



SMART CONTRACT AUDIT



interfinetwork



hello@interfi.network



<https://interfi.network>

PREPARED FOR

MAHINA TOKEN



INTRODUCTION

Auditing Firm	InterFi Network
Client Firm	Mahina Token
Methodology	Automated Analysis, Manual Code Review
Language	Solidity
Proxy	0xcB5174eb5a62B9EE62248C5b3CE91f0A84aa7117
Implementation	0xbF184B7a3fe7d648339a9620123d8e2FDbD0EDC6
Blockchain	Binance Smart Chain
Centralization	Active ownership
Commit	f53d5d91d291678079787e66a68e232191732cde
Website	
Telegram	
Twitter	
Discord	
Report Date	August 14, 2023


 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	2	5	0
Acknowledged	0	1	0	1	1
Resolved	1	0	0	3	0
Token Important Privileges	Authorize Upgrade, Blacklist, Toggle Trading, Pause Contract, Set Fees, Set Transaction Limit, Airdrop, Add/Remove LP Pool, Update Flex Pool, Update BBTF Distributor, Clear Stuck Tokens and BNB				
LP Swap Important Privileges	Update Routers, Set Liquify State, Update Liquidity Receiver, Update Token Swap Range, Update Currency Swap Range				
Access Control Important Privilege	Authorize Deployer				

 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.



TABLE OF CONTENTS

TABLE OF CONTENTS	4
SCOPE OF WORK.....	5
AUDIT METHODOLOGY	6
RISK CATEGORIES	8
CENTRALIZED PRIVILEGES	9
AUTOMATED ANALYSIS.....	10
INHERITANCE GRAPH	22
MANUAL REVIEW.....	23
DISCLAIMERS	39
ABOUT INTERFI NETWORK.....	42



SCOPE OF WORK

InterFi was consulted by Mahina Token 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:

- MahinaToken.sol

 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://bscscan.com/address/0xbfi84b7a3fe7d648339a9620123d8e2fdbd0edc6#code	
Contract Name	MahinaToken
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	<ul style="list-style-type: none">○ 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.

 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

| ****MahinaToken**** | Implementation | Initializable, IERC20MetadataUpgradeable, PausableUpgradeable, ReentrancyGuardUpgradeable, LPSwapSupportUpgradeable, UUPSAccessControlUpgradeable |||

|  | <Constructor> | Public  |  | NO  |

|  | initialize | External  |  | initializer |


|  | MahinaToken_init | Internal  |  | onlyInitializing |



|  | MahinaToken_init_unchained | Internal  |  | onlyInitializing |





|  | <Receive Ether> | External  |  | NO  |

|  | totalSupply | Public  | | NO  |





|  | decimals | External  | | NO  |




|  | balanceOf | Public  | | NO  |




|  | _balanceOf | Internal  | | |





|  | transfer | Public  |  | NO  |

|  | allowance | Public  | | NO  |

|  | approve | Public  |  | NO  |

|  | transferFrom | Public  |  | NO  |

|  | increaseAllowance | Public  |  | NO  |

|  | decreaseAllowance | Public  |  | NO  |



^L	_approve	Internal 🔒	🔴	
^L	totalFees	Public !		NO !
^L	getOwner	External !		NO !
^L	addLPPool	External !	🔴	onlyOwner
^L	removeLPPool	External !	🔴	onlyOwner
^L	updateAkamaiAddress	External !	🔴	onlyOwner
^L	updateMarketingAddress	External !	🔴	onlyOwner
^L	updateFlexPool	External !	🔴	onlyOwner
^L	updateBBTFDistributorContract	External !	🔴	onlyOwner
^L	updateBuyFees	External !	🔴	onlyOwner
^L	updateSellFees	External !	🔴	onlyOwner
^L	updateTransferFees	External !	🔴	onlyOwner
^L	updatePauseExempt	External !	🔴	onlyOwner
^L	updateBlacklist	External !	🔴	onlyOwner
^L	excludeFromFee	Public !	🔴	onlyOwner
^L	excludeFromMaxTxLimit	Public !	🔴	onlyOwner
^L	excludeFromReward	Public !	🔴	onlyOwner
^L	_excludeFromReward	Private 🔒	🔴	
^L	_includeInReward	Private 🔒	🔴	
^L	excludeFromProcessingReflections	External !	🔴	onlyOwner
^L	_senderIsExcluded	Private 🔒	🔴	
^L	_receiverIsExcluded	Private 🔒	🔴	
^L	tokenFromReflection	Public !		NO !
^L	_reflectFee	Private 🔒	🔴	
^L	_getRate	Private 🔒		
^L	_getCurrentSupply	Private 🔒		
^L	_takeLiquidity	Internal 🔒	🔴	

