Guard

Smart contracts security assessment

Final report

Tariff: Standard

Quartz

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Contents

Introduction

The report has been prepared for the Quartz team. The project website is https://quartz-defi.one.The audited project is a fork of the Tomb Finance Project. The purpose of the audit was to ensure that no issues were introduced with the changes to the original code and that known vulnerabilities (e.g. circumventing the protocol's fee system) are fixed.

Name	Quartz
Audit date	2022-01-24 - 2022-01-24
Language	Solidity
Platform	Harmony

Contracts checked

Name	Address
QShare	https://explorer.harmony.one/address/0xfa4b16b0f63f5a6d0651592620d585d308f749a4?activeTab=7
Oracle	https://explorer.harmony.one/address/0x543AB16f3EDe6dDD26a7C182869a282618B0891C?activeTab=7
QBond	https://explorer.harmony.one/address/0x5a12bc3ad86c674a50fae82510dcb03751ab218b?activeTab=7
QShareRewardPool	https://explorer.harmony.one/address/0x1da194F8baf85175519D92322a06b46A2638A530?activeTab=7
Treasury	https://explorer.harmony.one/address/0xfc0b7c105a6dd49fd956b607ca8c8f00ed159353
Boardroom	https://explorer.harmony.one/address/0xe1e48d3476027af9dc92542b3a60f2d45a36e082?activeTab=7
TaxOracle	https://explorer.harmony.one/address/0x24866b121217F391b0079348146Ea139d7Fd77c7?activeTab=7

Quartz	https://explorer.harmony.one/address/0xb9e05b4c168b56f73940980ae6ef366354357009](https://explorer.harmony.one/address/0xb9e05b4c168b56f73940980ae6ef366354357009) [?activeTab=7] (https://explorer.harmony.one/address/0xfa4b16b0f63f5a6d0651592620d585d308f749a4?activeTab=7

Procedure

We perform our audit according to the following procedure:

Automated analysis

- Scanning the project's smart contracts with several publicly available automated Solidity analysis tools
- Manual verification (reject or confirm) all the issues found by the tools

Manual audit

- Comparing the project to the Tomb Finance implementation

Classification of issue severity

High severity	High severity issues can cause a significant or full loss of funds, change of contract ownership, major interference with contract logic. Such issues require immediate attention.
Medium severity	Medium severity issues do not pose an immediate risk, but can be detrimental to the client's reputation if exploited. Medium severity issues may lead to a contract failure and can be fixed by modifying the contract state or redeployment. Such issues require attention.

Low severity	Low severity issues do not cause significant destruction to the contract's functionality. Such issues are recommended to be taken into consideration.

Issues

High severity issues

No issues were found

Medium severity issues

No issues were found

Low severity issues

No issues were found

Conclusion

The Quartz Project was compared with the Tomb Project. Quartz has changed the implementation of Token, Treasury and QShare contracts. The changed Token contract is not affected by the vulnerability that was discovered in the Tomb before because it doesn't contain the implementation of transfer with taxes.

In contracts Treasury and QShare were added team1Fund addresses which receive funds as well as devFund it the Tomb Finance.

Contract QShare sets state variables communityFundRewardRate, team1FundRewardRate and devFundRewardRate by calling external function setAllocations.

No serious issues were found in the audited changes.

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Static code analysis results

```
Reentrancy in Treasury.allocateSeigniorage() (Treasury.sol#1756-1816):
External calls:
- _updateUnitePrice() (Treasury.sol#1763)
  - IOracle(kittyOracle).update() (Treasury.sol#1612)
- _sendToBoardroom(_savedForBoardroom) (Treasury.sol#1807)
  - returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(Treasury.sol#746-749)
  - IBasisAsset(kitty).mint(address(this),_amount) (Treasury.sol#1707)
  - (success,returndata) = target.call{value: value}(data) (Treasury.sol#528-530)
  - IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (Treasury.sol#1712)
  - IERC20(kitty).transfer(devFund,_devFundSharedAmount) (Treasury.sol#1719)
  - IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (Treasury.sol#1728)
  - IERC20(kitty).safeApprove(boardroom,0) (Treasury.sol#1737)
  - IERC20(kitty).safeApprove(boardroom,_amount) (Treasury.sol#1738)
  - IBoardroom(boardroom).allocateSeigniorage(_amount) (Treasury.sol#1739)
External calls sending eth:
- _sendToBoardroom(_savedForBoardroom) (Treasury.sol#1807)
  - (success,returndata) = target.call{value: value}(data) (Treasury.sol#528-530)
State variables written after the call(s):
- seigniorageSaved = seigniorageSaved.add(_savedForBond) (Treasury.sol#1810)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-
vulnerabilities

Treasury._sendToBoardroom(uint256) (Treasury.sol#1706-1741) ignores return value by
IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (Treasury.sol#1712)
Treasury._sendToBoardroom(uint256) (Treasury.sol#1706-1741) ignores return value by
IERC20(kitty).transfer(devFund,_devFundSharedAmount) (Treasury.sol#1719)
Treasury._sendToBoardroom(uint256) (Treasury.sol#1706-1741) ignores return value by
IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (Treasury.sol#1728)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#unchecked-
transfer

Treasury.allocateSeigniorage() (Treasury.sol#1756-1816) performs a multiplication on
the result of a division:
-_seigniorage = kittySupply.mul(_percentage).div(1e18) (Treasury.sol#1793-1795)
-_savedForBoardroom = _seigniorage.mul(seigniorageExpansionFloorPercent).div(10000)
(Treasury.sol#1796-1798)
```

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Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#divide-before-multiply

Reentrancy in Treasury.buyBonds(uint256,uint256) (Treasury.sol#1622-1665):
	External calls:
	- IBasisAsset(kitty).burnFrom(msg.sender,_kittyAmount) (Treasury.sol#1656)
	- IBasisAsset(bbond).mint(msg.sender,_bondAmount) (Treasury.sol#1657)
	State variables written after the call(s):
	- epochSupplyContractionLeft = epochSupplyContractionLeft.sub(_kittyAmount) (Treasury.sol#1659-1661)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities-1

Treasury.setSupplyTiersEntry(uint8,uint256) (Treasury.sol#1459-1474) contains a tautology or contradiction:
	- require(bool,string)(_index >= 0,Index has to be higher than 0) (Treasury.sol#1464)
Treasury.setMaxExpansionTiersEntry(uint8,uint256) (Treasury.sol#1476-1486) contains a tautology or contradiction:
	- require(bool,string)(_index >= 0,Index has to be higher than 0) (Treasury.sol#1481)
Treasury._calculateMaxSupplyExpansionPercent(uint256) (Treasury.sol#1743-1754) contains a tautology or contradiction:
	- tierId >= 0 (Treasury.sol#1747)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#tautology-or-contradiction

Treasury.getUniteUpdatedPrice().price (Treasury.sol#1272) is a local variable never initialized
Treasury.allocateSeigniorage()._savedForBond (Treasury.sol#1778) is a local variable never initialized
Treasury.getUnitePrice().price (Treasury.sol#1264) is a local variable never initialized
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#uninitialized-local-variables

Treasury.getUnitePrice() (Treasury.sol#1263-1269) ignores return value by IOracle(kittyOracle).consult(kitty,1e18) (Treasury.sol#1264-1268)
Treasury.getUniteUpdatedPrice() (Treasury.sol#1271-1277) ignores return value by IOracle(kittyOracle).twap(kitty,1e18) (Treasury.sol#1272-1276)
Treasury.buyBonds(uint256,uint256) (Treasury.sol#1622-1665) ignores return value by IBasisAsset(bbond).mint(msg.sender,_bondAmount) (Treasury.sol#1657)
Treasury._sendToBoardroom(uint256) (Treasury.sol#1706-1741) ignores return value by
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IBasisAsset(kitty).mint(address(this),_amount) (Treasury.sol#1707)
Treasury.allocateSeigniorage() (Treasury.sol#1756-1816) ignores return value by
IBasisAsset(kitty).mint(address(this),_savedForBond) (Treasury.sol#1811)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#unused-return

Treasury.setOperator(address) (Treasury.sol#1423-1425) should emit an event for:
- operator = _operator (Treasury.sol#1424)
Treasury.setBoardroom(address) (Treasury.sol#1427-1429) should emit an event for:
- boardroom = _boardroom (Treasury.sol#1428)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-events-
access-control

Treasury.setUnitePriceCeiling(uint256) (Treasury.sol#1435-1445) should emit an event
for:
- kittyPriceCeiling = _kittyPriceCeiling (Treasury.sol#1444)
Treasury.setMaxSupplyExpansionPercents(uint256) (Treasury.sol#1447-1457) should emit an
event for:
- maxSupplyExpansionPercent = _maxSupplyExpansionPercent (Treasury.sol#1456)
Treasury.setBondDepletionFloorPercent(uint256) (Treasury.sol#1488-1498) should emit an
event for:
- bondDepletionFloorPercent = _bondDepletionFloorPercent (Treasury.sol#1497)
Treasury.setMaxDebtRatioPercent(uint256) (Treasury.sol#1511-1520) should emit an event
for:
- maxDebtRatioPercent = _maxDebtRatioPercent (Treasury.sol#1519)
Treasury.setBootstrap(uint256,uint256) (Treasury.sol#1522-1534) should emit an event
for:
- bootstrapEpochs = _bootstrapEpochs (Treasury.sol#1532)
- bootstrapSupplyExpansionPercent = _bootstrapSupplyExpansionPercent
(Treasury.sol#1533)
Treasury.setExtraFunds(address,uint256,address,uint256,address,uint256)
(Treasury.sol#1536-1556) should emit an event for:
- daoFundSharedPercent = _daoFundSharedPercent (Treasury.sol#1551)
- devFundSharedPercent = _devFundSharedPercent (Treasury.sol#1553)
- team1FundSharedPercent = _team1FundSharedPercent (Treasury.sol#1555)
Treasury.setMaxDiscountRate(uint256) (Treasury.sol#1558-1563) should emit an event for:
- maxDiscountRate = _maxDiscountRate (Treasury.sol#1562)
Treasury.setMaxPremiumRate(uint256) (Treasury.sol#1565-1567) should emit an event for:
- maxPremiumRate = _maxPremiumRate (Treasury.sol#1566)
Treasury.setDiscountPercent(uint256) (Treasury.sol#1569-1575) should emit an event for:
- discountPercent = _discountPercent (Treasury.sol#1574)
Treasury.setPremiumThreshold(uint256) (Treasury.sol#1577-1590) should emit an event
for:
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- premiumThreshold = _premiumThreshold (Treasury.sol#1589)
Treasury.setPremiumPercent(uint256) (Treasury.sol#1592-1595) should emit an event for:
- premiumPercent = _premiumPercent (Treasury.sol#1594)
Treasury.setMintingFactorForPayingDebt(uint256) (Treasury.sol#1597-1607) should emit an event for:
- mintingFactorForPayingDebt = _mintingFactorForPayingDebt (Treasury.sol#1606)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-events-arithmetic

