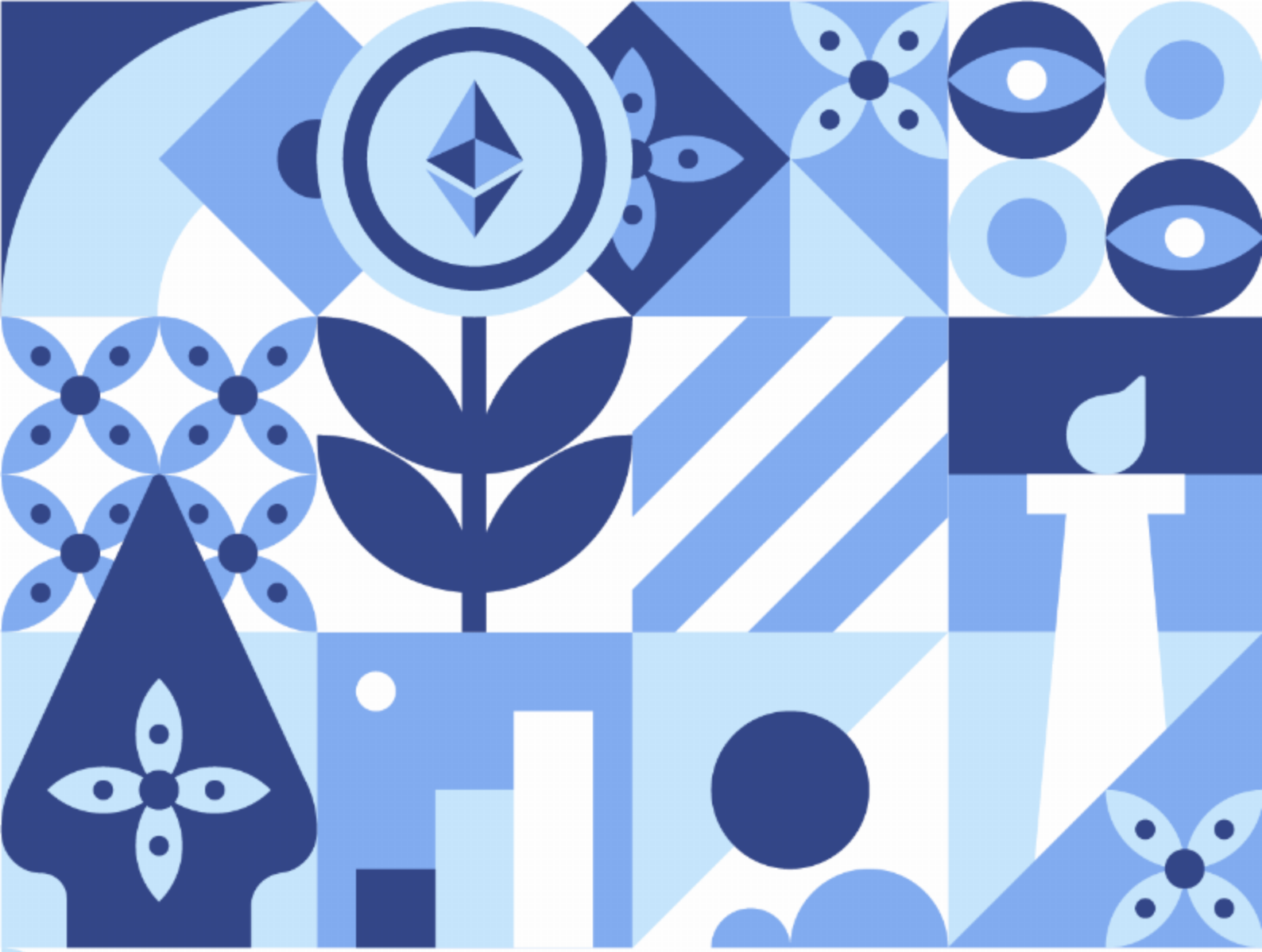

Harmony

Smart Contract Audit Report

SYSFIXED

31 Aug 2022

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AUDITED DETAILS

Audited Project

Project name	Token ticker	Blockchain
Harmony ▯▯	HARM	Ethereum

Addresses

Contract address	0xb8f78ae3df5c541657161194ddbd0c5b44d1bee9
Contract deployer address	0x807d4436F22d3AAeF096Be582cDA53fd89D8C518

Project Website

https://harmonytoken.org/

Codebase

https://etherscan.io/address/0xb8f78ae3df5c541657161194ddbd0c5b44d1bee9#code

SUMMARY

Harmony is setting a new trend. The dev is creating excitement by only communicating via etherscan. he releases encrypted messages and thats the way how he likes to talk. aswell he is updating the medium regulary ,where he talks about a love story. He combines love with being mystical. The community loves this and they keep becoming stronger and are growing every single day. they love that the project is 100% community driven and they trust their dev because he never let them down. Aswell they plan to become a DAO in the future - to give the power back to the people.

Contract Summary

Documentation Quality

Harmony ▯▯ 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 Harmony ▯▯ 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 86, 101, 109, 110, 124, 178, 178, 179, 179, 211, 211, 212, 212, 213, 213, 362, 442 and 601.
- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 15.
- 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 408, 409, 443 and 602.

