



## **RugFreeCoins Audit**



## **Epic Hero Token Audit**

## **Smart Contract Security Audit**

**September 10, 2021**



# Contents

Audit details	1
Disclaimer	2
Background	3
About the project	4
Target market and the concept	7
Potential to grow with score points	10
Total Points	10
Contract details	11
Token distribution	12
Contract code function details	13
Contract description table	14
Security issue checking status	20
Owner privileges	22
Audit conclusion	29

# Audit details



## **Audited project**

Epic Hero Token



## **Contract Address**

0x47cC5334F65611EA6Be9e933C49485c88C17F5F0



## **Client contact**

Epic Hero Token Team



## **Blockchain**

Binance smart chain



## **Project website**

<https://Epic Hero.io/>

# Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the disclaimer below – please make sure to read it in full.

**DISCLAIMER:** By reading this report or any part of it, you agree to the terms of this disclaimer. If you do not agree to the terms, then please immediately cease reading this report, and delete and destroy any and all copies of this report downloaded and/or printed by you. This report is provided for information purposes only and on a non-reliance basis, and does not constitute investment advice. No one shall have any right to rely on the report or its contents, and Rugfreecoins and its affiliates (including holding companies, shareholders, subsidiaries, employees, directors, officers and other representatives) (Rugfreecoins) owe no duty of care towards you or any other person, nor does Rugfreecoins make any warranty or representation to any person on the accuracy or completeness of the report. The report is provided "as is", without any conditions, warranties or other terms of any kind except as set out in this disclaimer, and Rugfreecoins hereby excludes all representations, warranties, conditions and other terms (including, without limitation, the warranties implied by law of satisfactory quality, fitness for purpose and the use of reasonable care and skill) which, but for this clause, might have effect in relation to the report. Except and only to the extent that it is prohibited by law, Rugfreecoins hereby excludes all liability and responsibility, and neither you nor any other person shall have any claim against Rugfreecoins, for any amount or kind of loss or damage that may result to you or any other person (including without limitation, any direct, indirect, special, punitive, consequential or pure economic loss or damages, or any loss of income, profits, goodwill, data, contracts, use of money, or business interruption, and whether in delict, tort (including without limitation negligence), contract, breach of statutory duty, misrepresentation (whether innocent or negligent) or otherwise under any claim of any nature whatsoever in any jurisdiction) in any way arising from or connected with this report and the use, inability to use or the results of use of this report, and any reliance on this report. The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.

# Background

Rugfreecoins was commissioned by Epic Hero to perform an audit of the smart contract.

**<https://bscscan.com/token/0x47cC5334F65611EA6Be9e933C49485c88C17F5F0>**

The focus of this audit is to verify that the smart contract is secure, resilient and working according to the specifications.

The information in this report should be used to understand the risk exposure of the smart contract, project feasibility, long term sustainability and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

# About the project

Epic Hero is a token built on the Binance Smart Chain that powers the Epic Hero NFT game; users can use \$EPIC HERO in game or just hold it to earn Thoreum reflection rewards. Each transaction, purchase incur a 5% fee, and sales incur an 15% fee, transfers incur a fee of 10%.

\$EPIC HERO is acquired by winning battles, completing quests, or simply participating in games. While \$EPIC HERO tokens are released regularly as game rewards, they are also burned by many in-game activities like summoning a new hero, evolving a hero to next level, merging two existing heroes to create a new one, and many more exciting interactions. These burns help bring balance to the supply.

\$EPIC HERO is also required for expenses when challenging dungeons and upgrading the equipment. You can also use \$EPIC HERO to hire other player's heroes to form a team together, etc. \$EPIC HERO can be obtained by mining, by participating in daily works. \$EPIC HERO can also be traded through the DEX platform.

All of this action, excitement, competition and collecting brought to you on the Fair Launch ITO Platform of Thoreum Finance, the stable choice for projects looking to guarantee a smooth and fair launch for ALL their users, not only a lucky few.

## Features

- ❖ The automatic Thoreum rewards will be distributed among every holder proportional to how many tokens each individual holds in values of 0.75% when buying and 2.25% when selling.
- ❖ The automatic WBNB rewards will be distributed among NFT holders proportional to how many tokens each individual holds in values of 1.25% when buying and 3.75% when selling.
- ❖ Tokens are getting burnt in every transaction with the fee of 0.25% when buying and 0.75% when selling.
- ❖ The fee of 0.25% when buying and 0.75% when selling will be allocated for the game incentive pool to distribute among the game winners and activities related to the game.
- ❖ The sustainability fee of 2.5% when buying and 7.5% when selling for Dev & marketing is what allows Epic Hero to hold the aforementioned promise. Tokens will be swapped into BNB and will be sent to a marketing wallet per transaction. This way, Epic Hero will have enough funds to promote the coin and spend for future development without selling tokens as the traditional way.

# Features

All the distinctive gaming features revolving around our ecosystem



## PLAY or JUST HOLD NFT TO EARN

The 1st Play to Earn NFT game ever with Hold to Earn mode. Just hold NFTs in your wallet and get 5% rewards in BNB from transaction tax. Your NFTs become more valuable than ever.



