



Smart Contract Security Audit Report

GemSpree

December 2022

Security Status



www.hacksafe.io



Audit Details



Audited project

GemSpree



Deployer address

0xf41a6011d5187bc27fd6ac89ae5e8bf272497b45



Client contacts

GemSpree Team



Blockchain

Binance smart chain



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.

Procedure

Step 1 - In-Depth Manual Review

Manual line-by-line code reviews to ensure the logic behind each function is sound and safe from various attack vectors. This is the most important and lengthy portion of the audit process (as automated tools often cannot find the nuances that lead to exploits such as flash loan attacks).

Step 2 - Automated Testing

Simulation of a variety of interactions with your Smart Contract on a test blockchain leveraging a combination of automated test tools and manual testing to determine if any security vulnerabilities exist.

Step 3 – Leadership Review

The engineers assigned to the audit will schedule meetings with our leadership team to review the contracts, any comments or findings, and ask questions to further apply adversarial thinking to discuss less common attack vectors.

Step 4 - Resolution of Issues

Consulting with the team to provide our recommendations to ensure the code's security and optimize its gas efficiency, if possible. We assist project team's in resolving any outstanding issues or implementing our recommendations.

Step 5 - Published Audit Report

Boiling down results and findings into an easy-to-read report tailored to the project. Our audit reports highlight resolved issues and any risks that exist to the project or its users, along with any remaining suggested remediation measures. Diagrams are included at the end of each report to help users understand the interactions which occur within the project.

Background

HackSafe was commissioned by to GemSpree perform an audit of smart contracts:

- <https://bscscan.com/token/0x48A64f116Ce221fD7c1119775ba7892701F9911d#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 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.

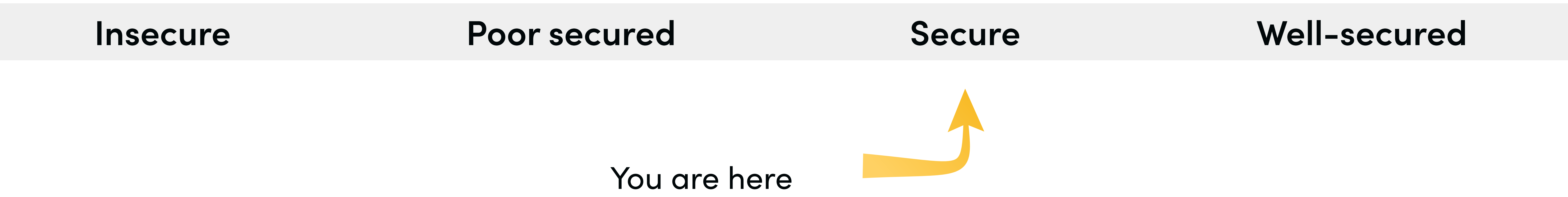
Contract Details

Token contract details for 03.12.2022

Token Type	: DEFI
Contract name	: GemSpree
Contract address	: 0x48A64f116Ce221fD7c1119775ba7892701F9911d
Total supply	: 1,000,000,000,000,000
Token ticker	: GEMS
Decimals	: 9
Token Holders	: 5,981
Transactions count	: 48,565
Compiler version	: v0.6.12+commit.27d51765
Contract deployer address	: 0xf41a6011d5187bc27fd6ac89ae5e8bf272497b45
Owner address	: 0xf41a6011d5187bc27fd6ac89ae5e8bf272497b45

Audit Summary

According to the standard audit assessment, Customer`s solidity smart contracts are **“Secure”**. This token contract does contain owner control, which do not make it fully decentralized as owner does have control over smart contract.



We used various tools like Slither, Mythril and Remix IDE. At the same time this finding is based on critical analysis of the manual audit. All issues found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the issues checking status.

