

# Security Assessment Report for OWASP Juice Shop Using Burp Suite

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Internship At: Future Interns

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# Table of Contents

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<b>1. Executive Summary</b>	<b>3</b>
<b>2. Scope</b>	<b>3</b>
<b>3. Methodology</b>	<b>3</b>
<b>4. Key Findings</b>	<b>3</b>
<b>5. Vulnerability Details</b>	<b>4</b>
SQL Injection on Login Form	4
Reflected Cross-Site Scripting (XSS)	4
Insecure Direct Object Reference (IDOR)	4
Security Misconfiguration	4
Missing Rate Limiting on Login	4
<b>6. OWASP Top 10 Compliance Mapping</b>	<b>5</b>
<b>7. Tools Used and Logs</b>	<b>5</b>
<b>8. Conclusion &amp; Recommendations</b>	<b>5</b>
<b>9. Appendix</b>	<b>6</b>
SQL Injection on Login Form	6
Reflected Cross-Site Scripting (XSS)	6
Insecure Direct Object Reference (IDOR)	7
Security Misconfiguration	8
Missing Rate Limiting on Login	10
<b>10. Bibliography</b>	<b>11</b>

## 1. Executive Summary

This report summarizes the findings from a web application security assessment conducted on OWASP Juice Shop, an intentionally vulnerable application used for penetration testing and cybersecurity learning. Using Burp Suite, I identified and analyzed several vulnerabilities in alignment with the OWASP Top 10 security risks. Each finding is documented with the corresponding impact, evidence, and recommended mitigation strategies.

## 2. Scope

The scope of the assessment includes:

Target: OWASP Juice Shop (localhost instance)

Tools Used:

- Burp Suite (Community Edition)
- Browser with Burp Proxy
- OWASP Juice Shop

Assessment Type: Black-box Testing

## 3. Methodology

The assessment was conducted using the following steps:

Reconnaissance via Burp Suite Spider

Vulnerability Scanning using Intruder, Repeater, and Scanner tools

Manual exploitation for confirmation

Mapping to OWASP Top 10

Risk Rating based on CVSS v3.1 (where applicable)

## 4. Key Findings

Vulnerability	OWASP Category	Risk Level	Status
SQL Injection on login	A1: Injection	High	Confirmed
Reflected XSS	A7: Cross-Site Scripting	Medium	Confirmed
Insecure Direct Object Reference (IDOR)	A4: IDOR	High	Confirmed
Security Misconfiguration	A6: Misconfiguration	Medium	Confirmed
Missing Rate Limiting on Login	A10: SSRF/Insufficient Logging & Monitoring	Low	Confirmed

## 5. Vulnerability Details

### SQL Injection on Login Form

Description	' OR '1'='1
Evidence	Login succeeded without valid credentials
Impact	Unauthorized access to user accounts
Mitigation	Use parameterized queries or ORM frameworks

### Reflected Cross-Site Scripting (XSS)

Description	/search?q=<script>alert(1)</script>
Evidence	Script executed in browser
Impact	Session hijacking or phishing
Mitigation	Encode output, use CSP headers

### Insecure Direct Object Reference (IDOR)

Description	Changed userId parameter
Evidence	Accessed other users' data via ID manipulation
Impact	Data leakage
Mitigation	Implement authorization checks on backend

### Security Misconfiguration

Description	Verbose error messages
Evidence	Displayed detailed error messages
Impact	Information disclosure
Mitigation	Disable detailed error messages in production

### Missing Rate Limiting on Login

Description	Brute force attempts not blocked
Evidence	Repeated login requests not denied
Impact	Increased risk of credential stuffing
Mitigation	Implement rate limiting and lockouts

## 6. OWASP Top 10 Compliance Mapping

OWASP Risk	Status
A1: Injection	✓ Found
A2: Broken Auth	⚠ Partial
A3: Sensitive Data Exposure	✗ Not observed
A4: IDOR	✓ Found
A5: Security Misconfig	✓ Found
A6: XSS	✓ Found
A7: Broken Access Control	✓ Found

A8: CSRF	 Not found
A9: Components w/ Known Vuln	 Not tested
A10: Insufficient Logging/Monitoring	 Observed

## 7. Tools Used and Logs

Burp Suite Logs:

- Proxy history
- Intruder payloads
- Scanner issues list

Screenshots:

- Injection and XSS payload success
- Burp Suite Scanner Results
- Response showing misconfiguration

## 8. Conclusion & Recommendations

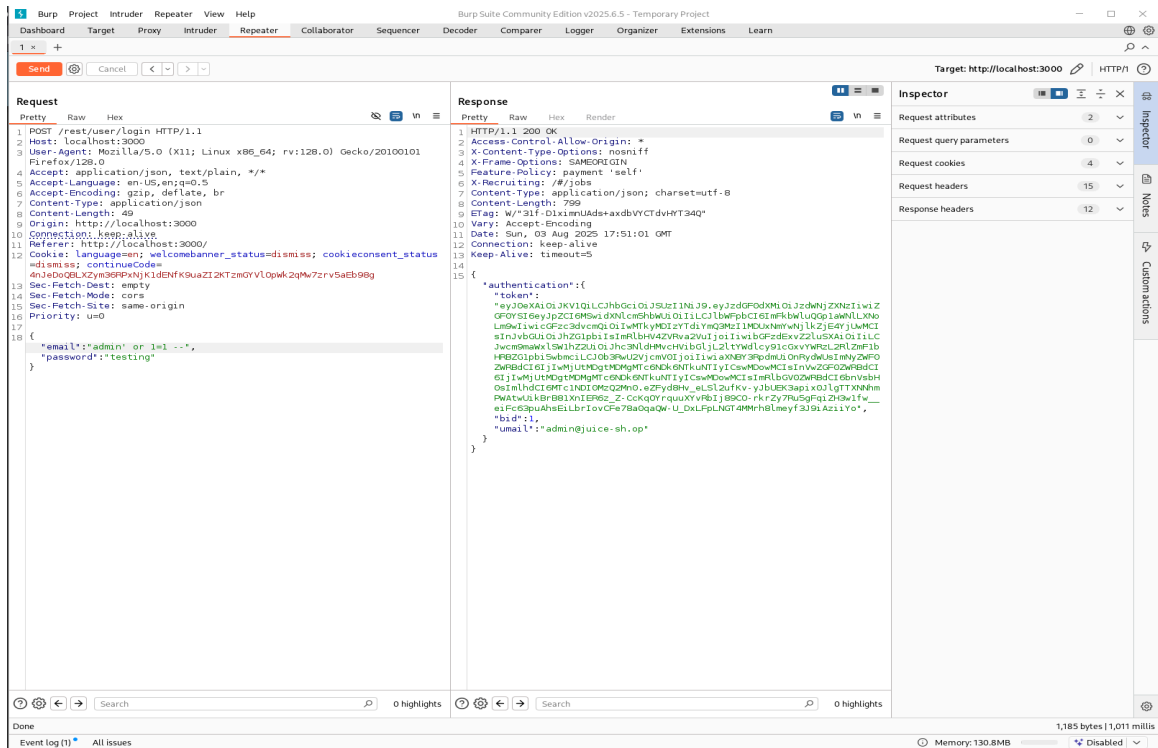
This assessment revealed several critical vulnerabilities in the target application. While OWASP Juice Shop is designed to be insecure, this simulation provided valuable experience in vulnerability discovery, risk analysis, and ethical hacking methodology. The use of Burp Suite enabled effective exploitation and verification of findings.

Top Recommendations:

- Apply input validation and output encoding
- Use secure development frameworks
- Enforce strict authorization logic
- Enable rate limiting and logging mechanisms

### Screenshots of Attack Execution

#### SQL Injection on Login Form



First one is original basket of the user and below is the modified request + response showing other user's items in basket

