

Draft
Security Assessment for

81-2022-01-notional (10K-FLP) (1Positive-UT) (StaticFail)

July 23, 2023



Issues

Executive Summary

Overview Opposition	
Project Name	81-2022-01-notional (10K-FLP) (1Positive-UT) (StaticFail)
Codebase URL	https://github.com/daoyuan14/2022-01- notional/
Scan Engine	Al Analyzer
Scan Time	2023/07/23 23:27:19
Commit Id	478607e

Total		N
Critical Issues	PIAL AUDIT REPORT	
High risk Issues	3 RT	
Medium risk Issues	0	
Low risk Issues	0	
Informational	0	

Critical Issues	The issue can cause large economic losses, large-scale data disorder, loss of control of authority management, failure of key functions, or indirectly affect the correct operation of other smart contracts interacting with it.
High Risk Issues	The issue puts a large number of users' sensitive information at risk or is reasonably likely to lead to catastrophic impacts on clients' reputations or serious financial implications for clients and users.
Medium Risk Issues	The issue puts a subset of users' sensitive information at risk, would be detrimental to the client's reputation if exploited, or is reasonably likely to lead to moderate financial impact.
Low Risk Issues	The risk is relatively small and could not be exploited on a recurring basis, or is a risk that the client has indicated is low-impact in view of the client's business circumstances.
Informational Issue	The issue does not pose an immediate risk but is relevant to security best practices or Defence in Depth.





Summary of Findings

MetaScan security assessment was performed on July 23, 2023 23:27:19 on project 81-2022-01-notional (10K-FLP) (1Positive-UT) (StaticFail) with the repository

https://github.com/daoyuan14/2022-01-notional/ on branch default branch. The assessment was carried out by scanning the project's codebase using the scan engine Al Analyzer. There are in total 3 vulnerabilities / security risks discovered during the scanning session, among which 0 critical vulnerabilities, 3 high risk vulnerabilities, 0 medium risk vulnerabilities, 0 low risk vulnerabilities, 0 informational issues.

ID Avo	Description	Severity
MSA-001	MWE-200: Insecure LP Token Value Calculation	High risk
MSA-002	MWE-200: Insecure LP Token Value Calculation	High risk
MSA-003	MWE-207: Unauthorized Transfer	High risk





Findings



Critical (0)

No Critical vulnerabilities found here TCIAL AUDIT REPORT



High risk (3)

1. MWE-200: Insecure LP Token Value Calculation



👍 High risk



Security Analyzer

Liquidity token value/price can be manipulated to cause flashloan attacks.

File(s) Affected

contracts/sNOTE.sol #271-293

```
function getVotingPower(uint256 sNOTEAmount) public view returns (uint256) {
   // Gets the BPT token price (in ETH)
   uint256 bptPrice = IPriceOracle(address(BALANCER_POOL_TOKEN)).getLatest(IPriceOracle.Variable.I
   // Gets the NOTE token price (in ETH)
   uint256 notePrice = IPriceOracle(address(BALANCER_POOL_TOKEN)).getLatest(IPriceOracle.Variable
   // Since both bptPrice and notePrice are denominated in ETH, we can use
    // this formula to calculate noteAmount
   // bptBalance * bptPrice = notePrice * noteAmount
   // noteAmount = bptPrice/notePrice * bptBalance
   uint256 priceRatio = bptPrice * 1e18 / notePrice;
   uint256 bptBalance = BALANCER_POOL_TOKEN.balanceOf(address(this));
   // Amount_note = Price_NOTE_per_BPT * BPT_supply * 80% (80/20 pool)
   uint256 noteAmount = priceRatio * bptBalance * 80 / 100;
   // Reduce precision down to 1e8 (NOTE token)
   // priceRatio and bptBalance are both 1e18 (1e36 total)
   // we divide by 1e28 to get to 1e8
   noteAmount /= 1e28;
   return (noteAmount * sNOTEAmount) / totalSupply();
                                        NON-OFFICIAL AUDIT REPORT
```

Recommendation

Do not use AMM pool or custom liquidity calculation to caculate LP token value/price.



2. MWE-200: Insecure LP Token Value Calculation





Liquidity token value/price can be manipulated to cause flashloan attacks.

