Cyberscope

Audit Report

Amart Charity Token

June 2024

Network	BSC
Address	0x7053fe3a966a89bc41b13a7c96f21e8135e1d191
Audited by	© cyberscope

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
●	CR	Code Repetition	Unresolved
●	IDI	Immutable Declaration Improvement	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved
●	L16	Validate Variable Setters	Unresolved

Table of Contents

Review

Contract Name	AmartCharityToken
Compiler Version	v0.8.17+commit.8df45f5f
Optimization	200 runs
Explorer	https://bscscan.com/address/0x7053fe3a966a89bc41b13a7c96f21e8135e1d191
Address	0x7053fe3a966a89bc41b13a7c96f21e8135e1d191
Network	BSC
Symbol	ACT
Decimals	18
Total Supply	1,000,000,000
Badge Eligibility	Yes

Audit Updates

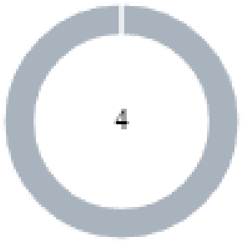
Initial Audit	10 Jun 2024

Source Files

Filename	SHA256
contracts/ReflectiveERC20.sol	8e9820a2678789110e1fbad978c1c86ae642cc129f2b9bcea6766792ccdd02fd
contracts/AmartCharityToken.sol	55bb6a8a00b0ffaa4d00569e1714361b0d1e7cd900add0a58dda6d24c4cc017d

contracts/lib/LibCommon.sol	ad40e79524942f0927be19739e7c96b7a52147f5cf54fdd7eb676720db70b66a
@openzeppelin/contracts/utils/Context.sol	b2cfee351bcafd0f8f27c72d76c054df9b571b62cfac4781ed12c86354e2a56c
@openzeppelin/contracts/token/ERC20/IERC20.sol	7ebde70853ccafcf1876900dad458f46eb9444d591d39bfc58e952e2582f5587
@openzeppelin/contracts/token/ERC20/ERC20.sol	d20d52b4be98738b8aa52b5bb0f88943f62128969b33d654fbca731539a7fe0a
@openzeppelin/contracts/token/ERC20/extensions/IERC20Metadata.sol	af5c8a77965cc82c33b7ff844deb9826166689e55dc037a7f2f790d057811990
@openzeppelin/contracts/access/Ownable.sol	a8e4e1ae19d9bd3e8b0a6d46577eec098c01fbaffd3ec1252fd20d799e73393b

Findings Breakdown



●	Critical	0
●	Medium	0
●	Minor / Informative	4

Severity		Unresolved	Acknowledged	Resolved	Other
●	Critical	0	0	0	0
●	Medium	0	0	0	0
●	Minor / Informative	4	0	0	0

CR - Code Repetition

Criticality	Minor / Informative
Location	contracts/AmartCharityToken.sol#L317
Status	Unresolved

Description

The contract contains repetitive code segments. There are potential issues that can arise when using code segments in Solidity. Some of them can lead to issues like gas efficiency, complexity, readability, security, and maintainability of the source code. It is generally a good idea to try to minimize code repetition where possible. Specifically the `transfer` and `transferFrom` functions share similar code segments.

```
function transfer(
    address to,
    uint256 amount
  ) public virtual override returns (bool) {
    uint256 taxAmount = _taxAmount(msg.sender, amount);
    uint256 deflationAmount = _deflationAmount(amount);
    uint256 amountToTransfer = amount - taxAmount -
deflationAmount;

    if (isMaxAmountOfTokensSet()) {
      if (balanceOf(to) + amountToTransfer >
maxTokenAmountPerAddress) {
        revert DestBalanceExceedsMaxAllowed(to);
      }
    }

    if (taxAmount != 0) {
      _transferNonReflectedTax(msg.sender, taxAddress,
taxAmount);
    }
    if (deflationAmount != 0) {
      _burn(msg.sender, deflationAmount);
    }
    return super.transfer(to, amountToTransfer);
  }

function transferFrom(
    address from,
    address to,
    uint256 amount
  ) public virtual override returns (bool) {
    uint256 taxAmount = _taxAmount(from, amount);
    uint256 deflationAmount = _deflationAmount(amount);
    uint256 amountToTransfer = amount - taxAmount -
deflationAmount;

    if (isMaxAmountOfTokensSet()) {
      if (balanceOf(to) + amountToTransfer >
maxTokenAmountPerAddress) {
        revert DestBalanceExceedsMaxAllowed(to);
      }
    }

    if (taxAmount != 0) {
      _transferNonReflectedTax(from, taxAddress, taxAmount);
    }
    if (deflationAmount != 0) {
      _burn(from, deflationAmount);
    }
```

```
        return super.transferFrom(from, to, amountToTransfer);
    }
```

