CERTIK

Preliminary Comments

ETHICA

May 21st, 2022

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Summary

This report has been prepared for ETHICA to discover issues and vulnerabilities in the source code of the ETHICA 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	ETHICA
Platform	Ethereum
Language	Solidity
Codebase	https://github.com/my-ethica/project-ethica
Commit	fdf36a9108ae40ed39934634e881e2a3debf7274

Audit Summary

Delivery Date	May 21, 2022 UTC
Audit Methodology	Static Analysis, Manual Review

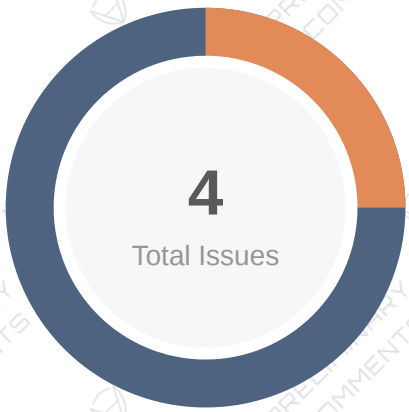
Vulnerability Summary

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

Audit Scope

ID	File	SHA256 Checksum
ETI	myETHICA.sol	9509b5d8faafd3b6f534d4280bcdb5cc846ad086761da7e96c87917b253b99a2

Findings



Critical	0 (0.00%)
Major	1 (25.00%)
Medium	0 (0.00%)
Minor	0 (0.00%)
Informational	3 (75.00%)
Discussion	0 (0.00%)

ID	Title	Category	Severity	Status
ETI-01	Initial Token Distribution	Centralization / Privilege	Major	Pending
ETI-02	Redundant Code Components	Volatile Code	Informational	Pending
ETI-03	Improper Usage Of `public` And `external` Type	Gas Optimization	Informational	Pending
ETI-04	Too Many Digits	Coding Style	Informational	Pending

ETI-01 | Initial Token Distribution

Category	Severity	Location	Status
Centralization / Privilege	**Major**	myETHICA.sol: 451	Pending

Description

Ten billion `myETHICA` tokens are sent to the contract deployer when deploying the contract. This could be a centralization risk as the deployer can distribute `myETHICA` tokens without obtaining the consensus of the community.

Recommendation

We recommend the team to be transparent regarding the initial token distribution process, and the team shall make enough efforts to restrict the access of the private key.

ETI-02 | Redundant Code Components

Category	Severity	Location	Status
Volatile Code	Informational	myETHICA.sol: 19	Pending

Description

The linked statements do not affect the functionality of the codebase and appear to be either leftovers from test code or older functionality.

Recommendation

We advise to remove the redundant statements for production environments.

ETI-03 | Improper Usage Of `public` And `external` Type

Category	Severity	Location	Status
Gas Optimization	Informational	myETHICA.sol: 175, 185, 205, 223, 242, 258, 428, 440	Pending

Description

`public` functions that are never called by the contract could be declared as `external`. `external` functions are more efficient than `public` functions.

Recommendation

Consider using the external attribute for public functions that are never called within the contract.

ETI-04 | Too Many Digits

Category	Severity	Location	Status
Coding Style	Informational	myETHICA.sol: 451	Pending

Description

Literals with many digits are difficult to read and review.

File: projects/ethica/myETHICA.sol (Line 451, Function `myETHICA.constructor`)

```
    _mint(msg.sender, 10000000000 * 10 ** decimals());
```

Recommendation

We advise the client to use the scientific notation to improve readability.

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.

Gas Optimization

Gas Optimization findings do not affect the functionality of the code but generate different, more optimal EVM opcodes resulting in a reduction on the total gas cost of a transaction.

Volatile Code

Volatile Code findings refer to segments of code that behave unexpectedly on certain edge cases that may result in a vulnerability.

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.

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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