File(s) Affected

contracts/sNOTE.sol #328-356

```
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function _mint(address account, uint256 bptAmount) internal override(ERC20Upgradeable, ERC20VotesUpgradeable, ERC2
         // Cannot mint if a cooldown is already in effect. If an account mints during a cool down period
         // be able to redeem the tokens immediately, bypassing the cool down.
         requireAccountNotInCoolDown(account):
         // Immediately after minting, we need to satisfy the equality:
         // (sNOTEToMint * bptBalance) / (totalSupply + sNOTEToMint) == bptAmount
         // Rearranging to get sNOTEToMint on one side:
         // (sNOTETOMint * bptBalance) = (totalSupply + sNOTETOMint) * bptAmount
  // (sNOTETOMint * bptBalance) = totalSupply * bptAmount + sNOTETOMint * bptAmount
         // (sNOTETOMint * bptBalance) - (sNOTETOMint * bptAmount) = totalSupply * bptAmount
         // sNOTEToMint * (bptBalance - bptAmount) = totalSupply * bptAmount
         // sNOTEToMint = (totalSupply * bptAmount) / (bptBalance - bptAmount)
         // NOTE: at this point the BPT has already been transferred into the sNOTE contract, so this
         uint256 bptBalance = BALANCER_POOL_TOKEN.balanceOf(address(this));
         uint256 _totalSupply = totalSupply();
         uint256 sNOTEToMint;
         if (_totalSupply == 0) {
                  sNOTEToMint = bptAmount;
        } else {
         sNOTEToMint = (_totalSupply * bptAmount) / (bptBalance - bptAmount);
         // Handles event emission, balance update and total supply update
         super._mint(account, sNOTEToMint);
```



contracts/sNOTE.sol #190-214

```
function _mintFromAssets(IAsset[] memory assets, uint256[] memory maxAmountsIn) internal {
        uint256 bptBefore = BALANCER_POOL_TOKEN.balanceOf(address(this));
        // Set msgValue when joining via ETH
         uint256 msgValue = assets[0] == IAsset(address(0)) ? maxAmountsIn[0] : 0;
IVault.JoinPoolRequest(
                assets,
                maxAmountsIn,
                abi.encode(
                    IVault.JoinKind.EXACT_TOKENS_IN_FOR_BPT_OUT,
                    maxAmountsIn,
                    0 // Accept however much BPT the pool will give us
                 false // Don't use internal balances
207N-OFFICIAL AUDIT
          uint256 bptAfter = BALANCER_POOL_TOKEN.balanceOf(address(this));
          // Balancer pool token amounts must increase
          _mint(msg.sender, bptAfter - bptBefore);
     }
```

Recommendation

Do not use AMM pool or custom liquidity calculation to caculate LP token value/price.



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3. MWE-207: Unauthorized Transfer





Security Analyzer

The contract allows transferring tokens from an address different from the message sender without checking the approval of the address owner.

File(s) Affected



contracts/TreasuryAction.sol #148-199

```
function transferReserveToTreasury(uint16[] calldata currencies)
           external
           override
           onlyManagerContract
           nonReentrant
           returns (uint256[] memory)
     uint256[] memory amountsTransferred = new uint256[](currencies.length);
           for (uint256 i; i < currencies.length; i++) {</pre>
               // Prevents duplicate currency IDs
               if (i > 0) require(currencies[i] > currencies[i - 1], "IDs must be sorted");
               uint16 currencyId = currencies[i];
               _checkValidCurrency(currencyId);
               // Reserve buffer amount in INTERNAL_TOKEN_PRECISION
               int256 bufferInternal = SafeInt256.toInt(reserveBuffer[currencyId]);
                                                 N-OFFICIAL AUDIT REPORT
     OFFICIA /// Reserve requirement not defined
               if (bufferInternal == 0) continue;
               // prettier-ignore
               (int256 reserveInternal, /* */, /* */, /* */) = BalanceHandler.getBalanceStorage(Constants.
               // Do not withdraw anything if reserve is below or equal to reserve requirement
               if (reserveInternal <= bufferInternal) continue;</pre>
               Token memory asset = TokenHandler.getAssetToken(currencyId);
               // Actual reserve amount allowed to be redeemed and transferred
     // Redeems cTokens and transfer underlying to treasury manager contract
               amountsTransferred[i] = _redeemAndTransfer(
                  currencyId,
                   asset,
                   assetInternalRedeemAmount
               );
               // Updates the reserve balance
                                             rveBaru.
VON-OFFICIAL AUDIT REPORT
               BalanceHandler.harvestExcessReserveBalance(
191N-OFFICIAL
                   currencyId,
                reserveInternal,
                   assetInternalRedeemAmount
               );
           // NOTE: TreasuryManager contract will emit an AssetsHarvested event
           return amountsTransferred;
```

Recommendation

Check the business logic about the transfer and add the approval check if necessary.



← Medium risk (0)

No Medium risk vulnerabilities found here



Low risk (0)

No Low risk vulnerabilities found here



FICIAL AUDIT REPORT (?) Informational (0)

No Informational vulnerabilities found here



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