HackSafe

# Smart Contract Security Audit Report

## BOT

April 2023

Security Status

★★★★☆

www.hacksafe.io

# Audit Details

**Audited project**
BOT

**Deployer address**
0xd1E78C9D59746C4f9673038B45fAA999e586Ab75

**Client contacts**
BOT 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 BOT  to perform an audit of smart contracts:**

- https://bscscan.com/token/0x29E3cBDd0375e17cA94677790779EB0A87BefbCC#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 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 05.04.2023

| | |
|---|---|
| **Type** | : DAFI |
| **Contract name** | : Token |
| **Contract address** | : 0x29E3cBDd0375e17cA94677790779EB0A87BefbCC |
| **Total supply** | : 200,000,000 |
| **Token Ticker** | : BOT |
| **Decimals** | : 18 |
| **Token Holders** | : 224 |
| **Transactions count** | : 267 |
| **Compiler version** | : v0.8.6+commit.11564f7e |
| **Contract deployer address** | : 0xd1E78C9D59746C4f9673038B45fAA999e586Ab75 |
| **Owner address** | : 0X37639278e703c68c2c21effcf42279bad5c1957e |

# 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.

| Insecure | Poor secured | Secure | Well-secured |
|---|---|---|---|

You are here 

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 and some very low-level issues. These issues are not critical ones.

