



# **Assist**

## **Smart Contract Review**

**Deliverable: Smart Contract Audit Report**

**Security Report**

**November 2021**

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## Report Summary

Title	Assist Smart Contract Audit		
Project Owner	Assist		
Type	Public		
Reviewed by	Vatsal Raychura	Revision date	16/11/2021
Approved by	eNebula Solutions Private Limited	Approval date	16/11/2021
		Nº Pages	31

## Overview

### Background

Assist's team requested that eNebula Solutions perform an Extensive Smart Contract audit.

### Project Dates

The following is the project schedule for this review and report:

- **October 16:** Smart Contract Review Completed *(Completed)*
- **October 16:** Delivery of Smart Contract Audit Report *(Completed)*

### Review Team

The following eNebula Solutions team member participated in this review:

- Sejal Barad, Security Researcher and Engineer
- Vatsal Raychura, Security Researcher and Engineer

## Coverage

### Target Specification and Revision

For this audit, we performed research, investigation, and review of the smart contract of Assist.

The following documentation repositories were considered in-scope for the review:

- Assist Project:  
<https://bscscan.com/address/0x800fbe01256d2f6f7795e90323f83baf0f5512b7#code>

## Introduction

Given the opportunity to review Assist Project's smart contract source code, we in the report outline our systematic approach to evaluate potential security issues in the smart contract implementation, expose possible semantic inconsistencies between smart contract code and design document, and provide additional suggestions or recommendations for improvement. Our results show that the given version of smart contracts is ready to launch after resolving the mentioned issues, there are no critical or high issues found related to business logic, security or performance.

About Assist: -

Item	Description
Issuer	Assist
Platform	Solidity
Type	BEP20
Audit Method	Whitebox
Latest Audit Report	November 16, 2021

The Test Method Information: -

Test method	Description
Black box testing	Conduct security tests from an attacker's perspective externally.
Grey box testing	Conduct security testing on code modules through the scripting tool, observing the internal running status, mining weaknesses.
White box testing	Based on the open-source code, non-open-source code, to detect whether there are vulnerabilities in programs such as nodes, SDK, etc.

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The vulnerability severity level information:

Level	Description
<b>Critical</b>	Critical severity vulnerabilities will have a significant effect on the security of the DeFi project, and it is strongly recommended to fix the critical vulnerabilities.
<b>High</b>	High severity vulnerabilities will affect the normal operation of the DeFi project. It is strongly recommended to fix high-risk vulnerabilities.
<b>Medium</b>	Medium severity vulnerability will affect the operation of the DeFi project. It is recommended to fix medium-risk vulnerabilities.
<b>Low</b>	Low severity vulnerabilities may affect the operation of the DeFi project in certain scenarios. It is suggested that the project party should evaluate and consider whether these vulnerabilities need to be fixed.
<b>Weakness</b>	There are safety risks theoretically, but it is extremely difficult to reproduce in engineering.

The Full List of Check Items:

Category	Check Item
<b>Basic Coding Bugs</b>	Constructor Mismatch
	Ownership Takeover
	Redundant Fallback Function
	Overflows & Underflows
	Reentrancy
	MONEY-Giving Bug
	Blackhole
	Unauthorized Self-Destruct
	Revert DoS
	Unchecked External Call
	Gasless Send
	Send Instead of Transfer
	Costly Loop
	(Unsafe) Use of Untrusted Libraries
	(Unsafe) Use of Predictable Variables
	Transaction Ordering Dependence
	Deprecated Uses
<b>Semantic Consistency Checks</b>	Semantic Consistency Checks
	Business Logics Review

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Advanced DeFi Scrutiny	Functionality Checks
	Authentication Management
	Access Control & Authorization
	Oracle Security
	Digital Asset Escrow
	Kill-Switch Mechanism
	Operation Trails & Event Generation
	ERC20 Idiosyncrasies Handling
	Frontend-Contract Integration
	Deployment Consistency
	Holistic Risk Management
Additional Recommendations	Avoiding Use of Variadic Byte Array
	Using Fixed Compiler Version
	Making Visibility Level Explicit
	Making Type Inference Explicit
	Adhering To Function Declaration Strictly
	Following Other Best Practices

Common Weakness Enumeration (CWE) Classifications Used in This Audit:

Category	Summary
<b>Configuration</b>	Weaknesses in this category are typically introduced during the configuration of the software.
<b>Data Processing Issues</b>	Weaknesses in this category are typically found in functionality that processes data.
<b>Numeric Errors</b>	Weaknesses in this category are related to improper calculation or conversion of numbers.
<b>Security Features</b>	Weaknesses in this category are concerned with topics like authentication, access control, confidentiality, cryptography, and privilege management. (Software security is not security software.)
<b>Time and State</b>	Weaknesses in this category are related to the improper management of time and state in an environment that supports simultaneous or near-simultaneous computation by multiple systems, processes, or threads.
<b>Error Conditions, Return Values, Status Codes</b>	Weaknesses in this category include weaknesses that occur if a function does not generate the correct return/status code, or if the application does not handle all possible return/status codes that could be generated by a function.
<b>Resource Management</b>	Weaknesses in this category are related to improper management of system resources.

