



Smart Contract Security Audit Report

PathFund

November 2022

Security Status



www.hacksafe.io



Audit Details



Audited project

PathFund



Deployer address

0x00f65796ab084131c809eb5aa44461739d2bd8b3



Client contacts

PathFund Team



Blockchain

Binance smart chain



Website

<https://pathfund.net/>

Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.

Procedure

Step 1 - In-Depth Manual Review

Manual line-by-line code reviews to ensure the logic behind each function is sound and safe from various attack vectors. This is the most important and lengthy portion of the audit process (as automated tools often cannot find the nuances that lead to exploits such as flash loan attacks).

Step 2 - Automated Testing

Simulation of a variety of interactions with your Smart Contract on a test blockchain leveraging a combination of automated test tools and manual testing to determine if any security vulnerabilities exist.

Step 3 – Leadership Review

The engineers assigned to the audit will schedule meetings with our leadership team to review the contracts, any comments or findings, and ask questions to further apply adversarial thinking to discuss less common attack vectors.

Step 4 - Resolution of Issues

Consulting with the team to provide our recommendations to ensure the code's security and optimize its gas efficiency, if possible. We assist project team's in resolving any outstanding issues or implementing our recommendations.

Step 5 - Published Audit Report

Boiling down results and findings into an easy-to-read report tailored to the project. Our audit reports highlight resolved issues and any risks that exist to the project or its users, along with any remaining suggested remediation measures. Diagrams are included at the end of each report to help users understand the interactions which occur within the project.

Background

HackSafe was commissioned by PathFund to perform an audit of smart contracts:

- <https://bscscan.com/address/0x9974F4E6FF49ac39469928E5d7cCa3E8649ae6b8#code>

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be understood to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

Contract Details

Token contract details for 22.11.2022

Token Type	: Launchpad
Contract name	: PathFund
Contract address	: 0x9974F4E6FF49ac39469928E5d7cCa3E8649ae6b8
Total supply	: 1,000,000,000,000,000
Token ticker	: PATH
Decimals	: 9
Token Holders	: 15,111
Transactions count	: 70,236
Compiler version	: v0.8.3+commit.8d00100c
Contract deployer address	: 0x00f65796ab084131c809eb5aa44461739d2bd8b3
Owner address	: 0x00f65796ab084131c809eb5aa44461739d2bd8b3

Audit Summary

According to the standard audit assessment, Customer`s solidity smart contracts are **“Poor Secure”**. This token contract does contain owner control, which do not make it fully decentralized as owner does have control over smart contract.

Insecure	Poor secured	Secure	Well-secured
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We used various tools like Slither, Mythril and Remix IDE. At the same time this finding is based on critical analysis of the manual audit. All issues found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the issues checking status.

We found 0 critical, 1 high, 1 medium and 1 low.

