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AUDIT COMPANY

Smart Contract Security Audit

TechRate

September, 2021

Audit Details

Audited project

SunSwapFinance

Deployer address

0x495a92c789008094cd7758489b630401069e383c

Client contacts:

SunSwapFinance team

Blockchain

Binance Smart Chain

Project website:

Not provided

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 SunSwapFinance to perform an audit of smart contracts:

- https://bscscan.com/address/0x23Adaa61BEf166D21dc1BE2B46D46026Cf90980E#code
- https://bscscan.com/address/0x443eF8083f1b3C882C10C3A1A21645c2aE720c94#code
- https://bscscan.com/address/0xBa99e6F814ACBE66a6ad353798748aFC662d9534#code
- https://bscscan.com/address/0x3F7D42098acc35A27Fd0eB2D978357749A563F8F#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

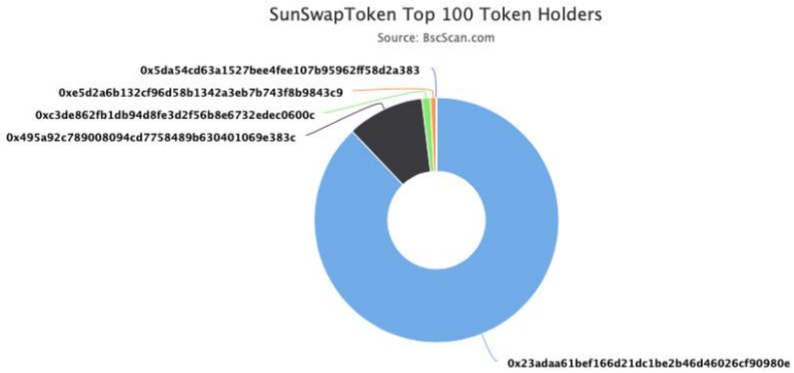
Token contract details for 02.09.2021

Contract name	SunSwapFinance
Contract address	0x443eF8083f1b3C882C10C3A1A21645c2aE720c94
Total supply	24,907.959043
Token ticker	Sun
Decimals	18
Token holders	11
Transactions count	175
Top 100 holders dominance	100.00%
Contract deployer address	0x495a92c789008094cd7758489b630401069e383c
Contract’s current owner address	0x23adaa61bef166d21dc1be2b46d46026cf90980e

SunSwapFinance Token Distribution

The top 100 holders collectively own 100.00% (24,907.96 Tokens) of SunSwapToken

Token Total Supply: 24,907.96 Token | Total Token Holders: 11

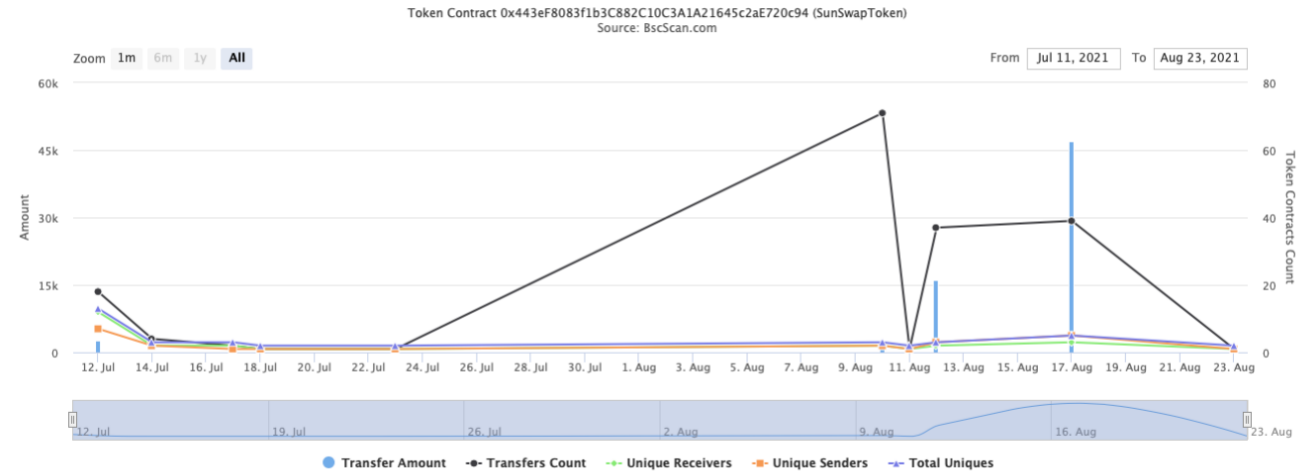


(A total of 24,907.96 tokens held by the top 100 accounts from the total supply of 24,907.96 token)

