Cyberscope

Audit Report

Suriname Bitcoin

February 2024

SHA256 9a58e43d1d5674b445d962e6f99519ed8bfe04ab078d68aaed53a976d5fd062f

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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
●	MEM	Misleading Error Messages	Unresolved
●	RSW	Redundant Storage Writes	Unresolved
●	L02	State Variables could be Declared Constant	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved
●	L11	Unnecessary Boolean equality	Unresolved
●	L16	Validate Variable Setters	Unresolved
●	L19	Stable Compiler Version	Unresolved

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Review

Contract Name	SurinameBitcoin
Testing Deploy	https://testnet.bscscan.com/address/0xb353387a92585ccb64ad628ac9a3a846d82bc224
Symbol	SBC
Decimals	18
Total Supply	1,975,000,000
Badge Eligibility	Yes

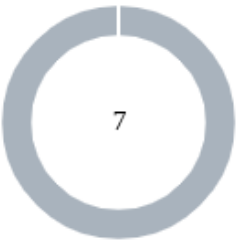
Audit Updates

Initial Audit	14 Feb 2024

Source Files

Filename	SHA256
contracts/SurinameBitcoin.sol	9a58e43d1d5674b445d962e6f99519ed8bfe04ab078d68aaed53a976d5fd062f

Findings Breakdown



Critical	0
Medium	0
Minor / Informative	7

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	0	0	0	0
Medium	0	0	0	0
Minor / Informative	7	0	0	0

MEM - Misleading Error Messages

Criticality	Minor / Informative
Location	contracts/ShibaKeanu.sol#L482,496
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.

The contract is utilizing the `changeTxTax` function that enables the owner to modify the transaction tax rates. This function includes a validation step to ensure that the sum of the new taxs does not exceed a predefined maximum limit (`MAXTAX`), which is internally set to `40` . However, the error message provided within the `require` statement misleadingly states that `you can't increase taxes above 5%` , despite the actual calculation being based on a maximum combined tax rate of 40 units. Given that the `MAXTAX` value represents a percentage in a base of `1000` , the maximum tax rate that can be set is effectively `4%` , not the `5%` as indicated by the error message. This discrepancy between the error message and the actual maximum tax rate can lead to confusion and misinterpretation of the contract's tax setting limitations.

```
    uint8 internal MAXTAX = 40;

     function changeTxTax(uint8 newTxTax, uint8 newAutoburnTax)
public onlyOwner {
         require(
             newTxTax + newAutoburnTax <= MAXTAX,
             "you can't increase taxes above 5%"
         );
     ...
     }
```

Recommendation

The team is suggested to provide a descriptive message to the errors. 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. It is recommended to modify the error message within the `changeTxTax` function to accurately reflect the maximum tax rate that can be applied. This adjustment will ensure clarity and prevent any misunderstanding regarding the tax rate modification capabilities of the contract, thereby enhancing the transparency and usability of the smart contract for its administrators.

RSW - Redundant Storage Writes

Criticality	Minor / Informative
Location	contracts/SurinameBitcoin.sol#L508,516
Status	Unresolved

Description

The contract modifies the state of the following variables without checking if their current value is the same as the one given as an argument. As a result, the contract performs redundant storage writes, when the provided parameter matches the current state of the variables, leading to unnecessary gas consumption and inefficiencies in contract execution.

```
   function excludeFromTax(address user, bool exclude) public
onlyOwner {
        _isExcludedFromTax[user] = exclude;
        emit UserExcludedFromTax(user, exclude);
    }

    function excludeFromAntiwhale(address user, bool exclude)
public onlyOwner {
        _isExcludedFromAntiwhale[user] = exclude;
        emit UserExcludedFromAntiwhale(user, exclude);
    }
```

Recommendation

The team is advised to implement additional checks within to prevent redundant storage writes when the provided argument matches the current state of the variables. By incorporating statements to compare the new values with the existing values before proceeding with any state modification, the contract can avoid unnecessary storage operations, thereby optimizing gas usage.

L02 - State Variables could be Declared Constant

Criticality	Minor / Informative
Location	contracts/SurinameBitcoin.sol#L482
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.

```
uint8 internal MAXTAX = 40
```

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/SurinameBitcoin.sol#L479,482,483,484,694,700,706
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.

```
uint8 internal _txTax = 0
uint8 internal MAXTAX = 40
mapping(address => bool) internal _isExcludedFromTax
mapping(address => bool) internal _isExcludedFromAntiwhale

function SeeIfExcludedFromTax(
        address user
...
    }

function SeeIfExcludedFromAntiwhale(
        address user
    ) public view returns (bool isExcludedFromAntiwhale) {
        return (_isExcludedFromAntiwhale[user]);
    }

...
```

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.

