



**TechRate**  
AUDIT COMPANY

# Smart Contract Security Audit

# Audit Details



Audited project

**The Essential Coin**



Deployer address

**0xd1e78c9d59746c4f9673038b45faa999e586ab75**



Client contacts:

**The Essential Coin team**



Blockchain

**Binance Smart Chain**



Project website:

**Not provided**

# Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at 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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The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.

# Background

TechRate was commissioned by The Essential Coin to perform an audit of smart contracts:

<https://bscscan.com/address/0x4c48cca6153Db911002F965D22fdeFcD95f33BE9#code>

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

# Contracts Details

## Token contract details for 14.12.2021

|                                  |  |
|----------------------------------|--|
| Contract name                    | The Essential Coin                         |
| Contract address                 | 0x4c48cca6153Db911002F965D22fdeFcD95f33BE9 |
| Total supply                     | 1,000,000,000,000,000                      |
| Token ticker                     | ESC  |
| Decimals                         | 18   |
| Token holders                    | 3  |
| Transactions count               | 8  |
| Top 100 holders dominance        | 99.92%                                     |
| Liquidity fee                    | 4  |
| Tax fee                          | 5  |
| Total fees                       | 41000000000000000000000000000000           |
| PCS V2 pair                      | 0xf8abe75aa59df74d15bb50ae36219fd03d70a550 |
| Contract deployer address        | 0xd1e78c9d59746c4f9673038b45faa999e586ab75 |
| Contract's current owner address | 0x87e238797812d6f218add58d388283102e9f3afc |

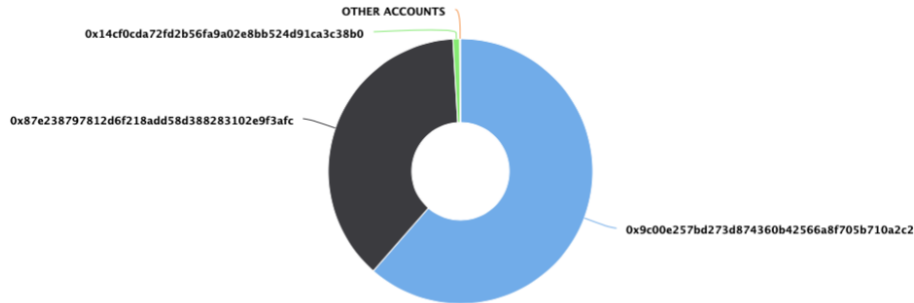
# The Essential Coin Token Distribution

The top 100 holders collectively own 99.92% (999,179,056,651,421.00 Tokens) of The Essential Coin

Token Total Supply: 1,000,000,000,000,000.00 Token | Total Token Holders: 3

The Essential Coin Top 100 Token Holders

Source: BscScan.com



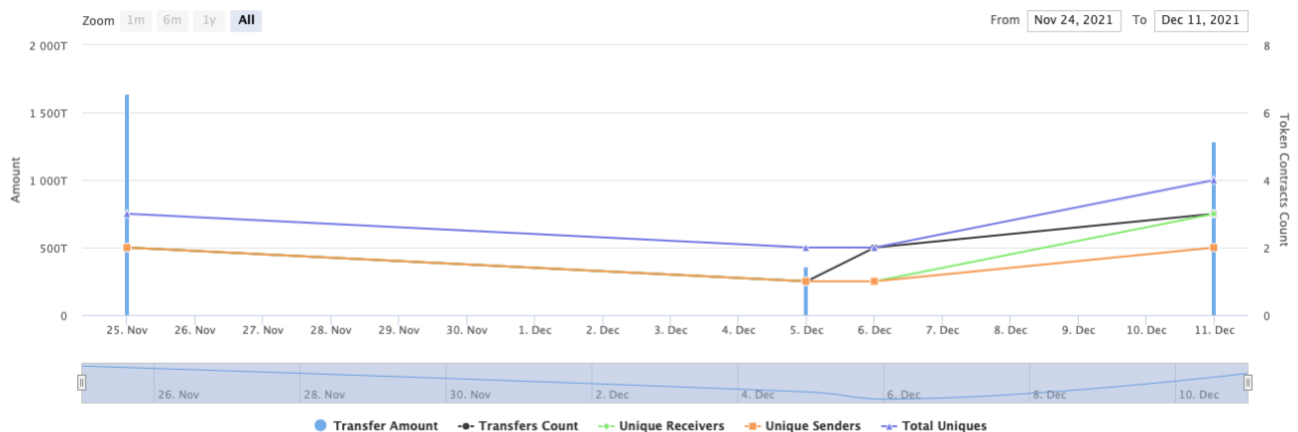
(A total of 999,179,056,651,421.00 tokens held by the top 100 accounts from the total supply of 1,000,000,000,000,000.00 token)

