



Smart Contract Security Audit Report

TCW TOKEN

February 2023

Security Status



www.hacksafe.io



Audit Details



Audited project

TCW TOKEN



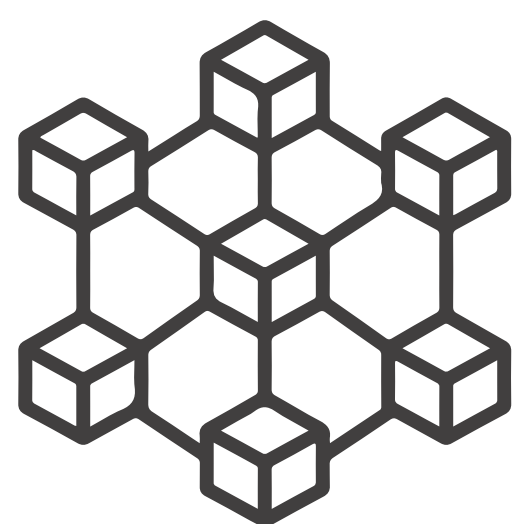
Deployer address

0xe465bf97175d0d0aaafa249d1535987530f7ef5d



Client contacts

TCW TOKEN 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 TCW TOKEN to perform an audit of smart contracts:

- <https://bscscan.com/token/0x2478d6c228c75EAf53c60707D0102F7bFE1aE379#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.

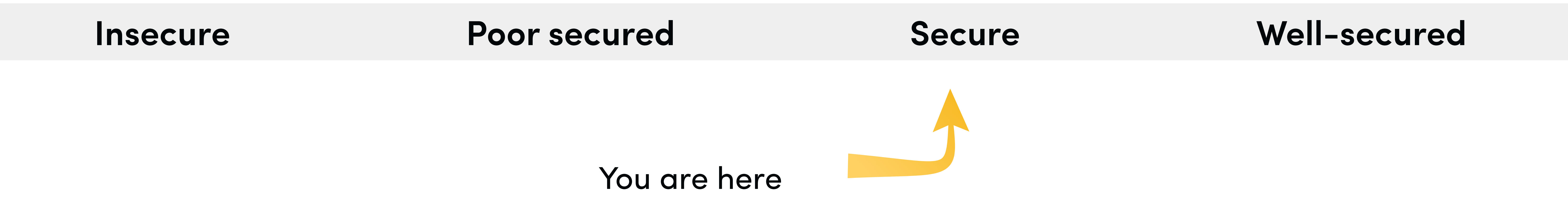
Contract Details

Token contract details for 01.03.2023

Token Type	: DEFI
Contract name	: TCW
Contract address	: 0x2478d6c228c75EAf53c60707D0102F7bFE1aE379
Total supply	: 100,000,000,000,000
Token ticker	: TCW
Decimals	: 18
Token Holders	: 757
Transactions count	: 6,125
Compiler version	: v0.8.10+commit.fc410830
Contract deployer address	: 0xe465bf97175d0d0aaafa249d1535987530f7ef5d
Owner address	: 0xe465bf97175d0d0aaafa249d1535987530f7ef5d

Audit Summary

According to the standard audit assessment, Customer`s solidity smart contracts are “**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.

