEFEiExQQYTUWEHInEUMoGRoQgjQrHBFVLR 8
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yb /he/xL0uCxsYYtO8QaqjXMsEZyftknGSOuevvWcda8UXrvqK3EEc9soK7Y1APp0X FfCZkpSle9nfzOCOEhGrFqq7JnMa3+0j8dovE914bu/G3idEZsRyw6tfDKnofll4 /Cuos/jD+0CNNt7eDx/4oubizmDLnVL0vJGTyG/ec4
TxP4hRQuA3 267WRfcEvXxjqGu/EHSZIrx/EN2q3i+ZE6S8MucE8Vr6bq2p6lPE+t69qM6sQGxc MDtPvU0Z1pSVSUrp7HmOjhr3lNn1V4n1T9oLw3BJBZ+MNfulGHjc6hclijdm/edR XnSfEn9oMWwgu/E+vQyF/mkOqXAG3tjMnF
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```
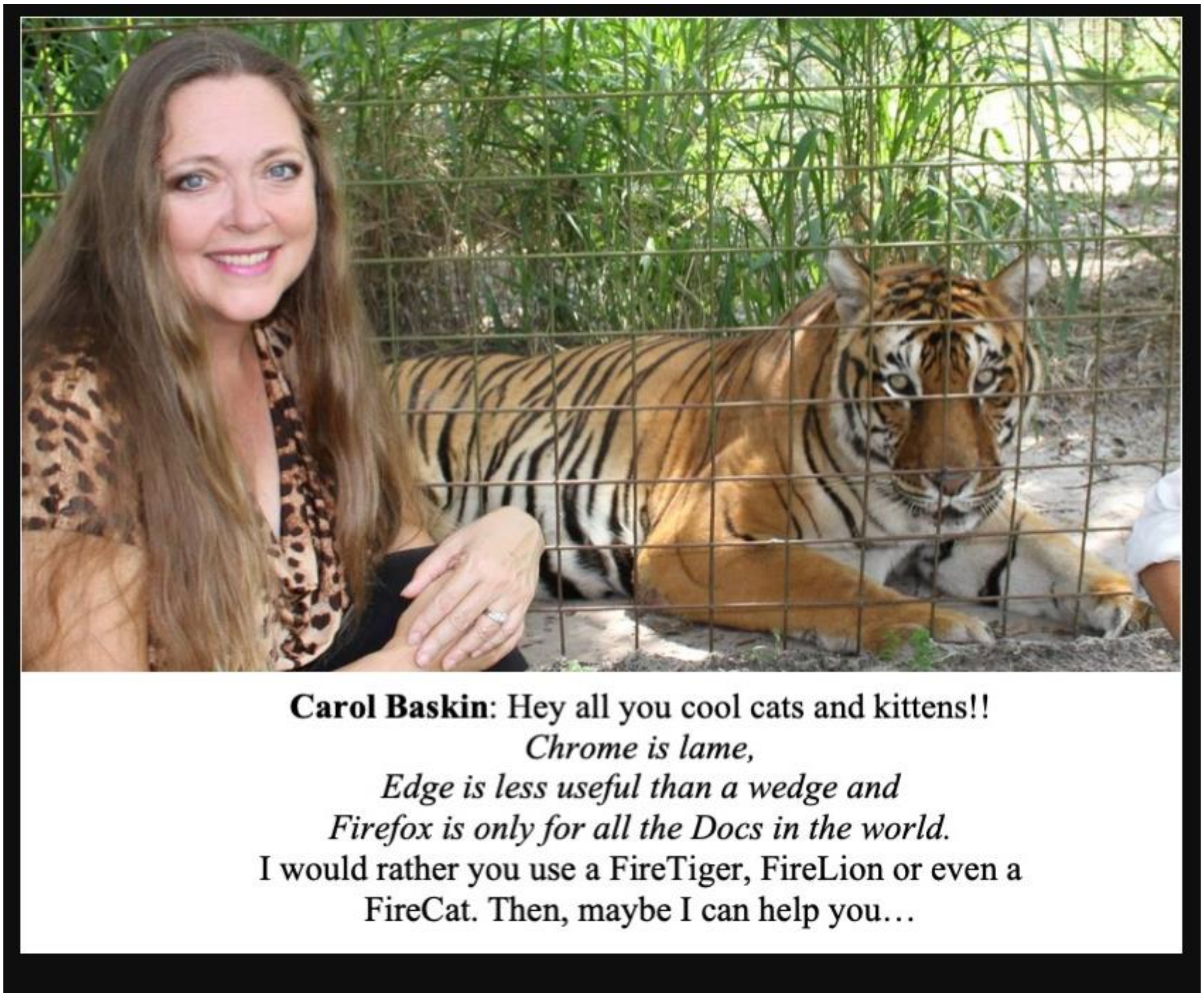

