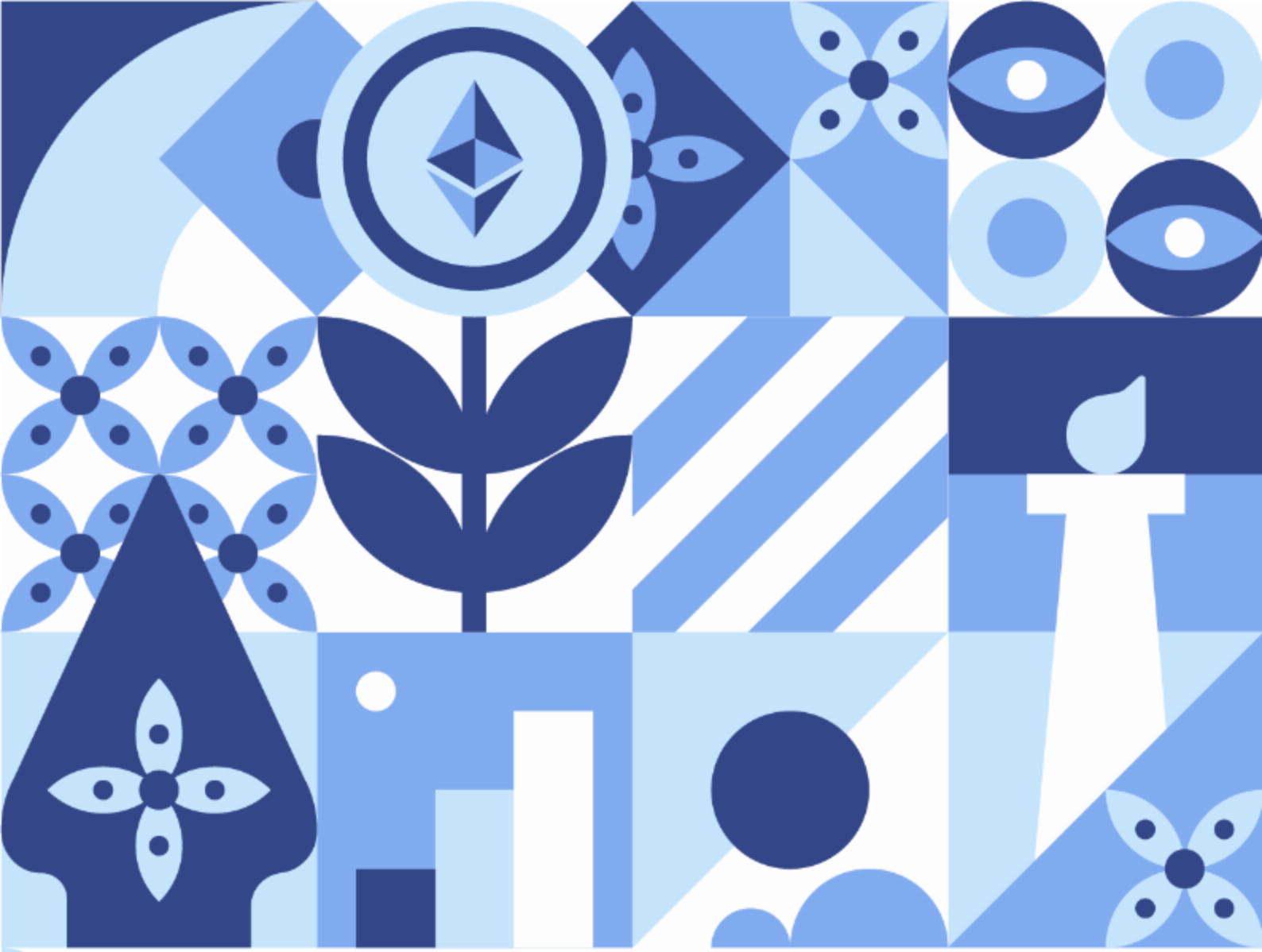

Swaperium

Smart Contract Audit Report

SYSFIXED

04 Feb 2023

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AUDITED DETAILS

Audited Project

Project name	Token ticker	Blockchain
Swaperium	$WAPIUM	Ethereum

Addresses

Contract address	0xbd5d8e6eb59b3e42099c065b0280b2a69a23a9a8
Contract deployer address	0x44ce0003D828F99Cd8f8576a7444f5a37c4987e4

Project Website

https://swaperium.world/

Codebase

https://etherscan.io/address/0xbd5d8e6eb59b3e42099c065b0280b2a69a23a9a8#code

SUMMARY

Swaperium is a swap developed for the L2 Shibarium blockchain. Swaperium is a multilayer swap and includes blockchains such as ERC20, BSC, SOLANA, AVAX, and a lot more. With Swaperium, you will be able to bridge different chains to Shibarium and swap $SWAPIUM tokens for upcoming coins on the Shibarium blockchain.

