Information Disclosure (with a twist of SQLi)

As already discussed, security-related inefficiencies or misconfigurations in a web service or API can result in information disclosure.

When assessing a web service or API for information disclosure, we should spend considerable time on fuzzing.

Information Disclosure through Fuzzing

Proceed to the end of this section and click on `Click here to spawn the target system!` or the `Reset Target` icon. Use the provided Pwnbox or a local VM with the supplied VPN key to reach the target API and follow along.

Suppose we are assessing an API residing in `http://<TARGET IP>:3003`.

Maybe there is a parameter that will reveal the API's functionality. Let us perform parameter fuzzing using *ffuf* and the burp-parameter-names.txt list, as follows.

Information Disclosure (with a twist of SQLi)

```
MisaelMacias@htb[/htb]$ ffuf -w "/home/htb-acxxxxx/Desktop/Useful Repos/SecLists/Discovery/Web-Content/burp-parameter-

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

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 :: Method           : GET
 :: URL              : http://<TARGET IP>:3003/?FUZZ=test_value
 :: Wordlist         : FUZZ: /home/htb-acxxxxx/Desktop/Useful Repos/SecLists/Discovery/Web-Content/burp-parameter-name
 :: Follow redirects : false
 :: Calibration      : false
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200,204,301,302,307,401,403,405
________________________________________________

:: Progress: [40/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errorpassword               [Status: 200,
:: Progress: [40/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errorurl                  [Status: 200,
:: Progress: [41/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errorc                    [Status: 200,
:: Progress: [42/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errorid                   [Status: 200,
:: Progress: [43/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Erroremail                [Status: 200,
:: Progress: [44/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errortype                 [Status: 200,
:: Progress: [45/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errorusername             [Status: 200,
:: Progress: [46/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errorq                    [Status: 200,
:: Progress: [47/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errortitle                [Status: 200,
:: Progress: [48/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errordata                 [Status: 200,
:: Progress: [49/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errordescription          [Status: 200,
:: Progress: [50/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errorfile                 [Status: 200,
:: Progress: [51/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errormode                 [Status: 200,
:: Progress: [52/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errors                   [Status: 200,
:: Progress: [53/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errororder               [Status: 200,
:: Progress: [54/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errorcode               [Status: 200,
:: Progress: [55/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errorlang               [Status: 200,
```

We notice a similar response size in every request. This is because supplying any parameter will return the same text, not an error like 404.

Let us filter out any responses having a size of 19, as follows.

Information Disclosure (with a twist of SQLi)

```
MisaelMacias@htb[/htb]$ ffuf -w "/home/htb-acxxxxx/Desktop/Useful Repos/SecLists/Discovery/Web-Content/burp-parameter-

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

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________________________________________________

 :: Method           : GET
 :: URL              : http://<TARGET IP>:3003/?FUZZ=test_value
 :: Wordlist         : FUZZ: /home/htb-acxxxxx/Desktop/Useful Repos/SecLists/Discovery/Web-Content/burp-parameter-name
 :: Follow redirects : false
 :: Calibration      : false
 :: Timeout          : 10
 :: Threads          : 40
 :: Matcher          : Response status: 200,204,301,302,307,401,403,405
 :: Filter           : Response size: 19
________________________________________________

:: Progress: [40/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errors: 0 id                    [Status:
:: Progress: [57/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errors: 0
:: Progress: [187/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errors: 0
:: Progress: [375/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errors: 0
:: Progress: [567/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errors: 0
:: Progress: [755/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errors: 0
:: Progress: [952/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errors: 0
:: Progress: [1160/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errors:
:: Progress: [1368/2588] :: Job [1/1] :: 0 req/sec :: Duration: [0:00:00] :: Errors:
:: Progress: [1573/2588] :: Job [1/1] :: 1720 req/sec :: Duration: [0:00:01] :: Error
:: Progress: [1752/2588] :: Job [1/1] :: 1437 req/sec :: Duration: [0:00:01] :: Error
:: Progress: [1947/2588] :: Job [1/1] :: 1625 req/sec :: Duration: [0:00:01] :: Error
:: Progress: [2170/2588] :: Job [1/1] :: 1777 req/sec :: Duration: [0:00:01] :: Error
:: Progress: [2356/2588] :: Job [1/1] :: 1435 req/sec :: Duration: [0:00:01] :: Error
:: Progress: [2567/2588] :: Job [1/1] :: 2103 req/sec :: Duration: [0:00:01] :: Error
:: Progress: [2588/2588] :: Job [1/1] :: 2120 req/sec :: Duration: [0:00:01] :: Error
:: Progress: [2588/2588] :: Job [1/1] :: 2120 req/sec :: Duration: [0:00:02] :: Errors: 0 ::
```

? Go to Questions

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- XML External Entity (XXE) Injection
- Web Service & API Attacks - Skills Assessment

My Workstation

OFFLINE

Start Instance

∞ / 1 spawns left

It looks like *id* is a valid parameter. Let us check the response when specifying *id* as a parameter and a test value.

