Cyberscope

Audit Report

KairanX

August 2023

Network BSC

Address 0xe291b85d62ddec6168737562b4ade5368ec4cb90

Audited by © cyberscope

Analysis

Critical Medium Minor / Informative Pass

Severity	Code	Description	Status
●	ST	Stops Transactions	Passed
●	OTUT	Transfers User's Tokens	Passed
●	ELFM	Exceeds Fees Limit	Passed
●	MT	Mints Tokens	Passed
●	BT	Burns Tokens	Passed
●	BC	Blacklists Addresses	Passed

Diagnostics

Critical Medium Minor / Informative

Severity	Code	Description	Status
	CR	Code Repetition	Unresolved
	PAV	Pair Address Validation	Unresolved
	MEM	Misleading Error Messages	Unresolved
	RSML	Redundant SafeMath Library	Unresolved
	L04	Conformance to Solidity Naming Conventions	Unresolved
	L16	Validate Variable Setters	Unresolved

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Review

Explorer	https://bscscan.com/address/0xe291b85d62ddec6168737562b4ade5368ec4cb90

Audit Updates

Initial Audit	14 Aug 2023 https://github.com/cyberscope-io/audits/blob/main/kix/v1/audit.pdf
Corrected Phase 2	16 Aug 2023 https://github.com/cyberscope-io/audits/blob/main/kix/v2/audit.pdf
Corrected Phase 3	17 Aug 2023

Source Files

Filename	SHA256
KairanX.sol	f4e8f7cc2d029bb91b5639ec10c4643bbd0eeb2257ab6814f8740cf8dd1cefb8
@openzeppelin/contracts/utils/Context.sol	1458c260d010a08e4c20a4a517882259a23a4baa0b5bd9add9fb6d6a1549814a
@openzeppelin/contracts/utils/math/SafeMath.sol	fc16aa4564878e1bb65740239d0c1422451cd32136306626ac37f5d5e0606a7b
@openzeppelin/contracts/token/ERC20/IERC20.sol	7ebde70853ccafcf1876900dad458f46eb9444d591d39bfc58e952e2582f5587
@openzeppelin/contracts/token/ERC20/ERC20.sol	d20d52b4be98738b8aa52b5bb0f88943f62128969b33d654fbca731539a7fe0a

@openzeppelin/contracts/token/ERC20/extensions/IERC20Metadata.sol	af5c8a77965cc82c33b7ff844deb9826166689e55dc037a7f2f790d057811990
@openzeppelin/contracts/token/ERC20/extensions/ERC20Burnable.sol	0344809a1044e11ece2401b4f7288f414ea41fa9d1dad24143c84b737c9fc02e
@openzeppelin/contracts/access/Ownable.sol	a8e4e1ae19d9bd3e8b0a6d46577eec098c01fbaffd3ec1252fd20d799e73393b

Findings Breakdown

Critical	0
Medium	0
Minor / Informative	6

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	0	0	0	0
Medium	0	0	0	0
Minor / Informative	6	0	0	0

CR - Code Repetition

Criticality	Minor / Informative
Location	KairanX.sol#L30
Status	Unresolved

Description

The contract contains repetitive code segments. There are potential issues that can arise when using repetitive code segments in Solidity. Some of them can lead to issues like gas efficiency, complexity, readability, security, and maintainability of the source code. It is generally a good idea to try to minimize code repetition where possible.

```
if (from == uniswapV2Pair) {
    //This means that the token is comming from the uniswap v2
pair i.e user is buying the token
    uint256 taxAmount =
(amount.mul(buyFeePercentage)).div(100);
    super._transfer(from, to, amount.sub(taxAmount));
    super._transfer(from, feeWallet, taxAmount);
} else if (to == uniswapV2Pair) {
    //This means that the user is selling the token
    uint256 taxAmount =
(amount.mul(sellFeePercentage)).div(100);
    super._transfer(from, to, amount.sub(taxAmount));
    super._transfer(from, feeWallet, taxAmount);
} else {
    super._transfer(from, to, amount);
}
```

Recommendation

The team is advised to avoid repeating the same code in multiple places, which can make the contract easier to read and maintain. The authors could try to reuse code wherever possible, as this can help reduce the complexity and size of the contract. For instance, the contract could reuse the common code segments in an internal function in order to avoid repeating the same code in multiple places.

