



# ValerStudios

## Smart Contract Review

Deliverable: Smart Contract Audit Report

Security Report

November 2021

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## Report Summary

<b>Title</b>	VALERSTUDIOS Smart Contract Audit		
<b>Project Owner</b>	VALERSTUDIOS		
<b>Type</b>	Public		
<b>Reviewed by</b>	Vatsal Raychura	<b>Revision date</b>	25/11/2021
<b>Approved by</b>	eNebula Solutions Private Limited	<b>Approval date</b>	25/11/2021
		<b>N° Pages</b>	26

## Overview

### Background

VALERSTUDIOS's team requested that eNebula Solutions perform an Extensive Smart Contract audit of their VlrStaker Smart Contract.

### Project Dates

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

- **November 25:** Smart Contract Review Completed (*Completed*)
- **November 25:** 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 VALERSTUDIOS.

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

- VALERSTUDIOS Project:  
<https://github.com/valerstudios/VLR-Staking>

## Introduction

Given the opportunity to review VALERSTUDIOS's Contract related 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 VALERSTUDIOS: -

Item	Description
Issuer	VALERSTUDIOS
Website	<a href="http://www.valerstudios.com">www.valerstudios.com</a>
Platform	Solidity
Audit Method	Whitebox
Latest Audit Report	November 25, 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
	Functionality Checks

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<b>Advanced DeFi Scrutiny</b>	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
<b>Additional Recommendations</b>	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 multiplesystems, 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 VALERSTUDIOS Smart Contract Review. During the first phase of our audit, we studied the smart contract source code 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 business logics, examine system operations, and place DeFi-related aspects under scrutiny to uncover possible pitfalls and/or bugs.

Severity	No. of Issues
Critical	0
High	0
Medium	0
Low	2
Total	2

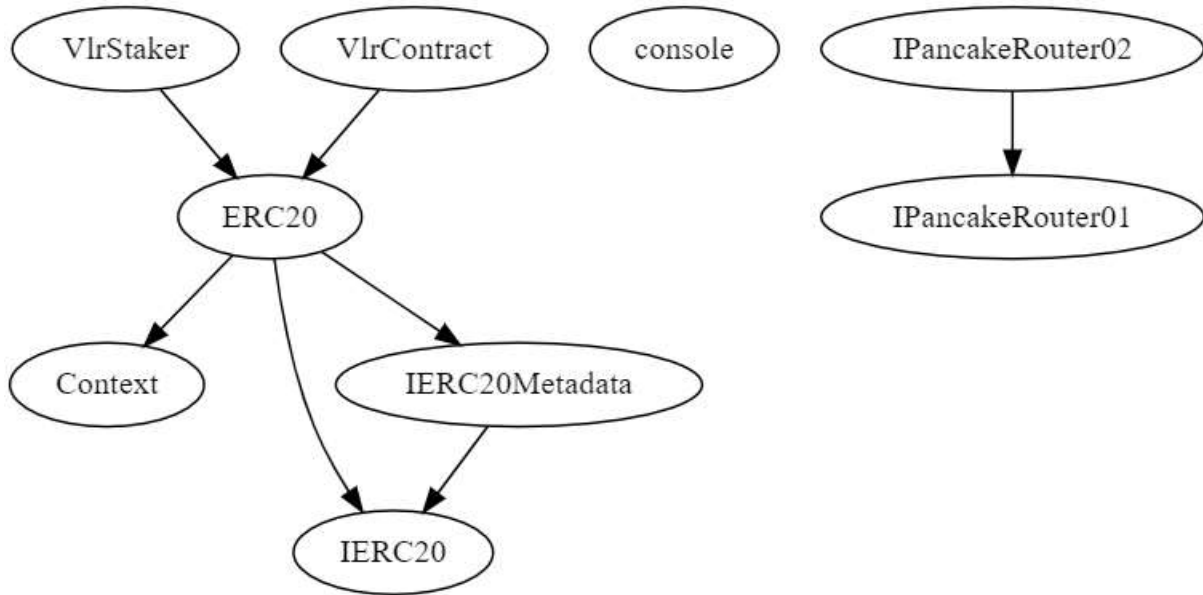
We have so far identified that there are potential issues with severity of **0 Critical, 0 High, 0 Medium, and 2 Low**. Overall, these smart contracts are well-designed and engineered.

## Functional Overview

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

```
+ VlrStaker (ERC20)
- [Pub] <Constructor> #
  - modifiers: ERC20
- [Ext] getCharityAddress
- [Ext] getStakingRewardsBag
- [Ext] getStake
- [Pub] getStakeValue
- [Prv] _buyMtc #
- [Pub] stakeWithTimeParameters #
- [Ext] stake #
- [Ext] unstake #
- [Prv] _bagsOwned
- [Ext] distributeRewards #
- [Prv] resetRewardsStakes #
- [Pub] getTotalStakedValue
- [Prv] _createStakeBag #
- [Prv] closeUnstakedBags #
```

## Inheritance



## Detailed Results

### Issues Checking Status

#### 1. Floating Pragma

- SWC ID: 103
- Severity: Low
- Location: VlrStaker.sol
- Relationships: CWE-664: Improper Control of a Resource Through its Lifetime
- Description: A floating pragma is set. The current pragma Solidity directive is ""^0.8.0"". 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.

```
2  
3  pragma solidity ^0.8.0;  
4
```

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

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## 2. Missing zero address validation

- Severity: Low
- Location: VlrStaker.sol
- Description: Detect missing zero address validation.

```
29     constructor(  
30         address _VlrContractAddress,  
31         address _charityBagAddress,  
32         address _mtcContractAddress,  
33         address _pancakeRouterAddress,  
34         address _wbnbAddress,  
35         address _distributorAddress  
36     ) ERC20("Staked VLR Token", "SVLR") {  
37         vlrContract = VlrContract(_VlrContractAddress);  
38         stakingRewardsBag = 0;  
39         charityBagAddress = _charityBagAddress;  
40         vlrToMtcPath.push(_VlrContractAddress);  
41         vlrToMtcPath.push(_wbnbAddress);  
42         vlrToMtcPath.push(_wbnbAddress);  
43         vlrToMtcPath.push(_mtcContractAddress);  
44         pancakeRouter = IPancakeRouter02(_pancakeRouterAddress);  
45         distributor = _distributorAddress;  
46     }
```

- Remediations: Check that the address is not zero.

