Privacy Ninja

TRONTOTHEMOON SMART CONTRACT CODE REVIEW AND SECURITY ANALYSIS REPORT

Customer: TTTM Team (www.tttm.app)
Prepared on: 11/05/2021
Platform: TRON
Language: Solidity
Audit Type: Standard

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THIS IS SECURITY AUDIT REPORT DOCUMENT AND WHICH MAY CONTAIN INFORMATION WHICH IS CONFIDENTIAL. WHICH INCLUDES ANY POTENTIAL VULNERABILITIES AND MALICIOUS CODES WHICH CAN BE USED TO EXPLOIT THE SOFTWARE. THIS MUST BE REFERRED INTERNALLY AND ONLY SHOULD BE MADE AVAILABLE TO PUBLIC AFTER ISSUES ARE RESOLVED.

Documents

Name	Code Review and Security Analysis Report for TronToTheMoon Smart Contract
Platform	TRON / Solidity
File name1	TronToTheMoon.sol
MD5 hash	92C5BE1DAC54EC3F44FFFCA4CEFFBCE0
SHA256 hash	FE9DFE2EF0761ED425080492040C51C5B921DBFB709487724F9344A62B089FBC
Initial Audit Date	14/05/2021
Revision Date	02/06/2021

Introduction

We were contracted by the TTTM team to perform the Security audit of the TronToTheMoon smart contracts code. The audit has been performed using manual analysis as well as using automated software tools. This report presents all the findings regarding the audit performed on 11/05/2021.

Audit type was Standard Audit. Which means one senior auditor performing an audit for 2 days. So, this audit is concluded based on standard audit scope. And because the use case scenarios are unlimited, it is encouraged to perform an Extensive audit (which is performed by 2 or more auditors for about 4 days) to come to a more solid conclusion.

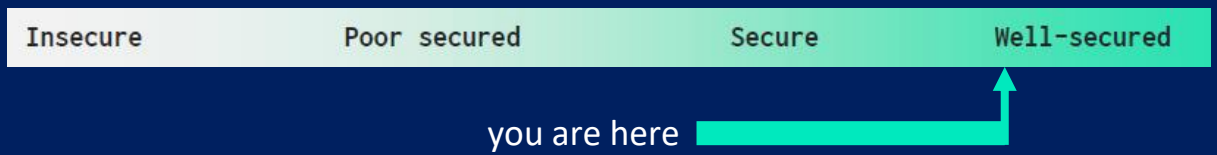
Quick Stats:

Main Category	Subcategory	Result
Contract Programming	Solidity version not specified	Passed
	Solidity version too old	Moderated
	Integer overflow/underflow	Passed
	Function input parameters lack of check	Passed
	Function input parameters check bypass	Passed
	Function access control lacks management	Passed
	Critical operation lacks event log	Passed
	Human/contract checks bypass	Passed
	Random number generation/use vulnerability	N/A
	Fallback function misuse	N/A
	Race condition	Passed
	Logical vulnerability	Passed
	Other programming issues	Passed
Code Specification	Visibility not explicitly declared	Passed
	Var. storage location not explicitly declared	Passed
	Use keywords/functions to be deprecated	Passed
	Other code specification issues	Passed
Gas Optimization	Assert() misuse	Passed
	High consumption ‘for/while’ loop	Passed
	High consumption ‘storage’ storage	Passed
	“Out of Gas” Attack	Passed
Business Risk	The maximum limit for mintage not set	Passed
	“Short Address” Attack	Passed
	“Double Spend” Attack	Passed

Overall Audit Result: PASSED

Executive Summary

According to the standard audit assessment, Customer`s solidity smart contract is Well-secured. Again, it is recommended to perform an Extensive audit assessment to bring a more assured conclusion.



We used various tools like Mythril, Slither and Remix IDE. At the same time this finding is based on critical analysis of the menual audit.
All issues found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the Audit overview section. General overview is presented in AS-IS section and all found issues can be found in the Audit overview section.

We found 0 critical, 0 high, 0 medium and 1 low level issues.

Code Quality

The TronToTheMoon protocol consists of one smart contract. It has other inherited contracts like Percentage and Divide. These are compact and well written contracts.

Libraries used in TronToTheMoon are part of its logical algorithm. They are smart contracts which contain reusable code. Once deployed on the blockchain (only once), it is assigned a specific address and its properties / methods can be reused many times by other contracts in protocol.

The TTTM team has **not** provided scenario and unit test scripts, which would help to determine the integrity of the code in an automated way.

Overall, the code is not commented. Commenting can provide rich documentation for functions, return variables and more.

Documentation

As mentioned above, It's recommended to write comments in the smart contract code, so anyone can quickly understand the programming flow as well as complex code logic.

We were given a TronToTheMoon smart contract code in the form of File. The hash of that code is mentioned above in the table.

Use of Dependencies

As per our observation, the libraries are used in this smart contract infrastructure that are based on well known industry standard open source projects. And even core code blocks are written well and systematically.

This smart contract does not interact with other external smart contracts.

AS-IS overview

It is an MLM smart contract running on TRON blockchain.

