

SMART CONTRACT AUDIT

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PREPARED FOR

LILLIAN



INTRODUCTION

Auditing Firm	InterFi Network
Client Firm	Lillian
Methodology	Automated Analysis, Manual Code Review
Language	Solidity
Contract	0xc3dBD99da846ea38d34430D852795684a211428B
Blockchain	Ethereum Chain
Centralization	Active ownership
Commit F INT	f21a0d100317c5fa34fc38cd38ee4259bcfd1b95 INTERF INTERF
Website	http://www.lillianfinance.com/
Telegram	https://t.me/lillianportal/
Twitter	https://twitter.com/LillianFinance/
Report Date	June 26, 2023

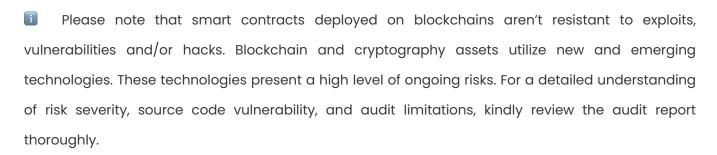
I Verify the authenticity of this report on our website: https://www.github.com/interfinetwork



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	1	0	0	0	1
Acknowledged	0	0	1	5	0
Resolved	0	0	0	1	0
Critical ● Privileges Disable Trading, Blacklist, Set Buy and Sell Taxes					
Noteworthy Privileges Whitelist, Set Wallets, Withdraw Stuck ETH and Tokens					



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

Public Contract Link				
https://etherscan.io/address/0xc3dbd99da846ea38d34430d852795684a211428b#code				
Contract Name TERF	ILYFERFI INTERFI INTERFI INTERFI INTERFI AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT			
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:

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



		late was Overflow
	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
	RFL INT	Compiler Specific Warnings
	0	Language Specific Warnings

REPORT

- o 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 O	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
Minor •	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.

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.
- o Implementing a time lock can prevent sudden changes. For example, if privileged role wants to change the tax rate, they would have to submit the change and then wait for a predetermined period (e.g., 48 hours) before the change takes effect.
- o 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

Symbol	Definition
	Function modifies state
∐s ₽	Function is payable
	Function is internal
	Function is private
Ţ	Function is important

```
| L | balanceOf | External ! | | NO! |

| L | transfer | External ! | | | NO! |

| L | allowance | External ! | | | NO! |

| L | approve | External ! | | | | NO! |
```

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

| L | totalSupply | External ! | NO! |

```
| **IERC20Metadata** | Interface | IERC20 |||
| L | name | External ! | |NO! |
| L | symbol | External ! | |NO! |
| L | decimals | External ! | |NO! |
```

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





```
| └ | <Constructor> | Public ! | ● |NO! | |
| L | name | Public ! | | NO! |
| L | symbol | Public ! | NO! |
| L | decimals | Public ! | NO! |
| L | totalSupply | Public ! | NO! |
| L | balanceOf | Public ! | NO! |
| L | transfer | Public ! | 🔴 |NO! |
| L | allowance | Public ! | NO! |
| L | approve | Public ! | • |NO! |
| L | transferFrom | Public ! | 📦 |NO! |
| L | increaseAllowance | Public ! | Governormal | NO! |
| L | decreaseAllowance | Public ! | Public ! | | NO! |
| └ | _transfer | Internal 🏻 | ● | |
| L | _burn | Internal 🗎 | 🛑 | |
| L | _approve | Internal = | = | |
| └ | _beforeTokenTransfer | Internal 🔒 | 🛑 | |
111111
| **Ownable** | Implementation | Context |||
| └ | <Constructor> | Public ! | ● |NO! |
| <sup>L</sup> | owner | Public ! |
                       |NO ! |
| L | renounceOwnership | Public ! | General | onlyOwner |
| L | transferOwnership | Public ! | Gentlement | onlyOwner |
| L | _setOwner | Private 🔐 | ● | |
\Pi\Pi\Pi\Pi
| **SafeMath** | Library | |||
| L | tryAdd | Internal 🗎 | | |
```



