

Smart Contract Security Audit V1

PREWA Token Smart Contract Audit

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Background

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

Project Information

- **Platform:** Binance Smart Chain
- **Name:** PREWAToken
- **Language :** Solidity
- **Contract Address:** 0xaf0057a256c9c5e209c1738aa870f8191b82286b, 0x828f07e624f227fde5906611461deab26dccc600
- **Code Source:** <https://github.com/TerraDharitri/drt-pREWA/tree/main/contracts>

PREWAToken

The Platform's ERC20 Token

A secure upgradeable ERC20 token with minting, burning, pausing and blacklisting capabilities. Integrates with AccessControl and EmergencyController.



Contract Details

Author

License

Reiva

Solidity Version

0.8.26

Dependencies

OpenZeppelin

Custom AccessControl

EmergencyController

EmergencyController

What is PREWAToken?

It is the platform's primary ERC20 token, supporting minting, burning, pausing and a time-locked blacklisting mechanism. Integrates with AccessControl for secure management.

Key Features

- ERC20 standard
- Upgradeable
- Supply cap
- Role-based access
- Blacklisting
- Emergency controls



Blacklisting

proposing
proposed
proposal
blacklist

Key Operations

Functions for token management restricted by roles or conditions.

- | | |
|------------------|-------------------------|
| Token operations | Control |
| preset() | Upgradeable |
| approval | _isEffectivelyPaused() |
| transferFrom | recoverTokens |
| mint() | SetBlacklisted proposal |
| burn() | SarenKs20 |
| burnFrom() | |

Event Emissions

- emergencyShutdown()
- _isEffectivelyPaused()
- setEmergencyController()



Data Storage

Key storage structures inherited from PREWATokenStorage

_name	string
_symbol	string
_decimals	Number of decimals uint8
_totalSupply	Total token supply uint256
FMV	0.11230
_balances	mapping(address => uint256)
_allowances	Approved allowances
_minters	Approved allowances - a bool
_blacklisted	Blacklist state - a bool
_blacklistProposals	Mapping of address to Blacklist proposal
blacklistMockburn	Blacklist - a bool
view functions	EmergencyController

Event Emissions

- emergencyShutdown()
- _isEffectivelyPaused()
- setEmergencyController()



How It Works

- emergencyShutdown
- _isEffectivelyPaused()
- setEmergencyController

Securely manage your tokens with PREWAToken!

Executive Summary

According to our assessment, the customer's solidity smart contract is **Well-Secured**.

Well Secured	✓
Secured	
Poor Secured	
Insecure	

Automated checks are with remix IDE. All issues were performed by the team, which included the analysis of code functionality, manual audit found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the audit overview section. The general overview is presented in the Project Information section and all issues found are located in the audit overview section.

Team found 0 critical, 0 high, 0 medium, 2 low, 0 very low-level issues and 2 notes in all solidity files of the contract

The files:

PREWAToken.sol

Audit Score:

99% secure



File and Function Level Report

File in Scope:

Contract Name	SHA 256 hash	Contract Address
PREWAToken.sol	63087a9537cbf16c95d80e93ab149efad7153990	0xaf0057a256c9c5e209c1738aa870f8191b82286b, 0x828f07e624f227fde5906611461deab26dccc600

- Contract: PREWAToken
- Inherit: Initializable, ReentrancyGuardUpgradeable, PausableUpgradeable, OwnableUpgradeable, PREWATokenStorage, IpREWAToken, EmergencyAwareBase
- Observation: All passed including security check
- Test Report: passed
- Score: passed
- Conclusion: passed

Function	Test Result	Type / Return Type	Score
accessControl	✓	Read / public	Passed
allowance	✓	Read / public	Passed
balanceOf	✓	Read / public	Passed
cap	✓	Read / public	Passed
decimals	✓	Read / public	Passed
checkEmergencyState	✓	Read / public	Passed
emergencyController	✓	Read / public	Passed
getBlacklistProposal	✓	Read / public	Passed
owner	✓	Read / public	Passed
getBlacklistTimelockDuration	✓	Read / public	Passed
getEmergencyController	✓	Read / public	Passed
isBlacklisted	✓	Read / public	Passed
isEmergencyPaused	✓	Read / public	Passed
isMinter	✓	Read / public	Passed

name	✓	Read / public	Passed
paused	✓	Read / public	Passed
symbol	✓	Read / public	Passed
totalSupply	✓	Read / public	Passed
renounceOwnership	✓	Read / public	Passed
registerContract	✓	Write / public	Passed
renounceOwnership	✓	Write / public	Passed
transferOwnership	✓	Write / public	Passed
addMinter	✓	Write / public	Passed
initialize	✓	Write / public	Passed
approve	✓	Write / public	Passed
blacklist	✓	Write / public	Passed
burn	✓	Write / public	Passed
burnFrom	✓	Write / public	Passed
cancelBlacklistproposal	✓	Write / public	Passed
emergencyShutdown	✓	Write / public	Passed
executeBlacklist	✓	Write / public	Passed
mint	✓	Write / public	Passed
pause	✓	Write / public	Passed
recoverTokens	✓	Write / public	Passed
removeMinter	✓	Write / public	Passed
setBlacklistTimelockDuration	✓	Write / public	Passed
setCap	✓	Write / public	Passed
setEmergencyController	✓	Write / public	Passed
transfer	✓	Write / public	Passed
unblacklist	✓	Write / public	Passed
unpause	✓	Write / public	Passed
transferFrom	✓	Write / public	Passed
transferTokenOwnership	✓	Write / public	Passed