TERFI
 CONFIDENTIAL

INTERFI
 CONFIDENTIAL



```

|  L | _takeWalletFees | Private 🗝️ | 🔴 | |
|  L | _takeBBTFRreflectionFees | Private 🗝️ | 🔴 | |
|  L | _takeFees | Private 🗝️ | 🔴 | |
|  L | _transferFull | Private 🗝️ | 🔴 | |
|  L | _transfer | Private 🗝️ | 🔴 | |
|  L | pushSwap | External ! | 🔴 | NO ! |
|  L | _selectSwapEvent | Private 🗝️ | 🔴 | lockTheSwap |
|  L | valuesForNoFees | Private 🗝️ | | |
|  L | toggleTrading | External ! | 🔴 | onlyOwner |
|  L | _getRValues | Private 🗝️ | | |
|  L | clearStuckTokens | External ! | 🔴 | onlyOwner |
|  L | clearStuckBNB | External ! | 🔴 | onlyOwner |
|  L | pause | External ! | 🔴 | onlyOwner |
|  L | unpause | External ! | 🔴 | onlyOwner |
|  L | batchAirdrop | External ! | 🔴 | onlyOwner |
|  L | _batchAirdrop | Private 🗝️ | 🔴 | lockTheSwap |
|||||
| **UUPSAccessControlUpgradeable** | Implementation | UUPSUpgradeable, OwnableUpgradeable |||
|  L | __UUPSAccessControlUpgradeable_init | Internal 🗝️ | 🔴 | onlyInitializing |
|  L | __UUPSAccessControlUpgradeable_init_unchained | Internal 🗝️ | 🔴 | onlyInitializing |
|  L | _authorizeUpgrade | Internal 🗝️ | 🔴 | |
|  L | authorizeDeployer | External ! | 🔴 | onlyOwner |
|  L | renounceDeployerAuthorization | External ! | 🔴 | NO ! |
|  L | getAuthorizedDeployers | External ! | | NO ! |
|  L | getAuthorizedDeployerAtIndex | External ! | | NO ! |
|  L | getAuthorizedDeployerCount | External ! | | NO ! |
|||||
| **IBBTFMultiDistributor** | Interface | |||

```



```

|  | deposit | External ! | 🚫 |NO ! |
|  | process | External ! | 🔴 |NO ! |
|  | excludeFromRewards | External ! | 🔴 |NO ! |
|  | setShares | External ! | 🔴 |NO ! |
|  | setShare | External ! | 🔴 |NO ! |
|  | updateGasForProcessing | External ! | 🔴 |NO ! |
|||||
| **LPSwapSupportUpgradeable** | Implementation | OwnableUpgradeable |||
|  | __LPSwapSupport_init | Internal 🚫 | 🔴 | onlyInitializing |
|  | __LPSwapSupport_init_unchained | Internal 🚫 | 🔴 | onlyInitializing |
|  | _approve | Internal 🚫 | 🔴 | |
|  | _balanceOf | Internal 🚫 | | |
|  | getSwapRouters | External ! | |NO ! |
|  | getSwapRouterAtIndex | External ! | |NO ! |
|  | getSwapRouterCount | External ! | |NO ! |
|  | updateRouters | Public ! | 🔴 | onlyOwner |
|  | updateMainRouter | Public ! | 🔴 | onlyOwner |
|  | updateLiquidityReceiver | External ! | 🔴 | onlyOwner |
|  | setSwapAndLiquifyEnabled | Public ! | 🔴 | onlyOwner |
|  | setBuybackAndLiquifyEnabled | Public ! | 🔴 | onlyOwner |
|  | swapAndLiquify | Internal 🚫 | 🔴 | |
|  | swapTokensForCurrency | Internal 🚫 | 🔴 | |
|  | swapTokensForCurrencyUnchecked | Private 🚫 | 🔴 | |
|  | swapTokensForCurrencyAdv | Internal 🚫 | 🔴 | |
|  | _swapTokensForCurrencyAdv | Private 🚫 | 🔴 | |
|  | addLiquidity | Private 🚫 | 🔴 | |
|  | swapCurrencyForTokens | Internal 🚫 | 🔴 | |
|  | swapCurrencyForTokensAdv | Internal 🚫 | 🔴 | |

