



# VRust

## **Security Assessment**

O2Lab VRust Team

03/04/2022 21:12:32

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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	jet
GitHub Location	<a href="https://github.com/parasol-aser/vrust">https://github.com/parasol-aser/vrust</a>
sha256	Unknown

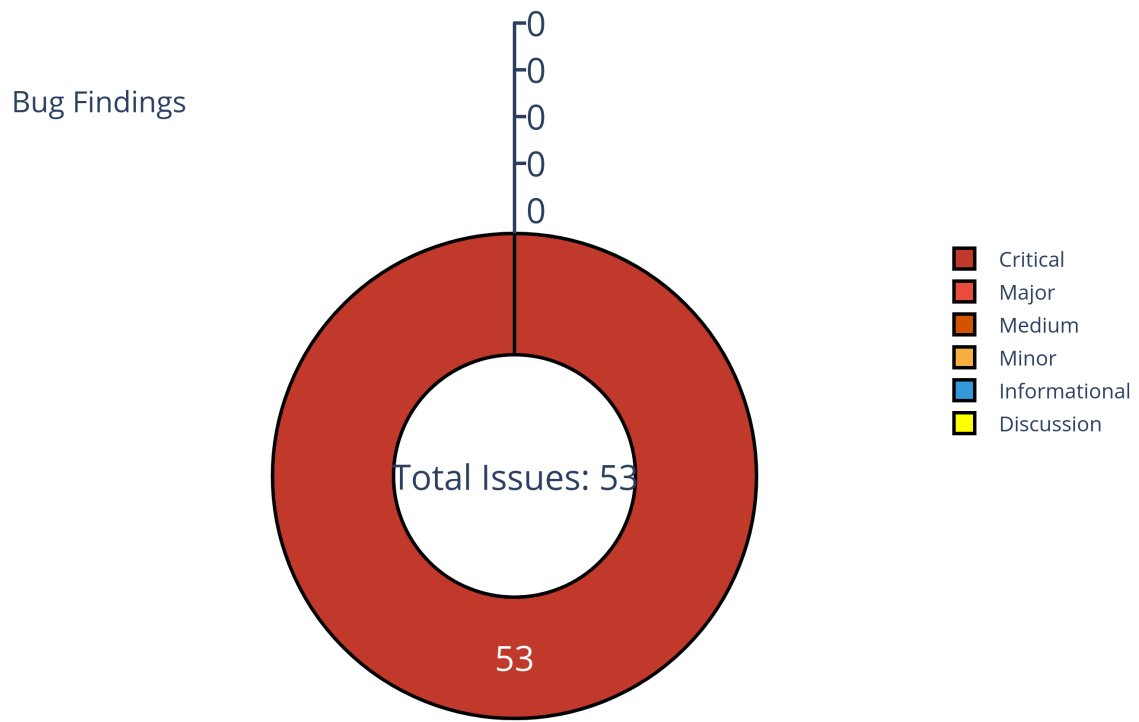
### Audit Summary

Delivery Date	03/04/2022
Audit Methodology	Static Analysis
Key Components	

### Vulnerability Summary

Vulnerability Level	Total
Critical	53
Major	0
Medium	0
Minor	0
Informational	0
Discussion	0

## Findings



**Figure 1:** Findings

## Finding Statistic

Category	Count
IntegerFlow	53

ID	Category	Severity	Status
0	IntegerFlow	Critical	UnResolved
1	IntegerFlow	Critical	UnResolved
2	IntegerFlow	Critical	UnResolved
3	IntegerFlow	Critical	UnResolved
4	IntegerFlow	Critical	UnResolved
5	IntegerFlow	Critical	UnResolved
6	IntegerFlow	Critical	UnResolved
7	IntegerFlow	Critical	UnResolved
8	IntegerFlow	Critical	UnResolved
9	IntegerFlow	Critical	UnResolved
10	IntegerFlow	Critical	UnResolved
11	IntegerFlow	Critical	UnResolved
12	IntegerFlow	Critical	UnResolved
13	IntegerFlow	Critical	UnResolved
14	IntegerFlow	Critical	UnResolved
15	IntegerFlow	Critical	UnResolved
16	IntegerFlow	Critical	UnResolved
17	IntegerFlow	Critical	UnResolved
18	IntegerFlow	Critical	UnResolved
19	IntegerFlow	Critical	UnResolved
20	IntegerFlow	Critical	UnResolved
21	IntegerFlow	Critical	UnResolved



ID	Category	Severity	Status
22	IntegerFlow	Critical	UnResolved
23	IntegerFlow	Critical	UnResolved
24	IntegerFlow	Critical	UnResolved
25	IntegerFlow	Critical	UnResolved
26	IntegerFlow	Critical	UnResolved
27	IntegerFlow	Critical	UnResolved
28	IntegerFlow	Critical	UnResolved
29	IntegerFlow	Critical	UnResolved
30	IntegerFlow	Critical	UnResolved
31	IntegerFlow	Critical	UnResolved
32	IntegerFlow	Critical	UnResolved
33	IntegerFlow	Critical	UnResolved
34	IntegerFlow	Critical	UnResolved
35	IntegerFlow	Critical	UnResolved
36	IntegerFlow	Critical	UnResolved
37	IntegerFlow	Critical	UnResolved
38	IntegerFlow	Critical	UnResolved
39	IntegerFlow	Critical	UnResolved
40	IntegerFlow	Critical	UnResolved
41	IntegerFlow	Critical	UnResolved
42	IntegerFlow	Critical	UnResolved
43	IntegerFlow	Critical	UnResolved
44	IntegerFlow	Critical	UnResolved
45	IntegerFlow	Critical	UnResolved
46	IntegerFlow	Critical	UnResolved
47	IntegerFlow	Critical	UnResolved
48	IntegerFlow	Critical	UnResolved

ID	Category	Severity	Status
49	IntegerFlow	Critical	UnResolved
50	IntegerFlow	Critical	UnResolved
51	IntegerFlow	Critical	UnResolved
52	IntegerFlow	Critical	UnResolved

**Issue: 0: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4             fn instructions::liquidate_dex::handler_raw() { //
                ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
                ↳ }
5                 fn instructions::liquidate_dex::handler() { // pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                    ↳ 733:2 }
6                 fn instruc-
                    ↳ tions::liquidate_dex::LiquidateDex::<'info>::verify_unhealth
                    ↳ pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:299:5:
                    ↳ 312:6 }
```

