Cyberscope

Audit Report

The McBoys Club

May 2024

Network ETH

Address 0xc48e8b261d79Ff04a10319dD68f90c0E1fBaC99F

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Analysis

Critical Medium Minor / Informative Pass

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

Diagnostics

Critical Medium Minor / Informative

Severity	Code	Description	Status
●	US	Untrusted Source	Unresolved
●	IDI	Immutable Declaration Improvement	Unresolved
●	MEE	Missing Events Emission	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved
●	L16	Validate Variable Setters	Unresolved

Table of Contents

Review

Contract Name	TokenFiERC20
Compiler Version	v0.8.23+commit.f704f362
Optimization	10 runs
Explorer	https://etherscan.io/address/0xc48e8b261d79ff04a10319dd68f90c0e1fbac99f
Address	0xc48e8b261d79ff04a10319dd68f90c0e1fbac99f
Network	ETH
Symbol	MCBC
Decimals	18
Total Supply	4,206,900,000,000,000
Badge Eligibility	Must Fix Criticals

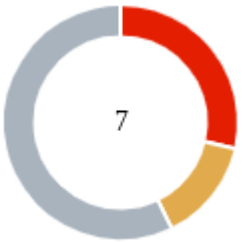
Audit Updates

Initial Audit	15 May 2024

Source Files

Filename	SHA256
contracts/token-launcher/templates/TokenFiERC20.sol	034acc140d2b9f812e17916f7e2606452d9e34495b79db96f3f40e81857d7436

Findings Breakdown



Critical	2
Medium	1
Minor / Informative	4

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	2	0	0	0
Medium	1	0	0	0
Minor / Informative	4	0	0	0

ST - Stops Transactions

Criticality	Critical
Location	contracts/token-launcher/templates/TokenFiERC20.sol#L470
Status	Unresolved

Description

The contract owner has the authority to stop transactions, as described in detail in section `US`. As a result, the contract might operate as a honeypot.

Recommendation

It is recommended to address the above finding by implementing the recommendation provided in section `US` to mitigate the risk of the contract operating as a honeypot.

ELFM - Exceeds Fees Limit

Criticality	Critical
Location	contracts/token-launcher/templates/TokenFiERC20.sol#L129
Status	Unresolved

Description

The contract owner has the authority to increase over the allowed limit of 25%. The owner may take advantage of it by calling the `updateFees` function with a high percentage value.

```
   function updateFees(ITokenLauncherERC20.Fees memory _fees) external
onlyRole(DEFAULT_ADMIN_ROLE) {
        if (isReflectionToken) {
            require(_fees.reflection.percentage > 0, "TokenFiERC20:
reflection percentage must be non-zero");
        } else {
            require(_fees.reflection.percentage == 0, "TokenFiERC20:
reflection percentage must be zero");
        }
        uint256 maxFee = _fees.transferFee.percentage +
_fees.burn.percentage + _fees.reflection.percentage +
_fees.buyback.percentage;
        require(maxFee <= MULTIPLIER_BASIS, "TokenFiERC20: fees sum must
be less than 100%");
        fees = _fees;
    }
```

Recommendation

The contract could embody a check for the maximum acceptable value. The team should carefully manage the private keys of the owner's account. We strongly recommend a powerful security mechanism that will prevent a single user from accessing the contract admin functions.

Temporary Solutions:

These measurements do not decrease the severity of the finding

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-signature wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.

Permanent Solution:

- Renouncing the ownership, which will eliminate the threats but it is non-reversible.

US - Untrusted Source

Criticality	Medium
Location	contracts/token-launcher/templates/TokenFiERC20.sol#L186,470
Status	Unresolved

Description

The contract uses an external contract in order to determine the transaction's flow. The external contract is untrusted. As a result, it may produce security issues and harm the transactions.

```
if (!_exchangePools.contains(sender) && buybackDetails.router
!= address(0)) {
    IBuyBackHandler(buybackHandler).buyback(treasury,
buybackDetails);
}
...
function updateTokenLauncher(address _newTokenLauncher)
external onlyRole(DEFAULT_ADMIN_ROLE) {
    _revokeRole(FEE_MANAGER_ROLE, tokenLauncher);
    tokenLauncher = _newTokenLauncher;

    _grantRole(FEE_MANAGER_ROLE, _newTokenLauncher);
    emit TokenLauncherUpdated(_newTokenLauncher);
}
```

Recommendation

The contract should use a trusted external source. A trusted source could be either a commonly recognized or an audited contract. The pointing addresses should not be able to change after the initialization.

