METATRUST

Security Assessment for

uniwhale

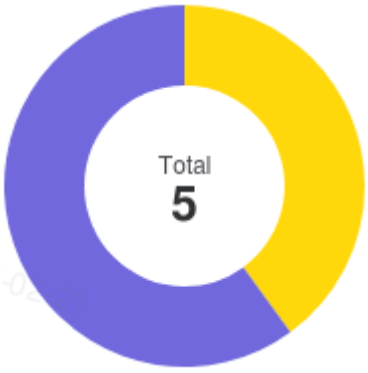
February 21, 2023

Executive Summary

Overview	
Project Name	uniwhale
Codebase Path	git://github.com/uniwhale
Scan Engine	Security Analyzer
Scan Time	2023/02/21 12:49:35
Source Code	uniwhale commit:-

Total	
Critical Issues	0
High risk Issues	0
Medium risk Issues	2
Low risk Issues	3
Informational Issues	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.



Critical Issues	0%	0
High risk Issues	0%	0
Medium risk Issues	40%	2
Low risk Issues	60%	3
Informational Issues	0%	0

Summary of Findings

MetaScan security assessment was performed on **February 21, 2023 12:49:35** on project **uniwhale** with the repository **uniwhale** on branch **default branch**. The assessment was carried out by scanning the project's codebase using the scan engine **Security Analyzer**. There are in total **5** vulnerabilities / security risks discovered during the scanning session, among which **0** critical vulnerabilities, **0** high risk vulnerabilities, **2** medium risk vulnerabilities, **3** low risk vulnerabilities, **0** informational issues.

ID	Description	Severity	Alleviation
MSA-001	Centralized Roles	Medium risk	Acknowledged
MSA-002	Lack of check of salt in updateOpenOrder in RegistryCore.sol	Medium risk	Fixed
MSA-003	Incompatible with fee-charging token	Low risk	Fixed
MSA-004	Potential Redundant ETH Locked in the TradingCore Contract	Low risk	Acknowledged
MSA-005	Unused return value in contracts/LiquidityPool.sol	Low risk	Acknowledged

Findings

Critical (0)

No Critical vulnerabilities found here

High risk (0)

No High risk vulnerabilities found here

Medium risk (2)

1. Centralized Roles

Medium risk Security Analyzer

In the LiquidityPool contract, the centralized role owner has permission for the following functions:

- setSwapRouter: update the swapRouter;
- setMintFee:update the mintFee;
- setBurnFee: update the burnFee;
- collectAccruedFee: send the fee to the owner;
- pause:pause the contract;

In the LiquidityPool contract, the approved role has permission for the following functions:

- transferBase:transfer the baseToken token to arbitrage account;
- transferBaseFrom:transferbaseToken from an arbitrage account to another arbitrage account with the amount the from account approved to the LiquidityPool contract.

In the AbstractRegistry contract, the centralized role owner has permission for the following functions:

- setMaxOpenTradesPerPriceId: update the maxOpenTradesPerPriceId;
- setMaxOpenTradesPerUser: update the maxOpenTradesPerUser;
- setMaxMarginPerUser: update the maxMarginPerUser;
- setMinPositionPerTrade: update the minPositionPerTrade;
- setApprovedPriceId: update the approvedPriceId for the specified priceId;
- setLiquidationThresholdPerPriceId:update the liquidationThresholdPerPriceId for the specified priceId;
- setLiquidationPenalty: update the liquidationPenalty;
- setMaxLeveragePerPriceId:update the maxLeveragePerPriceId for the specified priceId;
- setMinLeveragePerPriceId: update the minLeveragePerPriceId for the specified priceId;
- setMaxPercentagePnLFloor:update the maxPercentagePnLFloor;
- setMaxPercentagePnLCap:update the maxPercentagePnLCap;
- setMaxPercentagePnLFactor: update the maxPercentagePnLFactor;
- setFee: update the fee;
- setFeeFactor: update the feeFactor;
- setStopFee: update the stopFee;
- setFundingFeePerPriceId: update the _fundingFeePerPriceId for the specified priceId;
- setImpactRefDepthLongPerPriceId: update the impactRefDepthLongPerPriceId for the specified priceId;
- setImpactRefDepthShortPerPriceId: update the impactRefDepthShortPerPriceId for the specified priceId;

In the RegistryCore contract, the centralized approved role has permission for the following functions:

- openMarketOrder:open a market order for the specified priceId;
- closeMarketOrder:close a market order for the specified order;
- updateOpenOrder: update a market order for the specified order;

In the TradingCore contract, the centralized role owner has permission for the following functions:

- pause:pause the contract;

- setOracleAggregator: set the oracleAggregator;

In the TradingCore contract, the centralized approved role has permission for the following functions:

