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**Blockchain Security | Smart Contract Audits | KYC**

MADE IN GERMANY

# Setter Finance Audit

**Security Assessment**  
16.September,2022

**For**



setter.finance



[SolidProof.io](https://solidproof.io)



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Disclaimer	2
Description	5
Project Engagement	5
Logo	5
Contract Link	5
Methodology	7
Used Code from other Frameworks/Smart Contracts (direct imports)	8
Tested Contract Files	9
Source Lines	10
Risk Level	10
Capabilities	11
Inheritance Graph	12
CallGraph	13
Scope of Work/Verify Claims	14
Modifiers and public functions	24
Source Units in Scope	25
Critical issues	26
High issues	26
Medium issues	26
Low issues	26
Informational issues	26
Audit Comments	27
SWC Attacks	28

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Version	Date	Description
1.0	14.September,2022	<ul style="list-style-type: none"><li>• Layout project</li><li>• Automated- /Manual-Security Testing</li><li>• Summary</li></ul>

## Network

Binance (BSC)

## Website

<http://setter.finance>

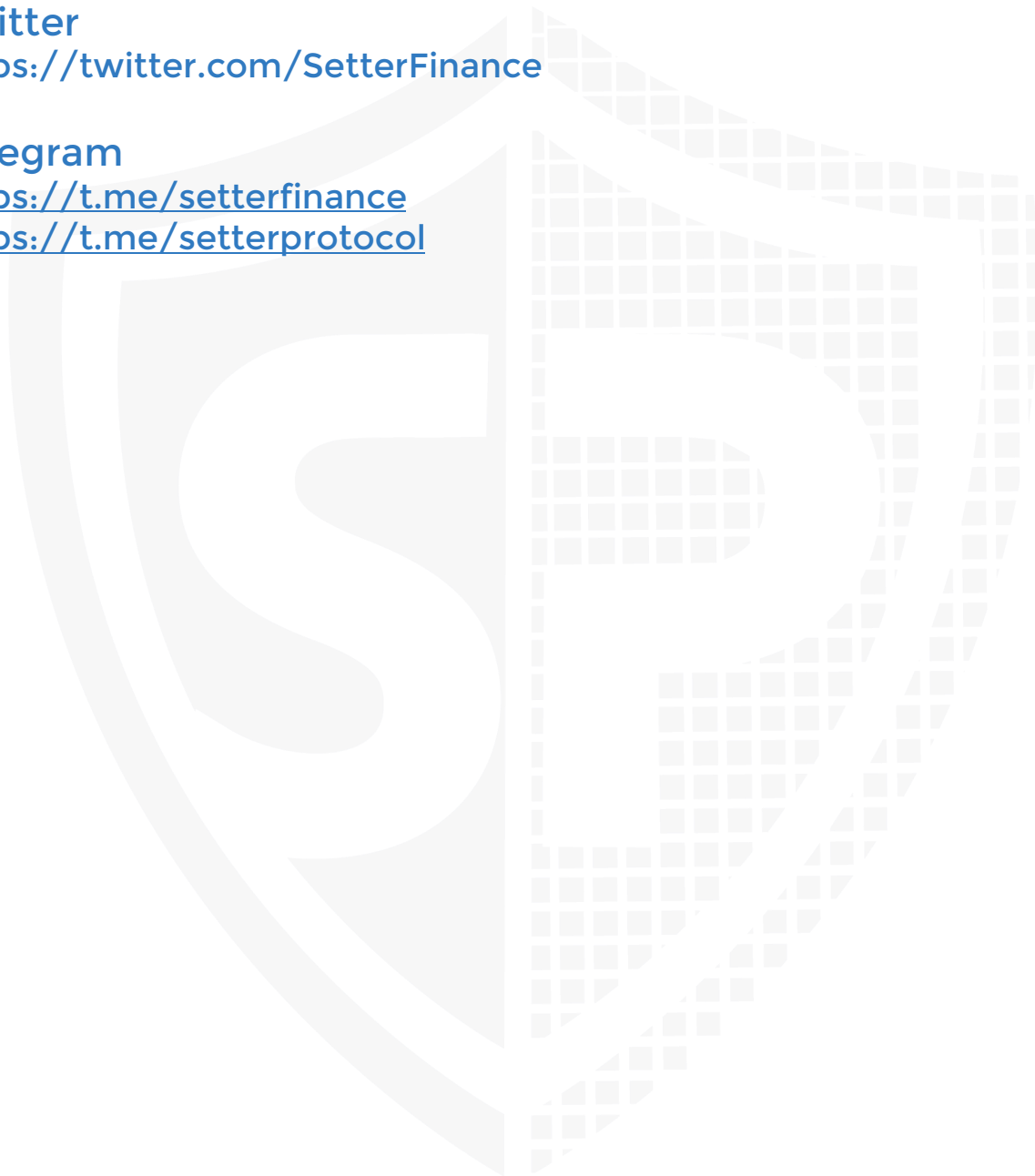
## Twitter

<https://twitter.com/SetterFinance>

## Telegram

<https://t.me/setterfinance>

<https://t.me/setterprotocol>



## Description

TBA

## Project Engagement

During the 12<sup>th</sup> of September 2022, **Setter Finance** team engaged Solidproof.io to audit the smart contracts that they created. The engagement was technical in nature and focused on identifying the security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

### Logo



### Contract Links

v1.0

<https://bscscan.com/address/0x9c50c41a0ec012173b49b587c5f52c0e247de250#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)
<b>Critical</b>	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.
