SOLIDProof
Bring trust into your projects

Blockchain Security | Smart Contract Audits | KYC

MADE IN GERMANY

Lop

Audit

Security Assessment

10. September, 2022

For

LEAGUE OF PETS

SolidProof_io

@solidproof_io

Disclaimer

SolidProof.io reports are not, nor should be considered, an "endorsement" or "disapproval" of any particular project or team. These reports are not, nor should be considered, an indication of the economics or value of any "product" or "asset" created by any team. SolidProof.io do not cover testing or auditing the integration with external contract or services (such as Unicrypt, Uniswap, PancakeSwap etc'...)

SolidProof.io Audits do not provide any warranty or guarantee regarding the absolute bug- free nature of the technology analyzed, nor do they provide any indication of the technology proprietors. SolidProof Audits should not be used in any way to make decisions around investment or involvement with any particular project. These reports in no way provide investment advice, nor should be leveraged as investment advice of any sort.

SolidProof.io Reports represent an extensive auditing process intending to help our customers increase the quality of their code while reducing the high level of risk presented by cryptographic tokens and blockchain technology. Blockchain technology and cryptographic assets present a high level of ongoing risk. SolidProof's position is that each company and individual are responsible for their own due diligence and continuous security. SolidProof in no way claims any guarantee of security or functionality of the technology we agree to analyze.

Version	Date	Description
1.0	03. September 2022	• Layout project • Automated- /Manual-Security Testing • Summary
1.1	10. September 2022	• Reaudit

Network
Binance Smart Chain (BEP20)

Website
https://leagueofpets.com/

Telegram
https://t.me/leagueofpets

Twitter
https://twitter.com/leagueofpets

Description

ENTER THE LEAGUE OF PETS AND EARN YOUR WAY TO GLORY! AN EPIC TURN-BASED 'PLAY TO EARN' RPG GAME. USE YOUR STRATEGY AND WIT TO OVERCOME ALL VILLAINS AND DESTROY EVIL. GLORY IS EARNT THROUGH VALOUR!

Project Engagement

During the 1st of September 2022, **LOP 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

v1.1

- Provided as files

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:

```
SafeMath
IERC20
IUniswapV2Router01
IUniswapV2Router02
IUniswapV2Pair
IUniswapV2Factory
Context
Ownable
ERC20
SwapContract
```

```
Context
SafeMath
Ownable
IUniswapV2Router01
IUniswapV2Router02
IERC20
```

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

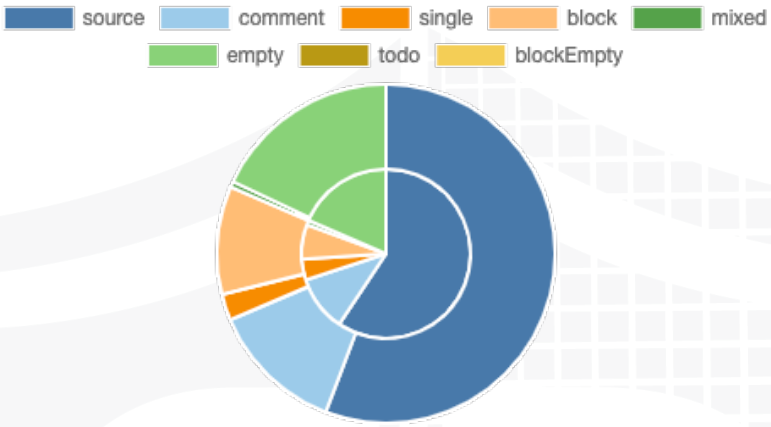
File Name	SHA-1 Hash
contracts/lop.sol	678240f27c8793f98bc5378ffa16016894133817
contracts/swapContract.sol	50f4a7f22854874f0253b4eeeacb7e755cfdb960

v1.1

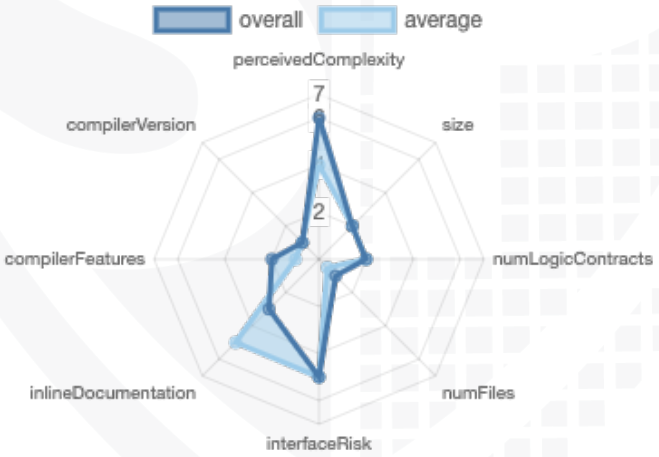
File Name	SHA-1 Hash
contracts/lop.sol	d09bf2ee4b05d09dacf2835e5c6a8202a2ea90f3
contracts/swapContract.sol	82c8b83bab53a7ab1c09169c33526ee85836f880