Contract Summary

Documentation Quality

Swaperium provides a very good documentation with standard of solidity base code.

- The technical description is provided clearly and structured and also dont have any high risk issue.

Code Quality

The Overall quality of the basecode is standard.

- Standard solidity basecode and rules are already followed by Swaperium with the discovery of several low issues.

Test Coverage

Test coverage of the project is 100% (Through Codebase)

Audit Findings Summary

- SWC-101 | It is recommended to use vetted safe math libraries for arithmetic operations consistently on lines 90, 105, 113, 114, 128, 182, 182, 183, 183, 208, 208, 209, 209, 210, 210, 359, 438 and 590.
- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 11.
- SWC-110 SWC-123 | It is recommended to use of revert(), assert(), and require() in Solidity, and the new REVERT opcode in the EVM on lines 405, 406, 439 and 591.

CONCLUSION

We have audited the Swaperium project released on February 2023 to discover issues and identify potential security vulnerabilities in Swaperium Project. This process is used to find technical issues and security loopholes which might be found in the smart contract.

The security audit report provides a satisfactory result with some low-risk issues.

The issues found in the Swaperium smart contract code do not pose a considerable risk. The writing of the contract is close to the standard of writing contracts in general. The low-risk issues found are some arithmetic operation issues, a floating pragma is set, and out of bounds array access which the index access expression can cause an exception in case of the use of an invalid array index value.

AUDIT RESULT

Article	Category	Description	Result
Default Visibility	SWC-100 SWC-108	Functions and state variables visibility should be set explicitly. Visibility levels should be specified consciously.	PASS
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	ISSUE FOUND
Outdated Compiler Version	SWC-102	It is recommended to use a recent version of the Solidity compiler.	PASS
Floating Pragma	SWC-103	Contracts should be deployed with the same compiler version and flags that they have been tested thoroughly.	ISSUE FOUND
Unchecked Call Return Value	SWC-104	The return value of a message call should be checked.	PASS
Unprotected Ether Withdrawal	SWC-105	Due to missing or insufficient access controls, malicious parties can withdraw from the contract.	PASS
SELFDESTRUCT Instruction	SWC-106	The contract should not be self-destructible while it has funds belonging to users.	PASS
Reentrancy	SWC-107	Check effect interaction pattern should be followed if the code performs recursive call.	PASS
Uninitialized Storage Pointer	SWC-109	Uninitialized local storage variables can point to unexpected storage locations in the contract.	PASS
Assert Violation	SWC-110 SWC-123	Properly functioning code should never reach a failing assert statement.	ISSUE FOUND
Deprecated Solidity Functions	SWC-111	Deprecated built-in functions should never be used.	PASS
Delegate call to Untrusted Callee	SWC-112	Delegatecalls should only be allowed to trusted addresses.	PASS

DoS (Denial of Service)	SWC-113 SWC-128	Execution of the code should never be blocked by a specific contract state unless required.	PASS
Race Conditions	SWC-114	Race Conditions and Transactions Order Dependency should not be possible.	PASS
Authorization through tx.origin	SWC-115	tx.origin should not be used for authorization.	PASS
Block values as a proxy for time	SWC-116	Block numbers should not be used for time calculations.	PASS
Signature Unique ID	SWC-117 SWC-121 SWC-122	Signed messages should always have a unique id. A transaction hash should not be used as a unique id.	PASS
Incorrect Constructor Name	SWC-118	Constructors are special functions that are called only once during the contract creation.	PASS
Shadowing State Variable	SWC-119	State variables should not be shadowed.	PASS
Weak Sources of Randomness	SWC-120	Random values should never be generated from Chain Attributes or be predictable.	PASS
Write to Arbitrary Storage Location	SWC-124	The contract is responsible for ensuring that only authorized user or contract accounts may write to sensitive storage locations.	PASS
Incorrect Inheritance Order	SWC-125	When inheriting multiple contracts, especially if they have identical functions, a developer should carefully specify inheritance in the correct order. The rule of thumb is to inherit contracts from more /general/ to more /specific/.	PASS
Insufficient Gas Griefing	SWC-126	Insufficient gas griefing attacks can be performed on contracts which accept data and use it in a sub-call on another contract.	PASS
Arbitrary Jump Function	SWC-127	As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value.	PASS