## OWNERSHIP

Your Heroes and Equipment are securely stored on the blockchain in the form of an NFT.



## MARKETPLACE

Use the Marketplace to find your best Hero and trade rare equipment with other players.



## WAR GAME

Become the King of all Heroes through Epic War System: 1 vs. 1, 3 vs. 3, 5 vs. 5 and Thousands vs. Thousands with real prize money!

## Tokenomics

### 5% fee when buying

- ❖ 0.75% of trade goes to holders' pockets in Thorem.
- ❖ 1.25% of trade goes to NFT holders' pockets in WBNB.
- ❖ 0.25% of trade goes to burn tokens.
- ❖ 2.5% of trade goes to marketing & dev wallet.
- ❖ 0.25% of trade goes to the game incentive pool.

### 15% fee when selling

- ❖ 2.25% of trade goes to holders' pockets in Thorem.
- ❖ 3.75% of trade goes to NFT holders' pockets in WBNB.
- ❖ 0.75% of trade goes to burn tokens.
- ❖ 7.5% of trade goes to marketing & dev wallet.
- ❖ 0.75% of trade goes to the game incentive pool.





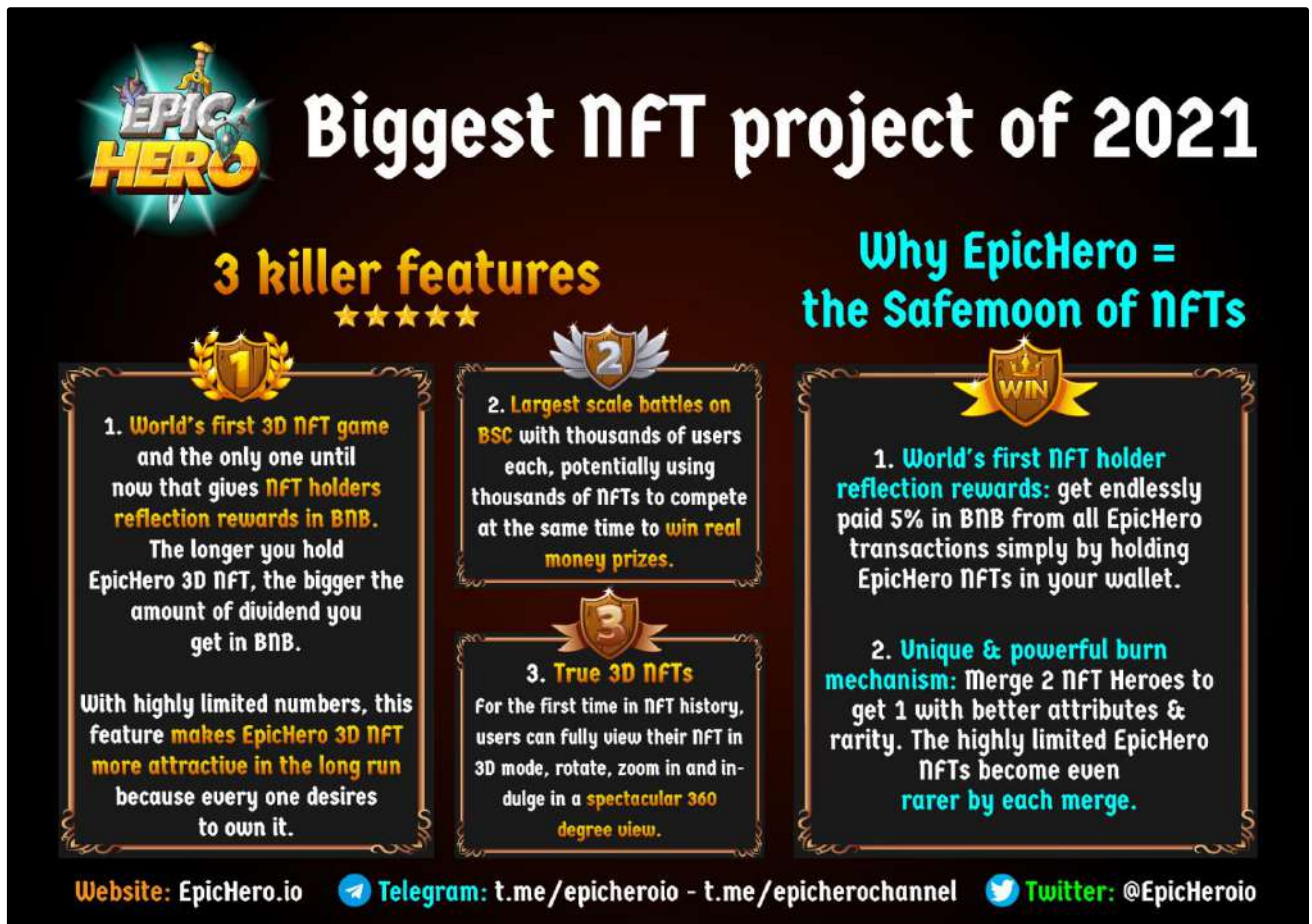
# Target market and the concept

## Target market

- ❖ Anyone who's interested in Crypto space with long term investment plans.
- ❖ Anyone who's ready to earn a passive income in Thorem by holding tokens.
- ❖ Anyone who's ready to earn a passive income in BNB by holding EPIC Hero NFTs.
- ❖ Anyone who's interested in owning 3D NFTs.
- ❖ Any casual or hardcore gamers out there play the war game and win rewards in \$Epic Hero or win in real money prices.
- ❖ Anyone who's interested in doing daily tasks in the game and gets rewards in \$Epic Hero tokens.
- ❖ Anyone who's interested in collecting NFTs or trading NFTs.
- ❖ Anyone who's interested in trading tokens.
- ❖ All Thorem and BNB investors and fans out there.
- ❖ Anyone who's interested in taking part with the future plans of the Epic Hero token.
- ❖ Anyone who's interested in making financial transactions with any other party using \$Epic Hero, Thorem or BNB as the currency.

## Core concept

### Epic Hero NFT game



**EPIC HERO** Biggest NFT project of 2021

**3 killer features** ★★★★★

- 1. World's first 3D NFT game** and the only one until now that gives **NFT holders reflection rewards in BNB**. The longer you hold EpicHero 3D NFT, the bigger the amount of dividend you get in BNB. With highly limited numbers, this feature **makes EpicHero 3D NFT more attractive in the long run** because every one desires to own it.
- 2. Largest scale battles on BSC** with thousands of users each, potentially using thousands of NFTs to compete at the same time to **win real money prizes**.
- 3. True 3D NFTs** For the first time in NFT history, users can fully view their NFT in 3D mode, rotate, zoom in and indulge in a **spectacular 360 degree view**.

**Why EpicHero = the Safemoon of NFTs**

- 1. World's first NFT holder reflection rewards:** get endlessly paid 5% in BNB from all EpicHero transactions simply by holding EpicHero NFTs in your wallet.
