DeHacker

Code Security Assessment

ANKR Token

Aug 30th, 2021

Contents

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	ANKR Token
Platform	Ethereum
website	https://www.ankr.com/
Type	Token
Deployed contract	https://etherscan.io/address/ 0x0d8775f648430679a709e98d2b0cb6250d2887ef
Language	Solidity

Audit Summary

Delivery Date	Aug 27, 2021
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	1	1	0	1	0	0
Medium	0	0	0	0	0	0
Minor	1	1	0	0	0	0
Informational	2	2	0	1	0	1
Discussion	0	0	0	0	0	0

Audit scope

ID	File	SHA256 Checksum
ANK	ANKRToken.sol	8c57baf9ec026d9b37ebeabd9e2d53b9021f7112972160d4721fd4b7da76e04c

Findings

ID	Title	Category	Severity	Status
ANK-01	Missing Zero Address Validation	Volatile Code	Minor	Pending
ANK-02	public functions could be declaredexternal	Gas Optimization	Informational	Pending
ANK-03	Centralized Token Holding Positions	Centralization /Privilege	Major	Pending
ANK-04	Variable could be declared constant	Coding Style	Informational	Pending

Minor

ANK-01 | Missing Zero Address Validation

Category	Severity	Location	Status
Volatile Code	Minor	ANKRToken.sol: 179~183	Pending

Description

The input parameter _spender in function approve() should be verified as non zero value to prevent beingmistakenly assigned as address(0) in function.

```
function approve(address _spender, uint256 _value) public returns (bool) {
    allowed[msg.sender][_spender] = _value;
    emit Approval(msg.sender, _spender, _value);
    return true;
}
```

Recommendation

Recommend adding zero address checks in the function.

Informational

ANK-02 | public Functions Could Be Declared external

Category	Severity	Location	Status
Gas Optimization	Informational	ANKRToken.sol: 64 ~66, 119~125, 211 ~222, 233~250	Pending

Description

Some public functions are never called by the contract.

```
    function totalSupply() public view returns (uint256);
    function balanceOf(address who) public view returns (uint256);
    function transfer(address to, uint256 value) public returns (bool);
    function allowance(address owner, address spender) public view returns (uint256);
    function transferFrom(address from, address to, uint256 value) public returns (bool);
    function approve(address spender, uint256 value) public returns (bool);
    function increaseApproval(address _spender, uint256 _addedValue) public returns
(bool)
    function decreaseApproval(address _spender, uint256 _subtractedValue) public returns
(bool)
```

Recommendation

We recommend declaring these functions as external to save gas.

Major

ANK-03 | Centralized Token Holding Positions

Category	Severity	Location	Status
Centralization / Privilege	Major	ANKRToken.sol: 260	Pending

Description

The totalSupply_ of the ANKR token is assigned to the contract owner at deployment.

Recommendation

Once the token goes live, we assume many transactions would involve the wallet unlock of the owneraddress and the team shall make enough efforts to restrict the access of the private key.

Informational

ANK-04 | Variable Could Be Declared constant

Category	Severity	Location	Status
Coding Style	Informational	ANKRToken.sol: 256	Pending

Description

The variables 'name', 'symbol', 'decimals', and 'INITIAL_SUPPLY' are fixed but not declared as constant

Recommendation

We recommend declaring the variable as constant, such as the following:

```
uint256 public constant INITIAL_SUPPLY = 10000000000 * 10 ** uint256(decimals);
```

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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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