Website Application Security Assessment Testing

Zero Bank

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CONTENTS

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Introduction

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Details of the Auditing Team

SN	Name	Designation	Email ID	Professional Qualifications/ Certifications	Whether the resource has been listed in the Snapshot information published on CERT-In's website (Yes/No)

Audit Activities

SN	Activity Name	Start Date	End Date

Audit Timelines

SN	Activity Name	Start Date	End Date

Audit Methodology and Standard Referred for Audit

Our testing methodology adapts from the following security frameworks and vulnerability categories:

1. Common Weakness Enumeration (CWE)
2. National Institute of Standards and Technology (NIST)
3. OWASP Top 10 (OWASP)
4. OWASP Mobile Top 10 (OWASP)

Our standard approach of testing is mentioned in the Appendix C of this report document.

Tools/ Software used

SN	Tools/ Software used	Version of the tool /Software used	Open Source/Licensed
1.	Kali linux	Kali-2025	Open
2.	Burp Suite	2025.7.4	Open
3.	N-Map	7.98	Open
4.	Python	3.13.7	Open
5.	VM-Ware	17 pro	Open
6.	CMD	10.0.26100.4946	Open
7.			
8.			

Executive Summary

The security assessment identified a total of **32 vulnerabilities** categorized by severity as follows:

Critical Severity: 4 Vulnerability

High Severity: 18 Vulnerability

Medium Severity: 6 Vulnerability

Low Severity: 4 Vulnerabilities

Informational Severity: 0 Vulnerabilities

SN	URL	Name of vulnerability	Severity	Status	Recommendation
1.	http://zero.webappsecurity.com/login.html?login http://zero.webappsecurity.com/search.html?searchTerm=	Copy Pate Allow	Low	Open	Disable copy-paste functionality in password input fields using HTML or JavaScript. Additionally, implement security measures such as CAPTCHA, account lockout after failed attempts, and Multi-Factor Authentication.
2.	http://zero.webappsecurity.com/bank/pay-bills.html	Reflected XSS	HIGH	OPEN	Implement proper input validation and output encoding for all user-supplied data. Use context-aware encoding

					before rendering inputs in the browser. Apply security headers like Content Security Policy and HttpOnly/Secure flags on cookies. Use trusted frameworks that auto-escape output wherever possible.
3.	http://zero.webappsecurity.com/bank/account-activity.html?accountId=	**Insecure Direct Object Reference (IDOR)**	**HIGH**	**OPEN**	Implement proper access control checks on the server side to ensure that users can only access their own resources. Use indirect references (like UUIDs or random tokens) instead of sequential identifiers. Apply robust authentication and authorization mechanisms for all sensitive endpoints.

					Regularly test for IDOR as part of secure code reviews and penetration testing
4.	http://zero.webappsecurity.com/docs/	**Directory Listing**	**LOW**	**OPEN**	Disable directory listing on the server and restrict public access to internal documentation or configuration files. Upgrade to a supported and patched version of Apache Tomcat. Implement proper server hardening practices, including limiting exposure of unnecessary files and directories.
5.	http://zero.webappsecurity.com/login.html?login_error=true	**Weak Password**	**HIGH**	**OPEN**	Enforce strong password policy: Implement multi-factor authentication for additional security. Secure the website with HTTPS to protect credentials in transit. Introduce

					account lockout / CAPTCHA mechanisms after multiple failed login attempts.
6.	http://zero.webappsecurity.com/manager/html	**Sensitive Data Exposure**	**HIGH**	**OPEN**	Disable detailed error messages for unauthorized users; show generic error pages instead. Restrict access to Tomcat Manager to trusted IP addresses only. Keep Tomcat and related components patched and updated.
7.	http://zero.webappsecurity.com/bank/pay-bills.html	**CSRF**	**HIGH**	**OPEN**	Implement CSRF tokens. Use same site cookies to limit cookie sending in cross-origin requests. Require re-authentication (password, OTP, or MFA) for critical

					actions (like fund transfers). Enforce secure cookie attributes
8.	http://zero.webappsecurity.com/bank/account-summary.html	**Plain Text Credentials**	**HIGH**	**OPEN**	Enforce the use of HTTPS (TLS/SSL) for all communication to encrypt sensitive information in transit. Implement strong authentication mechanisms such as hashing for password storage and use secure session management practices.
9.	http://zero.webappsecurity.com/sendFeedback.html	**Denial of Service**	**MEDIUM**	**OPEN**	Implement rate limiting and connection throttling to mitigate excessive requests. Deploy Web Application Firewalls (WAF) and Intrusion Detection/Prevention Systems (IDS/IPS) to filter malicious traffic.

					Optimize server capacity and use load balancing and redundancy to handle traffic spikes
10.	http://zero.webappsecurity.com/errors/errors.log	**Information Disclosure via Internal Files**	**MEDIUM**	**OPEN**	Restrict access to internal and sensitive files via proper authentication and authorization mechanisms. Implement proper file permissions, ensuring that only necessary processes or users can access sensitive files. Disable directory listing on all web servers.
11.	http://zero.webappsecurity.com/login.html	**SSL Certificate Missing**	**HIGH**	**OPEN**	Obtain and install a valid SSL/TLS certificate from a reputable Certificate Authority (CA). Configure the server to redirect all HTTP traffic to HTTPS, ensuring

					secure communication.
12.	http://zero.webappsecurity.com/admin/users.html	**Insecure Storage**	**HIGH**	**OPEN**	Store sensitive data securely using strong encryption algorithms and hashing functions for passwords. Avoid storing sensitive data on the client side; if necessary, ensure it is encrypted and protected with proper security flags. Implement strict access controls to prevent unauthorized access to stored data.
13.	http://zero.webappsecurity.com/login.html	**Session Hijacking**	**HIGH**	**OPEN**	Use secure, randomly generated session IDs that are long and unpredictable. Ensure session tokens are transmitted over HTTPS only. Implement session timeout and

					automatic logout after inactivity.
14.	http://zero.webappsecurity.com/bank/transfer-funds.html	**Browser Cache Weakness**	**HIGH**	**OPEN**	Configure HTTP headers to prevent caching of sensitive pages. Configure HTTP headers to prevent caching of sensitive pages. Implement session expiration and automatic logout mechanisms
15.	http://zero.webappsecurity.com/admin/users.html	**Authentication Bypass**	**CRITICAL**	**OPEN**	Enforce strong authentication mechanisms, including complex passwords and MFA. Validate all inputs and parameters to prevent manipulation. Ensure server-side authentication checks are mandatory for every request to

					restricted resources.
16.	http://zero.webappsecurity.com/forgot-password.html	**Insecure Password Reset**	**CRITICAL**	**OPEN**	Implement secure, time-limited, and random password reset tokens. Enforce strong verification for password reset requests. Use HTTPS to transmit all password reset links and tokens. Implement rate limiting and monitoring to prevent abuse of password reset functionality.
17.	http://zero.webappsecurity.com/bank/pay-bills.html	**HTTP Strict Transport Security Missing**	**HIGH**	**OPEN**	Enable and enforce HSTS by configuring the server. Ensure HTTPS is correctly configured with a valid SSL/TLS certificate. Register the domain for HSTS Preload List.

					Redirect all HTTP traffic to HTTPS
18.	http://zero.webappsecurity.com/bank/pay-bills.html	**CORS Misconfiguration**	**HIGH**	**OPEN**	Review and restrict the cross-domain policy file to only allow trusted domains. Avoid using wildcards (*) in domain permissions. Restrict access to only the specific resources that are required by external domains
19.	http://zero.webappsecurity.com/admin/	**Privilege Escalation**	**CRITICAL**	**OPEN**	Implement strict role-based access control and enforce authorization checks at the server-side for every sensitive function. Validate user roles and permissions before executing privileged operations. Avoid relying solely on client-side controls

					for access restrictions.
20.	http://zero.webappsecurity.com/admin/test.txt	**Server Version Disclosure**	MEDIUM	OPEN	Suppress or modify the Server and other version-related headers. Configure the web server to hide or obfuscate version information. Use custom error pages instead of default error messages to prevent information leakage
21.	http://zero.webappsecurity.com/admin/test.txt	**Weak Lockout mechanism**	HIGH	OPEN	Implement a robust lockout policy. Use progressive delays (rate-limiting) instead of simple lockouts to prevent automated brute force. Encourage strong password policies and multi-factor authentication (MFA).

22.	http://zero.webappsecurity.com/login.html?login_error=true	**Captcha Missing**	**MEDIUM**	**OPEN**	Implement CAPTCHA on login pages. Combine with rate limiting and account lockout mechanisms for stronger protection. Regularly update CAPTCHA libraries to the latest versions to avoid bypass techniques.
23.	http://zero.webappsecurity.com/forgotten-password-send.html	**Server Side Validation Is Absent**	**HIGH**	**OPEN**	Implement server-side validation for all user inputs, even if client-side validation exists. Use prepared statements or parameterized queries for database operations. Apply proper encoding and escaping for output to prevent XSS.
24.	http://zero.webappsecurity.com/	**Clickjacking**	**HIGH**	**OPEN**	During testing, it was found that the

					application does not implement sufficient protection against Clickjacking attacks. The tested web pages can be embedded within an <iframe> on a malicious domain, allowing attackers to trick users into unintentionally performing actions
25.	http://zero.webappsecurity.com/	**WAF Missing**	MEDIUM	OPEN	The application is deployed without a Web Application Firewall (WAF). As a result, there is no additional security layer to detect and mitigate common web-based attacks such as SQL Injection, Cross-Site Scripting (XSS), Local File Inclusion (LFI), Remote File

					Inclusion (RFI), and automated bot attacks.
26.	http://zero.webappsecurity.com/	**Security Headers Missing**	**MEDIUM**	**OPEN**	During testing it was found that security headers in website are missing.
27.	http://zero.webappsecurity.com/bank/pay-bills.html http://zero.webappsecurity.com/bank/pay-bills-saved-payee.html	**Stored XSS**	**HIGH**	**OPEN**	During testing it was observed that stored XSS occur on the pay saved payee field. User supplied input is saved on the server.
28.	http://zero.webappsecurity.com/bank/pay-bills-saved-payee	**HTTP Parameter manipulation**	**HIGH**	**OPEN**	During test it was observed that amount and account id are manipulated in burp suite request. Due to which response is positive

					and successfully change the fields.
29.	http://zero.webappsecurity.com/index.html	**Weak Lockout Suspension**	**CRITICAL**	**OPEN**	During testing it was observed that when user is login in website, server stores username and password in cookies attribute
30.	http://zero.webappsecurity.com/login.html?login_error=true	**Insecure Remember Password Implementation**	**HIGH**	**OPEN**	During testing it was observed that after failing multiple login attempts account is not locked or suspended. This indicates that the account suspension mechanism is either missing or improperly implemented.
31.	http://zero.webappsecurity.com/bank/pay-bills.html	**Business Logic Break**	**LOW**	**OPEN**	During testing it was observed that website allows anything in the date

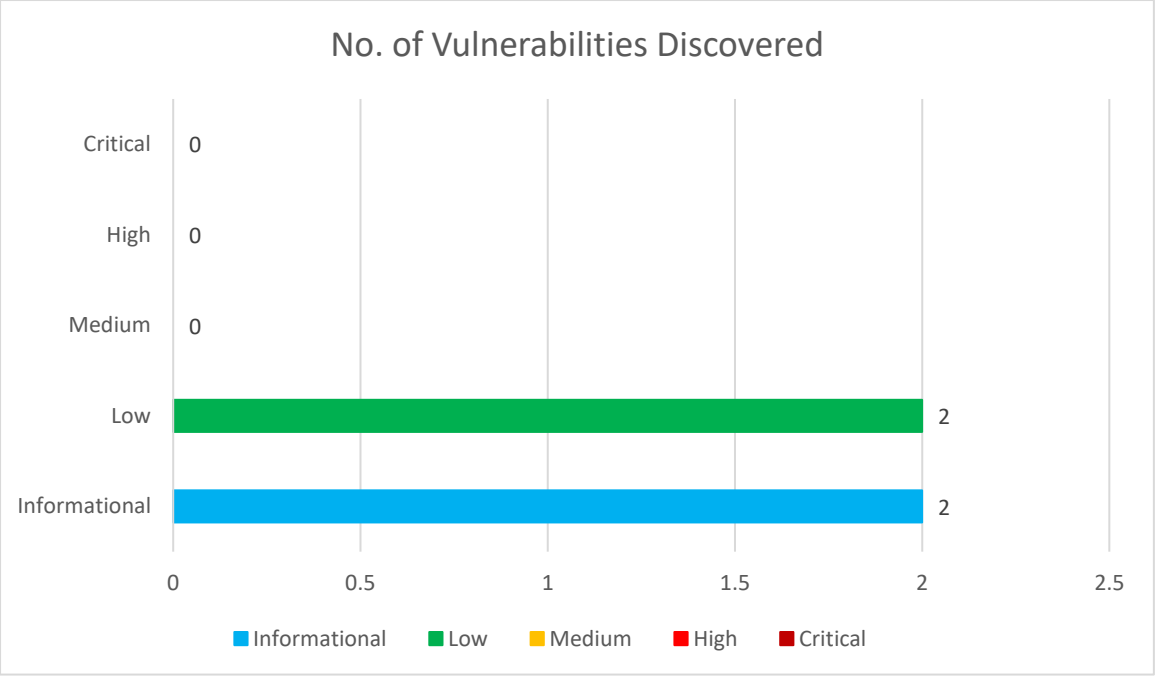
					field. By which, business logic is break.
32.	view-source:http://zero.webappsecurity.com/	**Outdated Library**	**LOW**	**OPEN**	During testing it was observed that in source code there is jquery library whose version is 1.8.2 which is old and is vulnerable to various attacks.

Tabular Summary

The following table summarizes the overall security assessment:

Category	Description				
Security Assessment Summary					
Number of Application	1				
Number of Vulnerabilities found	32				
Vulnerability Breakup based on Severity	4 Critical	18 High	6 Medium	4 Low	0 Info

Graphical Summary



Severity Rating

Info eShield follows the Common Vulnerability Scoring System (CVSS) scoring system to rate vulnerabilities.

The CVSS assessment measures three areas of concern:

- **Base Metrics** for qualities intrinsic to a vulnerability
- **Temporal Metrics** for characteristics that evolve over the lifetime of vulnerability
- **Environmental Metrics** for vulnerabilities that depend on an implementation or environment

For more information on what the Base, Temporal, and Environment Metrics in the CVSS scoring system are, please visit https://www.first.org/cvss/specification-document

Unless otherwise stated, the findings in the report are scored on the base-metric rating of the vulnerability. NII may consider Environmental and Temporal Metrics depending on information provided at project initiation and if this is a mandatory client reporting requirement.

Based on the severity of the vulnerability, they are assigned below ratings:

CVSS Qualitative severity rating scale *(For detailed definitions and details of severity ratings, please refer to* appendix B *in this report)*

CVSS Severity Rating	CVSS Score
Critical	9.0 - 10.0
High	7.0 - 8.9
Medium	4.0 - 6.9
Low	0.1 - 3.9
None	0.0

Vulnerability Status

The definition of status of various vulnerabilities after revalidation is given below:

Status	Description
OPEN	The vulnerability has not been fixed.
OPEN (PARTIAL)	The vulnerability was not fixed completely. Either some aspects were left unpatched, or the issue was fixed to address only some components of the vulnerability but possibly resulting in a lower severity rating.
CLOSED (UNVERIFIED)	The target could no longer be accessed or the vulnerability could not be verified due to the configuration change. Thus, it is considered closed.
CLOSED (EXCEPTION)	The vulnerability has not been fixed. However, the management has accepted the risks or due to business requirements the issue cannot be fixed. Thus, the issue has been considered closed.
CLOSED	The vulnerability has been verified to be fixed.

Detailed Observations

2.1 Copy-Paste Allow in Login Fields

Severity

LOW

Vulnerability Status

OPEN

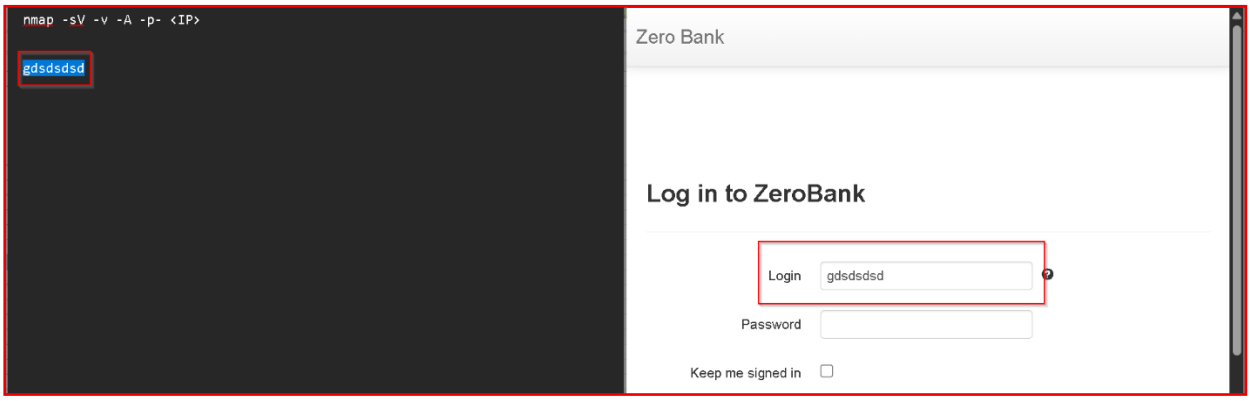
Affected URL

http://zero.webappsecurity.com/login.html?login

Detailed Observation

During testing, it was observed that the login input fields (username/password) allow unrestricted copy-paste operations. This could allow attackers to paste stolen credentials, automate brute force attempts, or facilitate credential stuffing attacks.