PAV - Pair Address Validation

Criticality	Minor / Informative
Location	KairanX.sol#L50
Status	Unresolved

Description

The contract is missing address validation in the pair address argument. The absence of validation reveals a potential vulnerability, as it lacks proper checks to ensure the integrity and validity of the pair address provided as an argument. The pair address is a parameter used in certain methods of decentralized exchanges for functions like token swaps and liquidity provisions.

The absence of address validation in the pair address argument can introduce security risks and potential attacks. Without proper validation, if the owner's address is compromised, the contract may lead to unexpected behavior like loss of funds.

```
function addUniswapV2PairAddress(address _uniswapPair) external
onlyOwner {
    uniswapV2Pair = _uniswapPair;
}
```

Recommendation

To mitigate the risks associated with the absence of address validation in the pair address argument, it is recommended to implement comprehensive address validation mechanisms. A recommended approach could be to verify pair existence in the decentralized application. Prior to interacting with the pair address contract, perform checks to verify the existence and validity of the contract at the provided address. This can be achieved by querying the provider's contract or utilizing external libraries that provide contract verification services.

MEM - Misleading Error Messages

Criticality	Minor / Informative
Location	KairanX.sol#L55
Status	Unresolved

Description

The contract is using misleading error messages. These error messages do not accurately reflect the problem, making it difficult to identify and fix the issue. As a result, the users will not be able to find the root cause of the error.

Specifically, the contract allows the owner to change the `sellFeePercentage` and `buyFeePercentage` values. However, while the error messages suggest that the allowable range for both `_sellTax` and `_buyTax` is between 1% and 25%, the actual code enforces a value up to 10%. This inconsistency can lead to confusion for users and developers, as the error messages do not accurately reflect the true constraints of the function.

```
   function changeTaxes(uint8 _sellTax, uint8 _buyTax) public
onlyOwner {
        require(_sellTax <= 10 && _sellTax > 0, "tax must be in
range 1% - 25% !");
        require(_buyTax <= 10 && _buyTax > 0, "tax must be in
range 1%- 25%!");
        ...
    }
```

Recommendation

The team is suggested to provide a descriptive message to the errors. Specifically, the error messages should be updated to accurately reflect the allowable range for `_sellTax` and `_buyTax`, which is between 1% and 10%. This message can be used to provide additional context about the error that occurred or to explain why the contract execution was halted. This can be useful for debugging and for providing more information to users that interact with the contract.

RSML - Redundant SafeMath Library

Criticality	Minor / Informative
Location	KairanX.sol
Status	Unresolved

Description

SafeMath is a popular Solidity library that provides a set of functions for performing common arithmetic operations in a way that is resistant to integer overflows and underflows.

Starting with Solidity versions that are greater than or equal to 0.8.0, the arithmetic operations revert to underflow and overflow. As a result, the native functionality of the Solidity operations replaces the SafeMath library. Hence, the usage of the SafeMath library adds complexity, overhead and increases gas consumption unnecessarily.

```
library SafeMath {...}
```

Recommendation

The team is advised to remove the SafeMath library. Since the version of the contract is greater than `0.8.0` then the pure Solidity arithmetic operations produce the same result.

If the previous functionality is required, then the contract could exploit the `unchecked { ... }` statement.

Read more about the breaking change on https://docs.soliditylang.org/en/v0.8.16/080-breaking-changes.html#solidity-v0-8-0-breaking-changes.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	KairanX.sol#L50,54,62
Status	Unresolved

Description

The Solidity style guide is a set of guidelines for writing clean and consistent Solidity code. Adhering to a style guide can help improve the readability and maintainability of the Solidity code, making it easier for others to understand and work with.

