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AUDIT COMPANY

Smart Contract Security Audit

TechRate

June, 2021

Audit Details

Audited project

SHELTIE INU

Deployer address

0x9154fae128Af7aA652fc69f3F0fdc73240576d3D

Client contacts:

SHELTIE INU team

Blockchain

Ethereum

Project website:

https://shinu.io

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 SHELTIE INU to perform an audit of smart contracts:
https://etherscan.io/address/0x71beff5533dd4c0a47b739da50c56a2dd28633fa#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 11.06.2021

Contract name	SHELTIE INU
Contract address	0x71BEFF5533dd4c0a47B739dA50C56A2dd28633fa
Total supply	1,000,000,000,000,000
Token ticker	SHINU
Decimals	18
Token holders	2
Transactions count	2
Top 100 holders dominance	100.00%
Tax fee	3
Total fees	0
Contract deployer address	0x9154fae128Af7aA652fc69f3F0fdc73240576d3D
Contract's current owner address	0x9154fae128af7aa652fc69f3f0fdc73240576d3d

SHELTIE INU Token Distribution

The top 100 holders collectively own 100.00% (1,000,000,000,000,000.00 Tokens) of SHELTIE INU

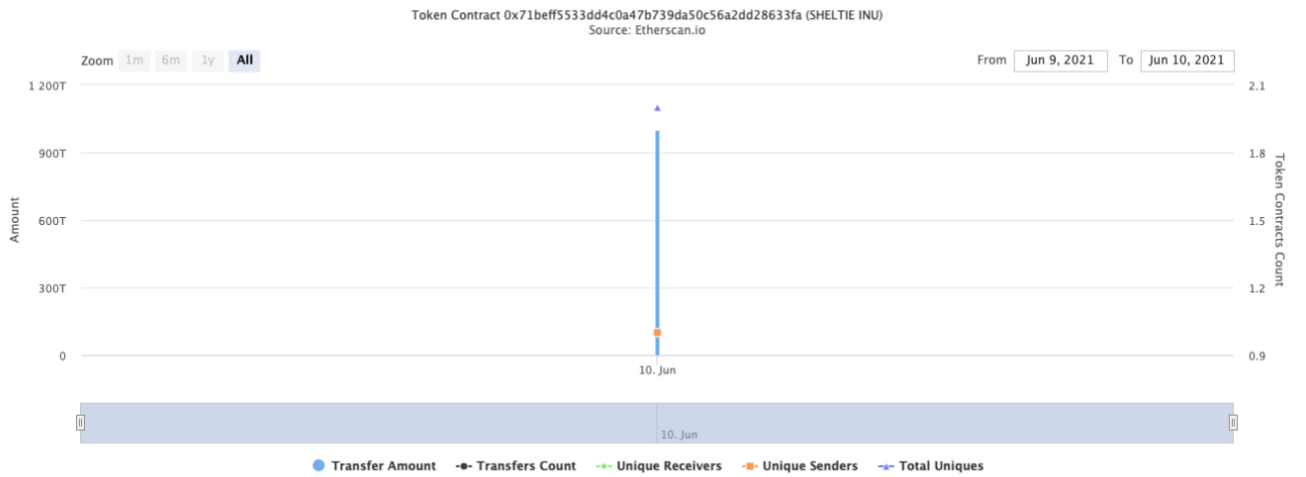
Token Total Supply: 1,000,000,000,000,000.00 Token | Total Token Holders: 2

(A total of 1,000,000,000,000,000.00 tokens held by the top 100 accounts from the total supply of 1,000,000,000,000,000.00 token)

SHELTIE INU Contract Interaction Details

Time Series: Token Contract Overview

Thu 10, Jun 2021 - Thu 10, Jun 2021



SHELTIE INU Top 10 Token Holders

Rank	Address	Quantity (Token)	Percentage
1	0xb8875714ffb3d04e3c4fadca2660c21051f062a7	774,140,000,000,000	77.4140%
2	0x9154fae128af7aa652fc69f3f0fdc73240576d3d	225,860,000,000,000	22.5860%

Contract functions details

+ [Int] IERC20
  - [Ext] totalSupply
  - [Ext] balanceOf
  - [Ext] transfer #
  - [Ext] allowance
  - [Ext] approve #
  - [Ext] transferFrom #

+ [Lib] SafeMath
  - [Int] tryAdd
  - [Int] trySub
  - [Int] tryMul
  - [Int] tryDiv
  - [Int] tryMod
  - [Int] add
  - [Int] sub
  - [Int] mul
  - [Int] div
  - [Int] mod
  - [Int] sub
  - [Int] div
  - [Int] mod

+ Context
  - [Int] _msgSender
  - [Int] _msgData

+ [Lib] Address
  - [Int] isContract
  - [Int] sendValue #
  - [Int] functionCall #
  - [Int] functionCall #
  - [Int] functionCallWithValue #
  - [Int] functionCallWithValue #
  - [Int] functionStaticCall
  - [Int] functionStaticCall
  - [Int] functionDelegateCall #
  - [Int] functionDelegateCall #
  - [Prv] _verifyCallResult