I got an image with Carol Baskin

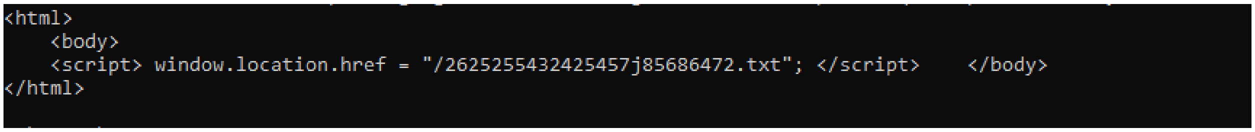


Carol Baskin: Hey all you cool cats and kittens!!
Chrome is lame,
Edge is less useful than a wedge and
Firefox is only for all the Docs in the world.
I would rather you use a FireTiger, FireLion or even a
FireCat. Then, maybe I can help you…

This hint says do not use any normal browser. Which means I need to change the User-Agent header. I tried sending a curl request with Header option FireTiger, FireLion and FireCat.

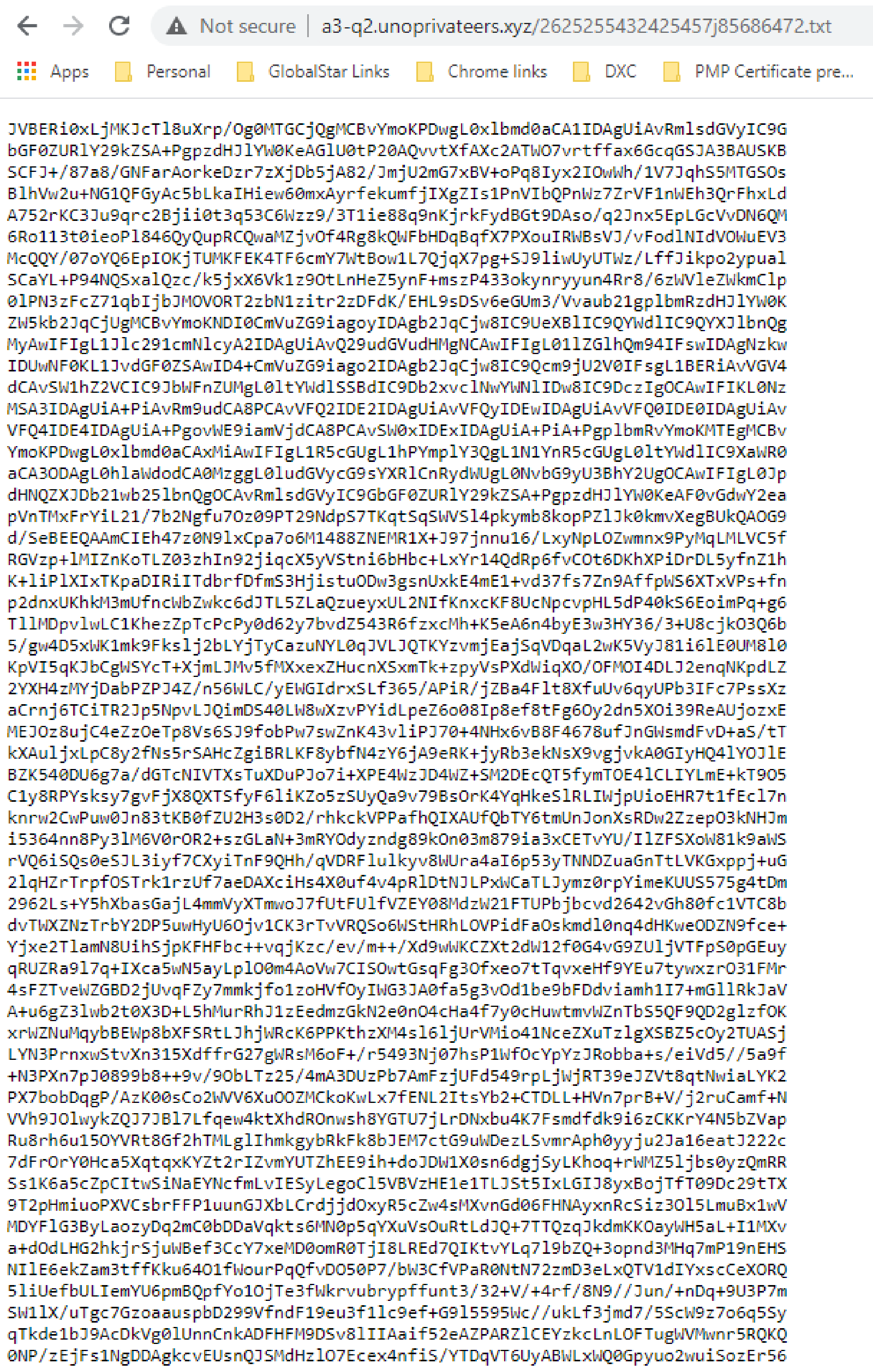
curl -H "Accept-Language: si" -A User-Agent:FireCat [*http://a3-q2.unoprivateers.xyz/*](http://a3-q2.unoprivateers.xyz/)

