



Cyberscope

# Audit Report

## **Genesis Presale**

June 2024

Network    ETH

Address    0x23f78e4c1ed1b0a66b30c00636c1323560f95532

Audited by    © cyberscope

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## Review

Contract Name	Presale
Explorer	<a href="https://etherscan.io/address/0x23f78e4c1ed1b0a66b30c00636c1323560f95532">https://etherscan.io/address/0x23f78e4c1ed1b0a66b30c00636c1323560f95532</a>
Address	0x23F78e4c1eD1B0A66B30C00636c1323560f95532

## Audit Updates

Initial Audit	19 Jun 2024 <a href="https://github.com/cyberscope-io/audits/blob/main/5-gen/v1/audit.pdf">https://github.com/cyberscope-io/audits/blob/main/5-gen/v1/audit.pdf</a>
Corrected Phase 2	20 Jun 2024 <a href="https://github.com/cyberscope-io/audits/blob/main/5-gen/v2/audit.pdf">https://github.com/cyberscope-io/audits/blob/main/5-gen/v2/audit.pdf</a>
Corrected Phase 3	21 Jun 2024 <a href="https://github.com/cyberscope-io/audits/blob/main/5-gen/v3/audit.pdf">https://github.com/cyberscope-io/audits/blob/main/5-gen/v3/audit.pdf</a>
Corrected Phase 4	25 Jun 2024

## Source Files

Filename	SHA256
Presale.sol	5d73faff3ea11e553848e400256506d5331 c71d7f3109a0b4603528ef6f74132

## Overview

The contract is designed to handle the presale of tokens, providing a structured process for users to participate by contributing native tokens (ETH) in exchange for the presale tokens. The contract ensures the presale's integrity by incorporating mechanisms for token deposits, user contributions, refunds, and the eventual launch of tokens on a decentralized exchange (Uniswap). The owner of the contract has specific administrative privileges to manage the presale effectively.

## Token Purchase and Contributions

Users have the ability to participate in the presale by sending native tokens (ETH) to the contract. Contributions are tracked in a mapping, and the total amount of funds raised is recorded in the contract's state. This functionality is facilitated through the `receive()` function, which handles direct ETH transfers to the contract. Additionally, the `_purchase()` function validates each contribution, ensuring it adheres to the predefined minimum and maximum limits, and the presale's overall cap.

## Claiming Tokens

After the presale is successfully finalized and launched, users can claim their allocated tokens. The `claim()` function allows contributors to retrieve their tokens based on their proportional contributions. This functionality ensures that users receive their due share of the presale tokens once the presale transitions to a claimable state.

## Refund Mechanism

In scenarios where the presale is canceled or fails to reach the soft cap by the end date, users are entitled to refunds. The `refund()` function enables contributors to retrieve their contributions if the presale conditions are not met. This is protected by the `onlyRefundable` modifier, which ensures refunds are only processed under appropriate conditions, providing security to the participants.

## Owner Privileges

The contract owner has significant control over the presale process. They can initialize the presale by depositing tokens through the `deposit()` function, finalize the presale with `finalize()`, and launch the presale on Uniswap using the `launch()` function. Additionally, the owner can cancel the presale with `cancel()`, extend the presale period with `extendEndTime()`, and unlock token claiming with `unlockClaim()`. These functions ensure the owner can manage the presale lifecycle effectively and respond to different scenarios.

## Token Deposit and Allocation

The `deposit()` function, callable only by the owner, is used to deposit the total tokens intended for the presale and liquidity provision. This function sets the contract's state to active and calculates the distribution of tokens between liquidity and presale allocations. The `_tokensForLiquidity()` and `_tokensForPresale()` functions determine the precise token amounts for these purposes, ensuring a clear allocation strategy.

## Finalization and Liquidity Provision

The `finalize()` function, restricted to the owner, concludes the presale when the soft cap is reached or the presale period ends. This process involves validating the presale state, ensuring the soft cap is met, and confirming the presale period has ended. It calculates and allocates tokens to seed investors, transferring these tokens to the owner for redistribution and adjusting the pool's token balance. The function determines the ETH required for liquidity using the `_liquidityWei()` function and subtracts this amount from the raised funds, distributing any remaining ETH to the owner. It then adds liquidity to Uniswap with the calculated ETH and remaining tokens using the `_liquify()` function, enabling public trading of the tokens. The function completes by updating the pool's token balance and emitting a finalization event, ensuring a seamless transition from presale to public trading while adhering to the defined contract rules.

