Cyberscope

Audit Report

Meme Buddha

July 2023

Network	ETH
Address	0x13eF45ed9dd6C4cd3a95A3383373087e3F6250A5
Audited by	© cyberscope

Analysis

🔴 Critical 🟠 Medium ⚪ Minor / Informative 🔵 Pass

Severity	Code	Description	Status
🔵	ST	Stops Transactions	Passed
🔵	OTUT	Transfers User's Tokens	Passed
🔵	ELFM	Exceeds Fees Limit	Passed
🔵	MT	Mints Tokens	Passed
🔵	BT	Burns Tokens	Passed
🔵	BC	Blacklists Addresses	Passed

Diagnostics

🔴 Critical 🟠 Medium ● Minor / Informative

Severity	Code	Description	Status
●	RSW	Redundant Storage Writes	Unresolved
●	IDI	Immutable Declaration Improvement	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved
●	L13	Divide before Multiply Operation	Unresolved

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Review

Explorer	https://etherscan.io/address/0x13ef45ed9dd6c4cd3a95a3383373087e3f6250a5

Audit Updates

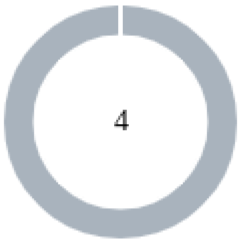
Initial Audit	25 Jul 2023 https://github.com/cyberscope-io/audits/blob/main/2-mebu/v1/audit.pdf
Corrected Phase 2	25 Jul 2023 https://github.com/cyberscope-io/audits/blob/main/2-mebu/v2/audit.pdf
Corrected Phase 3	25 Jul 2023

Source Files

Filename	SHA256
contracts/mebu.sol	2a36dfaca429b4fcc82cc55115f950d5c5fe7c3cf7c79a45496af5e2cfb9d556
@openzeppelin/contracts/utils/Context.sol	1458c260d010a08e4c20a4a517882259a23a4baa0b5bd9add9fb6d6a1549814a
@openzeppelin/contracts/token/ERC20/IERC20.sol	7ebde70853ccafcf1876900dad458f46eb9444d591d39bfc58e952e2582f5587
@openzeppelin/contracts/token/ERC20/ERC20.sol	d20d52b4be98738b8aa52b5bb0f88943f62128969b33d654fbca731539a7fe0a

@openzeppelin/contracts/token/ERC20/extensions/IERC20Metadata.sol	af5c8a77965cc82c33b7ff844deb9826166689e55dc037a7f2f790d057811990
@openzeppelin/contracts/token/ERC20/extensions/ERC20Burnable.sol	0344809a1044e11ece2401b4f7288f414ea41fa9d1dad24143c84b737c9fc02e
@openzeppelin/contracts/access/Ownable.sol	a8e4e1ae19d9bd3e8b0a6d46577eec098c01fbaffd3ec1252fd20d799e73393b

Findings Breakdown



●	Critical	0
●	Medium	0
●	Minor / Informative	4

Severity		Unresolved	Acknowledged	Resolved	Other
●	Critical	0	0	0	0
●	Medium	0	0	0	0
●	Minor / Informative	4	0	0	0

RSW - Redundant Storage Writes

Criticality	Minor / Informative
Location	contracts/contract.sol#L23,28
Status	Unresolved

Description

There are code segments that could be optimized. A segment may be optimized so that it becomes a smaller size, consumes less memory, executes more rapidly, or performs fewer operations.

The contract updates the `liquidityPools` of an address even if its current state is the same as the one passed as an argument. As a result, the contract performs redundant storage writes.

```
    function addLiquidityPool(address _liquidityPool) public onlyOwner {
        require(_liquidityPool != address(0), "Invalid liquidity pool address");
        liquidityPools[_liquidityPool] = true;
    }

    function removeLiquidityPool(address _liquidityPool) public onlyOwner {
        require(_liquidityPool != address(0), "Invalid liquidity pool address");
        liquidityPools[_liquidityPool] = false;
    }
```

Recommendation

The team is advised to take these segments into consideration and rewrite them so the runtime will be more performant. That way it will improve the efficiency and performance of the source code and reduce the cost of executing it.

IDI - Immutable Declaration Improvement

Criticality	Minor / Informative
Location	contracts/mebu.sol#L19,20
Status	Unresolved

Description

The contract declares state variables that their value is initialized once in the constructor and are not modified afterwards. The `immutable` is a special declaration for this kind of state variables that saves gas when it is defined.

```
charityWallet
communityWallet
```

Recommendation

By declaring a variable as immutable, the Solidity compiler is able to make certain optimizations. This can reduce the amount of storage and computation required by the contract, and make it more gas-efficient.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	contracts/mebu.sol#L23,28
Status	Unresolved

Description

The Solidity style guide is a set of guidelines for writing clean and consistent Solidity code. Adhering to a style guide can help improve the readability and maintainability of the Solidity code, making it easier for others to understand and work with.

