



VRust

Security Assessment

O2Lab VRust Team

11/04/2022 19:56:16

Contents

Summary	4
Overview	5
Project Summary	5
Audit Summary	5
Vulnerability Summary	5
Findings	6
Finding Statistic	7
Issue: 0: IntegerFlow	8
Issue: 1: IntegerFlow	10
Issue: 2: IntegerFlow	12
Issue: 3: IntegerFlow	14
Issue: 4: MissingKeyCheck	16
Issue: 5: CrossProgramInvocation	18
Issue: 6: CrossProgramInvocation	20
Issue: 7: CrossProgramInvocation	22
Issue: 8: CrossProgramInvocation	24
Issue: 9: TypeConfusion	26
Issue: 10: TypeConfusion	29
Issue: 11: TypeConfusion	32
Issue: 12: TypeConfusion	35
Appendix	37
Finding Categories	37
Gas Optimization	37
Mathematical Operations	37

Logical Issue	37
Language Specific	37
Coding Style	37
Checksum Calculation Method	37
Disclaimer	39

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
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	13
Major	0
Medium	0
Minor	0
Informational	0
Discussion	0

Findings

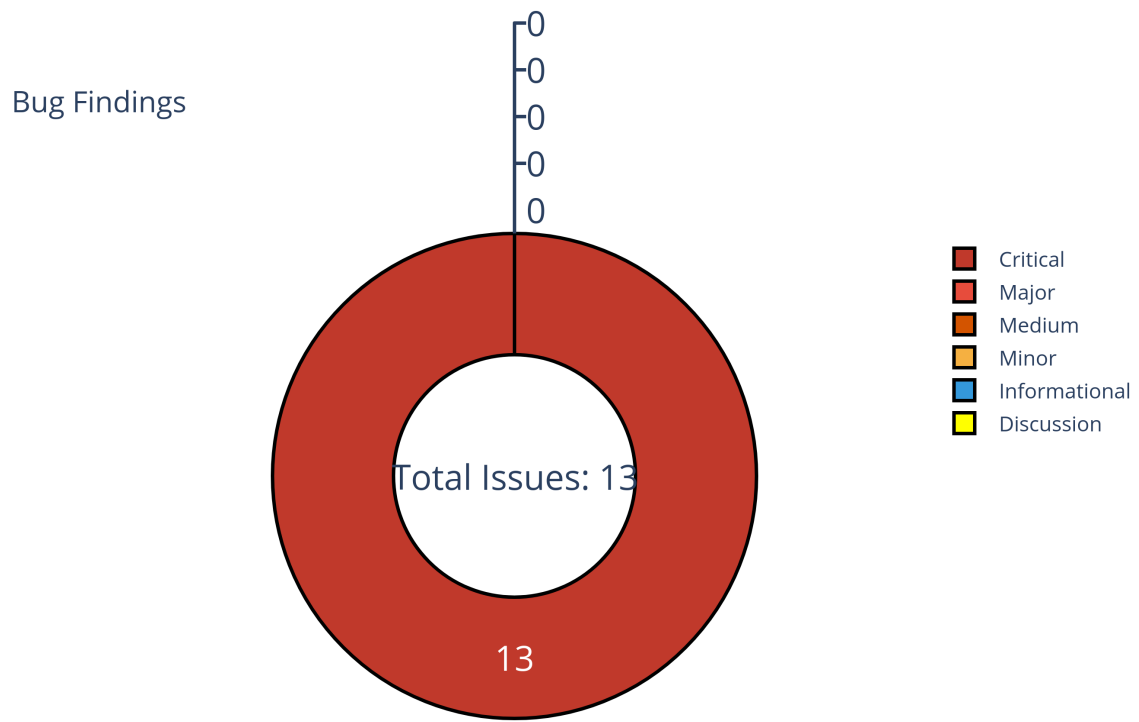


Figure 1: Findings

Finding Statistic

Category	Count
IntegerFlow	4
MissingKeyCheck	1
CrossProgramInvocation	4
TypeConfusion	4

ID	Category	Severity	Status
0	IntegerFlow	Critical	UnResolved
1	IntegerFlow	Critical	UnResolved
2	IntegerFlow	Critical	UnResolved
3	IntegerFlow	Critical	UnResolved
4	MissingKeyCheck	Critical	UnResolved
5	CrossProgramInvocation	Critical	UnResolved
6	CrossProgramInvocation	Critical	UnResolved
7	CrossProgramInvocation	Critical	UnResolved
8	CrossProgramInvocation	Critical	UnResolved
9	TypeConfusion	Critical	GitHub Link to be added.
10	TypeConfusion	Critical	GitHub Link to be added.
11	TypeConfusion	Critical	GitHub Link to be added.
12	TypeConfusion	Critical	GitHub Link to be added.