Issues Checking Status

SWC Attack Analysis

The Smart Contract Weakness Classification Registry (SWC Registry) is an implementation of the weakness classification scheme proposed in EIP-1470. It is loosely aligned to the terminologies and structure used in the Common Weakness Enumeration (CWE) for more info check

<https://swcregistry.io/>

No.	Issue Description	Checking Status
136	Unencrypted Private Data On-Chain	Passed
135	Code With No Effects	Passed
134	Message call with hardcoded gas amount	Passed
133	Hash Collisions With Multiple Variable Length Arguments	Passed
132	Unexpected Ether balance	Passed
131	Presence of unused variables	Passed
130	Right-To-Left-Override control character (U+202E)	Passed
129	Typographical Error	Passed
128	DoS with block gas limit.	Passed
127	Arbitrary Jump with Function Type Variable	Passed
126	Insufficient Gas Griefing	Passed
125	Incorrect Inheritance Order	Passed
124	Write to Arbitrary Storage Location	Passed
123	Requirement Violation	Passed
122	Lack of Proper Signature Verification	Passed
121	Missing Protection against Signature Replay Attacks	Passed
120	Weak Sources of Randomness from Chain Attributes	Passed
119	Shadowing State Variables	Passed

118	Incorrect Constructor Name	Passed
117	Signature Malleability	Passed
116	Block values as a proxy for time	Not Passed
115	Authorization through tx.origin	Passed
114	Transaction Order Dependence	Passed
113	DoS with Failed Call	Passed
112	Delegatecall to Untrusted Callee	Passed
111	Use of Deprecated Solidity Functions	Passed
110	Assert Violation	Passed
109	Uninitialized Storage Pointer	Passed
108	State Variable Default Visibility	Passed
107	Reentrancy	Passed
106	Unprotected SELFDESTRUCT Instruction	Passed
105	Unprotected Ether Withdrawal	Passed
104	Unchecked Call Return Value	Passed
103	Floating Pragma	Not Passed
102	Outdated Compiler Version	Passed
101	Integer Overflow and Underflow	Passed
100	Function Default Visibility	Passed

Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to tokens loss etc.
High	High-level vulnerabilities are difficult to exploit; however, they also have significant impact on smart contract execution, e.g. public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to tokens lose
Low	Low-level vulnerabilities are mostly related to outdated, unused etc. code snippets, that can't have significant impact on execution
Note	Lowest-level vulnerabilities, code style violations and info statements can't affect smart contract execution and can be ignored.

Audit Findings

Critical:

No Critical severity vulnerabilities were found.

High:

No High severity vulnerabilities were found.

Medium:

No Medium severity vulnerabilities were found.

Low:

#Unnecessary if condition for amount == 0 in _transfer

Description

In `_transfer`, there's a check `if (amount == 0) { emit Transfer(from, to, 0); return; }`. While harmless, an ERC20 `transfer` of 0 amount is usually handled implicitly without special casing.

Recommendation

Remove this explicit check for `amount == 0`. The subsequent logic will correctly handle a zero amount `transfer` (balances won't change, and a `Transfer` event with 0 will still be emitted).

Status: **Acknowledged**.

#Centralization Risk with Ownable and AccessControl

Description

The contract heavily relies on the owner for critical operations (`setCap`, `recoverTokens`, `addMinter`, `removeMinter`, `transferTokenOwnership`, `setBlacklistTimelockDuration`, `blacklist`, `executeBlacklist`, `cancelBlacklistProposal`, `unblacklist`, `setEmergencyController`). Additionally, the pause and unpause functions are restricted to a `PAUSER_ROLE` managed by an external `AccessControl` contract. This creates a significant centralization risk, as a compromise of the owner's private key or the `AccessControl` contract could lead to severe consequences (e.g., freezing transfers, minting unlimited tokens, blacklisting legitimate users).

Remediation

- **Decentralize Roles:** Explore ways to further decentralize some of the administrative roles if feasible for the project's requirements. For instance, some operations could be governed by a DAO or a more distributed set of addresses, reducing reliance on a single `AccessControl` contract.

- Time-locks on Critical Operations: While some blacklisting operations have a timelock, consider adding timelocks to other critical functions controlled by the owner, such as `setCap`, `addMinter`, `removeMinter`, and `setBlacklistTimelockDuration`. This would provide a window for the community or other authorized parties to react to malicious or erroneous actions.

P.S: This issue is common to the majority of those smart contracts.

Status: **Acknowledged**.

Very Low:

No Very Low severity vulnerabilities were found.

Notes:

#Pragam version not fixed

Description

It is a good practice to lock the solidity version for a live deployment (use 0.8.28 instead of ^0.8.28). contracts should be deployed with the same compiler version and flags that they have been tested the most with. Locking the pragma helps ensure that contracts do not accidentally get deployed using, for example, the latest compiler which may have higher risks of undiscovered bugs. Contracts may also be deployed by others and the pragma indicates the compiler version intended by the original authors. And avoid Solidity compiler Bugs check here

<https://sepolia.etherscan.io/solcbuginfo>

Remediation

Remove the ^ sign to lock the pragma version.