```

TERFI
CONFIDENTIAL

INTERFI
CONFIDENTIAL



```

|  | swapCurrencyForTokensUnchecked | Internal | 🔒 | 🔴 | |
|  | _swapCurrencyForTokensAdv | Private | 🔒 | 🔴 | |
|  | buybackAndLiquify | Internal | 🔒 | 🔴 | |
|  | forceBuybackAndLiquify | External | ! | 🔴 | onlyOwner |
|  | updateTokenSwapRange | External | ! | 🔴 | onlyOwner |
|  | updateCurrencySwapRange | External | ! | 🔴 | onlyOwner |

```

```

|||||

```

```

| **PausableUpgradeable** | Implementation | Initializable, ContextUpgradeable |||

```

```

|  | __Pausable_init | Internal | 🔒 | 🔴 | onlyInitializing |
|  | __Pausable_init_unchained | Internal | 🔒 | 🔴 | onlyInitializing |
|  | paused | Public | ! | | NO ! |
|  | _requireNotPaused | Internal | 🔒 | | |
|  | _requirePaused | Internal | 🔒 | | |
|  | _pause | Internal | 🔒 | 🔴 | whenNotPaused |
|  | _unpause | Internal | 🔒 | 🔴 | whenPaused |

```

```

|||||

```

```

| **ReentrancyGuardUpgradeable** | Implementation | Initializable |||

```

```

|  | __ReentrancyGuard_init | Internal | 🔒 | 🔴 | onlyInitializing |
|  | __ReentrancyGuard_init_unchained | Internal | 🔒 | 🔴 | onlyInitializing |
|  | _nonReentrantBefore | Private | 🔒 | 🔴 | |
|  | _nonReentrantAfter | Private | 🔒 | 🔴 | |

```

```

|||||

```

```

| **Initializable** | Implementation | |||

```

```

|  | _disableInitializers | Internal | 🔒 | 🔴 | |
|  | _getInitializedVersion | Internal | 🔒 | | |
|  | _isInitializing | Internal | 🔒 | | |

```

```

|||||

```

```

| **IERC20Upgradeable** | Interface | |||

```

TERFI
CONFIDENTIAL

INTERFI
CONFIDENTIAL



```


| L | totalSupply | External ! | |NO ! | |
| L | balanceOf | External ! | |NO ! |
| L | transfer | External ! | 🔴 |NO ! |
| L | allowance | External ! | |NO ! |
| L | approve | External ! | 🔴 |NO ! |
| L | transferFrom | External ! | 🔴 |NO ! |
|||||
| **EnumerableSetUpgradeable** | Library | |||
| L | _add | Private 🔒 | 🔴 | | |
| L | _remove | Private 🔒 | 🔴 | | |
| L | _contains | Private 🔒 | | | |
| L | _length | Private 🔒 | | | |
| L | _at | Private 🔒 | | | |
| L | _values | Private 🔒 | | | |
| L | add | Internal 🔒 | 🔴 | | |
| L | remove | Internal 🔒 | 🔴 | | |
| L | contains | Internal 🔒 | | | |
| L | length | Internal 🔒 | | | |
| L | at | Internal 🔒 | | | |
| L | values | Internal 🔒 | | | |
| L | add | Internal 🔒 | 🔴 | | |
| L | remove | Internal 🔒 | 🔴 | | |
| L | contains | Internal 🔒 | | | |
| L | length | Internal 🔒 | | | |
| L | at | Internal 🔒 | | | |
| L | values | Internal 🔒 | | | |
| L | add | Internal 🔒 | 🔴 | | |
| L | remove | Internal 🔒 | 🔴 | | |


