



Smart Contract Security Audit Report

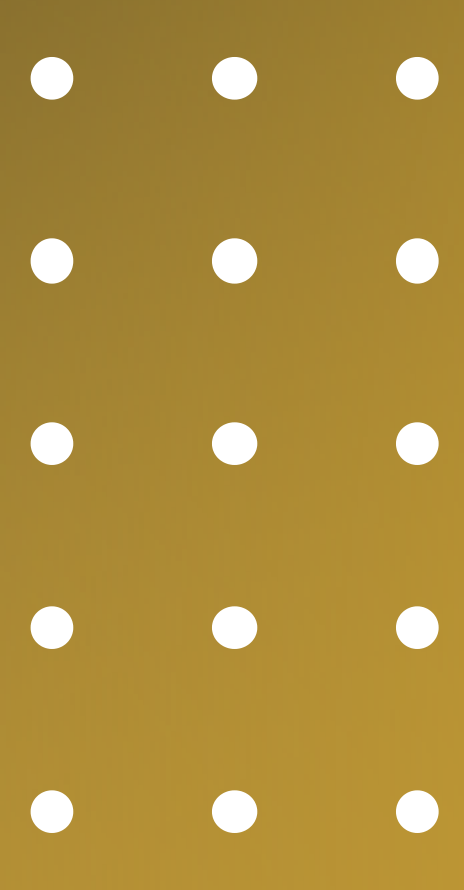
MULTISTARTER

March 2023

Security Status



www.hacksafe.io



Audit Details



Audited project

MULTISTARTER



Deployer address

0x264f4acf95625b5d64ac38c09306bf29e444117f



Client contacts

MULTISTARTER Team



Blockchain

Binance smart chain



Website

Not Provided

Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.

Procedure

Step 1 - In-Depth Manual Review

Manual line-by-line code reviews to ensure the logic behind each function is sound and safe from various attack vectors. This is the most important and lengthy portion of the audit process (as automated tools often cannot find the nuances that lead to exploits such as flash loan attacks).

Step 2 - Automated Testing

Simulation of a variety of interactions with your Smart Contract on a test blockchain leveraging a combination of automated test tools and manual testing to determine if any security vulnerabilities exist.

Step 3 – Leadership Review

The engineers assigned to the audit will schedule meetings with our leadership team to review the contracts, any comments or findings, and ask questions to further apply adversarial thinking to discuss less common attack vectors.

Step 4 - Resolution of Issues

Consulting with the team to provide our recommendations to ensure the code's security and optimize its gas efficiency, if possible. We assist project team's in resolving any outstanding issues or implementing our recommendations.

Step 5 - Published Audit Report

Boiling down results and findings into an easy-to-read report tailored to the project. Our audit reports highlight resolved issues and any risks that exist to the project or its users, along with any remaining suggested remediation measures. Diagrams are included at the end of each report to help users understand the interactions which occur within the project.

Background

HackSafe was commissioned by MULTISTARTER to perform an audit of smart contracts:

- <https://bscscan.com/token/0xF5e1cd8DeC07F21588B6225e75bf77d0B416bfb4#code>

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be understood to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

