



Cyberscope

# Audit Report

## **Chester's**

July 2023

Network    BSC

Address    0xe4faAA5Bde416e4C3D1e594C56165b4A94d5896C

Audited by    © cyberscope

# Analysis

● Critical ● Medium ● Minor / Informative ● Pass

| Severity | Code | Description             | Status |
|----------|------|-------------------------|--------|
| ●        | ST   | Stops Transactions      | Passed |
| ●        | OTUT | Transfers User's Tokens | Passed |
| ●        | ELFM | Exceeds Fees Limit      | Passed |
| ●        | MT   | Mints Tokens            | Passed |
| ●        | BT   | Burns Tokens            | Passed |
| ●        | BC   | Blacklists Addresses    | Passed |

# Diagnostics

● Critical ● Medium ● Minor / Informative

| Severity | Code | Description                       | Status     |
|----------|------|-----------------------------------|------------|
| ●        | RSML | Redundant SafeMath Library        | Unresolved |
| ●        | IDI  | Immutable Declaration Improvement | Unresolved |
| ●        | L09  | Dead Code Elimination             | Unresolved |
| ●        | L16  | Validate Variable Setters         | Unresolved |

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## Review

|                  |                                                                                                                                                             |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contract Name    | StandardToken                                                                                                                                               |
| Compiler Version | v0.8.4+commit.c7e474f2                                                                                                                                      |
| Optimization     | 200 runs                                                                                                                                                    |
| Explorer         | <a href="https://bscscan.com/address/0xe4faaa5bde416e4c3d1e594c56165b4a94d5896c">https://bscscan.com/address/0xe4faaa5bde416e4c3d1e594c56165b4a94d5896c</a> |
| Address          | 0xe4faaa5bde416e4c3d1e594c56165b4a94d5896c                                                                                                                  |
| Network          | BSC                                                                                                                                                         |
| Symbol           | CHEST                                                                                                                                                       |
| Decimals         | 18                                                                                                                                                          |
| Total Supply     | 1,000,000,000                                                                                                                                               |

## Audit Updates

|               |             |
|---------------|-------------|
| Initial Audit | 31 Jul 2023 |
|---------------|-------------|

## Source Files

|                   |                                                                  |
|-------------------|------------------------------------------------------------------|
| Filename          | SHA256                                                           |
| StandardToken.sol | 43810ac0dfad3de7f65f6848ac6e3953da2024288d0937b62fa80707ff0dd5bf |

## Findings Breakdown



|                       |   |
|-----------------------|---|
| ● Critical            | 0 |
| ● Medium              | 0 |
| ● Minor / Informative | 4 |

| Severity              | Unresolved | Acknowledged | Resolved | Other |
|-----------------------|------------|--------------|----------|-------|
| ● Critical            | 0          | 0            | 0        | 0     |
| ● Medium              | 0          | 0            | 0        | 0     |
| ● Minor / Informative | 4          | 0            | 0        | 0     |

## RSML - Redundant SafeMath Library

|             |                     |
|-------------|---------------------|
| Criticality | Minor / Informative |
| Location    | StandardToken.sol   |
| Status      | Unresolved          |

### Description

SafeMath is a popular Solidity library that provides a set of functions for performing common arithmetic operations in a way that is resistant to integer overflows and underflows.

Starting with Solidity versions that are greater than or equal to 0.8.0, the arithmetic operations revert to underflow and overflow. As a result, the native functionality of the Solidity operations replaces the SafeMath library. Hence, the usage of the SafeMath library adds complexity, overhead and increases gas consumption unnecessarily.

```
library SafeMath {...}
```

### Recommendation

The team is advised to remove the SafeMath library. Since the version of the contract is greater than `0.8.0` then the pure Solidity arithmetic operations produce the same result.

If the previous functionality is required, then the contract could exploit the `unchecked { ... }` statement.

Read more about the breaking change on

<https://docs.soliditylang.org/en/v0.8.16/080-breaking-changes.html#solidity-v0-8-0-breaking-changes>.

## IDI - Immutable Declaration Improvement

|                    |                            |
|--------------------|----------------------------|
| <b>Criticality</b> | Minor / Informative        |
| <b>Location</b>    | StandardToken.sol#L470,471 |
| <b>Status</b>      | Unresolved                 |

### Description

The contract declares state variables that their value is initialized once in the constructor and are not modified afterwards. The `immutable` is a special declaration for this kind of state variables that saves gas when it is defined.

```
_name  
_symbol
```

### Recommendation

By declaring a variable as immutable, the Solidity compiler is able to make certain optimizations. This can reduce the amount of storage and computation required by the contract, and make it more gas-efficient.