```


TERFI
CONFIDENTIAL


INTERFI
CONFIDENTIAL



| ^L | contains | Internal  | | |


| ^L | length | Internal  | | |


| ^L | at | Internal  | | |


| ^L | values | Internal  | | |


|||||


| ****SafeMathUpgradeable**** | Library | |||


| ^L | tryAdd | Internal  | | |


| ^L | trySub | Internal  | | |


| ^L | tryMul | Internal  | | |


| ^L | tryDiv | Internal  | | |


| ^L | tryMod | Internal  | | |

| ^L | add | Internal  | | |


| ^L | sub | Internal  | | |


| ^L | mul | Internal  | | |

| ^L | div | Internal  | | |

| ^L | mod | Internal  | | |



| ^L | sub | Internal  | | |


| ^L | div | Internal  | | |


| ^L | mod | Internal  | | |

|||||

| ****IERC20MetadataUpgradeable**** | Interface | IERC20Upgradeable |||



| ^L | name | External  | | NO  |



| ^L | symbol | External  | | NO  |

| ^L | decimals | External  | | NO  |

|||||

| ****OwnableUpgradeable**** | Implementation | Initializable, ContextUpgradeable |||

| ^L | __Ownable_init | Internal   | onlyInitializing |

| ^L | __Ownable_init_unchained | Internal   | onlyInitializing |

INTERFI
CONFIDENTIAL

INTERFI
CONFIDENTIAL




```

|  | owner | Public ! | |NO! |
|  | _checkOwner | Internal | | |
|  | renounceOwnership | Public ! | | onlyOwner |
|  | transferOwnership | Public ! | | onlyOwner |
|  | _transferOwnership | Internal | | |
|||||
| **UUPSUpgradeable** | Implementation | Initializable, IERC1822ProxiabaleUpgradeable,
ERC1967UpgradeUpgradeable |||
|  | __UUPSUpgradeable_init | Internal | | onlyInitializing |
|  | __UUPSUpgradeable_init_unchained | Internal | | onlyInitializing |
|  | proxiableUUID | External ! | | notDelegated |
|  | upgradeTo | External ! | | onlyProxy |
|  | upgradeToAndCall | External ! | | onlyProxy |
|  | _authorizeUpgrade | Internal | | |
|||||
| **ContextUpgradeable** | Implementation | Initializable |||
|  | __Context_init | Internal | | onlyInitializing |
|  | __Context_init_unchained | Internal | | onlyInitializing |
|  | _msgSender | Internal | | |
|  | _msgData | Internal | | |
|||||
| **AddressUpgradeable** | Library | |||
|  | isContract | Internal | | |
|  | sendValue | Internal | | |
|  | functionCall | Internal | | |
|  | functionCall | Internal | | |
|  | functionCallWithValue | Internal | | |
|  | functionCallWithValue | Internal | | |

```

INTERFI
CONFIDENTIAL

```

|  |  | functionStaticCall | Internal | | |
|  |  | functionStaticCall | Internal | | |
|  |  | verifyCallResultFromTarget | Internal | | |
|  |  | verifyCallResult | Internal | | |
|  |  | _revert | Private | | |
|||||
| **IERC1822ProxiabaleUpgradeable** | Interface | |||
|  |  | proxiabaleUUID | External | | NO |
|||||
| **ERC1967UpgradeUpgradeable** | Implementation | Initializable |||
|  |  | __ERC1967Upgrade_init | Internal | | onlyInitializing |
|  |  | __ERC1967Upgrade_init_unchained | Internal | | onlyInitializing |
|  |  | _getImplementation | Internal | | |
|  |  | _setImplementation | Private | | |
|  |  | _upgradeTo | Internal | | |
|  |  | _upgradeToAndCall | Internal | | |
|  |  | _upgradeToAndCallUUPS | Internal | | |
|  |  | _getAdmin | Internal | | |
|  |  | _setAdmin | Private | | |
|  |  | _changeAdmin | Internal | | |
|  |  | _getBeacon | Internal | | |
|  |  | _setBeacon | Private | | |
|  |  | _upgradeBeaconToAndCall | Internal | | |
|  |  | _functionDelegateCall | Private | | |
|||||
| **IBeaconUpgradeable** | Interface | |||
|  |  | implementation | External | | NO |
|||||