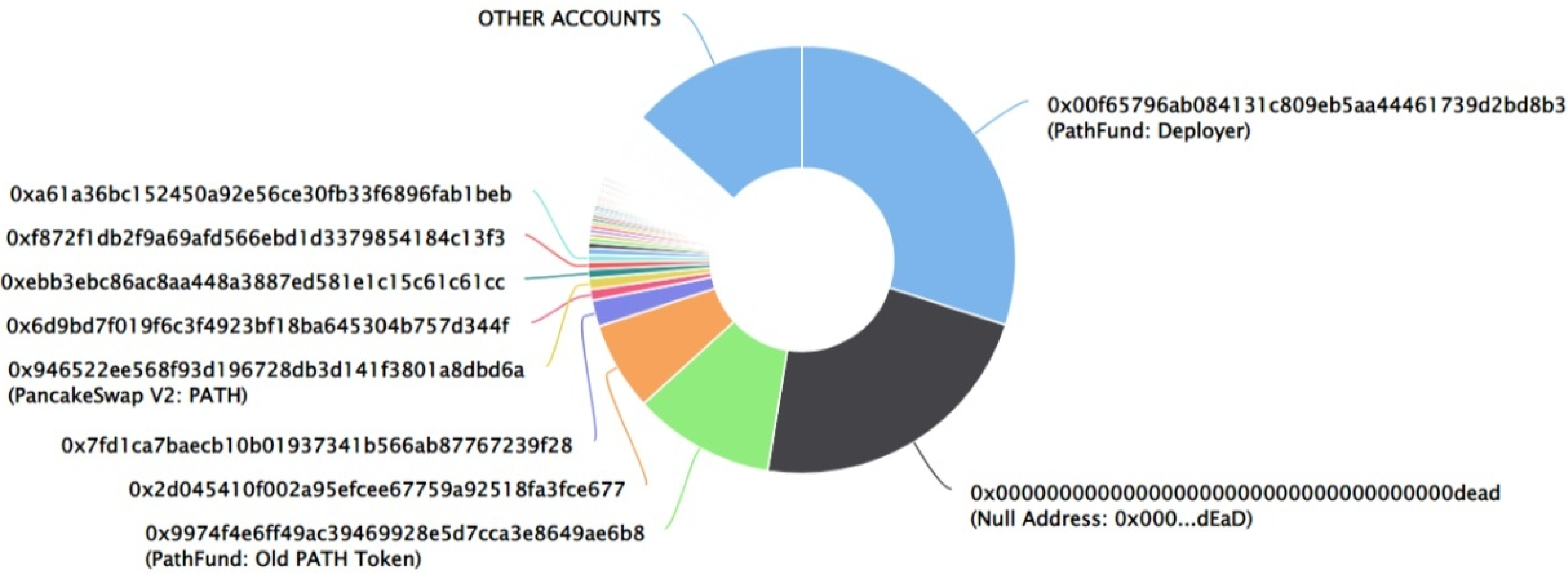
PathFund Distribution

💡 The top 100 holders collectively own 86.57% (865,703,953,096,167.00 Tokens) of PathFund

💡 Token Total Supply: 1,000,000,000,000,000.00 Token | Total Token Holders: 15,111