- 2. Unique & powerful burn mechanism:** Merge 2 NFT Heroes to get 1 with better attributes & rarity. The highly limited EpicHero NFTs become even **rarer by each merge**.

**Website:** [EpicHero.io](https://EpicHero.io) **Telegram:** [t.me/epicheroio](https://t.me/epicheroio) - [t.me/epicherochannel](https://t.me/epicherochannel) **Twitter:** [@EpicHeroio](https://twitter.com/EpicHeroio)

Stunning 3D designs, amazing gameplay, Epic Hero is the biggest War Game on the Binance Smart Chain Network. Collect and build an unstoppable force of characters by choosing from your favorite heroes from Greek, Norse, China, Japan, Egypt, India and Roman Mythology. Users can summon, merge and evolve thousands of Collectable Epic Hero Battle Card NFTs and bring them to the largest arena to do battle against other Epic Heroes.

Epic Hero is created to bring about the most unique gaming experiences on BSC. Summon, Merge, Fight, Quest, Join a Clan, Hire a hero from other users, Own your land and invade other's. We have many activities planned for users to Interact and Show Off their Collection. Dominate your opponents and raise your banner over the Epic Hero ranks. Do you have what it takes to rise up and overcome your enemies?

It will be the first NFT game with a 1000 vs. 1000 battle where thousands of players can fight with others at the same time to win a big real money prize monthly.

Each Epic Hero's NFT has a stunning 3D graphic, unlike other projects with just 2D NFT graphics, our NFT is truly 3D, users can view their hero in high definition and rotate them 360 degrees with a zoom in and zoom out function, a unique feature not yet implemented in any BSC NFT game.

For those not into battling and questing, collect exciting unique sets and combos, perfect for the collector in every group. One-off limited edition Epic Hero Battle Card NFTs will set you apart from other so-called, would-be collectors. Show off your collection of rare and precious NFT Epic Hero and be the envy of all.



## **The Thorem reward system**

0.75% of each transaction when buying and 2.25% when selling gets converted to Thorem and is split amongst all holders. The rewards are sent to holders that have at least 200,000 Epic Hero tokens, holders will be eligible to receive tokens every hour and rewards are proportional to how many tokens each individual holds.

## **The NFT reward system**

The longer the holders hold NFTs the bigger the amount of dividends that they get in BNB, it gives holders the incentive to hold to collect dividends and with highly limited numbers, this feature makes the NFT look more attractive in the long run because everyone desires to have it.

## **NFT burning mechanism**

Not only is Epic Hero NFT highly limited in numbers, but also it will become rarer and rarer day by day because of our NFT merging (burning) mechanism. Users can choose 2 heroes to merge into a new 1 with better attributes or rarity, so the number of heroes will be decreased a lot over time.

