

Audit Report

OxElonDogeBaseOptimismArbitr umLineaPolygonZKInu

Aug 2023

SHA256

c012b313e40d3ad9945e9ee3bdb9122f36acd5c3b418179dc431c99135658d43

Audited by © cyberscope



Analysis

CriticalMediumMinor / InformativePass

Severity	Code	Description	Status
•	ST	Stops Transactions	Passed
•	OTUT	Transfers User's Tokens	Passed
•	ELFM	Exceeds Fees Limit	Passed
•	MT	Mints Tokens	Passed
•	ВТ	Burns Tokens	Passed
•	ВС	Blacklists Addresses	Passed
•	PUA	Potential Unsynchronised Allowances	Unresolved
•	MVLC	Missing Variable Limit Checks	Unresolved



Diagnostics

CriticalMediumMinor / Informative

Severity	Code	Description	Status
•	NOO	Numeric Operation Optimization	Unresolved
•	MEE	Missing Events Emission	Unresolved
•	RSW	Redundant Storage Writes	Unresolved
•	RVD	Redundant Variable Declaration	Unresolved
•	RSML	Redundant SafeMath Library	Unresolved
•	RSK	Redundant Storage Keyword	Unresolved
•	L02	State Variables could be Declared Constant	Unresolved
•	L04	Conformance to Solidity Naming Conventions	Unresolved
•	L07	Missing Events Arithmetic	Unresolved
•	L09	Dead Code Elimination	Unresolved
•	L13	Divide before Multiply Operation	Unresolved
•	L16	Validate Variable Setters	Unresolved
•	L17	Usage of Solidity Assembly	Unresolved
•	L19	Stable Compiler Version	Unresolved



L20 Succeeded Transfer Check Unresolved



Table of Contents

Analysis	1
Diagnostics	2
Table of Contents	4
Review	6
Audit Updates	6
Source Files	6
Overview	7
Findings Breakdown	8
PUA - Potential Unsynchronised Allowances	9
Description	9
Recommendation	9
MVLC - Missing Variable Limit Checks	10
Description	10
Recommendation	10
NOO - Numeric Operation Optimization	11
Description	11
Recommendation	11
MEE - Missing Events Emission	12
Description	12
Recommendation	12
RSW - Redundant Storage Writes	13
Description	13
Recommendation	13
RVD - Redundant Variable Declaration	14
Description	14
Recommendation	14
RSML - Redundant SafeMath Library	15
Description	15
Recommendation	15
RSK - Redundant Storage Keyword	16
Description	16
Recommendation	16
L02 - State Variables could be Declared Constant	17
Description	17
Recommendation	17
L04 - Conformance to Solidity Naming Conventions	18
Description	18
Recommendation	19
L07 - Missing Events Arithmetic	20



Description	20
Recommendation	20
L09 - Dead Code Elimination	21
Description	21
Recommendation	22
L13 - Divide before Multiply Operation	23
Description	23
Recommendation	23
L16 - Validate Variable Setters	24
Description	24
Recommendation	24
L17 - Usage of Solidity Assembly	25
Description	25
Recommendation	25
L19 - Stable Compiler Version	26
Description	26
Recommendation	26
L20 - Succeeded Transfer Check	27
Description	27
Recommendation	27
Functions Analysis	28
Inheritance Graph	35
Flow Graph	36
Summary	37
Disclaimer	38
About Cyberscope	39



Review

Contract Name	TEST
Testing Deploy	https://testnet.bscscan.com/address/0x9f5d3800004d1e028280 2a02d45362f60e4fc90b
Symbol	ETST
Decimals	9
Total Supply	1,000,000,000,000,000

Audit Updates

Initial Audit	09 Aug 2023 https://github.com/cyberscope-io/audits/blob/main/v1/1-ethere um/audit.pdf
Corrected Phase 2	11 Aug 2023

Source Files

Filename	SHA256
contracts/newrebase.sol	c012b313e40d3ad9945e9ee3bdb9122f36acd5c3b418179dc431c9913 5658d43



Overview

The audit scope is to check for security vulnerabilities, validate the business logic and propose potential optimizations. The contract is missing the fundamental principles of a Solidity smart contract regarding gas consumption, code readability, and data structures. According to the previously mentioned issues, the contract cannot be assumed that it is in a production-ready state. Given these issues, it is not advisable to assume that the contract is in a production-ready state. The development team is strongly encouraged to re-evaluate the business logic and Solidity guidelines to ensure that the contract adheres to established best practices and security measures. It is recommended that the team review the contract's gas consumption and optimize it accordingly to minimize costs and improve the contract's efficiency. The code's readability should also be improved by simplifying function definitions and using descriptive variable names, as this will enhance the contract's auditability and maintenance.



