American Cannabis Society (ACST) Token

Smart Contract Audit

ACST

Terrance Nibbles - Certified Auditor

June 27, 2024

(ACST) Token

Smart ContractAudit

Preface

This audit is of the ACST contract that was provided for detailed analysis on June 24, 2024. The entire solidity smart contract code is listed at the end of the report. This contract is deployed on the BASE chain.

https://basescan.org/address/0x563F0eb3fB03824443606f94313AB0C1fc5589377#code#L1

Website: http://ACST.IO
Legacy Token: https://reefertoken.io
Facebook: https://www.facebook.com/profile.php?id=100077209938066

DISCLAIMER:

Disclaimer:

This audit report is based on a professional review of the provided smart contract deployed on the BASE network. It is important to note that this assessment represents our expert opinion and analysis of the code at the time of the evaluation. The findings and recommendations presented herein are not intended to serve as warranties, guarantees, or assurances of the contract's performance, security, or functionality on any live network, including the Ethereum or BASE mainnet.

We expressly disclaim any responsibility for errors, omissions, or inaccuracies in this report, as the assessment is conducted on a non-exhaustive basis and may not cover all possible scenarios or future developments. The audit is conducted in accordance with industry best practices and standards at the time of evaluation.

Furthermore, we are unable to confirm the deployment of this specific contract on the Ethereum or BASE mainnet. This report is solely based on the provided code and does not verify the actual deployment status on any live blockchain. It is the responsibility of the contract deployer to ensure the accurate deployment of the contract and adhere to security best practices when deploying to production environments.

Users, developers, and stakeholders are advised to perform additional due diligence and testing before deploying or interacting with the contract on any live network. This report should be considered as a tool for risk assessment rather than a guarantee of the contract's security or performance. In the dynamic and rapidly evolving field of blockchain technology, risks and vulnerabilities may emerge over time, and it is crucial to stay vigilant and up-to-date on security best practices.

By relying on this audit report, the reader acknowledges and accepts that the audit is based on the provided information and that no warranties, guarantees, or assurances are expressed or implied.

Audit Report for the ACST Smart Contract

Introduction

This report provides a detailed audit of the "American Cannabis Society Token" (ACST) smart contract implemented on the Ethereum blockchain. The ACST contract is an ERC20 token with additional tax functionality on transfers, using an inherited Ownable2Step contract for enhanced ownership controls.

Contract Components

1. IERC20 Interface: Implements the standard ERC20 interface.
2. Ownable2Step: An extension of the typical Ownable pattern, likely adding two-step verification for ownership transfer operations.
3. ACST Contract: Utilizes IERC20 and Ownable2Step, introducing tax functionality on transfers and an immutable tax receiver address.

Key Features and Functions

- Tokenomics:
    - Name: "American Cannabis Society"
    - Symbol: "ACST"
    - Total Supply: 100 billion (100,000,000,000 * 10^18 due to 18 decimal places)
- Tax Functionality:
    - A tax is applied on all transfers, adjustable by the owner, with a maximum cap of 99%.
    - Taxes collected are sent to a predefined immutable tax receiver address.

- ERC20 Functions:
    - Standard functions (transfer, approve, transferFrom) are implemented with additional logic to handle tax deductions.
- Ownership Functions:
    - Enhanced ownership management potentially provided by Ownable2Step.

