



TechRate

AUDIT COMPANY

Smart Contract Security Audit

TechRate

June, 2021

Audit Details



Audited project

Blacksheep



Deployer address

0x8170DFF1f39488D7e4809559cE73781940EA8E07



Client contacts:

Blacksheep team



Blockchain

Binance Smart Chain



Project website:

<https://www.blacksheepdefi.com/>

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 below disclaimer below – please make sure to read it in full.

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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

TechRate was commissioned by Blacksheep to perform an audit of smart contracts:

- <https://bscscan.com/address/0x58B0cA90a3FCaE7E6c139E63807A092fA415f0C7#code>
- <https://bscscan.com/address/0x61Ca70EEe6D08846D0a9071A24BE7A7Df3DaCA30#code>
- <https://bscscan.com/address/0x3858AB81E0295C8EA635adC7742a164E360F37c9#code>
- <https://bscscan.com/address/0xa51Db13C573F72c12024c7dd01616E952BaD51c7#code>

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

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

Contracts Details

Token contract details for 10.06.2021

Contract name	Blacksheep
Contract address	0x309b22772be363db755894ebD8B9F167F4a985C7
Total supply	0
Token ticker	BLACKSHEEP
Decimals	18
Token holders	0
Transactions count	0
Top 100 holders dominance	100.00%
Contract deployer address	0x8170DFF1f39488D7e4809559cE73781940EA8E07
Contract's current owner address	0x8170dff1f39488d7e4809559ce73781940ea8e07

MasterChef functions details

- + [Int] IUniswapV2Router02 (IUniswapV2Router01)
 - [Ext] removeLiquidityETHSupportingFeeOnTransferTokens #
 - [Ext] removeLiquidityETHWithPermitSupportingFeeOnTransferTokens #
 - [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #
 - [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens (\$)
 - [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #

- + [Int] IUniswapV2Router01
 - [Ext] factory
 - [Ext] WETH
 - [Ext] addLiquidity #
 - [Ext] addLiquidityETH (\$)
 - [Ext] removeLiquidity #
 - [Ext] removeLiquidityETH #
 - [Ext] removeLiquidityWithPermit #
 - [Ext] removeLiquidityETHWithPermit #
 - [Ext] swapExactTokensForTokens #
 - [Ext] swapTokensForExactTokens #
 - [Ext] swapExactETHForTokens (\$)
 - [Ext] swapTokensForExactETH #
 - [Ext] swapExactTokensForETH #
 - [Ext] swapETHForExactTokens (\$)
 - [Ext] quote
 - [Ext] getAmountOut
 - [Ext] getAmountIn
 - [Ext] getAmountsOut
 - [Ext] getAmountsIn

- + [Int] IUniswapV2Pair
 - [Ext] name
 - [Ext] symbol
 - [Ext] decimals
 - [Ext] totalSupply
 - [Ext] balanceOf
 - [Ext] allowance
 - [Ext] approve #
 - [Ext] transfer #
 - [Ext] transferFrom #
 - [Ext] DOMAIN_SEPARATOR
 - [Ext] PERMIT_TYPEHASH
 - [Ext] nonces
 - [Ext] permit #
 - [Ext] MINIMUM_LIQUIDITY
 - [Ext] factory
 - [Ext] token0
 - [Ext] token1
 - [Ext] getReserves
 - [Ext] price0CumulativeLast
 - [Ext] price1CumulativeLast
 - [Ext] kLast
 - [Ext] mint #
 - [Ext] burn #

- [Ext] swap #
- [Ext] skim #
- [Ext] sync #
- [Ext] initialize #

+ [Int] IUniswapV2Factory

- [Ext] feeTo
- [Ext] feeToSetter
- [Ext] getPair
- [Ext] allPairs
- [Ext] allPairsLength
- [Ext] createPair #
- [Ext] setFeeTo #
- [Ext] setFeeToSetter #