Findings Breakdown



Sev	erity	Unresolved	Acknowledged	Resolved	Other
•	Critical	1	0	0	0
•	Medium	1	0	0	0
	Minor / Informative	15	0	0	0



PUA - Potential Unsynchronised Allowances

Criticality	Critical
Location	contracts/newrebase.sol#L1082
Status	Unresolved

Description

The contract employs a token normalization mechanism that is controlled by the BASE variable. This mechanism involves the multiplication and division of token quantities as needed. However, a significant drawback arises from this approach, as adjustments to the BASE value by the owner can lead in a lack of synchronization in the allowances.

```
function approve(address spender, uint256 amount) public override returns
(bool) {
    _allowances[msg.sender][spender] = amount;
    emit Approval(msg.sender, spender, amount);
    return true;
}
```

Recommendation

The team is advised to take these segments into consideration and rewrite them so that the allowances are always in sync with any modification in the BASE variable.



MVLC - Missing Variable Limit Checks

Criticality	Medium
Location	contracts/newrebase.sol#L1074
Status	Unresolved

Description

The variable BASE plays a crucial role in scaling operations involving balances and the totalSupply within the contract. However, altering its value without appropriate validation can trigger unforeseen and undesirable outcomes. One such scenario involves the potential for an overflow in operations like amount.mul(BASE) if an excessively large value is utilized. Consequently, this could severely compromise the predictability and reliability of the contract's behavior.

```
function setBaseratioAndSync(uint256 _ratio) external onlyOwner {
    require(_ratio>0);
    BASE = _ratio;
    IUniswapV2Pair(uniswapV2PairAddress).sync();
}
```

Recommendation

The team is advised to take these segments into consideration and rewrite them so the runtime is more reliable and predictable. The contract could embody a check for not allowing setting the BASE more than a reasonable amount.



NOO - Numeric Operation Optimization

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L1206
Status	Unresolved

Description

There are code segments that could be optimized. A segment may be optimized so that it becomes a smaller size, consumes less memory, executes more rapidly, or performs fewer operations.

The 1 * 10 ** 18 operation can be simplified further: 1e18.

```
uint256 _totalSupply = 1 * 10 ** 18 * (10 ** _decimals)
```

Recommendation

The team is advised to take these segments into consideration and rewrite them so the runtime will be more performant. That way it will improve the efficiency and performance of the source code and reduce the cost of executing it.



MEE - Missing Events Emission

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L1268,1366,1367,1371,1393,1398,1421
Status	Unresolved

Description

The contract performs actions and state mutations from external methods that do not result in the emission of events. Emitting events for significant actions is important as it allows external parties, such as wallets or dApps, to track and monitor the activity on the contract. Without these events, it may be difficult for external parties to accurately determine the current state of the contract.

```
BASE = _ratio
uniswapV2PairAddress = _pair
isPair[_pair] = yes
isNoFee[_NoFee] = yes
tradingOpen = true
isFeeExempt[holder] = exempt
FeeReceiver = _receiver
```

Recommendation

It is recommended to include events in the code that are triggered each time a significant action is taking place within the contract. These events should include relevant details such as the user's address and the nature of the action taken. By doing so, the contract will be more transparent and easily auditable by external parties. It will also help prevent potential issues or disputes that may arise in the future.



RSW - Redundant Storage Writes

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L1371,1393,1398,1421
Status	Unresolved

Description

There are code segments that could be optimized. A segment may be optimized so that it becomes a smaller size, consumes less memory, executes more rapidly, or performs fewer operations.

The contract modifies the state of certain variables even when their current state is equal to the provided argument. As a result, the contract performs redundant storage writes.

```
isNoFee[_NoFee] = yes
tradingOpen = true
isFeeExempt[holder]
FeeReceiver = _receiver
```

Recommendation

The team is advised to take these segments into consideration and rewrite them so the runtime will be more performant. That way it will improve the efficiency and performance of the source code and reduce the cost of executing it.



RVD - Redundant Variable Declaration

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L1212,1214
Status	Unresolved

Description

There are code segments that could be optimized. A segment may be optimized so that it becomes a smaller size, consumes less memory, executes more rapidly, or performs fewer operations.