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## Automated Tool Results

Slither: -

```
VlrStaker.stakeWithTimeParameters(uint256,uint256,uint256) (VlrStaker.sol#111-137) ignores return value by vlrContract.transferFrom(msg.sender,charityBagAddress,charityFeePaid) (VlrStaker.sol#148)
VlrStaker.stakeWithTimeParameters(uint256,uint256,uint256) (VlrStaker.sol#111-137) ignores return value by vlrContract.transferFrom(msg.sender,burnAddress,burnFeePaid) (VlrStaker.sol#149)
VlrStaker.stakeWithTimeParameters(uint256,uint256,uint256) (VlrStaker.sol#111-137) ignores return value by vlrContract.transferFrom(msg.sender,address{133}),stakedVlrAmount - burnFeePaid - charityFeePaid - mtcFeePaid) (VlrStaker.sol#108-134)
VlrStaker.stakeWithTimeParameters(uint256,uint256,uint256) (VlrStaker.sol#111-137) ignores return value by vlrContract.transferFrom(msg.sender,burnAddress,mtcFeePaid) (VlrStaker.sol#150)
VlrStaker.unstake(uint256) (VlrStaker.sol#193-215) ignores return value by vlrContract.transfer(msg.sender,vlrReturned - stakingFeePaid - mtcFeePaid - charityFeePaid - burnFeePaid) (VlrStaker.sol#198-205)
VlrStaker.unstake(uint256) (VlrStaker.sol#193-215) ignores return value by vlrContract.transfer(charityBagAddress,charityFeePaid) (VlrStaker.sol#208)
VlrStaker.unstake(uint256) (VlrStaker.sol#193-215) ignores return value by vlrContract.transfer(burnAddress,mtcFeePaid) (VlrStaker.sol#210)
VlrStaker.unstake(uint256) (VlrStaker.sol#193-215) ignores return value by vlrContract.transfer(burnAddress,burnFeePaid) (VlrStaker.sol#212)
VlrStaker.distributeRewards(address[],uint256[]) (VlrStaker.sol#232-256) ignores return value by enterpriseContract.transferFrom(msg.sender,stakes[i].ownerAddress,transferAmount) (VlrStaker.sol#248-252)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#checked-transfer

VlrStaker.getStakeValue(uint256,uint256) (VlrStaker.sol#80-90) performs a multiplication on the result of a division:
- bagValue += ((endTime - selectedBag.startTime) / 86400) * selectedBag.stakedTokens (VlrStaker.sol#88-90)
VlrStaker.getStakeValue(uint256,uint256) (VlrStaker.sol#80-90) performs a multiplication on the result of a division:
- bagValue += ((selectedBag.stopTime - selectedBag.startTime) / 86400) * selectedBag.stakedTokens (VlrStaker.sol#92-94)
VlrStaker.getTotalStakedValue(uint256) (VlrStaker.sol#274-293) performs a multiplication on the result of a division:
- stakedTime_scope_0 = (endTime - stakes[i].startTime) / 86400 (VlrStaker.sol#287)
- totalValue += (stakedTime_scope_0 * stakes[i].stakedTokens) (VlrStaker.sol#289)
VlrStaker.getTotalStakedValue(uint256) (VlrStaker.sol#274-293) performs a multiplication on the result of a division:
- stakedTime = (stakes[i].stopTime - stakes[i].startTime) / 86400 (VlrStaker.sol#287-289)
- totalValue += (stakedTime * stakes[i].stakedTokens) (VlrStaker.sol#285)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#divide-before-multiply

VlrStaker.bagsOwned(address) (VlrStaker.sol#217-228) uses a dangerous strict equality:
- stakes[i].ownerAddress == owner (VlrStaker.sol#224)
VlrStaker.closeUnstakedBags(address,uint256) (VlrStaker.sol#310-324) uses a dangerous strict equality:
- stakes[i].ownerAddress == owner (VlrStaker.sol#313)
VlrStaker.getStakeValue(uint256,uint256) (VlrStaker.sol#80-90) uses a dangerous strict equality:
- selectedBag.stopTime == 0 (VlrStaker.sol#87)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#dangerous-strict-equalities

Reentrancy in VlrStaker.unstake(uint256) (VlrStaker.sol#193-215):
  External calls:
  - vlrContract.transfer(msg.sender,vlrReturned - stakingFeePaid - mtcFeePaid - charityFeePaid - burnFeePaid) (VlrStaker.sol#198-205)
  State variables written after the call(s):
  - burn(msg.sender,unstakedAmount) (VlrStaker.sol#200)
    - _balances[account] = accountBalance - amount (ERC20.sol#282)
  - burn(msg.sender,unstakedAmount) (VlrStaker.sol#200)
    - totalSupply += amount (ERC20.sol#284)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities-1

VlrStaker.createStakeBag(uint256,uint256,uint256,address).newBag (VlrStaker.sol#301) is a local variable never initialized
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#uninitialized-local-variables

VlrStaker.buyMtc(uint256,address) (VlrStaker.sol#99-108) ignores return value by pancakeRouter.swapExactTokensForTokens(_VlrToSwap,mtnOut,vlrToMtcPath,recipientAddress,(block.timestamp + (60 * 10))) (VlrStaker.sol#101-107)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#unused-return

VlrStaker.unstake(uint256).totalSupply (VlrStaker.sol#185) shadows:
- ERC20.totalSupply() (ERC20.sol#93-95) (function)
- IERC20.totalSupply() (IERC20.sol#12) (function)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#local-variable-shadowing

VlrStaker.stakeWithTimeParameters(uint256,uint256,uint256) (VlrStaker.sol#111-137) should emit an event for:
- stakingRewardsBag == stakingFeePaid (VlrStaker.sol#133)
VlrStaker.unstake(uint256) (VlrStaker.sol#193-215) should emit an event for:
- stakingRewardsBag == stakingFeePaid (VlrStaker.sol#180)
- stakingRewardsBag == vlrRewardsReturned (VlrStaker.sol#194)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-events-arithmetic

VlrStaker.constructor(address,address,address,address,address,address),_charityBagAddress (VlrStaker.sol#31) lacks a zero-check on :
- charityBagAddress = _charityBagAddress (VlrStaker.sol#30)
VlrStaker.constructor(address,address,address,address,address,address),_distributorAddress (VlrStaker.sol#35) lacks a zero-check on :
- distributor = _distributorAddress (VlrStaker.sol#45)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#missing-zero-address-validation

VlrStaker.distributeRewards(address[],uint256[]) (VlrStaker.sol#232-256) has external calls inside a loop; enterpriseContract.transferFrom(msg.sender,stakes[i].ownerAddress,transferAmount) (VlrStaker.sol#248-252)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#calls-inside-a-loop
```



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```
Reentrancy in VlrStaker.unstake(uint256) (VlrStaker.sol#165-213):
  External calls:
  - vlrContract.transfer(msg.sender, vlrReturned - stakingFeePaid - ntcFeePaid - charityFeePaid - burnFeePaid) (VlrStaker.sol#190-205)
  - vlrContract.transfer(charltyBagAddress, charityFeePaid) (VlrStaker.sol#208)
  - vlrContract.transfer(burnAddress, ntcFeePaid) (VlrStaker.sol#210)
  - vlrContract.transfer(burnAddress, burnFeePaid) (VlrStaker.sol#212)
  State variables written after the call(s):
  - closeUnstakedBags(msg.sender, unstakedAmount) (VlrStaker.sol#214)
    - stakes[i].stopTime = block.timestamp (VlrStaker.sol#312)
    - stakes[i].stakedTokens = remainder (VlrStaker.sol#320)
Reference: https://github.com/cryptic/sliether/wiki/Detector-Documentation#reentrancy-vulnerabilities-2

