



Code Security Assessment

Cake5X

Jan 28th, 2022



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About

Summary

This report has been prepared for Cake5x to discover issues and vulnerabilities in the source code of the Cake5X project as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Static Analysis and Manual Review techniques.

The auditing process pays special attention to the following considerations:

- 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 codebase 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.

Overview

Project Summary

Project Name	Cake5X
Platform	bsc
Language	Solidity
Codebase	https://github.com/HoYiiKang13/HoYiiKang13
Commit	c53d31346ccda2aa97884b872578c655537b4d171f3a47e7ec283e36a3773e4b05bd4402dc26ae3d

Audit Summary

Delivery Date	Jan 28, 2022
Audit Methodology	Static Analysis, Manual Review

Vulnerability Summary

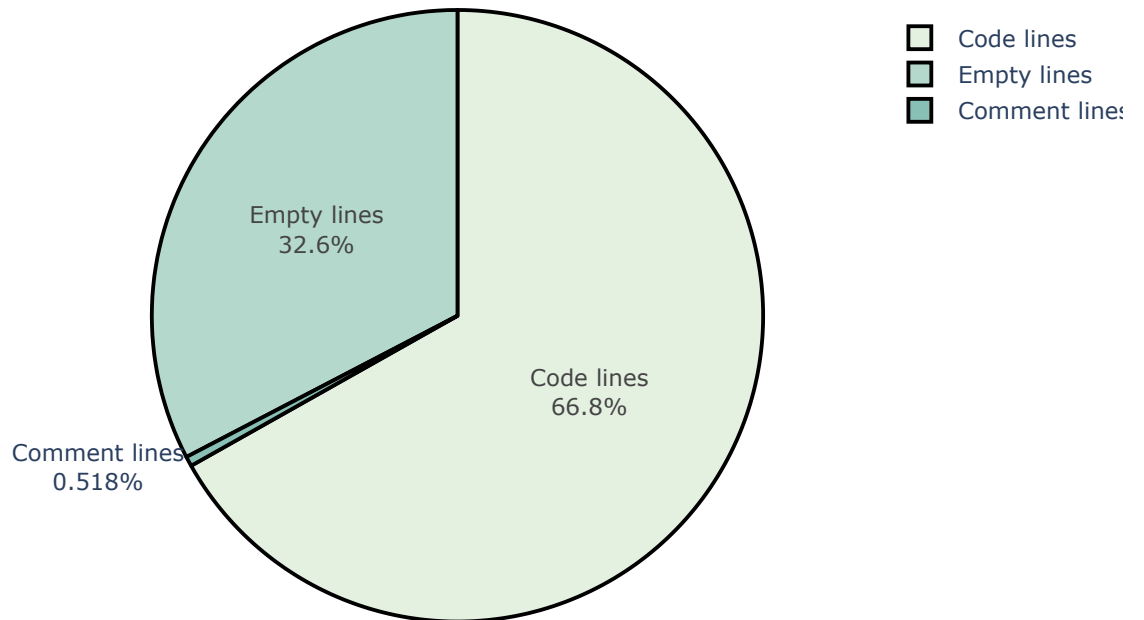
Vulnerability Level	Total	Pending	Declined	Acknowledged	Partially Resolved	Mitigated	Resolved
● Critical	0	0	0	0	0	0	0
● Major	0	0	0	0	0	0	0
● Medium	0	0	0	0	0	0	0
● Minor	1	0	0	0	0	0	1
● Informational	2	0	0	1	1	0	0
● Discussion	0	0	0	0	0	0	0

Audit Scope

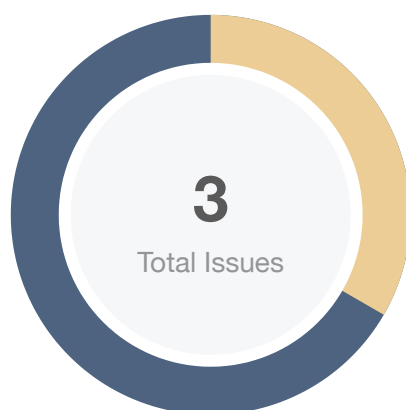
ID	File	SHA256 Checksum
CCP	cake5x.sol	6c4e69652edb7120c3d70ee5bb1dfda47c36b529bf159c5a531561211cdcfe3b
CAK	cake5x10.sol	0e42a9de3b8ee6c73f3e622897c260dedaeced86cf8977723e6d90b33cb56047

