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MADE IN GERMANY

Fraktal Audit

Security Assessment
03. March, 2022

For



FRAKTAL

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

Network

Ethereum Chain

Website

<https://www.fraktal.io/>

Twitter

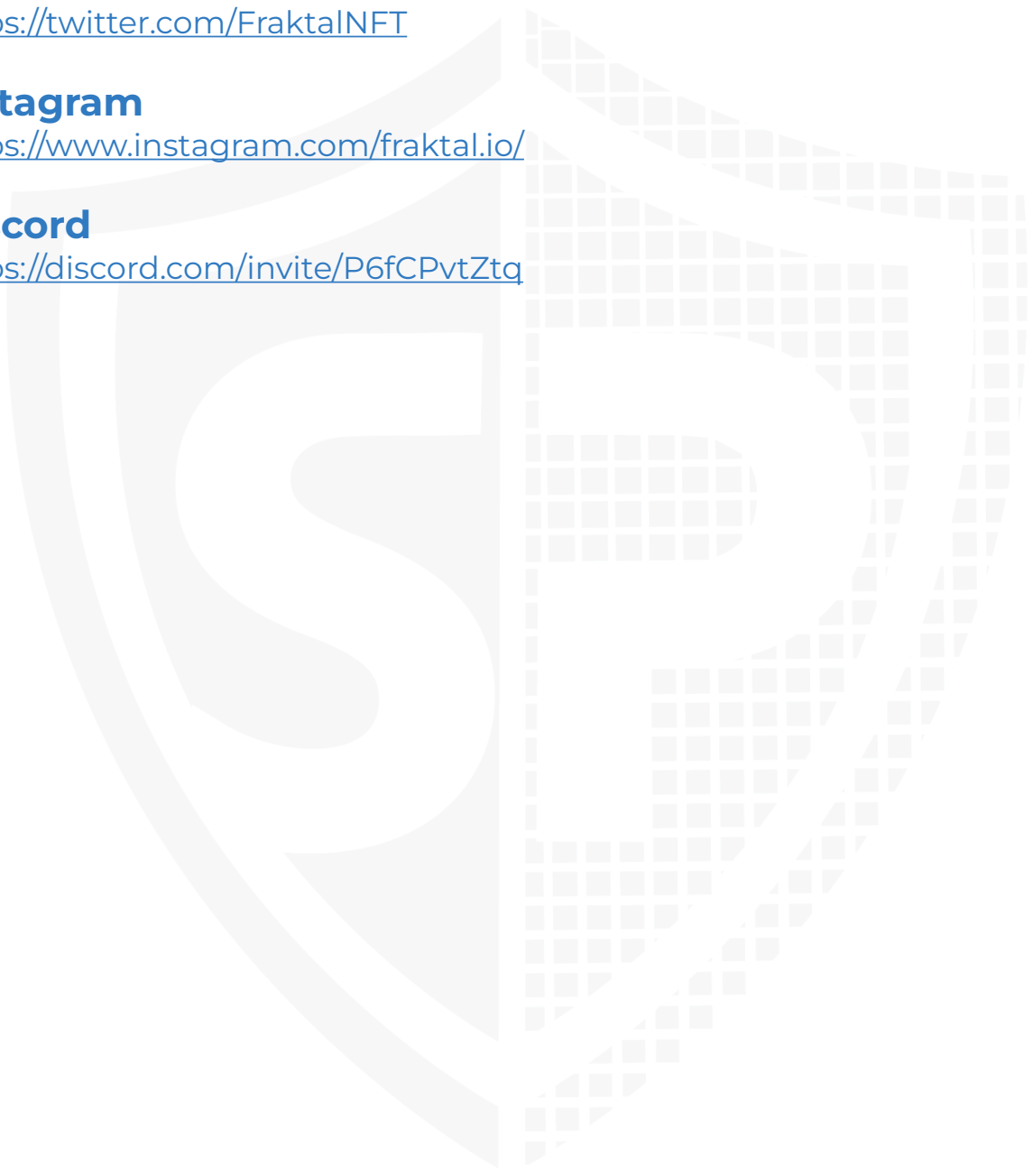
<https://twitter.com/FraktalNFT>

Instagram

<https://www.instagram.com/fraktal.io/>

Discord

<https://discord.com/invite/P6fCPvtZtq>



Description

Fraktal is a community first project, with a mission to to empower artists to be in full control of their work and have unlimited creative freedom.

