MoonStar

Smart Contract Audit Report

SYSFIXED

04 Apr 2021

TABLE OF CONTENTS

AUDITED DETAILS

Audited Project

Project name	Token ticker	Blockchain
MoonStar	MOONSTAR	Binance Smart Chain

Addresses

Contract address	0xce5814efff15d53efd8025b9f2006d4d7d640b9b
Contract deployer address	0x418c3d5CD2Ba7E51D32D987FF0810f8fdBc1f992

Project Website

https://moonstartoken.com/

Codebase

https://bscscan.com/address/0xce5814efff15d53efd8025b9f2006d4d7d640b9b#code

SUMMARY

MoonStar was first conceptualized by a now-anonymous initial developer who forged into the crypto-verse with a new approach to token farming and deflationary currency. The coin began as a supply vs. demand experiment and has blossomed into a full utility, inertly cultivating burn token. The MoonStar Token is the premier static-rewards token for holders. MoonStar capitalizes on an advanced static farming algorithm incentivizing holders to stake prominent positions and hold. Every time a token holder closes a portion of their work, 5% of their close will be broken up among all other wallets, bringing the user more shares for free. With an initial burn of 4,000,000,000,000 (trillion) tokens, 0.4% of the initial supply pool has already been permanently destroyed. The token burn is a strategic anti-inflationary measure that guarantees the value of the coin will not become drowned out by its supply.

Contract Summary

Documentation Quality

MoonStar 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 MoonStar 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 739.
- SWC-101 | It is recommended to use vetted safe math libraries for arithmetic operations consistently on lines 127, 159, 182, 183, 218, 254, 481, 722, 722, 722, 722, 723, 723, 742, 742, 742, 742, 743, 743, 743, 743, 874, 876, 913, 959, 978, 984 and 876.
- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 28.
- 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 875, 876, 876, 960, 960, 961, 962, 1087 and 1088.

CONCLUSION

We have audited the MoonStar project released on April 2021 to discover issues and identify potential security vulnerabilities in MoonStar 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 satisfactory results with low-risk issues.

The issues found in the MoonStar 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, a state variable visibility is not 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.	ISSUE FOUND
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	Saturday Apr 03 2021 10:06:20 GMT+0000 (Coordinated Universal Time)
Finished	Sunday Apr 04 2021 14:18:58 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	MoonStar.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
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SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
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SWC-101	ARITHMETIC OPERATION "**" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "**" DISCOVERED	low	acknowledged

SWC-101	COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
SWC-110	OUT OF BOUNDS ARRAY ACCESS	low	acknowledged
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SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 127

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
126   function add(uint256 a, uint256 b) internal pure returns (uint256) {
127   uint256 c = a + b;
128   require(c >= a, "SafeMath: addition overflow");
129
130   return c;
131
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 159

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
158   require(b <= a, errorMessage);
159   uint256 c = a - b;
160
161   return c;
162   }
163
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 182

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
181
182   uint256 c = a * b;
183   require(c / a == b, "SafeMath: multiplication overflow");
184
185   return c;
186
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 183

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
182   uint256 c = a * b;
183   require(c / a == b, "SafeMath: multiplication overflow");
184
185   return c;
186   }
187
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 218

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
217   require(b > 0, errorMessage);
218   uint256 c = a / b;
219   // assert(a == b * c + a % b); // There is no case in which this doesn't hold
220
221   return c;
222
```

SWC-101 | ARITHMETIC OPERATION "%" DISCOVERED

LINE 254

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
253   require(b != 0, errorMessage);
254   return a % b;
255   }
256   }
257
258
```

SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 481

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
480   _owner = address(0);
481   _lockTime = now + time;
482   emit OwnershipTransferred(_owner, address(0));
483   }
484
485
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 722

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
721   uint256 private constant MAX = ~uint256(0);
722   uint256 private _tTotal = 1000000000 * 10**6 * 10**9;
723   uint256 private _rTotal = (MAX - (MAX % _tTotal));
724   uint256 private _tFeeTotal;
725
726
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

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SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

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SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 723

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
722   uint256 private _tTotal = 1000000000 * 10**6 * 10**9;
723   uint256 private _rTotal = (MAX - (MAX % _tTotal));
724   uint256 private _tFeeTotal;
725
726   string private _name = "MoonStar";
727
```

SWC-101 | ARITHMETIC OPERATION "%" DISCOVERED

LINE 723

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
722   uint256 private _tTotal = 1000000000 * 10**6 * 10**9;
723   uint256 private _rTotal = (MAX - (MAX % _tTotal));
724   uint256 private _tFeeTotal;
725
726   string private _name = "MoonStar";
727
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 742

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
741
742   uint256 public _maxTxAmount = 5000000 * 10**6 * 10**9;
743   uint256 private numTokensSellToAddToLiquidity = 500000 * 10**6 * 10**9;
744
745   event MinTokensBeforeSwapUpdated(uint256 minTokensBeforeSwap);
746
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 742

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SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 743

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

Source File

- MoonStar.sol

Locations

```
742   uint256 public _maxTxAmount = 5000000 * 10**6 * 10**9;
743   uint256 private numTokensSellToAddToLiquidity = 500000 * 10**6 * 10**9;
744
745   event MinTokensBeforeSwapUpdated(uint256 minTokensBeforeSwap);
746   event SwapAndLiquifyEnabledUpdated(bool enabled);
747
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 743