Testing PoC



Impact

This increases the risk of automated attacks such as bot-based brute force and credential stuffing. Stolen credentials can be reused directly, reducing the overall security posture of the authentication mechanism.

Recommendation

Disable copy-paste functionality in password input fields using HTML or JavaScript. Additionally, implement security measures such as CAPTCHA, account lockout after failed attempts, and Multi-Factor Authentication (MFA).

References

https://cheatsheetseries.owasp.org/cheatsheets/Authentication_Cheat_Sheet.html

2.2 Reflected XSS

Severity

HIGH

Vulnerability Status

OPEN

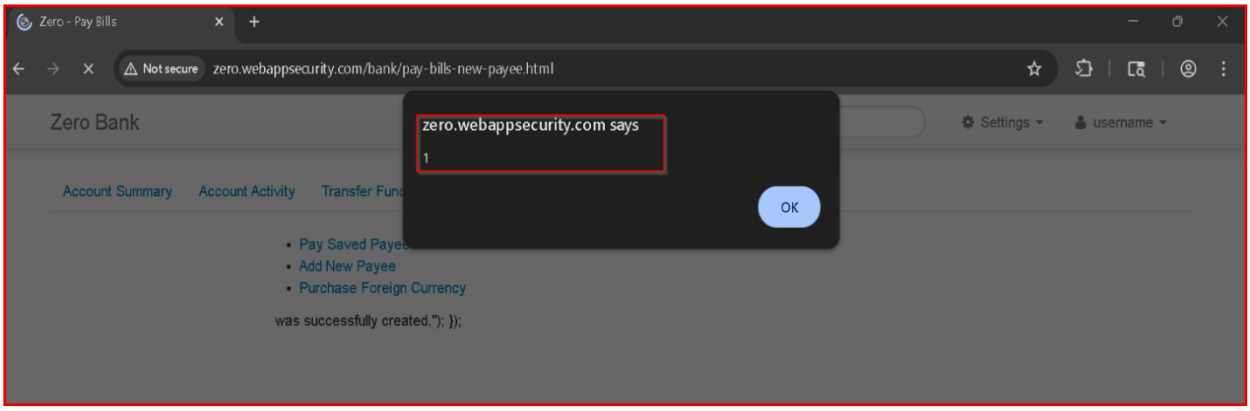
Affected URL

http://zero.webappsecurity.com/bank/pay-bills.html

Detailed Observation

It was identified that the application does not properly sanitize user-supplied input. When crafted payloads were injected into the request, the malicious script was reflected back and executed in the browser, as evidenced by the alert pop-up shown during testing.

Testing PoC



Impact

Successful exploitation allows attackers to execute arbitrary JavaScript in the victim's browser. This may lead to session hijacking, redirection to malicious sites, defacement, theft of sensitive information such as cookies, or performing unauthorized actions on behalf of the user.

Recommendation

Implement proper input validation and output encoding for all user-supplied data. Use context-aware encoding (HTML, JavaScript, URL) before rendering inputs in the browser. Apply security headers like Content Security Policy (CSP) and HttpOnly/Secure flags on cookies. Use trusted frameworks that auto-escape output wherever possible.

References

https://cheatsheetseries.owasp.org/cheatsheets/Cross_Site_Scripting_Prevention_Cheat_Sheet.html

2.3 Insecure Direct Object Reference (IDOR)

Severity

HIGH

Vulnerability Status

OPEN

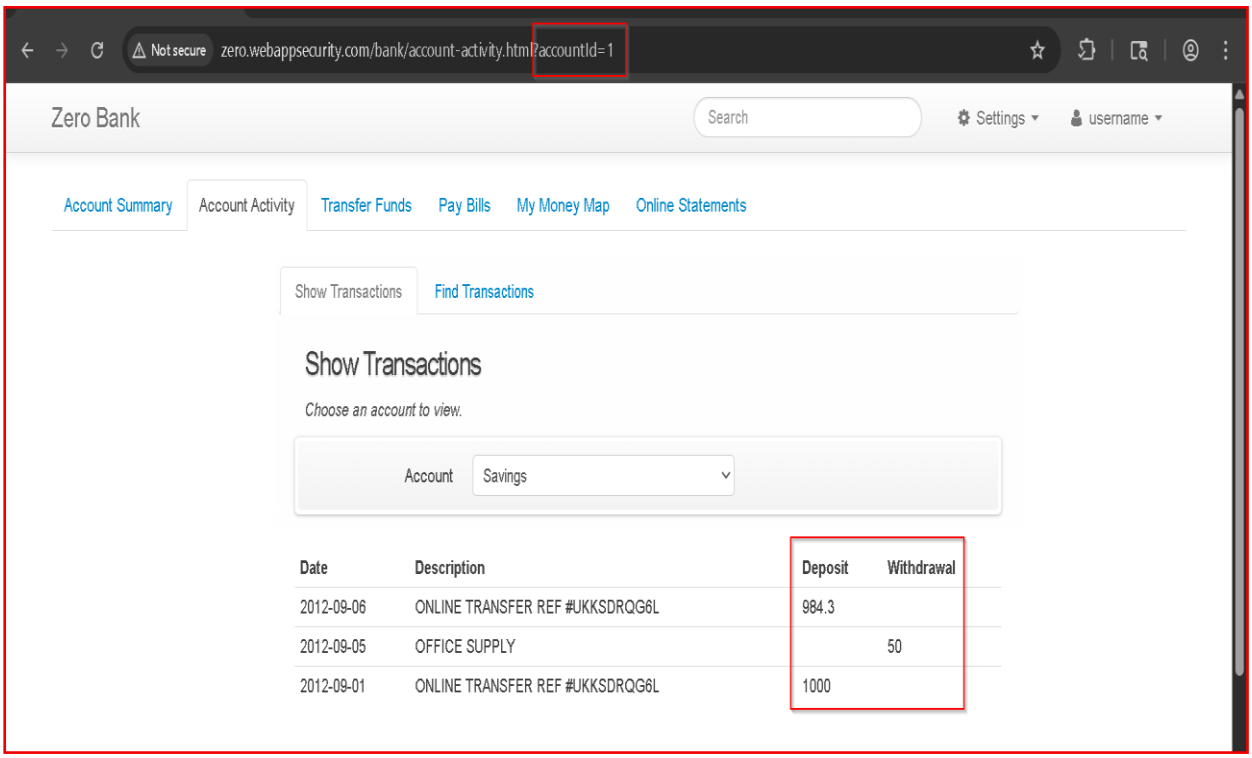
Affected URL

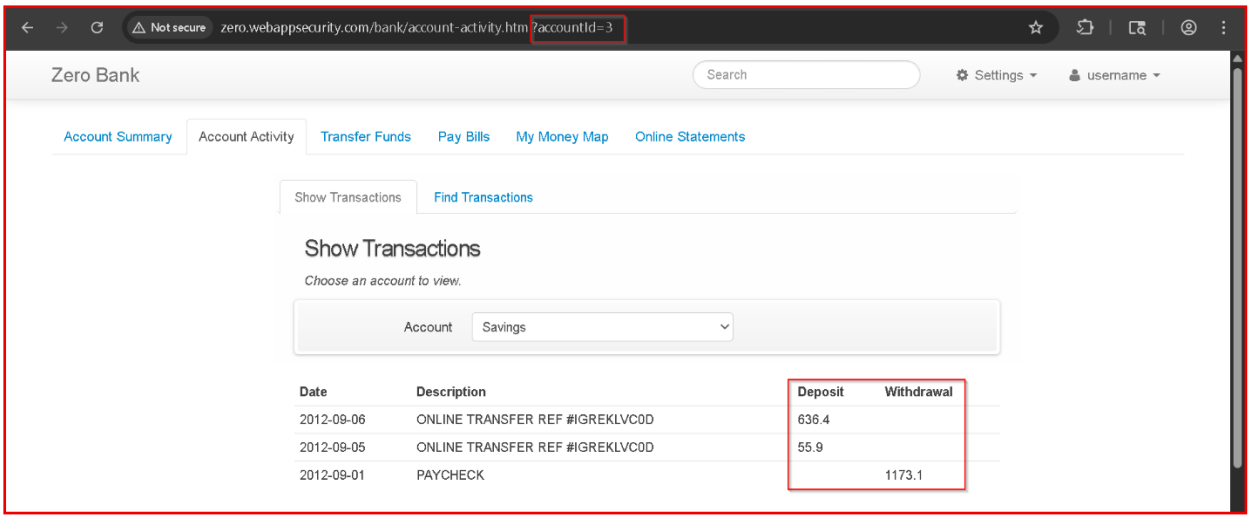
http://zero.webappsecurity.com/bank/account-activity.html?accountId=

Detailed Observation

It was observed that the application exposes sensitive account details by using sequential or predictable account IDs in the request parameter (accountId). By changing the accountId value in the URL, an attacker is able to access transaction details of other users without authorization, as demonstrated in the provided evidence.

Testing PoC





Impact

This vulnerability can lead to unauthorized access to sensitive financial information, including account balance, deposits, and withdrawals. An attacker can exploit this flaw to view or manipulate other users' transaction data, leading to privacy violations, financial fraud, and loss of customer trust

Recommendation

Implement proper access control checks on the server side to ensure that users can only access their own resources. Use indirect references (like UUIDs or random tokens) instead of sequential identifiers. Apply robust authentication and authorization mechanisms for all sensitive endpoints. Regularly test for IDOR as part of secure code reviews and penetration testing

References

https://owasp.org/Top10/A01_2021-Broken_Access_Control/

2.4 Directory Listing

Severity

LOW

Vulnerability Status

OPEN

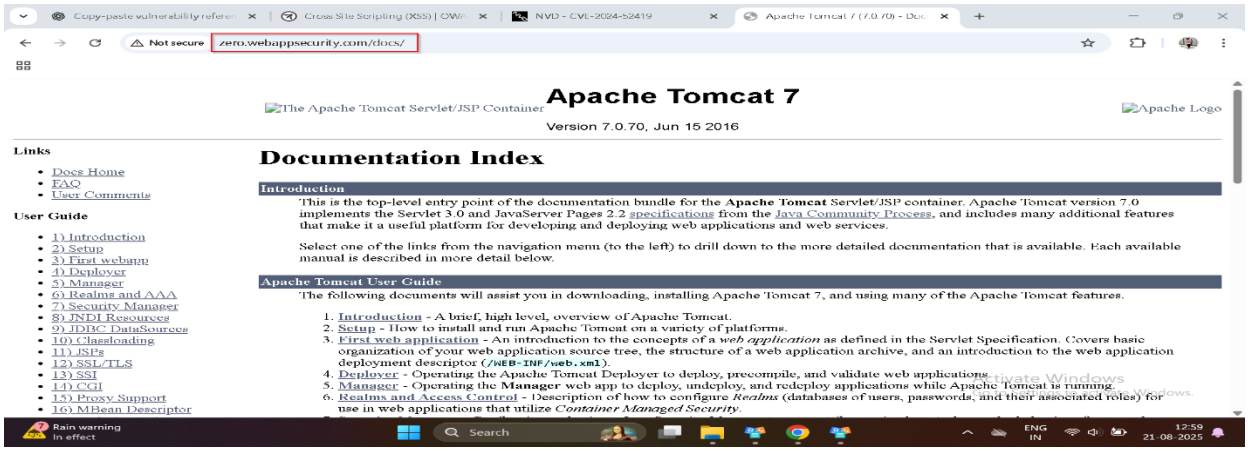
Affected URL

http://zero.webappsecurity.com/docs/

Detailed Observation

It was observed that the application allows direct access to the /docs/ directory on the web server, which exposes Apache Tomcat documentation and configuration details. This reveals sensitive information about the server setup, technologies in use, and version details (Apache Tomcat 7.0.70), which could assist attackers in identifying potential exploits.

Testing PoC



Impact

An attacker can leverage exposed documentation and version details to perform reconnaissance, identify known vulnerabilities, and craft targeted attacks. Since Apache Tomcat 7 is outdated and no longer supported, this also increases the risk of exploitation through unpatched security flaws

Recommendation

Disable directory listing on the server and restrict public access to internal documentation or configuration files. Upgrade to a supported and patched version of Apache Tomcat. Implement proper server hardening practices, including limiting exposure of unnecessary files and directories.

References

https://owasp.org/www-community/attacks/Information_disclosure

2.5 Weak Password

Severity

HIGH

Vulnerability Status

OPEN

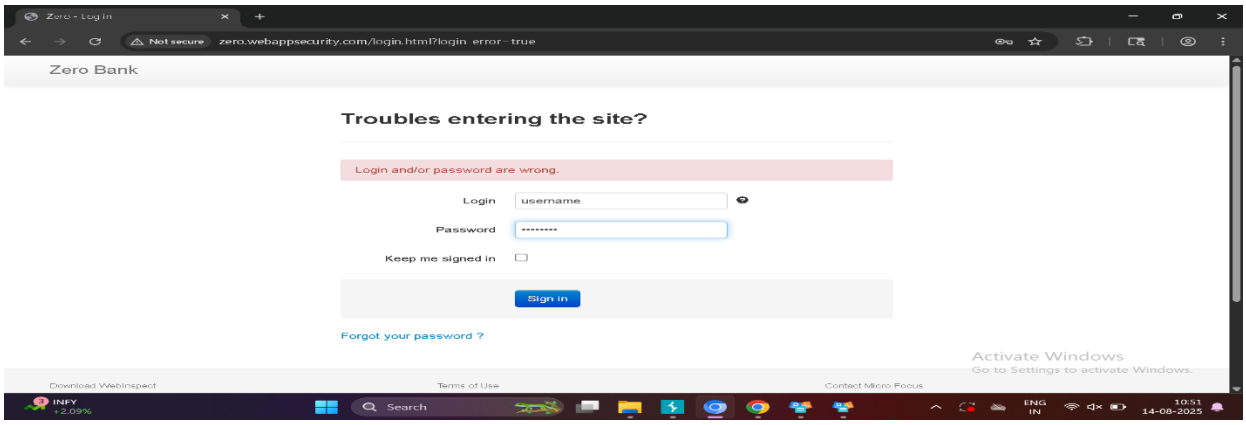
Affected URL

http://zero.webappsecurity.com/login.html?login_error=true

Detailed Observation

The login page does not enforce strong password policies. Users may set weak passwords such as short, simple, or dictionary-based passwords

Testing PoC



Impact

Attackers can easily guess or brute-force weak passwords to gain unauthorized access. The lack of HTTPS further increases the risk of man-in-the-middle (MITM) attacks.

Recommendation

Enforce strong password policy: Implement multi-factor authentication (MFA) for additional security. Secure the website with HTTPS (TLS/SSL) to protect credentials in transit. Introduce account lockout / CAPTCHA mechanisms after multiple failed login attempts.

References

https://cheatsheetseries.owasp.org/cheatsheets/Authentication_Cheat_Sheet.html

2.6 Sensitive Data Exposure

Severity

HIGH

Vulnerability Status

OPEN

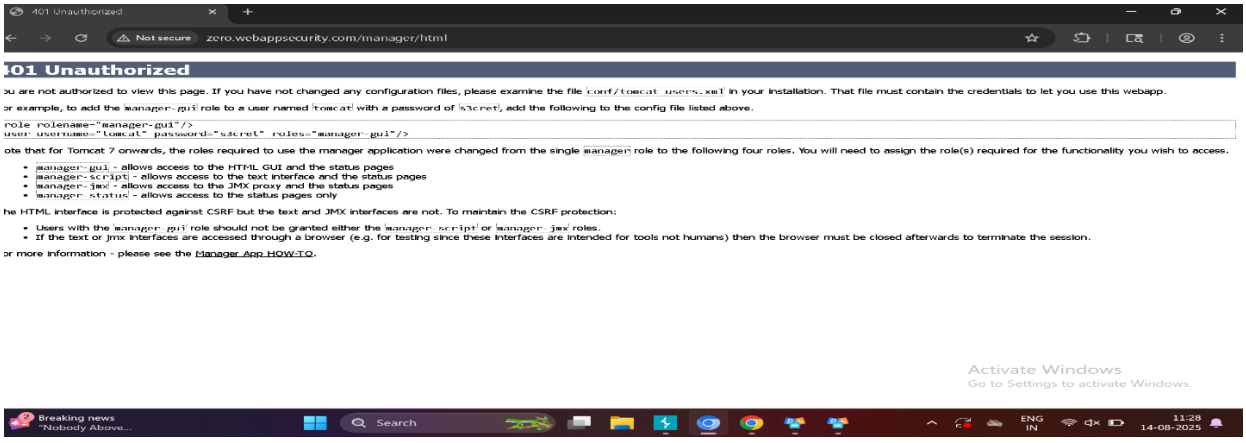
Affected URL

http://zero.webappsecurity.com/manager/html

Detailed Observation

The Tomcat Manager error page is revealing internal information about the server configuration. This includes the path to the tomcat-users.xml file, sample username and password, and security configuration details. Such information helps attackers craft targeted brute-force or privilege escalation attacks.

