



Smart Contract Audit

FOR
SafeRug

DATED : 25 October 23'

MANUAL TESTING

Centralization – Enabling Trades

Severity: High

function: EnableTrading

Status: Open

Overview:

The EnableTrading function permits only the contract owner to activate trading capabilities. Until this function is executed, no investors can buy, sell, or transfer their tokens. This places a high degree of control and centralization in the hands of the contract owner.

```
function EnableTrading() external onlyOwner {  
    require(!tradingEnabled, "Cannot re-enable trading");  
    tradingEnabled = true;  
    providingLiquidity = true;  
    genesis_block = block.number;  
}
```

Suggestion

To reduce centralization and potential manipulation, consider one of the following approaches:

1. Automatically enable trading after a specified condition, such as the completion of a presale, is met.
2. If manual activation is still desired, consider transferring the ownership of the contract to a trustworthy, third-party entity like a certified "PinkSale Safu" developer. This can provide investors with more confidence in the eventual activation of trading capabilities, mitigating concerns of potential bad faith actions by the original owner



AUDIT SUMMARY

Project name – SafeRug

Date: 25 October 2023

Scope of Audit- Audit Ace was consulted to conduct the smart contract audit of the solidity source codes.

Audit Status: **Passed with High Risk**

Issues Found

| Status | Critical | High | Medium | Low | Suggestion |
|--------------|----------|------|--------|-----|------------|
| Open | 0 | 1 | 1 | 0 | 0 |
| Acknowledged | 0 | 0 | 0 | 0 | 0 |
| Resolved | 0 | 0 | 0 | 0 | 0 |

USED TOOLS

Tools:

1- Manual Review:

A line by line code review has been performed by audit ace team.

2- BSC Test Network: All tests were conducted on the BSC Test network, and each test has a corresponding transaction attached to it. These tests can be found in the "Functional Tests" section of the report.

3- Slither :

The code has undergone static analysis using Slither.

Testnet version:

The tests were performed using the contract deployed on the BSC Testnet, which can be found at the following address:

<https://testnet.bscscan.com/token/0xC98A399eDf0B4B79f2dF37F5AEe605f6bd9B307b>



Token Information

Token Address :

0xA23eCC1e02d84ef4691e009274667711A2A5E183

Name: SafeRug

Symbol: SafeRug

Decimals: 18

Network: Binance smart chain

Token Type: BEP20

Owner: 0x208142880569eb758EC797Ce0d630fD965691131

Deployer: 0x208142880569eb758EC797Ce0d630fD965691131

Token Supply: 1,000,000

Checksum:

af747e29e250fa2181f56bced993ee804a62665c

Testnet version:

The tests were performed using the contract deployed on the Binance smart chain Testnet, which can be found at the following address:

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TOKEN OVERVIEW

buy fee: 0-5%

Sell fee: 0-24%

transfer fee: 0-1%

Fee Privilege: Owner

Ownership: Owned

Minting: None

Max Tx: No

Blacklist: No

Other Privileges:

- Initial distribution of the tokens
 - Modifying fees
 - Enabling trades
-



AUDIT METHODOLOGY

The auditing process will follow a routine as special considerations by Auditace:

- Review of the specifications, sources, and instructions provided to Auditace to make sure the contract logic meets the intentions of the client without exposing the user's funds to risk.
 - Manual review of the entire codebase by our experts, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
 - Specification comparison is the process of checking whether the code does what the specifications, sources, and instructions provided to Auditace describe.
 - Test coverage analysis determines whether the test cases are covering the code and how much code is exercised when we run the test cases.
 - Symbolic execution is analysing a program to determine what inputs cause each part of a program to execute.
 - Reviewing the codebase to improve maintainability, security, and control based on the established industry and academic practices.
-

VULNERABILITY CHECKLIST

- | | |
|------------------------------------|-------------------------------|
| ✓ Return values of low-level calls | ✓ Gasless Send |
| ✓ Private modifier | ✓ Using block.timestamp |
| ✓ Multiple Sends | ✓ Re-entrancy |
| ✓ Using Suicide | ✓ Tautology or contradiction |
| ✓ Gas Limitand Loops | ✓ Timestamp Dependence |
| ✓ Address hardcoded | ✓ Revert/require functions |
| ✓ Exception Disorder | ✓ Use of tx.origin |
| ✓ Using inline assembly | ✓ Integer overflow/underflow |
| ✓ Divide before multiply | ✓ Dangerous strict equalities |
| ✓ Missing Zero Address Validation | ✓ Using SHA3 |
| ✓ Compiler version not fixed | ✓ Using throw |
-



CLASSIFICATION OF RISK

Severity

Description

◆ Critical

These vulnerabilities could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.