- createTrade: create a trade;
- openMarketOrder(OpenTradeInput calldata openData,uint256 openPrice):open a market order;
- openMarketOrder(OpenTradeInput calldata openData, bytes[] calldata priceData): open a market order;
- closeMarketOrder:close a market order;
- addMargin: add some margin for an order;
- removeMargin: remove some for an order;

In the TradingCore contract, the centralized role liquidator has permission for the following functions:

- liquidateMarketOrder: liquidate a market order;

File(s) Affected

contracts/LiquidityPool.sol #15-19
contracts/interfaces/AbstractRegistry.sol #12-20
contracts/RegistryCore.sol #7-9
contracts/TradingCore.sol #18-23

Examples

```
15
16 contract LiquidityPool is
17   AbstractPool,
18   ERC20PausableUpgradeable,
19   ReentrancyGuardUpgradeable,
```

Recommendation

We advise using the multi-signature wallet and the timelock to mitigate the centralized role issue.

Alleviation Acknowledged

Owner will be a multisig/DAO contract, partially mitigating the centralisation risk

2. Lack of check of salt in updateOpenOrder in RegistryCore.sol

Medium risk Security Analyzer

When the updateOpenOrder is executed, the check of salt in order is missing, resulting in the fact that the orderHash and trade in the input parameter may not be the same order Normally, the salt in trade should be self-increasing. If the salt in trade is filled incorrectly, even if the orderhash is filled correctly, it will cause an unexpected order to be updated, which will cause a situation, that is, different orderhashes correspond to orders with the same information, or the same trade information corresponds to different orderhashes, which violates the requirements of data consistency

File(s) Affected

contracts/RegistryCore.sol #131-139

Examples

```
137   ) external override onlyRole(APPROVED_ROLE) {
138     Trade memory t = _openTradeByOrderHash[orderHash];
139
140     _require(t.user == trade.user, Errors.TRADER_OWNER_MISMATCH);
141     _require(t.priceId == trade.priceId, Errors.PRICE_ID_MISMATCH);
142     _require(t.isBuy == trade.isBuy, Errors.TRADE_DIRECTION_MISMATCH);
143
144     _openTradeByOrderHash[orderHash] = trade;
145     totalMarginPerUser[trade.user] = totalMarginPerUser[trade.user]
```

Recommendation

Add check of t.salt == trade.salt.

Alleviation Fixed

-

Low risk (3)

1. Incompatible with fee-charging token

Low risk Security Analyzer

If the tokenIn token is a deflationary token, the LiquidityPool contract received tokens will be less than the assigned number, amountIn , as a result, there is not enough tokenIn token can be swapped by the swapRouter . If the tokenIn token is a deflationary token, whether the function swapGivenIn supports the fee-charing tokens also counts.

File(s) Affected

contracts/LiquidityPool.sol #324-332

Examples

```
324          swapRouter.swapGivenIn(
325            ISwapRouter.SwapGivenInInput(
326              address(baseToken),
  •••
330              poolFee
331            )
332          )
```

Recommendation

If the client supports fee-charging tokens in the protocol now or in the future, we advise checking how many tokens the liquidity pool actually received and calling the 3rd party functions that support the fee-charging tokens.

Alleviation Fixed

-

2. Potential Redundant ETH Locked in the TradingCore Contract

Low risk Security Analyzer

A user needs to pay the updateFee to the oracleAggregator contract to get the price of opening or closing an order. However, there is no logic to return redundant ETH back to the user if the user paid more ETH to open or close an order

File(s) Affected

contracts/TradingCore.sol #20-25

Examples

```
20  contract TradingCore is
21    ITradingBook,
22    OwnableUpgradeable,
23    AccessControlUpgradeable,
24    ReentrancyGuardUpgradeable
25  {
```

Recommendation

We advise returning redundant ETH back to the user if there is.

Alleviation Acknowledged

this affects all contracts including payable and we will add appropriate withdrawl function as part of our book of work.

3. Unused return value in contracts/LiquidityPool.sol

Low risk Security Analyzer

Either the return value of an external call is not stored in a local or state variable, or the return value is declared but never used in the function body.

File(s) Affected

contracts/LiquidityPool.sol #247-285 #287-335

Examples

```
260       baseToken.transferFromFixed(sender, address(this), amountGross);
261     } else {
262       ERC20(tokenIn).transferFromFixed(sender, address(this), amountIn);
263       ERC20(tokenIn).approveFixed(address(swapRouter), amountIn);
264
265       amountGross = swapRouter.swapGivenIn(
266         ISwapRouter.SwapGivenInInput(
```

Recommendation

Ensure the return value of external function calls is used. Remove or comment out the unused return function parameters.

Alleviation Acknowledged

-

Informational (0)

No Informational vulnerabilities found here

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