Security Assessment

MOBOX

May 7th, 2021

Summary

This report has been prepared for MOBOX smart contracts, to discover issues and vulnerabilities in the source code of their Smart Contract as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Static Analysis and Manual Review techniques.

The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

The security assessment resulted in findings that ranged from critical to informational. We recommend addressing these findings to ensure a high level of security standards and industry practices. We suggest recommendations that could better serve the project from the security perspective:

- Enhance general coding practices for better structures of source codes;
- Add enough unit tests to cover the possible use cases given they are currently missing in the repository;
- Provide more comments per each function for readability, especially contracts are verified in public;
- Provide more transparency on privileged activities once the protocol is live.

Overview

Project Summary

Project Name	MOBOX
Description	DeFi
Platform	BSC
Language	Solidity
Codebase	https://github.com/moboxio/NFTfarmer/tree/f3b6a2176ced7828867d366648063f3b672cd212
Commits	9443add71a3dadfefab237ac2b016c942d16e204

Audit Summary

Delivery Date	May 07, 2021
Audit Methodology	Static Analysis, Manual Review
Key Components	

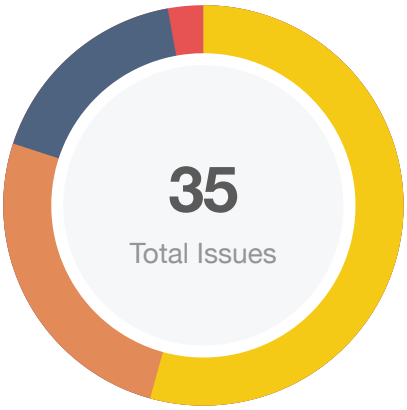
Vulnerability Summary

Total Issues	35
Critical	1
Major	9
Medium	0
Minor	19
Informational	6
Discussion	0

Audit Scope

ID	file	SHA256 Checksum
KTM	KeyToken.sol	0ca758d4ea6dfcc2570330f5f3e917fc7d5e57d2c48e574e0565006db9cc5e4d
MFM	MoboxFarm.sol	175b601762befc9dc4e228144ea1c14d1a52305a886e1ec057f5b67773c05048
MSP	MoboxStrategyP.sol	f4fdac6c357352990cfe144ac9417eb67597aba9e76b0ce64ccb3ee5f0cfda48
MSV	MoboxStrategyV.sol	5953f3c3ad07bc482fea4d32f13dd7eeadedbefc25efb48e37b5329d443413a1
MTM	MoboxToken.sol	40ada3a9edf02f55eb862482e85d56cafc998da8794822c4b739c0c56b65b0a1
MSM	MomoStaker.sol	569c40585b02e7daad1adf2300146f04b51a70357905428a3e5889578fae6ecc

Findings



Critical	**1** (2.86%)
Major	**9** (25.71%)
Medium	**0** (0.00%)
Minor	**19** (54.29%)
Informational	**6** (17.14%)
Discussion	**0** (0.00%)

ID	Title	Category	Severity	Status
MOBOX-01	Privileged Ownerships	**Centralization / Privilege**	**Minor**	**Partially Resolved**
KTM-01	Missing Zero Address Validation	Volatile Code	Minor	Acknowledged
MFM-01	Implicitly Return Values	Coding Style	Informational	Acknowledged
MFM-02	Missing Return Value Handling	Logical Issue	Minor	Resolved
MFM-03	Dangerous Usage of block.timestamp	Logical Issue	Minor	Acknowledged
MFM-04	Missing Checks for Reentrancy	Logical Issue	Major	Resolved
MSM-01	Divide Before Multiply	Logical Issue	Minor	Acknowledged
MSM-02	userHashratePercent is Undefined for One amountV6 Holders	Logical Issue	Major	Acknowledged
MSM-03	Dangerous Strict Equalities	Logical Issue	Minor	Acknowledged
MSM-04	Inaccurate Parameter of HashrateChange Event	Logical Issue	Minor	Declined
MSM-05	Stake Nft without doing real transfer	Logical Issue	Major	Partially Resolved
MSM-06	Reentrancy vulnerabilities	Logical Issue	Major	Resolved
MSM-07	Unused Return	Volatile Code	Minor	Resolved
MSM-08	3rd Party Dependencies	Control Flow	Minor	Acknowledged

