



Smart Contract Security Audit Report

Thunderbird Token

November 2022

Security Status



www.hacksafe.io



Audit Details



Audited project

Thunderbird Token



Deployer address

0x52b01a5c2ac1eb0da285188ce06fb8df18356581



Client contacts

Thunderbird 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 Thunderbird Token to perform an audit of smart contracts:

- <https://bscscan.com/token/0xD30A9bAB0Db0f81a3cC8ED48Cd5AF5142C1b4fB7#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.

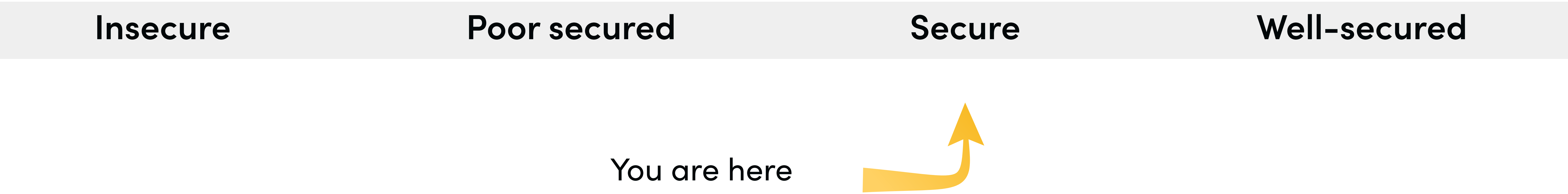
Contract Details

Token contract details for 23.11.2022

Token Type	: DEFI
Contract name	: ThunderbirdToken
Contract address	: 0xD30A9bAB0Db0f81a3cC8ED48Cd5AF5142C1b4fB7
Total supply	: 4,840,256.622456
Token ticker	: TBIRD
Decimals	: 18
Token Holders	: 1,665
Transactions count	: 40,603
Compiler version	: v0.6.12+commit.27d51765
Contract deployer address	: 0x52b01a5c2ac1eb0da285188ce06fb8df18356581
Owner address	: 0x40c5187b7e8f25f17b878bb8d31874ba266e7134

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 as owner does have control over smart contract.



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, 0 medium and 1 low.

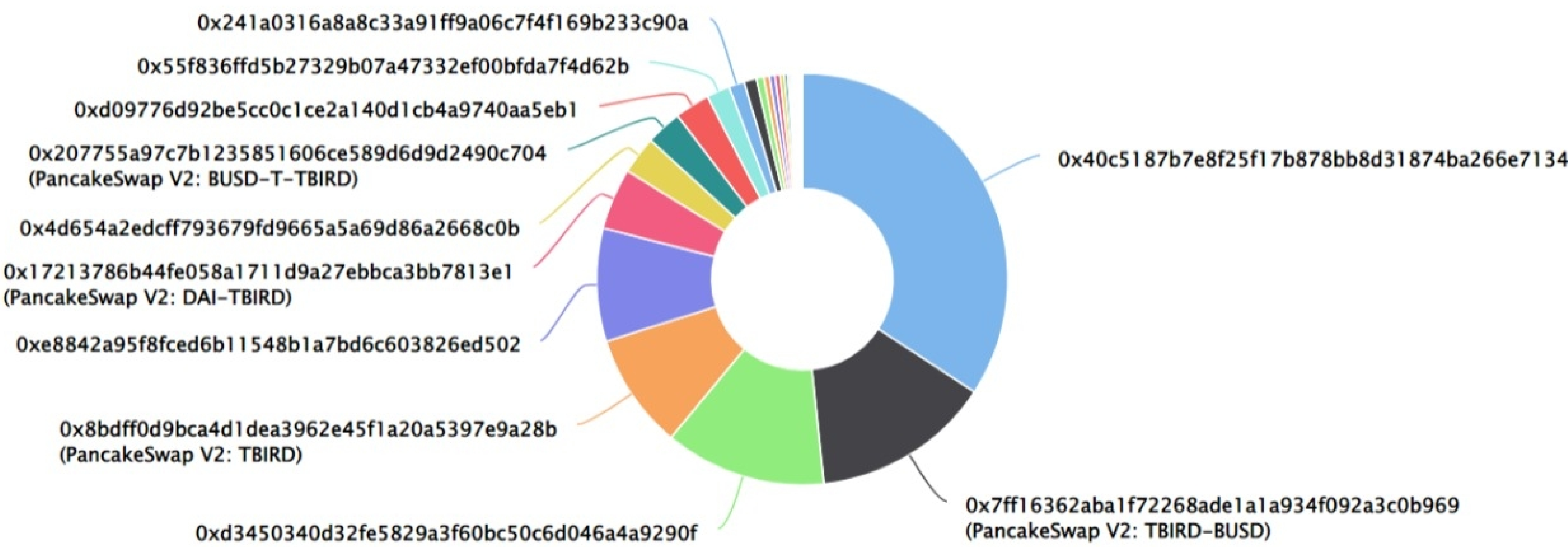
ThunderbirdToken Distribution

💡 The top 100 holders collectively own 99.99% (4,839,808.83 Tokens) of Thunderbird Token

