



Smart Contract Audit

FOR

Kirby Inu

DATED : 18 Apr 23'



AUDIT SUMMARY

Project name – Kirby Inu

Date: 18 April, 2023

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

Audit Status: **Passed**

Issues Found

Status	Critical	High	Medium	Low	Suggestion
Open	0	2	0	0	2
Acknowledged	0	0	0	0	0
Resolved	0	1	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 done on BSC Test network, each test has its transaction has attached to it.

3- Slither : Static Analysis

Testnet Link: all tests were done using this contract, tests are done on BSC Testnet

<https://testnet.bscscan.com/token/0x881F7c4e0cBAcac94A4bC0555525c665A5669a2C>



Token Information

Token Name : Kirby Inu

Token Symbol: Kinu

Decimals: 18

Token Supply: 42,000,000,000,000

Token Address:

0xEa81224464c3173a38586157aB866eE63216e1Da

Checksum:

34d3a3e8f0b23d06aed78dcef65cd84ae4f0b5c6

Owner:

0x8a94cA37223Fae96a3696B48F4F55Af0C40B4e04

Deployer:

0x41B7b487B9F6726e114f9F4aFa9Fa7217219F805



TOKEN OVERVIEW

Fees:

Buy Fees: up to 10%

Sell Fees: up to 10%

Transfer Fees: 0%

Fees Privilige: none

Ownership : Owned

Minting: No mint function

Max Tx Amount/ Max Wallet Amount: No

Blacklist: Yes

Other Privileges: excluding from fees - including in fees



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.