SunSwapFinance Contract Interaction Details

Time Series: Token Contract Overview

Mon 12, Jul 2021 - Mon 23, Aug 2021



SunSwapFinance Top 10 Token Holders

Rank	Address	Quantity (Token)	Percentage
1	0x23adaa61bef166d21dc1be2b46d46026cf90980e	21,894.226438797405162533	87.9005%
2	0x495a92c789008094cd7758489b630401069e383c	2,534.916321208512680927	10.1771%
3	0xc3de862fb1db94d8fe3d2f56b8e6732edec0600c	281.67499080160311159	1.1309%
4	0xe5d2a6b132cf96d58b1342a3eb7b743f8b9843c9	181.997220319462598773	0.7307%
5	0x5da54cd63a1527bee4fee107b95962ff58d2a383	5.348134755286863435	0.0215%
6	PancakeSwap V2: Sun-BUSD 4	4.076294527992143859	0.0164%
7	0xdf754835c733e90a37685c9d0f922fcc6c83db86	3.045043549136007858	0.0122%
8	0x52d96a78e51405e9ef7e3529d949c7d0599f2575	0.832012504793455502	0.0033%
9	0x2be87ad70cf11ea294d7c42044b5b8277a3e4874	0.831596498541058774	0.0033%
10	0xd696ecb09c394d5be0b1dc43befeef2afb9ca209	0.619340442430758943	0.0025%

MasterChef functions details

+ [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)
  - [Pub] <Constructor> #
  - [Pub] owner
  - [Pub] renounceOwnership #
    - modifiers: onlyOwner
  - [Pub] transferOwnership #
    - modifiers: onlyOwner
  - [Prv] _setOwner #

+ 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

+ [Int] IBEP20
  - [Ext] totalSupply
  - [Ext] decimals
  - [Ext] symbol
  - [Ext] name
  - [Ext] getOwner
  - [Ext] balanceOf
  - [Ext] transfer #
  - [Ext] allowance
  - [Ext] approve #
  - [Ext] transferFrom #

+ SunSwapToken (BEP20)
  - [Pub] mint #
    - modifiers: onlyOwner
  - [Ext] delegates
  - [Ext] delegate #
  - [Ext] delegateBySig #
  - [Ext] getCurrentVotes
  - [Ext] getPriorVotes
  - [Int] _delegate #
  - [Int] _moveDelegates #
  - [Int] _writeCheckpoint #
  - [Int] safe32
  - [Int] getChainId

+ [Lib] SafeBEP20
  - [Int] safeTransfer #
  - [Int] safeTransferFrom #
  - [Int] safeApprove #
  - [Int] safeIncreaseAllowance #
  - [Int] safeDecreaseAllowance #
  - [Prv] _callOptionalReturn #

+ BEP20 (Context, IBEP20, Ownable)
  - [Pub] <Constructor> #
  - [Ext] getOwner
  - [Pub] name
  - [Pub] symbol
  - [Pub] decimals
  - [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 #

+ MasterChef (Ownable)
  - [Pub] <Constructor> #
  - [Ext] poolLength
  - [Pub] setStartBlock #
    - modifiers: onlyOwner
  - [Pub] add #
    - modifiers: onlyOwner
  - [Pub] set #
    - modifiers: onlyOwner
  - [Pub] getMultiplier

- [Ext] pendingSun
- [Pub] massUpdatePools #
- [Pub] updatePool #
- [Pub] deposit #
- [Pub] withdraw #
- [Pub] emergencyWithdraw #
- [Int] safeSunTransfer #
- [Pub] dev #
- [Pub] setFeeAddress #
- [Pub] updateEmissionRate #
  - modifiers: onlyOwner

($) = payable function
= non-constant function

SunFactory functions details

+ [Lib] UQ112x112
  - [Int] encode
  - [Int] uqdiv

+ [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

+ [Lib] Math
  - [Int] min
  - [Int] sqrt

+ [Int] ISunFactory
  - [Ext] INIT_CODE_PAIR_HASH
  - [Ext] feeTo
  - [Ext] feeToSetter
  - [Ext] getPair
  - [Ext] allPairs
  - [Ext] allPairsLength
  - [Ext] createPair #
  - [Ext] setFeeTo #
  - [Ext] setFeeToSetter #

+ [Int] ISunCallee
  - [Ext] sunCall #

+ [Int] IERC20
  - [Ext] name
  - [Ext] symbol
  - [Ext] decimals
  - [Ext] totalSupply
  - [Ext] balanceOf
  - [Ext] allowance
  - [Ext] approve #
  - [Ext] transfer #
  - [Ext] transferFrom #

+ SunPair (SunERC20)
  - [Pub] getReserves
  - [Prv] _safeTransfer #
  - [Pub] <Constructor> #
  - [Ext] initialize #
  - [Prv] _update #
  - [Prv] _mintFee #
  - [Ext] mint #
    - modifiers: lock
  - [Ext] burn #
    - modifiers: lock
  - [Ext] swap #
    - modifiers: lock
  - [Ext] skim #
    - modifiers: lock
  - [Ext] sync #
    - modifiers: lock

