Cyberscope

Audit Report

BenderCoin

June 2023

Network	ETH
Address	0x72a18B1C61BC1d98A76Cf57DB0e786073E91ae80
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
●	L02	State Variables could be Declared Constant	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved
●	L15	Local Scope Variable Shadowing	Unresolved
●	L16	Validate Variable Setters	Unresolved
●	L19	Stable Compiler Version	Unresolved
●	L22	Potential Locked Ether	Unresolved

Table of Contents

Review

Contract Name	BenderCoin
Compiler Version	v0.5.0+commit.1d4f565a
Optimization	200 runs
Explorer	https://etherscan.io/address/0x72a18b1c61bc1d98a76cf57db0e786073e91ae80
Address	0x72a18b1c61bc1d98a76cf57db0e786073e91ae80
Network	ETH
Symbol	BENDER
Decimals	18
Total Supply	420,000,000,000

Audit Updates

Initial Audit	06 Jun 2023

Source Files

Filename	SHA256
BenderCoin.sol	e401235320fcc5711341717c8d4f4b26aa3c042c1928c26e2b31cced65939c57

Findings Breakdown

Critical	1
Medium	0
Minor / Informative	6

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	1	0	0	0
Medium	0	0	0	0
Minor / Informative	6	0	0	0

ST - Stops Transactions

Criticality	Critical
Location	BenderCoin.sol#L214
Status	Unresolved

Description

The transactions are initially disabled for all users excluding the owner. The owner can enable the transactions for all users. Once the transactions are enabled the owner will not be able to disable them again.

```
require(tradingLive || sender == _owner, "Trading not enabled yet");
```

Recommendation

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 multi-sign wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.

L02 - State Variables could be Declared Constant

Criticality	Minor / Informative
Location	BenderCoin.sol#L90,92
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.

```
bool internal tradingLive
address internal _owner
```

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	BenderCoin.sol#L92,176
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 internal _owner
address public _owner
```

Recommendation

By following the Solidity naming convention guidelines, the codebase increased the readability, and 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.

L15 - Local Scope Variable Shadowing

Criticality	Minor / Informative
Location	BenderCoin.sol#L188
Status	Unresolved

Description

Local scope variable shadowing occurs when a local variable with the same name as a variable in an outer scope is declared within a function or code block. When this happens, the local variable "shadows" the outer variable, meaning that it takes precedence over the outer variable within the scope in which it is declared.

```
uint256 totalSupply
uint8 decimals
string memory name
string memory symbol
```

Recommendation

It's important to be aware of shadowing when working with local variables, as it can lead to confusion and unintended consequences if not used correctly. It's generally a good idea to choose unique names for local variables to avoid shadowing outer variables and causing confusion.

L16 - Validate Variable Setters

Criticality	Minor / Informative
Location	BenderCoin.sol#L192
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 = tokenOwnerAddress
```

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.

L19 - Stable Compiler Version

Criticality	Minor / Informative
Location	BenderCoin.sol#L1,25,79,168
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 ^0.5.0;
```

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.

L22 - Potential Locked Ether

Criticality	Minor / Informative
Location	BenderCoin.sol#L188
Status	Unresolved

Description

The contract contains Ether that has been placed into a Solidity contract and is unable to be transferred. Thus, it is impossible to access the locked Ether. This may produce a financial loss for the users that have called the payable method.