CONCLUSION

We have audited the Harmony project released on August 2022 to discover issues and identify potential security vulnerabilities in Harmony 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 Harmony 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	Tuesday Aug 30 2022 09:22:36 GMT+0000 (Coordinated Universal Time)
Finished	Wednesday Aug 31 2022 11:28:19 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	Harmony.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 86

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
85   function add(uint256 a, uint256 b) internal pure returns (uint256) {
86   uint256 c = a + b;
87   require(c >= a, "SafeMath: addition overflow");
88   return c;
89   }
90
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 101

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
100   require(b <= a, errorMessage);
101   uint256 c = a - b;
102   return c;
103   }
104
105
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 109

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
108   }
109   uint256 c = a * b;
110   require(c / a == b, "SafeMath: multiplication overflow");
111   return c;
112   }
113
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 110

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
109   uint256 c = a * b;
110   require(c / a == b, "SafeMath: multiplication overflow");
111   return c;
112   }
113
114
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 124

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
123   require(b > 0, errorMessage);
124   uint256 c = a / b;
125   return c;
126   }
127   }
128
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 178

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
177   uint256 private constant MAX = ~uint256(0);
178   uint256 private constant _tTotal = 4200000000000 * 10**9;
179   uint256 private _rTotal = (MAX - (MAX % _tTotal));
180   uint256 private _tFeeTotal;
181   uint256 public launchBlock;
182
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 178

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
177   uint256 private constant MAX = ~uint256(0);
178   uint256 private constant _tTotal = 4200000000000 * 10**9;
179   uint256 private _rTotal = (MAX - (MAX % _tTotal));
180   uint256 private _tFeeTotal;
181   uint256 public launchBlock;
182
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 179

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
178   uint256 private constant _tTotal = 4200000000000 * 10**9;
179   uint256 private _rTotal = (MAX - (MAX % _tTotal));
180   uint256 private _tFeeTotal;
181   uint256 public launchBlock;
182
183
```

SWC-101 | ARITHMETIC OPERATION "%" DISCOVERED

LINE 179

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
178   uint256 private constant _tTotal = 4200000000000 * 10**9;
179   uint256 private _rTotal = (MAX - (MAX % _tTotal));
180   uint256 private _tFeeTotal;
181   uint256 public launchBlock;
182
183
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 211

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
210
211   uint256 public _maxTxAmount = 84000000000 * 10**9;
212   uint256 public _maxWalletSize = 84000000000 * 10**9;
213   uint256 public _swapTokensAtAmount = 42000000 * 10**9;
214
215
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 211

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
210
211   uint256 public _maxTxAmount = 84000000000 * 10**9;
212   uint256 public _maxWalletSize = 84000000000 * 10**9;
213   uint256 public _swapTokensAtAmount = 42000000 * 10**9;
214
215
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 212

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
211   uint256 public _maxTxAmount = 84000000000 * 10**9;
212   uint256 public _maxWalletSize = 84000000000 * 10**9;
213   uint256 public _swapTokensAtAmount = 42000000 * 10**9;
214
215   event MaxTxAmountUpdated(uint256 _maxTxAmount);
216
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 212

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
211   uint256 public _maxTxAmount = 84000000000 * 10**9;
212   uint256 public _maxWalletSize = 84000000000 * 10**9;
213   uint256 public _swapTokensAtAmount = 42000000 * 10**9;
214
215   event MaxTxAmountUpdated(uint256 _maxTxAmount);
216
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 213

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
212   uint256 public _maxWalletSize = 84000000000 * 10**9;
213   uint256 public _swapTokensAtAmount = 42000000 * 10**9;
214
215   event MaxTxAmountUpdated(uint256 _maxTxAmount);
216   modifier lockTheSwap {
217
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 213

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
212   uint256 public _maxWalletSize = 84000000000 * 10**9;
213   uint256 public _swapTokensAtAmount = 42000000 * 10**9;
214
215   event MaxTxAmountUpdated(uint256 _maxTxAmount);
216   modifier lockTheSwap {
217
```

SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 362

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
361   if(to != uniswapV2Pair) {
362   require(balanceOf(to) + amount < _maxWalletSize, "TOKEN: Balance exceeds wallet
size!");
363   }
364
365   uint256 contractTokenBalance = balanceOf(address(this));
366
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 442

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
441   function blockBots(address[] memory bots_) public onlyOwner {
442   for (uint256 i = 0; i < bots_.length; i++) {
443   bots[bots_[i]] = true;
444   }
445   }
446
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 601

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
600   function excludeMultipleAccountsFromFees(address[] calldata accounts, bool
excluded) public onlyOwner {
601   for(uint256 i = 0; i < accounts.length; i++) {
602   _isExcludedFromFee[accounts[i]] = excluded;
603   }
604   }
605
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 15

low SEVERITY

The current pragma Solidity directive is ""^0.8.4"". 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

- Harmony.sol

Locations

```
14   //SPDX-License-Identifier: UNLICENSED
15   pragma solidity ^0.8.4;
16
17   abstract contract Context {
18   function _msgSender() internal view virtual returns (address) {
19
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 408

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
407   address[] memory path = new address[](2);
408   path[0] = address(this);
409   path[1] = uniswapV2Router.WETH();
410   _approve(address(this), address(uniswapV2Router), tokenAmount);
411   uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(
412
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 409

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
408   path[0] = address(this);
409   path[1] = uniswapV2Router.WETH();
410   _approve(address(this), address(uniswapV2Router), tokenAmount);
411   uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(
412   tokenAmount,
413
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 443

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
442   for (uint256 i = 0; i < bots_.length; i++) {
443   bots[bots_[i]] = true;
444   }
445   }
446
447
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 602

low SEVERITY

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

Source File

- Harmony.sol

Locations

```
601   for(uint256 i = 0; i < accounts.length; i++) {
602   _isExcludedFromFee[accounts[i]] = excluded;
603   }
604   }
605   }
606
```

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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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