SOLIDProof

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Blockchain Security | Smart Contract Audits | KYC

MADE IN GERMANY

Audit

Security Assessment

21. December, 2021

For

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Version	Date	Description
1.0	21. December 2021	• Layout project • Automated- /Manual-Security Testing • Summary

Network
Ethereum (ERC20)

Website
https://archangeltoken.com/

Telegram
https://t.me/ArchAngelToken

Twitter
https://twitter.com/archangel_token

Facebook
https://m.facebook.com/ArchAngelTokenOfficial/

Github

Reddit
https://www.reddit.com/r/ArchAngelToken/

Instagram
https://www.instagram.com/invites/contact/?i=6dwtauyoc56j&utm_content=ms1ihq6

TikoTok
https://vm.tiktok.com/ZMRmjvsu1/

Youtube
https://www.youtube.com/channel/UC8UU1cV7L7ori-EKjOsQ1rw

Description

The driving force behind global crypto adoption

Project Engagement

During the 18th of December 2021, **ArchAngel 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

Contract Link

v1.0

- https://etherscan.io/address/0x36e43065e977bc72cb86dbd8405fae7057cdc7fd#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 aspossible.
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:

```
./Context.sol
./Pausable.sol
./Ownable.sol
./IERC20.sol
./IUniswapV2Factory.sol
./IUniswapV2Pair.sol
./IUniswapV2Router01.sol
./IUniswapV2Router02.sol
```

Tested Contract Files

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

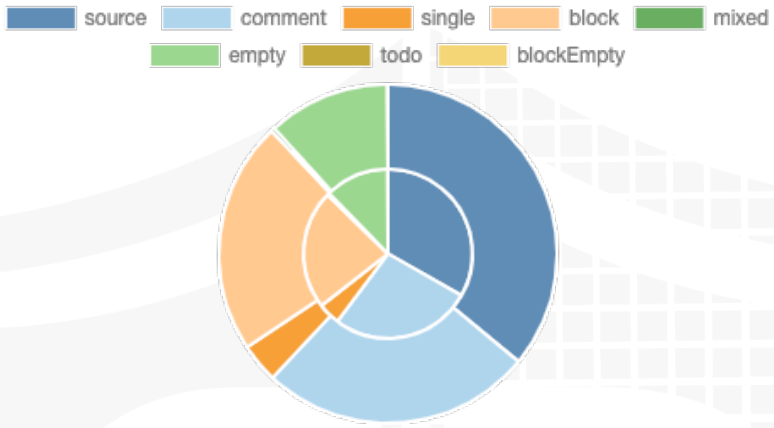
A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

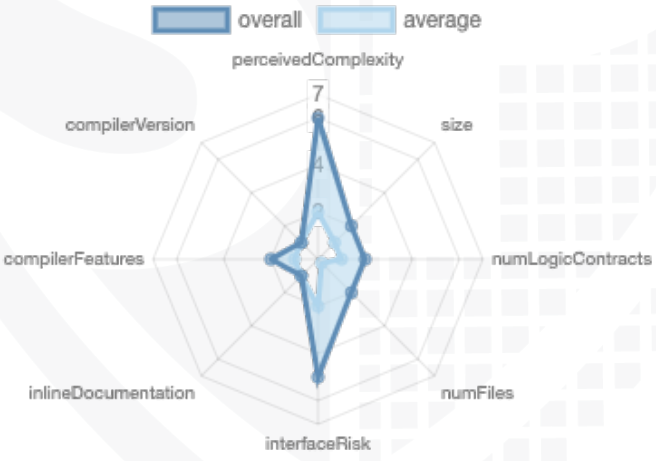
File Name	SHA-1 Hash
contracts/IUniswapV2Router02.sol	0d2ae53fa0c621cbc7e0e46e506c562068037f6c
contracts/Ownable.sol	fde041dccf41ea5a60691206ce353db54a3064b9
contracts/Pausable.sol	d42ae199d2cfb083f59069b5de92fd36ae28e7c5
contracts/ARCHA.sol	85b0b53554f937ed258ed824360af1168c086615
contracts/IUniswapV2Pair.sol	e20da54f1aa3841c2b532d81cd6cbe2d251a6768
contracts/Context.sol	f2f4dfdb86e9435268219ff58ef3db28f9f98a11
contracts/IUniswapV2Factory.sol	2c3596510104c4168977f19ff32c728982acf6f1
contracts/IUniswapV2Router01.sol	f150379f2a39f6d992f9a0aa35915ea1f64658d9
contracts/IERC20.sol	f61145ff3132ad25b2906fde7381081510259789

