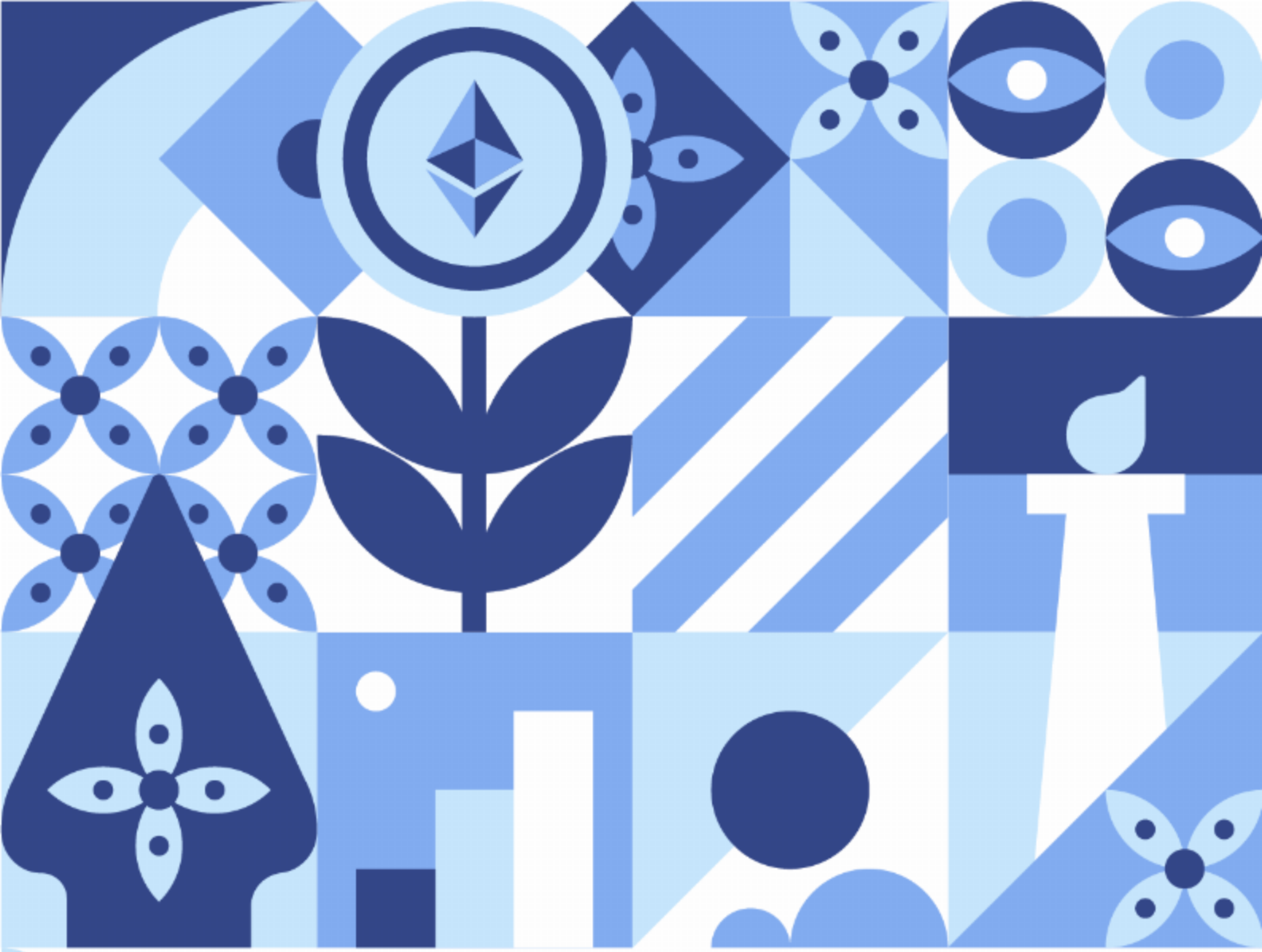

StarterCoin

Smart Contract Audit Report

SYSFIXED

06 Jan 2018

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AUDITED DETAILS

Audited Project

Project name	Token ticker	Blockchain
StarterCoin	STAC	Ethereum

Addresses

Contract address	0x9a005c9a89bd72a4bd27721e7a09a3c11d2b03c4
Contract deployer address	0x1B4Db82b23e50391D4380B780eCD405E4885d299

Project Website

https://coinstarter.com/

Codebase

https://etherscan.io/address/0x9a005c9a89bd72a4bd27721e7a09a3c11d2b03c4#code

SUMMARY

CoinStarter is an ecosystem for social engagement, news, and information and a fantasy crypto trading platform.