# The Essential Coin Contract Interaction Details

Time Series: Token Contract Overview

Thu 25, Nov 2021 - Sat 11, Dec 2021

Token Contract 0x4c48cca6153Db911002F965D22fdeFcD95f338E9 (The Essential Coin)  
Source: BscScan.com



# The Essential Coin Top 10 Token Holders

| Rank | Address  | Quantity (Token)                       | Percentage |
|------|--|--|------------|
| 1    |  <a href="#">0x9c00e257bd273d874360b42566a8f705b710a2c2</a> | 614,560,000,000,000                    | 61.4560%   |
| 2    |  <a href="#">0x87e238797812d6f218add58d388283102e9f3afc</a> | 376,411,038,188,501.360868711243300878 | 37.6411%   |
| 3    | <a href="#">0x14cf0cda72fd2b56fa9a02e8bb524d91ca3c38b0</a>   | 8,208,018,462,919.835012205729678161   | 0.8208%    |



# Contract functions details

## + [Int] IERC20

- [Ext] totalSupply
- [Ext] balanceOf
- [Ext] transfer #
- [Ext] allowance
- [Ext] approve #
- [Ext] transferFrom #

## + [Lib] SafeMath

- [Int] add
- [Int] sub
- [Int] sub
- [Int] mul
- [Int] div
- [Int] div
- [Int] mod
- [Int] mod

## + Context

- [Int] \_msgSender
- [Int] \_msgData

## + [Lib] Address

- [Int] isContract
- [Int] sendValue #
- [Int] functionCall #
- [Int] functionCall #
- [Int] functionCallWithValue #
- [Int] functionCallWithValue #
- [Prv] \_functionCallWithValue #

## + [Lib] SafeERC20

- [Int] safeTransfer #
- [Int] safeTransferFrom #
- [Int] safeApprove #
- [Int] safeIncreaseAllowance #
- [Int] safeDecreaseAllowance #
- [Prv] \_callOptionalReturn #

## + Ownable (Context)

- [Pub] <Constructor> #
- [Pub] owner
- [Pub] renounceOwnership #
  - modifiers: onlyOwner
- [Pub] transferOwnership #
  - modifiers: onlyOwner
- [Pub] geUnlockTime
- [Pub] lock #
  - modifiers: onlyOwner
- [Pub] unlock #



+ [Int] IUniswapV2Factory

- [Ext] feeTo
- [Ext] feeToSetter
- [Ext] getPair
- [Ext] allPairs
- [Ext] allPairsLength
- [Ext] createPair #
- [Ext] setFeeTo #
- [Ext] setFeeToSetter #

+ [Int] IUniswapV2Router01

- [Ext] factory
- [Ext] WETH
- [Ext] addLiquidity #
- [Ext] addLiquidityETH (\$)
- [Ext] removeLiquidity #
- [Ext] removeLiquidityETH #
- [Ext] removeLiquidityWithPermit #
- [Ext] removeLiquidityETHWithPermit #
- [Ext] swapExactTokensForTokens #
- [Ext] swapTokensForExactTokens #
- [Ext] swapExactETHForTokens (\$)
- [Ext] swapTokensForExactETH #
- [Ext] swapExactTokensForETH #
- [Ext] swapETHForExactTokens (\$)
- [Ext] quote
- [Ext] getAmountOut
- [Ext] getAmountIn
- [Ext] getAmountsOut
- [Ext] getAmountsIn

+ [Int] IUniswapV2Router02 (IUniswapV2Router01)

- [Ext] removeLiquidityETHSupportingFeeOnTransferTokens #
- [Ext] removeLiquidityETHWithPermitSupportingFeeOnTransferTokens #
- [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #
- [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens (\$)
- [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #

+ Token (Context, IERC20, Ownable)

- [Pub] <Constructor> #
- [Pub] name
- [Pub] symbol
- [Pub] decimals
- [Pub] totalSupply
- [Pub] balanceOf
- [Pub] transfer #
- [Pub] allowance
- [Pub] approve #
- [Pub] transferFrom #
- [Pub] increaseAllowance #
- [Pub] decreaseAllowance #
- [Pub] isExcludedFromReward
- [Pub] totalFees
- [Pub] deliver #
- [Pub] reflectionFromToken