Treasury.initialize(address,address,address,address,address,uint256)._kitty (Treasury.sol#1370) lacks a zero-check on :
- kitty = _kitty (Treasury.sol#1377)
Treasury.initialize(address,address,address,address,address,uint256)._bbond (Treasury.sol#1371) lacks a zero-check on :
- bbond = _bbond (Treasury.sol#1378)
Treasury.initialize(address,address,address,address,address,uint256)._bshare (Treasury.sol#1372) lacks a zero-check on :
- bshare = _bshare (Treasury.sol#1379)
Treasury.initialize(address,address,address,address,address,uint256)._kittyOracle (Treasury.sol#1373) lacks a zero-check on :
- kittyOracle = _kittyOracle (Treasury.sol#1380)
Treasury.initialize(address,address,address,address,address,uint256)._boardroom (Treasury.sol#1374) lacks a zero-check on :
- boardroom = _boardroom (Treasury.sol#1381)
Treasury.setOperator(address)._operator (Treasury.sol#1423) lacks a zero-check on :
- operator = _operator (Treasury.sol#1424)
Treasury.setBoardroom(address)._boardroom (Treasury.sol#1427) lacks a zero-check on :
- boardroom = _boardroom (Treasury.sol#1428)
Treasury.setUniteOracle(address)._kittyOracle (Treasury.sol#1431) lacks a zero-check on :
- kittyOracle = _kittyOracle (Treasury.sol#1432)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-zero-address-validation

Variable 'Treasury.getUnitePrice().price (Treasury.sol#1264)' in Treasury.getUnitePrice() (Treasury.sol#1263-1269) potentially used before declaration: uint256(price) (Treasury.sol#1265)
Variable 'Treasury.getUniteUpdatedPrice().price (Treasury.sol#1272)' in Treasury.getUniteUpdatedPrice() (Treasury.sol#1271-1277) potentially used before declaration: uint256(price) (Treasury.sol#1273)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#pre-

```
declaration-usage-of-local-variables

Reentrancy in Treasury.allocateSeigniorage() (Treasury.sol#1756-1816):
External calls:
- _updateUnitePrice() (Treasury.sol#1763)
- IOracle(kittyOracle).update() (Treasury.sol#1612)
State variables written after the call(s):
- _mse = _calculateMaxSupplyExpansionPercent(kittySupply).mul(1e14)
(Treasury.sol#1780-1781)
- maxSupplyExpansionPercent = maxExpansionTiers[tierId] (Treasury.sol#1749)
- previousEpochUnitePrice = getUnitePrice() (Treasury.sol#1764)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-
vulnerabilities-2

Reentrancy in Treasury._sendToBoardroom(uint256) (Treasury.sol#1706-1741):
External calls:
- IBasisAsset(kitty).mint(address(this),_amount) (Treasury.sol#1707)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (Treasury.sol#1712)
Event emitted after the call(s):
- DaoFundFunded(now,_daoFundSharedAmount) (Treasury.sol#1713)
Reentrancy in Treasury._sendToBoardroom(uint256) (Treasury.sol#1706-1741):
External calls:
- IBasisAsset(kitty).mint(address(this),_amount) (Treasury.sol#1707)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (Treasury.sol#1712)
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (Treasury.sol#1719)
Event emitted after the call(s):
- DevFundFunded(now,_devFundSharedAmount) (Treasury.sol#1720)
Reentrancy in Treasury._sendToBoardroom(uint256) (Treasury.sol#1706-1741):
External calls:
- IBasisAsset(kitty).mint(address(this),_amount) (Treasury.sol#1707)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (Treasury.sol#1712)
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (Treasury.sol#1719)
- IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (Treasury.sol#1728)
Event emitted after the call(s):
- TeamFundFunded(now,_team1FundSharedAmount) (Treasury.sol#1729)
Reentrancy in Treasury._sendToBoardroom(uint256) (Treasury.sol#1706-1741):
External calls:
- IBasisAsset(kitty).mint(address(this),_amount) (Treasury.sol#1707)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (Treasury.sol#1712)
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (Treasury.sol#1719)
- IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (Treasury.sol#1728)
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```
- IERC20(kitty).safeApprove(boardroom,0) (Treasury.sol#1737)
- IERC20(kitty).safeApprove(boardroom,_amount) (Treasury.sol#1738)
- IBoardroom(boardroom).allocateSeigniorage(_amount) (Treasury.sol#1739)
Event emitted after the call(s):
- BoardroomFunded(now,_amount) (Treasury.sol#1740)
Reentrancy in Treasury.allocateSeigniorage() (Treasury.sol#1756-1816):
External calls:
- _updateUnitePrice() (Treasury.sol#1763)
  - IOracle(kittyOracle).update() (Treasury.sol#1612)
- _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000))
(Treasury.sol#1768-1770)
  - returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(Treasury.sol#746-749)
  - IBasisAsset(kitty).mint(address(this),_amount) (Treasury.sol#1707)
  - (success,returndata) = target.call{value: value}(data) (Treasury.sol#528-530)
  - IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (Treasury.sol#1712)
  - IERC20(kitty).transfer(devFund,_devFundSharedAmount) (Treasury.sol#1719)
  - IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (Treasury.sol#1728)
  - IERC20(kitty).safeApprove(boardroom,0) (Treasury.sol#1737)
  - IERC20(kitty).safeApprove(boardroom,_amount) (Treasury.sol#1738)
  - IBoardroom(boardroom).allocateSeigniorage(_amount) (Treasury.sol#1739)
External calls sending eth:
- _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000))
(Treasury.sol#1768-1770)
  - (success,returndata) = target.call{value: value}(data) (Treasury.sol#528-530)
Event emitted after the call(s):
- BoardroomFunded(now,_amount) (Treasury.sol#1740)
  - _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000))
(Treasury.sol#1768-1770)
- DaoFundFunded(now,_daoFundSharedAmount) (Treasury.sol#1713)
  - _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000))
(Treasury.sol#1768-1770)
- DevFundFunded(now,_devFundSharedAmount) (Treasury.sol#1720)
  - _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000))
(Treasury.sol#1768-1770)
- TeamFundFunded(now,_team1FundSharedAmount) (Treasury.sol#1729)
  - _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000))
(Treasury.sol#1768-1770)
Reentrancy in Treasury.allocateSeigniorage() (Treasury.sol#1756-1816):
External calls:
- _updateUnitePrice() (Treasury.sol#1763)
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- IOracle(kittyOracle).update() (Treasury.sol#1612)
- _sendToBoardroom(_savedForBoardroom) (Treasury.sol#1807)
- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(Treasury.sol#746-749)
- IBasisAsset(kitty).mint(address(this),_amount) (Treasury.sol#1707)
- (success,returndata) = target.call{value: value}(data) (Treasury.sol#528-530)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (Treasury.sol#1712)
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (Treasury.sol#1719)
- IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (Treasury.sol#1728)
- IERC20(kitty).safeApprove(boardroom,0) (Treasury.sol#1737)
- IERC20(kitty).safeApprove(boardroom,_amount) (Treasury.sol#1738)
- IBoardroom(boardroom).allocateSeigniorage(_amount) (Treasury.sol#1739)
External calls sending eth:
- _sendToBoardroom(_savedForBoardroom) (Treasury.sol#1807)
- (success,returndata) = target.call{value: value}(data) (Treasury.sol#528-530)
Event emitted after the call(s):
- BoardroomFunded(now,_amount) (Treasury.sol#1740)
- _sendToBoardroom(_savedForBoardroom) (Treasury.sol#1807)
- DaoFundFunded(now,_daoFundSharedAmount) (Treasury.sol#1713)
- _sendToBoardroom(_savedForBoardroom) (Treasury.sol#1807)
- DevFundFunded(now,_devFundSharedAmount) (Treasury.sol#1720)
- _sendToBoardroom(_savedForBoardroom) (Treasury.sol#1807)
- TeamFundFunded(now,_team1FundSharedAmount) (Treasury.sol#1729)
- _sendToBoardroom(_savedForBoardroom) (Treasury.sol#1807)
Reentrancy in Treasury.allocateSeigniorage() (Treasury.sol#1756-1816):
External calls:
- _updateUnitePrice() (Treasury.sol#1763)
- IOracle(kittyOracle).update() (Treasury.sol#1612)
- _sendToBoardroom(_savedForBoardroom) (Treasury.sol#1807)
- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(Treasury.sol#746-749)
- IBasisAsset(kitty).mint(address(this),_amount) (Treasury.sol#1707)
- (success,returndata) = target.call{value: value}(data) (Treasury.sol#528-530)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (Treasury.sol#1712)
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (Treasury.sol#1719)
- IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (Treasury.sol#1728)
- IERC20(kitty).safeApprove(boardroom,0) (Treasury.sol#1737)
- IERC20(kitty).safeApprove(boardroom,_amount) (Treasury.sol#1738)
- IBoardroom(boardroom).allocateSeigniorage(_amount) (Treasury.sol#1739)
- IBasisAsset(kitty).mint(address(this),_savedForBond) (Treasury.sol#1811)
External calls sending eth:
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- _sendToBoardroom(_savedForBoardroom) (Treasury.sol#1807)
-- (success,returndata) = target.call{value: value}(data) (Treasury.sol#528-530)
Event emitted after the call(s):
- TreasuryFunded(now,_savedForBond) (Treasury.sol#1812)
Reentrancy in Treasury.buyBonds(uint256,uint256) (Treasury.sol#1622-1665):
External calls:
- IBasisAsset(kitty).burnFrom(msg.sender,_kittyAmount) (Treasury.sol#1656)
- IBasisAsset(bbond).mint(msg.sender,_bondAmount) (Treasury.sol#1657)
- _updateUnitePrice() (Treasury.sol#1662)
-- IOracle(kittyOracle).update() (Treasury.sol#1612)
Event emitted after the call(s):
- BoughtBonds(msg.sender,_kittyAmount,_bondAmount) (Treasury.sol#1664)
Reentrancy in Treasury.redeemBonds(uint256,uint256) (Treasury.sol#1667-1704):
External calls:
- IBasisAsset(bbond).burnFrom(msg.sender,_bondAmount) (Treasury.sol#1698)
- IERC20(kitty).safeTransfer(msg.sender,_kittyAmount) (Treasury.sol#1699)
- _updateUnitePrice() (Treasury.sol#1701)
-- IOracle(kittyOracle).update() (Treasury.sol#1612)
Event emitted after the call(s):
- RedeemedBonds(msg.sender,_kittyAmount,_bondAmount) (Treasury.sol#1703)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-
vulnerabilities-3

Address.isContract(address) (Treasury.sol#402-413) uses assembly
- INLINE ASM (Treasury.sol#409-411)
Address._verifyCallResult(bool,bytes,string) (Treasury.sol#607-628) uses assembly
- INLINE ASM (Treasury.sol#620-623)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#assembly-usage

Different versions of Solidity is used:
- Version used: ['0.6.12', '>=0.6.0<0.8.0', '>=0.6.2<0.8.0', '^0.6.0']
- >=0.6.0<0.8.0 (Treasury.sol#6)
- >=0.6.0<0.8.0 (Treasury.sol#39)
- >=0.6.0<0.8.0 (Treasury.sol#131)
- >=0.6.2<0.8.0 (Treasury.sol#379)
- >=0.6.0<0.8.0 (Treasury.sol#634)
- >=0.6.0<0.8.0 (Treasury.sol#764)
- ^0.6.0 (Treasury.sol#828)
- >=0.6.0<0.8.0 (Treasury.sol#849)
- >=0.6.0<0.8.0 (Treasury.sol#875)
- >=0.6.0<0.8.0 (Treasury.sol#880)
```

- 0.6.12 (Treasury.sol#955)
- 0.6.12 (Treasury.sol#1003)
- ^0.6.0 (Treasury.sol#1036)
- 0.6.12 (Treasury.sol#1055)
- 0.6.12 (Treasury.sol#1074)
- 0.6.12 (Treasury.sol#1118)

Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#different-pragma-directives-are-used

Treasury._calculateMaxSupplyExpansionPercent(uint256) (Treasury.sol#1743-1754) has costly operations inside a loop:
- maxSupplyExpansionPercent = maxExpansionTiers[tierId] (Treasury.sol#1749)

Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#costly-operations-inside-a-loop

Address.functionCall(address,bytes) (Treasury.sol#463-468) is never used and should be removed
Address.functionCallWithValue(address,bytes,uint256) (Treasury.sol#495-507) is never used and should be removed
Address.functionDelegateCall(address,bytes) (Treasury.sol#577-587) is never used and should be removed
Address.functionDelegateCall(address,bytes,string) (Treasury.sol#595-605) is never used and should be removed
Address.functionStaticCall(address,bytes) (Treasury.sol#540-551) is never used and should be removed
Address.functionStaticCall(address,bytes,string) (Treasury.sol#559-569) is never used and should be removed
Address.sendValue(address,uint256) (Treasury.sol#431-443) is never used and should be removed
Babylonian.sqrt(uint256) (Treasury.sol#831-843) is never used and should be removed
Context._msgData() (Treasury.sol#866-869) is never used and should be removed
Math.average(uint256,uint256) (Treasury.sol#30-33) is never used and should be removed
Math.max(uint256,uint256) (Treasury.sol#15-17) is never used and should be removed
SafeERC20.safeDecreaseAllowance(IERC20,address,uint256) (Treasury.sol#716-733) is never used and should be removed
SafeERC20.safeIncreaseAllowance(IERC20,address,uint256) (Treasury.sol#698-714) is never used and should be removed
SafeERC20.safeTransferFrom(IERC20,address,address,uint256) (Treasury.sol#660-670) is never used and should be removed
SafeMath.div(uint256,uint256,string) (Treasury.sol#342-349) is never used and should be removed

```
SafeMath.mod(uint256,uint256) (Treasury.sol#300-303) is never used and should be
removed
SafeMath.mod(uint256,uint256,string) (Treasury.sol#366-373) is never used and should be
removed
SafeMath.sub(uint256,uint256,string) (Treasury.sol#318-325) is never used and should be
removed
SafeMath.tryAdd(uint256,uint256) (Treasury.sol#152-160) is never used and should be
removed
SafeMath.tryDiv(uint256,uint256) (Treasury.sol#200-207) is never used and should be
removed
SafeMath.tryMod(uint256,uint256) (Treasury.sol#214-221) is never used and should be
removed
SafeMath.tryMul(uint256,uint256) (Treasury.sol#181-193) is never used and should be
removed
SafeMath.trySub(uint256,uint256) (Treasury.sol#167-174) is never used and should be
removed
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#dead-code

Pragma version>=0.6.0<0.8.0 (Treasury.sol#6) is too complex
Pragma version>=0.6.0<0.8.0 (Treasury.sol#39) is too complex
Pragma version>=0.6.0<0.8.0 (Treasury.sol#131) is too complex
Pragma version>=0.6.2<0.8.0 (Treasury.sol#379) is too complex
Pragma version>=0.6.0<0.8.0 (Treasury.sol#634) is too complex
Pragma version>=0.6.0<0.8.0 (Treasury.sol#764) is too complex
Pragma version^0.6.0 (Treasury.sol#828) allows old versions
Pragma version>=0.6.0<0.8.0 (Treasury.sol#849) is too complex
Pragma version>=0.6.0<0.8.0 (Treasury.sol#875) is too complex
Pragma version>=0.6.0<0.8.0 (Treasury.sol#880) is too complex
Pragma version^0.6.0 (Treasury.sol#1036) allows old versions
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-
versions-of-solidity

Low level call in Address.sendValue(address,uint256) (Treasury.sol#431-443):
- (success) = recipient.call{value: amount}() (Treasury.sol#438)
Low level call in Address.functionCallWithValue(address,bytes,uint256,string)
(Treasury.sol#515-532):
- (success,returndata) = target.call{value: value}(data) (Treasury.sol#528-530)
Low level call in Address.functionStaticCall(address,bytes,string)
(Treasury.sol#559-569):
- (success,returndata) = target.staticcall(data) (Treasury.sol#567)
Low level call in Address.functionDelegateCall(address,bytes,string)
(Treasury.sol#595-605):
```

- (success,returndata) = target.delegatecall(data) (Treasury.sol#603)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#low-level-calls

Parameter Treasury.initialize(address,address,address,address,address,uint256)._kitty (Treasury.sol#1370) is not in mixedCase
Parameter Treasury.initialize(address,address,address,address,address,uint256)._bbond (Treasury.sol#1371) is not in mixedCase
Parameter Treasury.initialize(address,address,address,address,address,uint256)._bshare (Treasury.sol#1372) is not in mixedCase
Parameter Treasury.initialize(address,address,address,address,address,uint256)._kittyOracle (Treasury.sol#1373) is not in mixedCase
Parameter Treasury.initialize(address,address,address,address,address,uint256)._boardroom (Treasury.sol#1374) is not in mixedCase
Parameter Treasury.initialize(address,address,address,address,address,uint256)._startTime (Treasury.sol#1375) is not in mixedCase
Parameter Treasury.setOperator(address)._operator (Treasury.sol#1423) is not in mixedCase
Parameter Treasury.setBoardroom(address)._boardroom (Treasury.sol#1427) is not in mixedCase
Parameter Treasury.setUniteOracle(address)._kittyOracle (Treasury.sol#1431) is not in mixedCase
Parameter Treasury.setUnitePriceCeiling(uint256)._kittyPriceCeiling (Treasury.sol#1435) is not in mixedCase
Parameter Treasury.setMaxSupplyExpansionPercents(uint256)._maxSupplyExpansionPercent (Treasury.sol#1447) is not in mixedCase
Parameter Treasury.setSupplyTiersEntry(uint8,uint256)._index (Treasury.sol#1459) is not in mixedCase
Parameter Treasury.setSupplyTiersEntry(uint8,uint256)._value (Treasury.sol#1459) is not in mixedCase
Parameter Treasury.setMaxExpansionTiersEntry(uint8,uint256)._index (Treasury.sol#1476) is not in mixedCase
Parameter Treasury.setMaxExpansionTiersEntry(uint8,uint256)._value (Treasury.sol#1476) is not in mixedCase
Parameter Treasury.setBondDepletionFloorPercent(uint256)._bondDepletionFloorPercent (Treasury.sol#1488) is not in mixedCase
Parameter Treasury.setMaxSupplyContractionPercent(uint256)._maxSupplyContractionPercent (Treasury.sol#1501) is not in mixedCase

