

SMART CONTRACT AUDIT

- interfinetwork
- hello@interfi.network
- https://interfi.network

PREPARED FOR

ZEUS EXCHANGE



INTRODUCTION

Auditing Firm	InterFi Network
-	
Client Firm	Zeus Exchange
Methodology	Automated Analysis, Manual Code Review
Language	Solidity
Contract	0x1111111111e6a0e96332F2bdb9A2b27701998c9
Blockchain	Arbitrum
Centralization	Active ownership
Commit AUDIT REPORT CONFI	1bc56bdc5ea6f0470409bdb14f529439ee820988 NERF NERF
Website	https://zeustrade.io/
Telegram	https://t.me/zeus_dex
X (Twitter)	https://twitter.com/zeus_exchange
Discord	https://discord.gg/cTKnZ2Rz
Report Date	April 25, 2024

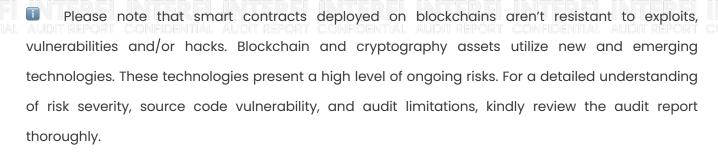
I Verify the authenticity of this report on our website: https://www.github.com/interfinetwork



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	0	0	1	3	0
Acknowledged	0	0	0	1	1
Resolved	0	0	0	2	0
Important Function	Important Function Permit				



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	
CENTRALIZED PRIVILEGES	.9
AUTOMATED ANALYSIS	10
NHERITANCE GRAPH	
MANUAL REVIEW	
DISCLAIMERS2	26
ABOUT INTERFI NETWORK2	29



SCOPE OF WORK

InterFi was consulted by Zeus Exchange 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 ZUS.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://arbiscan.io/address/0x11111111111e6a0e96332f2bdb9a2b27701998c9#code					
Contract Name TERF	ZUS ERF				
Compiler Version	0.8.20				
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



	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
	RFI INT	Compiler Specific Warnings
		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.

- o 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.
- 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

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

Symbol	Definition
	Function modifies state
Es	Function is payable
	Function is internal
	Function is private
Ţ	Function is important

```
| L | <Constructor> | Public ! | ● |NO! |
| L | owner | Public ! | NO! |
| L | renounceOwnership | Public ! | 🔴 | onlyOwner |
| L | transferOwnership | Public ! | 🔎 | onlyOwner |
\Pi\Pi\Pi\Pi
| **IERC5267** | Interface | |||
| L | eip712Domain | External ! |
| **ERC20** | Implementation | Context, IERC20, IERC20Metadata |||
| L | <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 ! | Public ! | | NO! |
| L | transferFrom | Public ! | 🔴 |NO! |
| L | increaseAllowance | Public ! | • | NO! |
| L | decreaseAllowance | Public ! | ● |NO! |
| └ | _transfer | Internal 🗎 | 🔎 | |
| L | _mint | Internal = | \Theta | |
| L | _burn | Internal 🗎 | 🛑 | |
| <sup>L</sup> | _approve | Internal 🔒 | ● | |
| └ | _spendAllowance | Internal 🗎 | ● | |
| L | _beforeTokenTransfer | Internal 🗎 | 🛑 | |
| └ | _afterTokenTransfer | Internal 🗎 | 🛑 | |
\Pi\Pi\Pi\Pi
| **ERC20Permit** | Implementation | ERC20, IERC20Permit, EIP712 ||| | |
| └ | <Constructor> | Public ! | ● | EIP712 |
| L | permit | Public ! | | NO! |
| L | nonces | Public ! | NO! |
| L | DOMAIN_SEPARATOR | External ! |
| | | | | | | |
| **IERC20Metadata** | Interface | IERC20 |||
| L | name | External ! | NO! |
| L | symbol | External ! | NO! |
| L | decimals | External ! | NO! |
111111
| **IERC20Permit** | Interface | |||
| L | permit | External ! | 🛑 |NO! |
```



```
| L | nonces | External ! | NO! |
| L | DOMAIN_SEPARATOR | External ! |
                              |NO ! |
| **IERC20** | Interface | ||| | |
| L | totalSupply | External ! |
| L | balanceOf | External ! | NO! |
| L | transfer | External ! | 🔎 |NO! |
| L | allowance | External ! | NO! |
| L | approve | External ! | O | NO! |
| L | transferFrom | External ! | • | NO! |
| | | | | | | |
| **Context** | Implementation | |||
| L | _msgSender | Internal 🗎 | | |
| L | _msgData | Internal 🗎 | | |
| **Counters** | Library | |||
| L | current | Internal 🗎 | | |
| └ | decrement | Internal 🔒 | 🔴 | |
| └ | reset | Internal 🗎 | 🔎 | |
| **ECDSA** | Library | |||
| └ | tryRecover | Internal 🗎 | | |
| L | recover | Internal 🗎 | | |
| L | recover | Internal 🗎 | | |
```



```
| L | tryRecover | Internal 🗎 | | |
| L | recover | Internal 🔒 | | |
| L | toEthSignedMessageHash | Internal 🗎 |
| └ | toEthSignedMessageHash | Internal 🗎 |
| └ | toTypedDataHash | Internal 🔒 |
| └ | toDataWithIntendedValidatorHash | Internal 🗎 | | |
| **EIP712** | Implementation | IERC5267 |||
| L | <Constructor> | Public ! | ● |NO! |
| └ | _buildDomainSeparator | Private 🔐 | | |
| L | eip712Domain | Public ! | NO! |
| **Math** | Library | |||
| L | max | Internal 🗎 | | |
| └ | min | Internal 🗎 | | |
| L | ceilDiv | Internal 🗎 | | |
| L | mulDiv | Internal 🗎 | | |
| L | mulDiv | Internal 🔒 |
| <sup>L</sup> | sqrt | Internal <sup>©</sup> |
| <sup>L</sup> | sqrt | Internal 🗎 |
\mid \mid \mid \mid log2 \mid Internal \mid \mid
\mid L \mid \log 10 \mid Internal = \mid
\mid \mid \mid log10 \mid Internal \mid \mid
| <sup>L</sup> | log256 | Internal 🗎 |
```



