



# Audit Report

## **Tendon**

February 2022

Type	BEP20
Network	BSC
Address	0x222f737285d0b60d8d4f27fa22ce8884c9f119f8
Audited by	© coinscope

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## Contract Review

<b>Contract Name</b>	Token
<b>Compiler Version</b>	v0.7.6+commit.7338295f
<b>Optimization</b>	200 runs
<b>Licence</b>	MIT
<b>Explorer</b>	<a href="https://bscscan.com/token/0x222f737285d0b60d8d4f27fa22ce8884c9f119f8">https://bscscan.com/token/0x222f737285d0b60d8d4f27fa22ce8884c9f119f8</a>
<b>Symbol</b>	TEND
<b>Decimals</b>	18
<b>Total Supply</b>	1,000,000,000,000,000
<b>Source</b>	contract.sol
<b>Domain</b>	tendontoken.com

## Audit Updates

<b>Initial Audit</b>	11th February 2022
<b>Corrected</b>	14th February 2022

# Contract Analysis

● Critical   
 ● Medium   
 ● Minor   
 ● Pass

Severity	Code	Description	Update
●	ST	Contract Owner is not able to stop or pause transactions	
●	OCTD	Contract Owner is not able to transfer tokens from specific address	
●	OTUT	Owner Transfer User's Tokens	
●	ELFM	Contract Owner is not able to increase fees more than a reasonable percent (25%)	
●	ULTW	Contract Owner is not able to increase the amount of liquidity taken by dev wallet more than a reasonable percent	Renounced Ownership
●	MT	Contract Owner is not able to mint new tokens	
●	BT	Contract Owner is not able to burn tokens from specific wallet	
●	BC	Contract Owner is not able to blacklist wallets from selling	

## ELFM - Exceed Limit Fees Manipulation

Criticality	medium
Location	contract.sol#L1
Status	Resolved

### Description

The contract owner has the authority to increase over the allowed limit of 25% but no more than 50%. The owner may take advantage of it by calling the `setAllFeePercent` function with a high percentage value.

```
function setAllFeePercent(uint8 taxFee, uint8 liquidityFee, uint8 burnFee, uint8 walletFee, uint8 buybackFee) external onlyOwner() {
    require(taxFee >= 0 && taxFee <=maxTaxFee,"TF err");
    require(liquidityFee >= 0 && liquidityFee <=maxLiqFee,"LF err");
    require(burnFee >= 0 && burnFee <=maxBurnFee,"BF err");
    require(walletFee >= 0 && walletFee <=maxWalletFee,"WF err");
    require(buybackFee >= 0 && buybackFee <=maxBuybackFee,"BBF err");
    _taxFee = taxFee;
    _liquidityFee = liquidityFee;
    _burnFee = burnFee;
    _buybackFee = buybackFee;
    _walletFee = walletFee;
}
```

### Recommendation

The contract could embody a check for the sum of 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. That risk can be prevented by temporarily locking the contract or renouncing ownership.

Update 14 February

The ownership has been renounced. Noone can manipulate the fees.

# Contract Diagnostics

● Critical    ● Medium    ● Minor

Severity	Code	Description
●	L01	Public Function could be Declared External
●	L02	State Variables could be Declared Constant
●	L04	Conformance to Solidity Naming Conventions
●	L09	Dead Code Elimination
●	L07	Missing Events Arithmetic
●	L15	Local Scope Variable Shadowing
●	L08	Tautology or Contradiction
●	L13	Divide before Multiply Operation



## L01 - Public Function could be Declared External

<b>Criticality</b>	minor
<b>Location</b>	contract.sol#L500,509,515,520,528,816 and 20 more

### Description

Public functions that are never called by the contract should be declared external to save gas.

```
recoverBEP20  
isExcludedFromFee  
setSwapAndLiquifyEnabled  
...
```

### Recommendation

Use the external attribute for functions never called from the contract

## L02 - State Variables could be Declared Constant

**Criticality**

minor

**Location**

contract.sol#L703,707,709,705,706,708 and 4 more

### Description

Constant state variables should be declared constant to save gas.

```
router  
mintedByMudra  
minMxWalletPercentage  
...
```

### Recommendation

Add the constant attribute to state variables that never change.

## L04 - Conformance to Solidity Naming Conventions

**Criticality**

minor

**Location**

contract.sol#L560,967,1032,1038,726,732 and 8 more

### Description

Solidity defines a naming convention that should be followed. Rule exceptions:

- Allow constant variable name/symbol/decimals to be lowercase.
- Allow \_ at the beginning of the mixed\_case match for private variables and unused parameters.

```
_maxWalletAmount  
_maxTxAmount  
_buybackFee  
...
```

### Recommendation

Follow the Solidity naming convention.