<b>High</b>	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.
<b>Medium</b>	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.
<b>Low</b>	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.
<b>Informational</b>	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 analyzing 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:

```
📄 @openzeppelin/contracts/token/ERC20/ERC20.sol  
📄 @openzeppelin/contracts/access/Ownable.sol  
📄 @openzeppelin/contracts/security/Pausable.sol  
📄 @openzeppelin/contracts/utils/structs/EnumerableSet.sol
```





## Tested Contract Files

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

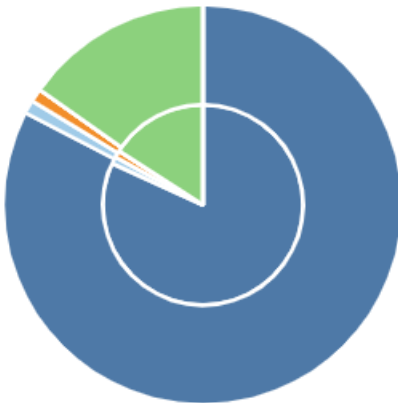
A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

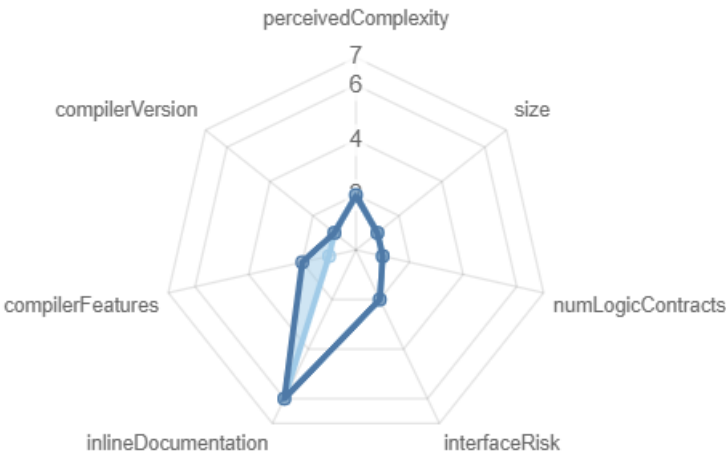
File Name	SHA-1 Hash
contracts/setterprotocol.sol	2c592cf9a019314aa221db94c1157b3a9187860c

# Metrics

## Source Lines v1.0






## Risk Level v1.0



# Capabilities

## v1.0

## Components

 Contracts	 Libraries	 Interfaces	 Abstract
1	0	0	0

### Exposed Functions

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













 Public	 Payable
10	1

External	Internal	Private	Pure	View
6	14	0	0	0

### StateVariables

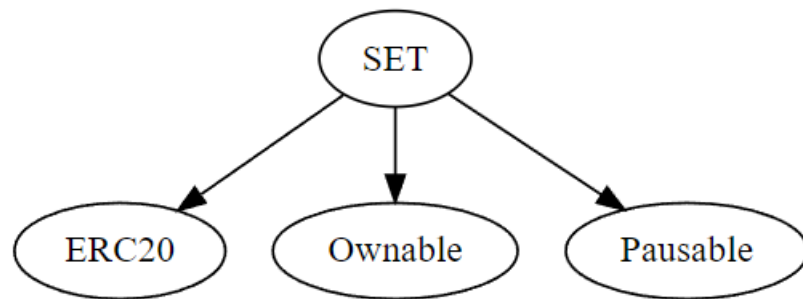
Total	 Public
3	2

### Capabilities

Solidity Versions observed	 Experimental Features	 Can Receive Funds	 Uses Assembly	 Has Destroyable Contracts	
<input type="text" value="^0.8.0"/>		<input type="text" value="yes"/>	<input type="text"/>	<input type="text"/>	
 Transfers ETH	 Low-Level Calls	 DelegateCall	 Uses Hash Functions	 ECRecover	 New/Create/Create2
<input type="text" value="yes"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
 TryCatch	 $\Sigma$ Unchecked				
<input type="text"/>	<input type="text"/>				

