



# Smart Contract Security Audit Report

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## Serum

April 2022

Security Status



[www.hacksafe.io](https://www.hacksafe.io)



# Audit Details



## Audited project

Serum



## Deployer address

0xe8cb77c2585051AA4E2D05fAbbAf9Bb40a0C5eBE



## Client contacts

Serum team



## Blockchain

Ethereum



## Website

<https://www.projectserum.com/>



# 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

**HeckSafe was commissioned by Serum to perform an audit of smart contracts:**

- <https://etherscan.io/address/0x476c5E26a75bd202a9683ffD34359C0CC15be0fF#code>



# Contract Details

## Token contract details for 19.04.2022

Contract name	: Generic Token
Contract address	: 0x476c5E26a75bd202a9683ffD34359C0CC15be0fF
Total supply	: 211, 000, 002
Token Ticker	: SRM
Decimals	: 6
Token Holders	: 10,234
Transactions count	: 406, 226
Contract deployer address	: 0xe8cb77c2585051AA4E2D05fAbbAf9Bb40a0C5eBE
Owner address	: 0x8d6c92aDEa0aD61163df8FCc7040dBba245E2F6E

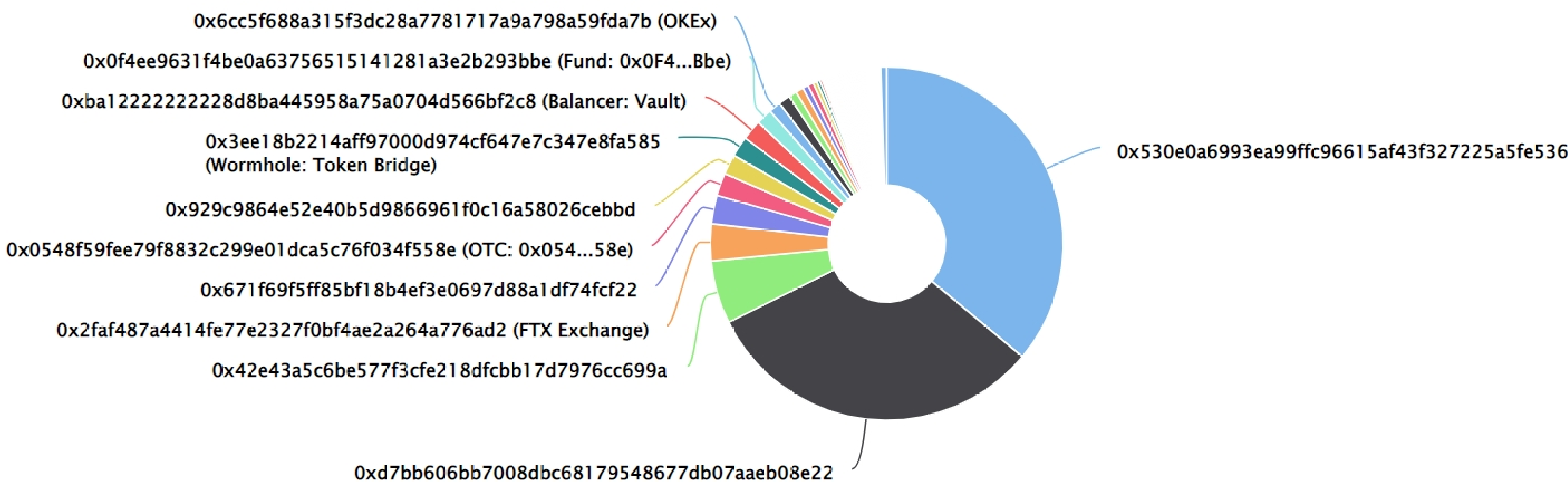
# Serum Token Distribution

💡 The top 500 holders collectively own 99.45% (209,847,825.78 Tokens) of Serum

💡 Token Total Supply: 211,000,002.00 Token | Total Token Holders: 10,233



## Serum Top 500 Token Holders

Source: Etherscan.io



## Serum Top 10 Token Holders

(A total of 186,770,102.16 tokens held by the top 10 accounts from the total supply of 211,000,002.00 token)

Rank	Address	Quantity (Token)	Percentage
1	0x530e0a6993ea99ffc96615af43f327225a5fe536	76,088,540	36.0609%
2	0xd7bb606bb7008dbc68179548677db07aaeb08e22	66,706,484.441098	31.6144%
3	0x42e43a5c6be577f3cfe218dfcbb17d7976cc699a	12,142,916	5.7549%
4	FTX Exchange	7,125,535.873465	3.3770%
5	0x671f69f5ff85bf18b4ef3e0697d88a1df74fcf22	5,501,879.796	2.6075%
6	OTC: 0x054...58e	4,357,191.021244	2.0650%
7	0x929c9864e52e40b5d9866961f0c16a58026cebbd	3,944,719.23395	1.8695%
8	 Wormhole: Token Bridge	3,911,503.072397	1.8538%
9	 Balancer: Vault	3,893,095.481842	1.8451%
10	Fund: 0x0F4...Bbe	3,098,237.241727	1.4684%