Metrics

Source Lines
v1.0



Risk Level
v1.0



Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	2	0	5	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	132	5

Version	External	Internal	Private	Pure	View
1.0	75	100	17	11	61

State Variables

Version	Total	Public
1.0	53	5

Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	`>=0.6.2` `^0.8.0` `^0.8.2` `>=0.5.0`		`yes`	**** (0 asm blocks)	

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

Scope of Work

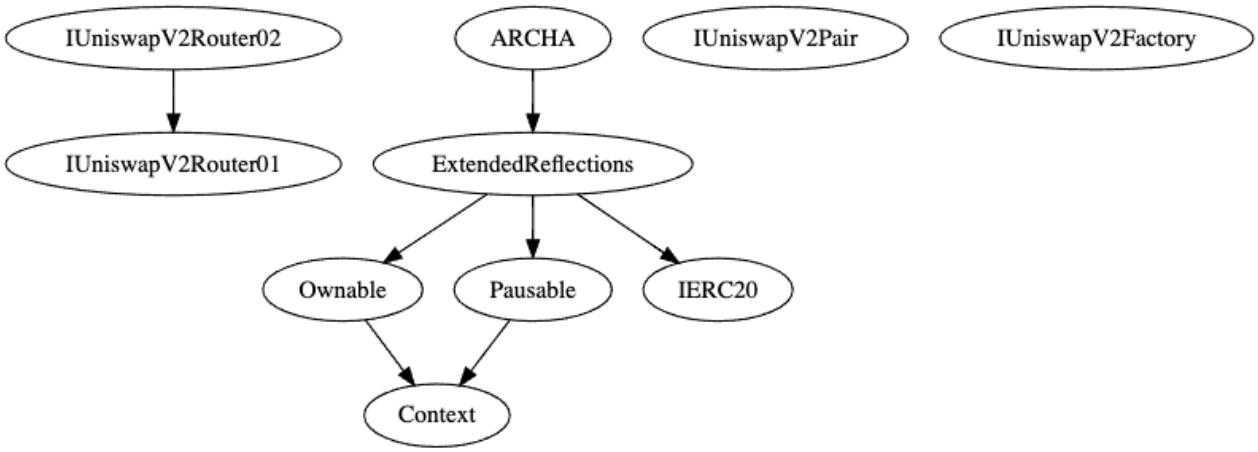
The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

1. Correct implementation of Token standard
2. Deployer cannot mint any new tokens
3. Deployer cannot burn or lock user funds
4. Deployer cannot pause the contract
5. Overall checkup (Smart Contract Security)

Inheritance Graph

v1.0



Verify Claims

Correct implementation of Token standard

Tested	Verified
✓	✓

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

1. airdrop
2. approve
3. blacklistAddress
4. burn
5. burnFrom
6. changeMaxSellAmountNormalTax
7. changeMaxSellAmountPercent
8. decreaseAllowance
9. disableAutoBurn
10. disableAutoSwapAndLiquify
11. disableMarketingTax
12. disableReward
13. enableAutoBurn
14. enableAutoSwapAndLiquify
15. enableMarketingTax
16. enableReward
17. excludeAccountFromFee
18. excludeAccountFromReward
19. includeAccountInFee
20. includeAccountInReward
21. increaseAllowance
22. initSwap
23. pause
24. recoverERC20
25. recoverETH
26. renounceOwnership
27. setAMMPair
28. setMarketingAddress
29. setMarketingTax
30. setMinTokensBeforeSwap
31. setTaxBurn
32. setTaxLiquify
33. setTaxReward
34. transfer
35. transferFrom
36. transferOwnership
37. unpause

Deployer cannot mint any new tokens

Name	Exist	Tested	Verified
Deployer cannot mint	✓	✓	✓

Max / Total Supply: 100.000.000.000.000.000

Deployer cannot burn or lock user funds

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

Comments:

v1.0

- Deployer can
  - pause and lock user funds
  - Blacklist addresses to lock user funds
  - Set maxSellAmountPercent to 0

Deployer cannot pause the contract

Name	Exist	Tested	Verified
Deployer cannot pause	✓	✓	✗

Comments:

v1.0

- Deployer can pause contract and functions
- Following functions cannot be called when pause is enabled
  - _burn
  - _transfer
  - airdrop

Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

Attribute	Symbol
Verfified / Checked	✓
Partly Verified	⚑
Unverified / Not checked	✗
Not available	–

