Smart Contract Security Audit

Audit details:

Audited project:	TIER-1 EXCHANGE
Deployer address:	0xf103d2aba493749a402b7de11cf31f5844062b74
Client contacts:	TIER-1 EXCHANGE team
Blockchain:	Binance Smart Chain
Project website:	Not provided

May, 2021
TechRate

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 TIER-1 EXCHANGE to perform an audit of smart contracts:

- *https://bscscan.com/address/0x794531f7fc2788bcd7c96485e12781add2b12072#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

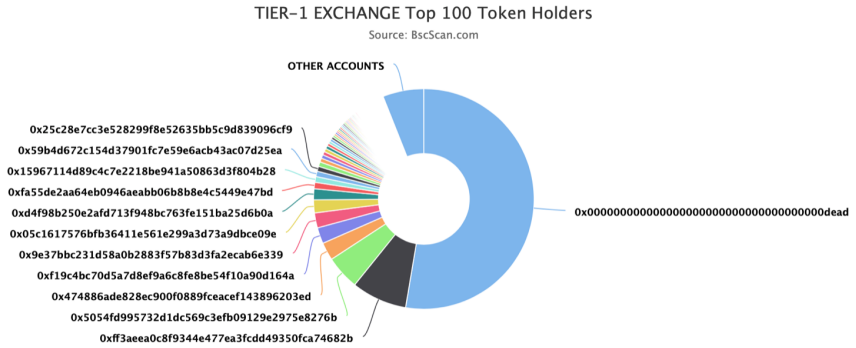
Token contract details for 11.05.2021.

Contract name:	TIER-1 EXCHANGE
Contract address:	0x794531f7fc2788bcd7c96485e12781add2b12072
Total supply:	100000000000000000000000000
Token ticker:	T-1E
Decimals:	9
Token holders:	671
Transactions count:	1677
Top 100 holders dominance:	93.97 %
Liquidity fee:	3
Tax fee:	5
Total fees:	6365020674821017792738 8
Uniswap V2 pair:	0xff3aeea0c8f9344e477ea3fcdd49350fca74682b
Contract deployer address:	0xf103d2aba493749a402b7de11cf31f5844062b74
Contract’s current owner address:	0x46dc82a8724fe105b22fe24f9829282c57611ce8

TIER-1 EXCHANGE token distribution

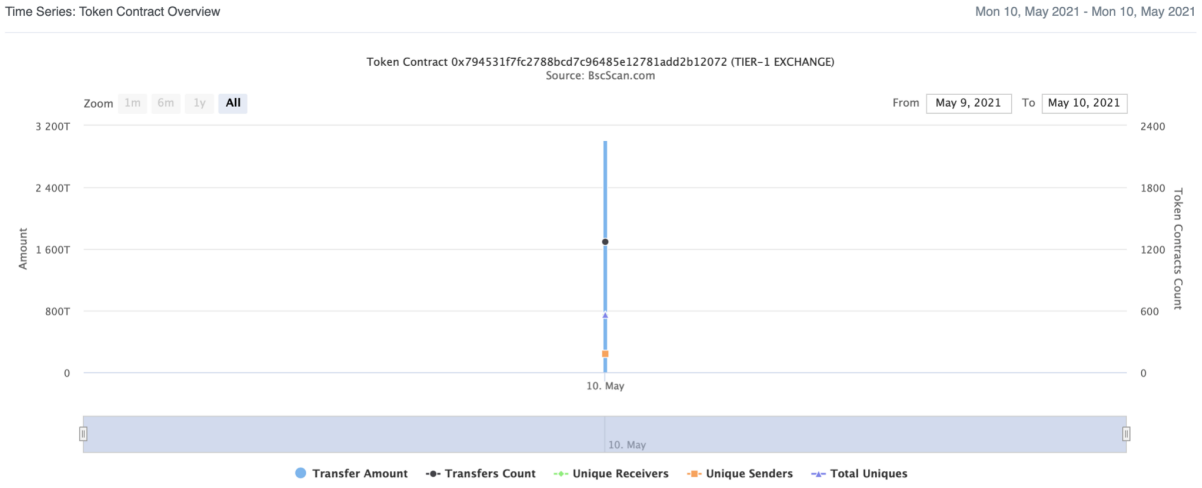
The top 100 holders collectively own 93.97% (939,701,958,811,870.00 Tokens) of TIER-1 EXCHANGE

Token Total Supply: 1,000,000,000,000,000.00 Token | Total Token Holders: 671



(A total of 939,701,958,811,870.00 tokens held by the top 100 accounts from the total supply of 1,000,000,000,000,000.00 token)

