



TechRate
AUDIT COMPANY

Smart Contract Security Audit

TechRate

November, 2021

Audit Details



Audited project

metadoge



Deployer address

0x37dcbbeac40471810da2bc4b964e66fd277e8537



Client contacts:

metadoge team



Blockchain

Binance Smart Chain



Project website:

metadogetoken.net

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 metadoge to perform an audit of smart contracts:

<https://bscscan.com/address/0x4f091b74373b11375f976e44a96e29e9204c1d2d#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 09.11.2021

Contract name	metadoge
Contract address	0x4F091b74373B11375F976e44A96E29E9204c1d2d
Total supply	1,000,000,000,000
Token ticker	md
Decimals	9
Token holders	846
Transactions count	10,538
Top 100 holders dominance	90.76%
Liquidity fee	400
Tax fee	200
Total fees	0
Uniswap V2 pair	0x6a1fc9c35e91fb44d2b0cb89b75f8d20efa0fbac
Contract deployer address	0x37dcbbeac40471810da2bc4b964e66fd277e8537
Contract's current owner address	0x289adee996821438b9b33c65c66bbefd1e3ac4da

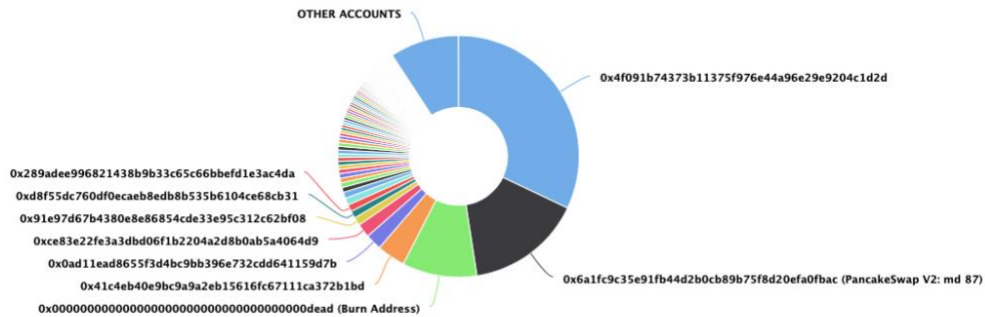
metadoge Token Distribution

The top 100 holders collectively own 90.76% (907,558,425,815.45 Tokens) of metadoge

Token Total Supply: 1,000,000,000,000.00 Token | Total Token Holders: 846

metadoge Top 100 Token Holders

Source: BscScan.com



(A total of 907,558,425,815.45 tokens held by the top 100 accounts from the total supply of 1,000,000,000,000.00 token)

metadoge Contract Interaction Details



Time Series: Token Contract Overview

Sun 31, Oct 2021 - Mon 8, Nov 2021

Token Contract 0x4f091b74373b11375f976e44a96e29e9204c1d2d (metadoge)
Source: BscScan.com



metadoge Top 10 Token Holders

Rank	Address	Quantity (Token)	Percentage
1	 0x4f091b74373b11375f976e44a96e29e9204c1d2d	320,354,865,523.99201541	32.0355%
2	 PancakeSwap V2: md 87	155,336,029,287.021431955	15.5336%
3	Burn Address	100,000,000,000	10.0000%
4	0x41c4eb40e9bc9a9a2eb15616fc67111ca372b1bd	38,162,061,158.758503469	3.8162%
5	0x0ad11ead8655f3d4bc9bb396e732cdd641159d7b	21,630,444,281.184653359	2.1630%
6	0xce83e22fe3a3dbd06f1b2204a2d8b0ab5a4064d9	18,428,024,010.076416655	1.8428%
7	0x91e97d67b4380e8e86854cde33e95c312c62bf08	11,002,218,448.991785317	1.1002%
8	0xd8f55dc760df0ecaeb8edb8b535b6104ce68cb31	9,832,830,833.640856113	0.9833%
9	0x289adee996821438b9b33c65c66bbefd1e3ac4da	9,446,484,753.129371956	0.9446%
10	0x6fc963bb4d422272a0dd33e77c5c4afe61f00653	9,400,000,000	0.9400%