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<b>Behavioral Issues</b>	Weaknesses in this category are related to unexpected behaviors from code that an application uses.
<b>Business Logics</b>	Weaknesses in this category identify some of the underlying problems that commonly allow attackers to manipulate the business logic of an application. Errors in business logic can be devastating to an entire application.
<b>Initialization and Cleanup</b>	Weaknesses in this category occur in behaviors that are used for initialization and breakdown.
<b>Arguments and Parameters</b>	Weaknesses in this category are related to improper use arguments or parameters within function calls.
<b>Expression Issues</b>	Weaknesses in this category are related to incorrectly written expressions within code.
<b>Coding Practices</b>	Weaknesses in this category are related to coding practices that are deemed unsafe and increase the chances that an exploitable vulnerability will be present in the application. They may not directly introduce a vulnerability, but indicate the product has not been carefully developed or maintained.



## Findings

### Summary

Here is a summary of our findings after analyzing the Assist's Smart Contract. During the first phase of our audit, we studied the smart contract sourcecode and ran our in-house static code analyzer through the Specific tool. The purpose here is to statically identify known coding bugs, and then manually verify (reject or confirm) issues reported by tool. We further manually review businesslogics, examine system operations, and place DeFi-related aspects under scrutinyto uncover possible pitfalls and/or bugs.

Severity	No. of Issues
Critical	0
High	0
Medium	0
Low	3
Total	3

We have so far identified that there are potential issues with severity of **0 Critical, 0 High, 0 Medium, and 3 Low**. Overall, these smart contracts are well- designed and engineered, though the implementation can be improved and bug free by common recommendations given under POCs.

## Functional Overview

(\$ ) = payable function	[Pub] public
# = non-constant function	[Ext] external
	[Prv] private
	[Int] internal

### + [Int] IERC20

- [Ext] totalSupply
- [Ext] balanceOf
- [Ext] transfer #
- [Ext] allowance
- [Ext] approve #
- [Ext] transferFrom #

### + [Lib] SafeMath

- [Int] add
- [Int] sub
- [Int] sub
- [Int] mul
- [Int] div
- [Int] div
- [Int] mod
- [Int] mod

### + Context

- [Int] \_msgSender
- [Int] \_msgData

- + [Lib] Address
  - [Int] isContract
  - [Int] sendValue #
  - [Int] functionCall #
  - [Int] functionCall #
  - [Int] functionCallWithValue #
  - [Int] functionCallWithValue #
  - [Prv] \_functionCallWithValue #

- + Ownable (Context)
  - [Pub] <Constructor> #
  - [Pub] owner
  - [Pub] renounceOwnership #
    - modifiers: onlyOwner
  - [Pub] transferOwnership #
    - modifiers: onlyOwner
  - [Pub] geUnlockTime
  - [Pub] lock #
    - modifiers: onlyOwner
  - [Pub] unlock #

- + [Int] IUniswapV2Factory
  - [Ext] feeTo
  - [Ext] feeToSetter
  - [Ext] getPair
  - [Ext] allPairs
  - [Ext] allPairsLength
  - [Ext] createPair #
  - [Ext] setFeeTo #
  - [Ext] setFeeToSetter #

## + [Int] IUniswapV2Pair

- [Ext] name
- [Ext] symbol
- [Ext] decimals
- [Ext] totalSupply
- [Ext] balanceOf
- [Ext] allowance
- [Ext] approve #
- [Ext] transfer #
- [Ext] transferFrom #
- [Ext] DOMAIN\_SEPARATOR
- [Ext] PERMIT\_TYPEHASH
- [Ext] nonces
- [Ext] permit #
- [Ext] MINIMUM\_LIQUIDITY
- [Ext] factory
- [Ext] token0
- [Ext] token1
- [Ext] getReserves
- [Ext] price0CumulativeLast
- [Ext] price1CumulativeLast
- [Ext] kLast
- [Ext] mint #
- [Ext] burn #
- [Ext] swap #
- [Ext] skim #
- [Ext] sync #
- [Ext] initialize #

## + [Int] IUniswapV2Router01

- [Ext] factory

- [Ext] WETH
  - [Ext] addLiquidity #
  - [Ext] addLiquidityETH (\$)
  - [Ext] removeLiquidity #
  - [Ext] removeLiquidityETH #
  - [Ext] removeLiquidityWithPermit #
  - [Ext] removeLiquidityETHWithPermit #
  - [Ext] swapExactTokensForTokens #
  - [Ext] swapTokensForExactTokens #
  - [Ext] swapExactETHForTokens (\$)
  - [Ext] swapTokensForExactETH #
  - [Ext] swapExactTokensForETH #
  - [Ext] swapETHForExactTokens (\$)
  - [Ext] quote
  - [Ext] getAmountOut
  - [Ext] getAmountIn
  - [Ext] getAmountsOut
  - [Ext] getAmountsIn
- + [Int] IUniswapV2Router02 (IUniswapV2Router01)
- [Ext] removeLiquidityETHSupportingFeeOnTransferTokens #
  - [Ext] removeLiquidityETHWithPermitSupportingFeeOnTransferTokens #
  - [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #
  - [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens (\$)
  - [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #
- + Assist (Context, IERC20, Ownable)
- [Pub] <Constructor> #
  - [Pub] name
  - [Pub] symbol
  - [Pub] decimals

