Cyberscope

Static Analysis Report

Pocketcoin

March 2025

Repository	https://github.com/pocketnetteam/pocketnet.gui
Commit	7992bef5bebae4604f27f3c2565bd29b2ee0a1cf
Audited by	© cyberscope

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Risk Classification

The criticality of findings in Cyberscope's smart contract audits is determined by evaluating multiple variables. The two primary variables are:

1. **Likelihood of Exploitation**: This considers how easily an attack can be executed, including the economic feasibility for an attacker.
2. **Impact of Exploitation**: This assesses the potential consequences of an attack, particularly in terms of the loss of funds or disruption to the contract's functionality.

Based on these variables, findings are categorized into the following severity levels:

1. **Critical**: Indicates a vulnerability that is both highly likely to be exploited and can result in significant fund loss or severe disruption. Immediate action is required to address these issues.
2. **Medium**: Refers to vulnerabilities that are either less likely to be exploited or would have a moderate impact if exploited. These issues should be addressed in due course to ensure overall contract security.
3. **Minor**: Involves vulnerabilities that are unlikely to be exploited and would have a minor impact. These findings should still be considered for resolution to maintain best practices in security.
4. **Informative**: Points out potential improvements or informational notes that do not pose an immediate risk. Addressing these can enhance the overall quality and robustness of the contract.

Severity	Likelihood / Impact of Exploitation
● Critical	Highly Likely / High Impact
● Medium	Less Likely / High Impact or Highly Likely/ Lower Impact
● Minor / Informative	Unlikely / Low to no Impact

Review

Repository	https://github.com/pocketnetteam/pocketnet.gui
Commit	7992bef5bebae4604f27f3c2565bd29b2ee0a1cf

Audit Updates

Initial Audit	04 Mar 2025
Corrected Phase 2	11 Mar 2025
Corrected Phase 2	14 Mar 2025

Overview

The Bastyon Desktop Browser is a decentralized social network client built on blockchain technology. It provides users with a censorship-resistant platform for content creation, interaction, and cryptocurrency-based rewards without relying on centralized entities. Unlike traditional social media platforms, Bastyon prioritizes privacy, allowing users to register and interact without requiring an email or phone number. Authentication is secured through a private key mechanism, ensuring full user control over accounts.

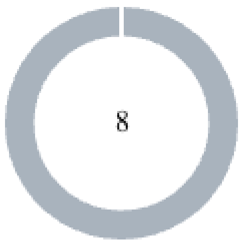
As an open-source project, Bastyon aims to provide a transparent and community-driven ecosystem. The desktop application, which is the focus of this audit, enables users to access the Bastyon network across multiple operating systems, including Windows, macOS, and Linux.

Audit Scope

The primary objective of this audit was to perform a static security analysis of the Bastyon Desktop Browser's codebase. The audit focused on identifying security vulnerabilities, performance bottlenecks, maintainability concerns, and deviations from best practices through static code analysis. The assessment did not involve dynamic testing, runtime analysis, or penetration testing of live environments.

The audit specifically examined areas including security vulnerabilities, code maintainability, performance optimizations, and best practices compliance. By identifying and addressing issues in these areas, the audit aims to enhance the security, reliability, and efficiency of the Bastyon Desktop Browser, ensuring a safer and more robust user experience.

Findings Breakdown



●	Critical	0
●	Medium	0
●	Minor / Informative	8

Severity		Unresolved	Acknowledged	Resolved	Other
●	Critical	0	0	0	0
●	Medium	0	0	0	0
●	Minor / Informative	8	0	0	0

Diagnostics

● Critical ● Medium ● Minor / Informative

Severity	Code	Description	Status
●	DCE	Dead Code Elimination	Unresolved
●	EBS	Empty Block Statements	Unresolved
●	MEC	Missing ESLint Configuration	Unresolved
●	PEAF	Promise Executors Async Functions	Unresolved
●	PBU	Prototype Builtins Usage	Unresolved
●	RVD	Redundant Variable Declaration	Unresolved
●	UV	Undefined Variables	Unresolved
●	ULD	Unexpected Lexical Declarations	Unresolved

DCE - Dead Code Elimination

Criticality	Minor / Informative
Status	Unresolved

Description

In JavaScript, dead code is code that is written in the codebase, but is never executed or reached during normal execution. Dead code can occur for a variety of reasons, such as:

- Conditional statements that are always false.
- Functions that are never called.
- Unreachable code (e.g., code that follows a return statement).

Dead code can make a codebase more difficult to understand and maintain, and can also increase the size of the app and the cost of deploying and interacting with it. The following code segment is an example of unreachable code.

```
if : function(){
    return false
    if(isTablet()) return true
}
```

Recommendation

To avoid creating dead code, it's important to carefully consider the logic and flow of the contract and to remove any code that is not needed or that is never executed. This can help improve the clarity and efficiency of the contract.

EBS - Empty Block Statements

Criticality	Minor / Informative
Status	Unresolved

Description

Empty block statements, such as an unimplemented if statement, often appear in code due to incomplete refactoring or as placeholders for future logic. While these empty blocks do not cause runtime errors, they can create confusion for anyone reading the code, as they suggest that logic was intended to be included but was either forgotten or left unfinished. This can lead to misunderstandings about the purpose of the code and may cause issues during future maintenance or development.

Recommendation

To mitigate this issue, the team is advised to rewrite such code segments accordingly:

- If a block is not needed, the team could remove it entirely. This will keep the codebase clean and reduce unnecessary complexity.
- If a block is intended to be implemented later, the team could add a TODO comment explaining what needs to be added. This provides clear guidance for future development.
- If a block was left empty by mistake, the team should complete the necessary logic to handle the required cases.

Ensuring that all block statements are purposeful and complete helps maintain a clean, understandable, and functional codebase.

