Sicherheitsprüfung für Smart Contracts

Prüfungsdetails

Geprüftes Projekt	:BODA
Bereitstellungsadresse:	0x4acd5d62f01f13a397e5bf5cdf8f4c0a69534ede
Kundenkontakt:	BODA-Team
Blockchain:	Binance Smart Chain
Projektwebseite:	https://www.bodatoken.org

Mai 2021
TechRate

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.

Hintergrund

TechRate wurde von BODA beauftragt, eine Prüfung von Smart Contracts durchzuführen:

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

Ziel der Prüfung war folgendes festzustellen:

- Sicherzustellen, dass der Smart Contract wie vorgesehen funktioniert.
- Potenzielle Sicherheitsprobleme mit dem Smart Contract zu Identifizieren.

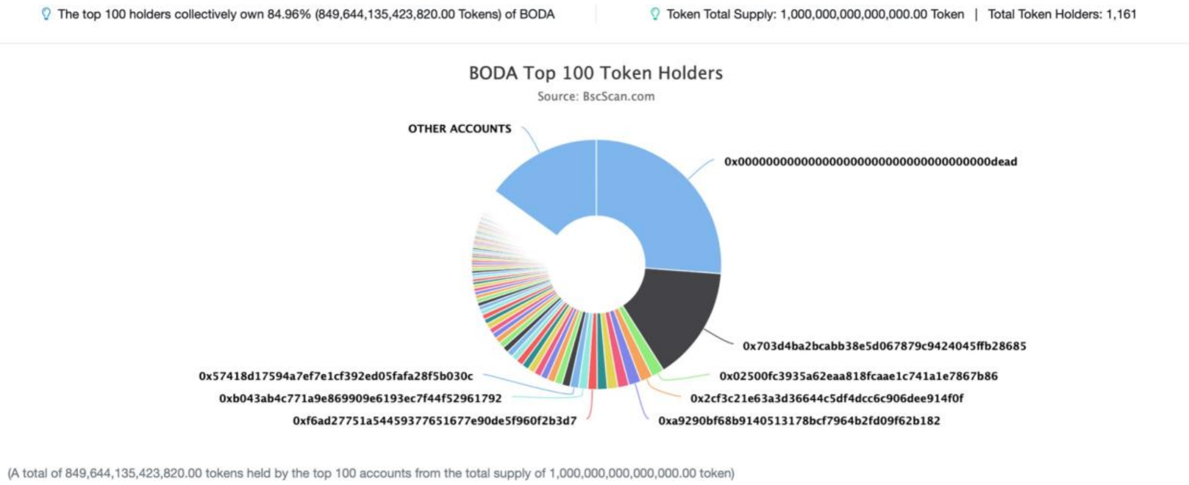
Die Informationen in diesem Bericht sollten verwendet werden, um die Risikopotenzial des Smart Contracts zu verstehen und als Leitfaden zur Verbesserung der Sicherheitslage des Smart Contracts durch Beheben der identifizierten Probleme zu dienen.

Vertragsdetails

Token-Vertragsdetails für den 06.05.2021.

Contract Name:	BODA
Contract Adresse:	0x81cfb5e400eb2caa319130a0dae3b32cfb19392d
Gesamtangebot:	1_000_000_000_000_000_000_000_000
Token-Ticker:	BODA
Kommastellen:	9
Token-Inhaber:	1161
Anzahl der Transaktionen:	6645
Dominanz der Top-100-Inhaber:	84,96 %
Liquiditätsgebühr:	7
Steuergebühr:	3
Gesamtgebühren:	158_388_874_733_266_276_146_654
PancakeSwap V2-Paar:	0x703d4ba2bcabb38e5d067879c9424045ffb28685
Adresse des Vertragsbereitstellers:	0x4acd5d62f01f13a397e5bf5cdf8f4c0a69534ede
Adresse des aktuellen Eigentümers des Vertrags:	0x0000000000000000000000000000000000000000

