



Smart Contract Audit

FOR
X-AI

DATED : 26 August 23'



MANUAL TESTING

Centralization – Enabling Trades

Severity: **High**

function: enableTrading

Status: Open

Overview:

The launch function permits only the contract owner to activate trading capabilities. Until this function is executed, no investors can buy, sell, or transfer their tokens. This places a high degree of control and centralization in the hands of the contract owner.

```
function enableTrading() external onlyOwner {  
    require(tradingEnabled == false, "Trading is already enabled");  
    tradingEnabled = true;  
}
```

Suggestion

To reduce centralization and potential manipulation, consider one of the following approaches:

1. Automatically enable trading after a specified condition, such as the completion of a presale, is met.
2. If manual activation is still desired, consider transferring the ownership of the contract to a trustworthy, third-party entity like a certified "PinkSale Safu" developer. This can provide investors with more confidence in the eventual activation of trading capabilities, mitigating concerns of potential bad faith actions by the original owner.



AUDIT SUMMARY

Project name – X-AI

Date: 24 August 2023

Scope of Audit- Audit Ace was consulted to conduct the smart contract audit of the solidity source codes.

Audit Status: **Passed With High Risk**

Issues Found

Status	Critical	High	Medium	Low	Suggestion
Open	0	1	0	0	1
Acknowledged	0	0	0	0	0
Resolved	0	0	0	0	0

USED TOOLS

Tools:

1- Manual Review:

A line by line code review has been performed by audit ace team.

2- BSC Test Network: All tests were conducted on the BSC Test network, and each test has a corresponding transaction attached to it. These tests can be found in the "Functional Tests" section of the report.

3- Slither :

The code has undergone static analysis using Slither.

Testnet version:

The tests were performed using the contract deployed on the BSC Testnet, which can be found at the following address:

<https://testnet.bscscan.com/token/0xBdCC83b975feb93060A255beb3AA0C05A046f502>



Token Information

Token Address :

0xF30153d8A69Afde3f7e41E009480a4D5f70fBb44

Name: X-AI

Symbol: XAI

Decimals: 18

Network: Binance smart chain

Token Type: BEP20

Owner: 0x6B71BC620DDc1EBFEAfE7d4D010bd1a858Fe4FF4

Deployer: 0x6B71BC620DDc1EBFEAfE7d4D010bd1a858Fe4FF4

Token Supply: 3,000,000

Checksum:

481a8c4dcb4665feeac96a69412e38db5afd3ae8

Testnet version:

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TOKEN OVERVIEW

buy fee: 0-20%

Sell fee: 0-20%

transfer fee: 0%

Fee Privilege: Owner

Ownership: Owned

Minting: None

Max Tx: No

Blacklist: No

Other Privileges:

- Modifying fees
 - Enabling trades
 - Initial distribution of the tokens
-



AUDIT METHODOLOGY

The auditing process will follow a routine as special considerations by Auditace:

- Review of the specifications, sources, and instructions provided to Auditace to make sure the contract logic meets the intentions of the client without exposing the user's funds to risk.
 - Manual review of the entire codebase by our experts, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
 - Specification comparison is the process of checking whether the code does what the specifications, sources, and instructions provided to Auditace describe.
 - Test coverage analysis determines whether the test cases are covering the code and how much code is exercised when we run the test cases.
 - Symbolic execution is analysing a program to determine what inputs cause each part of a program to execute.
 - Reviewing the codebase to improve maintainability, security, and control based on the established industry and academic practices.
-



VULNERABILITY CHECKLIST

- | | |
|--|---|
|  Return values of low-level calls |  Gasless Send |
|  Private modifier |  Using block.timestamp |
|  Multiple Sends |  Re-entrancy |
|  Using Suicide |  Tautology or contradiction |
|  Gas Limitand Loops |  Timestamp Dependence |
|  Address hardcoded |  Revert/require functions |
|  Exception Disorder |  Use of tx.origin |
|  Using inline assembly |  Integer overflow/underflow |
|  Divide before multiply |  Dangerous strict equalities |
|  Missing Zero Address Validation |  Using SHA3 |
|  Compiler version not fixed |  Using throw |
-

CLASSIFICATION OF RISK

Severity

Description

◆ Critical	These vulnerabilities could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.
◆ High-Risk	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.
◆ Medium-Risk	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.
◆ Low-Risk	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.
◆ Gas Optimization / Suggestion	A vulnerability that has an informational character but is not affecting any of the code.

