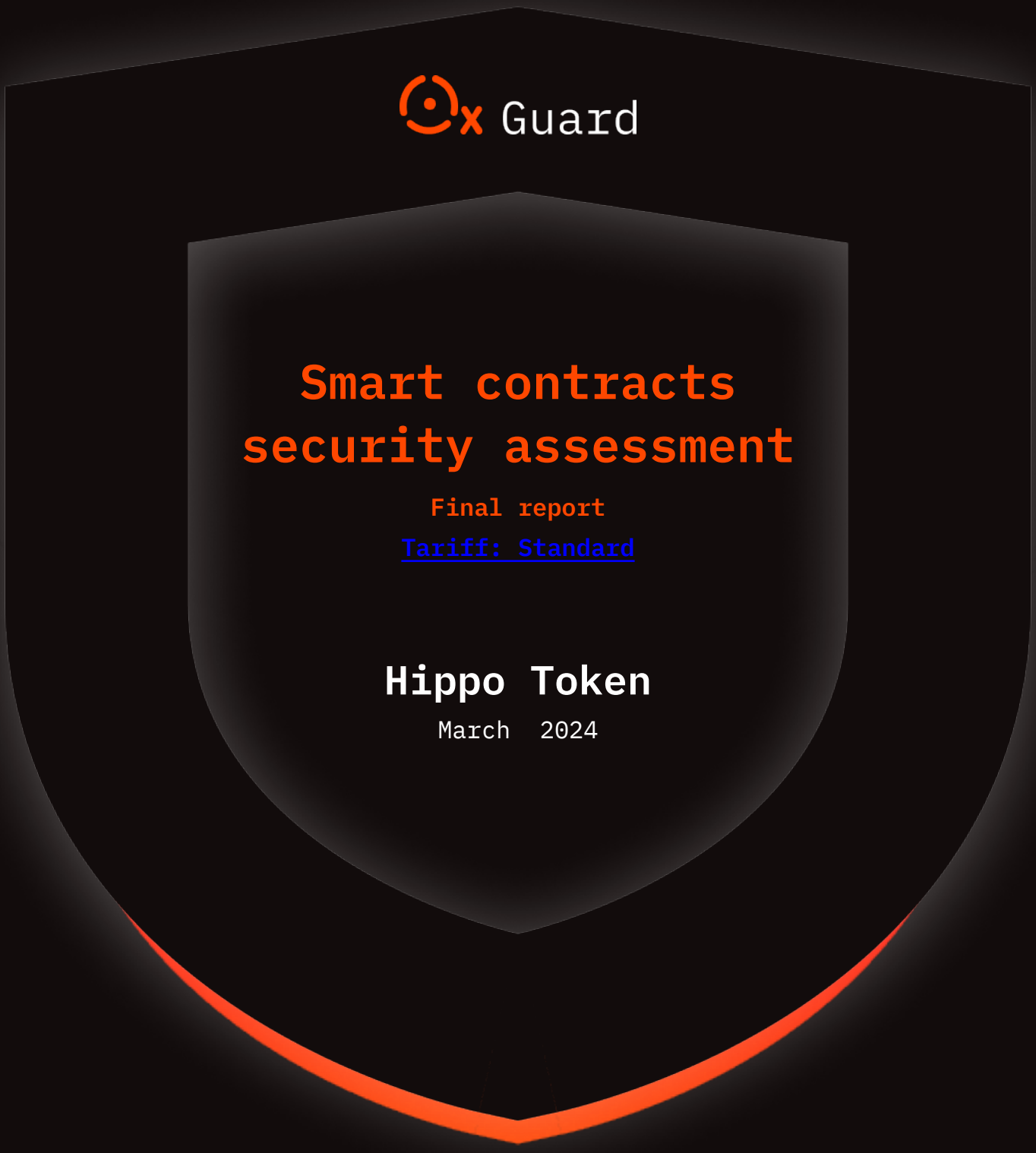

Guard

# Smart contracts security assessment

Final report

Tariff: Standard

## Hippo Token

March 2024

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# Contents

# Introduction

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

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

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

| Name | Hippo 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 |

| | |
|---|---|
| Use of Deprecated Solidity Functions | passed |
| Assert Violation | passed |
| State Variable Default Visibility | not passed |
| Reentrancy | passed |
| Unprotected SELFDESTRUCT Instruction | passed |
| Unprotected Ether Withdrawal | passed |
| Unchecked Call Return Value | passed |
| Floating Pragma | passed |
| Outdated Compiler Version | passed |
| Integer Overflow and Underflow | passed |
| Function Default Visibility | 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

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

# Disclaimer

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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 mixedCase
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-
```

```
variables-that-could-be-declared-immutable
INFO:Slither:. analyzed (36 contracts with 88 detectors), 15 result(s) found
```

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