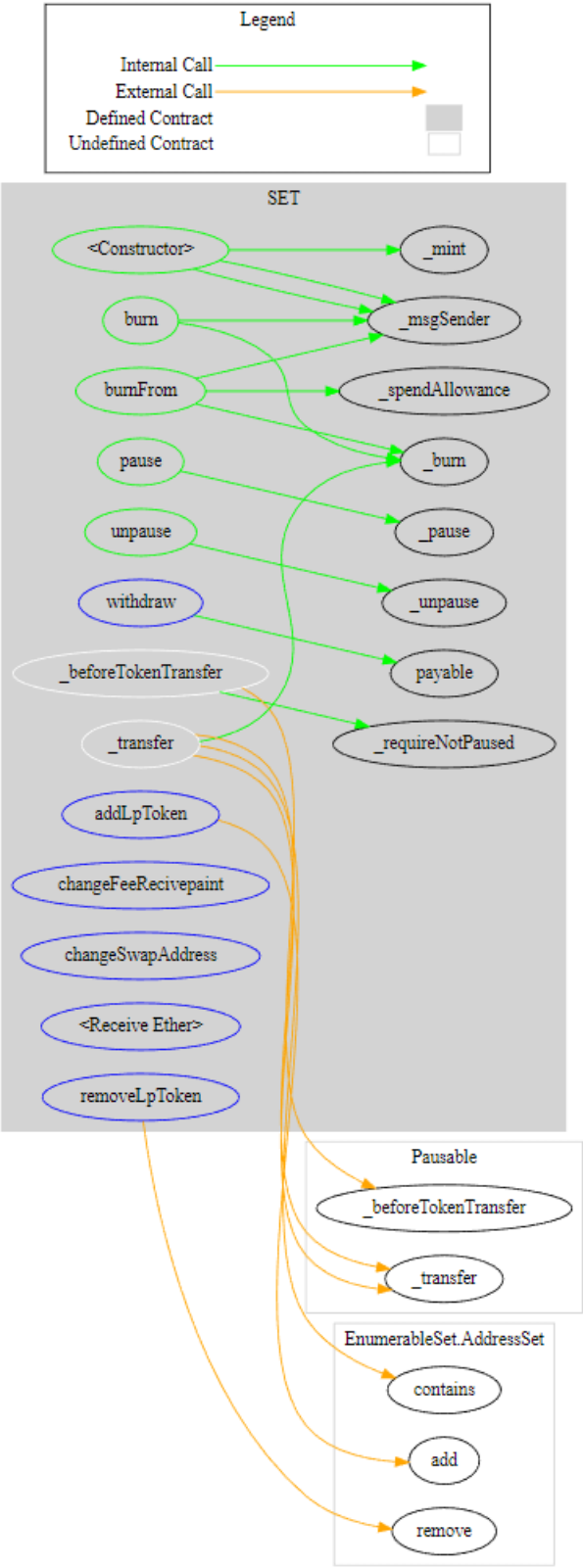
# Inheritance Graph

v1.0



# Call Graph

v1.0



## 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 can set fees
7. Deployer can blacklist/antisnipe address
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 contracts

v1.0

1. addLpToken	16. withdraw
2. approve	
3. burn	
4. burnFrom	
5. changeFeeRecivepaint	
6. changeSwapAddress	
7. decreaseAllowance	
8. increaseAllowance	
9. pause	
10. removeLpToken	
11. renounceOwnership	
12. transfer	
13. transferFrom	
14. transferOwnership	
15. unpause	

## Deployer cannot mint any new tokens

Name	Exist	Tested	Status
Deployer cannot mint			
Max / Total Supply	10_000_000		



## Deployer cannot burn or lock user funds

Name	Exist	Tested	Status
Deployer cannot lock			
Deployer cannot burn			

### Comments:

- Deployer cannot burn tokens from users account. Users and the owner can only burn their own tokens and the tokens that they have approval for.
- If the tokens are being transferred from swap contract to lpToken then while transferring tokens a partial amount of the tokens will be burnt which will affect the price of the token because the amount is burned from the same address from where the fees is being transferred to the recipient.
- Deployer/Owner can lock user funds by pausing the contract.