Typographical Error	SWC-129	A typographical error can occur for example when the intent of a defined operation is to sum a number to a variable.	PASS
Override control character	SWC-130	Malicious actors can use the Right-To-Left-Override unicode character to force RTL text rendering and confuse users as to the real intent of a contract.	PASS
Unused variables	SWC-131 SWC-135	Unused variables are allowed in Solidity and they do not pose a direct security issue.	PASS
Unexpected Ether balance	SWC-132	Contracts can behave erroneously when they strictly assume a specific Ether balance.	PASS
Hash Collisions Variable	SWC-133	Using abi.encodePacked() with multiple variable length arguments can, in certain situations, lead to a hash collision.	PASS
Hardcoded gas amount	SWC-134	The transfer() and send() functions forward a fixed amount of 2300 gas.	PASS
Unencrypted Private Data	SWC-136	It is a common misconception that private type variables cannot be read.	PASS

SMART CONTRACT ANALYSIS

Started	Friday Feb 03 2023 23:04:04 GMT+0000 (Coordinated Universal Time)
Finished	Saturday Feb 04 2023 05:44:36 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	SWAPERIUM.sol

Detected Issues

ID	Title	Severity	Status
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "**" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "%" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "**" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "**" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged

SWC-101	ARITHMETIC OPERATION "**" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "++" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "++" DISCOVERED	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-110	OUT OF BOUNDS ARRAY ACCESS	low	acknowledged
SWC-110	OUT OF BOUNDS ARRAY ACCESS	low	acknowledged
SWC-110	OUT OF BOUNDS ARRAY ACCESS	low	acknowledged
SWC-110	OUT OF BOUNDS ARRAY ACCESS	low	acknowledged

SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 90

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
89   function add(uint256 a, uint256 b) internal pure returns (uint256) {
90   uint256 c = a + b;
91   require(c >= a, "SafeMath: addition overflow");
92   return c;
93   }
94
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 105

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
104   require(b <= a, errorMessage);
105   uint256 c = a - b;
106   return c;
107   }
108
109
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 113

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
112   }
113   uint256 c = a * b;
114   require(c / a == b, "SafeMath: multiplication overflow");
115   return c;
116   }
117
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 114

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
113   uint256 c = a * b;
114   require(c / a == b, "SafeMath: multiplication overflow");
115   return c;
116   }
117
118
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 128

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
127   require(b > 0, errorMessage);
128   uint256 c = a / b;
129   return c;
130   }
131   }
132
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 182

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
181   uint256 private constant MAX = ~uint256(0);
182   uint256 private constant _tTotal = 1000000000000 * 10**9;
183   uint256 private _rTotal = (MAX - (MAX % _tTotal));
184   uint256 private _tFeeTotal;
185   uint256 private _redisFeeOnBuy = 0;
186
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 182

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
181   uint256 private constant MAX = ~uint256(0);
182   uint256 private constant _tTotal = 1000000000000 * 10**9;
183   uint256 private _rTotal = (MAX - (MAX % _tTotal));
184   uint256 private _tFeeTotal;
185   uint256 private _redisFeeOnBuy = 0;
186
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 183

