

# Contracts vulnerabilities

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## Involved contracts and level of the bugs

The present document aims to point out some vulnerabilities in the contracts veOLAS, buOLAS, and Sale. Some of these vulnerabilities may lead to critical<sup>1</sup> bugs.

## Vulnerabilities

### 1. `createLockFor` vulnerability

**Severity:** Medium

In veOLAS and buOLAS contracts, the following function is implemented:

```
function createLockFor(address account, uint256 amount, uint256
unlockTime) external
```

This function allows anyone, even a smart contract, to create a lock for a third-party account. If the third-party account has already a locked amount the call will be reverted. If not and the OLAS amount provided as input is non-zero then a lock is created. As a consequence, any third-party account can be forced into a long lock length (for a maximum of 4 years for veOLAS and 10 years for buOLAS) by an attacker calling `createLockFor` with a very small amount of OLAS (i.e.  $1/10^{18}$ ) and a max lock length. An attacker could use this to prevent locks over a given adversarially chosen interval by front-running all locks in this manner. All accounts with an intent to lock for less than 4 years would be affected.

We assign a low likelihood to this attack, as it is not economically profitable for the attacker.

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<sup>1</sup> The level of the bug is assigned by following the [Immunefi classification](#)

Indeed, the caller of the ``createLockFor`` function can lock for third-party users only by using its own OLAS tokens. So the mintable OLAS tokens can be temporarily frozen only with an attacker's extensive cost.

In the buOLAS contract, there is also an extra guardrail can be considered. If the attack has been discovered, it is possible to invoke a governance vote to revoke the unvested OLAS of the third-party account that has been forced in a long lock into buOLAS. If the governance approves the revoke, the third-party account can call the buOLAS' s withdraw function, and all non-vested OLAS tokens will be burned. When the withdraw function is called less the one year later the attack, all the contract status can return to their original status before the attack has been made.

## 2. `createBalanceFor` vulnerability

### **Severity:** Critical

The owner of the Sale contracts can lock the OLAS in the sale account by creating a veOLAS and/or a buOLAS balance for any address. Once a balance is created for an account, the account owner's private key(s) is (are) the only one(s) that can claim its balance. So if a balance is erroneously created, the OLAS in the sale account would be rendered unusable.

Furthermore, any given address can only claim exactly once on the Sale contract. Consider the scenario, where an account has a balance created via ``createBalanceFor``, then the account claims, then another balance is created. The second time the account cannot claim due to the fact that both in veOLAS and buOLAS in order to ``createLockFor`` for an account its locked balance must be zero leading to stuck funds.

Finally, an attacker can acquire OLAS and create a very small lock with ``createLockFor`` into the veOLAS or buOLAS contracts for any account with a balance to claim in Sale. This would make all these balances stuck.

We recommend no further usage of the Sale contract and its deprecation after the Autonolas private sale.

## Comments

The following are not vulnerabilities. These are properties of the code that are not necessarily wanted in the design but that do not lead, as far as we can tell, to any attacks.

### 1. `depositFor` comment

In veOLAS contract, the following function is implemented:

```
function depositFor(address account, uint256 amount) external
```

This function allows anyone, even a smart contract, to increase the locking amount for a third-party account. If the third-party account has not already a locked amount the call will be reverted. If not and the OLAS amount provided as input is non-zero then a lock is created. So the third-party account can be forced by an attacker into a larger lock amount (potentially all mintable OLAS that can be acquired and locked for the third-party account).

We don't think this qualifies as an attack/vulnerability. It would just be an issue whether no one has OLAS to sell (a very unlikely event), but there's still the utility of the system