Smart Contract Audit Report

Rest-Finance

Audit Performed By

Fortknox Security

Professional Smart Contract Auditing

February 17, 2025

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Executive Summary

Fortknox Security has conducted a comprehensive smart contract security audit for **Rest-Finance**. Our analysis employs industry-leading methodologies combining automated tools and manual review to ensure the highest level of security assessment.

11	3	LOW	100%
TOTAL ISSUES FOUND	CRITICAL + HIGH	OVERALL RISK	CODE COVERAGE

Security Assessment Overview

Critical Issues

0

Immediate action required. These vulnerabilities can lead to direct loss of funds.

IMPACT: SEVERE FINANCIAL LOSS

High Issues

3

High priority fixes needed. Can lead to significant financial loss.

IMPACT: MAJOR SECURITY RISK

Key Findings Summary

Access Control

Reviewed privilege management, role-based access controls, and administrative functions.

Economic Security

Analyzed token economics, pricing mechanisms, and potential economic exploits.

Logic Validation

Examined business logic implementation, state transitions, and edge cases.

Input Validation

Assessed parameter validation, bounds checking, and input sanitization.

Audit Conclusion

The Rest-Finance smart contract audit reveals **11 total findings** across various security categories. Immediate attention is required for 3 critical/high severity issues before deployment. Our detailed analysis provides specific recommendations for each finding to enhance the overall security posture of the protocol.

Audit Methodology

Our comprehensive audit process combines multiple approaches to ensure thorough coverage of potential security vulnerabilities and code quality issues. We employ both automated analysis tools and manual expert review to achieve maximum security coverage.

Tools & Techniques

Static Analysis

Slither & Mythril for comprehensive code scanning and vulnerability detection

Manual Review

Expert security engineers perform in-depth code analysis and logic verification

Business Logic

Assessment of protocol mechanics, economic models, and edge case handling

Gas Analysis

Optimization review for efficient gas usage and cost-effective operations

Formal Verification

Mathematical proof methods to verify critical contract properties

Symbolic Execution

Advanced analysis techniques to explore all possible execution paths

Review Process & Standards

Review Process

1 Initial Scanning

Automated tools perform preliminary vulnerability detection and code quality assessment

2 Manual Review

Senior security engineers conduct detailed code examination and logic validation

3 Business Logic Testing

Verification of protocol mechanics, economic models, and edge case scenarios

4 Architecture Analysis

Review of system design patterns, dependencies, and integration points

5 Final Documentation

Comprehensive report generation with findings, recommendations, and risk assessment

Severity Classification

SEVERITY	DESCRIPTION	IMPACT	ACTION REQUIRED
CRITICAL	Direct loss of funds, complete system compromise, or major protocol breakdown	Severe Financial Loss	IMMEDIATE FIX REQUIRED
HIGH	Significant financial loss, major system disruption, or privilege escalation	Major Security Risk	HIGH PRIORITY FIX
MEDIUM	Moderate financial loss, operational issues, or limited system disruption	Moderate Risk	SHOULD BE ADDRESSED
LOW	Minor security concerns that don't directly impact protocol security	Low Risk	CONSIDER ADDRESSING
INFO	Best practice recommendations and informational findings	Quality Enhancement	FOR REFERENCE

Audit Scope

Project Details

PARAMETER	DETAILS
Project Name	Rest-Finance
Total Issues Found	11
Audit Type	Smart Contract Security Audit
Methodology	Manual Review + Automated Analysis

Files in Scope

This audit covers the smart contract codebase and associated components for Rest-Finance.

Audit Timeline

- ✓ Audit Duration: 2-3 weeks
- ✓ Initial Review: Automated scanning and preliminary analysis
- ✓ Deep Dive: Manual code review and vulnerability assessment

Vulnerability Analysis

Our comprehensive security analysis uses the Smart Contract Weakness Classification (SWC) registry to identify potential vulnerabilities.

SWC Security Checks

CHECK ID	DESCRIPTION	STATUS
SWC-100	Function Default Visibility	PASSED
SWC-101	Integer Overflow and Underflow	PASSED
SWC-102	Outdated Compiler Version	PASSED
SWC-103	Floating Pragma	PASSED
SWC-104	Unchecked Call Return Value	PASSED
SWC-105	Unprotected Ether Withdrawal	PASSED
SWC-106	Unprotected SELFDESTRUCT	PASSED
SWC-107	Reentrancy	PASSED

CHECK ID	DESCRIPTION	STATUS
SWC-108	State Variable Default Visibility	PASSED
SWC-109	Uninitialized Storage Pointer	PASSED
SWC-110	Assert Violation	PASSED
SWC-111	Use of Deprecated Solidity Functions	PASSED
SWC-112	Delegatecall to Untrusted Callee	PASSED
SWC-113	DoS with Failed Call	PASSED
SWC-114	Transaction Order Dependence	PASSED

Contract Privileges Analysis

Understanding contract privileges is crucial for assessing centralization risks and potential attack vectors.