◆ High-Risk

A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.

◆ Medium-Risk

A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.

◆ Low-Risk

A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.

◆ Gas Optimization /Suggestion

A vulnerability that has an informational character but is not affecting any of the code.

Findings

Severity

Found

◆ Critical

0

◆ High-Risk

1

◆ Medium-Risk

1

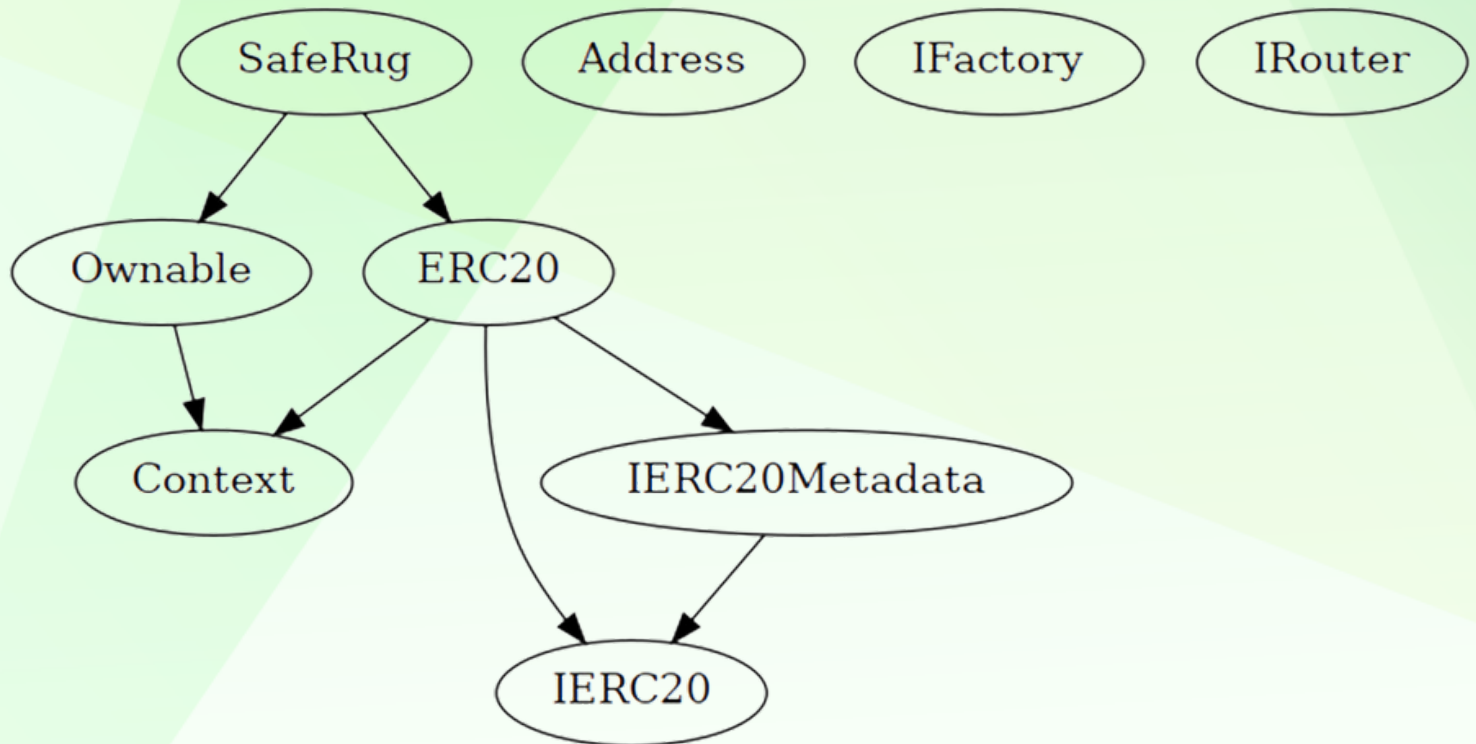
◆ Low-Risk

0

◆ Gas Optimization / Suggestions

0

INHERITANCE TREE



POINTS TO NOTE

- **Owner is able to adjust buy/transfer fees within 0-5%**
 - **Owner is able to adjust sell fees within 0 – 24%**
 - Owner is not able to blacklist an arbitrary wallet
 - Owner is not able to disable trades
 - Owner is not able to mint new tokens
 - Owner is not able to set maximum wallet and maximum buy/sell/transfer limits
 - **Owner must enable trades manually**
-



STATIC ANALYSIS

```
Reentrancy in SafeRug.transferFrom(address,address,uint256) (contracts/Token.sol#493-508):
  External calls:
    - _transfer(sender,recipient,amount) (contracts/Token.sol#498)
      - router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,deadWallet,block.timestamp) (contracts/Token.sol#664-671)
      - (success) = recipient.call{value: amount}() (contracts/Token.sol#347)
      - router.swapExactTokensForETHSupportingFeeOnTransferTokens(tokenAmount,0,path,address(this),block.timestamp) (contracts/Token.sol#650-656)
      - address(devWallet).sendValue(devAmt) (contracts/Token.sol#636)
    External calls sending eth:
      - _transfer(sender,recipient,amount) (contracts/Token.sol#498)
        - router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,deadWallet,block.timestamp) (contracts/Token.sol#664-671)
        - (success) = recipient.call{value: amount}() (contracts/Token.sol#347)
    Event emitted after the call(s):
      - Approval(owner,spender,amount) (contracts/Token.sol#336)
        - _approve(sender,_msgSender(),currentAllowance - amount) (contracts/Token.sol#505)
  Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities-3
INFO:Detectors:
Context._msgData() (contracts/Token.sol#17-20) is never used and should be removed