The followings are a few key points from the Solidity style guide:

1. Use camelCase for function and variable names, with the first letter in lowercase (e.g., myVariable, updateCounter).
2. Use PascalCase for contract, struct, and enum names, with the first letter in uppercase (e.g., MyContract, UserStruct, ErrorEnum).
3. Use uppercase for constant variables and enums (e.g., MAX_VALUE, ERROR_CODE).
4. Use indentation to improve readability and structure.
5. Use spaces between operators and after commas.
6. Use comments to explain the purpose and behavior of the code.
7. Keep lines short (around 120 characters) to improve readability.

```
address _uniswapPair
uint8 _buyTax
uint8 _sellTax
address _address
```

Recommendation

By following the Solidity naming convention guidelines, the codebase increased the readability, maintainability, and makes it easier to work with.
Find more information on the Solidity documentation
https://docs.soliditylang.org/en/v0.8.17/style-guide.html#naming-convention.

L16 - Validate Variable Setters

Criticality	Minor / Informative
Location	KairanX.sol#L20,51
Status	Unresolved

Description

The contract performs operations on variables that have been configured on user-supplied input. These variables are missing of proper check for the case where a value is zero. This can lead to problems when the contract is executed, as certain actions may not be properly handled when the value is zero.

```
feeWallet = _feeWallet
uniswapV2Pair = _uniswapPair
```

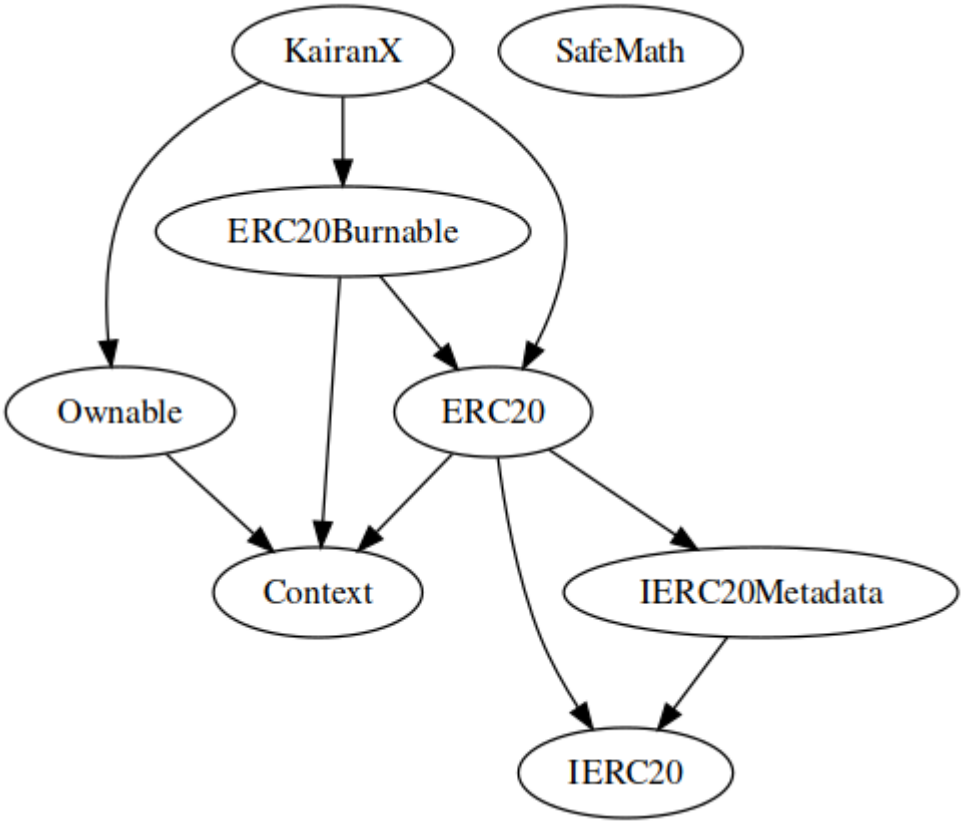
Recommendation

By adding the proper check, the contract will not allow the variables to be configured with zero value. This will ensure that the contract can handle all possible input values and avoid unexpected behavior or errors. Hence, it can help to prevent the contract from being exploited or operating unexpectedly.

