AUDITS

MH SWIFTSCAN REVIEW

METAXY

JUNE 23 RD 2022

AUDITS

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MH Audits' goal is to help reduce the attack vectors and the high level of variance associated with utilizing new and consistently changing technologies, and in no way claims any guarantee of security or functionality of the technology we agree to analyze.

MH Audits represents an extensive auditing process intending to help our customers increase the quality of their code while reducing the high level of risk presented by cryptographic tokens and blockchain technology.

Blockchain technology and cryptographic assets present a high level of ongoing risk. MH Audits' position is that each company and individual are responsible for their own due diligence and continuous security.

The security audit is not meant to replace functional testing done before a software release. As one audit-based assessment cannot be considered comprehensive, we always recommend proceeding with several independent manual audits and a public bug bounty program to ensure the security of the smart contracts.

INTRODUCTION

MH Audits is a leading blockchain security company that serves to verify the security and correctness of smart contracts and blockchain-based protocols. Through the utilization of our world-class technical expertise, alongside our proprietary, innovative tech, we're able to support the success of our clients with best-in-class security, all whilst realizing our overarching vision; provable trust for all throughout all facets of blockchain.

Secure your project with MH Audits

We offer field-proven audits with in-depth reporting and a range of suggestions to improve and avoid contract vulnerabilities.

Industry-leading comprehensive and transparent smart contract auditing on all public and private blockchains.

Vunerability checking

A crucial manual inspection carried out to eliminate any code flaws and security loopholes. This is vital to avoid vulnerabilities and exposures incurring costly errors at a later stage.

Contract verification

A thorough and comprehensive review in order to verify the safety of a smart contract and ensure it is ready for launch and built to protect the end-user.

Risk assessment

Analyse the architecture of the blockchain system to evaluate, assess and eliminate probable security breaches. This includes a full assessment of risk and a list of expert suggestions.

In-depth reporting

A truly custom exhaustive report that is transparent and depicts details of any identified threats and vulnerabilities and classifies those by severity.

Fast turnaround

We know that your time is valuable and therefore provide you with the fastest turnaround times in the industry to ensure that both your project and community are at ease.

Best-of-class blockchain engineers

Our engineers combine both experience and knowledge stemming from a large pool of developers at our disposal. We work with some of the brightest minds that have audited countless smart contracts over the last 4 years.

PROJECT SUMMARY

PROJECT INTRODUCTION

Metaxy is a decentralized NFT based fighting game, featuring the most diverse anime-inspired characters, that creates a Multiverse where players can summon their favorite superheroes to battle and earn massive rewards of NFT collectibles and MXY tokens.

Metaxy takes place in a fantasy world where superheroes are summoned for the great Multiverse War. Each game character comes with different appearances and unique fighting attributes that are developed over time along with the user's experience. Available PvP and PvE game modes.

Project Name *Metaxy*

Contract Name *MXY Token*

Contract Address *0x965D3704DE812F5e1E7eEf1ac22fE92174258bd9*

Contract Chain *Mainnet*

Contract Type *Smart Contract*

Platform *EVM*

Language *Solidity*

Codebase *https://bscscan.com/address/0x965D3704DE812F5e1E7eEf1ac22fE92174258bd9#code*

INFO & SOCIALS

Network *BNB Smart Chain (BEP20)*

Max Token Supply *1.500.000.000*

Website *https://www.metaxy.game/*

Twitter *https://twitter.com/MetaxyMXY*

Telegram Chat *https://t.me/metaxyglobal*

Telegram Ann *https://t.me/metaxyANN*

Discord *https://discord.gg/TTJvjERCgB*

Facebook *https://www.facebook.com/MetaxyMXY*

Medium *https://medium.com/@metaxy*

BSCScan *https://bscscan.com/token/0x965D3704DE812F5e1E7eEf1ac22fE92174258bd9*

AUDIT SCORES

Issues	5
Critical	0
Major	1
Medium	1
Minor	3
Informational	0
Discussion	0

All issues are described in further detail on the following pages.

* Note that if no manual in-depth expert review has been performed a score multiplier of .9 will apply to the final result.

AUDIT SCOPE

FILE	LOCATION
MxyToken.sol	*BSC Deployment: /address/0x965D3704DE812F5e1E7eEf1ac22fE92174258bd9#code*

REVIEW METHODOLOGY

TECHNIQUES

This report has been prepared for Metaxy to discover issues and vulnerabilities in the source code of the Metaxy project as well as any contract dependencies that were not part of an officially recognized library. An examination has been performed, utilizing Static Analysis and MH SwiftScan 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 producedby industry leaders.