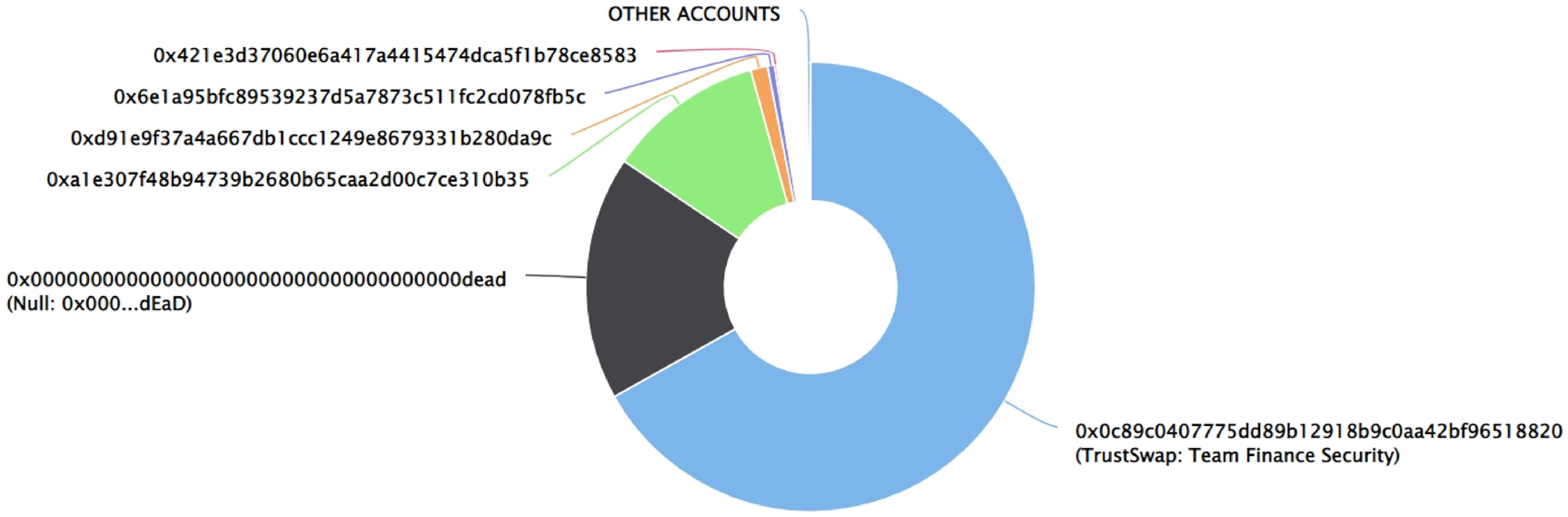
# BOT Token Distribution

The top 100 holders collectively own 99.76% (199,523,723.34 Tokens) of BOT

Token Total Supply: 200,000,000.00 Token | Total Token Holders: 224

BOT Top 100 Token Holders

Source: BscScan.com



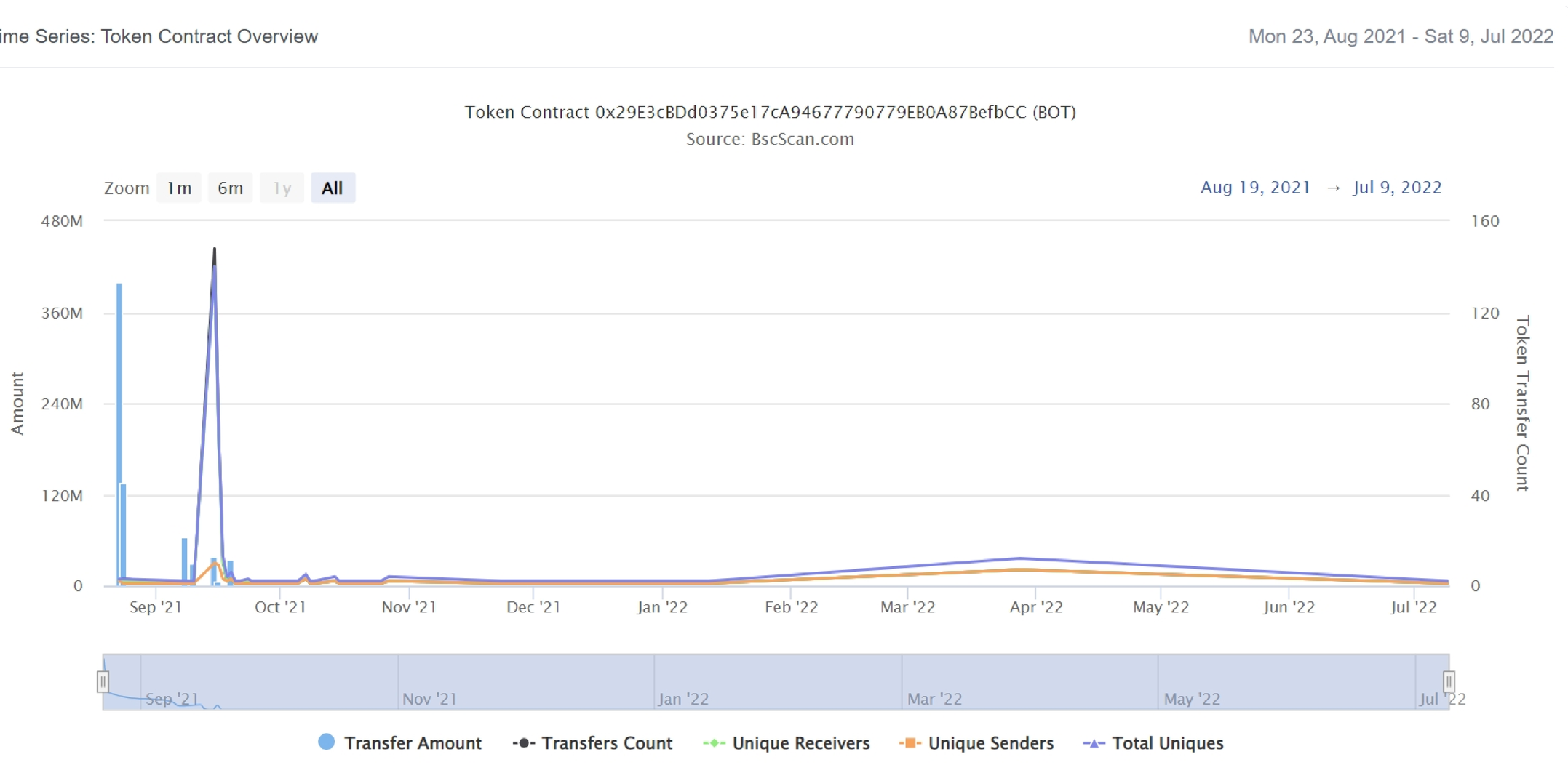

## BOT Token Top 20 Token Holders

(A total of 199,523,723.34 tokens held by the top 100 accounts from the total supply of 200,000,000.00 token)

| Rank | Address | Quantity (Token) | Percentage |
|---|---|---|---|
| 1 | TrustSwap: Team Finance Security | 133,800,000 | 66.9000% |
| 2 | Null: 0x000...dEaD | 35,100,000 | 17.5500% |
| 3 | 0xa1e307f48b94739b2680b65caa2d00c7ce310b35 | 22,522,013.44 | 11.2610% |
| 4 | 0xd91e9f37a4a667db1ccc1249e8679331b280da9c | 2,445,714.005 | 1.2229% |
| 5 | 0x6e1a95bfc89539237d5a7873c511fc2cd078fb5c | 980,000 | 0.4900% |
| 6 | 0x421e3d37060e6a417a4415474dca5f1b78ce8583 | 349,954 | 0.1750% |
| 7 | 0x1a48d84daec6f0d6b70f10584538ca8e335e7053 | 299,954 | 0.1500% |
| 8 | 0xc9b01b99c43fa49d81348cf66aca97325c52ed92 | 264,000 | 0.1320% |
| 9 | 0x424a3217533757b9311aec7e68a0083cc61d9326 | 215,662 | 0.1078% |
| 10 | 0x3d4ccf81cc7fc0450e8ebc585a68c344f809af43 | 200,000 | 0.1000% |
| 11 | 0x07979fc81b189403a0dea7c853d33c1df1e010a6 | 180,000 | 0.0900% |
