Security Assessment

Meta

Sept 23rd, 2021

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Summary

This report has been prepared for Meta to discover issues and vulnerabilities in the source code of the Meta 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	Meta
Platform	Ethereum
Language	Solidity
Codebase	https://github.com/Meta-Protocol/simple-meta-token
Commit	6141a380cd30df283a1d704c5675c420b60db66a 3e56b8fc17d94caff486ae51001bd3a1e1076b41

Audit Summary

Delivery Date	Sept 23, 2021
Audit Methodology	Static Analysis, Manual Review
Key Components	

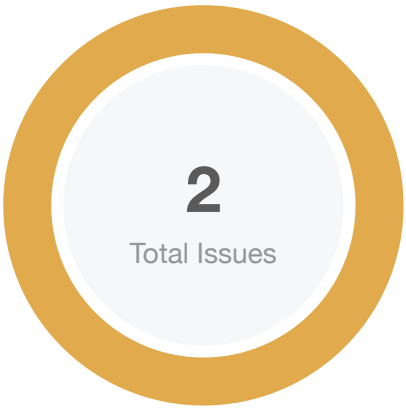
Vulnerability Summary

Vulnerability Level	Total	Pending	Declined	Acknowledged	Partially Resolved	Resolved
Critical	0	0	0	0	0	0
Major	0	0	0	0	0	0
Medium	2	0	0	1	0	1
Minor	0	0	0	0	0	0
Informational	0	0	0	0	0	0
Discussion	0	0	0	0	0	0

Audit Scope

ID			File	SHA256 Checksum

Findings



Critical	0 (0.00%)
Major	0 (0.00%)
Medium	2 (100.00%)
Minor	0 (0.00%)
Informational	0 (0.00%)
Discussion	0 (0.00%)

ID	Title	Category	Severity	Status
MTC-01	Initial token distribution	Centralization / Privilege	Medium	Acknowledged
MTC-02	Potential Overflow/Underflow in Unchecked Block	Mathematical Operations	Medium	Resolved

MTC-01 | Initial token distribution

Category	Severity	Location	Status
Centralization / Privilege	**Medium**	MetaToken.sol: 142	Acknowledged

Description

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

Recommendation

We recommend the team to be transparent regarding the initial token distribution process.

MTC-02 | Potential Overflow/Underflow in Unchecked Block

Category	Severity	Location	Status
Mathematical Operations	Medium	MetaToken.sol: 102~104, 123~125, 89~91	Resolved

Description

Prior to Solidity 0.8.0, arithmetic operations would always wrap in case of under-or overflow leading to widespread use of libraries that introduce additional checks.

Since Solidity 0.8.0, all arithmetic operations revert on over- and underflow by default, thus making the use of these libraries unnecessary.

To obtain the previous behavior, an unchecked block can be used

Several locations inside the contract use the unchecked block that would cause over/underflow.

Recommendation

We recommend removing the unchecked block.

Alleviation

The unchecked block is removed from the code.

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.

Mathematical Operations

Mathematical Operation findings relate to mishandling of math formulas, such as overflows, incorrect operations etc.

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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