Testing PoC



Impact

Attackers gain knowledge of default credentials often used in misconfigured systems. Can lead to unauthorized access or complete server takeover if weak/default credentials are used. File path disclosure helps in local file inclusion (LFI**)\)** or directory traversal attacks.

Recommendation

Disable detailed error messages for unauthorized users; show generic error pages instead. Restrict access to Tomcat Manager (/manager/html) to trusted IP addresses only. Keep Tomcat and related components patched and updated.

References

https://owasp.org/Top10/A02_2021-Cryptographic_Failures/

2.7 Cross Site Request Forgery (CSRF)

Severity

HIGH

Vulnerability Status

OPEN

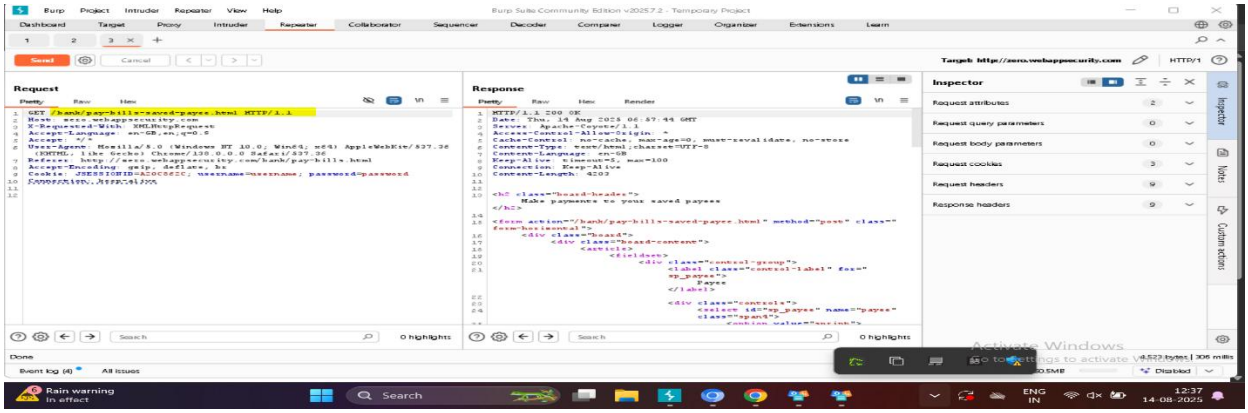
Affected URL

http://zero.webappsecurity.com/bank/pay-bills.html

Detailed Observation

Authentication is handled using a session cookie (JSESSIONID=...) along with credentials (username=username; password=password) stored in cookies, which makes it easier for attackers to forge requests. Since the application accepts GET or POST requests without additional verification, an attacker can trick a logged-in user into executing unwanted actions like adding a payee or transferring funds by embedding malicious links or forms on an external site..

Testing PoC



Impact

An attacker can perform unauthorized transactions (e.g., transferring money, modifying account details) by tricking an authenticated user into clicking a crafted link or visiting a malicious page. This compromises integrity of user accounts and can lead to financial fraud

Recommendation

Implement CSRF tokens. Use same site cookies to limit cookie sending in cross-origin requests. Require re-authentication (password, OTP, or MFA) for critical actions (like fund transfers). Enforce secure cookie attributes.

References

https://cheatsheetseries.owasp.org/cheatsheets/Cross-Site_Request_Forgery_Prevention_Cheat_Sheet.html

2.8 Plain Text Credentials

Severity

HIGH

Vulnerability Status

OPEN

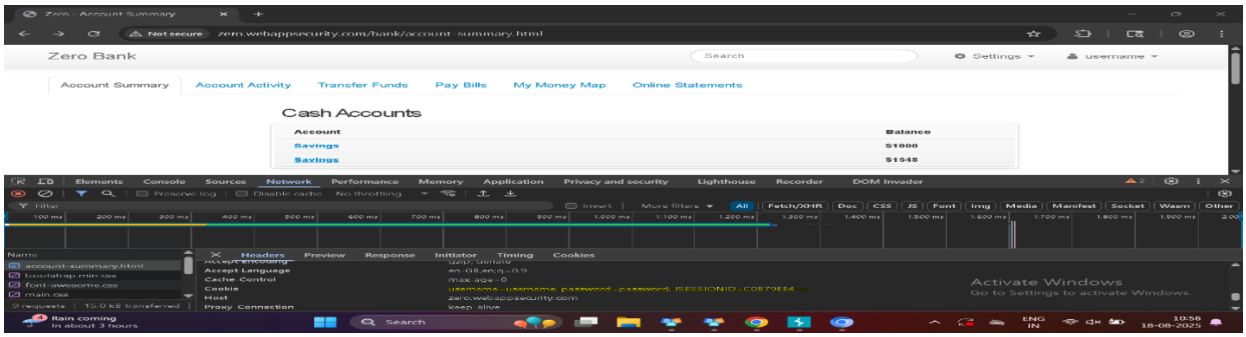
Affected URL

http://zero.webappsecurity.com/bank/account-summary.html

Detailed Observation

While analyzing the network traffic of the application, it was observed that the username and password are being transmitted in plain text within the HTTP request header.

Testing PoC



Impact

The transmission of credentials in plain text can lead to account compromise if an attacker intercepts the traffic over insecure channels. Once obtained, the attacker can log in to the application and gain unauthorized access to sensitive financial data or perform malicious transactions.

Recommendation

Enforce the use of HTTPS (TLS/SSL) for all communication to encrypt sensitive information in transit. Implement strong authentication mechanisms such as hashing for password storage and use secure session management practices.

References

https://cheatsheetseries.owasp.org/cheatsheets/Transport_Layer_Protection_Cheat_Sheet.html

2.9 Denial of Service Attack

Severity

MEDIUM

Vulnerability Status

OPEN

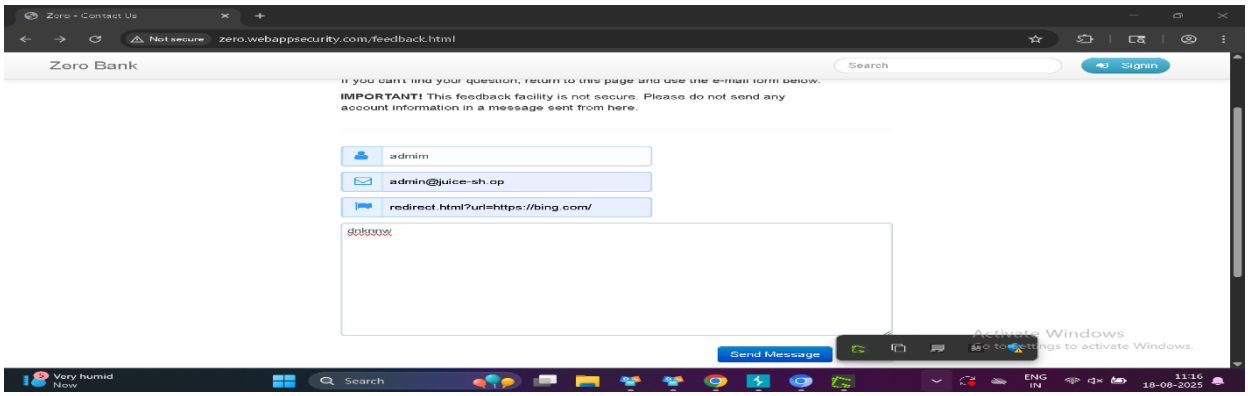
Affected URL

http://zero.webappsecurity.com/sendFeedback.html

Detailed Observation

During testing, it was observed that the feedback form can be overwhelmed by a high volume of automated submissions in a short period of time. The form does not implement rate limiting, CAPTCHA, or request throttling, allowing attackers to repeatedly submit requests without restriction.

Testing PoC



Impact

Legitimate users may be unable to access the service, causing downtime and operational disruption. Potential financial loss due to service unavailability

Recommendation

Implement rate limiting and connection throttling to mitigate excessive requests. Deploy Web Application Firewalls (WAF) and Intrusion Detection/Prevention Systems (IDS/IPS) to filter malicious traffic. Optimize server capacity and use load balancing and redundancy to handle traffic spikes.

References

https://owasp.org/www-community/attacks/Denial_of_Service

2.10 Information Disclosure via Internal Files

Severity

MEDIUM

Vulnerability Status

OPEN

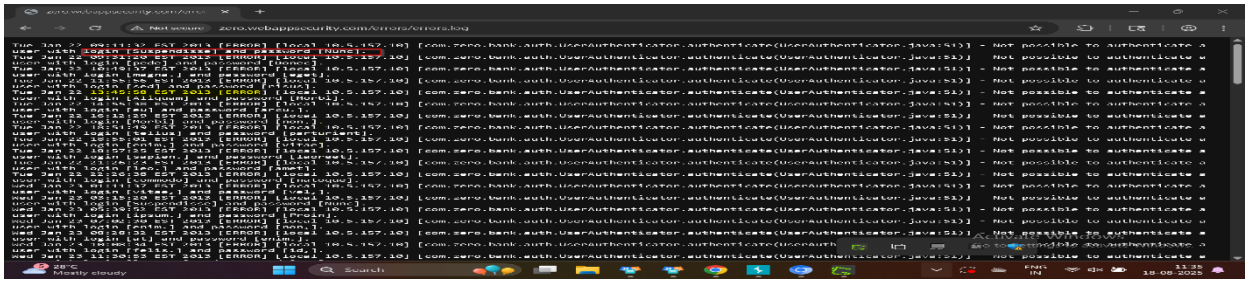
Affected URL

http://zero.webappsecurity.com/errors/errors.log

Detailed Observation

During testing, it was observed that the application exposes internal files ex; log file through predictable URLs. These files contain sensitive information such as database credentials.

Testing PoC



Impact

Potential compromise of the application, database, or other connected systems. Exposure of sensitive data such as passwords, API keys, or internal configuration, which can lead to unauthorized access.

Recommendation

Restrict access to internal and sensitive files via proper authentication and authorization mechanisms. Implement proper file permissions, ensuring that only necessary processes or users can access sensitive files. Disable directory listing on all web servers.

References

https://owasp.org/www-community/vulnerabilities/Information_Leak_through_Comments_and_Logs

2.11 SSL Certificate Missing

Severity

HIGH

Vulnerability Status

OPEN

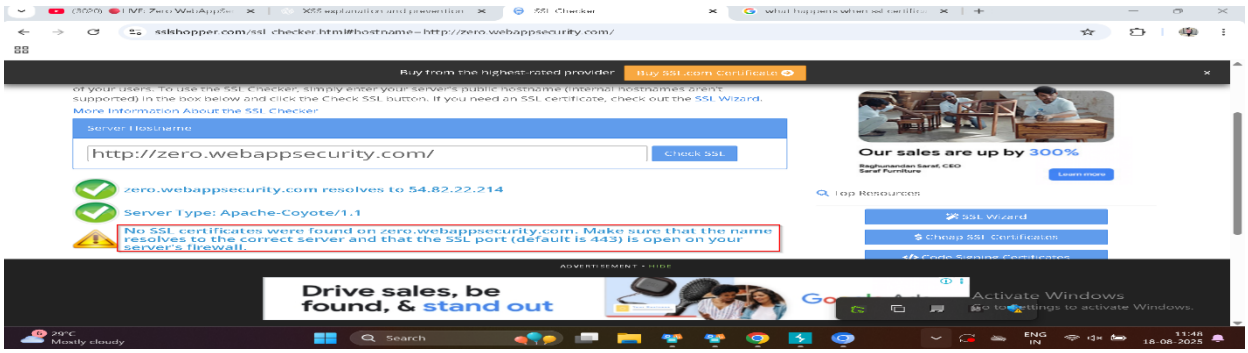
Affected URL

http://zero.webappsecurity.com/login.html

Detailed Observation

The Zero Bank website does not implement SSL/TLS encryption, making it accessible via HTTP instead of HTTPS.

Testing PoC



Impact

Sensitive user information transmitted over HTTP is vulnerable to interception by malicious actors. Without SSL/TLS, attackers can intercept and potentially alter communications between users and the server.

Recommendation

Obtain and install a valid SSL/TLS certificate from a reputable Certificate Authority (CA). Configure the server to redirect all HTTP traffic to HTTPS, ensuring secure communication.

References

https://www.cloudflare.com/learning/ssl/common-errors/

2.12 Insecure Storage

Severity

HIGH

Vulnerability Status

OPEN

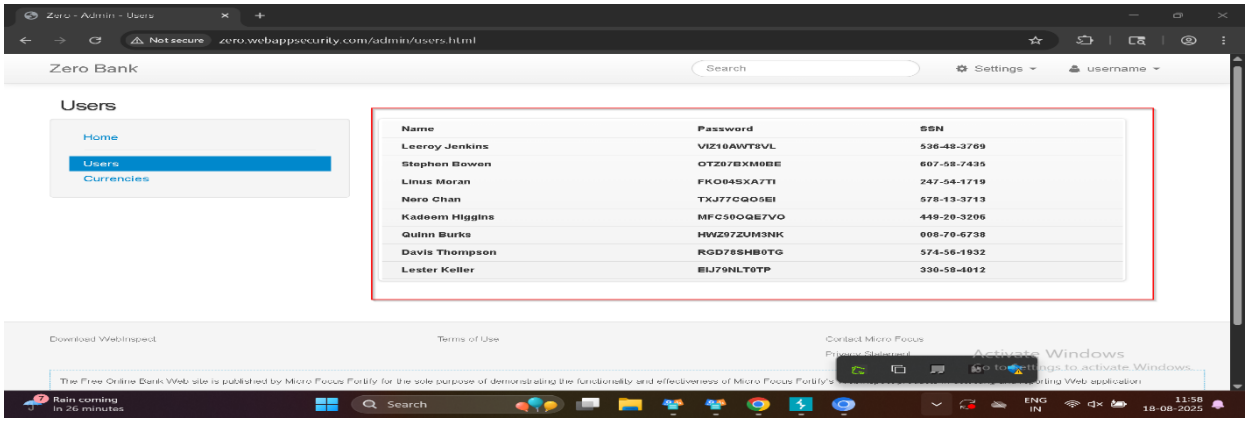
Affected URL

http://zero.webappsecurity.com/admin/users.html

Detailed Observation

During testing, it was observed that the application stores sensitive data such as passwords, authentication tokens, personal information, or financial data in an insecure manner

Testing PoC



Impact

Exposure of sensitive user information, leading to identity theft, account compromise, or financial fraud. Attackers may gain access to authentication credentials or session tokens, allowing unauthorized access.

Recommendation

Store sensitive data securely using strong encryption algorithms and hashing functions for passwords. Avoid storing sensitive data on the client side; if necessary, ensure it is encrypted and protected with proper security flags. Implement strict access controls to prevent unauthorized access to stored data.