- [Pub] tokenFromReflection
- [Pub] excludeFromReward #
  - modifiers: onlyOwner
- [Ext] includeInReward #
  - modifiers: onlyOwner
- [Pub] excludeFromFee #
  - modifiers: onlyOwner
- [Pub] includeInFee #
  - modifiers: onlyOwner
- [Ext] setAllFeePercent #
  - modifiers: onlyOwner
- [Pub] buyBackUpperLimitAmount
- [Ext] setBuybackUpperLimit #
  - modifiers: onlyOwner
- [Ext] setMaxTxPercent #
  - modifiers: onlyOwner
- [Ext] setMaxWalletPercent #
  - modifiers: onlyOwner
- [Pub] setSwapAndLiquifyEnabled #
  - modifiers: onlyOwner
- [Ext] setFeeWallet #
  - modifiers: onlyOwner
- [Ext] <Fallback> (\$)
- [Prv] \_reflectFee #
- [Prv] \_getValues
- [Prv] \_getTValues
- [Prv] \_getRValues
- [Prv] \_getRate
- [Prv] \_getCurrentSupply
- [Prv] \_takeLiquidity #
- [Prv] calculateTaxFee
- [Prv] calculateLiquidityFee
- [Prv] removeAllFee #
- [Prv] restoreAllFee #
- [Pub] isExcludedFromFee
- [Prv] \_approve #
- [Prv] \_transfer #
- [Prv] swapAndLiquify #
  - modifiers: lockTheSwap
- [Prv] buyBackTokens #
  - modifiers: lockTheSwap
- [Prv] swapTokensForBNB #
- [Prv] swapBNBForTokens #
- [Prv] addLiquidity #
- [Prv] \_tokenTransfer #
- [Prv] \_transferStandard #
- [Prv] \_transferToExcluded #
- [Prv] \_transferFromExcluded #
- [Prv] \_transferBothExcluded #
- [Prv] \_tokenTransferNoFee #
- [Pub] recoverBEP20 #
  - modifiers: onlyOwner

(\$) = payable function

# = non-constant function

# Issues Checking Status

| Issue description |   | Checking status |
|-------------------|---|-----------------|
| 1.                | Compiler errors.  | Passed          |
| 2.                | Race conditions and Reentrancy. Cross-function race conditions. | Passed          |
| 3.                | Possible delays in data delivery.                               | Passed          |
| 4.                | Oracle calls.   | Passed          |
| 5.                | Front running.  | Passed          |
| 6.                | Timestamp dependence.   | Passed          |
| 7.                | Integer Overflow and Underflow.                                 | Passed          |
| 8.                | DoS with Revert.  | Passed          |
| 9.                | DoS with block gas limit.                                       | Low issues      |
| 10.               | Methods execution permissions.                                  | Passed          |
| 11.               | Economy model of the contract.                                  | Passed          |
| 12.               | The impact of the exchange rate on the logic.                   | Passed          |
| 13.               | Private user data leaks.  | Passed          |
| 14.               | Malicious Event log.  | Passed          |
| 15.               | Scoping and Declarations.                                       | Passed          |
| 16.               | Uninitialized storage pointers.                                 | Passed          |
| 17.               | Arithmetic accuracy.  | Passed          |
| 18.               | Design Logic.   | Passed          |
| 19.               | Cross-function race conditions.                                 | Passed          |
| 20.               | Safe Open Zeppelin contracts implementation and usage.          | Passed          |
| 21.               | Fallback function security.                                     | Passed          |

# Security Issues

## ✓ High Severity Issues

No high severity issues found.

## ✓ Medium Severity Issues

No medium severity issues found.

## ✓ Low Severity Issues

### 1. Out of gas

Issue:

- The function `includeInReward()` uses the loop to find and remove addresses from the `_excluded` list. Function will be aborted with `OUT_OF_GAS` exception if there will be a long excluded addresses list.

```
function includeInReward(address account) external onlyOwner() {
    require(!_isExcluded[account], "Account is already excluded");
    for (uint256 i = 0; i < _excluded.length; i++) {
        if (_excluded[i] == account) {
            _excluded[i] = _excluded[_excluded.length - 1];
            _tOwned[account] = 0;
            _isExcluded[account] = false;
            _excluded.pop();
            break;
        }
    }
}
```

- The function `_getCurrentSupply` also uses the loop for evaluating total supply. It also could be aborted with `OUT_OF_GAS` exception if there will be a long excluded addresses list.

```
function _getCurrentSupply() private view returns (uint256, uint256) {
    uint256 rSupply = _rTotal;
    uint256 tSupply = _tTotal;
    for (uint256 i = 0; i < _excluded.length; i++) {
        if (
            _rOwned[_excluded[i]] > rSupply ||
            _tOwned[_excluded[i]] > tSupply
        ) return (_rTotal, _tTotal);
        rSupply = rSupply.sub(_rOwned[_excluded[i]]);
        tSupply = tSupply.sub(_tOwned[_excluded[i]]);
    }
    if (rSupply < _rTotal.div(_tTotal)) return (_rTotal, _tTotal);
    return (rSupply, tSupply);
}
```

Recommendation:

Check that the excluded array length is not too big.