Security Review

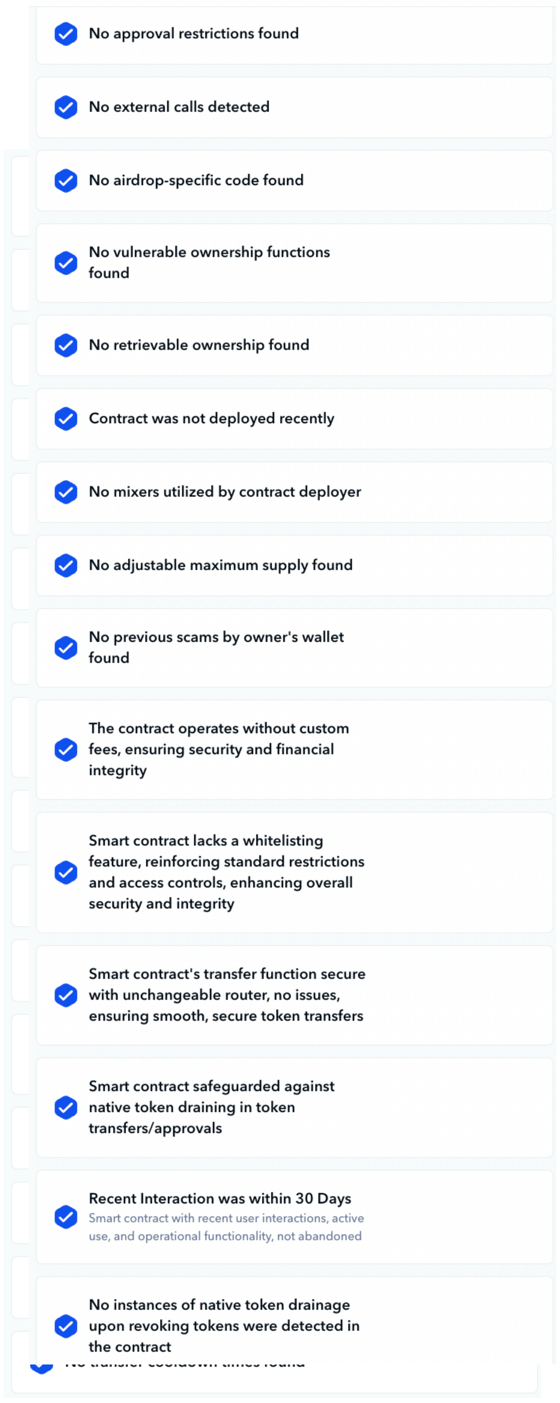
Observations and Recommendations

1. Tax Mechanism (Adjustable):
    - The tax mechanism is clear and should function as intended based on the current implementation. However, it's crucial that the implications of a potentially high tax rate (up to 99%) are considered and communicated to users.
2. Transfer and Approval Mechanics:
    - Standard ERC20 functions are modified to incorporate tax deductions. It’s vital to ensure that these modifications do not introduce rounding errors or unexpected behaviors, particularly under edge conditions like very small transfers.
3. Ownership and Administrative Controls:
    - Using Ownable2Step suggests an added layer of security for ownership-related operations, which is beneficial. Ensure that the mechanisms for stepping through ownership changes are secure and tested.

4. Tax Receiver Immutability:
    - The immutability of the tax receiver is good for transparency and security, preventing the redirection of funds. However, this also means that if the tax receiver address is compromised or needs to be updated for any reason, it cannot be changed, which could pose long-term risks.
5. Potential Risks:
    - Ensure there is a cap on the setNewTax function to prevent setting the tax to 100%, which would effectively lock transferred funds.
6. Gas Optimization:
    - Review and optimize gas usage, especially in functions that are called frequently, such as transfer and transferFrom.
7. Event Emissions:
    - The contract emits custom events such as TaxCollected, which enhances transparency. Ensure that all critical actions within the contract are accompanied by event emissions to facilitate tracking and verification on the blockchain.

Conclusion

The ACST smart contract introduces a functional ERC20 token with an innovative tax mechanism tailored for the American Cannabis Society's needs. The contract's integration of tax functionalities within the ERC20 standard operations is executed with attention to detail, adhering to security best practices such as the use of SafeMath and careful state management.



✓ No approval restrictions found

✓ No external calls detected

✓ No airdrop-specific code found

✓ No vulnerable ownership functions found

✓ No retrievable ownership found

✓ Contract was not deployed recently

✓ No mixers utilized by contract deployer

✓ No adjustable maximum supply found

✓ No previous scams by owner's wallet found

✓ The contract operates without custom fees, ensuring security and financial integrity

✓ Smart contract lacks a whitelisting feature, reinforcing standard restrictions and access controls, enhancing overall security and integrity

✓ Smart contract's transfer function secure with unchangeable router, no issues, ensuring smooth, secure token transfers

✓ Smart contract safeguarded against native token draining in token transfers/approvals

