



Code Security Assessment

Oraichain

October 9th, 2022



Contents

Contents	1
SUMMARY	2
ISSUE CATEGORIES	3
OVERVIEW	4
PROJECT SUMMARY	4
AUDIT SUMMARY	4
VULNERABILITY SUMMARY	5
AUDIT SCOPE	5
FINDINGS	6
Medium.....	7
OTO-01 InitialTokenDistribution.....	7
DESCRIPTION	7
RECOMMENDATION	7
ALLEVIATION.....	7
Informational.....	8
OTO-02 NeverUsedInternalFunction.....	8
DESCRIPTION	8
RECOMMENDATION	8
ALLEVIATION.....	8
Informational.....	9
OTO-03 Improper Usage Of Public And External Type.....	9
DESCRIPTION	9
RECOMMENDATION	9
ALLEVIATION.....	9
DISCLAIMER	10
APPENDIX	13
ABOUT	14



Summary

DeHacker's objective was to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices.

Possible issues we looked for included (but are not limited to):

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire code base by industry experts.

The security assessment resulted in findings that ranged from critical to informational. We recommend addressing these findings to ensure a high level of security standards and industry practices. We suggest recommendations that could better serve the project from the security perspective:

- Enhance general coding practices for better structures of source codes.
- Add enough unit tests to cover the possible use cases.
- Provide more comments per each function for readability, especially contracts that are verified in public.
- Provide more transparency on privileged activities once the protocol is live.



Issue Categories

Every issue in this report was assigned a severity level from the following:

Critical severity issues

A vulnerability that can disrupt the contract functioning in a number of scenarios or creates a risk that the contract may be broken.

Major severity issues

A vulnerability that affects the desired outcome when using a contract or provides the opportunity to use a contract in an unintended way.

Medium severity issues

A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.

Minor severity issues

A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.

Informational

A vulnerability that has informational character but is not affecting any of the code.



Overview

Project Summary

Project Name	Oraichain
Platform	bsc
website	https://orai.io/
Type	Others
Deployed contract	https://bscscan.com/address/0xa325ad6d9c92b55a3fc5ad7e412b1518f96441c0#code
Language	Solidity

Audit Summary

Delivery Date	October 9th 2022
Audit Methodology	Static Analysis, Manual Review



Vulnerability Summary

Vulnerability Level	Total	Pending	Declined	Acknowledged	Partially Resolved	Resolved
Critical	0	0	0	0	0	0
Major	0	0	0	0	0	0
Medium	1	0	0	1	0	0
Minor	0	0	0	0	0	0
Informational	2	0	0	2	0	0
Discussion	0	0	0	0	0	0

Audit scope

ID	File	SHA256 Checksum
OTO	OraiToken.sol	8647e81bdbe9c86a7ab2dcb1858b8925729c3aaf5fd1b79a913b2f7d8e6ee76a



Findings

ID	Title	Category	Severity	Status
OTO-01	Initial token distribution	Centralization / Privilege	Medium	Acknowledged
OTO-02	Never used internal function	unknown	Informational	Acknowledged
OTO-03	Improper usage of public and externaltype	Gas Optimization	Informational	Acknowledged



Medium

OTO-01 | Initial Token Distribution

Category	Severity	Location	Status
Centralization / Privilege	Medium	OraiToken.sol: 364	Acknowledged

Description

The 8.6 million ORAI tokens are sent to the contract deployer when deploying the contract. This could be a centralization risk as the deployer can distribute ORAI tokens without obtaining the consensus of the community.

Recommendation

We recommend the team be transparent regarding the initial token distribution process, and the team shall make enough efforts to restrict the access of the private key.

Alleviation

Oraichain team will set the owner for a multi-sig address to avoid leaking the private key.



Informational

OTO-02 | Never Used Internal Function

Category	Severity	Location	Status
unknown	Informational	OraiToken.sol: 531 ~ 537, 566-569	Acknowledged

Description

OraiToken._burn(address,uint256) (OraiToken.sol#531-537) is never used and should be removed

OraiToken._burnFrom(address,uint256) (OraiToken.sol#566-569) is never used and should be removed

Recommendation

We recommend removing the internal functions if they are never used.

Alleviation

Oraichain team acknowledged this finding.



Informational

OTO-03 | Improper Usage Of Public And External Type

Category	Severity	Location	Status
Gas Optimization	Informational	OraiToken.sol: 333~335, 324~327, 492~495, 473~476	Acknowledged

Description

The public functions that are never called by the contract could be declared as external . When the inputs are arrays external functions are more efficient than public functions.

Recommendation

Consider using the external attribute for public functions that are never called within the contract.

Alleviation

Oraichain team acknowledged this finding.



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Appendix

Finding Categories

Centralization / Privilege

Centralization / Privilege findings refer to either feature logic or implementation of components that act against the nature of decentralization, such as explicit ownership or specialized access roles in combination with a mechanism to relocate funds.

Coding Style

Coding Style findings usually do not affect the generated bytecode but rather comment on how to make the codebase more legible and, as a result, easily maintainable.

Volatile Code

Volatile Code findings refer to segments of code that behave unexpectedly on certain edge cases that may result in a vulnerability.

Logical Issue

Logical Issue findings detail a fault in the logic of the linked code, such as an incorrect notion on how block. timestamp works.

Checksum Calculation Method

The "Checksum" field in the "Audit Scope" section is calculated as the SHA-256 (Secure Hash Algorithm 2 with digest size of 256 bits) digest of the content of each file hosted in the listed source repository under the specified commit.

The result is hexadecimal encoded and is the same as the output of the Linux "sha256sum" command against the target file.



About

DeHacker is a team of auditors and white hat hackers who perform security audits and assessments. With decades of experience in security and distributed systems, our experts focus on the ins and outs of system security. Our services follow clear and prudent industry standards. Whether it's reviewing the smallest modifications or a new platform, we'll provide an in-depth security survey at every stage of your company's project. We provide comprehensive vulnerability reports and identify structural inefficiencies in smart contract code, combining high-end security research with a real-world attacker mindset to reduce risk and harden code.

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A series of concentric circles in a light green color, centered on the page, creating a ripple effect. The circles are thin and evenly spaced, filling most of the frame.

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