Cyberscope

Audit Report

Intelligent Signals

June 2023

Network	BSC
Address	0x61e142239f6459545bbadf3ce5d25d5b507e03b4
Audited by	© cyberscope

Analysis

Critical Medium Minor / Informative Pass

Severity	Code	Description	Status
	ST	Stops Transactions	Unresolved
	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
●	RSML	Redundant SafeMath Library	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved
●	L06	Missing Events Access Control	Unresolved
●	L09	Dead Code Elimination	Unresolved
●	L16	Validate Variable Setters	Unresolved

Table of Contents

Review

Contract Name	IntellSignals
Compiler Version	v0.8.7+commit.e28d00a7
Optimization	200 runs
Explorer	https://bscscan.com/address/0x61e142239f6459545bbadf3ce5d25d5b507e03b4
Address	0x61e142239f6459545bbadf3ce5d25d5b507e03b4
Network	BSC
Symbol	INSIG
Decimals	18
Total Supply	300,000,000

Audit Updates

Initial Audit	21 Jun 2023

Source Files

Filename	SHA256
IntellSignals.sol	d1e804e92482aa9f841dd1fdd76f463f61aac7692fab2e2a93e52ea20ca95bf7

Findings Breakdown

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

ST - Stops Transactions

Criticality	Minor / Informative
Location	IntellSignals.sol#L140
Status	Unresolved

Description

The contract owner has the authority to pause all transactions and transfers including sales for all users including the owner. This is achieved when the owner calls the `pauseContract` function which sets the `_paused` variable to `true` and enables the `whenNotPaused` modifier. When the contract is in the paused state, all functions with the `whenNotPaused` modifier cannot be executed. This includes key functions such as `transfer` , `approve` , `transferFrom` , `increaseAllowance` , and `decreaseAllowance` .

The ability to pause and unpause the contract is entirely in the hands of the contract owner through the `pauseContract` and `unpauseContract` functions, which are guarded by the `onlyOwner` modifier. This means that once the contract is paused, no transactions or transfers can take place until the owner decides to unpause the contract.

```
function pauseContract() public onlyOwner{
  _pause();
}

function _pause() internal virtual whenNotPaused {
  _paused = true;
  emit Paused(msg.sender);
}
```

Recommendation

The contract owner should consider either removing the pause functionality altogether or implementing a more decentralized approach to pausing the contract. This could be achieved through a multi-signature requirement or a voting mechanism among token holders.

On any case, the team should carefully manage the private keys of the owner's account. We strongly recommend a powerful security mechanism that will prevent a single user from accessing the contract admin functions. Some suggestions are:

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-sign wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.
- Renouncing the ownership will eliminate the threats but it is non-reversible.

RSML - Redundant SafeMath Library

Criticality	Minor / Informative
Location	IntellSignals.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	IntellSignals.sol#L171
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 _newonwer
```

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.

L06 - Missing Events Access Control

Criticality	Minor / Informative
Location	IntellSignals.sol#L172
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. There are functions that have no event emitted, so it is difficult to track off-chain changes.

```
owner=_newonwer
```

Recommendation

To avoid this issue, 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.

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.

L09 - Dead Code Elimination

Criticality	Minor / Informative
Location	IntellSignals.sol#L206,222
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 _burn(address account, uint256 value) internal
whenNotPaused {
        require(account != address(0), "ERC20: burn from the
zero address");

        _totalSupply = _totalSupply.sub(value);
        _balances[account] = _balances[account].sub(value);
        emit Transfer(account, address(0), value);
    }

function _burnFrom(address account, uint256 amount) internal
whenNotPaused {
        _burn(account, amount);
        _approve(account, msg.sender,
_allowances[account][msg.sender].sub(amount));
    }
```

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.

