Cyberscope

A TAC Security Company

Audit Report

Plutus

September 2025

Repository https://github.com/PlutusDao/berancia

Commit 8355de1bb330d3515c5f37e27f53c31d8958e076

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/PlutusDao/berancia
Commit	8355de1bb330d3515c5f37e27f53c31d8958e076

Audit Updates

Initial Audit	19 Jun 2025
Corrected Phase 2	20 Aug 2025
Corrected Phase 3	11 Sep 2025

Overview

Cyberscope conducted an audit of the `berancia` repository within the Plutus ecosystem. The repository consists of two projects. Together, Orange and Plutus offer a robust infrastructure: Orange focuses on orchestrating real-time on-chain actions, while Plutus enables the secure, standards-compliant construction of transactions and signature workflows.

Orange

Orange serves as the middleware backbone for client applications interacting with on-chain protocols on the Berachain network. Built with Node.js and Express, it functions as a centralized gateway that abstracts the complexity of raw JSON-RPC communication, offering a streamlined interface for both data retrieval and state-changing operations. Whether it's querying balances and rewards or executing deposits, withdrawals, and emergency exits, Orange handles these actions on behalf of front-end dashboards, automation layers, and external integrations.

At its core, Orange manages communication with Berachain nodes through configurable RPC endpoints, incorporating reconnection strategies and fallback logic to ensure resilience. It interfaces directly with the Bearn Protocol's smart contracts, overseeing aspects such as gas estimation, nonce tracking, and dynamic fee calculations. Its RESTful API surface can be consumed by a variety of clients, ranging from CLI tools to web-based dashboards and scheduled job runners.

Operationally, Orange emphasizes environment separation and observability. Configuration is centralized through environment variables or CLI-driven config files, simplifying deployment across development, staging, and production. Middleware components take care of cross-origin resource sharing, request logging, rate limiting, and consistent error formatting—creating a standardized and predictable interface for client systems. The service is stateless by design, enabling horizontal scaling behind load balancers and facilitating coordination through shared Redis caches or message queues.

Plutus

Plutus, on the other hand, is a TypeScript-based monorepo tailored for constructing and managing EIP-712 typed-data transactions. It plays a critical role in multi-signature workflows, especially within protocols that require off-chain signature aggregation prior to on-chain execution, such as those using Gnosis Safe.

Plutus generates domain-specific payloads conforming to the EIP-712 standard, enabling transaction clarity for both users and wallets. These payloads are validated against strict TypeScript interfaces to catch discrepancies during development, ensuring a more secure and predictable deployment pipeline. The monorepo wraps the Safe Protocol Kit, streamlining the full lifecycle of a multi-sig transaction—from proposal creation to signature collection and execution. It supports multiple signer backends, accommodating various setups including Web3 wallets, hardware devices, and custodial signers.

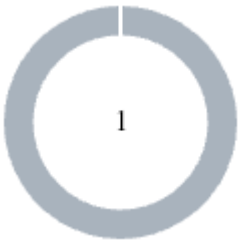
To manage complexity and optimize performance, Plutus loads large ABI files dynamically as separate JSON artifacts. This not only reduces memory usage but also supports automated code generation for type-safe contract bindings. It provides reusable schema modules for common DeFi operations such as swaps, staking, and liquidity provision, ensuring transactional consistency across the ecosystem.

In terms of deployment, Plutus includes lightweight serverless handlers, deployable on platforms like AWS Lambda, that expose minimal HTTP endpoints suitable for integration with front-end applications or orchestration layers. It’s also distributed as a set of internal NPM packages, making its components modular and composable. Whether it's typed-data generation, signer abstraction, or ABI management, each module can be selectively integrated as needed.

Code Duplication Comment

The two projects contain duplicated or closely related code segments, indicating an opportunity for reuse through modularization. Extracting these shared components into a standalone NPM library or a shared internal package within a monorepo would improve maintainability, reduce redundancy, and ensure consistency across both codebases. This approach promotes code reuse, simplifies updates, and fosters a cleaner architecture by centralizing logic that is common to multiple services or applications.

Findings Breakdown



Critical	0
Medium	0
Minor / Informative	1

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	0	0	0	0
Medium	0	0	0	0
Minor / Informative	0	1	0	0

Diagnostics

Critical Medium Minor / Informative

Severity	Code	Description	Status
	CR	Code Repetition	Acknowledged

CR - Code Repetition

Criticality	Minor / Informative
Location	orange/app/api/v1/strategies/manage/claimAll/route.ts#L12 orange/app/api/v1/strategies/manage/compoundToPoolToken/route.ts#L13 orange/app/api/v1/strategies/manage/exitAll/route.ts#L11 orange/app/api/v1/strategies/manage/fetchFurthermoreData/route.ts#L11 orange/app/api/v1/strategies/manage/returnToVault/route.ts#L13 orange/app/api/v1/strategies/manage/stakeAll/route.ts#L13
Status	Acknowledged

Description

The codebase contains repetitive code segments. There are potential issues that can arise when using code segments in Javascript. Some of them can lead to issues like efficiency, complexity, readability, security, and maintainability of the source code. It is generally a good idea to try to minimize code repetition where possible.

```
const authHeader = request.headers.get('authorization') ||
request.headers.get('Authorization')
const expectedKey = process.env.ORANGE_API_KEY

if (!authHeader || !authHeader.startsWith('Bearer ') || !expectedKey) {
    return new Response(JSON.stringify({ error: 'Unauthorized' }), {
        status: 401,
        headers: { 'Content-Type': 'application/json' },
    })
}

const token = authHeader.replace('Bearer ', '').trim()
if (token !== expectedKey) {
    return new Response(JSON.stringify({ error: 'Unauthorized' }), {
        status: 401,
        headers: { 'Content-Type': 'application/json' },
    })
}
```

Recommendation

The team is advised to avoid repeating the same code in multiple places, which can make the codebase easier to read and maintain. The authors could try to reuse code wherever possible, as this can help reduce the complexity and size of the codebase. For instance, the team could reuse the common code segments in a separate module that exports the common code segments in order to avoid repeating the same code in multiple places.

Summary

Plutus implements a frontend and backend mechanism. This audit investigates security issues, business logic concerns, and potential improvements.

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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 TAC 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.

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The Cyberscope team

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