



**TechRate**  
AUDIT COMPANY

# Smart Contract Security Audit

# Audit Details



Audited project

**SaitamaX**



Deployer address

**0xff3b571f74005101c3773d9fa0c47f3c820d1a4c**



Client contacts:

**SaitamaX team**



Blockchain

**Ethereum**



Project website:

**<https://saitamax.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 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 SaitamaX to perform an audit of smart contracts:

<https://etherscan.io/address/0xc795fba221f7920f1c6ac0f1598886742d8ea661#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 28.10.2021

Contract name	SaitamaX
Contract address	0xC795fBa221f7920F1C6ac0f1598886742D8Ea661
Total supply	100,000,000,000,000
Token ticker	SaitaX
Decimals	9
Token holders	1,074
Transactions count	2,561
Top 100 holders dominance	77.12%
Marketing fee	11
Tax fee	1
Total fees	4396425131192039368250
Uniswap V2 pair	0x037a4245bf5f656571e7f54fa95ab4a9d30e9b73
Contract deployer address	0xff3b571f74005101c3773d9fa0c47f3c820d1a4c
Contract's current owner address	0x00

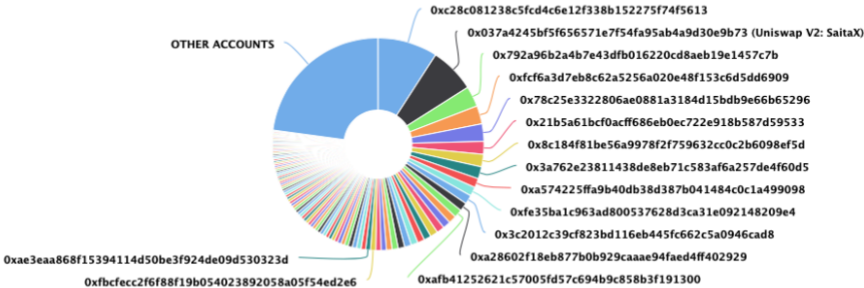
# SaitamaX Token Distribution

The top 100 holders collectively own 77.12% (77,123,340,543.032.20 Tokens) of SaitamaX

Token Total Supply: 100,000,000,000.00 Token | Total Token Holders: 1,074

SaitamaX Top 100 Token Holders

Source: Etherscan.io



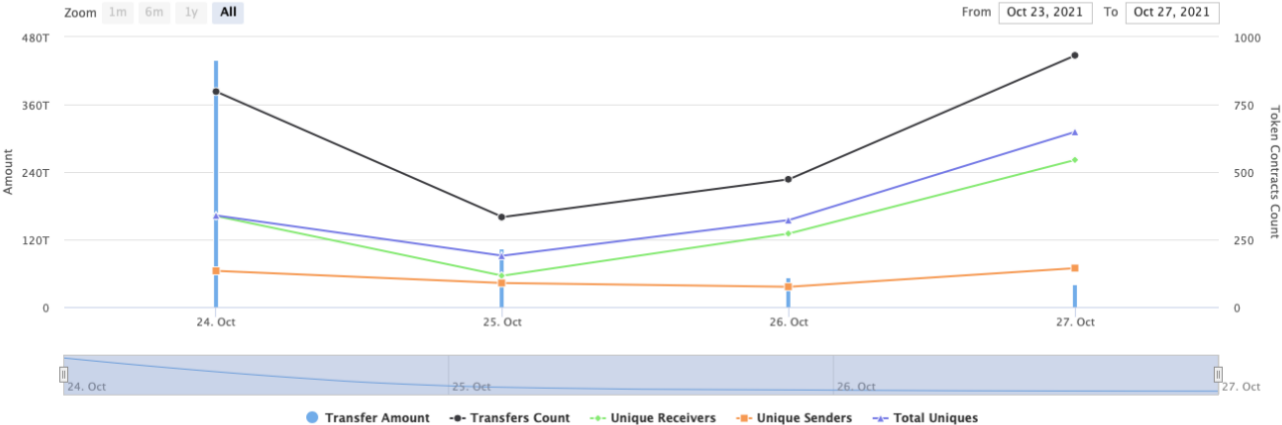
(A total of 77,123,340,543.032.20 tokens held by the top 100 accounts from the total supply of 100,000,000,000.00 token)

# SaitamaX Contract Interaction Details

Time Series: Token Contract Overview


Sun 24, Oct 2021 - Wed 27, Oct 2021

Token Contract 0xc795fba221f7920f1c6ac0f1598886742d8ea661 (SaitamaX)  
Source: Etherscan.io