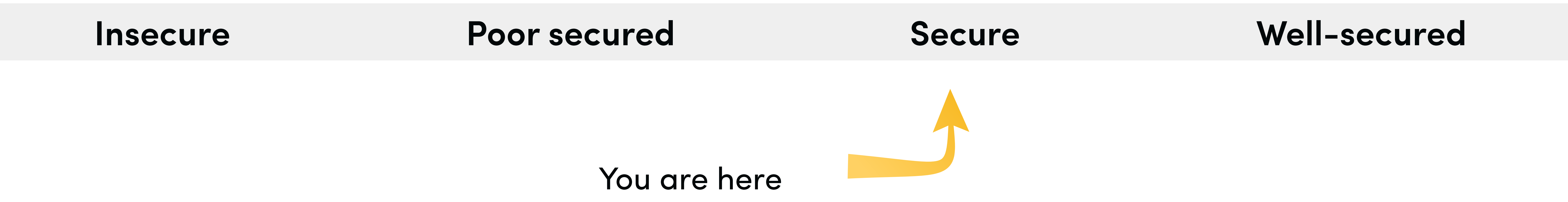
Contract Details

Token contract details for 01.03.2023

Token Type	: Launchpad
Contract name	: MSTART
Contract address	: 0xF5e1cd8DeC07F21588B6225e75bf77d0B416bfb4
Total supply	: 100,000,000
Token ticker	: MSTART
Decimals	: 9
Token Holders	: 3
Transactions count	: 15
Compiler version	: v0.8.10+commit.fc410830
Contract deployer address	: 0x264f4acf95625b5d64ac38c09306bf29e444117f
Owner address	: 0x264f4acf95625b5d64ac38c09306bf29e444117f

Audit Summary


According to the standard audit assessment, Customer`s solidity smart contracts are “**poor Secure**”. This token contract does contain owner control, which do not make it fully decentralized.



We used various tools like Slither, Mythril and Remix IDE. At the same time this finding is based on critical analysis of the manual audit. All issues found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the issues checking status.

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

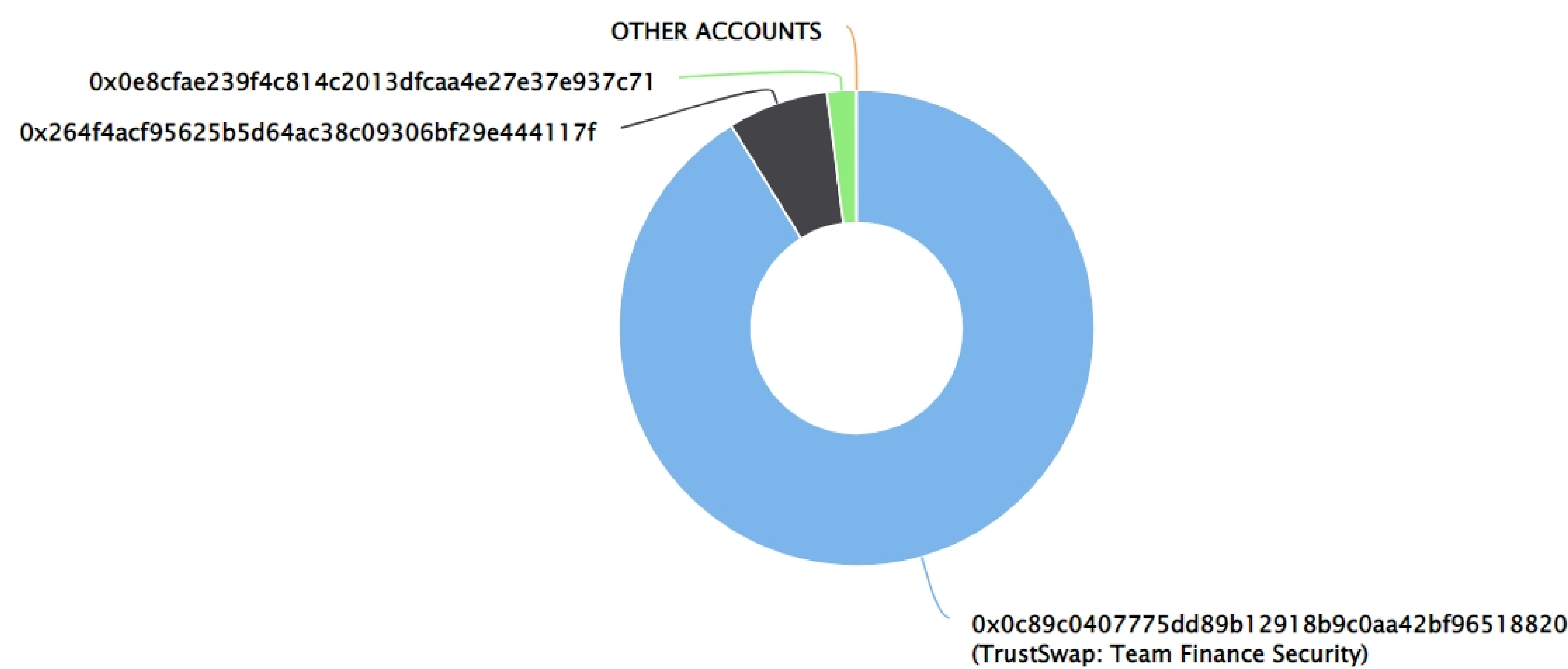
MULTISTARTER Token Distribution

 The top 100 holders collectively own 100.00% (100,000,000.00 Tokens) of MultiStarter

