Smart Contract Audit Report

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Contents

Purpose of this report

Web3 Technologies Solutions has been engaged to performed an audit of [redacted] smart contract. The purpose of this engagement has been to review the codebase for quality, security, and correctness and to report any findings.

This audit report contains details of any and all findings made during the audit process. A detailed examination of the codebase has been performed, utilizing Automated and Manual Review techniques.

The primary objectives of the audit have been to:

- Determine whether the codebase meets industry standard best practices.
- Assess the codebase to the documentation and comments match the logic and expected behavior.
- Ensure the token distribution and calculations are as per the intended behavior mentioned in the whitepaper.
- Determine ERC-721 token standards are implemented.
- Assess for efficient use of gas.
- Assess to ensure the codebase is safe from reentrancy and other vulnerabilities.

Scope of Audit

The scope of this audit was to audit [redacted] smart contract smart contract's codebase for quality, security, and correctness.

Project Name	[redacted] – Audit
Platform	Polygon (MATIC)
Language	Solidity
Codebase	[redacted]
Commit ID	20f5123945d2b24f86cfdff83ee1433a0593286f

Methodology

We have audited the smart contract both automatic and manual line by line for commonly known vulnerabilities and best practices. Here are some of the items we have audited for:

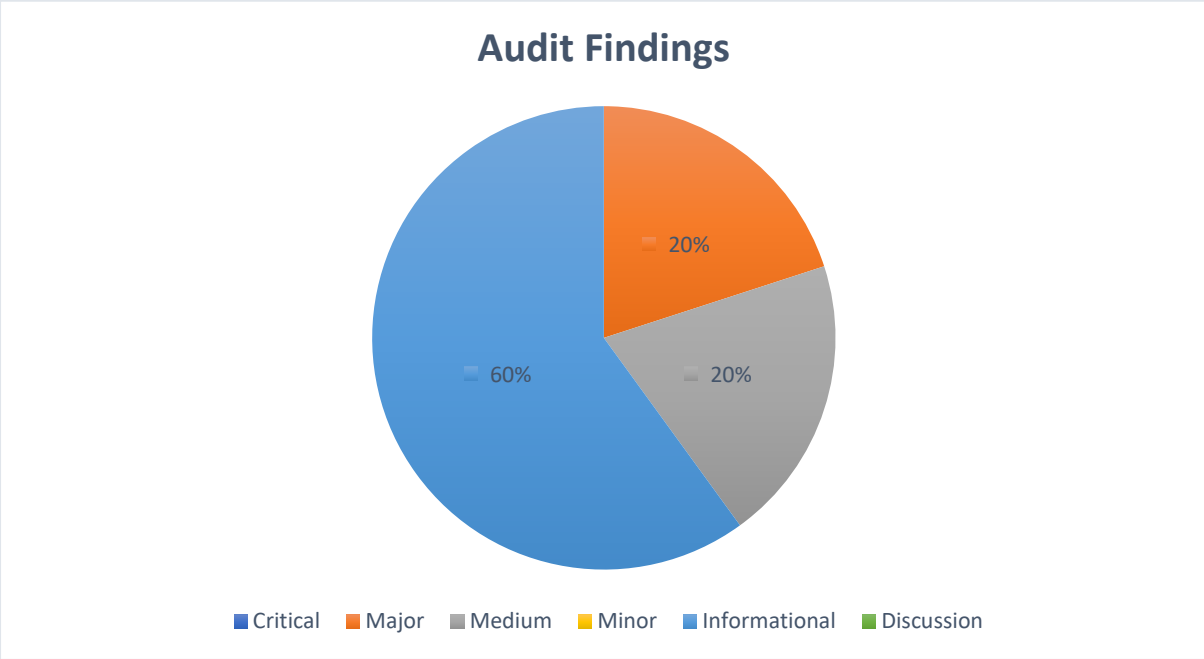
- Re-entrancy
- Timestamp Dependence
- Gas Limit and Loops
- Exception Disorder
- Gasless Send
- Use of tx.origin
- Malicious libraries
- Compiler version not fixed
- Address hardcoded
- Divide before multiply
- Integer overflow/underflow
- Using throw
- Using inline assembly

Audit Summary

We have audited the contract based on the described methodology. We have found the code quality to be Good. The contract has been found free of any known severe vulnerability and precautions to have been optimized for Gas consumption. The found issue are of Major (1), Medium (1), and Informational (3).