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
182   uint256 private constant _tTotal = 1000000000000 * 10**9;
183   uint256 private _rTotal = (MAX - (MAX % _tTotal));
184   uint256 private _tFeeTotal;
185   uint256 private _redisFeeOnBuy = 0;
186   uint256 private _taxFeeOnBuy = 5;
187
```

SWC-101 | ARITHMETIC OPERATION "%" DISCOVERED

LINE 183

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
182   uint256 private constant _tTotal = 1000000000000 * 10**9;
183   uint256 private _rTotal = (MAX - (MAX % _tTotal));
184   uint256 private _tFeeTotal;
185   uint256 private _redisFeeOnBuy = 0;
186   uint256 private _taxFeeOnBuy = 5;
187
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 208

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
207
208   uint256 public _maxTxAmount = 1000000000000 * 10**9;
209   uint256 public _maxWalletSize = 30000000000 * 10**9;
210   uint256 public _swapTokensAtAmount = 1000000000 * 10**9;
211
212
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 208

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
207
208   uint256 public _maxTxAmount = 1000000000000 * 10**9;
209   uint256 public _maxWalletSize = 30000000000 * 10**9;
210   uint256 public _swapTokensAtAmount = 1000000000 * 10**9;
211
212
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 209

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
208   uint256 public _maxTxAmount = 1000000000000 * 10**9;
209   uint256 public _maxWalletSize = 30000000000 * 10**9;
210   uint256 public _swapTokensAtAmount = 1000000000 * 10**9;
211
212   event MaxTxAmountUpdated(uint256 _maxTxAmount);
213
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 209

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
208   uint256 public _maxTxAmount = 1000000000000 * 10**9;
209   uint256 public _maxWalletSize = 30000000000 * 10**9;
210   uint256 public _swapTokensAtAmount = 1000000000 * 10**9;
211
212   event MaxTxAmountUpdated(uint256 _maxTxAmount);
213
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 210

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
209   uint256 public _maxWalletSize = 30000000000 * 10**9;
210   uint256 public _swapTokensAtAmount = 1000000000 * 10**9;
211
212   event MaxTxAmountUpdated(uint256 _maxTxAmount);
213   modifier lockTheSwap {
214
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 210

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
209   uint256 public _maxWalletSize = 30000000000 * 10**9;
210   uint256 public _swapTokensAtAmount = 1000000000 * 10**9;
211
212   event MaxTxAmountUpdated(uint256 _maxTxAmount);
213   modifier lockTheSwap {
214
```

SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 359

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
358   if(to != uniswapV2Pair) {
359   require(balanceOf(to) + amount < _maxWalletSize, "TOKEN: Balance exceeds wallet
size!");
360   }
361
362   uint256 contractTokenBalance = balanceOf(address(this));
363
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 438

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
437   function blockBots(address[] memory bots_) public onlyOwner {
438   for (uint256 i = 0; i < bots_.length; i++) {
439   bots[bots_[i]] = true;
440   }
441   }
442
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 590

low SEVERITY

This plugin produces issues to support false positive discovery within mythril.

Source File

- SWAPERIUM.sol

Locations

```
589   function excludeMultipleAccountsFromFees(address[] calldata accounts, bool
excluded) public onlyOwner {
590   for(uint256 i = 0; i < accounts.length; i++) {
591   _isExcludedFromFee[accounts[i]] = excluded;
592   }
593   }
594
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 11

low SEVERITY

The current pragma Solidity directive is ""^0.8.9"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Source File

- SWAPERIUM.sol

Locations

```
10
11   pragma solidity ^0.8.9;
12
13   // SWAPERIUM
14
15
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 405

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- SWAPERIUM.sol

Locations

```
404   address[] memory path = new address[](2);
405   path[0] = address(this);
406   path[1] = uniswapV2Router.WETH();
407   _approve(address(this), address(uniswapV2Router), tokenAmount);
408   uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(
409
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 406

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- SWAPERIUM.sol

Locations

```
405   path[0] = address(this);
406   path[1] = uniswapV2Router.WETH();
407   _approve(address(this), address(uniswapV2Router), tokenAmount);
408   uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(
409   tokenAmount,
410
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 439

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- SWAPERIUM.sol

Locations

```
438   for (uint256 i = 0; i < bots_.length; i++) {
439   bots[bots_[i]] = true;
440   }
441   }
442
443
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 591

low SEVERITY

The index access expression can cause an exception in case of use of invalid array index value.

Source File

- SWAPERIUM.sol

Locations

```
590   for(uint256 i = 0; i < accounts.length; i++) {
591   _isExcludedFromFee[accounts[i]] = excluded;
592   }
593   }
594
595
```

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This is a limited report on our findings based on our analysis, in accordance with good industry practice as of 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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