| 12 | 0x93dbca1a11b5396c602e538e3c033eea316d7dde | 135,000 | 0.0675% |
| 13 | 0x176146efb323fa213ea33419a219035a115f56f5 | 100,000 | 0.0500% |
| 14 | 0x70f0f3d360b2a9ac66b3c67d827f7549f1d486b5 | 100,000 | 0.0500% |
| 15 | 0xa415bfc702eb2345f7a8396626379a11669497d3 | 100,000 | 0.0500% |
| 16 | 0xe8939eb74d74fd17e3bc8aafaf678183bb08abcb | 100,000 | 0.0500% |
| 17 | 0x4a65955135b5ce961249d6ae66b474d98a57770c | 100,000 | 0.0500% |
| 18 | 0x30056d77b0a6fd20c439669d352afe1fa3e9bfcc | 99,999 | 0.0500% |
| 19 | 0xb6a7270cfaf6f6aa62583b0ad2327d3a417fb6bb | 93,954 | 0.0470% |
| 20 | 0xec68a74b2f85adb6f79a2d64f01f91b3979f5523 | 76,000 | 0.0380% |

# BOT Token Distribution

## BOT Contract Overview



# Contract functions details

+[Int] IERC20
    -[Ext] totalSupply
    -[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

+Context
    -[Int] _msgSender
    -[Int] _msgData

+[Lib] Address
    -[Int] isContract
    -[Int] sendValue #
    -[Int] functionCall #
    -[Int] functionCall #
    -[Int] functionCallWithValue #
    -[Int] functionCallWithValue #
    -[Pvt] _functionCallWithValue #

+Ownable (Context)
    -[Pub] < Constructor> #
    -[Pub] owner
    -[Pub] renounceOwnership #
     - modifiers: onlyOwner
    -[Pub] transferOwnership #
     - modifiers: onlyOwner
    -[Pub] getUnlockTime
    -[Pub] lock #

