

SMART CONTRACT AUDIT

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PREPARED FOR

BLAZEX STAKING CONTRACT



INTRODUCTION

Auditing Firm	InterFi Network
Client Firm	BlazeX
Methodology	Automated Analysis, Manual Code Review
Language	Solidity
Contract	0x3E1385ea646ed225B95367B8d3d93b5bab516525
Blockchain	Binance Smart Chain
Centralization	Active ownership
Commit F INT	326241ed8935407aa4ac72c2b8e4d80a4e7283a4 NERF NERF
Website	https://blazex.org/
Telegram	https://t.me/BlazeXCoin/
Twitter	https://twitter.com/blazexcoin/
YouTube	https://www.youtube.com/@Blazextoken/
Report Date	August 14, 2023

I Verify the authenticity of this report on our website: https://www.github.com/interfinetwork



EXECUTIVE SUMMARY

InterFi has performed the automated and manual analysis of solidity codes. Solidity codes were reviewed for common contract vulnerabilities and centralized exploits. Here's a quick audit summary:

Status	Critical 🔵	Major 🛑	Medium 🖯	Minor	Unknown
Open	0	0	1	4	0
Acknowledged	0	1	0	1	1
Resolved	0	1	0	1	0
Noteworthy Privileges Emergency Withdraw, Withdraw Marketing, Set Minimum Burn Threshold, Change Reward Percentage, Set Minimum Amount Tokens					urn Threshold,

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Please note that smart contracts deployed on blockchains aren't resistant to exploits, vulnerabilities and/or hacks. Blockchain and cryptography assets utilize new and emerging technologies. These technologies present a high level of ongoing risks. For a detailed understanding of risk severity, source code vulnerability, and audit limitations, kindly review the audit report thoroughly.

Please note that centralization privileges regardless of their inherited risk status - constitute an elevated impact on smart contract safety and security.



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SCOPE OF WORK

InterFi was consulted by BlazeX to conduct the smart contract audit of their solidity source codes. The audit scope of work is strictly limited to mentioned solidity file(s) only:

- o StakingBlazex.sol
- If source codes are not deployed on the main net, they can be modified or altered before mainnet deployment. Verify the contract's main-net deployment status below:

Public Contract Link				
https://bscscan.com/address/0x3e1385ea646ed225b95367b8d3d93b5bab516525#code				
Contract Name	StakingBlazex StakingBlazex			
Compiler Version	0.8.17			
License	MIT			
Blockchain Type	Mainnet			



AUDIT METHODOLOGY

Smart contract audits are conducted using a set of standards and procedures. Mutual collaboration is essential to performing an effective smart contract audit. Here's a brief overview of InterFi's auditing process and methodology:

CONNECT

 The onboarding team gathers source codes, and specifications to make sure we understand the size, and scope of the smart contract audit.

AUDIT

- Automated analysis is performed to identify common contract vulnerabilities. We may use the following third-party frameworks and dependencies to perform the automated analysis:
 - Remix IDE Developer Tool
 - Open Zeppelin Code Analyzer
 - SWC Vulnerabilities Registry
 - DEX Dependencies, e.g., Pancakeswap, Uniswap
- Simulations are performed to identify centralized exploits causing contract and/or trade locks.
- A manual line-by-line analysis is performed to identify contract issues and centralized privileges.
 We may inspect below mentioned common contract vulnerabilities, and centralized exploits:

	o Token Supply Manipulation
	o Access Control and Authorization
	o Assets Manipulation
Controlizad Evalaita	o Ownership Control
Centralized Exploits	o Liquidity Access
	 Stop and Pause Trading
	 Ownable Library Verification



	0	Integer Overflow
	0	Lack of Arbitrary limits
	0	Incorrect Inheritance Order
	0	Typographical Errors
	0	Requirement Violation
	0	Gas Optimization
	0	Coding Style Violations
Common Contract Vulnerabilities	0	Re-entrancy
	0	Third-Party Dependencies
	0	Potential Sandwich Attacks
	0	Irrelevant Codes
	0	Divide before multiply
	0	Conformance to Solidity Naming Guides
	FL INT	Compiler Specific Warnings
	0	Language Specific Warnings

REPORT

- The auditing team provides a preliminary report specifying all the checks which have been performed and the findings thereof.
- o The client's development team reviews the report and makes amendments to solidity codes.
- o The auditing team provides the final comprehensive report with open and unresolved issues.

PUBLISH

- o The client may use the audit report internally or disclose it publicly.
- It is important to note that there is no pass or fail in the audit, it is recommended to view the audit as an unbiased assessment of the safety of solidity codes.