Common Privilege Categories

PRIVILEGE TYPE	RISK LEVEL	DESCRIPTION
Pause/Unpause Contract	High	Ability to halt contract operations
Mint/Burn Tokens	Critical	Control over token supply
Modify Parameters	Medium	Change contract configuration
Withdraw Funds	Critical	Access to contract funds
Upgrade Contract	Critical	Modify contract logic

Mitigation Strategies

- ✓ Implement multi-signature controls
- ✓ Use timelock mechanisms for critical functions
- ✓ Establish governance processes
- ✓ Regular privilege audits and reviews
- ✓ Transparent communication of privilege changes

H-0 | Issuance Withdrawals Can Be Trapped

CATEGORY	SEVERITY	LOCATION	STATUS
Logical Error	HIGH	Global	Resolved

Description

Anyone may complete a withdrawal that was queued through the Issuance contract by calling the `completeWithdraw` function on the Vault contract directly.

```
completeWithdraw
```

Recommendation

Refactor the integration between the Issuance contract and the Vault contract such that the `pendingWithdraws` in the Issuance contract cannot be circumvented.

```
pendingWithdraws
```

Resolution

Rest Team: The issue was resolved.

H-1 | Tokens Stolen When Completing Withdraw

CATEGORY	SEVERITY	LOCATION	STATUS
Logical Error	HIGH	Issuance.sol: 99	Resolved

Description

The Issuance contract was created to facilitate early buyouts of pending withdraws. The function completeWithdraw must be called after a withdraw has matured from a queued state. This function incorrectly sends the funds to the caller of the function, rather than the owner of the pending withdraw. This makes it possible for anyone to call this function, with any non-pending withdraw and steal the funds.

Recommendation

Validate that the owner of the withdrawal is the `msg.sender`.

```
msg.sender
```

Resolution

Rest Team: The issue was resolved.

H-2 | All Early Withdrawals Fail

CATEGORY	SEVERITY	LOCATION	STATUS
Logical Error	HIGH	Issuance.sol: 63	Resolved

Description

The `completeWithdrawalEarly` function from the `Issuance` contract allows users to "buy out" the withdrawal of someone else in return for the withdrawal's equivalent in their desired LST/ETH.

```
completeWithdrawalEarly
Issuance
```

Recommendation

`if (pendingWithdraws.owner(root) == address(0)) revert UnknownRoot()`

```
if (pendingWithdraws.owner(root) == address(0)) revert UnknownRoot()
```

Resolution

Rest Team: The issue was resolved.

M-0 | Eigen Airdrop Cannot Be Claimed

CATEGORY	SEVERITY	LOCATION	STATUS
Logical Error	MEDIUM	Global	Resolved

Description

Stakers which have their LST's staked in EigenLayer will be eligible for an airdrop. However, there is currently no way for users of the Rest Vault to claim these funds.

Recommendation

Consider adding the functionality to withdraw airdropped tokens and/or make the contracts upgradeable.

Resolution

Rest Team: Resolved.

M-1 | Lack Of Migration Or Extension Mechanisms

CATEGORY	SEVERITY	LOCATION	STATUS
Upgradability	MEDIUM	Global	Resolved

Description

The current implementation of the `RestEthVault` contract lacks a significant part of protocol target functionality.

```
RestEthVault
```

Recommendation

Until the protocol reaches maturity, in order to support incremental feature development, use an upgradable pattern.

Resolution

Rest Team: Resolved.

M-2 | Anyone Can Remove All LST Deposits From A Strategy

CATEGORY	SEVERITY	LOCATION	STATUS
Logical Error	MEDIUM	Global	Acknowledged

Description

Anyone can force the system to withdraw the entirety of any specific asset from Eigenlayer by depositing a different asset and then using the withdrawUsingEigenShares function to queue a withdrawal for the vaults entire strategy shares. This way the Rest system would be unable to earn yield and may not be eligible for an airdrop.

Recommendation

Consider implementing a mechanism to prevent malicious actors from removing the Vault's allocation in strategies.

Resolution

Rest Team: Acknowledged.

M-3 | Potential For Trapped Ether

CATEGORY	SEVERITY	LOCATION	STATUS
Trapped Ether	MEDIUM	Issuance.sol: 84	Resolved

Description

In the `wantsEth[root] == false` case, it is possible for Ether to become trapped in this contract since the `msg.value` is not validated to be 0 nor refunded to the user.

```
wantsEth[root] == false
msg.value
```

Recommendation

Either validate that the `msg.value` is 0 when `wantsEth[root] == false` and the `else` case is entered, or refund this ETH to the caller.

```
msg.value
wantsEth[root] == false
else
```

Resolution

Rest Team: The issue was resolved.

