BlockApex

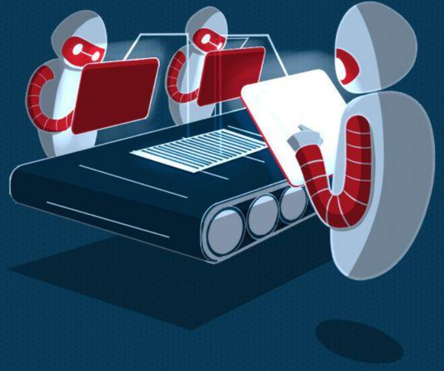
SMART CONTRACT SECURITY ANALYSIS REPORT

```
pragma solidity 0.7.0;
contract Contract {

    function hello() public returns (string) {
        return "Hello World!";
    }

    function findVulnerability() public returns (string) {
        return "Finding Vulnerability";
    }

    function solveVulnerability() public returns (string) {
        return "Solve Vulnerability";
    }
}
```



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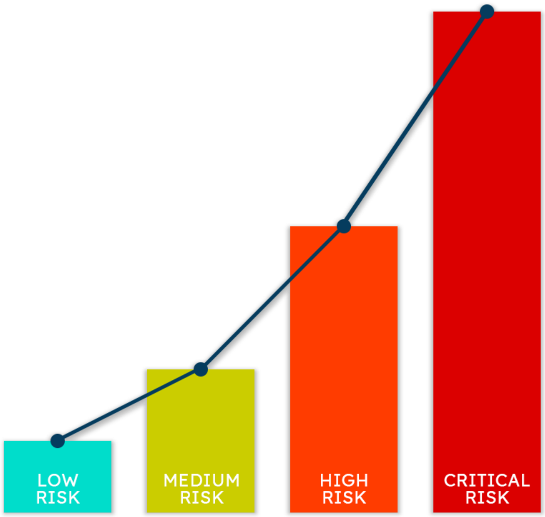
PREFACE

Objectives

The purpose of this document is to highlight the identified bugs/issues in the provided codebase. This audit has been conducted in a closed and secure environment, free from influence or bias of any sort. This document may contain confidential information about IT systems/architecture and intellectual property of the client. It also contains information about potential risks and the processes involved in mitigating/exploiting the risks mentioned below.

The usage of information provided in this report is limited, internally, to the client. However, this report can be disclosed publicly with the intention to aid our growing blockchain community; under the discretion of the client.

Key Understandings



CRITICAL RISK xxxx	Critical vulnerabilities are too easy to exploit and can lead to damages/loss in assets or manipulations.
HIGH RISK xxx	High-level vulnerabilities are difficult to exploit; however, they also have a significant impact on smart contract execution.
MEDIUM RISK xx	Medium-level vulnerabilities are equally imperative to fix but they tend to have minimal impact on asset loss or data manipulations.
LOW RISK x	Lowest-level vulnerabilities, informational errors, violating code styles/practices usually can't affect smart contract execution; hence they can be ignored.

PREFACE **2**

Objectives 2

Key Understandings 2

INTRODUCTION **4**

Project Details 4

Scope 5

AUDIT REPORT **6**

Executive Summary 6

Findings 7

Critical-risk issues 7

High-risk issues 7

Medium-risk issues 7

Low-risk issues 8

Test Coverage 8

DISCLAIMER **9**

INTRODUCTION

BlockApex (Auditor) was contracted by __PheonixDAO___ (Client) for the purpose of conducting a Smart Contract Audit/Code Review. This document presents the findings of our analysis which took place on _____12th June 2021_____.

Project Details

Name
PheonixDAO Bride ETH2BNB and BNB2ETH **(Initial Audit)**
Auditor
Moazzam Arif | Shakeib Shaida
Platform
Ethereum/Solidity
Type of review
Bridge Implementation
Methods
Static Analysis and Manual Review
Git Repository
https://github.com/XORD-one/bsc-bridge-contracts/tree/5c67b4c60c1bed1008ad58bd750c8375ee83470c/contracts
Document log
Day1: 17th April 2021 (Initial Audit)
Day2: (Final Audit pending)

Scope

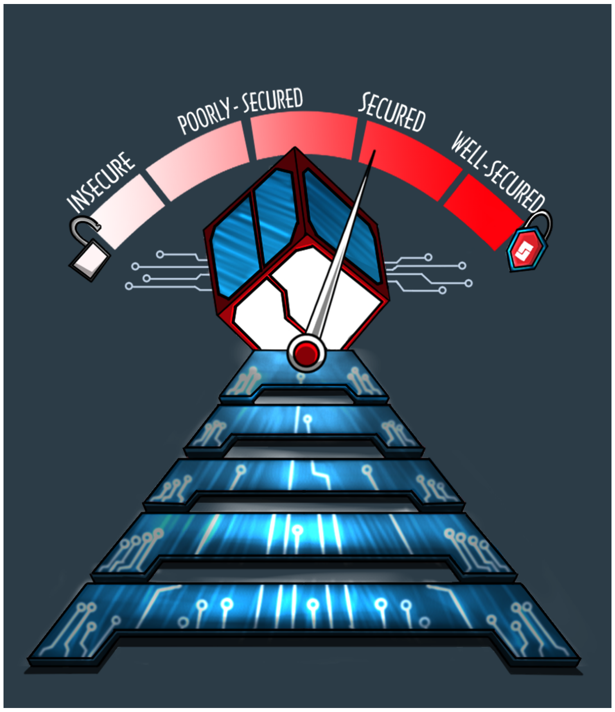
The git-repository shared was checked for common code violations along with vulnerability-specific probing to detect major issues/vulnerabilities. Some specific checks are as follows:

Code review		Functional review
Reentrancy	Unchecked external call	Business Logics Review
Ownership Takeover	ERC20 API violation	Functionality Checks
Timestamp Dependence	Unchecked math	Access Control & Authorization
Gas Limit and Loops	Unsafe type inference	Escrow manipulation
DoS with (Unexpected) Throw	Implicit visibility level	Token Supply manipulation
DoS with Block Gas Limit	Deployment Consistency	Asset’s integrity
Transaction-Ordering Dependence	Repository Consistency	User Balances manipulation
Style guide violation	Data Consistency	Kill-Switch Mechanism
Costly Loop		Operation Trails & Event Generation

AUDIT REPORT

Executive Summary

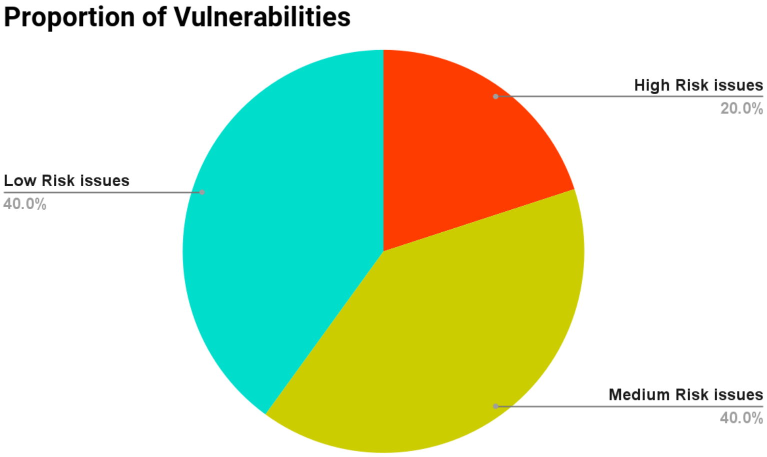
The analysis indicates that the contracts audited are **secure**. However, one issue that can be exploited is the case of frontrunning.



Our team performed a technique called “Filtered Audit”, where the contract was separately audited by two individuals. After their thorough and rigorous process of manual testing, an automated review was carried out using Mythril and Slither. All the flags raised were manually reviewed and re-tested.

Our team found:

# of issues	Severity of the risk
0	Critical Risk issue
1	High Risk issue
2	Medium Risk issue
2	Low Risk issue



Findings

Critical-risk issues

No critical issues were found

High-risk issues

1. **Frontrunning**:

   function withdrawToken() in **ETH2BNBBridge.sol** and function mintToken() in **BNB2ETH.sol** can be exploited by frontrunners. As the functions are public and anyone can invoke them.

   Remedy:

   Check that function is invoked by the signer by adding a modifier or by adding msg.sender in bytes32 encodeData = keccak256(abi.encode(v1,r1,s1,_nonce, msg.sender))

Medium-risk issues

1. Signer can mint without burning on the other chain. Maybe due to race conditions on a centralized relayer server.
2. Reentrancy in function depositToken() at line IERC20(phnxAddress).transferFrom(msg.sender,address(this),amount); if phnxAddress is malicious.

   Suggestion: Team ensured that PhoenixAddress won't be malicious and is also never be set again once deployed

Low-risk issues

1. Variable shadowing in _nonce at function withdrawToken(uint256 amount ,uint256 _nonce ,uint8 v1, bytes32 r1, bytes32 s1,uint8 v2, bytes32 r2, bytes32 s2).

   Suggestions: use any other name for _nonce

2. Unchecked zero-address while transferring token in function depositToken() and also in function withdrawToken()

   Suggestion: require address(0)

Test Coverage

No tests were provided in the repository.

DISCLAIMER

The smart contracts provided by the client for audit purposes have been thoroughly analyzed in compliance with the global best practices till date w.r.t cybersecurity vulnerabilities and issues in smart contract code, the details of which are enclosed in this report.

This report is not an endorsement or indictment of the project or team, and they do not in any way guarantee the security of the particular object in context. This report is not considered, and should not be interpreted as an influence, on the potential economics of the token, its sale or any other aspect of the project.

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Smart contracts are deployed and executed on a blockchain. The platform, its programming language, and other software related to the smart contract can have its vulnerabilities that can lead to hacks. The scope of our review is limited to a review of the Solidity code and only the Solidity code we note as being within the scope of our review within this report. The Solidity language itself remains under development and is subject to unknown risks and flaws. The review does not extend to the compiler layer, or any other areas beyond Solidity that could present security risks.

This audit cannot be considered as a sufficient assessment regarding the utility and safety of the code, bug-free 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.