L11 - Unnecessary Boolean equality

Criticality	Minor / Informative
Location	contracts/SurinameBitcoin.sol#L558,568,579
Status	Unresolved

Description

Boolean equality is unnecessary when comparing two boolean values. This is because a boolean value is either true or false, and there is no need to compare two values that are already known to be either true or false.

it's important to be aware of the types of variables and expressions that are being used in the contract's code, as this can affect the contract's behavior and performance. The comparison to boolean constants is redundant. Boolean constants can be used directly and do not need to be compared to true or false.

```
_isExcludedFromAntiwhale[to] == false
```

Recommendation

Using the boolean value itself is clearer and more concise, and it is generally considered good practice to avoid unnecessary boolean equalities in Solidity code.

L16 - Validate Variable Setters

Criticality	Minor / Informative
Location	contracts/SurinameBitcoin.sol#L526
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.

```
taxReciever = newReciever
```

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	contracts/SurinameBitcoin.sol#L9,35,124,211,229,254,716,750
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 ^0.8.4;
```

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.

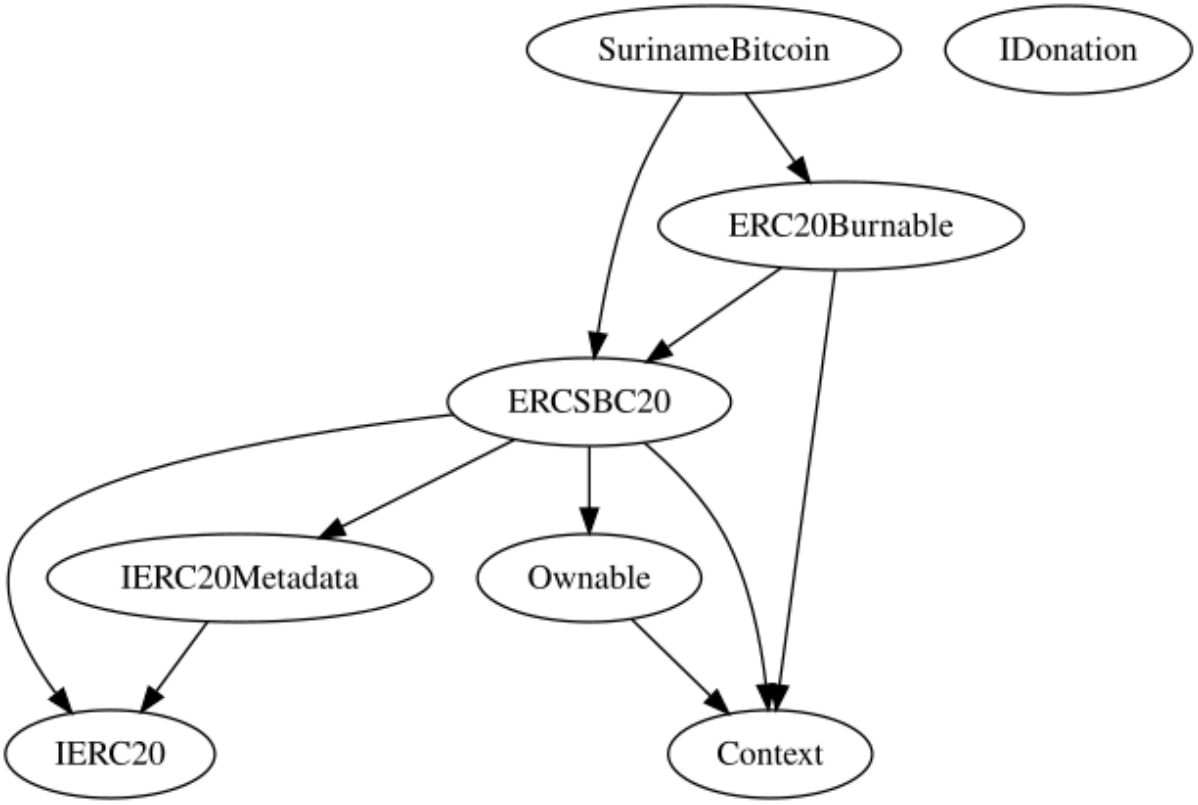
Functions Analysis

Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
Context	Implementation			
	_msgSender	Internal		
	_msgData	Internal		
Ownable	Implementation	Context		
		Public	✓	-
	owner	Public		-
	_checkOwner	Internal		
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
	_transferOwnership	Internal	✓	
IERC20	Interface			
	totalSupply	External		-
	balanceOf	External		-
	transfer	External	✓	-
	allowance	External		-
	approve	External	✓	-
	transferFrom	External	✓	-

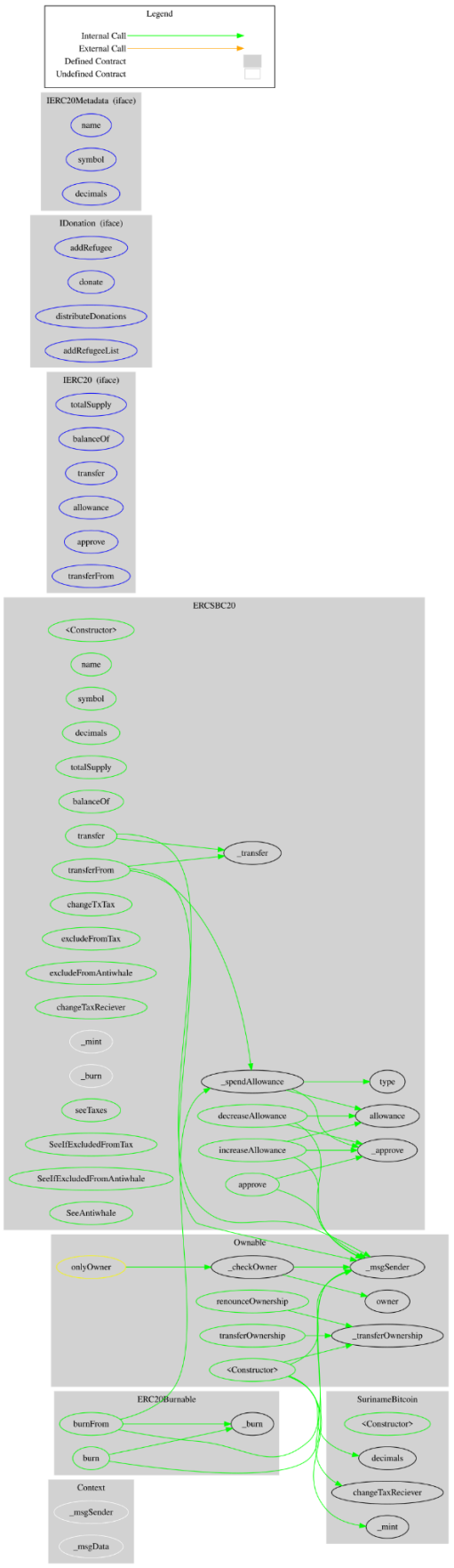
IDonation	Interface			
	addRefugee	External	✓	-
	donate	External	✓	-
	distributeDonations	External	✓	-
	addRefugeeList	External	✓	-
IERC20Metadata	Interface	IERC20		
	name	External		-