- [Pub] totalSupply
- [Pub] balanceOf
- [Pub] transfer #
- [Pub] allowance
- [Pub] approve #
- [Pub] transferFrom #
- [Pub] increaseAllowance #
- [Pub] decreaseAllowance #
- [Pub] isExcludedFromReward
- [Pub] totalFees
- [Pub] deliver #
- [Pub] reflectionFromToken
- [Pub] tokenFromReflection
- [Pub] excludeFromReward #
  - modifiers: onlyOwner
- [Ext] includeInReward #
  - modifiers: onlyOwner
- [Prv] \_transferBothExcluded #
- [Ext] <Fallback> (\$)
- [Prv] \_reflectFee #
- [Prv] \_getValues
- [Prv] \_getTValues
- [Prv] \_getRValues
- [Prv] \_getRate
- [Prv] \_getCurrentSupply
- [Prv] \_takeLiquidity #
- [Prv] calculateTaxFee
- [Prv] calculateLiquidityFee
- [Prv] removeAllFee #
- [Prv] restoreAllFee #
- [Pub] isExcludedFromFee

- [Prv] \_approve #
- [Prv] \_transfer #
- [Prv] swapAndLiquify #
  - modifiers: lockTheSwap
- [Prv] swapTokensForEth #
- [Prv] addLiquidity #
- [Prv] \_tokenTransfer #
- [Prv] \_transferStandard #
- [Prv] \_transferToExcluded #
- [Prv] \_transferFromExcluded #
- [Pub] excludeFromFee #
  - modifiers: onlyOwner
- [Pub] includeInFee #
  - modifiers: onlyOwner
- [Ext] setCharityWallet #
  - modifiers: onlyOwner
- [Ext] setMaxTxAmount #
  - modifiers: onlyOwner
- [Ext] setTaxFee #
  - modifiers: onlyOwner
- [Ext] setLiquidityFee #
  - modifiers: onlyOwner
- [Ext] setBurnFee #
  - modifiers: onlyOwner
- [Ext] setCharityFee #
  - modifiers: onlyOwner
- [Pub] setSwapAndLiquifyEnabled #
  - modifiers: onlyOwner

## Detailed Results

### Issues Checking Status

#### 1. Floating Pragma

- SWC ID:103
- Severity: Low
- Location:<https://bscscan.com/address/0x800fbe01256d2f6f7795e90323f83baf0f5512b7#code>
- Relationships: CWE-664: Improper Control of a Resource Through its Lifetime
- Description: A floating pragma is set. The current pragma Solidity directive is ""^0.8.4"". 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.

```
8  
9  pragma solidity ^0.8.4;  
10
```

- Remediations: Lock the pragma version and also consider known bugs (<https://github.com/ethereum/solidity/releases>) for the compiler version that is chosen.



## 2. State Variable Default Visibility

- SWC ID:108
- Severity: Low
- Location:<https://bscscan.com/address/0x800fbe01256d2f6f7795e90323f83baf0f5512b7#code>
- Relationships: CWE-710: Improper Adherence to Coding Standards
- Description: State variable visibility is not set. It is best practice to set the visibility of state variables explicitly. The default visibility for "inSwapAndLiquify" is internal. Other possible visibility settings are public and private.

```
728     bool inSwapAndLiquify;  
729     bool public swapAndLiquifyEnabled = false;
```

- Remediations: Variables can be specified as being public, internal or private. Explicitly define visibility for all state variables.

## 3. Block values as a proxy for time

- SWC ID:116
- Severity: Low
- Location:<https://bscscan.com/address/0x800fbe01256d2f6f7795e90323f83baf0f5512b7#code>
- Relationships: CWE-829: Inclusion of Functionality from Untrusted Control Sphere
- Description: A control flow decision is made based on The block.timestamp environment variable. The block.timestamp environment variable is used to determine a control flow decision. Note that the values of variables like coinbase, gaslimit, block number and timestamp are predictable and can be manipulated by a malicious miner. Also keep in mind that attackers know hashes of earlier blocks. Don't use any of those environment variables as sources of randomness and be aware that use of these variables introduces a certain level of trust into miners.

```
466 //Unlocks the contract for owner when _lockTime is exceeds
467 function unlock() public virtual {
468     require(_previousOwner == msg.sender, "You don't have permission to unlock");
469     require(block.timestamp < _lockTime , "Contract is locked until 7 days");
470     emit OwnershipTransferred(_owner, _previousOwner);
471     _owner = _previousOwner;
472 }
473 }
```

- Remediations: Developers should write smart contracts with the notion that block values are not precise, and the use of them can lead to unexpected effects. Alternatively, they may make use oracles.

