InterFi NETWORK

SMART CONTRACT AUDIT

interfinetwork

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PREPARED FOR

HINA INU

INTRODUCTION

Auditing Firm	InterFi Network
Client Firm	Hina Inu
Methodology	Automated Analysis, Manual Code Review
Language	Solidity
Contract	0xDCF68150e66627C4CA8c1b68E834Ef9cdAA348a8
Blockchain	Base
Centralization	Active ownership with multi-signature wallet
Commit	c09a29004ce60b76532140c8b67f0fb0523ed83c
Website	https://hinainu.com
Telegram	https://t.me/hinainubaseportal
X (Twitter)	https://x.com/realhinainu
Report Date	April 13, 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	0	0
Acknowledged	0	1	0	1	1
Resolved	0	0	0	3	0
Important Privileges	Set Pair, Enable Tax				
Note Regarding Launch Fee	`_transfer()` function implements high transfer fee schedule based on the time elapsed since `launchedTime`. For the first 5 minutes after launch, transfer fee is whopping 50%, decreasing over time.				
Hina Inu project has successfully completed smart contract security audit of Base contract - 0xDCF68150e66627C4CA8c1b68E834Ef9cdAA348a8 with 86/100 score.					

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 Hina Inu 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:

- HinaInu.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://basescan.org/address/0xDCF68150e66627C4CA8c1b68E834Ef9cdAA348a8#code	
Contract Name	HinaInu
Compiler Version	0.8.24
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.

ℹ️ 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

ReentrancyGuard	Implementation			
└	<Constructor>	Public !	🛑	NO!
└	_nonReentrantBefore	Private 🔐	🛑	
└	_nonReentrantAfter	Private 🔐	🛑	
└	_reentrancyGuardEntered	Internal 🔒		
Context	Implementation			
└	_msgSender	Internal 🔒		
└	_msgData	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 🔒	🛑	
└	_approve	Internal 🔒	🛑	
└	_beforeTokenTransfer	Internal 🔒	🛑	
Address	Library			
└	sendValue	Internal 🔒	🛑	
Ownable	Implementation	Context		
└	<Constructor>	Public ❗	🛑	NO❗

| └ | owner | Public ❗ | | NO❗ |

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

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

| └ | _setOwner | Private 🔐 | 🛑 | |

||||||

| **HinaInu** | Implementation | ERC20, Ownable, ReentrancyGuard |||

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

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

| └ | setUniswapV2Pair | Public ❗ | 🛑 | onlyOwner |

| └ | takingFees | Private 🔐 | 🛑 | |

| └ | _addHolder | Private 🔐 | 🛑 | |

| └ | distributeRewards | Private 🔐 | 🛑 | |

| └ | addRewardBalance | Internal 🔒 | 🛑 | |

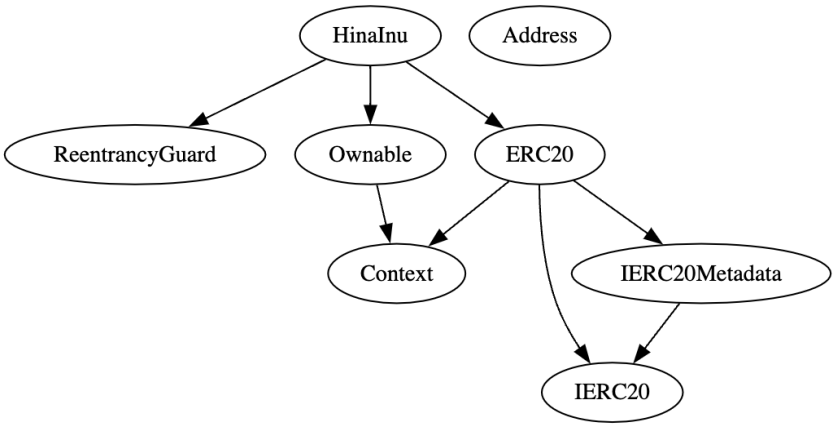
| └ | claimRewards | External ❗ | 🛑 | nonReentrant |

| └ | enableTax | External ❗ | 🛑 | onlyOwner |

| └ | setExcludedFromFees | External ❗ | 🛑 | onlyOwner |

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

INHERITANCE GRAPH



MANUAL REVIEW

Identifier	Definition	Severity
CEN-01	Centralized privileges	Major 🟠
CEN-04	Privileged role can update contract pair	

Important `onlyOwner` centralized privileges are listed below:

```
renounceOwnership()
transferOwnership()
setUniswapV2Pair()
enableTax()
setExcludedFromFees()
```


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.