ID	Title	Category	Severity	Status
MSM-09	Missing Zero Address Validation	Control Flow	Minor	Resolved
MSM-10	Calls Inside A Loop	Logical Issue	Minor	Acknowledged
MSM-11	Public Function Could Be Declared External	Gas Optimization	Informational	Acknowledged
MSP-01	Integer Overflow	Mathematical Operations	Minor	Resolved
MSP-02	Missing Checks for Reentrancy	Logical Issue	Major	Resolved
MSP-03	Missing Zero Address Validation	Logical Issue	Minor	Resolved
MSP-04	Missing slippage protection	Logical Issue	Minor	Acknowledged
MSP-05	Wrong Withdraw Amount	Logical Issue	Major	Resolved
MSP-06	Implicitly Return Values	Coding Style	Informational	Acknowledged
MSP-07	Unimpletation Constructor Function	Volatile Code	Informational	Resolved
MSP-08	3rd Party Dependencies	Control Flow	Minor	Acknowledged
MSV-01	Integer Overflow	Mathematical Operations	Minor	Resolved
MSV-02	Missing slippage protection	Logical Issue	Minor	Acknowledged
MSV-03	Compile Error	Compiler Error	Critical	Resolved
MSV-04	Missing Checks for Reentrancy	Logical Issue	Major	Resolved
MSV-05	Missing Access Control	Logical Issue	Major	Resolved
MSV-06	Implicitly Return Values	Coding Style	Informational	Acknowledged
MSV-07	Ignored Return Values	Logical Issue	Major	Acknowledged
MSV-08	Leverage risk	Logical Issue	Informational	Resolved
MSV-09	3rd Party Dependencies	Control Flow	Minor	Acknowledged
MTM-01	Mint to _dest address instead of mining pool	Logical Issue	Minor	Acknowledged

MOBOX-01 | Privileged Ownerships

Category	Severity	Location	Status
Centralization / Privilege	Minor	Global	Partially Resolved

Description

The owner and Strategist has the permission to setDevTeam, setFeeRate and other global controls without obtaining the consensus of the community.

Recommendation

Renounce ownership when it is the right timing, or gradually migrate to a timelock plus multisig governing procedure and let the community monitor in respect of transparency considerations.

KTM-01 | Missing Zero Address Validation

Category	Severity	Location	Status
Volatile Code	Minor	KeyToken.sol: 36	Acknowledged

Description

lacks a zero-check on : - moboxFarm = farm_ (KeyToken.sol#36)

Recommendation

Adding check that farm_ is not zero. If zero address is used to stop mining, then similar check like require(msg.sender == moboxFarm, "not farm") should also be added to mintForEvent().

MFM-01 | Implicitly Return Values

Category	Severity	Location	Status
Coding Style	Informational	MoboxFarm.sol: 251	Acknowledged

Description

Functions defined with return values but values are returned implicitly.

Recommendation

We recommend always return values explicitly.

MFM-02 | Missing Return Value Handling

Category	Severity	Location	Status
Logical Issue	Minor	MoboxFarm.sol: 110~111	Resolved

Description

Approve is not a void-returning function per IERC20 interface. Ignoring the return value might cause some unexpected exception, especially if the callee function doesn't revert automatically when failing.

Recommendation

We recommend checking the return value before continuing processing.

MFM-03 | Dangerous Usage of block.timestamp

Category	Severity	Location	Status
Logical Issue	Minor	MoboxFarm.sol: 126, 170, 181, 206, 229, 234, 297, 309	Acknowledged

Description

block.timestamp can be manipulated by miners.

Recommendation

Avoid relying on block.timestamp.

MFM-04 | Missing Checks for Reentrancy

Category	Severity	Location	Status
Logical Issue	Major	MoboxFarm.sol: 461~462, 178, 123, 450, 107, 148, 201, 328	Resolved

Description

Functions have state updates or event emits after external calls are vulnerable to reentrancy attack.

Recommendation

We recommend applying OpenZeppelin ReentrancyGuard library - nonReentrant modifier for the aforementioned functions to prevent reentrancy attack.