The variables <code>isFeeExempt</code> and <code>isNoFee</code> both serve the same purpose from our understanding. Both are used to determine if a given address should be excluded from fees or not. As a result, declaring both variables is redundant.

```
mapping(address => bool) isFeeExempt;
mapping(address => bool) isNoFee;
```

Recommendation

The team is advised to take these segments into consideration and rewrite them so the runtime will be more performant. That way it will improve the efficiency and performance of the source code and reduce the cost of executing it.



RSML - Redundant SafeMath Library

Criticality	Minor / Informative
Location	contracts/newrebase.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.



RSK - Redundant Storage Keyword

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L354,364,374,384
Status	Unresolved

Description

The contract uses the storage keyword in a view function. The storage keyword is used to persist data on the contract's storage. View functions are functions that do not modify the state of the contract and do not perform any actions that cost gas (such as sending a transaction). As a result, the use of the storage keyword in view functions is redundant.

```
AddressSlot storage r
BooleanSlot storage r
Bytes32Slot storage r
Uint256Slot storage r
```

Recommendation

It is generally considered good practice to avoid using the storage keyword in view functions because it is unnecessary and can make the code less readable.



L02 - State Variables could be Declared Constant

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L1024,1025,1030,1042
Status	Unresolved

Description

State variables can be declared as constant using the constant keyword. This means that the value of the state variable cannot be changed after it has been set. Additionally, the constant variables decrease gas consumption of the corresponding transaction.

Recommendation

Constant state variables can be useful when the contract wants to ensure that the value of a state variable cannot be changed by any function in the contract. This can be useful for storing values that are important to the contract's behavior, such as the contract's address or the maximum number of times a certain function can be called. The team is advised to add the constant keyword to state variables that never change.



L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L939,951,952,1024,1025,1027,1028,1029,1030, 1032,1034,1043,1044,1045,1046,1048,1074,1148,1153,1182,1188,1194, 1206
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.



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.



L07 - Missing Events Arithmetic

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L1076,1184,1190
Status	Unresolved

Description

Events are a way to record and log information about changes or actions that occur within a contract. They are often used to notify external parties or clients about events that have occurred within the contract, such as the transfer of tokens or the completion of a task.

It's important to carefully design and implement the events in a contract, and to ensure that all required events are included. It's also a good idea to test the contract to ensure that all events are being properly triggered and logged.

```
BASE = _ratio
SellFee = _Fee
BuyFee = _Fee
```

Recommendation

By including all required events in the contract and thoroughly testing the contract's functionality, the contract ensures that it performs as intended and does not have any missing events that could cause issues with its arithmetic.



L09 - Dead Code Elimination

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L15,22,30,41,51,132,145,181,192,234,245,283, 296,326,354,364,374,384,709,738,764,811,851,1064
Status	Unresolved

Description

In Solidity, dead code is code that is written in the contract, but is never executed or reached during normal contract execution. Dead code can occur for a variety of reasons, such as:

- Conditional statements that are always false.
- Functions that are never called.
- Unreachable code (e.g., code that follows a return statement).

Dead code can make a contract more difficult to understand and maintain, and can also increase the size of the contract and the cost of deploying and interacting with it.

```
function max(uint256 a, uint256 b) internal pure returns (uint256) {
    return a > b ? a : b;
}

function min(uint256 a, uint256 b) internal pure returns (uint256) {
    return a < b ? a : b;
...
    return (a & b) + (a ^ b) / 2;
}

function ceilDiv(uint256 a, uint256 b) internal pure returns (uint256) {
    // (a + b - 1) / b can overflow on addition, so we distribute.
    return a == 0 ? 0 : (a - 1) / b + 1;
}
...</pre>
```



Recommendation

To avoid creating dead code, it's important to carefully consider the logic and flow of the contract and to remove any code that is not needed or that is never executed. This can help improve the clarity and efficiency of the contract.



L13 - Divide before Multiply Operation

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L94,97,109,113,114,115,116,117,118,124,1166, 1167
Status	Unresolved

Description

It is important to be aware of the order of operations when performing arithmetic calculations. This is especially important when working with large numbers, as the order of operations can affect the final result of the calculation. Performing divisions before multiplications may cause loss of prediction.

```
denominator := div(denominator, twos)
inverse *= 2 - denominator * inverse
```

Recommendation

To avoid this issue, it is recommended to carefully consider the order of operations when performing arithmetic calculations in Solidity. It's generally a good idea to use parentheses to specify the order of operations. The basic rule is that the multiplications should be prior to the divisions.



L16 - Validate Variable Setters

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L913,1149,1195
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.

```
owner = adr
uniswapV2PairAddress = _pair
FeeReceiver = _receiver
```

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.