Parameter Treasury.setMaxDebtRatioPercent(uint256)._maxDebtRatioPercent (Treasury.sol#1511) is not in mixedCase
Parameter Treasury.setBootstrap(uint256,uint256)._bootstrapEpochs (Treasury.sol#1523) is not in mixedCase
Parameter Treasury.setBootstrap(uint256,uint256)._bootstrapSupplyExpansionPercent (Treasury.sol#1524) is not in mixedCase
Parameter Treasury.setExtraFunds(address,uint256,address,uint256,address,uint256)._daoFund (Treasury.sol#1537) is not in mixedCase
Parameter Treasury.setExtraFunds(address,uint256,address,uint256,address,uint256)._daoFundSharedPercent (Treasury.sol#1538) is not in mixedCase
Parameter Treasury.setExtraFunds(address,uint256,address,uint256,address,uint256)._devFund (Treasury.sol#1539) is not in mixedCase
Parameter Treasury.setExtraFunds(address,uint256,address,uint256,address,uint256)._devFundSharedPercent (Treasury.sol#1540) is not in mixedCase
Parameter Treasury.setExtraFunds(address,uint256,address,uint256,address,uint256)._team1Fund (Treasury.sol#1541) is not in mixedCase
Parameter Treasury.setExtraFunds(address,uint256,address,uint256,address,uint256)._team1FundSharedPercent (Treasury.sol#1542) is not in mixedCase
Parameter Treasury.setMaxDiscountRate(uint256)._maxDiscountRate (Treasury.sol#1558) is not in mixedCase
Parameter Treasury.setMaxPremiumRate(uint256)._maxPremiumRate (Treasury.sol#1565) is not in mixedCase
Parameter Treasury.setDiscountPercent(uint256)._discountPercent (Treasury.sol#1569) is not in mixedCase
Parameter Treasury.setPremiumThreshold(uint256)._premiumThreshold (Treasury.sol#1577) is not in mixedCase
Parameter Treasury.setPremiumPercent(uint256)._premiumPercent (Treasury.sol#1592) is not in mixedCase
Parameter Treasury.setMintingFactorForPayingDebt(uint256)._mintingFactorForPayingDebt (Treasury.sol#1597) is not in mixedCase
Parameter Treasury.buyBonds(uint256,uint256)._kittyAmount (Treasury.sol#1622) is not in mixedCase
Parameter Treasury.redeemBonds(uint256,uint256)._bondAmount (Treasury.sol#1667) is not in mixedCase
Parameter Treasury.governanceRecoverUnsupported(IERC20,uint256,address)._token (Treasury.sol#1819) is not in mixedCase
Parameter Treasury.governanceRecoverUnsupported(IERC20,uint256,address)._amount (Treasury.sol#1820) is not in mixedCase

```
Parameter Treasury.governanceRecoverUnsupported(IERC20,uint256,address)._to
(Treasury.sol#1821) is not in mixedCase
Parameter Treasury.boardroomSetOperator(address)._operator (Treasury.sol#1830) is not
in mixedCase
Parameter Treasury.boardroomSetLockUp(uint256,uint256)._withdrawLockupEpochs
(Treasury.sol#1835) is not in mixedCase
Parameter Treasury.boardroomSetLockUp(uint256,uint256)._rewardLockupEpochs
(Treasury.sol#1836) is not in mixedCase
Parameter
Treasury.boardroomGovernanceRecoverUnsupported(address,uint256,address)._token
(Treasury.sol#1852) is not in mixedCase
Parameter
Treasury.boardroomGovernanceRecoverUnsupported(address,uint256,address)._amount
(Treasury.sol#1853) is not in mixedCase
Parameter Treasury.boardroomGovernanceRecoverUnsupported(address,uint256,address)._to
(Treasury.sol#1854) is not in mixedCase
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-
solidity-naming-conventions

Redundant expression "this (Treasury.sol#867)" inContext (Treasury.sol#861-870)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#redundant-
statements

Variable Treasury.setExtraFunds(address,uint256,address,uint256,address,uint256)._daoFun
dSharedPercent (Treasury.sol#1538) is too similar to Treasury.setExtraFunds(address,uint
256,address,uint256,address,uint256)._devFundSharedPercent (Treasury.sol#1540)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#variable-names-
are-too-similar

Treasury.initialize(address,address,address,address,address,uint256)
(Treasury.sol#1369-1421) uses literals with too many digits:
- supplyTiers = (0,200000000000000000000000,400000000000000000000000,6000000000000000
000000000,800000000000000000000000,200000000000000000000000000,4000000000000000000000000
0,800000000000000000000000,2000000000000000000000000) (Treasury.sol#1388-1398)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#too-many-
digits

renounceOwnership() should be declared external:
- Ownable.renounceOwnership() (Treasury.sol#933-936)
transferOwnership(address) should be declared external:
- Ownable.transferOwnership(address) (Treasury.sol#942-949)
```

```
operator() should be declared external:
 - Operator.operator() (Treasury.sol#970-972)
isOperator() should be declared external:
 - Operator.isOperator() (Treasury.sol#982-984)
transferOperator(address) should be declared external:
 - Operator.transferOperator(address) (Treasury.sol#986-988)
isInitialized() should be declared external:
 - Treasury.isInitialized() (Treasury.sol#1253-1255)
getUniteUpdatedPrice() should be declared external:
 - Treasury.getUniteUpdatedPrice() (Treasury.sol#1271-1277)
getReserve() should be declared external:
 - Treasury.getReserve() (Treasury.sol#1280-1282)
getBurnableUniteLeft() should be declared external:
 - Treasury.getBurnableUniteLeft() (Treasury.sol#1284-1307)
getRedeemableBonds() should be declared external:
 - Treasury.getRedeemableBonds() (Treasury.sol#1309-1322)
initialize(address,address,address,address,address,uint256) should be declared
external:
 - Treasury.initialize(address,address,address,address,address,uint256)
(Treasury.sol#1369-1421)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#public-
function-that-could-be-declared-external
```

```
INFO:Detectors:
Boardroom.setOperator(address) (contracts/Boardroom.sol#138-140) should emit an event
for:
 - operator = _operator (contracts/Boardroom.sol#139)
Treasury.setOperator(address) (contracts/Treasury.sol#275-277) should emit an event
for:
 - operator = _operator (contracts/Treasury.sol#276)
Treasury.setBoardroom(address) (contracts/Treasury.sol#279-281) should emit an event
for:
 - boardroom = _boardroom (contracts/Treasury.sol#280)
UShareRewardPool.setOperator(address) (contracts/distribution/
UShareRewardPool.sol#260-262) should emit an event for:
 - operator = _operator (contracts/distribution/UShareRewardPool.sol#261)
UniteGenesisRewardPool.setOperator(address) (contracts/distribution/
UniteGenesisRewardPool.sol#263-265) should emit an event for:
 - operator = _operator (contracts/distribution/UniteGenesisRewardPool.sol#264)
UniteRewardPool.setOperator(address) (contracts/distribution/
```

```
UniteRewardPool.sol#264-266) should emit an event for:
	- operator = _operator (contracts/distribution/UniteRewardPool.sol#265)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-events-access-control
INFO:Detectors:
Boardroom.setLockUp(uint256,uint256) (contracts/Boardroom.sol#142-146) should emit an event for:
	- withdrawLockupEpochs = _withdrawLockupEpochs (contracts/Boardroom.sol#144)
	- rewardLockupEpochs = _rewardLockupEpochs (contracts/Boardroom.sol#145)
Treasury.setUnitePriceCeiling(uint256) (contracts/Treasury.sol#287-290) should emit an event for:
	- kittyPriceCeiling = _kittyPriceCeiling (contracts/Treasury.sol#289)
Treasury.setMaxSupplyExpansionPercents(uint256) (contracts/Treasury.sol#292-295) should emit an event for:
	- maxSupplyExpansionPercent = _maxSupplyExpansionPercent (contracts/Treasury.sol#294)
Treasury.setBondDepletionFloorPercent(uint256) (contracts/Treasury.sol#318-321) should emit an event for:
	- bondDepletionFloorPercent = _bondDepletionFloorPercent (contracts/Treasury.sol#320)
Treasury.setMaxDebtRatioPercent(uint256) (contracts/Treasury.sol#328-331) should emit an event for:
	- maxDebtRatioPercent = _maxDebtRatioPercent (contracts/Treasury.sol#330)
Treasury.setBootstrap(uint256,uint256) (contracts/Treasury.sol#333-338) should emit an event for:
	- bootstrapEpochs = _bootstrapEpochs (contracts/Treasury.sol#336)
	- bootstrapSupplyExpansionPercent = _bootstrapSupplyExpansionPercent (contracts/Treasury.sol#337)
Treasury.setExtraFunds(address,uint256,address,uint256,address,uint256) (contracts/Treasury.sol#340-360) should emit an event for:
	- daoFundSharedPercent = _daoFundSharedPercent (contracts/Treasury.sol#355)
	- devFundSharedPercent = _devFundSharedPercent (contracts/Treasury.sol#357)
	- team1FundSharedPercent = _team1FundSharedPercent (contracts/Treasury.sol#359)
Treasury.setMaxDiscountRate(uint256) (contracts/Treasury.sol#362-364) should emit an event for:
	- maxDiscountRate = _maxDiscountRate (contracts/Treasury.sol#363)
Treasury.setMaxPremiumRate(uint256) (contracts/Treasury.sol#366-368) should emit an event for:
	- maxPremiumRate = _maxPremiumRate (contracts/Treasury.sol#367)
Treasury.setDiscountPercent(uint256) (contracts/Treasury.sol#370-373) should emit an event for:
	- discountPercent = _discountPercent (contracts/Treasury.sol#372)
Treasury.setPremiumThreshold(uint256) (contracts/Treasury.sol#375-379) should emit an
```

```
event for:
- premiumThreshold = _premiumThreshold (contracts/Treasury.sol#378)
Treasury.setPremiumPercent(uint256) (contracts/Treasury.sol#381-384) should emit an
event for:
- premiumPercent = _premiumPercent (contracts/Treasury.sol#383)
Treasury.setMintingFactorForPayingDebt(uint256) (contracts/Treasury.sol#386-389) should
emit an event for:
- mintingFactorForPayingDebt = _mintingFactorForPayingDebt (contracts/
Treasury.sol#388)
UShareRewardPool.add(uint256,IERC20,bool,uint256) (contracts/distribution/
UShareRewardPool.sol#85-123) should emit an event for:
- totalAllocPoint = totalAllocPoint.add(_allocPoint) (contracts/distribution/
UShareRewardPool.sol#121)
UShareRewardPool.set(uint256,uint256) (contracts/distribution/
UShareRewardPool.sol#126-135) should emit an event for:
- totalAllocPoint = totalAllocPoint.sub(pool.allocPoint).add(_allocPoint) (contracts/
distribution/UShareRewardPool.sol#130-132)
UniteGenesisRewardPool.add(uint256,IERC20,bool,uint256) (contracts/distribution/
UniteGenesisRewardPool.sol#94-124) should emit an event for:
- totalAllocPoint = totalAllocPoint.add(_allocPoint) (contracts/distribution/
UniteGenesisRewardPool.sol#122)
UniteGenesisRewardPool.set(uint256,uint256) (contracts/distribution/
UniteGenesisRewardPool.sol#127-134) should emit an event for:
- totalAllocPoint = totalAllocPoint.sub(pool.allocPoint).add(_allocPoint) (contracts/
distribution/UniteGenesisRewardPool.sol#131)
UniteRewardPool.add(uint256,IERC20,bool,uint256) (contracts/distribution/
UniteRewardPool.sol#89-119) should emit an event for:
- totalAllocPoint = totalAllocPoint.add(_allocPoint) (contracts/distribution/
UniteRewardPool.sol#117)
UniteRewardPool.set(uint256,uint256) (contracts/distribution/
UniteRewardPool.sol#122-129) should emit an event for:
- totalAllocPoint = totalAllocPoint.sub(pool.allocPoint).add(_allocPoint) (contracts/
distribution/UniteRewardPool.sol#126)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-events-
arithmetic
INFO:Detectors:
Boardroom.setOperator(address)._operator (contracts/Boardroom.sol#138) lacks a zero-
check on :
- operator = _operator (contracts/Boardroom.sol#139)
Timelock.constructor(address,uint256).admin_ (contracts/Timelock.sol#56) lacks a zero-
check on :
```

- admin = admin_ (contracts/Timelock.sol#60)
Timelock.setPendingAdmin(address).pendingAdmin_ (contracts/Timelock.sol#83) lacks a zero-check on :
- pendingAdmin = pendingAdmin_ (contracts/Timelock.sol#85)
Timelock.executeTransaction(address,uint256,string,bytes,uint256).target (contracts/Timelock.sol#123) lacks a zero-check on :
- (success,returnData) = target.call{value: value}(callData) (contracts/Timelock.sol#147)
Treasury.initialize(address,address,address,address,address,uint256)._kitty (contracts/Treasury.sol#232) lacks a zero-check on :
- kitty = _kitty (contracts/Treasury.sol#239)
Treasury.initialize(address,address,address,address,address,uint256)._bbond (contracts/Treasury.sol#233) lacks a zero-check on :
- bbond = _bbond (contracts/Treasury.sol#240)
Treasury.initialize(address,address,address,address,address,uint256)._bshare (contracts/Treasury.sol#234) lacks a zero-check on :
- bshare = _bshare (contracts/Treasury.sol#241)
Treasury.initialize(address,address,address,address,address,uint256)._kittyOracle (contracts/Treasury.sol#235) lacks a zero-check on :
- kittyOracle = _kittyOracle (contracts/Treasury.sol#242)
Treasury.initialize(address,address,address,address,address,uint256)._boardroom (contracts/Treasury.sol#236) lacks a zero-check on :
- boardroom = _boardroom (contracts/Treasury.sol#243)
Treasury.setOperator(address)._operator (contracts/Treasury.sol#275) lacks a zero-check on :
- operator = _operator (contracts/Treasury.sol#276)
Treasury.setBoardroom(address)._boardroom (contracts/Treasury.sol#279) lacks a zero-check on :
- boardroom = _boardroom (contracts/Treasury.sol#280)
Treasury.setUniteOracle(address)._kittyOracle (contracts/Treasury.sol#283) lacks a zero-check on :
- kittyOracle = _kittyOracle (contracts/Treasury.sol#284)
UShare.setTreasuryFund(address)._communityFund (contracts/UShare.sol#67) lacks a zero-check on :
- communityFund = _communityFund (contracts/UShare.sol#69)
UShareRewardPool.setOperator(address)._operator (contracts/distribution/UShareRewardPool.sol#260) lacks a zero-check on :
- operator = _operator (contracts/distribution/UShareRewardPool.sol#261)
UniteGenesisRewardPool.setOperator(address)._operator (contracts/distribution/UniteGenesisRewardPool.sol#263) lacks a zero-check on :
- operator = _operator (contracts/distribution/UniteGenesisRewardPool.sol#264)

```
UniteRewardPool.setOperator(address)._operator (contracts/distribution/
UniteRewardPool.sol#264) lacks a zero-check on :
        - operator = _operator (contracts/distribution/UniteRewardPool.sol#265)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-zero-
address-validation
INFO:Detectors:
Modifier Migrations.restricted() (contracts/Migrations.sol#13-15) does not always
execute _; or revertReference: https://github.com/crytic/slither/wiki/Detector-
Documentation#incorrect-modifier
INFO:Detectors:
Distributor.distribute() (contracts/Distributor.sol#14-18) has external calls inside a
loop: distributors[i].distribute() (contracts/Distributor.sol#16)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation/#calls-inside-
a-loop
INFO:Detectors:
Variable 'Treasury.getUnitePrice().price (contracts/Treasury.sol#149)' in
Treasury.getUnitePrice() (contracts/Treasury.sol#148-154) potentially used before
declaration: uint256(price) (contracts/Treasury.sol#150)
Variable 'Treasury.getUniteUpdatedPrice().price (contracts/Treasury.sol#157)' in
Treasury.getUniteUpdatedPrice() (contracts/Treasury.sol#156-162) potentially used
before declaration: uint256(price) (contracts/Treasury.sol#158)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#pre-
declaration-usage-of-local-variables
INFO:Detectors:
Reentrancy in Treasury.allocateSeigniorage() (contracts/Treasury.sol#501-541):
        External calls:
        - _updateUnitePrice() (contracts/Treasury.sol#502)
                - IOracle(kittyOracle).update() (contracts/Treasury.sol#394)
        State variables written after the call(s):
        - _mse = _calculateMaxSupplyExpansionPercent(kittySupply).mul(1e14) (contracts/
Treasury.sol#515)
                - maxSupplyExpansionPercent = maxExpansionTiers[tierId] (contracts/Treasury.sol#494)
        - previousEpochUnitePrice = getUnitePrice() (contracts/Treasury.sol#503)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-
vulnerabilities-2
INFO:Detectors:
Reentrancy in Treasury._sendToBoardroom(uint256) (contracts/Treasury.sol#459-489):
        External calls:
        - IBasisAsset(kitty).mint(address(this),_amount) (contracts/Treasury.sol#460)
        - IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (contracts/Treasury.sol#465)
        Event emitted after the call(s):
```

```
- DaoFundFunded(now,_daoFundSharedAmount) (contracts/Treasury.sol#466)
Reentrancy in Treasury._sendToBoardroom(uint256) (contracts/Treasury.sol#459-489):
External calls:
- IBasisAsset(kitty).mint(address(this),_amount) (contracts/Treasury.sol#460)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (contracts/Treasury.sol#465)
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (contracts/Treasury.sol#472)
Event emitted after the call(s):
- DevFundFunded(now,_devFundSharedAmount) (contracts/Treasury.sol#473)
Reentrancy in Treasury._sendToBoardroom(uint256) (contracts/Treasury.sol#459-489):
External calls:
- IBasisAsset(kitty).mint(address(this),_amount) (contracts/Treasury.sol#460)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (contracts/Treasury.sol#465)
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (contracts/Treasury.sol#472)
- IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (contracts/
Treasury.sol#479)
Event emitted after the call(s):
- TeamFundFunded(now,_team1FundSharedAmount) (contracts/Treasury.sol#480)
Reentrancy in Treasury._sendToBoardroom(uint256) (contracts/Treasury.sol#459-489):
External calls:
- IBasisAsset(kitty).mint(address(this),_amount) (contracts/Treasury.sol#460)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (contracts/Treasury.sol#465)
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (contracts/Treasury.sol#472)
- IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (contracts/
Treasury.sol#479)
- IERC20(kitty).safeApprove(boardroom,0) (contracts/Treasury.sol#485)
- IERC20(kitty).safeApprove(boardroom,_amount) (contracts/Treasury.sol#486)
- IBoardroom(boardroom).allocateSeigniorage(_amount) (contracts/Treasury.sol#487)
Event emitted after the call(s):
- BoardroomFunded(now,_amount) (contracts/Treasury.sol#488)
Reentrancy in Boardroom.allocateSeigniorage(uint256) (contracts/Boardroom.sol#233-246):
External calls:
- kitty.safeTransferFrom(msg.sender,address(this),amount) (contracts/
Boardroom.sol#244)
Event emitted after the call(s):
- RewardAdded(msg.sender,amount) (contracts/Boardroom.sol#245)
Reentrancy in Treasury.allocateSeigniorage() (contracts/Treasury.sol#501-541):
External calls:
- _updateUnitePrice() (contracts/Treasury.sol#502)
  - IOracle(kittyOracle).update() (contracts/Treasury.sol#394)
- _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000))
(contracts/Treasury.sol#507)
```

