InterFi NETWORK

SMART CONTRACT AUDIT

interfinetwork

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PREPARED FOR

BTC PIZZA

INTRODUCTION

Auditing Firm	InterFi Network
Client Firm	BTC Pizza
Methodology	Automated Analysis, Manual Code Review
Language	Solidity
Contract	0x1888847b50bc1833e268348896dee58701fc06a9
Blockchain	Binance smart chain
Centralization	Ownership renounced
Commit	2a379429fa308f5b3af782773123b1de38785ed2
Website	https://btcday.pizza
Telegram	https://t.me/BtcDayPizza
X (Twitter)	https://x.com/BtcDayPizza
Report Date	May 20, 2024

ℹ️ 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	0	1	0
Acknowledged	0	0	0	2	1
Resolved	0	0	1	1	0

ℹ️ 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.

ℹ️ 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 BTC Pizza 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:

- BitcoinPizzaDay.sol

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

Public Contract Link	
https://etherscan.io/address/0x1888847b50bc1833e268348896dee58701fc06a9#code	
Contract Name	BitcoinPizzaDay
Compiler Version	0.8.25
License	MIT

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:

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

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

REPORT

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

PUBLISH

- The client may use the audit report internally or disclose it publicly.

ℹ️ 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

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:

Risk Type	Definition
Critical 🔴	These risks pose immediate and severe threats, such as asset theft, data manipulation, or complete loss of contract functionality. They are often easy to exploit and can lead to significant, irreparable damage. Immediate fix is required.
Major 🟠	These risks can significantly impact code performance and security, and they may indirectly lead to asset theft and data loss. They can allow unauthorized access or manipulation of sensitive functions if exploited. Fixing these risks are important.
Medium 🟡	These risks may create attack vectors under certain conditions. They may enable minor unauthorized actions or lead to inefficiencies that can be exploited indirectly to escalate privileges or impact functionality over time.
Minor 🟢	These risks may include inefficiencies, lack of optimizations, code-style violations. These should be addressed to enhance overall code quality and maintainability.
Unknown 🟤	These risks pose uncertain severity to the contract or those who interact with it. Immediate fix is required to mitigate risk uncertainty.

All statuses which are identified in the audit report are categorized here:

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

AUTOMATED ANALYSIS

Symbol	Definition
🛑	Function modifies state
💵	Function is payable
🔒	Function is internal
🔐	Function is private
!	Function is important

Context	Implementation			
└	_msgSender	Internal 🔒		
└	_msgData	Internal 🔒		
IUniswapV2Router02	Interface			
└	factory	External !		NO!
└	WETH	External !		NO!
└	addLiquidity	External !	🛑	NO!
└	addLiquidityETH	External !	💵	NO!
└	swapExactTokensForETHSupportingFeeOnTransferTokens	External !	🛑	NO!
IUniswapV2Pair	Interface			
└	name	External !		NO!
└	symbol	External !		NO!
└	decimals	External !		NO!
└	totalSupply	External !		NO!
└	balanceOf	External !		NO!
└	allowance	External !		NO!

└	approve	External !	🛑	NO!
└	transfer	External !	🛑	NO!
└	transferFrom	External !	🛑	NO!
└	DOMAIN_SEPARATOR	External !		NO!
└	PERMIT_TYPEHASH	External !		NO!
└	nonces	External !		NO!
└	permit	External !	🛑	NO!
└	MINIMUM_LIQUIDITY	External !		NO!
└	factory	External !		NO!
└	token0	External !		NO!
└	token1	External !		NO!
└	getReserves	External !		NO!
└	price0CumulativeLast	External !		NO!
└	price1CumulativeLast	External !		NO!
└	kLast	External !		NO!
└	mint	External !	🛑	NO!
└	swap	External !	🛑	NO!
└	skim	External !	🛑	NO!
└	sync	External !	🛑	NO!
└	initialize	External !	🛑	NO!
IUniswapV2Factory	Interface			
└	feeTo	External !		NO!
└	feeToSetter	External !		NO!
└	getPair	External !		NO!
└	allPairs	External !		NO!
└	allPairsLength	External !		NO!
└	createPair	External !	🛑	NO!