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## Automated Tools Results

Slither: -

```
Reentrancy in Assist_transfer(address,address,uint256) (Assist.sol#984-1012):
  External calls:
    - swapAndLiquify(contractTokenBalance) (Assist.sol#1007)
      - uniSwapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1060-1067)
    - uniSwapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(tokenAmount,0,path,address(this),block.timestamp) (Assist.sol#1040-1052)
  External calls sending eth:
    - swapAndLiquify(contractTokenBalance) (Assist.sol#1007)
      - uniSwapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1060-1067)
  State variables written after the call(s):
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
      - _owned[address(this)] = _owned[address(this)].add(rLiquidity) (Assist.sol#1041)
      - _owned[sender] = _owned[sender].sub(rAmount) (Assist.sol#1120)
      - _owned[sender] = _owned[sender].sub(rAmount) (Assist.sol#1117)
      - _owned[recipient] = _owned[recipient].add(rTransferAmount) (Assist.sol#1110)
      - _owned[sender] = _owned[sender].sub(rAmount) (Assist.sol#1082)
      - _owned[sender] = _owned[sender].sub(rAmount) (Assist.sol#1137)
      - _owned[recipient] = _owned[recipient].add(rTransferAmount) (Assist.sol#1120)
      - _owned[recipient] = _owned[recipient].add(rTransferAmount) (Assist.sol#1130)
      - _owned[recipient] = _owned[recipient].add(rTransferAmount) (Assist.sol#1084)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
      - rTotal = rTotal.sub(rFee) (Assist.sol#1096)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
      - _owned[address(this)] = _owned[address(this)].add(tLiquidity) (Assist.sol#1043)
      - _owned[sender] = _owned[sender].sub(tAmount) (Assist.sol#1081)
      - _owned[sender] = _owned[sender].sub(tAmount) (Assist.sol#1130)
      - _owned[recipient] = _owned[recipient].add(tTransferAmount) (Assist.sol#1127)
      - _owned[recipient] = _owned[recipient].add(tTransferAmount) (Assist.sol#1083)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities

Assist.addLiquidity(uint256,uint256) (Assist.sol#1055-1060) ignores return value by uniSwapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1060-1067)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#unused-return

Assist.allowance(address,address).owner (Assist.sol#797) shadows:
  - Ownable.owner() (Assist.sol#420-422) (function)
Assist._approve(address,address,uint256).owner (Assist.sol#976) shadows:
  - Ownable.owner() (Assist.sol#420-422) (function)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#local-variable-shadowing

Assist.setMaxTxAmount(uint256) (Assist.sol#1157-1159) should emit an event for:
  - _maxTxAmount = MaxTxAmount (Assist.sol#1158)
Assist.setTaxFee(uint256) (Assist.sol#1103-1103) should emit an event for:
  - _taxFee = TaxFee (Assist.sol#1102)
Assist.setLiquidityFee(uint256) (Assist.sol#1105-1107) should emit an event for:
  - _liquidityFee = LiquidityFee (Assist.sol#1100)
Assist.setBurnFee(uint256) (Assist.sol#1108-1170) should emit an event for:
  - _burnFee = BurnFee (Assist.sol#1109)
Assist.setCharityFee(uint256) (Assist.sol#1172-1174) should emit an event for:
  - _fundingFee = CharityFee (Assist.sol#1173)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-events-arithmetic

Assist.setCharityWallet(address).newWallet (Assist.sol#1152) lacks a zero-check on :
  - charityAddress = newWallet (Assist.sol#1153)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-zero-address-validation

Reentrancy in Assist_transfer(address,address,uint256) (Assist.sol#984-1012):
  External calls:
    - swapAndLiquify(contractTokenBalance) (Assist.sol#1007)
      - uniSwapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1060-1067)
    - uniSwapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(tokenAmount,0,path,address(this),block.timestamp) (Assist.sol#1040-1052)
  External calls sending eth:
    - swapAndLiquify(contractTokenBalance) (Assist.sol#1007)
      - uniSwapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1060-1067)
  State variables written after the call(s):
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
      - _burnFee = 2 (Assist.sol#958)
      - _burnFee = 0 (Assist.sol#961)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
      - _fundingFee = 1 (Assist.sol#969)
      - _fundingFee = 0 (Assist.sol#962)
      - _fundingFee = 0 (Assist.sol#1099)
      - _fundingFee = _previousFundingFee (Assist.sol#1100)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
      - _liquidityFee = 2 (Assist.sol#967)
      - _liquidityFee = 0 (Assist.sol#960)
      - _liquidityFee = 0 (Assist.sol#1090)
      - _liquidityFee = _previousLiquidityFee (Assist.sol#1107)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
      - tFeeTotal = tFeeTotal.add(tFee) (Assist.sol#997)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
      - _taxFee = 2 (Assist.sol#960)
      - _taxFee = 0 (Assist.sol#959)
      - _taxFee = 0 (Assist.sol#1097)
      - _taxFee = _previousTaxFee (Assist.sol#1100)
```

