



QuillAudits



Audit Report
July, 2021



NETHER

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Scope of Audit

The scope of this audit was to analyze and document the Nether Token smart contract codebase for quality, security, and correctness.

Checked Vulnerabilities

We have scanned the smart contract for commonly known and more specific vulnerabilities. Here are some of the commonly known vulnerabilities that we considered:

- Re-entrancy
- Timestamp Dependence
- Gas Limit and Loops
- DoS with Block Gas Limit
- Transaction-Ordering Dependence
- Use of tx.origin
- Exception disorder
- Gasless send
- Balance equality
- Byte array
- Transfer forwards all gas
- ERC20 API violation
- Malicious libraries
- Compiler version not fixed
- Redundant fallback function
- Send instead of transfer
- Style guide violation
- Unchecked external call
- Unchecked math
- Unsafe type inference
- Implicit visibility level

Techniques and Methods

Throughout the audit of smart contract, care was taken to ensure:

- The overall quality of code.
- Use of best practices.
- Code documentation and comments match logic and expected behaviour.
- Token distribution and calculations are as per the intended behaviour mentioned in the whitepaper.
- Implementation of ERC-20 token standards.
- Efficient use of gas.
- Code is safe from re-entrancy and other vulnerabilities.

The following techniques, methods and tools were used to review all the smart contracts.

Structural Analysis

In this step we have analyzed the design patterns and structure of smart contracts. A thorough check was done to ensure the smart contract is structured in a way that will not result in future problems.

SmartCheck.

Static Analysis

Static Analysis of Smart Contracts was done to identify contract vulnerabilities. In this step a series of automated tools are used to test security of smart contracts.

Code Review / Manual Analysis

Manual Analysis or review of code was done to identify new vulnerability or verify the vulnerabilities found during the static analysis. Contracts were completely manually analyzed, their logic was checked and compared with the one described in the whitepaper. Besides, the results of automated analysis were manually verified.

Gas Consumption

In this step we have checked the behaviour of smart contracts in production. Checks were done to know how much gas gets consumed and possibilities of optimization of code to reduce gas consumption.

Tools and Platforms used for Audit

Remix IDE, Truffle, Truffle Team, Ganache, Solhint, Mythril, Slither, SmartCheck.

Issue Categories

Every issue in this report has been assigned with a severity level. There are four levels of severity and each of them has been explained below.

High severity issues

A high severity issue or vulnerability means that your smart contract can be exploited. Issues on this level are critical to the smart contract's performance or functionality and we recommend these issues to be fixed before moving to a live environment.

Medium level severity issues

The issues marked as medium severity usually arise because of errors and deficiencies in the smart contract code. Issues on this level could potentially bring problems and they should still be fixed.

Low level severity issues

Low level severity issues can cause minor impact and or are just warnings that can remain unfixed for now. It would be better to fix these issues at some point in the future.

Informational

These are severity four issues which indicate an improvement request, a general question, a cosmetic or documentation error, or a request for information. There is low-to-no impact.

Number of issues per severity

Type	High	Medium	Low	Informational
Open	0	0	0	3
Closed	0	0	0	0

Introduction

During the period of **June 29, 2021 to June 30, 2021** - QuillAudits Team performed a security audit for Nether smart contracts.

The code for the audit was taken from following the official link:
<https://bscscan.com/address/0x8182ac1c5512eb67756a89c40fadb2311757bd32#code>

Issues Found – Code Review / Manual Testing

High severity issues

No issues were found.

Medium severity issues

No issues were found.

Low level severity issues

No issues were found.

Informational

1. Wrong comment

Line	Comment
627	// Mint 100 tokens to msg.sender

Description

The above comment is wrong. According to the code, 26000000 tokens are minted for the address `0x7C8137772216B54cc7a4399A76a98E76Ab63b579`.

A misunderstanding comment could influence code readability.

Remediation

We recommend the comment should be corrected, or removed properly.

2. Public function that could be declared external

Description

The following public functions that are never called by the contract should be declared external to save gas:

- `name()`
- `symbol()`
- `totalSupply()`
- `balanceOf()`
- `transfer()`
- `approve()`
- `transferFrom()`
- `allowance()`
- `increaseAllowance()`
- `decreaseAllowance()`

Remediation

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

3. Unlocked pragma and Incorrect versions of Solidity

`^0.6.2`

`^0.6.0`

Description

solc frequently releases new compiler versions. Using an old version prevents access to new Solidity security checks. We also recommend avoiding complex pragma statements or using unlocked pragma.

Remediation

Deploy with any of the following Solidity versions:

0.6.11 - 0.6.12

0.7.5 - 0.7.6

Use a simple pragma version that allows any of these versions. Use one Solidity version for all contracts. Consider using the latest version of Solidity for testing.

Functional test

Function Names	Testing results
name()	Passed
symbol()	Passed
decimals()	Passed
totalSupply()	Passed
balanceOf()	Passed
transfer()	Passed
approve()	Passed
allowance()	Passed
transferFrom()	Passed
increaseAllowance()	Passed
decreaseAllowance()	Passed