```
7          fn
8              ↳ state::obligation::Obligation::cache_calculations() { //
9              ↳ programs/jet/src/state/obligation.rs:143:5:
10             ↳ 153:6 }
11 fn state::obligation::ObligationSide::_market_value() { //
12     ↳ programs/jet/src/state/obligation.rs:474:5: 487:6 }
    fn state::market::MarketReserves::get_cached() { //
        ↳ programs/jet/src/state/market.rs:202:5: 216:6 }
    fn state::cache::Cache::<T, TTL>::try_get() { //
        ↳ programs/jet/src/state/cache.rs:83:5: 86:6 }
    fn state::cache::Cache::<T, TTL>::validate_fresh() { //
        ↳ programs/jet/src/state/cache.rs:57:5: 72:6 }
```

- description:
- link:
- alleviation:

## Issue: 1: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
   ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
   ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
   ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4             fn instructions::liquidate_dex::handler_raw() { //
   ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
   ↳ }
5                 fn instructions::liquidate_dex::handler() { // pro-
   ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
   ↳ 733:2 }
6                 fn instruc-
   ↳ tions::liquidate_dex::LiquidateDex::<'info>::verify_unhealth
   ↳ pro-
   ↳ grams/jet/src/instructions/liquidate_dex.rs:299:5:
   ↳ 312:6 }
```

```
7          fn
8              ↪ state::obligation::Obligation::is_healthy() { //
9              ↪ programs/jet/src/state/obligation.rs:157:5:
10             ↪ 182:6 }
11
12 fn state::cache::Cache::<T, TTL>::expect() { //
13     ↪ programs/jet/src/state/cache.rs:97:5: 99:6 }
14     fn state::cache::Cache::<T, TTL>::try_get() { //
15         ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }
16     fn state::cache::Cache::<T, TTL>::validate_fresh() { //
17         ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }
```

- description:
- link:
- alleviation:

## Issue: 2: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
   ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
   ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
   ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4             fn instructions::liquidate_dex::handler_raw() { //
               ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
               ↳ }
5                 fn instructions::liquidate_dex::handler() { // pro-
                   ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                   ↳ 733:2 }
6                 fn instruc-
                   ↳ tions::liquidate_dex::calculate_collateral_swap_plan() { //
                   ↳ pro-
                   ↳ grams/jet/src/instructions/liquidate_dex.rs:498:1:
                   ↳ 514:2 }
```

```
7         fn instruc-
            ↳ tions::liquidate_dex::SwapCalculator::<'a,
            ↳ 'info>::new() { // pro-
            ↳ grams/jet/src/instructions/liquidate_dex.rs:364:5:
            ↳ 388:6 }
8     fn state::market::MarketReserves::get_cached() { //
            ↳ programs/jet/src/state/market.rs:202:5: 216:6 }
9     fn state::cache::Cache::<T, TTL>::try_get() { //
            ↳ programs/jet/src/state/cache.rs:83:5: 86:6 }
10    fn state::cache::Cache::<T, TTL>::validate_fresh() { //
            ↳ programs/jet/src/state/cache.rs:57:5: 72:6 }
11
```

- description:
- link:
- alleviation:



### Issue: 3: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4  fn instructions::liquidate_dex::handler_raw() { //
    ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
    ↳ }
5  fn instructions::liquidate_dex::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
    ↳ 733:2 }
6  fn instruc-
    ↳ tions::liquidate_dex::calculate_collateral_swap_plan() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:498:1:
    ↳ 514:2 }

```

```
7         fn instruc-
          ↳ tions::liquidate_dex::SwapCalculator::<'a,
          ↳ 'info>::plan() { // pro-
          ↳ grams/jet/src/instructions/liquidate_dex.rs:440:5:
          ↳ 494:6 }
8     fn state::obligation::Obligation::collateral_value() { //
          ↳ programs/jet/src/state/obligation.rs:293:5: 299:6 }
9     fn state::cache::Cache::<T, TTL>::try_get() { //
          ↳ programs/jet/src/state/cache.rs:83:5: 86:6 }
10    fn state::cache::Cache::<T, TTL>::validate_fresh() { //
          ↳ programs/jet/src/state/cache.rs:57:5: 72:6 }
11
```

- description:
- link:
- alleviation:

## Issue: 4: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4             fn instructions::liquidate_dex::handler_raw() { //
                ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
                ↳ }
5                 fn instructions::liquidate_dex::handler() { // pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                    ↳ 733:2 }
6                 fn instruc-
                    ↳ tions::liquidate_dex::calculate_collateral_swap_plan() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:498:1:
                    ↳ 514:2 }
```

```
7         fn instruc-
            ↳ tions::liquidate_dex::SwapCalculator::<'a,
            ↳ 'info>::plan() { // pro-
            ↳ grams/jet/src/instructions/liquidate_dex.rs:440:5:
            ↳ 494:6 }
8     fn state::obligation::Obligation::collateral_value() { //
            ↳ programs/jet/src/state/obligation.rs:293:5: 299:6 }
9     fn state::obligation::ObligationSide::_market_value() { //
            ↳ programs/jet/src/state/obligation.rs:474:5: 487:6 }
10    fn state::market::MarketReserves::get_cached() { //
            ↳ programs/jet/src/state/market.rs:202:5: 216:6 }
11    fn state::cache::Cache::<T, TTL>::try_get() { //
            ↳ programs/jet/src/state/cache.rs:83:5: 86:6 }
12    fn state::cache::Cache::<T,
            ↳ TTL>::validate_fresh() { //
            ↳ programs/jet/src/state/cache.rs:57:5: 72:6 }
13
```

- description:
- link:
- alleviation:

## Issue: 5: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4             fn instructions::liquidate_dex::handler_raw() { //
                ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
                ↳ }
5                 fn instructions::liquidate_dex::handler() { // pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                    ↳ 733:2 }
6                 fn instruc-
                    ↳ tions::liquidate_dex::calculate_collateral_swap_plan() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:498:1:
                    ↳ 514:2 }
```

```
7         fn instruc-  
           ↳ tions::liquidate_dex::SwapCalculator::<'a,  
           ↳ 'info>::plan() { // pro-  
           ↳ grams/jet/src/instructions/liquidate_dex.rs:440:5:  
           ↳ 494:6 }  
8     fn state::obligation::Obligation::loan_value() { //  
       ↳ programs/jet/src/state/obligation.rs:301:5: 307:6 }  
9     fn state::cache::Cache::<T, TTL>::try_get() { //  
       ↳ programs/jet/src/state/cache.rs:83:5: 86:6 }  
10    fn state::cache::Cache::<T, TTL>::validate_fresh() { //  
      ↳ programs/jet/src/state/cache.rs:57:5: 72:6 }  
11
```

- description:
- link:
- alleviation:

## Issue: 6: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4  fn instructions::liquidate_dex::handler_raw() { //
    ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
    ↳ }
5  fn instructions::liquidate_dex::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
    ↳ 733:2 }
6  fn instruc-
    ↳ tions::liquidate_dex::calculate_collateral_swap_plan() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:498:1:
    ↳ 514:2 }

```