## **Sustainable mechanism**

The **sustainability fee of 2.5% when buying and 7.5% when selling for Dev & marketing** is what allows Epic Hero to promote the token and use funds to further development of the platform. Tokens will be swapped into BNB and will be sent to a marketing wallet per transaction. This way, Epic Hero will have access to the funds without selling tokens as the traditional way, which will enable them to consume funds without hurting the project.

The fee of 0.25% when buying and 0.75% when selling burn that benefits and rewards those who invest long-term. This feature slowly reduces supply making Epic Hero price more and more valuable.

The fee of 0.25% when buying and 0.75% when selling will be allocated for the game incentive pool to distribute among the game winners and activities related to the game.

# Potential to grow with score points

1.	Project efficiency	10/10
2.	Project uniqueness	10/10
3	Information quality	10/10
4	Service quality	9/10
5	System quality	10/10
6	Impact on the community	10/10
7	Impact on the business	10/10
8	Preparing for the future	10/10
Total Points		<b>9.88/10</b>



# Contract details

## Token contract details for 10<sup>th</sup> September 2021

<b>Contract name</b>	Epic Hero.io 3D NFT
<b>Contract address</b>	0x47cC5334F65611EA6Be9e933C49485c88C17F5F0
<b>Token supply</b>	1,000,000,000
<b>Token ticker</b>	EPIC HERO
<b>Decimals</b>	18
<b>Token holders</b>	0
<b>Transaction count</b>	0
<b>Game treasury wallet</b>	0xb7497bb4dec6b4be62f77dbdeb90f4e179d8fcfe
<b>Team wallet</b>	0x9bf2891fa94f6d9954d6eafa89c759b3c9ddc05a
<b>Marketing wallet address</b>	0x02ad160cb2e10984ad492df2ace18ad725b8a70c
<b>Thoreum Dividend token</b>	0x580de58c1bd593a43dadcf0a739d504621817c05
<b>Thoreum Dividend tracker</b>	0x2e0098362d5fe36a83ab2dcf0c49d008813d079f
<b>WBNB Dividend token</b>	0xbb4cdb9cbd36b01bd1cbaebf2de08d9173bc095c
<b>WBNB Dividend tracker</b>	0x4fbee542a42216e5abf8b361d975d8f55c4d01a9
<b>Burn alliance token</b>	0x580de58c1bd593a43dadcf0a739d504621817c05
<b>Contract deployer address</b>	0x8E377Cc27aBfB273313791097bcCe590a84F1F97
<b>Contract's current owner address</b>	0x8e377cc27abfb273313791097bcce590a84f1f97

# Token distribution

**Tokens are distributed as follows:**










































- ❖ Initial Burn: 50%
- ❖ Angel investors rounds: 5%. Distribution: 1 month full locked, then 0.1% weekly.
- ❖ Advisors: 2.5%. Distribution: 6 months full locked, then 0.5% Quarterly
- ❖ Team: 5%. Distribution: 6 months full locked, then 1% Quarterly
- ❖ Foundation: 10% Marketing, Audit, Exchanges, etc. + 2.5% partnership
- ❖ Game Incentives (farming, PvP, PvE, prizes) : 17.5%
- ❖ Airdrop: 1.25%
- ❖ Public sale: 5%
- ❖ Liquidity: 1.25%.

# Contract code function details







































































No	Category	Item	Result
1	Coding conventions	BRC20 Token standards	pass
		compile errors	pass
		Compiler version security	pass
		visibility specifiers	pass
		Gas consumption	pass
		SafeMath features	pass
		Fallback usage	pass
		tx.origin usage	pass
		deprecated items	pass
		Redundant code	pass
		Overriding variables	pass
2	Function call audit	Authorization of function call	pass
		Low level function (call/delegate call) security	pass
		Returned value security	pass
		Selfdestruct function security	pass
3	Business security	Access control of owners	informational
		Business logics	pass
		Business implementations	pass
4	Integer overflow/underflow		pass
5	Reentrancy		pass
6	Exceptional reachable state		pass
7	Transaction ordering dependence		pass
8	Block properties dependence		pass
9	Pseudo random number generator (PRNG)		pass
10	DoS (Denial of Service)		pass
11	Token vesting implementation		pass
12	Fake deposit		pass
13	Event security		pass






















































# Contract description table

Below table represents the summary of the contracts and methods in the token contract. We scanned the whole contract and listed down all the Interfaces, functions and implementations with its visibility and mutability.

Contract	Type	Bases		
L	Function Name	Visibility	Mutability	Modifiers
Context	Implementation			
L	_msgSender	Internal 		
L	_msgData	Internal 		
Ownable	Implementation	Context		
L		Public 		NO 
L	owner	Public 		NO 
L	renounceOwnership	Public 		onlyOwner
L	transferOwnership	Public 		onlyOwner
L	lock	Public 		onlyOwner
IERC20	Interface			
L	totalSupply	External 		NO 
L	balanceOf	External 		NO 
L	transfer	External 		NO 
L	allowance	External 		NO 
L	approve	External 		NO 
L	transferFrom	External 		NO 
ERC20	Implementation	Context, IERC20		
L		Public 		NO 
L	name	Public 		NO 
L	symbol	Public 		NO 
L	decimals	Public 		NO 
L	totalSupply	Public 		NO 
L	balanceOf	Public 		NO 



