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Crombie Audit

**Security Assessment
12. September, 2022**

For



CROMBIE



SolidProof_io



@solidproof_io

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Version	Date	Description
1.0	26. August 2022	<ul style="list-style-type: none">• Layout project• Automated- /Manual-Security Testing• Summary
1.1	12. September 2022	<ul style="list-style-type: none">• Reaudit + Checking new functions

Network

Binance Smart Chain (BEP20)

Website

<https://www.crombie.live/>

Telegram

<https://t.me/Crombies>

Twitter

https://twitter.com/Crombie_cronos



Description

TBA

Project Engagement

During the 24th of August 2022, **Crombie Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

Logo



CROMBIE

Contract Link

v1.1

- <https://bscscan.com/address/0x460fCa20D7508546D5b45f7606F3Fd9043596fD6#code>

Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
Critical	9 - 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
High	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon as possible.
Medium	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
Low	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
Informational	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.


Methodology

The auditing process follows a routine series of steps:

1. Code review that includes the following:
 - i) Review of the specifications, sources, and instructions provided to SolidProof to make sure we understand the size, scope, and functionality of the smart contract.
 - ii) Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
 - iii) Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to SolidProof describe.
2. Testing and automated analysis that includes the following:
 - i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
 - ii) Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

Used Code from other Frameworks/Smart Contracts (direct imports)

Imported packages:



```
IERC20  
Context  
Ownable  
SafeMath  
BaseToken  
StandardToken
```


Tested Contract Files

This audit covered the following files listed below with a SHA-1 Hash.

A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

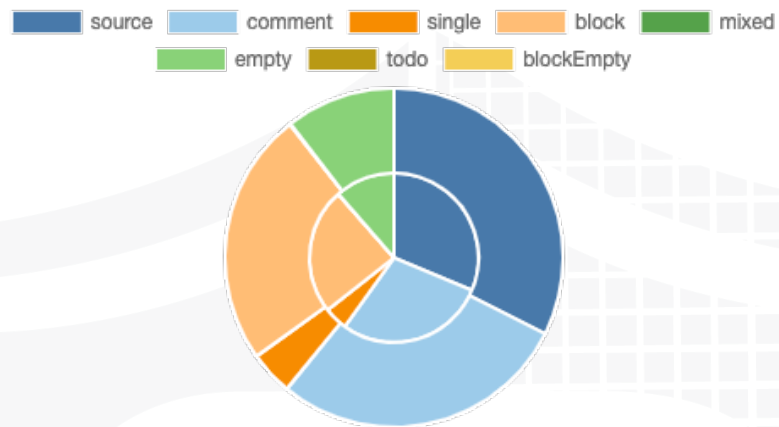
File Name	SHA-1 Hash
contracts/crombie2.sol	b542abe395f3ad10e9aee09cc57907b61c3ba07f

v1.1

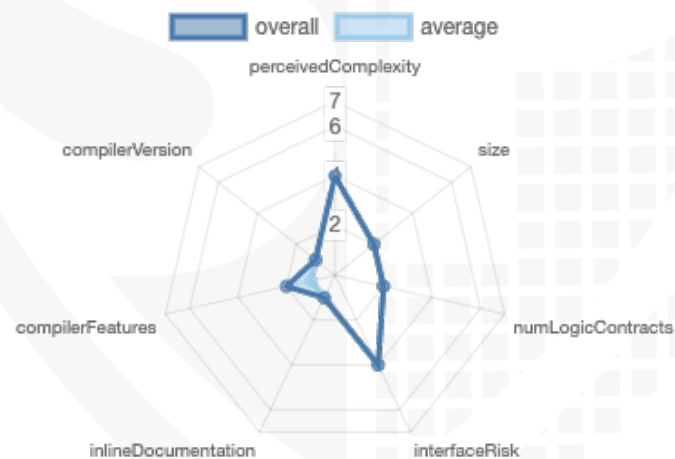
File Name	SHA-1 Hash
contracts/crombie.sol	86249a6739d85e40aaad2ce42281fde56cee7aeb

Metrics

Source Lines v1.1



Risk Level v1.1



Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	1	1	1	3

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.