Findings

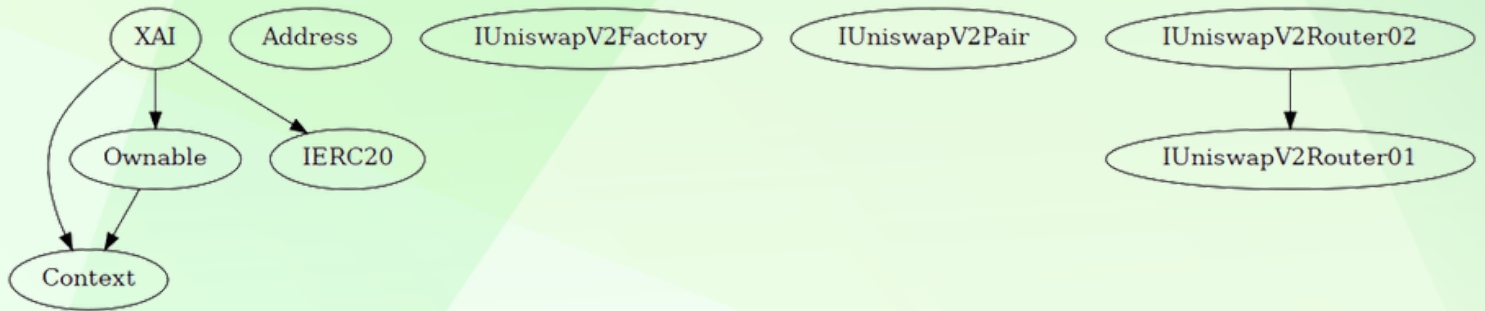
Severity

Found

◆ Critical	0
◆ High-Risk	1
◆ Medium-Risk	0
◆ Low-Risk	0
◆ Gas Optimization / Suggestions	1



INHERITANCE TREE





POINTS TO NOTE

- **Owner is able to adjust buy/sell fees within 0-20% (0% transfer fee)**
 - Owner is not able to blacklist an arbitrary wallet
 - Owner is not able to disable trades
 - Owner is not able to mint new tokens
 - Owner is not able to set maximum wallet and maximum buy/sell/transfer limits
 - **Owner must enable trades manually**
-