<https://docs.soliditylang.org/en/v0.4.25/style-guide.html#naming-conventions>

## L09 - Dead Code Elimination

**Criticality**

minor

**Location**

contract.sol#L359,319,329,344,354,266 and 10 more

### Description

Functions that are not used in the contract, and make the code's size bigger.

```
mod
safeTransferFrom
safeTransfer
...
```

### Recommendation

Remove unused functions.

## L07 - Missing Events Arithmetic

**Criticality**

minor

**Location**

contract.sol#L932,949,953,960

### Description

Detected missing events for critical arithmetic parameters. There are functions that have no event emitted, so it is difficult to track off-chain changes.

```
_maxWalletAmount = _tTotal.mul(maxWalletPercent).div(10 ** 2)
_maxTxAmount = _tTotal.mul(maxTxPercent).div(10 ** 2)
buyBackUpperLimit = buyBackLimit * 10 ** 18
...
```

### Recommendation

Emit an event for critical parameter changes.

## L15 - Local Scope Variable Shadowing

**Criticality**

minor

**Location**

contract.sol#L842,1072

### Description

There are variables that are defined in the local scope containing the same name from an upper scope.

```
owner
```

### Recommendation

The local variables should have different names from the upper scoped variables.

## L08 - Tautology or Contradiction

**Criticality**

minor

**Location**

contract.sol#L932

### Description

Detects expressions that are tautologies or contradictions. For instance, an uint variable will always be greater than or equal to zero.

```
require(bool,string)(buybackFee >= 0 && buybackFee <= maxBuybackFee,BBF err)
require(bool,string)(taxFee >= 0 && taxFee <= maxTaxFee,TF err)
require(bool,string)(walletFee >= 0 && walletFee <= maxWalletFee,WF err)
...
```

### Recommendation

Fix the incorrect comparison by changing the value type or the comparison.

## L13 - Divide before Multiply Operation

**Criticality**

minor

**Location**

contract.sol#L1143

### Description

Performing divisions before multiplications may cause lose of prediction.

```
spentAmount = contractTokenBalance.div(totFee).mul(_buybackFee)
spentAmount = contractTokenBalance.div(totFee).mul(_walletFee)
spentAmount = contractTokenBalance.div(totFee).mul(_burnFee)
```

### Recommendation

The multiplications should be prior to the divisions.



# Contract Functions

Contract	Type	Bases		
	Function Name	Visibility	Mutability	Modifiers
<b>IERC20</b>	Interface			
	totalSupply	External		-
	balanceOf	External		-
	transfer	External	✓	-
	allowance	External		-
	approve	External	✓	-
	transferFrom	External	✓	-
<b>SafeMath</b>	Library			
	add	Internal		
	sub	Internal		
	sub	Internal		
	mul	Internal		
	div	Internal		
	div	Internal		
	mod	Internal		
	mod	Internal		
<b>Context</b>	Implementation			
	_msgSender	Internal		
	_msgData	Internal		
<b>Address</b>	Library			
	isContract	Internal		
	sendValue	Internal	✓	
	functionCall	Internal	✓	
	functionCall	Internal	✓	
	functionCallWithValue	Internal	✓	
	functionCallWithValue	Internal	✓	