Version	Public	Payable
1.0	26	3
1.1	32	3

Version	External	Internal	Private	Pure	View
1.0	5	41	7	13	20
1.1	5	44	5	13	21

State Variables

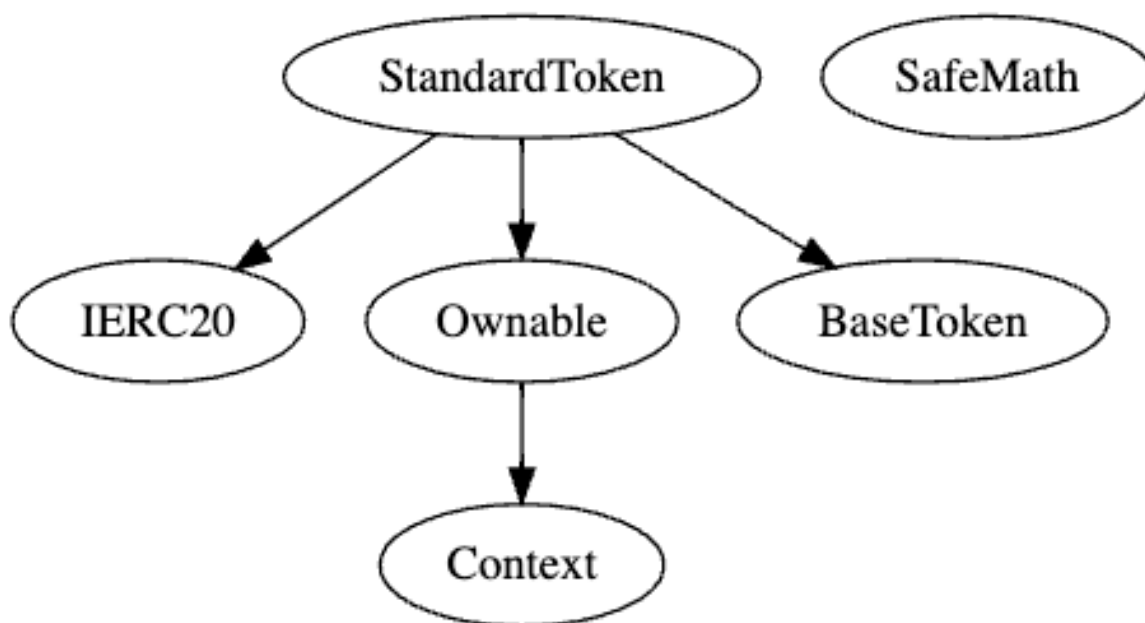
Version	Total	Public
1.0	22	4
1.1	26	11

Capabilities

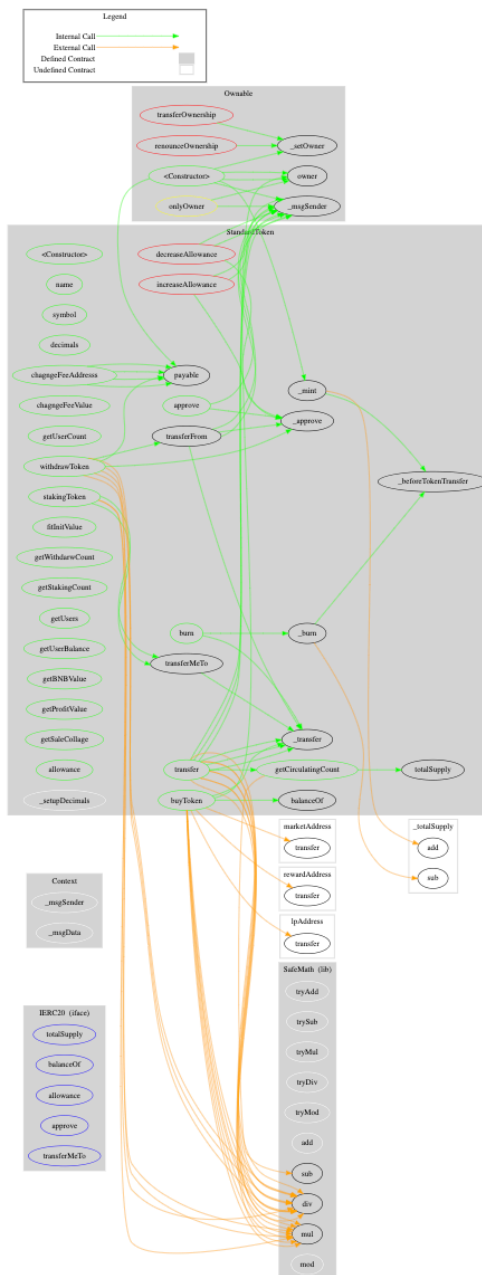
Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	<code>>=0.8.13</code>		<code>yes</code>		

Version	Transfers ETH	Low-Level Calls	DelegateCall	Uses Hash Functions	EC Recover	New/Create/Create2
1.0	yes					

Inheritance Graph v1.1



v1.1



Scope of Work/Verify Claims

The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

1. Is contract an upgradeable
2. Correct implementation of Token standard
3. Deployer cannot mint any new tokens
4. Deployer cannot burn or lock user funds
5. Deployer cannot pause the contract
6. Deployer cannot set fees
7. Deployer cannot blacklist/antisnipe addresses
8. Overall checkup (Smart Contract Security)



Is contract an upgradeable

Name	
Is contract an upgradeable?	No



Correct implementation of Token standard

ERC20				
Function	Description	Exist	Tested	Verified
TotalSupply	Provides information about the total token supply	✓	✓	✓
BalanceOf	Provides account balance of the owner's account	✓	✓	✓
Transfer	Executes transfers of a specified number of tokens to a specified address	✓	✓	✓
TransferFrom	Executes transfers of a specified number of tokens from a specified address	✓	✓	✓
Approve	Allow a spender to withdraw a set number of tokens from a specified account	✓	✓	✓
Allowance	Returns a set number of tokens from a spender to the owner	✓	✓	✓

Write functions of contract v1.0

Crombie2.sol

```
buyToken 💰  
stakingToken  
withdrawToken  
userWithdrawTokens 💰  
approve  
transferMeTo
```

Note: Crombie2.sol file inherited from Ownable but functions was modified. All basic public functions were changed to private. Owner is not able to renounce/transfer ownership

v1.1

```
changeFeeAddresss  
changeFeeValue  
buyToken 💰  
burn  
stakingToken  
withdrawToken 💰  
fitInitValue  
transfer  
approve  
transferFrom  
transferMeTo
```

