PotentStake

SMART CONTRACT AUDIT REPORT

Prepared by:

BlockAudit

Date Of Enrollment:

March 14th, 2022 - March 20th, 2022

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SUMMARY

This Audit Report mainly focuses on the extensive security of **POTENTSTAKE** Smart Contracts. With this report, we attempt to ensure the reliability and correctness of the smart contract by complete and rigorous assessment of the system's architecture and the smart contract codebase.

The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase 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 producedby industry leaders.
- Thorough line-by-line manual review of the entire codebase 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:

- Enhance general coding practices for better structures of source codes;
- Add enough unit tests to cover the possible use cases;
- Provide more comments per each function for readability, especially contracts that are verified inpublic;
- Provide more transparency on privileged activities once the protocol is live.

OVERVIEW

Project Summary

Project Name	POTENTSTAKE
Logo	
Platform	BSC
Language	Solidity
Code Link	https://bscscan.com/address/0x18521961b54973BC8b4d542DB6168275a3393871#code

File Summary

ID	File Name	Audit Status
PS	token.sol	Failed

Audit Summary

Date of Delivery	20 March 2022
Audit Methodology	Code Analysis. Automatic Assesment, Manual Review
Audit Result	Failed ✕
Audit Team	BlockAudit Report Team

FINDINGS

Critical	0	0.0%
High	0	0.0%
Medium	2	15%
Low	1	8%
Informational	0	0.0%
Ownership	0	0.0%
Gas Optimization	10	77%

Vulnerability Findings Summary

ID	Type	Line	Severity	Status
PS01	Use SafeTransfer/ SafeTransferFrom Consistently Instead Of Transfer/ TransferFrom	430	Medium	Reported
PS02	USE SAFEAPPROVE INSTEAD OF APPROVE	190/199/211	Low	Reported
PS03	Use Of Block.Timestamp	291/350/391	Low	Reported
PS04	++I/I++ Should Be Unchecked{++I}/ Unchecked{I++} When It Is Not Possible For Them To Overflow, As Is The Case When Used In For- And While-Loops	279	Low	Reported
PS05	Using > 0 Costs More Gas Than != 0 When Used On A Uint In A Require() Statement	336/368	Low	Reported
PS06	An Array's Length Should Be Cached To Save Gas In For-Loops	299/385/408	Low	Reported
PS07	Use A More Recent Version Of Solidity	7	Gas Optimization	Reported

PS01

Type	Use safeTransfer/safeTransferFrom consistently instead of transfer/ transferFrom
Severity	Medium
File	Token.sol
Line	430
Status	**Reported**

Description

It is good to add a require() statement that checks the return value of token transfers or to use something like OpenZeppelin's safeTransfer/safeTransferFrom unless one is sure the given token reverts in case of a failure. Failure to do so will cause silent failures of transfers and affect token accounting in contract.

Remediation

Consider using safeTransfer/safeTransferFrom or require() consistently.

Snapshot

PS02

Type	USE SAFEAPPROVE INSTEAD OF APPROVE
Severity	Medium
File	Token.sol
Line	190/199/211
Status	**Reported**