MSM-01 | Divide Before Multiply

Category	Severity	Location	Status
Logical Issue	Minor	MomoStaker.sol: 200~204(MomoStaker), 311~360(MomoStaker)	Acknowledged

Description

MoMoStaker.*earned(address,uint256) (MomoStaker.sol#200-204) performs a multiplication on the result of a division: -userHashRate = uint256(info.userHashrateFixed).mul(uint256(info.userHashratePercent) + 10000).div(10000) (MomoStaker.sol#202) -* *userHashRate.mul(rewardPerHashrate*.sub(uint256(info.userRewardPerTokenPaid))).add(uint256(info.userReward)) (MomoStaker.sol#203)

For example,Line #323:

```
else if (amount <= 200) {
                percent = (amount - 100) / 25 * 100 + 1700;     // 17% ~ 21%
            }
```

If `25` is greater than `amount - 100`, result will be zero. In general, it's usually a good idea to re-arrange arithmetic to perform multiplication before division, unless the limit of a smaller type makes this dangerous.

Recommendation

Consider ordering multiplication before division.

MSM-02 | userHashratePercent is Undefined for One amountV6 Holders

Category	Severity	Location	Status
Logical Issue	Major	MomoStaker.sol: 347	Acknowledged

Description

345 // V6 collection 346 amount = uint256(counter.amountV6); 347 if (amount > 1) { 348 if (amount <= 2) {

userHashratePercent is default 0 if "amount == 1", please confirm that's the right value.

Recommendation

We recommend to return userHashratePercent explicitly for each possible amount.

MSM-03 | Dangerous Strict Equalities

Category	Severity	Location	Status
Logical Issue	Minor	MomoStaker.sol: 187~194(MomoStaker)	Acknowledged

Description

Use of strict equalities that can be easily manipulated by an attacker.

MoMoStaker._rewardPerHashrate(uint256) (MomoStaker.sol#187-194) uses a dangerous strict equality:

```
    function _rewardPerHashrate(uint256 lastTimeRewardApplicable_) internal view returns
(uint256) {
        if (totalHashrate == 0 || block.timestamp <= rewardStartTime) {
            return rewardPerTokenStored;
        }
        return rewardPerTokenStored.add(

lastTimeRewardApplicable_.sub(lastUpdateTime).mul(rewardRate).div(totalHashrate)
        );
    }
```

`_rewardPerHashrate` relies on `totalHashrate == 0 || block.timestamp <= rewardStartTime` to know rewardPerHashrate or RewardPerTokenStored.

Recommendation

Don't use strict equality to determine if an account has enough Ether or tokens.

MSM-04 | Inaccurate Parameter of HashrateChange Event

Category	Severity	Location	Status
Logical Issue	Minor	MomoStaker.sol: 542, 555, 600	Declined

Description

```
33     // changeType: 1 stake/2 mint and stake/3 withdraw/4 level up/5 create auction/6
cancel auction/7 bid auct    ion
 34     event HashrateChange(address indexed user, uint256 changeType, uint256
oldhashRate, uint256 newHashRate);
 35
```

There is no promise HashrateChange will emit with the right changeType as the comment.

```
600         uint256 hashrateFixedSub = _removeNft(msg.sender, protosV1V2V3_,
amountsV1V2V3_, tokensV4V5_, 0x02, 0)    ;
```

Also this call happens in level up but call _removeNft() with changeType=0.

Recommendation

We recommend to set the right changeType of HashrateChange directly like in Line 612. 612 emit HashrateChange(msg.sender, 4, oldHashRate, newHashRate);

And check all calling to HashrateChange() with the right changeType.

MSM-05 | Stake Nft without doing real transfer

Category	Severity	Location	Status
Logical Issue	Major	MomoStaker.sol: 542~543, 588	Partially Resolved

Description

_stakeNft(msg.sender, ids, vals, tokenIds, false, 2);

There are places call "_stakeNft()" without doing real transfer.

Recommendation

We recommend to confirm whether this is the right behavior.

Alleviation

The logic for momoMinter.mintByStaker, The owner after minter NFT is direclty set to MomoStaker.