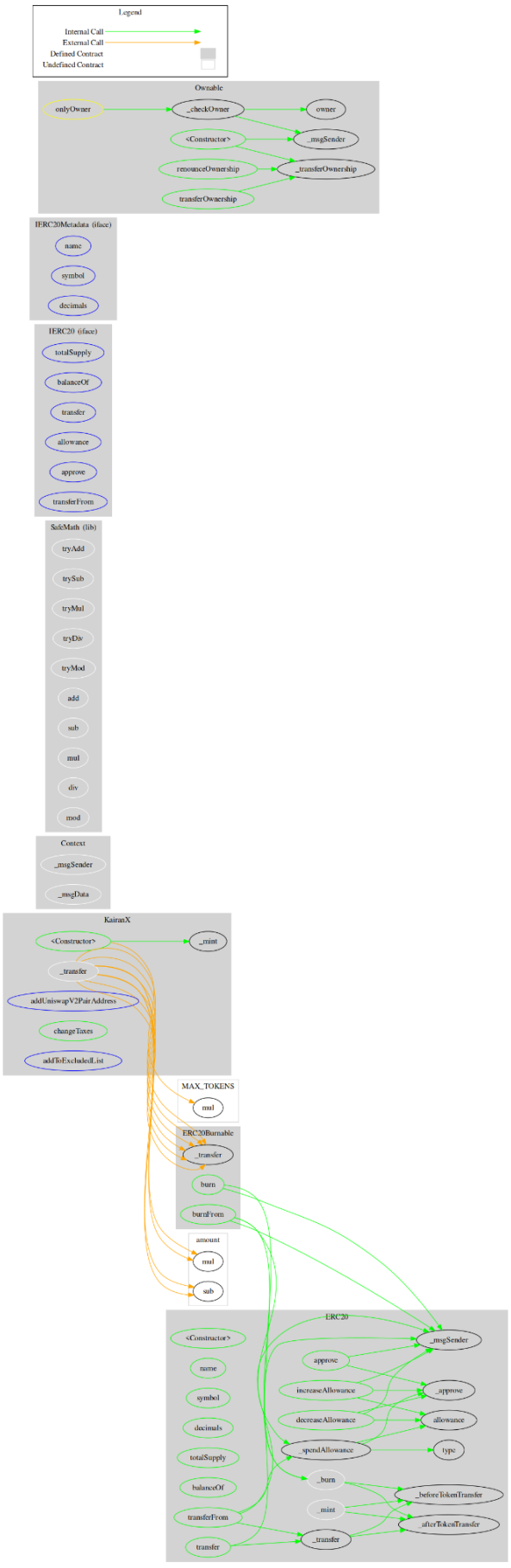
Functions Analysis

Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
KairanX	Implementation	ERC20, Ownable, ERC20Burnable		
		Public	✓	ERC20
	_transfer	Internal	✓	
	addUniswapV2PairAddress	External	✓	onlyOwner
	changeTaxes	Public	✓	onlyOwner
	addToExcludedList	External	✓	onlyOwner

Inheritance Graph



Flow Graph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
Ownable
onlyOwner
_checkOwner
owner
<Constructor>
_msgSender
renounceOwnership
_transferOwnership
transferOwnership
IERC20Metadata (iface)
name
symbol
decimals
IERC20 (iface)
totalSupply
balanceOf
transfer
allowance
approve
transferFrom
SafeMath (lib)
tryAdd
trySub
tryMul
tryDiv
tryMod
add
sub
mul
div
mod
Context
_msgSender
_msgData
KairanX
<Constructor>
_mint
_transfer
addUniswapV2PairAddress
changeTaxes
addToExcludedList
MAX_TOKENS
mul
ERC20Burnable
_transfer
burn
burnFrom
amount
mul
sub
ERC20
<Constructor>
name
symbol
decimals
totalSupply
balanceOf
transferFrom
transfer
_msgSender
approve
increaseAllowance
decreaseAllowance
_spendAllowance
_approve
allowance
type
_burn
_mint
_transfer
_beforeTokenTransfer
_afterTokenTransfer

Summary

KairanX contract implements a token mechanism. This audit investigates security issues, business logic concerns and potential improvements. KairanX is an interesting project that has a friendly and growing community. The Smart Contract analysis reported no compiler error or critical issues. The contract Owner can access some admin functions that can not be used in a malicious way to disturb the users' transactions. There is also a limit of max 10% fees.

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The Cyberscope team

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