Issue: 0: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

auction/program/src/processor.rs:529:26: 529:42

```
529 (100 + gap_tick)
530
```

- Code Context

– Function Definition:

```
521 fn assert_valid_gap_insertion(
522     gap_tick: u8,
523     beaten_bid: &Bid,
524     beating_bid: &Bid,
525 ) -> ProgramResult
526
```

Vulnerability at Line: 529

```
524     beating_bid: &Bid,
525 ) -> ProgramResult {
526     // Use u128 to avoid potential overflow due to temporary mult of
527     ↪ 100x since
528     // we haven't divided yet.
529     let mut minimum_bid_amount: u128 = (beaten_bid.1 as u128)
530         .checked_mul((100 + gap_tick) as u128)
531         .ok_or(AuctionError::NumericalOverflowError)?;
532     minimum_bid_amount = minimum_bid_amount
533         .checked_div(100u128)
534         .ok_or(AuctionError::NumericalOverflowError)?;
```

- Call Stack


```

1 fn entrypoint::entrypoint() { // /home/yifei/.cargo/registry/src/github.com-
  ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10
  ↳ }
2 fn entrypoint::process_instruction() { //
  ↳ auction/program/src/entrypoint.rs:12:1: 23:2 }
3 fn processor::process_instruction() { //
  ↳ auction/program/src/processor.rs:30:1: 48:2 }
4 fn processor::place_bid::place_bid() { //
  ↳ auction/program/src/processor/place_bid.rs:125:1: 341:2 }
5 fn processor::AuctionData::place_bid() { //
  ↳ auction/program/src/processor.rs:386:5: 423:6 }
6 fn processor::BidState::place_bid() { //
  ↳ auction/program/src/processor.rs:545:5: 629:6 }
7 fn proces-
  ↳ sor::BidState::assert_valid_gap_insertion() { //
  ↳ auction/program/src/processor.rs:521:5:
  ↳ 541:6 }
8

```

- description:
- link:
- alleviation:

Issue: 1: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

auction/program/src/processor.rs:499:24: 499:36

```
499 2 * real_max
500
```

- Code Context

Vulnerability at Line: 499

```
494 pub fn max_array_size_for(n: usize) -> usize {
495     let mut real_max = n;
496     if real_max < 8 {
497         real_max = 8;
498     } else {
499         real_max = 2 * real_max
500     }
501     real_max
502 }
503
```

- Call Stack

```
1 fn entrypoint::entrypoint() { // /home/yifei/.cargo/registry/src/github.com-
  ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10
  ↳ }
2 fn entrypoint::process_instruction() { //
  ↳ auction/program/src/entrypoint.rs:12:1: 23:2 }
3 fn processor::process_instruction() { //
  ↳ auction/program/src/processor.rs:30:1: 48:2 }
4 fn processor::place_bid::place_bid() { //
  ↳ auction/program/src/processor/place_bid.rs:125:1: 341:2 }
5 fn processor::AuctionData::place_bid() { //
  ↳ auction/program/src/processor.rs:386:5: 423:6 }
```

```
6      fn processor::BidState::place_bid(){//  
    ↪ auction/program/src/processor.rs:545:5: 629:6 }  
7      fn processor::BidState::max_array_size_for(){//  
    ↪ auction/program/src/processor.rs:494:5:  
    ↪ 502:6 }
```

- description:
- link:
- alleviation:

Issue: 2: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

auction/program/src/processor.rs:718:44: 718:61

```
718 bids.len() - *max
719
```