References

https://owasp.org/www-project-mobile-top-10/2016-risks/m2-insecure-data-storage

2.13 Session Hijacking

Severity

HIGH

Vulnerability Status

OPEN

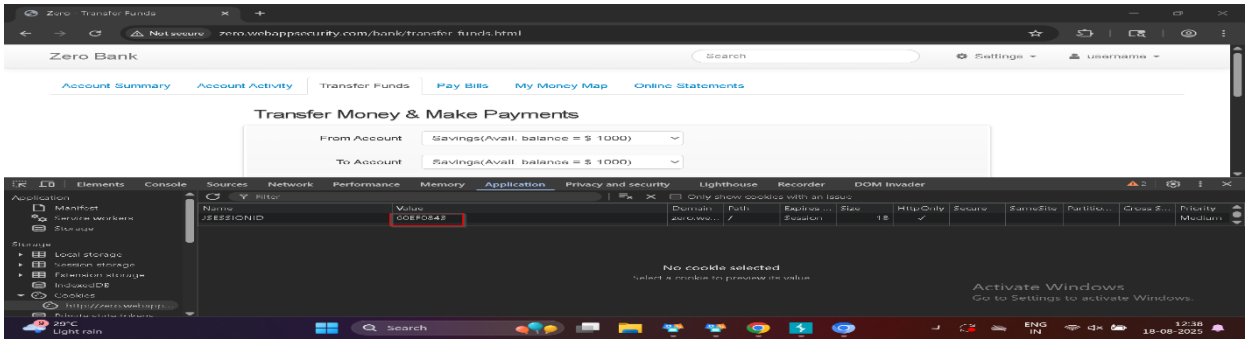
Affected URL

http://zero.webappsecurity.com/login.html

Detailed Observation

During testing, it was observed that the application's session management is vulnerable to hijacking attacks. Session tokens (e.g., cookies, URL tokens) are transmitted or stored without proper protection, such as secure flags, HttpOnly attributes, or encryption. During testing, it was observed that the application stores sensitive data such as passwords, authentication tokens, personal information, or financial data in an insecure manner

Testing PoC



Impact

Unauthorized access to user accounts, including sensitive information and transactional capabilities. Potential full compromise of user data and administrative privileges if an admin session is hijacked. May facilitate further attacks such as privilege escalation or identity theft.

Recommendation

Use secure, randomly generated session IDs that are long and unpredictable. Ensure session tokens are transmitted over HTTPS only. Implement session timeout and automatic logout after inactivity.

References

https://owasp.org/www-community/attacks/Session_hijacking_attack

2.14 Browser Cache Weakness

Severity

HIGH

Vulnerability Status

OPEN

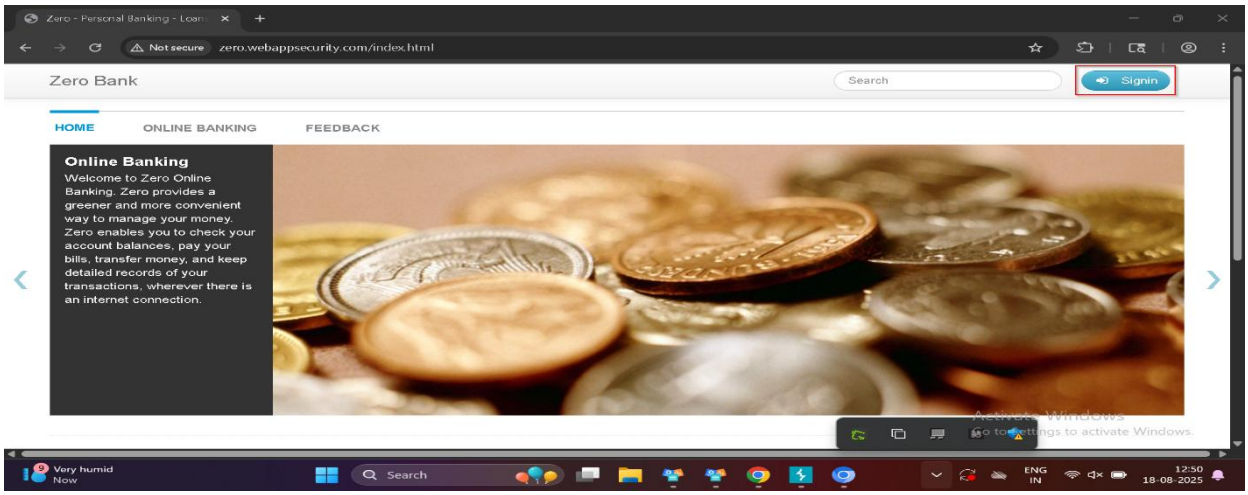
Affected URL

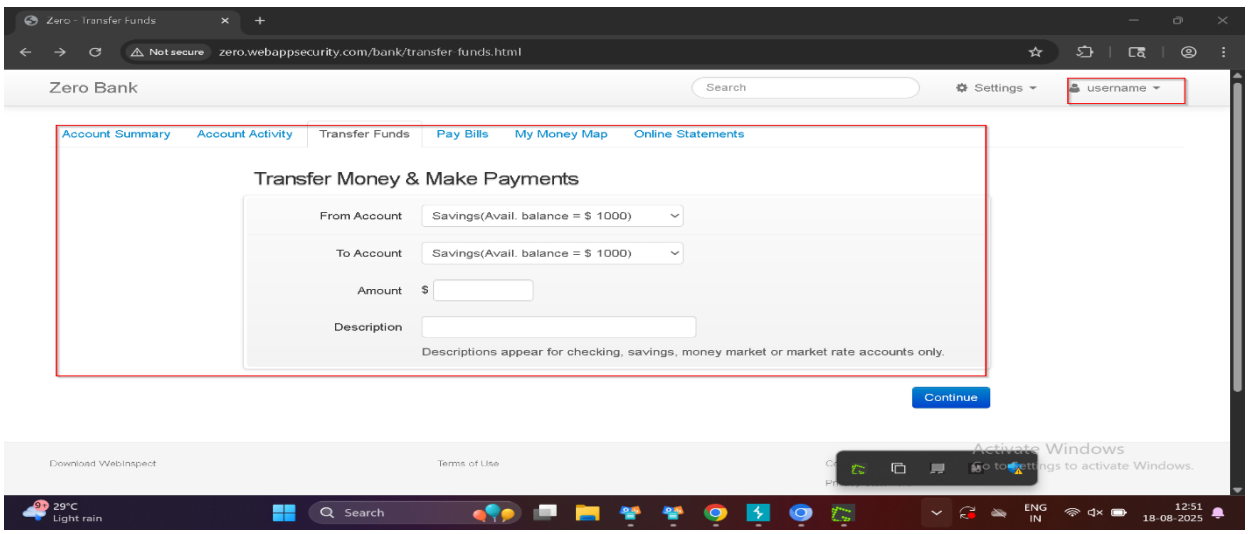
http://zero.webappsecurity.com/bank/transfer-funds.html

Detailed Observation

During testing, it was observed that sensitive information, such as personal data, authentication tokens, or confidential pages, is being cached by the browser. This occurs because HTTP headers like are either missing, misconfigured, or set to allow caching of sensitive content.

Testing PoC





Impact

Exposure of sensitive user information stored in the browser cache. Unauthorized access to confidential pages or data by anyone with physical or remote access to the client machine. Potential facilitation of session hijacking or other attacks if cached pages include session tokens or personal data.

Recommendation

Configure HTTP headers to prevent caching of sensitive pages. Configure HTTP headers to prevent caching of sensitive pages. Implement session expiration and automatic logout mechanisms.

References

https://cheatsheetseries.owasp.org/cheatsheets/Cache_Control_Cheat_Sheet.html

2.15 Authentication Bypass

Severity

CRITICAL

Vulnerability Status

OPEN

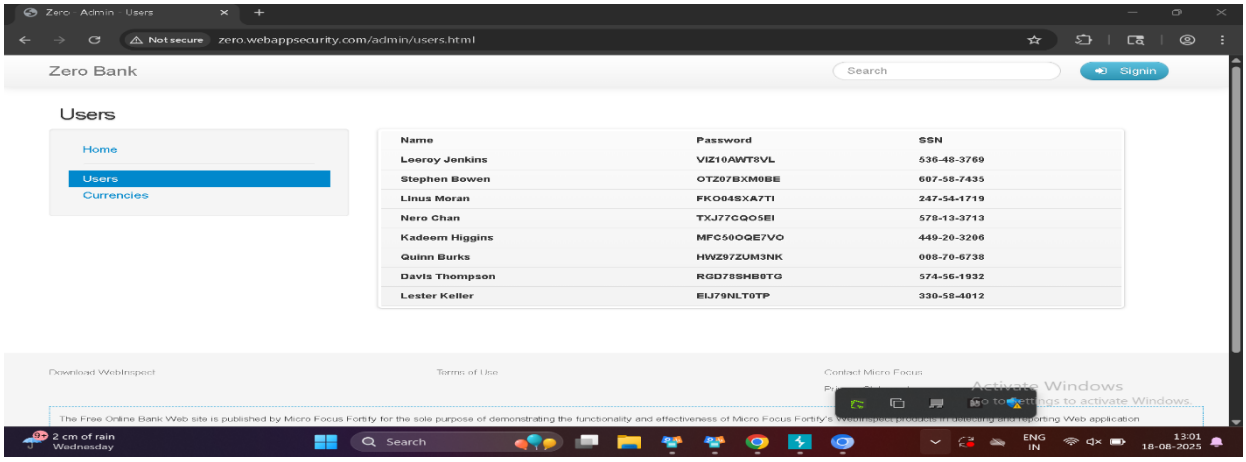
Affected URL

http://zero.webappsecurity.com/admin/users.html

Detailed Observation

During testing, it was observed that the application's authentication mechanism is bypassed through parameter manipulation.

Testing PoC



Impact

Unauthorized access to sensitive data and functionalities. Potential data theft, modification, or deletion. Increased risk of further attacks like privilege escalation, data exfiltration, or fraudulent transactions

Recommendation

Enforce strong authentication mechanisms, including complex passwords and MFA. Validate all inputs and parameters to prevent manipulation. Ensure server-side authentication checks are mandatory for every request to restricted resources.

References

https://cheatsheetseries.owasp.org/cheatsheets/Authentication_Cheat_Sheet.html

2.16 Insecure Password Reset

Severity

CRITICAL

Vulnerability Status

OPEN

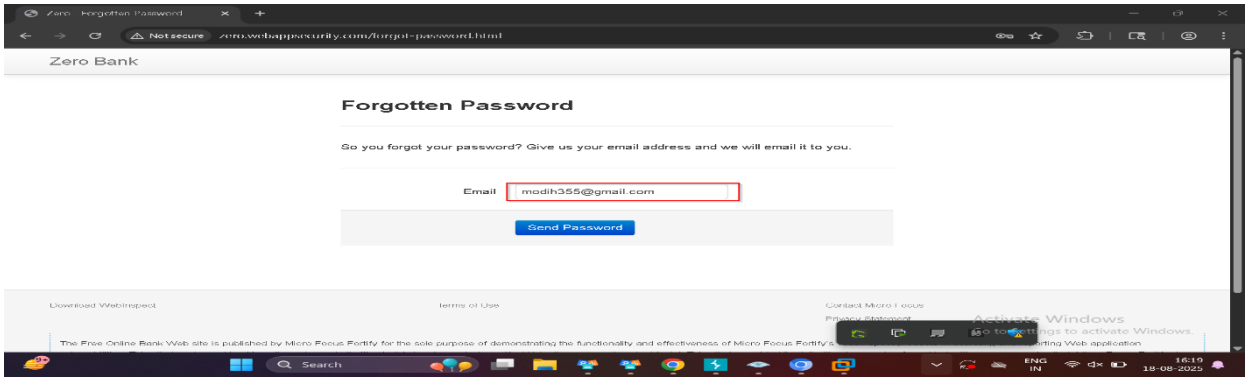
Affected URL

http://zero.webappsecurity.com/forgot-password.html

Detailed Observation

During testing, it was observed that the application's password reset functionality is insecure. It accepts the unformat email to give password link.

Testing PoC



Impact

Unauthorized access to user accounts. Compromise of sensitive personal or financial data. Potential account takeover leading to fraud or data manipulation.

Recommendation

Implement secure, time-limited, and random password reset tokens. Enforce strong verification for password reset requests. Use HTTPS to transmit all password reset links and tokens. Implement rate limiting and monitoring to prevent abuse of password reset functionality.

References

https://cheatsheetseries.owasp.org/cheatsheets/Forgot_Password_Cheat_Sheet.html

2.17 HTTP Strict Transport Security Missing

Severity

HIGH

Vulnerability Status

OPEN

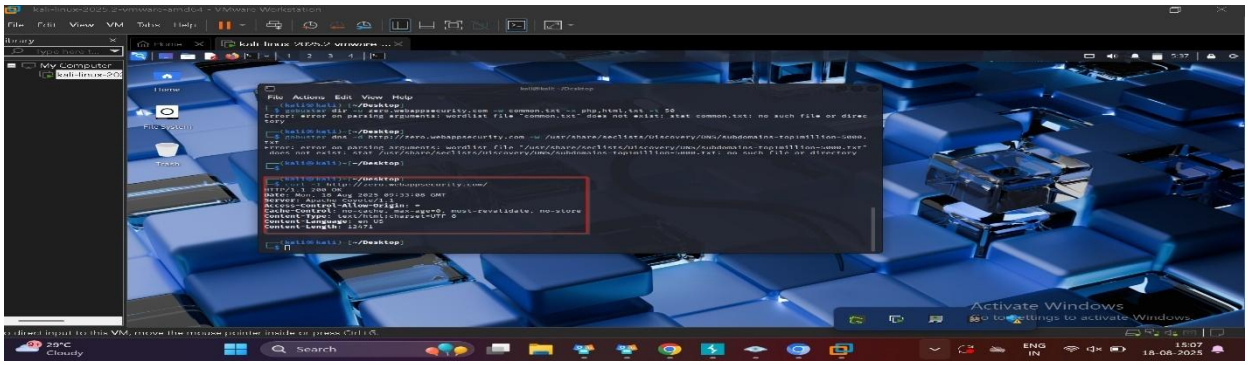
Affected URL

http://zero.webappsecurity.com/bank/pay-bills.html

Detailed Observation

During testing, it was observed that the application does not implement the HTTP Strict Transport Security (HSTS) response header.

Testing PoC



Impact

Sensitive information can be intercepted over an insecure HTTP connection. Increased risk of man-in-the-middle attacks, session hijacking, and credential theft.

Recommendation

Enable and enforce HSTS by configuring the server. Ensure HTTPS is correctly configured with a valid SSL/TLS certificate. Register the domain for HSTS Preload List. Redirect all HTTP traffic to HTTPS

References

https://hstspreload.org/

2.18 CORS Misconfiguration

Severity

HIGH

Vulnerability Status

OPEN

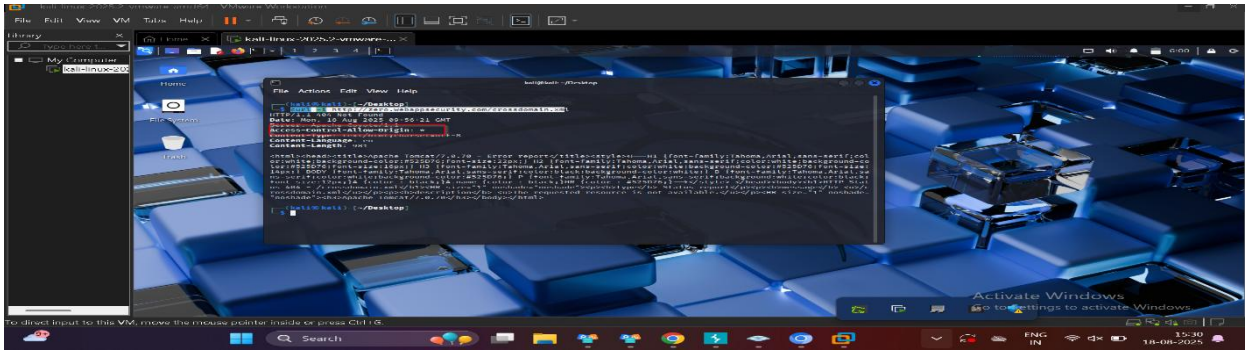
Affected URL

http://zero.webappsecurity.com/bank/pay-bills.html

Detailed Observation

During testing, it was observed that the application uses a cross-domain policy file that is either missing proper restrictions or overly permissive (e.g., allows access from all domains using *). This insecure configuration enables untrusted domains to interact with the application and access sensitive data or services that should be restricted to trusted origins only.

Testing PoC



Impact

Malicious domains can send requests to the vulnerable application, potentially bypassing the same-origin policy. Exposure of sensitive data such as user information, authentication tokens, or API responses. Increased risk of cross-site request forgery (CSRF), data theft, and session hijacking.

Recommendation

Review and restrict the cross-domain policy file to only allow trusted domains. Avoid using wildcards (*) in domain permissions. Restrict access to only the specific resources that are required by external domains.

