



Security Assessment ToolBox

Verified by Vibranium Audits on 04 September 2023



Vibranium Audits Verified on September 04th, 2023

ToolBox

The security assessment was prepared by Vibranium Audits.

Executive Summary

TYPES

DEFI

ECOSYSTEM

Ethereum

METHODS

Manual Review & Static Analysis

LANGUAGE

Solidity

TIMELINE

Delivered on 04/09/2023

KEY COMPONENTS

N/A

CODEBASE

<https://github.com/ldeevooog/Toolblox.Token>

COMMITS

1aec710c51adef84fbd3e52d279afe363c234c76
cdb28661498b7d50bff4e0b2c799ea2abbda2dec

Vulnerability Summary

11

0

0

0

29

0

29

Total Findings

Resolved

Mitigated

Partially Resolved

Acknowledged

Declined

Unresolved

■ 0 Critical

Critical vulnerabilities are usually straightforward to exploit and can lead to the loss of user funds or contract state manipulation by external or internal actors.

■ 3 High

0 Resolved

High vulnerabilities are usually harder to exploit, requiring specific conditions, or have a more limited scope, but can still lead to the loss of user funds or contract state manipulation by external or internal actors.

■ 3 Medium

0 Resolved

Medium vulnerabilities are usually limited to state manipulations, but cannot lead to assets loss. Major deviations from best practices are also in this category.

■ 3 Low

0 Resolved

Low vulnerabilities are related to outdated and unused code or minor gas optimization. These issues won't have a significant impact on code execution, but affect the code quality.

■ 2 Informational

0 Resolved

Informational errors are often recommendations to improve the style of the code or certain operations to fall within industry best practices. They usually do not affect the overall functioning of the code.

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Disclaimer

CODEBASE | TOOLBOX

Repository

<https://github.com/Ideevog/Toolblox.Token>

Commits

1aec710c51adef84fb3e52d279afe363c234c76
cdb28661498b7d50bff4e0b2c799ea2abbda2dec

AUDIT SCOPE | TOOLBOX

2 files audited • 2 file with Acknowledged findings • 0 files with Resolved findings

ID	Files	Commit Hash
● RVA	 RentalWorkflow.sol	1aec710c51adef84fb3e52d279afe36 3c234c76
● WVA	 WorkflowBase.sol	cdb28661498b7d50bff4e0b2c799ea 2abbda2dec

APPROACH & METHODS | TOOLBOX

This report has been prepared for TOOLBOX(2023) to discover issues and vulnerabilities in the source code of the TOOLBOX project as well as any contract dependencies that were not part of an officially recognized library. A comprehensive examination has been performed, utilizing Manual Review and Static Analysis techniques.

The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the code base 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 code base 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:

- Testing the smart contracts against both common and uncommon attack vectors.
- Enhance general coding practices for better structures of source codes.
- Review unit tests to cover the possible use cases.
- Review functions for readability, especially for future development work.

FINDINGS | TOOLBOX



This report has been prepared to discover issues and vulnerabilities for TOOLBOX. Through this audit, we have uncovered 29 issues ranging from different severity levels. Utilizing the techniques of Manual Review & Static Analysis to complement rigorous manual code reviews, we discovered the following findings:

ID	Title	Category	Severity	Status
RVA-01	Contract Locking Ethereum	Logical Issue	High	● Acknowledged
RVA-02	Reentrancy-Events	Logical Issue	High	● Acknowledged
WVA-01	Incorrect Conditional Declaration	Logical Issue	Medium	● Acknowledged
RVA-03 WVA-02	Lack of 'potential' loss prevention	Logical Issue	Medium	● Acknowledged
RVA-04	Missing Core Functionalities	Logical Issue	High	● Acknowledged
RVA-05	Gas optimization (Modifiers)	Logical Issue	Minor	● Acknowledged
RVA-06 WVA-03	Lack of Documentation	Coding Style	Informational	● Acknowledged
RVA-07 WVA-04	Floating pragma	Logical Issue	Minor	● Acknowledged

RVA-01 | Contract Locking Ethereum

Category	Severity	Location	Status
Logical Issue	● High	RentalWorkflow.sol	● Acknowledged

■ Description

The smart contract ‘RentalWorkflow.sol’ implements both the `receive()` and `fallback()` functions, enabling it to receive Ethereum.