## L09 - Dead Code Elimination

|             |                            |
|-------------|----------------------------|
| Criticality | Minor / Informative        |
| Location    | StandardToken.sol#L727,772 |
| Status      | Unresolved                 |

### Description

In Solidity, dead code is code that is written in the contract, but is never executed or reached during normal contract execution. Dead code can occur for a variety of reasons, such as:

- Conditional statements that are always false.
- Functions that are never called.
- Unreachable code (e.g., code that follows a return statement).

Dead code can make a contract more difficult to understand and maintain, and can also increase the size of the contract and the cost of deploying and interacting with it.

```
function _burn(address account, uint256 amount) internal virtual {
    require(account != address(0), "ERC20: burn from the zero address");

    _beforeTokenTransfer(account, address(0), amount);

    _balances[account] = _balances[account].sub(
        amount,
        "ERC20: burn amount exceeds balance"
    );
    _totalSupply = _totalSupply.sub(amount);
    emit Transfer(account, address(0), amount);
}

...
```

## Recommendation

To avoid creating dead code, it's important to carefully consider the logic and flow of the contract and to remove any code that is not needed or that is never executed. This can help improve the clarity and efficiency of the contract.

## L16 - Validate Variable Setters

|                    |                        |
|--------------------|------------------------|
| <b>Criticality</b> | Minor / Informative    |
| <b>Location</b>    | StandardToken.sol#L477 |
| <b>Status</b>      | Unresolved             |

### Description

The contract performs operations on variables that have been configured on user-supplied input. These variables are missing of proper check for the case where a value is zero. This can lead to problems when the contract is executed, as certain actions may not be properly handled when the value is zero.

```
payable(serviceFeeReceiver_).transfer(serviceFee_)
```

### Recommendation

By adding the proper check, the contract will not allow the variables to be configured with zero value. This will ensure that the contract can handle all possible input values and avoid unexpected behavior or errors. Hence, it can help to prevent the contract from being exploited or operating unexpectedly.

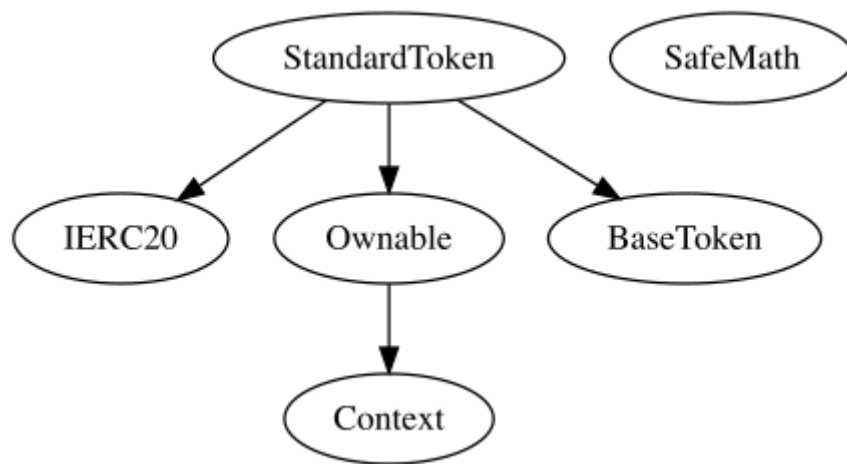
# Functions Analysis

| Contract | Type              | Bases      |            |           |
|----------|-------------------|------------|------------|-----------|
|          | Function Name     | Visibility | Mutability | Modifiers |
| IERC20   | Interface         |            |            |           |
|          | totalSupply       | External   |            | -         |
|          | balanceOf         | External   |            | -         |
|          | transfer          | External   | ✓          | -         |
|          | allowance         | External   |            | -         |
|          | approve           | External   | ✓          | -         |
|          | transferFrom      | External   | ✓          | -         |
|          |                   |            |            |           |
| Context  | Implementation    |            |            |           |
|          | _msgSender        | Internal   |            |           |
|          | _msgData          | Internal   |            |           |
|          |                   |            |            |           |
| Ownable  | Implementation    | Context    |            |           |
|          |                   | Public     | ✓          | -         |
|          | owner             | Public     |            | -         |
|          | renounceOwnership | Public     | ✓          | onlyOwner |
|          | transferOwnership | Public     | ✓          | onlyOwner |
|          | _setOwner         | Private    | ✓          |           |