# SaitamaX Top 10 Token Holders

Rank	Address	Quantity (Token)	Percentage
1	<a href="#">0xc28c081238c5fcd4c6e12f338b152275f74f5613</a>	9,146,863,101,598.125909978	9.1469%
2	 Uniswap V2: SaitaX	6,890,153,415,263.458323685	6.8902%
3	<a href="#">0x792a96b2a4b7e43dfb016220cd8aeb19e1457c7b</a>	3,124,959,189,741.712819379	3.1250%
4	<a href="#">0xfcf6a3d7eb8c62a5256a020e48f153c6d5dd6909</a>	2,768,527,449,395.126969772	2.7685%
5	<a href="#">0x78c25e3322806ae0881a3184d15bdb9e66b65296</a>	2,652,310,632,134.45422594	2.6523%
6	<a href="#">0x21b5a61bcf0acff686eb0ec722e918b587d59533</a>	1,959,391,927,517.592294793	1.9594%
7	<a href="#">0x8c184f81be56a9978f2f759632cc0c2b6098ef5d</a>	1,889,153,308,883.620024881	1.8892%
8	<a href="#">0x3a762e23811438de8eb71c583af6a257de4f60d5</a>	1,859,192,004,901.488848951	1.8592%
9	<a href="#">0xa574225ffa9b40db38d387b041484c0c1a499098</a>	1,389,738,132,133.25901922	1.3897%
10	<a href="#">0xfe35ba1c963ad800537628d3ca31e092148209e4</a>	1,389,654,097,085.508990064	1.3897%



# Contract functions details

- + [Int] IERC20
  - [Ext] totalSupply
  - [Ext] balanceOf
  - [Ext] transfer #
  - [Ext] allowance
  - [Ext] approve #
  - [Ext] transferFrom #
- + [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
- + 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
- + Ownable (Context)
  - [Pub] <Constructor> #
  - [Pub] owner
  - [Pub] renounceOwnership #
    - modifiers: onlyOwner
  - [Pub] transferOwnership #
    - modifier: onlyOwner
- + [Int] IUniswapV2Factory
  - [Ext] feeTo
  - [Ext] feeToSetter



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

- + [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] 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] IUniswapV2Router02 (IUniswapV2Router01)
  - [Ext] removeLiquidityETHSupportingFeeOnTransferTokens #
  - [Ext] removeLiquidityETHWithPermitSupportingFeeOnTransferTokens #
  - [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #
  - [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens (\$)
  - [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #
- + SaitamaX (Context, IERC20, Ownable)
  - [Pub] <Constructor> #
  - [Pub] name
  - [Pub] symbol
  - [Pub] decimals
  - [Pub] totalSupply
  - [Pub] balanceOf
  - [Pub] transfer #
  - [Pub] allowance
  - [Pub] approve #
  - [Pub] transferFrom #
  - [Pub] increaseAllowance #
  - [Pub] decreaseAllowance #
  - [Pub] isExcludedFromReward
  - [Pub] totalFees
  - [Pub] reflectionFromToken
  - [Pub] tokenFromReflection
  - [Pub] excludeFromReward #
    - modifiers: onlyOwner
  - [Ext] includeInReward #
    - modifiers: onlyOwner
  - [Pub] excludeFromFee #
    - modifiers: onlyOwner
  - [Pub] includeInFee #
    - modifiers: onlyOwner
  - [Prv] removeAllFee #
  - [Prv] restoreAllFee #
  - [Ext] <Fallback> (\$)
  - [Prv] \_reflectFee #
  - [Ext] addToBlackList #
    - modifiers: onlyOwner
  - [Ext] removeFromBlackList #
    - modifiers: onlyOwner
  - [Prv] \_getValues
  - [Prv] \_getTValues
  - [Prv] \_getRValues
  - [Prv] \_getRate
  - [Prv] \_getCurrentSupply
  - [Prv] \_takeMarketing #
  - [Prv] calculateTaxFee
  - [Prv] calculateMarketingFee
  - [Pub] isExcludedFromFee
  - [Prv] \_approve #
  - [Prv] \_transfer #
  - [Prv] setFees #
  - [Prv] SwapAndSend #

- modifiers: lockTheSwap
- [Prv] \_tokenTransfer #
- [Prv] \_transferStandard #
- [Prv] \_transferToExcluded #
- [Prv] \_transferFromExcluded #
- [Prv] \_transferBothExcluded #
- [Ext] setDefaultMarketingFee #
  - modifiers: onlyOwner
- [Ext] setMarketingFee4Sellers #
  - modifiers: onlyOwner
- [Pub] setFeesOnSellersAndBuyers #
  - modifiers: onlyOwner
- [Pub] setSwapAndSendEnabled #
  - modifiers: onlyOwner
- [Pub] setnumTokensToExchangeForMarketing #
  - modifiers: onlyOwner
- [Ext] \_setMarketingWallet #
  - modifiers: onlyOwner
- [Ext] \_setMaxTxAmount #
  - modifiers: onlyOwner

(\$) = 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.	Passed
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 medium severity issues found.