Information Disclosure (with a twist of SQLi)

```
MisaelMacias@htb[/htb]$ curl http://<TARGET IP>:3003/?id=1
[{"id":"1","username":"admin","position":"1"}]
```

Find below a Python script that could automate retrieving all information that the API returns (save it as `brute_api.py`).

Code: python

```python
import requests, sys

def brute():
    try:
        value = range(10000)
        for val in value:
            url = sys.argv[1]
            r = requests.get(url + '/?id='+str(val))
            if "position" in r.text:
                print("Number found!", val)
                print(r.text)
    except IndexError:
        print("Enter a URL E.g.: http://<TARGET IP>:3003/")

brute()
```

- We import two modules *requests* and *sys*. *requests* allows us to make HTTP requests (GET, POST, etc.), and *sys* allows us to parse system arguments.
- We define a function called *brute*, and then we define a variable called *value* which has a range of *10000*. *try* and *except* help in exception handling.
- *url = sys.argv[1]* receives the first argument.
- *r = requests.get(url + '/?id='+str(val))* creates a response object called *r* which will allow us to get the response of our GET request. We are just appending */?id=* to our request and then *val* follows, which will have a value in the specified range.
- *if "position" in r.text:* looks for the *position* string in the response. If we enter a valid ID, it will return the position and other information. If we don't, it will return *[]*.

The above script can be run, as follows.

Information Disclosure (with a twist of SQLi)

```
MisaelMacias@htb[/htb]$ python3 brute_api.py http://<TARGET IP>:3003
Number found! 1
[{"id":"1","username":"admin","position":"1"}]
Number found! 2
[{"id":"2","username":"HTB-User-John","position":"2"}]
...
```

Now you can proceed to the end of this section and answer the first question!

TIP: If there is a rate limit in place, you can always try to bypass it through headers such as X-Forwarded-For, X-Forwarded-IP, etc., or use proxies. These headers have to be compared with an IP most of the time. See an example below.