## Refunds and Token Claiming Post-Launch

After the presale is successfully launched, the owner can call `unlockClaim()` to enable contributors to claim their tokens. This function changes the state to allow claims, ensuring that participants can retrieve their tokens. The `refund()` function remains available for scenarios where the presale is canceled or fails, providing a safety net for contributors.

## Roles

### Owner

The owner can interact with the following functions:

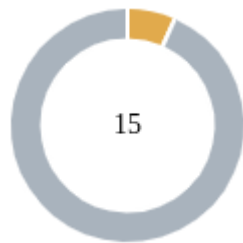
- function finalize
- function cancel
- function extendEndTime
- function unlockClaim

### Users

The users can interact with the following functions:

- function deposit
- function claim
- function refund

## Findings Breakdown



Critical	0
Medium	1
Minor / Informative	14

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	0	0	0	0
Medium	0	1	0	0
Minor / Informative	14	0	0	0



# Diagnostics

● Critical ● Medium ● Minor / Informative

Severity	Code	Description	Status
●	PTU	Potential Token Underflow	Acknowledged
●	CCR	Contract Centralization Risk	Unresolved
●	EUI	Enum Usage Improvement	Unresolved
●	ITE	Incorrect Time Extension	Unresolved
●	MREM	Misleading Revert Error Message	Unresolved
●	MEE	Missing Events Emission	Unresolved
●	MPV	Missing Parameter Verification	Unresolved
●	MU	Modifiers Usage	Unresolved
●	PDTD	Potential Disproportionate Token Distribution	Unresolved
●	PTAI	Potential Transfer Amount Inconsistency	Unresolved
●	RC	Repetitive Calculations	Unresolved
●	L08	Tautology or Contradiction	Unresolved
●	L13	Divide before Multiply Operation	Unresolved
●	L19	Stable Compiler Version	Unresolved

## PTU - Potential Token Underflow

Criticality	Medium
Location	Presale.sol#L1136,1308,1317
Status	Acknowledged

### Description

The contract is calculating `seederTokens`, which are the tokens owed to the seed investors, based on a percentage of the `tokensClaimable` value. These tokens are then deducted from the `pool.tokensLiquidity`. However, this deduction may result in an underflow if the `pool.tokensLiquidity` is not sufficient to cover the `seederTokens`, potentially leading to serious issues in the contract's operation and distribution of tokens. Specifically, if the `_seederTotalValue` is disproportionate to the available funds, the resulting `seederTokens` calculation could exceed the `pool.tokensLiquidity`. This mismatch may cause an underflow, which could disrupt the accurate allocation of tokens and adversely affect the contract's stability and functionality.

```
uint256 seederTokens = _seederTokens();
// Send seed investor tokens to owner, for further redistribution
IERC20(pool.token).safeTransfer(msg.sender, seederTokens);
pool.tokenBalance -= seederTokens;
// Subtract the seed investor tokens from the amount allocated to the LP
pool.tokensLiquidity -= seederTokens;
...
function _seederTokens() internal view returns(uint256) {
    return ((_seederTotalValue() * SCALE) / pool.weiRaised *
    pool.tokensClaimable) / SCALE;
}

function _seederTotalValue() internal view returns (uint256) {
    return pool.options.seederRaisedWei + (pool.options.seederRaisedWei *
    pool.options.seederPremiumBps / 10_000);
}
```

## Recommendation

It is recommended to add additional checks to verify that `pool.tokensLiquidity` is greater than the `seederTokens` being subtracted. This will prevent underflow errors and ensure the contract operates securely and as intended, maintaining the integrity of token distributions.

## Team Update

The team has acknowledged that this is not a security issue and states:

*The seed investment is a fixed, known value. If the amount of liquidity raised is so low that the seed investors would gain more than the LP contains, the softcap would not be reached.*

## CCR - Contract Centralization Risk

<b>Criticality</b>	Minor / Informative
<b>Location</b>	Presale.sol#L1087,1107,1166,1185
<b>Status</b>	Unresolved

### Description

The contract's functionality and behavior are heavily dependent on external parameters or configurations. While external configuration can offer flexibility, it also poses several centralization risks that warrant attention. Centralization risks arising from the dependence on external configuration include Single Point of Control, Vulnerability to Attacks, Operational Delays, Trust Dependencies, and Decentralization Erosion.