Reentrancy in VlrStaker.unstake(uint256) (VlrStaker.sol#163-213):
  External calls:
  - vlrContract.transfer(msg.sender, vlrReturned - stakingFeePaid - ntcFeePaid - charityFeePaid - burnFeePaid) (VlrStaker.sol#190-205)
  Event emitted after the call(s):
  - Transfer(account, address(0), amount) (ERC20.sol#286)
  - burn(msg.sender, unstakedAmount) (VlrStaker.sol#206)
Reference: https://github.com/cryptic/sliether/wiki/Detector-Documentation#reentrancy-vulnerabilities-3

VlrStaker.getStakeValue(uint256, uint256) (VlrStaker.sol#80-96) uses timestamp for comparisons
  Dangerous comparisons:
  - selectedBag.stopTime == 0 (VlrStaker.sol#87)
VlrStaker.bagsOwned(address) (VlrStaker.sol#217-228) uses timestamp for comparisons
  Dangerous comparisons:
  - 1 < stakes.length (VlrStaker.sol#223)
  - stakes[i].ownerAddress == owner (VlrStaker.sol#224)
VlrStaker.distributeRewards(address[], uint256[]) (VlrStaker.sol#232-256) uses timestamp for comparisons
  Dangerous comparisons:
  - 1 < stakes.length (VlrStaker.sol#244)
VlrStaker.resetRewardsStakes() (VlrStaker.sol#259-271) uses timestamp for comparisons
  Dangerous comparisons:
  - 1 < stakes.length (VlrStaker.sol#268)
  - stakes[i].stopTime > 0 (VlrStaker.sol#263)
VlrStaker.getTotalStakedValue(uint256) (VlrStaker.sol#274-293) uses timestamp for comparisons
  Dangerous comparisons:
  - 1 < stakes.length (VlrStaker.sol#288)
  - stakes[i].stopTime > 0 (VlrStaker.sol#281)
VlrStaker.closeUnstakedBags(address, uint256) (VlrStaker.sol#310-324) uses timestamp for comparisons
  Dangerous comparisons:
  - 1 < stakes.length (VlrStaker.sol#312)
  - stakes[i].ownerAddress == owner (VlrStaker.sol#313)
  - stakesum + stakes[i].stakedTokens <= totalRemoved (VlrStaker.sol#314)
Reference: https://github.com/cryptic/sliether/wiki/Detector-Documentation#block-timestamp

console._sendLogPayload(bytes) (console.sol#7-14) uses assembly
  - INLINE_ASM (console.sol#10-13)
Reference: https://github.com/cryptic/sliether/wiki/Detector-Documentation#assembly-usage

Different versions of Solidity is used:
  - Version used: ['>=0.4.22<0.9.0', '>=0.6.2', '^0.8.0']
  - ^0.8.0 (Context.sol#7)
  - ^0.8.0 (ERC20.sol#23)
  - ^0.8.0 (ERC20.sol#21)
  - ^0.8.0 (ERC20Metadata.sol#3)
  - >=0.6.2 (IFancakeRouter01.sol#1)
  - >=0.6.2 (IFancakeRouter02.sol#1)
  - ^0.8.0 (VlrContract.sol#2)
  - ^0.8.0 (VlrStaker.sol#3)
  - >=0.4.22<0.9.0 (console.sol#2)
Reference: https://github.com/cryptic/sliether/wiki/Detector-Documentation#different-pragma-directives-are-used