- returndata = address(token).functionCall(data,SafeERC20: low-level call failed) (node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
- IBasisAsset(kitty).mint(address(this),_amount) (contracts/Treasury.sol#460)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (contracts/Treasury.sol#465)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (contracts/Treasury.sol#472)
- IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (contracts/Treasury.sol#479)
- IERC20(kitty).safeApprove(boardroom,0) (contracts/Treasury.sol#485)
- IERC20(kitty).safeApprove(boardroom,_amount) (contracts/Treasury.sol#486)
- IBoardroom(boardroom).allocateSeigniorage(_amount) (contracts/Treasury.sol#487)

External calls sending eth:

- _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000)) (contracts/Treasury.sol#507)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)

Event emitted after the call(s):

- BoardroomFunded(now,_amount) (contracts/Treasury.sol#488)
- _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000)) (contracts/Treasury.sol#507)
- DaoFundFunded(now,_daoFundSharedAmount) (contracts/Treasury.sol#466)
- _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000)) (contracts/Treasury.sol#507)
- DevFundFunded(now,_devFundSharedAmount) (contracts/Treasury.sol#473)
- _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000)) (contracts/Treasury.sol#507)
- TeamFundFunded(now,_team1FundSharedAmount) (contracts/Treasury.sol#480)
- _sendToBoardroom(kittySupply.mul(bootstrapSupplyExpansionPercent).div(10000)) (contracts/Treasury.sol#507)

Reentrancy in Treasury.allocateSeigniorage() (contracts/Treasury.sol#501-541):

External calls:

- _updateUnitePrice() (contracts/Treasury.sol#502)
- IOracle(kittyOracle).update() (contracts/Treasury.sol#394)
- _sendToBoardroom(_savedForBoardroom) (contracts/Treasury.sol#532)
- returndata = address(token).functionCall(data,SafeERC20: low-level call failed) (node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
- IBasisAsset(kitty).mint(address(this),_amount) (contracts/Treasury.sol#460)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (contracts/Treasury.sol#465)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)

```
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (contracts/Treasury.sol#472)
- IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (contracts/
Treasury.sol#479)
- IERC20(kitty).safeApprove(boardroom,0) (contracts/Treasury.sol#485)
- IERC20(kitty).safeApprove(boardroom,_amount) (contracts/Treasury.sol#486)
- IBoardroom(boardroom).allocateSeigniorage(_amount) (contracts/Treasury.sol#487)
External calls sending eth:
- _sendToBoardroom(_savedForBoardroom) (contracts/Treasury.sol#532)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
Event emitted after the call(s):
- BoardroomFunded(now,_amount) (contracts/Treasury.sol#488)
- _sendToBoardroom(_savedForBoardroom) (contracts/Treasury.sol#532)
- DaoFundFunded(now,_daoFundSharedAmount) (contracts/Treasury.sol#466)
- _sendToBoardroom(_savedForBoardroom) (contracts/Treasury.sol#532)
- DevFundFunded(now,_devFundSharedAmount) (contracts/Treasury.sol#473)
- _sendToBoardroom(_savedForBoardroom) (contracts/Treasury.sol#532)
- TeamFundFunded(now,_team1FundSharedAmount) (contracts/Treasury.sol#480)
- _sendToBoardroom(_savedForBoardroom) (contracts/Treasury.sol#532)
Reentrancy in Treasury.allocateSeigniorage() (contracts/Treasury.sol#501-541):
External calls:
- _updateUnitePrice() (contracts/Treasury.sol#502)
- IOracle(kittyOracle).update() (contracts/Treasury.sol#394)
- _sendToBoardroom(_savedForBoardroom) (contracts/Treasury.sol#532)
- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
- IBasisAsset(kitty).mint(address(this),_amount) (contracts/Treasury.sol#460)
- IERC20(kitty).transfer(daoFund,_daoFundSharedAmount) (contracts/Treasury.sol#465)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
- IERC20(kitty).transfer(devFund,_devFundSharedAmount) (contracts/Treasury.sol#472)
- IERC20(kitty).transfer(team1Fund,_team1FundSharedAmount) (contracts/
Treasury.sol#479)
- IERC20(kitty).safeApprove(boardroom,0) (contracts/Treasury.sol#485)
- IERC20(kitty).safeApprove(boardroom,_amount) (contracts/Treasury.sol#486)
- IBoardroom(boardroom).allocateSeigniorage(_amount) (contracts/Treasury.sol#487)
- IBasisAsset(kitty).mint(address(this),_savedForBond) (contracts/Treasury.sol#536)
External calls sending eth:
- _sendToBoardroom(_savedForBoardroom) (contracts/Treasury.sol#532)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
```

```
Event emitted after the call(s):
- TreasuryFunded(now,_savedForBond) (contracts/Treasury.sol#537)
Reentrancy in Treasury.buyBonds(uint256,uint256) (contracts/Treasury.sol#404-431):
External calls:
- IBasisAsset(kitty).burnFrom(msg.sender,_kittyAmount) (contracts/Treasury.sol#424)
- IBasisAsset(bbond).mint(msg.sender,_bondAmount) (contracts/Treasury.sol#425)
- _updateUnitePrice() (contracts/Treasury.sol#428)
  - IOracle(kittyOracle).update() (contracts/Treasury.sol#394)
Event emitted after the call(s):
- BoughtBonds(msg.sender,_kittyAmount,_bondAmount) (contracts/Treasury.sol#430)
Reentrancy in Boardroom.claimReward() (contracts/Boardroom.sol#222-231):
External calls:
- kitty.safeTransfer(msg.sender,reward) (contracts/Boardroom.sol#228)
Event emitted after the call(s):
- RewardPaid(msg.sender,reward) (contracts/Boardroom.sol#229)
Reentrancy in SimpleERCFund.deposit(address,uint256,string) (contracts/
SimpleERCFund.sol#14-21):
External calls:
- IERC20(token).safeTransferFrom(msg.sender,address(this),amount) (contracts/
SimpleERCFund.sol#19)
Event emitted after the call(s):
- Deposit(msg.sender,now,reason) (contracts/SimpleERCFund.sol#20)
Reentrancy in UShareRewardPool.deposit(uint256,uint256) (contracts/distribution/
UShareRewardPool.sol#197-215):
External calls:
- safeUShareTransfer(_sender,_pending) (contracts/distribution/
UShareRewardPool.sol#205)
  - returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
  - bshare.safeTransfer(_to,_bshareBal) (contracts/distribution/
UShareRewardPool.sol#253)
  - (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
  - bshare.safeTransfer(_to,_amount) (contracts/distribution/UShareRewardPool.sol#255)
External calls sending eth:
- safeUShareTransfer(_sender,_pending) (contracts/distribution/
UShareRewardPool.sol#205)
  - (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
Event emitted after the call(s):
- RewardPaid(_sender,_pending) (contracts/distribution/UShareRewardPool.sol#206)
```

```
Reentrancy in UShareRewardPool.deposit(uint256,uint256) (contracts/distribution/
UShareRewardPool.sol#197-215):
	External calls:
	- safeUShareTransfer(_sender,_pending) (contracts/distribution/
UShareRewardPool.sol#205)
		- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
		- bshare.safeTransfer(_to,_bshareBal) (contracts/distribution/
UShareRewardPool.sol#253)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
		- bshare.safeTransfer(_to,_amount) (contracts/distribution/UShareRewardPool.sol#255)
	- pool.token.safeTransferFrom(_sender,address(this),_amount) (contracts/distribution/
UShareRewardPool.sol#210)
	External calls sending eth:
	- safeUShareTransfer(_sender,_pending) (contracts/distribution/
UShareRewardPool.sol#205)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
	Event emitted after the call(s):
	- Deposit(_sender,_pid,_amount) (contracts/distribution/UShareRewardPool.sol#214)
Reentrancy in UniteGenesisRewardPool.deposit(uint256,uint256) (contracts/distribution/
UniteGenesisRewardPool.sol#196-218):
	External calls:
	- safeUniteTransfer(_sender,_pending) (contracts/distribution/
UniteGenesisRewardPool.sol#204)
		- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
		- bomb.safeTransfer(_to,_bombBalance) (contracts/distribution/
UniteGenesisRewardPool.sol#256)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
		- bomb.safeTransfer(_to,_amount) (contracts/distribution/
UniteGenesisRewardPool.sol#258)
	External calls sending eth:
	- safeUniteTransfer(_sender,_pending) (contracts/distribution/
UniteGenesisRewardPool.sol#204)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
	Event emitted after the call(s):
	- RewardPaid(_sender,_pending) (contracts/distribution/UniteGenesisRewardPool.sol#205)
```

```
Reentrancy in UniteGenesisRewardPool.deposit(uint256,uint256) (contracts/distribution/
UniteGenesisRewardPool.sol#196-218):
	External calls:
	- safeUniteTransfer(_sender,_pending) (contracts/distribution/
UniteGenesisRewardPool.sol#204)
		- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
		- bomb.safeTransfer(_to,_bombBalance) (contracts/distribution/
UniteGenesisRewardPool.sol#256)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
		- bomb.safeTransfer(_to,_amount) (contracts/distribution/
UniteGenesisRewardPool.sol#258)
	- pool.token.safeTransferFrom(_sender,address(this),_amount) (contracts/distribution/
UniteGenesisRewardPool.sol#209)
	External calls sending eth:
	- safeUniteTransfer(_sender,_pending) (contracts/distribution/
UniteGenesisRewardPool.sol#204)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
	Event emitted after the call(s):
	- Deposit(_sender,_pid,_amount) (contracts/distribution/
UniteGenesisRewardPool.sol#217)
Reentrancy in UniteRewardPool.deposit(uint256,uint256) (contracts/distribution/
UniteRewardPool.sol#201-219):
	External calls:
	- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteRewardPool.sol#209)
		- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
		- bomb.safeTransfer(_to,_bombBal) (contracts/distribution/UniteRewardPool.sol#257)
		- bomb.safeTransfer(_to,_amount) (contracts/distribution/UniteRewardPool.sol#259)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
	External calls sending eth:
	- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteRewardPool.sol#209)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
	Event emitted after the call(s):
	- RewardPaid(_sender,_pending) (contracts/distribution/UniteRewardPool.sol#210)
Reentrancy in UniteRewardPool.deposit(uint256,uint256) (contracts/distribution/
UniteRewardPool.sol#201-219):
```

```
External calls:
- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteRewardPool.sol#209)
- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
- bomb.safeTransfer(_to,_bombBal) (contracts/distribution/UniteRewardPool.sol#257)
- bomb.safeTransfer(_to,_amount) (contracts/distribution/UniteRewardPool.sol#259)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
- pool.token.safeTransferFrom(_sender,address(this),_amount) (contracts/distribution/
UniteRewardPool.sol#214)
External calls sending eth:
- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteRewardPool.sol#209)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
Event emitted after the call(s):
- Deposit(_sender,_pid,_amount) (contracts/distribution/UniteRewardPool.sol#218)
Reentrancy in UShareRewardPool.emergencyWithdraw(uint256) (contracts/distribution/
UShareRewardPool.sol#238-246):
External calls:
- pool.token.safeTransfer(msg.sender,_amount) (contracts/distribution/
UShareRewardPool.sol#244)
Event emitted after the call(s):
- EmergencyWithdraw(msg.sender,_pid,_amount) (contracts/distribution/
UShareRewardPool.sol#245)
Reentrancy in UniteGenesisRewardPool.emergencyWithdraw(uint256) (contracts/distribution/
UniteGenesisRewardPool.sol#241-249):
External calls:
- pool.token.safeTransfer(msg.sender,_amount) (contracts/distribution/
UniteGenesisRewardPool.sol#247)
Event emitted after the call(s):
- EmergencyWithdraw(msg.sender,_pid,_amount) (contracts/distribution/
UniteGenesisRewardPool.sol#248)
Reentrancy in UniteRewardPool.emergencyWithdraw(uint256) (contracts/distribution/
UniteRewardPool.sol#242-250):
External calls:
- pool.token.safeTransfer(msg.sender,_amount) (contracts/distribution/
UniteRewardPool.sol#248)
Event emitted after the call(s):
- EmergencyWithdraw(msg.sender,_pid,_amount) (contracts/distribution/
UniteRewardPool.sol#249)
Reentrancy in Timelock.executeTransaction(address,uint256,string,bytes,uint256)
```

```
(contracts/Timelock.sol#122-153):
	External calls:
	- (success,returnData) = target.call{value: value}(callData) (contracts/
Timelock.sol#147)
	Event emitted after the call(s):
	- ExecuteTransaction(txHash,target,value,signature,data,eta) (contracts/
Timelock.sol#150)
Reentrancy in Treasury.redeemBonds(uint256,uint256) (contracts/Treasury.sol#433-457):
	External calls:
	- IBasisAsset(bbond).burnFrom(msg.sender,_bondAmount) (contracts/Treasury.sol#451)
	- IERC20(kitty).safeTransfer(msg.sender,_kittyAmount) (contracts/Treasury.sol#452)
	- _updateUnitePrice() (contracts/Treasury.sol#454)
		- IOracle(kittyOracle).update() (contracts/Treasury.sol#394)
	Event emitted after the call(s):
	- RedeemedBonds(msg.sender,_kittyAmount,_bondAmount) (contracts/Treasury.sol#456)
Reentrancy in Boardroom.stake(uint256) (contracts/Boardroom.sol#203-208):
	External calls:
	- super.stake(amount) (contracts/Boardroom.sol#205)
		- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
		- share.safeTransferFrom(msg.sender,address(this),amount) (contracts/
Boardroom.sol#32)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
	External calls sending eth:
	- super.stake(amount) (contracts/Boardroom.sol#205)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
	Event emitted after the call(s):
	- Staked(msg.sender,amount) (contracts/Boardroom.sol#207)
Reentrancy in Boardroom.withdraw(uint256) (contracts/Boardroom.sol#210-216):
	External calls:
	- claimReward() (contracts/Boardroom.sol#213)
		- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
		- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/
contracts/utils/Address.sol#119)
		- kitty.safeTransfer(msg.sender,reward) (contracts/Boardroom.sol#228)
	- super.withdraw(amount) (contracts/Boardroom.sol#214)
		- returndata = address(token).functionCall(data,SafeERC20: low-level call failed)
(node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
```

