TechRate
Blockchain solutions and consulting

智能合约安全审计

审计细节:

审计项目:	BODA
部署地址:	0x4acd5d62f01f13a397e5bf5cdf8f4c0a69534ede
客户联系人:	BODA 团队
区块链:	币安网智能链
项目网站:	https://www.bodatoken.org

May, 2021
TechRate

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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.

背景

BODA委托TechRate对智能合约进行审计:

- *https://bscscan.com/address/0x81cfb5e400eb2caa319130a0dae3b32cfb19392d#code*

审计是为了达到以下目的:

- 确保智能合约功能符合要求。
- 识别智能合约的潜在安全问题。

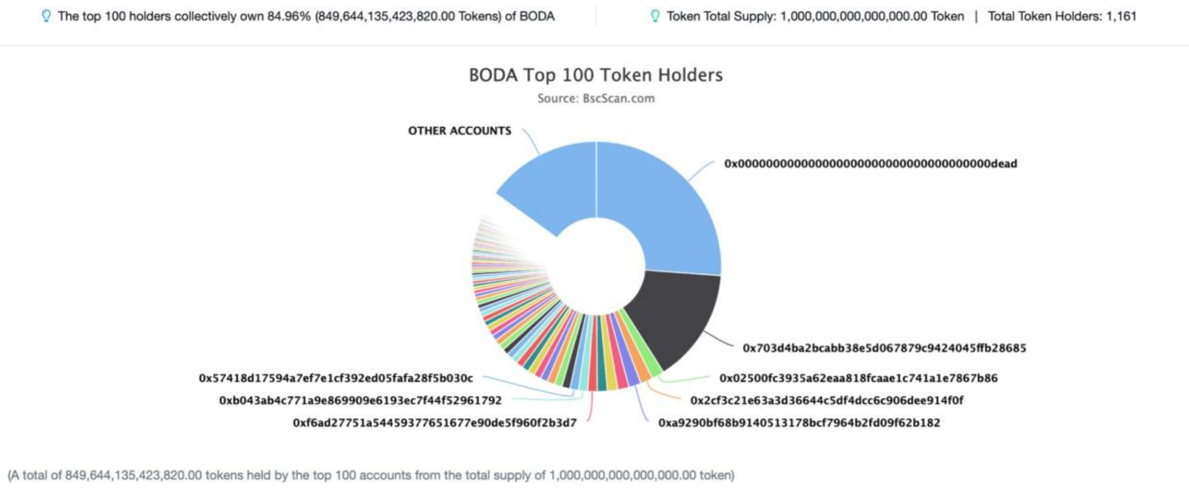
本报告中的信息应用于了解智能合约的风险敞口，并作为通过纠正已确定的问题来改善智能合约安全状况的指南。

合约细节

代币合约细节2021.05. 06

合约名称:	BODA
合约地址:	0x81cfb5e400eb2caa319130a0dae3b32cfb19392d
总供给量:	1_000_000_000_000_000_000_000_000
代币代码:	BODA
位数:	9
代币持有人数:	1161
交易笔数:	6645
前100名持股人的优势:	84.96 %
流动性费用:	7
税费:	3
总费用:	158_388_874_733_266_276_146_654
PancakeSwap V2 pair:	0x703d4ba2bcabb38e5d067879c9424045ffb28685
合约部署人员地址:	0x4acd5d62f01f13a397e5bf5cdf8f4c0a69534ede
合约当前所有者地址:	0x0000000000000000000000000000000000000000

BODA代币分布



The top 100 holders collectively own 84.96% (849,644,135,423,820.00 Tokens) of BODA

