



Security Assessment

O2Lab VRust Team

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Summary

This report has been prepared for O2Lab VRust Team to discover issues and vulnerabilities in the source code of the O2Lab VRust Team project as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Static Analysis and Manual Review techniques. The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

The security assessment resulted in findings that ranged from critical to informational. We recommend addressing these findings to ensure a high level of security standards and industry practices. We suggest recommendations that could better serve the project from the security perspective:

- Enhance general coding practices for better structures of source codes;
- Add enough unit tests to cover the possible use cases;
- Provide more comments per each function for readability, especially contracts that are verified in public;
- Provide more transparency on privileged activities once the protocol is live.

Overview

Project Summary

| | |
|-----------------|---|
| Project Name | O2Lab VRust Team |
| Platform | Ethereum |
| Language | Solana |
| Crate | mpl_auction_house |
| GitHub Location | https://github.com/parasol-aser/vrust |
| sha256 | Unknown |

Audit Summary

| | |
|-------------------|-----------------|
| Delivery Date | 11/04/2022 |
| Audit Methodology | Static Analysis |
| Key Components | |

Vulnerability Summary

| Vulnerability Level | Total |
|---------------------|-------|
| Critical | 3 |
| Major | 0 |
| Medium | 0 |
| Minor | 0 |
| Informational | 0 |
| Discussion | 0 |

Findings

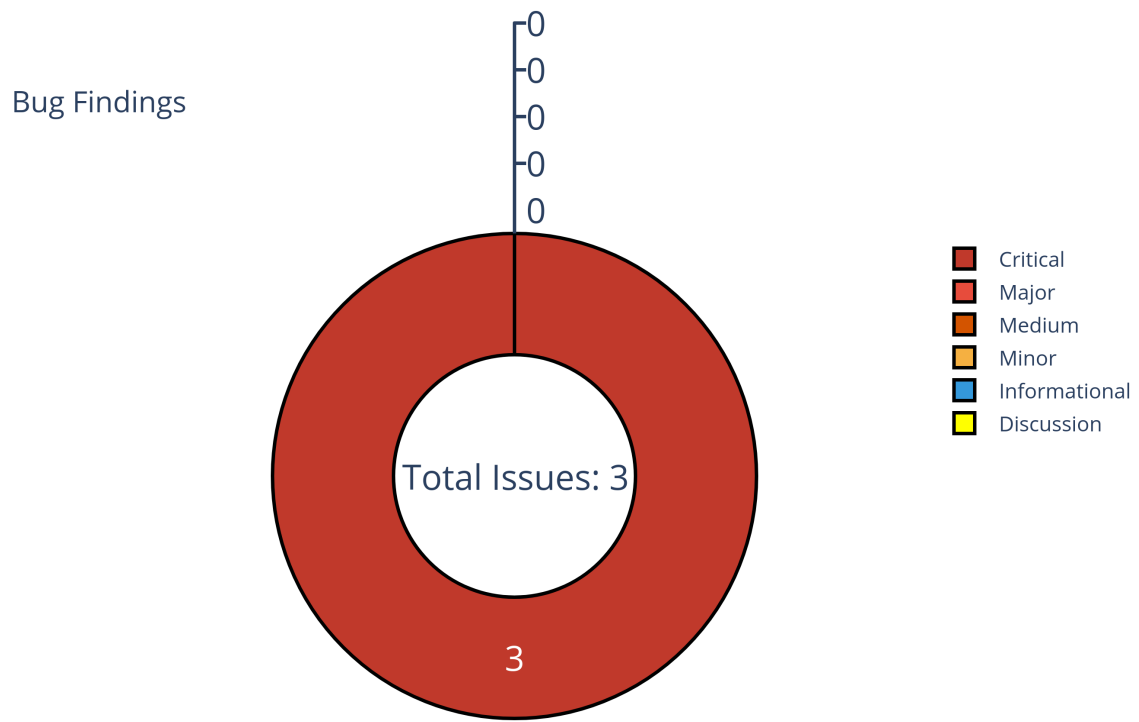


Figure 1: Findings

Finding Statistic

| Category | Count |
|-----------------|-------|
| MissingKeyCheck | 3 |

| ID | Category | Severity | Status |
|----|-----------------|----------|------------|
| 0 | MissingKeyCheck | Critical | UnResolved |
| 1 | MissingKeyCheck | Critical | UnResolved |
| 2 | MissingKeyCheck | Critical | UnResolved |

Issue: 0: MissingKeyCheck

| Category | Severity | Status |
|-----------------|----------|------------|
| MissingKeyCheck | Critical | UnResolved |

- Location

auction-house/program/src/utils.rs:174:43: 174:69

```
174 account_info.data.borrow()
175
```