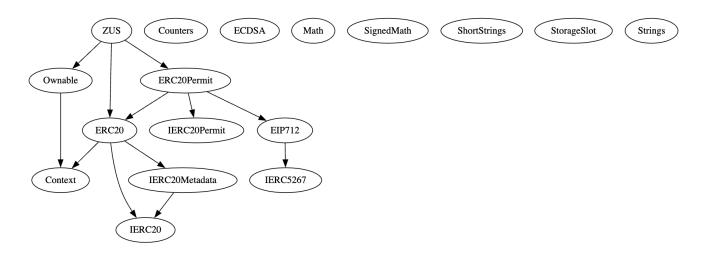
```
| **SignedMath** | Library | |||
| <sup>L</sup> | max | Internal 🔒 |
| L | average | Internal 🗎 | | |
| └ | abs | Internal 🗎 | | |
| **ShortStrings** | Library | |||
| └ | toShortString | Internal 🗎 | | |
| L | toShortStringWithFallback | Internal 🗎 | 🛑 | |
| L | toStringWithFallback | Internal 🗎 | | |
| L | byteLengthWithFallback | Internal 🗎 | | |
| **StorageSlot** | Library | |||
| └ | getAddressSlot | Internal 🗎 |
| L | getBooleanSlot | Internal 🗎 |
| \cdot |
| L | getUint256Slot | Internal 🗎 |
                            \perp
| L | getStringSlot | Internal 🔒 | | |
| L | getStringSlot | Internal 🗎 |
| L | getBytesSlot | Internal 🗎 |
| **Strings** | Library | |||
| L | toString | Internal 🔒 |
```



TERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTE Hidenitial audit report confidential audit report confidential audit report confidential audit report confiden



INHERITANCE GRAPH







MANUAL REVIEW

Identifier	Definition	Severity
CEN-01	Centralized privileges	Minor

Important only0wner centralized privileges are listed below:

renounceOwnership()

transferOwnership()

RECOMMENDATION

Deployers', owners', administrators', 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. It is recommended to:

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.

RESOLUTION

Zeus project has confirmed that privileged roles are used as intended. Limited centralized roles are used.



Identifier	Definition	Severity
CEN-02	Initial asset distribution	Medium 🛑

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.

_mint(msg.sender, 100000000 * 10 ** decimals());

TERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTE ifidential audit report confidential audit report confidential audit report confidential audit report confide

RECOMMENDATION

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



Identifier	Definition	Severity
LOG-02	Potential front-running	Minor •

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

TERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTE

RECOMMENDATION

Use commit reveal scheme or hide use transaction ordering to hide transactions until successfully verified on the block.



Identifier	Definition	Severity
COD-02	Block manipulation by miners	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.

permit()
delegateBySig()
clock()
CLOCK_MODE()

TERFI INTERFI INTE

RECOMMENDATION

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

ACKNOWLEDGEMENT

Zeus project uses OpenZeppelin libraries extensively, which is positive as these are well-tested and secure components. Some kind of miner manipulation is always present on a public blockchain.



Identifier	Definition
COD-09	Lack of contract balance withdraw

Smart contract may collect tokens, and ethers from external addresses. Add withdraw() function to take out tokens and ethers from the contract.





Identifier	Definition	Severity
COD-10	Direct and indirect dependencies	Unknown
COD-11	Reliance on OpenZeppelin libraries	Unknown •

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

TERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTE Fidential audit report confidential audit report confidential audit report confidential audit report confide

RECOMMENDATION

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

ACKNOWLEDGEMENT

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



Identifier	Definition	Severity
COD-11	Possible signature replay attack	Minor •

permit() function follows the EIP-2612 standard which is good as it allows for gasless transactions, however **ECDSA** must be implemented properly prevent possible signature replay attacks.

TERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTE Ifidential audit report confidential audit report confidential audit report confidential audit report confide

RECOMMENDATION

Verify and enforce strict nonce management on both the contract and the client side to prevent misuse.

NOTE

Checks are set in permit() function to validate signature.

require(signer == owner, "ERC20Permit: invalid signature");



Identifier	Definition	
COD-12	Note regarding keccak256 secure hashing	Minor •

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.

TERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTERFI INTE Ifidential audit report confidential audit report confidential audit report confidential audit report confide

NOTE

Zeus 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
COM-02	Multiple pragma directives	Minor •

Compiler is set to 0.8.20

Smart contract uses multiple pragma directives.





RECOMMENDATION

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

RESOLUTION

Zeus has deployed smart contract with fixed and stable compiler version.



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 INTERF

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.





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









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