Three Sigma Labs

Code Audit

D1

DistrictOne Social Space with Money Games

Disclaimer

Code Audit

DistrictOne Social Space with Money Games

Disclaimer

The ensuing audit offers no assertions or assurances about the code's security. It cannot be deemed an adequate judgment of the contract's correctness on its own. The authors of this audit present it solely as an informational exercise, reporting the thorough research involved in the secure development of the intended contracts, and make no material claims or guarantees regarding the contract's post-deployment operation. The authors of this report disclaim all liability for all kinds of potential consequences of the contract's deployment or use. Due to the possibility of human error occurring during the code's manual review process, we advise the client team to commission several independent audits in addition to a public bug bounty program.

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Summary

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Summary

Three Sigma Labs audited DistrictOne in a 2 days engagement. The audit was conducted from 2-4-2024 to 3-4-2024.

Protocol Description

DistrictOne (D1) merges the excitement of money games with social interaction on Blast L2. It features five engaging activities: Linkup for reward earning and networking, Space Sprint for competitive visibility and earnings, Daily Rally to enhance engagement through gem collection and lotteries, SpaceShare for investing in spaces' success while earning from transactions, and the upcoming Battle Mode for head-to-head competition. D1 offers influencers and projects a dynamic platform for growth without entry barriers, leveraging gamified elements for enhanced community traction and engagement.

Scope

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Scope

SpaceShareV2

Assumptions

Erc20Utils and ReentrancyGuard are secure.

Methodology

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Methodology

To begin, we reasoned meticulously about the contract's business logic, checking security-critical features to ensure that there were no gaps in the business logic and/or inconsistencies between the aforementioned logic and the implementation. Second, we thoroughly examined the code for known security flaws and attack vectors. Finally, we discussed the most catastrophic situations with the team and reasoned backwards to ensure they are not reachable in any unintentional form.

Taxonomy

In this audit we report our findings using as a guideline Immunefi's vulnerability taxonomy, which can be found at immunefi.com/severity-updated/. The final classification takes into account the severity, according to the previous link, and likelihood of the exploit. The following table summarizes the general expected classification according to severity and likelihood; however, each issue will be evaluated on a case-by-case basis and may not strictly follow it.

Severity / Likelihood	LOW	MEDIUM	HIGH
NONE	None		
LOW	Low		
MEDIUM	Low	Medium	Medium
HIGH	Medium	High	High
CRITICAL	High	Critical	Critical

Project Dashboard

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Project Dashboard

Application Summary

Name	DistrictOne
Commit	de22d21ebbc03b7e5c9a36f1fc3cf86db24baafa
Language	Solidity
Platform	Blast

Engagement Summary

Timeline	2-4-2024 to 3-4-2024
№ of Auditors	2
Review Time	2 days

Vulnerability Summary

Issue Classification	Found	Addressed	Acknowledged
Critical	0	0	0
High	0	0	0
Medium	0	0	0
Low	1	1	0

None	1	1	0

Category Breakdown

Suggestion	0
Documentation	0
Bug	1
Optimization	0
Good Code Practices	1

Code Maturity Evaluation

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Code Maturity Evaluation

Code Maturity Evaluation Guidelines

Category	Evaluation
Access Controls	The use of robust access controls to handle identification and authorization and to ensure safe interactions with the system.
Arithmetic	The proper use of mathematical operations and semantics.
Centralization	The presence of a decentralized governance structure for mitigating insider threats and managing risks posed by contract upgrades
Code Stability	The extent to which the code was altered during the audit.
Upgradeability	The presence of parameterizations of the system that allow modifications after deployment.
Function Composition	The functions are generally small and have clear purposes.
Front-Running	The system's resistance to front-running attacks.
Monitoring	All operations that change the state of the system emit events, making it simple to monitor the state of the system. These events need to be correctly emitted.
Specification	The presence of comprehensive and readable codebase documentation.
Testing and Verification	The presence of robust testing procedures (e.g., unit tests, integration tests, and verification methods) and sufficient test coverage.

Code Maturity Evaluation Results

Category	Evaluation
Access Controls	Satisfactory. All functions had proper access control.
Arithmetic	Satisfactory. No rounding errors were found.
Centralization	Satisfactory. The owner could increase the fees but users can freely opt out.
Code Stability	Satisfactory. The code was stable throughout the audit.
Upgradeability	Weak. The contracts are not upgradeable.
Function Composition	Satisfactory. Functionality was well split into helpers.
Front-Running	Satisfactory. The code has slippage protection.
Monitoring	Moderate. Some events were missing.
Specification	Satisfactory. The code reflected the specification.
Testing and Verification	Moderate. Some bugs should have been found by tests.

Findings

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Findings

3S-D1-L01

SpaceIds lower or equal to **3000** might not be initialized

Id	3S-D1-L01
Classification	Low
Severity	Low
Likelihood	High
Category	Bug
Status	Addressed in #74cce15.

Description

spaceIdx was set to **3000**, overriding the process of increasing it via **createSpace()** for spaceIds lower than 3000. This means that **spaceIds** lower than **3000** may be created without initialization.

Recommendation

Change the check of the **spaceId** in _buyShares() and _sellShares() to be:

```
if (spaceId > spaceIdx || spaceId <= 3000) revert SpaceNotExists();
```

3S-D1-N01

`3000` should not be hardcoded and named **`INITIAL_SPACE_ID`** instead

Id	3S-D1-N01
Classification	None
Category	Good Code Practices
Status	Addressed in #74cce15.

Description

`spaceIdx` starts at 3000, an hardcoded number, and will be used more than once after fixing #11.

Recommendation

Replace the occurrences of **`3000`** by **`INITIAL_SPACE_ID`** for better readability and being less error prone.