Smart Contract Security Audit

Audit details:

Audited project:	Sheep
Deployer address	0xe641310e834a250086bd741b380fd7a60bae03c4
Blockchain:	Binance Smart Chain
Project website:	https://sheeptoken.cash

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 Sheep to perform an audit of smart contracts:

- *https://bscscan.com/address/0x0025b42bfc22cbba6c02d23d4ec2abfcf6e014d4#code*
- *https://bscscan.com/address/0x912DCfBf1105504fB4FF8ce351BEb4d929cE9c24#code*
- *https://bscscan.com/address/0x44c7A6cED1EF63410fB2baC1AaBCA4e616D0Cd8F#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 02.05.2021.

Contract name:	Sheep
Contract address:	0x0025b42bfc22cbba6c02d23d4ec2abfcf6e014d4
Total supply:	84_617_674_627_624_712_556
Token ticker:	SHEEP
Decimals:	9
Token holders:	2384
Transactions count:	20323
Top 100 holders dominance:	98.95 %
Charity fee rate:	300
Burn fee rate:	300
Tax fee rate:	0
Total burn:	15_382_325_372_375_287_444
Total charity:	15_382_325_372_375_287_444
Contract deployer address:	0xe641310e834a250086bd741b380fd7a60bae03c4
Contract’s current owner address:	0x0000000000000000000000000000000000000000

Sheep top 100 token distribution

The top 100 holders collectively own 98.95% (83,732,879,740.46 Tokens) of Sheep Token

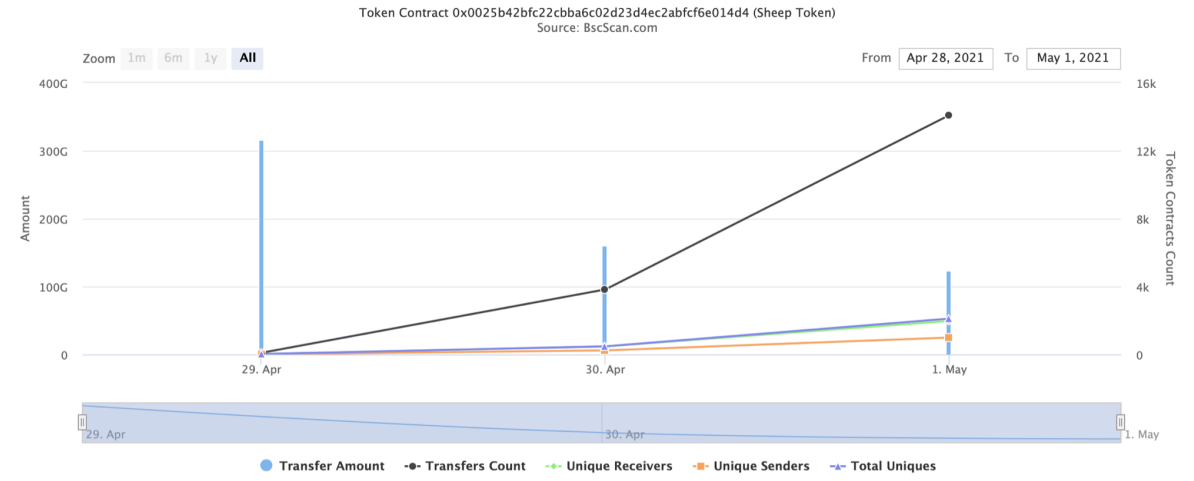
Token Total Supply: 84,622,179,662.03 Token | Total Token Holders: 2,384

(A total of 83,732,879,740.46 tokens held by the top 100 accounts from the total supply of 84,622,179,662.03 token)

Sheep contract interaction details

Time Series: Token Contract Overview

Thu 29, Apr 2021 - Sat 1, May 2021



Sheep top 10 token holders

Rank	Address	Quantity (Token)	Percentage
1	0x0000000000000000000000000000000000000000	16,876,406,522.673821699	19.9432%
2	0x912dcfbf1105504fb4ff8ce351beb4d929ce9c24	6,223,683,523.718428611	7.3547%
3	0xd173e5c5f129a8b0b23a522201f0593602a5455f	3,221,827,761.072426961	3.8073%
4	0xe641310e834a250086bd741b380fd7a60bae03c4	3,036,099,956.226519584	3.5878%
5	0x0e7244d99a7e69b1392f10f210682c0729476bb2	2,822,542,576.637948306	3.3355%
6	0x1d7a23bac5860195d8413c4e41c99dd4ea07e344	2,583,607,308.661308934	3.0531%
7	0xffb7b5ead692b63847927d7692b4ab56a2036b02	2,573,182,833.770908766	3.0408%
8	0xf5826e10f89cc13eb4c40c897194eb7a70c72088	2,225,400,305.408416208	2.6298%
9	0x79b0b4cf5dc72828e9f1945b0c6901db24d1d1c2	2,157,407,432.941505987	2.5495%
10	0xfd7ea9cccc1f0c06fa6d46a420b137516b1c2117	2,021,896,574.657162695	2.3893%

LP contract details for 02.05.2021.

Contract name:	PancakePair
Compiler version:	v0.5.16+commit.9c3226ce
Contract address:	0x912DCfBf1105504fB4FF8ce351BEb4d929cE9c24
Factory:	0xca143ce32fe78f1f7019d7d551a6402fc5350c73
Symbol:	Cake-LP
Token0:	0x0025b42bfc22cbba6c02d23d4ec2abfcf6e014d4
Token1:	0xbb4cdb9cbd36b01bd1cbaebf2de08d9173bc095c
Total supply:	30_734_336_186_090_161_452
Minimum liquidity:	1000

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.

Conclusion

Smart contracts contain low severity issues.

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