When I used the User-Agent FireCat I got a different response as shown below



```
<html>
    <body>
    <script> window.location.href = "/2625255432425457j85686472.txt"; </script>    </body>
</html>
```

I got a reference to a txt file with some random base64 characters



```
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+N3PXn7pJ0899b/b/UwPb87AmFzjUFd549rpLjWjRT39eJZVt8qtNwiaLYK2
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VVh9JOlwykZQJ7JBl7Lfqew4ktXhdROnwsh8YGTU7jLrDNxbu4K7Fsmdfdk9i6zCKKrY4N5bZVap
Ru8rh6u15OYVRt8Gf2hTMLglIhmkgybRkFk8bJEM7ctG9uWDezLSvmrAph0yyju2Ja16eatJ222c
7dFrOrY0Hca5XqtqxKYZt2rIZvmYUTZhEE9ih+doJDW1X0sn6dgjSyLKhoq+rWMZ5ljbs0yzQmRR
Ss1K6a5cZpCItwSiNaEYNcfmLvIESyLegoCl5VBVzHE1e1TLJSt5IxLGIJ8yxBojTfT09Dc29tTX
9T2pHmiuoPXVCsbrFFP1uunGJXbLCrdjjdOxyR5cZw4sMXvnGd06FHNAyxnRcSiz3Ol5LmuBx1wV
MDYFlG3ByLaozyDq2mC0bDDaVqkts6MN0p5qYXuVsOuRtLdJQ+7TTQzqJkdmKKOayWH5aL+I1MXv
a+dOdLHG2hkjrSjuWBef3CcY7xeMD0omR0TjI8LREd7QIKtvYLq7l9bZQ+3opnd3MHq7mP19nEHS
NIlE6ekZam3tffKku64O1fWourPqQfvDO50P7/bW3CfVPaR0NtN72zmD3eLxQTV1dIYxscCeXORQ
5liUefbULIemYU6pmBQpfYo1OjTe3fWkrvubypbrpff/+N9//8N9//Jun/+nDq+9U3P7m/5sc
SW1lX/uTgc7GzoaausDGzoaauspbD299VfndF19+eu3+G9l5595Wc//ukLf3jmd7/5ScW9z7o6q5Sy
qTkde1bJ9AcDkVg0lUnnCnkADFHFM9DSv8lIIAaif52eAZPARZlCEYzkcLnLOFTugWVMwnr5RQKQ
0NP/zEjFs1NgDDAgkcvEUsnQJSMdHzl07OAyp/YTDqVT6UyABWLxWQ0GpyuoSozEr56
```
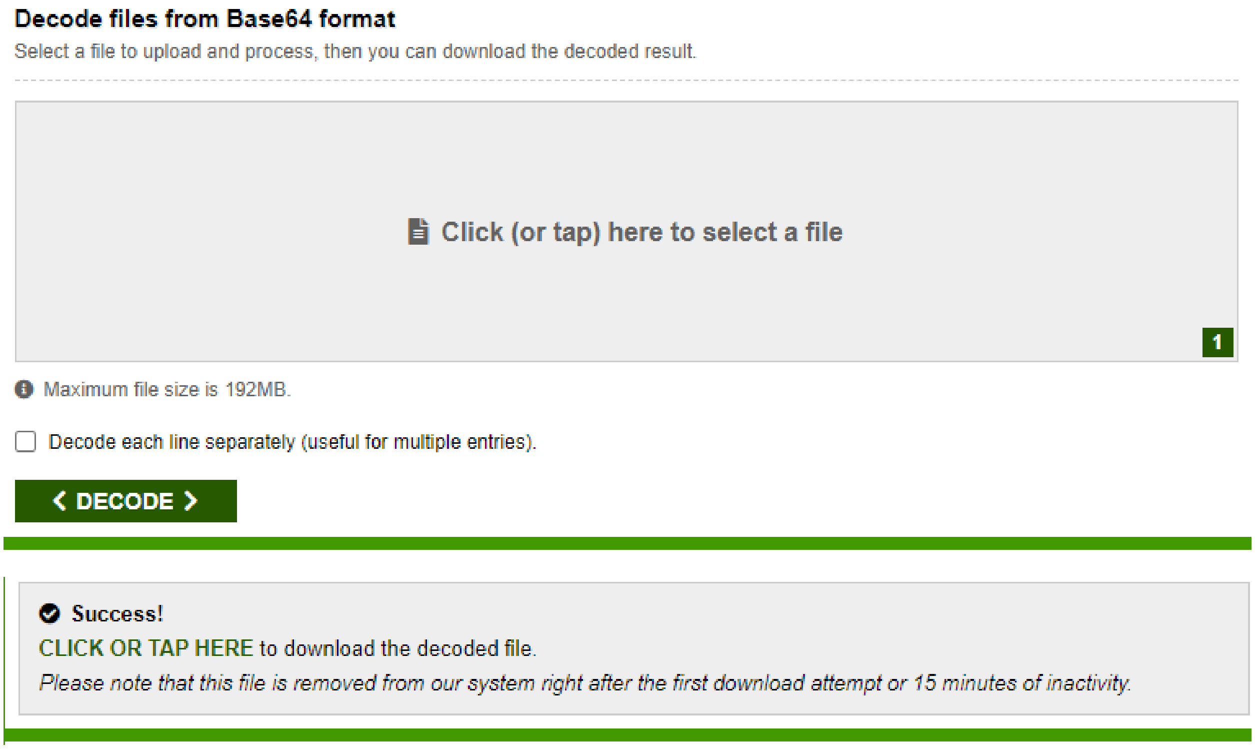