Automated Testing

Slither

```
INFO:Detectors:
ERC20.constructor(string,string).name (Nether.sol#370) shadows:
  - ERC20.name() (Nether.sol#379-381) (function)
ERC20.constructor(string,string).symbol (Nether.sol#370) shadows:
  - ERC20.symbol() (Nether.sol#387-389) (function)
Nether.constructor(string,string).name (Nether.sol#626) shadows:
  - ERC20.name() (Nether.sol#379-381) (function)
Nether.constructor(string,string).symbol (Nether.sol#626) shadows:
  - ERC20.symbol() (Nether.sol#387-389) (function)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#local-variable-shadowing
INFO:Detectors:
Address.isContract(address) (Nether.sol#284-293) uses assembly
  - INLINE ASM (Nether.sol#291)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#assembly-usage
INFO:Detectors:
Different versions of Solidity is used:
  - Version used: ['>=0.4.22<0.9.0', '^0.6.0', '^0.6.2']
  - ^0.6.0 (Nether.sol#5)
  - ^0.6.0 (Nether.sol#33)
  - ^0.6.0 (Nether.sol#110)
  - ^0.6.2 (Nether.sol#261)
  - ^0.6.0 (Nether.sol#321)
  - ^0.6.0 (Nether.sol#623)
  - >=0.4.22<0.9.0 (Migrations.sol#2)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#different-pragma-directives-are-used
```

```
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#different-pragma-directives-are-used
```

```
INFO:Detectors:
Address.isContract(address) (Nether.sol#284-293) is never used and should be removed
Address.sendValue(address,uint256) (Nether.sol#311-317) is never used and should be removed
Context._msgData() (Nether.sol#26-29) is never used and should be removed
ERC20._burn(address,uint256) (Nether.sol#563-571) is never used and should be removed
ERC20._setupDecimals(uint8) (Nether.sol#601-603) is never used and should be removed
SafeMath.div(uint256,uint256) (Nether.sol#205-207) is never used and should be removed
SafeMath.div(uint256,uint256,string) (Nether.sol#220-227) is never used and should be removed
SafeMath.mod(uint256,uint256) (Nether.sol#240-242) is never used and should be removed
SafeMath.mod(uint256,uint256,string) (Nether.sol#255-258) is never used and should be removed
SafeMath.mul(uint256,uint256) (Nether.sol#180-192) is never used and should be removed
SafeMath.sub(uint256,uint256) (Nether.sol#151-153) is never used and should be removed
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#dead-code
```

```
INFO:Detectors:
Pragma version^0.6.0 (Nether.sol#5) allows old versions
Pragma version^0.6.0 (Nether.sol#33) allows old versions
Pragma version^0.6.0 (Nether.sol#110) allows old versions
Pragma version^0.6.2 (Nether.sol#261) allows old versions
Pragma version^0.6.0 (Nether.sol#321) allows old versions
Pragma version^0.6.0 (Nether.sol#623) allows old versions
Pragma version>=0.4.22<0.9.0 (Migrations.sol#2) is too complex
solc-0.6.2 is not recommended for deployment
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#incorrect-versions-of-solidity
```

```
INFO:Detectors:
Low level call in Address.sendValue(address,uint256) (Nether.sol#311-317):
  - (success) = recipient.call{value: amount}() (Nether.sol#315)
```

```
- (success) = recipient.call{value: amount}() (Nether.sol#315)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#low-level-calls
INFO:Detectors:
Variable Migrations.last_completed_migration (Migrations.sol#6) is not in mixedCase
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-solidity-naming-conventions
INFO:Detectors:
Redundant expression "this (Nether.sol#27)" inContext (Nether.sol#17-30)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#redundant-statements
INFO:Detectors:
Nether.constructor(string,string) (Nether.sol#626-632) uses literals with too many digits:
- _mint(0x7C8137772216B54cc7a4399A76a98E76Ab63b579,26000000 * 10 ** uint256(decimals())) (Nether.sol#631)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#too-many-digits
INFO:Detectors:
name() should be declared external:
- ERC20.name() (Nether.sol#379-381)
symbol() should be declared external:
- ERC20.symbol() (Nether.sol#387-389)
totalSupply() should be declared external:
- ERC20.totalSupply() (Nether.sol#411-413)
balanceOf(address) should be declared external:
- ERC20.balanceOf(address) (Nether.sol#418-420)
transfer(address,uint256) should be declared external:
- ERC20.transfer(address,uint256) (Nether.sol#430-433)
allowance(address,address) should be declared external:
- ERC20.allowance(address,address) (Nether.sol#438-440)
approve(address,uint256) should be declared external:
- ERC20.approve(address,uint256) (Nether.sol#449-452)
```

```
transferFrom(address,address,uint256) should be declared external:
- ERC20.transferFrom(address,address,uint256) (Nether.sol#466-470)
increaseAllowance(address,uint256) should be declared external:
- ERC20.increaseAllowance(address,uint256) (Nether.sol#484-487)
decreaseAllowance(address,uint256) should be declared external:
- ERC20.decreaseAllowance(address,uint256) (Nether.sol#503-506)
setCompleted(uint256) should be declared external:
- Migrations.setCompleted(uint256) (Migrations.sol#16-18)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#public-function-that-could-be-declared-external
INFO:Slither:. analyzed (7 contracts with 75 detectors), 40 result(s) found
INFO:Slither:Use https://crytic.io/ to get access to additional detectors and Github integration
```

Results

No major issues were found. Some false positive errors were reported by the tool. All the other issues have been categorized above according to their level of severity.

Disclaimer

Quillhash audit is not a security warranty, investment advice, or an endorsement of the Nether platform. This audit does not provide a security or correctness guarantee of the audited smart contracts. The statements made in this document should not be interpreted as investment or legal advice, nor should its authors be held accountable for decisions made based on them. Securing smart contracts is a multistep process. One audit cannot be considered enough. We recommend that the Nether Team put in place a bug bounty program to encourage further analysis of the smart contract by other third parties.

Closing Summary

Overall, smart contracts are very well written and adhere to guidelines.

No instances of Integer Overflow and Underflow vulnerabilities or Back-Door Entry were found in the contract, but relying on other contracts might cause Reentrancy Vulnerability.

Numerous issues of least severity were discovered during the initial audit. It is recommended to kindly go through the above-mentioned details and fix the code accordingly.



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