| └ | setFeeTo | External ❗ | 🛑 |NO❗ |

| └ | setFeeToSetter | External ❗ | 🛑 |NO❗ |

||||||

| **SafeMath** | Library | |||

| └ | tryAdd | Internal 🔒 | | |

| └ | trySub | Internal 🔒 | | |

| └ | tryMul | Internal 🔒 | | |

| └ | tryDiv | Internal 🔒 | | |

| └ | tryMod | Internal 🔒 | | |

| └ | add | Internal 🔒 | | |

| └ | sub | Internal 🔒 | | |

| └ | mul | Internal 🔒 | | |

| └ | div | Internal 🔒 | | |

| └ | mod | Internal 🔒 | | |

| └ | sub | Internal 🔒 | | |

| └ | div | Internal 🔒 | | |

| └ | mod | Internal 🔒 | | |

||||||

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

| └ | totalSupply | External ❗ | |NO❗ |

| └ | balanceOf | External ❗ | |NO❗ |

| └ | transfer | External ❗ | 🛑 |NO❗ |

| └ | allowance | External ❗ | |NO❗ |

| └ | approve | External ❗ | 🛑 |NO❗ |

| └ | transferFrom | External ❗ | 🛑 |NO❗ |

||||||

| **IERC20Metadata** | Interface | IERC20 |||

| └ | name | External ❗ | |NO❗ |

| └ | symbol | External ❗ | | NO❗ |

| └ | decimals | External ❗ | | NO❗ |

||||||

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

| └ | <Constructor> | Public ❗ | 🛑 | NO❗ |

| └ | owner | Public ❗ | | NO❗ |

| └ | _checkOwner | Internal 🔒 | | |

| └ | renounceOwnership | Public ❗ | 🛑 | onlyOwner |

| └ | transferOwnership | Public ❗ | 🛑 | onlyOwner |

| └ | _transferOwnership | Internal 🔒 | 🛑 | |

||||||

| **ERC20** | Implementation | Context, IERC20, IERC20Metadata |||

| └ | <Constructor> | Public ❗ | 🛑 | NO❗ |

| └ | name | Public ❗ | | NO❗ |

| └ | symbol | Public ❗ | | NO❗ |

| └ | decimals | Public ❗ | | NO❗ |

| └ | totalSupply | Public ❗ | | NO❗ |

| └ | balanceOf | Public ❗ | | NO❗ |

| └ | transfer | Public ❗ | 🛑 | NO❗ |

| └ | allowance | Public ❗ | | NO❗ |

| └ | approve | Public ❗ | 🛑 | NO❗ |

| └ | transferFrom | Public ❗ | 🛑 | NO❗ |

| └ | increaseAllowance | Public ❗ | 🛑 | NO❗ |

| └ | decreaseAllowance | Public ❗ | 🛑 | NO❗ |

| └ | _transfer | Internal 🔒 | 🛑 | |

| └ | _mint | Internal 🔒 | 🛑 | |

| └ | _burn | Internal 🔒 | 🛑 | |

| └ | _approve | Internal 🔒 | 🛑 | |

| └ | _spendAllowance | Internal 🔒 | 🛑 | | |

| └ | _beforeTokenTransfer | Internal 🔒 | 🛑 | | |

| └ | _afterTokenTransfer | Internal 🔒 | 🛑 | | |

||||||

| **BitcoinPizzaDay** | Implementation | ERC20, Ownable |||

| └ | <Constructor> | Public ❗ | 🛑 | ERC20 |

| └ | <Receive Ether> | External ❗ | 💵 |NO❗ |

| └ | openTrading | External ❗ | 🛑 | onlyOwner |

| └ | excludeFromMaxTransaction | Private 🔐 | 🛑 | | |

| └ | excludeFromFees | Private 🔐 | 🛑 | | |

| └ | setAutomatedMarketMakerPair | Public ❗ | 🛑 | onlyOwner |

| └ | _setAutomatedMarketMakerPair | Private 🔐 | 🛑 | | |

| └ | isExcludedFromFees | Public ❗ | |NO❗ |

| └ | _transfer | Internal 🔒 | 🛑 | | |

| └ | swapTokensForEth | Private 🔐 | 🛑 | | |

| └ | removeLimits | External ❗ | 🛑 | onlyOwner |

| └ | clearStuckEth | External ❗ | 🛑 | onlyOwner |

| └ | clearStuckTokens | External ❗ | 🛑 | onlyOwner |

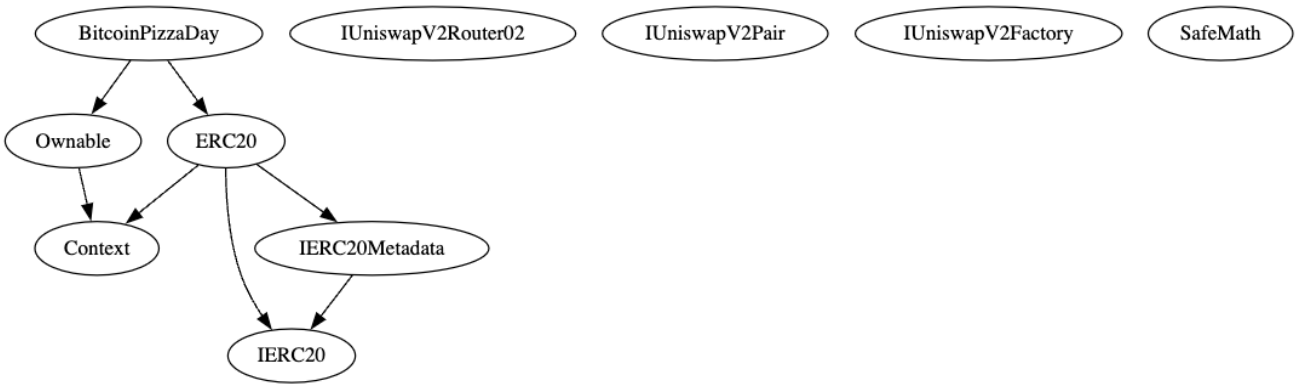
| └ | SetFees | External ❗ | 🛑 | onlyOwner |

