Cyberscope

Penetration Test Report

Galaxy Fox

May 2024

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Review

Domain	https://app.galaxyfox.io
Assessment Scope	Landing Page
Initial Report	14 May 2024

Overview

Cyberscope has conducted a comprehensive penetration test on the web application “Galaxy Fox” hosted at https://app.galaxyfox.io. This report focuses on evaluating the security and performance aspects of the web application. The assessment encompasses various facets of the application, including but not limited to authentication and authorization mechanisms, data handling and storage practices, network security measures, and response to high traffic volumes.

The expansion of blockchain technology has introduced a myriad of innovative applications, each with its own unique security challenges. Galaxy Fox, as a prime example within the realm of digital currency ecosystems, ensures robust protection of user data and system integrity.

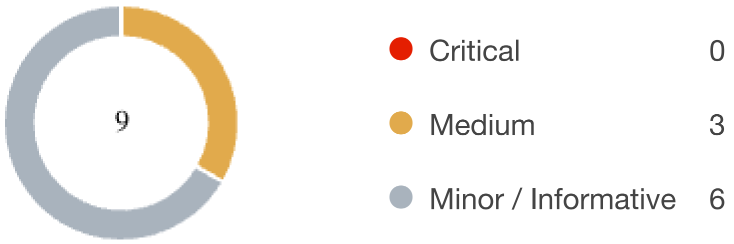
Penetration Assessment Scope

The scope of this assessment extends to identifying vulnerabilities and weaknesses in the application's architecture and functionality, with the aim of providing actionable recommendations to enhance its security posture. The report aims to offer a comprehensive understanding of the application's strengths and areas for improvement, facilitating informed decision-making to mitigate risks, fortify against potential cyber threats, and bolster overall security resilience.

Web Technologies

Technology	Category	Version
Svelte	JavaScript Frameworks	N/A
Vite	Miscellaneous	N/A
HTTP/3	Miscellaneous	N/A
Cloudflare	CDN	N/A
Radix UI	UI Frameworks	N/A
shadcn-svelte	UI Frameworks	N/A
SvelteKit	UI Frameworks	N/A
Tailwind CSS	UI Frameworks	N/A
shadcn/ui	UI Frameworks	N/A
Lucide	Font scripts	N/A
Google Font API	Font scripts	N/A

Findings Breakdown



Severity	Unresolved	Acknowledged	Resolved	Other
● Critical	0	0	0	0
● Medium	0	3	0	0
● Minor / Informative	0	6	0	0

Diagnostics

🔴 Critical 🟠 Medium ⚪ Minor / Informative

Severity	Code	Description	Status
🟠	CM	Cross-Domain Misconfiguration	Acknowledged
🟠	MACH	Missing Anti-Clickjacking Header	Acknowledged
🟠	MCSPH	Missing Content Security Policy (CSP) Header	Acknowledged
⚪	BPC	Best Practices Compliance	Acknowledged
⚪	DCV	DNS Configuration Vulnerability	Acknowledged
⚪	LTC	Latency And Throughput Challenges	Acknowledged
⚪	MSTSH	Missing Strict Transport Security Header	Acknowledged
⚪	MXH	Missing X-Content-Type-Options Header	Acknowledged
⚪	SIUL	Server Instability Under Load	Acknowledged

CM - Cross-Domain Misconfiguration

Criticality	Medium
Status	Acknowledged

Description

A Cross-Origin Resource Sharing (CORS) misconfiguration on the web server has been identified, potentially enabling unauthorized data access across domains. While browser implementations restrict access to authenticated APIs, unauthenticated APIs remain vulnerable. This misconfiguration poses a risk of unauthorized data access, particularly if sensitive data is accessible in an unauthenticated manner, relying solely on other security measures like IP address white-listing. Several requests include the “Access-Control-Allow-Origin” HTTP header being set to “*”, allowing cross-domain access from any origin.

Recommendation

To mitigate this risk, the team is advised to ensure sensitive data is not accessible in an unauthenticated manner, implementing additional security measures such as IP address white-listing. Additionally, the team could configure the “Access-Control-Allow-Origin” header to a more restricted set of domains, limiting cross-domain access, or remove CORS headers entirely to enforce the Same Origin Policy (SOP) more strictly. By implementing these measures, the team can strengthen web security and prevent unauthorized data access across domains.