Contract functions details

+ [Int] IERC20Upgradeable

- [Ext] totalSupply
- [Ext] balanceOf
- [Ext] transfer #
- [Ext] allowance
- [Ext] approve #
- [Ext] transferFrom #

+ [Lib] AddressUpgradeable

- [Int] isContract
- [Int] sendValue #
- [Int] functionCall #
- [Int] functionCall #
- [Int] functionCallWithValue #
- [Int] functionCallWithValue #
- [Int] functionStaticCall
- [Int] functionStaticCall
- [Prv] _verifyCallResult

+ Initializable

- [Prv] _isConstructor

+ ContextUpgradeable (Initializable)

- [Int] __Context_init #
 - modifiers: initializer
- [Int] __Context_init_unchained #
 - modifier: initializer
- [Int] _msgSender
- [Int] _msgData

+ OwnableUpgradeable (Initializable, ContextUpgradeable)

- [Int] __Ownable_init #
 - modifiers: initializer
- [Int] __Ownable_init_unchained #
 - modifiers: initializer
- [Pub] owner
- [Pub] renounceOwnership #
 - modifiers: onlyOwner
- [Pub] transferOwnership #
 - modifiers: onlyOwner

+ [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

+ [Lib] Address

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

+ [Int] IUniswapV2Factory

- [Ext] feeTo
- [Ext] feeToSetter
- [Ext] getPair
- [Ext] allPairs
- [Ext] allPairsLength
- [Ext] createPair #
- [Ext] setFeeTo #
- [Ext] setFeeToSetter #

+ [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 #

- + [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] ILiquidityGeneratorToken
 - [Ext] initialize #

+ LiquidityGeneratorToken (IERC20Upgradeable, OwnableUpgradeable, ILiquidityGeneratorToken)

- [Ext] initialize #
 - modifiers: initializer
- [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
- [Pub] setExcludeFromMaxTx #
 - modifiers: onlyOwner
- [Pub] isExcludedFromMaxTx
- [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] _takeCharityFee #
- [Prv] calculateTaxFee
- [Prv] calculateLiquidityFee
- [Prv] calculateCharityFee
- [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

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.	Passed
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

No high severity issues found.

✓ Medium Severity Issues

No medium severity issues found.

✓ Low Severity Issues

1. 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 and liquidity fee.

```
function setTaxFeePercent(uint256 taxFeeBps↑) external onlyOwner() {
    require(taxFeeBps↑ >= 0 && taxFeeBps↑ <= 10**4, "Invalid bps");
    _taxFee = taxFeeBps↑;
}

ftrace | funcSig
function setLiquidityFeePercent(uint256 liquidityFeeBps↑) external onlyOwner() {
    require(liquidityFeeBps↑ >= 0 && liquidityFeeBps↑ <= 10**4, "Invalid bps");
    _liquidityFee = liquidityFeeBps↑;
}
```

- Owner can change the maximum transaction amount.

```
function setMaxTxPercent(uint256 maxTxBps↑) external onlyOwner() {
    require(maxTxBps↑ >= 0 && maxTxBps↑ <= 10**4, "Invalid bps");
    _maxTxAmount = _tTotal.mul(maxTxBps↑).div(10**4);
}
```

- Owner can exclude from the fee.

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

- Owner can exclude from maxTx.

```
function setExcludeFromMaxTx(address account↑, bool exclude↑) public onlyOwner {
    _isExcludedFromMaxTx[account↑] = exclude↑;
}
```

Conclusion

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

Liquidity locking details provided by the team:

<https://mudra.website/?certificate=yes&type=0&lp=0x6a1fc9c35e91fb44d2b0cb89b75f8d20efa0fbac>

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.