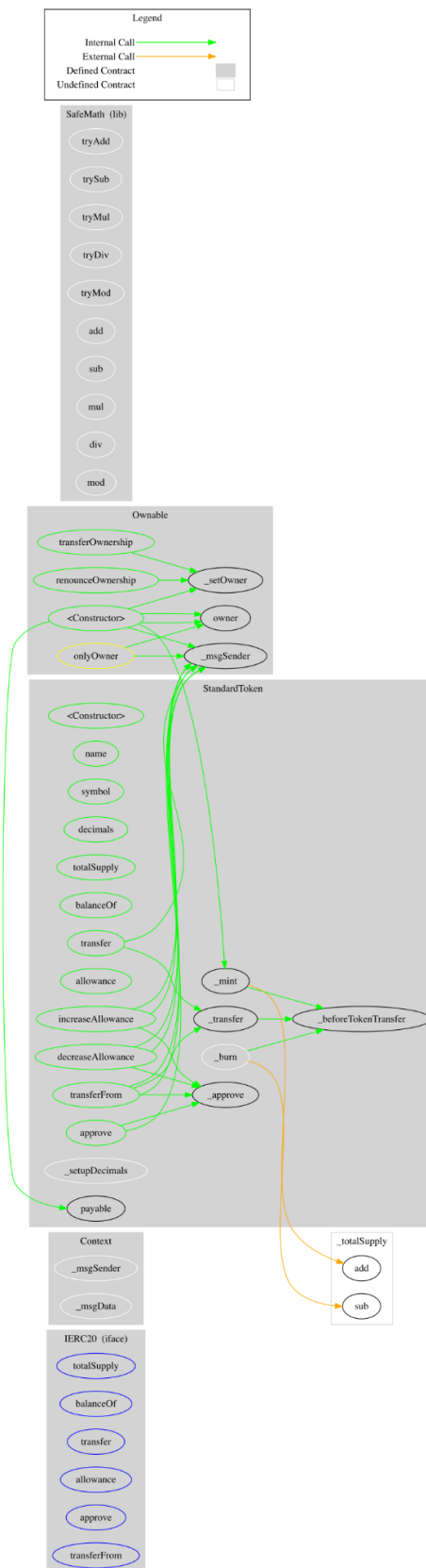
|                      |                |                                  |         |   |
|----------------------|----------------|----------------------------------|---------|---|
|                      |                |                                  |         |   |
| <b>SafeMath</b>      | Library        |                                  |         |   |
|                      | tryAdd         | Internal                         |         |   |
|                      | trySub         | Internal                         |         |   |
|                      | tryMul         | Internal                         |         |   |
|                      | tryDiv         | Internal                         |         |   |
|                      | tryMod         | Internal                         |         |   |
|                      | add            | Internal                         |         |   |
|                      | sub            | Internal                         |         |   |
|                      | mul            | Internal                         |         |   |
|                      | div            | Internal                         |         |   |
|                      | mod            | Internal                         |         |   |
|                      | sub            | Internal                         |         |   |
|                      | div            | Internal                         |         |   |
|                      | mod            | Internal                         |         |   |
|                      |                |                                  |         |   |
| <b>BaseToken</b>     | Implementation |                                  |         |   |
|                      |                |                                  |         |   |
| <b>StandardToken</b> | Implementation | IERC20,<br>Ownable,<br>BaseToken |         |   |
|                      |                | Public                           | Payable | - |
|                      | name           | Public                           |         | - |
|                      | symbol         | Public                           |         | - |
|                      | decimals       | Public                           |         | - |

|  |                      |          |   |   |
|--|----------------------|----------|---|---|
|  | totalSupply          | Public   |   | - |
|  | balanceOf            | Public   |   | - |
|  | transfer             | Public   | ✓ | - |
|  | allowance            | Public   |   | - |
|  | approve              | Public   | ✓ | - |
|  | transferFrom         | Public   | ✓ | - |
|  | increaseAllowance    | Public   | ✓ | - |
|  | decreaseAllowance    | Public   | ✓ | - |
|  | _transfer            | Internal | ✓ |   |
|  | _mint                | Internal | ✓ |   |
|  | _burn                | Internal | ✓ |   |
|  | _approve             | Internal | ✓ |   |
|  | _setupDecimals       | Internal | ✓ |   |
|  | _beforeTokenTransfer | Internal | ✓ |   |

## Inheritance Graph



# Flow Graph



## Summary

Chester's contract implements a token mechanism. This audit investigates security issues, business logic concerns and potential improvements. Chester's is an interesting project that has a friendly and growing community. The Smart Contract analysis reported no compiler error or critical issues. The contract Owner can access some admin functions that can not be used in a malicious way to disturb the users' transactions.

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Cyberscope is one of the leading smart contract audit firms in the crypto space and has built a high-profile network of clients and partners.



**The Cyberscope team**

<https://www.cyberscope.io>