+ SunERC20
  - [Pub] <Constructor> #
  - [Int] _mint #
  - [Int] _burn #
  - [Prv] _approve #
  - [Prv] _transfer #
  - [Ext] approve #
  - [Ext] transfer #
  - [Ext] transferFrom #
  - [Ext] permit #

+ SunFactory
  - [Pub] <Constructor> #
  - [Ext] allPairsLength
  - [Ext] createPair #
  - [Ext] setFeeTo #
  - [Ext] setFeeToSetter #

($) = payable function
= non-constant function

SunRouter functions details

+ [Lib] TransferHelper
  - [Int] safeApprove #
  - [Int] safeTransfer #
  - [Int] safeTransferFrom #
  - [Int] safeTransferETH #

+ [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)
  - [Pub] <Constructor> #
  - [Pub] owner
  - [Pub] renounceOwnership #
    - modifiers: onlyOwner
  - [Pub] transferOwnership #
    - modifiers: onlyOwner
  - [Prv] _setOwner #

+ Context
  - [Int] _msgSender
  - [Int] _msgData

+ [Int] IWETH
  - [Ext] deposit ($)
  - [Ext] transfer #
  - [Ext] withdraw #

+ [Int] ISunRouter02 (ISunRouter01)
  - [Ext] removeLiquidityETHSupportingFeeOnTransferTokens #
  - [Ext] removeLiquidityETHWithPermitSupportingFeeOnTransferTokens #
  - [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #
  - [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens ($)
  - [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #

+ [Int] ISunRouter01
  - [Ext] factory
  - [Ext] WETH
  - [Ext] addLiquidity #
  - [Ext] addLiquidityETH ($)
  - [Ext] removeLiquidity #

- [Ext] removeLiquidityETH #
- [Ext] removeLiquidityWithPermit #
- [Ext] removeLiquidityETHWithPermit #
- [Ext] swapExactTokensForTokens #
- [Ext] swapTokensForExactTokens #
- [Ext] swapExactETHForTokens ($)
- [Ext] swapTokensForExactETH #
- [Ext] swapExactTokensForETH #
- [Ext] swapETHForExactTokens ($)

+ [Int] ISunPair
  - [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] ISunFactory
  - [Ext] INIT_CODE_PAIR_HASH
  - [Ext] feeTo
  - [Ext] feeToSetter
  - [Ext] getPair
  - [Ext] allPairs
  - [Ext] allPairsLength
  - [Ext] createPair #
  - [Ext] setFeeTo #
  - [Ext] setFeeToSetter #

+ [Int] IERC20
  - [Ext] name
  - [Ext] symbol
  - [Ext] decimals
  - [Ext] totalSupply

- [Ext] balanceOf
- [Ext] allowance
- [Ext] approve #
- [Ext] transfer #
- [Ext] transferFrom #

+ SunRouter (ISunRouter02, Ownable)
- [Pub] <Constructor> #
- [Ext] <Fallback> ($)
- [Int] sortTokens
- [Int] pairFor
- [Int] getReserves
- [Int] quote
- [Int] getAmountOut
- [Int] getAmountIn
- [Int] getAmountsOut
- [Int] getAmountsIn
- [Int] _addLiquidity #
- [Ext] addLiquidity #
  - modifiers: ensure
- [Ext] addLiquidityETH ($)
  - modifiers: ensure
- [Pub] removeLiquidity #
  - modifiers: ensure
- [Pub] removeLiquidityETH #
  - modifiers: ensure
- [Ext] removeLiquidityWithPermit #
- [Ext] removeLiquidityETHWithPermit #
- [Pub] removeLiquidityETHSupportingFeeOnTransferTokens #
  - modifiers: ensure
- [Ext] removeLiquidityETHWithPermitSupportingFeeOnTransferTokens #
- [Int] _swap #
- [Ext] swapExactTokensForTokens #
  - modifiers: ensure
- [Ext] swapTokensForExactTokens #
  - modifiers: ensure
- [Ext] swapExactETHForTokens ($)
  - modifiers: ensure
- [Ext] swapTokensForExactETH #
  - modifiers: ensure
- [Ext] swapExactTokensForETH #
  - modifiers: ensure
- [Ext] swapETHForExactTokens ($)
  - modifiers: ensure
- [Int] _swapSupportingFeeOnTransferTokens #
- [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #
  - modifiers: ensure
- [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens ($)
  - modifiers: ensure
- [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #
  - modifiers: ensure

($) = payable function
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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.	Low 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

No high severity issues found.

Low Severity Issues

1. Block gas limit (MasterChef)

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 (MasterChef)

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 change start block.
- Owner can change sunPerBlock.

Conclusion

Smart contracts contain low severity issues.
10% of rewards also adds to devAddress. The further transfers and operations with the funds raise are not related to this particular contracts.

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.