Use of block.timestamp for comparisons

The value of `block.timestamp` can be manipulated by the miner. And conditions with strict equality is difficult to achieve - `block.timestamp`.

```
if ( _blacklistProposals[account].pending) revert
PREWÄ_BlacklistPropExists(account);
        uint256 executeTime = block.timestamp +
currentTimelockDuration;
        _blacklistProposals[account] =
BlacklistProposal(block.timestamp, executeTime, msg.sender, true);
        emit BlacklistProposed(account, executeTime,
msg.sender);
```

Recommendation

Avoid use of `block.timestamp`.

Automatic Testing

1- SOLIDITY STATIC ANALYSIS

SOLIDITY STATIC ANALYSIS

☒ Select all ☒ Autorun

Run

Security

☒ Select Security

- ☒ **Transaction origin:**
'tx.origin' used
- ☒ **Check-effects-interaction:**
Potential reentrancy bugs
- ☒ **Inline assembly:**
Inline assembly used
- ☒ **Block timestamp:**
Can be influenced by miners
- ☒ **Low level calls:**
Should only be used by experienced devs
- ☒ **Block hash:**
Can be influenced by miners
- ☒ **Selfdestruct:**
Contracts using destructed contract can be broken

Gas & Economy

☒ Select Gas & Economy

- ☒ **Gas costs:**
Too high gas requirement of functions
- ☒ **This on local calls:**
Invocation of local functions via 'this'
- ☒ **Delete dynamic array:**
Use require/assert to ensure complete deletion
- ☒ **For loop over dynamic array:**
Iterations depend on dynamic array's size
- ☒ **Ether transfer in loop:**
Transferring Ether in a for/while/do-while loop

SOLIDITY STATIC ANALYSIS

ERC

☒ Select ERC

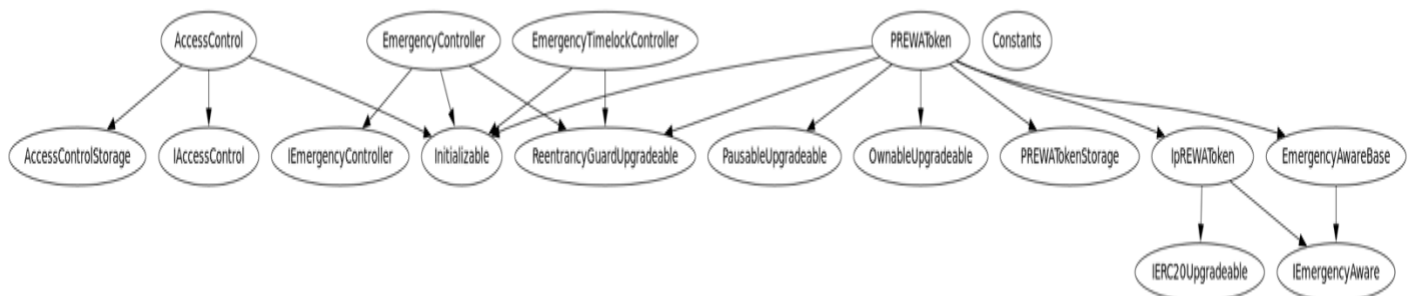
- ☒ **ERC20:**
'decimals' should be 'uint8'