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#dead-code
INFO:Detectors:
Pragma version^0.8.17 (contracts/Token.sol#10) allows old versions
solc-0.8.17 is not recommended for deployment
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-versions-of-solidity
INFO:Detectors:
Low level call in Address.sendValue(address,uint256) (contracts/Token.sol#341-352):
  - (success) = recipient.call{value: amount}() (contracts/Token.sol#347)
  Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#low-level-calls
INFO:Detectors:
Variable ERC20._balances (contracts/Token.sol#73) is not in mixedCase
Variable ERC20._allowances (contracts/Token.sol#75) is not in mixedCase
Function IRouter.WETH() (contracts/Token.sol#405) is not in mixedCase
Function SafeRug.Liquify(uint256,SafeRug.Taxes) (contracts/Token.sol#600-639) is not in mixedCase
Parameter SafeRug.updateLiquidityTreshhold(uint256).new_amount (contracts/Token.sol#678) is not in mixedCase
Function SafeRug.EnableTrading() (contracts/Token.sol#686-691) is not in mixedCase
Parameter SafeRug.updatedeadline(uint256)._deadline (contracts/Token.sol#693) is not in mixedCase
Parameter SafeRug.updateExemptFee(address,bool)._address (contracts/Token.sol#722) is not in mixedCase
Variable SafeRug.genesis_block (contracts/Token.sol#440) is not in mixedCase
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-solidity-naming-conventions
INFO:Detectors:
Redundant expression "this (contracts/Token.sol#18)" inContext (contracts/Token.sol#12-21)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#redundant-statements
INFO:Detectors:
SafeRug.launchtax (contracts/Token.sol#442) should be constant
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-constant
INFO:Detectors:
SafeRug.pair (contracts/Token.sol#432) should be immutable
SafeRug.router (contracts/Token.sol#431) should be immutable
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-immutable
INFO:Slither:./contracts/Token.sol analyzed (9 contracts with 88 detectors), 34 result(s) found
```

**Result => A static analysis of contract's source code has been performed using slither,
No major issues were found in the output**



