

SMART CONTRACT

Security Audit Report

Project: DeadMemes Token
Website: deadmemestoken.com
Platform: Ethereum
Language: Solidity
Date: May 10th, 2023

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Introduction

EtherAuthority was contracted by the DeadMemes team to perform the Security audit of the DeadMemes Token smart contract code. The audit has been performed using manual analysis as well as using automated software tools. This report presents all the findings regarding the audit performed on May 10th, 2023.

The purpose of this audit was to address the following:

- Ensure that all claimed functions exist and function correctly.
- Identify any security vulnerabilities that may be present in the smart contract.

Project Background

- DeadMemes is a standard ERC20 token, having functions like approve, transferFrom, transfer, decreaseAllowance, etc.

Audit scope

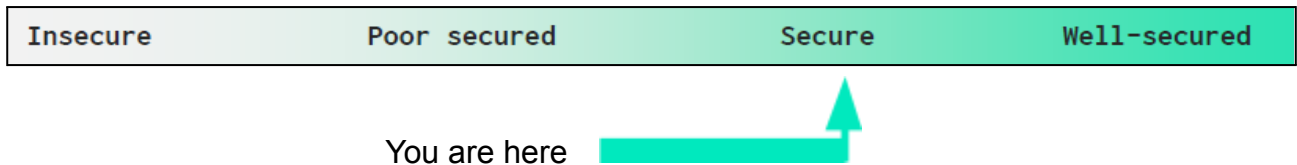
Name	Code Review and Security Analysis Report for DeadMemes Token Smart Contract
Platform	Ethereum / Solidity
File	DeadMeme.sol
Initial code link	0x5efd390437ae9cf82ae65d7cd2e0701b6554db31
Revised code link	0x57e902b50c0e16968875a39de180f3e980c2b44e
Audit Date	May 10th, 2023
Revised Audit Date	July 5th,2023

Claimed Smart Contract Features

Claimed Feature Detail	Our Observation
<p>Tokenomics:</p> <ul style="list-style-type: none">• Name: DeadMemes• Symbol: DEADMEMES• Decimals: 18• Developer And Marketing Sell Tax: 1%• Total Supply: 420.690 Billion	<p>YES, this is valid.</p> <p>The smart contract owner controls these functions, so the owner must handle the private key of the owner's wallet very securely. Because if the private key is compromised, then it will create problems.</p>
<p><u>Owner has control over following functions:</u></p> <ul style="list-style-type: none">• Added addresses to the blacklist.• Set the isExcludedFromFee account status.• Set the isExcludedFromMaxWallet account status.• Current owners can transfer ownership of the contract to a new account.• Deleting ownership will leave the contract without an owner, removing any owner-only functionality.	<p>YES, this is valid.</p>

Audit Summary

According to the standard audit assessment, Customer's solidity based smart contracts are "**Secured**". This token contract does contain owner control, which does not make it fully decentralized.



We used various tools like Slither, Solhint and Remix IDE. At the same time this finding is based on critical analysis of the manual audit.

All issues found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the Audit overview section. General overview is presented in AS-IS section and all identified issues can be found in the Audit overview section.

We found 0 critical, 0 high, 0 medium and 1 low and 1 very low level issues.

We confirm that these issues have been fixed / acknowledged in the revised code.

Investors Advice: Technical audit of the smart contract does not guarantee the ethical nature of the project. Any owner controlled functions should be executed by the owner with responsibility. All investors/users are advised to do their due diligence before investing in the project.

Technical Quick Stats

Main Category	Subcategory	Result
Contract Programming	Solidity version not specified	Passed
	Solidity version too old	Passed
	Integer overflow/underflow	Passed
	Function input parameters lack of check	Passed
	Function input parameters check bypass	Passed
	Function access control lacks management	Passed
	Critical operation lacks event log	Passed
	Human/contract checks bypass	Passed
	Random number generation/use vulnerability	N/A
	Fallback function misuse	Passed
	Race condition	Passed
	Logical vulnerability	Passed
	Features claimed	Passed
	Other programming issues	Passed
Code Specification	Function visibility not explicitly declared	Passed
	Var. storage location not explicitly declared	Passed
	Use keywords/functions to be deprecated	Passed
	Unused code	Passed
Gas Optimization	"Out of Gas" Issue	Passed
	High consumption 'for/while' loop	Passed
	High consumption 'storage' storage	Passed
	Assert() misuse	Passed
Business Risk	The maximum limit for mintage not set	Passed
	"Short Address" Attack	Passed
	"Double Spend" Attack	Passed

Overall Audit Result: **PASSED**

Code Quality

This audit scope has 1 smart contract. Smart contract contains Libraries, Smart contracts, inherits and Interfaces. This is a compact and well written smart contract.