STATIC ANALYSIS








































```
Variable XAI._transferStandard(address,address,uint256).rTransferAmount (contracts/Token.sol#1089) is too similar to XAI._getTValues(uint256).tTransferAmount (contracts/Token.sol#821)
Variable XAI._transferBothExcluded(address,address,uint256).rTransferAmount (contracts/Token.sol#1157) is too similar to XAI._transferBothExcluded(address,address,uint256).tTransferAmount (c
ontracts/Token.sol#1159)
Variable XAI._getRValues(uint256,uint256,uint256,uint256,uint256).rTransferAmount (contracts/Token.sol#836) is too similar to XAI._getTValues(uint256).tTransferAmount (contracts/Token.sol#792
)
Variable XAI._transferStandard(address,address,uint256).rTransferAmount (contracts/Token.sol#1089) is too similar to XAI._transferToExcluded(address,address,uint256).tTransferAmount (contrac
ts/Token.sol#1113)
Variable XAI._getRValues(uint256,uint256,uint256,uint256,uint256).rTransferAmount (contracts/Token.sol#836) is too similar to XAI._getTValues(uint256).tTransferAmount (contracts/Token.sol#82
1)
Variable XAI._getRValues(uint256,uint256,uint256,uint256,uint256).rTransferAmount (contracts/Token.sol#836) is too similar to XAI._transferToExcluded(address,address,uint256).tTransferAmount
(contracts/Token.sol#1113)
Variable XAI._transferFromExcluded(address,address,uint256).rTransferAmount (contracts/Token.sol#1134) is too similar to XAI._transferStandard(address,address,uint256).tTransferAmount (contr
acts/Token.sol#1091)
Variable XAI._reflectionFromToken(uint256,bool).rTransferAmount (contracts/Token.sol#728) is too similar to XAI._getTValues(uint256).tTransferAmount (contracts/Token.sol#792)
Variable XAI._transferFromExcluded(address,address,uint256).rTransferAmount (contracts/Token.sol#1134) is too similar to XAI._transferBothExcluded(address,address,uint256).tTransferAmount (c
ontracts/Token.sol#1159)
Variable XAI._reflectionFromToken(uint256,bool).rTransferAmount (contracts/Token.sol#728) is too similar to XAI._getTValues(uint256).tTransferAmount (contracts/Token.sol#821)
Variable XAI._transferBothExcluded(address,address,uint256).rTransferAmount (contracts/Token.sol#1157) is too similar to XAI._getTValues(uint256).tTransferAmount (contracts/Token.sol#821)
Variable XAI._transferToExcluded(address,address,uint256).rTransferAmount (contracts/Token.sol#1111) is too similar to XAI._getTValues(uint256).tTransferAmount (contracts/Token.sol#792)
Variable XAI._transferToExcluded(address,address,uint256).rTransferAmount (contracts/Token.sol#1111) is too similar to XAI._transferToExcluded(address,address,uint256).tTransferAmount (contr
acts/Token.sol#1113)
Variable XAI._reflectionFromToken(uint256,bool).rTransferAmount (contracts/Token.sol#728) is too similar to XAI._transferToExcluded(address,address,uint256).tTransferAmount (contracts/Token.s
ol#1113)
Variable XAI._transferFromExcluded(address,address,uint256).rTransferAmount (contracts/Token.sol#1134) is too similar to XAI._transferFromExcluded(address,address,uint256).tTransferAmount (c
ontracts/Token.sol#1136)
Variable XAI._getTValues(uint256).rTransferAmount (contracts/Token.sol#797) is too similar to XAI._transferToExcluded(address,address,uint256).tTransferAmount (contracts/Token.sol#1113)
Variable XAI._transferBothExcluded(address,address,uint256).rTransferAmount (contracts/Token.sol#1157) is too similar to XAI._getTValues(uint256).tTransferAmount (contracts/Token.sol#792)
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tracts/Token.sol#1113)
Variable XAI._transferFromExcluded(address,address,uint256).rTransferAmount (contracts/Token.sol#1134) is too similar to XAI._getTValues(uint256).tTransferAmount (contracts/Token.sol#792)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#variable-names-too-similar
INFO:Detectors:
Loop condition 'i < _excluded.length' (contracts/Token.sol#848) should use cached array length instead of referencing 'length' member of the storage array.
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#cache-array-length
INFO:Detectors:
XAI.DEAD (contracts/Token.sol#552) should be constant
XAI._decimals (contracts/Token.sol#527) should be constant
XAI._name (contracts/Token.sol#525) should be constant
XAI._symbol (contracts/Token.sol#526) should be constant
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-constant
INFO:Detectors:
XAI._tTotal (contracts/Token.sol#530) should be immutable
XAI.uniswapV2Pair (contracts/Token.sol#555) should be immutable
XAI.uniswapV2Router (contracts/Token.sol#554) should be immutable
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-immutable
INFO:Slither:./contracts/Token.sol analyzed (9 contracts with 88 detectors), 99 result(s) found
```

Result => A static analysis of contract's source code has been performed using slither,

No major issues were found in the output



CONTRACT ASSESMENT

Contract	Type	Bases			
:-----: :-----: :-----: :-----: :-----:					
└─ **Function Name** **Visibility** **Mutability** **Modifiers**					
Context Implementation					
└─ _msgSender Internal 					
└─ _msgData Internal 					
Ownable Implementation Context					
└─ <Constructor> Public   NO 					
└─ owner Public  NO 					
└─ renounceOwnership Public   onlyOwner					
└─ transferOwnership Public   onlyOwner					
IERC20 Interface					
└─ totalSupply External  NO 					
└─ balanceOf External  NO 					
└─ transfer External   NO 					
└─ allowance External  NO 					
└─ approve External   NO 					
└─ transferFrom External   NO 					
Address Library					
└─ isContract Internal 					
└─ sendValue Internal  					
└─ functionCall Internal  					
└─ functionCall Internal  					
└─ functionCallWithValue Internal  					
└─ functionCallWithValue Internal  					
└─ _functionCallWithValue Private  					



CONTRACT ASSESMENT

|||||

****IUniswapV2Factory****	Interface			
	feeTo	External !		NO !
	feeToSetter	External !		NO !
	getPair	External !		NO !
	allPairs	External !		NO !
	allPairsLength	External !		NO !
	createPair	External !	●	NO !
	setFeeTo	External !	●	NO !
	setFeeToSetter	External !	●	NO !

|||||

****IUniswapV2Pair****	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 !
	burn	External !	●	NO !
	swap	External !	●	NO !
	skim	External !	●	NO !
	sync	External !	●	NO !
	initialize	External !	●	NO !