Specifically, the owner has significant control over the presale process. The owner has the authority to set the correct attributes and initialize the contract. Additionally, the owner can control the flow and process of the presale by calling functions such as `deposit`, `finalize`, `launch`, `cancel`, `extendEndTime`, and `unlockClaim` in correct flow. This centralization of control could potentially be exploited, leading to unfair practices or mismanagement.

```
    constructor (address _weth, address _token, address _uniswapV2Router02,
PresaleOptions memory _options) Ownable(msg.sender) {
    _prevalidatePool(_options);
    pool.uniswapV2Router02 = IUniswapV2Router02(_uniswapV2Router02);
    pool.routerAddress = _uniswapV2Router02;
    pool.token = IERC20(_token);
    pool.state = 1;
    pool.weth = _weth;
    pool.options = _options;
}

    function deposit() external onlyOwner returns (uint256) {
        ...

        IERC20(pool.token).safeTransferFrom(msg.sender, address(this),
pool.options.tokenDeposit);

        emit Deposit(msg.sender, pool.options.tokenDeposit,
block.timestamp);
        return pool.options.tokenDeposit;
    }

    function finalize() external onlyOwner returns(bool) {
        ...
        if (withdrawable > 0) payable(msg.sender).sendValue(withdrawable);

        emit Finalized(msg.sender, pool.weiRaised, block.timestamp);

        return true;
    }

    function launch() external onlyOwner {
        ...
        _liquify(liquidityWei, pool.tokensLiquidity);
        pool.tokenBalance -= pool.tokensLiquidity;
    }

    function cancel() external onlyOwner returns(bool){
        ...
        emit Cancel(msg.sender, block.timestamp);

        return true;
    }

    function extendEndTime(uint112 end) external onlyOwner {
        ...
        pool.options.end = end;
    }
}
```

## Recommendation

To address this finding and mitigate centralization risks, it is recommended to evaluate the feasibility of migrating critical configurations and functionality into the contract's codebase itself. This approach would reduce external dependencies and enhance the contract's self-sufficiency. It is essential to carefully weigh the trade-offs between external configuration flexibility and the risks associated with centralization.

## EUI - Enum Usage Improvement

Criticality	Minor / Informative
Location	Presale.sol#L1057
Status	Unresolved

### Description

The contract is using a `uint8` variable to represent different states of the presale, which could lead to potential issues with readability and maintainability. Using an enumeration ( `enum` ) instead of a `uint8` for the state variable would make the code more understandable and reduce the risk of incorrect state assignments, as enums provide a more explicit representation of the different states.

```
    * @param state Current state of the presale {1: Initialized, 2:
Active, 3: Canceled, 4: Finalized, 5: Launched, 6: Claimable}.
    * @param options PresaleOptions struct containing configuration for
the presale.
    */
    struct Pool {
        ...
        uint8 state;
        ...
    }
```

### Recommendation

It is recommended to replace the `uint8` state variable with an enumeration ( `enum` ) to clearly define the different states of the presale. This will enhance code readability, improve maintainability, and minimize the risk of assigning invalid states.

## ITE - Incorrect Time Extension

Criticality	Minor / Informative
Location	Presale.sol#L1185
Status	Unresolved

### Description

The contract is currently resetting the end time when extending the presale period using the `extendEndTime` function. Instead of adding additional time to the existing end time, the function replaces the current end time with a new value. This approach can be misleading and may not align with the expected behavior of extending the presale period, potentially causing confusion and mismanagement of the presale timeline.

```
function extendEndTime(uint112 end) external onlyOwner {
    if(block.timestamp < pool.options.start || block.timestamp >
pool.options.end) revert NotInPurchasePeriod(); // Presale can only be
extended during active period
    if(pool.state != 2) revert InvalidState(pool.state);
    pool.options.end = end;
}
```

### Recommendation

It is recommended to modify the `extendEndTime` function to add the specified time to the existing `end` time, rather than resetting it. This will ensure that the presale period is accurately extended, preserving the intended duration and avoiding any potential issues related to time management.