The libraries in the DeadMemes Token are part of its logical algorithm. A library is a different type of smart contract that contains reusable code. Once deployed on the blockchain (only once), it is assigned a specific address and its properties / methods can be reused many times by other contracts in the DeadMemes Token.

The DeadMemes team has **not** provided scenario and unit test scripts, which would have helped to determine the integrity of the code in an automated way.

Code parts are **not** well commented on in the smart contracts. Ethereum's NatSpec commenting style is used, which is a good thing.

Documentation

We were given a DeadMemes Token smart contract code in the form of a file. The hash of that code is mentioned above in the table.

As mentioned above, code parts are not **well** commented. But the logic is straightforward. So it is easy to quickly understand the programming flow as well as complex code logic. Comments are very helpful in understanding the overall architecture of the protocol.

Another source of information was its official website: <https://deadmemestoken.com> which provided rich information about the project architecture and tokenomics.

Use of Dependencies

As per our observation, the libraries are used in this smart contract infrastructure that are based on well known industry standard open source projects.

Apart from libraries, its functions are not used in external smart contract calls.

AS-IS overview

Functions

Sl.	Functions	Type	Observation	Conclusion
1	constructor	write	Passed	No Issue
2	balanceOf	external	Removed	No Issue
3	transfer	external	Removed	No Issue
4	allowance	read	Removed	No Issue
5	approve	external	Removed	No Issue
6	transferFrom	external	Removed	No Issue
7	increaseAllowance	external	Removed	No Issue
8	decreaseAllowance	external	Removed	No Issue
9	_transfer	internal	Passed	No Issue
10	_mint	internal	Removed	No Issue
11	_approve	internal	Removed	No Issue
12	_spendAllowance	internal	Removed	No Issue
13	name	external	Removed	No Issue
14	symbol	external	Removed	No Issue
15	decimals	write	Removed	No Issue
16	totalSupply	external	Removed	No Issue
17	onlyOwner	modifier	Passed	No Issue
18	owner	read	Passed	No Issue
19	_checkOwner	internal	Passed	No Issue
20	renounceOwnership	write	access only Owner	No Issue
21	transferOwnership	write	access only Owner	No Issue
22	_transferOwnership	internal	Passed	No Issue
23	name	read	Passed	No Issue
24	symbol	read	Passed	No Issue
25	decimals	read	Passed	No Issue
26	balanceOf	read	Passed	No Issue
27	totalSupply	read	Passed	No Issue
28	transfer	write	Passed	No Issue
29	allowance	read	Passed	No Issue
30	approve	write	Passed	No Issue
31	transferFrom	write	Passed	No Issue
32	increaseAllowance	write	Passed	No Issue
33	decreaseAllowance	write	Passed	No Issue
34	_transfer	internal	Passed	No Issue
35	_mint	internal	Passed	No Issue
36	_approve	internal	Passed	No Issue
37	_spendAllowance	internal	Passed	No Issue
38	lockTheSwap	modifier	Passed	No Issue
39	changeDevAndMarketingSel lTax	external	Removed	No Issue
40	changeDevAndMarketingW allet	external	Passed	Fixed

41	swapTokensForEth	write	Passed	No Issue
42	blacklist	external	access only Owner	No Issue
43	excludeFromFee	external	access only Owner	No Issue
44	excludeFromMaxWallet	external	access only Owner	No Issue

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Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to token loss etc.
High	High-level vulnerabilities are difficult to exploit; however, they also have significant impact on smart contract execution, e.g. public access to crucial
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to tokens lose
Low	Low-level vulnerabilities are mostly related to outdated, unused etc. code snippets, that can't have significant impact on execution
Lowest / Code Style / Best Practice	Lowest-level vulnerabilities, code style violations and info statements can't affect smart contract execution and can be ignored.