MEE - Missing Events Emission

Criticality	Minor / Informative
Location	contracts/token-launcher/templates/TokenFiERC20.sol#L129
Status	Unresolved

Description

The contract performs actions and state mutations from external methods that do not result in the emission of events. Emitting events for significant actions is important as it allows external parties, such as wallets or dApps, to track and monitor the activity on the contract. Without these events, it may be difficult for external parties to accurately determine the current state of the contract.

```
    function updateFees(ITokenLauncherERC20.Fees memory _fees)
external onlyRole(DEFAULT_ADMIN_ROLE) {
        if (isReflectionToken) {
            require(_fees.reflection.percentage > 0,
"TokenFiERC20: reflection percentage must be non-zero");
        } else {
            require(_fees.reflection.percentage == 0,
"TokenFiERC20: reflection percentage must be zero");
        }
        uint256 maxFee = _fees.transferFee.percentage +
_fees.burn.percentage + _fees.reflection.percentage +
_fees.buyback.percentage;
        require(maxFee <= MULTIPLIER_BASIS, "TokenFiERC20: fees
sum must be less than 100%");
        fees = _fees;
    }
```

Recommendation

It is recommended to include events in the code that are triggered each time a significant action is taking place within the contract. These events should include relevant details such as the user's address and the nature of the action taken. By doing so, the contract will be more transparent and easily auditable by external parties. It will also help prevent potential issues or disputes that may arise in the future.

IDI - Immutable Declaration Improvement

Criticality	Minor / Informative
Location	contracts/token-launcher/templates/TokenFiERC20.sol#L66,67,69,74,82 contracts/token-launcher/templates/TokenFiERC20.sol#L66,67,69,74,82
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.

```
treasury
maxSupply
_decimals
buybackHandler
isReflectionToken
```

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/token-launcher/templates/TokenFiERC20.sol#L37,101,129,470
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.

```
EnumerableSet.AddressSet internal _exchangePools
ITokenLauncherLiquidityPoolFactory.BuyBackDetails memory
_buybackDetails
ITokenLauncherERC20.Fees memory _fees
address _newTokenLauncher
```

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.

L16 - Validate Variable Setters

Criticality	Minor / Informative
Location	contracts/token-launcher/templates/TokenFiERC20.sol#L472
Status	Unresolved

Description

The contract performs operations on variables that have been configured on user-supplied input. These variables are missing of proper check for the case where a value is zero. This can lead to problems when the contract is executed, as certain actions may not be properly handled when the value is zero.

```
tokenLauncher = _newTokenLauncher
```

Recommendation

By adding the proper check, the contract will not allow the variables to be configured with zero value. This will ensure that the contract can handle all possible input values and avoid unexpected behavior or errors. Hence, it can help to prevent the contract from being exploited or operating unexpectedly.

Functions Analysis

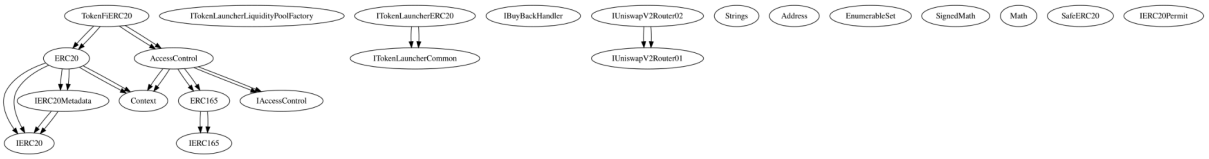
Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
TokenFiERC20	Implementation	ERC20, AccessControl		
		Public	✓	ERC20
	decimals	Public		-
	setBuybackDetails	External	✓	onlyRole
	addExchangePool	External	✓	onlyRole
	addExemptAddress	External	✓	onlyRole
	updateFees	External	✓	onlyRole
	isExemptedFromTax	External		-
	isExchangePool	External		-
	balanceOf	Public		-
	totalSupply	Public		-
	isExcludedFromReflectionRewards	Public		-
	reflect	External	✓	onlyReflection
	reflectionFromToken	Public		-
	tokenFromReflection	Public		-
	excludeAccount	External	✓	onlyReflection onlyFromAdmin OrLauncher
	includeAccount	External	✓	onlyReflection onlyFromAdmin OrLauncher

	totalFees	Public		-
	_balanceOfReflection	Private		
	_transferStandard	Private	✓	
	_transferToExcluded	Private	✓	
	_transferFromExcluded	Private	✓	
	_transferBothExcluded	Private	✓	
	_reflectFee	Private	✓	
	_getValues	Private		
	_getTValues	Private		
	_getRValues	Private		
	_getRate	Private		
	_getCurrentSupply	Private		
	removeExchangePool	External	✓	onlyRole
	removeExemptAddress	External	✓	onlyRole
	_transfer	Internal	✓	
	_transferReflection	Private	✓	
	_transferInternal	Private	✓	
	_isSwap	Internal		
	_isExemptedFromTax	Internal		
	_mintReflection	Private	✓	
	mint	External	✓	onlyRole
	updateTokenLauncher	External	✓	onlyRole