MSM-06 | Reentrancy vulnerabilities

Category	Severity	Location	Status
Logical Issue	Major	MomoStaker.sol: 442~530(MomoStaker), 362~438(MomoStaker), 580~590(MomoStaker), 131~141(MomoStaker)	Resolved

Description

Reentrancy in MoMoStaker.*removeNft(address,uint256[],uint256[],uint256[],uint256,uint256) (MomoStaker.sol#442-530): External calls: - momomToken.safeBatchTransferFrom(address(this),user,ids*,amounts_,) (MomoStaker.sol#475) - *momoToken.transferFrom(address(this),user*,tokenIds_[i]) (MomoStaker.sol#505) State variables written after the call(s): - counter.amountV4 = SafeMathExt.sub64(counter.amountV4,uint64(1)) (MomoStaker.sol#509) - counter.amountV5 = SafeMathExt.sub64(counter.amountV5,1) (MomoStaker.sol#519) - counter.amountV6 = SafeMathExt.sub64(counter.amountV6,1) (MomoStaker.sol#521)

Reentrancy in MoMoStaker.*stakeNft(address,uint256[],uint256[],uint256[],bool,uint256) (MomoStaker.sol#362-438): External calls: - momomToken.safeBatchTransferFrom(user,address(this),ids*,amounts_,) (MomoStaker.sol#380) - *momoToken.transferFrom(user*,address(this),tokenIds_[i]) (MomoStaker.sol#407) State variables written after the call(s): - momos.push(tokenIds_[i]) (MomoStaker.sol#414) - counter.amountV4 = SafeMathExt.add64(counter.amountV4,uint64(1)) (MomoStaker.sol#417) - counter.amountV5 = SafeMathExt.add64(counter.amountV5,1) (MomoStaker.sol#427) - counter.amountV6 = SafeMathExt.add64(counter.amountV6,1) (MomoStaker.sol#429)

Reentrancy in MoMoStaker.mintAndStake(uint256) (MomoStaker.sol#580-590): External calls: - (ids,vals,tokenIds) = momoMinter.mintByStaker(msg.sender,amount_) (MomoStaker.sol#587) - *stakeNft(msg.sender,ids,vals,tokenIds,false,2) (MomoStaker.sol#588)* - *momomToken.safeBatchTransferFrom(user,address(this),ids*,amounts_,) (MomoStaker.sol#380) - *momoToken.transferFrom(user*,address(this),tokenIds_[i]) (MomoStaker.sol#407) State variables written after the call(s): - *stakeNft(msg.sender,ids,vals,tokenIds,false,2) (MomoStaker.sol#588)* - *info.userHashrateFixed = SafeMathExt.sub128(info.userHashrateFixed,SafeMathExt.safe128(hashrateFixedSub*)) (MomoStaker.sol#563) - info.userHashrateFixed = SafeMathExt.add128(info.userHashrateFixed,SafeMathExt.safe128(hashrateFixedAdd_)) (MomoStaker.sol#567) - info.userHashratePercent = SafeMathExt.safe128(*checkCollection(user*))

(MomoStaker.sol#570) - _stakeNft(msg.sender,ids,vals,tokenIds,false,2) (MomoStaker.sol#588) - totalHashrate = totalHashrate.add(newHashRate).sub(oldHashRate) (MomoStaker.sol#572)

Recommendation

Apply the check-effects-interactions pattern.

MSM-07 | Unused Return

Category	Severity	Location	Status
Volatile Code	Minor	MomoStaker.sol: 134(MomoStaker), 140(MomoStaker), 299(MomoStaker), 638 (MomoStaker)	Resolved

Description

MoMoStaker.setRewardMgr(address) (MomoStaker.sol#131-141) ignores return value by _moboxToken.approve(rewardMgr,0) (MomoStaker.sol#134) MoMoStaker.setRewardMgr(address) (MomoStaker.sol#131-141) ignores return value by _moboxToken.approve(rewardMgr,uint256(- 1)) (MomoStaker.sol#140) MoMoStaker.getDevTeamReward() (MomoStaker.sol#293-300) ignores return value by _moboxToken.transfer(devTeam,amount) (MomoStaker.sol#299) MoMoStaker.getReward() (MomoStaker.sol#631-641) ignores return value by _moboxToken.transfer(msg.sender,userReward) (MomoStaker.sol#638)

Recommendation

Ensure that all the return values of the function calls are used.

