

Smart Contract Security Audit Report

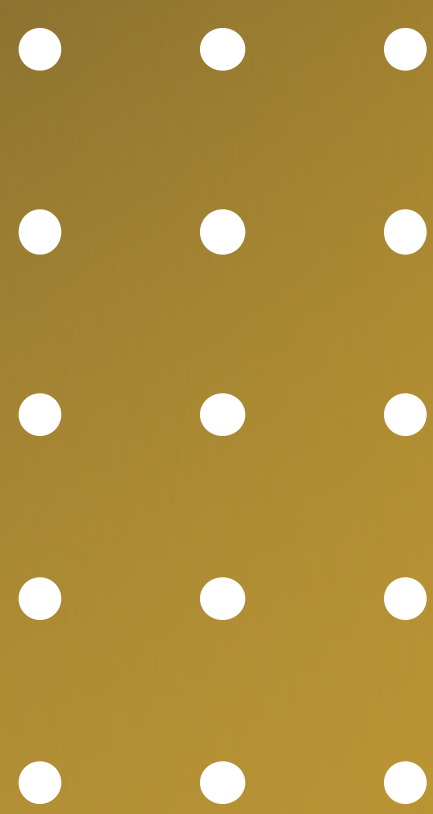
QRL

February 2023

Security Status



www.hacksafe.io



Audit Details



Audited project

QRL



Deployer address

0x584ebc1a41fea2854c7a90d45bb8f253ec7e02a6



Client contacts

QRL Team



Blockchain

Ethereum



Website

<https://www.theqrl.org/>

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 QRL to perform an audit of smart contracts:

- <https://etherscan.io/token/0x697beac28b09e122c4332d163985e8a73121b97f#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 understood 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.

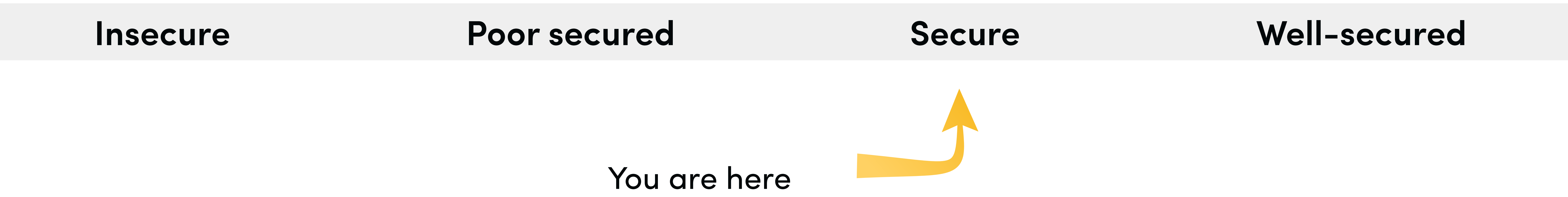
Contract Details

Token contract details for 20.02.2023

Token Type	: Security
Contract name	: QRL_Token
Contract address	: 0x697beac28B09E122C4332D163985e8a73121b97F
Total supply	: 65,000,000
Token ticker	: ORL
Decimals	: 8
Token Holders	: 2,511
Transactions count	: 23,189
Compiler version	: v0.4.11+commit.68ef5810
Contract deployer address	: 0x584eBC1A41fea2854C7A90d45Bb8F253EC7e02A6
Owner address	: 0x584eBC1A41fea2854C7A90d45Bb8F253EC7e02A6

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.



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, 0 medium and 1 low.