# Contract functions details

## + [Lib] SafeMath

- [Int] add
- [Int] sub
- [Int] sub
- [Int] mul
- [Int] div
- [Int] div
- [Int] mod
- [Int] mod

## + [Int] IERC20

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

## + ERC20Detailed (IERC20)

- [Pub] <constructor> #
- [Pub] name
- [Pub] symbol
- [Pub] decimals

## + Context

- [Int] \_msgSender
- [Int] \_msgData

## + ERC20 (Context, IERC20)

- [Pub] totalSupply
- [Pub] balanceOf
- [Pub] transfer #
- [Pub] allowance
- [Pub] approve #
- [Pub] transferFrom #
- [Pub] increaseAllowance #
- [Pub] decreaseAllowance #
- [Int] \_transfer #
- [Int] \_mint #

# Contract functions details

- [Int] \_burn #
- [Int] \_approve #
- [Int] \_burnFrom #

## + [Lib] Roles

- [Int] add #
- [Int] remove #
- [Int] has

## + PauserRole (Context)

- [Pub] <Constructor> #
- [Pub] isPauser
- [Pub] addPauser
  - modifiers: onlyPauser
- [Pub] renouncePauser
- [Int] \_addPauser
- [Int] \_removePauser

## + Pausable (Context, PauserRole)

- [Int] <Constructor> #
- [Pub] paused
- [Pub] pause #
  - modifiers: onlyPauser, whenNotPaused
- [Pub] unpause #
  - modifiers: onlyPauser whenPaused

## + ERC20Pausable (ERC20Pausable)

- [Pub] transfer #
  - modifiers: whenNotPaused
- [Pub] transferFrom #
  - modifiers: whenNotPaused
- [Pub] approve #
  - modifiers: whenNotPaused
- [Pub] increaseAllowance #
  - modifiers: whenNotPaused
- [Pub] decreaseAllowance #
  - modifiers: whenNotPaused



# Contract functions details

## + MinterRole (Context)

- [Int] <Constructor> #
- [Pub] isMinter
- [Pub] addMinter #
  - Modifiers: onlyMinter
- [Pub] renounceMinter #
- [Int] \_addMinter
- [Int] \_removeMinter

## + ERC20Mintable (ERC20, MinterRole)

- [Pub] mint #
  - modifiers: onlyMinter

## + BurnerRole

- [Int] <Constructor> #
- [Pub] isBurner
- [Pub] addBurner #
  - modifiers: onlyBurner
- [Pub] renounceBurner #
- [Int] \_addBurner #
- [Int] \_removeBurner #

## + ERC20Burnable (ERC20, BurnerRole)

- [Pub] burn #
  - modifiers: onlyBurner
- [Pub] burnFrom #
  - modifiers: onlyBurner

## + Ownable (Context)

- [Int] <Constructor> #
- [Pub] owner
- [Pub] isOwner
- [Pub] renounceOwnership #
  - modifiers: onlyOwner
- [Pub] transferOwnership #
  - modifiers: onlyOwner
- [Int] \_transferOwnership #

## + CanReclaimEther (Ownable)

- [Ext] reclaimEther #
  - modifiers: onlyOwner

# Contract functions details

## + [Lib] Address

- [Int] isContract
- [Int] toPayable
- [Int] sendValue

## + [Lib] SafeERC20

- [Int] safeTransfer #
- [Int] safeTransferFrom #
- [Int] safeApprove #
- [Int] safeIncreaseAllowance #
- [Int] safeDecreaseAllowance #
- [Pvt] callOptionalReturn

## + CanReclaimToken (Ownable)

- [Ext] reclaimToken #
- modifiers: onlyOwner

## + GenericToken (ERC20Detailed, ERC20Pausable, ERC20Mintable, ERC20Burnable, CanReclaimEther, CanReclaimToken)

- [Pub] <Constructor> #

# 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.	Passed
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.	Low issue
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



# 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

No medium severity issues found.

## ✔ Low Severity Issues

Two low severity issues 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 v0.5.0 the contract should contain the following line:

```
pragma solidity 0.5.0;
```

### 2. Scoping and Declarations.

#### Unused function.

- **Description**

The div, mod, \_msgData, toPayable, sendValue functions do nothing.

- **Location**

div, mod, \_msgData, toPayable, sendValue functions

- **Recommendation**

We advise to remove unused code which can help you to develop clean coding style and save some computational gas too.

# Owner Privileges

## Owner Privileges (in the period when the owner is not renounced) :

- Serum Contract:
  - Owner can transfer ownership.
  - Owner can renounce ownership.
  - Owner can reclaim ethers and tokens.



# Conclusion

Smart contract contains low 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.