

Web Application Security Testing – Task 1 Report

Cyber Security Internship – Future Interns

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Track: Cyber Security (CS)

Task: Web Application Security Testing

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1. Introduction

The objective of this task was to perform **Web Application Security Testing** on a vulnerable web application to identify potential security risks and weaknesses. The assessment was conducted to understand how attackers exploit web vulnerabilities and how such issues can be mitigated to protect real-world applications. This task aligns with the **OWASP Top 10 Web Application Security Risks**.

2. Tools Used

Tool	Purpose
OWASP ZAP	Automated scanning & manual testing
Burp Suite	Intercepting and modifying HTTP requests
Browser Developer Tools	Inspecting web elements & responses
GitHub	Documentation & version control

3. Target Application

Application Tested: OWASP Juice Shop

This application is intentionally vulnerable and used for practicing ethical hacking techniques in a safe environment.

4. Testing Methodology

1. **Reconnaissance:** Understanding application structure and endpoints
2. **Scanning:** Automated scanning using OWASP ZAP
3. **Manual Testing:** Attempting exploitation of discovered vulnerabilities

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- 4. **Documentation:** Recording findings with screenshots and remediation steps

5. Vulnerabilities Identified

5.1 SQL Injection

- **Description:** The application failed to validate user inputs in SQL queries.
- **Impact:** Attackers can extract or modify sensitive database data.
- **Recommendation:** Use parameterized queries and input sanitization.

5.2 Cross-Site Scripting (XSS)

- **Description:** The application reflected user input directly to the browser without encoding.
- **Impact:** Allows execution of malicious scripts in victim browser sessions.
- **Recommendation:** Implement output encoding and proper input validation.

5.3 Broken Authentication

- **Description:** Weak login/session handling made user accounts vulnerable.
- **Impact:** Unauthorized access to user accounts.
- **Recommendation:** Enforce strong password policies and secure session tokens.

5.4 Security Misconfiguration

- **Description:** Application revealed debug/error messages exposing internal details.
 - **Impact:** Attackers can use these details to perform targeted attacks.
 - **Recommendation:** Disable debugging mode and configure secure error handling.
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5. Screenshots

The screenshot displays two windows from the ZAP (Zed Attack Proxy) tool.

Top Window (ZAP 2.16.1):

- Header:** Text (selected), Body: Text, Requester.
- Content:** Shows a captured HTTP response for the URL `http://10.209.33.17:3000`. The status code is 200 OK. Headers include: Access-Control-Allow-Origin: *, X-Content-Type-Options: nosniff, X-Frame-Options: SAMEORIGIN, Feature-Policy: payment 'self', X-Recruiting: #jobs, Accept-Ranges: bytes, Cache-Control: public, max-age=8, Last-Modified: Fri, 07 Nov 2025 18:29:43 GMT, Etag: W/"124fa:19a5f94e0da", Content-Type: text/html; charset=UTF-8, Content-Length: 75082, Vary: Accept-Encoding, Date: Fri, 07 Nov 2025 18:43:50 GMT, Connection: keep-alive, Keep-Alive: timeout=5.
- Scripting:** A snippet of JavaScript is shown in the "Content Modified" panel:

```
window.cookieconsent.initialise({
  'palette': {
    'popup': { 'background': 'var(--theme-primary)', 'text': 'var(--theme-text)' },
    'button': { 'background': 'var(--theme-accent)', 'text': 'var(--theme-text)' }
  }
});
```
- Table:** Shows a list of URLs processed during the scan, including their methods and URIs. Some entries are redacted.
- Bottom Bar:** Includes tabs for History, Search, Alerts, Output, WebSockets, Spider, and Active Scan. It also shows the progress of the scan (0% complete).

Bottom Window (OWASP Juice Shop):

- Address Bar:** Shows the URL `10.209.33.17:3000/#/login`.
- Content:** Displays the OWASP Juice Shop login page. It features a "Login" form with fields for "Email*" and "Password*", a "Forgot your password?" link, a "Log in" button, and a "Remember me" checkbox. Below the form is a link for new users: "Not yet a customer?"

Screenshot of ZAP 2.16.1 showing two sessions for the URL <http://10.209.33.17:3000>.

Session 1: Modern Web Application (51)

Header:

```
HTTP/1.1 200 OK
Access-Control-Allow-Origin: *
X-Content-Type-Options: nosniff
X-Frame-Options: SAMEORIGIN
Feature-Policy: payment 'self'
X-Recruiting: #jobs
Accept: */*
Accept-Ranges: bytes
Cache-Control: public, max-age=0
Last-Modified: Fri, 07 Nov 2025 18:29:43 GMT
ETag: W/"124fa-19a5f94e0d"
Content-Type: text/html; charset=UTF-8
Content-Length: 75892
Vary: Accept-Encoding
Date: Fri, 07 Nov 2025 18:43:57 GMT
Connection: keep-alive
Keep-Alive: timeout=5
```

Body:

```
<script src="//cdnjs.cloudflare.com/ajax/libs/cookieconsent2/3.1.0/cookieconsent.min.js"></script>
<script src="//cdnjs.cloudflare.com/ajax/libs/jquery/2.2.4/jquery.min.js"></script>
<script>
    window.addEventListener('load', function() {
        window.cookieconsent.initialise({
            'onStatusChange': function(status) {
                console.log(`Cookie consent status changed to ${status}`);
            }
        });
    });
</script>
```

Content Modified:

The application appears to be a modern web application. If you need to explore it automatically then the Ajax Spider may well be more effective than the standard one.