Project Engagement

During the 1st of March 2022, **Fraktal 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



FRAKTAL

Contract Link

v1.0

- Github
 - <https://github.com/FraktalNFT/contracts>
 - Commit: 75534712a376cbbf54d91d5cdae455e134a5c797

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:

Dependency / Import Path	Count
@openzeppelin/contracts/access/Ownable.sol	2
@openzeppelin/contracts/security/Pausable.sol	2
@openzeppelin/contracts/security/ReentrancyGuard.sol	2
@openzeppelin/contracts/token/ERC1155/IERC1155.sol	1
@openzeppelin/contracts/token/ERC20/utils/SafeERC20.sol	2
@openzeppelin/contracts/token/ERC721/IERC721.sol	1
@openzeppelin/contracts/utils/cryptography/MerkleProof.sol	1

Tested Contract Files

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

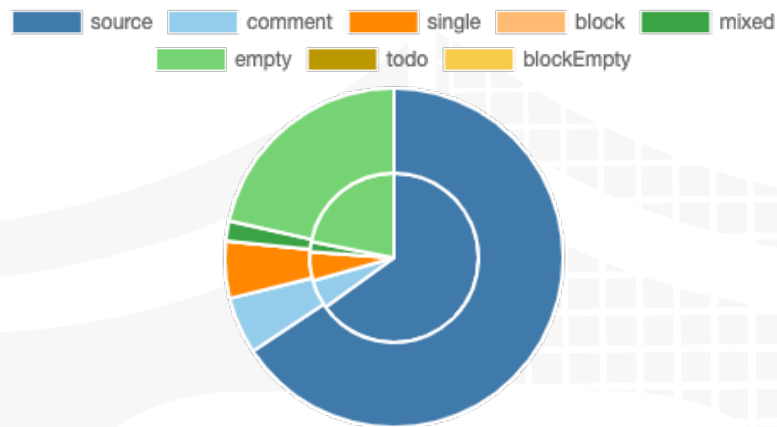
A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

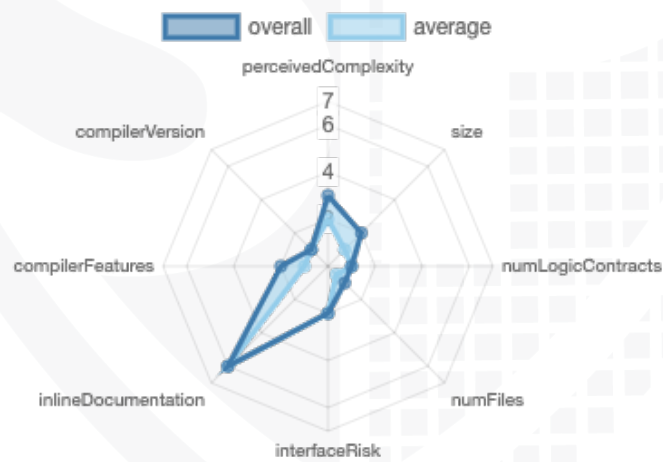
File Name	SHA-1 Hash
contracts/FraktalAirdrop.sol	72bd4e3b35b4c3b54e3647117d819945cab9e636
contracts/StakingPoolForUniswapV2Tokens.sol	b32ecb3f640f936713f6330b4ca0adabee4845a8

Metrics

Source Lines v1.0



Risk Level v1.0



Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	2	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.

