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SMART CONTRACT CODE REVIEW AND SECURITY ANALYSIS REPORT

Customer: NFTB
Date: July 7th, 2021

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Document

Name	Smart Contract Code Review and Security Analysis Report for NFTB - Initial Audit
Approved by	Andrew Matiukhin | CTO Hacken OU
Type	Staking, Farming
Platform	Ethereum / Solidity
Methods	Architecture Review, Functional Testing, Computer-Aided Verification, Manual Review
Zip archive	nftbstaking-main.zip md5: 09275cf2129a5c6f4128909eaca2617f
Timeline	6 JULY 2021 - 7 JULY 2021
Changelog	7 JULY 2021 - INITIAL AUDIT

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Introduction

Hacken OÜ (Consultant) was contracted by NFTB (Customer) to conduct a Smart Contract Code Review and Security Analysis. This report presents the findings of the security assessment of Customer's smart contract and its code review conducted between July 6th, 2021 - July 7th, 2021.

Scope

The scope of the project is the smart contracts in zip archive:

```
nftbstaking-main.zip
md5: 09275cf2129a5c6f4128909eaca2617f

CompoundRateKeeper      md5: 50fcae57e8708f7759937c980f25a8b0
Factory.sol             md5: 0cb4a76be02692d401741ef4f8d45e20
Farming.sol             md5: bde7dc4ced02712bc84e09121cf4da8b
Staking.sol             md5: 15e21bc15465f59fc84fc7cce1b0d70e
```

We have scanned these smart contracts for commonly known and more specific vulnerabilities. Here are some of the commonly known vulnerabilities that are considered:

Category	Check Item
Code review	▪ Reentrancy ▪ Ownership Takeover ▪ Timestamp Dependence ▪ Gas Limit and Loops ▪ DoS with (Unexpected) Throw ▪ DoS with Block Gas Limit ▪ Transaction-Ordering Dependence ▪ Style guide violation ▪ Costly Loop ▪ ERC20 API violation ▪ Unchecked external call ▪ Unchecked math ▪ Unsafe type inference ▪ Implicit visibility level ▪ Deployment Consistency ▪ Repository Consistency ▪ Data Consistency

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Functional review	▪ Business Logics Review ▪ Functionality Checks ▪ Access Control & Authorization ▪ Escrow manipulation ▪ Token Supply manipulation ▪ Asset’s integrity ▪ User Balances manipulation ▪ Kill-Switch Mechanism ▪ Operation Trails & Event Generation

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Executive Summary

According to the assessment, the Customer's smart contracts are secured but having some issues with gas consumptions and centralization.

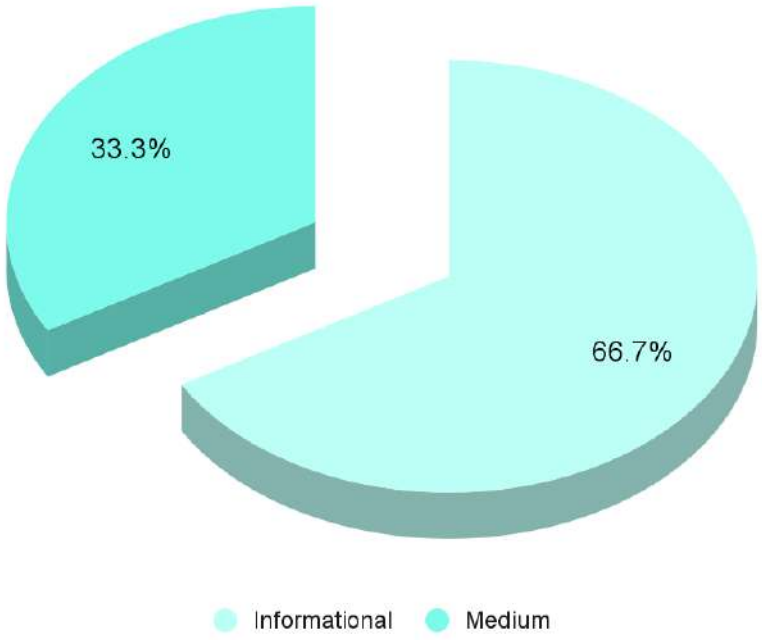
Insecure	Poor secured	Secured	Well-secured