MSM-08 | 3rd Party Dependencies

Category	Severity	Location	Status
Control Flow	Minor	MomoStaker.sol: 604, 409, 587	Acknowledged

Description

409 (prototype, hashrate) = *momoToken.getMomoSimpleByTokenId(tokenIds*[i]); 587 (ids, vals, tokenIds) = momoMinter.mintByStaker(msg.sender, amount_); 604 *momoToken.levelUp(tokenId*, protosV1V2V3_, amountsV1V2V3_, tokensV4V5_);

"hashrate", mint and levelUp depends on 3rd party entities.

Recommendation

We encourage the team to constantly monitor the status of those 3rd parties to mitigate the side effects when unexpected activities are observed.

Alleviation

MomoToken is our developer ERC-721 token, not a 3rd contract

MSM-09 | Missing Zero Address Validation

Category	Severity	Location	Status
Control Flow	Minor	MomoStaker.sol: 162~167(MomoStaker)	Resolved

Description

MoMoStaker.setMoMoStakerAuction(address).addr_ (MomoStaker.sol#162) lacks a zero-check on : - stakerAuction = addr_ (MomoStaker.sol#163) MoMoStaker.setDevTeam(address).addr_ (MomoStaker.sol#166) lacks a zero-check on : - devTeam = addr_ (MomoStaker.sol#167)

Recommendation

Check that the address is not zero.

MSM-10 | Calls Inside A Loop

Category	Severity	Location	Status
Logical Issue	Minor	MomoStaker.sol: 362~438(MomoStaker), 442~530(MomoStaker)	Acknowledged

Description

Calls inside a loop might lead to a denial-of-service attack.

MoMoStaker.*stakeNft(address,uint256[],uint256[],uint256[],bool,uint256) (MomoStaker.sol#362-438) has external calls inside a loop: momoToken.transferFrom(user,address(this),tokenIds*[i]) (MomoStaker.sol#407)

MoMoStaker._stakeNft(address,uint256[],uint256[],uint256[],bool,uint256) (MomoStaker.sol#362-438) has external calls inside a loop: (prototype,hashrate) = *momoToken.getMomoSimpleByTokenId(tokenIds*[i]) (MomoStaker.sol#409)

MoMoStaker._removeNft(address,uint256[],uint256[],uint256[],uint256,uint256) (MomoStaker.sol#442-530) has external calls inside a loop: (prototype,shareParams[1]) = *momoToken.getMomoSimpleByTokenId(tokenIds*[i]) (MomoStaker.sol#487)

MoMoStaker.*removeNft(address,uint256[],uint256[],uint256[],uint256,uint256) (MomoStaker.sol#442-530) has external calls inside a loop: momoToken.transferFrom(address(this),user,tokenIds*[i]) (MomoStaker.sol#505)

Recommendation

Favor pull over push strategy for external calls.

MSM-11 | Public Function Could Be Declared External

Category	Severity	Location	Status
Gas Optimization	Informational	MomoStaker.sol: 51~59(MomoStaker)	Acknowledged

Description

transferOwnership(address) should be declared external: - Ownable.transferOwnership(address) (comm/Ownable.sol#51-59)

`public` functions that are never called by the contract should be declared external to save gas.

Recommendation

Use the external attribute for functions never called from the contract.

MSP-01 | Integer Overflow

Category	Severity	Location	Status
Mathematical Operations	Minor	MoboxStrategyP.sol: 266, 242, 252, 313	Resolved

Description

Although integer overflows would not happen if some variables such as now are within regular ranges, SafeMath is still highly recommended for mathematical operations, if gas costs are not considered as a most significant factor in implementations, to prevent exceptions.

Recommendation

We recommend applying SafeMath.add at the aforementioned line

MSP-02 | Missing Checks for Reentrancy

Category	Severity	Location	Status
Logical Issue	Major	MoboxStrategyP.sol: 266	Resolved

Description

Function harvest() have state updates or event emits after external calls and thus are vulnerable to reentrancy attack.

Recommendation

Applying nonReentrant modifier.

MSP-03 | Missing Zero Address Validation

Category	Severity	Location	Status
Logical Issue	Minor	MoboxStrategyP.sol: 319	Resolved

Description

lacks a zero-check on :

- strategist = strategist_ (MoboxStrategyP.sol#319)

Recommendation

Adding check that strategist_ is not zero address.