However, the smart contract doesn’t have a function enabling the withdrawal of received ETH, making it impossible to retrieve deposited ETH in any way.

```
42     receive() external payable {}
43     fallback() external payable {}
```

■ Recommendation

Implementing a simple `onlyOwner` function to withdraw all of the smart contract’s address balance of ETH will solve the problem.

Also, although some of `RentalWorkflow.sol`’s functions have the ability to withdraw tokens, it is again recommended to implement a simple `onlyOwner` function that enables the withdrawal of all the addressee’s balance of a certain token.

Example:

```
function withdrawFunds() public onlyOwner {
    (bool success, ) = msg.sender.call{value: address(this).balance}("");
    require(success, "Transfer failed.");
}
```

MVA-02 | Reentrancy-Events

Category	Severity	Location	Status
Logical Issue	High	RentalWorkflow.sol	Acknowledged

■ Description (Finding is present in 5 functions in RentalWorkflow.sol)

Possible manipulation of the order or value of events. This may cause issues for offchain components that rely on the values of events e.g. checking for the amount deposited to a bridge.

Functions: charge(...), endAndSettle(...), finalCharge(...), releaseCollateral(...), startRent(...)

```
function charge(uint256 id) external returns (uint256) {
    Rental memory item = getItem(id);
    _checkOwner();
    _assertStatus(item, 1);
    uint daysToCharge = ( (block.timestamp - item.startTime) / ( ( 24 * 60 ) * 60 ) ) - item.daysCharged;
    item.daysCharged = item.daysCharged + daysToCharge;
    item.leftoverCharge = daysToCharge * item.pricePerDay;
    item.status = 1;
    items[id] = item;
    if (owner() != address(0) && item.renter != address(0) && item.leftoverCharge > 0)[
        safeTransferFromExternal(token, item.renter, owner(), item.leftoverCharge);
    ]
    emit ItemUpdated(id, item.status);
    return id;
}
```

■ Recommendation

Use the check-effects-interactions pattern.

WVA-01 | Incorrect Conditional Declaration

Category	Severity	Location	Status
Logical Issue	● Medium	Workflow.sol	● Acknowledged

Description

Workflow.sol's getLatestIds() function includes an 'if' statement that includes a comparison of uint256 variable `toIndex` the value 0.

Unsigned integers can't have a negative value e.g -1, thus a subtraction that would normally result in a negative value will return 0 (Protection again under/overflowing since solidity 0.8+)

This means that `toIndex < 0` will always return false. Nonetheless, `toIndex` is initialized to the `counter` variable's value, meaning it can only be 0+.

```
18     if (fromIndex > toIndex || toIndex < 0) {  
19         return new uint256[](0);  
20     }
```

Recommendation

Simply change the condition to '`toIndex == 0`'

```
18     if ([fromIndex > toIndex || toIndex == 0]) {  
19         return new uint256[](0);  
20     }
```

RVA-04 | Missing Core functionalities

Category	Severity	Location	Status
Logical Issue	● High	RentalWorkflow.sol	● Acknowledged

Description

RentalWorkflow.sol's functionalities revolving around registering, starting and ending an item's rental are all under the contract owner's sole control.

