



TechRate
AUDIT COMPANY

Smart Contract Security Audit

TechRate

November, 2021

Audit Details



Audited project

Schrodinger



Deployer address

0x12f600dc6205301bf6d7237b070f2369659dccb2



Client contacts:

Schrodinger team



Blockchain

Ethereum



Project website:

<https://schrodinger.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

TechRate was commissioned by Schrodinger to perform an audit of smart contracts:

<https://etherscan.io/address/0x2c33b28527a63cdf13c0b24ce4cf5bf9c9fb3bc6#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 22.11.2021

Contract name	Schrodinger
Contract address	0x2C33B28527A63Cdf13C0B24Ce4cf5BF9C9fB3BC6
Total supply	1,000,000,000,000
Token ticker	Kitty Dinger
Decimals	9
Token holders	1,145
Transactions count	4,335
Top 100 holders dominance	68.02%
B/S Liquidity fee	1/1
B/S Tax fee	2/2
Total fees	95339938648050918139
Uniswap V2 pair	0x0cecc726d097c756c62272f1180ebfff29cb57f9
Contract deployer address	0x12f600dc6205301bf6d7237b070f2369659dcc2
Contract's current owner address	0x12f600dc6205301bf6d7237b070f2369659dcc2

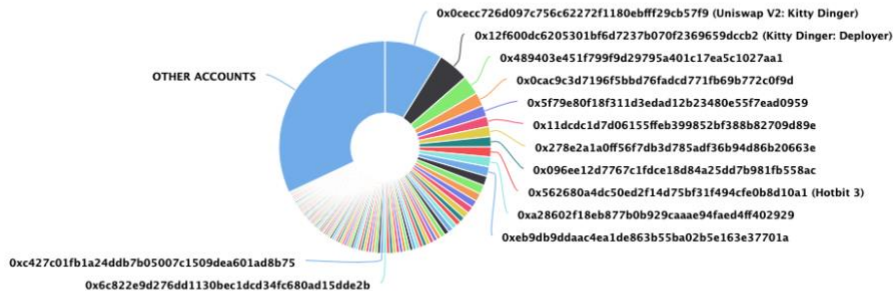
Schrodinger Token Distribution

The top 100 holders collectively own 68.02% (680,173,999,713.56 Tokens) of Schrodinger

Token Total Supply: 1,000,000,000.00 Token | Total Token Holders: 1,145

Schrodinger Top 100 Token Holders

Source: Etherscan.io



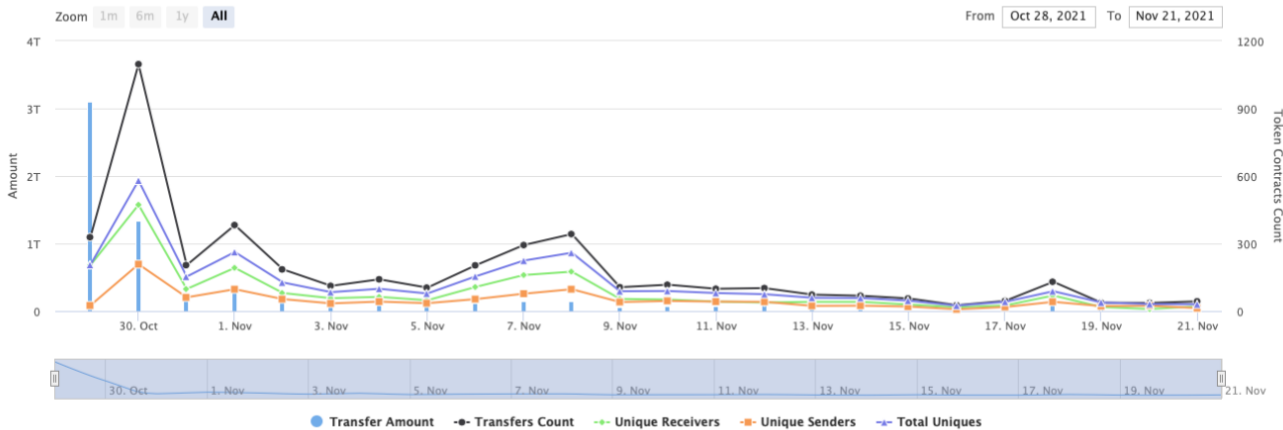
(A total of 680,173,999,713.56 tokens held by the top 100 accounts from the total supply of 1,000,000,000.00 token)

Schrodinger Contract Interaction Details


Time Series: Token Contract Overview

Fri 29, Oct 2021 - Sun 21, Nov 2021

Token Contract 0x2c33b28527a63cdf13c0b24ce4cf5bf9c9fb3bc6 (Schrodinger)
Source: Etherscan.io