Reference:
https://vulncat.fortify.com/en/detail?id=desc.config.dotnet.html5_overly_permissive_cors_policy

MACH - Missing Anti-Clickjacking Header

Criticality	Medium
Status	Acknowledged

Description

The absence of an Anti-Clickjacking header exposes the application to potential Clickjacking attacks. Clickjacking is a malicious technique that tricks users into clicking on unintended elements by disguising them as legitimate UI elements. This can lead to unauthorized actions being performed without the user's knowledge or consent. Without proper protection mechanisms in place, attackers can exploit Clickjacking vulnerabilities to perform actions on behalf of users, such as making purchases, changing account settings, or clicking on malicious links.

The response from the following URLs does not include either Content-Security-Policy with 'frame-ancestors' directive or X-Frame-Options to protect against 'ClickJacking' attacks.

1. https://app.galaxyfox.io
2. https://app.galaxyfox.io/bridge
3. https://app.galaxyfox.io/claim
4. https://app.galaxyfox.io/faq
5. https://app.galaxyfox.io/marketplace
6. https://app.galaxyfox.io/staking

Recommendation

Modern Web browsers support the Content-Security-Policy and X-Frame-Options HTTP headers. The team is advised to ensure one of them is set on all web pages returned by the site/app.

If the team expects the page to be framed only by pages on their server (e.g. it's part of a FRAMESET) then they'll want to use SAMEORIGIN, otherwise if the team never expects the page to be framed, they should use DENY. Alternatively, the team could consider implementing Content Security Policy's "frame-ancestors" directive.

Reference: https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/X-Frame-Options

MCSPH - Missing Content Security Policy (CSP) Header

Criticality	Medium
Status	Acknowledged

Description

Content Security Policy (CSP) is an added layer of security that helps to detect and mitigate certain types of attacks, including Cross Site Scripting (XSS) and data injection attacks. These attacks are used for everything from data theft to site defacement or distribution of malware. CSP provides a set of standard HTTP headers that allow website owners to declare approved sources of content that browsers should be allowed to load on that page — covered types are JavaScript, CSS, HTML frames, fonts, images and embeddable objects such as Java applets, ActiveX, audio and video files.

The following URLs are missing a Content Security Policy (CSP) header.

1. https://app.galaxyfox.io
2. https://app.galaxyfox.io/bridge
3. https://app.galaxyfox.io/claim
4. https://app.galaxyfox.io/faq
5. https://app.galaxyfox.io/marketplace
6. https://app.galaxyfox.io/robots.txt
7. https://app.galaxyfox.io/sitemap.xml
8. https://app.galaxyfox.io/staking

Recommendation

To address the absence of Content Security Policy (CSP) headers and enhance the security of the application, the following steps are recommended:

- Verify that your web server, application server, load balancer, or any other relevant components are properly configured to set the Content-Security-Policy header in HTTP responses.
- Define a comprehensive CSP policy tailored to the specific requirements and functionalities of your application. Consider including directives such as default-src, script-src, style-src, img-src, font-src, connect-src, frame-src, media-src, object-src, and sandbox, among others, to restrict content loading from unauthorized sources.
- Utilize CSP reporting mechanisms to monitor policy violations and fine-tune your CSP directives over time based on real-world usage and detected issues.

By implementing a robust Content Security Policy (CSP) and adhering to best practices for CSP configuration and management, you can significantly reduce the risk of XSS attacks, data injection vulnerabilities, and other web security threats, thereby enhancing the overall security posture of your application.

References:

1. Mozilla Developer Network: Introducing Content Security Policy
2. OWASP Content Security Policy Cheat Sheet
3. W3C Content Security Policy Specification

BPC - Best Practices Compliance

Criticality	Minor / Informative
Status	Acknowledged

Description

Several issues spanning performance, security, and best practices were identified as part of the assessment. Performance metrics including Largest Contentful Paint, Speed Index, and Total Blocking Time indicate subpar performance levels, which could significantly impact user experience and engagement. Moreover, security vulnerabilities were uncovered, particularly concerning the use of deprecated APIs, which expose the application to potential attacks like man-in-the-middle and data interception. Additionally, best practices violations, such as console errors and inspector issues, were identified. These findings underscore the importance of addressing these issues promptly to ensure the application's usability, security, and compliance with industry standards.