- Code Context

Vulnerability at Line: 718

```
713 pub fn lowest_winning_bid_is_instant_bid_price(&self, instant_sale_amount:
    ↳ u64) -> bool {
714     match self {
715         // In a capped auction, track the limited number of winners.
716         BidState::EnglishAuction { bids, max } => {
717             // bids.len() - max = index of the last winner bid
718             bids.len() >= *max && bids[bids.len() - *max].1 >=
    ↳ instant_sale_amount
719         }
720         _ => false,
721     }
722 }
723
```

- Call Stack

```
1 fn entrypoint::entrypoint() { // /home/yifei/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10
    ↳ }
2 fn entrypoint::process_instruction() { //
    ↳ auction/program/src/entrypoint.rs:12:1: 23:2 }
3 fn processor::process_instruction() { //
    ↳ auction/program/src/processor.rs:30:1: 48:2 }
4 fn processor::place_bid::place_bid() { //
    ↳ auction/program/src/processor/place_bid.rs:125:1: 341:2 }
```

5
6
7
8

```
fn processor::AuctionData::place_bid(){//  
    ↪ auction/program/src/processor.rs:386:5: 423:6 }  
fn proces-  
    ↪ sor::AuctionData::consider_instant_bid(){//  
    ↪ auction/program/src/processor.rs:373:5: 384:6 }  
fn proces-  
    ↪ sor::BidState::lowest_winning_bid_is_instant_bid_price()  
    ↪ auction/program/src/processor.rs:713:5:  
    ↪ 722:6 }
```

- description:
- link:
- alleviation:

Issue: 3: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

auction/program/src/processor/create_auction.rs:97:13: 97:68

```

97 mem::size_of::<Bid>() * BidState::max_array_size_for(n)
98

```

- Code Context

Vulnerability at Line: 97

```

92     return Err(AuctionError::InvalidAuctionAccount.into());
93 }
94 // The data must be large enough to hold at least the number of
95 ↪ winners.
96 let auction_size = match args.winners {
97     WinnerLimit::Capped(n) => {
98         mem::size_of::<Bid>() * BidState::max_array_size_for(n) +
99         ↪ BASE_AUCTION_DATA_SIZE
100     }
101     WinnerLimit::Unlimited(_) => BASE_AUCTION_DATA_SIZE,
102 };

```

- Call Stack

```

1 fn entrypoint::entrypoint() { // /home/yifei/.cargo/registry/src/github.com-
  ↪ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10
  ↪ }
2 fn entrypoint::process_instruction() { //
  ↪ auction/program/src/entrypoint.rs:12:1: 23:2 }
3 fn processor::process_instruction() { //
  ↪ auction/program/src/processor.rs:30:1: 48:2 }

```

```
4      fn processor::create_auction::create_auction(){//  
      ↪      auction/program/src/processor/create_auction.rs:72:1: 181:2  
5      ↪      }
```

- description:
- link:
- alleviation:

Issue: 4: MissingKeyCheck

Category	Severity	Status
MissingKeyCheck	Critical	UnResolved

- Location

/home/yifei/.cargo/registry/src/github.com-1ecc6299db9ec823/solana-program-1.9.5/src/account_info.rs:66:11: 66:33

```
66 self.lamports.borrow()
67
```

- Code Context

Vulnerability at Line: 66

```
65 pub fn lamports(&self) -> u64 {
66     **self.lamports.borrow()
67 }
68
```

- Call Stack

```
1 fn entrypoint::entrypoint() { // /home/yifei/.cargo/registry/src/github.com-
  ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10
  ↳ }
2 fn entrypoint::process_instruction() { //
  ↳ auction/program/src/entrypoint.rs:12:1: 23:2 }
3 fn processor::process_instruction() { //
  ↳ auction/program/src/processor.rs:30:1: 48:2 }
4 fn processor::create_auction_v2::create_auction_v2() { //
  ↳ auction/program/src/processor/create_auction_v2.rs:77:1:
  ↳ 99:2 }
5 fn processor::create_auction::create_auction() { // auc-
  ↳ tion/program/src/processor/create_auction.rs:72:1:
  ↳ 181:2 }
6 fn utils::create_or_allocate_account_raw() { //
  ↳ auction/program/src/utils.rs:90:1: 133:2 }
```