## MREM - Misleading Revert Error Message

Criticality	Minor / Informative
Location	Presale.sol#L1130
Status	Unresolved

### Description

The contract is using an error message "SoftCapNotReached" when checking if `pool.weiRaised < pool.options.softCap && block.timestamp < pool.options.end`. This check reverts the transaction if the `softCap` is not reached and the current time is before the end time. However, the same error message is also triggered if the `softCap` is reached but the current time is after the end time. This is misleading because it does not accurately reflect the actual issue, which could either be the `softCap` not being reached or the fundraising period having ended.

```
if(pool.weiRaised < pool.options.softCap && block.timestamp <
pool.options.end) revert SoftCapNotReached();
```

### Recommendation

It is recommended to revise the error handling logic to provide distinct and accurate error messages for different failure conditions. This will ensure that users and developers can clearly understand whether the issue is due to the `softCap` not being reached or the fundraising period having ended, thereby improving the transparency and usability of the contract.

## MEE - Missing Events Emission

Criticality	Minor / Informative
Location	Presale.sol#L1185,1211
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.

```
function extendEndTime(uint112 end) external onlyOwner {
    if(block.timestamp < pool.options.start || block.timestamp >
pool.options.end) revert NotInPurchasePeriod(); // Presale can only be
extended during active period
    if(pool.state != 2) revert InvalidState(pool.state);
    pool.options.end = end;
}

function unlockClaim() external onlyOwner {
    if(pool.state != 5) revert InvalidState(pool.state);
    pool.state = 6;
}
```

### 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.

## MPV - Missing Parameter Verification

Criticality	Minor / Informative
Location	Presale.sol#L1287
Status	Unresolved

### Description

The contract is missing checks to verify parameters during the constructor initialization. Specifically, there are no checks to ensure that `seederPremiumBps` is not zero and less than 10,000, `seederRaisedWei` is not zero, and `launchIncreaseBps` is less than 10,000. These missing checks could lead to improper initialization of the contract and potential vulnerabilities in the contract's operation.

```
function _prevalidatePool(PresaleOptions memory _options) internal view
returns(bool) {
    if (_options.softCap == 0) revert InvalidCapValue();
    if (_options.min == 0 || _options.min > _options.max) revert
InvalidLimitValue();
    if (_options.liquidityBps < 0 || _options.liquidityBps > 10000) revert
InvalidLiquidityValue();
    if (_options.start > block.timestamp || _options.end < _options.start)
revert InvalidTimestampValue(); // Comment this line out for testing
purpose
    return true;
}
```

### Recommendation

It is recommended to include validation checks during the constructor initialization to ensure that `seederPremiumBps` is not zero and is less than 10,000, `seederRaisedWei` is not zero, and `launchIncreaseBps` is less than 10,000. Implementing these checks will enhance the security and robustness of the contract by preventing invalid parameter values from being used.

## MU - Modifiers Usage

<b>Criticality</b>	Minor / Informative
<b>Location</b>	Presale.sol#L1129,1187,1275
<b>Status</b>	Unresolved

### Description

The contract is using repetitive statements on some methods to validate some preconditions. In Solidity, the form of preconditions is usually represented by the modifiers. Modifiers allow you to define a piece of code that can be reused across multiple functions within a contract. This can be particularly useful when you have several functions that require the same checks to be performed before executing the logic within the function.

```
if(pool.state != 2) revert InvalidState(pool.state);
```

### Recommendation

The team is advised to use modifiers since it is a useful tool for reducing code duplication and improving the readability of smart contracts. By using modifiers to perform these checks, it reduces the amount of code that is needed to write, which can make the smart contract more efficient and easier to maintain.