References

https://owasp.org/www-community/attacks/CORS_Configuration

2.19 Privelege Escalation

Severity

CRITICAL

Vulnerability Status

OPEN

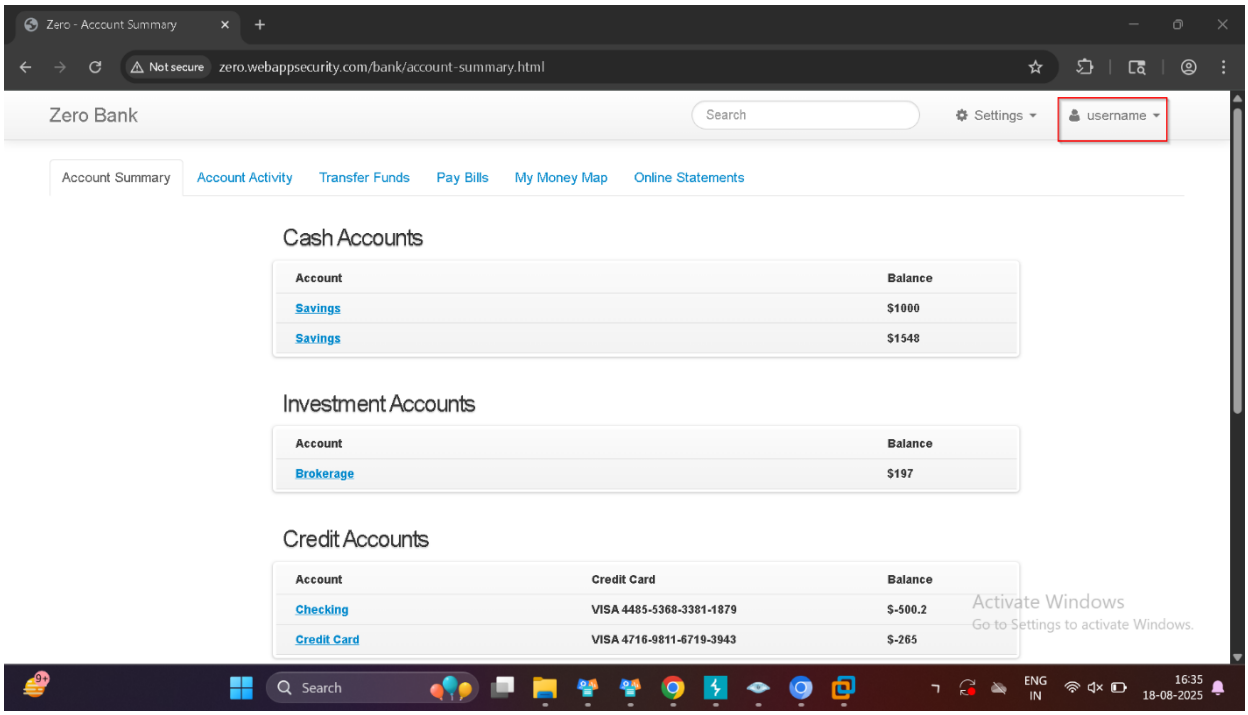
Affected URL

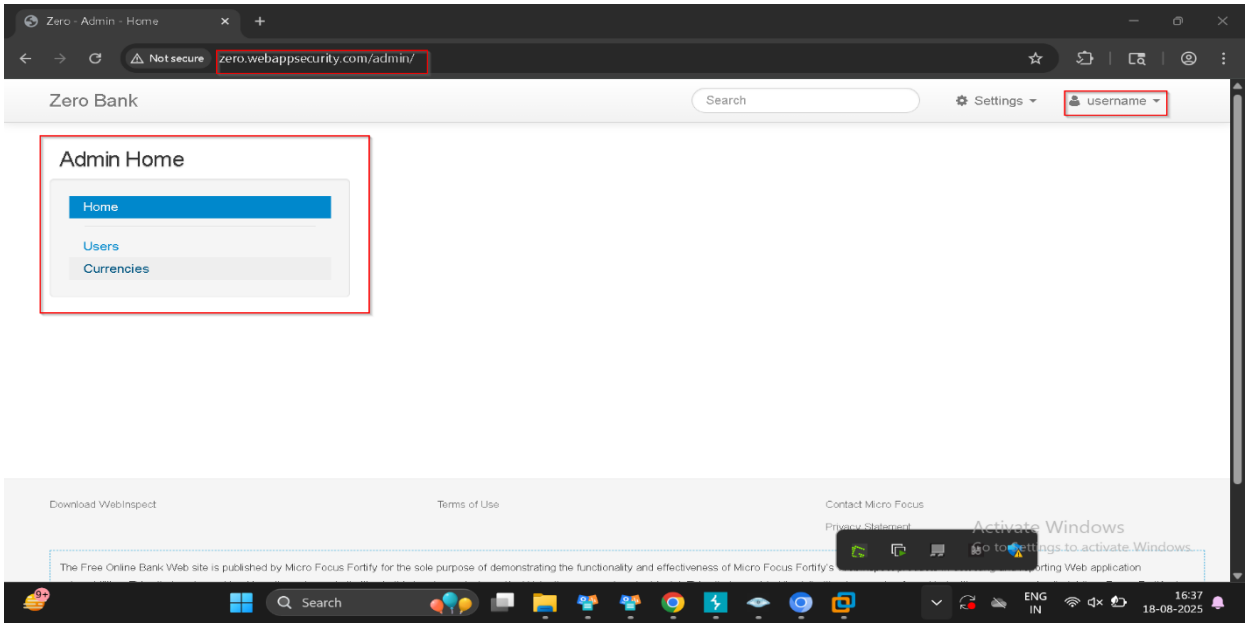
http://zero.webappsecurity.com/admin/

Detailed Observation

During testing, it was observed that the application allows users with lower-level privileges to perform actions or access resources intended only for higher-privileged accounts.

Testing PoC





Impact

Unauthorized users can gain administrative or higher-level privileges. Full compromise of the application, including creation/deletion of accounts, modification of financial transactions, or access to sensitive data. Potential for data manipulation, fraud, and service disruption

Recommendation

Implement strict role-based access control and enforce authorization checks at the server-side for every sensitive function. Validate user roles and permissions before executing privileged operations. Avoid relying solely on client-side controls for access restrictions.

References

https://owasp.org/Top10/A01_2021-Broken_Access_Control/

2.20 Server Version Disclosure

Severity

MEDIUM

Vulnerability Status

OPEN

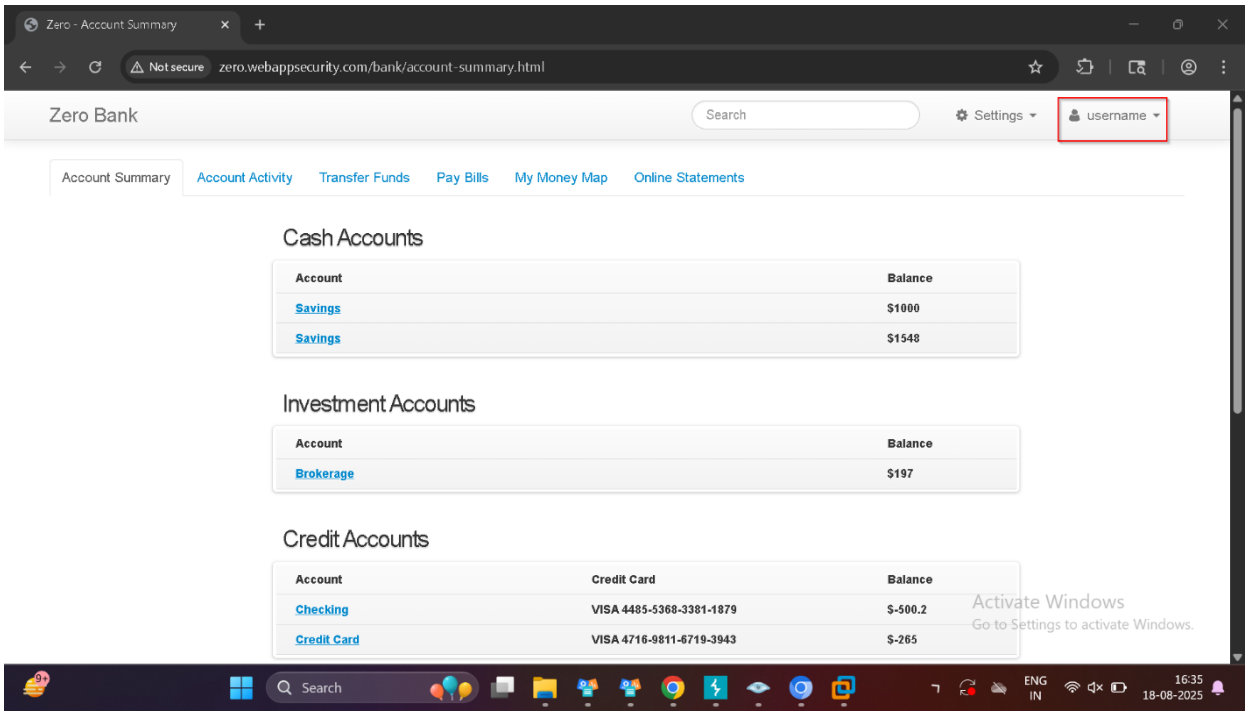
Affected URL

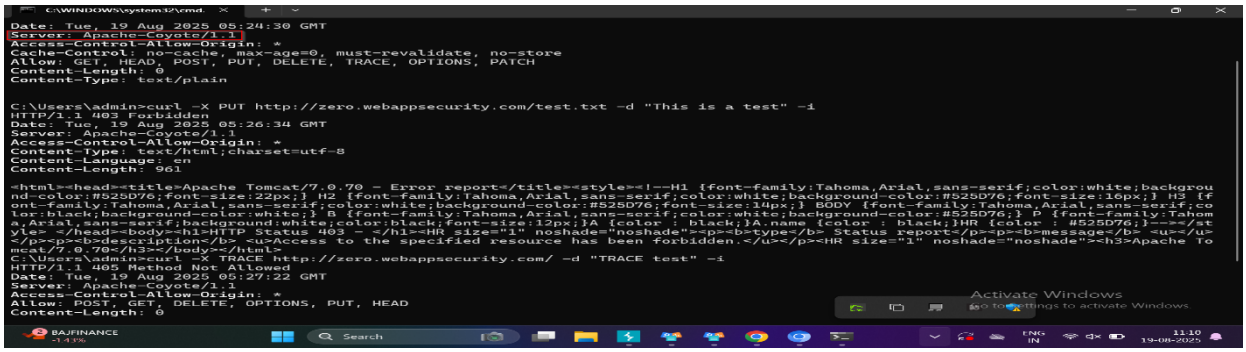
http://zero.webappsecurity.com/admin/test.txt

Detailed Observation

During the assessment, it was observed that the web server discloses its version details through HTTP response headers or error messages.

Testing PoC





Impact

Enables attackers to perform fingerprinting of the underlying server and technologies. Increases the risk of targeted attacks using publicly available exploits. May lead to full compromise if the disclosed version has unpatched vulnerabilities.

Recommendation

Suppress or modify the Server and other version-related headers. Configure the web server to hide or obfuscate version information. Use custom error pages instead of default error messages to prevent information leakage.

References

https://owasp.org/www-community/attacks/Information_exposure_through_error_messages

2.21 Weak Lockout Mechanism

Severity

HIGH

Vulnerability Status

OPEN

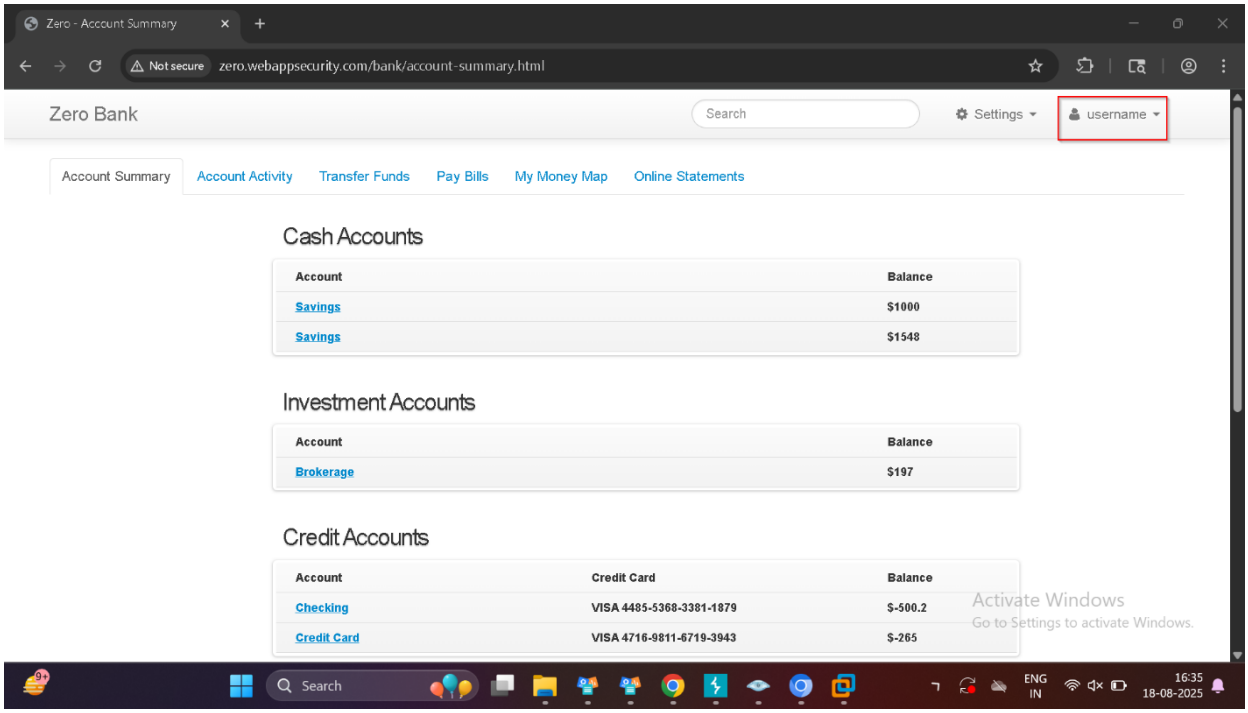
Affected URL

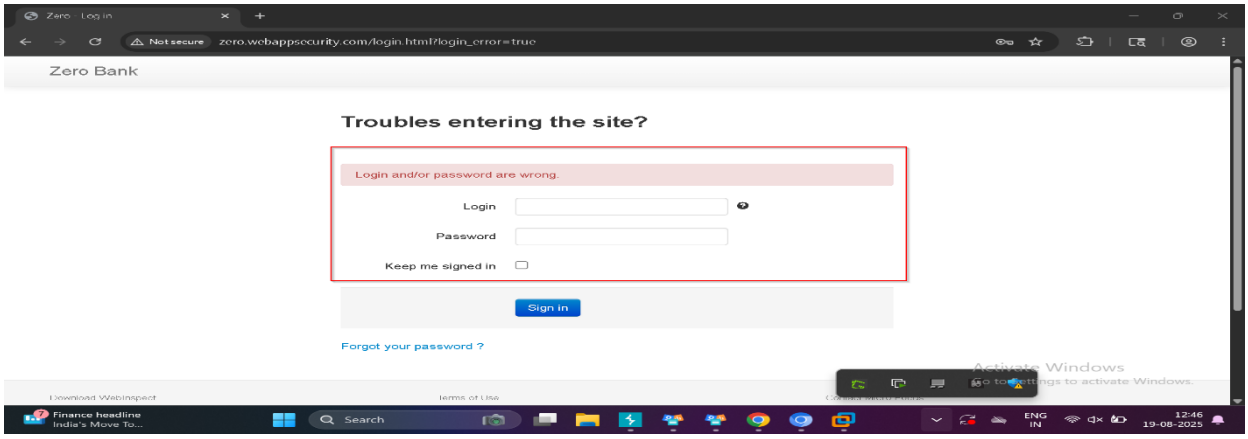
http://zero.webappsecurity.com/admin/test.txt

Detailed Observation

During testing, it was observed that the application has an inadequate account lockout policy after multiple failed login attempts. Accounts are not locked after repeated incorrect login attempts.

Testing PoC





Impact

Increases the likelihood of **unauthorized access** via brute-force attacks. If common or weak passwords are used, accounts may be compromised. May lead to exposure of sensitive customer or financial data.

Recommendation

Implement a robust lockout policy. Use progressive delays (rate-limiting) instead of simple lockouts to prevent automated brute force. Encourage strong password policies and multi-factor authentication (MFA).