## Deployer cannot pause the contract

Name	Exist	Tested	Status
Deployer cannot pause			

### Comments:

- The deployer can pause and unpause contract.



## Deployer can set fees

Name	Exist	Tested	Status
Deployer can set fees over 25%			
Deployer can set fees to nearly 100% or more			

### Comments:

- The fees can't be set by the owner, but the owner can change the fee receiver address

## Deployer cannot blacklist/antisnipe addresses

Name	Exist	Tested	Status
Deployer can 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

◆	burn	
◆	burnFrom	
◆	pause	
Ⓜ	onlyOwner	
◆	unpause	
Ⓜ	onlyOwner	
◆	addLpToken	
Ⓜ	onlyOwner	
◆	removeLpToken	
Ⓜ	onlyOwner	
◆	changeFeeRecivepaint	
Ⓜ	onlyOwner	
◆	changeSwapAddress	
Ⓜ	onlyOwner	
◆	withdraw	
Ⓜ	onlyOwner	

## Comments:

### The owner can:

- Pause/Unpause the contract
- Set maximum transaction limit and fee recipient addresses
- Add/Remove Lp Token
- Modify Swap Address
- Pause/Unpause Trading
- Withdraw tokens from the contract



# Source Units in Scope

v1.0

File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score
contracts/setterprotocol.sol	1	————	91	87	72	1	71
Totals	1	————	91	87	72	1	71

## 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

## High issues

No high issues

## Medium issues

No medium issues

## Low issues

Issue	File	Type	Line	Description
#1	Main	Missing Events	59,65,71,79,88	Emit an event for critical parameter changes.
#2	Main	Missing Zero Check	59,65,71,79,88	Check that the address is not zero
#3	Main	Owner can drain tokens	88	The owner can withdraw the tokens from the contract
#4	Main	Floating Pragma	-	The current pragma Solidity directive is " <code>^0.8.0</code> ". Contracts should be deployed with the same compiler version and flags that they have been tested with thoroughly. Locking the pragma helps to ensure that contracts do not accidentally get deployed using other versions.

## Informational issues

Issue	File	Type	Line	Description
#1	Main	NatSpec documentation missing	—	If you started to comment your code, also comment all other functions, variables etc.
#2	Main	Spelling Error	71	Correct the spelling of the function/variable names in order to avoid any confusions in coad readability

## 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.

### 16. September, 2022:

- There is still an owner (Owner still has not renounced ownership).
- Read the whole report and modifiers section for more information.

## SWC Attacks

ID	Title	Relationships	Status
<a href="#">SWC-1136</a>	Unencrypted Private Data On-Chain	<a href="#">CWE-767: Access to Critical Private Variable via Public Method</a>	PASSED
<a href="#">SWC-1135</a>	Code With No Effects	<a href="#">CWE-1164: Irrelevant Code</a>	PASSED
<a href="#">SWC-1134</a>	Message call with hardcoded gas amount	<a href="#">CWE-655: Improper Initialization</a>	PASSED
<a href="#">SWC-1133</a>	Hash Collisions With Multiple Variable Length Arguments	<a href="#">CWE-294: Authentication Bypass by Capture-replay</a>	PASSED
<a href="#">SWC-1132</a>	Unexpected Ether balance	<a href="#">CWE-667: Improper Locking</a>	PASSED
<a href="#">SWC-1131</a>	Presence of unused variables	<a href="#">CWE-1164: Irrelevant Code</a>	PASSED

131			
SWC 130	Right-To-Left-Override control character (U+202E)	<a href="#">CWE-451: User Interface (UI) Misrepresentation of Critical Information</a>	PASSED
SWC 129	Typographical Error	<a href="#">CWE-480: Use of Incorrect Operator</a>	PASSED
SWC 128	DoS With Block Gas Limit	<a href="#">CWE-400: Uncontrolled Resource Consumption</a>	PASSED
SWC 127	Arbitrary Jump with Function Type Variable	<a href="#">CWE-695: Use of Low-Level Functionality</a>	PASSED
SWC 125	Incorrect Inheritance Order	<a href="#">CWE-696: Incorrect Behavior Order</a>	PASSED
SWC 1	Write to Arbitrary	<a href="#">CWE-123: Write-what-where Condition</a>	PASSED