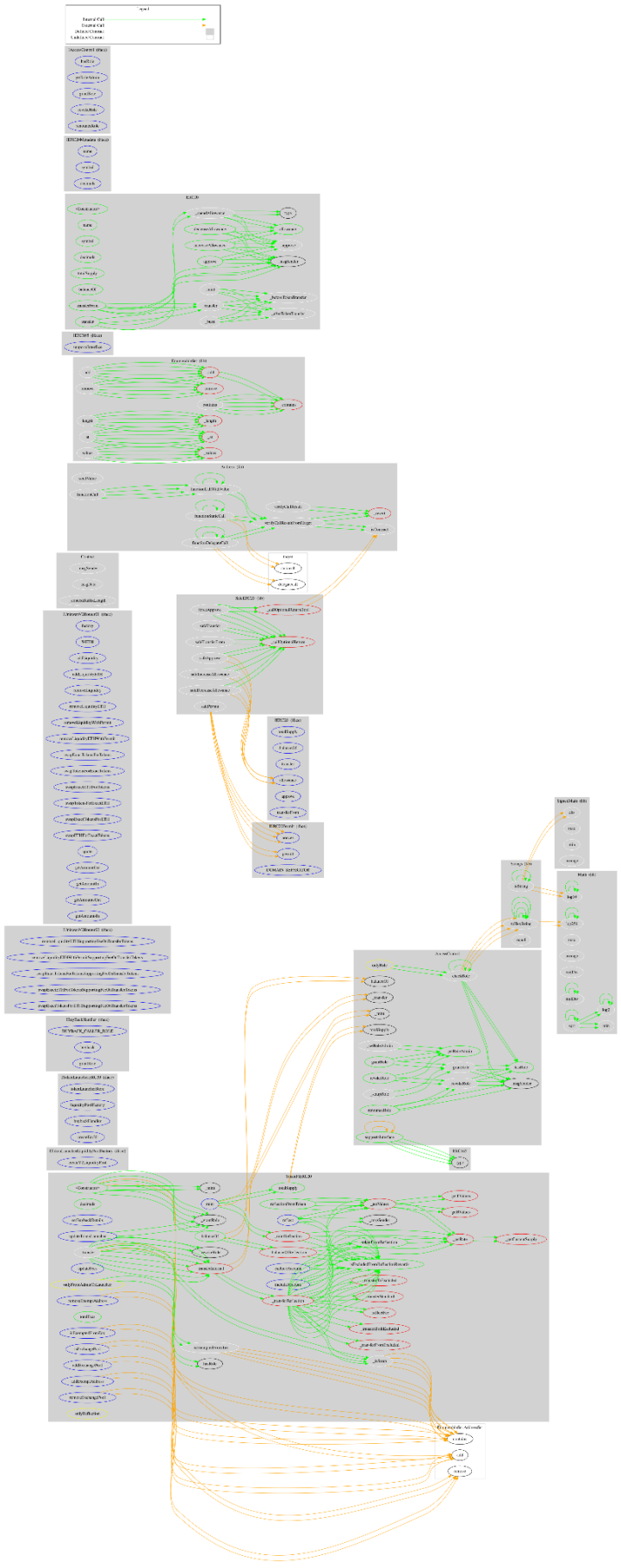
TokenFiERC20	Implementation	ERC20, AccessControl		
		Public	✓	ERC20
	decimals	Public		-
	setBuybackDetails	External	✓	onlyRole
	addExchangePool	External	✓	onlyRole
	addExemptAddress	External	✓	onlyRole
	updateFees	External	✓	onlyRole
	isExemptedFromTax	External		-
	isExchangePool	External		-
	balanceOf	Public		-
	totalSupply	Public		-
	isExcludedFromReflectionRewards	Public		-
	reflect	External	✓	onlyReflection
	reflectionFromToken	Public		-
	tokenFromReflection	Public		-
	excludeAccount	External	✓	onlyReflection onlyFromAdmin OrLauncher
	includeAccount	External	✓	onlyReflection onlyFromAdmin OrLauncher
	totalFees	Public		-
	_balanceOfReflection	Private		
	_transferStandard	Private	✓	
	_transferToExcluded	Private	✓	
	_transferFromExcluded	Private	✓	

	_transferBothExcluded	Private	✓	
	_reflectFee	Private	✓	
	_getValues	Private		
	_getTValues	Private		
	_getRValues	Private		
	_getRate	Private		
	_getCurrentSupply	Private		
	removeExchangePool	External	✓	onlyRole
	removeExemptAddress	External	✓	onlyRole
	_transfer	Internal	✓	
	_transferReflection	Private	✓	
	_transferInternal	Private	✓	
	_isSwap	Internal		
	_isExemptedFromTax	Internal		
	_mintReflection	Private	✓	
	mint	External	✓	onlyRole
	updateTokenLauncher	External	✓	onlyRole

Inheritance Graph



Flow Graph



Summary

The McBoys Club contract implements a token mechanism. This audit investigates security issues, business logic concerns and potential improvements. There are some functions that can be abused by the owner like stop transactions and manipulate the fees. A multi-wallet signing pattern will provide security against potential hacks. Temporarily locking the contract or renouncing ownership will eliminate all the contract threats.

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Cyberscope is one of the leading smart contract audit firms in the crypto space and has built a high-profile network of clients and partners.

The Cyberscope team

https://www.cyberscope.io