HACKEN

SMART CONTRACT CODE REVIEW AND SECURITY ANALYSIS REPORT

Customer: 100xCoin

Date: April 10th, 2021

Hacken OÜ
Parda 4, Kesklinn, Tallinn,
10151 Harju Maakond, Eesti,
Kesklinna, Estonia
support@hacken.io

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Document

Name	Smart Contract Code Review and Security Analysis Report for 100xCoin
Approved by	Andrew Matiukhin | CTO Hacken OU
Type	Token
Platform	BSC
Methods	Architecture Review, Functional Testing, Computer-Aided Verification, Manual Review
Deployed contract	https://bscscan.com/address/0x4cC20A024324B6c487f50Ba448999Ae29f8F6022#code
Timeline	9 APR 2021 – 10 APR 2021
Changelog	10 APR 2021 – INITIAL AUDIT

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Hacken OÜ
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Kesklinna, Estonia
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Kesklinna, Estonia
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Introduction

Hacken OÜ (Consultant) was contracted by 100xCoin(Customer) to conduct a Smart Contract Code Review and Security Analysis. This report presents the findings of the security assessment of Customer's smart contract and its code review conducted between April 9th, 2021 – April 10th, 2021.

Scope

The scope of the project is smart contracts in the repository:
Contract deployment address: 0x4cC20A024324B6c487f50Ba448999Ae29f8F6022
We have scanned this smart contract for commonly known and more specific vulnerabilities. Here are some of the commonly known vulnerabilities that are considered:

Category	Check Item
Code review	▪ Reentrancy ▪ Ownership Takeover ▪ Timestamp Dependence ▪ Gas Limit and Loops ▪ DoS with (Unexpected) Throw ▪ DoS with Block Gas Limit ▪ Transaction-Ordering Dependence ▪ Style guide violation ▪ Costly Loop ▪ ERC20 API violation ▪ Unchecked external call ▪ Unchecked math ▪ Unsafe type inference ▪ Implicit visibility level ▪ Deployment Consistency ▪ Repository Consistency ▪ Data Consistency
Functional review	▪ Business Logics Review ▪ Functionality Checks ▪ Access Control & Authorization ▪ Escrow manipulation ▪ Token Supply manipulation ▪ Assets integrity ▪ User Balances manipulation ▪ Kill-Switch Mechanism ▪ Operation Trails & Event Generation

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Executive Summary

According to the assessment, the Customer's smart contracts are secured.

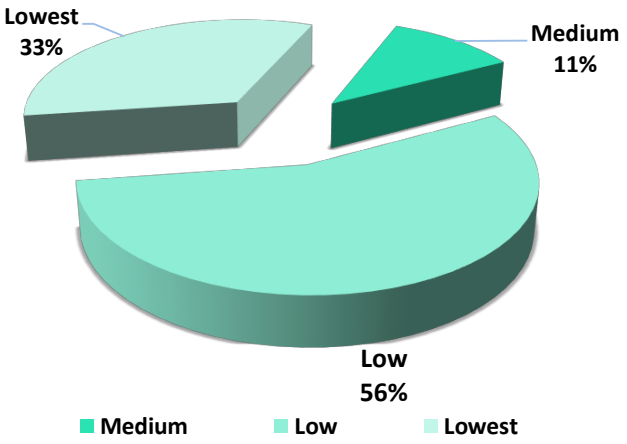
Insecure	Poor secured	Secured	Well-secured

You are here

Our team performed an analysis of code functionality, manual audit, and automated checks with Mythril and Slither. All issues found during automated analysis were manually reviewed, and important vulnerabilities are presented in the Audit overview section. A general overview is presented in AS-IS section, and all found issues can be found in the Audit overview section.

Security engineers found **0** critical, **0** high, **1** medium, **5** low, and **3** informational issues during the audit.

Graph 1. The distribution of vulnerabilities after the first review.



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Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to assets loss or data manipulations.
High	High-level vulnerabilities are difficult to exploit; however, they also have a significant impact on smart contract execution, e.g., public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to assets loss or data manipulations.
Low	Low-level vulnerabilities are mostly related to outdated, unused, etc. code snippets that can't have a significant impact on execution
Lowest / Code Style / Best Practice	Lowest-level vulnerabilities, code style violations, and info statements can't affect smart contract execution and can be ignored.

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Audit overview

Critical

No critical issues were found.

High

No high issues were found.

Medium

1. Sensitive functions which change protocol behaviour should emit an event (changeDevAddress, changeMaxTxAmount, changeMinimumTokenToLiquify, and many others).

Low

1. State visibility is not defined on various variables throughout the contract (_name, _symbol, _initialSupply)
2. The contract lacks a zero-address check on setting a new developer: **dev = newDev** (Token100xCoin.sol#1068)
3. Name, initialSupply and symbol should be declared constant.
4. Unused state variable _holdersArray should be removed.
5. allPairs array in the Factory maintains a count and could be replaced by a simple counter, saving substantial gas.

Lowest / Code style / Best Practice

1. Multiple functions should be declared external to save gas.
2. Multiple code style issues were found by static code analyzers, predominantly around variables not in mixed case.
3. The Ether suffix should be used in place of literals with too many digits (used throughout, but particularly within percentage distributions).

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Conclusion

Smart contracts within the scope were manually reviewed and analyzed with static analysis tools. For the contract, high-level description of functionality was presented in As-Is overview section of the report.

Audit report contains all found security vulnerabilities and other issues in the reviewed code.

Security engineers found **0** critical, **0** high, **1** medium, **5** low, and **3** informational issues during the audit.

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Disclaimers

Hacken Disclaimer

The smart contracts given for audit have been analyzed in accordance with the best industry practices at the date of this report, in relation to cybersecurity vulnerabilities and issues in smart contract source code, the details of which are disclosed in this report (Source Code); the Source Code compilation, deployment, and functionality (performing the intended functions).

The audit makes no statements or warranties on security of the code. It also cannot be considered as a sufficient assessment regarding the utility and safety of the code, bugfree status or any other statements of the contract. While we have done our best in conducting the analysis and producing this report, it is important to note that you should not rely on this report only - we recommend proceeding with several independent audits and a public bug bounty program to ensure security of smart contracts.

Technical Disclaimer

Smart contracts are deployed and executed on blockchain platform. The platform, its programming language, and other software related to the smart contract can have its vulnerabilities that can lead to hacks. Thus, the audit can't guarantee the explicit security of the audited smart contracts.

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