```
constructor(string memory name, string memory symbol, uint8 decimals,
uint256 totalSupply, address tokenOwnerAddress) public payable {
        _name = name;
        _symbol = symbol;
        _decimals = decimals;
        _owner = tokenOwnerAddress;
        _mint(tokenOwnerAddress, totalSupply);
    }
```

Recommendation

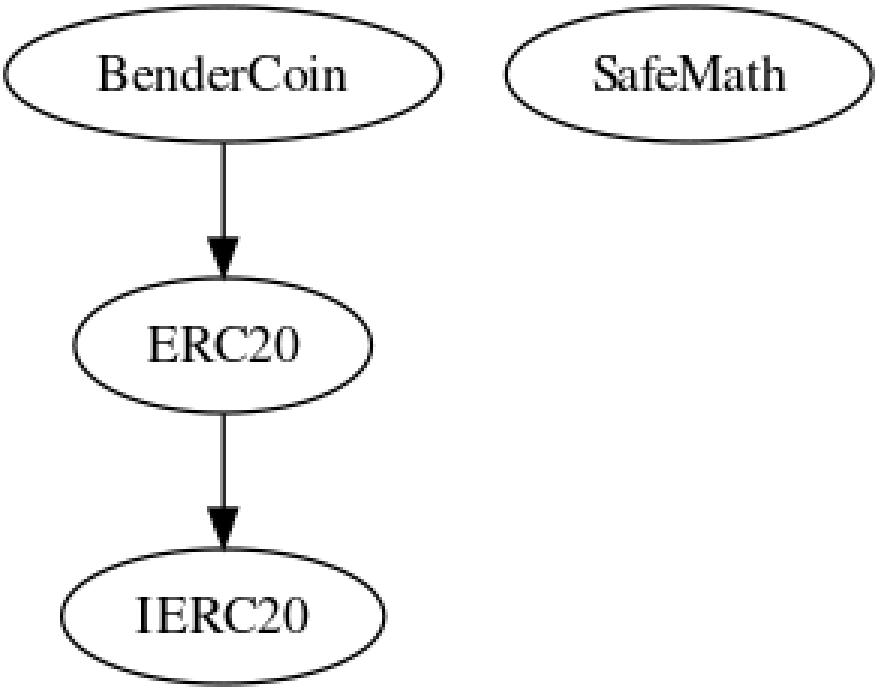
The team is advised to either remove the payable method or add a withdraw functionality. it is important to carefully consider the risks and potential issues associated with locked Ether.

Functions Analysis

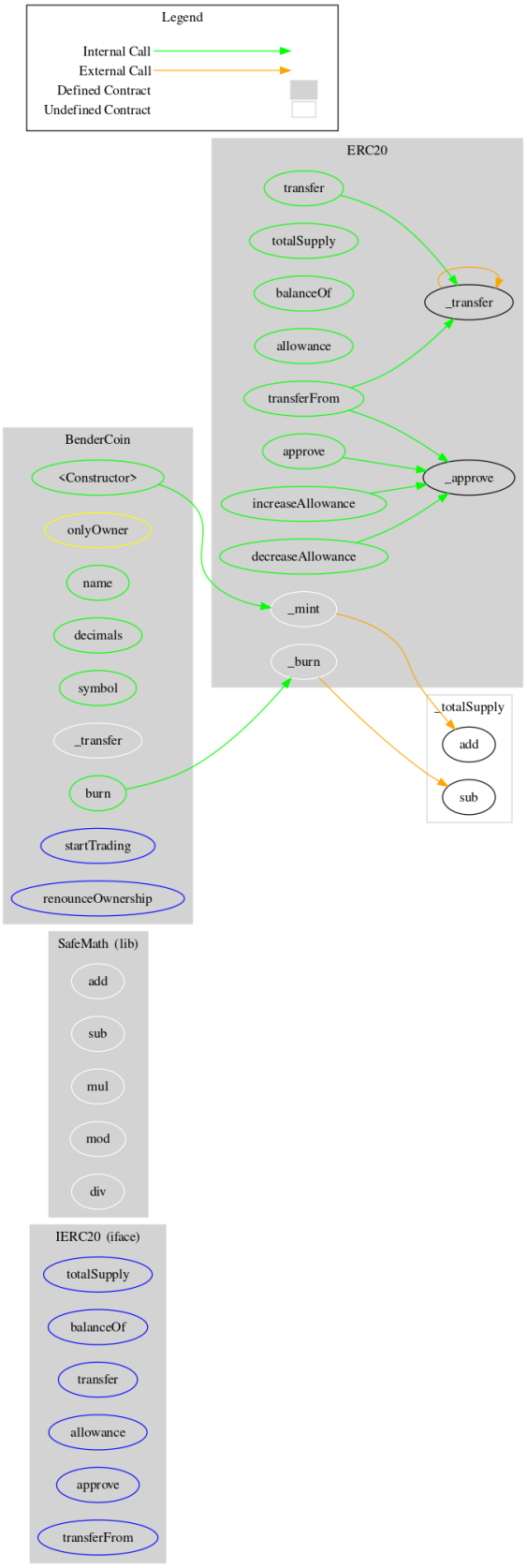
Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
IERC20	Interface			
	totalSupply	External		-
	balanceOf	External		-
	transfer	External	✓	-
	allowance	External		-
	approve	External	✓	-
	transferFrom	External	✓	-
SafeMath	Library			
	add	Internal		
	sub	Internal		
	mul	Internal		
	mod	Internal		
	div	Internal		
ERC20	Implementation	IERC20		
	transfer	Public	✓	-
	totalSupply	Public		-

	balanceOf	Public		-
	allowance	Public		-
	approve	Public	✓	-
	transferFrom	Public	✓	-
	increaseAllowance	Public	✓	-
	decreaseAllowance	Public	✓	-
	_mint	Internal	✓	
	_transfer	Internal	✓	
	_burn	Internal	✓	
	_approve	Internal	✓	
BenderCoin	Implementation	ERC20		
		Public	Payable	-
	name	Public		-
	decimals	Public		-
	symbol	Public		-
	_transfer	Internal	✓	
	burn	Public	✓	-
	startTrading	External	✓	onlyOwner
	renounceOwnership	External	✓	-

Inheritance Graph



Flow Graph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
ERC20
transfer
totalSupply
balanceOf
allowance
transferFrom
approve
increaseAllowance
decreaseAllowance
_transfer
_approve
_mint
_burn
_totalSupply
add
sub
BenderCoin
<Constructor>
onlyOwner
name
decimals
symbol
_transfer
burn
startTrading
renounceOwnership
SafeMath (lib)
add
sub
mul
mod
div
IERC20 (iface)
totalSupply
balanceOf
transfer
allowance
approve
transferFrom

Summary

BenderCoin 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 stopping transactions. A multi-wallet signing pattern will provide security against potential hacks.

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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

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