Context._msgData() (Context.sol#26-27) is never used and should be removed
VlrStaker.bagsOwned(address) (VlrStaker.sol#217-228) is never used and should be removed
VlrStaker.buyWtc(uint256, address) (VlrStaker.sol#99-188) is never used and should be removed
console._sendLogPayload(bytes) (console.sol#7-14) is never used and should be removed
console.log() (console.sol#10-13) is never used and should be removed
console.log(address) (console.sol#184-186) is never used and should be removed
console.log(address, address) (console.sol#248-250) is never used and should be removed
console.log(address, address, address) (console.sol#504-506) is never used and should be removed
console.log(address, address, address, address) (console.sol#1520-1530) is never used and should be removed
console.log(address, address, address, bool) (console.sol#1524-1526) is never used and should be removed
console.log(address, address, address, string) (console.sol#1530-1522) is never used and should be removed
console.log(address, address, address, uint256) (console.sol#1516-1518) is never used and should be removed
console.log(address, address, bool) (console.sol#500-502) is never used and should be removed
console.log(address, address, bool, address) (console.sol#1512-1514) is never used and should be removed
console.log(address, address, bool, bool) (console.sol#1508-1510) is never used and should be removed
console.log(address, address, bool, string) (console.sol#1504-1506) is never used and should be removed
console.log(address, address, bool, uint256) (console.sol#1500-1502) is never used and should be removed
console.log(address, address, string) (console.sol#496-498) is never used and should be removed
```

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```
console.log(address,address,string,address) (console.sol#1496-1498) is never used and should be removed
console.log(address,address,string,bool) (console.sol#1492-1494) is never used and should be removed
console.log(address,address,string,string) (console.sol#1488-1490) is never used and should be removed
console.log(address,address,string,uint256) (console.sol#1484-1486) is never used and should be removed
console.log(address,address,uint256) (console.sol#1482-494) is never used and should be removed
console.log(address,address,uint256,address) (console.sol#1480-1482) is never used and should be removed
console.log(address,address,uint256,bool) (console.sol#1476-1478) is never used and should be removed
console.log(address,address,uint256,string) (console.sol#1472-1474) is never used and should be removed
console.log(address,address,uint256,uint256) (console.sol#1468-1470) is never used and should be removed
console.log(address,bool) (console.sol#1464-1466) is never used and should be removed
console.log(address,bool,address) (console.sol#1460-1462) is never used and should be removed
console.log(address,bool,address,address) (console.sol#1456-1458) is never used and should be removed
console.log(address,bool,address,uint256) (console.sol#1452-1454) is never used and should be removed
console.log(address,bool,bool) (console.sol#1448-1450) is never used and should be removed
console.log(address,bool,bool,address) (console.sol#1444-1446) is never used and should be removed
console.log(address,bool,bool,string) (console.sol#1440-1442) is never used and should be removed
console.log(address,bool,bool,uint256) (console.sol#1436-1438) is never used and should be removed
console.log(address,bool,string) (console.sol#1432-1434) is never used and should be removed
console.log(address,bool,string,address) (console.sol#1428-1430) is never used and should be removed
console.log(address,bool,string,string) (console.sol#1424-1426) is never used and should be removed
console.log(address,bool,string,uint256) (console.sol#1420-1422) is never used and should be removed
console.log(address,bool,uint256) (console.sol#1416-1418) is never used and should be removed
console.log(address,bool,uint256,address) (console.sol#1412-1414) is never used and should be removed
console.log(address,bool,uint256,bool) (console.sol#1408-1410) is never used and should be removed
console.log(address,bool,uint256,string) (console.sol#1404-1406) is never used and should be removed
console.log(address,bool,uint256,uint256) (console.sol#1400-1402) is never used and should be removed
console.log(address,string) (console.sol#1396-1398) is never used and should be removed
console.log(address,string,address) (console.sol#1392-1394) is never used and should be removed
console.log(address,string,address,bool) (console.sol#1388-1390) is never used and should be removed
console.log(address,string,address,string) (console.sol#1384-1386) is never used and should be removed
console.log(address,string,address,uint256) (console.sol#1380-1382) is never used and should be removed
console.log(address,string,bool) (console.sol#1376-1378) is never used and should be removed
console.log(address,string,bool,address) (console.sol#1372-1374) is never used and should be removed
console.log(address,string,bool,string) (console.sol#1368-1370) is never used and should be removed
console.log(address,string,string) (console.sol#1364-1366) is never used and should be removed
console.log(address,string,string,address) (console.sol#1360-1362) is never used and should be removed
console.log(address,string,string,string) (console.sol#1356-1358) is never used and should be removed
console.log(address,string,string,uint256) (console.sol#1352-1354) is never used and should be removed
console.log(address,string,uint256) (console.sol#1348-1350) is never used and should be removed
console.log(address,string,uint256,address) (console.sol#1344-1346) is never used and should be removed
console.log(address,string,uint256,bool) (console.sol#1340-1342) is never used and should be removed
console.log(address,string,uint256,string) (console.sol#1336-1338) is never used and should be removed
console.log(address,uint256) (console.sol#1332-1334) is never used and should be removed
console.log(address,uint256,address) (console.sol#1328-1330) is never used and should be removed
console.log(address,uint256,address,bool) (console.sol#1324-1326) is never used and should be removed
console.log(address,uint256,address,string) (console.sol#1320-1322) is never used and should be removed
console.log(address,uint256,address,uint256) (console.sol#1316-1318) is never used and should be removed
console.log(address,uint256,bool) (console.sol#1312-1314) is never used and should be removed
console.log(address,uint256,bool,address) (console.sol#1308-1310) is never used and should be removed
console.log(address,uint256,bool,bool) (console.sol#1304-1306) is never used and should be removed
console.log(address,uint256,bool,string) (console.sol#1300-1302) is never used and should be removed
console.log(address,uint256,string) (console.sol#1296-1298) is never used and should be removed
console.log(address,uint256,string,address) (console.sol#1292-1294) is never used and should be removed
console.log(address,uint256,string,bool) (console.sol#1288-1290) is never used and should be removed
console.log(address,uint256,string,string) (console.sol#1284-1286) is never used and should be removed
console.log(address,uint256,uint256) (console.sol#1280-1282) is never used and should be removed
console.log(address,uint256,uint256,address) (console.sol#1276-1278) is never used and should be removed
console.log(address,uint256,uint256,bool) (console.sol#1272-1274) is never used and should be removed
console.log(address,uint256,uint256,string) (console.sol#1268-1270) is never used and should be removed
console.log(address,uint256,uint256,uint256) (console.sol#1264-1266) is never used and should be removed
console.log(bool) (console.sol#1260-1262) is never used and should be removed
console.log(bool,address) (console.sol#1256-1258) is never used and should be removed
console.log(bool,address,address) (console.sol#1252-1254) is never used and should be removed
console.log(bool,address,address,address) (console.sol#1248-1250) is never used and should be removed
console.log(bool,address,address,bool) (console.sol#1244-1246) is never used and should be removed
console.log(bool,address,address,string) (console.sol#1240-1242) is never used and should be removed
console.log(bool,address,address,uint256) (console.sol#1236-1238) is never used and should be removed
console.log(bool,address,bool) (console.sol#1232-1234) is never used and should be removed
console.log(bool,address,bool,address) (console.sol#1228-1230) is never used and should be removed
console.log(bool,address,bool,bool) (console.sol#1224-1226) is never used and should be removed
console.log(bool,address,bool,string) (console.sol#1220-1222) is never used and should be removed
console.log(bool,address,bool,uint256) (console.sol#1216-1218) is never used and should be removed
console.log(bool,address,string) (console.sol#1212-1214) is never used and should be removed
console.log(bool,address,string,address) (console.sol#1208-1210) is never used and should be removed
```