Schrodinger Top 10 Token Holders

Rank	Address	Quantity (Token)	Percentage
1	 Uniswap V2: Kitty Dinger	88,555,191,792.022790968	8.8555%
2	Kitty Dinger: Deployer	47,678,293,379.308460768	4.7678%
3	0x489403e451f799f9d29795a401c17ea5c1027aa1	29,170,149,773.143639828	2.9170%
4	0x0cac9c3d7196f5bbd76fadcd771fb69b772c0f9d	20,655,788,112.647847108	2.0656%
5	0x5f79e80f18f311d3edad12b23480e55f7ead0959	16,926,354,516.563977332	1.6926%
6	0x11dcdc1d7d06155ffeb399852bf388b82709d89e	15,639,635,384.920516454	1.5640%
7	0x278e2a1a0ff56f7db3d785adf36b94d86b20663e	15,592,720,458.398399766	1.5593%
8	0x096ee12d7767c1fdce18d84a25dd7b981fb558ac	15,393,071,159.24189313	1.5393%
9	Hotbit 3	15,272,468,856.220322669	1.5272%
10	0xa28602f18eb877b0b929caaae94faed4ff402929	15,015,015,986.033664066	1.5015%



Contract functions details

+ Context

- [Int] _msgSender
- [Int] _msgData

+ [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

+ [Lib] Address

- [Int] isContract
- [Int] sendValue #
- [Int] functionCall #
- [Int] functionCall #
- [Int] functionCallWithValue #
- [Int] functionCallWithValue #
- [Prv] _functionCallWithValue #

+ Ownable (Context)

- [Pub] <Constructor> #
- [Pub] owner
- [Pub] renounceOwnership #
 - modifiers: onlyOwner
- [Pub] transferOwnership #
 - modifiers: onlyOwner
- [Pub] getUnlockTime
- [Pub] getTime

+ [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] 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 #
```

+ schrodinger (Context, IERC20, Ownable)

- [Pub] <Constructor> (\$)
- [Ext] name
- [Ext] symbol
- [Ext] decimals
- [Ext] totalSupply
- [Pub] balanceOf
- [Ext] transfer #
- [Ext] allowance
- [Pub] approve #
- [Ext] transferFrom #
- [Ext] increaseAllowance #
- [Ext] decreaseAllowance #
- [Ext] isExcludedFromReward
- [Ext] totalFees
- [Ext] removeLimits #
 - modifiers: onlyOwner
- [Ext] disableTransferDelay #
 - modifiers: onlyOwner
- [Pub] excludeFromMaxTransaction #
 - modifiers: onlyOwner
- [Int] enableTrading #
 - modifiers: onlyOwner
- [Ext] launch #
 - modifiers: onlyOwner
- [Ext] minimumTokensBeforeSwapAmount
- [Pub] setAutomatedMarketMakerPair #
 - modifiers: onlyOwner
- [Prv] _setAutomatedMarketMakerPair #
- [Ext] setGasPriceLimit #
 - modifiers: onlyOwner
- [Ext] reflectionFromToken
- [Pub] tokenFromReflection
- [Pub] excludeFromReward #
 - modifiers: onlyOwner
- [Pub] includeInReward #
 - modifiers: onlyOwner
- [Prv] _approve #
- [Prv] _transfer #
- [Prv] swapBack #
 - modifiers: lockTheSwap
- [Ext] forceSwapBack #
 - modifiers: onlyOwner
- [Prv] swapTokensForETH #
- [Prv] addLiquidity #
- [Prv] _tokenTransfer #
- [Prv] _transferStandard #
- [Prv] _transferToExcluded #
- [Prv] _transferFromExcluded #
- [Prv] _transferBothExcluded #
- [Prv] _reflectFee #
- [Prv] _getValues
- [Prv] _getTValues
- [Prv] _getRValues

- [Prv] _getRate
- [Prv] _getCurrentSupply
- [Prv] _takeLiquidity #
- [Prv] calculateTaxFee
- [Prv] calculateLiquidityFee
- [Prv] removeAllFee #
- [Prv] restoreAllFee #
- [Ext] isExcludedFromFee
- [Ext] removeBoughtEarly #
 - modifiers: onlyOwner
- [Ext] excludeFromFee #
 - modifiers: onlyOwner
- [Ext] includeInFee #
 - modifiers: onlyOwner
- [Ext] setBuyFee #
 - modifiers: onlyOwner
- [Ext] setSellFee #
 - modifiers: onlyOwner
- [Ext] setMarketingAddress #
 - modifiers: onlyOwner
- [Pub] setLiquidityAddress #
 - modifiers: onlyOwner
- [Pub] setSwapAndLiquifyEnabled #
 - modifiers: onlyOwner
- [Ext] <Fallback> (\$)
- [Ext] transferForeignToken #
 - modifiers: onlyOwner
- [Ext] withdrawStuckETH #
 - 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.	Passed
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

No low severity issues found.

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

- Owner can remove limits and disable transfer delay.
- Owner can exclude from the maximum transaction amount restriction.
- Owner can enable trading.
- Owner can launch contract (set basic settings, liquidity, enable trading).
- Owner can include in automatedMarketMakerPairs array.
- Owner can change gas restriction value.
- Owner can manually call swapBack() function.
- Owner can remove boughtEarly addresses.
- Owner can exclude from the fee.
- Owner can change fees.
- Owner can change marketing and liquidity addresses.
- Owner can withdraw contract ERC20 tokens and ETHs.

Conclusion

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

Liquidity locking details are provided by the team:

Dextools :

<https://www.dextools.io/app/ether/pair-explorer/0x0cecc726d097c756c62272f1180ebfff29cb57f9>

LP lock 1 year:

<https://app.unicrypt.network/amm/uni-v2/pair/0x0cecc726d097c756c62272f1180ebfff29cb57f9>

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.