RISK CATEGORIES

Smart contracts are generally designed to hold, approve, and transfer tokens. This makes them very tempting attack targets. A successful external attack may allow the external attacker to directly exploit. A successful centralization-related exploit may allow the privileged role to directly exploit. All risks which are identified in the audit report are categorized here for the reader to review:

Risk Type	Definition
Critical •	These risks could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.
Major	These risks are hard to exploit but very important to fix, they carry an elevated risk of smart contract manipulation, which can lead to high-risk severity.
Medium INTERE II AUDIT REPORT CO	These risks should be fixed, as they carry an inherent risk of future exploits, and hacks which may or may not impact the smart contract execution. Low-risk reentrancy-related vulnerabilities should be fixed to deter exploits. These risks do not pose a considerable risk to the contract or those who interact with it. They are code-style violations and deviations from standard practices. They should be highlighted and fixed nonetheless.
Unknown	These risks pose uncertain severity to the contract or those who interact with it. They should be fixed immediately to mitigate the risk uncertainty.

All statuses which are identified in the audit report are categorized here for the reader to review:

Status Type	Definition
Open	Risks are open.
Acknowledged	Risks are acknowledged, but not fixed.
Resolved	Risks are acknowledged and fixed.



CENTRALIZED PRIVILEGES

Centralization risk is the most common cause of cryptography asset loss. When a smart contract has a privileged role, the risk related to centralization is elevated.

There are some well-intended reasons have privileged roles, such as:

- o Privileged roles can be granted the power to pause() the contract in case of an external attack.
- Privileged roles can use functions like, include(), and exclude() to add or remove wallets from fees, swap checks, and transaction limits. This is useful to run a presale and to list on an exchange.

Authorizing privileged roles to externally-owned-account (EOA) is dangerous. Lately, centralization-related losses are increasing in frequency and magnitude.

- o The client can lower centralization-related risks by implementing below mentioned practices:
- o Privileged role's private key must be carefully secured to avoid any potential hack.
- Privileged role should be shared by multi-signature (multi-sig) wallets.
- Authorized privilege can be locked in a contract, user voting, or community DAO can be introduced to unlock the privilege.
- Renouncing the contract ownership, and privileged roles.
- o Remove functions with elevated centralization risk.
- Understand the project's initial asset distribution. Assets in the liquidity pair should be locked.

 Assets outside the liquidity pair should be locked with a release schedule.



AUTOMATED ANALYSIS

| ****IERC20**** | Interface | |||

Symbol	Definition
	Function modifies state
	Function is payable
	Function is internal
	Function is private
Ţ	Function is important

| **Ownable** | Implementation | Context |||

| L | <Constructor> | Public ! | • |NO! |

| L | renounceOwnership | Public ! | General | onlyOwner |

| L | transferOwnership | Public ! | 🔴 | onlyOwner |

| L | owner | Public ! | NO! |





```
\Pi\Pi\Pi\Pi
| **SafeMath** | Library | |||
| <sup>L</sup> | tryAdd | Internal 🔒 |
| L | trySub | Internal 🗎 |
| L | tryMul | Internal 🗎 |
| L | tryDiv | Internal 🗎 |
                                 III
| L | tryMod | Internal 🗎 | | |
\mid \mid \mid add \mid Internal \mid \mid
| <sup>L</sup> | sub | Internal 🗎 |
| <sup>L</sup> | mul | Internal 🗎 |
| <sup>L</sup> | div | Internal 🔒 |
                             | |
| L | mod | Internal 🗎 | | | |
                              | <sup>L</sup> | sub | Internal 🗎 |
| <sup>L</sup> | div | Internal <sup>©</sup> |
| <sup>L</sup> | mod | Internal <sup>@</sup> |
| **ReentrancyGuard** | Implementation | |||
| L | <Constructor> | Public ! | • | NO! |
| └ | _nonReentrantBefore | Private 🔐 | 🛑 | |
| └ | _nonReentrantAfter | Private 🔐 | 🛑 | |
| └ | _reentrancyGuardEntered | Internal 🗎 | | |
| **Math** | Library | |||
| L | max | Internal 🗎 | | |
| L | min | Internal = | | | |
| L | average | Internal 🗎 | | |
\mid \mid \mid ceilDiv \mid Internal \mid \mid \mid \mid
```



```
| L | mulDiv | Internal 🔒 |
| <sup>L</sup> | mulDiv | Internal 🔒 |
| <sup>L</sup> | sqrt | Internal 🔒 |
| <sup>L</sup> | sqrt | Internal 🗎 |
\mid \mid \mid \mid log2 \mid Internal \mid \mid
\mid \mid \mid \mid log2 \mid Internal \mid \mid
                               | |
| <sup>L</sup> | log10 | Internal 🔒 |
| L | log10 | Internal 🗎 |
| L | log256 | Internal 🗎 |
\mid L \mid log256 \mid Internal \mid \mid
| **SignedMath** | Library | |||
| <sup>L</sup> | max | Internal 🗎 |
| <sup>L</sup> | min | Internal 庙 |
| L | average | Internal 🗎 | | |
| L | abs | Internal 🗎 | | |
| **Strings** | Library | |||
| <sup>L</sup> | toString | Internal <sup>©</sup> |
| └ | toString | Internal 🔒 | | |
| L | toHexString | Internal 🗎 |
| L | toHexString | Internal 🗎 |
| L | equal | Internal 🗎 | | |
| **StakingBlazex** | Implementation | Ownable, ReentrancyGuard |||
| L | <Constructor> | Public ! | • |NO! |
| └ | setMinimumBurnThreshold | External ! | ● | onlyOwner |
```