Modifiers

onlyOwner

excludeAccountFromReward
includeAccountInReward
excludeAccountFromFee
includeAccountInFee

enableAutoBurn
enableReward
initSwap
enableAutoSwapAndLiquify
enableMarketingTax
disableAutoBurn
disableReward
disableAutoSwapAndLiquify
disableMarketingTax
setMinTokensBeforeSwap
setTaxBurn
setTaxReward
setTaxLiquify
setMarketingTax
setMarketingAddress
setAMMPair
changeMaxSellAmountPercent
changeMaxSellAmountNormalTax
blacklistAddress
pause
unpause
recoverERC20
recoverETH

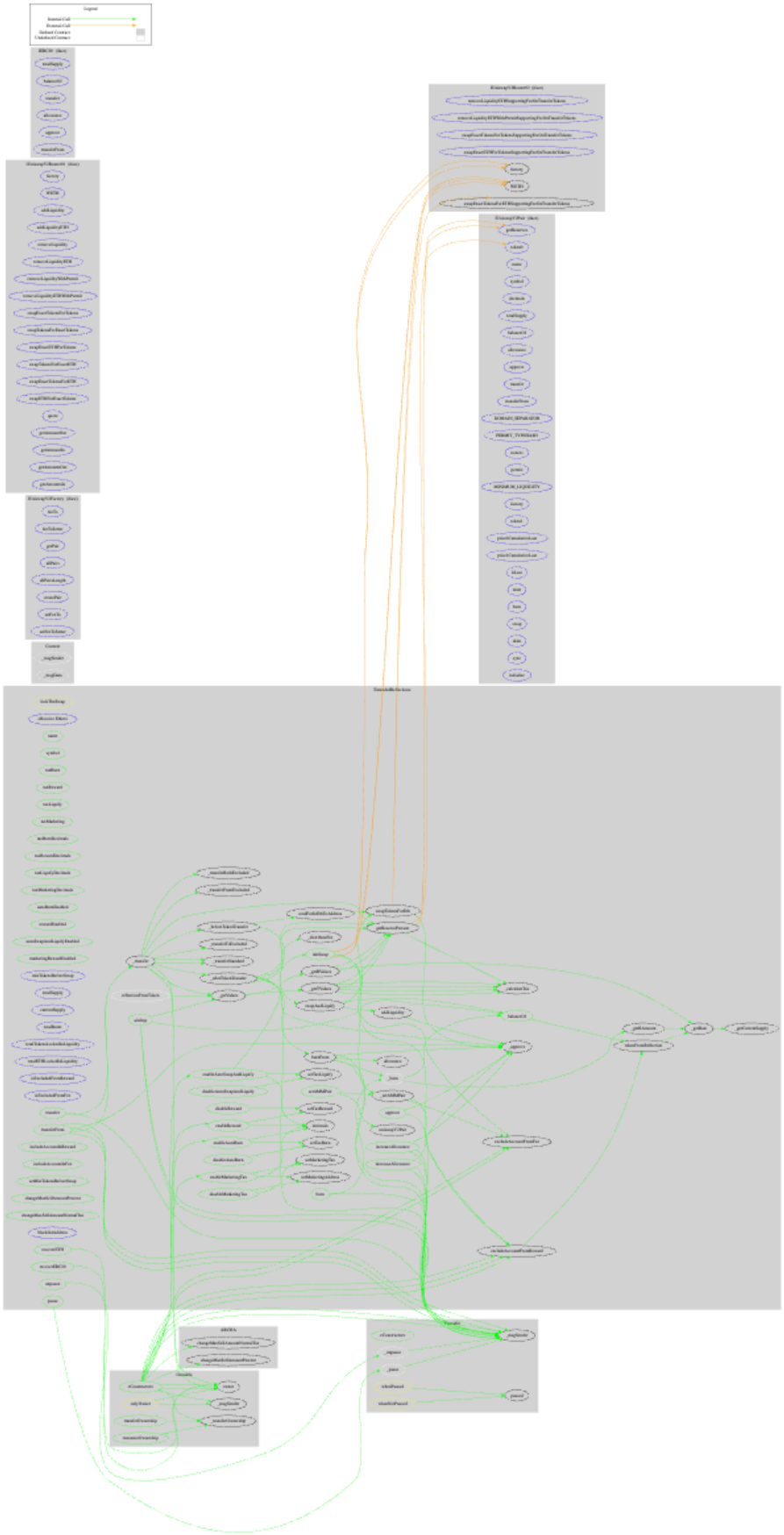
whenNotPaused

airdrop

Comments

- Deployer can set following state variables without any limitations
  - _taxBurn
  - _taxBurnDecimals
  - _taxReward
  - _taxRewardDecimals
  - _taxLiquify
  - _taxLiquifyDecimals
  - _taxMarketing
  - _taxMarketingDecimals
  - maxSellAmountPercent
  - maxSellAmountNormalTax
- Deployer can enable/disable following state variables
  - _autoBurnEnabled
  - _rewardEnabled
  - _marketingRewardEnabled