L17 - Usage of Solidity Assembly

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L58,356,366,376,386
Status	Unresolved

Description

Using assembly can be useful for optimizing code, but it can also be error-prone. It's important to carefully test and debug assembly code to ensure that it is correct and does not contain any errors.

Some common types of errors that can occur when using assembly in Solidity include Syntax, Type, Out-of-bounds, Stack, and Revert.

Recommendation

It is recommended to use assembly sparingly and only when necessary, as it can be difficult to read and understand compared to Solidity code.



L19 - Stable Compiler Version

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L3
Status	Unresolved

Description

The symbol indicates that any version of Solidity that is compatible with the specified version (i.e., any version that is a higher minor or patch version) can be used to compile the contract. The version lock is a mechanism that allows the author to specify a minimum version of the Solidity compiler that must be used to compile the contract code. This is useful because it ensures that the contract will be compiled using a version of the compiler that is known to be compatible with the code.

```
pragma solidity ^0.8.0;
```

Recommendation

The team is advised to lock the pragma to ensure the stability of the codebase. The locked pragma version ensures that the contract will not be deployed with an unexpected version. An unexpected version may produce vulnerabilities and undiscovered bugs. The compiler should be configured to the lowest version that provides all the required functionality for the codebase. As a result, the project will be compiled in a well-tested LTS (Long Term Support) environment.



L20 - Succeeded Transfer Check

Criticality	Minor / Informative
Location	contracts/newrebase.sol#L1207
Status	Unresolved

Description

According to the ERC20 specification, the transfer methods should be checked if the result is successful. Otherwise, the contract may wrongly assume that the transfer has been established.

```
ERC20Token.transfer(msg.sender, ERC20Token.balanceOf(address(this)));
```

Recommendation

The contract should check if the result of the transfer methods is successful. The team is advised to check the SafeERC20 library from the Openzeppelin library.



Functions Analysis

Contract	Туре	Bases		
	Function Name	Visibility	Mutability	Modifiers
Math	Library			
	max	Internal		
	min	Internal		
	average	Internal		
	ceilDiv	Internal		
	mulDiv	Internal		
	mulDiv	Internal		
	sqrt	Internal		
	sqrt	Internal		
	log2	Internal		
	log2	Internal		
	log10	Internal		
	log10	Internal		
	log256	Internal		
	log256	Internal		
StorageSlot	Library			
	getAddressSlot	Internal		



	getBooleanSlot	Internal		
	getBytes32Slot	Internal		
	getUint256Slot	Internal		
SafeMath	Library			
	add	Internal		
	sub	Internal		
	sub	Internal		
	mul	Internal		
	div	Internal		
	div	Internal		
Context	Implementation			
	_msgSender	Internal		
	_msgData	Internal		
IERC20	Interface			
	totalSupply	External		-
	balanceOf	External		-
	transfer	External	1	-
	allowance	External		-
	approve	External	1	-
	transferFrom	External	✓	-



IERC20Metadat	Interface	IERC20		
	name	External		-
	symbol	External		-
	decimals	External		-
ERC20	Implementation	Context, IERC20, IERC20Meta data		
	name	Public		-
	symbol	Public		-
	decimals	Public		-
	totalSupply	Public		-
	balanceOf	Public		-
	transfer	Public	✓	-
	allowance	Public		-
	approve	Public	✓	-
	transferFrom	Public	✓	-
	increaseAllowance	Public	✓	-
	decreaseAllowance	Public	✓	-
	_transfer	Internal	✓	
	_mint	Internal	✓	
	_burn	Internal	✓	
	_approve	Internal	✓	



	_spendAllowance	Internal	✓	
	_beforeTokenTransfer	Internal	✓	
	_afterTokenTransfer	Internal	✓	
Auth	Implementation			
		Public	1	-
	authorize	Public	1	onlyOwner
	unauthorize	Public	1	onlyOwner
	isOwner	Public		-
	isAuthorized	Public		-
	transferOwnership	Public	1	onlyOwner
IUniswapV2Pair	Interface			
	approve	External	✓	-
	transfer	External	1	-
	transferFrom	External	1	-
	burn	External	✓	-
	swap	External	✓	-
	skim	External	✓	-
	sync	External	✓	-
	initialize	External	✓	-
	permit	External	✓	-
	totalSupply	External		-



	balanceOf	External		-
	allowance	External		-
	DOMAIN_SEPARATOR	External		-
	nonces	External		-
	factory	External		-
	token0	External		-
	token1	External		-
	getReserves	External		-
	price0CumulativeLast	External		-
	price1CumulativeLast	External		-
	kLast	External		-
	name	External		-
	symbol	External		-
	decimals	External		-
	PERMIT_TYPEHASH	External		-
	MINIMUM_LIQUIDITY	External		-
ReentrancyGua rd	Implementation			
		Public	✓	-
TEST	Implementation	ERC20, Auth, ReentrancyG uard		
		Public	✓	Auth