Metrics

Source Lines
v1.0



Risk Level
v1.0



Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	3	2	9	4

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	136	8

Version	External	Internal	Private	Pure	View
1.0	107	116	4	29	40
1.1	107	117	5	29	40

State Variables

Version	Total	Public
1.0	44	33

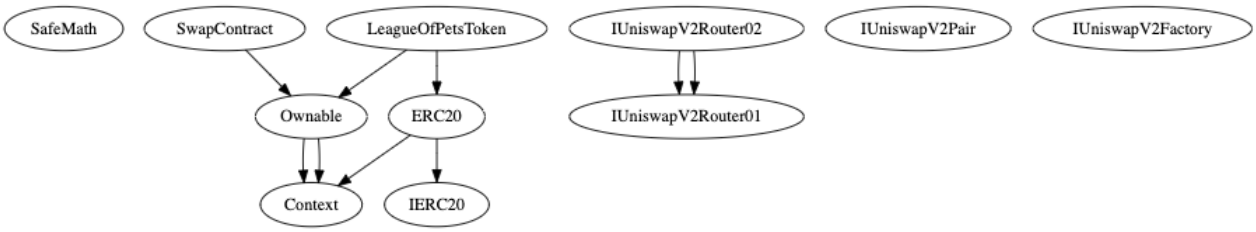
Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	`>=0.7.5` `^0.8.0` `>=0.7.0` `<0.9.0`		`yes`		

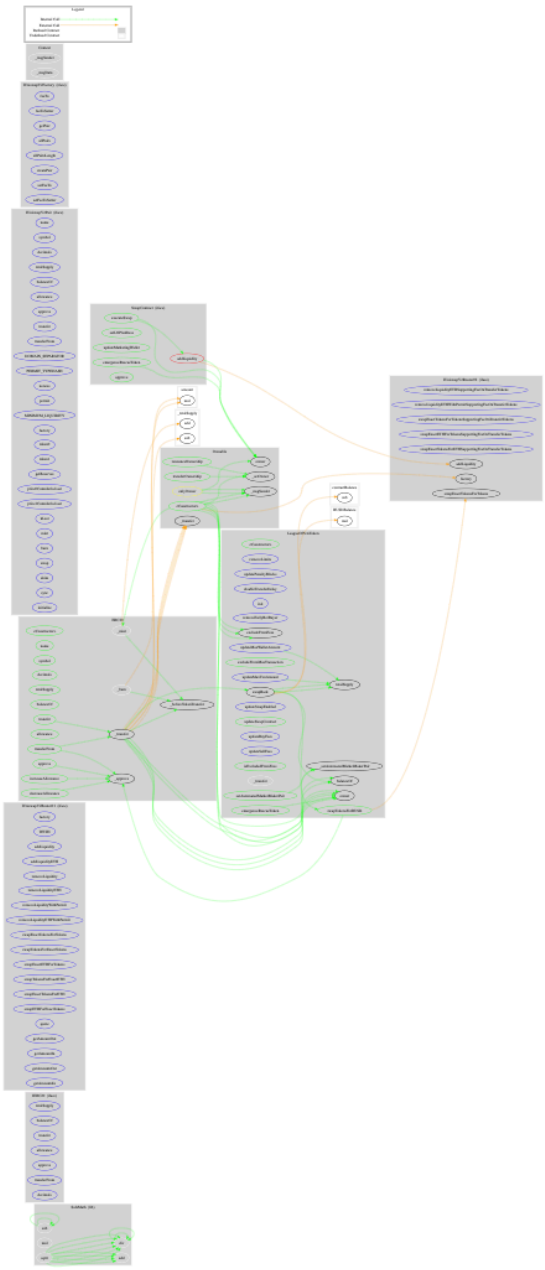
Version	Transfers ETH	Low-Level Calls	DelegateCall	Uses Hash Functions	ECRecover	New/Create/Create2
1.0	yes					

Inheritance Graph

v1.1



CallGraph
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

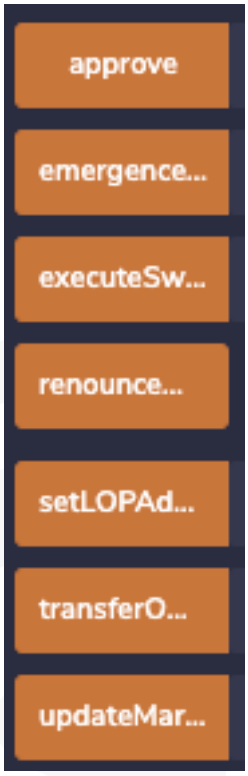
Name	
Is contract an upgradeable?	No

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



v1.1

- Update game vault function has been added

Deployer cannot mint any new tokens

Name	Exist	Tested	Status
Deployer cannot mint	✓	✓	✓
Max / Total Supply			100000000