I saved this text file and used a online base64 decoder https://www.base64decode.org/ uploaded the file into this website



Decode files from Base64 format

Select a file to upload and process, then you can download the decoded result.

Click (or tap) here to select a file

Maximum file size is 192MB.

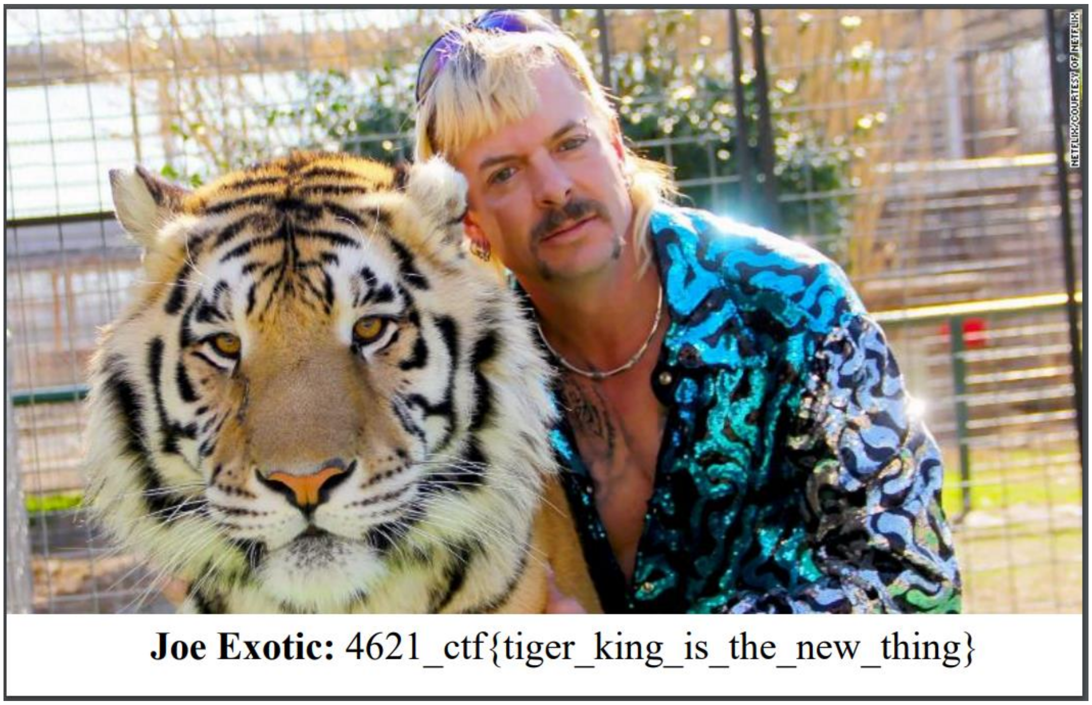
□ Decode each line separately (useful for multiple entries).