References

https://pages.nist.gov/800-63-3/

2.22 Captcha Missing

Severity

MEDIUM

Vulnerability Status

OPEN

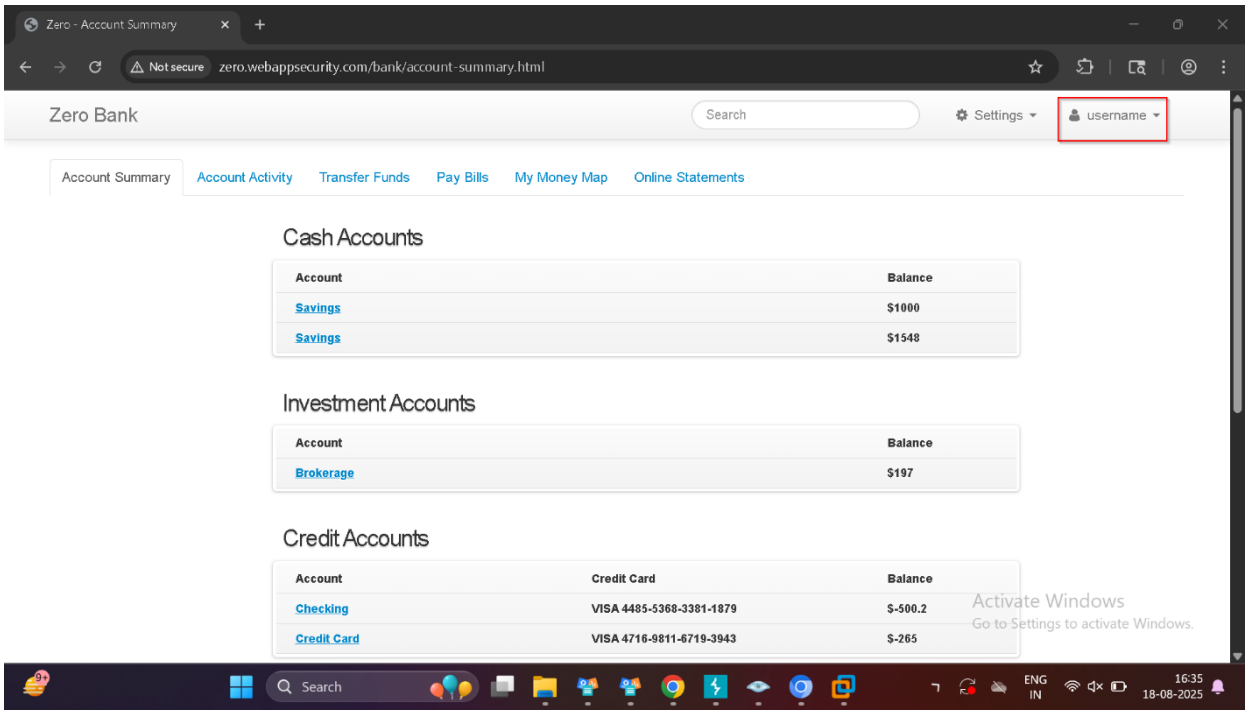
Affected URL

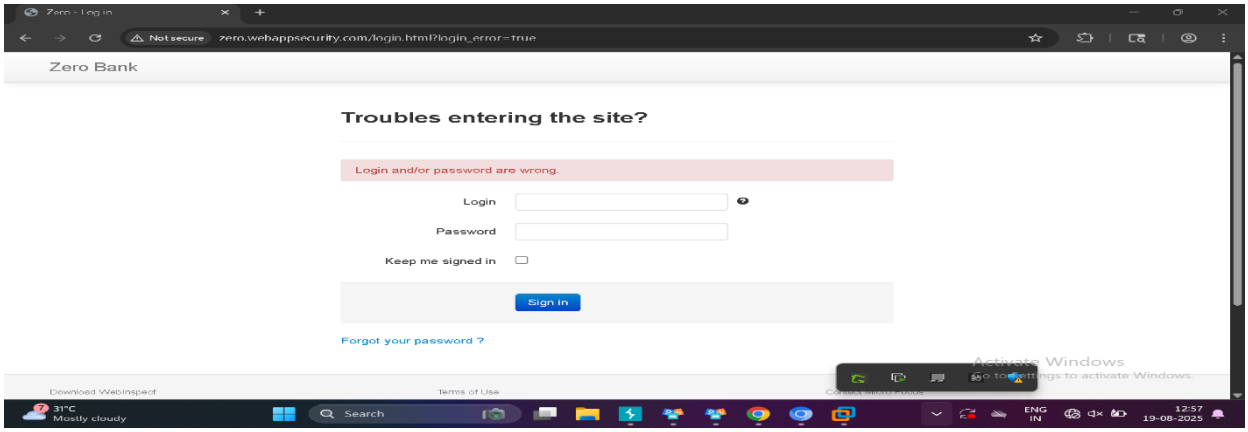
http://zero.webappsecurity.com/login.html?login_error=true

Detailed Observation

During assessment, it was observed that the application does not implement a CAPTCHA (Completely Automated Public Turing test to tell Computers and Humans Apart) on sensitive forms such as login page.

Testing PoC





Impact

Increased risk of account takeover due to brute-force or credential stuffing attacks. Attackers can flood the application with fake requests, impacting availability (DoS). Increases server load, degrading performance for legitimate users.

Recommendation

Implement CAPTCHA on login pages. Combine with rate limiting and account lockout mechanisms for stronger protection. Regularly update CAPTCHA libraries to the latest versions to avoid bypass techniques.

References

https://developers.google.com/recaptcha

2.23 Server Side Validation is Absent

Severity

HIGH

Vulnerability Status

OPEN

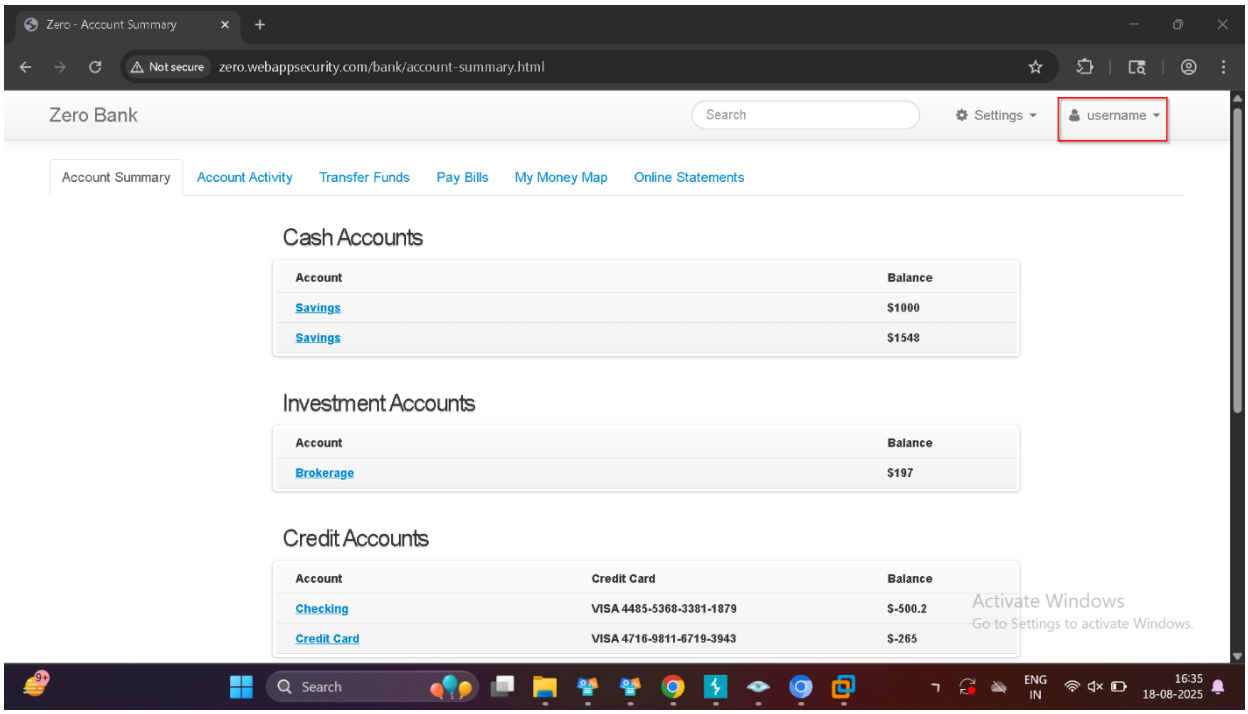
Affected URL

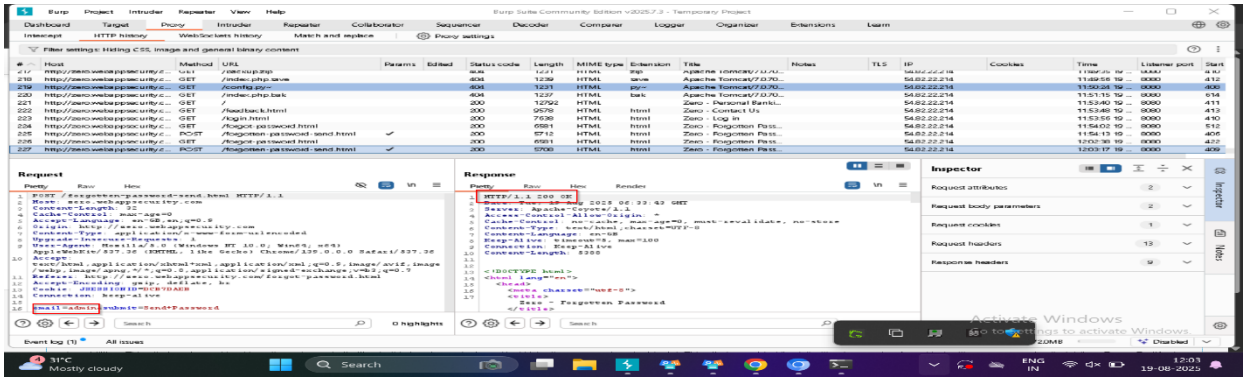
http://zero.webappsecurity.com/forgotten-password-send.html

Detailed Observation

During testing, it was observed that the application relies solely on client-side validation to validate user input. No proper server-side validation is enforced for critical input fields, including password reset form.

Testing PoC





Impact

Increased risk of data manipulation, data corruption, or unauthorized access. Potential execution of malicious code on the server Exposure of sensitive data to attackers.

Recommendation

Implement server-side validation for all user inputs, even if client-side validation exists. Use prepared statements or parameterized queries for database operations. Apply proper encoding and escaping for output to prevent XSS.

References

https://cheatsheetseries.owasp.org/cheatsheets/Input_Validation_Cheat_Sheet.html

2.24 Clickjacking

Severity

HIGH

Vulnerability Status

OPEN

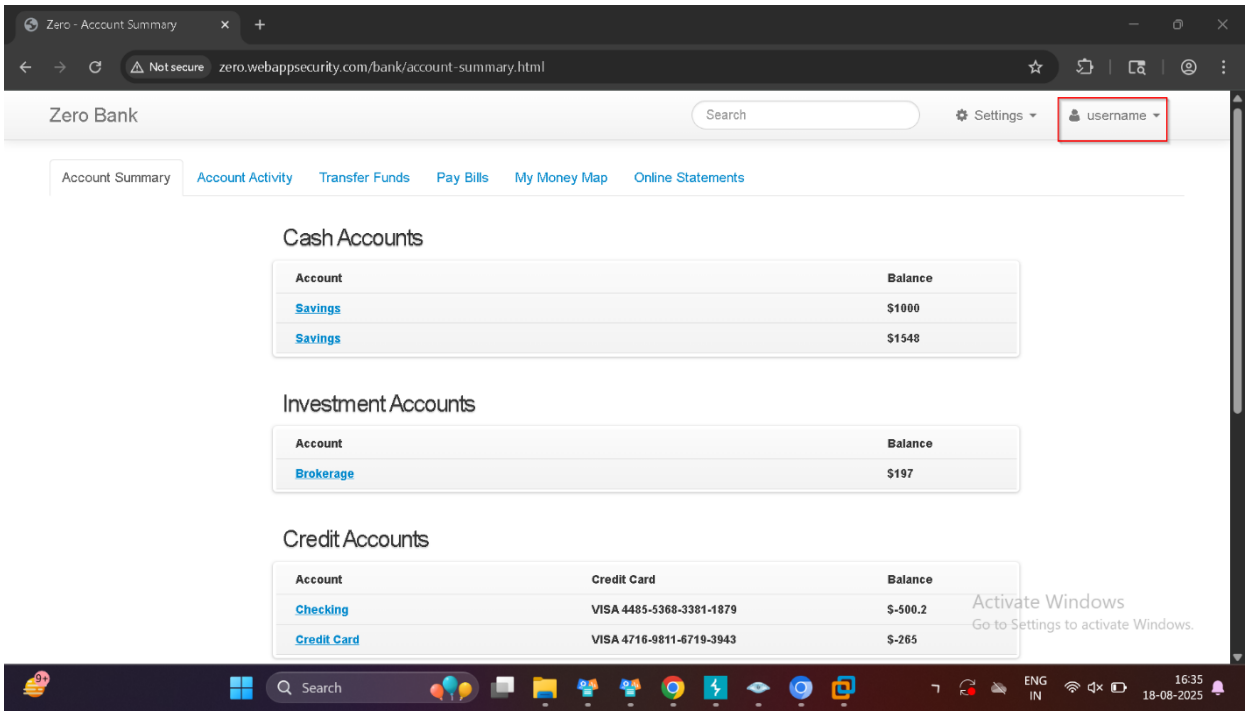
Affected URL

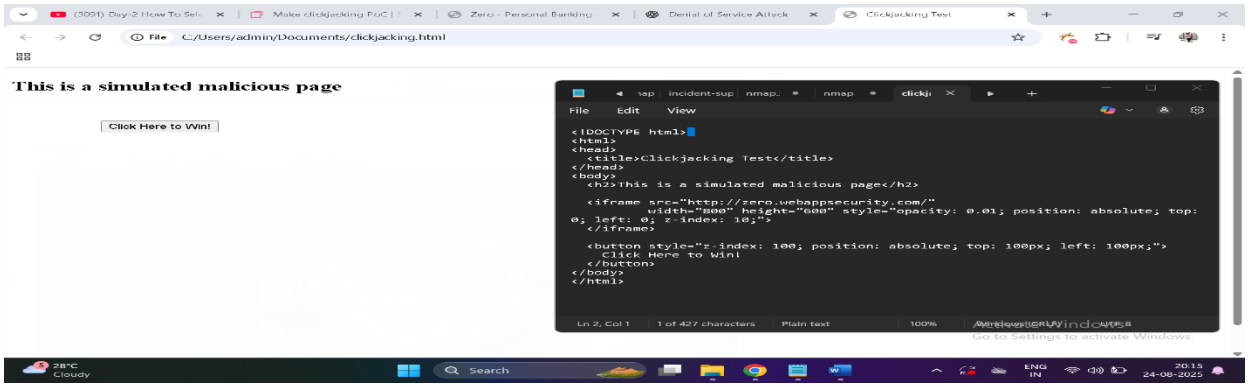
http://zero.webappsecurity.com/

Detailed Observation

During testing, it was found that the application does not implement sufficient protection against Clickjacking attacks. The tested web pages can be embedded within an <iframe> on a malicious domain, allowing attackers to trick users into unintentionally performing actions

Testing PoC





Impact

Attackers can trick users into executing unintended actions on their accounts. Potential for financial fraud, unauthorized transactions, or account takeover. May lead to loss of user trust and reputational damage. Attack could be combined with phishing/social engineering for higher impact.

Recommendation

Implement the X-Frame-Options HTTP response header with values like DENY or SAMEORIGIN. Use Content-Security-Policy (CSP) frame-ancestors directive to restrict iframe embedding. Regularly test for Clickjacking by attempting to load sensitive pages within iframes.