TIER-1 EXCHANGE contract interaction details



TIER-1 EXCHANGE top 10 token holders

Rank	Address	Quantity (Token)	Percentage
1	0x000000000000000000000000000000000000dead	526,575,948,723,770.951560235	52.6576%
2	0xff3aeea0c8f9344e477ea3fcdd49350fca74682b	81,292,982,839,224.258264447	8.1293%
3	0x5054fd995732d1dc569c3efb09129e2975e8276b	50,000,000,000,000	5.0000%
4	0x474886ade828ec900f0889fceacef143896203ed	26,329,362,748,505.437888413	2.6329%
5	0xf19c4bc70d5a7d8ef9a6c8fe8be54f10a90d164a	23,456,034,926,835.989774548	2.3456%
6	0x9e37bbc231d58a0b2883f57b83d3fa2ecab6e339	22,079,166,710,895.628359482	2.2079%
7	0x05c1617576bfb36411e561e299a3d73a9dbce09e	19,025,904,827,880.879705952	1.9026%
8	0xd4f98b250e2afd713f948bc763fe151ba25d6b0a	16,113,636,522,344.391996716	1.6114%
9	0xfa55de2aa64eb0946aeabb06b8b8e4c5449e47bd	9,330,596,893,126.282553846	0.9331%
10	0x15967114d89c4c7e2218be941a50863d3f804b28	8,413,935,777,900.202033202	0.8414%

TIER-1 EXCHANGE LP token holders

Rank	Address	Quantity	Percentage
1	0xeb3a9c56d963b971d320f889be2fb8b59853e449	2,073.885242726800444468	83.6806%
2	0x46dc82a8724fe105b22fe24f9829282c57611ce8	374.413415272070711922	15.1075%
3	0x07d80ae6f36a5e08dca74ce884a24d39db9934ed	23.174719055228324205	0.9351%
4	0x05c1617576bfb36411e561e299a3d73a9dbce09e	15.419453512886873273	0.6222%
5	0x0000000000000000000000000000000000000000	0.000000000000001	0.0000%

Contract functions details

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

+ [Lib] SafeMath
  - [Int] add
  - [Int] sub
  - [Int] sub
  - [Int] mul
  - [Int] div
  - [Int] div
  - [Int] mod
  - [Int] mod

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

+ [Lib] Address
  - [Int] isContract
  - [Int] sendValue #
  - [Int] functionCall #
  - [Int] functionCall #
  - [Int] functionCallWithValue #
  - [Int] functionCallWithValue #
  - [Prv] _functionCallWithValue #

+ Ownable (Context)
  - [Pub] owner
  - [Pub] renounceOwnership #
    - modifiers: onlyOwner
  - [Pub] transferOwnership #
    - modifiers: onlyOwner
  - [Pub] geUnlockTime
  - [Pub] lock #
    - modifiers: onlyOwner
  - [Pub] unlock #

+ [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 #

+ CoinToken (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] deliver #
  - [Pub] reflectionFromToken
  - [Pub] tokenFromReflection
  - [Pub] excludeFromReward #
    - modifiers: onlyOwner
  - [Ext] includeInReward #
    - modifiers: onlyOwner
  - [Prv] _transferBothExcluded #
  - [Pub] excludeFromFee #
    - modifiers: onlyOwner
  - [Pub] includeInFee #
    - modifiers: onlyOwner
  - [Ext] setTaxFeePercent #
    - modifiers: onlyOwner

- [Ext] setLiquidityFeePercent #
  - modifiers: onlyOwner
- [Pub] setNumTokensSellToAddToLiquidity #
  - modifiers: onlyOwner
- [Pub] setMaxTxPercent #
  - modifiers: onlyOwner
- [Pub] setSwapAndLiquifyEnabled #
  - modifiers: onlyOwner
- [Ext] <Fallback> ($)
- [Prv] _reflectFee #
- [Prv] _getValues
- [Prv] _getTValues
- [Prv] _getRValues
- [Prv] _getRate
- [Prv] _getCurrentSupply
- [Prv] _takeLiquidity #
- [Pub] claimTokens #
  - modifiers: onlyOwner
- [Prv] calculateTaxFee
- [Prv] calculateLiquidityFee
- [Prv] removeAllFee #
- [Prv] restoreAllFee #
- [Pub] isExcludedFromFee
- [Prv] _approve #
- [Prv] _transfer #
- [Prv] swapAndLiquify #
  - modifiers: lockTheSwap
- [Prv] swapTokensForEth #
- [Prv] addLiquidity #
- [Prv] _tokenTransfer #
- [Prv] _transferStandard #
- [Prv] _transferToExcluded #
- [Prv] _transferFromExcluded #

($) = 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 `includeAccount` 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 includeAccount(address account⬆) external onlyOwner() {
    require(_isExcluded[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:

Use EnumerableSet instead of array or do not use long arrays.

Owner privileges

- ❏ Owner can change the tax and liquidity fee.
- ❏ Owner can change the maximum transaction amount.
- ❏ Owner can exclude from the fee.
- ❏ Owner can claim the BNBs from the contract.

Conclusion

Smart contracts do not contain high severity issues! Liquidity pair contract's security is not checked due to out of scope.

Liquidity burning transaction provided by the team -
https://dxsale.app/app/pages/dxlockview?id=0&add=0x46dc82a8724FE105b22Fe24f9829282C57611cE8&type=lplock&chain=BSC&fbclid=IwAR1UtL0eYtRYIG3BqIrRE65fXCavFx40g9J96i232aXP2VGy91IdQLt26Ec

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