(1) Libraries

(a) using SafeMath for uint256

(2) Inherits

(a) Percentage

(b) Divide

(3) Events

(a) event Buy(string nature, address indexed _buyer, uint256 _tokens, uint256 _amounts);

(b) event Sell(string nature, address indexed _seller, uint256 _tokens, uint256 _amounts);

(c) event Withdraw(string nature, address indexed _drawer, uint256 _amountWithDrawn);

(d) event Transfer(address indexed from, address indexed to, uint256 tokens);

(4) Functions

Sl.	Function	Type	Observation	Conclusion	Score
1	constructor	write	Passed	No Issue	Passed
2	buyToken	write	Passed	No Issue	Passed
3	withdraw	write	Passed	No Issue	Passed
4	sellToken	write	Passed	No Issue	Passed
5	transfer	write	Passed	No Issue	Passed
6	disableInitialStage	write	Admin function	No Issue	Passed
7	setAdministrator	write	Admin function	No Issue	Passed
8	setStakingRequirement	write	Admin function	No Issue	Passed
9	setName	write	Admin function	No Issue	Passed
10	setSymbol	write	Admin function	No Issue	Passed
11	totalEthereumBalance	read	Passed	No Issue	Passed
12	circulatingSupply	read	Passed	No Issue	Passed
13	myTokens	read	Passed	No Issue	Passed
14	myDividends	read	Passed	No Issue	Passed

15	balanceOf	read	Passed	No Issue	Passed
16	dividendsOf	read	Passed	No Issue	Passed
17	calculateTokensReceived	read	Passed	No Issue	Passed
18	calculateTrxReceived	read	Passed	No Issue	Passed
19	_burnFrom	write	Passed	No Issue	Passed
20	purchaseTokens	internal	Passed	No Issue	Passed
21	buyPriceCalculation	internal	Passed	No Issue	Passed
22	trxToTokens_	internal	Passed	No Issue	Passed
23	marketCap	read	Passed	No Issue	Passed
24	sellPriceCalculation	internal	Passed	No Issue	Passed
25	TrxToTTTM	read	Passed	No Issue	Passed
26	TTTMtoTrx	read	Passed	No Issue	Passed
27	tokensToTrx	internal	Passed	No Issue	Passed
28	sqrt	internal	Passed	No Issue	Passed

Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to token loss etc.
High	High-level vulnerabilities are difficult to exploit; however, they also have 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 tokens lose
Low	Low-level vulnerabilities are mostly related to outdated, unused etc. code snippets, that can't have 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.

Audit Findings

Critical

No critical severity vulnerabilities were found.

High

No high severity vulnerabilities were found.

Medium

No Medium severity vulnerabilities were found.

Low

(1) Compiler version can be upgraded.

```
pragma solidity ^0.4.20;
```

Although this does not raise any security vulnerability, using the latest compiler version can help to prevent any compiler level bugs.
Solution: This issue is acknowledged.

Conclusion

We were given a contract code. And we have used all possible tests based on given objects as files. So it is good to go for production.

Since possible test cases can be unlimited for such extensive smart contract protocol, hence we provide no such guarantee of future outcomes. We have used all the latest static tools and manual observations to cover maximum possible test cases to scan everything.

Smart contracts within the scope were manually reviewed and analyzed with static analysis tools. Smart Contract's 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 state of the reviewed contract is "Well Secured ".

Our Methodology

We like to work with a transparent process and make our reviews a collaborative effort. The goals of our security audits are to improve the quality of systems we review and aim for sufficient remediation to help protect users. The following is the methodology we use in our security audit process.

Manual Code Review:

In manually reviewing all of the code, we look for any potential issues with code logic, error handling, protocol and header parsing, cryptographic errors, and random number generators. We also watch for areas where more defensive programming could reduce the risk of future mistakes and speed up future audits. Although our primary focus is on the in-scope code, we examine dependency code and behavior when it is relevant to a particular line of investigation.

Vulnerability Analysis:

Our audit techniques included manual code analysis, user interface interaction, and whitebox penetration testing. We look at the project's web site to get a high level understanding of what functionality the software under review provides. We then meet with the developers to gain an appreciation of their vision of the software. We install and use the relevant software, exploring the user interactions and roles. While we do this, we brainstorm threat models and attack surfaces. We read design documentation, review other audit results, search for similar projects, examine source code dependencies, skim open issue tickets, and generally investigate details other than the implementation.

Documenting Results:

We follow a conservative, transparent process for analyzing potential security vulnerabilities and seeing them through successful remediation. Whenever a potential issue is discovered, we immediately create an Issue entry for it in this document, even though we have not yet verified the feasibility and impact of the issue. This process is conservative because we document our suspicions early even if they are later shown to not represent exploitable vulnerabilities. We generally follow a process of first documenting the suspicion with unresolved questions, then confirming the issue through code analysis, live experimentation, or automated tests. Code analysis is the most tentative, and we strive to provide test code, log captures, or screenshots demonstrating our confirmation. After this we analyze the feasibility of an attack in a live system.

Suggested Solutions:

We search for immediate mitigations that live deployments can take, and finally we suggest the requirements for remediation engineering for future releases. The mitigation and remediation recommendations should be scrutinized by the developers and deployment engineers, and successful mitigation and remediation is an ongoing collaborative process after we deliver our report, and before the details are made public.

Disclaimers

Privacy Ninja Disclaimer

Privacy Ninja team has analyzed this smart contract 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).

Due to the fact that the total number of test cases are unlimited, 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, bug free 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 also suggest conducting a bug bounty program to confirm the high level of security of this smart contract.

Technical Disclaimer

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

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