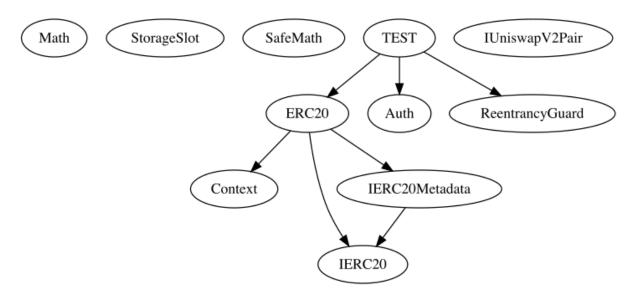
totalSupply	Public		-
decimals	Public		-
symbol	Public		-
name	Public		-
getOwner	Public		-
balanceOf	Public		-
allowance	Public		-
isContract	Internal		
setBaseratioAndSync	External	1	onlyOwner
approve	Public	1	-
approveMax	External	1	-
transfer	Public	1	-
transferFrom	Public	1	-
_transferFrom	Internal	1	
_basicTransfer	Internal	1	
shouldTakeFee	Internal		
setPair	External	1	authorized
setNoFeeContracts	External	1	authorized
takeFee	Internal	✓	
setIsFeeExempt	External	✓	authorized
setSellFee	External	✓	authorized
setBuyFee	External	1	authorized
setFeeReceiver	External	✓	authorized



clearStuckBalance	External	✓	authorized
recoverERC20	External	1	authorized
getCirculatingSupply	Public		-

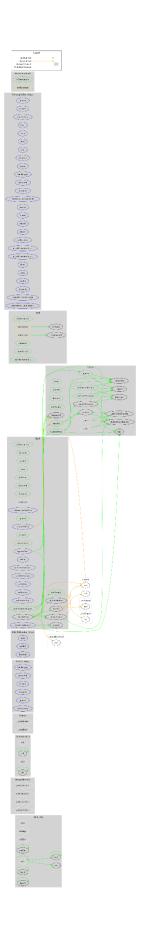


Inheritance Graph





Flow Graph





Summary

0xElonDogeBaseOptimismArbitrumLineaPolygonZKInu contract implements a token mechanism. This audit investigates security issues, business logic concerns and potential improvements. 0xElonDogeBaseOptimismArbitrumLineaPolygonZKInu is an interesting project that has a friendly and growing community. The Smart Contract analysis reported no compiler errors 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 14% fees.



Disclaimer

The information provided in this report does not constitute investment, financial or trading advice and you should not treat any of the document's content as such. This report may not be transmitted, disclosed, referred to or relied upon by any person for any purposes nor may copies be delivered to any other person other than the Company without Cyberscope's prior written consent. This report is not nor should be considered an "endorsement" or "disapproval" of any particular project or team. This report is not nor should be regarded as an indication of the economics or value of any "product" or "asset" created by any team or project that contracts Cyberscope to perform a security assessment. This document does not provide any warranty or guarantee regarding the absolute bug-free nature of the technology analyzed, nor do they provide any indication of the technologies proprietors' business, business model or legal compliance. This report should not be used in any way to make decisions around investment or involvement with any particular project. This report represents an extensive assessment process intending to help our customers increase the quality of their code while reducing the high level of risk presented by cryptographic tokens and blockchain technology.

Blockchain technology and cryptographic assets present a high level of ongoing risk Cyberscope's position is that each company and individual are responsible for their own due diligence and continuous security Cyberscope's goal is to help reduce the attack vectors and the high level of variance associated with utilizing new and consistently changing technologies and in no way claims any guarantee of security or functionality of the technology we agree to analyze. The assessment services provided by Cyberscope are subject to dependencies and are under continuing development. 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 Cryptographic tokens are emergent technologies and carry with them high levels of technical risk and uncertainty. The assessment reports could include false positives false negatives and other unpredictable results. The services may access and depend upon multiple layers of third parties.



About Cyberscope

Cyberscope is a blockchain cybersecurity company that was founded with the vision to make web3.0 a safer place for investors and developers. Since its launch, it has worked with thousands of projects and is estimated to have secured tens of millions of investors' funds.

Cyberscope is one of the leading smart contract audit firms in the crypto space and has built a high-profile network of clients and partners.

