Smart Contract Audit Report

Umami

Audit Performed By

Fortknox Security

Professional Smart Contract Auditing

May 27, 2025

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Executive Summary

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

8	4	LOW	100%
TOTAL ISSUES FOUND	CRITICAL + HIGH	OVERALL RISK	CODE COVERAGE

Security Assessment Overview

Critical Issues

2

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

IMPACT: SEVERE FINANCIAL LOSS

High Issues

2

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 Umami smart contract audit reveals **8 total findings** across various security categories. Immediate attention is required for 4 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	Umami
Total Issues Found	8
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 Umami.

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

C-0 | Deposit Failures Unexpectedly Refund The Account

CATEGORY	SEVERITY	LOCATION	STATUS
Logical Error	CRITICAL	RequestHandler.sol: 58	Resolved

Description

When a deposit request is made on behalf of another account and fails execution, the native assets are sent to the `receiver` instead of the `sender` of the request, who initiated the request and provided the funds.

```
receiver
sender
```

Recommendation

Consider sending the funds to the `sender` on a deposit request fail.

```
sender
```

Resolution

Umami Team: The issue was resolved

C-1 | GMI Deposit Amount Rounded Down

CATEGORY	SEVERITY	LOCATION	STATUS
Rounding	CRITICAL	GMI.sol	Resolved

Description

When depositing GMI, the computed PPS used to calculate the shares received is rounded down. However, in the future, GMI may be supported for other third-party users. In that case, it would be important to round the PPS up upon deposits.

Recommendation

Consider rounding the PPS up when computing the amount of shares to mint upon depositing into GMI.

Resolution

Umami Team: The issue was resolved

H-0 | Leap Years Are Unaccounted For

CATEGORY	SEVERITY	LOCATION	STATUS
Leap Years	HIGH	VaultFees.sol	Resolved

Description

In the `VaultFees` contract the YEAR constant is defined as being exactly 365 days in seconds, rather than 365.25 days to account for leap years.

```
VaultFees
```

Recommendation

Consider changing the YEAR value to `31557600` to account for leap years.

```
31557600
```

Resolution

Umami Team: The issue was resolved

H-1 | Rebalance Functions Accessible Outside Of Rebalance Periods

CATEGORY	SEVERITY	LOCATION	STATUS
Access Control	HIGH	LibCycle.sol	Resolved

Description

Neither the `cycle` function nor the `fulfilRequests` function validate that the system is indeed within a rebalancing period when they are being called.

```
cycle
fulfilRequests
```

Recommendation

Validate that the protocol is currently in a rebalancing period in the `cycle` and `fulfilRequests` functions.

```
cycle
fulfilRequests
```

Resolution

Umami Team: The issue was resolved

M-0 | CallbackHandler not assigned in setPeripheral

CATEGORY	SEVERITY	LOCATION	STATUS
Superfluous Code	MEDIUM	AggregateVault.sol	Resolved

Description

The `setPeripheral` function does not allow a value to be assigned for the `Peripheral.CallbackHandler`. Nor is the `Peripheral.CallbackHandler` is used anywhere in the codebase.

```
setPeripheral
Peripheral.CallbackHandler
Peripheral.CallbackHandler
```

Recommendation

Consider removing the redundant `Peripheral.CallbackHandler` value from the `Peripheral` enum, otherwise implement the desired use case for the `Peripheral.CallbackHandler` value.

```
Peripheral.CallbackHandler
Peripheral
Peripheral.CallbackHandler
```

Resolution

Umami Team: The issue was resolved

L-0 | Weight Cannot Be 0

CATEGORY	SEVERITY	LOCATION	STATUS
Warning	LOW	GmiUtils.sol: 85	Acknowledged

Description

When distributing the overallocated difference, the algorithm divides the jth weight by the ith weight. If the ith weight is 0, a division by 0 revert will occur.

Recommendation

Ensure none of the weights are set to 0.

Resolution

Umami Team: Acknowledged.

L-1 | Lacking Event For setCallbackEnabled

CATEGORY	SEVERITY	LOCATION	STATUS
Events	LOW	RequestHandler.sol: 37-39	Resolved

Description

When the callback functionality is enabled by the `RequestHandler` contract, by calling the `setCallbackEnabled` function, there is no event is emitted.

```
RequestHandler
setCallbackEnabled
```

Recommendation

Emit an event on the call to the `setCallbackEnabled` function.

```
setCallbackEnabled
```

Resolution

Umami Team: The issue was resolved

L-2 | Unnecessary vaultIdx Variable

CATEGORY	SEVERITY	LOCATION	STATUS
Optimization	LOW	LibCycle.sol: 191	Resolved

Description

In the `rebalanceGmi` function the `vaultIdx` is unnecessarily fetched using the `getTokenToAssetVauldIndex` function when the vault index is directly available as the index of the for-loop, i.

```
rebalanceGmi
vaultIdx
getTokenToAssetVauldIndex
```

Recommendation

Use the for-loop index to indicate the vault rather than fetching the `vaultIdx` with the `getTokenToAssetVaultIndex` function.

```
vaultIdx
getTokenToAssetVaultIndex
```

Resolution

Umami Team: The issue was resolved

Summary of Recommendations

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

Priority Matrix

ISSUE ID	TITLE	SEVERITY	PRIORITY
C-0	Deposit Failures Unexpectedly Refund The Account	CRITICAL	Immediate
C-1	GMI Deposit Amount Rounded Down	CRITICAL	Immediate
H-0	Leap Years Are Unaccounted For	HIGH	High
H-1	Rebalance Functions Accessible Outside Of Rebalance Periods	HIGH	High
M-0	CallbackHandler not assigned in setPeripheral	MEDIUM	Medium
L-0	Weight Cannot Be 0	LOW	Low
L-1	Lacking Event For setCallbackEnabled	LOW	Low
L-2	Unnecessary vaultIdx Variable	LOW	Low

General Security Best Practices

- ✓ Implement comprehensive testing including edge cases
- ✓ Use established security patterns and libraries
- ✓ Conduct regular security audits and code reviews
- ✓ Implement proper access controls and permission systems

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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