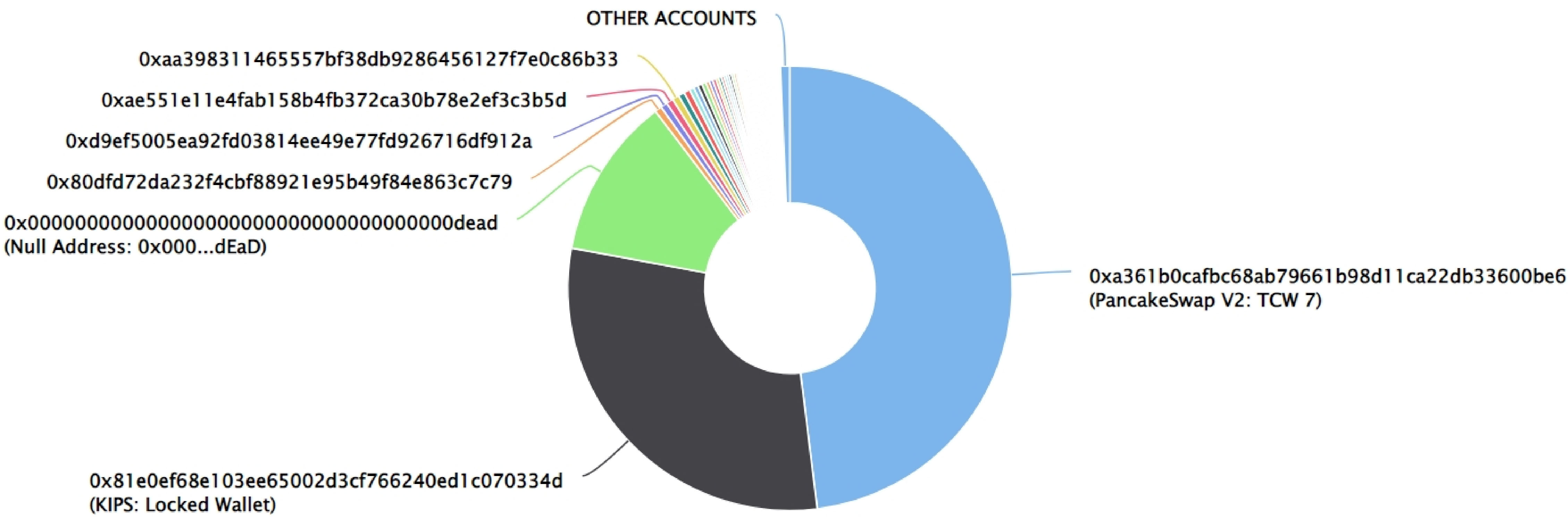
We found 0 critical, 0 high, 1 medium and 0 low.

TCW Token Distribution

💡 The top 100 holders collectively own 99.31% (99,307,609,902,255.90 Tokens) of TCW Token



