Elephant Money Stable

Smart Contract Audit Report

SYSFIXED

22 Sep 2021

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AUDITED DETAILS

Audited Project

Project name	Token ticker	Blockchain
Elephant Money Stable	TRUNK	Binance Smart Chain

Addresses

Contract address	0xdd325c38b12903b727d16961e61333f4871a70e0
Contract deployer address	0x16E76819aC1f0dfBECc48dFE93B198830e0C85EB

Project Website

https://elephant.money/

Codebase

https://bscscan.com/address/0xdd325c38b12903b727d16961e61333f4871a70e0#code

SUMMARY

Elephant Money Stable is simply the first global decentralized community bank. It is a permissionless system for economic inclusion and helps its community accumulate wealth through active and passive cash flows.

Contract Summary

Documentation Quality

Elephant Money Stable 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 Elephant Money Stable 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 252 and 254.
- SWC-101 | It is recommended to use vetted safe math libraries for arithmetic operations consistently on lines 98, 150, 178, 202, 203, 214, 222, 229, 467, 467, 516, 519, 520, 534, 537, 538, 540, 554, 557, 558 and 560.
- 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 151 and 179.

CONCLUSION

We have audited the Elephant Money Stable project released on September 2021 to discover issues and identify potential security vulnerabilities in Elephant Money Stable 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 Elephant Money Stable, smart contract code issues 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. Specifying a fixed compiler version is recommended 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. It is best practice to set the visibility of state variables explicitly. The default visibility for "totalSupply_" is internal. Other possible visibility settings are public and private.

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	Tuesday Sep 21 2021 04:10:50 GMT+0000 (Coordinated Universal Time)
Finished	Wednesday Sep 22 2021 15:17:13 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	ElephantDollar.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-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-108	STATE VARIABLE VISIBILITY IS NOT SET.	low	acknowledged
SWC-108	STATE VARIABLE VISIBILITY IS NOT SET.	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 98

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
97   _owner = address(0);
98   _lockTime = now + time;
99   emit OwnershipTransferred(_owner, address(0));
100   }
101
102
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 150

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
149   function addAddressesToWhitelist(address[] calldata  addrs) onlyOwner public
returns(bool success) {
150   for (uint256 i = 0; i < addrs.length; i++) {
151   if (addAddressToWhitelist(addrs[i])) {
152   success = true;
153   }
154
```

SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

LINE 178

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
177   function removeAddressesFromWhitelist(address[] calldata addrs) onlyOwner public
returns(bool success) {
178   for (uint256 i = 0; i < addrs.length; i++) {
179   if (removeAddressFromWhitelist(addrs[i])) {
180   success = true;
181   }
182
```

SWC-101 | ARITHMETIC OPERATION "*" DISCOVERED

LINE 202

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
201   }
202   c = a * b;
203   assert(c / a == b);
204   return c;
205   }
206
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 203

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
202   c = a * b;
203   assert(c / a == b);
204   return c;
205   }
206
207
```

SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 214

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
213   // assert(a == b * c + a % b); // There is no case in which this doesn't hold
214   return a / b;
215   }
216
217   /**
218
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 222

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
221   assert(b <= a);
222   return a - b;
223   }
224
225   /**
226
```

SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 229

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
228   function add(uint256 a, uint256 b) internal pure returns (uint256 c) {
229   c = a + b;
230   assert(c >= a);
231   return c;
232   }
233
```

SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 467

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
466   uint8 public constant decimals = 18;
467   uint256 public constant MAX_INT = 2**256 - 1;
468   uint256 public constant targetSupply = MAX_INT;
469   uint256 public totalTxs;
470   uint256 public participants;
471
```

SWC-101 | ARITHMETIC OPERATION "**" DISCOVERED

LINE 467

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
466   uint8 public constant decimals = 18;
467   uint256 public constant MAX_INT = 2**256 - 1;
468   uint256 public constant targetSupply = MAX_INT;
469   uint256 public totalTxs;
470   uint256 public participants;
471
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 516

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
515   if (stats[_to].txs == 0) {
516   participants += 1;
517   }
518
519   stats[_to].txs += 1;
520
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 519

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
518
519   stats[_to].txs += 1;
520   totalTxs += 1;
521
522   return true;
523
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 520

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
519   stats[_to].txs += 1;
520   totalTxs += 1;
521
522   return true;
523
524
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 534

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
533   if (stats[_to].txs == 0) {
534   participants += 1;
535   }
536
537   stats[_to].txs += 1;
538
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 537

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
536
537   stats[_to].txs += 1;
538   stats[_from].txs += 1;
539
540   totalTxs += 1;
541
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 538

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
537   stats[_to].txs += 1;
538   stats[_from].txs += 1;
539
540   totalTxs += 1;
541
542
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 540

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
539
540   totalTxs += 1;
541
542   return true;
543
544
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 554

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
553   if (stats[_to].txs == 0) {
554   participants += 1;
555   }
556
557   stats[_to].txs += 1;
558
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 557

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
556
557   stats[_to].txs += 1;
558   stats[msg.sender].txs += 1;
559
560   totalTxs += 1;
561
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 558

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
557   stats[_to].txs += 1;
558   stats[msg.sender].txs += 1;
559
560   totalTxs += 1;
561
562
```

SWC-101 | ARITHMETIC OPERATION "+=" DISCOVERED

LINE 560

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
559
560   totalTxs += 1;
561
562   return true;
563   }
564
```

SWC-103 | A FLOATING PRAGMA IS SET.

LINE 5

low SEVERITY

The current pragma Solidity directive is ""^0.6.8"". 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

- ElephantDollar.sol

Locations

```
4
5   pragma solidity ^0.6.8;
6
7   /*
8   SPDX-License-Identifier: MIT
9
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 252

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

- ElephantDollar.sol

Locations

```
251
252   mapping(address => uint256) balances;
253
254   uint256 totalSupply_;
255
256
```

SWC-108 | STATE VARIABLE VISIBILITY IS NOT SET.

LINE 254

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
253
254   uint256 totalSupply_;
255
256   /**
257   * @dev total number of tokens in existence
258
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 151

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
150   for (uint256 i = 0; i < addrs.length; i++) {
151   if (addAddressToWhitelist(addrs[i])) {
152   success = true;
153   }
154   }
155
```

SWC-110 | OUT OF BOUNDS ARRAY ACCESS

LINE 179

low SEVERITY

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

Source File

- ElephantDollar.sol

Locations

```
178   for (uint256 i = 0; i < addrs.length; i++) {
179   if (removeAddressFromWhitelist(addrs[i])) {
180   success = true;
181   }
182   }
183
```

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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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