The followings are a few key points from the Solidity style guide:

1. Use camelCase for function and variable names, with the first letter in lowercase (e.g., myVariable, updateCounter).
2. Use PascalCase for contract, struct, and enum names, with the first letter in uppercase (e.g., MyContract, UserStruct, ErrorEnum).
3. Use uppercase for constant variables and enums (e.g., MAX_VALUE, ERROR_CODE).
4. Use indentation to improve readability and structure.
5. Use spaces between operators and after commas.
6. Use comments to explain the purpose and behavior of the code.
7. Keep lines short (around 120 characters) to improve readability.

```
address _liquidityPool
```

Recommendation

By following the Solidity naming convention guidelines, the codebase increased the readability, maintainability, and makes it easier to work with.
Find more information on the Solidity documentation
https://docs.soliditylang.org/en/v0.8.17/style-guide.html#naming-convention.

L13 - Divide before Multiply Operation

Criticality	Minor / Informative
Location	contracts/mebu.sol#L39,46
Status	Unresolved

Description

It is important to be aware of the order of operations when performing arithmetic calculations. This is especially important when working with large numbers, as the order of operations can affect the final result of the calculation. Performing divisions before multiplications may cause loss of prediction.

```
uint256 distributeAmount = fee / 3
uint256 remainingFee = fee - (2 * distributeAmount)
```

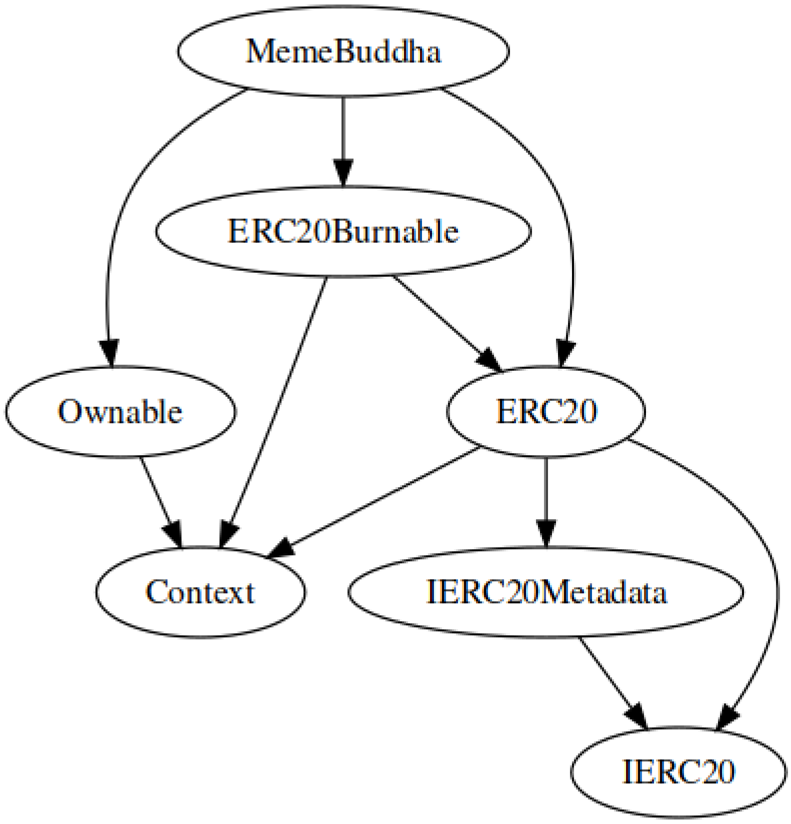
Recommendation

To avoid this issue, it is recommended to carefully consider the order of operations when performing arithmetic calculations in Solidity. It's generally a good idea to use parentheses to specify the order of operations. The basic rule is that the multiplications should be prior to the divisions.