MEC - Missing ESLint Configuration

Criticality	Minor / Informative
Status	Unresolved

Description

The codebase lacks an ESLint configuration, which is a valuable tool for identifying and fixing issues in JavaScript code. ESLint not only helps catch errors but also enforces a consistent code style and promotes best practices. It can significantly enhance code quality and maintainability by providing a standardized approach to coding conventions and identifying potential problems.

Recommendation

The team is strongly advised to integrate ESLint into the project by creating an ESLint configuration file (e.g., `.eslintrc.js` or `.eslintrc.json`) and defining rules that align with the team's coding standards. Consider using popular ESLint configurations, such as Airbnb, Standard, or your own customized set of rules. By incorporating ESLint into the project, the team ensures consistent code quality, catches potential problems early in the development process, and establishes a foundation for collaborative and maintainable code.

PEAF - Promise Executors Async Functions

Criticality	Minor / Informative
Status	Unresolved

Description

Using an async function as the executor inside a new Promise constructor is problematic because:

1. If the async function throws an error before explicitly calling resolve or reject, the error is lost, and the Promise does not reject as expected. This makes debugging difficult.
2. The async function already returns a Promise, making the explicit new Promise wrapper unnecessary in most cases.
3. Awaiting inside the Promise constructor is often unnecessary and can lead to unpredictable execution flow.

```
return new Promise(async (resolve, reject) => {
    let req = request(meta[key].url);

    progress(req, { throttle: 500 })
        .on('progress', function (state) {
            if (progressState) {
                let st = progressState(state);
                if (st && st.break) req.abort();
            }
        })
        .on('error', function (err) {
            if (err.message === 'aborted') return resolve();
            console.log(err);
            return reject(err);
        })
        .on('end', function () {
            return resolve();
        })
        .pipe(fs.createWriteStream(endFile, { mode: 0o755 }));
}).then(r => {
    return Promise.resolve(endFile);
});
```

Recommendation

To mitigate this issue, it is recommended to remove the async keyword from the executor function and handle asynchronous operations using callbacks or `.then()/.catch()`. If await is needed, an async function without manually creating a Promise would be more suitable. Additionally, all errors should be properly handled using explicit reject calls. By making these changes, the promise executors become more predictable, easier to debug, and adheres to best practices in asynchronous JavaScript.

PBU - Prototype Builtins Usage

Criticality	Minor / Informative
Status	Unresolved

Description

Calling `hasOwnProperty` directly on an object can be unsafe because the object may have a property named `hasOwnProperty`, which would shadow the built-in method. This can lead to unexpected behavior, including crashes or security vulnerabilities, particularly when dealing with user-supplied data such as JSON inputs.

For instance, an object created using `Object.create(null)` won't inherit from `Object.prototype`, leading to a TypeError when calling `hasOwnProperty` directly.

```
if (overrides.hasOwnProperty(key))
{
    defaults[key] = overrides[key];
}
```

Recommendation

To avoid potential issues, always call `hasOwnProperty` from `Object.prototype` instead of directly invoking it on an object. This ensures that the correct method is used, even if the object has a conflicting property, preventing unintended errors or security issues.

RVD - Redundant Variable Declaration

Criticality	Minor / Informative
Status	Unresolved

Description

There are code segments that could be optimized. A segment may be optimized so that it becomes a smaller size, consumes less memory, executes more rapidly, or performs fewer operations.

The codebase declares certain variables that are not used in a meaningful way. As a result, these variables are redundant.

Recommendation

The team is advised to remove any unnecessary variables to clean up the code. If they are meant for future usage, the team could prefix them with _ (e.g., _actions) to indicate intentional non-use. That way it will improve the efficiency and performance of the source code and reduce the cost of executing it.

UV - Undefined Variables

Criticality	Minor / Informative
Status	Unresolved

Description

Several variables are used in the codebase but are not defined before use. This leads to potential ReferenceError exceptions at runtime and is indicative of missing imports, typos, or undeclared dependencies.

Recommendation

The team is advised to verify if these variables should be imported or declared before usage. If they belong to a third-party library, ensure the dependency is properly installed and imported.

ULD - Unexpected Lexical Declarations

Criticality	Minor / Informative
Status	Unresolved

Description

The codebase uses lexical declarations such as let, const, and function inside `case` or `default` clauses within a switch statement. Lexical declarations are hoisted to the top of the switch block, meaning they are in scope for the entire switch but remain uninitialized until the case where they are declared is executed. If a different case is executed first, accessing such variables will throw a ReferenceError before the variable is initialized.

This can lead to unexpected behavior and difficult-to-debug issues since the variable appears to be in scope but isn't initialized unless its associated case is executed. The following segment is a sample of all the occurrences.

```
case 413:
    const err413 = Error('Error 413: Video was rejected by Peertube server');

    err413.video = {
        size: parameters.video.size,
        type: parameters.video.type,
    };

    return Promise.reject(err413);

case 415:
    const err415 = Error('Error 415: Unsupported video type');

    err415.video = {
        type: parameters.video.type,
    };

    return Promise.reject(err415);
...
```

Recommendation

To mitigate this issue, the team is advised to wrap each case clause in a block {} to ensure that lexical declarations are scoped to their respective cases, ensuring that variables are only accessible and initialized within the correct case block. By properly scoping lexical declarations within switch statements, the code will become more stable and less prone to errors related to variable hoisting and initialization.

Summary

Pocketcoin implements a desktop app mechanism. This audit investigates security issues, business logic concerns, and potential improvements. The analysis focused on identifying vulnerabilities in the Bastyon Desktop Browser, through static code analysis. Additionally, the audit examined maintainability, performance optimizations, and adherence to best coding practices in JavaScript.

Disclaimer

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

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