InterFi NETWORK

SMART CONTRACT AUDIT

interfinetwork

hello@interfi.network

https://interfi.network

PREPARED FOR

FEPE

INTRODUCTION

Auditing Firm	InterFi Network
Client Firm	FEPE
Methodology	Automated Analysis, Manual Code Review
Language	Solidity
Contract	0xcaE33D4f643a82Af2271AD80b8F925658a328f9a
Blockchain	Ethereum Chain
Centralization	Active ownership
Commit	b1c64c2d5905efd39a13d0bcc52e69d0619f9902
Website	https://fepe.life/
Telegram	https://t.me/FEPE_Chat/
X (Twitter)	https://twitter.com/FEPE_OFFICIAL/
Report Date	March 09, 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	4	0
Acknowledged	0	1	2	2	1
Resolved	0	0	1	1	0
Important Privileges	Set Buy Taxes, Set Sell Taxes, Normalize Taxes				
Important Note	`_takeTax` charges high tax in the initial blocks after launch				
`enableTrading()`	Trading must be enabled by deployer to allow buys, sells, and transfers				

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 FEPE 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:

- FEPE.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/0xcaE33D4f643a82Af2271AD80b8F925658a328f9a#code	
Contract Name	FEPE
Compiler Version	0.8.19
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

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 🟡	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 re-entrancy-related vulnerabilities should be fixed to deter exploits.
Minor 🟢	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:

- 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.

- The client can lower centralization-related risks by implementing below mentioned practices:
- 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.
- 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

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

Context	Implementation			
└	_msgSender	Internal 🔒		
└	_msgData	Internal 🔒		
Ownable	Implementation	Context		
└	<Constructor>	Public !	🛑	NO!
└	owner	Public !		NO!
└	_checkOwner	Internal 🔒		
└	renounceOwnership	Public !	🛑	onlyOwner
└	transferOwnership	Public !	🛑	onlyOwner
└	_transferOwnership	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❗
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 🔒	🛑	
DexFactory	Interface			
└	createPair	External ❗	🛑	NO❗
DexRouter	Interface			
└	factory	External ❗		NO❗
└	WETH	External ❗		NO❗

| └ | addLiquidityETH | External ❗ | 💵 |NO❗ |

| └ | swapExactTokensForETHSupportingFeeOnTransferTokens | External ❗ | 🛑 |NO❗ |

||||||

| **FEPE** | Implementation | ERC20, Ownable |||

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

| └ | setmarketingWallet | External ❗ | 🛑 | onlyOwner |

| └ | enableTrading | External ❗ | 🛑 | onlyOwner |

| └ | setBuyTaxes | External ❗ | 🛑 | onlyOwner |

| └ | setSellTaxes | External ❗ | 🛑 | onlyOwner |

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

| └ | toggleSwapping | External ❗ | 🛑 | onlyOwner |

| └ | setWhitelistStatus | External ❗ | 🛑 | onlyOwner |

| └ | NormalizeTaxes | External ❗ | 🛑 | onlyOwner |

| └ | _takeTax | Internal 🔒 | 🛑 | |

| └ | _transfer | Internal 🔒 | 🛑 | |

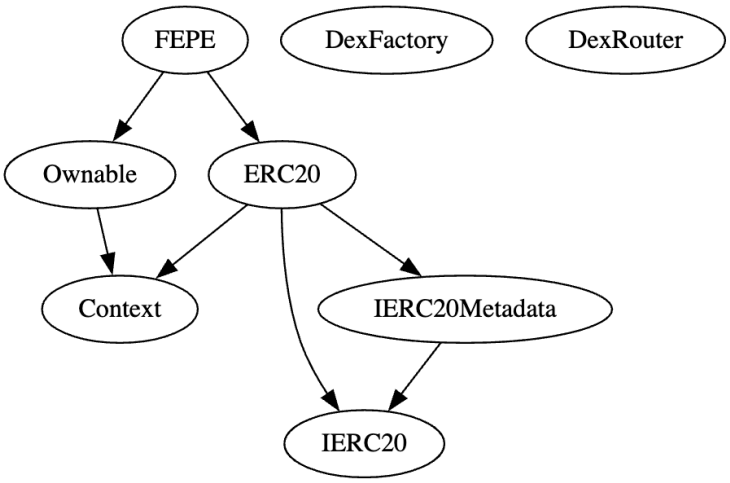
| └ | internalSwap | Internal 🔒 | 🛑 | |

| └ | swapToETH | Internal 🔒 | 🛑 | |

| └ | checkWhitelist | External ❗ | |NO❗ |

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

INHERITANCE GRAPH



MANUAL REVIEW

Identifier	Definition	Severity
CEN-01	Centralized privileges	Major 🟠
FEP-01	Trading must be enabled to allow EOAs to transfer/trade assets	

Important `onlyOwner` centralized privileges are listed below:

```
renounceOwnership()
transferOwnership()
setmarketingWallet()
enableTrading()
setBuyTaxes()
setSellTaxes()
setSwapTokensAtAmount()
toggleSwapping()
setWhitelistStatus()
NormalizeTaxes()
```


RECOMMENDATION

Deployers, contract owners, operators', 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.

