HACKEN

SMART CONTRACT CODE REVIEW AND SECURITY ANALYSIS REPORT

Customer: BlackFisk
Date: February 4th, 2021

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Document

Name	Smart Contract Code Review and Security Analysis Report for BlackFisk (11 pages)
Approved by	Andrew Matiukhin | CTO Hacken OU
Type	Token
Platform	Ethereum / Solidity
Methods	Architecture Review, Functional Testing, Computer-Aided Verification, Manual Review
Address	https://etherscan.io/address/0x417fFdBc285dd2C4dC00937798ab901634137caA#code
Timeline	3RD FEB 2021 - 4TH FEB 2021
Changelog	4TH FEB 2021- Initial Audit

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Introduction

Hacken OÜ (Consultant) was contracted by BlackFisk (Customer) to conduct a Smart Contract Code Review and Security Analysis. This report presents the findings of the security assessment of the Customer's smart contract and its code review conducted between February 3rd, 2021 - February 4th, 2021.

Scope

The scope of the project is smart contract in the mainnet:

```
Address:
https://etherscan.io/address/0x417fFdBc285dd2C4dC00937798ab901634137caA#code
```

We have scanned this smart contract 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
Functional review	▪ Business Logics Review ▪ Functionality Checks ▪ Access Control & Authorization ▪ Escrow manipulation ▪ Token Supply manipulation ▪ Assets integrity ▪ User Balances manipulation ▪ Data Consistency manipulation ▪ Kill-Switch Mechanism ▪ Operation Trails & Event Generation

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Executive Summary

According to the assessment, the Customer's Token smart contract has not critical vulnerabilities and can be considered secure.

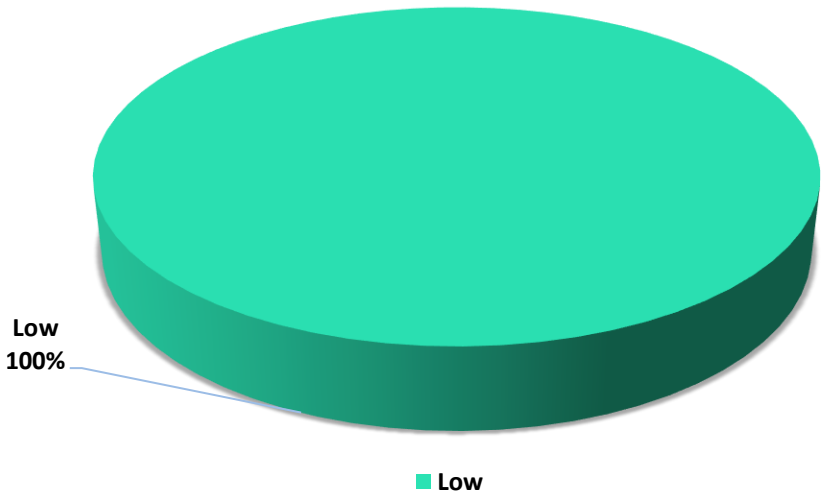
Insecure	Poor secured	Secured	Well-secured

You are

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. A general overview is presented in AS-IS section, and all found issues can be found in the Audit overview section.

Security engineers found **2** low severity issues during the audit.

Graph 1. The distribution of vulnerabilities.



[1] Look for details and justification in conclusion section

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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 essential 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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AS-IS overview

Description

BlackFisk is an ERC20 token contract based on the *OpenZeppelin* source code. The only difference is the *constructor* function, which mints 140,000 BLFI tokens. After the contract is deployed, new tokens cannot be minted, but can be burned.

Imports

BlackFisk contract has 6 imports:

- *Context* – from *OpenZeppelin*
- *IERC20* – from *OpenZeppelin*
- *SafeMath* – from *OpenZeppelin*
- *Address* – from *OpenZeppelin*
- *Ownable* – from *OpenZeppelin*
- *ERC20* – from *OpenZeppelin*

Inheritance

BlackFisk contract inherits *ERC20* and *Ownable*.

Fields

BlackFisk contract has 1 field:

- *uint256 public total* – total supply;

Functions

BlackFisk contract has 2 functions:

- ***constructor***

  Description

  Initializes the contract. Mints 140,000 BLFI tokens.

  Visibility

  public

  Input parameters

None

Constraints

None

Events emit

None

Output

None

- *burn*

  Description

  Burns the tokens from *msg.sender*.

  Visibility

  public

  Input parameters

  - *uint256 _amount* – an amount to burn;

  Constraints

  None

  Events emit

  None

  Output

  None

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Audit overview

Critical

No critical issues were found.

High

No high issues were found.

Medium

No medium issues were found.

Low

1. No functions of the *Ownable* contract are used. This contract import is not needed.
2. The *total* field should be constant because it doesn't change.

Lowest / Code style / Best Practice

No lowest severity issues were found.

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Conclusion

Smart contracts within the scope were manually reviewed and analyzed with static analysis tools. For the contract, high-level description of functionality was presented in As-is overview section of the report.

Security engineers found **2** low severity issues during the audit.

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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 the 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 the security of smart contracts.

Technical Disclaimer

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