- share.safeTransfer(msg.sender,amount) (contracts/Boardroom.sol#40)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
External calls sending eth:
- claimReward() (contracts/Boardroom.sol#213)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
- super.withdraw(amount) (contracts/Boardroom.sol#214)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
Event emitted after the call(s):
- Withdrawn(msg.sender,amount) (contracts/Boardroom.sol#215)

Reentrancy in SimpleERCFund.withdraw(address,uint256,address,string) (contracts/SimpleERCFund.sol#23-31):
External calls:
- IERC20(token).safeTransfer(to,amount) (contracts/SimpleERCFund.sol#29)
Event emitted after the call(s):
- Withdrawal(msg.sender,to,now,reason) (contracts/SimpleERCFund.sol#30)

Reentrancy in UShareRewardPool.withdraw(uint256,uint256) (contracts/distribution/UShareRewardPool.sol#218-235):
External calls:
- safeUShareTransfer(_sender,_pending) (contracts/distribution/UShareRewardPool.sol#226)
- returndata = address(token).functionCall(data,SafeERC20: low-level call failed) (node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
- bshare.safeTransfer(_to,_bshareBal) (contracts/distribution/UShareRewardPool.sol#253)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
- bshare.safeTransfer(_to,_amount) (contracts/distribution/UShareRewardPool.sol#255)
External calls sending eth:
- safeUShareTransfer(_sender,_pending) (contracts/distribution/UShareRewardPool.sol#226)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
Event emitted after the call(s):
- RewardPaid(_sender,_pending) (contracts/distribution/UShareRewardPool.sol#227)

Reentrancy in UShareRewardPool.withdraw(uint256,uint256) (contracts/distribution/UShareRewardPool.sol#218-235):
External calls:
- safeUShareTransfer(_sender,_pending) (contracts/distribution/UShareRewardPool.sol#226)

- returndata = address(token).functionCall(data,SafeERC20: low-level call failed) (node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
- bshare.safeTransfer(_to,_bshareBal) (contracts/distribution/UShareRewardPool.sol#253)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
- bshare.safeTransfer(_to,_amount) (contracts/distribution/UShareRewardPool.sol#255)
- pool.token.safeTransfer(_sender,_amount) (contracts/distribution/UShareRewardPool.sol#231)

External calls sending eth:
- safeUShareTransfer(_sender,_pending) (contracts/distribution/UShareRewardPool.sol#226)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)

Event emitted after the call(s):
- Withdraw(_sender,_pid,_amount) (contracts/distribution/UShareRewardPool.sol#234)

Reentrancy in UniteGenesisRewardPool.withdraw(uint256,uint256) (contracts/distribution/UniteGenesisRewardPool.sol#221-238):

External calls:
- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteGenesisRewardPool.sol#229)
- returndata = address(token).functionCall(data,SafeERC20: low-level call failed) (node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
- bomb.safeTransfer(_to,_bombBalance) (contracts/distribution/UniteGenesisRewardPool.sol#256)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
- bomb.safeTransfer(_to,_amount) (contracts/distribution/UniteGenesisRewardPool.sol#258)

External calls sending eth:
- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteGenesisRewardPool.sol#229)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)

Event emitted after the call(s):
- RewardPaid(_sender,_pending) (contracts/distribution/UniteGenesisRewardPool.sol#230)

Reentrancy in UniteGenesisRewardPool.withdraw(uint256,uint256) (contracts/distribution/UniteGenesisRewardPool.sol#221-238):

External calls:
- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteGenesisRewardPool.sol#229)

- returndata = address(token).functionCall(data,SafeERC20: low-level call failed) (node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
- bomb.safeTransfer(_to,_bombBalance) (contracts/distribution/UniteGenesisRewardPool.sol#256)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
- bomb.safeTransfer(_to,_amount) (contracts/distribution/UniteGenesisRewardPool.sol#258)
- pool.token.safeTransfer(_sender,_amount) (contracts/distribution/UniteGenesisRewardPool.sol#234)

External calls sending eth:
- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteGenesisRewardPool.sol#229)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)

Event emitted after the call(s):
- Withdraw(_sender,_pid,_amount) (contracts/distribution/UniteGenesisRewardPool.sol#237)

Reentrancy in UniteRewardPool.withdraw(uint256,uint256) (contracts/distribution/UniteRewardPool.sol#222-239):

External calls:
- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteRewardPool.sol#230)
- returndata = address(token).functionCall(data,SafeERC20: low-level call failed) (node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
- bomb.safeTransfer(_to,_bombBal) (contracts/distribution/UniteRewardPool.sol#257)
- bomb.safeTransfer(_to,_amount) (contracts/distribution/UniteRewardPool.sol#259)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)

External calls sending eth:
- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteRewardPool.sol#230)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)

Event emitted after the call(s):
- RewardPaid(_sender,_pending) (contracts/distribution/UniteRewardPool.sol#231)

Reentrancy in UniteRewardPool.withdraw(uint256,uint256) (contracts/distribution/UniteRewardPool.sol#222-239):

External calls:
- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteRewardPool.sol#230)
- returndata = address(token).functionCall(data,SafeERC20: low-level call failed) (node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#69)
- bomb.safeTransfer(_to,_bombBal) (contracts/distribution/UniteRewardPool.sol#257)

