Cyberscope

Audit Report

TLife Coin

July 2023

Network	BSC
Address	0xc9f8c639135fc1412f011cc84810635d6bbca19d
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	Unresolved
●	BT	Burns Tokens	Passed
●	BC	Blacklists Addresses	Passed

Diagnostics

Critical Medium Minor / Informative

Severity	Code	Description	Status
	OCTD	Transfers Contract's Tokens	Unresolved
	MEE	Missing Events Emission	Unresolved
	L04	Conformance to Solidity Naming Conventions	Unresolved
	L18	Multiple Pragma Directives	Unresolved
	L19	Stable Compiler Version	Unresolved
	L20	Succeeded Transfer Check	Unresolved

Table of Contents

Review

Contract Name	TLIFE_Coin
Compiler Version	v0.8.11+commit.d7f03943
Optimization	200 runs
Explorer	https://bscscan.com/address/0xc9f8c639135fc1412f011cc84810635d6bbca19d
Address	0xc9f8c639135fc1412f011cc84810635d6bbca19d
Network	BSC
Symbol	TLIFE
Decimals	8
Total Supply	21,000,000

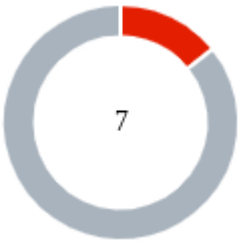
Audit Updates

Initial Audit	26 Jul 2023

Source Files

Filename	SHA256
TLIFE_Coin.sol	0f181f30fd2d1e9ab9363638612fe3e16596fdc90fcd6f89d090e9efbe0d936c

Findings Breakdown



Critical	1
Medium	0
Minor / Informative	6

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	1	0	0	0
Medium	0	0	0	0
Minor / Informative	6	0	0	0

MT - Mints Tokens

Criticality	Critical
Location	TLIFE_Coin.sol#L424
Status	Unresolved

Description

The contract owner has the authority to mint tokens. The owner may take advantage of it by calling the `mint` function. As a result, the contract tokens will be highly inflated.

```
function mint(address account, uint256 amount) external canMint {
        _mint(account, amount);
    }
```

Recommendation

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. Some suggestions are:

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-sign wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.
- Renouncing the ownership will eliminate the threats but it is non-reversible.

OCTD - Transfers Contract's Tokens

Criticality	Minor / Informative
Location	TLIFE_Coin.sol#L109
Status	Unresolved

Description

The contract owner has the authority to claim all the tokens held by the contract. The owner may take advantage of it by calling the `recoverToken` function.

```
    function recoverToken(address tokenAddress, uint256
tokenAmount) public virtual onlyOwner {
        IERC20(tokenAddress).transfer(owner(), tokenAmount);
    }
```

Recommendation

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. Some suggestions are:

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-sign wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.
- Renouncing the ownership will eliminate the threats but it is non-reversible.

MEE - Missing Events Emission

Criticality	Minor / Informative
Location	TLIFE_Coin.sol#L424
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 mint(address account, uint256 amount) external
canMint {
        _mint(account, amount);
    }
```

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.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	TLIFE_Coin.sol#L11,12,495
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 private __target
string private __identifier

...
```

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.

L18 - Multiple Pragma Directives

Criticality	Minor / Informative
Location	TLIFE_Coin.sol#L8,29,51,87,106,116,408,440,455,493
Status	Unresolved

Description

If the contract includes multiple conflicting pragma directives, it may produce unexpected errors. To avoid this, it's important to include the correct pragma directive at the top of the contract and to ensure that it is the only pragma directive included in the contract.

```
pragma solidity >=0.5.0;
pragma solidity ^0.8.0;
pragma solidity ^0.8.11;
```

Recommendation

It is important to include only one pragma directive at the top of the contract and to ensure that it accurately reflects the version of Solidity that the contract is written in.

By including all required compiler options and flags in a single pragma directive, the potential conflicts could be avoided and ensure that the contract can be compiled correctly.

