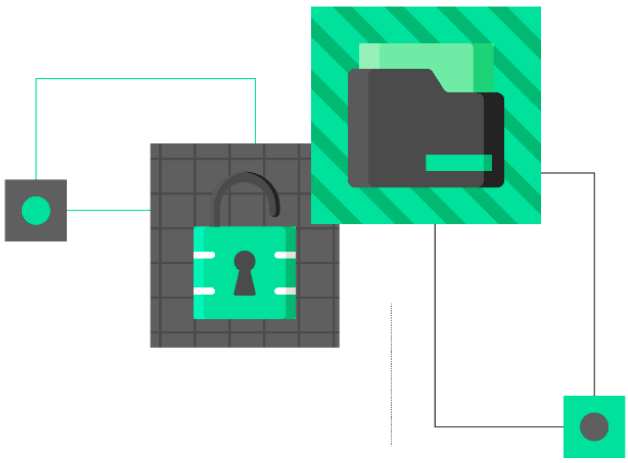
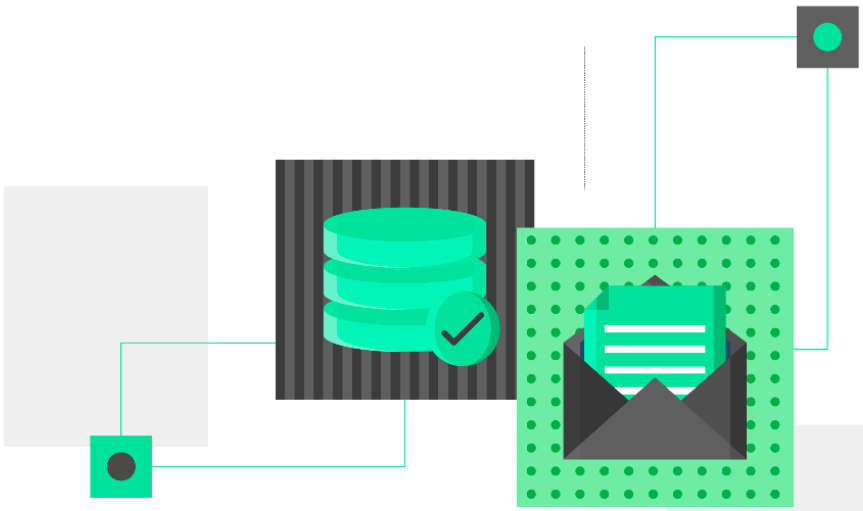
Mantisec Labs

Smart Contract Audit



Presearch

PRETokenBaseV2



July 2024

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Audit Process & Methodology

The Mantisec Labs team carried out a thorough audit for the project, starting with an in-depth analysis of code design patterns. This initial step ensured the smart contract's architecture was well-structured and securely integrated with third-party smart contracts and libraries.Also, our team conducted a thorough line-by-line inspection of the smart contract,seeking out potential issues such as Signature Replay Attacks, Unchecked External Calls, External Contract Referencing, Variable Shadowing, Race conditions, Transaction-ordering dependence, timestamp dependence, DoS attacks, among others.
During the Unit testing phase, we assessed the functions authored by the developer to ascertain their precise functionality. Our Automated Testing procedures leveraged proprietary tools designed in-house to spot vulnerabilities and security flaws within the Smart Contract. The code was subjected to an in-depth audit administered by an independent team of auditors, encompassing the following critical aspects:

- Scrutiny of the smart contract's structural analysis to verify its integrity.
- Extensive automated testing of the contract
- A manual line-by-line Code review, undertaken with the aim of evaluating, analyzing, and identifying potential security risks.
- An evaluation of the contract's intended behavior, encompassing a review of provided documentation to ensure the contract conformed to expectations.
- Rigorous verification of storage layout in upgradeable contracts.
- An integral component of the audit procedure involved the identification and recommendation of enhanced gas optimization techniques for the contract

Audit Purpose

Mantisec Labs was hired by the Presearch team to review their smart contract. This audit was conducted in **July 2024**.

The main reasons for this review were:

- To find any possible security issues in the smart contract.
- To carefully check the logic behind the given smart contract.

This report provides valuable information for assessing the level of risk associated with this smart contract and offers suggestions on how to improve its security by addressing any identified issues.