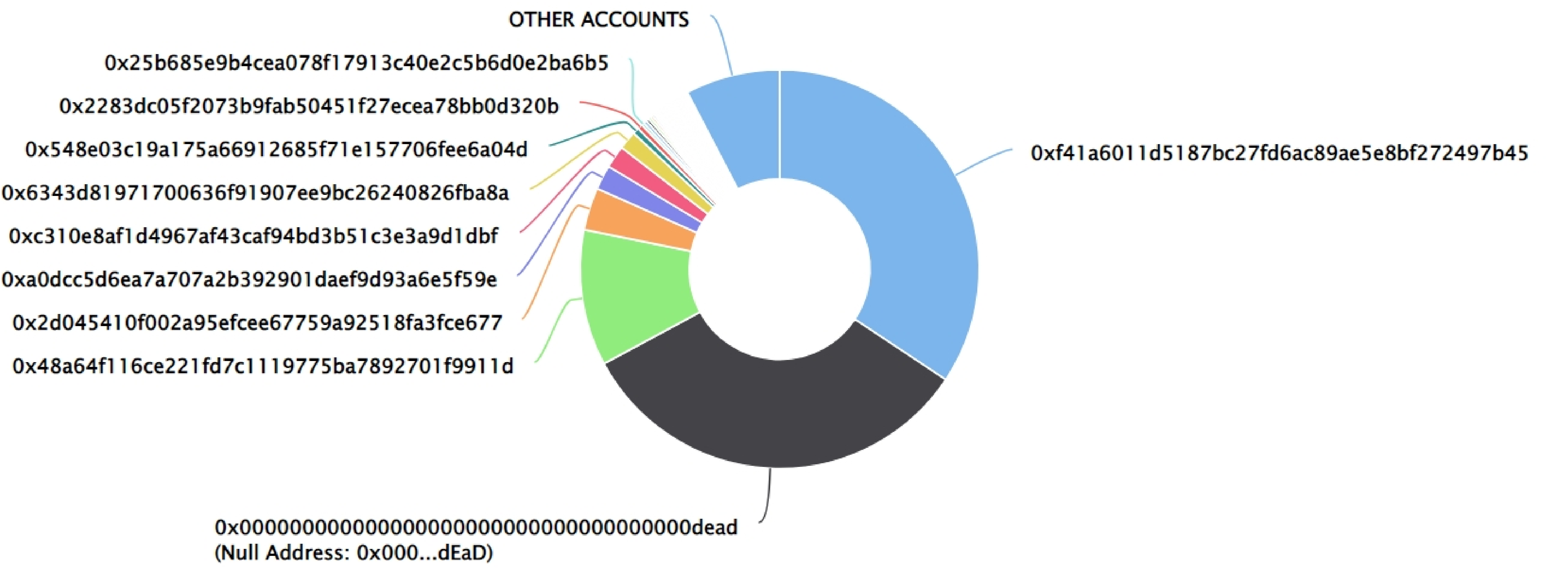
We found 0 critical, 0 high, 1 medium and 2 low.

GemSpree Distribution

💡 The top 100 holders collectively own 92.36% (923,565,960,873,381.00 Tokens) of GemSpree

💡 Token Total Supply: 1,000,000,000,000,000.00 Token | Total Token Holders: 5,981