+ Ownable (Context)
  - [Pub] <Constructor> #
  - [Pub] owner
  - [Pub] renounceOwnership #
    - modifiers: onlyOwner
  - [Pub] transferOwnership #
    - modifiers: onlyOwner

+ SHINU (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] totalBurns
- [Pub] deliver #
- [Pub] reflectionFromToken
- [Pub] tokenFromReflection
- [Pub] excludeFromReward #
  - modifiers: onlyOwner
- [Ext] includeInReward #
  - modifiers: onlyOwner
- [Prv] _transferBothExcluded #
- [Pub] excludeFromFee #
  - modifiers: onlyOwner
- [Pub] includeInFee #
  - modifiers: onlyOwner
- [Ext] setTaxFeePercent #
  - modifiers: onlyOwner
- [Ext] setMaxTxPercent #
  - modifiers: onlyOwner
- [Prv] _reflectFee #
- [Prv] _getValues
- [Prv] _getTValues
- [Prv] _getRValues
- [Prv] _getRate
- [Prv] _getCurrentSupply
- [Prv] calculateRewardFee
- [Prv] calculateBurnFee
- [Prv] calculateTaxFee
- [Prv] removeAllFee #
- [Prv] restoreAllFee #
- [Pub] isExcludedFromFee
- [Prv] _approve #
- [Prv] _transfer #
- [Prv] _tokenTransfer #
- [Prv] _transferStandard #
- [Prv] _transferToExcluded #
- [Prv] _transferFromExcluded #
- [Prv] _takeBurn #
- [Prv] _takeCharity #
- [Int] parseAddr

($) = 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.	High issues
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

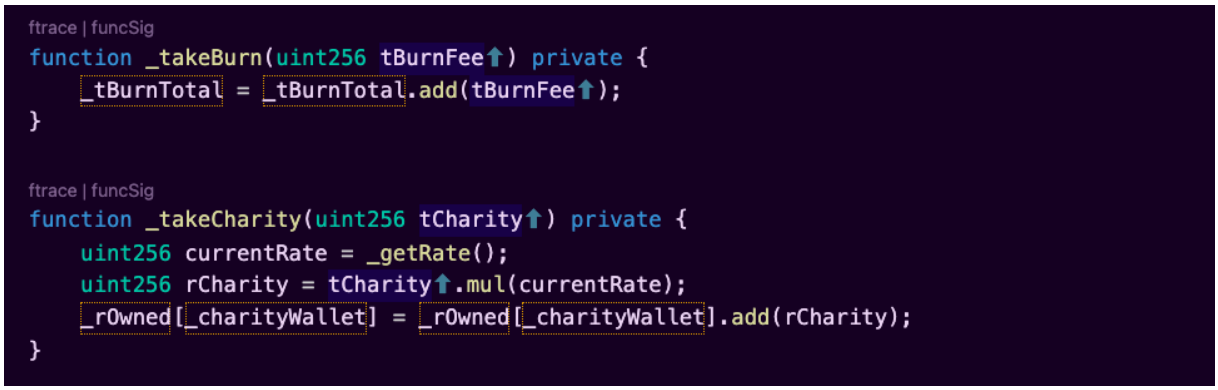
Security Issues

High Severity Issues

1. Wrong take of burn and charity fees

Issue:

- Function `_takeBurn` only adding burn value to _tBurnTotal. But should decrease rTotal and tTotal with proper values, otherwise burn amount is also existing.
- Function `_takeCharity` not checking if charity address is excluded from reward. So that it can't realize proper RFI logic if there would be excluded address.



```
ftrace | funcSig
function _takeBurn(uint256 tBurnFee⬆) private {
    _tBurnTotal = _tBurnTotal.add(tBurnFee⬆);
}

ftrace | funcSig
function _takeCharity(uint256 tCharity⬆) private {
    uint256 currentRate = _getRate();
    uint256 rCharity = tCharity⬆.mul(currentRate);
    _rOwned[_charityWallet] = _rOwned[_charityWallet].add(rCharity);
}
```

Recommendation:

Check functions and correct them to fit RFI logic by decreasing proper values in `_takeBurn` function and proper checking in `_takeCharity`.

Medium Severity Issues

No medium severity issues found.

Low Severity Issues

2. 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.

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

- Owner can change the tax fee.

```
ftrace | funcSig
function setTaxFeePercent(uint256 taxFee⬆) external onlyOwner() {
    _taxFee = taxFee⬆;
}
```

- Owner can change the maximum transaction amount.

```
function setMaxTxPercent(uint256 maxTxPercent⬆) external onlyOwner() {
    _maxTxAmount = _tTotal.mul(maxTxPercent⬆).div(
        10**2
    );
}
```

- Owner can exclude from the fee.

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

Conclusion

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

Liquidity locking details provided by the team:
https://app.unicrypt.network/amm/uni-v2/ilo/0xb8875714ffB3d04E3C4FADca2660C21051f062A7

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.