7

fn

```
↳ solana_program::account_info::AccountInfo::<'a>::lamport
↳ /home/yifei/.cargo/registry/src/github.com-
↳ 1ecc6299db9ec823/solana-program-
↳ 1.9.5/src/account_info.rs:65:5: 67:6
↳ }
```

8

- description:
- link:
- alleviation:

Issue: 5: CrossProgramInvocation

Category	Severity	Status
CrossProgramInvocation	Critical	UnResolved

- Location

auction/program/src/utils.rs

- Code Context

```
216 pub fn spl_token_create_account<'a>(params: TokenCreateAccount<'_, '_>) ->
    ↳ ProgramResult {
217     let TokenCreateAccount {
218         payer,
219         mint,
220         account,
221         authority,
222         authority_seeds,
223         token_program,
224         system_program,
225         rent,
226     } = params;
227     let acct = &account.key.clone();
228
229     create_or_allocate_account_raw(
230         *token_program.key,
231         &account,
232         &rent,
233         &system_program,
234         &payer,
235         spl_token::state::Account::LEN,
236         authority_seeds,
237     )?;
238     msg!("Created account {}", acct);
239     invoke_signed(
240         &spl_token::instruction::initialize_account(
241             &spl_token::id(),
```

```

242         acct,
243         mint.key,
244         authority.key,
245     )?,
246     &[
247         account,
248         authority,
249         mint,
250         token_program,
251         system_program,
252         rent,
253     ],
254     &[authority_seeds],
255 )?;
256
257 Ok(())
258 }
259

```

- Call Stack

```

1  fn entrypoint::entrypoint() { // /home/yifei/.cargo/registry/src/github.com-
   ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10
   ↳ }
2  fn entrypoint::process_instruction() { //
   ↳ auction/program/src/entrypoint.rs:12:1: 23:2 }
3  fn processor::process_instruction() { //
   ↳ auction/program/src/processor.rs:30:1: 48:2 }
4  fn processor::place_bid::place_bid() { //
   ↳ auction/program/src/processor/place_bid.rs:125:1: 341:2 }
5      fn utils::spl_token_create_account() { //
   ↳ auction/program/src/utils.rs:216:1: 258:2 }
6

```

- description:
- link:
- alleviation:

Issue: 6: CrossProgramInvocation

Category	Severity	Status
CrossProgramInvocation	Critical	UnResolved

- Location

auction/program/src/utils.rs

- Code Context

```
152 pub fn spl_token_transfer(params: TokenTransferParams<'_, '_>) ->
    ↳ ProgramResult {
153     let TokenTransferParams {
154         source,
155         destination,
156         authority,
157         token_program,
158         amount,
159         authority_signer_seeds,
160     } = params;
161
162     let result = invoke_signed(
163         &spl_token::instruction::transfer(
164             token_program.key,
165             source.key,
166             destination.key,
167             authority.key,
168             &[],
169             amount,
170         )?,
171         &[source, destination, authority, token_program],
172         &[authority_signer_seeds],
173     );
174
175     result.map_err(|_| AuctionError::TokenTransferFailed.into())
176 }
177
```

- Call Stack

```
1 fn entrypoint::entrypoint() { // /home/yifei/.cargo/registry/src/github.com-  
  ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10  
  ↳ }  
2 fn entrypoint::process_instruction() { //  
  ↳ auction/program/src/entrypoint.rs:12:1: 23:2 }  
3 fn processor::process_instruction() { //  
  ↳ auction/program/src/processor.rs:30:1: 48:2 }  
4 fn processor::place_bid::place_bid() { //  
  ↳ auction/program/src/processor/place_bid.rs:125:1: 341:2 }  
5 fn utils::spl_token_transfer() { //  
  ↳ auction/program/src/utils.rs:152:1: 176:2 }  
6
```

- description:
- link:
- alleviation:

Issue: 7: CrossProgramInvocation

Category	Severity	Status
CrossProgramInvocation	Critical	UnResolved

- Location

auction/program/src/utils.rs

- Code Context

```
152 pub fn spl_token_transfer(params: TokenTransferParams<'_, '_>) ->
    ↳ ProgramResult {
153     let TokenTransferParams {
154         source,
155         destination,
156         authority,
157         token_program,
158         amount,
159         authority_signer_seeds,
160     } = params;
161
162     let result = invoke_signed(
163         &spl_token::instruction::transfer(
164             token_program.key,
165             source.key,
166             destination.key,
167             authority.key,
168             &[],
169             amount,
170         )?,
171         &[source, destination, authority, token_program],
172         &[authority_signer_seeds],
173     );
174
175     result.map_err(|_| AuctionError::TokenTransferFailed.into())
176 }
177
```

- Call Stack

```
1 fn entrypoint::entrypoint() { // /home/yifei/.cargo/registry/src/github.com-  
  ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10  
  ↳ }  
2 fn entrypoint::process_instruction() { //  
  ↳ auction/program/src/entrypoint.rs:12:1: 23:2 }  
3 fn processor::process_instruction() { //  
  ↳ auction/program/src/processor.rs:30:1: 48:2 }  
4 fn processor::claim_bid::claim_bid() { //  
  ↳ auction/program/src/processor/claim_bid.rs:87:1: 214:2 }  
5 fn utils::spl_token_transfer() { //  
  ↳ auction/program/src/utils.rs:152:1: 176:2 }  
6
```

- description:
- link:
- alleviation:

Issue: 8: CrossProgramInvocation

Category	Severity	Status
CrossProgramInvocation	Critical	UnResolved

- Location

auction/program/src/utils.rs

- Code Context

```
152 pub fn spl_token_transfer(params: TokenTransferParams<'_, '_>) ->
    ↳ ProgramResult {
153     let TokenTransferParams {
154         source,
155         destination,
156         authority,
157         token_program,
158         amount,
159         authority_signer_seeds,
160     } = params;
161
162     let result = invoke_signed(
163         &spl_token::instruction::transfer(
164             token_program.key,
165             source.key,
166             destination.key,
167             authority.key,
168             &[],
169             amount,
170         )?,
171         &[source, destination, authority, token_program],
172         &[authority_signer_seeds],
173     );
174
175     result.map_err(|_| AuctionError::TokenTransferFailed.into())
176 }
177
```


- Call Stack

```
1 fn entrypoint::entrypoint() { // /home/yifei/.cargo/registry/src/github.com-  
  ↳ 1ecc6299db9ec823/solana-program-1.9.5/src/entrypoint.rs:120:9: 127:10  
  ↳ }  
2 fn entrypoint::process_instruction() { //  
  ↳ auction/program/src/entrypoint.rs:12:1: 23:2 }  
3 fn processor::process_instruction() { //  
  ↳ auction/program/src/processor.rs:30:1: 48:2 }  
4 fn processor::cancel_bid::cancel_bid() { //  
  ↳ auction/program/src/processor/cancel_bid.rs:93:1: 253:2 }  
5 fn utils::spl_token_transfer() { //  
  ↳ auction/program/src/utils.rs:152:1: 176:2 }  
6
```

- description:
- link:
- alleviation:

Issue: 9: TypeConfusion

Category	Severity	Status
TypeConfusion	Critical	GitHub Link to be added.

- Location

auction/program/src/processor/cancel_bid.rs:38:1: 40:2

```

38 pub struct CancelBidArgs {
39     pub resource: Pubkey,
40 }
41 auction/program/src/processor/claim_bid.rs:33:1: 35:2
42     pub struct ClaimBidArgs {
43         pub resource: Pubkey,
44     }
45 auction/program/src/processor/start_auction.rs:45:1: 48:2
46     pub struct StartAuctionArgs {
47         /// The resource being auctioned. See AuctionData.
48         pub resource: Pubkey,
49     }
50 auction/program/src/processor/end_auction.rs:28:1: 34:2
51     pub struct EndAuctionArgs {
52         /// The resource being auctioned. See AuctionData.
53         pub resource: Pubkey,
54         /// If the auction was blinded, a revealing price must be specified to
55         ↪ release the auction
56         /// winnings.
56         pub reveal: Option<Revealer>,
57     }
58 auction/program/src/processor.rs:461:1: 461:37
59     pub struct Bid(pub Pubkey, pub u64);
60 auction/program/src/processor.rs:765:1: 774:2
61     pub struct BidderPot {
62         /// Points at actual pot that is a token account
63         pub bidder_pot: Pubkey,
64         /// Originating bidder account
65         pub bidder_act: Pubkey,
66         /// Auction account
67         pub auction_act: Pubkey,