Deployer cannot mint any new tokens

Name	Exist	Tested	Status
Deployer cannot mint	✓	✓	✓

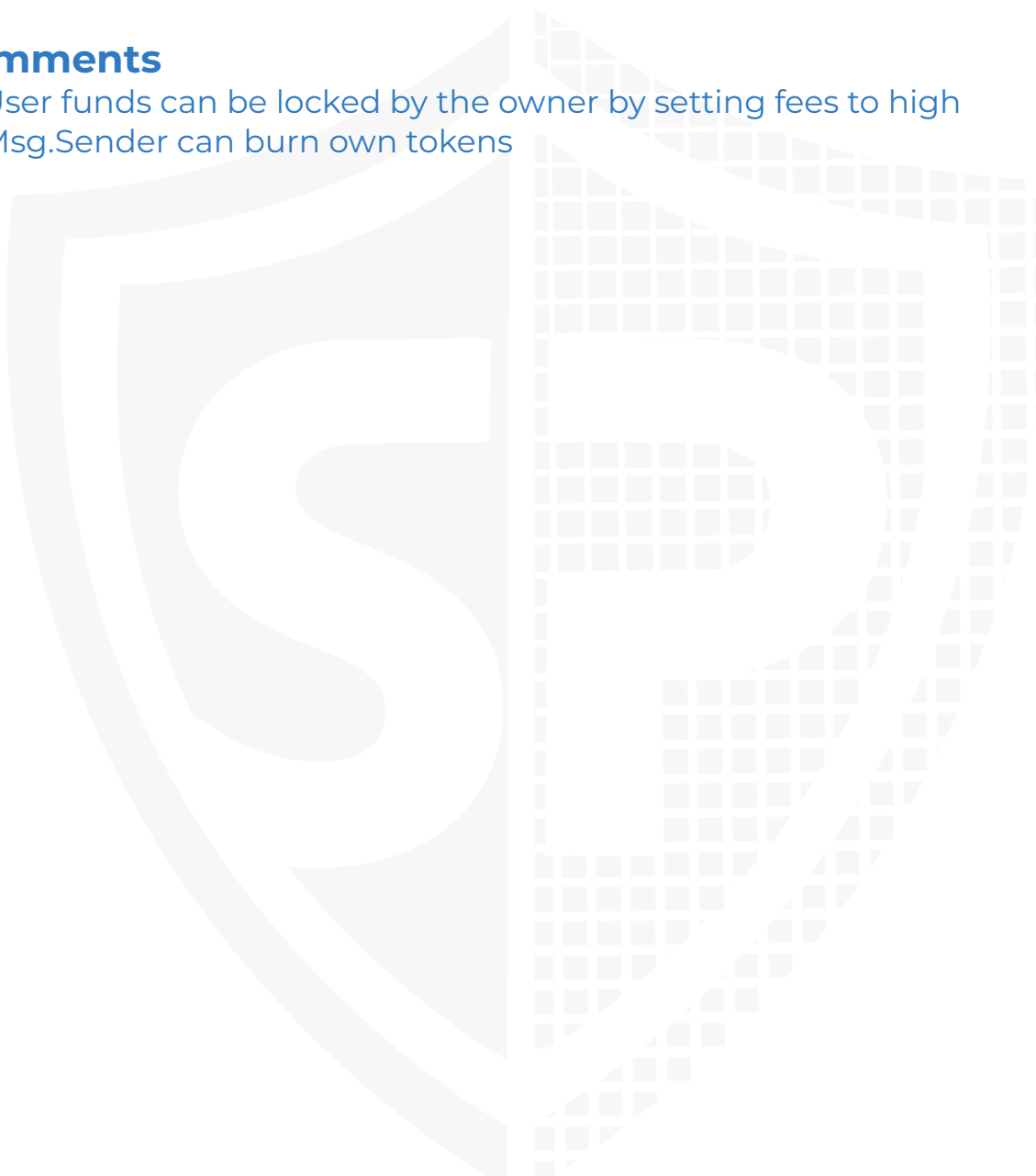


Deployer cannot burn or lock user funds

Name	Exist	Tested	Status
Deployer cannot lock	✓	✓	✗
Deployer cannot burn	✓	✓	✗

Comments

- User funds can be locked by the owner by setting fees to high
- Msg.Sender can burn own tokens



Deployer cannot pause the contract

Name	Exist	Tested	Status
Deployer cannot pause	—	—	—



Deployer cannot set fees

Name	Exist	Tested	Status
Deployer cannot set fees over 25%	✓	✓	✗
Deployer cannot set fees to nearly 100% or to 100%	✓	✓	✗