Contract Summary

Documentation Quality

StarterCoin 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 StarterCoin with the discovery of several low issues.

Test Coverage

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

Audit Findings Summary

- SWC-100 SWC-108 | Explicitly define visibility for all state variables on lines 58, 212, 219, 279, 126 and 156.
- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 5.
- 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 28 and 22.
- SWC-111 | It is recommended to use alternatives to the deprecated constructions on lines 8, 14, 21, 26, 35, 41, 118, 148, 202 and 284.
- SWC-116 | It is recommended to use oracles for block values as a proxy for time on lines 286 and 286.

CONCLUSION

We have audited the StarterCoin project released in January 2018 to discover issues and identify potential security vulnerabilities in StarterCoin 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 StarterCoin 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 function visibility is not set (prior to Solidity 0.5.0), a floating pragma is set, a state variable visibility is not set, use of the "constant" state mutability modifier is deprecated, a control flow decision is made based on The block.timestamp environment variable 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.	ISSUE FOUND
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	PASS
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.	ISSUE FOUND
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.	ISSUE FOUND
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 Jan 05 2018 14:33:08 GMT+0000 (Coordinated Universal Time)
Finished	Saturday Jan 06 2018 23:28:07 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	StarterCoin.sol

Detected Issues

ID	Title	Severity	Status
SWC-100	FUNCTION VISIBILITY IS NOT SET (PRIOR TO SOLIDITY 0.5.0)	low	acknowledged
SWC-100	FUNCTION VISIBILITY IS NOT SET (PRIOR TO SOLIDITY 0.5.0)	low	acknowledged
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SWC-100	FUNCTION VISIBILITY IS NOT SET (PRIOR TO SOLIDITY 0.5.0)	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
SWC-110	AN ASSERTION VIOLATION WAS TRIGGERED.	low	acknowledged
SWC-110	AN ASSERTION VIOLATION WAS TRIGGERED.	low	acknowledged

SWC-111	USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.	low	acknowledged
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SWC-116	A CONTROL FLOW DECISION IS MADE BASED ON THE BLOCK.TIMESTAMP ENVIRONMENT VARIABLE.	low	acknowledged
SWC-116	A CONTROL FLOW DECISION IS MADE BASED ON THE BLOCK.TIMESTAMP ENVIRONMENT VARIABLE.	low	acknowledged

SWC-100 | FUNCTION VISIBILITY IS NOT SET (PRIOR TO SOLIDITY 0.5.0)

LINE 58

low SEVERITY

The function definition of "Ownable" lacks a visibility specifier. Note that the compiler assumes "public" visibility by default. Function visibility should always be specified explicitly to assure correctness of the code and improve readability.

Source File

- StarterCoin.sol

Locations

```
57   */
58   function Ownable() {
59   owner = msg.sender;
60   }
61
62
```

SWC-100 | FUNCTION VISIBILITY IS NOT SET (PRIOR TO SOLIDITY 0.5.0)

LINE 212

low SEVERITY

The function definition of "increaseApproval" lacks a visibility specifier. Note that the compiler assumes "public" visibility by default. Function visibility should always be specified explicitly to assure correctness of the code and improve readability.

Source File

- StarterCoin.sol

Locations

```
211   */
212   function increaseApproval (address _spender, uint _addedValue)
213   returns (bool success) {
214   allowed[msg.sender][_spender] = allowed[msg.sender][_spender].add(_addedValue);
215   Approval(msg.sender, _spender, allowed[msg.sender][_spender]);
216
```

SWC-100 | FUNCTION VISIBILITY IS NOT SET (PRIOR TO SOLIDITY 0.5.0)

LINE 219

low SEVERITY

The function definition of "decreaseApproval" lacks a visibility specifier. Note that the compiler assumes "public" visibility by default. Function visibility should always be specified explicitly to assure correctness of the code and improve readability.