```

```
68     /// emptied or not
69     pub emptied: bool,
70 }
71 auction/program/src/processor.rs:737:1: 749:2
72     pub struct BidderMetadata {
73         /// Relationship with the bidder who's metadata this covers.
74         pub bidder_pubkey: Pubkey,
75         /// Relationship with the auction this bid was placed on.
76         pub auction_pubkey: Pubkey,
77         /// Amount that the user bid.
78         pub last_bid: u64,
79         /// Tracks the last time this user bid.
80         pub last_bid_timestamp: UnixTimestamp,
81         /// Whether the last bid the user made was cancelled. This should also
82         ↳ be enough to know if the
83         /// user is a winner, as if cancelled it implies previous bids were also
84         ↳ cancelled.
85         pub cancelled: bool,
86     }
87 auction/program/src/processor.rs:72:1: 96:2
88     pub struct AuctionData {
89         /// Pubkey of the authority with permission to modify this auction.
90         pub authority: Pubkey,
91         /// Pubkey of the resource being bid on.
92         /// TODO try to bring this back some day. Had to remove this due to a
93         ↳ stack access violation bug
94         /// interactin that happens in metaplex during redemptions due to some
95         ↳ low level rust error
96         /// that happens when AuctionData has too many fields. This field was
97         ↳ the least used.
98         ///pub resource: Pubkey,
99         /// Token mint for the SPL token being used to bid
100        pub token_mint: Pubkey,
101        /// The time the last bid was placed, used to keep track of auction
102        ↳ timing.
103        pub last_bid: Option<UnixTimestamp>,
104        /// Slot time the auction was officially ended by.
105        pub ended_at: Option<UnixTimestamp>,
106        /// End time is the cut-off point that the auction is forced to end by.
107        pub end_auction_at: Option<UnixTimestamp>,
108        /// Gap time is the amount of time in slots after the previous bid at
109        ↳ which the auction ends.
```

```
103     pub end_auction_gap: Option<UnixTimestamp>,  
104     /// Minimum price for any bid to meet.  
105     pub price_floor: PriceFloor,  
106     /// The state the auction is in, whether it has started or ended.  
107     pub state: AuctionState,  
108     /// Auction Bids, each user may have one bid open at a time.  
109     pub bid_state: BidState,  
110 }  
111
```

- Call Stack

1 UnResolved

- description:
- link:
- alleviation:

Issue: 10: TypeConfusion

Category	Severity	Status
TypeConfusion	Critical	GitHub Link to be added.

- Location

auction/program/src/processor/claim_bid.rs:33:1: 35:2

```

33 pub struct ClaimBidArgs {
34     pub resource: Pubkey,
35 }
36 auction/program/src/processor/start_auction.rs:45:1: 48:2
37     pub struct StartAuctionArgs {
38         /// The resource being auctioned. See AuctionData.
39         pub resource: Pubkey,
40     }
41 auction/program/src/processor/end_auction.rs:28:1: 34:2
42     pub struct EndAuctionArgs {
43         /// The resource being auctioned. See AuctionData.
44         pub resource: Pubkey,
45         /// If the auction was blinded, a revealing price must be specified to
46         ↪ release the auction
47         /// winnings.
48         pub reveal: Option<Revealer>,
49     }
50 auction/program/src/processor.rs:461:1: 461:37
51     pub struct Bid(pub Pubkey, pub u64);
52 auction/program/src/processor.rs:765:1: 774:2
53     pub struct BidderPot {
54         /// Points at actual pot that is a token account
55         pub bidder_pot: Pubkey,
56         /// Originating bidder account
57         pub bidder_act: Pubkey,
58         /// Auction account
59         pub auction_act: Pubkey,
60         /// emptied or not
61         pub emptied: bool,
62     }
63 auction/program/src/processor.rs:737:1: 749:2