Token Total Supply: 1,000,000,000,000,000.00 Token | Total Token Holders: 1,161

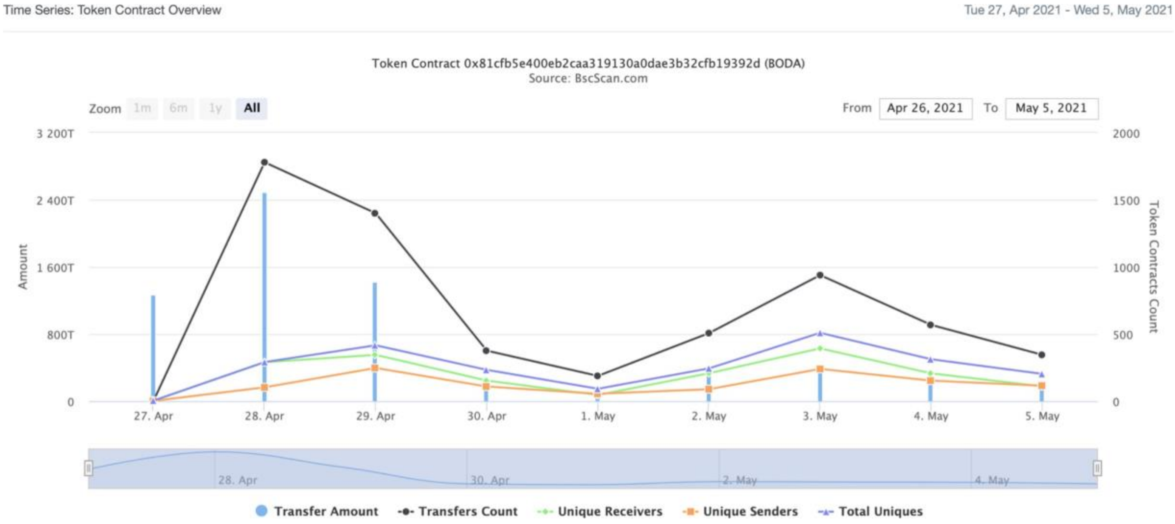
BODA Top 100 Token Holders

Source: BscScan.com

OTHER ACCOUNTS
0x000000000000000000000000000000000000dead
0x703d4ba2bcabb38e5d067879c9424045ffb28685
0x02500fc3935a62eaa818fcaae1c741a1e7867b86
0x2cf3c21e63a3d36644c5df4dcc6c906dee914f0f
0xa9290bf68b9140513178bcf7964b2fd09f62b182
0x57418d17594a7ef7e1cf392ed05fafa28f5b030c
0xb043ab4c771a9e869909e6193ec7f44f52961792
0xf6ad27751a54459377651677e90de5f960f2b3d7

(A total of 849,644,135,423,820.00 tokens held by the top 100 accounts from the total supply of 1,000,000,000,000,000.00 token)

BODA合约交互细节



Time Series: Token Contract Overview

Tue 27, Apr 2021 - Wed 5, May 2021

Token Contract 0x81cfb5e400eb2caa319130a0dae3b32cfb19392d (BODA)

