



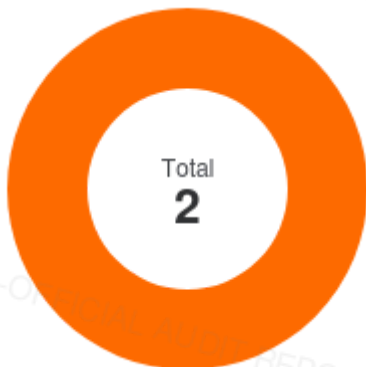
METATRUST






Draft
Security Assessment for
**39-2021-09-swivel
(10K-UT) (1Positive-
FLP)**

July 23, 2023

Executive Summary

Overview			
Project Name	39-2021-09-swivel (1OK-UT) (1Positive-FLP)	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.
Codebase URL	https://github.com/yixiao5428/39-2021-09-swivel		
Scan Engine	AI Analyzer		
Scan Time	2023/07/23 01:39:29	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.
Commit Id	9930536		
Total		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.
Critical Issues	0		
High risk Issues	2	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.
Medium risk Issues	0		
Low risk Issues	0	Informational Issue	The issue does not pose an immediate risk but is relevant to security best practices or Defence in Depth.
Informational Issues	0		



	Critical Issues	0%	0
	High risk Issues	100%	2
	Medium risk Issues	0%	0
	Low risk Issues	0%	0
	Informational Issues	0%	0

Summary of Findings

MetaScan security assessment was performed on **July 23, 2023 01:39:29** on project **39-2021-09-swivel (10K-UT) (1Positive-FLP)** with the repository <https://github.com/yixiao5428/39-2021-09-swivel> on branch **default branch**. The assessment was carried out by scanning the project's codebase using the scan engine **AI Analyzer**. There are in total **2** vulnerabilities / security risks discovered during the scanning session, among which **0** critical vulnerabilities, **2** high risk vulnerabilities, **0** medium risk vulnerabilities, **0** low risk vulnerabilities, **0** informational issues.

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



Findings

Critical (0)

No Critical vulnerabilities found here

High risk (2)

1. MWE-207: Unauthorized Transfer

 High risk 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



gost/build/marketplace/VaultTracker.sol #144-196

```
144 function transferNotionalFrom(address f, address t, uint256 a) external onlyAdmin(admin) returns (bool)
145     Vault memory from = vaults[f];
146     Vault memory to = vaults[t];
147
148     require(from.notional >= a, "amount exceeds available balance");
149
150     uint256 yield;
151     uint256 interest;
152     uint256 exchangeRate = CErc20(cTokenAddr).exchangeRateCurrent();
153
154     // if market has matured, calculate marginal interest between the maturity rate and previous position
155     // otherwise, calculate marginal exchange rate between current and previous exchange rate.
156     if (matured) {
157         // calculate marginal interest
158         yield = ((maturityRate * 1e26) / from.exchangeRate) - 1e26;
159     } else {
160         yield = ((exchangeRate * 1e26) / from.exchangeRate) - 1e26;
161     }
162
163     interest = (yield * from.notional) / 1e26;
164     // remove amount from position, Add interest to position, reset cToken exchange rate
165     from.redeemable += interest;
166     from.notional -= a;
167     from.exchangeRate = exchangeRate;
168
169     vaults[f] = from;
170
171     // transfer notional to address "t", calculate interest if necessary
172     if (to.notional > 0) {
173         uint256 newVaultInterest;
174
175         // if market has matured, calculate marginal interest between the maturity rate and previous position
176         // otherwise, calculate marginal exchange rate between current and previous exchange rate.
177         if (matured) {
178             // calculate marginal interest
179             yield = ((maturityRate * 1e26) / to.exchangeRate) - 1e26;
180         } else {
181             yield = ((exchangeRate * 1e26) / to.exchangeRate) - 1e26;
182         }
183
184         newVaultInterest = (yield * to.notional) / 1e26;
185         // add interest and amount to position, reset cToken exchange rate
186         to.redeemable += newVaultInterest;
187         to.notional += a;
188     } else {
189         to.notional += a;
190     }
191
192     to.exchangeRate = exchangeRate;
193     vaults[t] = to;
194
195     return true;
196 }
```

Recommendation

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

2. 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

gost/build/marketplace/MarketPlace.sol #160-167

```
160 function calculateReturn(address u, uint256 m, uint256 a) internal returns (uint256) {
161     // calculate difference between the cToken exchange rate @ maturity and the current cToken exchange
162     uint256 yield = ((CErc20(markets[u][m].cTokenAddr).exchangeRateCurrent() * 1e26) / maturityRate[u]
163     uint256 interest = (yield * a) / 1e26;
164
165     // calculate the total amount of underlying principle to return
166     return a + interest;
167 }
```

gost/build/marketplace/MarketPlace.sol #122-141

```
122 function redeemZcToken(address u, uint256 m, address t, uint256 a) external onlySwivel(swivel) returns
123     Market memory mkt = markets[u][m];
124     bool matured = mature[u][m];
125
126     if (!matured) {
127         require(matureMarket(u, m), 'failed to mature the market');
128     }
129
130     // burn user's zcTokens
131     require(ZcToken(mkt.zcTokenAddr).burn(t, a), 'could not burn');
132
133     emit RedeemZcToken(u, m, t, a);
134
135     if (!matured) {
136         return a;
137     } else {
138         // if the market was already mature the return should include the amount + marginal floating inte
139         return calculateReturn(u, m, a);
140     }
141 }
```

Recommendation

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

Medium risk (0)

No Medium risk vulnerabilities found here

Low risk (0)

No Low risk vulnerabilities found here

Informational (0)

No Informational vulnerabilities found here

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