# Smart Contract Audit

```
console.log(bool, address, string, address) (console.sol#1240-1242) is never used and should be removed
console.log(bool, address, string, bool) (console.sol#1236-1238) is never used and should be removed
console.log(bool, address, string, string) (console.sol#1232-1234) is never used and should be removed
console.log(bool, address, string, uint256) (console.sol#1228-1230) is never used and should be removed
console.log(bool, address, uint256) (console.sol#428-430) is never used and should be removed
console.log(bool, address, uint256, address) (console.sol#1224-1226) is never used and should be removed
console.log(bool, address, uint256, bool) (console.sol#1220-1222) is never used and should be removed
console.log(bool, address, uint256, string) (console.sol#1216-1218) is never used and should be removed
console.log(bool, address, uint256, uint256) (console.sol#1212-1214) is never used and should be removed
console.log(bool, bool) (console.sol#228-230) is never used and should be removed
console.log(bool, bool, address) (console.sol#424-426) is never used and should be removed
console.log(bool, bool, address, address) (console.sol#1208-1210) is never used and should be removed
console.log(bool, bool, address, bool) (console.sol#1204-1206) is never used and should be removed
console.log(bool, bool, address, string) (console.sol#1200-1202) is never used and should be removed
console.log(bool, bool, address, uint256) (console.sol#1196-1198) is never used and should be removed
console.log(bool, bool, bool) (console.sol#420-422) is never used and should be removed
console.log(bool, bool, address) (console.sol#1192-1194) is never used and should be removed
console.log(bool, bool, bool, bool) (console.sol#1188-1190) is never used and should be removed
console.log(bool, bool, bool, string) (console.sol#1184-1186) is never used and should be removed
console.log(bool, bool, bool, uint256) (console.sol#1180-1182) is never used and should be removed
console.log(bool, bool, string) (console.sol#416-418) is never used and should be removed
console.log(bool, bool, string, address) (console.sol#1176-1178) is never used and should be removed
console.log(bool, bool, string, bool) (console.sol#1172-1174) is never used and should be removed
console.log(bool, bool, string, string) (console.sol#1168-1170) is never used and should be removed
console.log(bool, bool, string, uint256) (console.sol#1164-1166) is never used and should be removed
console.log(bool, bool, uint256) (console.sol#412-414) is never used and should be removed
console.log(bool, bool, uint256, address) (console.sol#1160-1162) is never used and should be removed
console.log(bool, bool, uint256, bool) (console.sol#1156-1158) is never used and should be removed
console.log(bool, bool, uint256, string) (console.sol#1152-1154) is never used and should be removed
console.log(bool, bool, uint256, uint256) (console.sol#1148-1150) is never used and should be removed
console.log(bool, string) (console.sol#224-226) is never used and should be removed
console.log(bool, string, address) (console.sol#408-410) is never used and should be removed
console.log(bool, string, address, address) (console.sol#1144-1146) is never used and should be removed
console.log(bool, string, address, bool) (console.sol#1140-1142) is never used and should be removed
console.log(bool, string, address, string) (console.sol#1136-1138) is never used and should be removed
console.log(bool, string, address, uint256) (console.sol#1132-1134) is never used and should be removed
console.log(bool, string, bool) (console.sol#404-406) is never used and should be removed
console.log(bool, string, bool, address) (console.sol#1128-1130) is never used and should be removed
console.log(bool, string, bool, bool) (console.sol#1124-1126) is never used and should be removed
console.log(bool, string, bool, string) (console.sol#1120-1122) is never used and should be removed
console.log(bool, string, bool, uint256) (console.sol#1116-1118) is never used and should be removed
console.log(bool, string, string) (console.sol#400-402) is never used and should be removed
console.log(bool, string, string, address) (console.sol#1112-1114) is never used and should be removed
console.log(bool, string, string, bool) (console.sol#1108-1110) is never used and should be removed
console.log(bool, string, string, string) (console.sol#1104-1106) is never used and should be removed
console.log(bool, string, string, uint256) (console.sol#1100-1102) is never used and should be removed
console.log(bool, string, uint256) (console.sol#396-398) is never used and should be removed
console.log(bool, string, uint256, address) (console.sol#1096-1098) is never used and should be removed
console.log(bool, string, uint256, bool) (console.sol#1092-1094) is never used and should be removed
console.log(bool, string, uint256, string) (console.sol#1088-1090) is never used and should be removed
console.log(bool, string, uint256, uint256) (console.sol#1084-1086) is never used and should be removed
console.log(bool, uint256) (console.sol#220-222) is never used and should be removed
console.log(bool, uint256, address) (console.sol#392-394) is never used and should be removed
console.log(bool, uint256, address, address) (console.sol#1080-1082) is never used and should be removed
console.log(bool, uint256, address, bool) (console.sol#1076-1078) is never used and should be removed
console.log(bool, uint256, address, string) (console.sol#1072-1074) is never used and should be removed
console.log(bool, uint256, address, uint256) (console.sol#1068-1070) is never used and should be removed
console.log(bool, uint256, bool) (console.sol#288-290) is never used and should be removed
console.log(bool, uint256, address) (console.sol#1064-1066) is never used and should be removed
console.log(bool, uint256, bool, bool) (console.sol#1060-1062) is never used and should be removed
console.log(bool, uint256, bool, string) (console.sol#1056-1058) is never used and should be removed
console.log(bool, uint256, bool, uint256) (console.sol#1052-1054) is never used and should be removed
console.log(bool, uint256, string) (console.sol#384-386) is never used and should be removed
console.log(bool, uint256, string, address) (console.sol#1048-1050) is never used and should be removed
console.log(bool, uint256, string, bool) (console.sol#1044-1046) is never used and should be removed
console.log(bool, uint256, string, string) (console.sol#1040-1042) is never used and should be removed
console.log(bool, uint256, string, uint256) (console.sol#1036-1038) is never used and should be removed
console.log(bool, uint256, uint256) (console.sol#380-382) is never used and should be removed
console.log(bool, uint256, uint256, address) (console.sol#1032-1034) is never used and should be removed
console.log(bool, uint256, uint256, bool) (console.sol#1028-1030) is never used and should be removed
console.log(bool, uint256, uint256, string) (console.sol#1024-1026) is never used and should be removed
console.log(bool, uint256, uint256, uint256) (console.sol#1020-1022) is never used and should be removed
console.log(string) (console.sol#176-178) is never used and should be removed
console.log(string, address) (console.sol#216-218) is never used and should be removed
console.log(string, address, address) (console.sol#176-178) is never used and should be removed
console.log(string, address, address, address) (console.sol#1816-1818) is never used and should be removed
console.log(string, address, address, bool) (console.sol#1812-1814) is never used and should be removed
console.log(string, address, address, string) (console.sol#1908-1910) is never used and should be removed
console.log(string, address, address, uint256) (console.sol#1804-1806) is never used and should be removed
console.log(string, address, bool) (console.sol#372-374) is never used and should be removed
console.log(string, address, bool, address) (console.sol#1800-1802) is never used and should be removed
console.log(string, address, bool, bool) (console.sol#996-998) is never used and should be removed
console.log(string, address, bool, string) (console.sol#992-994) is never used and should be removed
console.log(string, address, bool, uint256) (console.sol#988-990) is never used and should be removed
console.log(string, address, string) (console.sol#368-370) is never used and should be removed
console.log(string, address, string, address) (console.sol#984-986) is never used and should be removed
```