- bomb.safeTransfer(_to,_amount) (contracts/distribution/UniteRewardPool.sol#259)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
- pool.token.safeTransfer(_sender,_amount) (contracts/distribution/UniteRewardPool.sol#235)
External calls sending eth:
- safeUniteTransfer(_sender,_pending) (contracts/distribution/UniteRewardPool.sol#230)
- (success,returndata) = target.call{value: value}(data) (node_modules/@openzeppelin/contracts/utils/Address.sol#119)
Event emitted after the call(s):
- Withdraw(_sender,_pid,_amount) (contracts/distribution/UniteRewardPool.sol#238)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities-3
INFO:Detectors:
TaxOfficeV2.addLiquidityTaxFree(address,uint256,uint256,uint256,uint256) (contracts/TaxOfficeV2.sol#84-129) uses timestamp for comparisons
Dangerous comparisons:
- amtUnite.sub(resultAmtUnite) > 0 (contracts/TaxOfficeV2.sol#122)
- amtToken.sub(resultAmtToken) > 0 (contracts/TaxOfficeV2.sol#125)
TaxOfficeV2.addLiquidityETHTaxFree(uint256,uint256,uint256) (contracts/TaxOfficeV2.sol#131-168) uses timestamp for comparisons
Dangerous comparisons:
- amtUnite.sub(resultAmtUnite) > 0 (contracts/TaxOfficeV2.sol#164)
Timelock.queueTransaction(address,uint256,string,bytes,uint256) (contracts/Timelock.sol#90-105) uses timestamp for comparisons
Dangerous comparisons:
- require(bool,string)(eta >= getBlockTimestamp().add(delay),Timelock::queueTransaction: Estimated execution block must satisfy delay.) (contracts/Timelock.sol#98)
Timelock.executeTransaction(address,uint256,string,bytes,uint256) (contracts/Timelock.sol#122-153) uses timestamp for comparisons
Dangerous comparisons:
- require(bool,string)(getBlockTimestamp() >= eta,Timelock::executeTransaction: Transaction hasn't surpassed time lock.) (contracts/Timelock.sol#133)
- require(bool,string)(getBlockTimestamp() <= eta.add(GRACE_PERIOD),Timelock::executeTransaction: Transaction is stale.) (contracts/Timelock.sol#134)
UShare.unclaimedTreasuryFund() (contracts/UShare.sol#84-89) uses timestamp for comparisons
Dangerous comparisons:
- _now > endTime (contracts/UShare.sol#86)

- communityFundLastClaimed >= _now (contracts/UShare.sol#87)
UShare.unclaimedDevFund() (contracts/UShare.sol#91-96) uses timestamp for comparisons
Dangerous comparisons:
- _now > endTime (contracts/UShare.sol#93)
- devFundLastClaimed >= _now (contracts/UShare.sol#94)
UShare.unclaimedTeam1Fund() (contracts/UShare.sol#98-103) uses timestamp for comparisons
Dangerous comparisons:
- _now > endTime (contracts/UShare.sol#100)
- team1FundLastClaimed >= _now (contracts/UShare.sol#101)
UShareRewardPool.constructor(address,uint256) (contracts/distribution/UShareRewardPool.sol#59-70) uses timestamp for comparisons
Dangerous comparisons:
- _poolStartTime == 0 || _poolStartTime < block.timestamp (contracts/distribution/UShareRewardPool.sol#63)
UShareRewardPool.checkPoolDuplicate(IERC20) (contracts/distribution/UShareRewardPool.sol#77-82) uses timestamp for comparisons
Dangerous comparisons:
- pid < length (contracts/distribution/UShareRewardPool.sol#79)
- require(bool,string)(poolInfo[pid].token != _token,UShareRewardPool: existing pool?) (contracts/distribution/UShareRewardPool.sol#80)
UShareRewardPool.add(uint256,IERC20,bool,uint256) (contracts/distribution/UShareRewardPool.sol#85-123) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp < poolStartTime (contracts/distribution/UShareRewardPool.sol#95)
- _lastRewardTime == 0 (contracts/distribution/UShareRewardPool.sol#97)
- _lastRewardTime < poolStartTime (contracts/distribution/UShareRewardPool.sol#100)
- _lastRewardTime == 0 || _lastRewardTime < block.timestamp (contracts/distribution/UShareRewardPool.sol#106)
- _isStarted = (_lastRewardTime <= poolStartTime) || (_lastRewardTime <= block.timestamp) (contracts/distribution/UShareRewardPool.sol#110-112)
UShareRewardPool.getGeneratedReward(uint256,uint256) (contracts/distribution/UShareRewardPool.sol#138-149) uses timestamp for comparisons
Dangerous comparisons:
- _fromTime >= _toTime (contracts/distribution/UShareRewardPool.sol#139)
- _toTime >= poolEndTime (contracts/distribution/UShareRewardPool.sol#140)
- _fromTime >= poolEndTime (contracts/distribution/UShareRewardPool.sol#141)
- _fromTime <= poolStartTime (contracts/distribution/UShareRewardPool.sol#142)
- _toTime <= poolStartTime (contracts/distribution/UShareRewardPool.sol#145)
- _fromTime <= poolStartTime (contracts/distribution/UShareRewardPool.sol#146)
UShareRewardPool.pendingShare(uint256,address) (contracts/distribution/

```
UShareRewardPool.sol#152-163) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp > pool.lastRewardTime && tokenSupply != 0 (contracts/distribution/
UShareRewardPool.sol#157)
UShareRewardPool.massUpdatePools() (contracts/distribution/
UShareRewardPool.sol#166-171) uses timestamp for comparisons
Dangerous comparisons:
- pid < length (contracts/distribution/UShareRewardPool.sol#168)
UShareRewardPool.updatePool(uint256) (contracts/distribution/
UShareRewardPool.sol#174-194) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp <= pool.lastRewardTime (contracts/distribution/
UShareRewardPool.sol#176)
UShareRewardPool.governanceRecoverUnsupported(IERC20,uint256,address) (contracts/
distribution/UShareRewardPool.sol#264-275) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp < poolEndTime + 7776000 (contracts/distribution/
UShareRewardPool.sol#265)
UniteGenesisRewardPool.constructor(address,address,uint256) (contracts/distribution/
UniteGenesisRewardPool.sol#68-79) uses timestamp for comparisons
Dangerous comparisons:
- require(bool,string)(block.timestamp < _poolStartTime,late) (contracts/distribution/
UniteGenesisRewardPool.sol#73)
UniteGenesisRewardPool.checkPoolDuplicate(IERC20) (contracts/distribution/
UniteGenesisRewardPool.sol#86-91) uses timestamp for comparisons
Dangerous comparisons:
- pid < length (contracts/distribution/UniteGenesisRewardPool.sol#88)
- require(bool,string)(poolInfo[pid].token != _token,UniteGenesisPool: existing pool?)
(contracts/distribution/UniteGenesisRewardPool.sol#89)
UniteGenesisRewardPool.add(uint256,IERC20,bool,uint256) (contracts/distribution/
UniteGenesisRewardPool.sol#94-124) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp < poolStartTime (contracts/distribution/
UniteGenesisRewardPool.sol#104)
- _lastRewardTime == 0 (contracts/distribution/UniteGenesisRewardPool.sol#106)
- _lastRewardTime < poolStartTime (contracts/distribution/
UniteGenesisRewardPool.sol#109)
- _lastRewardTime == 0 || _lastRewardTime < block.timestamp (contracts/distribution/
UniteGenesisRewardPool.sol#115)
- _isStarted = (_lastRewardTime <= poolStartTime) || (_lastRewardTime <=
block.timestamp) (contracts/distribution/UniteGenesisRewardPool.sol#119)
```

```
UniteGenesisRewardPool.getGeneratedReward(uint256,uint256) (contracts/distribution/
UniteGenesisRewardPool.sol#137-148) uses timestamp for comparisons
Dangerous comparisons:
- _fromTime >= _toTime (contracts/distribution/UniteGenesisRewardPool.sol#138)
- _toTime >= poolEndTime (contracts/distribution/UniteGenesisRewardPool.sol#139)
- _toTime <= poolStartTime (contracts/distribution/UniteGenesisRewardPool.sol#144)
UniteGenesisRewardPool.pendingUNITE(uint256,address) (contracts/distribution/
UniteGenesisRewardPool.sol#151-162) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp > pool.lastRewardTime && tokenSupply != 0 (contracts/distribution/
UniteGenesisRewardPool.sol#156)
UniteGenesisRewardPool.massUpdatePools() (contracts/distribution/
UniteGenesisRewardPool.sol#165-170) uses timestamp for comparisons
Dangerous comparisons:
- pid < length (contracts/distribution/UniteGenesisRewardPool.sol#167)
UniteGenesisRewardPool.updatePool(uint256) (contracts/distribution/
UniteGenesisRewardPool.sol#173-193) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp <= pool.lastRewardTime (contracts/distribution/
UniteGenesisRewardPool.sol#175)
UniteGenesisRewardPool.governanceRecoverUnsupported(IERC20,uint256,address) (contracts/
distribution/UniteGenesisRewardPool.sol#267-282) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp < poolEndTime + 7776000 (contracts/distribution/
UniteGenesisRewardPool.sol#272)
UniteRewardPool.constructor(address,uint256) (contracts/distribution/
UniteRewardPool.sol#60-74) uses timestamp for comparisons
Dangerous comparisons:
- require(bool,string)(block.timestamp < _poolStartTime,late) (contracts/distribution/
UniteRewardPool.sol#61)
UniteRewardPool.checkPoolDuplicate(IERC20) (contracts/distribution/
UniteRewardPool.sol#81-86) uses timestamp for comparisons
Dangerous comparisons:
- pid < length (contracts/distribution/UniteRewardPool.sol#83)
- require(bool,string)(poolInfo[pid].token != _token,UniteRewardPool: existing pool?)
(contracts/distribution/UniteRewardPool.sol#84)
UniteRewardPool.add(uint256,IERC20,bool,uint256) (contracts/distribution/
UniteRewardPool.sol#89-119) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp < poolStartTime (contracts/distribution/UniteRewardPool.sol#99)
- _lastRewardTime == 0 (contracts/distribution/UniteRewardPool.sol#101)
```

```
- _lastRewardTime < poolStartTime (contracts/distribution/UniteRewardPool.sol#104)
- _lastRewardTime == 0 || _lastRewardTime < block.timestamp (contracts/distribution/
UniteRewardPool.sol#110)
- _isStarted = (_lastRewardTime <= poolStartTime) || (_lastRewardTime <=
block.timestamp) (contracts/distribution/UniteRewardPool.sol#114)
UniteRewardPool.getGeneratedReward(uint256,uint256) (contracts/distribution/
UniteRewardPool.sol#132-153) uses timestamp for comparisons
Dangerous comparisons:
- _toTime >= epochEndTimes[epochId - 1] (contracts/distribution/
UniteRewardPool.sol#134)
UniteRewardPool.pendingUNITE(uint256,address) (contracts/distribution/
UniteRewardPool.sol#156-167) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp > pool.lastRewardTime && tokenSupply != 0 (contracts/distribution/
UniteRewardPool.sol#161)
UniteRewardPool.massUpdatePools() (contracts/distribution/UniteRewardPool.sol#170-175)
uses timestamp for comparisons
Dangerous comparisons:
- pid < length (contracts/distribution/UniteRewardPool.sol#172)
UniteRewardPool.updatePool(uint256) (contracts/distribution/
UniteRewardPool.sol#178-198) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp <= pool.lastRewardTime (contracts/distribution/
UniteRewardPool.sol#180)
UniteRewardPool.governanceRecoverUnsupported(IERC20,uint256,address) (contracts/
distribution/UniteRewardPool.sol#268-283) uses timestamp for comparisons
Dangerous comparisons:
- block.timestamp < epochEndTimes[1] + 2592000 (contracts/distribution/
UniteRewardPool.sol#273)
UniswapV2OracleLibrary.currentCumulativePrices(address) (contracts/lib/
UniswapV2OracleLibrary.sol#18-42) uses timestamp for comparisons
Dangerous comparisons:
- blockTimestampLast != blockTimestamp (contracts/lib/UniswapV2OracleLibrary.sol#33)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#block-
timestamp
INFO:Detectors:
Address.isContract(address) (node_modules/@openzeppelin/contracts/utils/
Address.sol#26-35) uses assembly
- INLINE ASM (node_modules/@openzeppelin/contracts/utils/Address.sol#33)
Address._verifyCallResult(bool,bytes,string) (node_modules/@openzeppelin/contracts/
utils/Address.sol#171-188) uses assembly
```