Audit Findings

Critical Severity

No Critical severity vulnerabilities were found in the revised smart contract code.

High Severity

No high severity vulnerabilities were found in the revised smart contract code.

Medium

No medium severity vulnerabilities were found in the revised smart contract code.

Low

(1) Function input parameters lack of check:
Variable validation is not performed in the below functions:


- changeDevAndMarketingWallet = _devAndMarketingWallet

Resolution: We advise putting validation: int type variables should not be empty and greater than 0 & address type variables should not be address(0).

Status: **Fixed**

Very Low / Informational / Best practices:

(1) Hardcoded router address:

```
constructor() ERC20("DeadMemes", "DEADMEMES") {  infinite gas 2265800 gas
    devAndMarketingWallet = msg.sender;
    _mint(msgSender(), (420690000000 * 10 ** decimals()));
    maxWalletAmount = (totalSupply() * 2) / 100;

    IUniswapV2Router02 _uniswapV2Router = IUniswapV2Router02(0xD99D1c33F9fC3444f8101754a8C46c52416550D1);
    uniswapV2Pair = IUniswapV2Factory(_uniswapV2Router.factory()).createPair(address(this), _uniswapV2Router.WETH());
    uniswapV2Router = _uniswapV2Router;

    isExcludedFromFee[owner()] = true;
    isExcludedFromMaxWallet[owner()] = true;
    isExcludedFromMaxWallet[uniswapV2Pair] = true;
}
```

In the constructor, the router address is hardcoded.

Resolution: We advise to always ensure the correct network router address is set.

Status: **Acknowledged**

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Centralization

This smart contract has some functions that can only be executed by the Admin (Owner). For the admin roles and the owners of the smart contract, multisignature is used to reduce the centralization risk. If the admin wallet private key were compromised, then it would create trouble.

Following are admin functions:

Ownable.sol

- `renounceOwnership`: Deleting ownership will leave the contract without an owner, removing any owner-only functionality.
- `transferOwnership`: Current owner can transfer ownership of the contract to a new account.
- `_checkOwner`: Thrown when the sender is not the owner.

DeadMemes.sol

- `changeDevAndMarketingWallet`: The `changeDevAndMarketingWallet` address can be updated by the owner.
- `blacklist`: The owner can add addresses to the blacklist.
- `excludeFromFee`: The owner can set the `isExcludedFromFee` account status.
- `excludeFromMaxWallet`: The owner can set the `isExcludedFromMaxWallet` account status.

To make the smart contract 100% decentralized, we suggest renouncing ownership in the smart contract once its function is completed.

Conclusion

We were given a contract code in the form of a file and we have used all possible tests based on the given objects as files. We have observed 1 low severity issue and 1 informational severity issue in the revised token smart contract. We confirm that these all issues have been fixed / acknowledged in the revised code. So, **it's good to go for the mainnet deployment.**

Since possible test cases can be unlimited for such smart contracts protocols, we provide no such guarantee of future outcomes. We have used all the latest static tools and manual observations to cover maximum possible test cases to scan everything.

Smart contracts within the scope were manually reviewed and analyzed with static analysis tools. Smart Contract's high-level description of functionality was presented in the As-is overview section of the report.

The audit report contains all found security vulnerabilities and other issues in the reviewed code.

The security state of the reviewed smart contract, based on standard audit procedure scope, is **"Secured"**.

Our Methodology

We like to work with a transparent process and make our reviews a collaborative effort. The goals of our security audits are to improve the quality of systems we review and aim for sufficient remediation to help protect users. The following is the methodology we use in our security audit process.

Manual Code Review:

In manually reviewing all of the code, we look for any potential issues with code logic, error handling, protocol and header parsing, cryptographic errors, and random number generators. We also watch for areas where more defensive programming could reduce the risk of future mistakes and speed up future audits. Although our primary focus is on the in-scope code, we examine dependency code and behavior when it is relevant to a particular line of investigation.