CONTRACT ASSESMENT

```
| Contract|      Type      |Bases |      |      |
|:-----:|:-----:|:-----:|:-----:|:-----:|
|  └─ | **Function Name** | **Visibility** | **Mutability** | **Modifiers** |
|||||
| **Context** | Implementation | |||
|  └─ | _msgSender | Internal 🔒 | |||
|  └─ | _msgData | Internal 🔒 | |||
|||||
| **IERC20** | Interface | |||
|  └─ | totalSupply | External ! | | NO ! |
|  └─ | balanceOf | External ! | | NO ! |
|  └─ | transfer | External ! | | ● NO ! |
|  └─ | allowance | External ! | | NO ! |
|  └─ | approve | External ! | | ● NO ! |
|  └─ | transferFrom | External ! | | ● NO ! |
|||||
| **IERC20Metadata** | Interface | IERC20 |||
|  └─ | name | External ! | | NO ! |
|  └─ | symbol | External ! | | NO ! |
|  └─ | decimals | External ! | | NO ! |
|||||
| **ERC20** | Implementation | Context, IERC20, IERC20Metadata |||
|  └─ | <Constructor> | Public ! | | ● NO ! |
|  └─ | name | Public ! | | NO ! |
|  └─ | symbol | Public ! | | NO ! |
|  └─ | decimals | Public ! | | NO ! |
|  └─ | totalSupply | Public ! | | NO ! |
|  └─ | balanceOf | Public ! | | NO ! |
|  └─ | transfer | Public ! | | ● NO ! |
|  └─ | allowance | Public ! | | NO ! |
|  └─ | approve | Public ! | | ● NO ! |
|  └─ | transferFrom | Public ! | | ● NO ! |
|  └─ | increaseAllowance | Public ! | | ● NO ! |
|  └─ | decreaseAllowance | Public ! | | ● NO ! |
|  └─ | _transfer | Internal 🔒 | | ● |||
|  └─ | _tokengeneration | Internal 🔒 | | ● |||
|  └─ | _approve | Internal 🔒 | | ● |||
```



CONTRACT ASSESMENT

|||||

| ****Address**** | Library | |||

| | sendValue | Internal | 🔒 | ● | |

|||||

| ****Ownable**** | Implementation | Context |||

| | <Constructor> | Public | ! | ● | NO ! |

| | owner | Public | ! | | NO ! |

| | renounceOwnership | Public | ! | ● | onlyOwner |

| | transferOwnership | Public | ! | ● | onlyOwner |

| | _setOwner | Private | 🔒 | ● | |

|||||

| ****IFactory**** | Interface | |||

| | createPair | External | ! | ● | NO ! |

|||||

| ****IRouter**** | Interface | |||

| | factory | External | ! | | NO ! |

| | WETH | External | ! | | NO ! |

| | addLiquidityETH | External | ! | 💰 | NO ! |

| | swapExactTokensForETHSupportingFeeOnTransferTokens | External | ! | ● | NO ! |

|||||

| ****SafeRug**** | Implementation | ERC20, Ownable |||

| | <Constructor> | Public | ! | ● | ERC20 |

| | approve | Public | ! | ● | NO ! |

| | transferFrom | Public | ! | ● | NO ! |

| | increaseAllowance | Public | ! | ● | NO ! |

| | decreaseAllowance | Public | ! | ● | NO ! |

| | transfer | Public | ! | ● | NO ! |

| | _transfer | Internal | 🔒 | ● | |

| | Liquify | Private | 🔒 | ● | lockTheSwap |

| | swapTokensForETH | Private | 🔒 | ● | |

| | addLiquidity | Private | 🔒 | ● | |

| | updateLiquidityProvide | External | ! | ● | onlyOwner |

| | updateLiquidityTreshhold | External | ! | ● | onlyOwner |

| | EnableTrading | External | ! | ● | onlyOwner |

| | updatedeadline | External | ! | ● | onlyOwner |














| | updateDevWallet | External | ! | ● | onlyOwner |

| | updateTax | External | ! | ● | onlyOwner |



| | updateExemptFee | External | ! | ● | onlyOwner |



CONTRACT ASSESMENT

|  | bulkExemptFee | External  |  | onlyOwner |
|  | rescueBNB | External  |  | onlyOwner |
|  | rescueBEP20 | External  |  | onlyOwner |
|  | <Receive Ether> | External  |  | NO  |