GemSpree Top 100 Token Holders
Source: BscScan.com



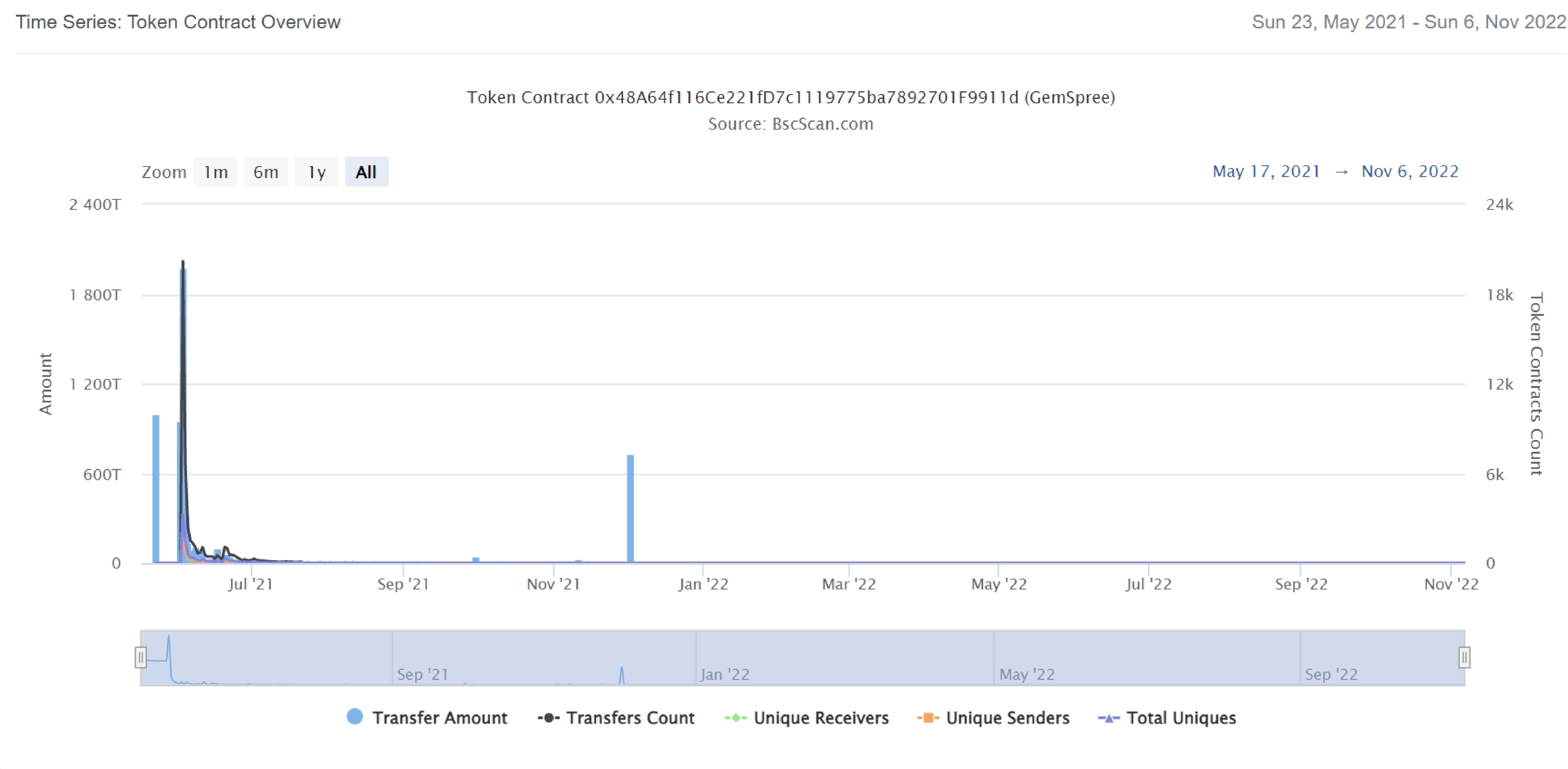
GemSpree Top 20 Token Holders

(A total of 923,565,960,873,381.00 tokens held by the top 100 accounts from the total supply of 1,000,000,000,000,000.00 token)

Rank	Address	Quantity (Token)	Percentage
1	0xf41a6011d5187bc27fd6ac89ae5e8bf272497b45	343,617,895,460,402.414670708	34.3618%
2	Null Address: 0x000...dEaD	327,852,176,896,002.451475464	32.7852%
3	📄 0x48a64f116ce221fd7c119775ba7892701f9911d	110,438,179,800,367.547392754	11.0438%
4	📄 0x2d045410f002a95efcee67759a92518fa3fce677	34,306,828,963,103.847878329	3.4307%
5	0xa0dcc5d6ea7a707a2b392901daef9d93a6e5f59e	20,025,403,741,845.764575572	2.0025%
6	0xc310e8af1d4967af43caf94bd3b51c3e3a9d1dbf	18,189,815,912,884.418034232	1.8190%
7	📄 0x6343d81971700636f91907ee9bc26240826fba8a	15,025,978,143,356.497621465	1.5026%
8	0x548e03c19a175a66912685f71e157706fee6a04d	5,000,642,017,700.076520893	0.5001%
9	0x2283dc05f2073b9fab50451f27ecea78bb0d320b	4,148,980,664,713.873007045	0.4149%
10	0x25b685e9b4cea078f17913c40e2c5b6d0e2ba6b5	2,476,934,317,992.225626508	0.2477%
11	0xc6b2bacfd805aef1e30eae612b5666dff96a7d5	2,447,378,754,320.797512666	0.2447%
12	0xe111eaf23bf5f5a884b24612e7f958e29ee70f6e	2,414,583,705,227.940174478	0.2415%
13	0xe545175c2a6a78a4e41430d72d98b926e2fbcea5	2,130,182,366,511.371963126	0.2130%
14	0x950b84c91b40d9c6228d5f5d261aab8ebb4445c3	1,916,294,015,725.57325228	0.1916%
15	0xaff2b348056220668a40d8f9d1f214d6bf4f88ce	1,672,708,613,234.986440306	0.1673%
16	0x8fe4596e3dbbfff59cb5cfb506ba65e715fbf7a9	1,429,778,381,228.242118106	0.1430%
17	0x2c610993b89f836253a19252da3fc47bd4050c9a	1,180,423,361,285.017094219	0.1180%
18	0xe02fef50f5c7b2f5ec4b28f680bc317ea745c906	1,155,596,879,689.373595102	0.1156%
19	0x5e782ea280791edad2388e86ea65bf18d5ef6c6f	1,000,234,498,005.337645164	0.1000%
20	0x251c58ab1629777b33314854a27875a188320282	948,767,446,332.118668961	0.0949%

GemSpree Distribution

GemSpree Overview



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
- `- [Pvt]` _functionCallWithValue

`+ Ownable (Context)`

- `- [Int]` <constructor>
- `- [Pub]` owner
- `- [Pub]` renounceOwnership #
 - modifiers: onlyOwner
- `- [Pub]` transferOwnership #
 - modifiers: onlyOwner
- `- [Pub]` geUnlockTime
- `- [Pub]` lock #

Contract functions details

-[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

Contract functions details

- [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

+GemSpree (Context, IERC20, Ownable)