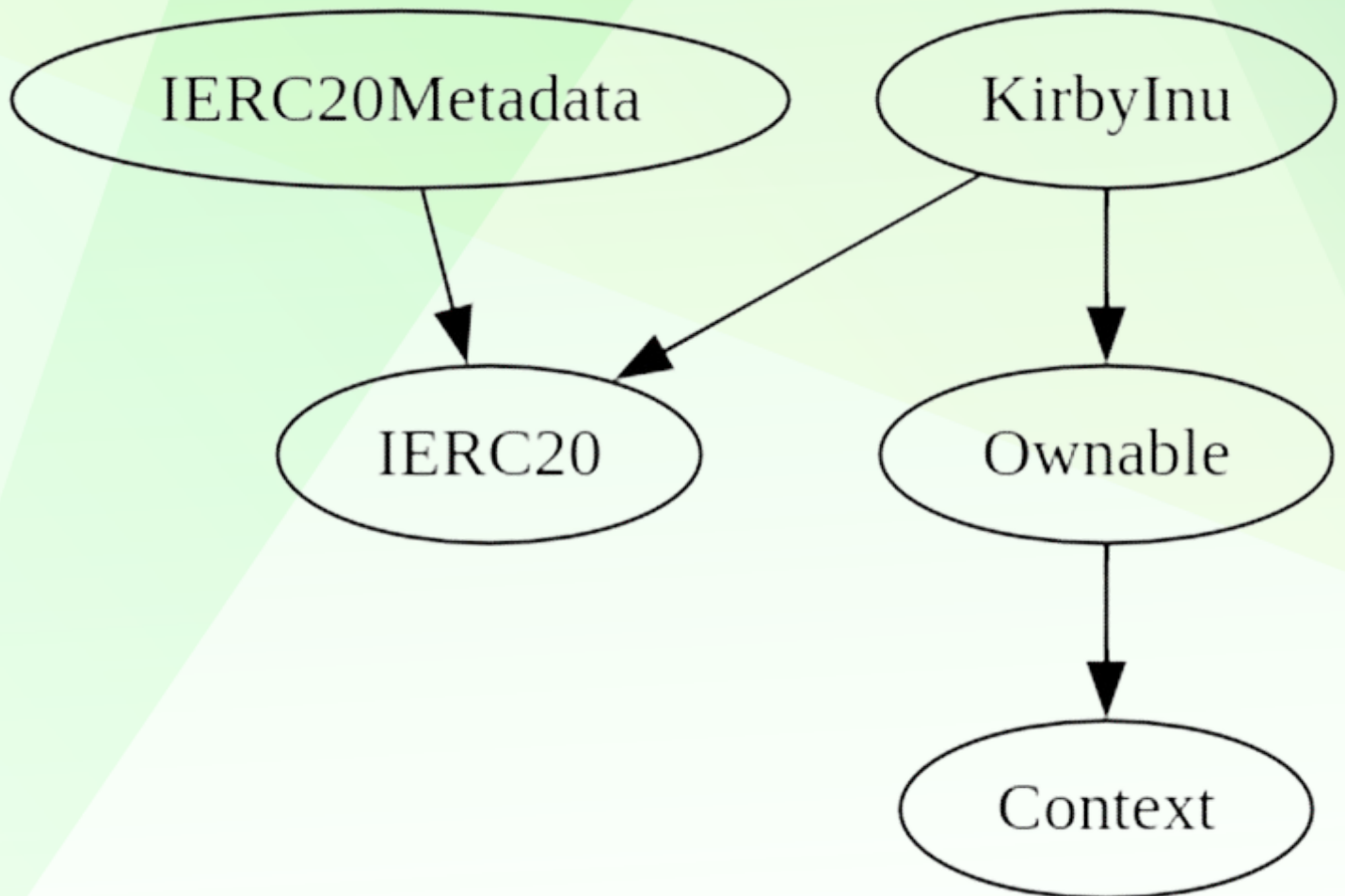
Findings

Severity

Found

◆ Critical	0
◆ High-Risk	2 (1 resolved)
◆ Medium-Risk	0
◆ Low-Risk	0
◆ Gas Optimization / Suggestions	2

INHERITANCE TREE





POINTS TO NOTE

- Owner is change fees (10% buy, 10% sell, 0% transfers)
 - Owner is not able to set max buy/sell/transfer/hold amount
 - Owner is not able to blacklist an arbitrary wallet
 - Owner is not able to disable trades
 - Owner is not able to mint new tokens
-



CONTRACT ASSESMENT

Contract	Type	Bases			
-----	-----	-----	-----	-----	-----
L	**Function Name**	**Visibility**	**Mutability**	**Modifiers**	
IERC20	Interface				
L	decimals	External !		NO !	
L	symbol	External !		NO !	
L	name	External !		NO !	
L	totalSupply	External !		NO !	
L	balanceOf	External !		NO !	
L	transfer	External !		NO !	
L	allowance	External !		NO !	
L	approve	External !		NO !	
L	transferFrom	External !		NO !	
ISwapRouter	Interface				
L	factory	External !		NO !	
L	WETH	External !		NO !	
L	swapExactTokensForTokensSupportingFeeOnTransferTokens	External !		NO !	
L	addLiquidity	External !		NO !	
ISwapFactory	Interface				
L	createPair	External !		NO !	
Ownable	Implementation				
L	<Constructor>	Public !		NO !	
L	owner	Public !		NO !	
L	transferOwnership	Public !		onlyOwner	
TokenDistributor	Implementation				
L	<Constructor>	Public !		NO !	
KirbyInu	Implementation	IERC20, Ownable			
L	<Constructor>	Public !		NO !	
L	symbol	External !		NO !	
L	name	External !		NO !	
L	decimals	External !		NO !	
L	totalSupply	Public !		NO !	
L	balanceOf	Public !		NO !	
L	transfer	Public !		NO !	
L	allowance	Public !		NO !	
L	approve	Public !		NO !	

CONTRACT ASSESMENT





```

|  | transferFrom | Public ! |  | NO! |
|  | _approve | Private  |  |  |
|  | _transfer | Private  |  |  |
|  | _tokenTransfer | Private  |  |  |
|  | swapTokenForFund | Private  |  | lockTheSwap |
|  | _takeTransfer | Private  |  |  |
|  | setFundAddress | External ! |  | onlyFunder |
|  | setFeeWhiteList | External ! |  | onlyFunder |
|  | setSwapPairList | External ! |  | onlyFunder |
|  | claimBalance | External ! |  | NO! |
|  | <Receive Ether> | External ! |  | NO! |
|  | addHolder | Private  |  |  |
|  | addHolder_manual1 | Public ! |  | onlyFunder |
|  | addHolder_manual2 | Public ! |  | onlyFunder |
|  | processReward | Private  |  |  |
|  |  |  |  |  |
|  | **DividendPayingTokenInterface** | Interface |  |  |
|  | dividendOf | External ! |  | NO! |
|  | distributeDividends | External ! |  | NO! |
|  | withdrawableDividendOf | External ! |  | NO! |
|  | withdrawnDividendOf | External ! |  | NO! |
|  | accumulativeDividendOf | External ! |  | NO! |
|  |  |  |  |  |
|  | **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! |
|  |  |  |  |  |
|  | **Ownable** | Implementation | Context |  |
|  | <Constructor> | Public ! |  | NO! |
|  | owner | Public ! |  | NO! |
|  | renounceOwnership | Public ! |  | onlyOwner |
|  | transferOwnership | Public ! |  | onlyOwner |
|  |  |  |  |  |