PathFund Top 100 Token Holders

Source: BscScan.com



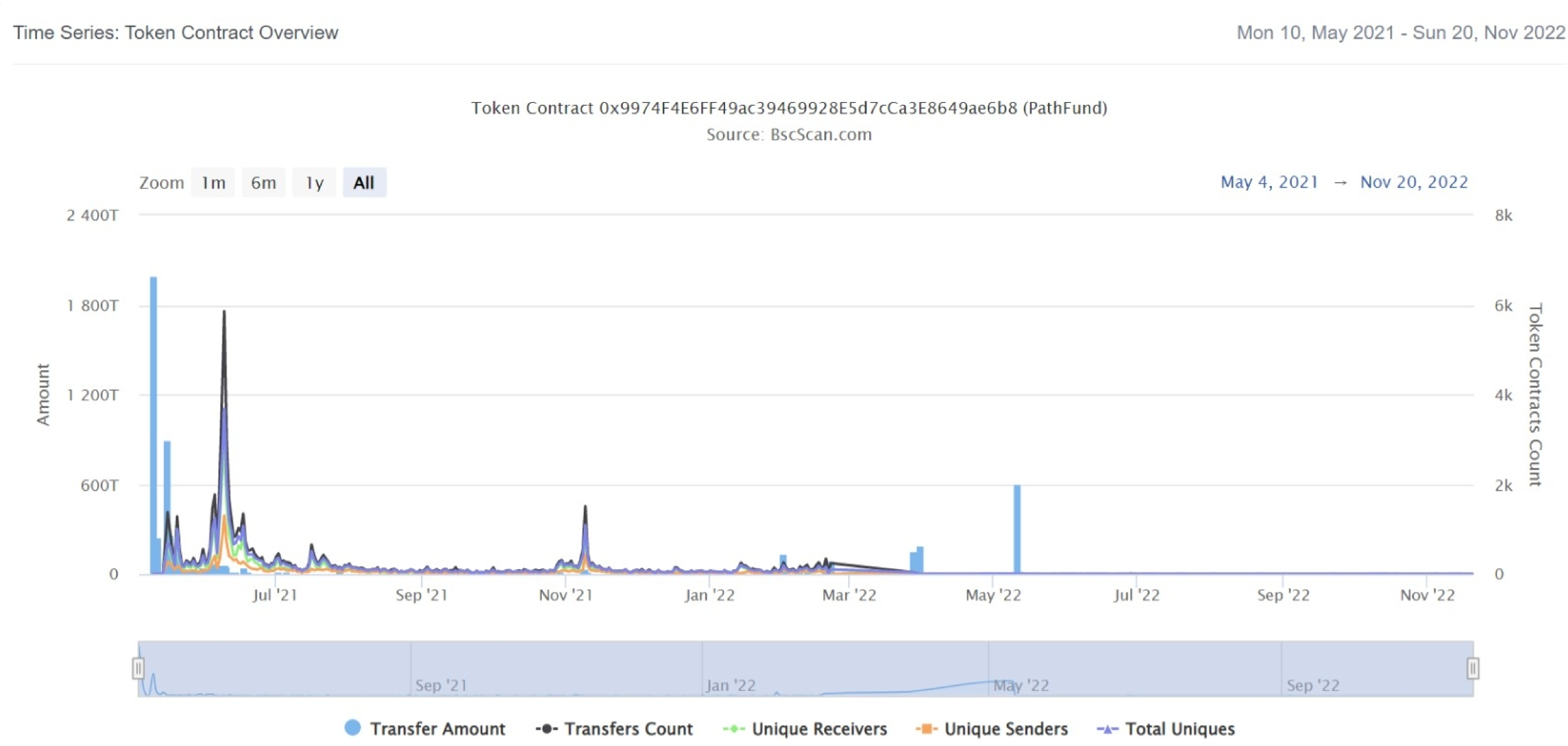
PathFund Top 20 Token Holders

(A total of 865,703,953,096,167.00 tokens held by the top 100 accounts from the total supply of 1,000,000,000,000,000.00 token)

Rank	Address	Quantity (Token)	Percentage
1	PathFund: Deployer	299,470,119,976,769.965973791	29.9470%
2	Null Address: 0x000...dEaD	226,115,812,746,324.800247962	22.6116%
3	 PathFund: Old PATH Token	107,013,168,691,450.181619369	10.7013%
4	 0x2d045410f002a95efcee67759a92518fa3fce677	66,899,671,951,773.481195818	6.6900%
5	 0x7fd1ca7baecb10b01937341b566ab87767239f28	19,815,966,254,265.659374427	1.9816%
6	0x6d9bd7f019f6c3f4923bf18ba645304b757d344f	8,337,836,152,866.770011767	0.8338%
7	 PancakeSwap V2: PATH	8,334,026,498,261.935773032	0.8334%
8	0xebb3ebc86ac8aa448a3887ed581e1c15c61c61cc	6,941,868,507,188.485493277	0.6942%
9	0xf872f1db2f9a69afd566ebd1d3379854184c13f3	5,544,092,729,442.477444669	0.5544%
10	0xa61a36bc152450a92e56ce30fb33f6896fab1beb	5,342,551,165,392.836174225	0.5343%
11	0x0ddcc935d5b122e113a68845144a631883658e7a	5,072,332,171,637.563559192	0.5072%
12	0xa49702a29c99e6c4516b4f867a763eb913b978b4	4,074,463,305,075.042498286	0.4074%
13	0x8de36a7b2855c8ee735098e1d12aacf5815f72e5	3,755,105,530,381.916261444	0.3755%
14	 0x0bd09744a384c23d1ec97b39225a90fc38f4d70c	3,303,411,115,281.255602959	0.3303%
15	0x409b00a6a90ca7eea230418db402c8c68605b72b	2,977,164,593,394.915944972	0.2977%
16	0xb9a7fd6d1d84042daaaf754393e7d7b730ea8e10	2,945,008,494,521.649595186	0.2945%
17	0x2f21f2a6d0d081dfc0f79591295d8ee8768916e8	2,879,877,856,033.2303	0.2880%
18	0x25cba41d4b58ba081cbc7d404e0131538a8a5858	2,689,808,673,274.840687771	0.2690%
19	0x48ae21cc292a8b3182bc7714fb8e5f125c464326	2,567,600,000,000	0.2568%
20	0xc81ff87ad8378eace3668f1c451f2663081eb4ae	2,378,787,320,000	0.2379%

PathFund Distribution

PathFund Contract Overview



Contract functions details

+[Int] IERC20

- [Ext] totalSupply
- [Ext] balanceOf
- [Ext] transfer
- [Ext] allowance
- [Ext] approve
- [Ext] transferFrom

+[Lib] SafeMath

- [Int] tryAdd
- [Int] trySub
- [Int] tryMul
- [Int] tryDiv
- [Int] tryMod
- [Int] add
- [Int] sub
- [Int] mul
- [Int] div
- [Int] mod
- [Int] sub
- [Int] div
- [Int] mod