- INLINE ASM (node_modules/@openzeppelin/contracts/utils/Address.sol#180-183)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#assembly-usage
INFO:Detectors:
Different versions of Solidity is used:
- Version used: ['0.6.12', '>=0.6.0<0.8.0', '>=0.6.2<0.8.0', '^0.6.0']
- >=0.6.0<0.8.0 (node_modules/@openzeppelin/contracts/GSN/Context.sol#3)
- >=0.6.0<0.8.0 (node_modules/@openzeppelin/contracts/access/Ownable.sol#3)
- >=0.6.0<0.8.0 (node_modules/@openzeppelin/contracts/math/Math.sol#3)
- >=0.6.0<0.8.0 (node_modules/@openzeppelin/contracts/math/SafeMath.sol#3)
- >=0.6.0<0.8.0 (node_modules/@openzeppelin/contracts/token/ERC20/ERC20.sol#3)
- >=0.6.0<0.8.0 (node_modules/@openzeppelin/contracts/token/ERC20/ERC20Burnable.sol#3)
- >=0.6.0<0.8.0 (node_modules/@openzeppelin/contracts/token/ERC20/IERC20.sol#3)
- >=0.6.0<0.8.0 (node_modules/@openzeppelin/contracts/token/ERC20/SafeERC20.sol#3)
- >=0.6.2<0.8.0 (node_modules/@openzeppelin/contracts/utils/Address.sol#3)
- >=0.6.0<0.8.0 (node_modules/@openzeppelin/contracts/utils/Context.sol#3)
- >=0.6.0<0.8.0 (node_modules/@openzeppelin/contracts/utils/ReentrancyGuard.sol#3)
- 0.6.12 (contracts/Boardroom.sol#3)
- 0.6.12 (contracts/DummyToken.sol#3)
- 0.6.12 (contracts/Oracle.sol#3)
- ^0.6.0 (contracts/SimpleERCFund.sol#3)
- 0.6.12 (contracts/TaxOffice.sol#3)
- 0.6.12 (contracts/TaxOfficeV2.sol#3)
- 0.6.12 (contracts/TaxOracle.sol#3)
- 0.6.12 (contracts/Timelock.sol#3)
- 0.6.12 (contracts/Treasury.sol#3)
- 0.6.12 (contracts/UBond.sol#3)
- 0.6.12 (contracts/UShare.sol#3)
- 0.6.12 (contracts/Unite.sol#3)
- 0.6.12 (contracts/distribution/UShareRewardPool.sol#3)
- 0.6.12 (contracts/distribution/UniteGenesisRewardPool.sol#3)
- 0.6.12 (contracts/distribution/UniteRewardPool.sol#3)
- ^0.6.0 (contracts/interfaces/IBasisAsset.sol#3)
- 0.6.12 (contracts/interfaces/IBoardroom.sol#3)
- 0.6.12 (contracts/interfaces/IERC20.sol#3)
- 0.6.12 (contracts/interfaces/IOracle.sol#3)
- ^0.6.0 (contracts/interfaces/ISimpleERCFund.sol#3)
- 0.6.12 (contracts/interfaces/ITaxable.sol#3)
- 0.6.12 (contracts/interfaces/ITreasury.sol#3)
- ^0.6.0 (contracts/interfaces/IUniswapV2Pair.sol#3)
- 0.6.12 (contracts/interfaces/IUniswapV2Router.sol#3)
- 0.6.12 (contracts/interfaces/IWrappedEth.sol#3)

```
 - ^0.6.0 (contracts/lib/Babylonian.sol#3)
 - ^0.6.0 (contracts/lib/FixedPoint.sol#3)
 - 0.6.12 (contracts/lib/SafeMath8.sol#3)
 - ^0.6.0 (contracts/lib/UniswapV2Library.sol#3)
 - ^0.6.0 (contracts/lib/UniswapV2OracleLibrary.sol#3)
 - 0.6.12 (contracts/owner/Operator.sol#3)
 - 0.6.12 (contracts/utils/ContractGuard.sol#3)
 - ^0.6.0 (contracts/utils/Epoch.sol#3)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#different-
pragma-directives-are-used
INFO:Detectors:
Different versions of Solidity is used:
 - Version used: ['0.6.12', '^0.6.0']
 - 0.6.12 (contracts/Distributor.sol#3)
 - ^0.6.0 (contracts/interfaces/IDistributor.sol#3)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#different-
pragma-directives-are-used
INFO:Detectors:
Treasury._calculateMaxSupplyExpansionPercent(uint256) (contracts/Treasury.sol#491-499)
has costly operations inside a loop:
 - maxSupplyExpansionPercent = maxExpansionTiers[tierId] (contracts/Treasury.sol#494)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#costly-
operations-inside-a-loop
```

```
Quartz.governanceRecoverUnsupported(IERC20,uint256,address) (Quartz.sol#1202-1208)
ignores return value by _token.transfer(_to,_amount) (Quartz.sol#1207)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#unchecked-
transfer

Different versions of Solidity is used:
 - Version used: ['0.6.12', '>=0.6.0<0.8.0']
 - >=0.6.0<0.8.0 (Quartz.sol#6)
 - >=0.6.0<0.8.0 (Quartz.sol#32)
 - >=0.6.0<0.8.0 (Quartz.sol#124)
 - >=0.6.0<0.8.0 (Quartz.sol#372)
 - >=0.6.0<0.8.0 (Quartz.sol#746)
 - >=0.6.0<0.8.0 (Quartz.sol#790)
 - 0.6.12 (Quartz.sol#823)
 - >=0.6.0<0.8.0 (Quartz.sol#996)
 - >=0.6.0<0.8.0 (Quartz.sol#1001)
```

- 0.6.12 (Quartz.sol#1076)
- 0.6.12 (Quartz.sol#1124)
- 0.6.12 (Quartz.sol#1143)

Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#different-pragma-directives-are-used

Context._msgData() (Quartz.sol#23-26) is never used and should be removed
ERC20._setupDecimals(uint8) (Quartz.sol#718-720) is never used and should be removed
Math.average(uint256,uint256) (Quartz.sol#814-817) is never used and should be removed
Math.max(uint256,uint256) (Quartz.sol#799-801) is never used and should be removed
Math.min(uint256,uint256) (Quartz.sol#806-808) is never used and should be removed
SafeMath.div(uint256,uint256) (Quartz.sol#276-279) is never used and should be removed
SafeMath.div(uint256,uint256,string) (Quartz.sol#335-342) is never used and should be removed
SafeMath.mod(uint256,uint256) (Quartz.sol#293-296) is never used and should be removed
SafeMath.mod(uint256,uint256,string) (Quartz.sol#359-366) is never used and should be removed
SafeMath.mul(uint256,uint256) (Quartz.sol#257-262) is never used and should be removed
SafeMath.tryAdd(uint256,uint256) (Quartz.sol#145-153) is never used and should be removed
SafeMath.tryDiv(uint256,uint256) (Quartz.sol#193-200) is never used and should be removed
SafeMath.tryMod(uint256,uint256) (Quartz.sol#207-214) is never used and should be removed
SafeMath.tryMul(uint256,uint256) (Quartz.sol#174-186) is never used and should be removed
SafeMath.trySub(uint256,uint256) (Quartz.sol#160-167) is never used and should be removed
SafeMath8.add(uint8,uint8) (Quartz.sol#849-854) is never used and should be removed
SafeMath8.div(uint8,uint8) (Quartz.sol#927-929) is never used and should be removed
SafeMath8.div(uint8,uint8,string) (Quartz.sol#943-953) is never used and should be removed
SafeMath8.mod(uint8,uint8) (Quartz.sol#967-969) is never used and should be removed
SafeMath8.mod(uint8,uint8,string) (Quartz.sol#983-990) is never used and should be removed
SafeMath8.mul(uint8,uint8) (Quartz.sol#901-913) is never used and should be removed
SafeMath8.sub(uint8,uint8) (Quartz.sol#866-868) is never used and should be removed
SafeMath8.sub(uint8,uint8,string) (Quartz.sol#880-889) is never used and should be removed

Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#dead-code

```
Pragma version>=0.6.0<0.8.0 (Quartz.sol#6) is too complex
Pragma version>=0.6.0<0.8.0 (Quartz.sol#32) is too complex
Pragma version>=0.6.0<0.8.0 (Quartz.sol#124) is too complex
Pragma version>=0.6.0<0.8.0 (Quartz.sol#372) is too complex
Pragma version>=0.6.0<0.8.0 (Quartz.sol#746) is too complex
Pragma version>=0.6.0<0.8.0 (Quartz.sol#790) is too complex
Pragma version>=0.6.0<0.8.0 (Quartz.sol#996) is too complex
Pragma version>=0.6.0<0.8.0 (Quartz.sol#1001) is too complex
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-
versions-of-solidity

Parameter Quartz.distributeReward(address,address)._launcherAddress (Quartz.sol#1190)
is not in mixedCase
Parameter Quartz.distributeReward(address,address)._airdropAddress (Quartz.sol#1190) is
not in mixedCase
Parameter Quartz.governanceRecoverUnsupported(IERC20,uint256,address)._token
(Quartz.sol#1203) is not in mixedCase
Parameter Quartz.governanceRecoverUnsupported(IERC20,uint256,address)._amount
(Quartz.sol#1204) is not in mixedCase
Parameter Quartz.governanceRecoverUnsupported(IERC20,uint256,address)._to
(Quartz.sol#1205) is not in mixedCase
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-
solidity-naming-conventions

Redundant expression "this (Quartz.sol#24)" inContext (Quartz.sol#18-27)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#redundant-
statements

name() should be declared external:
 - ERC20.name() (Quartz.sol#429-431)
symbol() should be declared external:
 - ERC20.symbol() (Quartz.sol#437-439)
decimals() should be declared external:
 - ERC20.decimals() (Quartz.sol#454-456)
totalSupply() should be declared external:
 - ERC20.totalSupply() (Quartz.sol#461-463)
transfer(address,uint256) should be declared external:
 - ERC20.transfer(address,uint256) (Quartz.sol#486-494)
approve(address,uint256) should be declared external:
 - ERC20.approve(address,uint256) (Quartz.sol#516-524)
transferFrom(address,address,uint256) should be declared external:
```

```
- ERC20.transferFrom(address,address,uint256) (Quartz.sol#539-554)
increaseAllowance(address,uint256) should be declared external:
- ERC20.increaseAllowance(address,uint256) (Quartz.sol#568-579)
decreaseAllowance(address,uint256) should be declared external:
- ERC20.decreaseAllowance(address,uint256) (Quartz.sol#595-609)
burnFrom(address,uint256) should be declared external:
- ERC20Burnable.burnFrom(address,uint256) (Quartz.sol#776-784)
renounceOwnership() should be declared external:
- Ownable.renounceOwnership() (Quartz.sol#1054-1057)
transferOwnership(address) should be declared external:
- Ownable.transferOwnership(address) (Quartz.sol#1063-1070)
operator() should be declared external:
- Operator.operator() (Quartz.sol#1091-1093)
isOperator() should be declared external:
- Operator.isOperator() (Quartz.sol#1103-1105)
transferOperator(address) should be declared external:
- Operator.transferOperator(address) (Quartz.sol#1107-1109)
mint(address,uint256) should be declared external:
- Quartz.mint(address,uint256) (Quartz.sol#1171-1181)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#public-
function-that-could-be-declared-external
```

0x Guard