7

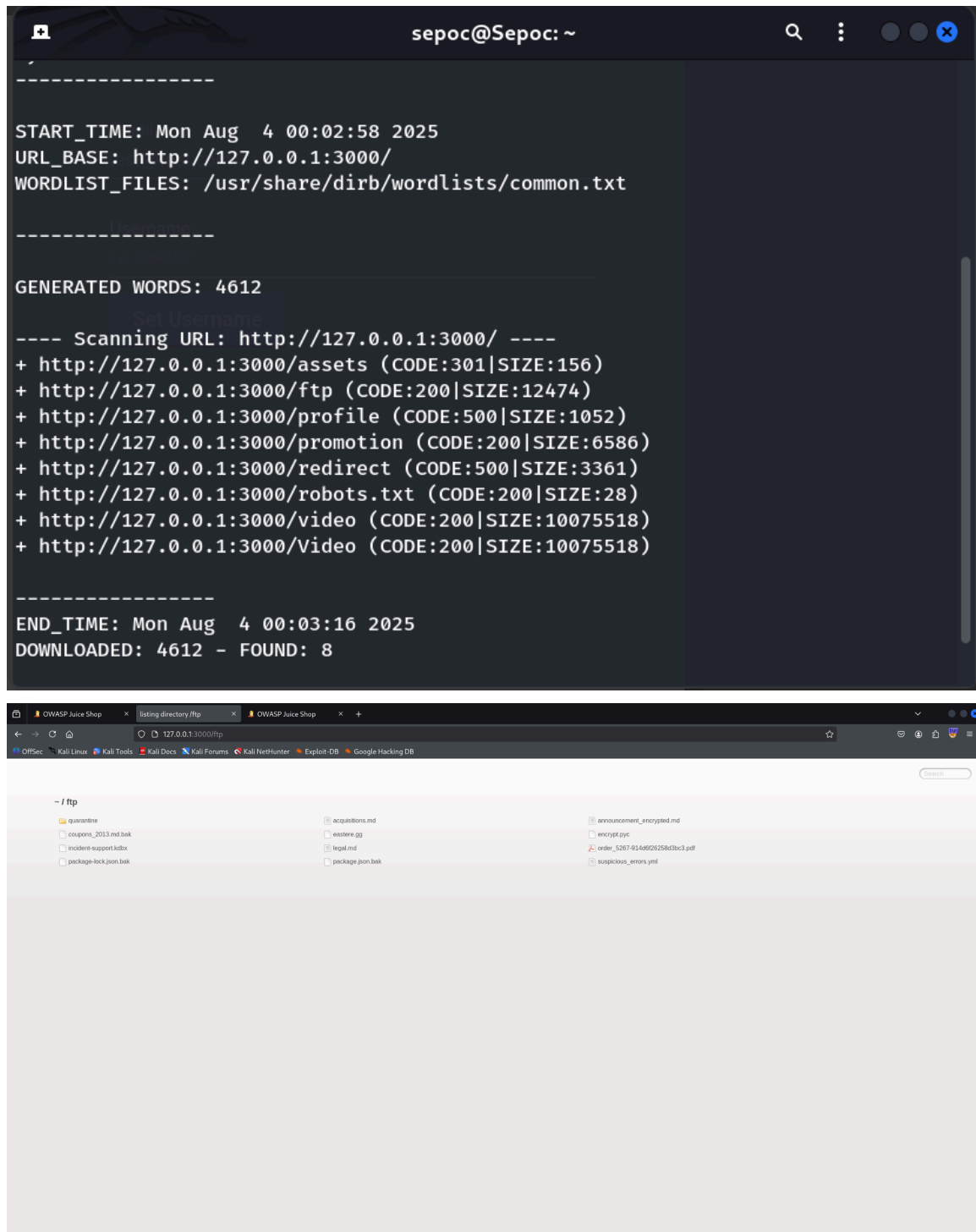
The screenshot displays the Burp Suite Community Edition v2025.6.5 interface. The top menu bar includes options like Burp, Project, Intruder, Repeater, View, and Help. Below the menu is a toolbar with tabs for Dashboard, Target, Proxy, Intruder, Repeater, Collaborator, Sequencer, Decoder, Comparer, Logger, Organizer, Extensions, and Learn. The main workspace is divided into three panels: Request, Response, and Inspector. The Request panel shows a GET request to /rest/basket/4 with various headers and a cookie. The Response panel shows a 200 OK status with a JSON body containing product details for Raspberry Juice. The Inspector panel on the right shows request attributes, query parameters, body parameters, cookies, headers, and response headers. The bottom status bar indicates 'Done' and '944 bytes | 1,011 millis'.