+Context

- [Int] _msgSender
- [Int] _msgData

+Address

- [Int] isContract
- [Int] sendValue
- [Int] functionCall
- [Int] functionCall
- [Int] functionCallWithValue
- [Int] functionCallWithValue
- [Int] functionStaticCall
- [Int] functionStaticCall
- [Int] functionDelegateCall
- [Int] functionDelegateCall
- [Pvt] _verifyCallResult

Contract functions details

+ [Int] IUniswapV2Factory

- [Ext] feeTo
- [Ext] feeToSetter
- [Ext] getPair
- [Ext] allPairs
- [Ext] allPairsLength
- [Ext] createPair
- [Ext] setFeeTo
- [Ext] setFeeToSetter

+ [Int] IUniswapV2Pair

- [Ext] name
- [Ext] symbol
- [Ext] decimals
- [Ext] totalSupply
- [Ext] balanceOf
- [Ext] allowance
- [Ext] approve
- [Ext] transfer
- [Ext] transferFrom
- [Ext] DOMAIN_SEPARATOR
- [Ext] PERMIT_TYPEHASH
- [Ext] MINIMUM_LIQUIDITY
- [Ext] factory
- [Ext] token0
- [Ext] token1
- [Ext] getReserves
- [Ext] price0CumulativeLast
- [Ext] price1CumulativeLast
- [Ext] kLast
- [Ext] mint
- [Ext] burn
- [Ext] swap
- [Ext] skim
- [Ext] sync
- [Ext] initialize

+ [Int] IUniswapV2Router01

- [Ext] factory

Contract functions details

- [Ext] WETH
- [Ext] addLiquidity
- [Ext] addLiquidityETH
- [Ext] removeLiquidity
- [Ext] removeLiquidityETH
- [Ext] removeLiquidityWithPermit
- [Ext] removeLiquidityETHWithPermit
- [Ext] swapExactTokensForTokens
- [Ext] swapTokensForExactTokens
- [Ext] swapExactETHForTokens
- [Ext] swapTokensForExactETH
- [Ext] swapExactTokensForETH
- [Ext] swapETHForExactTokens
- [Ext] quote
- [Ext] getAmountOut
- [Ext] getAmountIn
- [Ext] getAmountsOut
- [Ext] getAmountsIn

+ [Int] IUniswapV2Router02 (IUniswapV2Router01)

- [Ext] removeLiquidityETHSupportingFeeOnTransferTokens
- [Ext] removeLiquidityETHWithPermitSupportingFeeOnTransferTokens
- [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens
- [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens
- [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens

+ PathFund (Context, IERC20, Ownable)

- <constructor>
- [Pub] name
- [Pub] symbol
- [Pub] decimals
- [Pub] totalSupply
- [Pub] balanceOf
- [Pub] transfer #
- [Pub] allowance
- [Pub] approve #
- [Pub] transferFrom #
- [Pub] increaseAllowance #
- [Pub] decreaseAllowance #

Contract functions details

- [Pub] isExcludedFromReward #
- [Pub] totalFees
- [Pub] deliver #
- [Pub] reflectionFromToken #
- [Pub] tokenFromReflection #
- [Pub] excludeFromReward #
 - modifiers: onlyOwner
- [Ext] includeInReward #
 - modifiers: onlyOwner
- [Pvt] _transferBothExcluded #
- [Pub] excludeFromFee #
 - modifiers: onlyOwner
- [Pub] includeInFee #
 - modifiers: onlyOwner
- [Ext] setTaxFeePercent #
 - modifiers: onlyOwner
- [Ext] setMarketingFeePercent #
 - modifiers: onlyOwner
- [Ext] setLiquidityFeePercent #
 - modifiers: onlyOwner
- [Ext] setMaxTxPercent #
 - modifiers: onlyOwner
- [Ext] setSwapAndLiquifyEnabled #
 - modifiers: onlyOwner
- [Pvt] _reflectFee
- [Pvt] _getValues
- [Pvt] _getTValues
- [Pvt] _getRValues
- [Pvt] _getRate
- [Pvt] _getCurrentSupply
- [Pvt] _takeLiquidity
- [Pvt] _takeMarketing
- [Pvt] calculateTaxFee
- [Pvt] calculateMarketingFee
- [Pvt] calculateLiquidityFee
- [Pvt] removeAllFee
- [Pvt] restoreAllFee
- [Pub] isExcludedFromFee #