# Smart Contract Audit

```
console.log(string,address,string,bool) (console.sol#998-982) is never used and should be removed
console.log(string,address,string,string) (console.sol#976-978) is never used and should be removed
console.log(string,address,string,uint256) (console.sol#972-974) is never used and should be removed
console.log(string,address,uint256) (console.sol#364-366) is never used and should be removed
console.log(string,address,uint256,address) (console.sol#968-970) is never used and should be removed
console.log(string,address,uint256,bool) (console.sol#964-966) is never used and should be removed
console.log(string,address,uint256,string) (console.sol#960-962) is never used and should be removed
console.log(string,address,uint256,uint256) (console.sol#956-958) is never used and should be removed
console.log(string,bool) (console.sol#212-214) is never used and should be removed
console.log(string,bool,address) (console.sol#360-362) is never used and should be removed
console.log(string,bool,address,address) (console.sol#952-954) is never used and should be removed
console.log(string,bool,address,bool) (console.sol#948-950) is never used and should be removed
console.log(string,bool,address,string) (console.sol#944-946) is never used and should be removed
console.log(string,bool,address,uint256) (console.sol#940-942) is never used and should be removed
console.log(string,bool,bool) (console.sol#356-358) is never used and should be removed
console.log(string,bool,bool,address) (console.sol#936-938) is never used and should be removed
console.log(string,bool,bool,bool) (console.sol#932-934) is never used and should be removed
console.log(string,bool,bool,string) (console.sol#928-930) is never used and should be removed
console.log(string,bool,bool,uint256) (console.sol#924-926) is never used and should be removed
console.log(string,bool,string) (console.sol#322-324) is never used and should be removed
console.log(string,bool,string,address) (console.sol#920-922) is never used and should be removed
console.log(string,bool,string,bool) (console.sol#916-918) is never used and should be removed
console.log(string,bool,string,string) (console.sol#912-914) is never used and should be removed
console.log(string,bool,string,uint256) (console.sol#908-910) is never used and should be removed
console.log(string,bool,uint256) (console.sol#348-350) is never used and should be removed
console.log(string,bool,uint256,address) (console.sol#904-906) is never used and should be removed
console.log(string,bool,uint256,bool) (console.sol#900-902) is never used and should be removed
console.log(string,bool,uint256,string) (console.sol#896-898) is never used and should be removed
console.log(string,bool,uint256,uint256) (console.sol#892-894) is never used and should be removed
console.log(string,string) (console.sol#208-210) is never used and should be removed
console.log(string,string,address) (console.sol#344-346) is never used and should be removed
console.log(string,string,address,address) (console.sol#888-890) is never used and should be removed
console.log(string,string,address,bool) (console.sol#884-886) is never used and should be removed
console.log(string,string,address,string) (console.sol#880-882) is never used and should be removed
console.log(string,string,address,uint256) (console.sol#876-878) is never used and should be removed
console.log(string,string,bool) (console.sol#340-342) is never used and should be removed
console.log(string,string,bool,address) (console.sol#872-874) is never used and should be removed
console.log(string,string,bool,bool) (console.sol#868-870) is never used and should be removed
console.log(string,string,bool,string) (console.sol#864-866) is never used and should be removed
console.log(string,string,bool,uint256) (console.sol#860-862) is never used and should be removed
console.log(string,string,string) (console.sol#336-338) is never used and should be removed
console.log(string,string,string,address) (console.sol#856-858) is never used and should be removed
console.log(string,string,string,bool) (console.sol#852-854) is never used and should be removed
console.log(string,string,string,string) (console.sol#848-850) is never used and should be removed
console.log(string,string,uint256) (console.sol#844-846) is never used and should be removed
console.log(string,string,uint256) (console.sol#332-334) is never used and should be removed
console.log(string,string,uint256,address) (console.sol#840-842) is never used and should be removed
console.log(string,string,uint256,bool) (console.sol#836-838) is never used and should be removed
console.log(string,string,uint256,string) (console.sol#832-834) is never used and should be removed
console.log(string,string,uint256,uint256) (console.sol#828-830) is never used and should be removed
console.log(string,uint256) (console.sol#204-206) is never used and should be removed
console.log(string,uint256,address) (console.sol#328-330) is never used and should be removed
console.log(string,uint256,address,address) (console.sol#824-826) is never used and should be removed
console.log(string,uint256,address,bool) (console.sol#820-822) is never used and should be removed
console.log(string,uint256,address,string) (console.sol#816-818) is never used and should be removed
console.log(string,uint256,address,uint256) (console.sol#812-814) is never used and should be removed
console.log(string,uint256,bool) (console.sol#324-326) is never used and should be removed
console.log(string,uint256,bool,address) (console.sol#808-810) is never used and should be removed
console.log(string,uint256,bool,bool) (console.sol#804-806) is never used and should be removed
console.log(string,uint256,bool,string) (console.sol#800-802) is never used and should be removed
console.log(string,uint256,bool,uint256) (console.sol#796-798) is never used and should be removed
console.log(string,uint256,string) (console.sol#320-322) is never used and should be removed
console.log(string,uint256,string,address) (console.sol#792-794) is never used and should be removed
console.log(string,uint256,string,bool) (console.sol#788-790) is never used and should be removed
console.log(string,uint256,string,string) (console.sol#784-786) is never used and should be removed
console.log(string,uint256,string,uint256) (console.sol#780-782) is never used and should be removed
console.log(string,uint256,uint256) (console.sol#316-318) is never used and should be removed
console.log(string,uint256,uint256,address) (console.sol#776-778) is never used and should be removed
console.log(string,uint256,uint256,bool) (console.sol#772-774) is never used and should be removed
console.log(string,uint256,uint256,string) (console.sol#768-770) is never used and should be removed
console.log(string,uint256,uint256,uint256) (console.sol#764-766) is never used and should be removed
console.log(uint256) (console.sol#172-174) is never used and should be removed
console.log(uint256,address) (console.sol#200-202) is never used and should be removed
console.log(uint256,address,address) (console.sol#312-314) is never used and should be removed
console.log(uint256,address,address,address) (console.sol#760-762) is never used and should be removed
console.log(uint256,address,address,bool) (console.sol#756-758) is never used and should be removed
console.log(uint256,address,address,string) (console.sol#752-754) is never used and should be removed
console.log(uint256,address,address,uint256) (console.sol#748-750) is never used and should be removed
console.log(uint256,address,bool) (console.sol#308-310) is never used and should be removed
console.log(uint256,address,bool,address) (console.sol#744-746) is never used and should be removed
console.log(uint256,address,bool,bool) (console.sol#740-742) is never used and should be removed
console.log(uint256,address,bool,string) (console.sol#736-738) is never used and should be removed
console.log(uint256,address,bool,uint256) (console.sol#732-734) is never used and should be removed
console.log(uint256,address,string) (console.sol#304-306) is never used and should be removed
console.log(uint256,address,string,address) (console.sol#728-730) is never used and should be removed
console.log(uint256,address,string,bool) (console.sol#724-726) is never used and should be removed
```