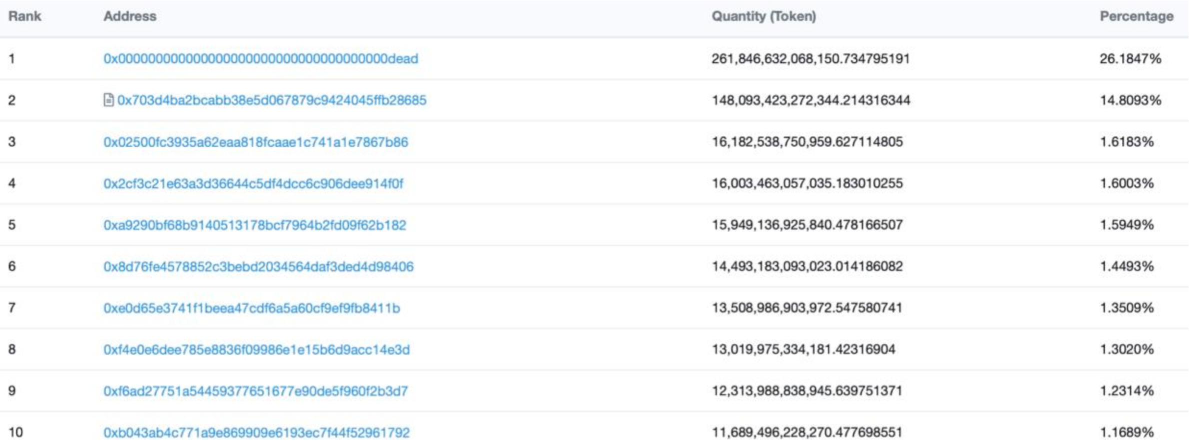
Source: BscScan.com

Zoom: All

From: Apr 26, 2021

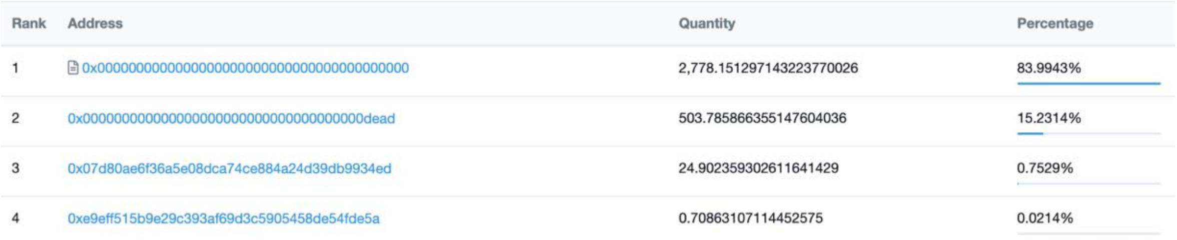
To: May 5, 2021

BODA 十大代币持有者



Rank	Address	Quantity (Token)	Percentage
1	0x000000000000000000000000000000000000dead	261,846,632,068,150.734795191	26.1847%
2	📄 0x703d4ba2bcabb38e5d067879c9424045ffb28685	148,093,423,272,344.214316344	14.8093%
3	0x02500fc3935a62eaa818fcaae1c741a1e7867b86	16,182,538,750,959.627114805	1.6183%
4	0x2cf3c21e63a3d36644c5df4dcc6c906dee914f0f	16,003,463,057,035.183010255	1.6003%
5	0xa9290bf68b9140513178bcf7964b2fd09f62b182	15,949,136,925,840.478166507	1.5949%
6	0x8d76fe4578852c3bebd2034564daf3ded4d98406	14,493,183,093,023.014186082	1.4493%
7	0xe0d65e3741f1beea47cdf6a5a60cf9ef9fb8411b	13,508,986,903,972.547580741	1.3509%
8	0xf4e0e6dee785e8836f09986e1e15b6d9acc14e3d	13,019,975,334,181.42316904	1.3020%
9	0xf6ad27751a54459377651677e90de5f960f2b3d7	12,313,988,838,945.639751371	1.2314%
10	0xb043ab4c771a9e869909e6193ec7f44f52961792	11,689,496,228,270.477698551	1.1689%

BODA 有限合伙人代币持有者



Rank	Address	Quantity	Percentage
1	📄 0x0000000000000000000000000000000000000000	2,778.151297143223770026	83.9943%
2	0x000000000000000000000000000000000000dead	503.785866355147604036	15.2314%
3	0x07d80ae6f36a5e08dca74ce884a24d39db9934ed	24.902359302611641429	0.7529%
4	0xe9eff515b9e29c393af69d3c5905458de54fde5a	0.70863107114452575	0.0214%