Miscellaneous

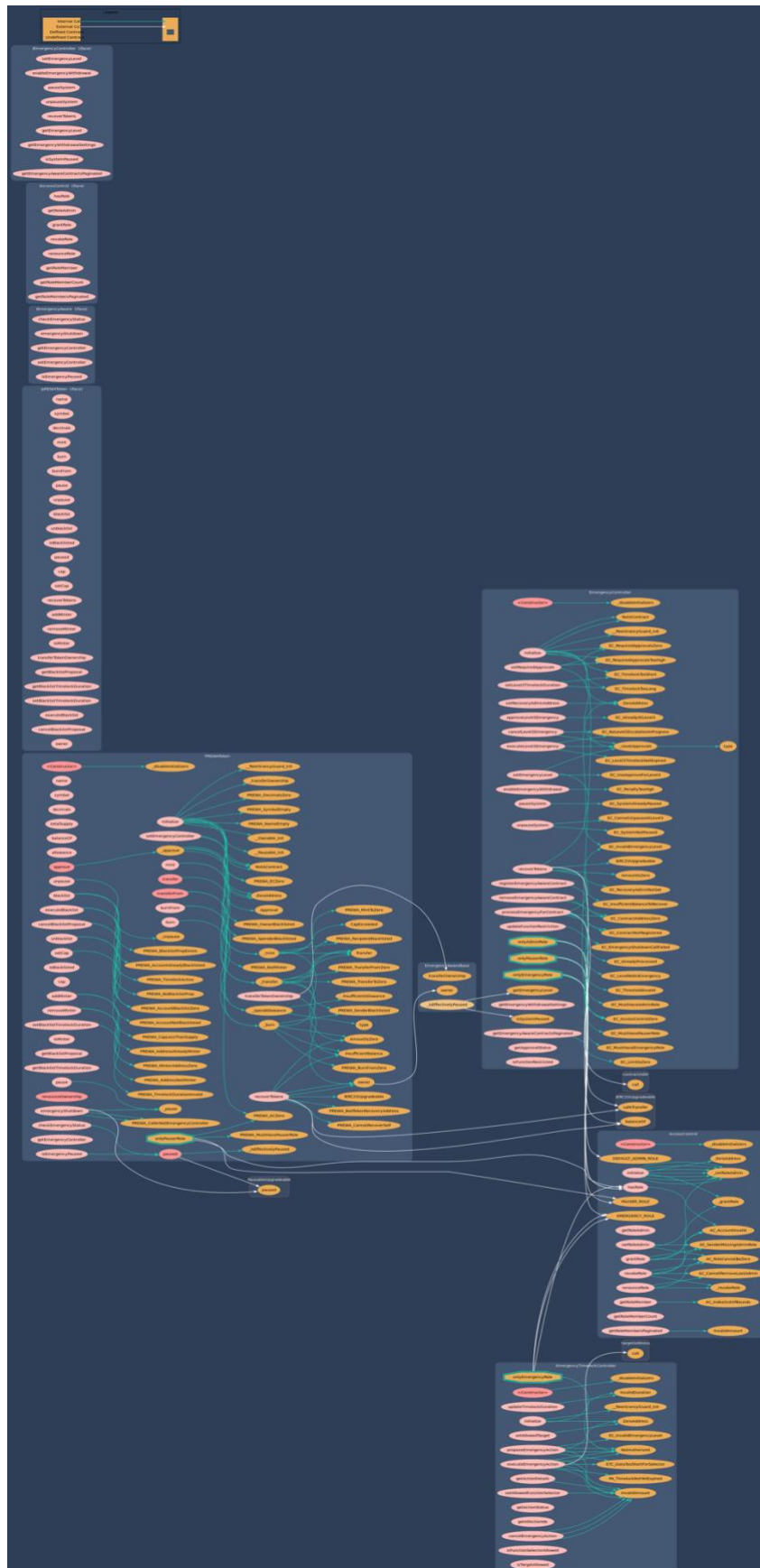
☒ Select Miscellaneous

- ☒ **Constant/View/Pure functions:**
Potentially constant/view/pure functions
- ☒ **Similar variable names:**
Variable names are too similar
- ☒ **No return:**
Function with 'returns' not returning
- ☒ **Guard conditions:**
Ensure appropriate use of require/assert
- ☒ **Result not used:**
The result of an operation not used
- ☒ **String length:**
Bytes length != String length
- ☒ **Delete from dynamic array:**
'delete' leaves a gap in array
- ☒ **Data truncated:**
Division on int/uint values truncates the result

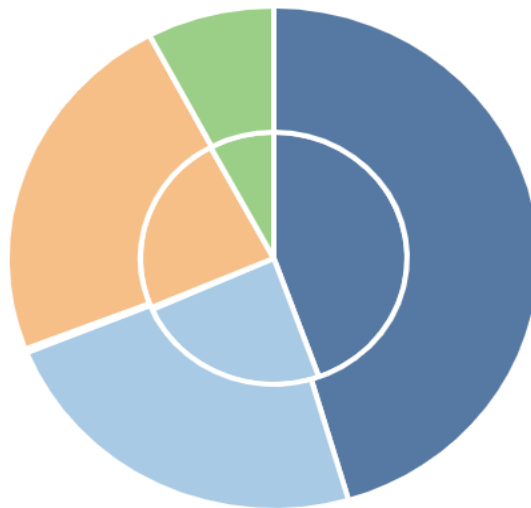
2- Inheritance graph



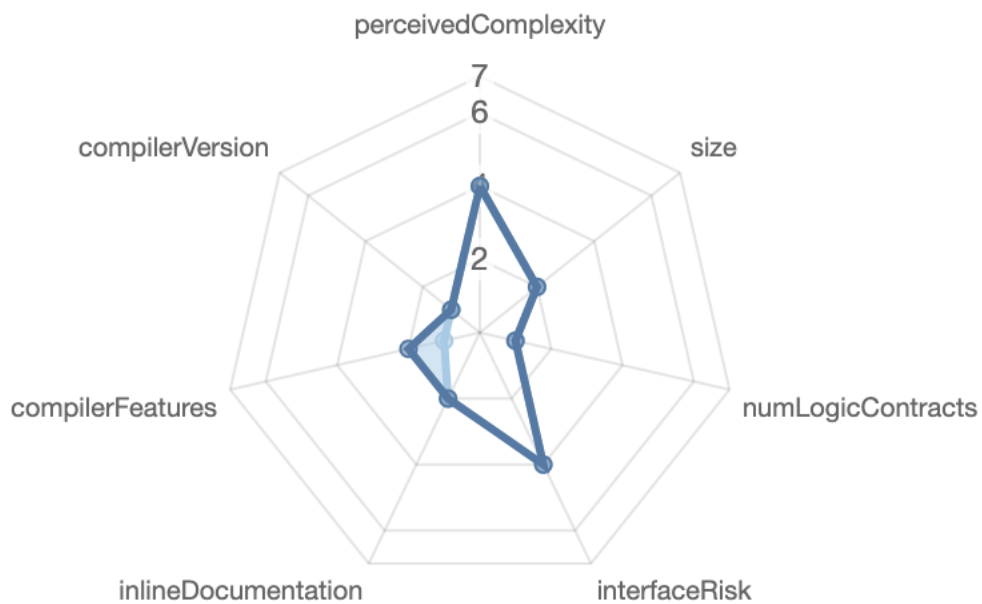
3- Call graph



Source lines



Risk level



Source units in scope

Source Units in Scope

Source Units Analyzed: 1
Source Units in Scope: 1 (100%)