In summary, the assessment identified the following issues:

- Largest Contentful Paint
- Speed Index
- Total Blocking Time
- Errors in console
- Inspector issues

Recommendation

The team is advised to address the identified issues and improve the overall quality of the application. Specifically, the team could ensure compliance with web development best practices by addressing the aforementioned issues. By addressing the identified issues, the application can improve its performance, security posture, and compliance with industry standards, ultimately enhancing user satisfaction and engagement.

DCV - DNS Configuration Vulnerability

Criticality	Minor / Informative
Status	Acknowledged

Description

The domain's DNS records demonstrate an important misconfiguration. It has been identified that essential records crucial for ensuring security and email deliverability are missing. Specifically, the domain lacks the following crucial records:

- DMARC Record: A Domain-based Message Authentication, Reporting, and Conformance (DMARC) record, leaving the domain vulnerable to email spoofing and phishing attacks.
- DKIM Record: The absence of a DKIM (DomainKeys Identified Mail) record, essential for email authentication, integrity, and authenticity.
- Softfail Without DMARC: The SPF (Sender Policy Framework) record contains a softfail mechanism without being accompanied by a DMARC record, potentially affecting email deliverability and reputation.

Recommendation

To mitigate this risk, the team is advised to improve the security and deliverability of email communications by following the recommendations below:

1. Establish and publish a DMARC record to set email authentication policies, specify actions for failed authentication, and receive reports on email authentication results.
2. Configure DKIM records to add cryptographic signatures to outgoing emails, ensuring integrity and authenticity throughout the email delivery process.
3. Ensure coherence between the SPF record and DMARC policy to maintain consistent email authentication results, thus improving deliverability and security.

By adhering to these recommendations and rectifying the identified DNS configuration issues, the domain can significantly enhance its email security, mitigate the risk of phishing attacks, and bolster email deliverability and reputation.

LTC - Latency And Throughput Challenges

Criticality	Minor / Informative
Status	Acknowledged

Description

As part of the rate-limiting test, the web app highlighted concerns regarding latency and throughput, with varying response times across percentiles and an average latency of 3843.03 milliseconds. Additionally, fluctuations in data transfer rates indicate potential bottlenecks or inefficiencies in data processing and transmission, impacting system performance.

Stat	Avg	Stdev	Min
Latency	3843.03 ms	2765.51 ms	23789 ms
Req/Sec	190.2	110.53	2
Bytes/Sec	4.45 MB	2.59 MB	46.8 kB

Recommendation

To enhance system performance, a comprehensive performance analysis is recommended. This analysis should focus on identifying and addressing latency bottlenecks, such as inefficient database queries, resource-intensive operations, or network congestion. Optimization efforts should target the codebase, database queries, and network configurations to improve response times and enhance overall system throughput, resulting in a smoother user experience and improved system efficiency.

MSTSH - Missing Strict Transport Security Header

Criticality	Minor / Informative
Status	Acknowledged

Description

The absence of the HTTP Strict Transport Security (HSTS) header poses a security risk to the application. HSTS is a crucial web security mechanism that instructs compliant web browsers to interact with the server using only secure HTTPS connections, thereby enhancing the overall security of communication between the client and the server. By enforcing HTTPS usage, HSTS helps mitigate various security threats, including man-in-the-middle attacks, network eavesdropping, and protocol downgrade attacks.

The following URLs are a sample of all the occurrences where a HTTP Strict Transport Security (HSTS) header was not set.

1. https://app.galaxyfox.io
2. https://app.galaxyfox.io/bridge
3. https://app.galaxyfox.io/claim
4. https://app.galaxyfox.io/faq
5. https://app.galaxyfox.io/favicon.ico
6. https://app.galaxyfox.io/logo.webp
7. https://app.galaxyfox.io/marketplace
8. https://app.galaxyfox.io/ripple.svg
9. https://app.galaxyfox.io/robots.txt
10. https://app.galaxyfox.io/sitemap.xml
11. https://app.galaxyfox.io/staking

Recommendation

To enhance the security of the application and enforce secure communication over HTTPS, it is essential to ensure that the web server, application server, load balancer, or any other relevant components are configured to enforce Strict Transport Security (HSTS). By configuring the application to enforce Strict Transport Security (HSTS) and following best practices for HSTS implementation, the application can significantly reduce the risk of network-based attacks, protect sensitive data in transit, and enhance overall security posture.