Audit Findings

Vulnerability Level	Total	Pending	Acknowledged	Resolved
Critical	0	0	0	0
Major	1	1	0	0
Medium	1	1	0	0
Minor	0	0	0	0
Informational	3	3	0	0
Discussion	0	0	0	0



ID	Title	Category	Severity	Status
W3T 01	Centralization Risks in [redacted].sol	Centralization/ Privilege	Major	Open
W3T 02	Potential Re-entrancy Attack	Logical Issue	Medium	Open
W3T 03	Missing Emit Events	Coding Style	Informational	Open
W3T 04	Missing Error Messages	Coding Style	Informational	Open
W3T 05	Short Error Message	Coding Style	Informational	Open

W3T 01 | Centralization Risk

Category	Severity	Location	Status
Centralization / Privilege	Major	A[redacted].sol: 704, 731, 736, 741, 746, 751, 757, 778, 785, 792, 847	Open

Description

[redacted]'s Contract has multiple function which has role _owner to one address. Any compromise to the _owner account may allow the hacker to take advantages of this authority.

Recommendation

We advise the client to carefully manage the privileged account's private key to avoid any potential risk. In general, we strongly recommended centralized privileges or roles in the protocol be improved. For example; multi-signature wallets, Time lock, Role Based Contract.

W3T 02 | Reentrancy Attack

Category	Severity	Location	Status
Logical Issue	Medium	[redacted].sol: 797~845, 799, 815, 847	Open

Description

We recommend applying OpenZeppelin ReentrancyGuard library - nonReentrant modifier for mentioned functions to prevent reentrancy attack.

Recommendation

We recommend applying OpenZeppelin ReentrancyGuard library - nonReentrant modifier for the aforementioned functions to prevent reentrancy attack.

W3T 03 | Missing Emit Events

Category	Severity	Location	Status
Coding Style	Informational	A[redacted].sol: 627, 704, 731, 736, 741, 746, 751, 757, 778, 785, 792, 847	Open

Description

There should always be events emitted in the sensitive functions that are controlled by centralization roles.

Recommendation

It is recommended emitting events for the sensitive functions that are controlled by centralization roles.

W3T 04 | Missing Error Messages

Category	Severity	Location	Status
Coding Style	Informational	[redacted].sol: 689, 694, 699	Open

Description

The require can be used to check for conditions and throw an exception if the condition is not met. It is better to provide a string message containing details about the error that will be passed back to the caller.

Recommendation

We advise adding error messages to the linked require statements.

W3T 05 | Short Error Messages

Category	Severity	Location	Status
Coding Style	Informational	A[redacted].sol:802,818, 835, 848, 849	Open

Description:

Use Short error message when any error message trigger less gas need to consume.

Recommendation:

Mention in Comments the error message error and use short name in the message. Like ISF in require condition and Insufficient fund in comment.

Appendix

Finding Categories

Centralization / Privilege

Centralization / Privilege findings refer to either feature logic or implementation of components that act against the nature of decentralization, such as explicit ownership or specialized access roles in combination with a mechanism to relocate funds.

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.

Coding Style

Coding Style findings usually do not affect the generated byte-code but rather comment on how to make the codebase more legible and, as a result, easily maintainable.

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The purpose of this audit is not to provide any advice on any decision other than to help our customers increase quality of code and to reduce the risk presented by the blockchain technology.

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