0xSAFE

SMART CONTRACT SECURITY AUDIT
for

Pair Contract

Token Overview

0xSafe received the application for a smart contract security audit of **QI DEX's Pair** smart contract on December 24, 2022.

Details

Client: QI DEX

Blockchain: QIE Blockchain

Contract: N/D

Compiler: N/D

Optimization: N/D

Website: https://www.qidex.site

KEY

N/D - Not Deployed Yet

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Methodology

Audit Details

This comprehensive audit report provides an overview of the **QI DEX Pair** smart contract. 0xSafe utilizes a combination of static, automated, and manual analysis tools to check for any potential vulnerabilities or hacks in the system.

Code Quality

This includes a full review of the smart contract code. The prime areas of focus are:

- Accuracy
- Exploits
- Functionality
- Readability
- Security
- Vulnerabilities

Scope of work

QI DEX's team provided us with the files that need to be tested (BSCscan, Etherscan, Github, etc.). The focus of the security audit is the main token smart contract.

Tools

Ganache, Mithril, MythX, Open Zeppelin Code Analyzer, Proprietary tests, Remix IDE, Solidity Compiler, SWC Registry.

Risk Classification

!Critical	This signifies vulnerabilities with the smart contract's functionality or performance. Issues should be resolved immediately.
!Medium	This signifies vulnerabilities that can potentially cause problems and should eventually be fixed.
!Minor	Minor vulnerabilities may or may not impact smart contract functionality.
!Informational	This is there to offer suggestions for improvement

Audit Findings

Critical Issues

-no critical issues found-

Medium Issues

-no medium issues found-

Minor Issues

Issue	Type	Line #(s)	Description
#1	A floating pragma is set.	7, 157, 268, 291, 302	Current pragma directive is: "^v0.5.16"
#2	Read/Write of persistent state following external call.	374, 531	The contract account state is accessed after an external call to a fixed address.
#3	Multiple calls are executed in the same transaction.	384, 536	This call is executed following another call within the same transaction.

#4	A control flow decision is made based on The block.timestamp environment variable.	138, 414	The block.timestamp environment variable is used to determine a control flow decision.

SWC Attacks

SWC ID	Description	Status
SWC-100	Function Default Visibility	PASSED
SWC-101	Integer Overflow and Underflow	PASSED
SWC-102	Outdated Compiler Version	PASSED
SWC-103	Floating Pragma	MINOR
SWC-104	Unchecked Call Return Value	PASSED
SWC-105	Unprotected Ether Withdrawal	PASSED
SWC-106	Unprotected SELFDESTRUCT Instruction	PASSED
SWC-107	Reentrancy	MINOR
SWC-108	State Variable Default Visibility	PASSED
SWC-109	Uninitialized Storage Pointer	PASSED
SWC-110	Assert Violation	PASSED
SWC-111	Use of Deprecated Solidity Functions	PASSED
SWC-112	Delegatecall to Untrusted Callee	PASSED
SWC-113	DoS with Failed Call	MINOR
SWC-114	Transaction Order Dependence	PASSED

SWC-115	Authorization through tx.origin	PASSED
SWC-116	Block values as a proxy for time	MINOR
SWC-117	Signature Malleability	PASSED
SWC-118	Incorrect Constructor Name	PASSED
SWC-119	Shadowing State Variables	PASSED
SWC-120	Weak Sources of Randomness from Chain Attributes	PASSED
SWC-121	Missing Protection against Signature Replay Attacks	PASSED
SWC-122	Lack of Proper Signature Verification	PASSED
SWC-123	Requirement Violation	PASSED
SWC-124	Write to Arbitrary Storage Location	PASSED
SWC-125	Incorrect Inheritance Order	PASSED
SWC-126	Insufficient Gas Griefing	PASSED
SWC-127	Arbitrary Jump with Function Type Variable	PASSED
SWC-128	DoS With Block Gas Limit	PASSED
SWC-129	Typographical Error	PASSED
SWC-130	Right-To-Left-Override control character (U+202E)	PASSED
SWC-131	Presence of unused variables	PASSED
SWC-132	Unexpected Ether balance	PASSED
SWC-133	Hash Collisions With Multiple Variable Length Arguments	PASSED
SWC-134	Message call with hardcoded gas amount	PASSED
SWC-135	Code With No Effects	PASSED
SWC-136	Unencrypted Private Data On-Chain	PASSED

