



SOLIDProof
Bring trust into your projects

Blockchain Security | Smart Contract Audits | KYC

MADE IN GERMANY

Audit

Security Assessment
26. November, 2021

For



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Version	Date	Description
1.0	26. November 2021	<ul style="list-style-type: none">• Layout project• Automated- /Manual-Security Testing• Summary

Network

Binance Smart Chain (BEP20)

Website

<https://ibee.finance>

Telegram

<https://t.me/ibeefinance>

Twitter

<https://twitter.com/ibeefinance>



Description

iBee is a single assets yield optimizer platform that provides users with an easy and safe way to maximize their yield farming income.

Project Engagement

During the 18th of November 2021, **IBEE 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

TBA

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:

- IBEToken

Context

 SafeMath

IERC20

ERC20

Ownable

- MasterChef

./libraries/contracts-upgradeable/proxy/utils/Initializable.sol

./libraries/contracts-upgradeable/access/OwnableUpgradeable.sol

./libraries/contracts-upgradeable/utils/AddressUpgradeable.sol

 SafeMath

IERC20

ERC20

 SafeERC20

 EnumerableSet

ReentrancyGuardUpgradeable

NATIVEToken

IStrategy

- TimelockController

IERC20

 SafeMath

 Address

 SafeERC20

Context

 EnumerableSet

AccessControl

ReentrancyGuard

INativeFarm

IStrategy

Tested Contract Files

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

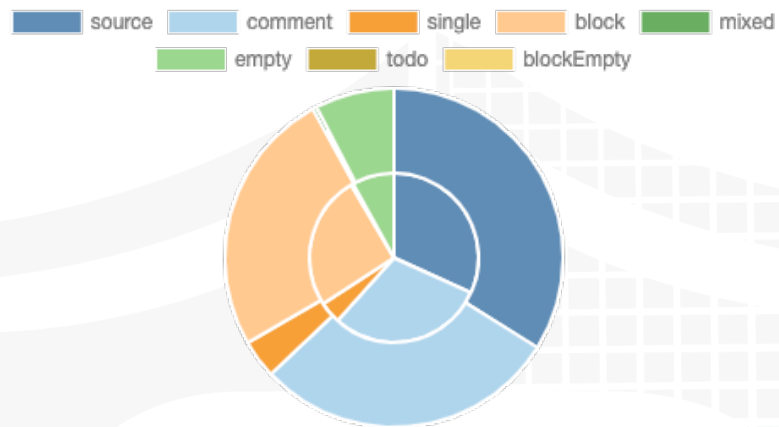
A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

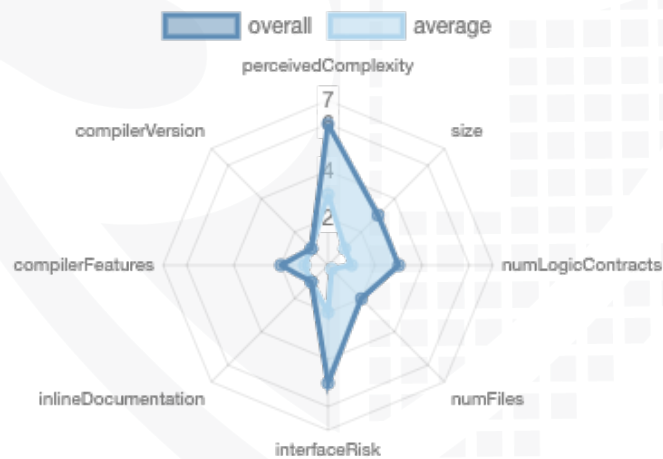
File Name	SHA-1 Hash
contracts/TimelockController.sol	63e6e1cd2558a2dc8611a7297f27c98ef5a6b1e7
contracts/Masterchef.sol	3a3b3f8d245d39739944ee493569ba23829e65bb
contracts/IBEToken.sol	ff7556e249605b587d19e65abd63372d62235685
contracts/libraries/contracts-upgradeable/access/OwnableUpgradeable.sol	e1bf83be931d03a236beadd64078f5c96dcc34be
contracts/libraries/contracts-upgradeable/utis/AddressUpgradeable.sol	9e0760140099d14a3982057d618a562a5e1463e6
contracts/libraries/contracts-upgradeable/utis/ReentrancyGuardUpgradeable.sol	594cf27eba7962d028ae79c4778ca286dc3e9220
contracts/libraries/contracts-upgradeable/utis/ContextUpgradeable.sol	dd49749d3d7febf716f1ec4340c906c9fb275bac
contracts/libraries/contracts-upgradeable/utis/PausableUpgradeable.sol	343ccf862f1aaf01c07b6700f52f4ec148f07aee
contracts/libraries/contracts-upgradeable/proxy/utis/Initializable.sol	8d70de5d3b6c727aa86a9e311d2715861cd96fdf