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```
Reentrancy in Assist.constructor() (Assist.sol#748-768):
  External calls:
  - _uniswapV2Pair = IUniswapV2Factory(_uniswapV2Router.factory()).createPair(address(this),_uniswapV2Router.WETH()) (Assist.sol#757-758)
  )
  State variables written after the call(s):
  - _isExcludedFromFee[owner()] = true (Assist.sol#764)
  - _isExcludedFromFee[address(this)] = true (Assist.sol#765)
  - _uniswapV2Router = _uniswapV2Router (Assist.sol#761)
Reentrancy in Assist.swapAndLiquify(uint256) (Assist.sol#1014-1035):
  External calls:
  - swapTokensForEth(half) (Assist.sol#1026)
    - _uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(tokenAmount,0,path,address(this),block.timestamp) (Assist.sol#1046-1052)
  - addLiquidity(otherHalf,newBalance) (Assist.sol#1032)
    - _uniswapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1000-1007)
  007)
  External calls sending eth:
  - addLiquidity(otherHalf,newBalance) (Assist.sol#1032)
    - _uniswapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1000-1007)
  007)
  State variables written after the call(s):
  - addLiquidity(otherHalf,newBalance) (Assist.sol#1032)
  - _allowances[owner][spender] = amount (Assist.sol#980)
Reentrancy in Assist.transferFrom(address,address,uint256) (Assist.sol#886-916):
  External calls:
  - _transfer(sender,recipient,amount) (Assist.sol#887)
    - _uniswapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1000-1007)
  007)
    - _uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(tokenAmount,0,path,address(this),block.timestamp) (Assist.sol#1046-1052)
  External calls sending eth:
  - _transfer(sender,recipient,amount) (Assist.sol#887)
    - _uniswapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1000-1007)
  007)
  State variables written after the call(s):
  - _approve(sender,_msgSender(),_allowances[sender][_msgSender()].sub(amount,ERC20: transfer amount exceeds allowance)) (Assist.sol#888)
  )
  - _allowances[owner][spender] = amount (Assist.sol#980)
Reference: https://github.com/cryptic/sliether/wiki/Detector-Docummentation#reentrancy-vulnerabilities-2
Reentrancy in Assist._transfer(address,address,uint256) (Assist.sol#984-1012):
  External calls:
  - swapAndLiquify(contractTokenBalance) (Assist.sol#1007)
    - _uniswapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1000-1007)
  007)
    - _uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(tokenAmount,0,path,address(this),block.timestamp) (Assist.sol#1046-1052)
  External calls sending eth:
  - swapAndLiquify(contractTokenBalance) (Assist.sol#1007)
    - _uniswapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1000-1007)
  007)
  Event emitted after the call(s):
  - Transfer(sender,recipient,tTransferAmount) (Assist.sol#1121)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
  - Transfer(sender,recipient,tTransferAmount) (Assist.sol#1131)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
  - Transfer(sender,recipient,tTransferAmount) (Assist.sol#1141)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
  - Transfer(sender,recipient,tTransferAmount) (Assist.sol#1151)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
  - Transfer(sender,recipient,tTransferAmount) (Assist.sol#1161)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
  - Transfer(sender,recipient,tTransferAmount) (Assist.sol#1171)
    - _tokenTransfer(from,to,amount) (Assist.sol#1011)
Reentrancy in Assist.constructor() (Assist.sol#748-768):
  External calls:
  - _uniswapV2Pair = IUniswapV2Factory(_uniswapV2Router.factory()).createPair(address(this),_uniswapV2Router.WETH()) (Assist.sol#757-758)
  )
  Event emitted after the call(s):
  - Transfer(address(0),owner(),_tTotal) (Assist.sol#767)
Reentrancy in Assist.swapAndLiquify(uint256) (Assist.sol#1014-1035):
  External calls:
  - swapTokensForEth(half) (Assist.sol#1026)
    - _uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(tokenAmount,0,path,address(this),block.timestamp) (Assist.sol#1046-1052)
  - addLiquidity(otherHalf,newBalance) (Assist.sol#1032)
    - _uniswapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1000-1007)
  007)
```



# Smart Contract Audit

```
- uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(tokenAmount,0,path,address(this),block.timestamp) (Assis
t.sol#1046-1052)
  External calls sending eth:
  - _transfer(sender,recipient,amount) (Assist.sol#807)
  - uniswapV2Router.addLiquidityETH(value: ethAmount)(address(this),tokenAmount,0,0,owner(),block.timestamp) (Assist.sol#1000-1
807)
  Event emitted after the call(s):
  - Approve(owner,spender,amount) (Assist.sol#981)
  - _approve(sender,_msgSender(),_allowances[sender][_msgSender()].sub(amount,ERC20: transfer amount exceeds allowance)) (Assis
t.sol#808)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities-3

Ownable.unlock() (Assist.sol#467-472) uses timestamp for comparisons
  Dangerous comparisons:
  - require(bool,string)(block.timestamp < lockTime,Contract is locked until 7 days) (Assist.sol#469)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#block-timestamp

Address.isContract(address) (Assist.sol#272-281) uses assembly
  - INLINE ASM (Assist.sol#279)
Address.functionCallWithValue(address,bytes,uint256,string) (Assist.sol#365-386) uses assembly
  - INLINE ASM (Assist.sol#378-381)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#assembly-usage

Address.functionCallWithValue(address,bytes,uint256,string) (Assist.sol#365-386) is never used and should be removed
Address.functionCall(address,bytes) (Assist.sol#325-327) is never used and should be removed
Address.functionCall(address,bytes,string) (Assist.sol#335-337) is never used and should be removed
Address.functionCallWithValue(address,bytes,uint256) (Assist.sol#350-352) is never used and should be removed
Address.functionCallWithValue(address,bytes,uint256,string) (Assist.sol#360-363) is never used and should be removed
Address.isContract(address) (Assist.sol#272-281) is never used and should be removed
Address.sendValue(address,uint256) (Assist.sol#299-305) is never used and should be removed
Context._msgData() (Assist.sol#245-248) is never used and should be removed
SafeMath.mod(uint256,uint256) (Assist.sol#218-220) is never used and should be removed
SafeMath.mod(uint256,uint256,string) (Assist.sol#234-237) is never used and should be removed
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#dead-code