L16 - Validate Variable Setters

Criticality	Minor / Informative
Location	IntellSignals.sol#L172
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=_newonwer
```

Recommendation

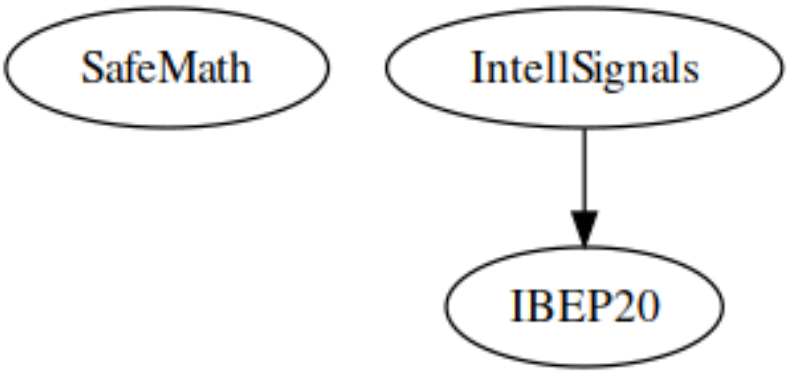
By adding the proper check, the contract will not allow the variables to be configured with zero value. This will ensure that the contract can handle all possible input values and avoid unexpected behavior or errors. Hence, it can help to prevent the contract from being exploited or operating unexpectedly.

Functions Analysis

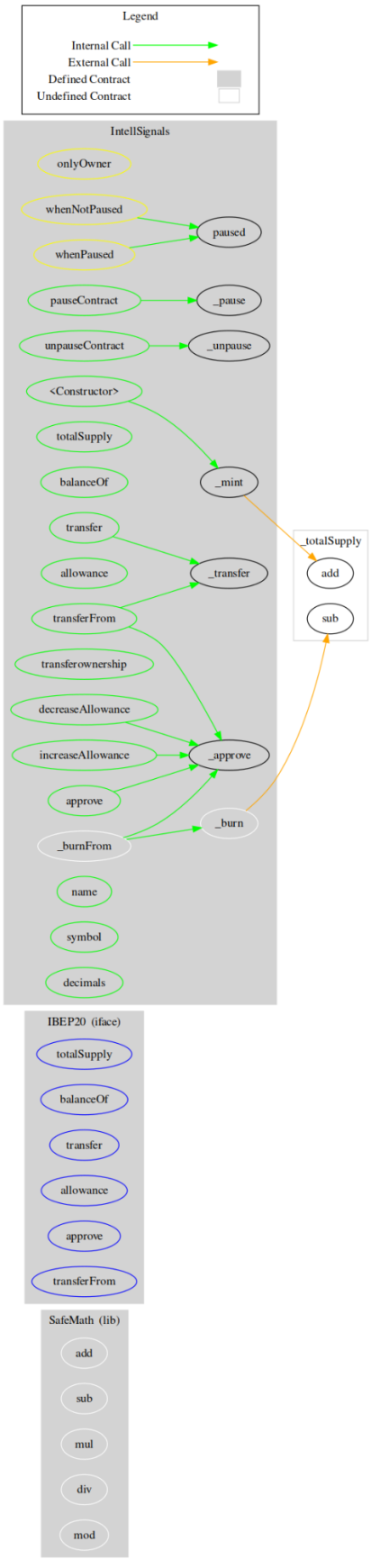
Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
SafeMath	Library			
	add	Internal		
	sub	Internal		
	mul	Internal		
	div	Internal		
	mod	Internal		
IBEP20	Interface			
	totalSupply	External		-
	balanceOf	External		-
	transfer	External	✓	-
	allowance	External		-
	approve	External	✓	-
	transferFrom	External	✓	-
IntellSignals	Implementation	IBEP20		
		Public	✓	-
	paused	Public		-

	_pause	Internal	✓	whenNotPaused
	_unpause	Internal	✓	whenPaused
	pauseContract	Public	✓	onlyOwner
	unpauseContract	Public	✓	onlyOwner
	totalSupply	Public		-
	balanceOf	Public		-
	transfer	Public	✓	whenNotPaused
	allowance	Public		-
	approve	Public	✓	-
	transferownership	Public	✓	onlyOwner
	transferFrom	Public	✓	whenNotPaused
	increaseAllowance	Public	✓	whenNotPaused
	decreaseAllowance	Public	✓	whenNotPaused
	_transfer	Internal	✓	whenNotPaused
	_mint	Internal	✓	
	_burn	Internal	✓	whenNotPaused
	_approve	Internal	✓	whenNotPaused
	_burnFrom	Internal	✓	whenNotPaused
	name	Public		-
	symbol	Public		-
	decimals	Public		-

Inheritance Graph



Flow Graph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
IntellSignals
onlyOwner
whenNotPaused
whenPaused
paused
pauseContract
_pause
unpauseContract
_unpause
<Constructor>
totalSupply
balanceOf
_mint
transfer
allowance
_transfer
transferFrom
transferownership
decreaseAllowance
increaseAllowance
_approve
approve
_burn
_burnFrom
name
symbol
decimals
_totalSupply
add
sub
IBEP20 (iface)
totalSupply
balanceOf
transfer
allowance
approve
transferFrom
SafeMath (lib)
add
sub
mul
div
mod

Summary

Intelligent Signals contract implements a token mechanism. This audit investigates security issues, business logic concerns and potential improvements. There are some functions that can be abused by the owner like stop transactions. A multi-wallet signing pattern will provide security against potential hacks. Temporarily locking the contract or renouncing ownership will eliminate all the contract threats.

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The Cyberscope team

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