💡 Token Total Supply: 4,840,256.62 Token | Total Token Holders: 1,665






Thunderbird Token Top 100 Token Holders

Source: BscScan.com



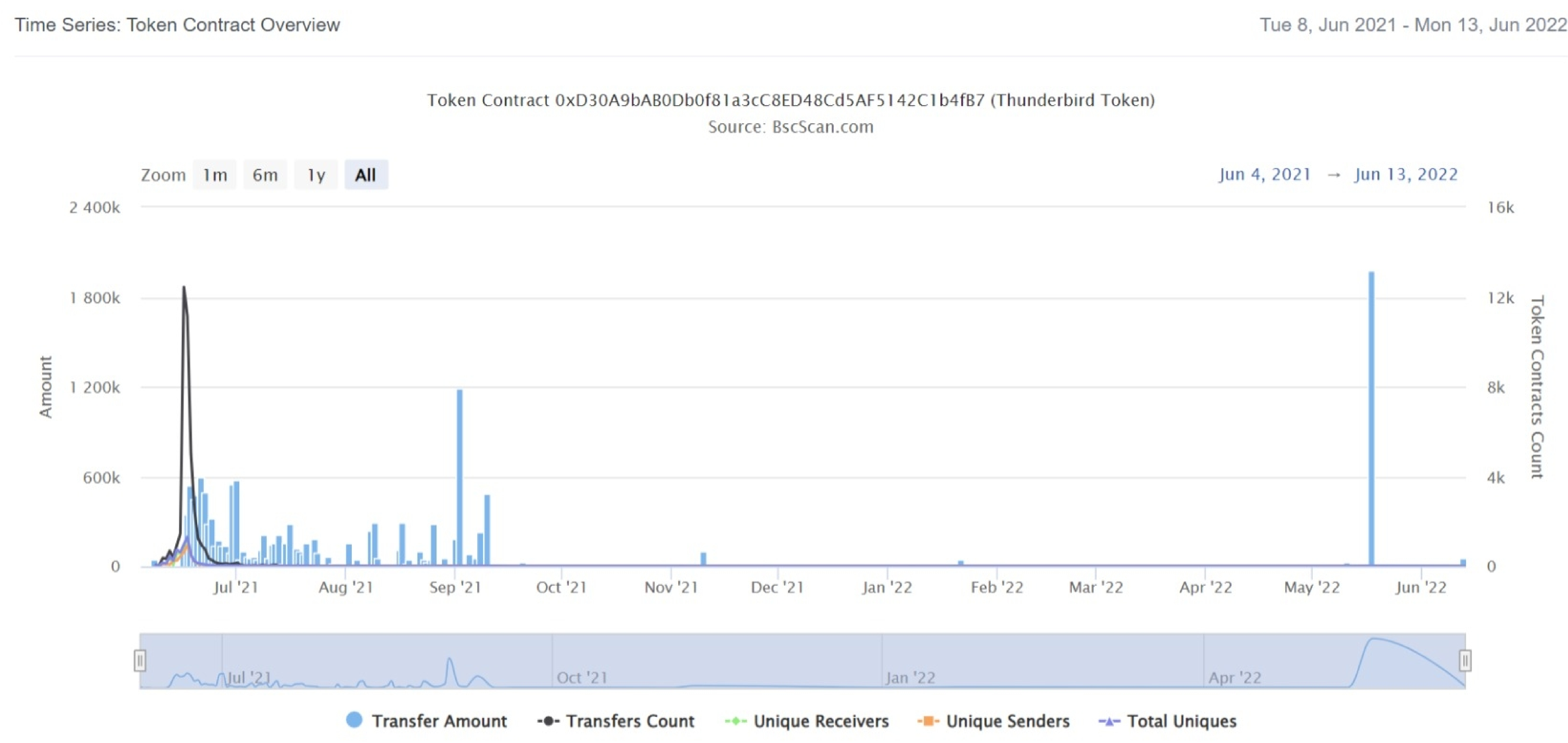
ThunderbirdToken Top 20 Token Holders

(A total of 4,839,808.83 tokens held by the top 100 accounts from the total supply of 4,840,256.62 token)