BODA token distribution



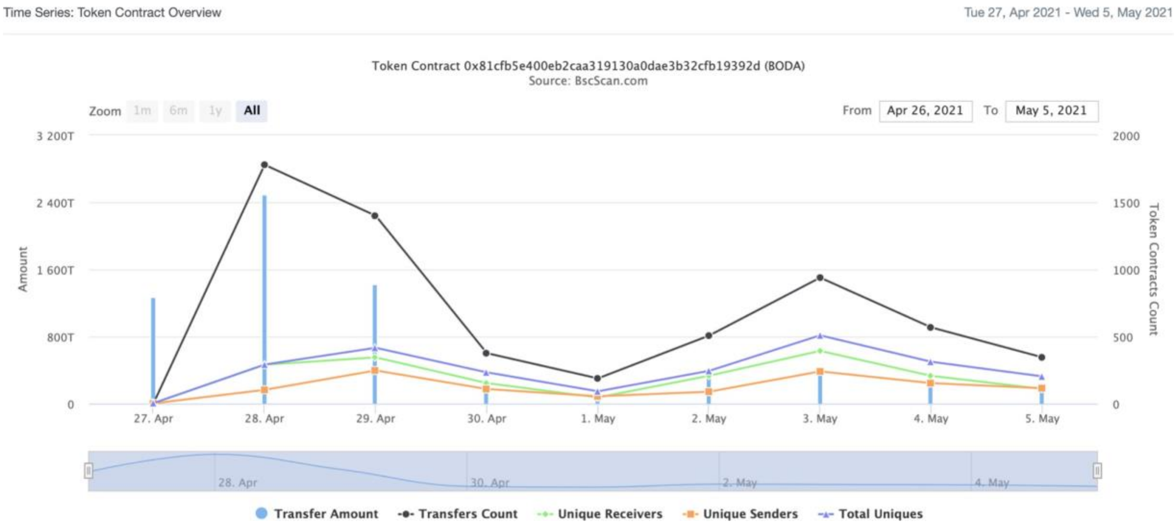
The top 100 holders collectively own 84.96% (849,644,135,423,820.00 Tokens) of BODA

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
0x57418d17594a7ef7e1cf392ed05fafa28f5b030c
0x02500fc3935a62eaa818fcaae1c741a1e7867b86
0xb043ab4c771a9e869909e6193ec7f44f52961792
0x2cf3c21e63a3d36644c5df4dcc6c906dee914f0f
0xf6ad27751a54459377651677e90de5f960f2b3d7
0xa9290bf68b9140513178bcf7964b2fd09f62b182

(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)

