

Possum — Portals V_I

Security Review

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Introduction

Possum's Portals allow users to deposit yield-earning assets to receive all their yield upfront. This review consists of an issue found in the Hats Finance Possum contest in November 2023. It does not represent a full and exhaustive audit of the protocol.

Finding

Users can bypass `portalEnergy` calculations when unstaking to steal extra yield from the contract

Severity: High risk

Description: An attacker can inflate their `portalEnergy` infinitely by exploiting the rounding error on `L314` of `Portal.sol` — since the division will round down, any `_amount` small enough to make `_amount * maxLockDuration` less than `SECONDS_PER_YEAR` will return 0. Any logic that uses the raw `_amount` proceeds as intended, so the attacker still receives their unstaked funds like they normally would. But they also keep all the `portalEnergy` they built up in the process.

Proof of concept: It is possible that this could be exploited more efficiently or with greater impact than the loop in this PoC, but this attack is already significant enough to consider it high-risk: `portalEnergy` has real value within `Portal`, and that value can be stolen without limit by any attacker.

Recommendation: The simplest solution would likely be instituting a minimum for the `_amount` of principal tokens in both `stake` and `unstake`. Note that this minimum is a function of the `maxLockDuration`: it should not be referenced explicitly, since it will change with `maxLockDuration` (which, itself, is designed to change). As is, the minimum number of principal tokens with which the contract operates properly is 5.

You could check for this dynamically with:

```
require (_amount * maxLockDuration >= SECONDS_PER_YEAR)
```

The reason I suggest this over adjusting the math is that rounding up instead of down could present a different risk in this context. However, if it is important to retain this functionality for small `_amounts`, the math could be reworked instead.