Rank	Address	Quantity (Token)	Percentage
1	 0x40c5187b7e8f25f17b878bb8d31874ba266e7134	1,656,956.511891027867041418	34.2328%
2	 PancakeSwap V2: TBIRD-BUSD	681,294.704612719727783743	14.0756%
3	0xd3450340d32fe5829a3f60bc50c6d046a4a9290f	615,935.134247106452264986	12.7253%
4	 PancakeSwap V2: TBIRD	440,178.240752024788700747	9.0941%
5	0xe8842a95f8fed6b11548b1a7bd6c603826ed502	429,205.147496012759166094	8.8674%
6	 PancakeSwap V2: DAI-TBIRD	233,456.468433465762982016	4.8232%
7	0x4d654a2edcff793679fd9665a5a69d86a2668c0b	144,594.784644928323563439	2.9873%
8	 PancakeSwap V2: BUSD-T-TBIRD	136,209.602991061291920788	2.8141%
9	0xd09776d92be5cc0c1ce2a140d1cb4a9740aa5eb1	132,902.203270328402543509	2.7458%
10	0x55f836ffd5b27329b07a47332ef00bfda7f4d62b	88,738.948043587184138355	1.8334%
11	0x241a0316a8a8c33a91ff9a06c7f4f169b233c90a	60,000	1.2396%
12	0x80f419a19df5077dce73143098dbbbfe35f24aa4	46,858.760455120240039078	0.9681%
13	0x3ccdcc85468aa82bfb1473614c9d10099bba75e3	28,548.088628253895484355	0.5898%
14	0xe051aa7e6e38ae717a5277688695ba88f7f5ee03	22,601.741480393144116411	0.4670%
15	0x74185e8b79ca5db048aedb643d97b75ef0d46f7e	19,791.418470780878928685	0.4089%
16	Null Address: 0x000...dEaD	18,500	0.3822%
17	0x6d86f089b2f8844fabdfa1dd1e2593b0a95c6da0	16,057.000515053577902184	0.3317%
18	0xb1a66c67d4878a6331d0550e7ec4c18c69d6dd9d	12,436.801061917237204833	0.2569%
19	0x545351e18fc4ba6af09b89745bb24d32798d39b3	8,822.251472420654616018	0.1823%
20	0xad6fd867b7ffd3b6f44232fcb4b4ded0001cab81	8,179.191866572888601419	0.1690%

ThunderbirdToken Distribution

ThunderbirdToken Contract Overview



Contract functions details

+Context

- [Int] _msgSender
- [Int] _msgData

+Ownable (Context)

- [Int] <constructor>
- [Pub] owner
- [Pub] renounceOwnership #
-modifiers: onlyOwner
- [Pub] transferOwnership #
-modifiers: onlyOwner

+ [Int] IBEP20

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

+ [Lib] SafeMath

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

+ BEP20 (Context, IBEP20, Ownable)

- [Pub] <constructor>
- [Ext] getOwner
- [Pub] name
- [Pub] name

Contract functions details

- [Pub] decimals
- [Pub] totalSupply
- [Pub] totalSupply
- [Pub] transfer #
- [Pub] allowance
- [Pub] approve #
- [Pub] transferFrom #
- [Pub] increaseAllowance #
- [Pub] decreaseAllowance #
- [Pub] mint #
 - modifiers: onlyOwner
- [Int] _transfer #
- [Int] _mint #
- [Int] _burn #
- [Int] _approve #
- [Int] _burnFrom #

+ ThunderbirdToken (BEP20)

- [Pub] mint #
 - modifiers: onlyOwner
- [Ext] delegates
- [Ext] delegate #
- [Ext] delegateBySig #
- [Ext] getCurrentVotes
- [Ext] getPriorVotes
- [Int] _delegate #
- [Int] _moveDelegates #
- [Int] _writeCheckpoint #
- [Int] safe32
- [Int] getChainId

(\$) = payable function

= non-constant function

Issues Checking Status

No.	Title	Status
1.	Unlocked Compiler Version	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.	Passed
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	Low issue

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

No medium severity issue found.

✔ Low Severity Issues

One low severity issue found.

1. Old compiler version

- **Description**

Contract has been deployed using too old solidity version.

- **Recommendation**

It is advisable to deploy contract using any of the latest version of solidity

Centralization

Owner Privileges :

- Thunderbird Token Contract:
 - Owner can renounce and transfer ownership.
 - Owner can mint tokens.

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. Following are Admin functions:

- `renounceOwnership`
- `transferOwnership`
- `mint`

Conclusion

Smart contract contains low 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.