```
7         fn instruc-
            ↳ tions::liquidate_dex::SwapCalculator::<'a,
            ↳ 'info>::plan() { // pro-
            ↳ grams/jet/src/instructions/liquidate_dex.rs:440:5:
            ↳ 494:6 }
8     fn state::obligation::Obligation::loan_value() { //
            ↳ programs/jet/src/state/obligation.rs:301:5: 307:6 }
9     fn state::obligation::ObligationSide::_market_value() { //
            ↳ programs/jet/src/state/obligation.rs:474:5: 487:6 }
10    fn state::market::MarketReserves::get_cached() { //
            ↳ programs/jet/src/state/market.rs:202:5: 216:6 }
11    fn state::cache::Cache::<T, TTL>::try_get() { //
            ↳ programs/jet/src/state/cache.rs:83:5: 86:6 }
12    fn state::cache::Cache::<T,
            ↳ TTL>::validate_fresh() { //
            ↳ programs/jet/src/state/cache.rs:57:5: 72:6 }
13
```

- description:
- link:
- alleviation:



## Issue: 7: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4             fn instructions::liquidate_dex::handler_raw() { //
                ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
                ↳ }
5                 fn instructions::liquidate_dex::handler() { // pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                    ↳ 733:2 }
6                 fn instruc-
                    ↳ tions::liquidate_dex::verify_proceeds() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:590:1:
                    ↳ 619:2 }
```

```
7          fn
            ↳ state::market::MarketReserves::get_cached() { //
            ↳ programs/jet/src/state/market.rs:202:5:
            ↳ 216:6 }
8  fn state::cache::Cache::<T, TTL>::try_get() { //
    ↳ programs/jet/src/state/cache.rs:83:5: 86:6 }
9      fn state::cache::Cache::<T, TTL>::validate_fresh() { //
    ↳ programs/jet/src/state/cache.rs:57:5: 72:6 }
10
```

- description:
- link:
- alleviation:

## Issue: 8: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4             fn instructions::liquidate_dex::handler_raw() { //
                ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
                ↳ }
5                 fn instructions::liquidate_dex::handler() { // pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                    ↳ 733:2 }
6                 fn instruc-
                    ↳ tions::liquidate_dex::update_accounting() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:623:1:
                    ↳ 681:2 }
```

```
7          fn
            ↳ state::market::MarketReserves::get_cached() { //
            ↳ programs/jet/src/state/market.rs:202:5:
            ↳ 216:6 }
8  fn state::cache::Cache::<T, TTL>::try_get() { //
    ↳ programs/jet/src/state/cache.rs:83:5: 86:6 }
9      fn state::cache::Cache::<T, TTL>::validate_fresh() { //
    ↳ programs/jet/src/state/cache.rs:57:5: 72:6 }
10
```

- description:
- link:
- alleviation:

## Issue: 9: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4             fn instructions::liquidate_dex::handler_raw() { //
                ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
                ↳ }
5                 fn instructions::liquidate_dex::handler() { // pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                    ↳ 733:2 }
6                 fn instruc-
                    ↳ tions::liquidate_dex::update_accounting() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:623:1:
                    ↳ 681:2 }
```

```
7         fn state::reserve::Reserve::repay() {  
            ↪ programs/jet/src/state/reserve.rs:252:5:  
            ↪ 263:6 }  
8     fn state::reserve::Reserve::unwrap_state_mut() {  
        ↪ programs/jet/src/state/reserve.rs:207:5: 210:6 }  
9     fn state::cache::Cache::<T, TTL>::expect_mut() {  
        ↪ programs/jet/src/state/cache.rs:103:5: 105:6 }  
10    fn state::cache::Cache::<T, TTL>::try_get_mut() {  
        ↪ programs/jet/src/state/cache.rs:90:5: 93:6 }  
11    fn state::cache::Cache::<T, TTL>::validate_fresh() {  
        ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }  
12
```

- description:
- link:
- alleviation:

## Issue: 10: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
4             fn instructions::liquidate_dex::handler_raw() { //
                ↳ programs/jet/src/instructions/liquidate_dex.rs:739:1: 756:2
                ↳ }
5                 fn instructions::liquidate_dex::handler() { // pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                    ↳ 733:2 }
6                 fn instruc-
                    ↳ tions::liquidate_dex::update_accounting() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/liquidate_dex.rs:623:1:
                    ↳ 681:2 }
```

```
7          fn
8              ↪ state::reserve::Reserve::add_uncollected_fees() { //
9              ↪ programs/jet/src/state/reserve.rs:267:5:
10             ↪ 271:6 }
11
12 fn state::reserve::Reserve::unwrap_state_mut() { //
    ↪ programs/jet/src/state/reserve.rs:207:5: 210:6 }
    fn state::cache::Cache::<T, TTL>::expect_mut() { //
        ↪ programs/jet/src/state/cache.rs:103:5: 105:6 }
        fn state::cache::Cache::<T, TTL>::try_get_mut() { //
            ↪ programs/jet/src/state/cache.rs:90:5: 93:6 }
            fn state::cache::Cache::<T, TTL>::validate_fresh() { //
                ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }
```

- description:
- link:
- alleviation:



## Issue: 11: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4  fn __private::__global::liquidate() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5  fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
    ↳ 180:6 }
6  fn instructions::liquidate::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
    ↳ 126:2 }
7  fn instruc-
    ↳ tions::liquidate::transfer_collateral() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate.rs:128:1:
    ↳ 180:2 }

```

```
8      fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
9      fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
10     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
11
```

- description:
- link:
- alleviation:

## Issue: 12: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::liquidate() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
                ↳ 180:6 }
6                 fn instructions::liquidate::handler() { // pro-
                    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
                    ↳ 126:2 }
7                 fn instruc-
                    ↳ tions::liquidate::transfer_collateral() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/liquidate.rs:128:1:
                    ↳ 180:2 }
```

```
8      fn state::obligation::Obligation::cache_calculations(){//  
    ↪   programs/jet/src/state/obligation.rs:143:5: 153:6 }  
9      fn state::obligation::ObligationSide::_market_value(){//  
    ↪   programs/jet/src/state/obligation.rs:474:5: 487:6 }  
10     fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
11     fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
12     fn state::cache::Cache::<T,  
    ↪   TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
13
```

- description:
- link:
- alleviation:

**Issue: 13: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3     fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4     fn __private::__global::liquidate() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5     fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
    ↳ 180:6 }
6     fn instructions::liquidate::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
    ↳ 126:2 }
7     fn instruc-
    ↳ tions::liquidate::transfer_collateral() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate.rs:128:1:
    ↳ 180:2 }
```

```
8      fn state::obligation::Obligation::is_healthy(){//  
    ↪   programs/jet/src/state/obligation.rs:157:5: 182:6 }  
9      fn state::cache::Cache::<T, TTL>::expect(){//  
    ↪   programs/jet/src/state/cache.rs:97:5: 99:6 }  
10     fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
11     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
12
```

- description:
- link:
- alleviation:

## Issue: 14: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4  fn __private::__global::liquidate() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5  fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
    ↳ 180:6 }
6  fn instructions::liquidate::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
    ↳ 126:2 }
7  fn instruc-
    ↳ tions::liquidate::transfer_collateral() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate.rs:128:1:
    ↳ 180:2 }

```

```
8      fn state::obligation::Obligation::liquidate() {  
9          ↪ programs/jet/src/state/obligation.rs:188:5: 256:6 }  
10         fn state::obligation::Obligation::loan_value() {  
11             ↪ programs/jet/src/state/obligation.rs:301:5: 307:6 }  
12         fn state::cache::Cache::<T, TTL>::try_get() {  
            ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
        fn state::cache::Cache::<T, TTL>::validate_fresh() {  
            ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }
```

- description:
- link:
- alleviation:



## Issue: 15: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4  fn __private::__global::liquidate() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5  fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
    ↳ 180:6 }
6  fn instructions::liquidate::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
    ↳ 126:2 }
7  fn instruc-
    ↳ tions::liquidate::transfer_collateral() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate.rs:128:1:
    ↳ 180:2 }