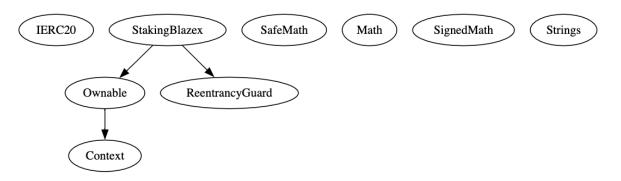








INHERITANCE GRAPH



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MANUAL REVIEW

Identifier	Definition	Severity
CEN-01	Centralized privileges	
BZX-01	Privileged role withdraws marketingToWithdraw and address(this) balance	Major 🛑

only0wner centralized privileges are listed below:

transferOwnership()
setMinimumBurnThreshold()
withdrawMarketing()
emergencyWithdraw()



withdrawMarketing() and emergencyWithdraw() functions are callable by contract owner. Make sure these functions are called only when absolutely required, and aren't maliciously used to withdraw contract balance.



RECOMMENDATION

Deployers, contract owners, administrators, access controlled, and all other privileged roles' private-keys/access-keys/admin-keys should be secured carefully. These entities can have a single point of failure that compromises the security of the project. Manage centralized and privileged roles carefully, review PAGE 09 for more information.

ACKNOWLEDGEMENT

Project team acknowledged to use Gnosis multi-sig protocol to manage centralized privileges and argued that centralization and access-controlled privileges are used as required.



Identifier	Definition	Severity
BZX-02	Re-entrancy and Checks-Effects-Interactions	Major 🔵

Below mentioned functions should be provided nonReentrant modifier:

stake()
unstake()

Below mentioned functions are used with nonReentrant modifier deter re-entrant calls:

claimRewards()
updateRewards()
withdrawMarketing()

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RECOMMENDATION

Use Checks Effects Interactions pattern when handing over the flow to an external entity and/or guard functions against re-entrancy attacks. Re-entrancy guard is used to prevent re-entrant calls.

RESOLUTION

BlazeX team has added nonReentrant modifier to deter re-entrant calls to above mentioned functions.



Identifier	Definition	Severity
LOG-01	Lack of appropriate arbitrary boundaries	Minor •

Below mentioned function is set without any arbitrary boundaries.

setMinimumBurnThreshold()
changeRewardPercentage()
setMinimumAmountTokens()

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RECOMMENDATION

These functions should be provided appropriate upper and lower boundaries.



Identifier	Definition	Severity
LOG-02	Potential front-running	Minor •

Potential front-running also classified as – sandwich attack happens when an attacker observes a transaction swapping tokens or adding liquidity without setting restrictions on slippage or minimum output amount. The front-running risk exists because an attacker can observe the pending transactions in the mempool and submit a transaction with a higher gas price to have their transaction executed before the original one.

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RECOMMENDATION

Functions responsible for transfer should be provided reasonable minimum output amounts, instead of zero.

ACKNOWLEDGEMENT

BlazeX team argued that front-running is unavoidable on public blockchains, and each solution comes with a trade-off.



Identifier	Definition
LOG-04	Lack of reward distribution logic

While the smart contract code allows for accumulation of rewards in batches, it doesn't appear to have a mechanism to specify the amount of reward in a batch. Risk severity cannot be assessed as the implementation is not available.





Identifier	Definition	Severity
COD-01	Function visibility	Medium

Mentioned functions can be marked internal as they are used within contract:

lastRewardBatch()
updateRewards()

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RECOMMENDATION

Use appropriate visibility attributes to deter unauthorized access.