L	transfer	Public 		NO 
L	allowance	Public 		NO 
L	approve	Public 		NO 
L	transferFrom	Public 		NO 
L	increaseAllowance	Public 		NO 
L	decreaseAllowance	Public 		NO 
L	_transfer	Internal 		
L	_mint	Internal 		
L	_burn	Internal 		
L	_approve	Internal 		
L	_setupDecimals	Internal 		
L	_beforeTokenTransfer	Internal 		
<b>IDividendPayingToken</b>	<b>Interface</b>			
L	dividendOf	External 		NO 
L	withdrawDividend	External 		NO 
L	withdrawableDividendOf	External 		NO 
L	withdrawnDividendOf	External 		NO 
L	accumulativeDividendOf	External 		NO 
<b>DividendPayingToken</b>	<b>Implementation</b>	<b>ERC20, IDividendPayingToken</b>		
L		Public 		ERC20
L		External 		NO 
L	distributeDividends	Public 		NO 
L	withdrawDividend	Public 		NO 
L	setOnlyCaller	External 		NO 
L	setDividendTokenAddress	External 		NO 
L	setMinTokenBeforeSendDividend	External 		NO 
L	retrieveTokens	External 		NO 
L	retrieveBNB	External 		NO 
L	_withdrawDividendOfUser	Internal 		
L	dividendOf	Public 		NO 

L	withdrawableDividendOf	Public 		NO 
L	withdrawnDividendOf	Public 		NO 
L	accumulativeDividendOf	Public 		NO 
L	_transfer	Internal 		
L	_mint	Internal 		
L	_burn	Internal 		
L	_setBalance	Internal 		
<b>IDEXFactory</b>		<b>Interface</b>		
L	createPair	External 		NO 
<b>IDEXRouter</b>		<b>Interface</b>		
L	factory	External 		NO 
L	WETH	External 		NO 
L	addLiquidity	External 		NO 
L	addLiquidityETH	External 		NO 
L	swapExactTokensForTokensSupportingFeeOnTransferTokens	External 		NO 
L	swapExactETHForTokensSupportingFeeOnTransferTokens	External 		NO 
L	swapExactTokensForETHSupportingFeeOnTransferTokens	External 		NO 
<b>IterableMapping</b>		<b>Library</b>		
L	get	Public 		NO 
L	getIndexOfKey	Public 		NO 
L	getKeyAtIndex	Public 		NO 
L	size	Public 		NO 
L	set	Public 		NO 
L	remove	Public 		NO 
<b>SafeMath</b>		<b>Library</b>		
L	tryAdd	Internal 		
L	trySub	Internal 		
L	tryMul	Internal 		



L	tryDiv	Internal 🔒		
L	tryMod	Internal 🔒		
L	add	Internal 🔒		
L	sub	Internal 🔒		
L	mul	Internal 🔒		
L	div	Internal 🔒		
L	mod	Internal 🔒		
L	sub	Internal 🔒		
L	div	Internal 🔒		
L	mod	Internal 🔒		
<b>SafeMathInt</b>	<b>Library</b>			
L	mul	Internal 🔒		
L	div	Internal 🔒		
L	sub	Internal 🔒		
L	add	Internal 🔒		
L	toUint256Safe	Internal 🔒		
<b>SafeMathUint</b>	<b>Library</b>			
L	toInt256Safe	Internal 🔒		
<b>ThoreumDividendTracker</b>	<b>Implementation</b>	<b>DividendPaying Token, Ownable</b>		
L		Public 🔓	🔒	DividendPayingToken
L	setDividendTokenAddress	External 🔓	🔒	onlyOwner
L	updateMinimumTokenBalanceForDividends	External 🔓	🔒	onlyOwner
L	excludeFromDividends	External 🔓	🔒	onlyOwner
L	updateClaimWait	External 🔓	🔒	onlyOwner
L	setBalance	External 🔓	🔒	onlyOwner
L	processAccount	Public 🔓	🔒	onlyOwner
L	process	Public 🔓	🔒	NO🔓
L	_transfer	Internal 🔒		
L	withdrawDividend	Public 🔓		NO🔓
L	getNumberOfTokenHolders	External 🔓		NO🔓