```

```
8      fn state::obligation::Obligation::liquidate() {  
9          ↪ programs/jet/src/state/obligation.rs:188:5: 256:6 }  
10         fn state::obligation::Obligation::loan_value() {  
11             ↪ programs/jet/src/state/obligation.rs:301:5: 307:6 }  
12             fn state::obligation::ObligationSide::_market_value() {  
13                 ↪ programs/jet/src/state/obligation.rs:474:5: 487:6 }  
14                 fn state::market::MarketReserves::get_cached() {  
15                     ↪ programs/jet/src/state/market.rs:202:5: 216:6 }  
16                     fn state::cache::Cache::<T, TTL>::try_get() {  
17                         ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
18                         fn state::cache::Cache::<T,  
19                             ↪ TTL>::validate_fresh() {  
20                             ↪ programs/jet/src/state/cache.rs:57:5:  
21                             ↪ 72:6 }
```

- description:
- link:
- alleviation:

## Issue: 16: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4  fn __private::__global::liquidate() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5  fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
    ↳ 180:6 }
6  fn instructions::liquidate::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
    ↳ 126:2 }
7  fn instruc-
    ↳ tions::liquidate::transfer_collateral() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate.rs:128:1:
    ↳ 180:2 }

```

```
8      fn state::obligation::Obligation::liquidate(){//  
    ↪   programs/jet/src/state/obligation.rs:188:5: 256:6 }  
9      fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
10     fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
11     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
12
```

- description:
- link:
- alleviation:

**Issue: 17: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3     fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4     fn __private::__global::liquidate() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5     fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
    ↳ 180:6 }
6     fn instructions::liquidate::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
    ↳ 126:2 }
7     fn instruc-
    ↳ tions::liquidate::transfer_collateral() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate.rs:128:1:
    ↳ 180:2 }
```

```
8      fn state::obligation::Obligation::liquidate() {  
9          ↪ programs/jet/src/state/obligation.rs:188:5: 256:6 }  
10         fn state::obligation::Obligation::collateral_value() {  
11             ↪ programs/jet/src/state/obligation.rs:293:5: 299:6 }  
12         fn state::cache::Cache::<T, TTL>::try_get() {  
            ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
        fn state::cache::Cache::<T, TTL>::validate_fresh() {  
            ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }
```

- description:
- link:
- alleviation:

**Issue: 18: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3     fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4     fn __private::__global::liquidate() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5     fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
    ↳ 180:6 }
6     fn instructions::liquidate::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
    ↳ 126:2 }
7     fn instruc-
    ↳ tions::liquidate::transfer_collateral() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate.rs:128:1:
    ↳ 180:2 }
```

```
8      fn state::obligation::Obligation::liquidate() {  
9          ↪ programs/jet/src/state/obligation.rs:188:5: 256:6 }  
10         fn state::obligation::Obligation::collateral_value() {  
11             ↪ programs/jet/src/state/obligation.rs:293:5: 299:6 }  
12             fn state::obligation::ObligationSide::_market_value() {  
13                 ↪ programs/jet/src/state/obligation.rs:474:5: 487:6 }  
14                 fn state::market::MarketReserves::get_cached() {  
15                     ↪ programs/jet/src/state/market.rs:202:5: 216:6 }  
16                     fn state::cache::Cache::<T, TTL>::try_get() {  
17                         ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
18                         fn state::cache::Cache::<T,  
19                             ↪ TTL>::validate_fresh() {  
20                             ↪ programs/jet/src/state/cache.rs:57:5:  
21                             ↪ 72:6 }
```

- description:
- link:
- alleviation:



## Issue: 19: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4  fn __private::__global::liquidate() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5  fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
    ↳ 180:6 }
6  fn instructions::liquidate::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
    ↳ 126:2 }
7  fn instructions::repay::repay() { // pro-
    ↳ grams/jet/src/instructions/repay.rs:159:1:
    ↳ 204:2 }

```

```
8      fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
9      fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
10     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
11
```

- description:
- link:
- alleviation:

**Issue: 20: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::liquidate() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
                ↳ 180:6 }
6                 fn instructions::liquidate::handler() { // pro-
                    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
                    ↳ 126:2 }
7                 fn instructions::repay::repay() { // pro-
                    ↳ grams/jet/src/instructions/repay.rs:159:1:
                    ↳ 204:2 }
```

```
8      fn state::reserve::Reserve::unwrap_outstanding_debt() {  
9          ↪ programs/jet/src/state/reserve.rs:185:5: 187:6 }  
10         fn state::reserve::Reserve::unwrap_state() {  
11             ↪ programs/jet/src/state/reserve.rs:202:5: 205:6 }  
12             fn state::cache::Cache::<T, TTL>::expect() {  
13                 ↪ programs/jet/src/state/cache.rs:97:5: 99:6 }  
14                 fn state::cache::Cache::<T, TTL>::try_get() {  
15                     ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
16                     fn state::cache::Cache::<T,  
17                         ↪ TTL>::validate_fresh() {  
18                             ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }  
19                 }  
20             }  
21         }  
22     }  
23 }
```

- description:
- link:
- alleviation:

## Issue: 21: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4  fn __private::__global::liquidate() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5  fn jet::liquidate() { // programs/jet/src/lib.rs:174:5:
    ↳ 180:6 }
6  fn instructions::liquidate::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate.rs:112:1:
    ↳ 126:2 }
7  fn instructions::repay::repay() { // pro-
    ↳ grams/jet/src/instructions/repay.rs:159:1:
    ↳ 204:2 }

```

```

8      fn state::reserve::Reserve::repay() {
9          ↪ programs/jet/src/state/reserve.rs:252:5: 263:6 }
10         fn state::reserve::Reserve::unwrap_state_mut() {
11             ↪ programs/jet/src/state/reserve.rs:207:5: 210:6 }
12         fn state::cache::Cache::<T, TTL>::expect_mut() {
13             ↪ programs/jet/src/state/cache.rs:103:5: 105:6 }
14         fn state::cache::Cache::<T, TTL>::try_get_mut() {
15             ↪ programs/jet/src/state/cache.rs:90:5: 93:6 }
16         fn state::cache::Cache::<T,
17             ↪ TTL>::validate_fresh() {
18             ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }

```

- description:
- link:
- alleviation:

## Issue: 22: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4  fn __private::__global::repay() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5      fn jet::repay() { // programs/jet/src/lib.rs:169:5: 171:6
        ↳ }
6      fn instructions::repay::handler() { //
    ↳ programs/jet/src/instructions/repay.rs:154:1:
    ↳ 157:2 }
7      fn instructions::repay::repay() { // pro-
    ↳ grams/jet/src/instructions/repay.rs:159:1:
    ↳ 204:2 }

```

