Security Assessment Report

Monaco Protocol v0.8.0

April 19, 2023

Summary

The sec3 team (formerly Soteria) was engaged to do a thorough security analysis of the Monaco Protocol Solana smart contract in https://github.com/MonacoProtocol/protocol. The initial audit was done on the source code of the following version

- **Contract "monaco_protocol":**
  - v0.8.0, commit 84f419ef0594ba5e60b18728948ceee1e6943b5e

The review revealed 1 informational issue, which has been resolved.

Table of Contents

Result Overview

In total, the audit team found the following issues.

MONACO PROTOCOL v0.8.0

Issue	Impact	Status
[I-1] Round up the commission fees	Informational	Resolved

Findings in Detail

IMPACT – INFO

[I-1] Round up the commission fees

Consider rounding up the commission fee before converting to u64. Otherwise, less fees will be charged due to the division.

```
/* programs/monaco_protocol/src/instructions/math.rs */
034 | pub fn calculate_commission(commission_rate: f64, profit: i128) -> u64 {
035 |     let commission_rate_decimal = Decimal::from_f64(commission_rate).unwrap();
036 |     Decimal::from(profit)
037 |         .max(Decimal::ZERO)
038 |         .mul(commission_rate_decimal)
039 |         .div(Decimal::ONE_HUNDRED)
040 |         .to_u64()
041 |         .unwrap()
042 | }
```

Resolution

The team acknowledges the finding and is currently satisfied with this approach. They plan to review and determine a consistent approach in the next version.

Appendix: Methodology and Scope of Work

The sec3 (formerly Soteria) audit team, which consists of Computer Science professors and industrial researchers with extensive experience in Solana smart contract security, program analysis, testing, and formal verification, performed a comprehensive manual code review, software static analysis, and penetration testing.

Assisted by the sec3 Scanner developed in-house, the audit team particularly focused on the following work items:

- Check common security issues.
    - Missing ownership checks
    - Missing signer checks
    - Signed invocation of unverified programs
    - Solana account confusions
    - Arithmetic over- or underflows
    - Numerical precision errors
    - Loss of precision in calculation
    - Insufficient SPL-Token account verification
    - Missing rent exemption assertion
    - Casting truncation
    - Did not follow security best practices
    - Outdated dependencies
    - Redundant code
    - Unsafe Rust code
- Check program logic implementation against available design specifications.
- Check poor coding practices and unsafe behavior.
- The soundness of the economics design and algorithm is out of the scope of this work

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ABOUT

Founded by leading academics in the field of software security and senior industrial veterans, sec3 (formerly Soteria) is a leading blockchain security company that currently focuses on Solana programs. We are also building sophisticated security tools that incorporate static analysis, penetration testing, and formal verification.

At sec3, we identify and eliminate security vulnerabilities through the most rigorous process and aided by the most advanced analysis tools.

For more information, check out our website and follow us on twitter.

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