Version	Public	Payable
1.0	17	0

Version	External	Internal	Private	Pure	View
1.0	16	19	0	1	3

State Variables

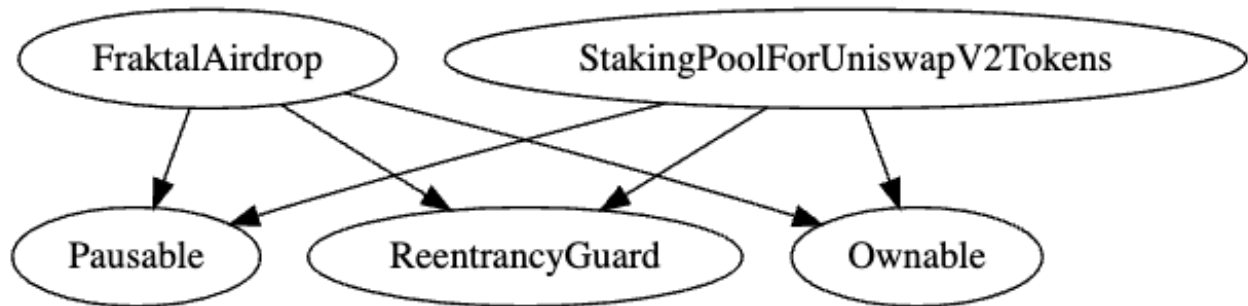
Version	Total	Public
1.0	17	17

Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	<code>^0.8.0</code>				

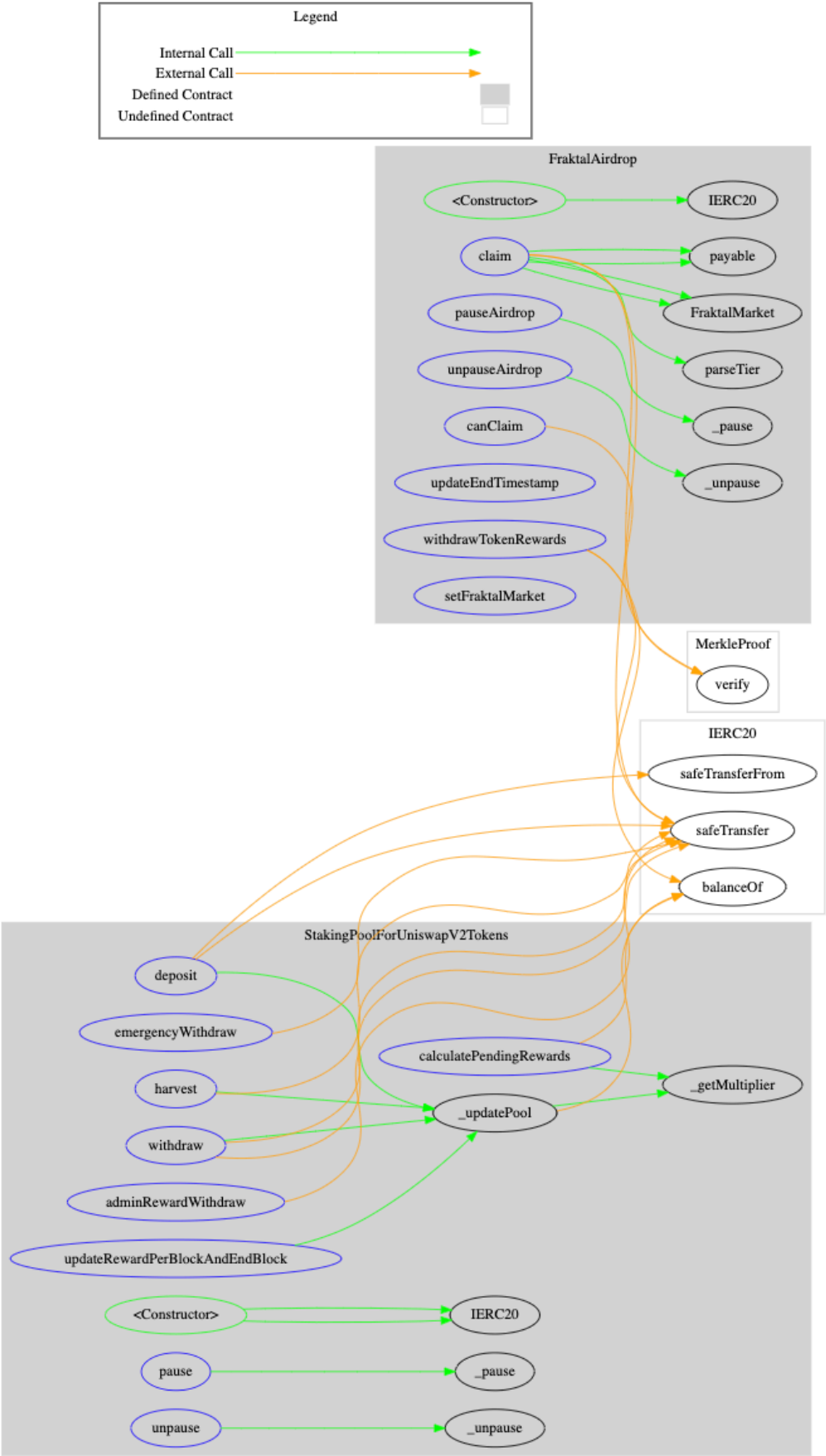
Version	Transfers ETH	Low-Level Calls	DelegateCall	Uses Hash Functions	EC Recover	New/Create/Create2
1.0				yes		