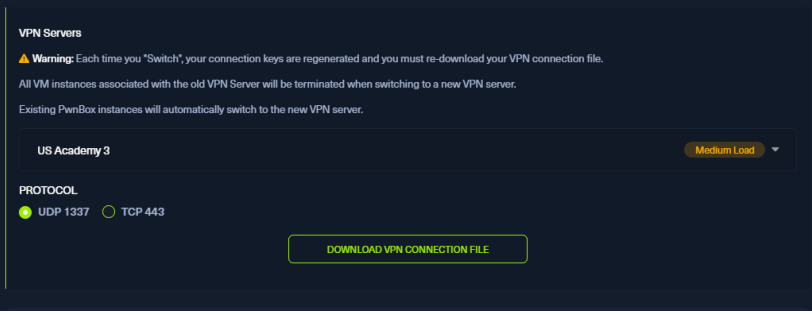
Code: php

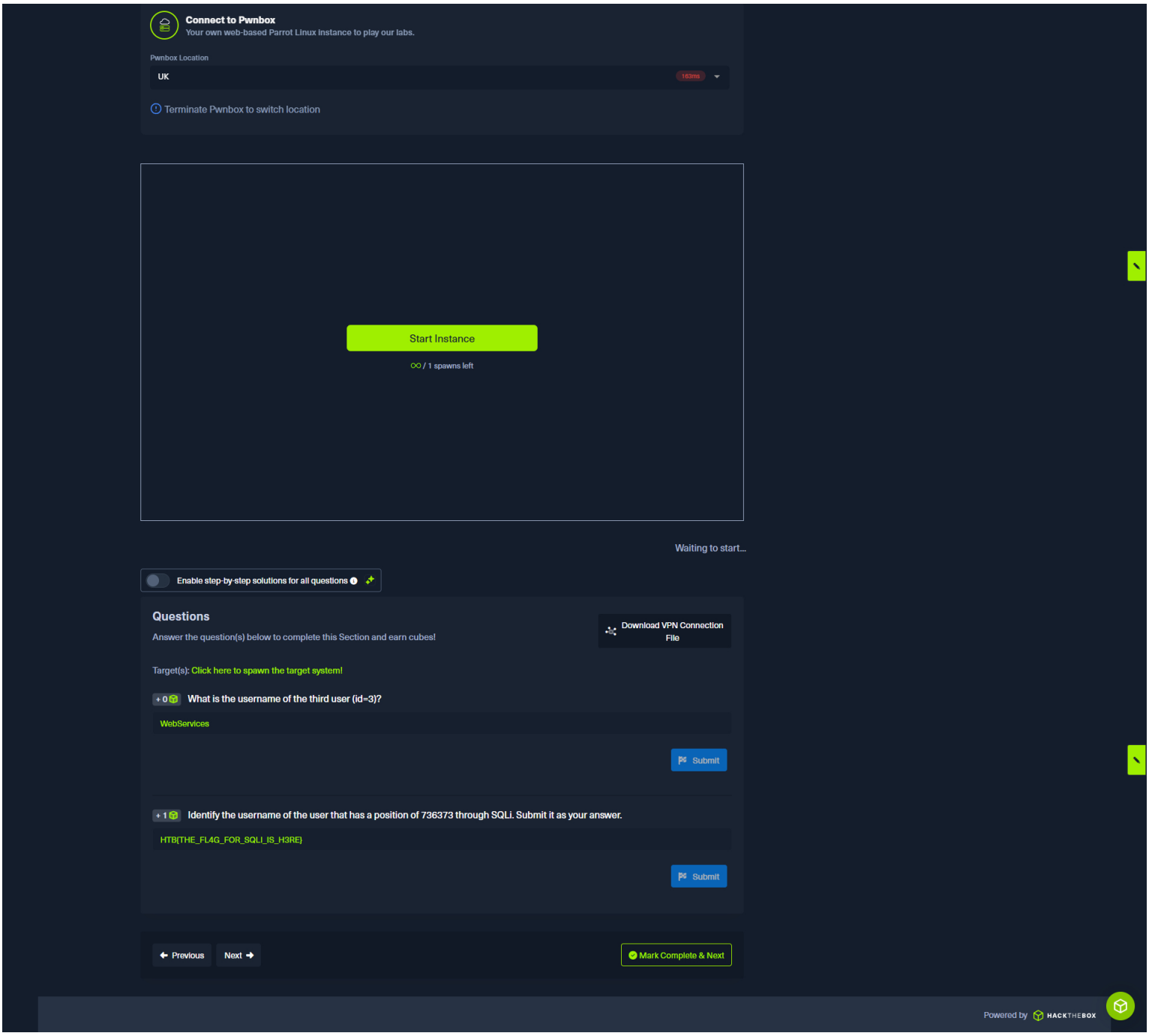
```php
<?php
$whitelist = array("127.0.0.1", "1.3.3.7");
if(!(in_array($_SERVER['HTTP_X_FORWARDED_FOR'], $whitelist)))
{
    header("HTTP/1.1 401 Unauthorized");
}
else
{
  print("Hello Developer team! As you know, we are working on building a way for users to see website pages in real pa
}
```

The issue here is that the code compares the *HTTP_X_FORWARDED_FOR* header to the possible *whitelist* values, and if the *HTTP_X_FORWARDED_FOR* is not set or is set without one of the IPs from the array, it'll give a 401. A possible bypass could be setting the *X-Forwarded-For* header and the value to one of the IPs from the array.

Information Disclosure through SQL Injection

SQL injection vulnerabilities can affect APIs as well. That *id* parameter looks interesting. Try submitting classic SQLi payloads and answer the second question.




Connect to Pwnbox
Your own web-based Parrot Linux instance to play our labs.
Pwnbox Location
UK
163ms
Terminate Pwnbox to switch location
Start Instance
∞ / 1 spawns left
Waiting to start...
Enable step-by-step solutions for all questions
Questions
Answer the question(s) below to complete this Section and earn cubes!
Download VPN Connection File
Target(s): Click here to spawn the target system!
+ 0 What is the username of the third user (id=3)?
WebServices
Submit
+ 1 Identify the username of the user that has a position of 736373 through SQLi. Submit it as your answer.
HTB{THE_FL4G_FOR_SQLI_IS_H3RE}
Submit
Previous
Next
Mark Complete & Next
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