合约功能细节

```
+ [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 #

 + Ownable (Context)
   - [Int] <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] IUniswapV2Pair
  - [Ext] name
  - [Ext] symbol
  - [Ext] decimals
  - [Ext] totalSupply
  - [Ext] balanceOf
  - [Ext] allowance
  - [Ext] approve #
  - [Ext] transfer #
  - [Ext] transferFrom #
  - [Ext] DOMAIN_SEPARATOR
  - [Ext] PERMIT_TYPEHASH
  - [Ext] nonces
  - [Ext] permit #
  - [Ext] MINIMUM_LIQUIDITY
  - [Ext] factory
  - [Ext] token0
  - [Ext] token1
  - [Ext] getReserves
  - [Ext]   price0CumulativeLast
  - [Ext]   price1CumulativeLast
  - [Ext] kLast
  - [Ext] mint #
  - [Ext] burn#
  - [Ext] swap #
  - [Ext] skim #
  - [Ext] sync #
  - [Ext] initialize #

+ [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 #

+ BODA (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
  - [Prv] _transferBothExcluded #
  - [Pub] excludeFromFee #
    - modifiers: onlyOwner
  - [Pub] includeInFee #
- modifiers: onlyOwner
- [Ext] setTaxFeePercent #

  - modifiers: onlyOwner
- [Ext] setLiquidityFeePercent #
  - modifiers: onlyOwner
- [Ext] setMaxTxPercent#
  - modifiers: onlyOwner
- [Pub] setSwapAndLiquifyEnabled #
  - 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] swapTokensForEth #
- [Prv] addLiquidity #
- [Prv] _tokenTransfer #
- [Prv] _transferStandard #
- [Prv] _transferToExcluded #
- [Prv] _transferFromExcluded #

($) = payable function
# = non-constant function

问题检查状态

№	问题描述。	检查状态
1	编译程序错误。	通过
2	竞态条件和重入性。依序竞态条件。	通过
3	数据传递可能的延迟。	通过
4	Oracle访问。	通过
5	提前交易。	通过
6	时间戳依赖。	通过
7	整数溢出和下溢出。	通过
8	DoS与恢复。	通过
9	有gas限制的DoS。	低严重性问题
10	方法执行权限。	通过
11	契约经济模型。	通过
12	汇率上逻辑的影响。	通过
13	私人用户数据泄露。	通过
14	恶意的事件日志。	通过
15	范围和声明。	通过
16	未初始化的指针存储。	通过
17	运算精度。	通过
18	设计逻辑。	通过
19	依序竞态条件。	通过
20	安全开放齐柏林飞船契约的实现和使用。	通过
21	回退功能安全。	通过

安全问题

高严重程度问题

没有发现高严重程度问题。

中等严重程度问题

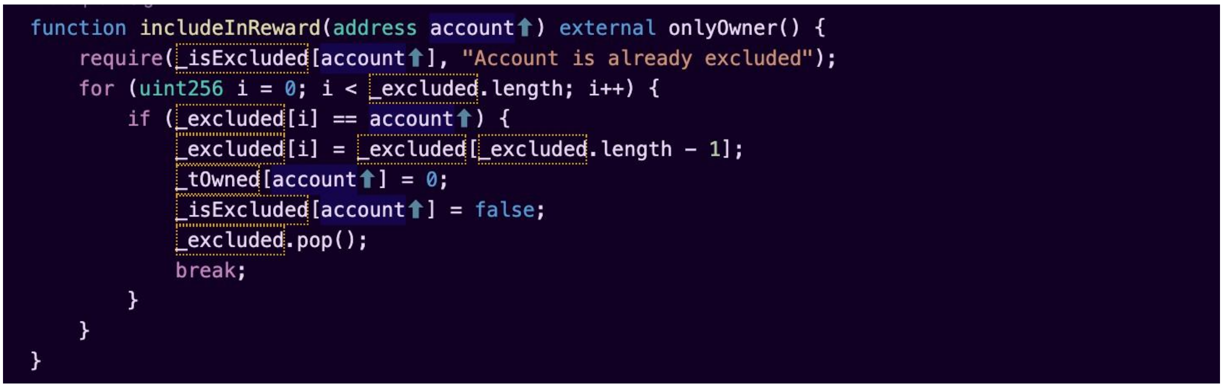
没有发现中等严重程度问题。

低严重程度问题

1. Out of gas

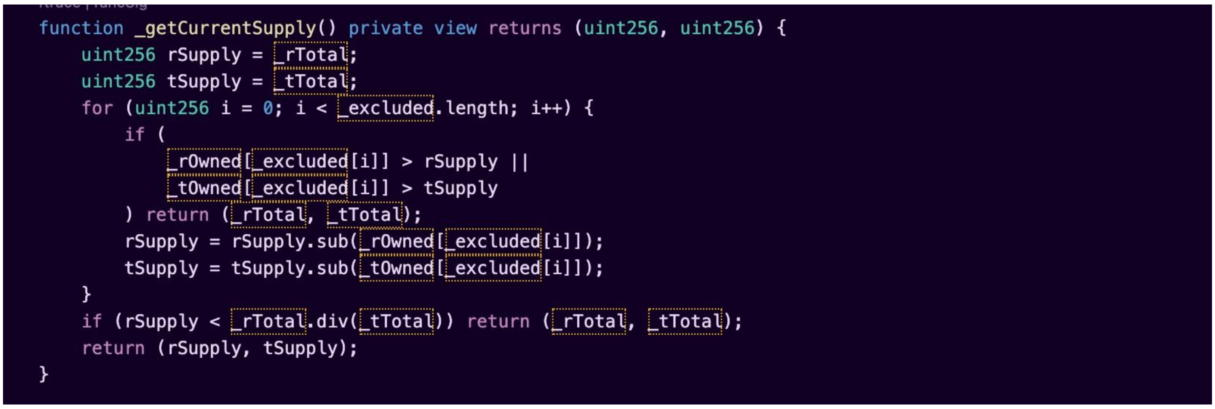
问题:

❑ includeInReward()函数使用循环从_excluded列表中查找和删除地址。如果有一个很长的被排除的地址列表，函数将被终止，并出现OUT_OF_GAS异常。



```
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;
        }
    }
}
```

❑ _getCurrentSupply函数还使用循环来计算总供给。如果有一个很长的被排除的地址列表，也可以使用OUT_OF_GAS异常中止。



```
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);
}
```

建议:使用可数集代替数组或不要使用长数组。

结论

智能合约不包含高严重程度问题！流动性配对合同的安全性因超出范围而不会被检查。

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