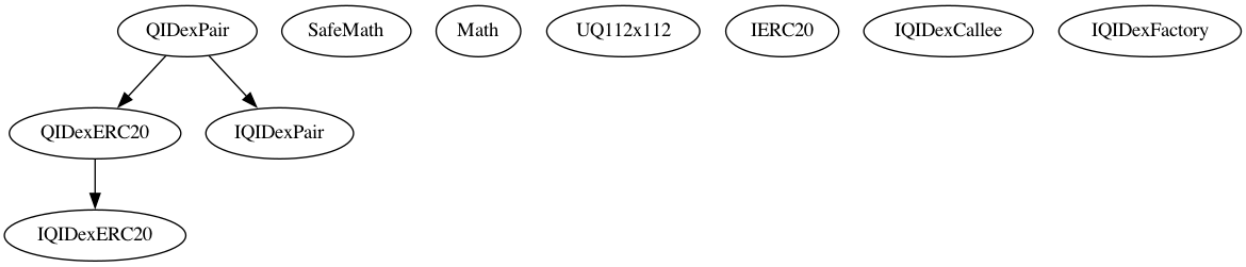
Important Notes

- Owner can’t do anything notible

Good Practices

- The smart contract utilizes “SafeMath” to prevent overflows

Inheritance Tree



Contract Inspection

Below is a visual description report comprising of information about the system's files, contracts, and their functions.

Legend

Symbol	Meaning
🛑	Function can modify state
💵	Function is payable
🔒	Internal function
NO ❗	Function has no modifier

Table

Contract	Type	Bases		
└	**Function Name**	**Visibility**	**Mutability**	**Modifiers**
IQIDexERC20	Interface			
└	name	External ❗		NO ❗
└	symbol	External ❗		NO ❗
└	decimals	External ❗		NO ❗
└	totalSupply	External ❗		NO ❗
└	balanceOf	External ❗		NO ❗
└	allowance	External ❗		NO ❗
└	approve	External ❗	🛑	NO ❗
└	transfer	External ❗	🛑	NO ❗
└	transferFrom	External ❗	🛑	NO ❗
└	DOMAIN_SEPARATOR	External ❗		NO ❗

└	PERMIT_TYPEHASH	External ❗			NO ❗
└	nonces	External ❗			NO ❗
└	permit	External ❗	🛑	NO ❗
SafeMath	Library			
└	add	Internal 🔒		
└	sub	Internal 🔒		
└	mul	Internal 🔒		
QIDexERC20	Implementation	IQIDexERC20		
└	<Constructor>	Public ❗	🛑	NO ❗
└	_mint	Internal 🔒	🛑	
└	_burn	Internal 🔒	🛑	
└	_approve	Private 🔐	🛑	
└	_transfer	Private 🔐	🛑	
└	approve	External ❗	🛑	NO ❗
└	transfer	External ❗	🛑	NO ❗
└	transferFrom	External ❗	🛑	NO ❗
└	permit	External ❗	🛑	NO ❗
IQIDexPair	Interface			
└	name	External ❗			NO ❗
└	symbol	External ❗			NO ❗
└	decimals	External ❗			NO ❗
└	totalSupply	External ❗			NO ❗
└	balanceOf	External ❗			NO ❗
└	allowance	External ❗			NO ❗
└	approve	External ❗	🛑	NO ❗
└	transfer	External ❗	🛑	NO ❗
└	transferFrom	External ❗	🛑	NO ❗
└	DOMAIN_SEPARATOR	External ❗			NO ❗
└	PERMIT_TYPEHASH	External ❗			NO ❗
└	nonces	External ❗			NO ❗
└	permit	External ❗	🛑	NO ❗
└	MINIMUM_LIQUIDITY	External ❗			NO ❗
└	factory	External ❗			NO ❗
└	token0	External ❗			NO ❗
└	token1	External ❗			NO ❗
└	getReserves	External ❗			NO ❗
└	price0CumulativeLast	External ❗			NO ❗