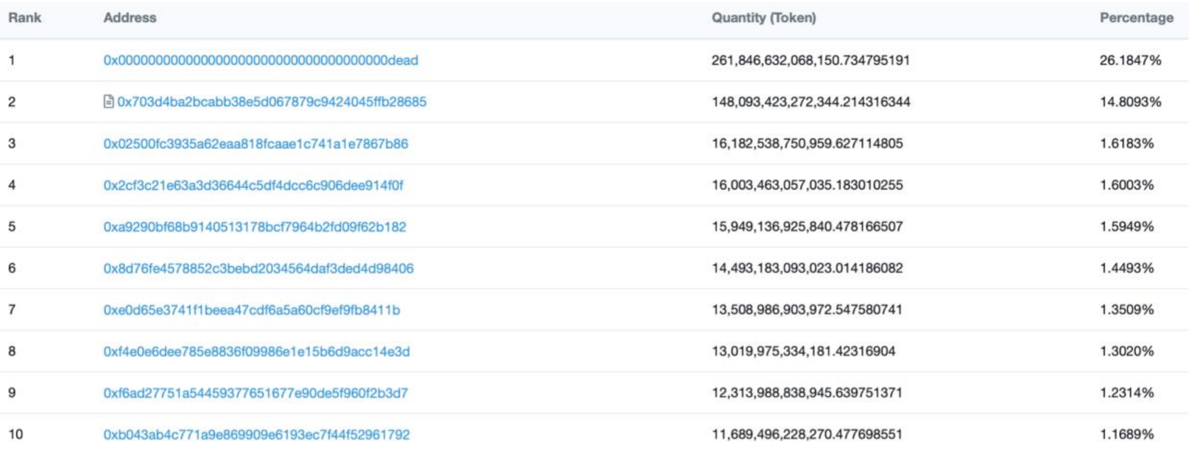
BODA contract interaction details



Time Series: Token Contract Overview

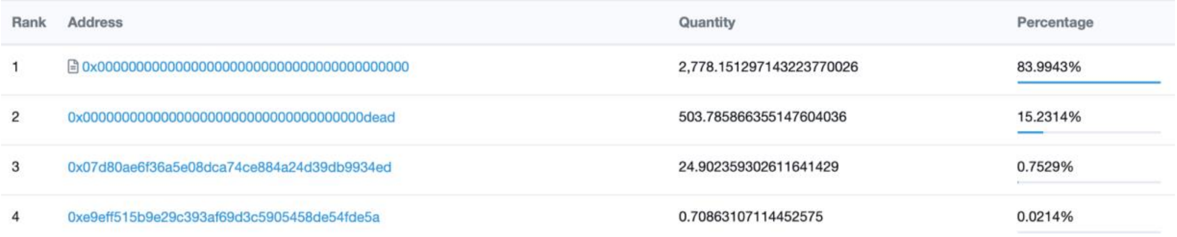
Tue 27, Apr 2021 - Wed 5, May 2021

BODA top 10 token holders



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 LP token holders



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%

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 #

  + 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

Probleme Prüfstatus

№	Problembeschreibung.	Prüfstatus
1	Compilerfehler.	Bestanden
2	Rennbedingungen und Wiedereinstieg. Bedingungen für funktionsübergreifende Rennen.	Bestanden
3	Mögliche Verzögerungen bei der Datenlieferung.	Bestanden
4	Oracle-Aufrufe.	Bestanden
5	Front Running	Bestanden
6	Zeitstempel-Abhängigkeit.	Bestanden
7	Integer Überlauf und Unterlauf.	Bestanden
8	DoS mit Zurücksetzen.	Bestanden
9	DoS mit Blockgasgrenzwert.	Geringe Probleme
10	Berechtigungen für die Durchführung von Methoden.	Bestanden
11	Economy-Modell des Vertrags.	Bestanden
12	Auswirkung der Wechselkurseffekte auf die Logik.	Bestanden
13	Datenverlust von privaten Benutzern.	Bestanden
14	Protokoll für bösartige Ereignisse.	Bestanden
15	Geltungsbereich und Erklärungen.	Bestanden
16	Nicht initialisierte Speicherverweise.	Bestanden
17	Arithmetische Genauigkeit.	Bestanden
18	Design-Logik.	Bestanden
19	Bedingungen für funktionsübergreifende Rennen.	Bestanden
20	Safe Open Zeppelin Verträge über die Implementierung und Nutzung.	Bestanden
21	Sicherheit der Fallback-Funktion.	Bestanden

Sicherheitsfragen

Probleme mit hoher Stufe

Keine Probleme mit hoher Stufe gefunden.