## ✓ Low Severity Issues

### 1. Out of gas

Issue:

- The function `includeInReward()` uses the loop to find and remove addresses from the `_excluded` list. Function will be aborted with `OUT_OF_GAS` exception if there will be a long excluded addresses list.

```
function includeInReward(address account) external onlyOwner() {
    require(!_excluded[account], "Account is already excluded");
    for (uint256 i = 0; i < _excluded.length; i++) {
        if (_excluded[i] == account) {
            _excluded[i] = _excluded[_excluded.length - 1];
            _tOwned[account] = 0;
            _isExcluded[account] = false;
            _excluded.pop();
            break;
        }
    }
}
```

- The function `_getCurrentSupply` also uses the loop for evaluating total supply. It also could be aborted with `OUT_OF_GAS` exception if there will be a long excluded addresses list.

```
function _getCurrentSupply() private view returns (uint256, uint256) {
    uint256 rSupply = _rTotal;
    uint256 tSupply = _tTotal;
    for (uint256 i = 0; i < _excluded.length; i++) {
        if (
            _rOwned[_excluded[i]] > rSupply ||
            _tOwned[_excluded[i]] > tSupply
        ) return (_rTotal, _tTotal);
        rSupply = rSupply.sub(_rOwned[_excluded[i]]);
        tSupply = tSupply.sub(_tOwned[_excluded[i]]);
    }
    if (rSupply < _rTotal.div(_tTotal)) return (_rTotal, _tTotal);
    return (rSupply, tSupply);
}
```

Recommendation:

Check that the excluded array length is not too big.

- The function `addToBlackList()` uses the loop to add addresses from function argument to blacklist. It also could be aborted with `OUT_OF_GAS` exception if there will be a long addresses list.

```
function addToBlackList(address[] calldata addresses↑) external onlyOwner {  
    for (uint256 i; i < addresses↑.length; ++i) {  
        _isBlacklisted[addresses↑[i]] = true;  
    }  
}
```

**Recommendation:**

Check that the array length is not too big.

## Owner privileges (In the period when the owner is not renounced)

- Owner can change fees.

```
function setDefaultMarketingFee(uint256 marketingFee↑) external onlyOwner() {
    defaultMarketingFee = marketingFee↑;
}

ftrace | funcSig
function setMarketingFee4Sellers(uint256 marketingFee4Sellers↑) external onlyOwner() {
    _marketingFee4Sellers = marketingFee4Sellers↑;
}

ftrace | funcSig
function setFeesOnSellersAndBuyers(bool _enabled↑) public onlyOwner() {
    feesOnSellersAndBuyers = _enabled↑;
}
```

- Owner can change the maximum transaction amount.

```
function _setMaxTxAmount(uint256 maxTxAmount↑) external onlyOwner() {
    _maxTxAmount = maxTxAmount↑;
}
```

- Owner can remove addresses from blacklist.

```
function removeFromBlackList(address account↑) external onlyOwner {
    _isBlacklisted[account↑] = false;
}
```

- Owner can exclude from the fee.

```
function excludeFromFee(address account↑) public onlyOwner {
    _isExcludedFromFee[account↑] = true;
}
```

- Owner can change number of tokens to exchange for marketing.

```
function setnumTokensToExchangeForMarketing(uint256 _numTokensToExchangeForMarketing↑) public onlyOwner() {
    numTokensToExchangeForMarketing = _numTokensToExchangeForMarketing↑;
}
```

- Owner can change marketing wallet.

```
function _setMarketingWallet(address payable wallet↑) external onlyOwner() {
    marketingWallet = wallet↑;
}
```



# Conclusion

Smart contracts contain low severity issues! Liquidity pair contract's security is not checked due to out of scope. Fee increases on sell.

Liquidity locking details provided by the team:

<https://app.unicrypt.network/amm/uni-v2/token/0xC795fBa221f7920F1C6ac0f1598886742D8Ea661>

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## *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.*