- Code Context

Vulnerability at Line: 174

```
171 pub fn assert_initialized<T: Pack + IsInitialized>(
172     account_info: &AccountInfo,
173 ) -> Result<T, ProgramError> {
174     let account: T = T::unpack_unchecked(&account_info.data.borrow())?;
175     if !account.is_initialized() {
176         Err(ErrorCode::UninitializedAccount.into())
177     } else {
178         Ok(account)
179     }
```

- Call Stack

```
1 fn entrypoint() { // /home/yifei/.cargo/registry/src/github.com-
  ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10
  ↳ }
2     fn entry() { // auction-house/program/src/lib.rs:21:1: 21:11 }
3         fn dispatch() { // auction-house/program/src/lib.rs:21:1: 21:11 }
4             fn __private::__global::buy() { //
  ↳ auction-house/program/src/lib.rs:21:1: 21:11 }
5                 fn auction_house::buy() { //
  ↳ auction-house/program/src/lib.rs:968:5: 1109:6 }
6                     fn utils::assert_initialized() { //
  ↳ auction-house/program/src/utils.rs:171:1: 180:2
  ↳ }
7
```

-
- description:
 - link:
 - alleviation:

Issue: 1: MissingKeyCheck

| Category | Severity | Status |
|-----------------|----------|------------|
| MissingKeyCheck | Critical | UnResolved |

- Location

auction-house/program/src/lib.rs:824:11: 824:51

```
824 seller_trade_state.lamports.borrow_mut()  
825
```

- Code Context

Vulnerability at Line: 824

```
819         ],  
820         &[&program_as_signer_seeds],  
821     )?;  
822  
823     let curr_seller_lamp = seller_trade_state.lamports();  
824     **seller_trade_state.lamports.borrow_mut() = 0;  
825  
826     **fee_payer.lamports.borrow_mut() = fee_payer  
827         .lamports()  
828         .checked_add(curr_seller_lamp)  
829
```

- Call Stack

```
1 fn entrypoint() { // /home/yifei/.cargo/registry/src/github.com-  
  ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10  
  ↳ }  
2     fn entry() { // auction-house/program/src/lib.rs:21:1: 21:11 }  
3         fn dispatch() { // auction-house/program/src/lib.rs:21:1: 21:11 }  
4             fn __private::__global::execute_sale() { //  
5                 ↳ auction-house/program/src/lib.rs:21:1: 21:11 }  
6                 fn auction_house::execute_sale() { //  
5                     ↳ auction-house/program/src/lib.rs:561:5: 849:6 }  
6
```

- description:
- link:
- alleviation:

Issue: 2: MissingKeyCheck

| Category | Severity | Status |
|-----------------|----------|------------|
| MissingKeyCheck | Critical | UnResolved |

- Location

auction-house/program/src/lib.rs:552:11: 552:44

```
552 trade_state.lamports.borrow_mut()
553
```

- Code Context

Vulnerability at Line: 552

```
547         ],
548     )?;
549 }
550
551 let curr_lamp = trade_state.lamports();
552 **trade_state.lamports.borrow_mut() = 0;
553
554 **fee_payer.lamports.borrow_mut() = fee_payer
555     .lamports()
556     .checked_add(curr_lamp)
557
```

- Call Stack

```
1 fn entrypoint() { // /home/yifei/.cargo/registry/src/github.com-
  ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10
  ↳ }
2   fn entry() { // auction-house/program/src/lib.rs:21:1: 21:11 }
3       fn dispatch() { // auction-house/program/src/lib.rs:21:1: 21:11 }
4           fn __private::__global::cancel() { //
  ↳ auction-house/program/src/lib.rs:21:1: 21:11 }
5               fn auction_house::cancel() { //
  ↳ auction-house/program/src/lib.rs:498:5: 559:6 }
6
```

- description:
- link:
- alleviation:

Appendix

Copied from <https://leaderboard.certik.io/projects/aave>

Finding Categories

Gas Optimization

Gas Optimization findings do not affect the functionality of the code but generate different, more optimal EVM opcodes resulting in a reduction on the total gas cost of a transaction.

Mathematical Operations

Mathematical Operation findings relate to mishandling of math formulas, such as overflows, incorrect operations etc.

Logical Issue

Logical Issue findings detail a fault in the logic of the linked code, such as an incorrect notion on how `block.timestamp` works.

Language Specific

Language Specific findings are issues that would only arise within Solidity, i.e. incorrect usage of `private` or `delete`.

Coding Style

Coding Style findings usually do not affect the generated byte-code but rather comment on how to make the codebase more legible and, as a result, easily maintainable.

Checksum Calculation Method

The “Checksum” field in the “Audit Scope” section is calculated as the SHA-256 (Secure Hash Algorithm 2 with digest size of 256 bits) digest of the content of each file hosted in the listed source repository under the specified commit.

The result is hexadecimal encoded and is the same as the output of the Linux “sha256sum” command against the target file.

Disclaimer

Copied from <https://leaderboard.certik.io/projects/aave>

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