Assist._rTotal (Assist.sol#784) is set pre-construction with a non-constant function or state variable:
  - (MAX - (MAX * _rTotal))
Assist._previousTaxFee (Assist.sol#712) is set pre-construction with a non-constant function or state variable:
  - _taxFee
Assist._previousLiquidityFee (Assist.sol#715) is set pre-construction with a non-constant function or state variable:
  - _liquidityFee
Assist._previousBurnFee (Assist.sol#710) is set pre-construction with a non-constant function or state variable:
  - _burnFee
Assist._previousFundingFee (Assist.sol#721) is set pre-construction with a non-constant function or state variable:
  - _fundingFee
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#function-initializing-state

Pragma version^0.8.4 (Assist.sol#9) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6
solc-0.8.4 is not recommended for deployment
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-versions-of-solidity

Low level call in Address.sendValue(address,uint256) (Assist.sol#299-305):
  - (success) = recipient.call(value: amount)() (Assist.sol#303)
Low level call in Address.functionCallWithValue(address,bytes,uint256,string) (Assist.sol#365-386):
  - (success,returndata) = target.call(value: weiValue)(data) (Assist.sol#369)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#low-level-calls

Function IUniswapV2Pair.DOMAIN_SEPARATOR() (Assist.sol#511) is not in mixedCase
Function IUniswapV2Pair.PERMIT_TYPEHASH() (Assist.sol#512) is not in mixedCase
Function IUniswapV2Pair.MINIMUM_LIQUIDITY() (Assist.sol#529) is not in mixedCase
Function IUniswapV2Router01.WETH() (Assist.sol#551) is not in mixedCase
Parameter Assist.calculateTaxFee(uint256)._amount (Assist.sol#946) is not in mixedCase
Parameter Assist.calculateLiquidityFee(uint256)._amount (Assist.sol#952) is not in mixedCase
Parameter Assist.setMaxTxAmount(uint256).MaxTxAmount (Assist.sol#1157) is not in mixedCase
Parameter Assist.setTaxFee(uint256).TaxFee (Assist.sol#1161) is not in mixedCase
Parameter Assist.setLiquidityFee(uint256).LiquidityFee (Assist.sol#1163) is not in mixedCase
Parameter Assist.setBurnFee(uint256).BurnFee (Assist.sol#1168) is not in mixedCase
Parameter Assist.setCharityFee(uint256).CharityFee (Assist.sol#1172) is not in mixedCase
Parameter Assist.setSwapAndLiquifyEnabled(bool)._enabled (Assist.sol#1176) is not in mixedCase
Variable Assist._taxFee (Assist.sol#711) is not in mixedCase
Variable Assist._liquidityFee (Assist.sol#714) is not in mixedCase
Variable Assist._burnFee (Assist.sol#717) is not in mixedCase
Variable Assist._fundingFee (Assist.sol#720) is not in mixedCase
Variable Assist._maxTxAmount (Assist.sol#731) is not in mixedCase
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-solidity-naming-conventions

Redundant expression "this (Assist.sol#246)" in Context (Assist.sol#248-249)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#redundant-statements
```



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[illegible]



# Smart Contract Audit

```
Variable Assist._transferStandard(address,address,uint256).rTransferAmount (Assist.sol#1116) is too similar to Assist._getValues(uint256).tTransferAmount (Assist.sol#981)
Variable Assist._transferToExcluded(address,address,uint256).rTransferAmount (Assist.sol#1125) is too similar to Assist._transferBothExcluded(address,address,uint256).tTransferAmount (Assist.sol#888)
Variable Assist._getValues(uint256).rTransferAmount (Assist.sol#982) is too similar to Assist._transferBothExcluded(address,address,uint256).tTransferAmount (Assist.sol#888)
Variable Assist._transferToExcluded(address,address,uint256).rTransferAmount (Assist.sol#1125) is too similar to Assist._getValues(uint256).tTransferAmount (Assist.sol#981)
Variable Assist._getValues(uint256).rTransferAmount (Assist.sol#982) is too similar to Assist._getValues(uint256).tTransferAmount (Assist.sol#981)
Variable Assist._transferStandard(address,address,uint256).rTransferAmount (Assist.sol#1116) is too similar to Assist._transferToExcluded(address,address,uint256).tTransferAmount (Assist.sol#1125)
Reference: https://github.com/cryptic/sliether/wiki/Detector-Docmentation#variable-names-are-too-similar
```

```
Assist.slietherConstructorVariables() (Assist.sol#689-1182) uses literals with too many digits:
- _tTotal = 1000000000000000 * 10 ** 9 (Assist.sol#783)
Assist.slietherConstructorVariables() (Assist.sol#689-1182) uses literals with too many digits:
- _maxTxAmount = 1000000000000000 * 10 ** 9 (Assist.sol#731)
Assist.slietherConstructorVariables() (Assist.sol#689-1182) uses literals with too many digits:
- numTokensSellToAddToLiquidity = 500000000 * 10 ** 9 (Assist.sol#732)
Reference: https://github.com/cryptic/sliether/wiki/Detector-Docmentation#too-many-digits
```

```
Assist._previousBurnFee (Assist.sol#718) is never used in Assist (Assist.sol#689-1182)
Reference: https://github.com/cryptic/sliether/wiki/Detector-Docmentation#unused-state-variable
```