Metrics

Source Lines v1.0



Risk Level v1.0



Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	5	9	6	12

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	124	7

Version	External	Internal	Private	Pure	View
1.0	42	269	20	28	76

State Variables

Version	Total	Public
1.0	54	20

Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	<code>^0.6.12</code> <code>0.6.12</code> <code>>=0.6.0</code> <code><0.8.0</code>	ABIEncoderV2	yes	yes (4 asm blocks)	

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



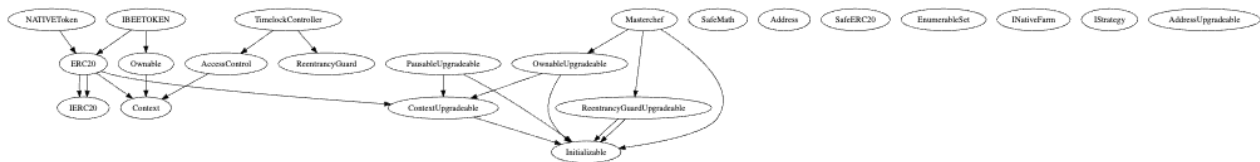
Scope of Work

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



Verify Claims

Correct implementation of Token standard

Tested	Verified
✓	✓

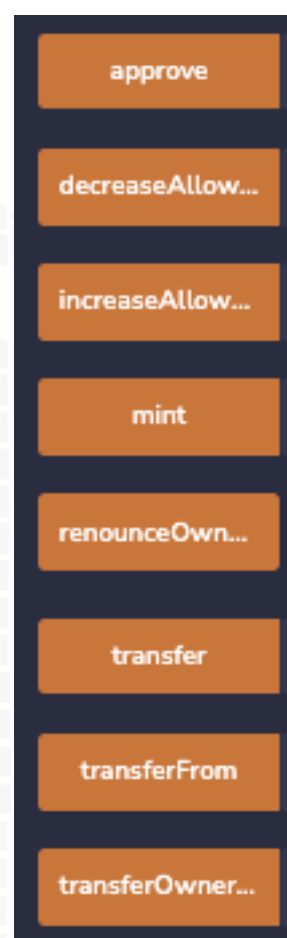
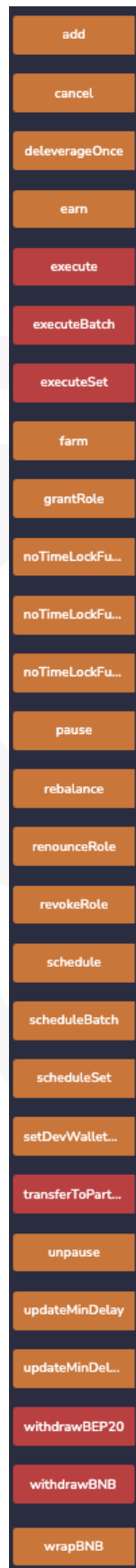
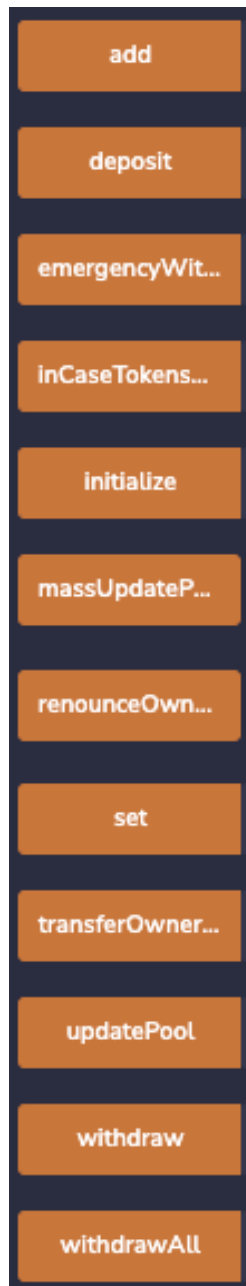
Function	Description	Exist	Tested	Verified
TotalSupply	provides information about the total token supply	✓	✓	✓
BalanceOf	provides account balance of the owner's account	✓	✓	✓
Transfer	executes transfers of a specified number of tokens to a specified address	✓	✓	✓
TransferFrom	executes transfers of a 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

MasterChef:

TimelockController:

IBEEToken:



Deployer cannot mint any new tokens

File	Name	Exist	Tested	Verified
MasterChef	Deployer cannot mint	–	–	–
TimelockController	Deployer cannot mint	–	–	–
IBEToken	Deployer cannot mint	✓	✓	✗

Max / Total Supply: 1.000.000

Comments:

v1.0

- Masterchef using NATIVEToken with token address to mint tokens
 - With updatePool function

Deployer cannot burn or lock user funds

File	Name	Exist	Tested	Verified
MasterChef	Deployer cannot lock	✓	✓	✓
	Deployer cannot burn	✓	✓	✓
TimelockController	Deployer cannot lock	✓	✓	✓
	Deployer cannot burn	—	—	—
IBEEToken	Deployer cannot lock	✓	✓	✓
	Deployer cannot burn	✓	✓	✓