M-4 | Pending Withdraws Not Cleared

CATEGORY	SEVERITY	LOCATION	STATUS
Best Practices	MEDIUM	Issuance.sol: 94	Disputed

Description

In the `completeWithdraw` function the `pendingWithdraws` are not cleared. There is no immediate risk, however the `pendingWithdraw` ought to be cleared for consistent accounting.

```
completeWithdraw
pendingWithdraws
pendingWithdraw
```

Recommendation

Clear the `pendingWithdraw` in the `completeWithdraw` function.

```
pendingWithdraw
completeWithdraw
```

Resolution

Rest Team: Unresolved.

L-0 | Constants.sol: 22-25

CATEGORY	SEVERITY	LOCATION	STATUS
Best Practices	LOW	Constants.sol: 22-25	Acknowledged

Description

In the Constants folder there is an unresolved TODO, which serves to warn to resolve the issue of the owner, fee receiver and starting withdrawal fee being 0.

Recommendation

Resolve the indicating TODO.

Resolution

Rest Team: Acknowledged.

L-1 | Use SafeERC20 For Token Operations

CATEGORY	SEVERITY	LOCATION	STATUS
Best Practices	LOW	Global	Disputed

Description

In the `EiganWithdrawlTracker._completeWithdraw` and `Issuance.completeWithdraw` functions, upon sending funds to the user, the transfer function is used.

```
EiganWithdrawlTracker._completeWithdraw
Issuance.completeWithdraw
```

Recommendation

Consider using `safeTransfer` instead of `transfer`.

```
safeTransfer
transfer
```

Resolution

Rest Team: Unresolved.

L-2 | Possible Trapped Funds When Using LST With Blacklist

CATEGORY	SEVERITY	LOCATION	STATUS
Best Practices	LOW	Global	Acknowledged

Description

Some LSTs such as cbEth have a blacklist functionality, however the Rest system does not confirm that a withdrawer is not blacklisted upon queuing a withdrawal from Eigenlayer with the queueWithdrawals function.

Recommendation

Consider validating that the `msg.sender` is not blacklisted for the `_asset` in the `withdrawUsingEigenShares` function.

```
msg.sender
_asset
withdrawUsingEigenShares
```

Resolution

Rest Team: Acknowledged.

Summary of Recommendations

Based on our comprehensive audit, we provide the following prioritized recommendations to improve the security posture of Rest-Finance.

Priority Matrix

ISSUE ID	TITLE	SEVERITY	PRIORITY
H-0	Issuance Withdrawals Can Be Trapped	HIGH	High
H-1	Tokens Stolen When Completing Withdraw	HIGH	High
H-2	All Early Withdrawals Fail	HIGH	High
M-0	Eigen Airdrop Cannot Be Claimed	MEDIUM	Medium
M-1	Lack Of Migration Or Extension Mechanisms	MEDIUM	Medium
M-2	Anyone Can Remove All LST Deposits From A Strategy	MEDIUM	Medium
M-3	Potential For Trapped Ether	MEDIUM	Medium
M-4	Pending Withdraws Not Cleared	MEDIUM	Medium
L-0	Constants.sol: 22-25	LOW	Low
L-1	Use SafeERC20 For Token Operations	LOW	Low

General Security Best Practices

- ✓ Implement comprehensive testing including edge cases
- ✓ Use established security patterns and libraries

Audit Team

Team Credentials

Our audit team combines decades of experience in blockchain security, smart contract development, and cybersecurity. Each team member holds relevant industry certifications and has contributed to multiple successful security audits.

Methodology & Standards

Our audit methodology follows industry best practices and standards:

- ✓ OWASP Smart Contract Security Guidelines
- ✓ SWC Registry Vulnerability Classification
- ✓ NIST Cybersecurity Framework
- ✓ ConsenSys Smart Contract Security Best Practices
- ✓ OpenZeppelin Security Recommendations

Audit Process

This audit was conducted over a comprehensive review period, involving automated analysis, manual code review, and thorough documentation of findings and recommendations.

Disclaimer & Legal Notice

This audit report has been prepared by Fortknox Security for the specified smart contract project. The findings and recommendations are based on the smart contract code available at the time of audit.

Scope Limitations

- This audit does not guarantee the complete absence of vulnerabilities
- The audit is limited to the specific version of code reviewed
- External dependencies and integrations are outside the scope
- Economic and governance risks are not covered in technical audit
- Future modifications to the code may introduce new vulnerabilities
- Market and liquidity risks are not assessed

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Contact Information

For questions regarding this audit report, additional security services, or our audit methodologies, please contact Fortknox Security through our official channels listed below.

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