Recommendation

The team is advised to avoid repeating the same code in multiple places, which can make the contract easier to read and maintain. The authors could try to reuse code wherever possible, as this can help reduce the complexity and size of the contract. For instance, the contract could reuse the common code segments in an internal function in order to avoid repeating the same code in multiple places.

IDI - Immutable Declaration Improvement

Criticality	Minor / Informative
Location	contracts/AmartCharityToken.sol#L150
Status	Unresolved

Description

The contract declares state variables that their value is initialized once in the constructor and are not modified afterwards. The `immutable` is a special declaration for this kind of state variables that saves gas when it is defined.

```
maxTotalSupply
```

Recommendation

By declaring a variable as immutable, the Solidity compiler is able to make certain optimizations. This can reduce the amount of storage and computation required by the contract, and make it more gas-efficient.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	contracts/AmartCharityToken.sol#L160,266,280,281,300
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 _taxAddress
uint256 _feeBPS
uint256 _taxBPS
uint256 _deflationBPS
```

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.

L16 - Validate Variable Setters

Criticality	Minor / Informative
Location	contracts/AmartCharityToken.sol#L138,145,292
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.

```
taxAddress = _taxAddress
initialTokenOwner = tokenOwner
```

Recommendation

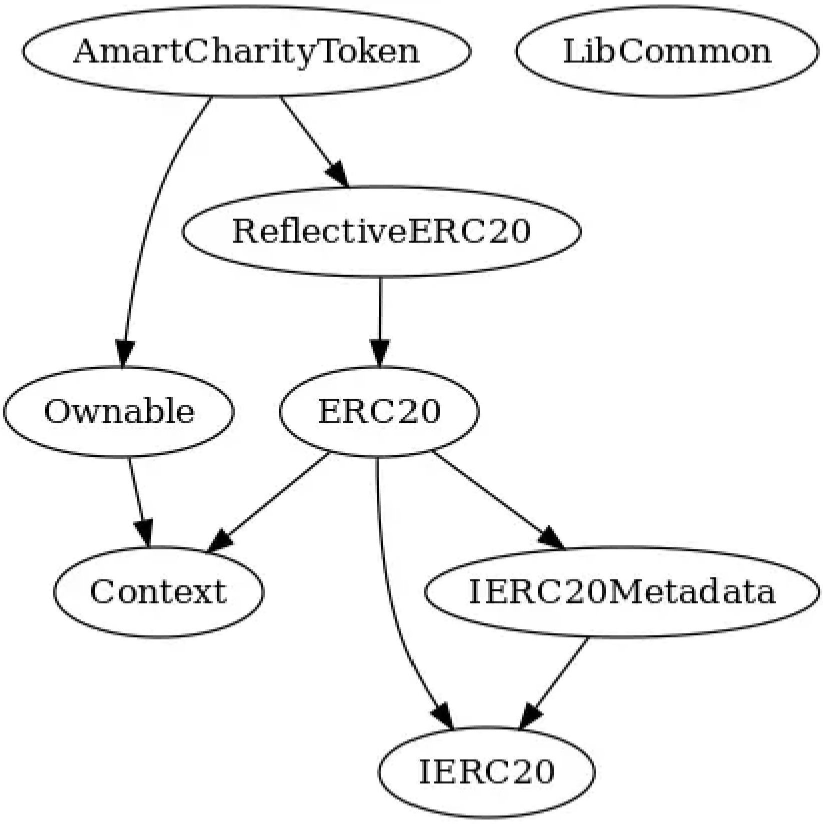