CallGraph



Source Units in Scope
v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
🔍	contracts/IUniswapV2Router02.sol	———	1	44	6	4	———	16	💰
🎨	contracts/Ownable.sol	1	———	76	76	28	38	23	———
🎨	contracts/Pausable.sol	1	———	91	91	29	51	16	———
📝	contracts/ARCHA.sol	2	———	1475	1475	692	535	522	💰💠
🔍	contracts/IUniswapV2Pair.sol	———	1	52	7	5	———	55	———
🎨	contracts/Context.sol	1	———	24	24	9	12	1	———
🔍	contracts/IUniswapV2Factory.sol	———	1	17	6	4	———	17	———
🔍	contracts/IUniswapV2Router01.sol	———	1	95	4	3	———	48	💰
🔍	contracts/IERC20.sol	———	1	82	27	17	58	13	🌟
📝🔍🎨	**Totals**	**5**	**5**	**1956**	**1716**	**791**	**694**	**711**	💰💠🌟

Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
nSLOC	normalized 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

AUDIT PASSED

Critical issues

- no critical issues found -

High issues

- no high issues found -

Medium issues

Issue	File	Type	Line	Description
#1	Main	Unchecked tokens transfer	1431	Use `SafeERC20`, or ensure that the transfer/ transferFrom return value is checked
#2	Main	State variables shadowing and redeclaration	1443-1445, 1449, 1453	Remove the state variable shadowing We recommend to put ARCHA contract marked variables into the constructor to change it in ExtendedReflections or rename those variables

Low issues

Issue	File	Type	Line	Description
#1	Main	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	Main	A floating pragma is set	3	The current pragma Solidity directive is „"^0.8.2"".

#3	Main	Local variables shadowing	537, 411	Rename the local variables that shadow another component Modify owner to owner_

Informational issues

Issue	File	Type	Line	Description
#1	Main	State variables that could be declared constant (constable-states)	1449, 1451, 1452, 1453, 1461, 1443, 1448, 1446, 1445, 1444, 1441	Add the `constant` attributes to state variables that never change
#2	Main	Unused return values	935	Ensure that all the return values of the function calls are used and handle both success and failure cases if needed by the business logic
#3	Main	Functions that are not used	847	Remove unused functions
#4	IUniswapV2Factory	SPDX is missing	-	Add SPDX License to source file
#5	IUniswapV2Pair	SPDX is missing	-	Add SPDX License to source file
#6	IUniswapV2Router01	SPDX is missing	-	Add SPDX License to source file
#7	IUniswapV2Router02	SPDX is missing	-	Add SPDX License to source file

Commented Code exist

There are some instances of code being commented out in the following files that should be removed:

Line	Comment
1136	// excludeAccountFromReward(uniswapV2Pair_);
1142	// excludeAccountFromFee(uniswapV2Pair_);

1354-1359	// function sendFeeToAddress(address addr, uint256 rAmount, uint256 tAmount) private { // if (_isExcludedFromReward[addr]) // _tokenBalances[addr] += tAmount; // _reflectionBalances[addr] += rAmount; // }

Recommendation

Remove the commented code, or address them properly.

Audit Comments

21. December 2021:

- Deployer can lock user funds
- Read whole report for more information

SWC Attacks

ID	Title	Relationships	Status
SWC-136	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SWC-135	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SWC-134	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SWC-133	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SWC-132	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SWC-131	Presence of unused variables	CWE-1164: Irrelevant Code	PASSED
SWC-130	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SWC-129	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SWC-128	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

SWC-127	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
SWC-125	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
SWC-124	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
SWC-123	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
SWC-122	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
SWC-121	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
SWC-120	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	PASSED
SWC-119	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	NOT PASSED
SWC-118	Incorrect Constructor Name	CWE-665: Improper Initialization	PASSED
SWC-117	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	PASSED

SWC-116	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SWC-115	Authorization through tx.origin	CWE-477: Use of Obsolete Function	PASSED
SWC-114	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	PASSED
SWC-113	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	PASSED
SWC-112	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SWC-111	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	PASSED
SWC-110	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	PASSED
SWC-109	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
SWC-108	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED
SWC-107	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	PASSED
SWC-106	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	PASSED

SWC-105	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	PASSED
SWC-104	Unchecked Call Return Value	CWE-252: Unchecked Return Value	NOT PASSED
SWC-103	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	NOT PASSED
SWC-102	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	PASSED
SWC-101	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	PASSED
SWC-100	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED

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