Comments

- Fees can be set without any limitations

Deployer can blacklist/antisnipe addresses

Name	Exist	Tested	Status
Deployer cannot blacklist/antisnipe addresses	—	—	—



Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

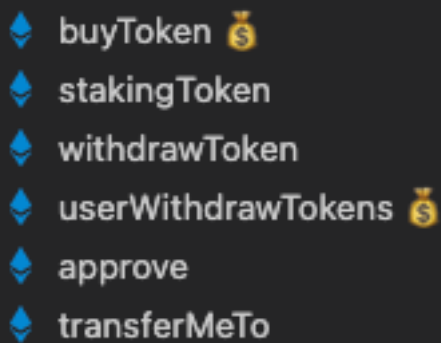
Legend

Attribute	Symbol
Verified / Checked	✓
Partly Verified	⚠
Unverified / Not checked	✗
Not available	—

Modifiers and public functions

v1.0

Crombie2.sol



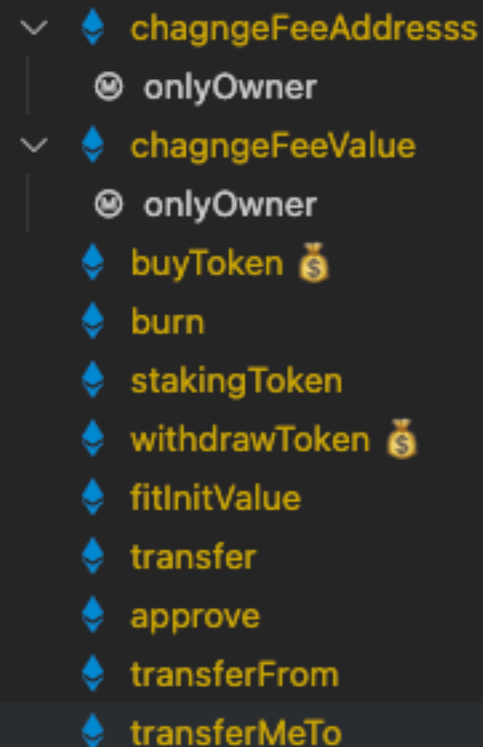
A screenshot of a Solidity IDE showing a list of public functions for the 'Crombie2.sol' contract. The functions are: buyToken (with a money bag icon), stakingToken, withdrawToken, userWithdrawTokens (with a money bag icon), approve, and transferMeTo. Each function name is preceded by a blue diamond icon.

- buyToken 💰
- stakingToken
- withdrawToken
- userWithdrawTokens 💰
- approve
- transferMeTo

Comments

- Tokens can be bought with native
- Quick tip: You can initialize values directly instead of declaring it and initializing it later in “buyToken” function L617-L621
- userBNBvalue will never decreased
- We recommend you to start private internal functions with an underscore

v1.1



A screenshot of a Solidity IDE showing a list of public functions for the 'Crombie2.sol' contract in version 1.1. The functions are: chagngeFeeAddresss (with a dropdown arrow), onlyOwner (with a lock icon), chagngeFeeValue (with a dropdown arrow), onlyOwner (with a lock icon), buyToken (with a money bag icon), burn, stakingToken, withdrawToken (with a money bag icon), fitlnitValue, transfer, approve, transferFrom, and transferMeTo. Each function name is preceded by a blue diamond icon.

- chagngeFeeAddresss
- onlyOwner
- chagngeFeeValue
- onlyOwner
- buyToken 💰
- burn
- stakingToken
- withdrawToken 💰
- fitlnitValue
- transfer
- approve
- transferFrom
- transferMeTo

Comments

- userBNBvalue has no functionality

- `stakingAddress` was not used in the contract and has no functionality
- `userWithdrawTokens` was removed by the team

Please check if an `OnlyOwner` or similar restrictive modifier has been forgotten.