Session 2: Cross-Domain JavaScript Source File Inclusion (9)

Header:

```
HTTP/1.1 200 OK
Access-Control-Allow-Origin: *
X-Content-Type-Options: nosniff
X-Frame-Options: SAMEORIGIN
Feature-Policy: payment 'self'
X-Recruiting: #jobs
Accept: */*
Accept-Ranges: bytes
Cache-Control: public, max-age=0
Last-Modified: Fri, 07 Nov 2025 18:29:43 GMT
ETag: W/"124fa-19a5f94e0d"
Content-Type: text/html; charset=UTF-8
Content-Length: 75892
Vary: Accept-Encoding
Date: Fri, 07 Nov 2025 18:43:58 GMT
Connection: keep-alive
Keep-Alive: timeout=5
```

Body:

```
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<link id="favicon" rel="icon" type="image/x-icon" href="/assets/public/favicon.ico">
<link rel="stylesheet" type="text/css" href="//cdnjs.cloudflare.com/ajax/libs/cookieconsent2/3.1.0/cookieconsent.min.css">
<script src="//cdnjs.cloudflare.com/ajax/libs/cookieconsent2/3.1.0/cookieconsent.min.js"></script>
<script src="//cdnjs.cloudflare.com/ajax/libs/jquery/2.2.4/jquery.min.js"></script>
```

Content Modified:

The page includes one or more script files from a third-party domain.

Alerts:

- Content Security Policy (CSP) Header Not Set (1)
- Cross-Domain Modification (174)
- X-Content-Type-Options Header Missing (4)
- Information Disclosure - Suspicious Comments (1)
- Modern Web Application (51)

Screenshot of Burp Suite Community Edition v2025.11 - Temporary Project showing network traffic and a specific request-response interaction.

Network Tab:

#	Host	Method	URL	Params	Edited	Status code	Length	MIME type	Extension	Title	Notes	TLS	IP	Cookies	Time	Listener port	Start response
1	http://10.209.33.17:3000	GET	/socket.io/?EIO=4&transport=polling&...	✓		200	326	JSON	io!				10.209.33.17		00:26:51 8 No... 8080	13	
2	http://10.209.33.17:3000	POST	/socket.io/?EIO=4&transport=polling&...	✓		200	215	text	io!				10.209.33.17		00:26:51 8 No... 8080	6	
3	http://10.209.33.17:3000	GET	/socket.io/?EIO=4&transport=polling&...	✓		200	262	JSON	io!				10.209.33.17		00:26:51 8 No... 8080	2	
4	http://10.209.33.17:3000	GET	/socket.io/?EIO=4&transport=polling&...	✓		200	230	text	io!				10.209.33.17		00:26:51 8 No... 8080	593	
5	http://10.209.33.17:3000	GET	/socket.io/?EIO=4&transport=websocke...	✓		101	129	text	io!				10.209.33.17		00:26:51 8 No... 8080	6	
6	http://localhost	GET	/3000												127.0.0.1		00:27:44 8 No... 8080

Request/Response Tab:

Request:

```
Pretty Raw Hex
1 POST /socket.io/?EIO=4&transport=polling&t=PfVhRN-&sid=s10tdy0E6p1wKNuADx HTTP/1.1
2 Host: 10.209.33.17:3000
3 User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:128.0) Gecko/20100101 Firefox/128.0
4 Accept: */*
5 Accept-Language: en-US,en;q=0.5
6 Accept-Encoding: gzip, deflate, br
7 Content-type: application/javascript; charset=UTF-8
8 Content-Length: 2
9 Origin: http://10.209.33.17:3000
10 Connection: keep-alive
11 Referer: http://10.209.33.17:3000/
12 Cookie: language=en; welcomebanner_status=dissmiss; continueCode=g872m0LbraqJwK709p834o2nmvd5btQGkqYRLExW6z1PeaBMNyX5ZMwrx0
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7. Conclusion

This task provided hands-on experience in identifying and analyzing common web application vulnerabilities. It also helped in understanding secure coding practices and mitigation strategies. Completing this task strengthened my skills in **Web Application Penetration Testing, OWASP Awareness, and Security Documentation.**

8. GitHub Repository Link

https://github.com/ANKI0310/FUTURE_CS_01/tree/main/Task1_WebAppSecurity/Scree nshots