Contract functions details

- [Pvt] _approve #
- [Pvt] _transfer #
- [Pvt] swapAndLiquify #
 - modifiers: lockTheSwap
- [Pvt] swapTokensForEth #
- [Pvt] addLiquidity #
- [Pvt] _tokenTransfer #
- [Pvt] _transferStandard #
- [Pvt] _transferToExcluded #
- [Pvt] _transferFromExcluded #

(\$) = payable function

= non-constant function

Issues Checking Status

No.	Title	Status
1.	Unlocked Compiler Version	Low issue
2.	Missing Input Validation	Passed
3.	Race conditions and Reentrancy. Cross-function race conditions.	Passed
4.	Possible delays in data delivery	Passed
5.	Oracle calls.	Passed
6.	Timestamp dependence.	High issue
7.	Integer Overflow and Underflow	Passed
8.	DoS with Revert.	Passed
9.	DoS with block gas limit.	Medium issue
10.	Methods execution permissions.	Passed
11.	Economy model of the contract.	Passed
12.	Private use data leaks.	Passed
13.	Malicious Event log.	Passed
14.	Scoping and Declarations.	Passed
15.	Uninitialized storage pointers.	Passed
16.	Arithmetic accuracy.	Passed
17.	Design Logic.	Passed
18.	Safe Open Zeppelin contracts implementation and usage.	Passed
19.	Incorrect Naming State Variable	Passed
20.	Too old version	Passed

Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to assets loss or data manipulations.
High	High-level vulnerabilities are difficult to exploit; however, they also have a significant impact on smart contract execution, e.g., public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to assets loss or data manipulations.
Low	Low-level vulnerabilities are mostly related to outdated, unused, etc. code snippets that can't have a significant impact on execution.

Security Issues

✔ Critical Severity Issues

No critical severity issue found.

✔ High Severity Issues

One high severity issue found.

1. Timestamp dependence.

- **Description**

The contract have used `block.timestamp` many times in some functions such as `_swapTokensForEth`, `addLiquidity` as the miners here can manipulate the smart contract in order to attack the contract.

- **Recommendation**

We advise you to not use `block.timestamp` in your contract and apply the 15-second rule which says that If the scale of your time-dependent event can vary by 15 seconds and maintain integrity, it is safe to use a `block.timestamp`.

✔ Medium Severity Issues

One medium severity issue found.

1. Out of gas limit.

- **Description**

The smart contract has functions which has used for `includeAccount`, `_getCurrentSupply`. Large length of `_excluded` can cause an error of out of gas for these two functions.

- **Recommendation**

It is advisable to either remove for loop or use smaller length to avoid the gas limit error while transaction.

✔ Low Severity Issues

One low severity issue found.

1. Unlocked Compiler Version

- **Description**

The contract utilizes an unlocked compiler version. An unlocked compiler version in the contract's source code permits the user to compile it at or above a particular version. This, in turn, leads to differences in the generated bytecode between compilations due to differing compiler version numbers. This can lead to ambiguity when debugging as compiler-specific bugs may occur in the codebase that would be difficult to identify over a span of multiple compiler versions rather than a specific one.

Security Issues

- **Recommendation**

It is advisable that the compiler version is alternatively locked at the lowest version possible so that the contract can be compiled. For example, for version ^0.8.3 the contract should contain the following line:

```
pragma solidity 0.8.3;
```


Centralization

Owner Privileges :

- PathFund Contract:
 - Owner can renounce and transfer ownership.
 - Owner can exclude and include account from rewards.
 - Owner can exclude and include account from fee.
 - Owner can set tax fee percentage.
 - Owner can set marketing fee percentage.
 - Owner can set liquidity fee percentage.
 - Owner can set max transaction percentage

This smart contract has some functions which can be executed by the admin (Owner) only. If the admin wallet private key would be compromised, then it would create trouble as smart contract ownership has not been renounced. Following are Admin functions:

- renounceOwnership
- transferOwnership
- excludeFromReward
- includeinReward
- excludeFromFee
- includeinFee
- settaxFeePercent
- setmarketingFeePercent
- setliquidityFeePercent
- setmaxTxPercent
- setSwapAndLiquifyEnabled

Conclusion

Smart contract contains low, medium, high severity issues! The further transfer and operations with the fund raised are not related to this particular contract.

HackSafe note: Please check the disclaimer above and note, the audit makes no statements or warranties on business model, investment attractiveness or code sustainability. The report is provided for the only contract mentioned in the report and does not include any other potential contracts deployed by Owner.