Diagrams

Source Line Chart



Findings



■ Critical	0 (0.00%)
■ Major	0 (0.00%)
■ Medium	0 (0.00%)
■ Minor	1 (33.33%)
■ Informational	2 (66.67%)
■ Discussion	0 (0.00%)

ID	Title	Category	Severity	Status
CCK-01	Variables that could be declared as immutable	Gas Optimization	● Informational	ⓘ Acknowledged
CCK-02	Third Party Dependencies	Volatile Code	● Minor	☑ Resolved
CCK-03	Lack of Documentation	Coding Style	● Informational	⌚ Partially Resolved

CCK-01 | Variables That Could Be Declared As Immutable

Category	Severity	Location	Status
Gas Optimization	● Informational	cake5x10.sol: 23, 24, 25, 26 cake5x.sol: 23, 24, 25, 26	ⓘ Acknowledged

Description

The linked variables assigned in the constructor can be declared as `immutable`. Immutable state variables can be assigned during contract creation but will remain constant throughout the lifetime of a deployed contract. A big advantage of immutable variables is that reading them is significantly cheaper than reading from regular state variables since they will not be stored in storage.

Recommendation

We recommend declaring these variables as immutable. Please note that the `immutable` keyword only works in Solidity version `v0.6.5` and up.

CCK-02 | Third Party Dependencies

Category	Severity	Location	Status
Volatile Code	● Minor	cake5x.sol: 38~40 cake5x10.sol: 38~40	☑ Resolved

Description

The contract is serving as the underlying entity to interact with third-party protocols and addresses. The scope of the audit treats 3rd party entities as black boxes and assumes their functional correctness. However, in the real world, 3rd parties can be compromised and this may lead to lost or stolen assets. In addition, upgrades of 3rd parties can possibly create severe impacts, such as increasing fees of 3rd parties, migrating to new LP pools, etc.

Recommendation

We understand that the business logic of Cake5x requires interaction with the following deployments. We encourage the team to constantly monitor the statuses of 3rd parties to mitigate the side effects when unexpected activities are observed.

```
NoUp = 0xeD9f31aa4409B7569209059765890969d4ec06CD;  
Marketing_addr = 0x48c65630BDdA8F9B315C144FB2e6Ed7dBde6B961;  
Developer_addr = 0xaA67Fcc2b13D5754713614fDf63f26F8Eeb6115b;  
planB.push(AddressDetail(0, 0xeD9f31aa4409B7569209059765890969d4ec06CD));
```

Alleviation

[Cake5X]: The production smart contract has been updated with the production `NoUp`, `Marketing_addr` and `Developer_addr` address on this GitHub link

```
NoUp = 0xF7b3840510Dd43eEa6350138f927ff76d338Dc5e;  
Marketing_addr = 0x31c14F921CAF073aeBA87d12d0Dd313814501a48;  
Developer_addr = 0x5C85253FEa555Eb106b457F50717191498476d0E;  
planB.push(AddressDetail(0, 0xF7b3840510Dd43eEa6350138f927ff76d338Dc5e));
```

CCK-03 | Lack Of Documentation

Category	Severity	Location	Status
Coding Style	● Informational	cake5x.sol: 32, 17~20, 87 cake5x10.sol: 87, 17, 32	🔄 Partially Resolved

Description

The contract lacks comments explaining the methodology of each variable, function and the reasoning behind the decisions taken. For example, the keys and values of the `investors` are undocumented. Missing documentation will hide the details of the sensitive project functionality to the developers and users and therefore increase the operation level failure.

Recommendation

We advice to add comments explaining the sensitive variables, functions and algorithms.

Alleviation

[Cake5X]: The documentation can be accessed on the <cake5x.com> website by clicking on the Documentation link at the top menu or can access it at <https://docs.cake5x.com/>

[Certik]: The documentation still lacks the comments and clarifications on the sensitive variables such as `bCount`, `Users.self`, `Users.tBCount`, `Users.upline` etc. We highly suggest the Cake5X team explicitly add comments in the codebase.

Appendix

Finding Categories

Gas Optimization

Gas Optimization findings do not affect the functionality of the code but generate different, more optimal EVM opcodes resulting in a reduction on the total gas cost of a transaction.

Volatile Code

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

Coding Style

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

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.

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