- [Pub] <constructor>
- [Pub] name
- [Pub] symbol
- [Pub] decimals
- [Pub] totalSupply
- [Pub] balanceOf

Contract functions details

- [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
- [Pvt] _transferBothExcluded #
- [Ext] <receive> \$
- [Pvt] _reflectFee #
- [Pvt] _getValues
- [Pvt] _getTValues
- [Pvt] _getRValues
- [Pvt] _getRate
- [Pvt] _getCurrentSupply #
- [Pvt] _takeLiquidity #
- [Pvt] calculateTaxFee
- [Pvt] calculateLiquidityFee
- [Pvt] removeAllFee #
- [Pvt] restoreAllFee #
- [Pub] isExcludedFromFee
- [Pvt] _approve #
- [Pvt] _transfer #
- [Pvt] swapAndLiquify #
 - modifiers: lockTheSwap
- [Pvt] swapTokensForEth #
- [Pvt] addLiquidity #
- [Pvt] _tokenTransfer #
- [Pvt] _transferStandard #
- [Pvt] _transferToExcluded #

Contract functions details

- [Pvt] _transferFromExcluded #
- [Pub] excludeFromFee #
 - modifiers: onlyOwner
- [Pub] includeInFee #
 - modifiers: onlyOwner
- [Ext] enableAllFees #
 - modifiers: onlyOwner
- [Ext] disableAllFees #
 - modifiers: onlyOwner
- [Ext] setCharityWallet #
 - modifiers: onlyOwner
- [Ext] setMaxTxPercent #
 - modifiers: onlyOwner
- [Pub] setSwapAndLiquifyEnabled #
 - modifiers: onlyOwner

(\$) = payable function

= non-constant function

Issues Checking Status

No.	Title	Status
1.	Unlocked Compiler Version	Low issue
2.	Missing Input Validation	Passed
3.	Race conditions and Reentrancy. Cross-function race conditions.	Passed
4.	Possible delays in data delivery	Passed
5.	Oracle calls.	Passed
6.	Timestamp dependence.	Passed
7.	Integer Overflow and Underflow	Passed
8.	DoS with Revert.	Passed
9.	DoS with block gas limit.	Medium
10.	Methods execution permissions.	Passed
11.	Economy model of the contract.	Passed
12.	Private use data leaks.	Passed
13.	Malicious Event log.	Passed
14.	Scoping and Declarations.	Passed
15.	Uninitialized storage pointers.	Passed
16.	Arithmetic accuracy.	Passed
17.	Design Logic.	Passed
18.	Safe Open Zeppelin contracts implementation and usage.	Passed
19.	Incorrect Naming State Variable	Passed
20.	Too old version	Low issue

Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to assets loss or data manipulations.
High	High-level vulnerabilities are difficult to exploit; however, they also have a significant impact on smart contract execution, e.g., public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to assets loss or data manipulations.
Low	Low-level vulnerabilities are mostly related to outdated, unused, etc. code snippets that can't have a significant impact on execution.

Security Issues

✔ Critical Severity Issues

No critical severity issue found.

✔ High Severity Issues

No high severity issue found.

✔ Medium Severity Issues

One medium severity issue found.

1. Out of gas limit

• Description

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.

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

• Recommendation

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

✔ Low Severity Issues

Two low severity issue found.

1. Unlocked Compiler Version.

• Description

The contract utilizes an unlocked compiler version. An unlocked compiler version in the contract's source code permits the user to compile it at or above a particular version. This, in turn, leads to differences in the generated bytecode between compilations due to differing compiler version numbers. This can lead to ambiguity when debugging as compiler-specific bugs may occur in the codebase that would be difficult to identify over a span of multiple compiler versions rather than a specific one.

• Recommendation

It is advisable that the compiler version is alternatively locked at the lowest version possible so that the contract can be compiled. For example, for version `^0.6.12` the contract should contain the following line:

```
pragma solidity 0.6.12;
```

Security Issues

2. Too old compiler version

- **Description**

Smart contract has been deployed using too old solidity compiler version.

- **Recommendation**

It is advisable to deploy contract using any one of the latest version of solidity compiler.

Centralization

Owner Privileges :

- GemSpree Contract :

This smart contract has some functions which can be executed by the admin (Owner) only. If the admin wallet private key would be compromised, then it would create trouble as smart contract ownership has not been renounced. Following are Admin functions:

- transferOwnership
- renounceOwnership
- excludeFromFee
- includeInFee
- enableAllFees
- disableAllFees
- setcharityWallet
- setMaxTxPercent
- setSwapAndLiquifyEnabled
- lock

Conclusion

Smart contract contains low and medium severity issues! The further transfer and operations with the fund raised are not related to this particular contract.

HackSafe 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.