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Smart Contract Security Audit

Date 30/June/2021

# 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 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.

# Purpose

This document details ApeAudits' findings and recommended solutions. This audit was performed on June 30, 2021. We did not audit a deployed contract. We will update our report if anything changes after deployment.

## Findings

NO.	Audit Items	Audit Subclass	Audit Subclass Result
1	Overflow Audit	N/A	Passed
2	Race Conditions Audit	N/A	Passed
3	Authority Control Audit	Permission Vulnerability Audit Excessive Auditing Authority	Passed Passed
4	Safe Design Audit	Zeppelin Module Safe Compiler Version Hard-coded Version Fallback Function Safeuse Show Coding Security Function Return Value Security Call Function Security	Passed Passed Passed Passed Passed Passed Passed
5	Denial of Service Audit	N/A	Passed
6	Gas Optimization Audit	N/A	Passed
7	Design Logic Audit	N/A	Passed
8	Malicious Event Log Audit	N/A	Passed
9	"False Deposit" Vulnerability Audit	N/A	Passed
10	Uninitialized Storage Pointers Audit	N/A	Passed
11	Arithmetic Accuracy Deviation Audit	N/A	Passed

## High Severity Issues

- None.

## Medium Severity Issues

**- Issue:**

The included SafeMath library only performs checks on subtraction.

**Recommendation:**

Use a full SafeMath library.

## Low Severity Issues

**- Issue:**

Lines 345 and 346 - charity and marketing are added to fees, but have 0 fees attached. This will burn unnecessary gas.

**Recommendation:**

Remove the unused fees.