Identifier	Definition	Severity
COD-02	Timestamp manipulation via block.timestamp	Minor •

Be aware that the timestamp of the block can be manipulated by a miner. When the contract uses the timestamp to seed a random number, the miner can actually post a timestamp within 15 seconds of the block being validated, effectively allowing the miner to precompute an option more favorable to their chances.

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RECOMMENDATION

To maintain block integrity, follow 15 seconds rule, and scale time dependent events accordingly.



Identifier	Definition
COD-04	Note regarding flash loan vulnerabilities

Smart contract does not appear to have direct flash loan vulnerabilities. Flash loan attacks typically exploit functions that rely on external data, e.g., oracles or functions that can be gamed within a single transaction.

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NOTE

Due to the interconnected nature of DeFi contracts, one contract's vulnerability can be exploited using another contract. Be cautious while interacting with third-party contracts.



Identifier	Definition	Severity
COD-05	Uninitialized variable	Minor •

uint $\,$ i; inside the updateRewards function is uninitialized. Initialize it to $\,$ 0

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RECOMMENDATION

Initialize variables appropriately.

RESOLUTION

BlazeX team has initialized the mentioned variable properly.



Identifier	Definition
COD-06	Note regarding keccak256 secure hashing

Note that the keccak256 function is not collision-resistant, and therefore there is a possibility of two different messages producing the same hash. Generating strong random input data, and properly securing and managing keys is recommended for fortification of keccak256.

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COMMENT

BlazeX team comments that the keccak256 collision has little effect on the functionality as it's related to signed data, except for the storage layout that can be solved by creating test files to check storage slot collisions. keccak256 function is widely adapted in cryptography, and its use is relatively safe.



Identifier	Definition	Severity
COD-10	Direct and indirect dependencies	Unknown 🗨

Smart contract is interacting with third party protocols e.g., Market Makers, External Contracts, Web 3 Applications, Open Zeppelin tools, such as Strings, Math. The scope of the audit treats these entities as black boxes and assumes their functional correctness. However, in the real world, all of them can be compromised, and exploited. Moreover, upgrades in these entities can create severe impacts, e.g., increased transactional fees, deprecation of previous routers, etc.

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RECOMMENDATION

Inspect third party dependencies regularly, and mitigate severe impacts whenever necessary.

ACKNOWLEDGEMENT

Project team will inspect third party dependencies to minimize downtime from third-party intervention.



Identifier	Definition	Severity
COD-12	Lack of event-driven architecture	Minor •

Smart contract uses function calls to update state, which can make it difficult to track and analyze changes to the contract over time.

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RECOMMENDATION

Use events to track state changes. Events improve transparency and provide a more granular view of contract activity.



Identifier	Definition	Severity
COM-04	Potential resource exhaustion errors	Minor •

Below mentioned function may throw out of gas errors upon executing: updateRewards()

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RECOMMENDATION

Set upper bounds for multi-address calls.



DISCLAIMERS

InterFi Network provides the easy-to-understand audit of solidity source codes (commonly known as smart contracts).

The smart contract for this particular audit was analyzed for common contract vulnerabilities, and centralization exploits. This audit report makes no statements or warranties on the security of the code. This audit report does not provide any warranty or guarantee regarding the absolute bug-free nature of the smart contract analyzed, nor do they provide any indication of the client's business, business model or legal compliance. This audit report does not extend to the compiler layer, any other areas beyond the programming language, or other programming aspects that could present security risks. Cryptographic tokens are emergent technologies, they carry high levels of technical risks and uncertainty. You agree that your access and/or use, including but not limited to any services, reports, and materials, will be at your sole risk on an as-is, where-is, and as-available basis. This audit report could include false positives, false negatives, and other unpredictable results.

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ABOUT INTERFI NETWORK

InterFi Network provides intelligent blockchain solutions. We provide solidity development, testing, and auditing services. We have developed 150+ solidity codes, audited 1000+ smart contracts, and analyzed 500,000+ code lines. We have worked on major public blockchains e.g., Ethereum, Binance, Cronos, Doge, Polygon, Avalanche, Metis, Fantom, Bitcoin Cash, Velas, Oasis, etc.

InterFi Network is built by engineers, developers, UI experts, and blockchain enthusiasts. Our team currently consists of 4 core members, and 6+ casual contributors.

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Telegram (Engineering): https://t.me/interfigudits

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SMART CONTRACT AUDITS | SOLIDITY DEVELOPMENT AND TESTING RELENTLESSLY SECURING PUBLIC AND PRIVATE BLOCKCHAINS