## PDTD - Potential Disproportionate Token Distribution

Criticality	Minor / Informative
Location	Presale.sol#L1308,1317
Status	Unresolved

### Description

The contract calculates the `_seederTotalValue`, which represents the effective wei raised by seed investors. This value is then used to calculate `seederTokens`, the amount of tokens owed to seed investors. However, the contract should verify that `_seederTotalValue` is less than `pool.weiRaised`, otherwise, there would be no tokens left for other distributions. Additionally, if `_seederTotalValue` becomes disproportionate compared to `pool.weiRaised * pool.tokensClaimable`, the contract may not have enough tokens to send to seed investors, causing inaccurate calculations and disrupting the accurate allocation and functionality of the contract.

```
/**
 * @notice Tokens per seed investor rate is dynamically calculated
 * using the proportional allocation of current raise amount in Wei.
 * @return The total amount of tokens allocated to the seed investors
 */
function _seederTokens() internal view returns(uint256) {
    return ((_seederTotalValue() * SCALE) / pool.weiRaised *
pool.tokensClaimable) / SCALE;
}

/**
 * @notice Calculates the amount of effective wei the seeders have
 * raised.
 * For example, at a 30% premium (seederPremiumBps = 3000), and 10 ETH
 * seed funds raised, the total value will be 13 ETH.
 * @return The amount of token value in wei the seeders have raised.
 */
function _seederTotalValue() internal view returns (uint256) {
    return pool.options.seederRaisedWei +
(pool.options.seederRaisedWei * pool.options.seederPremiumBps / 10_000);
}
```

## Recommendation

It is recommended to include additional checks to ensure that `_seederTotalValue` is less than `pool.weiRaised` before proceeding with any token calculations. Moreover, ensure that the calculated `seederTokens` does not exceed the available tokens in the contract. These checks will prevent inaccurate calculations and ensure the contract has sufficient tokens to fulfill its obligations, maintaining the integrity of token distribution.

## PTAI - Potential Transfer Amount Inconsistency

<b>Criticality</b>	Minor / Informative
<b>Location</b>	Presale.sol#L1115
<b>Status</b>	Unresolved

### Description

The `transfer()` and `transferFrom()` functions are used to transfer a specified amount of tokens to an address. The fee or tax is an amount that is charged to the sender of an ERC20 token when tokens are transferred to another address. According to the specification, the transferred amount could potentially be less than the expected amount. This may produce inconsistency between the expected and the actual behavior.

The following example depicts the diversion between the expected and actual amount.

Tax	Amount	Expected	Actual
No Tax	100	100	100
10% Tax	100	100	90

Specifically the `pool.token` address may apply fee values to its transactions and as a result the presale contract will receive less tokens.

```
IERC20(pool.token).safeTransferFrom(msg.sender, address(this),  
pool.options.tokenDeposit);
```

## Recommendation

The team is advised to take into consideration the actual amount that has been transferred instead of the expected.

It is important to note that an ERC20 transfer tax is not a standard feature of the ERC20 specification, and it is not universally implemented by all ERC20 contracts. Therefore, the contract could produce the actual amount by calculating the difference between the transfer call.

```
Actual Transferred Amount = Balance After Transfer - Balance  
Before Transfer
```



## RC - Repetitive Calculations

Criticality	Minor / Informative
Location	Presale.sol#L350,358
Status	Unresolved

### Description

The contract contains methods with multiple occurrences of the same calculation being performed. The calculation is repeated without utilizing a variable to store its result, which leads to redundant code, hinders code readability, and increases gas consumption. Each repetition of the calculation requires computational resources and can impact the performance of the contract, especially if the calculation is resource-intensive.

Specifically, the contract is calculating tokens for liquidity using the `_tokensForLiquidity` function, which determines the amount based on a percentage of the total token deposit. However, within the `_tokensForPresale` function, these tokens for liquidity are recalculated instead of reusing the value derived from `_tokensForLiquidity`. This approach introduces a risk of inconsistency and potential errors in token allocation calculations.

```
function _tokensForLiquidity() internal view returns (uint256){
    return pool.options.tokenDeposit * pool.options.liquidityBps /
    10_000;
}

function _tokensForPresale() internal view returns (uint256){
    return pool.options.tokenDeposit - (pool.options.tokenDeposit *
    pool.options.liquidityBps / 10_000);
}
```

## Recommendation

To address this finding and enhance the efficiency and maintainability of the contract, it is recommended to refactor the code by assigning the calculation result to a variable once and then utilizing that variable throughout the method. By storing the calculation result in a variable, the contract eliminates the need for redundant calculations and optimizes code execution.