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/core/pREWAToken.sol	1	_____	576	563	329	176	360	
	Totals	1	_____	576	563	329	176	360	

Legend: [-]

- **Lines**: total lines of the source unit
- **nLines**: normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
- **nSLOC**: normalized source lines of code (only source-code lines; no comments, no blank lines)
- **Comment Lines**: lines containing single or block comments
- **Complexity Score**: a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

Capabilities

Components

 Contracts	 Libraries	 Interfaces	 Abstract
1	0	0	0

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.

 Public	 Payable
38	0

External	Internal	Private	Pure	View
32	32	0	0	17

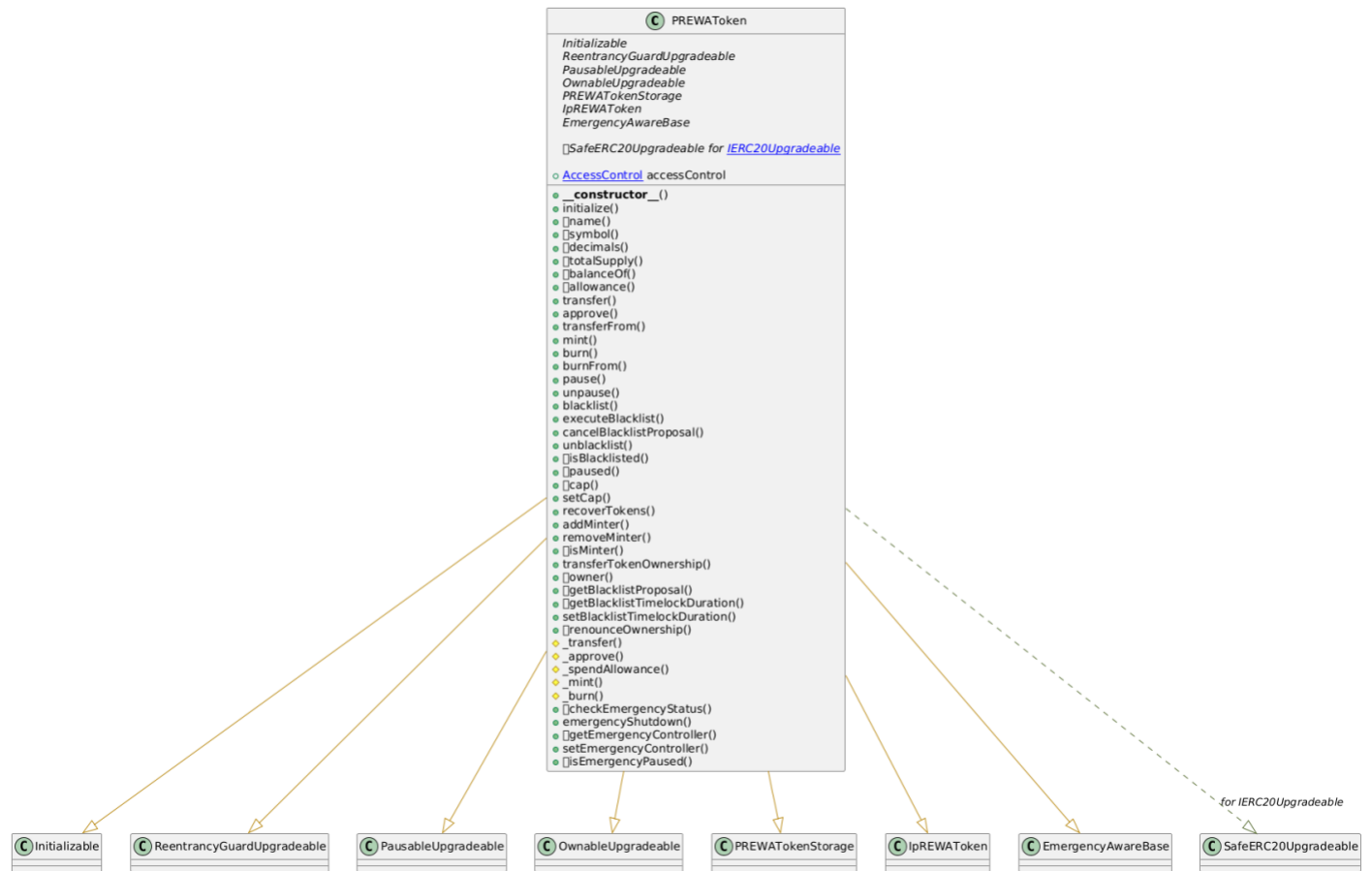
StateVariables

Total	 Public
1	1

Capabilities

Solidity Versions observed	🔧 Experimental Features	💰 Can Receive Funds	💻 Uses Assembly	💣 Has Destroyable Contracts	
0.8.28			yes (3 asm blocks)		
👤 Transfers ETH	⚡ Low-Level Calls	👥 DelegateCall	📄 Uses Hash Functions	🔄 ECRrecover	🌀 New/Create/Create2