ACKNOWLEDGEMENT

Hina Inu team argued that centralized privileged are required by the design. To enhance project security, Hina Inu team argued that their team will implement multi-signature (multi-sig) approach to manage centralized privileges.

Identifier	Definition	Severity
CEN-02	Initial asset distribution	Minor

All of the initially minted assets are sent to project wallets when deploying the contract.

```
        _mint(
            0x717510E198241305424852F966ddd651428D4Be2,
            868000000 * 10**decimals()
        );
        _mint(
            0xdF0D3b3F5863A85F4800D600Fd5Baa996323a8Fe,
            20000000 * 10**decimals()
        );
        _mint(
            0x23Be2cFF5498e5d1853dE34781533a98ac56f4b9,
            20000000 * 10**decimals()
        );
        _mint(
            0xb62d5a9F8111FA928E8FA7d0DF7a076faF806177,
            200000000 * 10**decimals()
        );
        _mint(
            0xf8A42e032f3a73d51bdc151c0Da6A7E15275ABAC,
            400000000 * 10**decimals()
        );
        _mint(
            0xe411CBCBfC24fE239dbc5Dca40ee544ba6049E12,
            200000000 * 10**decimals()
        );
        _mint(
            0x08c07324a0199d1c077881A328247EC8a7AdA7Be,
            100000000 * 10**decimals()
        );

        _mint(
            0x4c6D1e13aE0A65785178cCF11ba87a2Ff1425173,
            100000000 * 10**decimals()
        );
```

```
_mint(
    0x0000000000000000000000000000000000000000,
    92000000 * 10**decimals()
);
```


RECOMMENDATION

Constructor mints substantial amounts of tokens to specific addresses. This raises concerns about centralization and the potential for manipulation of the token price and supply.

RESOLUTION

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

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:

`_transfer()`

RECOMMENDATION

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

ACKNOWLEDGEMENT

Front-running is not avoidable on public blockchains. Hina Inu team commented that, feature like transaction tax - should deter front-runners, and mitigate the front-running viability.

Identifier	Definition
LOG-03	Re-entrancy

Below mentioned functions are used with a re-entrancy guard:

```
_transfer()
claimRewards()
```

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.

RECOMMENDATION

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

RESOLUTION

Timestamp of a block is not used to generate random numbers. Miner manipulation should be minimal.

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.

```
0x717510E198241305424852F966ddd651428D4Be2
0xdF0D3b3F5863A85F4800D600Fd5Baa996323a8Fe
0x23Be2cFF5498e5d1853dE34781533a98ac56f4b9
0xb62d5a9F8111FA928E8FA7d0DF7a076faF806177
0xf8A42e032f3a73d51bdc151c0Da6A7E15275ABAC
0xe411CBCBfC24fE239dbc5Dca40ee544ba6049E12
0x08c07324a0199d1c077881A328247EC8a7AdA7Be
0x4c6D1e13aE0A65785178cCF11ba87a2Ff1425173
0xf2256C95Bb3793204Cef68E569039bC6498B86F8
```


RECOMMENDATION

Private keys of externally owned accounts must be secured carefully.

RESOLUTION

Hina Inu team argued that these are project wallets. To enhance security, Hina Inu team argued that their team will implement multi-signature (multi-sig) approach to manage project wallets.

Identifier	Definition	Severity
COD-10	Direct and indirect dependencies	Unknown
COD-11	Reliance on DEX routers	

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

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

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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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