Vulnerability Analysis:

Our audit techniques included manual code analysis, user interface interaction, and whitebox penetration testing. We look at the project's web site to get a high level understanding of what functionality the software under review provides. We then meet with the developers to gain an appreciation of their vision of the software. We install and use the relevant software, exploring the user interactions and roles. While we do this, we brainstorm threat models and attack surfaces. We read design documentation, review other audit results, search for similar projects, examine source code dependencies, skim open issue tickets, and generally investigate details other than the implementation.

Documenting Results:

We follow a conservative, transparent process for analyzing potential security vulnerabilities and seeing them through successful remediation. Whenever a potential issue is discovered, we immediately create an Issue entry for it in this document, even though we have not yet verified the feasibility and impact of the issue. This process is conservative because we document our suspicions early even if they are later shown to not represent exploitable vulnerabilities. We generally follow a process of first documenting the suspicion with unresolved questions, then confirming the issue through code analysis, live experimentation, or automated tests. Code analysis is the most tentative, and we strive to provide test code, log captures, or screenshots demonstrating our confirmation. After this we analyze the feasibility of an attack in a live system.

Suggested Solutions:

We search for immediate mitigations that live deployments can take, and finally we suggest the requirements for remediation engineering for future releases. The mitigation and remediation recommendations should be scrutinized by the developers and deployment engineers, and successful mitigation and remediation is an ongoing collaborative process after we deliver our report, and before the details are made public.

Disclaimers

EtherAuthority.io Disclaimer

EtherAuthority team has analyzed this smart contract in accordance with the best industry practices at the date of this report, in relation to: cybersecurity vulnerabilities and issues in smart contract source code, the details of which are disclosed in this report, (Source Code); the Source Code compilation, deployment and functionality (performing the intended functions).

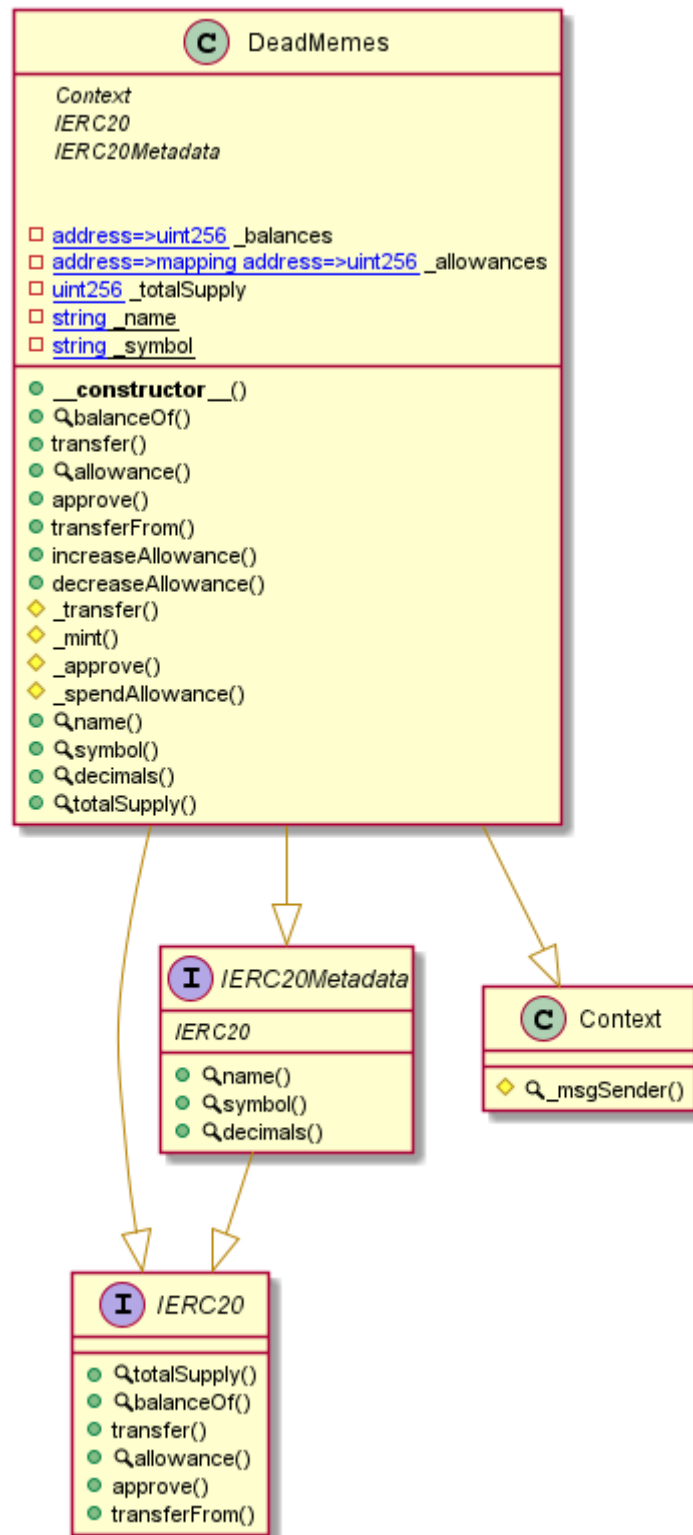
Due to the fact that the total number of test cases are unlimited, the audit makes no statements or warranties on security of the code. It also cannot be considered as a sufficient assessment regarding the utility and safety of the code, bugfree status or any other statements of the contract. While we have done our best in conducting the analysis and producing this report, it is important to note that you should not rely on this report only. We also suggest conducting a bug bounty program to confirm the high level of security of this smart contract.