References:

1. https://cheatsheetseries.owasp.org/cheatsheets/HTTP_Strict_Transport_Security_Cheat_Sheet.html
2. https://owasp.org/www-community/Security_Headers
3. http://en.wikipedia.org/wiki/HTTP_Strict_Transport_Security

MXH - Missing X-Content-Type-Options Header

Criticality	Minor / Informative
Status	Acknowledged

Description

The absence of the X-Content-Type-Options header exposes the application to potential MIME-sniffing attacks, particularly affecting older versions of Internet Explorer and Chrome. This vulnerability allows browsers to interpret response bodies as content types other than the declared type, potentially leading to security breaches and data exposure. Even error pages (e.g., 401, 403, 500) remain susceptible to such attacks, necessitating immediate action to safeguard against injection vulnerabilities.

The following URLs are a sample of all the occurrences where an X-Content-Type-Options header was not set.

1. https://app.galaxyfox.io
2. https://app.galaxyfox.io/bridge
3. https://app.galaxyfox.io/claim
4. https://app.galaxyfox.io/faq
5. https://app.galaxyfox.io/favicon.ico
6. https://app.galaxyfox.io/logo.webp
7. https://app.galaxyfox.io/marketplace
8. https://app.galaxyfox.io/ripple.svg
9. https://app.galaxyfox.io/staking

Recommendation

To mitigate this risk, the team is advised to ensure that the application or web server configures the Content-Type header accurately and includes the X-Content-Type-Options header set to 'nosniff' for all web pages. Additionally, consider recommending users employ modern, standards-compliant web browsers that either abstain from MIME-sniffing or allow for its suppression via directives from the server or application.

Reference:

https://learn.microsoft.com/en-us/previous-versions/windows/internet-explorer/ie-developer/compatibility/gg622941(v=vs.85) https://owasp.org/www-community/Security_Headers

SIUL - Server Instability Under Load

Criticality	Minor / Informative
Status	Acknowledged

Description

The web app highlighted a concerning number of errors (6440), out of which 6144 were timeouts during the assessment period, indicating potential challenges with server stability and resource allocation. Such issues can significantly impact user experience and necessitate a deeper investigation into server health and capacity planning.

In summary:

- The conducted test used 3000 concurrent connections in 30 seconds timespan.
- The number of requests that were sent was 15,146 requests in 31.5 seconds.
- The number of connection errors (including timeouts) that occurred were 6440.
- The number of connection timeouts that occurred were 6144.

Recommendation

To mitigate these challenges, it is advised to conduct a comprehensive analysis of server logs and infrastructure to pinpoint the underlying causes of errors and timeouts. This analysis should inform the optimization of server configurations, potential resource upgrades, and the implementation of robust error-handling mechanisms. By addressing these areas, disruptions to user access can be minimized, ensuring a smoother and more reliable service experience.

Summary

This report provides a thorough assessment of the web application's security and performance. Through meticulous analysis, the report identifies vulnerabilities and weaknesses in key areas such as data handling and network security. Recommendations are provided to address these issues and enhance the application's resilience against cyber threats.

Overall, the report serves as a valuable resource, offering insights into the application's security posture and actionable recommendations to fortify its defenses. By implementing the suggested measures, the team can strengthen the app’s security foundation and maintain trust among users. The team has acknowledged the findings.

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Blockchain technology and cryptographic assets present a high level of ongoing risk Cyberscope's position is that each company and individual are responsible for their own due diligence and continuous security Cyberscope's goal is to help reduce the attack vectors and the high level of variance associated with utilizing new and consistently changing technologies and in no way claims any guarantee of security or functionality of the technology we agree to analyze. The assessment services provided by Cyberscope are subject to dependencies and are under continuing development. You agree that your access and/or use including but not limited to any services reports and materials will be at your sole risk on an as-is where-is and as-available basis Cryptographic tokens are emergent technologies and carry with them high levels of technical risk and uncertainty. The assessment reports could include false positives false negatives and other unpredictable results. The services may access and depend upon multiple layers of third parties.

About Cyberscope

Cyberscope is a blockchain cybersecurity company that was founded with the vision to make web3.0 a safer place for investors and developers. Since its launch, it has worked with thousands of projects and is estimated to have secured tens of millions of investors' funds.

Cyberscope is one of the leading smart contract audit firms in the crypto space and has built a high-profile network of clients and partners.

The Cyberscope team

https://www.cyberscope.io