#HashEx
BLOCKCHAIN SECURITY

Lisk

smart contracts final audit report

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Contents

1. Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice at 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 us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the disclaimer below – please make sure to read it in full.

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2. Overview

HashEx was commissioned by the **Lisk** team to perform an audit of their smart contract. The audit was conducted between **2024-07-31** and **2024-08-01**.

The purpose of this audit was to achieve the following:

- Identify potential security issues with smart contracts
- Formally check the logic behind given smart contracts.

Information in this report should be used for understanding the risk exposure of smart contracts, and as a guide to improving the security posture of smart contracts by remediating the issues that were identified.

The code is available at the Ethereum network at address 0x6033F7f88332B8db6ad452B7C6D5bB643990aE3f.

2.1 Summary

Project name	Lisk
URL	https://lisk.com/
Platform	Ethereum
Language	Solidity
Centralization level	High
Centralization risk	High

2.2 Contracts

Name	Address
L1LiskToken	0x6033F7f88332B8db6ad452B7C6D5bB643990aE3f

3. Project centralization risks

The contract owner can assign BURNER roles to other accounts. Accounts with the BURNER role can burn tokens from any account. At the time of the audit, the contract owner is a multisig contract. Using a multisig contract reduces the risk of the owner account keys being compromised, but there remains a risk that users' tokens could be burned.

4. Found issues

No Issues Found

5. Contracts

C24. L1LiskToken

Overview

L1LiskToken is an ERC20 token implementation that extends the functionality of several key contracts, including `AccessControl`, `Ownable2Step`, `ERC20Permit`, and `ERC20Burnable`. This token contract incorporates enhanced access control and ownership features:

1. Access Control: The token uses the `AccessControl` contract to manage BURNER roles.
2. Ownership: Through the `Ownable2Step` contract, the token maintains a secure and controlled mechanism for transferring ownership. Only the current owners are permitted to transfer ownership.
3. Authorization for Burners: The `ERC20Burnable` extension authorizes specific burner accounts to reduce the total token supply. The management and assignment of these burner roles are exclusively controlled by the contract owner.
4. Permit Functionality: The `ERC20Permit` extension allows token approvals to be made via signatures, providing a gas-efficient way for token holders to grant approvals without the need for on-chain transactions.

6. Conclusion

No severity issues were found. The reviewed contracts are highly dependent on the owner's account. See the centralization risks chapter.

Appendix A. Issues severity classification

- **Critical.** Issues that may cause an unlimited loss of funds or entirely break the contract workflow. Malicious code (including malicious modification of libraries) is also treated as a critical severity issue. These issues must be fixed before deployments or fixed in already running projects as soon as possible.
- **High.** Issues that may lead to a limited loss of funds, break interaction with users, or other contracts under specific conditions. Also, issues in a smart contract, that allow a privileged account the ability to steal or block other users' funds.
- **Medium.** Issues that do not lead to a loss of funds directly, but break the contract logic. May lead to failures in contracts operation.
- **Low.** Issues that are of a non-optimal code character, for instance, gas optimization tips, unused variables, errors in messages.
- **Info.** Issues that do not impact the contract operation. Usually, info severity issues are related to code best practices, e.g. style guide.

Appendix B. Issue status description

Resolved. The issue has been completely fixed.

Partially fixed. Parts of the issue have been fixed but the issue is not completely resolved.

Acknowledged. The team has been notified of the issue, no action has been taken.

Open. The issue remains unresolved.

Appendix C. List of examined issue types

- Business logic overview
- Functionality checks
- Following best practices
- Access control and authorization
- Reentrancy attacks
- Front-run attacks
- DoS with (unexpected) revert
- DoS with block gas limit
- Transaction-ordering dependence
- ERC/BEP and other standards violation
- Unchecked math
- Implicit visibility levels
- Excessive gas usage
- Timestamp dependence
- Forcibly sending ether to a contract
- Weak sources of randomness
- Shadowing state variables
- Usage of deprecated code

Appendix D. Centralization risks classification

Centralization level

- **High.** The project owners can manipulate user's funds, lock user's funds on their will (reversible or irreversible), or maliciously update contracts parameters or bytecode.
- **Medium.** The project owners can modify contract's parameters to break some functions of the project contract or contracts, but user's funds remain withdrawable.
- **Low.** The contract is trustless or its governance functions are safe against a malicious owner.

Centralization risk

- **High.** Lost ownership over the project contract or contracts may result in user's losses. Contract's ownership belongs to EOA or EOAs, and their security model is unknown or out of scope.
- **Medium.** Contract's ownership is transferred to a contract with not industry-accepted parameters, or to a contract without an audit. Also includes EOA with a documented security model, which is out of scope.
- **Low.** Contract's ownership is transferred to a well-known or audited contract with industry-accepted parameters.

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