```
Assist._decimals (Assist.sol#789) should be constant
Assist._name (Assist.sol#787) should be constant
Assist._symbol (Assist.sol#788) should be constant
Assist._tTotal (Assist.sol#793) should be constant
Assist.numTokensSellToAddToLiquidity (Assist.sol#732) should be constant
Reference: https://github.com/cryptic/sliether/wiki/Detector-Docmentation#state-variables-that-could-be-declared-constant
```

renounceOwnership() should be declared external:

- Ownable.renounceOwnership() (Assist.sol#439-442)

transferOwnership(address) should be declared external:

- Ownable.transferOwnership(address) (Assist.sol#448-452)

geUnlockTime() should be declared external:

- Ownable.geUnlockTime() (Assist.sol#454-456)

lock(uint256) should be declared external:

- Ownable.lock(uint256) (Assist.sol#459-464)

unlock() should be declared external:

- Ownable.unlock() (Assist.sol#467-472)

name() should be declared external:

- Assist.name() (Assist.sol#771-773)

symbol() should be declared external:

- Assist.symbol() (Assist.sol#775-777)

decimals() should be declared external:

- Assist.decimals() (Assist.sol#779-781)

totalSupply() should be declared external:

- Assist.totalSupply() (Assist.sol#783-785)

transfer(address,uint256) should be declared external:

- Assist.transfer(address,uint256) (Assist.sol#792-795)

allowance(address,address) should be declared external:

- Assist.allowance(address,address) (Assist.sol#797-799)

approve(address,uint256) should be declared external:

- Assist.approve(address,uint256) (Assist.sol#801-804)

transferFrom(address,address,uint256) should be declared external:

- Assist.transferFrom(address,address,uint256) (Assist.sol#806-810)

increaseAllowance(address,uint256) should be declared external:

- Assist.increaseAllowance(address,uint256) (Assist.sol#812-815)

decreaseAllowance(address,uint256) should be declared external:

- Assist.decreaseAllowance(address,uint256) (Assist.sol#817-820)

isExcludedFromReward(address) should be declared external:

- Assist.isExcludedFromReward(address) (Assist.sol#822-824)

totalFees() should be declared external:

- Assist.totalFees() (Assist.sol#826-828)

deliver(uint256) should be declared external:

- Assist.deliver(uint256) (Assist.sol#830-837)

reflectionFromToken(uint256,bool) should be declared external:

- Assist.reflectionFromToken(uint256,bool) (Assist.sol#839-848)



# Smart Contract Audit

```
reflectionFromToken(uint256,bool) should be declared external:
- Assist.reflectionFromToken(uint256,bool) (Assist.sol#839-848)
excludeFromReward(address) should be declared external:
- Assist.excludeFromReward(address) (Assist.sol#856-864)
isExcludedFromFee(address) should be declared external:
- Assist.isExcludedFromFee(address) (Assist.sol#972-974)
excludeFromFee(address) should be declared external:
- Assist.excludeFromFee(address) (Assist.sol#1144-1146)
includeInFee(address) should be declared external:
- Assist.includeInFee(address) (Assist.sol#1148-1158)
setSwapAndLiquifyEnabled(bool) should be declared external:
- Assist.setSwapAndLiquifyEnabled(bool) (Assist.sol#1176-1179)
Reference: https://github.com/crytic/sliether/wiki/Detector-Documentation#public-function-that-could-be-declared-external
```

## MythX:

Report for Assist.sol <a href="https://dashboard.mythx.io/#/console/analyses/9ef3dac5-4a8b-4e1d-a93a-769cfd882675">https://dashboard.mythx.io/#/console/analyses/9ef3dac5-4a8b-4e1d-a93a-769cfd882675</a>			
Line	SWC Title	Severity	Short Description
9	(SWC-103) Floating Pragma	Low	A floating pragma is set.
109	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "+" discovered
141	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "-" discovered
164	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "*" discovered
165	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "/" discovered
208	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "/" discovered
236	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "%" discovered
462	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "+" discovered
703	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "*" discovered
703	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "**" discovered
704	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "-" discovered
704	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "%" discovered
728	(SWC-108) State Variable Default Visibility	Low	State variable visibility is not set.
731	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "*" discovered
731	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "**" discovered
732	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "*" discovered
732	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "**" discovered
868	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "++" discovered
869	(SWC-110) Assert Violation	Unknown	Out of bounds array access
870	(SWC-110) Assert Violation	Unknown	Out of bounds array access
870	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "-" discovered
870	(SWC-101) Integer Overflow and Underflow	Unknown	Compiler-rewritable "<uint> - 1" discovered
929	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "++" discovered
930	(SWC-110) Assert Violation	Unknown	Out of bounds array access
931	(SWC-110) Assert Violation	Unknown	Out of bounds array access
932	(SWC-110) Assert Violation	Unknown	Out of bounds array access
948	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "**" discovered
954	(SWC-101) Integer Overflow and Underflow	Unknown	Arithmetic operation "**" discovered
1040	(SWC-110) Assert Violation	Unknown	Out of bounds array access
1041	(SWC-110) Assert Violation	Unknown	Out of bounds array access



# Smart Contract Audit

## Solhint Linter:

```
Lint results:

Assist.sol:9:1: Error: Compiler version ^0.8.4 does not satisfy the r-semver requirement.