Implement multi-signature wallets: Require multiple signatures from different parties to execute certain sensitive functions within contracts. This spreads control and reduces the risk of a single party having complete authority.

Use a decentralized governance model: Implement a governance model that enables token holders or other stakeholders to participate in decision-making processes. This can include voting on contract upgrades, parameter changes, or any other critical decisions that impact the contract's functioning.

ACKNOWLEDGEMENT

FEPE team argued that centralized privileged are required by the design.

Identifier	Definition	Severity
CEN-02	Initial asset distribution	Minor

All of the initially minted assets are sent to the project owner when deploying the contract. This can be an issue as the project owner can distribute tokens without consulting the community.

```
uint256 private constant _totalSupply = 333_000_000_000 * 1e18;
    _mint(msg.sender, _totalSupply);
```


RECOMMENDATION

Project must communicate with stakeholders and obtain the community consensus while distributing assets.

ACKNOWLEDGEMENT

FEPE team will distribute these tokens according to their predefined tokenomics strategy.

Identifier	Definition	Severity
CEN-03	Launch tax logic	Medium 🟡
CEN-04	Transfer delay	

- Launch tax logic in `_takeTax` may be unfair or manipulative, as it imposes very high taxes in the initial blocks after launch.
- Transfer delay logic in `_transfer` only allows one transfer per block. This may be exploited in a denial-of-service attack by constantly sending transactions from a whitelisted address.

RECOMMENDATION

Launch tax and transfer delay logic must be clearly communicated to users.

ACKNOWLEDGEMENT

FEPE team argued that launch tax and transfer delay logic are implemented to deter initial asset price dump, and promote healthy asset growth.

Identifier	Definition	Severity
ZOO-03	Swapping logic	Minor

Logic in `internalSwap()` may lead to scenarios where not all taxes are properly converted to ETH, as it uses the entire balance of the contract for the swap.

RECOMMENDATION

Calculate `initialBalance` and transfer only `swappedAmount`.

```
uint256 initialBalance = address(this).balance;
swapToETH(taxAmount);
uint256 swappedAmount = address(this).balance - initialBalance;
```

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 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:

`swapToETH()`

RECOMMENDATION

This function should be provided reasonable minimum output amounts, instead of zero.

ACKNOWLEDGEMENT

Front-running is not avoidable on public blockchains. FEPE team commented that, features like transaction tax, and max wallet should deter front-runners, and mitigate the front-running viability.

Identifier	Definition	Severity
LOG-03	Re-entrancy	Medium 🟡

External call `marketingWallet.call{value: address(this).balance}("")` can be a point of exploit, since `isSwapping` is set to `false` after the call.

External call to `uniswapRouter` can introduce vulnerabilities as external call is being made for swaps or liquidity additions.

RECOMMENDATION

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

RESOLUTION

FEPE team argued that `marketingWallet` is trusted project wallet, hence all interactions should be trusted, and secure. `uniswapRouter` is also considered trusted, and secure.

Identifier	Definition	Severity
COD-01	Authorization through `tx.origin`	Medium 🟡

Using `tx.origin` for authorization could make the contract vulnerable as it refers to the original external account that started the transaction.

`_transfer()`

RECOMMENDATION

Avoid authorizations via global variables wherever necessary.

ACKNOWLEDGEMENT

FEPE team argued that `tx.origin` is only used to track `_holderLastTransferTimestamp` only.

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.

`swapToETH()`

RECOMMENDATION

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

Identifier	Definition	Severity
COD-06	Unknown externally owned account	Minor

An externally owned account (EOA) has no code, and one can send messages from an externally owned account by creating and signing a transaction.

```
address public marketingWallet = 0x7BaF9BA7917Fff9454899f6daD85394881fCeF81 ;
```


RECOMMENDATION

Private keys of externally owned accounts must be secured carefully.

Identifier	Definition
COD-09	Lack of contract balance withdraw

Smart contract may collect tokens, and ethers from external addresses. Some swap events may accumulate residual ethers, and tokens.

NOTE

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., Market Makers, External Contracts, Web 3 Applications, Open Zeppelin tools. 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

FEPE team will inspect third party dependencies regularly, and push updates as required.

Identifier	Definition	Severity
COD-12	Missing transfer event	Minor

Standard ERC20 `Transfer` event is not emitted in the `_takeTax` function, which may lead to incorrect balance tracking.

RECOMMENDATION

Use events to track balance changes.

Identifier	Definition	Severity
COM-01	Floating pragma state	Minor 🟢
COM-02	Multiple pragma directives	

Compiler pragma is set to:

```
pragma solidity ^0.8.0;
```

Smart contract uses multiple pragma directives.

RECOMMENDATION

Fix pragma to compiler version you'll deploy your contract with.

RESOLUTION

FEPE team has deployed smart contract with stable compiler.

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.

Website: https://interfi.network

Email: hello@interfi.network

GitHub: https://github.com/interfinetwork

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

Telegram (Onboarding): https://t.me/interfisupport

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hello@interfi.network

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SMART CONTRACT AUDITS | SOLIDITY DEVELOPMENT AND TESTING

RELENTLESSLY SECURING PUBLIC AND PRIVATE BLOCKCHAINS