```
8      fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
9      fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
10     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
11
```

- description:
- link:
- alleviation:



**Issue: 23: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3     fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4     fn __private::__global::repay() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5         fn jet::repay() { // programs/jet/src/lib.rs:169:5: 171:6
    ↳ }
6         fn instructions::repay::handler() { //
    ↳ programs/jet/src/instructions/repay.rs:154:1:
    ↳ 157:2 }
7         fn instructions::repay::repay() { // pro-
    ↳ grams/jet/src/instructions/repay.rs:159:1:
    ↳ 204:2 }
```

```

8      fn state::reserve::Reserve::unwrap_outstanding_debt() { //
      ↪   programs/jet/src/state/reserve.rs:185:5: 187:6 }
9      fn state::reserve::Reserve::unwrap_state() { //
      ↪   programs/jet/src/state/reserve.rs:202:5: 205:6 }
10     fn state::cache::Cache::<T, TTL>::expect() { //
      ↪   programs/jet/src/state/cache.rs:97:5: 99:6 }
11     fn state::cache::Cache::<T, TTL>::try_get() { //
      ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }
12     fn state::cache::Cache::<T,
      ↪   TTL>::validate_fresh() { //
      ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }
13

```

- description:
- link:
- alleviation:

**Issue: 24: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
   ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
   ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
   ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::repay() { //
   ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::repay() { // programs/jet/src/lib.rs:169:5: 171:6
   ↳ }
6             fn instructions::repay::handler() { //
   ↳ programs/jet/src/instructions/repay.rs:154:1:
   ↳ 157:2 }
7             fn instructions::repay::repay() { // pro-
   ↳ grams/jet/src/instructions/repay.rs:159:1:
   ↳ 204:2 }
```

```

8      fn state::reserve::Reserve::repay() {
9          ↪ programs/jet/src/state/reserve.rs:252:5: 263:6 }
10         fn state::reserve::Reserve::unwrap_state_mut() {
11             ↪ programs/jet/src/state/reserve.rs:207:5: 210:6 }
12         fn state::cache::Cache::<T, TTL>::expect_mut() {
13             ↪ programs/jet/src/state/cache.rs:103:5: 105:6 }
14         fn state::cache::Cache::<T, TTL>::try_get_mut() {
15             ↪ programs/jet/src/state/cache.rs:90:5: 93:6 }
16         fn state::cache::Cache::<T,
17             ↪ TTL>::validate_fresh() {
18             ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }

```

- description:
- link:
- alleviation:

**Issue: 25: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::borrow() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::borrow() { // programs/jet/src/lib.rs:164:5:
                ↳ 166:6 }
6                 fn instructions::borrow::handler() { //
                    ↳ programs/jet/src/instructions/borrow.rs:109:1:
                    ↳ 171:2 }
7                 fn
                    ↳ state::market::MarketReserves::get_cached() { //
                    ↳ programs/jet/src/state/market.rs:202:5:
                    ↳ 216:6 }
```

```
8      fn state::cache::Cache::<T, TTL>::try_get(){//  
      ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
9      fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
      ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
10
```

- description:
- link:
- alleviation:

**Issue: 26: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::borrow() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::borrow() { // programs/jet/src/lib.rs:164:5:
                ↳ 166:6 }
6                 fn instructions::borrow::handler() { //
                    ↳ programs/jet/src/instructions/borrow.rs:109:1:
                    ↳ 171:2 }
7                 fn state::reserve::Reserve::borrow() { //
                    ↳ programs/jet/src/state/reserve.rs:238:5:
                    ↳ 249:6 }
```

```
8      fn state::reserve::Reserve::unwrap_state_mut() {  
9          ↪ programs/jet/src/state/reserve.rs:207:5: 210:6 }  
10         fn state::cache::Cache::<T, TTL>::expect_mut() {  
11             ↪ programs/jet/src/state/cache.rs:103:5: 105:6 }  
12             fn state::cache::Cache::<T, TTL>::try_get_mut() {  
13                 ↪ programs/jet/src/state/cache.rs:90:5: 93:6 }  
14                 fn state::cache::Cache::<T, TTL>::validate_fresh() {  
15                     ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }
```

- description:
- link:
- alleviation:



## Issue: 27: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4  fn __private::__global::borrow() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5      fn jet::borrow() { // programs/jet/src/lib.rs:164:5:
        ↳ 166:6 }
6      fn instructions::borrow::handler() { //
        ↳ programs/jet/src/instructions/borrow.rs:109:1:
        ↳ 171:2 }
7      fn
        ↳ state::obligation::Obligation::cache_calculations() { //
        ↳ programs/jet/src/state/obligation.rs:143:5:
        ↳ 153:6 }

```

```
8      fn state::obligation::ObligationSide::_market_value(){//  
    ↪   programs/jet/src/state/obligation.rs:474:5: 487:6 }  
9      fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
10     fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
11     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
12
```

- description:
- link:
- alleviation:

**Issue: 28: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::borrow() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::borrow() { // programs/jet/src/lib.rs:164:5:
                ↳ 166:6 }
6                 fn instructions::borrow::handler() { //
                    ↳ programs/jet/src/instructions/borrow.rs:109:1:
                    ↳ 171:2 }
7                 fn
                    ↳ state::obligation::Obligation::is_healthy() { //
                    ↳ programs/jet/src/state/obligation.rs:157:5:
                    ↳ 182:6 }
```

```
8      fn state::cache::Cache::<T, TTL>::expect() {  
9          ↪ programs/jet/src/state/cache.rs:97:5: 99:6 }  
10         fn state::cache::Cache::<T, TTL>::try_get() {  
11             ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
12         fn state::cache::Cache::<T, TTL>::validate_fresh() {  
13             ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }
```

- description:
- link:
- alleviation:

**Issue: 29: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::withdraw_collateral() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::withdraw_collateral() { //
                ↳ programs/jet/src/lib.rs:155:5: 161:6 }
6                 fn instructions::withdraw_collateral::handler() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/withdraw_collateral.rs:104:1:
                    ↳ 149:2 }
7                 fn
                    ↳ state::market::MarketReserves::get_cached() { //
                    ↳ programs/jet/src/state/market.rs:202:5:
                    ↳ 216:6 }
```

```
8      fn state::cache::Cache::<T, TTL>::try_get(){//  
      ↪  programs/jet/src/state/cache.rs:83:5: 86:6 }  
9      fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
      ↪  programs/jet/src/state/cache.rs:57:5: 72:6 }  
10
```

- description:
- link:
- alleviation:

**Issue: 30: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::withdraw_collateral() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::withdraw_collateral() { //
                ↳ programs/jet/src/lib.rs:155:5: 161:6 }
6                 fn instructions::withdraw_collateral::handler() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/withdraw_collateral.rs:104:1:
                    ↳ 149:2 }
7                 fn
                    ↳ state::obligation::Obligation::cache_calculations() { //
                    ↳ programs/jet/src/state/obligation.rs:143:5:
                    ↳ 153:6 }
```

```
8      fn state::obligation::ObligationSide::_market_value() {  
9          ↪ programs/jet/src/state/obligation.rs:474:5: 487:6 }  
10         fn state::market::MarketReserves::get_cached() {  
11             ↪ programs/jet/src/state/market.rs:202:5: 216:6 }  
12             fn state::cache::Cache::<T, TTL>::try_get() {  
13                 ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
14                 fn state::cache::Cache::<T, TTL>::validate_fresh() {  
15                     ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }
```

- description:
- link:
- alleviation:



**Issue: 31: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::withdraw_collateral() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::withdraw_collateral() { //
                ↳ programs/jet/src/lib.rs:155:5: 161:6 }
6                 fn instructions::withdraw_collateral::handler() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/withdraw_collateral.rs:104:1:
                    ↳ 149:2 }
7                 fn
                    ↳ state::obligation::Obligation::is_healthy() { //
                    ↳ programs/jet/src/state/obligation.rs:157:5:
                    ↳ 182:6 }
```

```
8      fn state::cache::Cache::<T, TTL>::expect(){//  
    ↪   programs/jet/src/state/cache.rs:97:5: 99:6 }  
9      fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
10     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
11
```