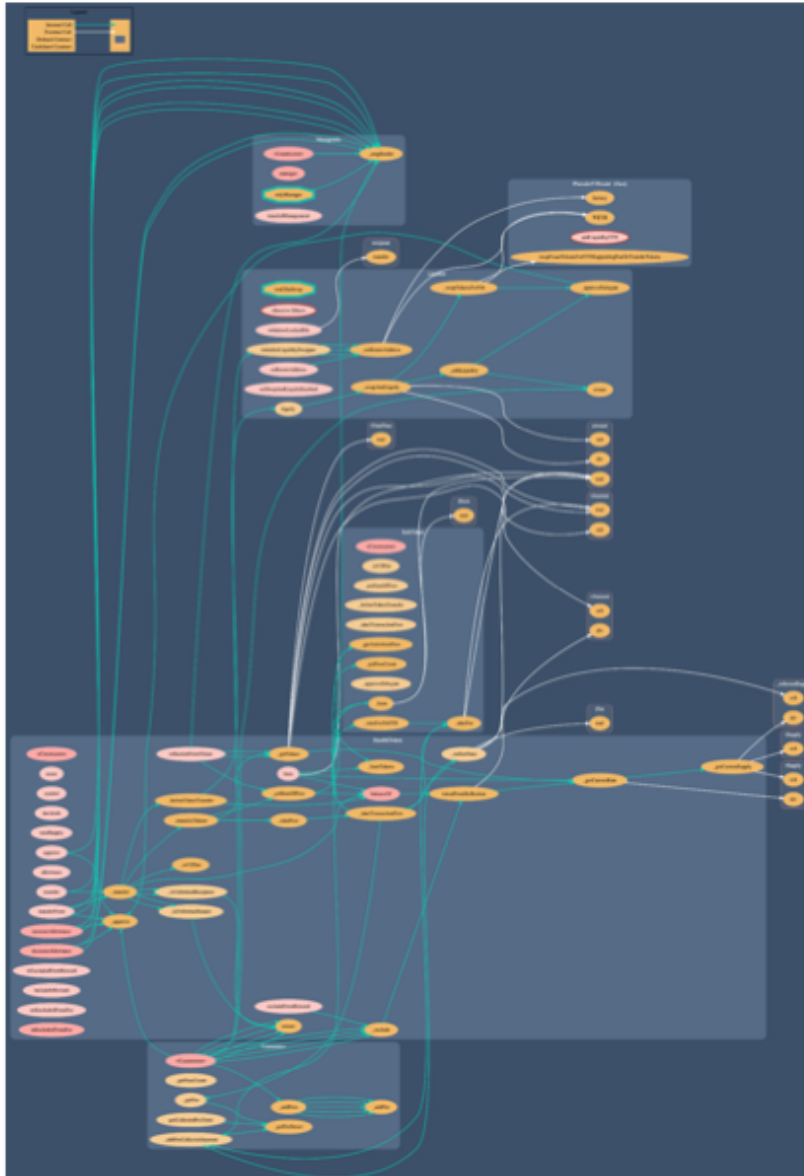
## Conclusion

One medium severity issue found, and a low severity issue that causes extra gas to be burned. The SafeMath library lacks most safe math functions, and should be replaced with a proper SafeMath library.

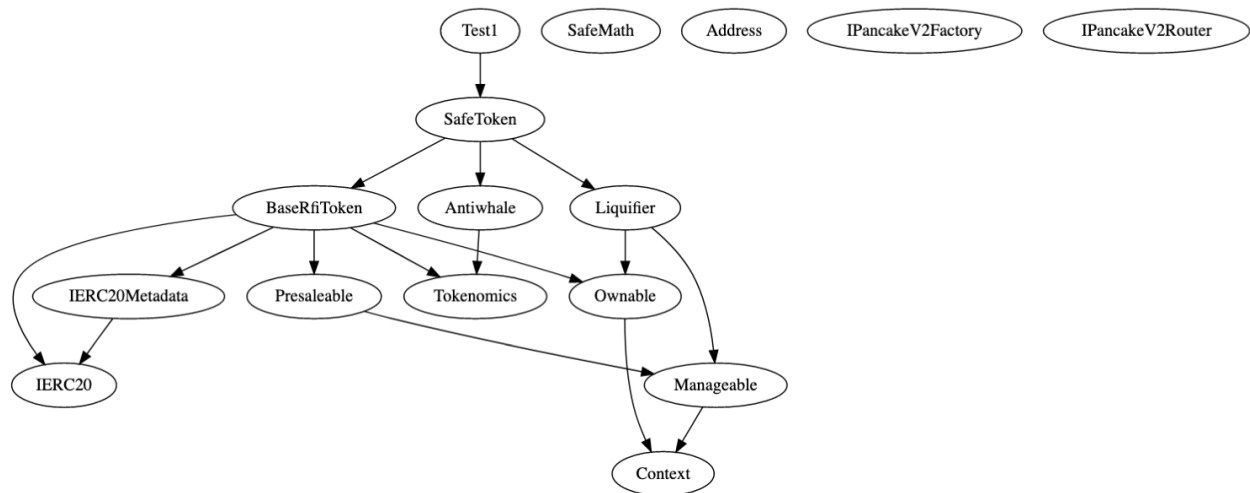
**ApeAudits note:**

Please check the disclaimer above and note, the audit is provided 'as-is' and makes no statements or warranties whatsoever. The report is provided only for the contract(s) mentioned in the report.

# Appendix A - Call Graph



## Appendix B - Inheritance Graph



# Appendix C - Function Information

- + [Int] IERC20
  - [Ext] totalSupply
  - [Ext] balanceOf
  - [Ext] transfer #
  - [Ext] allowance
  - [Ext] approve #
  - [Ext] transferFrom #
- + [Int] IERC20Metadata (IERC20) - [Ext] name
  - [Ext] symbol
  - [Ext] decimals
- + Context
  - [Int] \_msgSender
  - [Int] \_msgData
- + [Lib] SafeMath - [Int] add - [Int] sub - [Int] mul
  - [Int] div
  - [Int] mod - [Int] sub
- + [Lib] Address
  - [Int] isContract
  - [Int] sendValue #
  - [Int] functionCall #
  - [Int] functionCall #
  - [Int] functionCallWithValue # - [Int] functionCallWithValue # - [Int] functionStaticCall
  - [Int] functionStaticCall
  - [Int] functionDelegateCall # - [Int] functionDelegateCall # - [Prv] \_verifyCallResult
- + Ownable (Context)
  - [Pub] <Constructor> #
  - [Pub] owner
  - [Pub] renounceOwnership #
  - modifiers: onlyOwner
  - [Pub] transferOwnership # - modifiers: onlyOwner
  - [Pub] getUnlockTime - [Pub] lock #