💡 Token Total Supply: 100,000,000,000,000.00 Token | Total Token Holders: 757

TCW Token Top 100 Token Holders
Source: BscScan.com



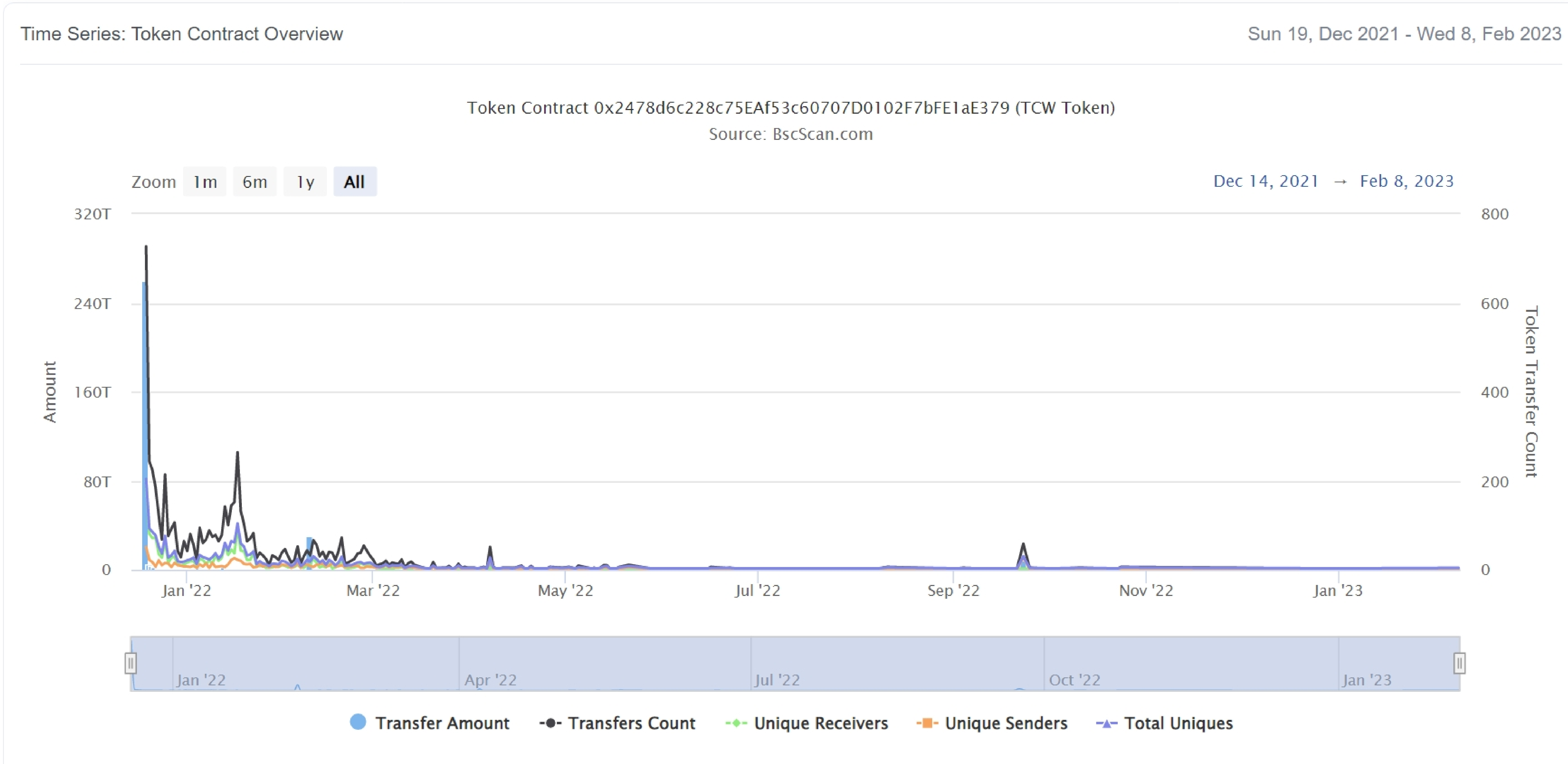
TCW TOKEN Top 20 Token Holders

(A total of 99,307,609,902,255.90 tokens held by the top 100 accounts from the total supply of 100,000,000,000,000.00 token)

Rank	Address	Quantity (Token)	Percentage
1	 PancakeSwap V2: TCW 7	48,046,930,523,367.350977424545214407	48.0469%
2	 KIPS: Locked Wallet	29,850,000,000,000	29.8500%
3	Null Address: 0x000...dEaD	11,747,876,535,813.55327203038062061	11.7479%
4	0x80dfd72da232f4cbf88921e95b49f84e863c7c79	511,062,455,373.384326921628026033	0.5111%
5	0xd9ef5005ea92fd03814ee49e77fd926716df912a	501,297,323,470.091402121860170314	0.5013%
6	0xae551e11e4fab158b4fb372ca30b78e2ef3c3b5d	500,223,705,225.127656960501961658	0.5002%
7	0xaa398311465557bf38db9286456127f7e0c86b33	495,825,887,112.181155868185386115	0.4958%
8	0xb3dbac5824ce679d250c9db19b88224b7b2546d9	446,826,024,380	0.4468%
9	0xf23b5dad10e0cf4f2926e668815e532b6d40e98c	445,000,000,000	0.4450%
10	0x3e24fef453f8c641a8280ddeac3d2e84aeb38e91	332,017,200,000	0.3320%
11	0xdd643c683e817e2f6de5aa5eb6ab1046c063b622	325,518,044,816.134230506272622064	0.3255%
12	0x397503de814ce7da119fadd036232e21176b89fc	314,387,132,178.701395982184200045	0.3144%
13	0x349b08d4120b744275981f2303199520894bf538	298,730,157,853.119422329265181161	0.2987%
14	0xc90d37aa5d28a778937e9ae4703946518787aee9	263,992,148,447.800687165055012112	0.2640%
15	0xa9d9c76f186ee2761fedee6512ba796b610a80ee	252,732,848,364.141910743721279931	0.2527%
16	0x81ad3b1e88a3dfe0e148512d263edddf1f9eed20	243,830,433,153.212714206009716754	0.2438%
17	0x55e333df842a9d84f4dbcbdc007ff7f89f663049	219,829,922,925.640768914147937612	0.2198%
18	0x2f734b74739017812a8232e82f9ae5e36da948ad	204,381,147,740.710893073822430914	0.2044%
19	0x275385f3ca7e127af77fa0895d9ad9a6f81fbb3a	194,597,605,300.744520492385609027	0.1946%
20	0x7a83fbd915e289945fd102e5737cbaff69b72276	182,612,700,000	0.1826%

TCW Token Distribution

TCW TOKEN Contract overview



Contract functions details

+[Lib] SafeMath

- [Int] add
- [Int] sub
- [Int] sub
- [Int] mul
- [Int] div
- [Int] div

+Context

- [Int] _msgSender
- [Int] _msgData

+Ownable (Context)

