

LoopNetwork

Smart Contract Audit Report



01 Feb 2022



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# **AUDITED DETAILS**

### Audited Project

Project name	Token ticker	Blockchain	
LoopNetwork	LOOP	Binance Smart Chain	

### Addresses

Contract address	0xce186ad6430e2fe494a22c9edbd4c68794a28b35
Contract deployer address	0x954137f063c821cd8247Ab2E1235b4548B8ac8D5

### Project Website

https://www.getloop.network/

### Codebase

https://bscscan.com/address/0xce186ad6430e2fe494a22c9edbd4c68794a28b35#code



### **SUMMARY**

A cryptocurrency system that supports smart contracts without the scalability and privacy limitations of earlier systems like Ethereum. Loop network, like Ethereum, allows parties to create smart contracts using code to specify the behavior of the virtual machine (VM) that executes the contract's function. Loop Network strives to solve scalability and usability issues, without compromising decentralization, and leverages the existing developer community and ecosystem. It is an off-chain/external scaling solution for existing platforms to provide scalability and superior user experience for DApps/user features.

### Contract Summary

#### **Documentation Quality**

LoopNetwork provides a very good documentation with standard of solidity base code.

• The technical description is provided clearly and structured and also dont have any high risk issue.

#### **Code Quality**

The Overall quality of the basecode is standard.

• Standard solidity basecode and rules are already followed by LoopNetwork with the discovery of several low issues.

#### **Test Coverage**

Test coverage of the project is 100% (Through Codebase)

### Audit Findings Summary

- SWC-101 | It is recommended to use vetted safe math libraries for arithmetic operations consistently on lines 36, 40, 44, 48, 54, 61, 413, 413, 598, 653, 658, 671, 676, 733, 733, 738, 738, 798, 900, 900, 974, 994 and 994.
- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 17.
- SWC-110 SWC-123 | It is recommended to use of revert(), assert(), and require() in Solidity, and the new REVERT opcode in the EVM on lines 656, 657, 674, 675, 909 and 910.
- SWC-131 SWC-135 | It is recommended to remove all unused variables from the code base on lines 898.



### CONCLUSION

We have audited the LoopNetwork project released on January 2022 to discover issues and identify potential security vulnerabilities in LoopNetwork Project. This process is used to find technical issues and security loopholes which might be found in the smart contract.

The security audit report provides satisfactory results with low-risk issues.

The issues found in the LoopNetwork smart contract code do not pose a considerable risk. The writing of the contract is close to the standard of writing contracts in general. The low-risk issues found are some arithmetic operation issues, a floating pragma is set, usage of equality comparison instead of assignment, and out-of-bounds array access which the index access expression can cause an exception in case of the use of an invalid array index value. The current pragma Solidity directive is "^0.8.7". Specifying a fixed compiler version is recommended 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. Using equality comparison instead of assignment, this equality comparison has no effect.



# **AUDIT RESULT**

Article	Category	Description	Result
Default Visibility	SWC-100 SWC-108	Functions and state variables visibility should be set explicitly. Visibility levels should be specified consciously.	PASS
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	
Outdated Compiler Version	SWC-102	It is recommended to use a recent version of the Solidity compiler.	PASS
Floating Pragma	Floating Pragma  Contracts should be deployed with the same compiler version and flags that they have been tested thoroughly.		ISSUE FOUND
Unchecked Call Return Value	SWC-104		PASS
Unprotected Ether Withdrawal	SWC-105		PASS
SELFDESTRUCT Instruction  SWC-106  The contract should not be self-destruct has funds belonging to users.		The contract should not be self-destructible while it has funds belonging to users.	PASS
Reentrancy SWC-10/		Check effect interaction pattern should be followed if the code performs recursive call.	PASS
SWC-109		Uninitialized local storage variables can point to unexpected storage locations in the contract.	PASS
Assert Violation SWC-110 Properly functioning code should never reach a failing assert statement.		. ,	ISSUE FOUND
Deprecated Solidity Functions	SWC-111 Deprecated built-in functions should never be used		PASS
Delegate call to Untrusted Callee	SWC-112		PASS