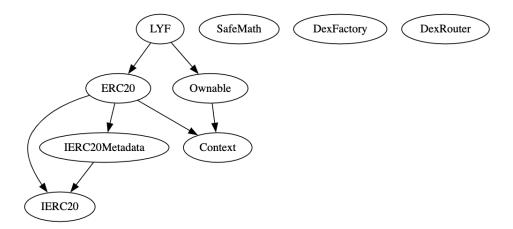
```
| L | trySub | Internal 🗎 |
| L | tryMul | Internal 🔒 |
| L | tryDiv | Internal 🗎 |
| L | tryMod | Internal 🔒 |
| <sup>L</sup> | add | Internal 🔒 |
| <sup>L</sup> | sub | Internal 🗎 |
| <sup>L</sup> | mul | Internal <sup>@</sup> |
                              | \cdot |
| <sup>L</sup> | div | Internal 🔒 |
| <sup>L</sup> | mod | Internal 🗎 |
                              | <sup>L</sup> | sub | Internal 🔒 |
                              | |
| <sup>L</sup> | div | Internal 🔒 |
                              III
| <sup>L</sup> | mod | Internal 🔒 | | |
| **DexFactory** | Interface | |||
| └ | createPair | External ! | ● |NO! |
\Pi\Pi\Pi\Pi
| **DexRouter** | Interface | |||
| L | factory | External ! | NO! |
| L | WETH | External ! | NO! |
| L | addLiquidityETH | External ! | 💹 |NO! |
| └ | swapExactTokensForETHSupportingFeeOnTransferTokens | External ! | ● |NO! |
\Pi\Pi\Pi\Pi
| **LYF** | Implementation | ERC20, Ownable |||
| └ | <Constructor> | Public ! | ● | ERC20 |
| └ | setFinanceAddress | External ! | ● | onlyOwner |
| └ | setTreasuryAddress | External ! | ● | onlyOwner |
| └ | setFoundationAddress | External ! | ● | onlyOwner |
| └ | setRewardsAddress | External ! | ● | onlyOwner |
```



```
| L | enableTrading | External ! | Government | |
| L | disableTrading | External ! | 📦 | onlyOwner |
| L | setBuyTaxes | External ! | • | onlyOwner |
| └ | setSellTaxes | External ! | ● | onlyOwner |
| └ | setSwapTokensAtAmount | External ! | ● | onlyOwner |
| └ | toggleSwapping | External ! | ● | onlyOwner |
| └ | setWhitelistStatus | External ! | ● | onlyOwner |
| └ | setBlacklist | External ! | ● | onlyOwner |
| L | checkWhitelist | External ! | NO! |
| L | checkBlacklist | External ! | NO! |
| L | _transfer | Internal 🗎 | 🛑 | |
| L | internalSwap | Internal 🗎 | 🔎 | |
| └ | transferToAddressETH | Private 🔒 | 🛑 | |
| └ | addLiquidity | Private 🔐 | 🔴 | |
| L | withdrawStuckETH | External ! | Good | onlyOwner |
| L | withdrawStuckTokens | External ! | 📦 | onlyOwner |
| L | <Receive Ether> | External ! | MO! |
```



INHERITANCE GRAPH







MANUAL REVIEW

Identifier	Definition	Severity
CEN-01	Extensive centralized privileges	
CEN-03	Privileged role performs blacklist	Critical 🔵
CEN-05	Privileged role changes trading state	

only0wner centralized privileges are listed below:

transferOwnership()

setFinanceAddress()

setTreasuryAddress()

setFoundationAddress()

setRewardsAddress()

enableTrading()

disableTrading()

setBuyTaxes()

setSellTaxes()

setSwapTokensAtAmount()

toggleSwapping()

setWhitelistStatus()

setBlacklist()

withdrawStuckETH()

withdrawStuckTokens()

RECOMMENDATION

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.