+ ReentrancyGuard

- [Int] <Constructor> #

+ Context

- [Int] _msgSender
- [Int] _msgData

+ [Lib] Address

- [Int] isContract
- [Int] sendValue #
- [Int] functionCall #
- [Int] functionCall #
- [Int] functionCallWithValue #
- [Int] functionCallWithValue #
- [Int] functionStaticCall
- [Int] functionStaticCall
- [Int] functionDelegateCall #
- [Int] functionDelegateCall #
- [Prv] _verifyCallResult

+ [Lib] SafeMath

- [Int] tryAdd
- [Int] trySub
- [Int] tryMul
- [Int] tryDiv
- [Int] tryMod
- [Int] add
- [Int] sub
- [Int] mul
- [Int] div
- [Int] mod
- [Int] sub
- [Int] div
- [Int] mod

+ Ownable (Context)

- [Int] <Constructor> #
- [Pub] owner
- [Pub] renounceOwnership #
- modifiers: onlyOwner

- [Pub] transferOwnership #
 - modifiers: onlyOwner
- + [Lib] SafeBEP20
 - [Int] safeTransfer #
 - [Int] safeTransferFrom #
 - [Int] safeApprove #
 - [Int] safeIncreaseAllowance #
 - [Int] safeDecreaseAllowance #
 - [Prv] _callOptionalReturn #
- + [Int] IBlacksheepReferral
 - [Ext] recordReferral #
 - [Ext] getReferrer
- + [Int] IBEP20
 - [Ext] totalSupply
 - [Ext] decimals
 - [Ext] symbol
 - [Ext] name
 - [Ext] getOwner
 - [Ext] balanceOf
 - [Ext] transfer #
 - [Ext] allowance
 - [Ext] approve #
 - [Ext] transferFrom #
- + BEP20 (Context, IBEP20, Ownable)
 - [Pub] <Constructor> #
 - [Ext] getOwner
 - [Pub] name
 - [Pub] decimals
 - [Pub] symbol
 - [Pub] totalSupply
 - [Pub] balanceOf
 - [Pub] transfer #
 - [Pub] allowance
 - [Pub] approve #
 - [Pub] transferFrom #
 - [Pub] increaseAllowance #
 - [Pub] decreaseAllowance #
 - [Pub] mint #
 - modifiers: onlyOwner
 - [Int] _transfer #
 - [Int] _mint #
 - [Int] _burn #
 - [Int] _approve #
 - [Int] _burnFrom #
- + BlacksheepToken (BEP20)
 - [Pub] <Constructor> #
 - modifiers: BEP20
 - [Pub] mint #
 - modifiers: onlyOwner
 - [Int] _transfer #

- modifiers: antiWhale,blackList
 - [Prv] swapAndLiquify #
 - modifiers: lockTheSwap,transferTaxFree
 - [Prv] swapTokensForEth #
 - [Prv] addLiquidity #
 - [Pub] maxTransferAmount
 - [Pub] maxHolding
 - [Pub] isExcludedFromAntiWhale
 - [Pub] _isIncludedFromBlackList
 - [Ext] <Fallback> (\$)
 - [Pub] updateTransferTaxRate #
 - modifiers: onlyOperator
 - [Pub] updateBurnRate #
 - modifiers: onlyOperator
 - [Pub] updateMaxTransferAmountRate #
 - modifiers: onlyOperator
 - [Pub] updateMinAmountToLiquify #
 - modifiers: onlyOperator
 - [Pub] setExcludedFromAntiWhale #
 - modifiers: onlyOperator
 - [Pub] setExcludeFromBlackList #
 - modifiers: onlyOperator
 - [Pub] setIncludeToBlackList #
 - modifiers: onlyOperator
 - [Pub] updateSwapAndLiquifyEnabled #
 - modifiers: onlyOperator
 - [Pub] updateBlacksheepSwapRouter #
 - modifiers: onlyOperator
 - [Pub] operator
 - [Pub] transferOperator #
 - modifiers: onlyOperator
 - [Ext] delegates
 - [Ext] delegate #
 - [Ext] delegateBySig #
 - [Ext] getCurrentVotes
 - [Ext] getPriorVotes
 - [Int] _delegate #
 - [Int] _moveDelegates #
 - [Int] _writeCheckpoint #
 - [Int] safe32
 - [Int] getChainId
- + MasterChef (Ownable, ReentrancyGuard)
- [Pub] <Constructor> #
 - [Ext] poolLength
 - [Pub] add #
 - modifiers: onlyOwner
 - [Pub] set #
 - modifiers: onlyOwner
 - [Pub] getMultiplier
 - [Ext] pendingBlacksheep
 - [Pub] massUpdatePools #
 - [Pub] updatePool #
 - [Pub] deposit #
 - modifiers: nonReentrant