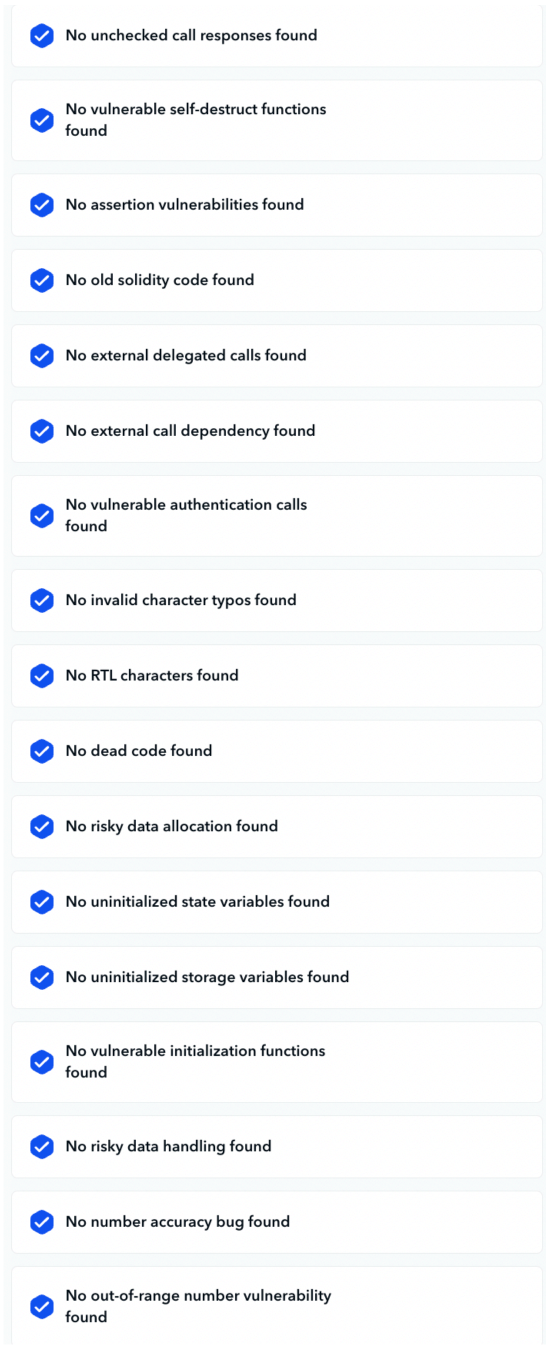
✓ Recent Interaction was within 30 Days
Smart contract with recent user interactions, active use, and operational functionality, not abandoned

✓ No instances of native token drainage upon revoking tokens were detected in the contract

SMART CONTRACT PROVIDED FOR REVIEW: ACST (token)

```
/**
 *Submitted for verification at basescan.org on 2024-06-22
*/

// Sources flattened with hardhat v2.22.2 https://hardhat.org

// SPDX-License-Identifier: MIT

// File @openzeppelin/contracts/utils/Context.sol@v5.0.2

// Original license: SPDX_License_Identifier: MIT
// OpenZeppelin Contracts (last updated v5.0.1) (utils/Context.sol)

pragma solidity ^0.8.20;

/**
 * @dev Provides information about the current execution context, including the
 * sender of the transaction and its data. While these are generally available
 * via msg.sender and msg.data, they should not be accessed in such a direct
 * manner, since when dealing with meta-transactions the account sending and
 * paying for execution may not be the actual sender (as far as an application
 * is concerned).
 *
 * This contract is only required for intermediate, library-like contracts.
 */
abstract contract Context {
    function _msgSender() internal view virtual returns (address) {
        return msg.sender;
    }

    function _msgData() internal view virtual returns (bytes calldata) {
        return msg.data;
    }

    function _contextSuffixLength() internal view virtual returns (uint256) {
        return 0;
    }
}
```