# Contract functions details

- modifiers: onlyOwner

-[Pub] unlock #

+[Int] IUniswapV2Factory

-[Ext] feeTo

-[Ext] feeToSetter

-[Ext] getPair

-[Ext] allPairs

-[Ext] allPairsLength

-[Ext] createPair #

-[Ext] setFeeTo #

-[Ext] setFeeToSetter #

+[Int] IUniswapV2Router01

-[Ext] factory

-[Ext] WETH

-[Ext] addLiquidity #

-[Ext] addLiquidityETH ($)

-[Ext] removeLiquidity #

-[Ext] removeLiquidityETH #

-[Ext] removeLiquidityWithPermit #

-[Ext] removeLiquidityETHWithPermit #

-[Ext] swapExactTokensForTokens #

-[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 #

# Contract functions details

+Token (Context, IERC20, Ownable)
  -[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] isExcludedFromReward
  -[Pub] totalFees
  -[Pub] deliver #
  -[Pub] reflectionFromToken
  -[Pub] tokenFromReflection
  -[Pub] excludeFromReward #
    - modifiers: onlyOwner
  -[Ext] includeInReward #
    - modifiers: onlyOwner
  -[Pub] excludeFromFee #
    - modifiers: onlyOwner
  -[Pub] includeInFee #
    - modifiers: onlyOwner
  -[Ext] setAllFeePercent #
    - modifiers: onlyOwner
  -[Pub] buyBackUpperLimitAmount
  -[Ext] setBuybackUpperLimit #
    - modifiers: onlyOwner
  -[Ext] setMaxTxPercent #
    - modifiers: onlyOwner
  -[Ext] setMaxWalletPercent #
    - modifiers: onlyOwner
  -[Pub] setSwapAndLiquifyEnabled #
    - modifiers: onlyOwner
  -[Ext] setFeeWallet #

# Contract functions details

  - modifiers: onlyOwner
-[Ext] <Fallback>($)
-[Pvt] _reflectFee #
-[Pvt] _getValues
-[Pvt] _getTValues
-[Pvt] _getRValues
-[Pvt] _getRate
-[Pvt] _getCurrentSupply
-[Pvt] _takeLiquidity #
-[Pvt] calculateTaxFee
-[Pvt] calculateLiquidityFee
-[Pvt] removeAllFee #
-[Pvt] restoreAllFee #
-[Pub] isExcludedFromFee
-[Pvt] _approve #
-[Pvt] _transfer #
-[Pvt] swapAndLiquify #
  - modifiers: lockTheSwap
-[Pvt] buyBackTokens #
  - modifiers: lockTheSwap
-[Pvt] swapTokensForBNB #
-[Pvt] swapBNBForTokens #
-[Pvt] addLiquidity #
-[Pvt] _tokenTransfer #
-[Pvt] _transferStandard #
-[Pvt] _transferToExcluded #
-[Pvt] _transferFromExcluded #
-[Pvt] _transferBothExcluded #
-[Pvt] _tokenTransferNoFee #
-[Pub] recoverBEP20 #
  - modifiers: onlyOwner

($) = 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 issues 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.

- **Low Severity Issues**
  No low severity issue found.

**Notes:**

- There is sending contract balance to dead address instead of real burn, using decreasing total supply

# Centralization

**Owner privileges (In the period when the owner is not renounced) :**

- BOT Contract:
    - Owner can change fees.
    - Owner can change the maximum transaction amount and maximum wallet amount.
    - Owner can change buyBackUpperLimit.
    - Owner can exclude from the fee.
    - Owner can change fee wallet.
    - Owner can withdraw ERC tokens except native.
    - Owner can lock and unlock. By the way, using these functions the owner could retake privileges even after the ownership was renounced.

# Conclusion

Smart contract contains medium severity issues! Liquidity pair contract's security is not checked due to out of scope.

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.