```

INTERFI
CONFIDENTIAL

```

| **StorageSlotUpgradeable** | Library | |||
|  L | getAddressSlot | Internal 🔒 | | |
|  L | getBooleanSlot | Internal 🔒 | | |
|  L | getBytes32Slot | Internal 🔒 | | |
|  L | getUint256Slot | Internal 🔒 | | |
|||||
| **IUniswapV2Pair** | Interface | |||
|  L | name | External ! | |NO ! |
|  L | symbol | External ! | |NO ! |
|  L | decimals | External ! | |NO ! |
|  L | totalSupply | External ! | |NO ! |
|  L | balanceOf | External ! | |NO ! |
|  L | allowance | External ! | |NO ! |
|  L | approve | External ! | 🔴 |NO ! |
|  L | transfer | External ! | 🔴 |NO ! |
|  L | transferFrom | External ! | 🔴 |NO ! |
|  L | DOMAIN_SEPARATOR | External ! | |NO ! |
|  L | PERMIT_TYPEHASH | External ! | |NO ! |
|  L | nonces | External ! | |NO ! |
|  L | permit | External ! | 🔴 |NO ! |
|  L | MINIMUM_LIQUIDITY | External ! | |NO ! |
|  L | factory | External ! | |NO ! |
|  L | token0 | External ! | |NO ! |
|  L | token1 | External ! | |NO ! |
|  L | getReserves | External ! | |NO ! |
|  L | price0CumulativeLast | External ! | |NO ! |
|  L | price1CumulativeLast | External ! | |NO ! |
|  L | kLast | External ! | |NO ! |

```

INTERFI
CONFIDENTIAL



```

|  L | mint | External ! | ● |NO ! |
|  L | burn | External ! | ● |NO ! |
|  L | swap | External ! | ● |NO ! |
|  L | skim | External ! | ● |NO ! |
|  L | sync | External ! | ● |NO ! |
|  L | initialize | External ! | ● |NO ! |

```

```

|||||

```

```

| **IUniswapV2Factory** | Interface | |||

```

```

|  L | feeTo | External ! | |NO ! |
|  L | feeToSetter | External ! | |NO ! |
|  L | getPair | External ! | |NO ! |
|  L | allPairs | External ! | |NO ! |
|  L | allPairsLength | External ! | |NO ! |
|  L | createPair | External ! | ● |NO ! |
|  L | setFeeTo | External ! | ● |NO ! |
|  L | setFeeToSetter | External ! | ● |NO ! |

```

```

|||||

```

```

| **IUniswapV2Router02** | Interface | IUniswapV2Router01 |||

```

```

|  L | removeLiquidityETHSupportingFeeOnTransferTokens | External ! | ● |NO ! |
|  L | removeLiquidityETHWithPermitSupportingFeeOnTransferTokens | External ! | ● |NO ! |
|  L | swapExactTokensForTokensSupportingFeeOnTransferTokens | External ! | ● |NO ! |
|  L | swapExactETHForTokensSupportingFeeOnTransferTokens | External ! | 📄 |NO ! |
|  L | swapExactTokensForETHSupportingFeeOnTransferTokens | External ! | ● |NO ! |

```

```

|||||

```

```

| **IUniswapV2Router01** | Interface | |||

```

```

|  L | factory | External ! | |NO ! |
|  L | WETH | External ! | |NO ! |
|  L | addLiquidity | External ! | ● |NO ! |