# Smart Contract Audit

```
console.log(uint256,address,string,string) (console.sol#728-722) is never used and should be removed
console.log(uint256,address,string,uint256) (console.sol#716-718) is never used and should be removed
console.log(uint256,address,uint256) (console.sol#386-382) is never used and should be removed
console.log(uint256,address,uint256,address) (console.sol#712-714) is never used and should be removed
console.log(uint256,address,uint256,bool) (console.sol#708-710) is never used and should be removed
console.log(uint256,address,uint256,string) (console.sol#704-706) is never used and should be removed
console.log(uint256,address,uint256,uint256) (console.sol#700-702) is never used and should be removed
console.log(uint256,bool) (console.sol#196-198) is never used and should be removed
console.log(uint256,bool,address) (console.sol#296-298) is never used and should be removed
console.log(uint256,bool,address,address) (console.sol#696-698) is never used and should be removed
console.log(uint256,bool,address,bool) (console.sol#692-694) is never used and should be removed
console.log(uint256,bool,address,string) (console.sol#688-690) is never used and should be removed
console.log(uint256,bool,address,uint256) (console.sol#684-686) is never used and should be removed
console.log(uint256,bool,bool) (console.sol#292-294) is never used and should be removed
console.log(uint256,bool,bool,address) (console.sol#680-682) is never used and should be removed
console.log(uint256,bool,bool,bool) (console.sol#676-678) is never used and should be removed
console.log(uint256,bool,bool,string) (console.sol#672-674) is never used and should be removed
console.log(uint256,bool,bool,uint256) (console.sol#668-670) is never used and should be removed
console.log(uint256,bool,string) (console.sol#290-292) is never used and should be removed
console.log(uint256,bool,string,address) (console.sol#664-666) is never used and should be removed
console.log(uint256,bool,string,bool) (console.sol#660-662) is never used and should be removed
console.log(uint256,bool,string,string) (console.sol#656-658) is never used and should be removed
console.log(uint256,bool,string,uint256) (console.sol#652-654) is never used and should be removed
console.log(uint256,bool,uint256) (console.sol#284-286) is never used and should be removed
console.log(uint256,bool,uint256,address) (console.sol#648-650) is never used and should be removed
console.log(uint256,bool,uint256,bool) (console.sol#644-646) is never used and should be removed
console.log(uint256,bool,uint256,string) (console.sol#640-642) is never used and should be removed
console.log(uint256,bool,uint256,uint256) (console.sol#636-638) is never used and should be removed
console.log(uint256,string) (console.sol#192-194) is never used and should be removed
console.log(uint256,string,address) (console.sol#288-282) is never used and should be removed
console.log(uint256,string,address,address) (console.sol#632-634) is never used and should be removed
console.log(uint256,string,address,bool) (console.sol#628-630) is never used and should be removed
console.log(uint256,string,address,string) (console.sol#624-626) is never used and should be removed
console.log(uint256,string,address,uint256) (console.sol#620-622) is never used and should be removed
console.log(uint256,string,bool) (console.sol#276-278) is never used and should be removed
console.log(uint256,string,bool,address) (console.sol#616-618) is never used and should be removed
console.log(uint256,string,bool,bool) (console.sol#612-614) is never used and should be removed
console.log(uint256,string,bool,string) (console.sol#608-610) is never used and should be removed
console.log(uint256,string,bool,uint256) (console.sol#604-606) is never used and should be removed
console.log(uint256,string,string) (console.sol#272-274) is never used and should be removed
console.log(uint256,string,string,address) (console.sol#600-602) is never used and should be removed
console.log(uint256,string,string,bool) (console.sol#596-598) is never used and should be removed
console.log(uint256,string,string,string) (console.sol#592-594) is never used and should be removed
console.log(uint256,string,string,uint256) (console.sol#588-590) is never used and should be removed
console.log(uint256,string,uint256) (console.sol#268-270) is never used and should be removed
console.log(uint256,string,uint256,address) (console.sol#584-586) is never used and should be removed
console.log(uint256,string,uint256,bool) (console.sol#580-582) is never used and should be removed
console.log(uint256,string,uint256,string) (console.sol#576-578) is never used and should be removed
console.log(uint256,string,uint256,uint256) (console.sol#572-574) is never used and should be removed
console.log(uint256,uint256) (console.sol#188-190) is never used and should be removed
console.log(uint256,uint256,address) (console.sol#264-266) is never used and should be removed
console.log(uint256,uint256,address,address) (console.sol#568-570) is never used and should be removed
console.log(uint256,uint256,address,bool) (console.sol#564-566) is never used and should be removed
console.log(uint256,uint256,address,string) (console.sol#560-562) is never used and should be removed
console.log(uint256,uint256,address,uint256) (console.sol#556-558) is never used and should be removed
console.log(uint256,uint256,bool) (console.sol#260-262) is never used and should be removed
console.log(uint256,uint256,bool,address) (console.sol#552-554) is never used and should be removed
console.log(uint256,uint256,bool,bool) (console.sol#548-550) is never used and should be removed
console.log(uint256,uint256,bool,string) (console.sol#544-546) is never used and should be removed
console.log(uint256,uint256,bool,uint256) (console.sol#540-542) is never used and should be removed
console.log(uint256,uint256,string) (console.sol#256-258) is never used and should be removed
console.log(uint256,uint256,string,address) (console.sol#536-538) is never used and should be removed
console.log(uint256,uint256,string,bool) (console.sol#532-534) is never used and should be removed
console.log(uint256,uint256,string,string) (console.sol#528-530) is never used and should be removed
console.log(uint256,uint256,string,uint256) (console.sol#524-526) is never used and should be removed
console.log(uint256,uint256,uint256) (console.sol#252-254) is never used and should be removed
console.log(uint256,uint256,uint256,address) (console.sol#520-522) is never used and should be removed
console.log(uint256,uint256,uint256,bool) (console.sol#516-518) is never used and should be removed
console.log(uint256,uint256,uint256,string) (console.sol#512-514) is never used and should be removed
console.log(uint256,uint256,uint256,uint256) (console.sol#508-510) is never used and should be removed
console.log(address,address) (console.sol#136-138) is never used and should be removed
console.log(bool,bool) (console.sol#132-134) is never used and should be removed
console.log(bytes(bytes)) (console.sol#40-42) is never used and should be removed
console.log(bytes1(bytes1)) (console.sol#44-46) is never used and should be removed
console.log(bytes10(bytes10)) (console.sol#80-82) is never used and should be removed
console.log(bytes11(bytes11)) (console.sol#84-86) is never used and should be removed
console.log(bytes12(bytes12)) (console.sol#88-90) is never used and should be removed
console.log(bytes13(bytes13)) (console.sol#92-94) is never used and should be removed
console.log(bytes14(bytes14)) (console.sol#96-98) is never used and should be removed
console.log(bytes15(bytes15)) (console.sol#100-102) is never used and should be removed
console.log(bytes16(bytes16)) (console.sol#104-106) is never used and should be removed
console.log(bytes17(bytes17)) (console.sol#108-110) is never used and should be removed
console.log(bytes18(bytes18)) (console.sol#112-114) is never used and should be removed
console.log(bytes19(bytes19)) (console.sol#116-118) is never used and should be removed
console.log(bytes20(bytes20)) (console.sol#120-122) is never used and should be removed
```