Refactoring the code to assign the calculation result to a variable has several benefits. It improves code readability by making the purpose and intent of the calculation explicit. It also reduces code redundancy, making the method more concise, easier to maintain, and gas effective. Additionally, by performing the calculation once and reusing the variable, the contract improves performance by avoiding unnecessary computations.

It is recommended to reuse the `_tokensForLiquidity` function within the `_tokensForPresale` function to ensure consistency and accuracy in token allocation. This change will enhance the reliability of the contract by preventing potential discrepancies in the calculation of tokens for liquidity and presale.

## L08 - Tautology or Contradiction

<b>Criticality</b>	Minor / Informative
<b>Location</b>	Presale.sol#L1290
<b>Status</b>	Unresolved

### Description

A tautology is a logical statement that is always true, regardless of the values of its variables. A contradiction is a logical statement that is always false, regardless of the values of its variables.

Using tautologies or contradictions can lead to unintended behavior and can make the code harder to understand and maintain. It is generally considered good practice to avoid tautologies and contradictions in the code.

```
_options.liquidityBps < 0 || _options.liquidityBps > 10000
```

### Recommendation

The team is advised to carefully consider the logical conditions is using in the code and ensure that it is well-defined and make sense in the context of the smart contract.

## L13 - Divide before Multiply Operation

Criticality	Minor / Informative
Location	Presale.sol#L1301,1309,1327,1328
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 precision.

```
return ((contributions[contributor] * SCALE) / pool.weiRaised *  
pool.tokensClaimable) / SCALE
```

### 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.

## L18 - Multiple Pragma Directives

<b>Criticality</b>	Minor / Informative
<b>Location</b>	Presale.sol#L6,88,119,221,314,476,593,691,965
<b>Status</b>	Unresolved

### Description

If the contract includes multiple conflicting pragma directives, it may produce unexpected errors. To avoid this, it's important to include the correct pragma directive at the top of the contract and to ensure that it is the only pragma directive included in the contract.

```
pragma solidity >=0.6.2;  
pragma solidity ^0.8.20;  
pragma solidity ^0.8.24;
```

### Recommendation

It is important to include only one pragma directive at the top of the contract and to ensure that it accurately reflects the version of Solidity that the contract is written in.

By including all required compiler options and flags in a single pragma directive, the potential conflicts could be avoided and ensure that the contract can be compiled correctly.