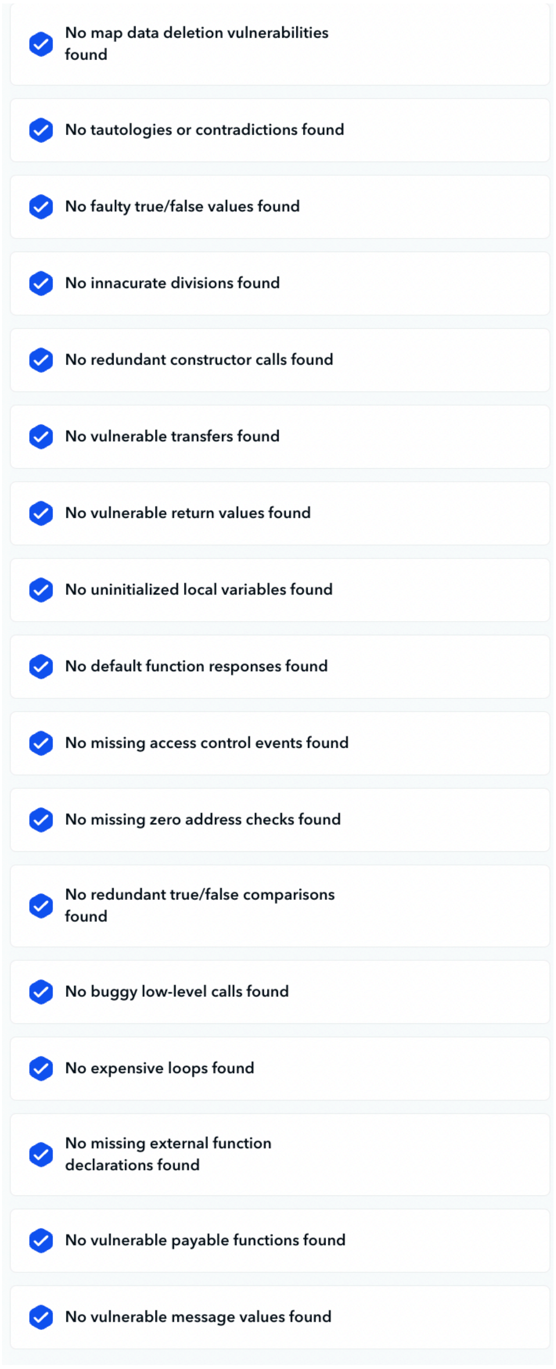
```
// File @openzeppelin/contracts/access/Ownable.sol@v5.0.2

// Original license: SPDX_License_Identifier: MIT
```



- ✓ No unchecked call responses found
- ✓ No vulnerable self-destruct functions found
- ✓ No assertion vulnerabilities found
- ✓ No old solidity code found
- ✓ No external delegated calls found
- ✓ No external call dependency found
- ✓ No vulnerable authentication calls found
- ✓ No invalid character typos found
- ✓ No RTL characters found
- ✓ No dead code found
- ✓ No risky data allocation found
- ✓ No uninitialized state variables found
- ✓ No uninitialized storage variables found
- ✓ No vulnerable initialization functions found
- ✓ No risky data handling found
- ✓ No number accuracy bug found
- ✓ No out-of-range number vulnerability found

```
// OpenZeppelin Contracts (last updated v5.0.0) (access/Ownable.sol)

pragma solidity ^0.8.20;

/**
 * @dev Contract module which provides a basic access control mechanism, where
 * there is an account (an owner) that can be granted exclusive access to
 * specific functions.
 *
 * The initial owner is set to the address provided by the deployer. This can
 * later be changed with {transferOwnership}.
 *
 * This module is used through inheritance. It will make available the modifier
 * `onlyOwner`, which can be applied to your functions to restrict their use to
 * the owner.
 */
abstract contract Ownable is Context {
    address private _owner;

    /**
     * @dev The caller account is not authorized to perform an operation.
     */
    error OwnableUnauthorizedAccount(address account);

    /**
     * @dev The owner is not a valid owner account. (eg. `address(0)`)
     */
    error OwnableInvalidOwner(address owner);

    event OwnershipTransferred(address indexed previousOwner, address indexed
newOwner);

    /**
     * @dev Initializes the contract setting the address provided by the deployer as the initial
owner.
     */
    constructor(address initialOwner) {
        if (initialOwner == address(0)) {
            revert OwnableInvalidOwner(address(0));
        }
       _transferOwnership(initialOwner);
```