- modifiers: onlyOwner - [Pub] unlock #
- + Manageable (Context)
  - [Pub] <Constructor> #
  - [Pub] manager
  - [Ext] transferManagement #
- modifiers: onlyManager
- + [Int] IPancakeV2Factory - [Ext] createPair #
- + [Int] IPancakeV2Router - [Ext] factory
- [Ext] WETH
- [Ext] addLiquidityETH (\$)
- [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #
- + Tokenomics
  - [Pub] <Constructor> #
  - [Prv] \_addFee #
  - [Prv] \_addFees #
  - [Int] \_getFeesCount
  - [Prv] \_getFeeStruct
  - [Int] \_getFee
  - [Int] \_addFeeCollectedAmount # - [Int] getCollectedFeeTotal
- + Presaleable (Manageable)
  - [Ext] setPreseableEnabled #
- modifiers: onlyManager
- + BaseRfiToken (IERC20, IERC20Metadata, Ownable, Presaleable, Tokenomics) -
  - [Pub] <Constructor> #
  - [Ext] name
  - [Ext] symbol
  - [Ext] decimals
  - [Ext] totalSupply
  - [Pub] balanceOf
  - [Ext] transfer #
  - [Ext] allowance
  - [Ext] approve #
  - [Ext] transferFrom #
  - [Ext] burn #
  - [Int] \_burnTokens #
  - [Pub] increaseAllowance #



- [Pub] decreaseAllowance #
- [Ext] isExcludedFromReward - [Ext] reflectionFromToken
- [Int] tokenFromReflection
- [Ext] excludeFromReward #
  
- modifiers: onlyOwner - [Int] \_exclude #
- [Ext] includeInReward #
  
- modifiers: onlyOwner
- [Ext] setExcludedFromFee #
  
- modifiers: onlyOwner
- [Pub] isExcludedFromFee - [Int] \_approve #
- [Int] \_isUnlimitedSender
  
- [Int] \_isUnlimitedRecipient - [Prv] \_transfer #
- [Prv] \_transferTokens #
- [Prv] \_takeFees #
  
- [Int] \_getValues
- [Int] \_getCurrentRate
- [Int] \_getCurrentSupply
- [Int] \_beforeTokenTransfer # - [Int] \_getSumOfFees
- [Int] \_isV2Pair
- [Int] \_redistribute #
- [Int] \_takeTransactionFees #
  
- + Liquifier (Ownable, Manageable) - [Ext] <Fallback> (\$)
  
- [Int] initializeLiquiditySwapper # - [Int] liquify #
- [Prv] \_setRouterAddress #
- [Prv] \_swapAndLiquify #
  
- modifiers: lockTheSwap - [Prv] \_swapTokensForEth # - [Prv] \_addLiquidity #
- [Ext] setRouterAddress #
  
- modifiers: onlyManager
- [Ext] setSwapAndLiquifyEnabled #
  
- modifiers: onlyManager - [Ext] withdrawLockedEth #
  
- modifiers: onlyManager - [Int] \_approveDelegate #
  
- + Antiwhale (Tokenomics)
- [Int] \_getAntiwhaleFees
  
- + SafeToken (BaseRfiToken, Liquifier, Antiwhale) - [Pub] <Constructor> #

- [Int] \_isV2Pair
- [Int] \_getSumOfFees
- [Int] \_beforeTokenTransfer # - [Int] \_takeTransactionFees # - [Prv] \_burn #
- [Prv] \_takeFee #
- [Prv] \_takeFeeToETH #
- [Int] \_approveDelegate #

+ Test1 (SafeToken)

- [Pub] <Constructor> #

- modifiers: SafeToken

(\$) = payable function

# = non-constant function