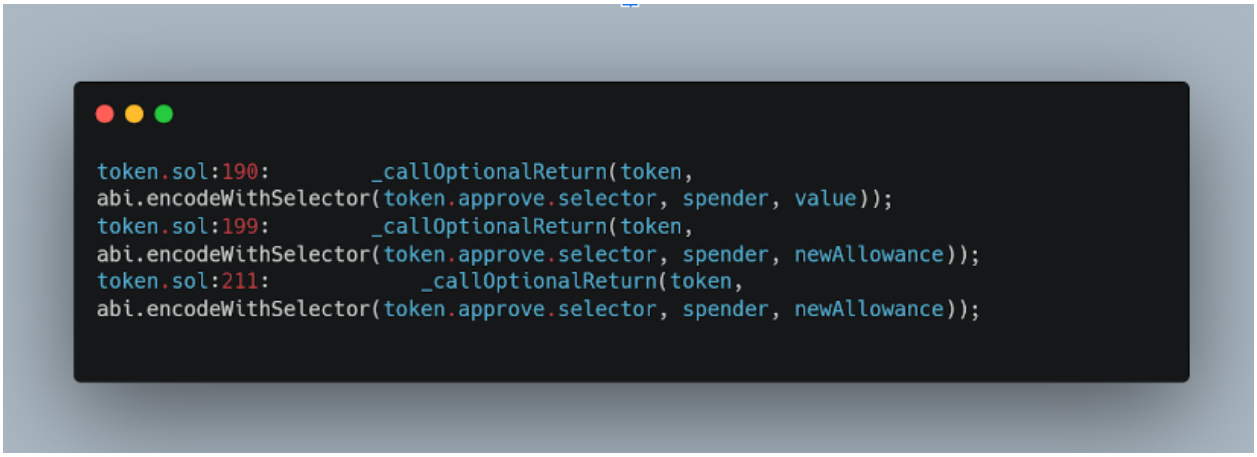
Description

This is probably an oversight since SafeERC20 was imported and safeTransfer() was used for ERC20 token transfers. Nevertheless, note that approve() will fail for certain token implementations that do not return a boolean value (). Hence it is recommend to use safeApprove().

Remediation

Update to safeapprove in the function.

Snapshot



PS03

Type	Use of Block.Timestamp
Severity	Low
File	Token.sol
Line	291/350/391
Status	**Reported**

Description

Block timestamps have historically been used for a variety of applications, such as entropy for random numbers (see the Entropy Illusion for further details), locking funds for periods of time, and various state-changing conditional statements that are time-dependent. Miners have the ability to adjust timestamps slightly, which can prove to be dangerous if block timestamps are used incorrectly in smart contracts.

Snapshot

```
token.sol:291:
 players[_addr].last_payout =
uint40(block.timestamp);
token.sol:350:              time:
uint40(block.timestamp)
token.sol:391:              uint40 to =
block.timestamp > time_end ? time_end :
uint40(block.timestamp);
```

PS04

Type	++i/i++ should be unchecked{++i}/unchecked{i++} when it is not possible for them to overflow, as is the case when used in for- and while-loops
Severity	Gas Optimisation
File	Token.sol
Line	279
Status	**Reported**

Description

The unchecked keyword is new in solidity version 0.8.0, so this only applies to that version or higher, which these instances are. This saves 30-40 gas [PER LOOP]

Snapshot

PS05

Type	Using > 0 costs more gas than != 0 when used on a uint in a require() statement
Severity	Gas Optimisation
File	Token.sol
Line	336/368
Status	**Reported**

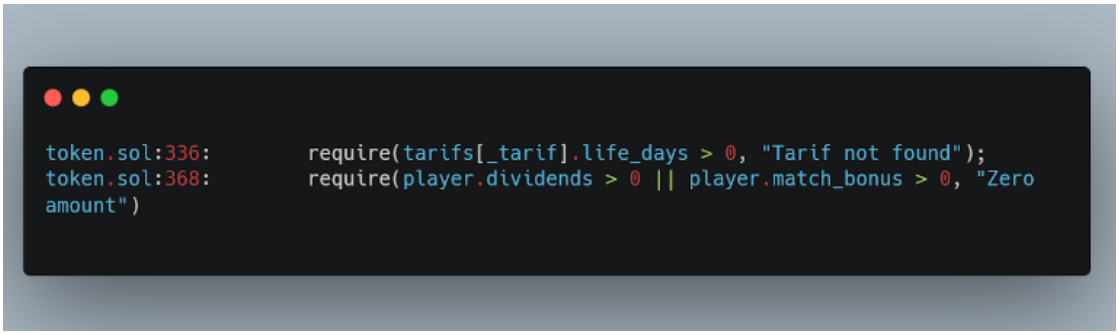
Description

> 0 is less efficient than != 0 for unsigned integers (with proof)
!= 0 costs less gas compared to > 0 for unsigned integers in require statements with the optimizer enabled (6 gas)
Proof: While it may seem that > 0 is cheaper than !=, this is only true without the optimizer enabled and outside a require statement. If you enable the optimizer at 10k AND you're in a require statement, this will save gas.

Remediation

I suggest changing > 0 with != 0. Also, please enable the Optimizer.

Snapshot



PS06

Type	An array's length should be cached to save gas in for-loops
Severity	Gas Optimisation
File	Token.sol
Line	299/385/408
Status	**Reported**

Description

Reading array length at each iteration of the loop takes 6 gas (3 for mload and 3 to place memory_offset) in the stack.
Caching the array length in the stack saves around 3 gas per iteration.

Remediation

Here, I suggest storing the array's length in a variable before the for-loop, and use it instead.