| └ | setSwapTokensAtAmount | External ❗ | 🛑 | onlyOwner |

| └ | manualSwap | External ❗ | 🛑 | onlyOwner |

| └ | swapBack | Private 🔐 | 🛑 | | |

INHERITANCE GRAPH



MANUAL REVIEW

Identifier	Definition	Severity
CEN-01	Centralized privileges	Minor 🟢

Important `onlyOwner` centralized privileges are listed below:

```
renounceOwnership
transferOwnership
openTrading
setAutomatedMarketMakerPair
removeLimits
onlyOwner
clearStuckEth
clearStuckTokens
SetFees
setSwapTokensAtAmount
manualSwap
```


RECOMMENDATION

Securing private keys or access credentials of deployers, contract owners, operators, and other roles with privileged access is crucial to prevent single points of failure that can compromise contract security.

Use of multi-signature wallets is recommended – These wallets require multiple authorizations to execute sensitive contract functions, reducing the risk associated with single-party control.

RESOLUTION

BTC Pizza team has renounced contract ownership:

https://etherscan.io/tx/0x5a0a150194d49bcf5de73df907d0e46eeea776fd503b70c2d6ddaf56959a34b7

Identifier	Definition	Severity
CEN-02	Initial token allocation	Medium 🟡

Upon deployment, all initially minted tokens are transferred to the contract deployer. It could be an issue as the deployer can distribute tokens without consulting the community.

```
uint256 public initialTotalSupply = 10000 * 1e18;
    _mint(deployerWallet, initialTotalSupply);
```


RECOMMENDATION

Establish transparent tokenomics model that involves community input in the decision-making process regarding token allocation.

RESOLUTION

BTC Pizza team has clarified that initial token allocation will adhere strictly to pre-determined tokenomics outlined in project documentation.

Identifier	Definition	Severity
LOG-02	Potential front-running	Minor

Potential front-running happens when an attacker observes a transaction swapping tokens or adding liquidity without setting restrictions on slippage or minimum output amount. The attacker can manipulate the exchange rate by front-running a transaction to purchase assets and make profits by back-running a transaction to sell assets. Below mentioned function is called without setting restrictions on slippage or minimum output:

`swapExactTokensForETHSupportingFeeOnTransferTokens()`

RECOMMENDATION

Functions that execute critical state changes should enforce minimum output thresholds. Setting these minimums above zero can deter malicious actors by reducing the predictability and profitability of front-running strategies.

Implement commit-reveal schemes or transaction ordering to protect against front-running.

ACKNOWLEDGEMENT

Front-running is not avoidable on public blockchains. BTC Pizza team commented that, most EVM chains are prone to some sort of front-running and external manipulation.

Identifier	Definition	Severity
COD-02	Timestamp dependence	Minor

Be aware that the timestamp of the block can be manipulated by miners. Since miners can slightly adjust the timestamp, they may influence contract outcomes to their advantage.

RECOMMENDATION

Avoid relying solely on timestamp of the block for critical contract functions. Follow 15 seconds rule, and scale time dependent events accordingly.

ACKNOWLEDGEMENT

Timestamp of the block is not used to generate random numbers.

Identifier	Definition
COD-09	Lack of contract balance withdraw

Smart contract may collect tokens, and ethers from external addresses. Some swap, and liquidity-add events may accumulate residual ethers, and tokens. Add `withdraw()` function to take out tokens and ethers from the contract.

Identifier	Definition	Severity
COD-10	Direct and indirect dependencies	Unknown

Smart contract is interacting with third party protocols e.g., DEX routers, external contracts, web3 applications, *OpenZeppelin* upgradeable and ERC20 libraries. 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.

RECOMMENDATION

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

ACKNOWLEDGEMENT

BTC Pizza team will inspect third party dependencies regularly, and push upgrades whenever required.

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.

RECOMMENDATION

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

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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SMART CONTRACT AUDITS | SOLIDITY DEVELOPMENT AND TESTING

RELENTLESSLY SECURING PUBLIC AND PRIVATE BLOCKCHAINS