Source Units in Scope

v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/crombie2.sol	5	1	1033	893	385	428	245	
	Totals	5	1	1033	893	385	428	245	

v1.1

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/crombie.sol	5	1	1101	961	422	440	282	
	Totals	5	1	1101	961	422	440	282	

Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalised lines of the source unit (e.g. normalises functions spanning multiple lines)
nSLOC	normalised source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

Audit Results

Critical issues

No critical issues

High issues

No high issues

Medium issues

Issue	File	Type	Line	Description
#1	Crombie	Uninitialised variable	491	Contract is using the variable. Initialize all the variables otherwise the contract is not working as it supposed to be

Low issues

Issue	File	Type	Line	Description
#1	All	Contract doesn't import npm packages from source (like OpenZeppelin etc.)	-	We recommend to import all packages from npm directly without flatten the contract. Functions could be modified or can be susceptible to vulnerabilities
#2	Crombie	A floating pragma is set	475	The current pragma Solidity directive is „>=0.8.13“.
#3	Crombie	Local variables shadowing	1060, 842	Rename the local variables that shadow another component
	Crombie	Missing Events Arithmetic	609, 610, 611	Emit an event for critical parameter changes
	Crombie	Missing Zero Address Validation	601	Check that the address is not zero

Informational issues

Issue	File	Type	Line	Description
-------	------	------	------	-------------

#1	Crombie	State variables that could be declared constant (constable-states)	504, 532	Add the `constant` attributes to state variables that never change
#2	Crombie	Unused state variables	493	Remove unused state variables
#3	All	NatSpec documentation missing	-	If you started to comment your code, also comment all other functions, variables etc.
#4	All	Unnecessary library	See description	<p>You must not implement SafeMath library because it is already implemented by default above pragma version 0.8.x.</p> <p>If you are going to remove the library make sure, that you are replacing "safemath" functionalities with raw math operations</p>

Commented Code exist

There are some instances of code being commented out in the following files that should be removed. Remove the commented code, or address them properly.

Audit Comments

We recommend you to use the special form of comments (NatSpec Format, Follow link for more information <https://docs.soliditylang.org/en/v0.5.10/natspec-format.html>) for your contracts to provide rich documentation for functions, return variables and more. This helps investors to make clear what that variables, functions etc. do.

12. September 2022:

- This contract seems to be a coin tool generated modified contract
- “RewardAddress” will get reward values but the rewards will never distributed to anyone. Same for “lpAddress”, “fitValue” is also not used.
- “stakingAddress” has no functionality
- Fees can be set without any limitations
- While withdrawing tokens. The “bug” amount will be divided by 100 and send as bnb/eth to the caller. Also you can add some bnb/eth to the contract.
- fitInitValue will set the fitValue to 0
- “userWithdrawTokens” was removed
- If the amount to send is higher than 1/4 of circulatingCount than the half will go to the recipient and the other half to the contract itself
- Read whole report and modifiers section for more information

SWC Attacks

ID	Title	Relationships	Status
SW C-1 36	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SW C-1 35	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SW C-1 34	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SW C-1 33	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SW C-1 32	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SW C-1 31	Presence of unused variables	CWE-1164: Irrelevant Code	NOT PASSED
SW C-1 30	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SW C-1 29	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SW C-1 28	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

SW C-1 27	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
SW C-1 25	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
SW C-1 24	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
SW C-1 23	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
SW C-1 22	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
SW C-1 21	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
SW C-1 20	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	PASSED
SW C-11 9	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	NOT PASSED
SW C-11 8	Incorrect Constructor Name	CWE-665: Improper Initialization	PASSED
SW C-11 7	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	PASSED

SW C-11 6	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SW C-11 5	Authorization through tx.origin	CWE-477: Use of Obsolete Function	PASSED
SW C-11 4	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	PASSED
SW C-11 3	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	PASSED
SW C-11 2	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SW C-11 1	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	PASSED
SW C-11 0	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	PASSED
SW C-1 09	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
SW C-1 08	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED
SW C-1 07	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	PASSED
SW C-1 06	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	PASSED

SW C-1 05	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	PASSED
SW C-1 04	Unchecked Call Return Value	CWE-252: Unchecked Return Value	PASSED
SW C-1 03	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	NOT PASSED
SW C-1 02	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	PASSED
SW C-1 01	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	PASSED
SW C-1 00	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED

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