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
742   uint256 public _maxTxAmount = 5000000 * 10**6 * 10**9;
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SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

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SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 743

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Source File

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743   uint256 private numTokensSellToAddToLiquidity = 500000 * 10**6 * 10**9;
744
745   event MinTokensBeforeSwapUpdated(uint256 minTokensBeforeSwap);
746   event SwapAndLiquifyEnabledUpdated(bool enabled);
747
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 874

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
873   require(_isExcluded[account], "Account is already excluded");
874   for (uint256 i = 0; i < _excluded.length; i++) {
875   if (_excluded[i] == account) {
876   _excluded[i] = _excluded[_excluded.length - 1];
877   _tOwned[account] = 0;
878
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 876

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
875   if (_excluded[i] == account) {
876   _excluded[i] = _excluded[_excluded.length - 1];
877   _tOwned[account] = 0;
878   _isExcluded[account] = false;
879   _excluded.pop();
880
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 913

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
912   _maxTxAmount = _tTotal.mul(maxTxPercent).div(
913   10**2
914   );
915   }
916
917
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 959

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
958   uint256 tSupply = _tTotal;
959   for (uint256 i = 0; i < _excluded.length; i++) {
960   if (_rOwned[_excluded[i]] > rSupply || _tOwned[_excluded[i]] > tSupply) return
(_rTotal, _tTotal);
961   rSupply = rSupply.sub(_rOwned[_excluded[i]]);
962   tSupply = tSupply.sub(_tOwned[_excluded[i]]);
963
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 978

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
977   return _amount.mul(_taxFee).div(
978   10**2
979   );
980   }
981
982
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 984

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
983   return _amount.mul(_liquidityFee).div(
984   10**2
985   );
986   }
987
988
```

SWC-101 | COMPILER-REWRITABLE "<UINT> - 1" DISCOVERED

LINE 876

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
875   if (_excluded[i] == account) {
876   _excluded[i] = _excluded[_excluded.length - 1];
877   _tOwned[account] = 0;
878   _isExcluded[account] = false;
879   _excluded.pop();
880
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 28

low SEVERITY

The current pragma Solidity directive is ""^0.6.12"". 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

- MoonStar.sol

Locations

```
27
28   pragma solidity ^0.6.12;
29   // SPDX-License-Identifier: Unlicensed
30   interface IERC20 {
31
32
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 739

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
738
739   bool inSwapAndLiquify;
740   bool public swapAndLiquifyEnabled = true;
741
742   uint256 public _maxTxAmount = 5000000 * 10**6 * 10**9;
743
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 875

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
874   for (uint256 i = 0; i < _excluded.length; i++) {
875   if (_excluded[i] == account) {
876   _excluded[i] = _excluded[_excluded.length - 1];
877   _tOwned[account] = 0;
878   _isExcluded[account] = false;
879
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 876

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
875   if (_excluded[i] == account) {
876   _excluded[i] = _excluded[_excluded.length - 1];
877   _tOwned[account] = 0;
878   _isExcluded[account] = false;
879   _excluded.pop();
880
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 876

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
875   if (_excluded[i] == account) {
876   _excluded[i] = _excluded[_excluded.length - 1];
877   _tOwned[account] = 0;
878   _isExcluded[account] = false;
879   _excluded.pop();
880
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 960

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
959   for (uint256 i = 0; i < _excluded.length; i++) {
960   if (_rOwned[_excluded[i]] > rSupply || _tOwned[_excluded[i]] > tSupply) return
(_rTotal, _tTotal);
961   rSupply = rSupply.sub(_rOwned[_excluded[i]]);
962   tSupply = tSupply.sub(_tOwned[_excluded[i]]);
963   }
964
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 960

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
959   for (uint256 i = 0; i < _excluded.length; i++) {
960   if (_rOwned[_excluded[i]] > rSupply || _tOwned[_excluded[i]] > tSupply) return
(_rTotal, _tTotal);
961   rSupply = rSupply.sub(_rOwned[_excluded[i]]);
962   tSupply = tSupply.sub(_tOwned[_excluded[i]]);
963   }
964
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 961

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
960   if (_rOwned[_excluded[i]] > rSupply || _tOwned[_excluded[i]] > tSupply) return
(_rTotal, _tTotal);
961   rSupply = rSupply.sub(_rOwned[_excluded[i]]);
962   tSupply = tSupply.sub(_tOwned[_excluded[i]]);
963   }
964   if (rSupply < _rTotal.div(_tTotal)) return (_rTotal, _tTotal);
965
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 962

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
961   rSupply = rSupply.sub(_rOwned[_excluded[i]]);
962   tSupply = tSupply.sub(_tOwned[_excluded[i]]);
963   }
964   if (rSupply < _rTotal.div(_tTotal)) return (_rTotal, _tTotal);
965   return (rSupply, tSupply);
966
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1087

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
1086   address[] memory path = new address[](2);
1087   path[0] = address(this);
1088   path[1] = uniswapV2Router.WETH();
1089
1090   _approve(address(this), address(uniswapV2Router), tokenAmount);
1091
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 1088

low SEVERITY

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

Source File

- MoonStar.sol

Locations

```
1087   path[0] = address(this);
1088   path[1] = uniswapV2Router.WETH();
1089
1090   _approve(address(this), address(uniswapV2Router), tokenAmount);
1091
1092
```

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