MSP-04 | Missing slippage protection

Category	Severity	Location	Status
Logical Issue	Minor	MoboxStrategyP.sol: 239, 249, 310	Acknowledged

Description

Missing slippage protection in all swapExactTokensForTokensSupportingFeeOnTransferTokens() functions.

Recommendation

There is well-known sandwich attacks in uniswap, we recommend always set slippage protection in similar functions.

MSP-05 | Wrong Withdraw Amount

Category	Severity	Location	Status
Logical Issue	Major	MoboxStrategyP.sol: 165~171	Resolved

Description

```
165         uint256 lpBalance = IERC20(wantToken).balanceOf(address(this));
166         if (lpBalance < amount_) {
169         }
170
171         uint256 wantAmount = lpBalance;
```

If lpBalance > amount_, then wantAmount still set to lpBalance.

Recommendation

Confirm this is intended, or set wantAmount to amount_.

MSP-06 | Implicitly Return Values

Category	Severity	Location	Status
Coding Style	Informational	MoboxStrategyP.sol: 198~199, 129	Acknowledged

Description

Functions defined with return values but values are returned implicitly.

Recommendation

We recommend always return values explicitly.

MSP-07 | Unimpletation Constructor Function

Category	Severity	Location	Status
Volatile Code	Informational	MoboxStrategyP.sol: 84~86	Resolved

Description

`constructor() public` Unimpletation constructor function

Recommendation

Impletation constructor function,should delete if not needed

MSP-08 | 3rd Party Dependencies

Category	Severity	Location	Status
Control Flow	Minor	MoboxStrategyP.sol	Acknowledged

Description

MoboxStrategyP and MoboxStrategyV are serving as the underlying entity to interact with third party cake and venus protocols. The scope of the audit would treat those 3rd party entities as black boxes and assume its functional correctness. However in the real world, 3rd parties may be compromised that led to assets lost or stolen.

Recommendation

We understand that the business logic of Mobox requires the interaction with cake and venus for the sake of pursuing capital gains of its users. We encourage the team to constantly monitor the status of those 3rd parties to mitigate the side effects when unexpected activities are observed.

MSV-01 | Integer Overflow

Category	Severity	Location	Status
Mathematical Operations	Minor	MoboxStrategyV.sol: 407, 447	Resolved

Description

Although integer overflows would not happen if some variables such as now are within regular ranges, SafeMath is still highly recommended for mathematical operations, if gas costs are not considered as a most significant factor in implementations, to prevent exceptions.

Recommendation

We recommend applying SafeMath.add at the aforementioned line

MSV-02 | Missing slippage protection

Category	Severity	Location	Status
Logical Issue	Minor	MoboxStrategyV.sol: 404, 444	Acknowledged

Description

Missing slippage protection in all swapExactTokensForTokensSupportingFeeOnTransferTokens() functions.

Recommendation

There is well-known sandwich attacks in uniswap, we recommend always set slippage protection in similar functions.

MSV-03 | Compile Error

Category	Severity	Location	Status
Compiler Error	Critical	MoboxStrategyV.sol: 450~451	Resolved

Description

Error: Expected '(' but got identifier --> MoboxStrategyV.sol:452:14:

Recommendation

Fix the compile error by moving the "}" to an new line.

MSV-04 | Missing Checks for Reentrancy

Category	Severity	Location	Status
Logical Issue	Major	MoboxStrategyV.sol: 329~330, 282, 248, 248, 316, 321	Resolved

Description

Many functions have state updates or event emits after external calls and thus are vulnerable to reentrancy attack.

Recommendation

We recommend applying OpenZeppelin ReentrancyGuard library - nonReentrant modifier for the aforementioned functions to prevent reentrancy attack.We recommend applying OpenZeppelin ReentrancyGuard library - nonReentrant modifier for the aforementioned functions to prevent reentrancy attack.

MSV-05 | Missing Access Control

Category	Severity	Location	Status
Logical Issue	Major	MoboxStrategyV.sol: 103~104	Resolved

Description

It's unsafe that init function can be called by anyone.

Recommendation

Add onlyOwner modifier.

MSV-06 | Implicitly Return Values

Category	Severity	Location	Status
Coding Style	Informational	MoboxStrategyV.sol: 161, 360	Acknowledged

Description

Functions defined with return values but values are returned implicitly.