	symbol	External		-
	decimals	External		-
ERCSBC20	Implementation	Context, IERC20, IERC20Metadata, Ownable		
		Public	✓	-
	name	Public		-
	symbol	Public		-
	decimals	Public		-
	totalSupply	Public		-
	balanceOf	Public		-
	transfer	Public	✓	-
	allowance	Public		-
	approve	Public	✓	-

	transferFrom	Public	✓	-
	increaseAllowance	Public	✓	-
	decreaseAllowance	Public	✓	-
	changeTxTax	Public	✓	onlyOwner
	excludeFromTax	Public	✓	onlyOwner
	excludeFromAntiwhale	Public	✓	onlyOwner
	changeTaxReciever	Public	✓	onlyOwner
	_transfer	Internal	✓	
	_mint	Internal	✓	
	_burn	Internal	✓	
	_approve	Internal	✓	
	_spendAllowance	Internal	✓	
	seeTaxes	Public		-
	SeeIfExcludedFromTax	Public		-
	SeeIfExcludedFromAntiwhale	Public		-
	SeeAntiwhale	Public		-
ERC20Burnable	Implementation	Context, ERCSBC20		
	burn	Public	✓	-
	burnFrom	Public	✓	-
SurinameBitcoin	Implementation	ERCSBC20, ERC20Burnable		

Inheritance Graph



Flow Graph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
IERC20Metadata (iface)
name
symbol
decimals
IDonation (iface)
addRefugee
donate
distributeDonations
addRefugeeList
IERC20 (iface)
totalSupply
balanceOf
transfer
allowance
approve
transferFrom
ERCSBC20
<Constructor>
name
symbol
decimals
totalSupply
balanceOf
transfer
transferFrom
changeTxTax
excludeFromTax
excludeFromAntiwhale
changeTaxReciever
_mint
_burn
seeTaxes
SeeIfExcludedFromTax
SeeIfExcludedFromAntiwhale
SeeAntiwhale
_transfer
_spendAllowance
decreaseAllowance
increaseAllowance
approve
type
allowance
_approve
Ownable
onlyOwner
_checkOwner
_msgSender
owner
renounceOwnership
transferOwnership
_transferOwnership
<Constructor>
ERC20Burnable
burnFrom
burn
_burn
Context
_msgSender
_msgData
SurinameBitcoin
<Constructor>
decimals
changeTaxReciever
_mint

Summary

Suriname Bitcoin contract implements a token mechanism. This audit investigates security issues, business logic concerns and potential improvements. Suriname Bitcoin 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 4% fees.

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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

https://www.cyberscope.io