L	getAccount	Public		NO
L	getAccountAtIndex	Public		NO
L	_canAutoClaim	Private		
<b>Epic HeroToken</b>	<b>Implementation</b>	<b>ERC20, Ownable</b>		
L		Public		ERC20
L		External		NO
L	afterPreSale	External		onlyOwner
L	prepareForPartner	External		onlyOwner
L	setMaxBuyTransaction	External		onlyOwner
L	setMaxSellTransaction	External		onlyOwner
L	setThoreumDividendToken	External		onlyOwner
L	setMinThoreumBeforeSendDividend	External		onlyOwner
L	setSendThoreumInTx	External		onlyOwner
L	setWbnbReflectToken	External		onlyOwner
L	setWbnbReflectTracker	External		onlyOwner
L	setTeamWallet	External		onlyOwner
L	setMarketingWallet	External		onlyOwner
L	setBurnAllianceToken	External		onlyOwner
L	setToBurnAllianceFee	External		onlyOwner
L	setToBurnTokenFee	External		onlyOwner
L	setGameTreasuryFee	External		onlyOwner
L	setMaxWalletToken	External		onlyOwner
L	setSwapTokensAtAmount	External		onlyOwner
L	setSellTransactionMultiplier	External		onlyOwner
L	setTradingIsEnabled	External		onlyOwner
L	setMinBNBAfterBuyback	Public		onlyOwner
L	setMinSellToTriggerBuyback	Public		onlyOwner
L	setBuyBackUpperLimitBNB	External		onlyOwner
L	setThoreumDividendTracker	External		onlyOwner
L	setThoreumDividendRewardFee	External		onlyOwner

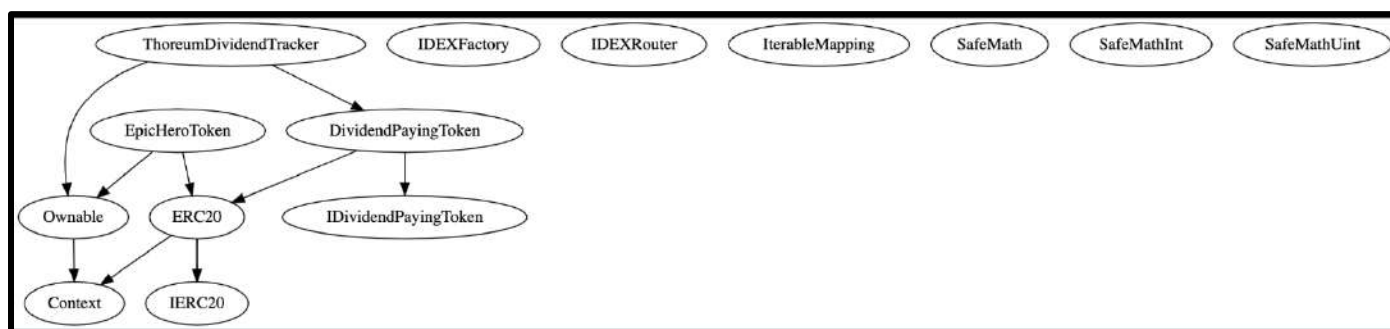


L	setWbnbReflectRewardFee	External		onlyOwner
L	setMarketingFee	External		onlyOwner
L	setBuyBackFee	External		onlyOwner
L	setLiquidityFee	External		onlyOwner
L	setDexRouter	External		onlyOwner
L	setIsBlacklisted	External		onlyOwner
L	setFeesOnNormalTransfers	External		onlyOwner
L	setAutomatedMarketMakerPair	Public		onlyOwner
L	_setAutomatedMarketMakerPair	Private		onlyOwner
L	setGasForProcessing	External		onlyOwner
L	setMinimumBalanceForDividends	External		onlyOwner
L	setClaimWait	External		onlyOwner
L	excludeFromFees	Public		onlyOwner
L	excludeFromDividend	Public		onlyOwner
L	processDividendTracker	External		onlyOwner
L	manualBuyBackAndBurn	Public		onlyOwner
L	retrieveTokens	External		onlyOwner
L	retrieveBNB	External		onlyOwner
L	claim	External		NO
L	_updateTotalFee	Internal		
L	_transfer	Internal		
L	_swapAndLiquify	Private		
L	_addLiquidity	Private		
L	_buyBackAllianceTokenAndBurn	Private		
L	_buyBackAndBurn	Private		
L	_swapTokensForBNB	Private		
L	_swapTokensForDividendToken	Private		
L	_swapAndSendThorumDividends	Private		
L	_swapAndSendWbnbReflects	Private		
L	_transferToWallet	Private		

## Legend

Symbol	Meaning
	Function can modify state
	Function is payable

## Inheritance Hierarchy



# Security issue checking status

## ❖ High severity issues

- No high severity issues found.

## ❖ Medium severity issues

- No medium severity issues found.

## ❖ Low severity issues

- No low severity issues found.

## ❖ Informational

- The owner can limit the max selling amount without any limitation.

```
ftrace | funcSig
function setMaxSellTransaction(uint256 _maxTxn↑) external onlyOwner {
    maxSellTransactionAmount = _maxTxn↑;
}
```

- The owner can increase sell fees without any limitation.

```
ftrace | funcSig
function setSellTransactionMultiplier(uint256 _multiplier↑)
    external
    onlyOwner
{
    sellFeeIncreaseFactor = _multiplier↑;
}
```

- The owner can enable and disable trading at any time.

```
ftrace | funcSig
function setTradingIsEnabled(bool _enabled↑) external onlyOwner {
    tradingIsEnabled = _enabled↑;
}
ftrace | funcSig
```