Recommendation

We recommend always return values explicitly.

MSV-07 | Ignored Return Values

Category	Severity	Location	Status
Logical Issue	Major	MoboxStrategyV.sol: 133~149	Acknowledged

Description

Ignored return values may cause unexpected risks. For example, if repayBorrow() failed then leverage can't decreased while no place aware this failure.

Recommendation

Check every function return values.

MSV-08 | Leverage risk

Category	Severity	Location	Status
Logical Issue	Informational	MoboxStrategyV.sol: 268, 118	Resolved

Description

This strategy uses leverage, which may introduce potential risk. E.g If the Strategist doesn't deleverage in time, the system may enter liquidity crisis in an extreme market.

Recommendation

Don't use leverage.

MSV-09 | 3rd Party Dependencies

Category	Severity	Location	Status
Control Flow	Minor	MoboxStrategyV.sol	Acknowledged

Description

MoboxStrategyP and MoboxStrategyV are serving as the underlying entity to interact with third party cake and venus protocols. The scope of the audit would treat those 3rd party entities as black boxes and assume its functional correctness. However in the real world, 3rd parties may be compromised that led to assets lost or stolen.

Recommendation

We understand that the business logic of Mobox requires the interaction with cake and venus for the sake of pursuing capital gains of its users. We encourage the team to constantly monitor the status of those 3rd parties to mitigate the side effects when unexpected activities are observed.

MTM-01 | Mint to _dest address instead of mining pool

Category	Severity	Location	Status
Logical Issue	Minor	MoboxToken.sol: 85	Acknowledged

Description

The comment of mint() said "Distribute MBOX to the main mining pool", but the code mints to _dest "*mint(dest*, amountThisYear)"

Recommendation

We recommend to confirm whether this is intended.

Appendix

Finding Categories

Centralization / Privilege

Centralization / Privilege findings refer to either feature logic or implementation of components that act against the nature of decentralization, such as explicit ownership or specialized access roles in combination with a mechanism to relocate funds.

Gas Optimization

Gas Optimization findings do not affect the functionality of the code but generate different, more optimal EVM opcodes resulting in a reduction on the total gas cost of a transaction.

Mathematical Operations

Mathematical Operation findings relate to mishandling of math formulas, such as overflows, incorrect operations etc.

Logical Issue

Logical Issue findings detail a fault in the logic of the linked code, such as an incorrect notion on how block.timestamp works.

Control Flow

Control Flow findings concern the access control imposed on functions, such as owner-only functions being invoke-able by anyone under certain circumstances.

Volatile Code

Volatile Code findings refer to segments of code that behave unexpectedly on certain edge cases that may result in a vulnerability.

Data Flow

Data Flow findings describe faults in the way data is handled at rest and in memory, such as the result of a struct assignment operation affecting an in-memory struct rather than an in-storage one.

Language Specific

Language Specific findings are issues that would only arise within Solidity, i.e. incorrect usage of private or delete.

Coding Style

Coding Style findings usually do not affect the generated byte-code but rather comment on how to make the codebase more legible and, as a result, easily maintainable.

Inconsistency

Inconsistency findings refer to functions that should seemingly behave similarly yet contain different code, such as a constructor assignment imposing different require statements on the input variables than a setter function.

Magic Numbers

Magic Number findings refer to numeric literals that are expressed in the codebase in their raw format and should otherwise be specified as constant contract variables aiding in their legibility and maintainability.

Compiler Error

Compiler Error findings refer to an error in the structure of the code that renders it impossible to compile using the specified version of the project.

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Blockchain technology and cryptographic assets present a high level of ongoing risk. CertiK's position is that each company and individual are responsible for their own due diligence and continuous security. CertiK's goal is to help reduce the attack vectors and the high level of variance associated with utilizing new and consistently changing technologies, and in no way claims any guarantee of security or functionality of the technology we agree to analyze.

About

Founded in 2017 by leading academics in the field of Computer Science from both Yale and Columbia University, CertiK is a leading blockchain security company that serves to verify the security and correctness of smart contracts and blockchain-based protocols. Through the utilization of our world-class technical expertise, alongside our proprietary, innovative tech, we're able to support the success of our clients with best-in-class security, all whilst realizing our overarching vision; provable trust for all throughout all facets of blockchain.