The security assessment resulted in findings that ranged from major 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 in the comments below.

TIMESTAMP

Version	v1.0
Date	2022/06/23
Description	Layout project
	Automated / Static security testing
	Summary

KEY FINDINGS

TITLE	SEVERITY	STATUS
Controlled Delegate Call	**Major**	*Pending*
Unprotected Ether Withdrawal	**Medium**	*Pending*
Custom Errors To Save Gas	**Minor**	*Pending*
Cheaper Inequalities In Require()	**Minor**	*Pending*
Cheaper Inequalities In If()	**Minor**	*Pending*

Description:

The contract was using delegatecall() *or* call() *which was accepting address controlled by a user. This can have devastating effects on the contract as a delegate call allows the contract to execute code belonging to other contracts but using it's own storage. This can very easily lead to a loss of funds and compromise of the contract.*

Location: *contracts/token/MxyToken.sol L132*

Issue: *Controlled Delegate Call*

Level: *Major*

Recommendation: *Do not allow user-controlled data inside the* delegatecall() *and the* call() *function.*

Alleviation:

Description:

Ether and tokens are the basis of smart contracts on which the contract runs and executes transactions. Therefore, it is absolutely necessary to have input and access control validations on the functions executing funds withdrawal within the contract.

Location: *contracts/token/MxyToken.sol L125-L137*

Issue: *Unprotected Ether Withdrawal*

Level: *Medium*

Recommendation: *It is recommended to go through the functions and make sure that the ether withdrawal implements an access control, input validation, and/or that the funds of the user is depreciated after they withdraws the amount.*

Alleviation:

Description:

The contract was found to be using revert() *statements. Since Solidity* v0.8.4*, custom errors have been introduced which are a better alternative to the revert. This allows the developers to pass custom errors with dynamic data while reverting the transaction and also making the whole implementation a bit cheaper than using reverts.*

Location: *contracts/token/MxyToken.sol L150*

Issue: *Custom Errors To Save Gas*

Level: *Minor*

Recommendation: *It is recommended to replace all the instances of* revert() *statements with* error() *to save gas.*

Alleviation:

Description:

The contract was found to be doing comparisons using inequalities inside the require statement. When inside the require statements, non-strict inequalities (>=, <=) are usually costlier than the strict equalities (>, <).

Location: *contracts/token/MxyToken.sol L26; L44*

Issue: *Cheaper Inequalities In* Require()

Level: *Minor*

Recommendation: *It is recommended to go through the code logic, and, if possible, modify the non-strict inequalities with the strict ones to save ~3 gas as long as the logic of the code is not affected.*

Alleviation:

Description:

The contract was found to be doing comparisons using inequalities inside the if statement. When inside the if statements, non-strict inequalities (>=, <=) are usually cheaper than the strict equalities (>, <).

Location: *contracts/token/MxyToken.sol L146-L147*

Issue: *Cheaper Inequalities In* If()

Level: *Minor*

Recommendation: *It is recommended to go through the code logic, and, if possible, modify the strict inequalities with the non-strict ones to save ~3 gas as long as the logic of the code is not affected.*

Alleviation:

https://bscscan.com/address/0x965D3704DE812F5e1E7eEf1ac22fE92174258bd9#code

FINDING CATEGORIES

The assessment process will utilize a mixture of static analysis, swift scan and other security techniques.

This report has been prepared for Metaxy project using MH SwiftScan to examine and discover vulnerabilities and safe coding practices in Supernova's smart contract including the libraries used by the contract that are not officially recognized.

The scan runs a comprehensive static analysis on the solidity code and finds vulnerabilities ranging from minor gas optimizations to major vulnerabilities leading to the loss of funds. The coverage scope pays attention to all the informational and critical vulnerabilities with over (110+) modules. The scanning and auditing process covers the following areas:

Various common and uncommon attack vectors will be investigated to ensure that the smart contracts are secure from malicious actors. The scanner modules find and flag issues related to gas optimizations that help in reducing the overall gas cost It scans and evaluates the codebase against industry best practices and standards to ensure compliance It makes sure that the officially recognized libraries used in the code are secure and up to date.

AUDIT SCORES

MH Audits AuditScores is not a live dynamic score. It is a fixed value determined at the time of the report issuance date.

*Note that if no manual in-depth expert review has been performed a score multiplier of .9 will apply to the final result.

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