Snapshot

PS07

Type	Use a more recent version of solidity
Severity	Gas Optimisation
File	Token.sol
Line	07
Status	**Reported**

Description

Use a solidity version of at least 0.8.2 to get simple compiler automatic inlining
Use a solidity version of at least 0.8.3 to get better struct packing and cheaper multiple storage reads
Use a solidity version of at least 0.8.4 to get custom errors, which are cheaper at deployment than revert()/require() strings
Use a solidity version of at least 0.8.10 to have external calls skip contract existence checks if the external call has a return value

Snapshot

APPENDIX

Auditing Approach and Methodologies applied

The Block Audit Report team has performed rigorous testing of the project including the analysis of the code design patterns where we reviewed the smart contract architecture to ensure it is structured along with the safe use of standard inherited contracts and libraries. Our team also conducted a formal line by line inspection of the Smart Contract i.e., a manual review, to find potential issues including but not limited to

- Race conditions
- Zero race conditions approval attacks
- Re-entrancy
- Transaction-ordering dependence
- Timestamp dependence
- Check-effects-interaction pattern (optimistic accounting)
- Decentralized denial-of-service attacks
- Secure ether transfer pattern
- Guard check pattern
- Fail-safe mode
- Gas-limits and infinite loops
- Call Stack depth

In the Unit testing Phase, we coded/conducted custom unit tests written against each function in the contract to verify the claimed functionality from our client. In Automated Testing, we tested the Smart Contract with our standard set of multifunctional tools to identify vulnerabilities and security flaws. The code was tested in collaboration of our multiple team members and this included but not limited to;

- Testing the functionality of the Smart Contract to determine proper logic has been followed throughout the whole process.
- Analyzing the complexity of the code in depth and in detail line-by-line manual review of the code.
- Deploying the code on testnet using multiple clients to run live tests.
- Analyzing failure preparations to check how the Smart Contract performs in case of any bugs and vulnerabilities.
- Checking whether all the libraries used in the code are on the latest version.
- Analyzing the security of the on-chain data.

Issue Categories:

Every issue in this report was assigned a severity level from the following:

Critical Severity Issues

Issues of Critical Severity leaves smart contracts vulnerable to major exploits and can lead to asset loss and data loss. These can have significant impact on the functionality/performance of the smart contract.
We recommend these issues must be fixed before proceeding to MainNet..

High Severity Issues

Issues of High Severity are not as easy to exploit but they might endanger the execution of the smart contract and potentially create crucial problems.
Fixing these issues is highly recommended before proceeding to MainNet.

Medium Severity Issues

Issues on this level are not a major cause of vulnerability to the smart contract, they cannot lead to data-manipulations or asset loss but may affect funtionality.
It is important to fix these issues before proceeding to MainNet.

Low Severity Issues

Issues at this level are very low in their impact on the overall functionality and execution of the smart contract. These are mostly code-level violations or improper formatting.
These issues can be remain unfixed or can be fixed at a later date if the code is redeployed or forked.

Informational Findings

These are finding that our team comes accross when manually reviewing a smart contract which are important to know for the owners as well as users of a contract.
These issues must be acknowledged by the owners before we publish our report.

Ownership Priviledges

Owner of a smart contract can include certain rights and priviledges while deploying a smart contract that might be hidden deep inside the codebase and may make the project vulnerable to rug-pulls or other types of scams.
We at BlockAudit believe in transparency and hence we showcase Ownership priviledges separately so the owner as well as the investors can get a better understanding about the project.

Gas Optimization

Solidity gas optimization is the process of lowering the cost of operating your Solidity smart code. The term "gas" refers to the level of processing power required to perform specific tasks on the Ethereum network.
Each Ethereum transaction costs a fee since it requires the use of computer resources. It will deduct a fee anytime any function in the smart contract is invoked by the contract's owner or users.

DISCLAIMER

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for the client to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that the client should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for the client to conduct the client's own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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The analysis of the security is purely based on the received smart contracts alone. No related/third-party smart contracts, applications or operations were reviewed for security. No product code has been reviewed.

Note: The statements made in this document should not be interpreted as investment or legal advice, nor should its authors be held accountable for decisions made based on them. Securing smart contracts is a multistep process. One audit cannot be considered enough. We recommend that the **POTENTSTAKE** team put a bug bounty program in place to encourage further analysis of the smart contracts by other third parties

About BlockAudit

BlockAudit is an industry leading security organisation that helps web3 blockchain based projects with their security and correctness of their smart-contracts. With years of experience we have a dedicated team that is capable of performing audits in a wide variety of languages including HTML, PHP, JS, Node, React, Native, Solidity, Rust and other Web3 frameworks for DApps, DeFi, GameFi and Metaverse platforms.

With a mission to make web3 a safe and secure place BlockAudit is commited to provide it's partners with a budget and investor friendly security Audit Report that will increase the value of their projects significantly.

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