Unified Modeling Language (UML)



Functions signature

Function Name	Sighash	Function Signature
initialize	7d6492f6	initialize(string,string,uint8,uint256,uint256,address,address,address)
name	06fdde03	name()
symbol	95d89b41	symbol()
decimals	313ce567	decimals()
totalSupply	18160ddd	totalSupply()
balanceOf	70a08231	balanceOf(address)
allowance	dd62ed3e	allowance(address,address)
transfer	a9059cbb	transfer(address,uint256)
approve	095ea7b3	approve(address,uint256)
transferFrom	23b872dd	transferFrom(address,address,uint256)
mint	40c10f19	mint(address,uint256)

```
| burn | 42966c68 | burn(uint256) |
| burnFrom | 79cc6790 | burnFrom(address,uint256) |
| pause | 8456cb59 | pause() |
| unpause | 3f4ba83a | unpause() |
| blacklist | f9f92be4 | blacklist(address) |
| executeBlacklist | 16492ce1 | executeBlacklist(address) |
| cancelBlacklistProposal | 71ef93fd | cancelBlacklistProposal(address) |
|
| unblacklist | 75e3661e | unblacklist(address) |
| isBlacklisted | fe575a87 | isBlacklisted(address) |
| paused | 5c975abb | paused() |
| cap | 355274ea | cap() |
| setCap | 47786d37 | setCap(uint256) |
| recoverTokens | 069c9fae | recoverTokens(address,uint256) |
| addMinter | 983b2d56 | addMinter(address) |
| removeMinter | 3092afd5 | removeMinter(address) |
| isMinter | aa271e1a | isMinter(address) |
| transferTokenOwnership | 21e6b53d | transferTokenOwnership(address) |
| owner | 8da5cb5b | owner() |
| getBlacklistProposal | f2f14617 | getBlacklistProposal(address) |
| getBlacklistTimelockDuration | 9ac55079 |
getBlacklistTimelockDuration() |
| setBlacklistTimelockDuration | 13acd718 |
setBlacklistTimelockDuration(uint256) |
| renounceOwnership | 715018a6 | renounceOwnership() |
| checkEmergencyStatus | 8aed668a | checkEmergencyStatus(bytes4) |
| emergencyShutdown | eb1676c1 | emergencyShutdown(uint8) |
| getEmergencyController | c993cc9d | getEmergencyController() |
| setEmergencyController | 6ca7dc89 | setEmergencyController(address) |
| isEmergencyPaused | 290d10c4 | isEmergencyPaused() |
```

Automatic general report

Files Description Table

File Name	SHA-1 Hash
/Users/macbook/Desktop/drt-pREWA/contracts/core/pREWAToken.sol	63087a9537cbf16c95d80e93ab149efad7153990
/Users/macbook/Desktop/drt-pREWA/contracts/core/storage/pREWATokenStorage.sol	fbf7b8fff5b8cb0a379250e502a3fa59d7fa7e9d
/Users/macbook/Desktop/drt-pREWA/contracts/core/interfaces/IpREWAToken.sol	df40b57f835620d51cecd5842c3672b40b2bec5
/Users/macbook/Desktop/drt-pREWA/contracts/interfaces/IEmergencyAware.sol	be6e0a371b0a5f62d5c7dc06e5c0c4121dcc7ca1
/Users/macbook/Desktop/drt-pREWA/contracts/controllers/EmergencyController.sol	8e73765eaa98f95db8f5eb7a40cd13b0dc845266
/Users/macbook/Desktop/drt-pREWA/contracts/access/AccessControl.sol	40163fa249f10365c03cf1fa9ddd26e2f6eb1005
/Users/macbook/Desktop/drt-pREWA/contracts/access/storage/AccessControlStorage.sol	2a1f4c3d6956a89011b090a62b15254b1d720d65
/Users/macbook/Desktop/drt-pREWA/contracts/access/interfaces/IAccessControl.sol	540ec54eaade1c05a650af086ebf959654ec6322
/Users/macbook/Desktop/drt-pREWA/contracts/libraries/Errors.sol	0974f6f49e3b655fa93a2792154f1b506ec03c74
/Users/macbook/Desktop/drt-pREWA/contracts/interfaces/IEmergencyController.sol	40bc149ec8a1da85c0e4c6170b06f3a0f3b77f3b
/Users/macbook/Desktop/drt-pREWA/contracts/controllers/EmergencyTimelockController.sol	94735e88ad7f750ead488b7ad618b1486cbdb483
/Users/macbook/Desktop/drt-pREWA/contracts/libraries/Constants.sol	62835a8af9d7ab21c0cad9ca03abff6cf4e8e68f
/Users/macbook/Desktop/drt-pREWA/contracts/utils/EmergencyAwareBase.sol	528be04847c5d3cf03edd961c878359eb3cafc6a

Contracts Description Table

Contract	Type	Bases
:	:	:
:	:	:

L	**Function Name**	**Visibility**	**Mutability**
Modifiers			
PREWAToken Implementation Initializable,			
ReentrancyGuardUpgradeable, PausableUpgradeable, OwnableUpgradeable,			
PREWATokenStorage, IpREWAToken, EmergencyAwareBase			
L	<Constructor>	Public !	NO !
L	initialize	External !	initializer
L	name	External !	NO !
L	symbol	External !	NO !
L	decimals	External !	NO !
L	totalSupply	External !	NO !
L	balanceOf	External !	NO !
L	allowance	External !	NO !
L	transfer	Public !	nonReentrant whenNotPaused
L	approve	Public !	nonReentrant
L	transferFrom	Public !	nonReentrant whenNotPaused
L	mint	External !	nonReentrant whenNotPaused
L	burn	External !	nonReentrant whenNotPaused
L	burnFrom	External !	nonReentrant whenNotPaused
L	pause	External !	onlyPauserRole nonReentrant
L	unpause	External !	onlyPauserRole nonReentrant
L	blacklist	External !	onlyOwner nonReentrant
L	executeBlacklist	External !	onlyOwner nonReentrant
L	cancelBlacklistProposal	External !	onlyOwner
nonReentrant			
L	unblacklist	External !	onlyOwner nonReentrant
L	isBlacklisted	External !	NO !
L	paused	Public !	NO !
L	cap	External !	NO !
L	setCap	External !	onlyOwner nonReentrant
L	recoverTokens	External !	onlyOwner nonReentrant
L	addMinter	External !	onlyOwner nonReentrant
L	removeMinter	External !	onlyOwner nonReentrant
L	isMinter	External !	NO !
L	transferTokenOwnership	External !	nonReentrant
L	owner	Public !	NO !
L	getBlacklistProposal	External !	NO !
L	getBlacklistTimelockDuration	External !	NO !
L	setBlacklistTimelockDuration	External !	onlyOwner
nonReentrant			
L	renounceOwnership	Public !	onlyOwner
L	_transfer	Internal !	
L	_approve	Internal !	
L	_spendAllowance	Internal !	
L	_mint	Internal !	
L	_burn	Internal !	
L	checkEmergencyStatus	External !	NO !
L	emergencyShutdown	External !	NO !
L	getEmergencyController	External !	NO !
L	setEmergencyController	External !	onlyOwner

```

| L | isEmergencyPaused | External ! | |NO! |
|||||
| **PREWATokenStorage** | Implementation | |||
|||||
| **IpREWAToken** | Interface | IERC20Upgradeable, IEmergencyAware |||
| L | name | External ! | |NO! |
| L | symbol | External ! | |NO! |
| L | decimals | External ! | |NO! |
| L | mint | External ! | ⬤ |NO! |
| L | burn | External ! | ⬤ |NO! |
| L | burnFrom | External ! | ⬤ |NO! |
| L | pause | External ! | ⬤ |NO! |
| L | unpause | External ! | ⬤ |NO! |
| L | blacklist | External ! | ⬤ |NO! |
| L | unblacklist | External ! | ⬤ |NO! |
| L | isBlacklisted | External ! | |NO! |
| L | paused | External ! | |NO! |
| L | cap | External ! | |NO! |
| L | setCap | External ! | ⬤ |NO! |
| L | recoverTokens | External ! | ⬤ |NO! |
| L | addMinter | External ! | ⬤ |NO! |
| L | removeMinter | External ! | ⬤ |NO! |
| L | isMinter | External ! | |NO! |
| L | transferTokenOwnership | External ! | ⬤ |NO! |
| L | getBlacklistProposal | External ! | |NO! |
| L | getBlacklistTimelockDuration | External ! | |NO! |
| L | setBlacklistTimelockDuration | External ! | ⬤ |NO! |
| L | executeBlacklist | External ! | ⬤ |NO! |
| L | cancelBlacklistProposal | External ! | ⬤ |NO! |
| L | owner | External ! | |NO! |
|||||
| **IEmergencyAware** | Interface | |||
| L | checkEmergencyStatus | External ! | |NO! |
| L | emergencyShutdown | External ! | ⬤ |NO! |
| L | getEmergencyController | External ! | |NO! |
| L | setEmergencyController | External ! | ⬤ |NO! |
| L | isEmergencyPaused | External ! | |NO! |
|||||
| **EmergencyController** | Implementation | Initializable,
ReentrancyGuardUpgradeable, IEmergencyController |||
| L | <Constructor> | Public ! | ⬤ |NO! |
| L | initialize | External ! | ⬤ | initializer |
| L | setRequiredApprovals | External ! | ⬤ | onlyAdminRole |
| L | setLevel3TimelockDuration | External ! | ⬤ | onlyAdminRole |
| L | setRecoveryAdminAddress | External ! | ⬤ | onlyAdminRole |
| L | approveLevel3Emergency | External ! | ⬤ | onlyEmergencyRole
nonReentrant |
| L | cancelLevel3Emergency | External ! | ⬤ | onlyEmergencyRole
nonReentrant |
| L | executeLevel3Emergency | External ! | ⬤ | onlyEmergencyRole
nonReentrant |