Comments:

v1.0

- Owner can mint new tokens

Deployer cannot burn or lock user funds

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

Comments:

v1.0

- Owner can lock user funds by
  - blacklisting addresses (earlyBotBuyers)

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:

v1.0

- Owner can set sell fees up to 30%

Deployer can blacklist/antisnipe addresses

Name	Exist	Tested	Status
Deployer cannot blacklist/antisnipe addresses	✓	✓	✗

Comments:

v1.0

- Owner can blacklist addresses (early bird)

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

- removeLimits
  - onlyOwner
- updatePenaltyBlocks
  - onlyOwner
- disableTransferDelay
  - onlyOwner
- init
  - onlyOwner
- removeEarlyBotBuyer
  - onlyOwner
- updateMaxTxnAmount
  - onlyOwner
- updateMaxWalletAmount
  - onlyOwner
- excludeFromMaxTransaction
  - onlyOwner
- setAutomatedMarketMakerPair
  - onlyOwner
- excludeFromFees
  - onlyOwner
- updateSwapEnabled
  - onlyOwner
- updateSwapContract
  - onlyOwner
- updateBuyFees
  - onlyOwner
- updateSellFees
  - onlyOwner
- swapTokensForBUSD
- emergenceRescueToken
  - onlyOwner

- setLOPAddress
  - onlyOwner
- updateMarketingWallet
  - onlyOwner
- executeSwap
- emergenceRescueToken
  - onlyOwner
- approve
  - onlyOwner

Comments

- *Deployer can set following state variables without any limitations*
  - LOP
    - penaltyBlocks

- *Deployer can enable/disable following state variables*
  - LOP
    - swapEnabled
    - _isExcludedFromFees
    - automatedMarketMakerPairs
    - _isExcludedMaxTransactionAmount

        - earlyBotBuyers
        - transferDelayEnabled
            - Can be set to false only
        - limitsInEffect
            - Can be set to false only

- *Deployer can set following addresses*
    - SwapContract
        - LOP
        - marketingWallet
    - LOP
        - swapContract

- *Existing Modifiers*
    - onlyOwner

- SwapContract
    - Owner can
        - Approve tokens
        - Rescue tokens
- Lop
    - Owner can drain tokens from contract
    - LiquidityTokens will be added to the swapContract and swapContract added the liquidity to the owner

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/lop.sol	5	6	948	650	457	103	482	💰💠🔆
📝📚🔍🎨	contracts/swapContract.sol	4	3	454	249	152	106	169	💰💠
📝📚🔍🎨	**Totals**	**9**	**9**	**1402**	**899**	**609**	**209**	**651**	💰💠🔆

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	LOP	Owner can drain contract	948	The owner is able to call the “emergenceRescueToken” function to drain contract tokens. We recommend to prevent passing own contract address
#2	SwapContract	Owner can drain contract	427	The owner is able to call the “emergenceRescueToken” function to drain contract tokens. We recommend to prevent passing own contract address

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	LOP	A floating pragma is set	3, 394	Contract used the “^” in the pragma. We recommend you to use a specific pragma version.

#3	SwapContract	A floating pragma is set	7, 90, 372	Contract used the "^" in the pragma. We recommend you to use a specific pragma version.
#4	LOP	Missing Zero Address Validation (missing-zero-check)	627, 696, 743,	Check that the address is not zero
#5	SwapContract	Missing Zero Address Validation (missing-zero-check)	382, 391, 395	Check that the address is not zero
#6	LOP	Missing Events Arithmetic	704, 709, 667	Emit an event for critical parameter changes

Informational issues

Issue	File	Type	Line	Description
#1	LOP	State variables that could be declared constant (constable-states)	580	Add the `constant` attributes to state variables that never change
#2	LOP	Misspelling	See description	Change following words: - exlcude L603 Make sure to change it everywhere else as well.
#3	All	NatSpec documentation missing	-	If you started to comment your code, also comment all other functions, variables etc.
#5	LOP	Transferring ownership	655	While transferring the ownership the old owner was not included into fees.

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.

03. September 2022:

- Gamevault contract was not provided to solidproof. Please do your own research here

- Read whole report and modifiers section for more information

10. September 2022:

- Gamevault contract was not provided to solidproof. Please do your own research here
- GameVault update function has been added to the contract
- Read whole report and modifiers section 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	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	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

SolidProof_io

@solidproof_io

SolidProofed

Blockchain Security | Smart Contract Audits | KYC

MADE IN GERMANY