```

```
63 pub struct BidderMetadata {
64     // Relationship with the bidder who's metadata this covers.
65     pub bidder_pubkey: Pubkey,
66     // Relationship with the auction this bid was placed on.
67     pub auction_pubkey: Pubkey,
68     // Amount that the user bid.
69     pub last_bid: u64,
70     // Tracks the last time this user bid.
71     pub last_bid_timestamp: UnixTimestamp,
72     // Whether the last bid the user made was cancelled. This should also
73     //   ↳ be enough to know if the
74     // user is a winner, as if cancelled it implies previous bids were also
75     //   ↳ cancelled.
76     pub cancelled: bool,
77 }
78 auction/program/src/processor.rs:72:1: 96:2
79 pub struct AuctionData {
80     /// Pubkey of the authority with permission to modify this auction.
81     pub authority: Pubkey,
82     /// Pubkey of the resource being bid on.
83     /// TODO try to bring this back some day. Had to remove this due to a
84     //   ↳ stack access violation bug
85     /// interactin that happens in metaplex during redemptions due to some
86     //   ↳ low level rust error
87     /// that happens when AuctionData has too many fields. This field was
88     //   ↳ the least used.
89     ///pub resource: Pubkey,
90     /// Token mint for the SPL token being used to bid
91     pub token_mint: Pubkey,
92     /// The time the last bid was placed, used to keep track of auction
93     //   ↳ timing.
94     pub last_bid: Option<UnixTimestamp>,
95     /// Slot time the auction was officially ended by.
96     pub ended_at: Option<UnixTimestamp>,
97     /// End time is the cut-off point that the auction is forced to end by.
98     pub end_auction_at: Option<UnixTimestamp>,
99     /// Gap time is the amount of time in slots after the previous bid at
100     //   ↳ which the auction ends.
101     pub end_auction_gap: Option<UnixTimestamp>,
102     /// Minimum price for any bid to meet.
103     pub price_floor: PriceFloor,
104     /// The state the auction is in, whether it has started or ended.
```

```
98     pub state: AuctionState,  
99     /// Auction Bids, each user may have one bid open at a time.  
100     pub bid_state: BidState,  
101 }  
102
```

- Call Stack

1 UnResolved

- description:
- link:
- alleviation:

Issue: 11: TypeConfusion

Category	Severity	Status
TypeConfusion	Critical	GitHub Link to be added.

- Location

auction/program/src/processor/start_auction.rs:45:1: 48:2

```

45 pub struct StartAuctionArgs {
46     /// The resource being auctioned. See AuctionData.
47     pub resource: Pubkey,
48 }
49 auction/program/src/processor/end_auction.rs:28:1: 34:2
50 pub struct EndAuctionArgs {
51     /// The resource being auctioned. See AuctionData.
52     pub resource: Pubkey,
53     /// If the auction was blinded, a revealing price must be specified to
54     ↪ release the auction
55     /// winnings.
56     pub reveal: Option<Revealer>,
57 }
58 auction/program/src/processor.rs:461:1: 461:37
59 pub struct Bid(pub Pubkey, pub u64);
60 auction/program/src/processor.rs:765:1: 774:2
61 pub struct BidderPot {
62     /// Points at actual pot that is a token account
63     pub bidder_pot: Pubkey,
64     /// Originating bidder account
65     pub bidder_act: Pubkey,
66     /// Auction account
67     pub auction_act: Pubkey,
68     /// emptied or not
69     pub emptied: bool,
70 }
71 auction/program/src/processor.rs:737:1: 749:2
72 pub struct BidderMetadata {
73     // Relationship with the bidder who's metadata this covers.
74     pub bidder_pubkey: Pubkey,
75     // Relationship with the auction this bid was placed on.