## L19 - Stable Compiler Version

<b>Criticality</b>	Minor / Informative
<b>Location</b>	Presale.sol#L6,88,119,221,314,476,965
<b>Status</b>	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 ^0.8.24;
```

### 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.

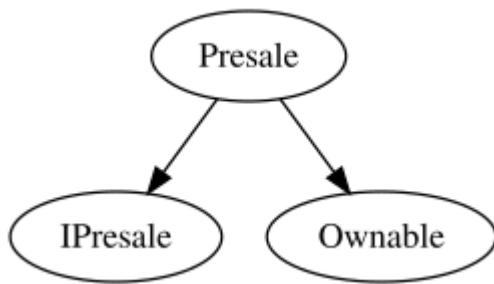
## Functions Analysis

Contract	Type	Bases		
	Function Name	Visibility	Mutability	Modifiers
Presale	Implementation	IPresale, Ownable		
		Public	✓	Ownable
		External	Payable	-
	deposit	External	✓	onlyOwner
	finalize	External	✓	onlyOwner
	cancel	External	✓	onlyOwner
	extendEndTime	External	✓	onlyOwner
	claim	External	✓	-
	unlockClaim	External	✓	onlyOwner
	refund	External	✓	onlyRefundable
	_purchase	Private	✓	
	_liquify	Private	✓	
	_prevalidatePurchase	Internal		
	_prevalidatePool	Internal		
	userTokens	Public		-
	_seederTokens	Internal		
	_seederTotalValue	Internal		
	_liquidityWei	Internal		
	_tokensForLiquidity	Internal		

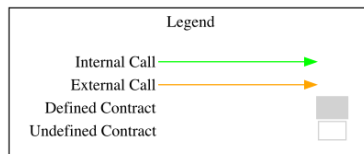
	_tokensForPresale	Internal		
<b>IPresale</b>	Interface			
	deposit	External	✓	-
	finalize	External	✓	-
	cancel	External	✓	-
	claim	External	✓	-
	unlockClaim	External	✓	-
	refund	External	✓	-



## Inheritance Graph



# Flow Graph



IPresale (iface)

deposit

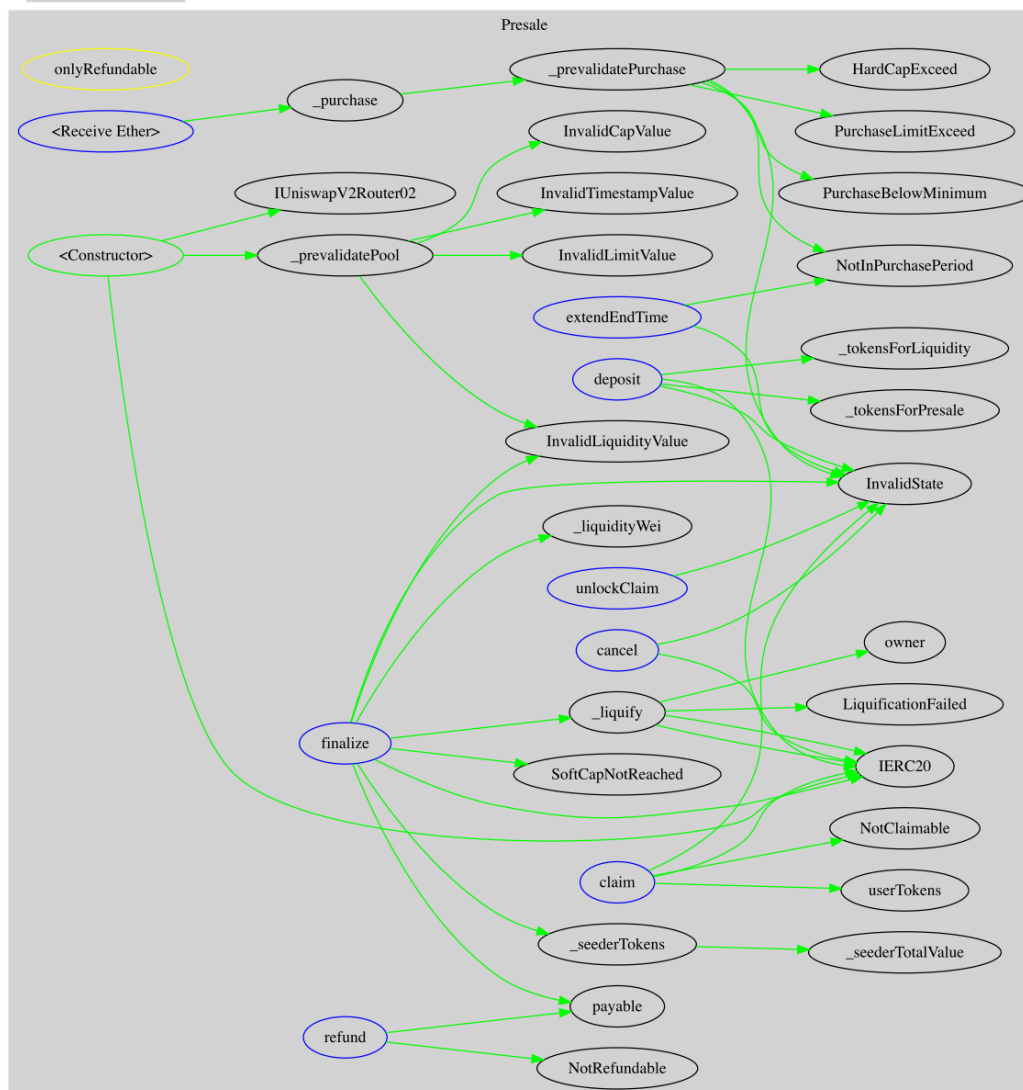
finalize

cancel

claim

unlockClaim

refund



## Summary

The Genesis contract implements a comprehensive presale mechanism designed to facilitate token sales and liquidity provisioning in a secure and structured manner. This audit investigates potential security issues, examines the business logic for any concerns, and identifies possible improvements to enhance the overall functionality and reliability of the contract.

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# 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.



**The Cyberscope team**

<https://www.cyberscope.io>