References

https://owasp.org/www-community/attacks/Clickjacking

2.25 WAF Missing

Severity

MEDIUM

Vulnerability Status

OPEN

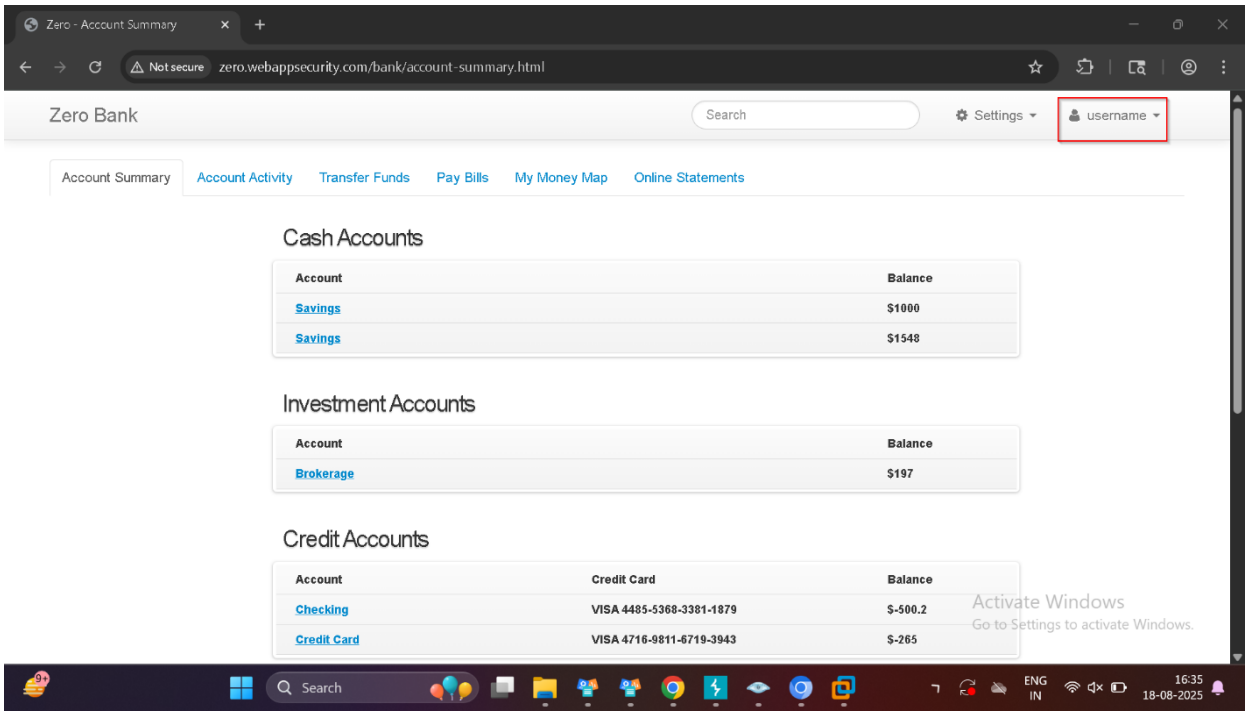
Affected URL

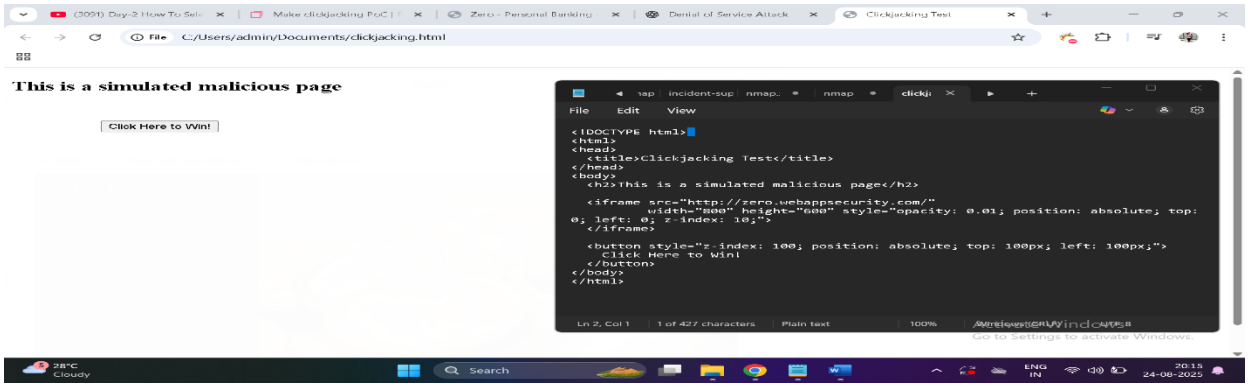
http://zero.webappsecurity.com/

Detailed Observation

The application is deployed without a Web Application Firewall (WAF). As a result, there is no additional security layer to detect and mitigate common web-based attacks such as SQL Injection, Cross-Site Scripting (XSS), Local File Inclusion (LFI), Remote File Inclusion (RFI), and automated bot attacks.

Testing PoC





Impact

Increased risk of successful exploitation of web application vulnerabilities. Attackers can directly interact with the backend server without filtering or monitoring. Higher chances of data breach, service disruption, and reputational damage.

Recommendation

Implement a Web Application Firewall. Configure WAF rules to block common attack patterns. Enable logging and monitoring to detect suspicious activity.

References

https://owasp.org/www-community/Web_Application_Firewall

2.26 Security Headers Missing

Severity

MEDIUM

Vulnerability Status

OPEN

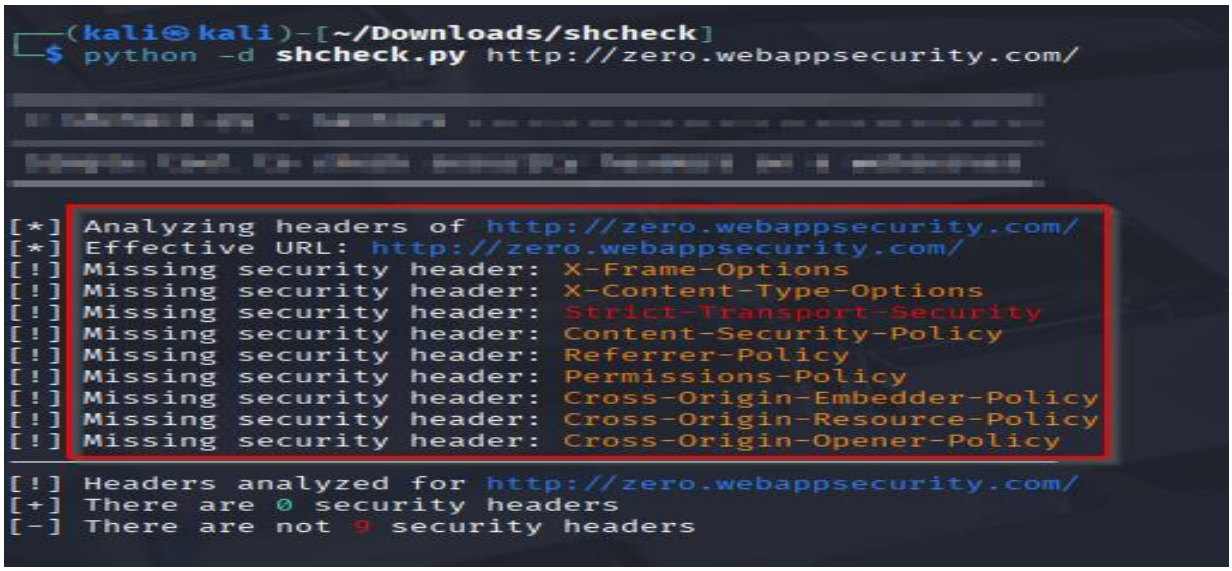
Affected URL

http://zero.webappsecurity.com/

Detailed Observation

During testing it was found that security headers in website are missing.

Testing PoC



Impact

Increased risk of Cross-Site Scripting (XSS). Possible Clickjacking attacks due to lack of framing protection. Exposure to MIME sniffing vulnerabilities.

Recommendation

Implement the security headers like CSP, X-Frame Options, HSTS, etc.

References

https://owasp.org/www-project-secure-headers/

2.27 Stored XSS

Severity

HIGH

Vulnerability Status

OPEN

Affected URL

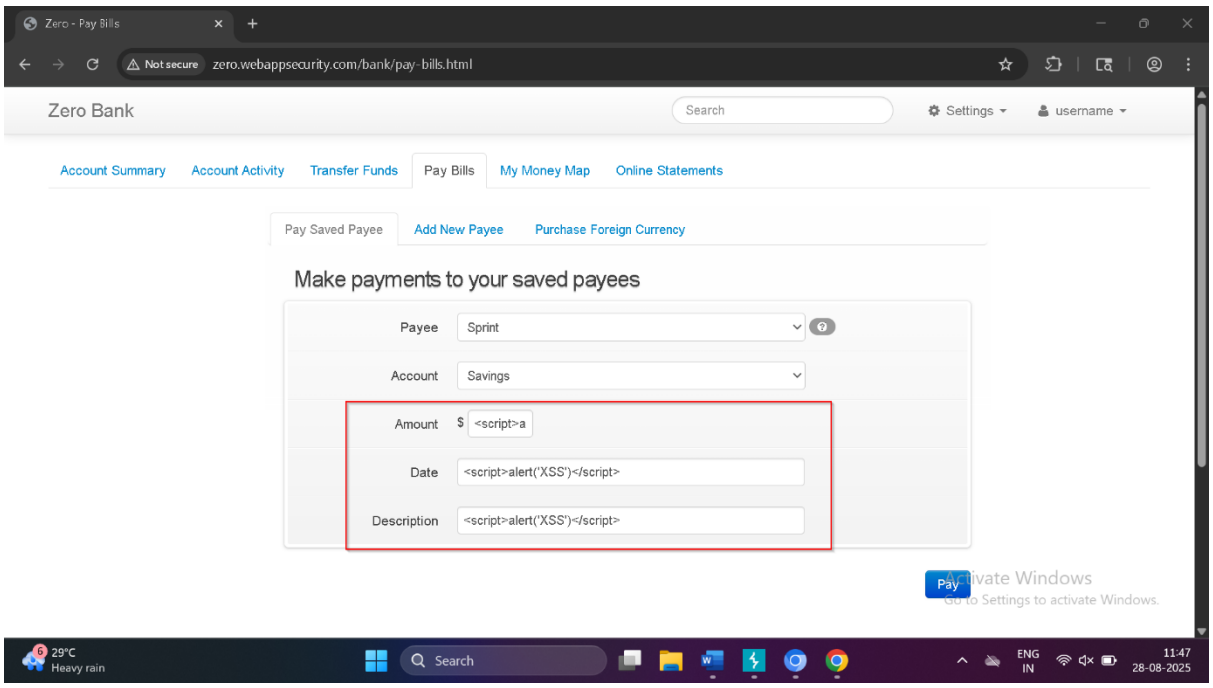
http://zero.webappsecurity.com/bank/pay-bills.html

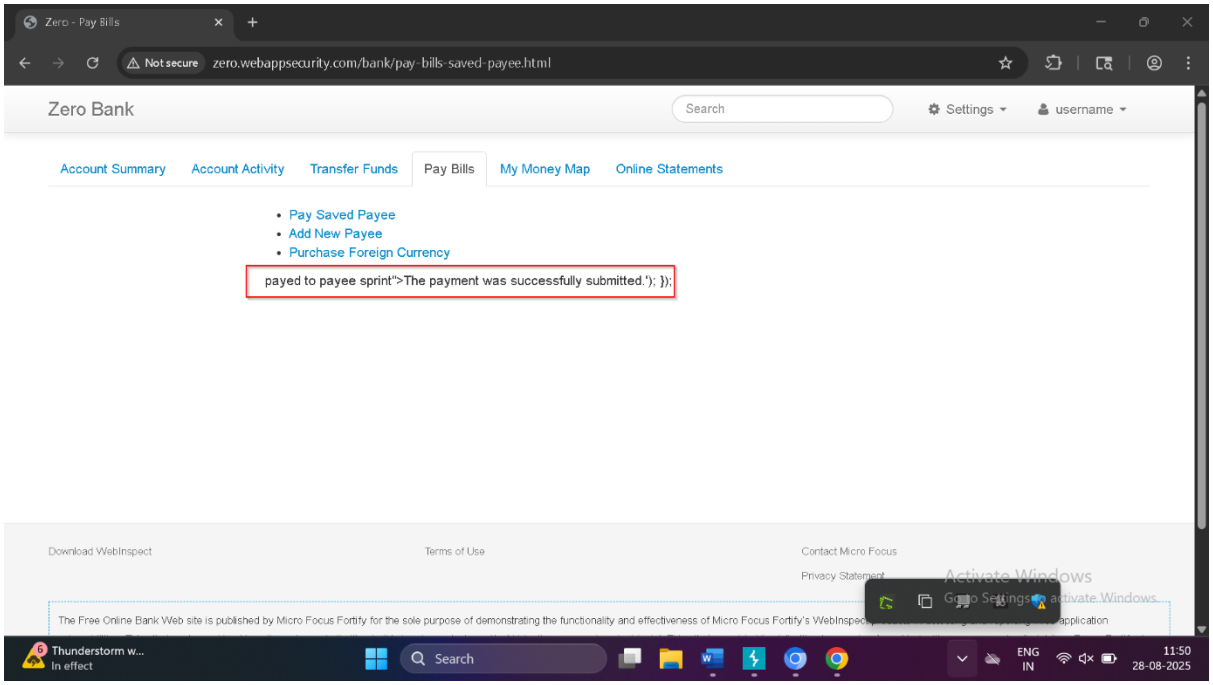
http://zero.webappsecurity.com/bank/pay-bills-saved-payee.html

Detailed Observation

During testing it was observed that stored Xss occur on the pay saved payee field. User supplied input is saved on the server.

Testing PoC





Impact

A Stored Cross-Site Scripting (XSS) vulnerability allows attackers to inject malicious scripts that are permanently stored on the server and executed whenever other users access the affected page. This can lead to session hijacking, where attackers steal authentication cookies or tokens, phishing attacks through fake forms or UI manipulation, and malware distribution by redirecting users to malicious sites. Additionally, attackers may perform unauthorized actions on behalf of other users, potentially leading to privilege escalation or sensitive data modification

Recommendation

Sanitize and encode all user input before storing or rendering in HTML contexts. Avoid using inner HTML, document.write, etc. with untrusted input. Implement a Content Security Policy (CSP) to restrict script execution.

References

https://owasp.org/www-community/attacks/xss/?utm_source=chatgpt.com#stored-xss

2.28 Client side Resource Manipulation

Severity

HIGH

Vulnerability Status

OPEN

Affected URL

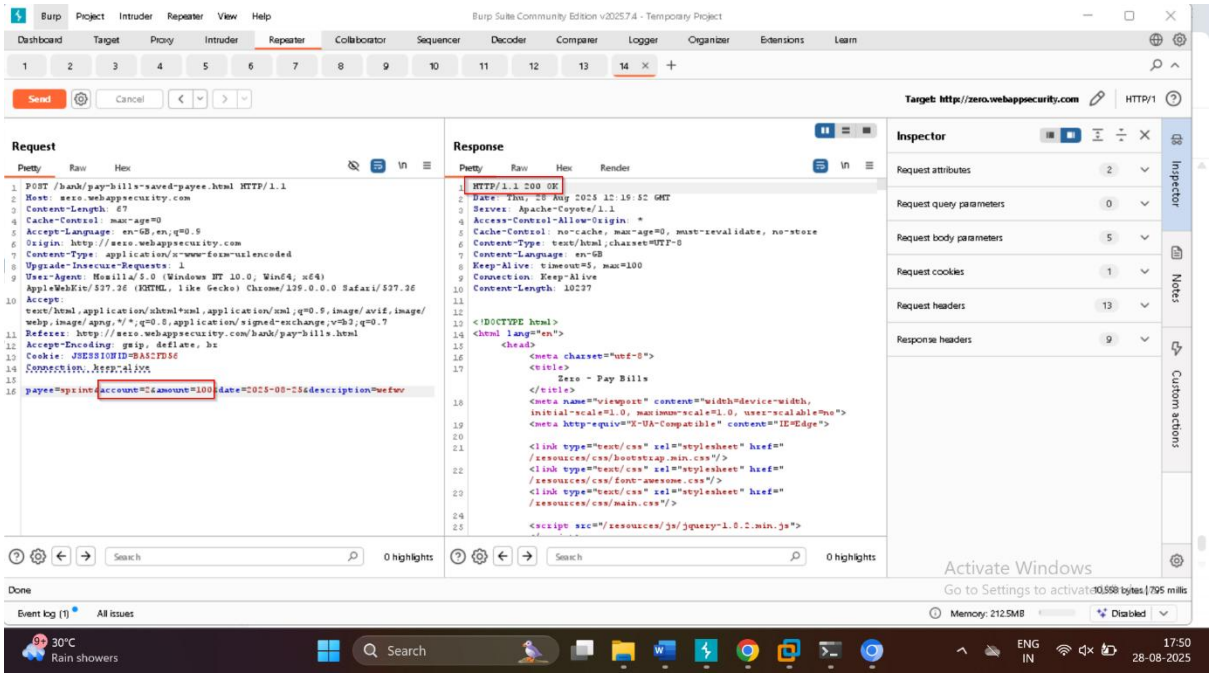
http://zero.webappsecurity.com/bank/pay-bills-saved-payee.

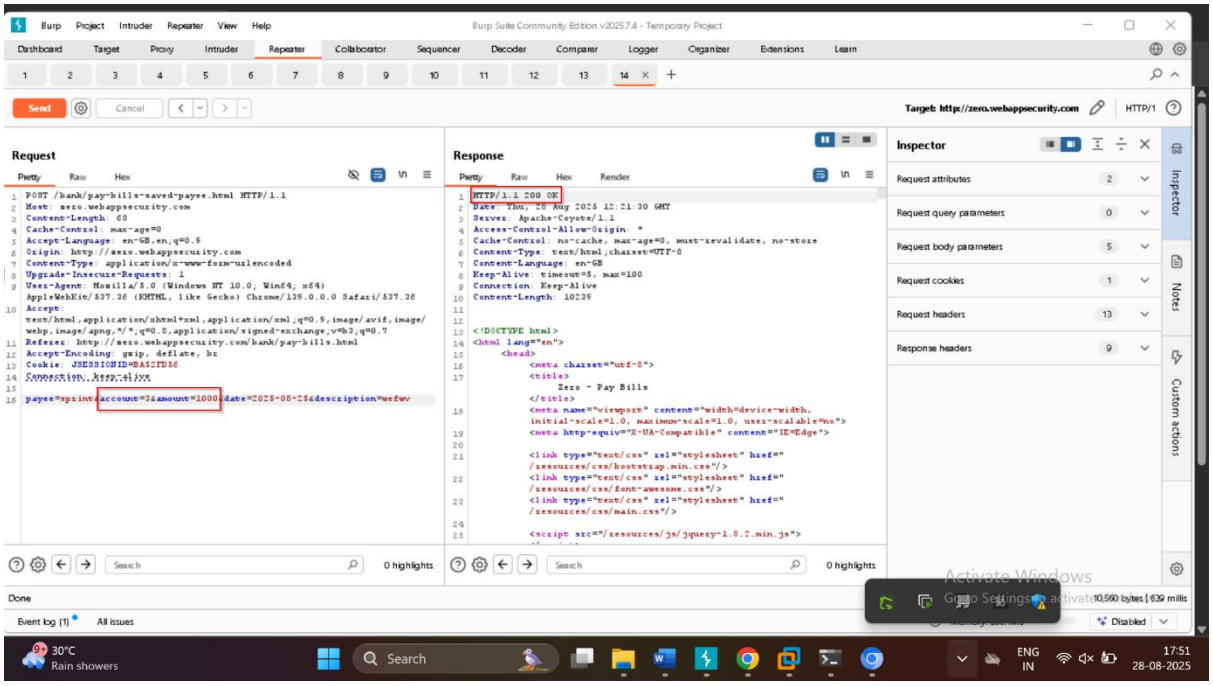
Detailed Observation

During test it was observed that amount and account id are manipulated in burp suite request.