<u>1</u> <u>2</u> <u>4</u>	Storage Location		
<u>S</u> <u>W</u> <u>C</u> : <u>1</u> <u>2</u> <u>3</u>	Requirement Violation	<a href="#">CWE-573: Improper Following of Specification by Caller</a>	PASSED
<u>S</u> <u>W</u> <u>C</u> : <u>1</u> <u>2</u> <u>2</u>	Lack of Proper Signature Verification	<a href="#">CWE-345: Insufficient Verification of Data Authenticity</a>	PASSED
<u>S</u> <u>W</u> <u>C</u> : <u>1</u> <u>2</u> <u>1</u>	Missing Protection against Signature Replay Attacks	<a href="#">CWE-347: Improper Verification of Cryptographic Signature</a>	PASSED
<u>S</u> <u>W</u> <u>C</u> : <u>1</u> <u>2</u> <u>0</u>	Weak Sources of Randomness from Chain Attributes	<a href="#">CWE-330: Use of Insufficiently Random Values</a>	PASSED
<u>S</u> <u>W</u> <u>C</u> : <u>1</u> <u>1</u> <u>1</u> <u>9</u>	Shadowing State Variables	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	NOT PASSED

<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : <a href="#">1</a> <a href="#">1</a> <a href="#">8</a>	Incorrect Constructor Name	<a href="#">CWE-665: Improper Initialization</a>	PASSED
<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : <a href="#">1</a> <a href="#">1</a> <a href="#">7</a>	Signature Malleability	<a href="#">CWE-347: Improper Verification of Cryptographic Signature</a>	PASSED
<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : <a href="#">1</a> <a href="#">1</a> <a href="#">6</a>	Timestamp Dependence	<a href="#">CWE-829: Inclusion of Functionality from Untrusted Control Sphere</a>	PASSED
<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : <a href="#">1</a> <a href="#">1</a> <a href="#">5</a>	Authorization through tx.origin	<a href="#">CWE-477: Use of Obsolete Function</a>	PASSED
<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : <a href="#">1</a> <a href="#">1</a> <a href="#">4</a>	Transaction Order Dependence	<a href="#">CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')</a>	PASSED
<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : <a href="#">1</a> <a href="#">1</a> <a href="#">3</a>	DoS with Failed Call	<a href="#">CWE-703: Improper Check or Handling of Exceptional Conditions</a>	PASSED

<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : 1 1 2	Delegatecall to Untrusted Callee	<a href="#">CWE-829: Inclusion of Functionality from Untrusted Control Sphere</a>	PASSED
<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : 1 1 1	Use of Deprecated Solidity Functions	<a href="#">CWE-477: Use of Obsolete Function</a>	PASSED
<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : 1 1 0	Assert Violation	<a href="#">CWE-670: Always-Incorrect Control Flow Implementation</a>	PASSED
<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : 1 0 9	Uninitialized Storage Pointer	<a href="#">CWE-824: Access of Uninitialized Pointer</a>	PASSED
<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : 1 0 8	State Variable Default Visibility	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	PASSED
<a href="#">S</a> <a href="#">W</a> <a href="#">C</a> : 1 0 7	Reentrancy	<a href="#">CWE-841: Improper Enforcement of Behavioral Workflow</a>	PASSED



<a href="#">SWC-1106</a>	Unprotected SELFDESTRUCT Instruction	<a href="#">CWE-284: Improper Access Control</a>	PASSED
<a href="#">SWC-1105</a>	Unprotected Ether Withdrawal	<a href="#">CWE-284: Improper Access Control</a>	PASSED
<a href="#">SWC-1104</a>	Unchecked Call Return Value	<a href="#">CWE-252: Unchecked Return Value</a>	PASSED
<a href="#">SWC-1103</a>	Floating Pragma	<a href="#">CWE-664: Improper Control of a Resource Through its Lifetime</a>	NOT PASSED
<a href="#">SWC-1102</a>	Outdated Compiler Version	<a href="#">CWE-937: Using Components with Known Vulnerabilities</a>	PASSED
<a href="#">SWC-1101</a>	Integer Overflow and Underflow	<a href="#">CWE-682: Incorrect Calculation</a>	PASSED

<div> <div> <div>S</div> <div>W</div> <div>C</div> <div>.</div> <div>1</div> <div>1</div> <div>0</div> <div>0</div> <div>0</div> <div>1</div> </div> </div>	<div>Function Default Visibility</div>	<div> <div>CWE-710: Improper Adherence to Coding Standards</div> </div>	<div>PASSED</div>
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