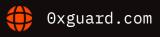


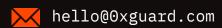
Smart contracts security assessment

Final report
Tariff: Standard

HPO Token

March 2024





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□ Introduction

The report has been prepared for **HPO Token**.

Hippo Token is an ERC-20 standard token with <u>ERC20Burnable</u> and <u>ERC20Pausable</u> extensions from the OpenZeppelin repository. The token has the minting functionality and no taxes. Mint is managed by accounts with the <u>MINTER_ROLE</u>, governed by the project owner. The total mintable amount at any moment can't exceed the <u>totalRelease</u> value, set by the owner. The total minted amount can't exceed the <u>maxTotalSupply</u> value. Initial mint is about 1/3 of the <u>maxTotalSupply</u>.

The code is available at the @hippowallet/hippotoken GitHub <u>repository</u> and was audited after the commit <u>649f50c8601f56750efdd38f677619c732502b9d</u>.

Name	HPO Token
Audit date	2024-02-27 - 2024-03-01
Language	Solidity
Platform	Binance Smart Chain

Contracts checked

Name	Address
ERC20PresetMinterPauser	

HPOToken

Procedure

We perform our audit according to the following procedure:

Automated analysis

- Scanning the project's smart contracts with several publicly available automated Solidity analysis tools
- Manual verification (reject or confirm) all the issues found by the tools

Manual audit

- Manually analyze smart contracts for security vulnerabilities
- Smart contracts' logic check

Known vulnerabilities checked

Title	Check result
Unencrypted Private Data On-Chain	passed
Code With No Effects	passed
Message call with hardcoded gas amount	passed
Typographical Error	passed
DoS With Block Gas Limit	passed
Presence of unused variables	not passed
Incorrect Inheritance Order	passed
Requirement Violation	passed
Weak Sources of Randomness from Chain Attributes	passed
Shadowing State Variables	passed
Incorrect Constructor Name	passed
Block values as a proxy for time	passed
Authorization through tx.origin	passed
DoS with Failed Call	passed
Delegatecall to Untrusted Callee	passed

<u>Use of Deprecated Solidity Functions</u> passed

<u>Assert Violation</u> passed

State Variable Default Visibility not passed

<u>Reentrancy</u> passed

<u>Unprotected SELFDESTRUCT Instruction</u> passed

<u>Unprotected Ether Withdrawal</u> passed

Unchecked Call Return Value passed

Floating Pragma passed

Outdated Compiler Version passed

Integer Overflow and Underflow passed

<u>Function Default Visibility</u> passed

Classification of issue severity

High severity High severity issues can cause a significant or full loss of funds, change

of contract ownership, major interference with contract logic. Such issues

require immediate attention.

Medium severity Medium severity issues do not pose an immediate risk, but can be

detrimental to the client's reputation if exploited. Medium severity issues may lead to a contract failure and can be fixed by modifying the contract

state or redeployment. Such issues require attention.

Low severity Low severity issues do not cause significant destruction to the contract's

functionality. Such issues are recommended to be taken into

consideration.

Issues

High severity issues

1. Privileged functions (ERC20PresetMinterPauser)

Status: Open

The token can be minted by the project owner or with his permission.

All transfer related token operations (transfer, transferFrom, mint, burn, burnFrom) can be paused by the project owner or with his permission.

Recommendation: Secure the owner account and all other accounts with the DEFAULT_ADMIN_ROLE.

Team response: The inclusion of a token pausing functionality within our contract is not intended for the selective suspension of individual wallet activities. Rather, it is designed with a holistic approach that allows for the temporary cessation of all token transactions, inclusive of those pertaining to our organization's own tokens. This ensures an equitable impact across all users, emphasizing a shared commitment to safeguarding interests without introducing specific risks to any party.

This feature's integration is a direct response to the stringent regulatory requirements imposed by our jurisdiction of operation. Such measures are vital for providing a framework that enables us to effectively manage and mitigate potential risks associated with financial crimes, including but not limited to money laundering. It is imperative to understand that this mechanism is employed as a protective measure, designed to ensure compliance and safeguard the integrity of all transactions within the ecosystem.