By adding the proper check, the contract will not allow the variables to be configured with zero value. This will ensure that the contract can handle all possible input values and avoid unexpected behavior or errors. Hence, it can help to prevent the contract from being exploited or operating unexpectedly.

Functions Analysis

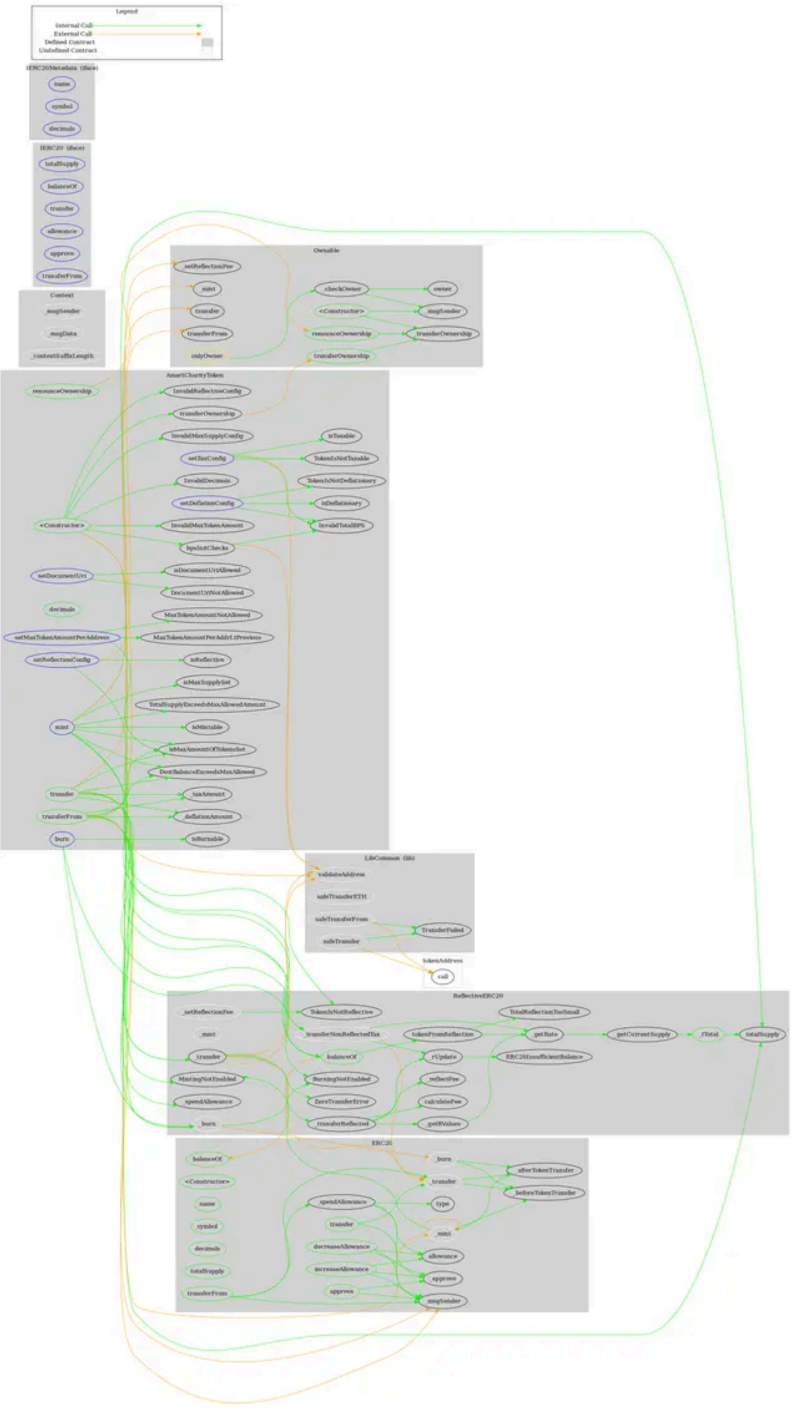
Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
AmartCharityToken	Implementation	ReflectiveERC20, Ownable		
		Public	✓	ReflectiveERC20
	bpsInitChecks	Private		
	isMintable	Public		-
	isBurnable	Public		-
	isMaxAmountOfTokensSet	Public		-
	isMaxSupplySet	Public		-
	isDocumentUriAllowed	Public		-
	decimals	Public		-
	isTaxable	Public		-
	isDeflationary	Public		-
	isReflective	Public		-
	setDocumentUri	External	✓	onlyOwner
	setMaxTokenAmountPerAddress	External	✓	onlyOwner
	setReflectionConfig	External	✓	onlyOwner
	setTaxConfig	External	✓	onlyOwner
	setDeflationConfig	External	✓	onlyOwner
	transfer	Public	✓	-

	transferFrom	Public	✓	-
	mint	External	✓	onlyOwner
	burn	External	✓	onlyOwner
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
	_taxAmount	Internal		
	_deflationAmount	Internal		

Inheritance Graph



Flow Graph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
IERC20Metadata (iface)
name
symbol
decimals
IERC20 (iface)
totalSupply
balanceOf
transfer
allowance
approve
transferFrom
Context
_msgSender
_msgData
_contextSuffixLength
Ownable
setReflectionFee
_mint
transfer
transferFrom
onlyOwner
checkOwner
<Constructor>
renounceOwnership
transferOwnership
owner
_msgSender
_transferOwnership
AmartCharityToken
renounceOwnership