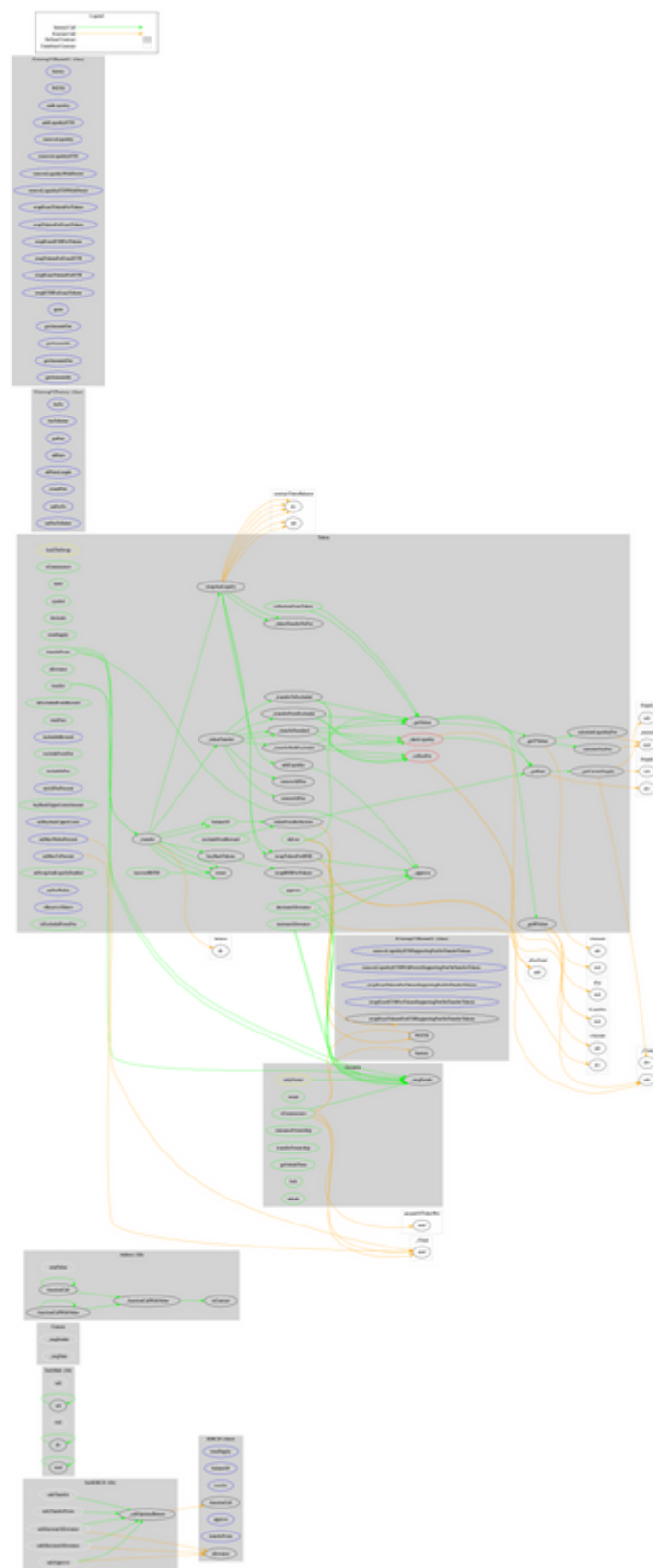
	_functionCallWithValue	Private	✓	
<b>SafeERC20</b>	Library			
	safeTransfer	Internal	✓	
	safeTransferFrom	Internal	✓	
	safeApprove	Internal	✓	
	safeIncreaseAllowance	Internal	✓	
	safeDecreaseAllowance	Internal	✓	
	_callOptionalReturn	Private	✓	
<b>Ownable</b>	Implementation	Context		
	<Constructor>	Public	✓	-
	owner	Public		-
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
	getUnlockTime	Public		-
	lock	Public	✓	onlyOwner
	unlock	Public	✓	-
<b>IUniswapV2Factory</b>	Interface			
	feeTo	External		-
	feeToSetter	External		-
	getPair	External		-
	allPairs	External		-
	allPairsLength	External		-
	createPair	External	✓	-
	setFeeTo	External	✓	-
	setFeeToSetter	External	✓	-
<b>IUniswapV2Router01</b>	Interface			
	factory	External		-
	WETH	External		-
	addLiquidity	External	✓	-
	addLiquidityETH	External	Payable	-

	removeLiquidity	External	✓	-
	removeLiquidityETH	External	✓	-
	removeLiquidityWithPermit	External	✓	-
	removeLiquidityETHWithPermit	External	✓	-
	swapExactTokensForTokens	External	✓	-
	swapTokensForExactTokens	External	✓	-
	swapExactETHForTokens	External	Payable	-
	swapTokensForExactETH	External	✓	-
	swapExactTokensForETH	External	✓	-
	swapETHForExactTokens	External	Payable	-
	quote	External		-
	getAmountOut	External		-
	getAmountIn	External		-
	getAmountsOut	External		-
	getAmountsIn	External		-
<b>IUniswapV2Router02</b>	Interface	IUniswapV2Router01		
	removeLiquidityETHSupportingFeeOnTransferTokens	External	✓	-
	removeLiquidityETHWithPermitSupportingFeeOnTransferTokens	External	✓	-
	swapExactTokensForTokensSupportingFeeOnTransferTokens	External	✓	-
	swapExactETHForTokensSupportingFeeOnTransferTokens	External	Payable	-
	swapExactTokensForETHSupportingFeeOnTransferTokens	External	✓	-
<b>Token</b>	Implementation	Context, IERC20, Ownable		
	<Constructor>	Public	✓	-
	name	Public		-
	symbol	Public		-
	decimals	Public		-
	totalSupply	Public		-
	balanceOf	Public		-

