Smart Contract Security Audit Report

[2021]

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1 Executive Summary

On 2021.05.17, the SlowMist security team received the Cook Finance team's security audit application for Cook Finance, developed the audit plan according to the agreement of both parties and the characteristics of the project, and finally issued the security audit report.

The SlowMist security team adopts the strategy of "white box lead, black, grey box assists" to conduct a complete security test on the project in the way closest to the real attack.

The test method information:

Test method	Description
Black box testing	Conduct security tests from an attacker's perspective externally.
Grey box testing	Conduct security testing on code modules through the scripting tool, observing the internal running status, mining weaknesses.
White box testing	Based on the open source code, non-open source code, to detect whether there are vulnerabilities in programs such as nodes, SDK, etc.

The vulnerability severity level information:

Level	Description
Critical	Critical severity vulnerabilities will have a significant impact on the security of the DeFi project, and it is strongly recommended to fix the critical vulnerabilities.
High	High severity vulnerabilities will affect the normal operation of the DeFi project. It is strongly recommended to fix high-risk vulnerabilities.
Medium	Medium severity vulnerability will affect the operation of the DeFi project. It is recommended to fix medium-risk vulnerabilities.
Low	Low severity vulnerabilities may affect the operation of the DeFi project in certain scenarios. It is suggested that the project party should evaluate and consider whether these vulnerabilities need to be fixed.
Weakness	There are safety risks theoretically, but it is extremely difficult to reproduce in engineering.

Level	Description
Suggestion	There are better practices for coding or architecture.

2 Audit Methodology

The security audit process of SlowMist security team for smart contract includes two steps:

Smart contract codes are scanned/tested for commonly known and more specific vulnerabilities using automated analysis tools.

Manual audit of the codes for security issues. The contracts are manually analyzed to look for any potential problems.

Following is the list of commonly known vulnerabilities that was considered during the audit of the smart contract:

- Reentrancy Vulnerability
- Replay Vulnerability
- Reordering Vulnerability
- Short Address Vulnerability
- Denial of Service Vulnerability
- Transaction Ordering Dependence Vulnerability
- Race Conditions Vulnerability
- Authority Control Vulnerability
- Integer Overflow and Underflow Vulnerability
- TimeStamp Dependence Vulnerability
- Uninitialized Storage Pointers Vulnerability
- Arithmetic Accuracy Deviation Vulnerability
- tx.origin Authentication Vulnerability

- "False top-up" Vulnerability
- Variable Coverage Vulnerability
- Gas Optimization Audit
- Malicious Event Log Audit
- Redundant Fallback Function Audit
- Unsafe External Call Audit
- Explicit Visibility of Functions State Variables Aduit
- Design Logic Audit
- Scoping and Declarations Audit

3 Project Overview

3.1 Project Introduction

Audit File information:

UniswapV2IndexExchangeAdapter

Github: https://github.com/CookFinance/cook-index/blob/main/cook-protocol-contracts/contracts/protocol/integration/index-exchange/UniswapV2IndexExchangeAdapter.sol

Commit: 6a9b5d9c2fa0001c30164f45e578ab0d7d153a46

BasicIssuanceModule

Github: https://github.com/CookFinance/cook-index/blob/main/cook-protocol-contracts/contracts/protocol/modules/BasicIssuanceModule.sol

Commit: c7c89b78d97e672a2bd8e046de5d0f7bb3643ae8

3.2 Vulnerability Information

The following is the status of the vulnerabilities found in this audit:

NO	Title	Category	Level	Status
N1	Risk of external call	Others	Suggestion	Confirmed

4 Code Overview

4.1 Contracts Description

The main network address of the contract is as follows:

The code was not deployed to the mainnet.

4.2 Visibility Description

The SlowMist Security team analyzed the visibility of major contracts during the audit, the result as follows:

UniswapV2IndexExchangeAdapter			
Function Name	**Visibility**	**Mutability**	**Modifiers**
Constructor	Public	can modify state	-
getTradeCalldata	External	-	-
getSpender	External	-	-

BasicIssuanceModule			
Function Name	**Visibility**	**Mutability**	**Modifiers**
Constructor	Public	-	ModuleBase

BasicIssuanceModule			
issue	External	-	nonReentrant onlyValidAndInitializedCK
redeem	External	-	nonReentrant onlyValidAndInitializedCK
initialize	External	-	onlyCKManager onlyValidAndPendingCK
removeModule	External	-	-
getRequiredComponentUnitsForIssue	Public	-	onlyValidAndInitializedCK
_callPreIssueHooks	Internal	-	-

4.3 Vulnerability Summary

[N1] [Suggestion] Risk of external call

Category: Others

Content

BasicIssuanceModule has many external call, it suggested to be aware of the risk of external call

e.g. initialize function

```
function initialize(
    ICKToken _ckToken,
    IManagerIssuanceHook _preIssueHook
)
    external
    onlyCKManager(_ckToken, msg.sender)

    onlyValidAndPendingCK(_ckToken)
{
    managerIssuanceHook[_ckToken] = _preIssueHook;
    //SlowMist// 注意外部调用风险
    _ckToken.initializeModule();
}
```

Solution

Status

Confirmed; The project party confirms that risk and will pay attention to the risk of external call

5 Audit Result

Audit Number	Audit Team	Audit Date	Audit Result
0X002105200003	SlowMist Security Team	2021.05.17 - 2021.05.20	Passed

Summary conclusion: The SlowMist security team use a manual and SlowMist team's analysis tool to audit the project, during the audit work we found 1 suggestion were confirmed and being fixed; All other findings were fixed. The code was not deployed to the mainnet.

6 Statement

SlowMist issues this report with reference to the facts that have occurred or existed before the issuance of this report, and only assumes corresponding responsibility based on these.

For the facts that occurred or existed after the issuance, SlowMist is not able to judge the security status of this project, and is not responsible for them. The security audit analysis and other contents of this report are based on the documents and materials provided to SlowMist by the information provider till the date of the insurance report (referred to as "provided information"). SlowMist assumes: The information provided is not missing, tampered with, deleted or concealed. If the information provided is missing, tampered with, deleted, concealed, or inconsistent with the actual situation, the SlowMist shall not be liable for any loss or adverse effect resulting therefrom. SlowMist only conducts the agreed security audit on the security situation of the project and issues this report. SlowMist is not responsible for the background and other conditions of the project.

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