There is no specified functionality allowing:

- o The startRent(..) function allows an item renter to start a rent, checking that the function caller is the item's renter; how can a rent start if it already has a renter? Also there is no other specified functionality responsible for setting an address as the renter for a certain item.
- o More importantly, a rent that has started can never be ended according to the renter address needs, this could eventually lead to internal problems where a renter wishes to end a rental but the owner isn't available to end it, leading to financial loss for the renter.

```

109     function startRent(uint256 id,uint64 numberofDays,uint allowance) external returns (uint256) {
110         Rental memory item = getItem(id);
111         _assertOnlyRenter(item);
112         _assertStatus(item, 3);
113         require(allowance == ( numberofDays * item.pricePerDay ), "Allowance is correct?");
114         item.numberofDays = numberofDays;
115         item.startTime = block.timestamp;
116         item.status = 1;
117         items[id] = item;
118         if (address(this) != address(0) && item.collateral > 0){
119             safeTransferFromExternal(token, _msgSender(), address(this), item.collateral);
120         }
121         emit ItemUpdated(id, item.status);
122         return id;
123     }

169     function endRental(uint256 id) external returns (uint256) {
170         Rental memory item = getItem(id);
171         _checkOwner();
172         _assertStatus(item, 1);
173         uint nominalFee = ( item.numberofDays - item.daysCharged ) * item.pricePerDay;
174         uint endTime = item.startTime + ( ( item.numberofDays * 24 ) * 60 ) * 60 ;
175         item.leftoverCharge = nominalFee + ( ( block.timestamp > endTime ) ? ( ( endTime - block.timestamp )
176             * ( ( item.pricePerDay / 24 ) / 60 ) / 60 ) : 0 );
177         item.status = 2;
178         items[id] = item;
179         emit ItemUpdated(id, item.status);
180         return id;
181     }

```

Recommendation

It is crucial to :

- o Modify the startRent(...) function so that it accepts the order of an address to rent a certain item.
- o Make the endRental(...) function accessible to both the owner and the current item renter in case they need to end a rent.

RVA-03 | Lack of 'potential' loss prevention

WVA-02 | Lack of 'potential' loss prevention

Category	Severity	Location	Status
Logical Issue	● Medium	RentalWorkflow.sol WorkflowBase.sol	● Acknowledged

Description

This vulnerability isn't related to any present problems within the code base, but rather a standard measure of prevention against future currently unknown vulnerabilities. All smart contracts with mutative functions that handle sensitive data and/or user/admin funds should implement the ability to be temporarily paused.

This is easily achieved through implementing OpenZeppelin's Pausable Smart Contract.

Reference:

<https://github.com/OpenZeppelin/openzeppelin-contracts/blob/master/contracts/security/Pausable.sol>

RVA-07 | Floating Pragma

WVA-04 | Floating Pragma

Category	Severity	Location	Status
Logical Issue	Minor	RentalWorkflow.sol WorkflowBase.sol	Acknowledged

Description

The current pragma Solidity directive is ""^0.8.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

Recommendation

Use a new specific stable Solidity version e.g 0.8.18, although avoid using the latest version avoiding any potential yet undiscovered bugs.

GVA-01 | Gas Optimization (Modifiers)

Category	Severity	Location	Status
Logical Issue	Minor	RentalWorkflow.sol	Acknowledged

Description

RentalWorkflow.sol relies on defined private functions to enforce some conditions e.g:

```
30  function _assertOnlyRenter(Rental memory item) private view {
31      address renter = item.renter;
32      if (renter != address(0))
33      {
34          require(_msgSender() == renter, "Invalid Renter");
35          return;
36      }
37      item.renter = _msgSender();
38 }
```

Recommendation

For the sole purpose of providing more optimal gas usage, it is recommended to specify the conditional functions and use them as modifiers (e.g use `onlyOwner` modifier instead of '`_checkOwner()`')

RVA-06 | Lack of documentation WVA-03

Category	Severity	Location	Status
Logical Issue	● Informational	RentalWorkflow.sol WorkflowBase.sol	● Acknowledged

■ Description

Although the TOOLBOX contract set features some documentation on the main contract RentalWorkflow.sol, it is recommended to fully document all the written code for better future communication between developers, auditors and any other involved party.

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