```



CONTRACT ASSESMENT

****Context****	Implementation			
^L	_msgSender	Internal 		
^L	_msgData	Internal 		
Symbol	Meaning
	Function can modify state
	Function is payable



STATIC ANALYSIS

```
Function ISwapRouter.WETH() (contracts/Token.sol#47) is not in mixedCase
Variable Ownable.owner (contracts/Token.sol#77) is not in mixedCase
Function KirbyInu.addHolder_manual1(address[]) (contracts/Token.sol#429-433) is not in mixedCase
Function KirbyInu.addHolder_manual2(address) (contracts/Token.sol#435-437) is not in mixedCase
Variable KirbyInu.ReceiveAddress (contracts/Token.sol#121) is not in mixedCase
Variable KirbyInu_feeWhiteList (contracts/Token.sol#123) is not in mixedCase
Variable KirbyInu_swapRouter (contracts/Token.sol#127) is not in mixedCase
Variable KirbyInu_WBNB (contracts/Token.sol#128) is not in mixedCase
Variable KirbyInu_swapPairList (contracts/Token.sol#129) is not in mixedCase
Variable KirbyInu_tokenDistributor (contracts/Token.sol#133) is not in mixedCase
Variable KirbyInu_buyFundFee (contracts/Token.sol#135) is not in mixedCase
Variable KirbyInu_buyPDividendFee (contracts/Token.sol#136) is not in mixedCase
Variable KirbyInu_sellPDividendFee (contracts/Token.sol#137) is not in mixedCase
Variable KirbyInu_sellFundFee (contracts/Token.sol#138) is not in mixedCase
Variable KirbyInu_sellLPFee (contracts/Token.sol#139) is not in mixedCase
Variable KirbyInu_mainPair (contracts/Token.sol#143) is not in mixedCase
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-solidity-naming-conventions

Variable ISwapRouter.addLiquidity(address,address,uint256,uint256,uint256,uint256,address,uint256).amountADesired (contracts/Token.sol#60) is too similar to ISwapRouter.addLiquidity(address,address,uint256,uint256,uint256,uint256,address,uint256).amountBDesired (contracts/Token.sol#61)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#variable-names-too-similar

KirbyInu.constructor() (contracts/Token.sol#151-193) uses literals with too many digits:
- total = 420000000000000 * 10 ** decimals (contracts/Token.sol#172)
KirbyInu_transfer(address,address,uint256) (contracts/Token.sol#257-299) uses literals with too many digits:
- processReward(5000000) (contracts/Token.sol#297)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#too-many-digits

KirbyInu_buyFundFee (contracts/Token.sol#135) should be constant
KirbyInu_buyPDividendFee (contracts/Token.sol#136) should be constant
KirbyInu_sellFundFee (contracts/Token.sol#138) should be constant
KirbyInu_sellPDividendFee (contracts/Token.sol#137) should be constant
KirbyInu_sellLPFee (contracts/Token.sol#139) should be constant
KirbyInu.startTradeBlock (contracts/Token.sol#141) should be constant
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-constant

KirbyInu.ReceiveAddress (contracts/Token.sol#121) should be immutable
KirbyInu_WBNB (contracts/Token.sol#128) should be immutable
KirbyInu_decimals (contracts/Token.sol#120) should be immutable
KirbyInu_mainPair (contracts/Token.sol#143) should be immutable
KirbyInu_name (contracts/Token.sol#118) should be immutable
KirbyInu_swapRouter (contracts/Token.sol#127) should be immutable
KirbyInu_symbol (contracts/Token.sol#119) should be immutable
KirbyInu_tTotal (contracts/Token.sol#125) should be immutable
KirbyInu_tokenDistributor (contracts/Token.sol#133) should be immutable
KirbyInu.holderRewardCondition (contracts/Token.sol#440) should be immutable
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-immutable
```

Result => A static analysis of contract's source code has been performed using slither,