Legend

| Symbol | Meaning |
|:-----:|:-----:|
|  | Function can modify state |
|  | Function is payable |



FUNCTIONAL TESTING

1- Adding liquidity (**passed**):

<https://testnet.bscscan.com/tx/0xd537e6f6009d554bc4f9dd1d17a8782996ac290c6e0d543619738fc66fccd1a1>

2- Buying when excluded (0% tax) (**passed**):

<https://testnet.bscscan.com/tx/0xd537e6f6009d554bc4f9dd1d17a8782996ac290c6e0d543619738fc66fccd1a1>

3- Selling when excluded (0% tax) (**passed**):

<https://testnet.bscscan.com/tx/0x639a3c799f1868489253ece3f819e263a0b7b17d6a6435b36f884fef944d764c>

4- Transferring when excluded from fees (0% tax) (**passed**):

<https://testnet.bscscan.com/tx/0x20164b1793abb2ea95d60043360e7a5b25a41f0ef19dfc3820834e686ed7028c>

5- Buying when not excluded from fees (tax 0-5%) (**passed**):

<https://testnet.bscscan.com/tx/0xee2f251a0c2162aabb468607582f76a4c127c7921dfe46831647c1100c8b1286>

6- Selling when not excluded from fees (tax 0-24%) (**passed**):

<https://testnet.bscscan.com/tx/0xca7d6eab12c18b2cbb97931ad1ff12562aa1e7ff2014e9e835aeafb7febfbf60>

7- Transferring when not excluded from fees (0-5% tax) (**passed**):

<https://testnet.bscscan.com/tx/0x959028b55b2ca1a77678585766094bae7d2b891c78cb1a711ec392d11279e020>

8- Internal swap (BNB set to dev wallet + Auto-liquidity) (**passed**):

<https://testnet.bscscan.com/tx/0xca7d6eab12c18b2cbb97931ad1ff12562aa1e7ff2014e9e835aeafb7febfbf60>

MANUAL TESTING

Centralization – Enabling Trades

Severity: High

function: EnableTrading

Status: Open

Overview:

The EnableTrading function permits only the contract owner to activate trading capabilities. Until this function is executed, no investors can buy, sell, or transfer their tokens. This places a high degree of control and centralization in the hands of the contract owner.

```
function EnableTrading() external onlyOwner {  
    require(!tradingEnabled, "Cannot re-enable trading");  
    tradingEnabled = true;  
    providingLiquidity = true;  
    genesis_block = block.number;  
}
```

Suggestion

To reduce centralization and potential manipulation, consider one of the following approaches:

1. Automatically enable trading after a specified condition, such as the completion of a presale, is met.
2. If manual activation is still desired, consider transferring the ownership of the contract to a trustworthy, third-party entity like a certified "PinkSale Safu" developer. This can provide investors with more confidence in the eventual activation of trading capabilities, mitigating concerns of potential bad faith actions by the original owner

MANUAL TESTING

Logical – Updating swap threshold

Severity: Medium

function: updateLiquidityThreshold

Status: Open

Overview:

updateLiquidityThreshold requires new swap threshold to be less than $1e7$ which is equal to 10x of total supply while error message indicates that new swap threshold amount must be less than 1% of total supply ($1e5$)

```
function updateLiquidityTreshhold(uint256 new_amount) external onlyOwner
{
    require(
        new_amount <= 1e7,
        "Swap threshold amount should be lower or equal to 1% of tokens"
    );
    tokenLiquidityThreshold = new_amount * 10 ** decimals();
}
```

Suggestion

Change condition to be compatible with the error message:

```
function updateLiquidityTreshhold(uint256 new_amount) external onlyOwner
{
    require(
        new_amount <= 1e5,
        "Swap threshold amount should be lower or equal to 1% of tokens"
    );
    tokenLiquidityThreshold = new_amount * 10 ** decimals();
}
```



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