Contract Details

Project Name	Presearch
Contract link	https://github.com/PresearchOfficial/PRE-Token-Base/blob/main/contracts/PRETokenBaseV2.sol
Language	Solidity
Type	ERC20

Security Level Reference

Each problem identified in this report has been categorized into one of the following severity levels:

- **High** severity issues pose significant risks and should be addressed promptly.
- **Medium** severity issues have the potential to create problems and should be on the agenda for future fixes.
- **Low** severity issues are minor concerns and warnings. While they may not require immediate action, addressing them in the future is advisable for overall improvement.

Issues	High	Medium	Low
Open	0	0	0
Closed	0	0	2

Findings

Contract Name: PRETokenBaseV2.sol

L001- Missing Reentrancy Guard on transferWithAuthorization and receiveWithAuthorization functions

Although the code does not seem to have any obvious reentrancy vulnerabilities due to its structure, adding reentrancy guards is a good practice for ensuring security.

Solution:

Using the ReentrancyGuard from OpenZeppelin can help mitigate reentrancy attacks.

L002-Missing a `__gap[50]`

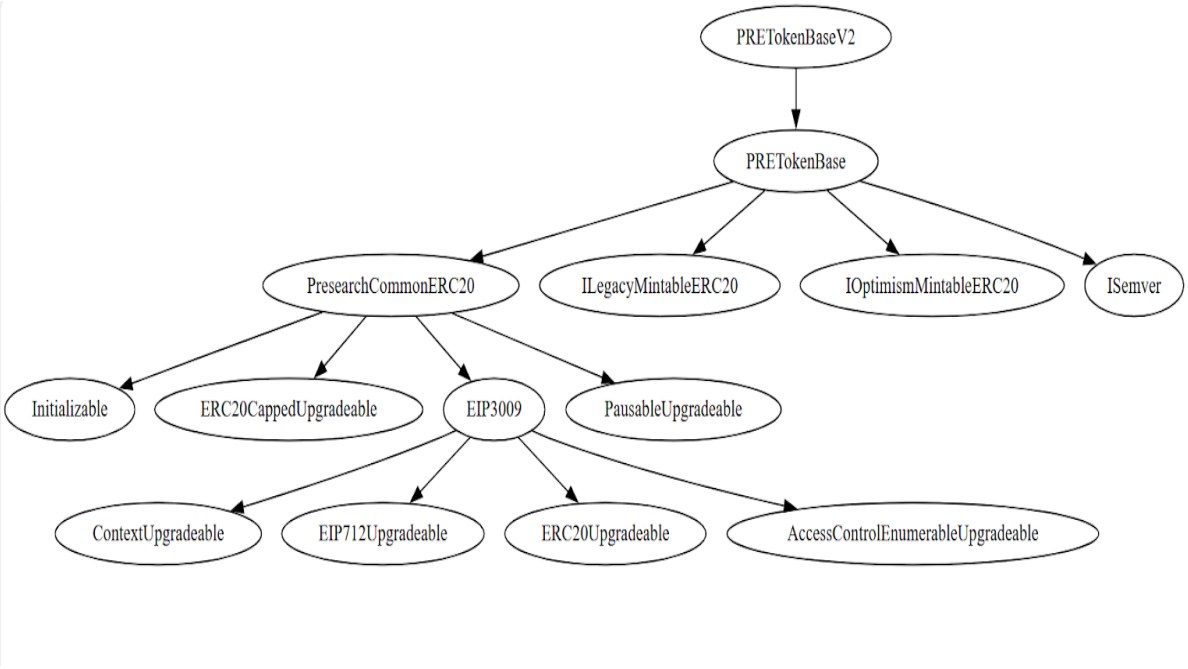
The upgradeable contract currently lacks a `__gap[50]` storage variable, a crucial element for maintaining storage compatibility in future versions.

Solution:

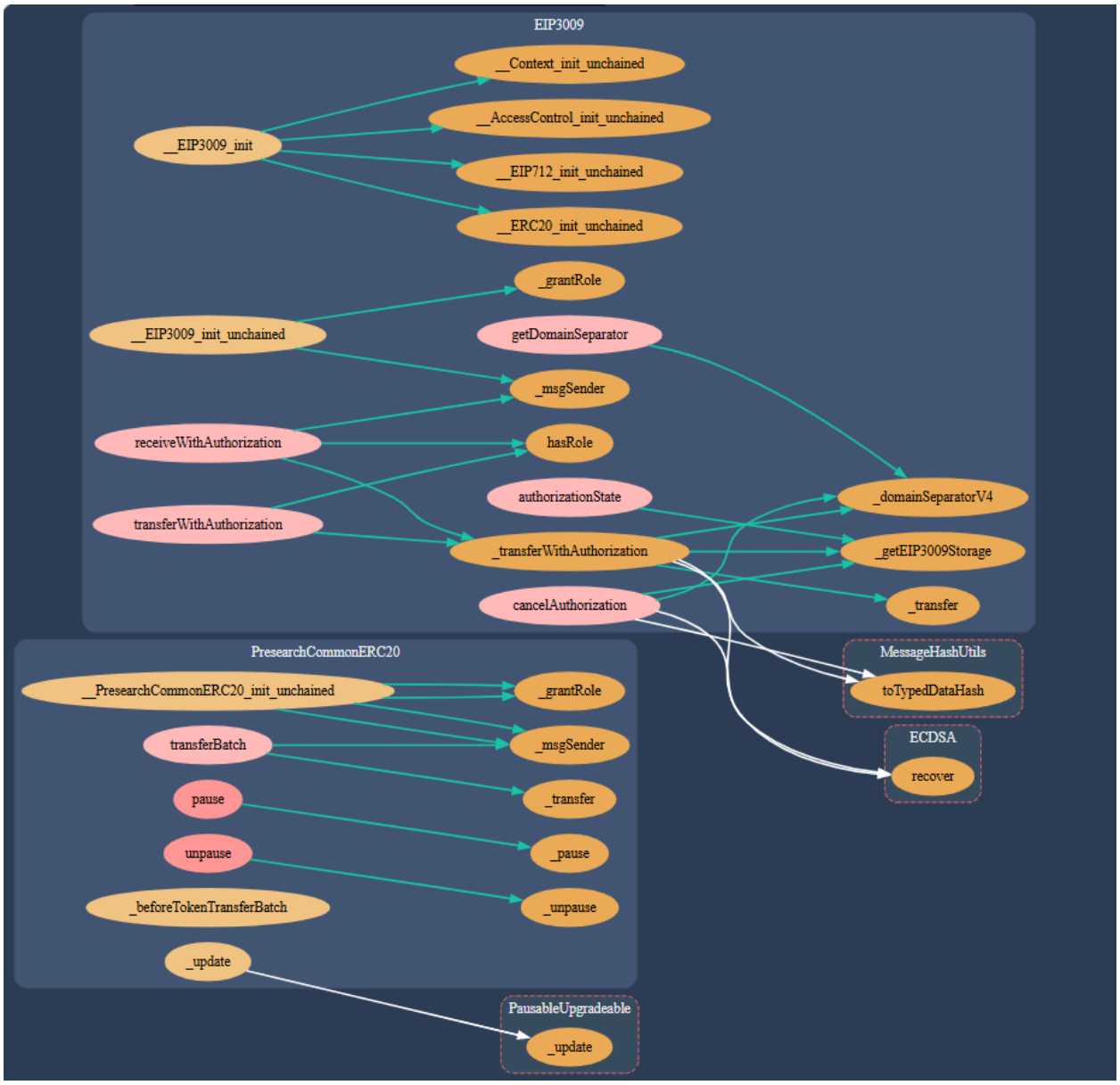
Implementing a `__gap[50]` storage variable allows for safe and flexible upgrades, ensuring that new storage variables can be seamlessly integrated without disrupting the existing storage layout.

Additional Details

Inheritance Chart



Call Graph


EIP3009
__Context_init_unchained
__AccessControl_init_unchained
__EIP3009_init
__EIP712_init_unchained
__ERC20_init_unchained
_grantRole
__EIP3009_init_unchained
getDomainSeparator
_msgSender
receiveWithAuthorization
hasRole
authorizationState
_domainSeparatorV4
transferWithAuthorization
_transferWithAuthorization
_getEIP3009Storage
cancelAuthorization
_transfer
PresearchCommonERC20
__PresearchCommonERC20_init_unchained
_grantRole
MessageHashUtils
toTypedDataHash
transferBatch
_msgSender
ECDSA
recover
pause
_transfer
unpause
_pause
_beforeTokenTransferBatch
_unpause
_update
PausableUpgradeable
_update

Concluding Remarks

To wrap it up, this PRETokenBaseV2 audit has given us a good look at the contract's security and functionality.
Our auditors confirmed that all the issues are now resolved by the developers.