InvalidReflectiveConfig
transferOwnership
InvalidMaxSupplyConfig
isTaxable
setTaxConfig
TokenIsNotTaxable
InvalidDecimals
TokenIsNotDeflationary
setDeflationConfig
isDeflationary
<Constructor>
InvalidMaxTokenAmount
InvalidTotalBPS
bpsInitChecks
setDocumentUri
isDocumentUriAllowed
DocumentUriNotAllowed
decimals
MaxTokenAmountNotAllowed
setMaxTokenAmountPerAddress
MaxTokenAmountPerAddrLtPrevious
setReflectionConfig
isReflective
isMaxSupplySet
TotalSupplyExceedsMaxAllowedAmount
mint
isMintable
isMaxAmountOfTokensSet
DestBalanceExceedsMaxAllowed
transfer
_taxAmount
transferFrom
_deflationAmount
burn
isBurnable
LibCommon (lib)
validateAddress
safeTransferETH
safeTransferFrom
TransferFailed
safeTransfer
tokenAddress
call
ReflectiveERC20
_setReflectionFee
TokenIsNotReflective
TotalReflectionTooSmall
_mint
_transferNonReflectedTax
tokenFromReflection
_getRate
_getCurrentSupply
_tTotal
totalSupply
_transfer
balanceOf
_rUpdate
ERC20InsufficientBalance
MintingNotEnabled
BurningNotEnabled
_reflectFee
_spendAllowance
ZeroTransferError
calculateFee
_burn
_transferReflected
_getRValues
ERC20
balanceOf
_burn
<Constructor>
_afterTokenTransfer
_transfer
_beforeTokenTransfer
name
_spendAllowance
type
symbol
transfer
_mint
decimals
decreaseAllowance
allowance
totalSupply
increaseAllowance
_approve
approve
transferFrom
_msgSender

Summary

Amart Charity Token contract implements a token mechanism. This audit investigates security issues, business logic concerns and potential improvements. Amart Charity Token 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.

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