HACKEN

SMART CONTRACT CODE REVIEW AND SECURITY ANALYSIS REPORT

Customer: StudentCoin

Date: April 8th, 2021

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Document

Name	Smart Contract Code Review and Security Analysis Report for StudentCoin.
Approved by	Andrew Matiukhin | CTO Hacken OU
Type	Token
Platform	Ethereum / Solidity
Methods	Architecture Review, Functional Testing, Computer-Aided Verification, Manual Review
Repository	https://github.com/StudentCoinTeam/stc-erc20-v2
Commit	412905FFA414C34B75FA4C52E5993318B2A5F067
Deployed contract	0x15B543e986b8c34074DFc9901136d9355a537e7E
Timeline	6 APR 2021 – 8 APR 2021
Changelog	8 APR 2021 – INITIAL AUDIT

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Introduction

Hacken OÜ (Consultant) was contracted by StudentCoin (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 6th, 2021 – April 8th, 2021.

Scope

The scope of the project is smart contracts in the repository:

Contract deployment address: 0x15B543e986b8c34074DFc9901136d9355a537e7E
Repository: https://github.com/StudentCoinTeam/stc-erc20-v2
File:
STCERC20.sol

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

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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

Executive Summary

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

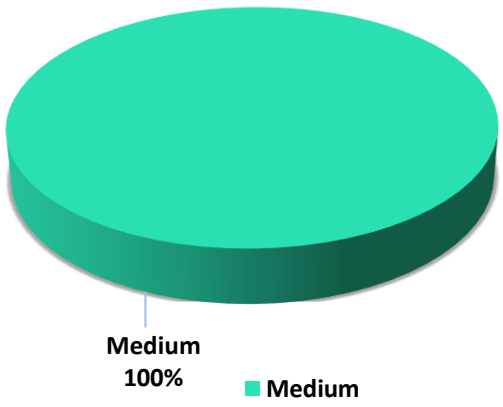
Insecure	Poor secured	Secured	Well-secured

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 **1** medium issue 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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AS-IS overview

STCERC20.sol

Description

STCERC20 is token contract.

Imports

STCERC20 contract has following imports:

- ERC20 – from the OpenZeppelin.

Inheritance

STCERC20 is ERC20.

Structs

STCERC20 contract has no data structures.

Enums

STCERC20 contract has no enums.

Events

STCERC20 contract has no custom events.

Modifiers

STCERC20 contract has no modifiers.

Fields

STCERC20 contract has no fields and constants.

Functions

STCERC20 contract has following functions:

- ***constructor***

Description

Initializes the contract. Mints 10 billion tokens to the deployer address.

Visibility

public

Input parameters

None

Constraints

None

Events emit

None

Output

None

- ***batchTransfer***

Description

Used to send tokens to multiple addresses.

Visibility

public

Input parameters

- address[] calldata destinations
- uint256[] calldata amounts

Constraints

- The length of the amounts should be the same as destinations length.

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Events emit

None

Output

None

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Audit overview

Critical

No critical issues were found.

High

No high issues were found.

Medium

1. batchTransfer function has a costly loop. For big input arrays, the gas limit can be reached.

Low

No low severity issues were found.

Lowest / Code style / Best Practice

No lowest severity issues were found.

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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 **1** medium issue during the audit.

Violations in the following categories were found and addressed to Customer:

Category	Check Item	Comments
Code review	▪ Costly loop	▪ batchTransfer function has a costly loop.

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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.