Inheritance Graph v1.0



CallGraph

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. Overall checkup (Smart Contract Security)



Write functions of contract v1.0

StakingPoolForUniswapV2Tokens

```
deposit  
harvest  
emergencyWithdraw  
withdraw  
adminRewardWithdraw  
pause  
unpause  
updateRewardPerBlockAndEndBlock
```

```
renounceOwnership  
transferOwnership
```

FraktalAirdrop

```
claim  
pauseAirdrop  
unpauseAirdrop  
updateEndTimestamp  
withdrawTokenRewards  
setFraktalMarket
```

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

✓  claim	✓  deposit
 whenNotPaused	 nonReentrant
 nonReentrant	✓  harvest
✓  pauseAirdrop	 nonReentrant
 onlyOwner	✓  emergencyWithdraw
 whenNotPaused	 nonReentrant
✓  unpauseAirdrop	 whenPaused
 onlyOwner	✓  withdraw
 whenPaused	 nonReentrant
✓  updateEndTimestamp	✓  adminRewardWithdraw
 onlyOwner	 onlyOwner
✓  withdrawTokenRewards	✓  pause
 onlyOwner	 onlyOwner
 setFraktalMarket	 whenNotPaused
	✓  unpause
	 onlyOwner
	 whenPaused
	✓  updateRewardPerBlockAndEndBlock
	 onlyOwner

Comments

Information: Not listed functions are from imported libraries

- StakingPoolForUniswapV2Tokens
 - Only owner can set following state variables without any limitations
 - endBlock
 - rewardPerBlock
 - Only owner can enable/disable state variables
 - _paused
 - Admin can withdraw specific fraktalToken
 - Addresses can call emergencyWithdraw only when contract is not paused
- Deployer can set following addresses
 - FraktalAirdrop
 - fraktalMarket






- FraktalAirdrop
 - Only owner can withdraw balance of FraktalAirdrop contract
 - Only owner can pause/unpause contract
 - Addresses can claim only if contract is not paused

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/FraktalAirdrop.sol	1	————	172	164	121	14	81	
	contracts/StakingPoolForUniswapV2Tokens.sol	1	————	212	212	149	9	90	————
	Totals	2	————	384	376	270	23	171	

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	FraktalA irdrop	A floating pragma is set	2	The current pragma Solidity directive is „^0.8.0“.
#2	Staking PoolFor Uniswa pV2Tok ens	Missing Zero Address Validation (missing- zero-check)	2	The current pragma Solidity directive is „^0.8.0“.
#3	FraktalA irdrop	Missing Zero Address Validation (missing- zero-check)	50, 169	Check that the address is not zero

Informational issues

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

#1	FraktalA irdrop	Code with no effect	See description	require(isMerkleRootSet,...) in L68 and isMerkleRootSet in L60, L28 is useless because it will be set to true in the constructor and there is no possibility to change it with functions
#2	FraktalA irdrop	Variables can be immutable	See description	Since you are setting startTimestamp and endTimestamp in the constructor only, it can be set to immutable in following lines: - L28 - L30 - L34
#3	FraktalA irdrop	Remove unused events	41	Remove unused events in L41

Audit Comments

03. March 2022:

- [Read whole report 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	NOT 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	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	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

The logo features the words "Solid Proofed" in a white, elegant script font. The word "Solid" is positioned above "Proofed". Behind the text is a faint, stylized shield emblem with a grid-like pattern, rendered in a darker shade of blue. The entire composition is set against a solid blue background.

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A small horizontal bar representing the German flag, with black, red, and gold stripes.

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