```

TERFI
CONFIDENTIAL

INTERFI
CONFIDENTIAL



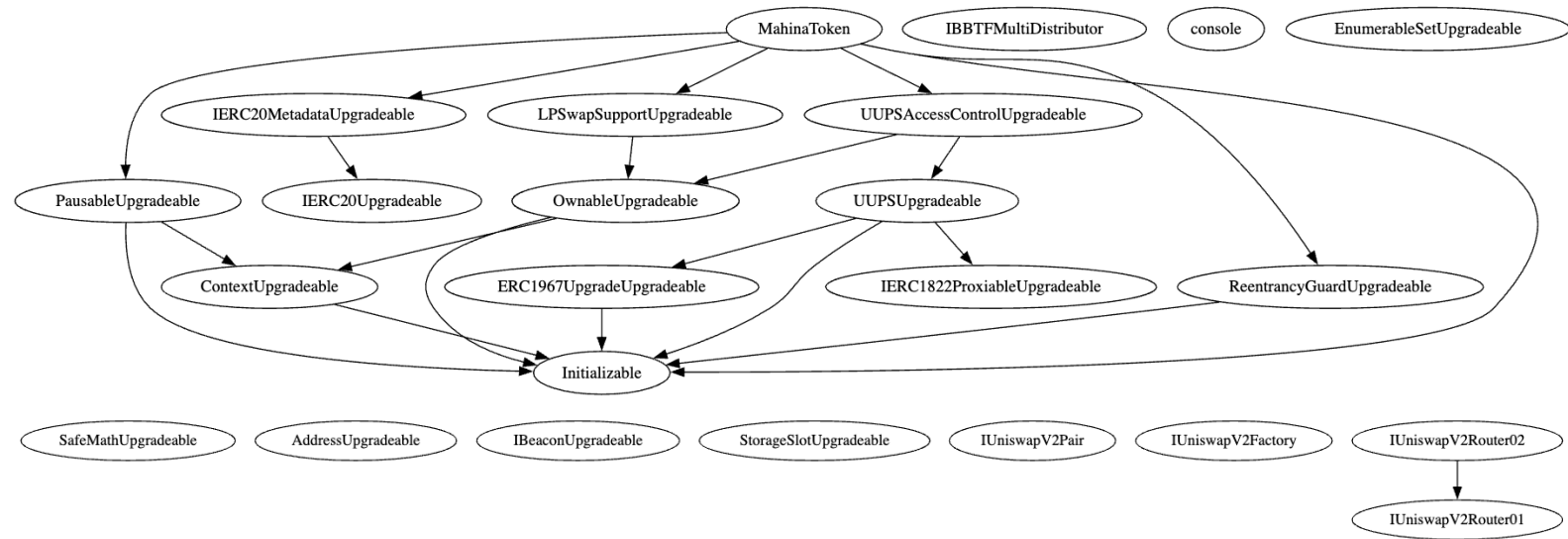
L	addLiquidityETH	External !	🚫	NO !
L	removeLiquidity	External !	🚫	NO !
L	removeLiquidityETH	External !	🚫	NO !
L	removeLiquidityWithPermit	External !	🚫	NO !
L	removeLiquidityETHWithPermit	External !	🚫	NO !
L	swapExactTokensForTokens	External !	🚫	NO !
L	swapTokensForExactTokens	External !	🚫	NO !
L	swapExactETHForTokens	External !	🚫	NO !
L	swapTokensForExactETH	External !	🚫	NO !
L	swapExactTokensForETH	External !	🚫	NO !
L	swapETHForExactTokens	External !	🚫	NO !
L	quote	External !		NO !
L	getAmountOut	External !		NO !
L	getAmountIn	External !		NO !
L	getAmountsOut	External !		NO !
L	getAmountsIn	External !		NO !

INTERFI
CONFIDENTIAL

INTERFI
CONFIDENTIAL



INHERITANCE GRAPH



INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL



MANUAL REVIEW

Identifier	Definition	Severity
CEN-01	Centralized privileges	Major 🟡
CEN-03	Privileged role can blacklist EOAs and contracts	
CEN-05	Privileged role can toggle trading status	
CEN-06	Privileged role can update LP Pool addresses, Pairs and Routers	
CEN-12	Privileged role can pause contract	
MAH-01	Privileged role can remove native token from contract	

onlyOwner centralized privileges are listed below:

```

addLPPool()
removeLPPool()
updateAkamaiAddress()
updateMarketingAddress()
updateFlexPool()
updateBBTFDistributorContract()
updateBuyFees()
updateSellFees()
updateTransferFees()
updatePauseExempt()
updateBlacklist()
excludeFromFee()
excludeFromMaxTxLimit()
excludeFromReward()
excludeFromProcessingReflections()
toggleTrading()
clearStuckTokens()
clearStuckBNB()
pause()
unpause()
batchAirdrop()

```



```
authorizeDeployer()  
updateRouters()  
updateMainRouter()  
updateLiquidityReceiver()  
setSwapAndLiquifyEnabled()  
setBuybackAndLiquifyEnabled()  
forceBuybackAndLiquify()  
updateTokenSwapRange()  
updateCurrencySwapRange()
```

owner() privileges are provided to mentioned functions:

```
pushSwap()
```

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.