No major issues were found in the output



FUNCTIONAL TESTING

Some features like auto-liquidity are disabled forever since taxes can not be changed, current tests are done to be compatible with contract at address

0xEa81224464c3173a38586157aB866eE63216e1Da

however other tests for auto-liquidity and distribution also been done in a local testing environment (not included here)

1- Adding liquidity (passed):

<https://testnet.bscscan.com/tx/0xa615f73b0549e69fad27e81acdd5b68fb7204168ca17364bcb16c3d7c73747a3>

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

<https://testnet.bscscan.com/tx/0x23b5a5b6a9c6a8afc453a3bc84149a9cd62101ba6ec01c9fe30df32838799d49>

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

<https://testnet.bscscan.com/tx/0xd8e2e835edc6661efa4b3c35376791c1be73d3a00bb110c36b3652bb5c538cfc>

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

<https://testnet.bscscan.com/tx/0x30051d67f55445adbd40ce5056730c4f6d2fb3c5548bf2dafb528baed3a6f032>

5- Buying when not excluded (upto 10% tax) (passed):

<https://testnet.bscscan.com/tx/0xa58f34b8d0f183949732d35354eae703614fbd51438573f6b65563b4791b9027>

6- Selling when not excluded (upto 10% tax) (passed):

<https://testnet.bscscan.com/tx/0x78b8d274825bea49d490d6490012d36493372b20eeab7e29484d5a91226eda72>



FUNCTIONAL TESTING

7- Transferring when not excluded (0% tax) (passed):

<https://testnet.bscscan.com/tx/0x13a6f34e633a4a4e4d5f0c9af8123910816ffc23f9360dab104f8fc1eba54440>

8- Internal swap (passed):

Fund wallet receiving BUSD (USDT in mainnet)

<https://testnet.bscscan.com/address/0x8a94ca37223fae96a3696b48f4f55af0c40b4e04#tokentxns>

MANUAL TESTING

Logical - Lack of allowance

Severity: **High**

Function: swapTokenForFund

Lines: 286

Status: **Resolved**

Overview:

Contract must approve router to spend its USDT tokens in order to be able to add liquidity.

```
if (lpAmount > 0) {  
    uint256 lpWbnb = (WbnbBalance * lpFee) / swapFee;  
    if (lpWbnb > 0) {  
        _swapRouter.addLiquidity(  
            address(this),  
            _WBNB,  
            lpAmount,  
            lpWbnb,  
            0,  
            0,  
            fundAddress,  
            block.timestamp  
        );  
    }  
}
```

Recommendation:

approve router to spend USDT tokens of the contract

```
WBNB.approve(address(_swapRouter), ~uint256(0))
```

Allevation:

Since LP tax is 0, this section of the code is disabled.

MANUAL TESTING

Logical - Dividend tracker

Severity: **High**

Function: processReward

Lines: 385

Status: **Not Resolved**

Overview:

There are several issue in dividend tracker:

1- Wallet that are excluded from wallets still affect the calculations of each wallet's rewards

```
if (tokenBalance > 0 && !excludeHolder[shareHolder]) {  
    amount = (balance * tokenBalance) / holdTokenTotal;  
  
    uint holdTokenTotal = holdToken.totalSupply(); // total shares
```

if a wallet is excluded from rewards, its balance must be deducted from total shares, otherwise a portion of reward tokens will be lost.

Recommendation:

you can create a variable to store total shares which is initially equal to total supply of the holding token. If a wallet is excluded, the balance of the wallet gets deducted from total shares.

2- Hold token might be assigned to an invalid address:

```
IERC20 holdToken = IERC20(_mainPair);  
uint holdTokenTotal = holdToken.totalSupply();
```

at current implementation of the code, LP tokens are used as holding token.

Recommendation:

if this implementation is not intentional, make sure to change the holdToken.

MANUAL TESTING

Informational - Withdrawing tokens

Status: Not Resolved

Overview:

Current implementation of the contract doesn't have a function to withdraw stuck ERC20 tokens.

Recommendation:

if this implementation is not intentional, make sure to change the holdToken.

```
function withdrawTokens(address _token) public onlyOwner {  
    IERC20(_token).transfer(owner(), IERC20(_token).balanceOf(Address(this)));  
}
```

Informational - Naming convention

Status: Not Resolved

Overview:

USDT token is declared as **WBNB** in the contract, this can cause confusion for investors.

Recommendation:

Change **WBNB** to **USDT**



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