

# Ducat

## smart contracts final audit report

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# 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 Ducat Technologies team to perform an audit of their smart contract. The audit was conducted between 14/02/2025 and 17/02/2025.

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 [0x687c24313c5F7B04Fc4cca2764ac0f3E1d792e2A](https://github.com/0x687c24313c5F7B04Fc4cca2764ac0f3E1d792e2A) in the Ethereum mainnet.

### 2.1 Summary

Project name	Ducat
URL	<a href="https://ducattechnologies.com/">https://ducattechnologies.com/</a>
Platform	Ethereum
Language	Solidity
Centralization level	● High
Centralization risk	● Medium

## 2.2 Contracts

Name	Address
Token	

## 3. Project centralization risks

### C93CR3b Owner privileges

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The contract owner has the ability to mint new tokens. If the owner's account is compromised or the owner acts with malicious intent, they could deploy a malicious contract on another blockchain supported by LayerZero and utilize the cross-chain protocol to mint additional tokens.

The OFT tokens have single privileged address that can be checked via the `owner()` function. The OFT ownership allows the owner to allow incoming and outgoing messages (token transfers) from/to different networks. This functionality can be used to mint new tokens even without a specific minting function, as the OFT contract calls the internal `_mint()` inside the OApp's `lzReceive()` function.

### Recommendations

#### Recommendation

Strengthen the security of the contract's ownership by implementing a governance mechanism or utilizing a multi-signature (Multisig) wallet with a Timelock smart contract to mitigate the risk of unauthorized token minting.

### Comments

#### Update

The token ownership and delegate account have been assigned to the DAO address [0x37e810FED09Cd86e9bBe8a38dd9Ee0bc57282D88](https://etherscan.io/address/0x37e810FED09Cd86e9bBe8a38dd9Ee0bc57282D88).

## 4. Found issues

No Issues Found

## 5. Contracts

### C93. Token

#### Overview

An [ERC20](#) standard token contract inherited from OpenZeppelin's ERC20 implementation with [ERC20Permit](#) and [ERC20Votes](#) extensions. The DUCAT token is built with cross-chain support with LayerZero's [Omnichain Fungible Token \(OFT\)](#) standard.

The OFT and OApp is developed and maintained by LayerZero, the code is available in [@LayerZero-Labs/LayerZero-v2](#) GitHub repository with several [audit](#) reports.



## 6. Conclusion

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

This audit includes recommendations on code improvement and the prevention of potential attacks.

## 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.
- **Informational.** Issues that do not impact the contract operation. Usually, informational 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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