CONTRACT ASSESMENT

```
| **IUniswapV2Router01** | Interface | |||
|  └ | factory | External ! | |NO ! |
|  └ | WETH | External ! | |NO ! |
|  └ | addLiquidity | External ! | ●|NO ! |
|  └ | addLiquidityETH | External ! | 🟢🟢|NO ! |
|  └ | removeLiquidity | External ! | ●|NO ! |
|  └ | removeLiquidityETH | External ! | ●|NO ! |
|  └ | removeLiquidityWithPermit | External ! | ●|NO ! |
|  └ | removeLiquidityETHWithPermit | External ! | ●|NO ! |
|  └ | swapExactTokensForTokens | External ! | ●|NO ! |
|  └ | swapTokensForExactTokens | External ! | ●|NO ! |
|  └ | swapExactETHForTokens | External ! | 🟢🟢|NO ! |
|  └ | swapTokensForExactETH | External ! | ●|NO ! |
|  └ | swapExactTokensForETH | External ! | ●|NO ! |
|  └ | swapETHForExactTokens | External ! | 🟢🟢|NO ! |
|  └ | quote | External ! | |NO ! |
|  └ | getAmountOut | External ! | |NO ! |
|  └ | getAmountIn | External ! | |NO ! |
|  └ | getAmountsOut | External ! | |NO ! |
|  └ | getAmountsIn | External ! | |NO ! |
|||||
| **IUniswapV2Router02** | Interface | IUniswapV2Router01 |||
|  └ | removeLiquidityETHSupportingFeeOnTransferTokens | External ! | ●
|NO ! |
|  └ | removeLiquidityETHWithPermitSupportingFeeOnTransferTokens |
External ! | ●|NO ! |
|  └ | swapExactTokensForTokensSupportingFeeOnTransferTokens | External
! | ●|NO ! |
|  └ | swapExactETHForTokensSupportingFeeOnTransferTokens | External !
| 🟢🟢|NO ! |
|  └ | swapExactTokensForETHSupportingFeeOnTransferTokens | External !
| ●|NO ! |
```




CONTRACT ASSESMENT

| ****XAI**** | Implementation | Context, IERC20, Ownable |||

| **└** | **<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 **!** |

| **└** | **isExcludedFromReward** | Public **!** | | NO **!** |

| **└** | **totalReflectionDistributed** | Public **!** | | NO **!** |

| **└** | **reflectionFromToken** | Public **!** | | NO **!** |


| **└** | **tokenFromReflection** | Public **!** | | NO **!** |


| **└** | **excludeFromReward** | Public **!** | **●** | onlyOwner |

| **└** | **includeInReward** | External **!** | **●** | onlyOwner |

| **└** | **<Receive Ether>** | External **!** |  | NO **!** |

| **└** | **claimStuckTokens** | External **!** | **●** | onlyOwner |


| **└** | **_reflectFee** | Private  | **●** | |

| **└** | **_getValues** | Private  | | |


| **└** | **_getTValues** | Private  | | |


| **└** | **_getRValues** | Private  | | |

| **└** | **_getRate** | Private  | | |


| **└** | **_getCurrentSupply** | Private  | | |


| **└** | **_takeLiquidity** | Private  | **●** | |


| **└** | **_takeMarketing** | Private  | **●** | |


| **└** | **calculateTaxFee** | Private  | | |

| **└** | **calculateLiquidityFee** | Private  | | |

| **└** | **calculateMarketingFee** | Private  | | |

| **└** | **removeAllFee** | Private  | **●** | |

| **└** | **setBuyFee** | Private  | **●** | |

| **└** | **setSellFee** | Private  | **●** | |

| **└** | **isExcludedFromFee** | Public **!** | | NO **!** |

| **└** | **_approve** | Private  | **●** | |

| **└** | **enableTrading** | External **!** | **●** | onlyOwner |



CONTRACT ASSESMENT

	_transfer	Private		
	swapAndLiquify	Private		
	swapAndSendMarketing	Private		
	setSwapTokensAtAmount	External		onlyOwner
	setSwapEnabled	External		onlyOwner
	_tokenTransfer	Private		
	_transferStandard	Private		
	_transferToExcluded	Private		
	_transferFromExcluded	Private		
	_transferBothExcluded	Private		
	excludeFromFees	External		onlyOwner
	changeMarketingWallet	External		onlyOwner
	setBuyFeePercentages	External		onlyOwner
	setSellFeePercentages	External		onlyOwner