You are here

Our team performed an analysis of code functionality, manual audit, and automated checks with Mythril and Slither. All issues found during automated analysis were manually reviewed, and important vulnerabilities are presented in the Audit overview section. All found issues can be found in the Audit overview section.

Security engineers found **1** medium and **2** informational issues during the first review.

Graph 1. The distribution of vulnerabilities after the first review.



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Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to assets loss or data manipulations.
High	High-level vulnerabilities are difficult to exploit; however, they also have a significant impact on smart contract execution, e.g., public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to assets loss or data manipulations.
Low	Low-level vulnerabilities are mostly related to outdated, unused, etc. code snippets that can't have a significant impact on execution
Lowest / Code Style / Best Practice	Lowest-level vulnerabilities, code style violations, and info statements can't affect smart contract execution and can be ignored.

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Audit overview

Critical

No Critical severity issues were found.

High

No High severity issues were found.

Medium

Vulnerability: Centralization

In any period of time the owner could set rewards per block to any amount, even 0. If a user didn't do updateRewards, all their rewards would be burned.
Also in the Staking.setInterestRate. Owner could change it any time and no one will be able to react to changes.

Recommendation: Please consider moving ownership to a timelock or governance contract.

Lines: Farming.sol#99-102

```
function updateRewardPerBlock(uint256 _newRewardPerBlock) external
onlyOwner {
    rewardPerBlock = _newRewardPerBlock;
    _updateCumulativeSum();
}
```

Lines: Staking.sol#177-182

```
function setInterestRate(uint256 _newInterestRate) external override
onlyOwner {
    require(_newInterestRate <= 76036763190083298292, "[E-202]-Can't
be more than 1000%.");

    updateCompoundRate();
    interestRate = _newInterestRate;
}
```

Low

No Low severity issues were found.

Lowest / Code style / Best Practice

1. **Vulnerability:** State variable should be immutable

State variable which initializes in the constructor and never changes its value should be declared immutable to save gas.

Lines: Farming.sol#10-11

```
IERC20 public stakeToken;
IERC20 public distributionToken;
```

Lines: Staking.sol#12-13

```
CompoundRateKeeper public compRateKeeper;
IERC20 public token;
```

2. **Vulnerability:** Public function that could be declared external

public functions that are never called by the contract should be declared **external** to save gas.

Lines: Staking.sol#154

```
function getBalance() public view override returns (uint256) {
```

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Conclusion

Smart contracts within the scope were manually reviewed and analyzed with static analysis tools.

Audit report contains all found security vulnerabilities and other issues in the reviewed code.

Security engineers found **1** medium and **2** informational issues during the first review.

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Disclaimers

Hacken Disclaimer

The smart contracts given for audit have been analyzed in accordance with the best industry practices at the date of this report, in relation to cybersecurity vulnerabilities and issues in smart contract source code, the details of which are disclosed in this report (Source Code); the Source Code compilation, deployment, and functionality (performing the intended functions).

The audit makes no statements or warranties on security of the code. It also cannot be considered as a sufficient assessment regarding the utility and safety of the code, bugfree status or any other statements of the contract. While we have done our best in conducting the analysis and producing this report, it is important to note that you should not rely on this report only - we recommend proceeding with several independent audits and a public bug bounty program to ensure security of smart contracts.

Technical Disclaimer

Smart contracts are deployed and executed on the blockchain platform. The platform, its programming language, and other software related to the smart contract can have its vulnerabilities that can lead to hacks. Thus, the audit can't guarantee the explicit security of the audited smart contracts.