 Token Total Supply: 100,000,000.00 Token | Total Token Holders: 3



MultiStarter Top 100 Token Holders

Source: BscScan.com



MULTISTARTER Top 03 Token Holders

(A total of 100,000,000.00 tokens held by the top 100 accounts from the total supply of 100,000,000.00 token)

Rank	Address	Quantity (Token)	Percentage
1	 TrustSwap: Team Finance Security	91,175,000	91.1750%
2	0x264f4acf95625b5d64ac38c09306bf29e444117f	6,825,000	6.8250%
3	 0x0e8cfae239f4c814c2013dfcaa4e27e37e937c71	2,000,000	2.0000%

MULTISTARTER Token Distribution

MULTISTARTER Contract overview



Contract functions details

+[Int] IERC20

- [Ext] totalSupply
- [Ext] balanceOf
- [Ext] transfer #
- [Ext] allowance
- [Ext] approve #
- [Ext] transferFrom #

+Context

- [Int] _msgSender
- [Int] _msgData

+[Lib] Address

- [Int] isContract
- [Int] sendValue #
- [Int] functionCall #
- [Int] functionCall #
- [Int] functionCallWithValue #
- [Int] functionCallWithValue #
- [Int] functionStaticCall
- [Int] functionStaticCall
- [Int] functionDelegateCall #
- [Int] functionDelegateCall #
- [Pvt] _verifyCallResult

+Ownable (Context)

- [Pub] <Constructor> #
- [Pub] owner
- [Pub] transferOwnership #
 - modifiers: onlyOwner

+ [Int] IUniswapV2Factory

- [Ext] feeTo
- [Ext] feeToSetter
- [Ext] getPair
- [Ext] allPairs
- [Ext] allPairsLength
- [Ext] createPair #
- [Ext] setFeeTo #
- [Ext] setFeeToSetter #

Contract functions details

+`[Int]` `IUniswapV2Pair`

- `[Ext]` `name`
- `[Ext]` `symbol`
- `[Ext]` `decimals`
- `[Ext]` `totalSupply`
- `[Ext]` `balanceOf`
- `[Ext]` `allowance`
- `[Ext]` `approve #`
- `[Ext]` `transfer #`
- `[Ext]` `transferFrom #`
- `[Ext]` `DOMAIN_SEPARATOR`
- `[Ext]` `PERMIT_TYPEHASH`
- `[Ext]` `nonces`
- `[Ext]` `permit #`
- `[Ext]` `MINIMUM_LIQUIDITY`
- `[Ext]` `factory`
- `[Ext]` `token0`
- `[Ext]` `token1`
- `[Ext]` `getReserves`
- `[Ext]` `price0CumulativeLast`
- `[Ext]` `price1CumulativeLast`
- `[Ext]` `kLast`
- `[Ext]` `mint #`
- `[Ext]` `burn #`
- `[Ext]` `swap #`
- `[Ext]` `skim #`
- `[Ext]` `sync #`
- `[Ext]` `initialize #`

+`[Int]` `IUniswapV2Router01`

- `[Ext]` `factory`
- `[Ext]` `WETH`
- `[Ext]` `addLiquidity #`
- `[Ext]` `addLiquidityETH ($)`
- `[Ext]` `removeLiquidity #`
- `[Ext]` `removeLiquidityETH #`
- `[Ext]` `removeLiquidityWithPermit #`
- `[Ext]` `removeLiquidityETHWithPermit #`
- `[Ext]` `swapExactTokensForTokens #`