- [Pub] withdraw #
 - modifiers: nonReentrant
- [Pub] emergencyWithdraw #
 - modifiers: nonReentrant
- [Int] safeBlacksheepTransfer #
- [Pub] setDevAddress #
- [Pub] setFeeAddress #
- [Pub] updateEmissionRate #
- [Pub] setBlacksheepReferral #
 - modifiers: onlyOwner
- [Pub] setReferralCommissionRate #
 - modifiers: onlyOwner
- [Int] payReferralCommission #

(\$) = payable function

= non-constant function

Issues Checking Status

Issue description		Checking status
1.	Compiler errors.	Passed
2.	Race conditions and Reentrancy. Cross-function race conditions.	Passed
3.	Possible delays in data delivery.	Passed
4.	Oracle calls.	Passed
5.	Front running.	Passed
6.	Timestamp dependence.	Passed
7.	Integer Overflow and Underflow.	Passed
8.	DoS with Revert.	Passed
9.	DoS with block gas limit.	Low issues
10.	Methods execution permissions.	Passed
11.	Economy model of the contract.	Passed
12.	The impact of the exchange rate on the logic.	Passed
13.	Private user data leaks.	Passed
14.	Malicious Event log.	Passed
15.	Scoping and Declarations.	Passed
16.	Uninitialized storage pointers.	Passed
17.	Arithmetic accuracy.	Passed
18.	Design Logic.	Medium issues
19.	Cross-function race conditions.	Passed
20.	Safe Open Zeppelin contracts implementation and usage.	Passed
21.	Fallback function security.	Passed

Security Issues

✓ High Severity Issues

No high severity issues found.

✓ Medium Severity Issues

1. Wrong burning

Issue:

There is sending tokens to the dead address in overridden `_transfer` functions, instead of burning them in token contract.

Recommendation:

There should be a burn instead of sending to the dead address.

✓ Low Severity Issues

1. Block gas limit

Issue:

`add(uint256 _allocPoint, ...)`, `set(uint256 _pid, ...)` and `updateEmissionRate()` could invoke `massUpdatePools()` function, that can fail due to block gas limit if the pool size is too big.

2. `add` function issue

Issue:

If some LP token is added to the contract twice using function `add`, then the total amount of reward in function `updatePool` will be incorrect.

Recommendation:

Add the mapping from address to bool and check that same address will not be added twice.

Owner privileges

- Owner can drain tokens that are sent to the referral contract which is useful for withdrawing tokens sent by mistake to the contract.
- Owner can change the operator of the referral contract.
- Operator can include and exclude from blacklist.
- Operator can change the transfer tax rate.
- Operator can change the burn rate.
- Operator can change the max transfer amount rate.
- Operator can change the min amount to liquify.
- Operator can exclude from antiWhale.
- Operator can change the router and pair contract addresses, which could be not audited contract

Conclusion

Smart contracts contain medium and low severity issues.

TechRate note:

Please check the disclaimer above and note, the audit makes no statements or warranties on business model, investment attractiveness or code sustainability. The report is provided for the only contract mentioned in the report and does not include any other potential contracts deployed by Owner.