## Notes:

- There is sending contract balance to dead address instead of real burn, using decreasing total supply.

## Owner privileges (In the period when the owner is not renounced)

- Owner can change fees.

```
ftrace | funcSig
function setAllFeePercent(uint8 taxFee↑, uint8 liquidityFee↑, uint8 burnFee↑, uint8 walletFee↑, uint8 buybackFee↑) external onlyOwner() {
    require(taxFee↑ >= 0 && taxFee↑ <= maxTaxFee, "TF err");
    require(liquidityFee↑ >= 0 && liquidityFee↑ <= maxLiqFee, "LF err");
    require(burnFee↑ >= 0 && burnFee↑ <= maxBurnFee, "BF err");
    require(walletFee↑ >= 0 && walletFee↑ <= maxWalletFee, "WF err");
    require(buybackFee↑ >= 0 && buybackFee↑ <= maxBuybackFee, "BBF err");
    _taxFee = taxFee↑;
    _liquidityFee = liquidityFee↑;
    _burnFee = burnFee↑;
    _buybackFee = buybackFee↑;
    _walletFee = walletFee↑;
}
```

- Owner can change the maximum transaction amount and maximum wallet amount.

```
ftrace | funcSig
function setMaxTxPercent(uint256 maxTxPercent↑) external onlyOwner() {
    require(maxTxPercent↑ >= minMxTxPercentage && maxTxPercent↑ <= 100, "err");
    _maxTxAmount = _tTotal.mul(maxTxPercent↑).div(
        10**2
    );
}

ftrace | funcSig
function setMaxWalletPercent(uint256 maxWalletPercent↑) external onlyOwner() {
    require(maxWalletPercent↑ >= minMxWalletPercentage && maxWalletPercent↑ <= 100, "err");
    _maxWalletAmount = _tTotal.mul(maxWalletPercent↑).div(
        10**2
    );
}
```

- Owner can change buyBackUpperLimit.

```
ftrace | funcSig
function setBuybackUpperLimit(uint256 buyBackLimit↑) external onlyOwner() {
    _buyBackUpperLimit = buyBackLimit↑ * 10**18;
}
```

- Owner can exclude from the fee.

```
function excludeFromFee(address account↑) public onlyOwner {
    _isExcludedFromFee[account↑] = true;
}
```

- Owner can change fee wallet.

```
ftrace | funcSig
function setFeeWallet(address payable newFeeWallet↑) external onlyOwner {
    require(newFeeWallet↑ != address(0), "ZERO ADDRESS");
    feeWallet = newFeeWallet↑;
}
```

- Owner can withdraw ERC tokens except native.

```
ftrace | funcSig
function recoverBEP20(address tokenAddress↑, uint256 tokenAmount↑) public onlyOwner {
    // do not allow recovering self token
    require(tokenAddress↑ != address(this), "Self withdraw");
    IERC20(tokenAddress↑).transfer(owner(), tokenAmount↑);
}
```

- Owner can lock and unlock. By the way, using these functions the owner could retake privileges even after the ownership was renounced.

```
//Locks the contract for owner for the amount of time provided
function lock(uint256 time) public virtual onlyOwner {
    _previousOwner = _owner;
    _owner = address(0);
    _lockTime = now + time;
    emit OwnershipTransferred(_owner, address(0));
}

//Unlocks the contract for owner when _lockTime is exceeds
function unlock() public virtual {
    require(_previousOwner == msg.sender, "You don't have permission to unlock");
    require(now > _lockTime, "Contract is locked until 7 days");
    emit OwnershipTransferred(_owner, _previousOwner);
    _owner = _previousOwner;
}
```

# Conclusion

Smart contracts contain low severity issues! Liquidity pair contract's security is not checked due to out of scope.

Liquidity locking details are NOT provided by the team.

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## *TechRate note:*

*Please check the disclaimer above and note, the audit makes no statements or warranties on business model, investment attractiveness or code sustainability. The report is provided for the only contract mentioned in the report and does not include any other potential contracts deployed by Owner.*



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