Success!

CLICK OR TAP HERE to download the decoded file.

Please note that this file is removed from our system right after the first download attempt or 15 minutes of inactivity.

and I got a decoded pdf file which when opened showed me the flag for this challenge

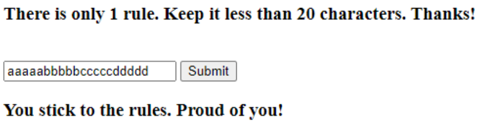


Joe Exotic: 4621_ctf{tiger_king_is_the_new_thing}

Question-3

Flag captured: **4621_ctf{rul3_breakers_r_fl4g_t4ker5}**

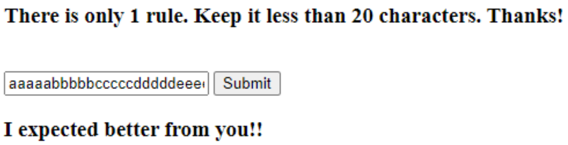
This is a JavaScript task. Using Chrome developer options source tab I was able to see the JavaScript used to render the response text on the page.



There is only 1 rule. Keep it less than 20 characters. Thanks!

aaaaabbbbbccccddddd Submit

You stick to the rules. Proud of you!



There is only 1 rule. Keep it less than 20 characters. Thanks!

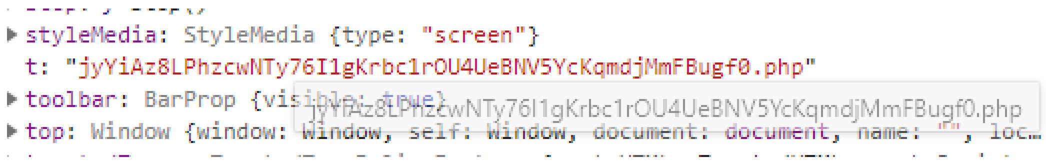
aaaaabbbbbcccccddddeee Submit

I expected better from you!!

The website renders a h3 element based on the input text's length. If the input length is less than 20 it displays "*You stick to the rules*" else "*I expect better from you*"

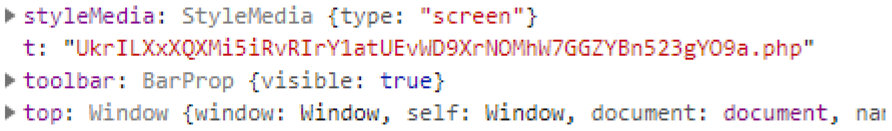
To understand how it is rendering these outputs I started adding breakpoints in the script and started debugging the code. The function se(u,x) seems to be the main function in the script. This function based on the length of the input text it calls a different .php file.