## Security Misconfiguration

Juice Shop, by design, simulates multiple misconfigurations, including default error pages showing stack traces, Unsecured endpoints (/ftp, /debug, /profile), Verbose error messages, Lack of secure headers, Open admin pages or debug interfaces. In the first step, we performed a port scan using **Nmap** to identify open services. Next, we used **Dirb** to enumerate accessible directories and URLs on the web server. This scan revealed confidential files and



directories that were unintentionally exposed, allowing unauthorized access to sensitive information.



The image shows two screenshots. The top screenshot is a terminal window titled 'sepoc@Sepoc: ~'. It displays the output of a directory enumeration tool. The output includes the start time (Mon Aug 4 00:02:58 2025), the URL base (http://127.0.0.1:3000/), the wordlist file (/usr/share/dirb/wordlists/common.txt), the number of generated words (4612), a list of scanned URLs with their status codes and sizes, the end time (Mon Aug 4 00:03:16 2025), and the total number of downloaded files (4612) and found files (8).

```
-----  
START_TIME: Mon Aug 4 00:02:58 2025  
URL_BASE: http://127.0.0.1:3000/  
WORDLIST_FILES: /usr/share/dirb/wordlists/common.txt  
-----  
  
GENERATED WORDS: 4612  
  
---- Scanning URL: http://127.0.0.1:3000/ ----  
+ http://127.0.0.1:3000/assets (CODE:301|SIZE:156)  
+ http://127.0.0.1:3000/ftp (CODE:200|SIZE:12474)  
+ http://127.0.0.1:3000/profile (CODE:500|SIZE:1052)  
+ http://127.0.0.1:3000/promotion (CODE:200|SIZE:6586)  
+ http://127.0.0.1:3000/redirect (CODE:500|SIZE:3361)  
+ http://127.0.0.1:3000/robots.txt (CODE:200|SIZE:28)  
+ http://127.0.0.1:3000/video (CODE:200|SIZE:10075518)  
+ http://127.0.0.1:3000/Video (CODE:200|SIZE:10075518)  
  
-----  
END_TIME: Mon Aug 4 00:03:16 2025  
DOWNLOADED: 4612 - FOUND: 8
```

The bottom screenshot is a web browser window showing the results of a directory listing on the URL http://127.0.0.1:3000/ftp. The browser displays a list of files and directories, including quarantine, acquisitions.md, announcement\_encrypted.md, coupons\_2013.md.bak, eastern.gp, encrypt.py, incident-support.kibox, legal.md, order\_5267-9148926258d3bc3.pdf, package-lock.json.bak, package.json.bak, and suspicious\_errors.yml.

## Missing Rate Limiting on Login

In this test, we targeted the login endpoint by first preparing a brute-force attack payload in **Burp Suite Intruder**. The first screenshot shows the configuration where multiple passwords were loaded against a fixed email address. In the second screenshot, the attack was executed, and the server responded with repeated **401 Unauthorized** status codes without any delay or blocking mechanism. This confirms that no rate limiting or brute-force protection is in place, exposing the system to credential-based attacks.

The first screenshot shows the Burp Suite Intruder configuration for a brute-force attack. The target is `http://localhost:3000`. The attack is configured as a "Sniper attack" with a "Simple list" payload type. The payload list contains the following items:

Index	Payload
1	password1
2	123456
3	qwerty
4	letmein
5	admin123
6	welcome

The request is a POST to `/rest/user/login` with the following headers and body:

```
POST /rest/user/login HTTP/1.1
Host: localhost:3000
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0
Accept: application/json, text/plain, */*
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate, br
Content-Type: application/json
Content-Length: 38
Origin: http://localhost:3000
Connection: keep-alive
Referer: http://localhost:3000/
Cookie: language=en; welcomebanner_status=dismiss; cookieconsent_status=dismiss; continueCode=ea9vb1g6618EXp8M2or1f9ue0I2594j t2p0Kw7dy779V01oqNQL2D1
Sec-Fetch-Dest: empty
Sec-Fetch-Mode: cors
Sec-Fetch-Site: same-origin
Priority: u=0
{"email":"admin","password":"$testing"}
```

The second screenshot shows the results of the attack. The table below displays the response for each payload:

Request	Payload	Status code	Response received	Error	Timeout	Length	Comment
0		401	4			413	
1	password1	401	4			413	
2	123456	401	6			413	
3	qwerty	401	10			413	
4	letmein	401	10			413	
5	admin123	401	15			413	
6	welcome	401	7			413	

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