L19 - Stable Compiler Version

Criticality	Minor / Informative
Location	TLIFE_Coin.sol#L8,29,51,106,116,408,440,455,493
Status	Unresolved

Description

The `^` symbol indicates that any version of Solidity that is compatible with the specified version (i.e., any version that is a higher minor or patch version) can be used to compile the contract. The version lock is a mechanism that allows the author to specify a minimum version of the Solidity compiler that must be used to compile the contract code. This is useful because it ensures that the contract will be compiled using a version of the compiler that is known to be compatible with the code.

```
pragma solidity ^0.8.11;
pragma solidity ^0.8.0;
```

Recommendation

The team is advised to lock the pragma to ensure the stability of the codebase. The locked pragma version ensures that the contract will not be deployed with an unexpected version. An unexpected version may produce vulnerabilities and undiscovered bugs. The compiler should be configured to the lowest version that provides all the required functionality for the codebase. As a result, the project will be compiled in a well-tested LTS (Long Term Support) environment.

L20 - Succeeded Transfer Check

Criticality	Minor / Informative
Location	TLIFE_Coin.sol#L110
Status	Unresolved

Description

According to the ERC20 specification, the transfer methods should be checked if the result is successful. Otherwise, the contract may wrongly assume that the transfer has been established.

```
IERC20(tokenAddress).transfer(owner(), tokenAmount)
```

Recommendation

The contract should check if the result of the transfer methods is successful. The team is advised to check the SafeERC20 library from the Openzeppelin library.

Functions Analysis

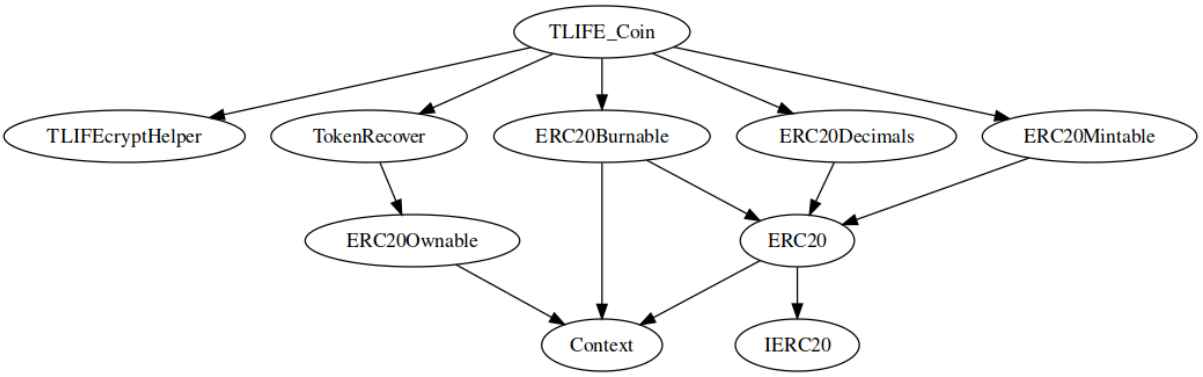
Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
TLIFEcryptHelper	Implementation			
		Public	Payable	-
	createdByTLIFEcrypt	Public		-
	getIdentifier	Public		-
Context	Implementation			
	_msgSender	Internal		
	_msgData	Internal		
ERC20Ownable	Implementation	Context		
		Public	✓	-
	owner	Public		-
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
IERC20	Interface			
	name	External		-
	symbol	External		-

	decimals	External		-
	totalSupply	External		-
	balanceOf	External		-
	allowance	External		-
	approve	External	✓	-
	transfer	External	✓	-
	transferFrom	External	✓	-
TokenRecover	Implementation	ERC20Ownable		
	recoverToken	Public	✓	onlyOwner
ERC20	Implementation	Context, IERC20		
		Public	✓	-
	name	Public		-
	symbol	Public		-
	decimals	Public		-
	totalSupply	Public		-
	balanceOf	Public		-
	transfer	Public	✓	-
	allowance	Public		-
	approve	Public	✓	-
	transferFrom	Public	✓	-
	increaseAllowance	Public	✓	-