Deployer cannot pause the contract

File	Name	Exist	Tested	Verified
MasterChef	Deployer cannot pause	—	—	—
TimelockController	Deployer cannot pause	✓	✓	✗
IBEEToken	Deployer cannot pause	—	—	—

Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

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

OnlyOwner functions

- TimelockController
 - onlyRole -> EXECUTOR_ROLE

execute 💰

executeBatch 💰

scheduleSet

executeSet 💰

add

earn

farm

pause

unpause

rebalance

deleverageOnce

wrapBNB

noTimeLockFunc1

noTimeLockFunc2

noTimeLockFunc3

- onlyRole -> PROPOSER_ROLE

schedule

scheduleBatch

cancel




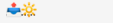



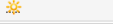



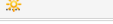



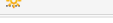




- IBEToken
 - onlyOwner
 - Mint
- MasterChef
 - Initializer
 - Initialize
 - onlyOwner
 - add
 - Set
 - inCaseTokensGetStuck

CallGraph



Source Units in Scope

v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/TimelockController.sol	8	3	1859	1517	714	733	459	
	contracts/Masterchef.sol	7	2	1433	1193	592	532	388	
	contracts/IBEToken.sol	5	1	659	547	214	328	137	
	contracts/libraries/contracts-upgradeable/access/OwnableUpgradeable.sol	1	—	78	78	34	33	30	
	contracts/libraries/contracts-upgradeable/utils/AddressUpgradeable.sol	1	—	189	152	69	101	42	
	contracts/libraries/contracts-upgradeable/utils/ReentrancyGuardUpgradeable.sol	1	—	68	68	20	38	11	
	contracts/libraries/contracts-upgradeable/utils/ContextUpgradeable.sol	1	—	31	31	16	11	7	
	contracts/libraries/contracts-upgradeable/utils/PausableUpgradeable.sol	1	—	97	97	35	50	23	
	contracts/libraries/contracts-upgradeable/proxy/utils/Initializable.sol	1	—	46	46	17	22	6	
	Totals	26	6	4460	3729	1711	1848	1103	

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

- no medium issues found -

Low issues

Issue	File	Type	Line	Description
#1	IBEEToken	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	MasterChef	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
#3	TimelockController	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
#4	IBEEToken	A floating pragma is set	1	The current pragma Solidity directive is „^0.6.12“.
#5	MasterChef	A floating pragma is set	1	The current pragma Solidity directive is „^0.6.12“.

#6	TimelockController	A floating pragma is set	1	The current pragma Solidity directive is „^0.6.12“.
#7	MasterChef	Missing Zero Address Validation (missing-zero-check)	1161, 1160	Check that the address is not zero

Informational issues

Issue	File	Type	Line	Description
#1	IBEEToken	SPDX license identifier not provided in source file	-	Consider adding a SPDX license in source file
#2	MasterChef	SPDX license identifier not provided in source file	-	Consider adding a SPDX license in source file
#3	TimelockController	SPDX license identifier not provided in source file	-	Consider adding a SPDX license in source file
#4	IBEEToken	Functions that are not used	520, 565	Remove unused functions

Commented Code exist

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

File	Line	Comment
TimelockController	206	// assert(a == b * c + a % b); // There is no case in which this doesn't hold
TimelockController	1385	// register proposers // for (uint256 i = 0; i < proposers.length; ++i) { // _setupRole(PROPOSER_ROLE, proposers[i]); // }
TimelockController	1391	// register executors // for (uint256 i = 0; i < executors.length; ++i) { // _setupRole(EXECUTOR_ROLE, executors[i]); // }

Recommendation

Remove the commented code, or address them properly.

Audit Comments

19. November 2021:

- For more information please read the report and do your own research



SWC Attacks

ID	Title	Relationships	Status
SW C-13 6	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SW C-13 5	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SW C-13 4	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SW C-13 3	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SW C-13 2	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SW C-13 1	Presence of unused variables	CWE-1164: Irrelevant Code	PASSED
SW C-13 0	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SW C-12 9	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SW C-12 8	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

SW C-12 7	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
SW C-12 5	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
SW C-12 4	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
SW C-12 3	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
SW C-12 2	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
SW C-12 1	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
SW C-12 0	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-111	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-10 9	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
SW C-10 8	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED
SW C-10 7	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	PASSED
SW C-10 6	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	PASSED

SW C-10 5	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	PASSED
SW C-10 4	Unchecked Call Return Value	CWE-252: Unchecked Return Value	PASSED
SW C-10 3	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	NOT PASSED
SW C-10 2	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	PASSED
SW C-10 1	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	PASSED
SW C-10 0	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED

The logo features the word "SolidProofed" in a white, handwritten-style script. The "P" is particularly large and stylized, with a long horizontal stroke that extends to the left. The background is a solid blue color with a faint, large shield emblem. The shield has a grid-like pattern on its right side and a solid blue area on its left side.

SolidProofed

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

MADE IN GERMANY