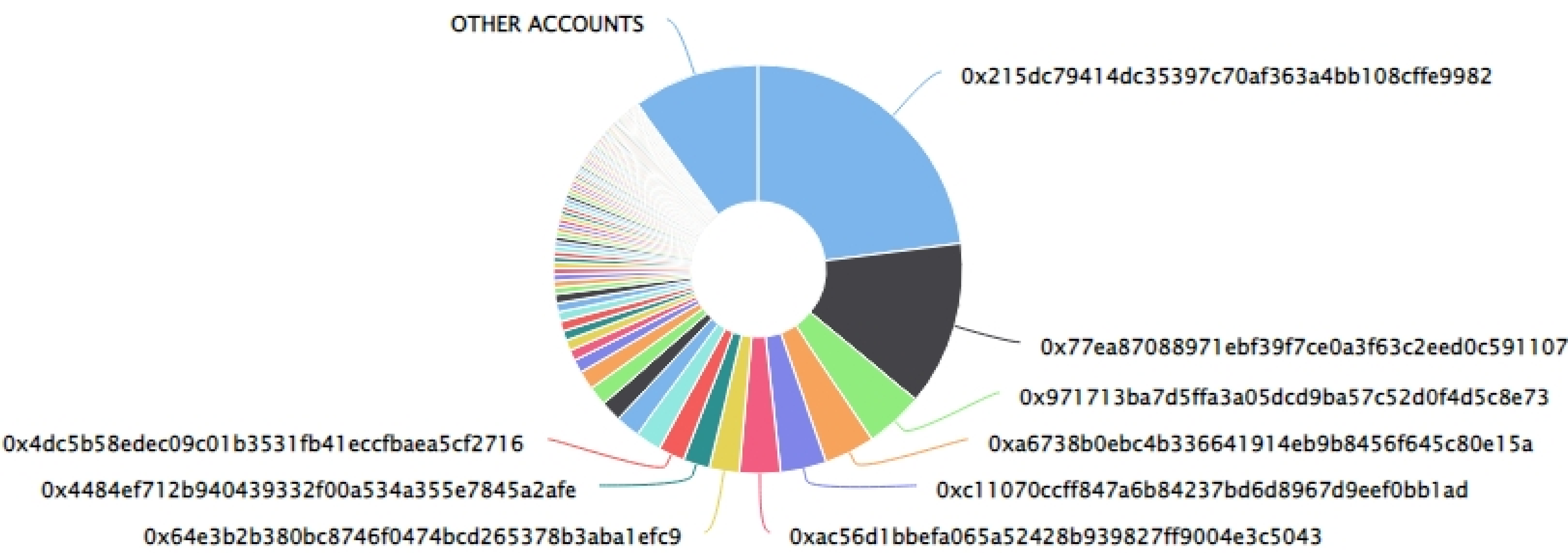
QRL Token Distribution

💡 The top 100 holders collectively own 89.98% (58,486,725.63 Tokens) of QRL

💡 Token Total Supply: 65,000,000.00 Token | Total Token Holders

QRL Top 100 Token Holders

Source: Etherscan.io



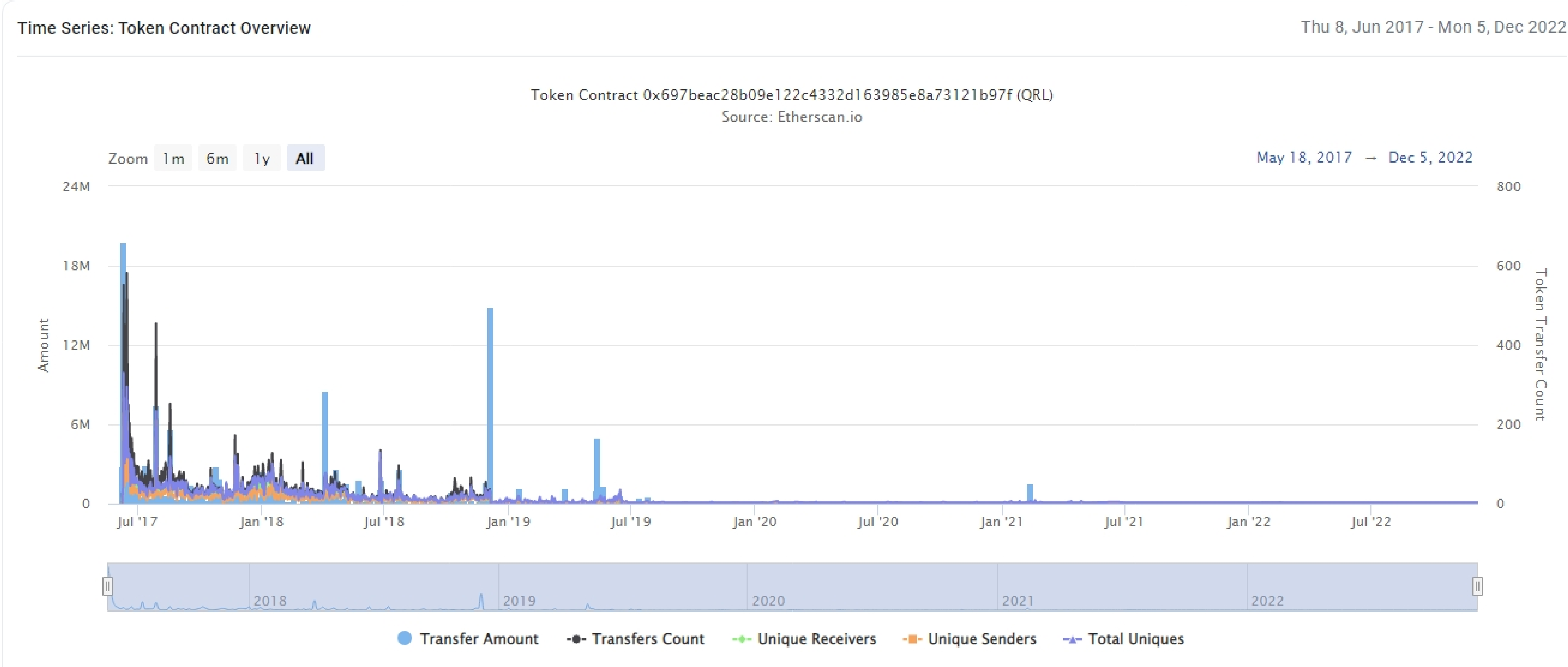
QRL Top 20Token Holders

(A total of 58,486,725.63 tokens held by the top 100 accounts from the total supply of 65,000,000.00 token)

Rank	Address	Quantity (Token)	Percentage
1	0x215dc7...cFFe9982	14,935,653.09571939	22.9779%
2	0x77EA87...0c591107	8,449,999.99786516	13.0000%
3	0x971713...4d5C8E73	3,015,049.35556282	4.6385%
4	0xa6738b...5c80E15A	2,589,079.35757634	3.9832%
5	0xC11070...eF0bb1Ad	2,362,675.358	3.6349%
6	0xAC56d1...4e3C5043	2,103,191.74271062	3.2357%
7	0x64E3b2...aBA1EfC9	1,550,000	2.3846%
8	0x4484EF...845A2afE	1,350,951.08149	2.0784%
9	0x4Dc5B5...a5CF2716	1,344,720.308	2.0688%
10	0x59b4f9...0F686146	1,335,188	2.0541%
11	0x991939...e00d346A	1,246,794.5811	1.9181%
12	0xd04CeD...182C7130	1,065,884.452	1.6398%
13	0x7e49f2...F4cF09A4	1,005,189.632	1.5464%
14	0x602dbf...59924f4D	955,331.141	1.4697%
15	0xcDF28C...552a80e6	672,353.4814	1.0344%
16	0xaF8B4B...e66AC958	550,917.7753	0.8476%
17	0x00D69C...0ec2647B	537,894.5779	0.8275%
18	0x874940...4F3cfB9f	500,000	0.7692%
19	0x215c20...4354ae4E	500,000	0.7692%
20	0x50e5Dd...063E116B	491,204.105	0.7557%

QRL Token Distribution

QRL Contract Overview



Contract functions details