Due to which response is positive and successfully change the fields.

Testing PoC





Impact

Unauthorized actions or business logic bypass**.** Possible authentication or authorization bypass.

Recommendation

Ensure server validates and normalizes parameters before processing. Only accept expected number of parameters. Implement server-side checks to reject duplicate or unexpected parameters

References

https://owasp.org/www-community/attacks/HTTP_Parameter_Pollution?utm_source=chatgpt.com

2.29 Weak Account Suspension

Severity

CRITICAL

Vulnerability Status

OPEN

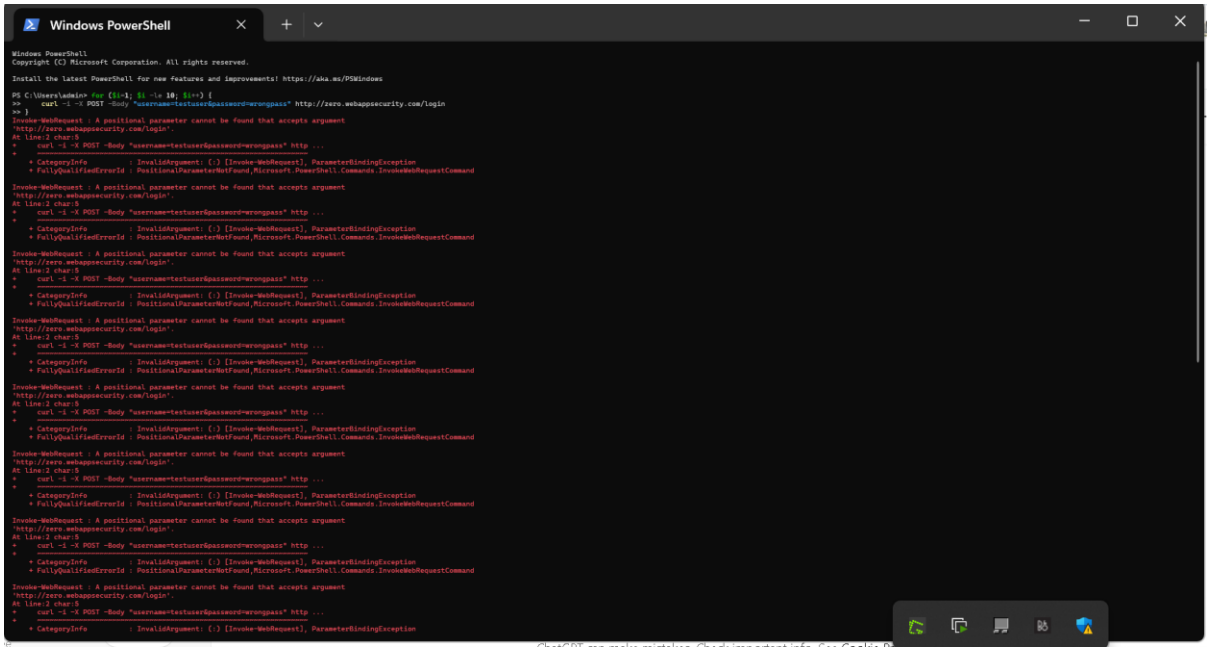
Affected URL

http://zero.webappsecurity.com/index.html.

Detailed Observation

During testing it was observed that when user is login in website, server stores username and password in cookies attribute.

Testing PoC



Impact

Attackers can systematically guess or replay passwords against user accounts, significantly increasing the likelihood of unauthorized access. In addition, if account lockout is poorly implemented, attackers may be able to cause a denial-of-service by locking out legitimate users.

Recommendation

Implement robust account suspension controls. After a predefined number of failed login attempts (e.g., 5), temporarily suspend the account and require manual resumption via email

verification or password reset. Ensure the resumption process itself is secure and not vulnerable to manipulation. Additionally, log all lockout events and alert administrators in case of repeated attempts.

References

https://owasp.org/www-project-web-security-testing-guide/stable/4-Web_Application_Security_Testing/05-Authentication_Testing/07-Testing_for_Account_Suspension_Resumption.html?utm_source=chatgpt.com

2.30 Insecure Remember Password Implementation

Severity

HIGH

Vulnerability Status

OPEN

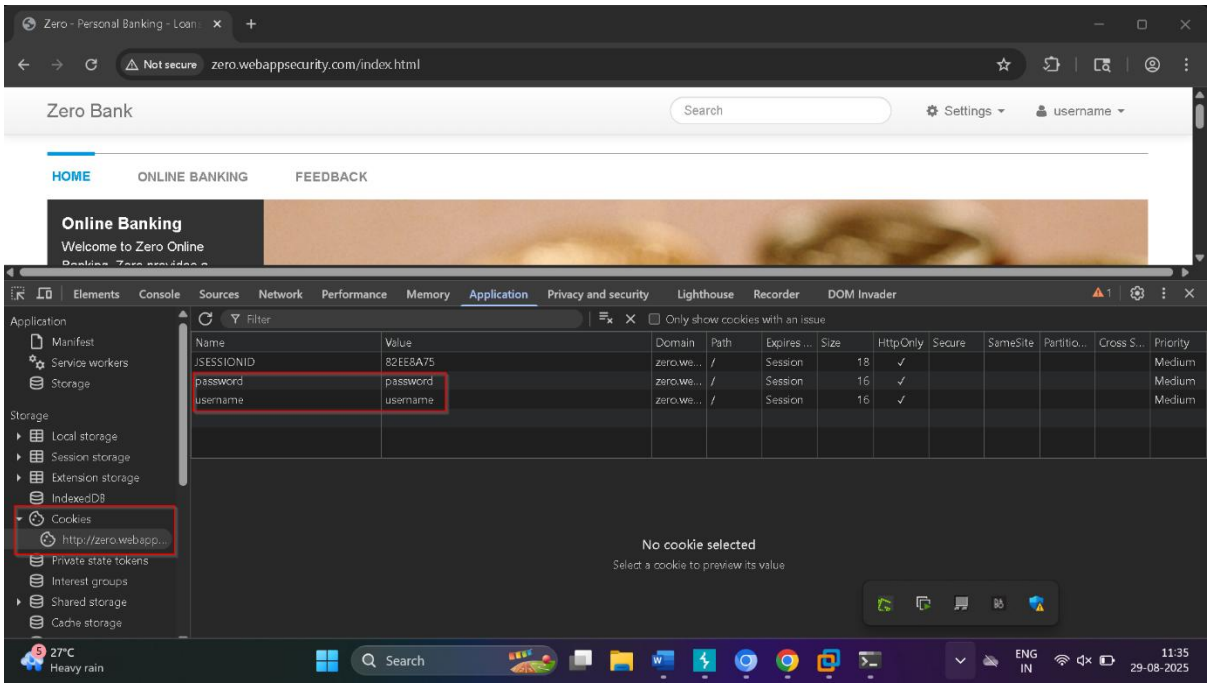
Affected URL

http://zero.webappsecurity.com/login.html?login_error=true

Detailed Observation

During testing it was observed that after failing multiple login attempts account is not locked or suspended. This indicates that the account suspension mechanism is either missing or improperly implemented.

Testing PoC



Impact

Storing the username and password in cookies exposes highly sensitive information to attackers. If an attacker gains access to the victim's browser through malware, shared systems, or physical access, they can easily retrieve the stored credentials. Furthermore, the credentials can also be stolen remotely through attacks such as Cross-Site Scripting (XSS) or via insecure transmission if the Secure flag is not set and cookies are sent over HTTP. Unlike session tokens, which can be invalidated, exposure of actual usernames and passwords results in permanent account compromise and may also impact other systems if the same

password is reused. This significantly increases the risk of unauthorized access and data breaches.

Recommendation

The application should never store plaintext or encoded passwords in cookies. Instead, it should implement a secure “Remember Me” feature by generating a long, random token that is stored server-side and mapped to the user’s account. This token should be stored in a cookie protected with the Http Only, Secure, and Same Site flags to mitigate theft. Additionally, the token should be time-bound, expiring after a reasonable duration, and users should have the ability to revoke active tokens or remembered sessions from their account settings. Refactoring the authentication mechanism to align with OWASP best practices will ensure that sensitive credentials remain protected and are never directly exposed on the client side.

References

https://owasp.org/www-community/controls/Remember_me?utm_source=chatgpt.com

2.31 Business Logic Break

Severity

LOW

Vulnerability Status

OPEN

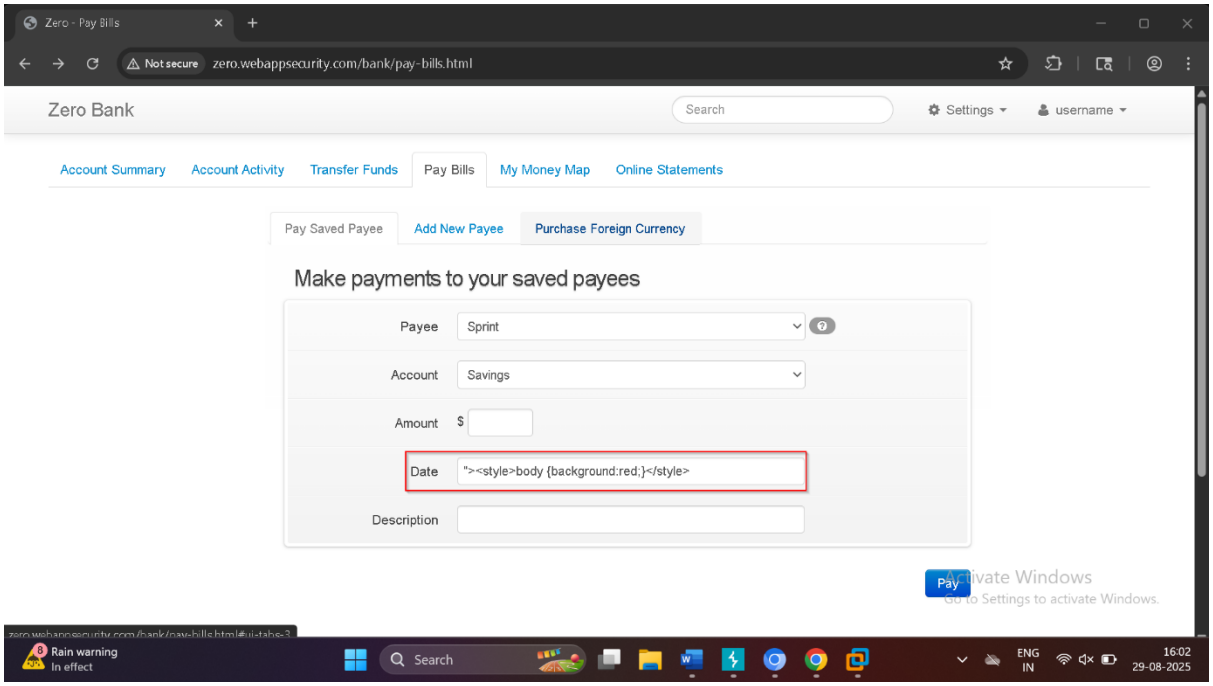
Affected URL

http://zero.webappsecurity.com/bank/pay-bills.html

Detailed Observation

During testing it was observed that website allows anything in the date field. By which, business logic is break.

Testing PoC



Impact

Attackers can exploit the lack of validation to manipulate workflows, bypass approval processes, or gain financial benefits, leading to revenue loss and potential fraud.

Recommendation

Attackers can exploit the lack of validation to manipulate workflows, bypass approval processes, or gain financial benefits, leading to revenue loss and potential fraud. Enforce strict checks on

parameters such as amount, quantity, and roles. Log and monitor suspicious transactions. Apply segregation of duties and approval workflows for sensitive actions.

References

https://owasp.org/www-project-web-security-testing-guide/stable/4-Web_Application_Security_Testing/12-Business_Logic_Testing/01-Test_Business_Logic_Data_Validation.html?utm_source=chatgpt.com

2.32 Outdated Library

Severity

LOW

Vulnerability Status

OPEN

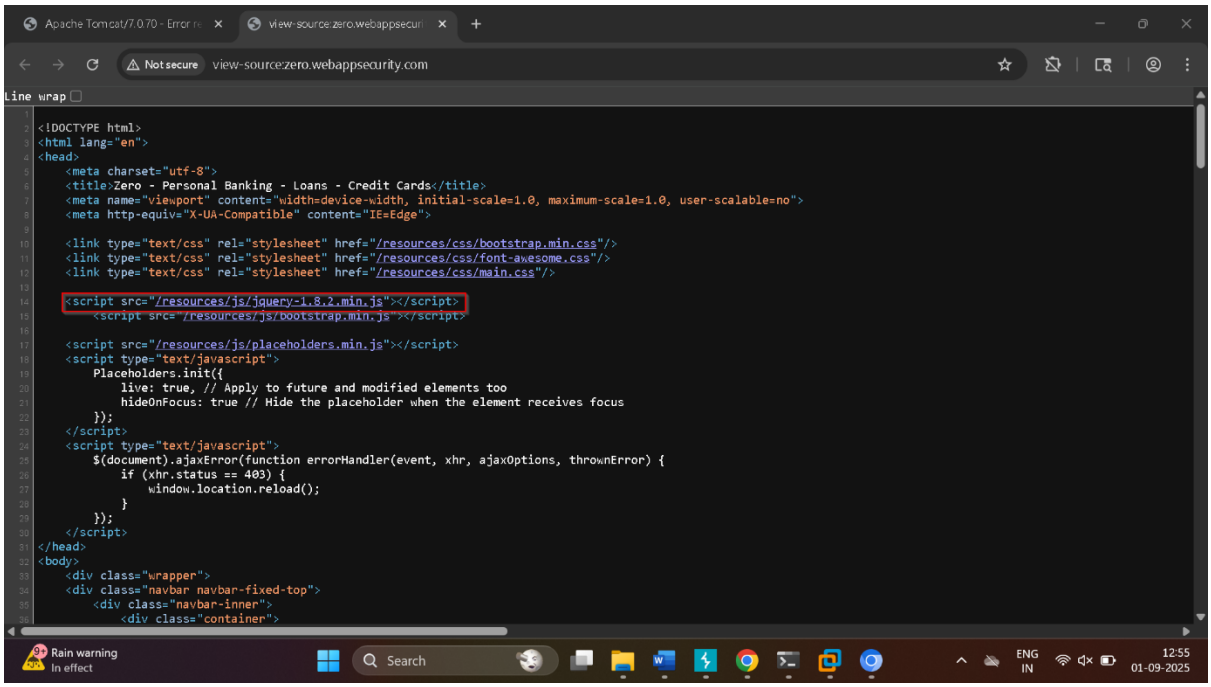
Affected URL

view-source:http://zero.webappsecurity.com/

Detailed Observation

During testing it was observed that in source code there is jquery library whose version is 1.8.2 which is old and is vulnerable to various attacks.

Testing PoC



Impact

These outdated libraries are known to have multiple security vulnerabilities, such as cross-site scripting (XSS), prototype pollution, and UI manipulation attacks. An attacker could exploit these vulnerabilities to execute malicious scripts in users' browsers, hijack sessions, manipulate the user interface, or bypass client-side restrictions, potentially leading to unauthorized actions or data exposure.

Recommendation

Update all frontend libraries and scripts to their latest stable versions. Specifically, upgrade jQuery to the latest 3.x release, update Bootstrap to the most recent stable version, and remove

or replace deprecated scripts like placeholders.min.js. Additionally, review all client-side code to ensure sensitive logic is validated server-side, implement proper input sanitization, and test the application after updates to confirm compatibility and security.

References

https://snyk.io/vuln/SNYK-JS-JQUERY-174006?utm_source=chatgpt.com