- description:
- link:
- alleviation:

**Issue: 32: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::deposit_collateral() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::deposit_collateral() { //
                ↳ programs/jet/src/lib.rs:146:5: 152:6 }
6                 fn instructions::deposit_collateral::handler() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/deposit_collateral.rs:99:1:
                    ↳ 138:2 }
7                 fn
                    ↳ state::market::MarketReserves::get_cached() { //
                    ↳ programs/jet/src/state/market.rs:202:5:
                    ↳ 216:6 }
```

```
8      fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
9      fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
10
```

- description:
- link:
- alleviation:

**Issue: 33: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/reserve.rs:315:27: 315:54

```
315 target_time - accrued_until
316
```

- Code Context

Vulnerability at Line: 315

```
310         outstanding_debt,
311         accrued_until,
312         ..
313     } = *self.state().get_stale();
314
315     let time_behind = target_time - accrued_until;
316     let time_to_accrue = std::cmp::min(time_behind,
317         ↪ MAX_ACCRUAL_SECONDS);
318
319     let interest_rate = self.interest_rate(outstanding_debt,
320         ↪ vault_total);
321     let state_cache: &mut Cache<ReserveState, 0> =
322         ↪ bytemuck::from_bytes_mut(&mut self.state);
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
  ↪ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
  ↪ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4             fn __private::__global::refresh_reserve() { //
  ↪         ↪ programs/jet/src/lib.rs:38:1: 38:11 }
```

```
5      fn jet::refresh_reserve(){//  
    ↪ programs/jet/src/lib.rs:192:5: 194:6 }  
6      fn instructions::refresh_reserve::handler(){// pro-  
    ↪ grams/jet/src/instructions/refresh_reserve.rs:70:1:  
    ↪ 142:2 }  
7      fn  
    ↪ state::reserve::Reserve::try_accrue_interest(){//  
    ↪ programs/jet/src/state/reserve.rs:303:5:  
    ↪ 348:6 }  
8
```

- description:
- link:
- alleviation:

**Issue: 34: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::refresh_reserve() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5         fn jet::refresh_reserve() { //
            ↳ programs/jet/src/lib.rs:192:5: 194:6 }
6         fn instructions::refresh_reserve::handler() { // pro-
            ↳ grams/jet/src/instructions/refresh_reserve.rs:70:1:
            ↳ 142:2 }
7         fn
            ↳ state::reserve::Reserve::deposit_note_exchange_rate() { //
            ↳ programs/jet/src/state/reserve.rs:274:5:
            ↳ 289:6 }
```

```
8      fn state::reserve::Reserve::unwrap_state() {  
9          ↪ programs/jet/src/state/reserve.rs:202:5: 205:6 }  
10         fn state::cache::Cache::<T, TTL>::expect() {  
11             ↪ programs/jet/src/state/cache.rs:97:5: 99:6 }  
12             fn state::cache::Cache::<T, TTL>::try_get() {  
13                 ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
14                 fn state::cache::Cache::<T, TTL>::validate_fresh() {  
15                     ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }
```

- description:
- link:
- alleviation:



**Issue: 35: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::refresh_reserve() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5         fn jet::refresh_reserve() { //
            ↳ programs/jet/src/lib.rs:192:5: 194:6 }
6         fn instructions::refresh_reserve::handler() { // pro-
            ↳ grams/jet/src/instructions/refresh_reserve.rs:70:1:
            ↳ 142:2 }
7         fn
            ↳ state::reserve::Reserve::loan_note_exchange_rate() { //
            ↳ programs/jet/src/state/reserve.rs:292:5:
            ↳ 300:6 }
```

```
8      fn state::reserve::Reserve::unwrap_state() {  
9          ↪ programs/jet/src/state/reserve.rs:202:5: 205:6 }  
10         fn state::cache::Cache::<T, TTL>::expect() {  
11             ↪ programs/jet/src/state/cache.rs:97:5: 99:6 }  
12             fn state::cache::Cache::<T, TTL>::try_get() {  
13                 ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
14                 fn state::cache::Cache::<T, TTL>::validate_fresh() {  
15                     ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }
```

- description:
- link:
- alleviation:

## Issue: 36: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4  fn __private::__global::refresh_reserve() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5  fn jet::refresh_reserve() { //
    ↳ programs/jet/src/lib.rs:192:5: 194:6 }
6  fn instructions::refresh_reserve::handler() { // pro-
    ↳ grams/jet/src/instructions/refresh_reserve.rs:70:1:
    ↳ 142:2 }
7  fn
    ↳ state::reserve::Reserve::collect_accrued_fees() { //
    ↳ programs/jet/src/state/reserve.rs:353:5:
    ↳ 368:6 }

```

```
8      fn state::reserve::Reserve::unwrap_state_mut(){//  
    ↪   programs/jet/src/state/reserve.rs:207:5: 210:6 }  
9      fn state::cache::Cache::<T, TTL>::expect_mut(){//  
    ↪   programs/jet/src/state/cache.rs:103:5: 105:6 }  
10     fn state::cache::Cache::<T, TTL>::try_get_mut(){//  
    ↪   programs/jet/src/state/cache.rs:90:5: 93:6 }  
11     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
12
```

- description:
- link:
- alleviation:

**Issue: 37: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::withdraw_tokens() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::withdraw_tokens() { //
                ↳ programs/jet/src/lib.rs:141:5: 143:6 }
6                 fn instructions::withdraw_tokens::handler() { // pro-
                    ↳ grams/jet/src/instructions/withdraw_tokens.rs:89:1:
                    ↳ 119:2 }
7                 fn
                    ↳ state::market::MarketReserves::get_cached() { //
                    ↳ programs/jet/src/state/market.rs:202:5:
                    ↳ 216:6 }
```

```
8      fn state::cache::Cache::<T, TTL>::try_get(){//  
      ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
9      fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
      ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
10
```

- description:
- link:
- alleviation:

**Issue: 38: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::withdraw() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::withdraw() { // programs/jet/src/lib.rs:136:5:
                ↳ 138:6 }
6                 fn instructions::withdraw::handler() { //
                    ↳ programs/jet/src/instructions/withdraw.rs:73:1:
                    ↳ 86:2 }
7                 fn instructions::withdraw_tokens::handler() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/withdraw_tokens.rs:89:1:
                    ↳ 119:2 }
```

```
8      fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
9      fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
10     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
11
```

- description:
- link:
- alleviation:



**Issue: 39: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::deposit_tokens() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::deposit_tokens() { //
                ↳ programs/jet/src/lib.rs:131:5: 133:6 }
6                 fn instructions::deposit_tokens::handler() { // pro-
                    ↳ grams/jet/src/instructions/deposit_tokens.rs:89:1:
                    ↳ 116:2 }
7                 fn
                    ↳ state::market::MarketReserves::get_cached() { //
                    ↳ programs/jet/src/state/market.rs:202:5:
                    ↳ 216:6 }
```

```
8      fn state::cache::Cache::<T, TTL>::try_get(){//  
      ↪  programs/jet/src/state/cache.rs:83:5: 86:6 }  
9      fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
      ↪  programs/jet/src/state/cache.rs:57:5: 72:6 }  
10
```

- description:
- link:
- alleviation:

**Issue: 40: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::deposit() { //
            ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5             fn jet::deposit() { // programs/jet/src/lib.rs:126:5:
                ↳ 128:6 }
6                 fn instructions::deposit::handler() { //
                    ↳ programs/jet/src/instructions/deposit.rs:73:1:
                    ↳ 86:2 }
7                 fn instructions::deposit_tokens::handler() { //
                    ↳ pro-
                    ↳ grams/jet/src/instructions/deposit_tokens.rs:89:1:
                    ↳ 116:2 }
```

```
8      fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
9      fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
10     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
11
```

- description:
- link:
- alleviation:

## Issue: 41: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn __private::__global::close_deposit_account() { //
    ↳ programs/jet/src/lib.rs:38:1: 38:11 }
5         fn jet::close_deposit_account() { //
    ↳ programs/jet/src/lib.rs:103:5: 105:6 }
6         fn instruc-
    ↳ tions::close_deposit_account::handler() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/close_deposit_account.rs:108:1:
    ↳ 150:2 }
```

```
7          fn
            ↳ state::market::MarketReserves::get_cached() { //
            ↳ programs/jet/src/state/market.rs:202:5:
            ↳ 216:6 }
8  fn state::cache::Cache::<T, TTL>::try_get() { //
    ↳ programs/jet/src/state/cache.rs:83:5: 86:6 }
9      fn state::cache::Cache::<T, TTL>::validate_fresh() { //
    ↳ programs/jet/src/state/cache.rs:57:5: 72:6 }
10
```

- description:
- link:
- alleviation:

**Issue: 42: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4             fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5                 fn instructions::liquidate_dex::handler_raw() { // pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
    ↳ 756:2 }
6                 fn instructions::liquidate_dex::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
    ↳ 733:2 }
7                 fn instruc-
    ↳ tions::liquidate_dex::LiquidateDex:::<'info>::verify_unhe
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:299:5:
    ↳ 312:6 }
```

```
8      fn state::obligation::Obligation::cache_calculations(){//  
    ↪   programs/jet/src/state/obligation.rs:143:5: 153:6 }  
9      fn state::obligation::ObligationSide::_market_value(){//  
    ↪   programs/jet/src/state/obligation.rs:474:5: 487:6 }  
10     fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
11     fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
12     fn state::cache::Cache::<T,  
    ↪   TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
13
```

- description:
- link:
- alleviation:



**Issue: 43: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4             fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5                 fn instructions::liquidate_dex::handler_raw() { // pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
    ↳ 756:2 }
6                 fn instructions::liquidate_dex::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
    ↳ 733:2 }
7                 fn instruc-
    ↳ tions::liquidate_dex::LiquidateDex:::<'info>::verify_unhe
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:299:5:
    ↳ 312:6 }
```

```
8      fn state::obligation::Obligation::is_healthy(){//  
    ↪   programs/jet/src/state/obligation.rs:157:5: 182:6 }  
9      fn state::cache::Cache::<T, TTL>::expect(){//  
    ↪   programs/jet/src/state/cache.rs:97:5: 99:6 }  
10     fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
11     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
12
```

- description:
- link:
- alleviation:

**Issue: 44: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5             fn instructions::liquidate_dex::handler_raw() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
                ↳ 756:2 }
6             fn instructions::liquidate_dex::handler() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                ↳ 733:2 }
7             fn instruc-
                ↳ tions::liquidate_dex::calculate_collateral_swap_plan() { //
                ↳ pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:498:1:
                ↳ 514:2 }
```

```
8      fn instructions::liquidate_dex::SwapCalculator::<'a,  
    ↪ 'info>::new() {  
    ↪ programs/jet/src/instructions/liquidate_dex.rs:364:5: 388:6 }  
9      fn state::market::MarketReserves::get_cached() {  
    ↪ programs/jet/src/state/market.rs:202:5: 216:6 }  
10     fn state::cache::Cache::<T, TTL>::try_get() {  
    ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
11     fn state::cache::Cache::<T, TTL>::validate_fresh() {  
    ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }  
12
```

- description:
- link:
- alleviation:

**Issue: 45: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5             fn instructions::liquidate_dex::handler_raw() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
                ↳ 756:2 }
6             fn instructions::liquidate_dex::handler() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                ↳ 733:2 }
7             fn instruc-
                ↳ tions::liquidate_dex::calculate_collateral_swap_plan() { //
                ↳ pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:498:1:
                ↳ 514:2 }
```

```
8      fn instructions::liquidate_dex::SwapCalculator::<'a,  
    ↪ 'info>::plan() {  
    ↪ programs/jet/src/instructions/liquidate_dex.rs:440:5: 494:6 }  
9      fn state::obligation::Obligation::collateral_value() {  
    ↪ programs/jet/src/state/obligation.rs:293:5: 299:6 }  
10     fn state::cache::Cache::<T, TTL>::try_get() {  
    ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
11     fn state::cache::Cache::<T, TTL>::validate_fresh() {  
    ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }  
12
```

- description:
- link:
- alleviation:

**Issue: 46: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
   ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
   ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
   ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4             fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5                 fn instructions::liquidate_dex::handler_raw() { // pro-
   ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
   ↳ 756:2 }
6                 fn instructions::liquidate_dex::handler() { // pro-
   ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
   ↳ 733:2 }
7                 fn instruc-
   ↳ tions::liquidate_dex::calculate_collateral_swap_plan() { //
   ↳ pro-
   ↳ grams/jet/src/instructions/liquidate_dex.rs:498:1:
   ↳ 514:2 }
```

```
8      fn instructions::liquidate_dex::SwapCalculator::<'a,  
    ↪ 'info>::plan() {  
    ↪ programs/jet/src/instructions/liquidate_dex.rs:440:5: 494:6 }  
9      fn state::obligation::Obligation::collateral_value() {  
    ↪ programs/jet/src/state/obligation.rs:293:5: 299:6 }  
10     fn state::obligation::ObligationSide::_market_value() {  
    ↪ programs/jet/src/state/obligation.rs:474:5: 487:6 }  
11     fn state::market::MarketReserves::get_cached() {  
    ↪ programs/jet/src/state/market.rs:202:5: 216:6 }  
12     fn state::cache::Cache::<T, TTL>::try_get() {  
    ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
13     fn state::cache::Cache::<T,  
    ↪ TTL>::validate_fresh() {  
    ↪ programs/jet/src/state/cache.rs:57:5:  
    ↪ 72:6 }  
14
```

- description:
- link:
- alleviation:



**Issue: 47: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5             fn instructions::liquidate_dex::handler_raw() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
                ↳ 756:2 }
6             fn instructions::liquidate_dex::handler() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                ↳ 733:2 }
7             fn instruc-
                ↳ tions::liquidate_dex::calculate_collateral_swap_plan() { //
                ↳ pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:498:1:
                ↳ 514:2 }
```

```

8      fn instructions::liquidate_dex::SwapCalculator::<'a,
    ↪   'info>::plan() { //
    ↪   programs/jet/src/instructions/liquidate_dex.rs:440:5: 494:6 }
9      fn state::obligation::Obligation::loan_value() { //
    ↪   programs/jet/src/state/obligation.rs:301:5: 307:6 }
10     fn state::cache::Cache::<T, TTL>::try_get() { //
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }
11     fn state::cache::Cache::<T, TTL>::validate_fresh() { //
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }
12

```

- description:
- link:
- alleviation:

**Issue: 48: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5             fn instructions::liquidate_dex::handler_raw() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
                ↳ 756:2 }
6             fn instructions::liquidate_dex::handler() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                ↳ 733:2 }
7             fn instruc-
                ↳ tions::liquidate_dex::calculate_collateral_swap_plan() { //
                ↳ pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:498:1:
                ↳ 514:2 }
```

```
8      fn instructions::liquidate_dex::SwapCalculator::<'a,  
    ↪ 'info>::plan() {  
    ↪ programs/jet/src/instructions/liquidate_dex.rs:440:5: 494:6 }  
9      fn state::obligation::Obligation::loan_value() {  
    ↪ programs/jet/src/state/obligation.rs:301:5: 307:6 }  
10     fn state::obligation::ObligationSide::_market_value() {  
    ↪ programs/jet/src/state/obligation.rs:474:5: 487:6 }  
11     fn state::market::MarketReserves::get_cached() {  
    ↪ programs/jet/src/state/market.rs:202:5: 216:6 }  
12     fn state::cache::Cache::<T, TTL>::try_get() {  
    ↪ programs/jet/src/state/cache.rs:83:5: 86:6 }  
13     fn state::cache::Cache::<T,  
    ↪ TTL>::validate_fresh() {  
    ↪ programs/jet/src/state/cache.rs:57:5:  
    ↪ 72:6 }  
14
```

- description:
- link:
- alleviation:

**Issue: 49: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5             fn instructions::liquidate_dex::handler_raw() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
                ↳ 756:2 }
6             fn instructions::liquidate_dex::handler() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                ↳ 733:2 }
7             fn instruc-
                ↳ tions::liquidate_dex::verify_proceeds() { //
                ↳ pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:590:1:
                ↳ 619:2 }
```

```
8      fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
9      fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
10     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
11
```

- description:
- link:
- alleviation:

**Issue: 50: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5             fn instructions::liquidate_dex::handler_raw() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
                ↳ 756:2 }
6             fn instructions::liquidate_dex::handler() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                ↳ 733:2 }
7             fn instruc-
                ↳ tions::liquidate_dex::update_accounting() { //
                ↳ pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:623:1:
                ↳ 681:2 }
```

```
8      fn state::market::MarketReserves::get_cached(){//  
    ↪   programs/jet/src/state/market.rs:202:5: 216:6 }  
9      fn state::cache::Cache::<T, TTL>::try_get(){//  
    ↪   programs/jet/src/state/cache.rs:83:5: 86:6 }  
10     fn state::cache::Cache::<T, TTL>::validate_fresh(){//  
    ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }  
11
```

- description:
- link:
- alleviation:



## Issue: 51: IntegerFlow

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```

58 current_slot - self.last_updated
59

```

- Code Context

Vulnerability at Line: 58

```

57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63

```

- Call Stack

```

1  fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2  fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3  fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4  fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5  fn instructions::liquidate_dex::handler_raw() { // pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
    ↳ 756:2 }
6  fn instructions::liquidate_dex::handler() { // pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
    ↳ 733:2 }
7  fn instruc-
    ↳ tions::liquidate_dex::update_accounting() { //
    ↳ pro-
    ↳ grams/jet/src/instructions/liquidate_dex.rs:623:1:
    ↳ 681:2 }

```

```

8      fn state::reserve::Reserve::repay() {
9          ↪ programs/jet/src/state/reserve.rs:252:5: 263:6 }
10         fn state::reserve::Reserve::unwrap_state_mut() {
11             ↪ programs/jet/src/state/reserve.rs:207:5: 210:6 }
12         fn state::cache::Cache::<T, TTL>::expect_mut() {
13             ↪ programs/jet/src/state/cache.rs:103:5: 105:6 }
14         fn state::cache::Cache::<T, TTL>::try_get_mut() {
15             ↪ programs/jet/src/state/cache.rs:90:5: 93:6 }
16         fn state::cache::Cache::<T,
17             ↪ TTL>::validate_fresh() {
18             ↪ programs/jet/src/state/cache.rs:57:5: 72:6 }

```

- description:
- link:
- alleviation:

**Issue: 52: IntegerFlow**

Category	Severity	Status
IntegerFlow	Critical	UnResolved

- Location

programs/jet/src/state/cache.rs:58:12: 58:44

```
58 current_slot - self.last_updated
59
```

- Code Context

Vulnerability at Line: 58

```
57 pub fn validate_fresh(&self, current_slot: u64) -> Result<(),
    ↳ CacheInvalidError> {
58     if current_slot - self.last_updated > TTL {
59         return Err(CacheInvalidError::Expired {
60             msg: self.time_msg(current_slot),
61         });
62     }
63
```

- Call Stack

```
1 fn entrypoint() { // /root/.cargo/registry/src/github.com-
    ↳ 1ecc6299db9ec823/solana-program-1.8.11/src/entrypoint.rs:119:9: 126:10
    ↳ }
2     fn entry() { // programs/jet/src/lib.rs:38:1: 38:11 }
3         fn dispatch() { // programs/jet/src/lib.rs:38:1: 38:11 }
4         fn jet::default() { // programs/jet/src/lib.rs:197:5: 209:6 }
5             fn instructions::liquidate_dex::handler_raw() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:739:1:
                ↳ 756:2 }
6             fn instructions::liquidate_dex::handler() { // pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:684:1:
                ↳ 733:2 }
7             fn instruc-
                ↳ tions::liquidate_dex::update_accounting() { //
                ↳ pro-
                ↳ grams/jet/src/instructions/liquidate_dex.rs:623:1:
                ↳ 681:2 }
```

```

8      fn state::reserve::Reserve::add_uncollected_fees() { //
      ↪   programs/jet/src/state/reserve.rs:267:5: 271:6 }
9      fn state::reserve::Reserve::unwrap_state_mut() { //
      ↪   programs/jet/src/state/reserve.rs:207:5: 210:6 }
10     fn state::cache::Cache::<T, TTL>::expect_mut() { //
      ↪   programs/jet/src/state/cache.rs:103:5: 105:6 }
11     fn state::cache::Cache::<T, TTL>::try_get_mut() { //
      ↪   programs/jet/src/state/cache.rs:90:5: 93:6 }
12     fn state::cache::Cache::<T,
      ↪   TTL>::validate_fresh() { //
      ↪   programs/jet/src/state/cache.rs:57:5: 72:6 }
13

```

- 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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