Contract functions details

- [Ext] swapTokensForExactTokens #
- [Ext] swapExactETHForTokens (\$)
- [Ext] swapTokensForExactETH #
- [Ext] swapExactTokensForETH #
- [Ext] swapETHForExactTokens (\$)
- [Ext] quote
- [Ext] getAmountOut
- [Ext] getAmountIn
- [Ext] getAmountsOut
- [Ext] getAmountsIn

+ [Int] IUniswapV2Router02 (IUniswapV2Router01)

- [Ext] removeLiquidityETHSupportingFeeOnTransferTokens #
- [Ext] removeLiquidityETHWithPermitSupportingFeeOnTransferTokens #
- [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #
- [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens (\$)
- [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #

+ [Int] IUniswapV2Router02 (IUniswapV2Router01)

- [Pub] <Constructor> #
- [Pub] name
- [Pub] symbol
- [Pub] decimals
- [Pub] totalSupply
- [Pub] balanceOf
- [Pub] transfer #
- [Pub] allowance
- [Pub] approve #
- [Pub] transferFrom #
- [Pub] increaseAllowance #
- [Pub] decreaseAllowance #
- [Pub] totalFees
- [Pub] isExcludedFromFee
- [Pub] ___tokenInfo
- [Pub] ___feesInfo
- [Pub] ___wallets
- [Ext] Change_Wallet_Marketing #
 - modifiers: onlyOwner
- [Ext] Change_Wallet_Buyback #
 - modifiers: onlyOwner

Contract functions details

- [Ext] Change_Wallet_Burn #
 - modifiers: onlyOwner
- [Pub] deliver #
- [Pub] reflectionFromToken
- [Pub] tokenFromReflection
- [Pub] excludeFromReward #
 - modifiers: onlyOwner
- [Ext] includeInReward #
 - modifiers: onlyOwner
- [Pub] isExcludedFromReward
- [Ext] setUniswapPair #
 - modifiers: onlyOwner
- [Pub] tradingStatus #
 - modifiers: onlyOwner
- [Pub] cooldownEnabled #
 - modifiers: onlyOwner
- [Ext] setNumTokensSellToAddToLiquidityt #
 - modifiers: onlyOwner
- [Ext] setMaxTxPercent_base1000 #
 - modifiers: onlyOwner
- [Ext] setMaxTxTokens #
 - modifiers: onlyOwner
- [Ext] setMaxWalletPercent_base1000 #
 - modifiers: onlyOwner
- [Ext] setMaxWalletTokens #
 - modifiers: onlyOwner
- [Pub] setSwapAndLiquifyEnabled #
 - modifiers: onlyOwner
- [Ext] s_manageExcludeFromFee #
 - modifiers: onlyOwner
- [Ext] s_manageBlacklist #
 - modifiers: onlyOwner
- [Ext] s_manageWhitelist #
 - modifiers: onlyOwner
- [Ext] s_excludeFromFee #
 - modifiers: onlyOwner
- [Pub] convertLiquidityBalance #
 - modifiers: onlyOwner

Contract functions details

- [Pub] purgeContractBalance #
- [Pvt] _getRate
- [Pvt] _getCurrentSupply
- [Pvt] _getValues
- [Pvt] _fees_to_bnb_process #
 - modifiers: lockTheSwap
- [Ext] fees_to_bnb_manual #
 - modifiers: onlyOwner
- [Pvt] _fees_to_bnb #
- [Pvt] _takeFee #
- [Pvt] _takefees_Liquidity #
- [Pvt] _takefees_burn #
- [Pvt] _takefees_buyback #
- [Pvt] _takefees_marketing #
- [Pvt] _take_reflectionFee #
- [Pvt] _setAllFees #
- [Ext] set_sell_multiplier #
 - modifiers: onlyOwner
- [Ext] set_All_Fees_Triggers #
 - modifiers: onlyOwner
- [Ext] set_All_Fees_Minimum_Balance #
 - modifiers: onlyOwner
- [Ext] set_All_Fees #
 - modifiers: onlyOwner
- [Pvt] removeAllFee #
- [Pvt] restoreAllFee #
- [Ext] burn_tokens_reduce_supply #
- [Ext] burn_tokens_to_dead #
- [Pvt] swapAndLiquify #
 - modifiers: lockTheSwap
- [Pvt] swapTokensForEth #
- [Pvt] swapTokensForEthAndSend #
- [Pvt] addLiquidity #
- [Pvt] _approve #
- [Pvt] _transfer #
- [Pvt] _transferStandard #
- [Ext] <Fallback>(\$)

