



Security Assessment

Threshold Network VendingMachine

Nov 19th, 2021

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Summary

This report has been prepared for Threshold Network to discover issues and vulnerabilities in the source code of the Threshold Network VendingMachine project as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Static Analysis and Manual Review techniques.

The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

The security assessment resulted in findings that ranged from critical to informational. We recommend addressing these findings to ensure a high level of security standards and industry practices. We suggest recommendations that could better serve the project from the security perspective:

- Enhance general coding practices for better structures of source codes;
- Add enough unit tests to cover the possible use cases;
- Provide more comments per each function for readability, especially contracts that are verified in public;
- Provide more transparency on privileged activities once the protocol is live.

Overview

Project Summary

Project Name	Threshold Network VendingMachine
Platform	Ethereum
Language	Solidity
Codebase	https://github.com/threshold-network/solidity-contracts/blob/main/contracts/vending/VendingMachine.sol
Commit	6c426311bc74acb035c95862b74a5247cbbab28a

Audit Summary

Delivery Date	Nov 19, 2021
Audit Methodology	Static Analysis, Manual Review
Key Components	

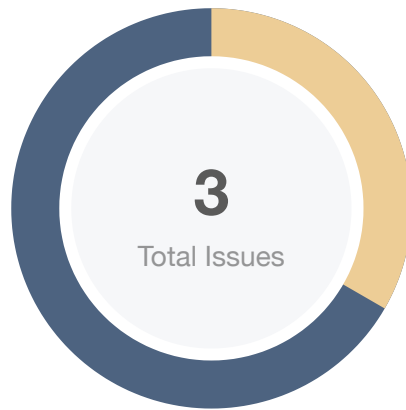
Vulnerability Summary

Vulnerability Level	Total	⚠ Pending	⊗ Declined	ℹ Acknowledged	🕒 Partially Resolved	✅ Resolved
🔴 Critical	0	0	0	0	0	0
🟠 Major	0	0	0	0	0	0
🟡 Medium	0	0	0	0	0	0
🟠 Minor	1	0	0	1	0	0
🟡 Informational	2	0	0	2	0	0
🟢 Discussion	0	0	0	0	0	0

Audit Scope

ID	File	SHA256 Checksum
VMK	VendingMachine.sol	2fc12b37250b617ff5b33a399bd7b05b0736b1abedec020c77611f9eb637ee0e

Findings



Critical	0 (0.00%)
Major	0 (0.00%)
Medium	0 (0.00%)
Minor	1 (33.33%)
Informational	2 (66.67%)
Discussion	0 (0.00%)

ID	Title	Category	Severity	Status
TTK-01	Third Party Dependencies	Control Flow	● Informational	ⓘ Acknowledged
VMK-01	Potential incorrect calculation	Logical Issue	● Minor	ⓘ Acknowledged
VMV-01	Third Party Dependencies	Control Flow	● Informational	ⓘ Acknowledged

TTK-01 | Third Party Dependencies

Category	Severity	Location	Status
Control Flow	● Informational	contracts/token/T.sol/T.sol (main): 5~6	① Acknowledged

Description

The contract imports third-party files from `thesis`. The scope of the audit treats third-party entities as black boxes and assumes their functional correctness. However, in the real world, third-party entities can be compromised and this may lead to lost or stolen assets. In addition, upgrades of third-party entities can possibly create severe impacts, such as increasing fees of third-party entities, migrating to new LP pools, etc.

Recommendation

We encourage the team to constantly monitor the statuses of third-party entities to mitigate the side effects when unexpected activities are observed.

VMK-01 | Potential incorrect calculation

Category	Severity	Location	Status
Logical Issue	● Minor	contracts/vending/VendingMachine.sol (main): 167	🕒 Acknowledged

Description

Based on comments in the code and context, `FLOATING_POINT_DIVISOR` should be used in the calculation instead of `ratio` to compute amount below specified precision.

Recommendation

We advise the client to use `FLOATING_POINT_DIVISOR` instead of `ratio` in the calculation.

VMV-01 | Third Party Dependencies

Category	Severity	Location	Status
Control Flow	● Informational	contracts/vending/VendingMachine.sol/VendingMachine.sol (main) : 9	ⓘ Acknowledged

Description

The contract imports third-party files from `thesis`. The scope of the audit treats third-party entities as black boxes and assumes their functional correctness. However, in the real world, third-party entities can be compromised and this may lead to lost or stolen assets. In addition, upgrades of third-party entities can possibly create severe impacts, such as increasing fees of third-party entities, migrating to new LP pools, etc.

Recommendation

We encourage the team to constantly monitor the statuses of third-party entities to mitigate the side effects when unexpected activities are observed.

Appendix

Finding Categories

Logical Issue

Logical Issue findings detail a fault in the logic of the linked code, such as an incorrect notion on how `block.timestamp` works.

Control Flow

Control Flow findings concern the access control imposed on functions, such as owner-only functions being invoke-able by anyone under certain circumstances.

Checksum Calculation Method

The "Checksum" field in the "Audit Scope" section is calculated as the SHA-256 (Secure Hash Algorithm 2 with digest size of 256 bits) digest of the content of each file hosted in the listed source repository under the specified commit.

The result is hexadecimal encoded and is the same as the output of the Linux `sha256sum` command against the target file.

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