	transfer	Public	✓	-
	allowance	Public		-
	approve	Public	✓	-
	transferFrom	Public	✓	-
	increaseAllowance	Public	✓	-
	decreaseAllowance	Public	✓	-
	isExcludedFromReward	Public		-
	totalFees	Public		-
	deliver	Public	✓	-
	reflectionFromToken	Public		-
	tokenFromReflection	Public		-
	excludeFromReward	Public	✓	onlyOwner
	includeInReward	External	✓	onlyOwner
	excludeFromFee	Public	✓	onlyOwner
	includeInFee	Public	✓	onlyOwner
	setAllFeePercent	External	✓	onlyOwner
	buyBackUpperLimitAmount	Public		-
	setBuybackUpperLimit	External	✓	onlyOwner
	setMaxTxPercent	External	✓	onlyOwner
	setMaxWalletPercent	External	✓	onlyOwner
	setSwapAndLiquifyEnabled	Public	✓	onlyOwner
	setFeeWallet	External	✓	onlyOwner
	<Receive Ether>	External	Payable	-
	_reflectFee	Private	✓	
	_getValues	Private		
	_getTValues	Private		
	_getRValues	Private		
	_getRate	Private		
	_getCurrentSupply	Private		
	_takeLiquidity	Private	✓	
	calculateTaxFee	Private		
	calculateLiquidityFee	Private		
	removeAllFee	Private	✓	
	restoreAllFee	Private	✓	
	isExcludedFromFee	Public		-

	_approve	Private	✓	
	_transfer	Private	✓	
	swapAndLiquify	Private	✓	lockTheSwap
	buyBackTokens	Private	✓	lockTheSwap
	swapTokensForBNB	Private	✓	
	swapBNBForTokens	Private	✓	
	addLiquidity	Private	✓	
	_tokenTransfer	Private	✓	
	_transferStandard	Private	✓	
	_transferToExcluded	Private	✓	
	_transferFromExcluded	Private	✓	
	_transferBothExcluded	Private	✓	
	_tokenTransferNoFee	Private	✓	
	recoverBEP20	Public	✓	onlyOwner

# Contract Flow



## Domain Info

<b>Domain Name</b>	
<b>Registry Domain ID</b>	2626322953_DOMAIN_COM-VRSN
<b>Creation Date</b>	2021-07-13T07:05:02.00Z
<b>Updated Date</b>	0001-01-01T00:00:00.00Z
<b>Registry Expiry Date</b>	
<b>Registrar WHOIS Server</b>	whois.namecheap.com
<b>Registrar URL</b>	<a href="http://www.namecheap.com">http://www.namecheap.com</a>
<b>Registrar</b>	NAMECHEAP INC
<b>Registrar IANA ID</b>	1068

The domain has been created 7 months before the creation of the audit.

There is no public billing information, the creator is protected by the privacy settings.

# Summary

Tendon is aiming to be a community driven de-fi token. The Project has a friendly and growing community. The Smart Contract analysis reported no compiler error and one medium severity issue. The contract Owner can increase the fees up to 50%. A multi-wallet signing pattern will provide security against potential hacks. Temporarily locking the contract or renouncing ownership will eliminate all the contract threats.

## Update 14 February

The contract owner has renounced the ownership. That means that the contract cannot be manipulated.



## Disclaimer

All the content provided in this document is for general information only and should not be used as financial advice or a reason to buy any investment.

Coinscope team provides no guarantees against the sale of team tokens or the removal of liquidity by the project audited in this document. Always Do your own research and protect yourselves from being scammed.

The Coinscope team has audited this project for general information and only expresses their opinion based on similar projects and checks from popular diagnostic tools. Under no circumstances did Coinscope receive a payment to manipulate those results or change the awarding badge that we will be adding in our website.

Always Do your own research and protect yourselves from scams. This document should not be presented as a reason to buy or not buy any particular token.

The Coinscope team disclaims any liability for the resulting losses.

## About Coinscope

Coinscope is the leading early coin listing, voting and auditing authority firm. The audit process is analyzing and monitoring many aspects of the project. That way, it gives the community a good sense of security using an informative report and a generic score.

Coinscope is aiming to make crypto discoverable and efficient globally. It provides all the essential tools to assist users draw their own conclusions.



The Coinscope.co team

<https://www.coinscope.co>