Assist.sol:411:5: Error: Explicitly mark visibility in function (Set ignoreConstructors to true if using solidity >=0.7.0)

Assist.sol:462:21: Error: Avoid to make time-based decisions in your business logic

Assist.sol:469:17: Error: Avoid to make time-based decisions in your business logic

Assist.sol:511:5: Error: function name must be in mixedCase

Assist.sol:512:5: Error: function name must be in mixedCase

Assist.sol:529:5: Error: Function name must be in mixedCase

Assist.sol:551:5: Error: function name must be in mixedCase

Assist.sol:689:1: Error: Contract has 25 states declarations but allowed no more than 15

Assist.sol:728:5: Error: Explicitly mark visibility of state

Assist.sol:748:5: Error: Explicitly mark visibility in function (Set ignoreConstructors to true if using solidity >=0.7.0)

Assist.sol:857:72: Error: Use double quotes for string literals.

Assist.sol:891:32: Error: Code contains empty blocks

Assist.sol:1051:13: Error: Avoid to make time-based decisions in your business logic

Assist.sol:1066:13: Error: Avoid to make time-based decisions in your business logic

Assist.sol:1157:29: Error: Variable name must be in mixedCase
```

# Smart Contract Audit

```
Assist.sol:1161:24: Error: Variable name must be in mixedCase.
```

```
Assist.sol:1165:30: Error: Variable name must be in mixedCase.
```

```
Assist.sol:1168:25: Error: Variable name must be in mixedCase.
```

```
Assist.sol:1172:29: Error: Variable name must be in mixedCase.
```

## Basic Coding Bugs

### 1. Constructor Mismatch

- Description: Whether the contract name and its constructor are not identical to each other.
- Result: PASSED
- Severity: Critical

### 2. Ownership Takeover

- Description: Whether the set owner function is not protected.
- Result: PASSED
- Severity: Critical

### 3. Redundant Fallback Function

- Description: Whether the contract has a redundant fallback function.
- Result: PASSED
- Severity: Critical

### 4. Overflows & Underflows

- Description: Whether the contract has general overflow or underflow vulnerabilities
- Result: PASSED
- Severity: Critical

### 5. Reentrancy

- Description: Reentrancy is an issue when code can call back into your contract and change state, such as withdrawing ETHs.
- Result: PASSED
- Severity: Critical

### 6. MONEY-Giving Bug

- Description: Whether the contract returns funds to an arbitrary address.
- Result: PASSED
- Severity: High

## 7. Blackhole

- Description: Whether the contract locks ETH indefinitely: merely in without out.
- Result: PASSED
- Severity: High

## 8. Unauthorized Self-Destruct

- Description: Whether the contract can be killed by any arbitrary address.
- Result: PASSED
- Severity: Medium

## 9. Revert DoS

- Description: Whether the contract is vulnerable to DoS attack because of unexpected revert.
- Result: PASSED
- Severity: Medium

## 10.Unchecked External Call

- Description: Whether the contract has any external call without checking the return value.
- Result: PASSED
- Severity: Medium

## 11.Gasless Send

- Description: Whether the contract is vulnerable to gasless send.
- Result: PASSED
- Severity: Medium

## 12.Send Instead of Transfer

- Description: Whether the contract uses send instead of transfer.
- Result: PASSED
- Severity: Medium

## 13. Costly Loop

- Description: Whether the contract has any costly loop which may lead to Out-Of-Gas exception.
- Result: PASSED
- Severity: Medium

## 14. (Unsafe) Use of Untrusted Libraries

- Description: Whether the contract use any suspicious libraries.
- Result: PASSED
- Severity: Medium

## 15. (Unsafe) Use of Predictable Variables

- Description: Whether the contract contains any randomness variable, but its value can be predicated.
- Result: PASSED
- Severity: Medium

## 16. Transaction Ordering Dependence

- Description: Whether the final state of the contract depends on the order of the transactions.
- Result: PASSED
- Severity: Medium

## 17. Deprecated Uses

- Description: Whether the contract use the deprecated tx.origin to perform the authorization.
- Result: PASSED
- Severity: Medium

## Semantic Consistency Checks

- Description: Whether the semantic of the white paper is different from the implementation of the contract.
- Result: PASSED
- Severity: Critical

## Conclusion

In this audit, we thoroughly analyzed Assist's Smart Contract. The current code base is well organized but there are promptly some low-level Type issues found in the first phase of Smart Contract Audit.

Meanwhile, we need to emphasize that smart contracts as a whole are still in an early, but exciting stage of development. To improve this report, we greatly appreciate any constructive feedbacks or suggestions, on our methodology, audit findings, or potential gaps in scope/coverage.

### About eNebula Solutions

We believe that people have a fundamental need to security and that the use of secure solutions enables every person to more freely use the Internet and every other connected technology. We aim to provide security consulting service to help others make their solutions more resistant to unauthorized access to data & inadvertent manipulation of the system. We support teams from the design phase through the production to launch and surely after.

The eNebula Solutions team has skills for reviewing code in C, C++, Python, Haskell, Rust, Node.js, Solidity, Go, and JavaScript for common security vulnerabilities & specific attack vectors. The team has reviewed implementations of cryptographic protocols and distributed system architecture, including in cryptocurrency, blockchains, payments, and smart contracts. Additionally, the team can utilize various tools to scan code & networks and build custom tools as necessary.

Although we are a small team, we surely believe that we can have a momentous impact on the world by being translucent and open about the work we do.

For more information about our security consulting, please mail us at – [contact@enebula.in](mailto:contact@enebula.in)