- The owner can change the minimum balance for dividend without any limit.

```
ftrace | funcSig
function setMinimumBalanceForDividends(uint256 newMinimumBalance↑)
    external
    onlyOwner
{
    thoreumDividendTracker.updateMinimumTokenBalanceForDividends(
        newMinimumBalance↑
    );
}
```

# Owner privileges

- ❖ The owner can exclude address from dividend.

```
ftrace | funcSig
function prepareForPartner(address _partnerOrExchangeAddress↑)
    external
    onlyOwner
{
    thoreumDividendTracker.excludeFromDividends(_partnerOrExchangeAddress↑);
    excludeFromFees(_partnerOrExchangeAddress↑, true);
}
```

- ❖ The owner can change the max buy amount.

```
ftrace | funcSig
function setMaxBuyTransaction(uint256 _maxTxn↑) external onlyOwner {
    maxBuyTransactionAmount = _maxTxn↑;
}
```

- ❖ The owner can change the max sell amount.

```
ftrace | funcSig
function setMaxSellTransaction(uint256 _maxTxn↑) external onlyOwner {
    maxSellTransactionAmount = _maxTxn↑;
}
```

- ❖ The owner can change Thoreum Dividend token address.

```
ftrace | funcSig
function setThoreumDividendToken(address _newContract↑) external onlyOwner {
    thoreumDividendToken = _newContract↑;
    thoreumDividendTracker.setDividendTokenAddress(_newContract↑);
}
```

- ❖ The owner can change the minimum Thoreum to send dividends.

```
ftrace | funcSig
function setMinThoreumBeforeSendDividend(uint256 _newAmount↑)
    external
    onlyOwner
{
    thoreumDividendTracker.setMinTokenBeforeSendDividend(_newAmount↑);
}
```

- ❖ The owner can enable/disable sending dividend in every transaction.

```
ftrace | funcSig
function setSendThoreumInTx(bool _newStatus↑) external onlyOwner {
    sendThoreumInTx = _newStatus↑;
}
```

- ❖ The owner can change WBNB reflection tracker and token address.

```
ftrace | funcSig
function setWbnbReflectToken(address _newContract↑) external onlyOwner {
    wbnbReflectToken = _newContract↑;
}

ftrace | funcSig
function setWbnbReflectTracker(address _newContract↑) external onlyOwner {
    wbnbReflectTracker = _newContract↑;
}
```

- ❖ The owner can change Team and marketing wallet.

```
ftrace | funcSig
function setTeamWallet(address _newWallet↑) external onlyOwner {
    excludeFromFees(_newWallet↑, true);
    teamWallet = _newWallet↑;
}

ftrace | funcSig
function setMarketingWallet(address _newWallet↑) external onlyOwner {
    excludeFromFees(_newWallet↑, true);
    marketingWallet = _newWallet↑;
}
```

- ❖ The owner can change Alliance token addresses to burn.

```
ftrace | funcSig
function setBurnAllianceToken(address _newAddress↑) external onlyOwner {
    toBurnAllianceToken = _newAddress↑;
}
```

- ❖ The owner can change Burn Alliance fee, token burn fee and Game Treasury fee up to 25%.

```
ftrace | funcSig
function setToBurnAllianceFee(uint256 newFee↑) external onlyOwner {
    require(newFee↑ <= MAX_FEE_RATE, "wrong");
    toBurnAllianceFee = newFee↑;
    _updateTotalFee();
}

ftrace | funcSig
function setToBurnTokenFee(uint256 newFee↑) external onlyOwner {
    require(newFee↑ <= MAX_FEE_RATE, "wrong");
    toBurnTokenFee = newFee↑;
    _updateTotalFee();
}

ftrace | funcSig
function setGameTreasuryFee(uint256 newFee↑) external onlyOwner {
    require(newFee↑ <= MAX_FEE_RATE, "wrong");
    gameTreasuryFee = newFee↑;
    _updateTotalFee();
}
```

- ❖ The owner can change max wallet token and token swap amount.

```
ftrace | funcSig
function setMaxWalletToken(uint256 _maxToken↑) external onlyOwner {
    maxWalletToken = _maxToken↑;
}

ftrace | funcSig
function setSwapTokensAtAmount(uint256 _swapAmount↑) external onlyOwner {
    swapTokensAtAmount = _swapAmount↑;
}
```



- ❖ The owner can change the max sell token limit.

```
ftrace | funcSig
function setSellTransactionMultiplier(uint256 _multiplier↑)
    external
    onlyOwner
{
    sellFeeIncreaseFactor = _multiplier↑;
}
```

- ❖ The owner can enable and disable trading.

```
ftrace | funcSig
function setTradingIsEnabled(bool _enabled↑) external onlyOwner {
    tradingIsEnabled = _enabled↑;
}

ftrace | funcSig
```