DoS (Denial of Service)	SWC-113 SWC-128	Execution of the code should never be blocked by a specific contract state unless required.	
Race Conditions	SWC-114	Race Conditions and Transactions Order Dependency should not be possible.	
Authorization through tx.origin	SWC-115	tx.origin should not be used for authorization.	
Block values as a proxy for time	SWC-116	Block numbers should not be used for time calculations.	
Signature Unique ID SWC-121 SWC-122		Signed messages should always have a unique id. A transaction hash should not be used as a unique id.	PASS
SWC-118		Constructors are special functions that are called only once during the contract creation.	PASS
Shadowing State Variable SWC-119		State variables should not be shadowed.	PASS
SWC-120		Random values should never be generated from Chain Attributes or be predictable.	
Write to Arbitrary Storage Location SWC-124		The contract is responsible for ensuring that only authorized user or contract accounts may write to sensitive storage locations.	PASS
Incorrect Inheritance Order		When inheriting multiple contracts, especially if they have identical functions, a developer should carefully specify inheritance in the correct order. The rule of thumb is to inherit contracts from more /general/ to more /specific/.	PASS
Insufficient Gas Griefing	SWC-126 contracts which accept data and use it in a sub-call on		PASS
Arbitrary Jump Function  As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value.		PASS	



Typographical Error	SWC-129	A typographical error can occur for example when the intent of a defined operation is to sum a number to a variable.	
Override control character	SWC-130 Malicious actors can use the Right-To-Left-Override unicode character to force RTL text rendering and confuse users as to the real intent of a contract.		PASS
Unused variables	SWC-131 SWC-135		
Unexpected Ether balance	SWC-132	Contracts can behave erroneously when they strictly assume a specific Ether balance.	
Hash Collisions Variable	SWC-133		PASS
Hardcoded gas amount	SWC-134		PASS
Unencrypted Private Data  It is a common misconception that private type variables cannot be read.		PASS	



# **SMART CONTRACT ANALYSIS**

Started	Monday Jan 31 2022 08:14:25 GMT+0000 (Coordinated Universal Time)		
Finished	Tuesday Feb 01 2022 16:26:47 GMT+0000 (Coordinated Universal Time)		
Mode	Standard		
Main Source File	LoopNetwork.sol		

### Detected Issues

ID	Title	Severity	Status
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "**" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "++" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "++" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "-" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged



SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "+" DISCOVERED	low	acknowledged
SWC-101	ARITHMETIC OPERATION "/" DISCOVERED	low	acknowledged
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SWC-101	ARITHMETIC OPERATION "*" DISCOVERED	low	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-135	USAGE OF EQUALITY COMPARISON INSTEAD OF ASSIGNMENT	low	acknowledged
SWC-110	OUT OF BOUNDS ARRAY ACCESS	low	acknowledged
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SWC-110	OUT OF BOUNDS ARRAY ACCESS	low	acknowledged



### SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

LINE 36

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
function add(uint256 a, uint256 b) internal pure returns (uint256) {
  return a + b;
}

function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256) {
  function sub(uint256 a, uint256 b) internal pure returns (uint256 b) {
  function sub(uint256 a, uint256 a, uint256 b) {
  function sub(uint256 a, uint256 a, u
```



# SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 40

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
function sub(uint256 a, uint256 b) internal pure returns (uint256) {
function sub(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256) {
function mul(uint256 a, uint256 b) internal pure returns (uint256 b) {
function mul(uint256 a, uint256 b) internal pure returns (uint256 b) {
function mul(uint256 a, uint256 b) internal pure returns (uint256 b) {
function mul(uint256 a, uint256 a, uint256 b) {
function mul(uint256 a, uint256 a, uint256
```



# SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

LINE 44

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
function mul(uint256 a, uint256 b) internal pure returns (uint256) {

return a * b;

}

function div(uint256 a, uint256 b) internal pure returns (uint256) {

function div(uint256 a, uint256 b) internal pure returns (uint256) {
```



### SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 48

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
47 function div(uint256 a, uint256 b) internal pure returns (uint256) {
48  return a / b;
49 }
50
51 function sub(uint256 a, uint256 b, string memory errorMessage) internal pure returns
(uint256) {
52
```



# SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

LINE 54

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
53    require(b <= a, errorMessage);
54    return a - b;
55    }
56    }
57
58</pre>
```



### SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

LINE 61

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
60 require(b > 0, errorMessage);
61 return a / b;
62 }
63 }
64
65
```



### SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

**LINE 413** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
412  uint8 private _decimals = 18;
413  uint256 private _tTotal = 200000000 * 10**18;
414  uint256 private _tFeeTotal;
415
416  // Counter for liquify trigger
417
```



### SWC-101 | ARITHMETIC OPERATION "\*\*" DISCOVERED

**LINE 413** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
412  uint8 private _decimals = 18;
413  uint256 private _tTotal = 2000000000 * 10**18;
414  uint256 private _tFeeTotal;
415
416  // Counter for liquify trigger
417
```



### SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

**LINE 598** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
597
598 require((Buy_Fee + Sell_Fee) <= maxPossibleFee, "Fee is too high!");
599 _sellFee = Sell_Fee;
600 _buyFee = Buy_Fee;
601
602</pre>
```



### SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

**LINE 653** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
652
653    for (uint256 i; i < addresses.length; ++i) {
654    if(gasUsed < gasleft()) {
655     startGas = gasleft();
656    if(!_isBlacklisted[addresses[i]]){
657</pre>
```



### SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

**LINE 658** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
657 _isBlacklisted[addresses[i]] = true;}
658  gasUsed = startGas - gasleft();
659  }
660  }
661  }
662
```



### SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

**LINE 671** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol



### SWC-101 | ARITHMETIC OPERATION "-" DISCOVERED

**LINE 676** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
675 _isBlacklisted[addresses[i]] = false;}
676   gasUsed = startGas - gasleft();
677  }
678  }
679  }
680
```



### SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

**LINE** 733

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol



### SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

**LINE** 733

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
function set_Max_Transaction_Percent(uint256 maxTxPercent_x100) external
onlyOwner() {
    maxTxAmount = _tTotal*maxTxPercent_x100/10000;
    }
}

735
736  // Set the maximum wallet holding (percent of total supply)
737
```



### SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

**LINE 738** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol



# SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

**LINE 738** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol



### SWC-101 | ARITHMETIC OPERATION "+" DISCOVERED

**LINE** 798

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
797 uint256 heldTokens = balanceOf(to);
798 require((heldTokens + amount) <= _maxWalletToken,"You are trying to buy too many tokens. You have reached the limit for one wallet.");}
799
800
801 // Limit the maximum number of tokens that can be bought or sold in one transaction
802
```



### SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

**LINE 900** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
uint256 tokensOnContract = balanceOf(address(this));
uint256 sendTokens = tokensOnContract*percent_Of_Tokens_To_Process/100;
swapAndLiquify(sendTokens);

902 }
903
904
```



# SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

**LINE 900** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
899  uint256 tokensOnContract = balanceOf(address(this));
900  uint256 sendTokens = tokensOnContract*percent_Of_Tokens_To_Process/100;
901  swapAndLiquify(sendTokens);
902  }
903
904
```



