DeHacker

Security Assessment

Scorefam

April 17th, 2022

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):

- Transaction-ordering dependence
- Timestamp dependence
- Mishandled exceptions and call stack limits
- Unsafe external calls
- Integer overflow/underflow
- Number rounding errors
- Reentrancy and cross-function vulnerabilities
- Denial of service/logical oversights
- Access control
- Centralization of power
- Business logic contradicting the specification
- Code clones, functionality duplication
- Gas usage
- Arbitrary token minting

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	Scorefam
Platform	BSC
website	https://www.scorefam.org
Type	GameFi
Language	Solidity

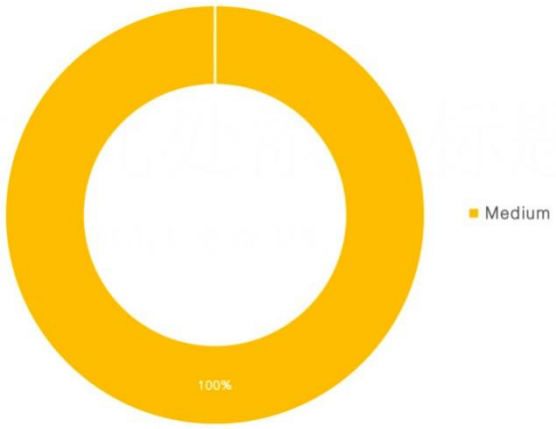
Vulnerability Summary

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

Audit scope

ID	File	SHA256 Checksum
FIP	Deployed.sol	9e8e152afe66c7f3a882edb739631840136b49e25e5f3581b4f18e367597e084

Findings



ID	Title	Category	Severity	Status
FIC-01	Centralization Related Risks	Centralization / Privilege	Medium	Resolved
ADS-02	Max Supply can be over minted	Logical Issue	Medium	Resolved

Medium

FIC-01 | Centralization Related Risks

Category	Severity	Location	Status
Centralization / Privilege	Medium	Deployed.sol: 2739	Resolved

Description

In the contract Deployed, the role MINTER_ROLE has the authority over the following function: `mint()`, which mints tokens in a BEP20 contract. Any compromise to the `MINTER_ROLE` account may allow the hacker to take advantage of this and gain unauthorized access to token mints.

Recommendation

We advise the client to carefully manage the `MINTER_ROLE` account's private key to avoid any potential risks of being hacked. In general, we strongly recommend centralized privileges or roles in the protocol to be improved via a decentralized mechanism or smart-contract-based accounts with enhanced security practices, e.g., multi-signature wallets. Here are some feasible suggestions that would also mitigate this risk in the short-term and long-term: A time-lock with reasonable latency, e.g., 48 hours, for awareness on privileged operations; Assignment of privileged roles to multi-signature wallets to prevent a single point of failure due to the private key; Introduction of a DAO/governance/voting module to increase transparency and user involvement.

Alleviation

The team has set the MINTER_ROLE to a MultiSig wallet 0x639932Ef9342aD64d9223CbdE14a1Cf5C1770875

ADS-02 | Max Supply can be over minted

Category	Severity	Location	Status
Logical Issue	Medium	Deployed.sol: 1913	Resolved

Description

The _mint() function on line 1913 is meant to mint tokens, but can't mint over the max supply 5e16.

require(_totalSupply <= 50000000000000000);

However, the max supply can be over minted. For example, _totalSupply is now 4e16, when given amount 2e16, the _totalSupply will be 6e16.

Recommendation

We recommend using this code instead.

require(_totalSupply + amount <= 50000000000000000);

Alleviation

The team has edited the _mint function according to the recommendation.

Disclaimer

This report is based on the scope of materials and documentation provided for a limited review at the time provided. Results may not be complete nor inclusive of all vulnerabilities. The review and this report are provided on an as-is, where-is, and as-available basis. You agree that your access and/or use, including but not limited to any associated services, products, protocols, platforms, content, and materials, will be at your sole risk. Blockchain technology remains under development and is subject to unknown risks and flaws. The review does not extend to the compiler layer, or any other areas beyond the programming language, or other programming aspects that could present security risks. A report does not indicate the endorsement of any particular project or team, nor guarantee its security. No third party should rely on the reports in any way, including for the purpose of making any decisions to buy or sell a product, service or any other asset. To the fullest extent permitted by law, we disclaim all warranties, expressed or implied, in connection with this report, its content, and the related services and products and your use thereof, including, without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement. We do not warrant, endorse, guarantee, or assume responsibility for any product or service advertised or offered by a third party through the product, any open source or third-party software, code, libraries, materials, or information linked to, called by, referenced by or accessible through the report, its content, and the related services and products, any hyperlinked websites, any websites or mobile applications appearing on any advertising, and we will not be a party to or in any way be responsible for monitoring any transaction between you and any third-party providers of products or services. As with the purchase or use of a product or service through any medium or in any environment, you should use your best judgment and exercise caution where appropriate.

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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.

BLOCKCHAIINS

- Ethereum
- Cosmos
- Eos
- Substrate

TECH STACK

- Python
- Solidity
- Rust
- c++

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