- ❖ The owner can set minimum BNB to buy back, minimum sell to trigger buy back and buy back upper limit.

```
ftrace | funcSig
function setMinBNBAfterBuyback(uint256 _newAmount↑) public onlyOwner {
    require(_newAmount↑ >= 0, "newAmount error");
    minBNBAfterBuyback = _newAmount↑;
}

ftrace | funcSig
function setMinSellToTriggerBuyback(uint256 _newAmount↑) public onlyOwner {
    require(_newAmount↑ > 0, "newAmount error");
    minSellToTriggerBuyback = _newAmount↑;
}

ftrace | funcSig
function setBuyBackUpperLimitBNB(uint256 buyBackLimit↑) external onlyOwner {
    require(buyBackLimit↑ > 0, "buyBackLimit error");
    buybackUpperLimitBNB = buyBackLimit↑;
}
```

- ❖ The owner can change all fees; each fee can set max up to 25%.

```
ftrace | funcSig
function setThoreumDividendRewardFee(uint8 newFee↑) external onlyOwner {
    require(newFee↑ <= MAX_FEE_RATE, "wrong");
    thoreumDividendRewardsFee = newFee↑;
    _updateTotalFee();
}

ftrace | funcSig
function setWbnbReflectRewardFee(uint8 newFee↑) external onlyOwner {
    require(newFee↑ <= MAX_FEE_RATE, "wrong");
    wbnbReflectRewardsFee = newFee↑;
    _updateTotalFee();
}

ftrace | funcSig
function setMarketingFee(uint8 newFee↑) external onlyOwner {
    require(newFee↑ <= MAX_FEE_RATE, "wrong");
    marketingFee = newFee↑;
    _updateTotalFee();
}

ftrace | funcSig
function setBuyBackFee(uint8 newFee↑) external onlyOwner {
    require(newFee↑ <= MAX_FEE_RATE, "wrong");
    buyBackFee = newFee↑;
    _updateTotalFee();
}

ftrace | funcSig
function setLiquidityFee(uint8 newFee↑) external onlyOwner {
    require(newFee↑ <= MAX_FEE_RATE, "wrong");
    liquidityFee = newFee↑;
    _updateTotalFee();
}
```

- ❖ The owner can change the dex router address.

```
ftrace | funcSig
function setDexRouter(address newAddress↑) external onlyOwner {
    dexRouter = IDexRouter(newAddress↑);
}
```

- ❖ The owner can enable or disable getting fees on normal transactions.

```
ftrace | funcSig
function setFeesOnNormalTransfers(bool _enabled↑) external onlyOwner {
    feesOnNormalTransfers = _enabled↑;
}
```

- ❖ The owner can change the minimum token balance requirement to get rewards.

```
ftrace | funcSig
function setMinimumBalanceForDividends(uint256 newMinimumBalance↑)
    external
    onlyOwner
{
    thoreumDividendTracker.updateMinimumTokenBalanceForDividends(
        newMinimumBalance↑
    );
}
```

- ❖ The owner can change the claim wait.

```
ftrace | funcSig
function setClaimWait(uint256 claimWait↑) external onlyOwner {
    thoreumDividendTracker.updateClaimWait(claimWait↑);
}
```

- ❖ The owner can exclude wallet from fees and dividends.

```
ftrace | funcSig
function excludeFromFees(address account↑, bool excluded↑) public onlyOwner {
    require(isExcludedFromFees[account↑] != excluded↑, "Already excluded");
    isExcludedFromFees[account↑] = excluded↑;

    emit ExcludeFromFees(account↑, excluded↑);
}

ftrace | funcSig
function excludeFromDividend(address account↑) public onlyOwner {
    thoreumDividendTracker.excludeFromDividends(address(account↑));
}
```

- ❖ The owner can process the dividend tracker manually.

```
ftrace | funcSig
function processDividendTracker(uint256 gas↑) external onlyOwner {
    (
        uint256 aIterations,
        uint256 aClaims,
        uint256 aLastProcessedIndex
    ) = thoreumDividendTracker.process(gas↑);
    emit ProcessedThoreumDividendTracker(
        aIterations,
        aClaims,
        aLastProcessedIndex,
        false,
        gas↑,
        tx.origin
    );
}
```

- ❖ The owner can manually buy back tokens.

```
ftrace | funcSig
function manualBuyBackAndBurn(uint256 _amount↑) public onlyOwner {
    uint256 balance = address(this).balance;
    require(
        balance >= minBNBAfterBuyback.add(_amount↑),
        "amount is too big"
    );

    if (!swapping) {
        _buyBackAndBurn(_amount↑);
    }
}
```

- ❖ The owner can transfer BNB and token balance in contract to the owner wallet.

```
ftrace | funcSig
function retrieveTokens(address token↑, uint256 amount↑) external onlyOwner {
    require(IERC20(token↑).transfer(msg.sender, amount↑), "Transfer failed");
}

ftrace | funcSig
function retrieveBNB(uint256 amount↑) external onlyOwner {
    (bool success, ) = payable(msg.sender).call{value: amount↑}("");
    require(success, "Failed to retrieve BNB");
}
```

# Audit conclusion

While conducting the audit of the Epic Hero smart contract, it was observed that there is nothing alarming with the code and it only contains informational concerns.