+Token

- totalSupply
- balanceOf
- transfer
- transferFrom
- approve
- allowance

+StdToken (Token)

- transfer #
- transferFrom #
- balanceOf
- approve #
- allowance
- totalSupply

+QRL_Token (StdToken)

- transfer #
- modifiers: notFrozen, onlyPayloadSize
- transferFrom #
- modifiers: notFrozen, onlyPayloadSize
- approve #
- QRL_Token #
- freeze #
- modifiers: onlyByCreator
- issueTokens #
- modifiers: onlyInState, onlyByCreator
- close #
- modifiers: onlyInState, onlyByCreator
- setAllSupply #
- modifiers: onlyInState, onlyByCreator
- changeCreator #
- modifiers: onlyByCreator

(\$) = payable function

= non-constant function

Issues Checking Status

No.	Title	Status
1.	Compiler error	Passed
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.	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

No medium severity issue found.

✔ Low Severity Issues

One low severity issue found.

1. Old compiler version

- **Description**

Contract has been deployed using too old solidity version.

- **Recommendation**

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

Centralization

Owner Privileges :

- QRL Contract :
 - creator can set all supply.
 - creator can freeze.
 - creator can issue tokens.
 - creator can close 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 the owner/creator functions:

- close
- setallsupply
- changecreator
- freeze
- issuetokens

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.