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 = 120_000_000 * 1e18;
_mint(0xeCe1129c4518dA93C802648d5220D34Bcc7e9AC0, _totalSupply);
```

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RECOMMENDATION

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

ACKNOWLEDGEMENT

Lillian team has acknowledged to distribute initially minted assets as per their pre-determined tokenomics, e.g., previous holders will get airdrops as planned.



Identifier	Definition	Severity
CEN-04	Privileged role receiving LP tokens	Minor •

```
Smart contract function addLiqudity() sends liquidity to owner()
  function addLiquidity(uint256 tokenAmount, uint256 ethAmount) private {
     // approve token transfer to cover all possible scenarios
     _approve(address(this), address(uniswapRouter), tokenAmount);

     // add the liquidity
     uniswapRouter.addLiquidityETH{value: ethAmount}(
         address(this),
         tokenAmount,
         0, // slippage is unavoidable
         0, // slippage is unavoidable
         owner(),
         block.timestamp
     );
}
```

RECOMMENDATION

Send LP tokens to dead address or unreachable address.

ACKNOWLEDGEMENT

Lillian team has stated that LP tokens will incur value over time with AutoLiquidity addition, and they should not be burnt (sent to dead address).



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

Below mentioned functions are set without any arbitrary boundaries.

setBuyTaxes()
setSellTaxes()

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RECOMMENDATION

These functions should be provided appropriate upper boundaries.

ACKNOWLEDGEMENT

Lillian team has acknowledged this finding, and kept the code as-is. Lillian team has stated that, both functions are only0wner, hence it is contract owners' responsibility to provide appropriate input to these functions.



Identifier	Definition	Severity
LOG-02	Potential front-running	Medium

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 functions are called without setting restrictions on slippage or minimum output:

swapExactTokensForETHSupportingFeeOnTransferTokens()
addLiquidity()
internalSwap()

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RECOMMENDATION

These functions should be provided reasonable minimum output amounts, instead of zero.

ACKNOWLEDGEMENT

Lillian team has stated that transaction tax may deter front-running, as it won't be feasible to front-run with high transaction taxes, and gas-costs. Lillian team has acknowledged this finding, and kept the code as-is.

If slippage is zero, front-running is feasible.



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.

RESOLUTION

block.timestamp and block.number are not being used to generate random numbers. Their output values only provide current block timestamp and current block number.



Identifier	Definition	Severity
COD-04	Unbounded loops	Minor •

swapToETH uses the swapExactTokensForETHSupportingFee0nTransferTokens method of the router which loops over the length of the path array. This could cause gas related issues if the path array becomes too large.

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RECOMMENDATION

Introduce a check in loop that breaks the loop if remaining gas is below a certain threshold.

ACKNOWLEDGEMENT

swapExactTokensForETHSupportingFee0nTransferTokens method for external call to router is standard, and utilized by third party market makers like Pancakeswap, Uniswap, etc. Lillian team has acknowledged this finding, and kept the code as-is.



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.

0x313DF74b4C441c1aD253D89Bb172141B8bA213b1
0x92C2a076680c0B47f717ac587bf0b895Dde3B252
0xE4752A7EBC1948Cb8E01234df49e6e576e1931e3
0x16dDbD8D5C7E11Fb7a819B55D6A78E03A909d828
0xeCe1129c4518dA93C802648d5220D34Bcc7e9AC0

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RECOMMENDATION

Private keys of externally owned accounts must be secured carefully.

ACKNOWLEDGEMENT

Lilian team has stated to adhere to industry standard practice to safeguard team, and distributor wallets. Lillian team has acknowledged this finding, and kept the code as-is.



Identifier	Definition	Severity
COD-10	Third Party Dependencies	Unknown

Smart contract is interacting with third party protocols e.g., Market Makers, Third-Party Smart Contracts, Decentralized and Centralized Applications, Open Zeppelin tools. The scope of the audit treats third party entities as black boxes and assumes their functional correctness. However, in the real world, third parties can be compromised, and exploited. Moreover, upgrades in third parties 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.



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.

INTERFI INTERFORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT

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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