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

Mahina team has argued that privileged roles are used as intended, and agreed to use multi-signature wallets to manage centralization wherever feasible.



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 _totalSupply,
tTotal = _totalSupply * 10 ** _decimals;
emit Transfer(address(this), owner(), tTotal);
```


RECOMMENDATION

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

ACKNOWLEDGEMENT

Mahina project confirmed to distribute tokens as per their pre-determined tokenomics.



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

Smart contract function `addLiquidity()` sends liquidity to `liquidityReceiver`.

```
function addLiquidity(uint256 tokenAmount, uint256 cAmount) private {
    uint256 routerIndex = (++_currentRouterIndex) % swapRouters.length();
    _currentRouterIndex = routerIndex;
    IUniswapV2Router02 swapRouter = IUniswapV2Router02(swapRouters.at(routerIndex));


    // approve token transfer to cover all possible scenarios
    _approve(address(this), address(swapRouter), tokenAmount);

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

RECOMMENDATION

Send LP tokens to dead address or unreachable address.



Identifier	Definition	Severity
CEN-09	Use of proxy and upgradeable contracts	Critical 

Contract upgradeability allows privileged roles to change current contract implementation.

```
contract MahinaToken is
    Initializable,
    IERC20MetadataUpgradeable,
    PausableUpgradeable,
    ReentrancyGuardUpgradeable,
    LPSwapSupportUpgradeable,
    UUPSAccessControlUpgradeable
{
```

Mahina team has added `_disableInitializers` in upgradeable implementation to add a safety measure that prevents initializer functions from being called more than once, reducing the risk of unintended behavior or vulnerabilities.

```
_authorizeUpgrade()
```

RECOMMENDATION

Test and validate current contract thoroughly before deployment. While proxy contracts are great for robust deployments while maintaining the upgradeable flexibility, proxy codes are prone to new security or logical issues that may compromise the project.

RESOLUTION

Mahina team confirmed that contract uses proxy mechanism to have future contract upgradeability, and contract flexibility.



Identifier	Definition	Severity
LOG-01	Lack of appropriate arbitrary boundaries	Medium 🟡

Below mentioned functions are set with high input boundary validation:

`updateBuyFees()`

`updateSellFees()`

`updateTransferFees()`

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL

RECOMMENDATION

These functions should be provided appropriate upper 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 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()
addLiquidityETH()
swapExactETHForTokensSupportingFeeOnTransferTokens()

```

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL

RECOMMENDATION

These functions should be provided reasonable minimum output amounts, instead of zero. Introduce commit reveal scheme to mitigate front-running.

RESOLUTION

Mahina team argued that front-running is unavoidable on public blockchains, and each solution comes with a trade-off. Smart contract uses features like blacklist, and transaction fees to deter front-runners.



Identifier	Definition	Severity
LOG-03	Re-entrancy	Medium 🟡

Re-entrancy guard is imported but never called.

Below mentioned function is used without re-entrancy guard:

```
_transfer()
```

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

```
_selectSwapEvent()
```

```
_batchAirdrop()
```

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL

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.



Identifier	Definition	Severity
COD-02	Timestamp manipulation via <code>block.timestamp</code>	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.

```

_swapTokensForCurrencyAdv()
addLiquidity()
_swapCurrencyForTokensAdv()

```

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL


RECOMMENDATION

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

RESOLUTION

Mahina team argued that `block.timestamp` is only used to stamp events, it is not being used to generate random numbers.



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.