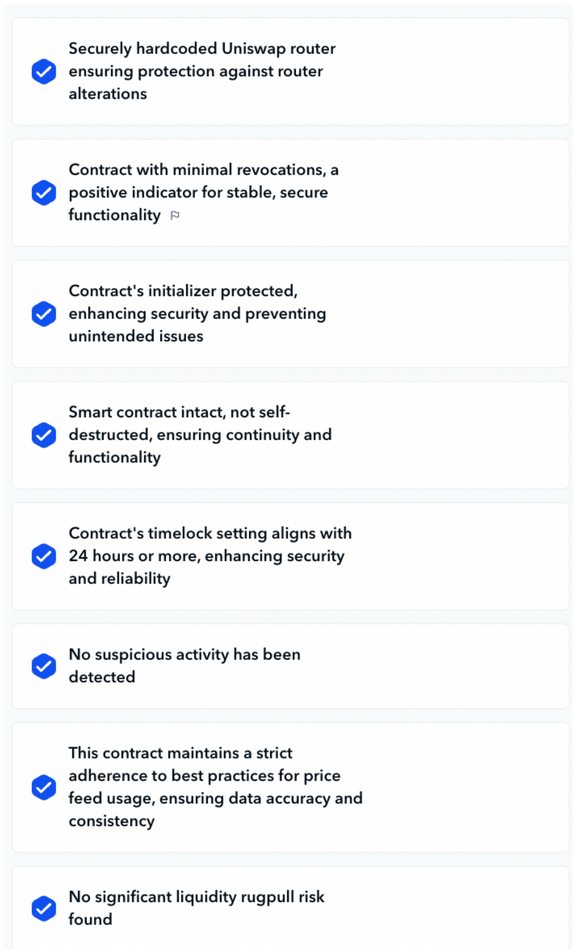
}



- ✓ No map data deletion vulnerabilities found
- ✓ No tautologies or contradictions found
- ✓ No faulty true/false values found
- ✓ No innacurate divisions found
- ✓ No redundant constructor calls found
- ✓ No vulnerable transfers found
- ✓ No vulnerable return values found
- ✓ No uninitialized local variables found
- ✓ No default function responses found
- ✓ No missing access control events found
- ✓ No missing zero address checks found
- ✓ No redundant true/false comparisons found
- ✓ No buggy low-level calls found
- ✓ No expensive loops found
- ✓ No missing external function declarations found
- ✓ No vulnerable payable functions found
- ✓ No vulnerable message values found

```
/**
 * @dev Throws if called by any account other than the owner.
 */
modifier onlyOwner() {
    _checkOwner();
    _;
}

/**
 * @dev Returns the address of the current owner.
 */
function owner() public view virtual returns (address) {
    return _owner;
}

/**
 * @dev Throws if the sender is not the owner.
 */
function _checkOwner() internal view virtual {
    if (owner() != _msgSender()) {
        revert OwnableUnauthorizedAccount(_msgSender());
    }
}

/**
 * @dev Leaves the contract without owner. It will not be possible to call
 * `onlyOwner` functions. Can only be called by the current owner.
 *
 * NOTE: Renouncing ownership will leave the contract without an owner,
 * thereby disabling any functionality that is only available to the owner.
 */
function renounceOwnership() public virtual onlyOwner {
    _transferOwnership(address(0));
}

/**
 * @dev Transfers ownership of the contract to a new account (`newOwner`).
 * Can only be called by the current owner.
 */
```

```
function transferOwnership(address newOwner) public virtual onlyOwner {
    if (newOwner == address(0)) {
```



✓ Securely hardcoded Uniswap router ensuring protection against router alterations

✓ Contract with minimal revocations, a positive indicator for stable, secure functionality

✓ Contract's initializer protected, enhancing security and preventing unintended issues

✓ Smart contract intact, not self-destructed, ensuring continuity and functionality

✓ Contract's timelock setting aligns with 24 hours or more, enhancing security and reliability

✓ No suspicious activity has been detected

✓ This contract maintains a strict adherence to best practices for price feed usage, ensuring data accuracy and consistency