### SWC-101 | ARITHMETIC OPERATION "++" DISCOVERED

**LINE 974** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol



### SWC-101 | ARITHMETIC OPERATION "/" DISCOVERED

**LINE 994** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
function _getValues(uint256 tAmount) private view returns (uint256, uint256) {
    uint256 tDev = tAmount*_TotalFee/100;
    uint256 tTransferAmount = tAmount.sub(tDev);
    return (tTransferAmount, tDev);
}
```



### SWC-101 | ARITHMETIC OPERATION "\*" DISCOVERED

**LINE 994** 

#### **low SEVERITY**

This plugin produces issues to support false positive discovery within mythril.

#### Source File

- LoopNetwork.sol

```
function _getValues(uint256 tAmount) private view returns (uint256, uint256) {
    uint256 tDev = tAmount*_TotalFee/100;
    uint256 tTransferAmount = tAmount.sub(tDev);
    return (tTransferAmount, tDev);
}
```



### SWC-103 | A FLOATING PRAGMA IS SET.

LINE 17

#### **low SEVERITY**

The current pragma Solidity directive is ""^0.8.7"". 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.

#### Source File

- LoopNetwork.sol

```
16
17 pragma solidity ^0.8.7;
18
19
20 interface IERC20 {
```



# SWC-135 | USAGE OF EQUALITY COMPARISON INSTEAD OF ASSIGNMENT

**LINE 898** 

#### **low SEVERITY**

This equality comparison doesn't have any effect. Did you mean to do assignment instead?

#### Source File

- LoopNetwork.sol

```
require(!inSwapAndLiquify, "Currently processing, try later.");
if (percent_Of_Tokens_To_Process > 100){percent_Of_Tokens_To_Process == 100;}
uint256 tokensOnContract = balanceOf(address(this));
uint256 sendTokens = tokensOnContract*percent_Of_Tokens_To_Process/100;
swapAndLiquify(sendTokens);
```



**LINE 656** 

#### **low SEVERITY**

The index access expression can cause an exception in case of use of invalid array index value.

#### Source File

- LoopNetwork.sol

```
655  startGas = gasleft();
656  if(!_isBlacklisted[addresses[i]]){
657   _isBlacklisted[addresses[i]] = true;}
658  gasUsed = startGas - gasleft();
659  }
660
```



**LINE 657** 

#### **low SEVERITY**

The index access expression can cause an exception in case of use of invalid array index value.

#### Source File

- LoopNetwork.sol

```
656  if(!_isBlacklisted[addresses[i]]){
657    _isBlacklisted[addresses[i]] = true;}
658    gasUsed = startGas - gasleft();
659  }
660  }
661
```



**LINE 674** 

#### **low SEVERITY**

The index access expression can cause an exception in case of use of invalid array index value.

#### Source File

- LoopNetwork.sol

```
673  startGas = gasleft();
674  if(_isBlacklisted[addresses[i]]){
675   _isBlacklisted[addresses[i]] = false;}
676  gasUsed = startGas - gasleft();
677  }
678
```



**LINE 675** 

#### **low SEVERITY**

The index access expression can cause an exception in case of use of invalid array index value.

#### Source File

- LoopNetwork.sol

```
674  if(_isBlacklisted[addresses[i]]){
675   _isBlacklisted[addresses[i]] = false;}
676   gasUsed = startGas - gasleft();
677  }
678  }
679
```



**LINE** 909

#### **low SEVERITY**

The index access expression can cause an exception in case of use of invalid array index value.

#### Source File

- LoopNetwork.sol

```
908 address[] memory path = new address[](2);
909 path[0] = address(this);
910 path[1] = uniswapV2Router.WETH();
911 _approve(address(this), address(uniswapV2Router), tokenAmount);
912 uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(
913
```



**LINE 910** 

#### **low SEVERITY**

The index access expression can cause an exception in case of use of invalid array index value.

#### Source File

- LoopNetwork.sol

```
909 path[0] = address(this);
910 path[1] = uniswapV2Router.WETH();
911 _approve(address(this), address(uniswapV2Router), tokenAmount);
912 uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(
913 tokenAmount,
914
```



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This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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