Contract functions details

(\$)= payable function
#= non-constant function

Issues Checking Status

No.	Title	Status
1.	Compiler error	Passed
2.	Missing Input Validation	Passed
3.	Race conditions and Reentrancy. Cross-function race conditions.	Passed
4.	Possible delays in data delivery	Passed
5.	Oracle calls.	Passed
6.	Timestamp dependence.	Passed
7.	Integer Overflow and Underflow	Passed
8.	DoS with Revert.	Passed
9.	DoS with block gas limit.	Medium Issue
10.	Methods execution permissions.	Passed
11.	Economy model of the contract.	Passed
12.	Private use data leaks.	Passed
13.	Malicious Event log.	Passed
14.	Scoping and Declarations.	Passed
15.	Uninitialized storage pointers.	Passed
16.	Arithmetic accuracy.	Passed
17.	Design Logic.	Passed
18.	Safe Open Zeppelin contracts implementation and usage.	Passed
19.	Incorrect Naming State Variable	Passed
20.	Too old version	Passed

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.

Security Issues

✔ Critical Severity Issues

No critical severity issue found.

✔ High Severity Issues

No high severity issue found.

✔ Medium Severity Issues

One medium severity issue found.

1. Out of gas

- **Issue:**

The function `includeInReward()` uses the loop to find and remove addresses from the `_excluded` list. Function will be aborted with `OUT_OF_GAS` exception if there will be a long excluded addresses list.

The function `_getCurrentSupply` also uses the loop for evaluating total supply. It also could be aborted with `OUT_OF_GAS` exception if there will be a long excluded addresses list.

- **Recommendation**

Check that the excluded array length is not too big.

The function `s_manageBlacklist()` uses the loop for blacklist addresses. It also could be aborted with `OUT_OF_GAS` exception if there will be a long addresses list.

The function `s_excludeFromFee()` uses the loop for excluding addresses from the fee. It also could be aborted with `OUT_OF_GAS` exception if there will be a long addresses list.

The function `s_manageWhitelist()` uses the loop for whitelisting addresses. It also could be aborted with `OUT_OF_GAS` exception if there will be a long addresses list.

The function `s_manageExcludeFromFee()` uses the loop for excluding addresses from the fee. It also could be aborted with `OUT_OF_GAS` exception if there will be a long addresses list.

- **Recommendation**

Check that the array length is not too big.

- **Notes:**

`_transfer` function has required `_fees_to_bnb` with static values calling.

✔ Low Severity Issues

No low severity issue found.

Centralization

Owner privileges :

- MULTISTARTER Contract:
 - Owner can change marketing, buyback and burn wallets.
 - Owner can change trading status.
 - Owner can change number of tokens to sell to add to liquidity.
 - Owner can change maximum transaction amount and maximum wallet token.
 - Owner can change cooldown settings.
 - Owner can change pair address.
 - Owner can manually swap and liquify.
 - Owner can manually call `_fees_to_bnb` function with wrapper.
 - Owner can change sell multiplier.
 - Owner can change fees, fee limits and fee minimum balances.

This smart contract has some functions which can be executed by the admin (Owner) only. If the admin wallet private key would be compromised, then it would create trouble as smart contract ownership has not been renounced.

Conclusion

Smart contract contains medium severity issues! The further transfer and operations with the fund raised are not related to this particular contract.

HackSafe note: Please check the disclaimer above and note, the audit makes no statements or warranties on business model, investment attractiveness or code sustainability. The report is provided for the only contract mentioned in the report and does not include any other potential contracts deployed by Owner.