```

```

| L | setEmergencyLevel | External ! | 🔒 | onlyEmergencyRole
nonReentrant |
| L | enableEmergencyWithdrawal | External ! | 🔒 | onlyEmergencyRole
nonReentrant |
| L | pauseSystem | External ! | 🔒 | onlyPauserRole nonReentrant |
| L | unpauseSystem | External ! | 🔒 | onlyPauserRole nonReentrant |
| L | recoverTokens | External ! | 🔒 | onlyEmergencyRole nonReentrant
|
| L | registerEmergencyAwareContract | External ! | 🔒 |
onlyEmergencyRole |
| L | removeEmergencyAwareContract | External ! | 🔒 |
onlyEmergencyRole |
| L | processEmergencyForContract | External ! | 🔒 | nonReentrant |
| L | updateFunctionRestriction | External ! | 🔒 | onlyEmergencyRole |
| L | getEmergencyLevel | External ! | |NO! |
| L | getEmergencyWithdrawalSettings | External ! | |NO! |
| L | isSystemPaused | External ! | |NO! |
| L | getEmergencyAwareContractsPaginated | External ! | |NO! |
| L | getApprovalStatus | External ! | |NO! |
| L | isFunctionRestricted | External ! | |NO! |
| L | _resetApprovals | Internal 🔓 | 🔒 | |
|||||
| **AccessControl** | Implementation | Initializable,
AccessControlStorage, IAccessControl |||
| L | <Constructor> | Public ! | 🔒 |NO! |
| L | initialize | External ! | 🔒 | initializer |
| L | hasRole | External ! | |NO! |
| L | getRoleAdmin | External ! | |NO! |
| L | grantRole | External ! | 🔒 |NO! |
| L | revokeRole | External ! | 🔒 |NO! |
| L | renounceRole | External ! | 🔒 |NO! |
| L | setRoleAdmin | External ! | 🔒 |NO! |
| L | getRoleMember | External ! | |NO! |
| L | getRoleMemberCount | External ! | |NO! |
| L | getRoleMembersPaginated | External ! | |NO! |
| L | _grantRole | Internal 🔓 | 🔒 | |
| L | _revokeRole | Internal 🔓 | 🔒 | |
| L | _setRoleAdmin | Internal 🔓 | 🔒 | |
|||||
| **AccessControlStorage** | Implementation | |||
|||||
| **IAccessControl** | Interface | |||
| L | hasRole | External ! | |NO! |
| L | getRoleAdmin | External ! | |NO! |
| L | grantRole | External ! | 🔒 |NO! |
| L | revokeRole | External ! | 🔒 |NO! |
| L | renounceRole | External ! | 🔒 |NO! |
| L | getRoleMember | External ! | |NO! |
| L | getRoleMemberCount | External ! | |NO! |
| L | getRoleMembersPaginated | External ! | |NO! |
|||||

```

```

| **IEmergencyController** | Interface | |||
| L | setEmergencyLevel | External ! |  | NO! |
| L | enableEmergencyWithdrawal | External ! |  | NO! |
| L | pauseSystem | External ! |  | NO! |
| L | unpauseSystem | External ! |  | NO! |
| L | recoverTokens | External ! |  | NO! |
| L | getEmergencyLevel | External ! | | NO! |
| L | getEmergencyWithdrawalSettings | External ! | | NO! |
| L | isSystemPaused | External ! | | NO! |
| L | getEmergencyAwareContractsPaginated | External ! | | NO! |
| |||||
| **EmergencyTimelockController** | Implementation | Initializable,
ReentrancyGuardUpgradeable |||
| L | <Constructor> | Public ! |  | NO! |
| L | initialize | External ! |  | initializer |
| L | setAllowedTarget | External ! |  | onlyEmergencyRole |
| L | setAllowedFunctionSelector | External ! |  | onlyEmergencyRole
|
| L | proposeEmergencyAction | External ! |  | onlyEmergencyRole
nonReentrant |
| L | executeEmergencyAction | External ! |  | onlyEmergencyRole
nonReentrant |
| L | cancelEmergencyAction | External ! |  | onlyEmergencyRole
nonReentrant |
| L | updateTimelockDuration | External ! |  | onlyEmergencyRole |
| L | getActionStatus | External ! | | NO! |
| L | getAllActionIds | External ! | | NO! |
| L | getActionDetails | External ! | | NO! |
| L | isFunctionSelectorAllowed | External ! | | NO! |
| L | isTargetAllowed | External ! | | NO! |
| |||||
| **Constants** | Library | |||
| |||||
| **EmergencyAwareBase** | Implementation | IEmergencyAware |||
| L | _isEffectivelyPaused | Internal  | | |

```

Legend

Symbol	Meaning
:-----:	-----
	Function can modify state
	Function is payable

Conclusion

The contracts are written systematically. Team found no critical issues. So, it is good to go for production.

Since possible test cases can be unlimited and developer level documentation (code flow diagram with function level description) not provided, for such an extensive smart contract protocol, we provide no such guarantee of future outcomes. We have used all the latest static tools and manual observations to cover maximum possible test cases to scan Everything.

Security state of the reviewed contract is “Well Secured”.

- ✓ No volatile code.
- ✓ No high severity issues were found.

Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against the team on the basis of what it says or doesn't say, or how team produced it, and it is important for you to conduct your own independent investigations before making any decisions. team go into more detail on this in the below disclaimer below – please make sure to read it in full.

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