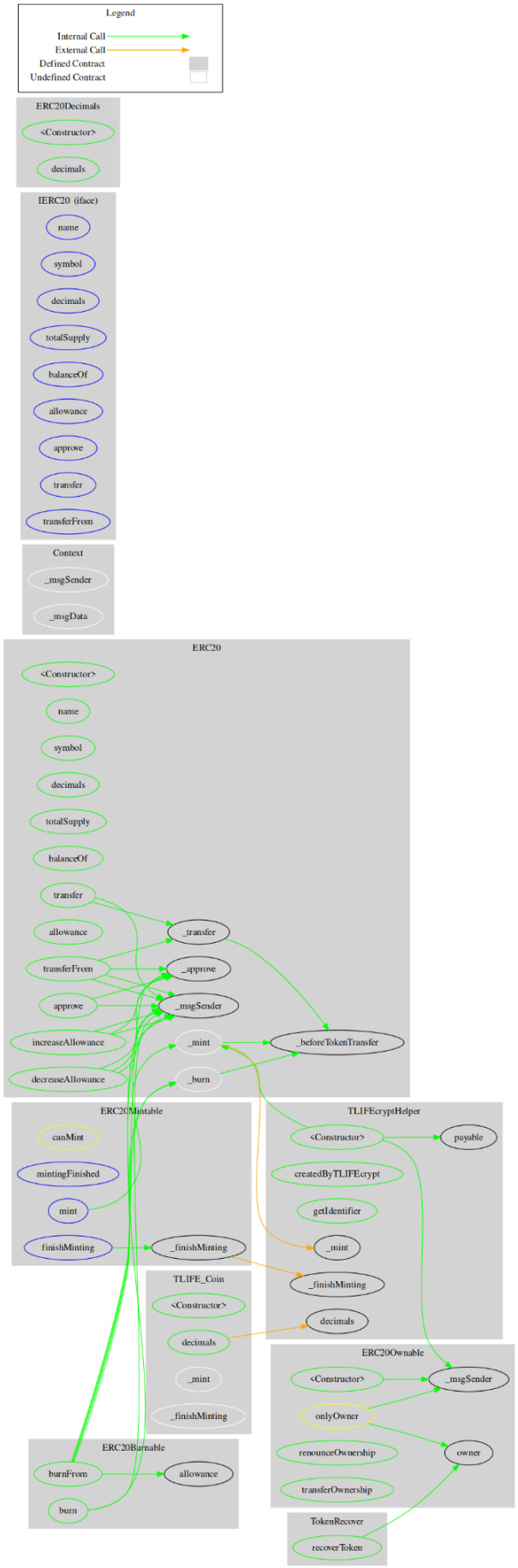
	decreaseAllowance	Public	✓	-
	_transfer	Internal	✓	
	_mint	Internal	✓	
	_burn	Internal	✓	
	_approve	Internal	✓	
	_beforeTokenTransfer	Internal	✓	
ERC20Mintable	Implementation	ERC20		
	mintingFinished	External		-
	mint	External	✓	canMint
	finishMinting	External	✓	canMint
	_finishMinting	Internal	✓	
ERC20Decimals	Implementation	ERC20		
		Public	✓	-
	decimals	Public		-
ERC20Burnable	Implementation	Context, ERC20		
	burn	Public	✓	-
	burnFrom	Public	✓	-

TLIFE_Coin	Implementation	ERC20Decimals, ERC20Mintable, ERC20Burnable, TokenRecover, TLIFEcryptHelper		
		Public	Payable	ERC20 ERC20Decimals TLIFEcryptHelper
	decimals	Public		-
	_mint	Internal	✓	onlyOwner
	_finishMinting	Internal	✓	onlyOwner

Inheritance Graph



Flow Graph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
ERC20Decimals
<Constructor>
decimals
IERC20 (iface)
name
symbol
decimals
totalSupply
balanceOf
allowance
approve
transfer
transferFrom
Context
_msgSender
_msgData
ERC20
<Constructor>
name
symbol
decimals
totalSupply
balanceOf
transfer
allowance
transferFrom
approve
increaseAllowance
decreaseAllowance
_transfer
_approve
_msgSender
_mint
_burn
_beforeTokenTransfer
ERC20Mintable
canMint
mintingFinished
mint
finishMinting
_finishMinting
TLIFEcryptHelper
<Constructor>
payable
createdByTLIFEcrypt
getIdentifier
_mint
_finishMinting
decimals
TLIFE_Coin
<Constructor>
decimals
_mint
_finishMinting
ERC20Ownable
<Constructor>
_msgSender
onlyOwner
renounceOwnership
transferOwnership
owner
ERC20Burnable
burnFrom
allowance
burn
TokenRecover
recoverToken

Summary

TLife Coin 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 mint tokens. If the contract owner abuses the mint functionality, then the contract will be highly inflated. 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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The Cyberscope team

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