If length less than 20 `jyYiAz8LPhzcwNTy76I1gKrbc1rOU4UeBNV5YcKqmdjMmFBugf0.php` is called else `UkrILXxXQXMi5iRvRIrY1atUEvWD9XrNOMhW7GGZYBn523gYO9a.php` is called



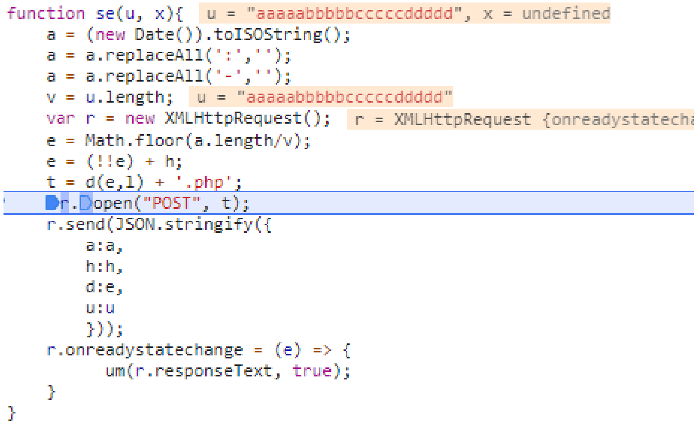
```
▶ styleMedia: StyleMedia {type: "screen"}
  t: "jyYiAz8LPhzcwNTy76I1gKrbc1rOU4UeBNV5YcKqmdjMmFBugf0.php"
▶ toolbar: BarProp {visible: true}
▶ top: Window {window: Window, self: Window, document: document, name: "", loc…
```

jyYiAz8LPhzcwNTy76I1gKrbc1rOU4UeBNV5YcKqmdjMmFBugf0.php



```
▶ styleMedia: StyleMedia {type: "screen"}
  t: "UkrILXxXQXMi5iRvRIrY1atUEvWD9XrNOMhW7GGZYBn523gYO9a.php"
▶ toolbar: BarProp {visible: true}
▶ top: Window {window: Window, self: Window, document: document, na
```

I assumed to get the Flag; I should call the `jyYiAz8LPhzcwNTy76I1gKrbc1rOU4UeBNV5YcKqmdjMmFBugf0.php` service with a proper input parameter.

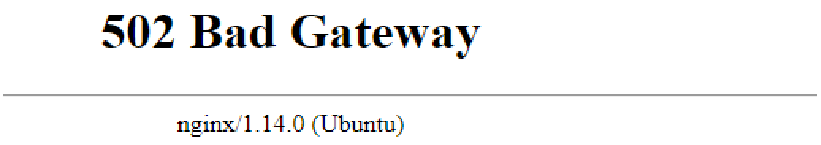


```
function se(u, x){  u = "aaaaabbbbbccccddddd", x = undefined
    a = (new Date()).toISOString();
    a = a.replaceAll(':','');
    a = a.replaceAll('-','');
    v = u.length;  u = "aaaaabbbbbccccddddd"
    var r = new XMLHttpRequest();  r = XMLHttpRequest {onreadystatecha
    e = Math.floor(a.length/v);
    e = (!!e) + h;
    t = d(e,l) + '.php';
    r.open("POST", t);
    r.send(JSON.stringify({
        a:a,
        h:h,
        d:e,
        u:u
        }));
    r.onreadystatechange = (e) => {
         um(r.responseText, true);
    }
}
```

But if I use the input box in the website I will not be calling the php script that I want always. So to bypass this behavior, I wrote my own function ac_lt_func(text) similar to se(u,x) and tried to call the `jyYiAz8LPhzcwNTy76I1gKrbc1rOU4UeBNV5YcKqmdjMmFBugf0.php` This function which I wrote always calls the php script which runs when input length is less than 20 with the POST parameters a,h,d,u

```
function ac_lt_func(inp)
{
    a = (new Date()).toISOString();
    a = a.replaceAll(':',");
    a = a.replaceAll('-',");
    //Skipping the part of verifying length
    h = 'rules.unoprivateers.xyz';
    // setting e to true
    e = 'true' + h;
    u = inp;
    t = 'jyYiAz8LPhzcwNTy76I1gKrbc1rOU4UeBNV5YcKqmdjMmFBugf0.php';
    var r = new XMLHttpRequest();
    r.open("POST", t);
    r.send(JSON.stringify({
        a:a,
        h:h,
        d:e,
        u:u
        }));
    r.onreadystatechange = (e) => {
          um(r.responseText, true);
    }
}
```

The server is currently returning 502 Gateway error. So, I could not take a screenshot of the working of this JavaScript that I wrote. Luckily, I noted down the Flag earlier



502 Bad Gateway

nginx/1.14.0 (Ubuntu)