Source File

- StarterCoin.sol

Locations

```
218
219   function decreaseApproval (address _spender, uint _subtractedValue)
220   returns (bool success) {
221   uint oldValue = allowed[msg.sender][_spender];
222   if (_subtractedValue > oldValue) {
223
```

SWC-100 | FUNCTION VISIBILITY IS NOT SET (PRIOR TO SOLIDITY 0.5.0)

LINE 279

low SEVERITY

The function definition of "StarterCoin" lacks a visibility specifier. Note that the compiler assumes "public" visibility by default. Function visibility should always be specified explicitly to assure correctness of the code and improve readability.

Source File

- StarterCoin.sol

Locations

```
278
279   function StarterCoin(uint256 _endTimeICO, address _bountyWallet) {
280   endTimeICO = _endTimeICO;
281   bountyWallet = _bountyWallet;
282   }
283
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 5

low SEVERITY

The current pragma Solidity directive is ""^0.4.13"". 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

- StarterCoin.sol

Locations

```
4
5   pragma solidity ^0.4.13;
6
7   library SafeMath {
8   function mul(uint256 a, uint256 b) internal constant returns (uint256) {
9
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 126

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "balances" is internal. Other possible visibility settings are public and private.

Source File

- StarterCoin.sol

Locations

```
125
126   mapping(address => uint256) balances;
127
128   /**
129   * @dev transfer token for a specified address
130
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 156

low SEVERITY

It is best practice to set the visibility of state variables explicitly. The default visibility for "allowed" is internal. Other possible visibility settings are public and private.

Source File

- StarterCoin.sol

Locations

```
155
156   mapping (address => mapping (address => uint256)) allowed;
157
158
159   /**
160
```

SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 28

low SEVERITY

It is possible to cause an assertion violation. Note that Solidity assert() statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use require() instead of assert() if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

Source File

- StarterCoin.sol

Locations

```
27   uint256 c = a + b;
28   assert(c >= a);
29   return c;
30   }
31   }
32
```

SWC-110 | AN ASSERTION VIOLATION WAS TRIGGERED.

LINE 22

low SEVERITY

It is possible to cause an assertion violation. Note that Solidity assert() statements should only be used to check invariants. Review the transaction trace generated for this issue and either make sure your program logic is correct, or use require() instead of assert() if your goal is to constrain user inputs or enforce preconditions. Remember to validate inputs from both callers (for instance, via passed arguments) and callees (for instance, via return values).

Source File

- StarterCoin.sol

Locations

```
21   function sub(uint256 a, uint256 b) internal constant returns (uint256) {
22   assert(b <= a);
23   return a - b;
24   }
25
26
```

SWC-111 | USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.

LINE 8

low SEVERITY

Using "constant" as a state mutability modifier in function "mul" is disallowed as of Solidity version 0.5.0. Use "view" instead.

Source File

- StarterCoin.sol

Locations

```
7   library SafeMath {
8   function mul(uint256 a, uint256 b) internal constant returns (uint256) {
9   uint256 c = a * b;
10   assert(a == 0 || c / a == b);
11   return c;
12
```

SWC-111 | USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.

LINE 14

low SEVERITY

Using "constant" as a state mutability modifier in function "div" is disallowed as of Solidity version 0.5.0. Use "view" instead.

Source File

- StarterCoin.sol

Locations

```
13
14   function div(uint256 a, uint256 b) internal constant returns (uint256) {
15   // assert(b > 0); // Solidity automatically throws when dividing by 0
16   uint256 c = a / b;
17   // assert(a == b * c + a % b); // There is no case in which this doesn't hold
18
```

SWC-111 | USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.

LINE 21

low SEVERITY

Using "constant" as a state mutability modifier in function "sub" is disallowed as of Solidity version 0.5.0. Use "view" instead.

Source File

- StarterCoin.sol

Locations

```
20
21   function sub(uint256 a, uint256 b) internal constant returns (uint256) {
22   assert(b <= a);
23   return a - b;
24   }
25
```

SWC-111 | USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.

LINE 26

low SEVERITY

Using "constant" as a state mutability modifier in function "add" is disallowed as of Solidity version 0.5.0. Use "view" instead.

Source File

- StarterCoin.sol

Locations