Consequently, the implementation of this feature does not entail any inherent risk to users. It is established as a precautionary measure, aligned with regulatory obligations and committed to the collective security and trust of our platform's participants. Furthermore, it is important to note that the nature of this feature's implementation is such that it underscores an intention for it to remain inactive under normal operating conditions. This deliberate design choice clearly indicates that the feature was written with the foresight of not being implemented, serving only as a regulatory compliance measure to be activated under strictly defined circumstances. This approach underscores our

dedication to maintaining a transparent, secure, and compliant operational environment.

Medium severity issues

No issues were found

Low severity issues

1. Wrong AccessControl modifier (HPOToken)

Status: Open

The function release is restricted to the accounts assigned an admin role of the DEFAULT_ADMIN_ROLE role, which is by coincidence is the DEFAULT_ADMIN_ROLE itself.

```
function release(uint256 amount) public onlyRole(getRoleAdmin(DEFAULT_ADMIN_ROLE))
returns (bool) {
    require((_maxTotalSupply - _totalRelease) >= amount, "Release amount out of max
total supply");
    __totalRelease += amount;
    return true;
}
```

Recommendation: Correct usage is onlyRole(DEFAULT_ADMIN_ROLE).

Conclusion

HPO Token ERC20PresetMinterPauser, HPOToken contracts were audited. 1 high, 1 low severity issues were found.

Disclaimer

This report is subject to the terms and conditions (including without limitation, description of services, confidentiality, disclaimer and limitation of liability)set forth in the Services Agreement, or the scope of services, and terms and conditions provided to the Company in connection with the Agreement. This report provided in connection with the Services set forth in the Agreement shall be used by the Company only to the extent permitted under the terms and conditions set forth in the Agreement. This report may not be transmitted, disclosed, referred to or relied upon by any person for any purposes without 0xGuard prior written consent.

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This report should not be used in any way to make decisions around investment or involvement with any particular project. This report in no way provides investment advice, nor should be leveraged as investment advice of any sort. This report represents an extensive assessing process intending to help our customers increase the quality of their code while reducing the high level of risk presented by cryptographic tokens and blockchain technology.

Slither output

```
INFO:Detectors:
HPOToken._maxTotalSupply (contracts/HPOToken.sol#10) is set pre-construction with a non-
constant function or state variable:
        - 30_000_000_000 * (10 ** _decimals)
HPOToken._initialRelease (contracts/HPOToken.sol#11) is set pre-construction with a non-
constant function or state variable:
        - 10_000_000_000 * (10 ** _decimals)
HPOToken. initial bridge Release (contracts/HPOToken.sol#12) is set pre-construction
with a non-constant function or state variable:
        - 500_000 * (10 ** _decimals)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#function-
initializing-state
INFO:Detectors:
Pragma version0.8.11 (contracts/ERC20PresetMinterPauser.sol#4) allows old versions
Pragma version0.8.11 (contracts/HPOToken.sol#3) allows old versions
solc-0.8.11 is not recommended for deployment
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-
versions-of-solidity
INFO:Detectors:
Variable HPOToken. initialRelease (contracts/HPOToken.sol#11) is not in mixedCase
Variable HPOToken._initial_bridge_Release (contracts/HPOToken.sol#12) is not in
mixedCase
Modifier HPOToken._isReleased(uint256) (contracts/HPOToken.sol#15-19) is not in
Modifier HPOToken._maxTotalSupplyNotFull(uint256) (contracts/HPOToken.sol#21-25) is not
in mixedCase
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-
solidity-naming-conventions
INFO: Detectors:
HPOToken. decimals (contracts/HPOToken.sol#9) should be constant
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-
variables-that-could-be-declared-constant
INFO: Detectors:
HPOToken._initialRelease (contracts/HPOToken.sol#11) should be immutable
HPOToken._initial_bridge_Release (contracts/HPOToken.sol#12) should be immutable
HPOToken._maxTotalSupply (contracts/HPOToken.sol#10) should be immutable
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-
```

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variables-that-could-be-declared-immutable

INFO:Slither:. analyzed (36 contracts with 88 detectors), 15 result(s) found