└	price1CumulativeLast	External ❗		NO ❗
└	kLast	External ❗		NO ❗
└	mint	External ❗	🛑	NO ❗
└	burn	External ❗	🛑	NO ❗
└	swap	External ❗	🛑	NO ❗
└	skim	External ❗	🛑	NO ❗
└	sync	External ❗	🛑	NO ❗
└	initialize	External ❗	🛑	NO ❗
Math	Library			
└	min	Internal 🔒		
└	sqrt	Internal 🔒		
UQ112x112	Library			
└	encode	Internal 🔒		
└	uqdiv	Internal 🔒		
IERC20	Interface			
└	name	External ❗		NO ❗
└	symbol	External ❗		NO ❗
└	decimals	External ❗		NO ❗
└	totalSupply	External ❗		NO ❗
└	balanceOf	External ❗		NO ❗
└	allowance	External ❗		NO ❗
└	approve	External ❗	🛑	NO ❗
└	transfer	External ❗	🛑	NO ❗
└	transferFrom	External ❗	🛑	NO ❗
IQIDexCallee	Interface			
└	dexCall	External ❗	🛑	NO ❗
IQIDexFactory	Interface			
└	feeTo	External ❗		NO ❗
└	feeToSetter	External ❗		NO ❗
└	staking	External ❗		NO ❗
└	minStakeToAddLiq	External ❗		NO ❗
└	minStakeForLessFee	External ❗		NO ❗
└	tradeFee	External ❗		NO ❗
└	relaxedTradeFee	External ❗		NO ❗
└	getPair	External ❗		NO ❗

└	allPairs	External ❗			NO ❗
└	allPairsLength	External ❗			NO ❗
└	createPair	External ❗	🛑	NO ❗
└	setFeeTo	External ❗	🛑	NO ❗
└	setFeeToSetter	External ❗	🛑	NO ❗
└	updateMinStakeForLessFee	External ❗	🛑	NO ❗
└	updateMinStakeToAddLiq	External ❗	🛑	NO ❗
└	updateTradeFee	External ❗	🛑	NO ❗
└	updateRelaxedTradeFee	External ❗	🛑	NO ❗
└	updateStakingContract	External ❗	🛑	NO ❗
QIDexPair	Implementation	IQIDexPair, QIDexERC20		
└	getReserves	Public ❗			NO ❗
└	_safeTransfer	Private 🔐	🛑		
└	<Constructor>	Public ❗	🛑	NO ❗
└	initialize	External ❗	🛑	NO ❗
└	_update	Private 🔐	🛑		
└	_mintFee	Private 🔐	🛑		
└	mint	External ❗	🛑	lock
└	burn	External ❗	🛑	lock
└	swap	External ❗	🛑	lock
└	skim	External ❗	🛑	lock
└	sync	External ❗	🛑	lock

Audit Results

QI DEX's Pair smart contract does not contain any severe issues or risks. The security of the smart contract was tested by 0xSafe using static, automated, and manual analysis. The

AUDIT PASSED

Note:
Please check the disclaimer below and note the audit makes no statements or warranties on the business model, investment attractiveness, or code sustainability of this project. The security audit report is provided for the only contract mentioned in this report.

Disclaimer

0xSafe.io provides contract auditing, KYC, development, and launch services for blockchain projects. The purpose of the security audit is to analyze the on-chain smart contract source code and to provide an easy-to-understand assessment of the crypto project and the smart contract. **0xSafe.io provides information as is.**

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