



Optimism Superchain

Security Review

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November 28, 2025

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1 Introduction

1.1 About Cantina

Cantina is a security services marketplace that connects top security researchers and solutions with clients. Learn more at cantina.xyz

1.2 Disclaimer

Cantina Managed provides a detailed evaluation of the security posture of the code at a particular moment based on the information available at the time of the review. While Cantina Managed endeavors to identify and disclose all potential security issues, it cannot guarantee that every vulnerability will be detected or that the code will be entirely secure against all possible attacks. The assessment is conducted based on the specific commit and version of the code provided. Any subsequent modifications to the code may introduce new vulnerabilities that were absent during the initial review. Therefore, any changes made to the code require a new security review to ensure that the code remains secure. Please be advised that the Cantina Managed security review is not a replacement for continuous security measures such as penetration testing, vulnerability scanning, and regular code reviews.

1.3 Risk assessment

Severity level	Impact: High	Impact: Medium	Impact: Low
Likelihood: high	Critical	High	Medium
Likelihood: medium	High	Medium	Low
Likelihood: low	Medium	Low	Low

1.3.1 Severity Classification

The severity of security issues found during the security review is categorized based on the above table. Critical findings have a high likelihood of being exploited and must be addressed immediately. High findings are almost certain to occur, easy to perform, or not easy but highly incentivized thus must be fixed as soon as possible.

Medium findings are conditionally possible or incentivized but are still relatively likely to occur and should be addressed. Low findings are a rare combination of circumstances to exploit, or offer little to no incentive to exploit but are recommended to be addressed.

Lastly, some findings might represent objective improvements that should be addressed but do not impact the project's overall security (Gas and Informational findings).

2 Security Review Summary

Optimism is a fast, stable, and scalable L2 blockchain built by Ethereum developers, for Ethereum developers. Built as a minimal extension to existing Ethereum software, Optimism's EVM-equivalent architecture scales your Ethereum apps without surprises. If it works on Ethereum, it works on Optimism at a fraction of the cost.

From Nov 20th to Nov 23rd the Cantina team conducted a review of [superchain-ops](#) on commit hash 5a01b8c1. The team identified a total of **2** issues:

Issues Found

Severity	Count	Fixed	Acknowledged
Critical Risk	0	0	0
High Risk	0	0	0
Medium Risk	0	0	0
Low Risk	0	0	0
Gas Optimizations	0	0	0
Informational	2	2	0
Total	2	2	0

The Cantina Managed team reviewed OP Labs's [superchain-ops](#) holistically on commit hash 692cab0d (PR 1308) and concluded that all findings were addressed and no new vulnerabilities were identified.

2.1 Scope

The security review had the following components in scope for [superchain-ops](#) on commit hash 5a01b8c1:

```
src
├── libraries
│   ├── FeeSplitterSetup.sol
│   ├── FeeVaultUpgrader.sol
│   └── RevShareCommon.sol
└── RevShareContractsUpgrader.sol
```

3 Findings

3.1 Informational

3.1.1 FeeVaultUpgrader.SETTERS_GAS_LIMIT can be moved to RevShareCommon

Severity: Informational

Context: RevShareContractsUpgrader.sol#L103

Description/Recommendation: Consider moving the FeeVaultUpgrader.SETTERS_GAS_LIMIT constant to the RevShareCommon library instead, as it is also used for other setters such as FeeSplitter.setSharesCalculator and not just exclusively for the fee vaults.

OP Labs: Fixed in PR 1308.

Cantina Managed: Fix verified.

3.1.2 Notes On Gas Costs

Severity: Informational

Context: (No context files were provided by the reviewer)

Description: We performed a deployment that uses upgradeAndSetupRevShare to upgrade a local chain that was originally not using the FeeSplitter contracts to then use it. All deposit transactions were executed successfully. The following table are the gas costs that were observed as compared to the gas limit and are meant to be provided as a reference:

Operation	Actual Gas Used	Gas Limit Configured
1. Deploy L1Withdrawer	558_032	700_000
2. Deploy SuperchainRevSharesCalculator	579_688	700_000
3. Deploy FeeSplitter implementation	1_127_359	1_400_000
4. Upgrade and initialize FeeSplitter proxy	112_009	150_000
5. Deploy OperatorFeeVault implementation	881_227	1_200_000
6. Upgrade and initialize OperatorFeeVault proxy	97_373	150_000
7. Deploy SequencerFeeVault implementation	883_547	1_200_000
8. Upgrade and initialize SequencerFeeVault proxy	94_851	150_000
9. Deploy L1FeeVault implementation	881_227	1_200_000
10. Upgrade and initialize BaseFeeVault proxy	97_373	150_000
11. Upgrade and initialize L1FeeVault proxy	97_373	150_000

For the setupRevShare path, we used eth_call tracing to track the gas costs. We observed that the gas consumed is around ~43173 which is less than SETTERS_GAS_LIMIT of 50_000 if the storage slot is initially non-zero, but around ~60275 if the storage slot is zero which exceeds the SETTERS_GAS_LIMIT. However, on a reasonable configuration none of the storage slots for the fee vaults or the fee splitter are initially zero (not even FeeSplitter.setSharesCalculator as the initialized bit located in the same slot as the sharesCalculator variable will be set).

Recommendation: All other gas costs are fine, but for the SETTERS_GAS_LIMIT, we recommend increasing it to 70_000 just in case any of the storage slots are initially zero.

OP Labs: Fixed in PR 1308.

Cantina Managed: Fix verified.