```
25
26   function add(uint256 a, uint256 b) internal constant returns (uint256) {
27   uint256 c = a + b;
28   assert(c >= a);
29   return c;
30
```

SWC-111 | USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.

LINE 35

low SEVERITY

Using "constant" as a state mutability modifier in function "balanceOf" is disallowed as of Solidity version 0.5.0. Use "view" instead.

Source File

- StarterCoin.sol

Locations

```
34   uint256 public totalSupply;
35   function balanceOf(address who) public constant returns (uint256);
36   function transfer(address to, uint256 value) public returns (bool);
37   event Transfer(address indexed from, address indexed to, uint256 value);
38   }
39
```

SWC-111 | USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.

LINE 41

low SEVERITY

Using "constant" as a state mutability modifier in function "allowance" is disallowed as of Solidity version 0.5.0. Use "view" instead.

Source File

- StarterCoin.sol

Locations

```
40   contract ERC20 is ERC20Basic {
41   function allowance(address owner, address spender) public constant returns
(uint256);
42   function transferFrom(address from, address to, uint256 value) public returns
(bool);
43   function approve(address spender, uint256 value) public returns (bool);
44   event Approval(address indexed owner, address indexed spender, uint256 value);
45
```

SWC-111 | USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.

LINE 118

low SEVERITY

Using "constant" as a state mutability modifier in function "transferableTokens" is disallowed as of Solidity version 0.5.0. Use "view" instead.

Source File

- StarterCoin.sol

Locations

```
117   */
118   function transferableTokens(address holder, uint64 time) public constant returns
(uint256) {
119   return balanceOf(holder);
120   }
121   }
122
```

SWC-111 | USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.

LINE 148

low SEVERITY

Using "constant" as a state mutability modifier in function "balanceOf" is disallowed as of Solidity version 0.5.0. Use "view" instead.

Source File

- StarterCoin.sol

Locations

```
147   */
148   function balanceOf(address _owner) public constant returns (uint256 balance) {
149   return balances[_owner];
150   }
151
152
```

SWC-111 | USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.

LINE 202

low SEVERITY

Using "constant" as a state mutability modifier in function "allowance" is disallowed as of Solidity version 0.5.0. Use "view" instead.

Source File

- StarterCoin.sol

Locations

```
201   */
202   function allowance(address _owner, address _spender) public constant returns
(uint256 remaining) {
203   return allowed[_owner][_spender];
204   }
205
206
```

SWC-111 | USE OF THE "CONSTANT" STATE MUTABILITY MODIFIER IS DEPRECATED.

LINE 284

low SEVERITY

Using "constant" as a state mutability modifier in function "transferableTokens" is disallowed as of Solidity version 0.5.0. Use "view" instead.

Source File

- StarterCoin.sol

Locations

```
283
284   function transferableTokens(address holder, uint64 time) public constant returns
(uint256) {
285   // allow transfers after the end of ICO
286   return (time > endTimeICO) || (holder == bountyWallet) ? balanceOf(holder) : 0;
287   }
288
```

SWC-116 | A CONTROL FLOW DECISION IS MADE BASED ON THE BLOCK.TIMESTAMP ENVIRONMENT VARIABLE.

LINE 286

low SEVERITY

The block.timestamp environment variable is used to determine a control flow decision. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- StarterCoin.sol

Locations

```
285   // allow transfers after the end of ICO
286   return (time > endTimeICO) || (holder == bountyWallet) ? balanceOf(holder) : 0;
287   }
288
289   }
290
```

SWC-116 | A CONTROL FLOW DECISION IS MADE BASED ON THE BLOCK.TIMESTAMP ENVIRONMENT VARIABLE.

LINE 286

low SEVERITY

The block.timestamp environment variable is used to determine a control flow decision. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

Source File

- StarterCoin.sol

Locations

```
285   // allow transfers after the end of ICO
286   return (time > endTimeICO) || (holder == bountyWallet) ? balanceOf(holder) : 0;
287   }
288
289   }
290
```

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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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