```
buybackEscrowAddress = address(0x00000000000000000000000000000000bEEF);
```

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL

RECOMMENDATION

Private keys of externally owned accounts must be secured carefully.



Identifier	Definition	
COD-07	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.

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL

COMMENT

Mahina 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, Flex Address, Distributor Contract, 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.

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL


RECOMMENDATION

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

ACKNOWLEDGEMENT

Mahina 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.

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT

RECOMMENDATION

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



Identifier	Definition	Severity
VOL-01	Irrelevant code	Minor ●

Redundant code in:

`isExcludedFromTxLimit()`

`ReentrancyGuardUpgradeable`


`SafeMathUpgradeable`

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL

RECOMMENDATION

Remove redundant and dead code.



Identifier	Definition	Severity
COM-01	Floating compiler status	Minor 

Compiler is set to ^0.8.9

TERFI
CONFIDENTIAL

INTERFI
CONFIDENTIAL


RECOMMENDATION

Pragma should be fixed to the version that you're indenting to deploy your contracts with.

RESOLUTION

Mahina team has deployed contract with a stable compiler version.



Identifier	Definition	Severity
COM-04	Potential resource exhaustion errors	Minor 

Below mentioned functions may throw out of gas errors upon executing:

`_batchAirdrop()`

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL

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.

CONFIDENTIALITY

This report is subject to the terms and conditions (including without limitations, description of services, confidentiality, disclaimer and limitation of liability) outlined in the scope of the audit provided to the client. This report should not be transmitted, disclosed, referred to, or relied upon by any individual for any purpose without InterFi Network's prior written consent.

NO FINANCIAL ADVICE

This audit report does not indicate the endorsement of any particular project or team, nor guarantees its security. No third party should rely on the reports in any way, including to make any decisions to buy or sell a product, service or any other asset. The information provided in this report does not constitute investment advice, financial advice, trading advice, or any other sort of advice and you should not treat any of the report's content as such. This audit report should not be used in any way



to make decisions around investment or involvement. This report in no way provides investment advice, nor should be leveraged as investment advice of any sort.

FOR AVOIDANCE OF DOUBT, SERVICES, INCLUDING ANY ASSOCIATED AUDIT REPORTS OR MATERIALS, SHALL NOT BE CONSIDERED OR RELIED UPON AS ANY FORM OF FINANCIAL, TAX, LEGAL, REGULATORY, OR OTHER ADVICE.

TECHNICAL DISCLAIMER

ALL SERVICES, AUDIT REPORTS, SMART CONTRACT AUDITS, OTHER MATERIALS, OR ANY PRODUCTS OR RESULTS OF THE USE THEREOF ARE PROVIDED "AS IS" AND "AS AVAILABLE" AND WITH ALL FAULTS AND DEFECTS WITHOUT WARRANTY OF ANY KIND. TO THE MAXIMUM EXTENT PERMITTED UNDER APPLICABLE LAW, INTERFI NETWORK HEREBY DISCLAIMS ALL WARRANTIES, WHETHER EXPRESSED, IMPLIED, STATUTORY, OR OTHERWISE WITH RESPECT TO SERVICES, AUDIT REPORT, OR OTHER MATERIALS. WITHOUT LIMITING THE FOREGOING, INTERFI NETWORK SPECIFICALLY DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT, AND ALL WARRANTIES ARISING FROM THE COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

WITHOUT LIMITING THE FOREGOING, INTERFI NETWORK MAKES NO WARRANTY OF ANY KIND THAT ALL SERVICES, AUDIT REPORTS, SMART CONTRACT AUDITS, OR OTHER MATERIALS, OR ANY PRODUCTS OR RESULTS OF THE USE THEREOF, WILL MEET THE CLIENT'S OR ANY OTHER INDIVIDUAL'S REQUIREMENTS, ACHIEVE ANY INTENDED RESULT, BE COMPATIBLE OR WORK WITH ANY SOFTWARE, SYSTEM, OR OTHER SERVICES, OR BE SECURE, ACCURATE, COMPLETE, FREE OF HARMFUL CODE, OR ERROR-FREE.

TIMELINESS OF CONTENT

The content contained in this audit report is subject to change without any prior notice. InterFi Network does not guarantee or warrant the accuracy, timeliness, or completeness of any report you access using the internet or other means, and assumes no obligation to update any information following the publication.



LINKS TO OTHER WEBSITES

This audit report provides, through hypertext or other computer links, access to websites and social accounts operated by individuals other than InterFi Network. Such hyperlinks are provided for your reference and convenience only and are the exclusive responsibility of such websites' and social accounts' owners. You agree that InterFi Network is not responsible for the content or operation of such websites and social accounts and that InterFi Network shall have no liability to you or any other person or entity for the use of third-party websites and social accounts. You are solely responsible for determining the extent to which you may use any content at any other websites and social accounts to which you link from the report.

INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI
CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL AUDIT REPORT CONFIDENTIAL



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>



 interfinetwork

 hello@interfi.network

 <https://interfi.network>

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