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

+[Int] IBEP20

- [Ext] totalSupply
- [Ext] decimals
- [Ext] symbol
- [Ext] name
- [Ext] balanceOf
- [Ext] transfer #
- [Ext] allowance
- [Ext] approve #
- [Ext] transferFrom #

+[Int] IDEXFactory

- [Ext] createPair #

+[Int] IDEXRouter

- [Ext] factory
- [Ext] WETH
- [Ext] addLiquidity #
- [Ext] addLiquidityETH (\$)
- [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #

Contract functions details

- [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens (\$)
- [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #

+ [Int] IDividendDistributor

- [Ext] setShare #
- [Ext] deposit #
- [Ext] claimDividend #

+BNBDistributor (IDividendDistributor)

- [Pub] <Constructor> #
- [Ext] setShare #
 - modifiers: onlyToken
- [Pub] getWalletShare
- [Ext] deposit #
 - modifiers: onlyToken
- [Int] distributeDividend #
- [Ext] claimDividend #
 - modifiers: onlyToken
- [Ext] setMarketingFeeReceiver #
 - modifiers: onlyToken
- [Ext] setLiquidityFeeReceiver #
 - modifiers: onlyToken
- [Ext] depositExternalBNB #
 - modifiers: onlyToken
- [Pvt] _calculateReward
- [Pub] currentRewards
- [Ext] <Fallback> (\$)

+TCW (Context, IBEP20, Ownable)

- [Pub] <Constructor> #
- [Ext] totalSupply
- [Ext] decimals
- [Ext] symbol
- [Ext] name
- [Pub] balanceOf
- [Ext] allowance
- [Pvt] _approve #
- [Pub] approve #
- [Ext] approveMax #
- [Ext] transfer #

Contract functions details

- [Ext] transferFrom #
- [Ext] openTrade #
 - modifiers: onlyOwner
- [Int] _transferFrom #
- [Ext] setSCount #
 - modifiers: onlyOwner
- [Int] _basicTransfer #
- [Ext] setMaxWalletPercent #
 - modifiers: onlyOwner
- [Int] shouldTakeFee
- [Int] shouldSwapBack
- [Ext] swapAndLiquidify #
 - modifiers: onlyOwner
- [Int] swapBack #
 - modifiers: swapping
- [Ext] BNBbalance
- [Ext] BNBRewardbalance
- [Ext] sendTax #
 - modifiers: onlyOwner
- [Ext] setIsDividendExempt #
 - modifiers: onlyOwner
- [Ext] setIsFeeExempt #
 - modifiers: onlyOwner
- [Ext] setMNF #
 - modifiers: onlyOwner
- [Ext] setFees #
 - modifiers: onlyOwner
- [Ext] setSwapThreshold #
 - modifiers: onlyOwner
- [Ext] setSwapEnabled #
 - modifiers: onlyOwner
- [Ext] setMarketingFeeReceiver #
 - modifiers: onlyOwner
- [Ext] setLiquidityFeeReceiver #
 - modifiers: onlyOwner
- [Ext] getCirculatingSupply
- [Ext] getClaimableBNB
- [Ext] getWalletClaimableBNB

Contract functions details

- [Ext] getWalletShareAmount
- [Ext] claim #
- [Ext] depositExternalBNB (\$)
- [Ext] addPair #
 - modifiers: onlyOwner
- [Ext] removeLastPair #
 - modifiers: onlyOwner
- [Ext] setFeesOnNormalTransfers #
 - modifiers: onlyOwner
- [Ext] setisRestricted #
 - modifiers: onlyOwner
- [Ext] setAB #
 - modifiers: onlyOwner
- [Ext] walletIsDividendExempt
- [Ext] walletIsTaxExempt
- [Ext] walletIsRestricted
- [Ext] recoverExcess #
 - modifiers: onlyOwner
- [Ext] withdrawTokens #
 - modifiers: onlyOwner
- [Pub] rescueToken #
 - modifiers: onlyOwner
- [Ext] <Fallback > (\$)

(\$) = 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 setMNF() uses the loop to include/exclude addresses from fee. Function will be aborted with OUT_OF_GAS exception if there will be a long addresses list.

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

- **Recommendation**

Check that the arrays' length is not too big.

✔ Low Severity Issues

No low severity issue found.

- **Notes:**

_transferFrom function adds tokens amount to sender's balance if it equals to zero.

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.