```



```
75     pub auction_pubkey: Pubkey,  
76     // Amount that the user bid.  
77     pub last_bid: u64,  
78     // Tracks the last time this user bid.  
79     pub last_bid_timestamp: UnixTimestamp,  
80     // Whether the last bid the user made was cancelled. This should also  
81     ↪ be enough to know if the  
82     // user is a winner, as if cancelled it implies previous bids were also  
83     ↪ cancelled.  
84     pub cancelled: bool,  
85 }  
86 auction/program/src/processor.rs:72:1: 96:2  
87 pub struct AuctionData {  
88     /// Pubkey of the authority with permission to modify this auction.  
89     pub authority: Pubkey,  
90     /// Pubkey of the resource being bid on.  
91     /// TODO try to bring this back some day. Had to remove this due to a  
92     ↪ stack access violation bug  
93     /// interactin that happens in metaplex during redemptions due to some  
94     ↪ low level rust error  
95     /// that happens when AuctionData has too many fields. This field was  
96     ↪ the least used.  
97     ///pub resource: Pubkey,  
98     /// Token mint for the SPL token being used to bid  
99     pub token_mint: Pubkey,  
100    /// The time the last bid was placed, used to keep track of auction  
101    ↪ timing.  
102    pub last_bid: Option<UnixTimestamp>,  
103    /// Slot time the auction was officially ended by.  
104    pub ended_at: Option<UnixTimestamp>,  
105    /// End time is the cut-off point that the auction is forced to end by.  
106    pub end_auction_at: Option<UnixTimestamp>,  
107    /// Gap time is the amount of time in slots after the previous bid at  
108    ↪ which the auction ends.  
109    pub end_auction_gap: Option<UnixTimestamp>,  
110    /// Minimum price for any bid to meet.  
111    pub price_floor: PriceFloor,  
112    /// The state the auction is in, whether it has started or ended.  
113    pub state: AuctionState,  
114    /// Auction Bids, each user may have one bid open at a time.  
115    pub bid_state: BidState,  
116 }
```

110

- Call Stack

1 UnResolved

- description:
- link:
- alleviation:

Issue: 12: TypeConfusion

Category	Severity	Status
TypeConfusion	Critical	GitHub Link to be added.

- Location

auction/program/src/processor/create_auction.rs:28:1: 47:2

```

28 pub struct CreateAuctionArgs {
29     /// How many winners are allowed for this auction. See AuctionData.
30     pub winners: WinnerLimit,
31     /// End time is the cut-off point that the auction is forced to end by.
32     ↪ See AuctionData.
33     pub end_auction_at: Option<UnixTimestamp>,
34     /// Gap time is how much time after the previous bid where the auction
35     ↪ ends. See AuctionData.
36     pub end_auction_gap: Option<UnixTimestamp>,
37     /// Token mint for the SPL token used for bidding.
38     pub token_mint: Pubkey,
39     /// Authority
40     pub authority: Pubkey,
41     /// The resource being auctioned. See AuctionData.
42     pub resource: Pubkey,
43     /// Set a price floor.
44     pub price_floor: PriceFloor,
45     /// Add a tick size increment
46     pub tick_size: Option<u64>,
47     /// Add a minimum percentage increase each bid must meet.
48     pub gap_tick_size_percentage: Option<u8>,
49 }
50 auction/program/src/processor/create_auction_v2.rs:29:1: 52:2
51 pub struct CreateAuctionArgsV2 {
52     /// How many winners are allowed for this auction. See AuctionData.
53     pub winners: WinnerLimit,
54     /// End time is the cut-off point that the auction is forced to end by.
55     ↪ See AuctionData.
56     pub end_auction_at: Option<UnixTimestamp>,
57     /// Gap time is how much time after the previous bid where the auction
58     ↪ ends. See AuctionData.

```

```
55     pub end_auction_gap: Option<UnixTimestamp>,  
56     /// Token mint for the SPL token used for bidding.  
57     pub token_mint: Pubkey,  
58     /// Authority  
59     pub authority: Pubkey,  
60     /// The resource being auctioned. See AuctionData.  
61     pub resource: Pubkey,  
62     /// Set a price floor.  
63     pub price_floor: PriceFloor,  
64     /// Add a tick size increment  
65     pub tick_size: Option<u64>,  
66     /// Add a minimum percentage increase each bid must meet.  
67     pub gap_tick_size_percentage: Option<u8>,  
68     /// Add a instant sale price.  
69     pub instant_sale_price: Option<u64>,  
70     /// Auction name  
71     pub name: Option<AuctionName>,  
72 }  
73
```

- Call Stack

1 UnResolved

- 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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