# Smart Contract Audit

```
console.logBytes24(bytes24) (console.sol#136-138) is never used and should be removed
console.logBytes25(bytes25) (console.sol#140-142) is never used and should be removed
console.logBytes26(bytes26) (console.sol#144-146) is never used and should be removed
console.logBytes27(bytes27) (console.sol#148-150) is never used and should be removed
console.logBytes28(bytes28) (console.sol#152-154) is never used and should be removed
console.logBytes29(bytes29) (console.sol#156-158) is never used and should be removed
console.logBytes3(bytes3) (console.sol#57-59) is never used and should be removed
console.logBytes30(bytes30) (console.sol#100-102) is never used and should be removed
console.logBytes31(bytes31) (console.sol#104-106) is never used and should be removed
console.logBytes32(bytes32) (console.sol#108-110) is never used and should be removed
console.logBytes4(bytes4) (console.sol#56-58) is never used and should be removed
console.logBytes5(bytes5) (console.sol#60-62) is never used and should be removed
console.logBytes6(bytes6) (console.sol#64-66) is never used and should be removed
console.logBytes7(bytes7) (console.sol#68-70) is never used and should be removed
console.logBytes8(bytes8) (console.sol#72-74) is never used and should be removed
console.logBytes9(bytes9) (console.sol#76-78) is never used and should be removed
console.logInt(int256) (console.sol#20-22) is never used and should be removed
console.logString(string) (console.sol#24-26) is never used and should be removed
console.logUint(uint256) (console.sol#24-26) is never used and should be removed
Reference: https://github.com/crytic/sliether/wiki/Detector-Documentation#dead-code

Pragma version<0.8.0 (Context.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6
Pragma version<0.8.0 (ERC20.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6
Pragma version<0.8.0 (IERC20.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6
Pragma version<0.8.0 (IERC20Metadata.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6
Pragma version<=0.6.2 (IPancakeRouter01.sol#1) allows old versions
Pragma version<=0.6.2 (IPancakeRouter02.sol#1) allows old versions
Pragma version<0.8.0 (VlrContract.sol#2) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6
Pragma version<0.8.0 (VlrStaker.sol#3) necessitates a version too recent to be trusted. Consider deploying with 0.6.12/0.7.6
Pragma version<=0.4.22<0.9.0 (console.sol#2) is too complex
solc-0.8.7 is not recommended for deployment
Reference: https://github.com/crytic/sliether/wiki/Detector-Documentation#incorrect-versions-of-solidity

Function IPancakeRouter01.WETH() (IPancakeRouter01.sol#5) is not in mixedCase
Parameter VlrStaker.stakeWithTimeParameters(uint256,uint256,uint256).stakedVlrAmount (VlrStaker.sol#114) is not in mixedCase
Parameter VlrStaker.stake(uint256).stakedAmount (VlrStaker.sol#159) is not in mixedCase
Parameter VlrStaker.unstake(uint256).unstakedAmount (VlrStaker.sol#163) is not in mixedCase
Contract console (console.sol#4-1532) is not in CapWords
Reference: https://github.com/crytic/sliether/wiki/Detector-Documentation#conformance-to-solidity-naming-conventions

Variable IPancakeRouter01.addLiquidity(address,address,uint256,uint256,uint256,uint256,address,uint256).amountADesired (IPancakeRouter01.sol#10) is too similar to IPancakeRouter01.addLiquidity(address,address,uint256,uint256,uint256,uint256,address,uint256).amountBDesired (IPancakeRouter01.sol#11)
Reference: https://github.com/crytic/sliether/wiki/Detector-Documentation#variable-names-are-too-similar

VlrStaker.allOtherConstructorVariables() (VlrStaker.sol#11-325) uses literals with too many digits:
- burnAddress = 0x0000000000000000000000000000000000000000000000000000000000000000 (VlrStaker.sol#21)
console.allOtherConstructorConstantVariables() (console.sol#4-1532) uses literals with too many digits:
- console.ADDRESS = address(0x0000000000000000000000000000000000000000000000000000000000000000) (console.sol#5)
Reference: https://github.com/crytic/sliether/wiki/Detector-Documentation#too-many-digits

VlrStaker.burnAddress (VlrStaker.sol#21) should be constant
Reference: https://github.com/crytic/sliether/wiki/Detector-Documentation#state-variables-that-could-be-declared-constant

name() should be declared external:
- ERC20.name() (ERC20.sol#61-63)
symbol() should be declared external:
- ERC20.symbol() (ERC20.sol#69-71)
decimals() should be declared external:
- ERC20.decimals() (ERC20.sol#86-88)
transfer(address,uint256) should be declared external:
- ERC20.transfer(address,uint256) (ERC20.sol#112-115)
allowance(address,address) should be declared external:
- ERC20.allowance(address,address) (ERC20.sol#120-122)
approve(address,uint256) should be declared external:
- ERC20.approve(address,uint256) (ERC20.sol#131-134)
transferFrom(address,address,uint256) should be declared external:
- ERC20.transferFrom(address,address,uint256) (ERC20.sol#149-163)
increaseAllowance(address,uint256) should be declared external:
- ERC20.increaseAllowance(address,uint256) (ERC20.sol#177-188)
decreaseAllowance(address,uint256) should be declared external:
- ERC20.decreaseAllowance(address,uint256) (ERC20.sol#196-204)
getContractAddress() should be declared external:
- VlrContract.getContractAddress() (VlrContract.sol#13-15)
Reference: https://github.com/crytic/sliether/wiki/Detector-Documentation#public-function-that-could-be-declared-external
```

MythX: -

Report for VlrStaker.sol  
<https://dashboard.mythx.io/#/console/analyses/403a0528-be9e-4c60-9e51-06f00a9aea0d>

Line	SWC Title	Severity	Short Description
3	(SWC-103) Floating Pragma	Low	A floating pragma is set.



# Smart Contract Audit

Mythril: -

```
root@sv-VirtualBox:/home/sv/ValerStudios_Ubuntu# myth analyze VlrStaker.sol
The analysis was completed successfully. No issues were detected.
```

Solhint: -

Lintor results:

```
VlrStaker.sol:3:1: Error: Compiler version ^0.8.0 does not satisfy the r semver requirement
```

```
VlrStaker.sol:29:5: Error: Explicitly mark visibility in function (Set ignoreConstructors to true if using solidity >=0.7.0)
```

```
VlrStaker.sol:30:9: Error: Variable name must be in mixedCase
```

```
VlrStaker.sol:99:22: Error: Variable name must be in mixedCase
```

```
VlrStaker.sol:106:14: Error: Avoid to make time-based decisions in your business logic
```

```
VlrStaker.sol:160:33: Error: Avoid to make time-based decisions in your business logic
```

```
VlrStaker.sol:243:60: Error: Avoid to make time-based decisions in your business logic
```

```
VlrStaker.sol:245:53: Error: Avoid to make time-based decisions in your business logic
```

```
VlrStaker.sol:267:39: Error: Avoid to make time-based decisions in your business logic
```

```
VlrStaker.sol:315:42: Error: Avoid to make time-based decisions in your business logic
```

# Smart Contract Audit

## Basic Coding Bugs

No.	Name	Description	Severity	Result
1.	Constructor Mismatch	Whether the contract name and its constructor are not identical to each other.	Critical	<b>PASSED</b>
2.	Ownership Takeover	Whether the set owner function is not protected.	Critical	<b>PASSED</b>
3.	Redundant Fallback Function	Whether the contract has a redundant fallback function.	Critical	<b>PASSED</b>
4.	Overflows & Underflows	Whether the contract has general overflow or underflow vulnerabilities	Critical	<b>PASSED</b>
5.	Reentrancy	Reentrancy is an issue when code can call back into your contract and change state, such as withdrawing ETHs	Critical	<b>PASSED</b>
6.	MONEY-Giving Bug	Whether the contract returns funds to an arbitrary address	High	<b>PASSED</b>
7.	Blackhole	Whether the contract locks ETH indefinitely: merely in without out	High	<b>PASSED</b>
8.	Unauthorized Self-Destruct	Whether the contract can be killed by any arbitrary address	Medium	<b>PASSED</b>

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9.	Revert DoS	Whether the contract is vulnerable to DoS attack because of unexpected revert	Medium	<b>PASSED</b>
10.	Unchecked External Call	Whether the contract has any external call without checking the return value	Medium	<b>PASSED</b>
11.	Gasless Send	Whether the contract is vulnerable to gasless send	Medium	<b>PASSED</b>
12.	Send Instead of Transfer	Whether the contract uses send instead of transfer	Medium	<b>PASSED</b>
13.	Costly Loop	Whether the contract has any costly loop which may lead to Out-Of-Gas exception	Medium	<b>PASSED</b>
14.	(Unsafe) Use of Untrusted Libraries	Whether the contract use any suspicious libraries	Medium	<b>PASSED</b>
15.	(Unsafe) Use of Predictable Variables	Whether the contract contains any randomness variable, but its value can be predicated	Medium	<b>PASSED</b>
16.	Transaction Ordering Dependence	Whether the final state of the contract depends on the order of the transactions	Medium	<b>PASSED</b>

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17.	Deprecated Uses	Whether the contract use the deprecated tx.origin to perform the authorization	Medium	<b>PASSED</b>
18.	Semantic Consistency Checks	Whether the semantic of the white paper is different from the implementation of the contract	Critical	<b>PASSED</b>



## Conclusion

In this audit, we thoroughly analyzed VALERSTUDIOS's VlrStaker Smart Contract. The current code base is well organized but there are promptly some low-level issues found in this 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)