VIBRANIUM AUDITS

Security Assessment

# PRDT Finance

Audited by Vibranium Audits on 06 June 2024

Revised on 12 June 2024

Vibranium Audits Verified on June 12th, 2024

# PRDT Finance

The security assessment was prepared by Vibranium Audits.

## Executive Summary

| TYPES | ECOSYSTEM | METHODS |
|---|---|---|
| DEFI | EVM | Manual Review & Static Analysis |

| LANGUAGE | TIMELINE | KEY COMPONENTS |
|---|---|---|
| Solidity | Delivered on 06/06/2024 | SafeERC20/Deposit |

CODEBASE

https://github.com/PRDTfinance/NewDeposit-Solidity/tree/main

COMMITS

75a85a6b2b6e23220ec1059d85e23f3d4770479f

## Vulnerability Summary

| 03 | 02 | 01 | 0 | 03 | 01 | 0 |
|---|---|---|---|---|---|---|
| Total Findings | Resolved | Mitigated | Partially Resolved | Acknowledged | Declined | Unresolved |

| | | |
|---|---|---|
| 0 Critical | 0 resolved | Critical vulnerabilities are usually straightforward to exploit and can lead to the loss of user funds or contract state manipulation by external or internal actors. |
| 1 High | 1 Resolved | High vulnerabilities are usually harder to exploit, requiring specific conditions, or have a more limited scope, but can still lead to the loss of user funds or contract state manipulation by external or internal actors. |
| 0 Medium | 0 Resolved | Medium vulnerabilities are usually limited to state manipulations, but cannot lead to assets loss. Major deviations from best practices are also in this category. |
| 1 Low | 1 Resolved | Low vulnerabilities are related to outdated and unused code or minor gas optimization. These issues won't have a significant impact on code execution, but affect the code quality. |
| 1 Informational | 1 Mitigated | Informational errors are often recommendations to improve the style of the code or certain operations to fall within industry best practices. They usually do not affect the overall functioning of the code. |

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# CODEBASE | PRDT FINANCE

## Repository

https://github.com/PRDTfinance/NewDeposit-Solidity/tree/main

## Commit

75a85a6b2b6e23220ec1059d85e23f3d4770479f

# AUDIT SCOPE | PRDT FINANCE

1 file audited ● 1 file with Acknowledged findings ● 1 files with Resolved findings

| ID | Files | Commit Hash |
|---|---|---|
| ● PRA | Vulnerabilities under ProBalance.sol | b474271943210921947b09bc6e005d55c8316db8 |

# APPROACH & METHODS | PRDT FINANCE

This report has been prepared for PRDT FINANCE(2024) to discover issues and vulnerabilities in the source code of the PRDT project as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Manual Review and Static Analysis techniques.

The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the code base 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:

- Testing the smart contracts against both common and uncommon attack vectors.
- Enhance general coding practices for better structures of source codes.
- Review unit tests to cover the possible use cases.
- Review functions for readability, especially for future development work.

# FINDINGS | PRDT

| 03 | 0 | 01 | 0 | 01 | 01 |
|---|---|---|---|---|---|
| Total Findings | Critical | High | Medium | Low | Informational |

This report has been prepared to discover issues and vulnerabilities for PRDT.
Through this audit, we have uncovered 3 issues ranging from different severity levels.
Utilizing the techniques of Manual Review & Static Analysis to complement rigorous manual code reviews, we discovered the following findings:

| ID | Title | Category | Severity | Status |
|---|---|---|---|---|
| PRA-01 | Reentrancy-eth | Logical Issue | High | Revised |
| PRA-02 | Centralized Ownership | Logical Issue | Low | Revised |
| PRA-03 | Lack of Documentation | Style Issue | Informational | Mitigated |

# PRA-01 | Reentrancy-eth

| Categor y | Severity | Location | Status |
|---|---|---|---|
| Logical Issue | High | ProBalance.sol | Revised |

## Description

A reentrancy is a programmatic approach in which an attacker performs recursive withdrawals to steal all Ethers locked in a contract.

Although the 'safeTransferFrom(..)' function is implemented and considered as good practice in comparison to using normal ERC20 Functions, some measures need to be taken to protect against Reentrancy in many of the smart contract's key functionalitites:

- addBalance()
- addBalanceWithSwap( address targetToken, uint256 amountOutMinimum, uint24 poolFee )
- addTokenBalance(address token, uint256 amount)
- addTokenBalanceWithSwap(...)
- addTokenBalanceWithMultihop(...)
- addTokenBalanceForUser(...)
- injectTreasury()

All these functionalities contain vulnerable operations on ETH/Tokens and changing of storage variables correlating to balances of users and accounts.

## Recommendation

Implement Openzeppelin's ReentrancyGuard.sol smart contract with the 'nonReentrant' modifier on the relevant functions and for better optimality and coding standards, implement the Check Effects Interactions pattern.

## Revision

The PRDT Finance team succesfully implemented OpenZeppelin's ReentrancyGuard smart contract and used the 'nonReentrant' modifier on all the needed functions.

# PRA-02 | Centralized Ownership

| Category | Severity | Location | Status |
|---|---|---|---|
| Logical Issue | Low | ProBalance.sol | Revised |

## Description

The reviewed smart contract relies on Openzeppelin's 'Ownable.sol' or a custom version of it to manage ownership of the contracts. Although no particular vulnerability is related to said used smart contract, having a single address gain ownership over the entire architecture could lead to severe issues outside of the project's or developers' control such as:

- Loss of the Owner address.
- Owner address private key gets compromised by external party.

## Recommendation

- Implement a multi-sig address as owner of the smart contracts, thus requiring multiple confirmations before executing one of the key and critical functionalities.
- OR implement a multi-owner structure (similar to Access Control) where multiple address on the smart contracts, thus preventing the complete loss of ownership if one owner address is lost.

## Revision

The PRDT Finance team will be opting for external measures to secure the Owner address.

# PRA-03 | Lack of Documentation

| Categor y | Severity | Location | Status |
|---|---|---|---|
| Style Issue | Informational | ProBalance.sol | Acknowledged |

## Description

The reviewed ‘ProBalance.sol’ smart contract hardly contains any documentation apart from a few comments on certain functions. We recommend providing a complete documentation for the purpose of easing the communication between internal and external developers in the future and any other interested third party.

## Acknowledgement:

The PRDT Finance team has confirmed that the documentation of their codebase is a work in progress as they continue on developing the PRDT protocol and will have a complete thorough documentation once certain functional milestones are completed.

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