Legend

Symbol	Meaning
	Function can modify state
	Function is payable



FUNCTIONAL TESTING

1- Adding liquidity (**passed**):

<https://testnet.bscscan.com/tx/0x277cc2d79a070de2bc153a5c2c2304cba95dac87067b73695d8bfa01e361567b>

2- Buying when excluded (0% tax) (**passed**):

<https://testnet.bscscan.com/tx/0xbfb674210ca5c7771399c1150f03f8facbf62ff42610be883b03eccdf52ef0e37>

3- Selling when excluded (0% tax) (**passed**):

<https://testnet.bscscan.com/tx/0xa0db1b353ae9dcbe60afd5e5a58538d5901e69c7a5a410b7542fdeedc40f76e4>

4- Transferring when excluded from fees (0% tax) (**passed**):

<https://testnet.bscscan.com/tx/0x3c78e287b7f814889071e9ab9397913e15ff7919e66735ae740e4696e943a3b6>

5- Buying when not excluded from fees (tax 0-20%) (**passed**):

<https://testnet.bscscan.com/tx/0x51c8f3001de1f43459ed8af068a25ba623273deb6bd1ba330f373198f93966b4>

6- Selling when not excluded from fees (tax 0-20%) (**passed**):

<https://testnet.bscscan.com/tx/0xc9ac354729726984317084add2716448c073da9857a09fdf98335157526a53e>

7- Transferring when not excluded from fees (0% tax) (**passed**):

<https://testnet.bscscan.com/tx/0x182d4af4a1ecd4bcad0d816857b34e03c38eb68221d97d0893845d2050ec1bdb>

8- Internal swap (BNB set to marketing wallet | Auto-liquidity)(**passed**):

<https://testnet.bscscan.com/tx/0xc9ac354729726984317084add2716448c073da9857a09fdf98335157526a53e>

MANUAL TESTING

Centralization – Enabling Trades

Severity: **High**

function: enableTrading

Status: Open

Overview:

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```
function enableTrading() external onlyOwner {  
    require(tradingEnabled == false, "Trading is already enabled");  
    tradingEnabled = true;  
}
```

Suggestion

To reduce centralization and potential manipulation, consider one of the following approaches:

1. Automatically enable trading after a specified condition, such as the completion of a presale, is met.
2. If manual activation is still desired, consider transferring the ownership of the contract to a trustworthy, third-party entity like a certified "PinkSale Safu" developer. This can provide investors with more confidence in the eventual activation of trading capabilities, mitigating concerns of potential bad faith actions by the original owner.



MANUAL TESTING

Centralization – Excessive Fees

Severity: **Informational**

function: setTaxFee – setBuybackFee - setMarketingFee

Status: Open

Overview:

Owner is able to set up to 20% tax on buy/sell

```
function setBuyFeePercentages(
uint256 _taxFeeonBuy,
uint256 _liquidityFeeonBuy,
uint256 _marketingFeeonBuy
) external onlyOwner {
taxFeeonBuy = _taxFeeonBuy;
liquidityFeeonBuy = _liquidityFeeonBuy;
marketingFeeonBuy = _marketingFeeonBuy;
totalBuyFees = _taxFeeonBuy + _liquidityFeeonBuy + _marketingFeeonBuy;
require(totalBuyFees <= 20, "Buy fees cannot be greater than 20%");
emit BuyFeesChanged(taxFeeonBuy, liquidityFeeonBuy, marketingFeeonBuy);
}
```

```
function setSellFeePercentages(
uint256 _taxFeeonSell,
uint256 _liquidityFeeonSell,
uint256 _marketingFeeonSell
) external onlyOwner {
taxFeeonSell = _taxFeeonSell;
liquidityFeeonSell = _liquidityFeeonSell;
marketingFeeonSell = _marketingFeeonSell;
totalSellFees =
_taxFeeonSell +
_liquidityFeeonSell +
_marketingFeeonSell;
require(totalSellFees <= 20, "Sell fees cannot be greater than 20%");
emit SellFeesChanged(
taxFeeonSell,
liquidityFeeonSell,
marketingFeeonSell
);
}
```

Suggestion

Keep fees within 0-10%



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