Technical Disclaimer

Smart contracts are deployed and executed on the blockchain platform. The platform, its programming language, and other software related to the smart contract can have their own vulnerabilities that can lead to hacks. Thus, the audit can't guarantee explicit security of the audited smart contracts.

Appendix

Code Flow Diagram - DeadMemes Token



Slither Results Log

Slither Log >> DeadMemes.sol

```
Pragma version0.8.19 (DeadMemes.sol#2) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6/0.16
solc-0.8.19 is not recommended for deployment
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-versions-of-solidity

Constant DeadMemes.name (DeadMemes.sol#53) is not in UPPER_CASE_WITH_UNDERSCORES
Constant DeadMemes._symbol (DeadMemes.sol#54) is not in UPPER_CASE_WITH_UNDERSCORES
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-solidity-naming-conventions

DeadMemes.constructor() (DeadMemes.sol#56-58) uses literals with too many digits:
- _mint(msg.sender,4206900000000000 * 10 ** decimals()) (DeadMemes.sol#57)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#too-many-digits
DeadMemes.sol analyzed (4 contracts with 84 detectors), 5 result(s) found
```

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Solidity Static Analysis

DeadMemes.sol

Gas & Economy

Gas costs:

Gas requirement of function DeadMemes.transfer is infinite: If the gas requirement of a function is higher than the block gas limit, it cannot be executed. Please avoid loops in your functions or actions that modify large areas of storage (this includes clearing or copying arrays in storage)

Pos: 66:4:

Miscellaneous

Constant/View/Pure functions:

IERC20.transfer(address,uint256) : Potentially should be constant/view/pure but is not.

[more](#)

Pos: 16:4:

No return:

IERC20.totalSupply(): Defines a return type but never explicitly returns a value.

Pos: 12:4:

Similar variable names:

DeadMemes._mint(address,uint256) : Variables have very similar names "account" and "amount".

Pos: 152:43:

Guard conditions:

Use "assert(x)" if you never ever want x to be false, not in any circumstance (apart from a bug in your code). Use "require(x)" if x can be false, due to e.g. invalid input or a failing external component.

[more](#)

Pos: 170:12:

Solhint Linter

DeadMemes.sol

```
DeadMemes.sol:121:18: Error: Parse error: missing ';' at '{'  
DeadMemes.sol:137:18: Error: Parse error: missing ';' at '{'  
DeadMemes.sol:149:18: Error: Parse error: missing ';' at '{'  
DeadMemes.sol:174:22: Error: Parse error: missing ';' at '{'
```

Software analysis result:

These software reported many false positive results and some are informational issues. So, those issues can be safely ignored.



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