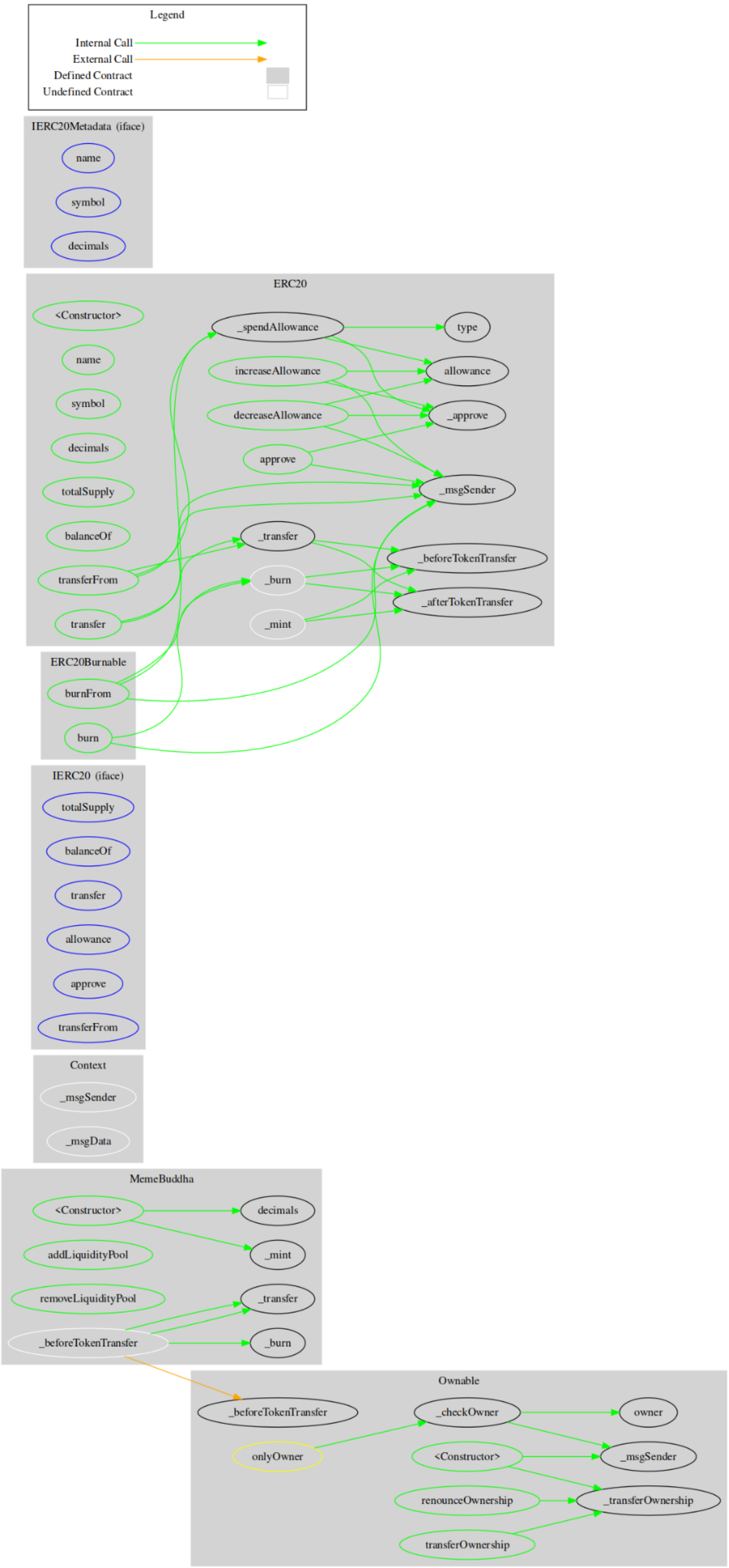
Functions Analysis

Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
MemeBuddha	Implementation	ERC20, ERC20Burnable, Ownable		
		Public	✓	ERC20
	addLiquidityPool	Public	✓	onlyOwner
	removeLiquidityPool	Public	✓	onlyOwner
	_beforeTokenTransfer	Internal	✓	

Inheritance Graph



Flow Graph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
IERC20Metadata (iface)
name
symbol
decimals
ERC20
<Constructor>
name
symbol
decimals
totalSupply
balanceOf
transferFrom
transfer
_spendAllowance
increaseAllowance
decreaseAllowance
approve
_transfer
_burn
_mint
type
allowance
_approve
_msgSender
_beforeTokenTransfer
_afterTokenTransfer
ERC20Burnable
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IERC20 (iface)
totalSupply
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transfer
allowance
approve
transferFrom
Context
_msgSender
_msgData
MemeBuddha
<Constructor>
addLiquidityPool
removeLiquidityPool
_beforeTokenTransfer
decimals
_mint
_transfer
_burn
Ownable
_beforeTokenTransfer
onlyOwner
_checkOwner
<Constructor>
renounceOwnership
transferOwnership
owner
_msgSender
_transferOwnership

Summary

Meme Buddha contract implements a token mechanism. This audit investigates security issues, business logic concerns and potential improvements. Meme Buddha is an interesting project that has a friendly and growing community. The Smart Contract analysis reported no compiler error or critical issues. The contract Owner can access some admin functions that can not be used in a malicious way to disturb the users' transactions. The fees are fixed to 6% for the sales.

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The Cyberscope team

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