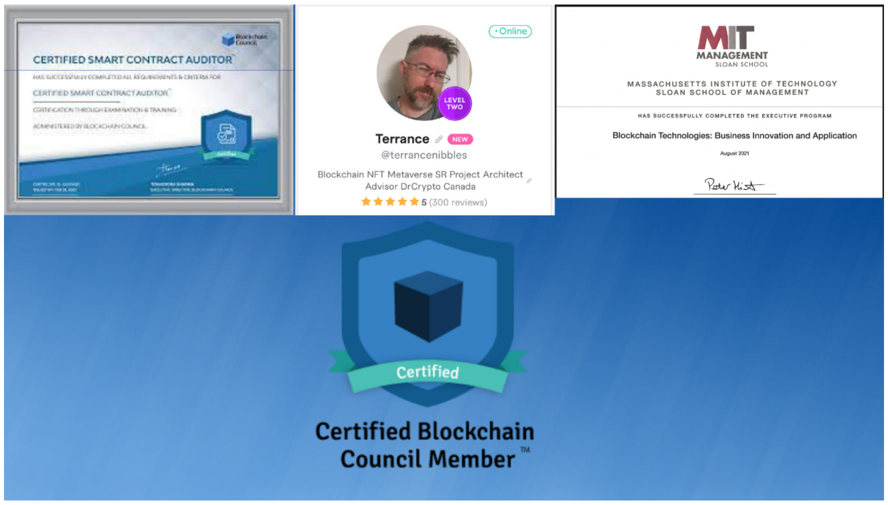
✓ No significant liquidity rugpull risk found

```
            revert OwnableInvalidOwner(address(0));
        }
        _transferOwnership(newOwner);
    }

    /**
     * @dev Transfers ownership of the contract to a new account (`newOwner`).
     * Internal function without access restriction.
     */
    function _transferOwnership(address newOwner) internal virtual {
        address oldOwner = _owner;
        _owner = newOwner;
        emit OwnershipTransferred(oldOwner, newOwner);
    }
}


// File @openzeppelin/contracts/token/ERC20/IERC20.sol@v5.0.2

// Original license: SPDX_License_Identifier: MIT
// OpenZeppelin Contracts (last updated v5.0.0) (token/ERC20/IERC20.sol)

pragma solidity ^0.8.20;

/**
 * @dev Interface of the ERC20 standard as defined in the EIP.
 */
interface IERC20 {
    /**
     * @dev Emitted when `value` tokens are moved from one account (`from`) to
    * another (`to`).
     *
     * Note that `value` may be zero.
     */
    event Transfer(address indexed from, address indexed to, uint256 value);

    /**
     * @dev Emitted when the allowance of a `spender` for an `owner` is set by
     * a call to {approve}. `value` is the new allowance.
     */
```

```
event Approval(address indexed owner, address indexed spender, uint256 value);

/**
 * @dev Returns the value of tokens in existence.
 */
function totalSupply() external view returns (uint256);

/**
 * @dev Returns the value of tokens owned by `account`.
 */
function balanceOf(address account) external view returns (uint256);

/**
 * @dev Moves a `value` amount of tokens from the caller's account to `to`.
 *
 * Returns a boolean value indicating whether the operation succeeded.
 *
 * Emits a {Transfer} event.
 */
function transfer(address to, uint256 value) external returns (bool);

/**
 * @dev Returns the remaining number of tokens that `spender` will be
 * allowed to spend on behalf of `owner` through {transferFrom}. This is
 * zero by default.
 *
 * This value changes when {approve} or {transferFrom} are called.
 */
function allowance(address owner, address spender) external view returns (uint256);

/**
 * @dev Sets a `value` amount of tokens as the allowance of `spender` over the
 * caller's tokens.
 *
 * Returns a boolean value indicating whether the operation succeeded.
 *
 * IMPORTANT: Beware that changing an allowance with this method brings the risk
 * that someone may use both the old and the new allowance by unfortunate
 * transaction ordering. One possible solution to mitigate this race
 * condition is to first reduce the spender's allowance to 0 and set the
 * desired value afterwards:
 * https://github.com/ethereum/EIPs/issues/20#issuecomment-263524729
 *
 * Emits an {Approval} event.
 */
function approve(address spender, uint256 value) external returns (bool);

/**
 * @dev Moves a `value` amount of tokens from `from` to `to` using the
 * allowance mechanism. `value` is then deducted from the caller's
 * allowance.
 *
 * Returns a boolean value indicating whether the operation succeeded.
 *
```

```
     * Emits a {Transfer} event.
     */
    function transferFrom(address from, address to, uint256 value) external returns (bool);
}


// File contracts/ACST.sol

// Original license: SPDX_License_Identifier: MIT
pragma solidity ^0.8.0;


contract ACST is IERC20, Ownable(msg.sender) {
    string public name = "American Cannabis Society";
    string public symbol = "ACST";
    uint256 public taxCollected = 6;
    address public immutable taxReceiver;
    uint8 private _decimals = 18;
    function decimals() public view returns (uint8) {
        return _decimals;
    }
    event TaxCollected(address indexed taxReceiver, uint256 amount);