Probleme mittlerer Stufe

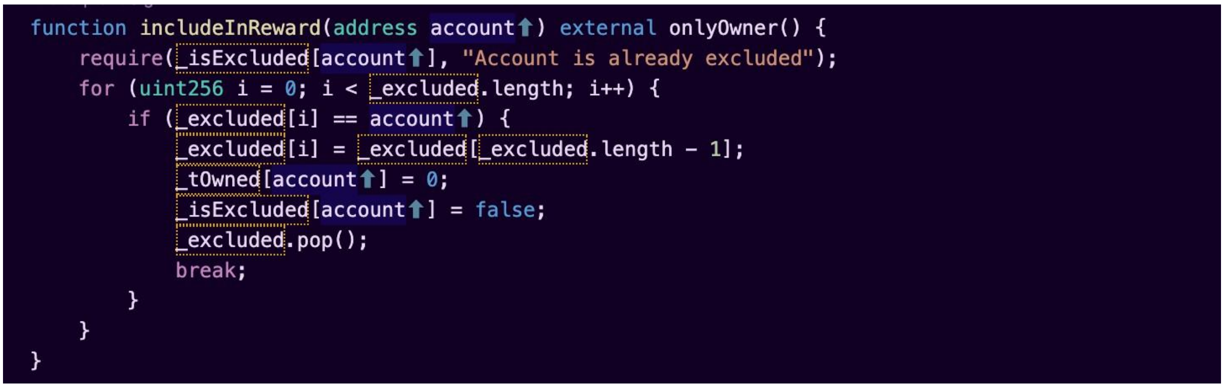
Keine Probleme mit mittlerer Stufe gefunden.

Probleme mit niedriger Stufe

1. Tank ist leer

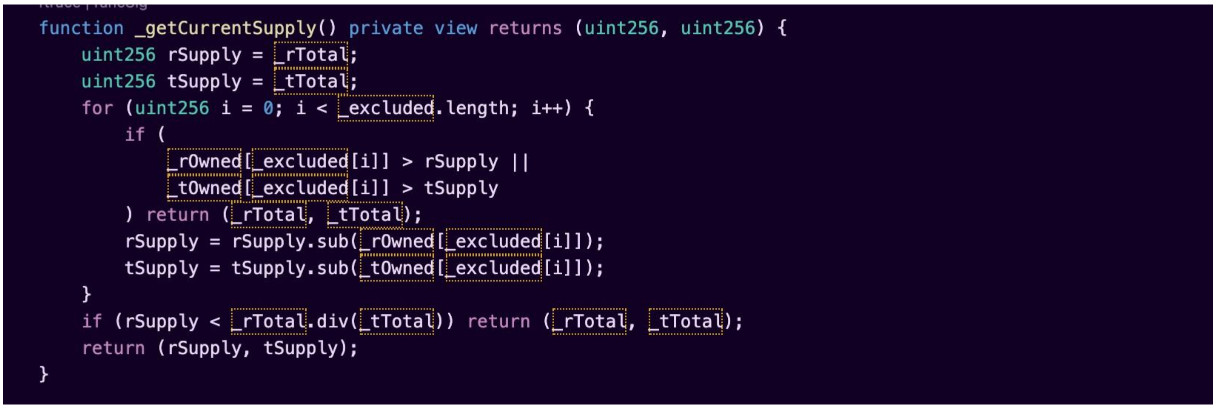
Gegenstand:

- ❏ Die Funktion includeInReward() verwendet die Schleife, um Adressen aus der _ excluded-Liste zu finden und zu entfernen. Die Funktion wird mit der Ausnahme OUT_OF_GAS abgebrochen, wenn eine lange Liste ausgeschlossener Adressen vorhanden ist.



```
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;
        }
    }
}
```

- ❏ Die Funktion _getCurrentSupply verwendet auch die Schleife zur Auswertung des Gesamtangebots. Es könnte auch mit der Ausnahme OUT_OF_GAS abgebrochen werden, wenn es eine lange Liste ausgeschlossener Adressen gibt.



```
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);
}
```

❏

Empfehlung: Verwenden Sie EnumerableSet anstelle von Array oder verwenden Sie keine langen Arrays.

Fazit

Smart Contracts enthalten keine Probleme mit hoher Stufe! Die Sicherheit des Liquiditätspaar-Kontrakts wird nicht überprüft, da er außerhalb des Geltungsbereichs liegt.

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