    uint256 public totalSupply = 100_000_000_000 * (10 ** uint256(decimals()));
    mapping(address => uint256) private balances;
    mapping(address => mapping(address => uint256)) private allowances;

    constructor(address _taxReceiver) {
        require(_taxReceiver != address(0), "Invalid tax receiver address");
        taxReceiver = _taxReceiver;
        balances[msg.sender] = totalSupply;
    }

    function balanceOf(address account) external view override returns (uint256) {
    return balances[account];
}
    function setNewTax(uint8 newTax) external onlyOwner returns (uint256) {
        require(newTax < 100, "Tax percentage cannot exceed 100");
        require(newTax >= 0, "Tax percentage cannot be negative");
        taxCollected = newTax;
        return taxCollected;
    }

    function transfer(address to, uint256 amount) external override returns (bool) {
        _transfer(msg.sender, to, amount);
        return true;
    }

    function _transfer(address from, address to, uint256 amount) internal {
        require(to != address(0), "ERC20: transfer to the zero address");
        uint256 senderBalance = balances[from];
        require(senderBalance >= amount, "ERC20: insufficient balance");

        balances[from] -= amount;
        balances[to] += amount;
        emit Transfer(from, to, amount);
    }
    function allowance(
        address owner,
        address spender
    ) external view override returns (uint256) {
        return allowances[owner][spender];
    }
    function approve(
        address spender,
        uint256 amount
    ) external override returns (bool) {
        allowances[msg.sender][spender] = amount;
        emit Approval(msg.sender, spender, amount);
        return true;
    }

    function transferFrom(address from, address to, uint256 amount) external override returns (bool) {
        _transferFrom(from, to, amount);
        return true;
    }

    function _transferFrom(address from, address to, uint256 amount) internal {
        require(to != address(0), "ERC20: transfer to the zero address");
        uint256 senderAllowance = allowances[from][msg.sender];
        require(senderAllowance >= amount, "ERC20: transfer amount exceeds allowance");

        uint256 fee = (amount / 100) * taxCollected;
        uint256 amountAfterFee = amount - fee;

        balances[from] -= amount;
        balances[to] += amountAfterFee;
        balances[taxReceiver] += fee;

        allowances[from][msg.sender] -= amount;
        emit Transfer(from, to, amountAfterFee);
        emit Transfer(from, taxReceiver, fee);
        emit TaxCollected(taxReceiver, fee); // Emitting a specific event for tax collection
    }

    function increaseAllowance(
        address spender,
        uint256 addedValue
    ) external returns (bool) {
        uint256 newAllowance = allowances[msg.sender][spender] + addedValue;
        _approve(msg.sender, spender, newAllowance);
        return true;
    }
    function decreaseAllowance(
        address spender,
        uint256 subtractedValue
    ) external returns (bool) {
        uint256 currentAllowance = allowances[msg.sender][spender];
        require(
          currentAllowance >= subtractedValue,
          "ERC20: decreased allowance below zero"
        );
        uint256 newAllowance = currentAllowance - subtractedValue;
        _approve(msg.sender, spender, newAllowance);
        return true;
    }

    function _approve(address owner, address spender, uint256 amount) internal {
        allowances[owner][spender] = amount;
        emit Approval(owner, spender, amount);
    }
  }
```

Terrence Nibbles, CCE, CCA Auditor #17865



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