# CONTRACT WOLF

**Blockchain Security - Smart Contract Audits**

# Security Assessment

January 18, 2022

# Disclaimer

**ContractWolf.io** audits and reports should not be considered as a form of project's "advertisement" and does not cover any interaction and assessment from "project's contract" to "external contracts" such as Pancakeswap or similar.

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**ContractWolf** provides transparent report to all its "clients" and to its "clients participants" and will not claim any guarantee of bug-free code within it's **SMART CONTRACT**.

**ContractWolf** presence is to analyze, audit and assess the client's smart contract's code.

Each company or projects should be liable to its security flaws and functionalities.

# Network

BSC / Binance Smart Chain (BEP20 protocol)

# Website

https://www.arenaswap.com

# Twitter

https://twitter.com/arenaswap

# Telegram

https://t.me/arenaswap

# Other channels

Discord: https://discord.com/invite/dS2a4DznEy

# Description

Arena Token is a utility and yield farming token made to be used on the ArenaSwap platform. Arena aims to merge NFT Gaming, Gambling, and Yield Farming all into one.

# ContractWolf Engagement

18th of January 2022, **ArenaSwap** engaged and agrees to audit their smart contract's code by ContractWolf. The goal of this engagement was to identify if there is a possibility of security flaws in the implementation of the contract or system.

**ContractWolf** will be focusing on contract issues and functionalities along with the projects claims from smart contract to their website, whitepaper and repository which has been provided by **ArenaSwap.**

# Logo



## Contract Link

https://bscscan.com/address/0x2a17dc11a1828725cdb318e0036acf1272
7d27a2

# Risk level classification

Risk Level represents the classification or the probability that a certain function or threat that can exploit vulnerability and have an impact within the system or contract.
Risk Level is computed based on CVSS Version 3.0

| Level | Value | Vulnerability |
|---|---|---|
| Critical | 9 - 10 | An exposure that can affect the contract functions in several events that can risk and disrupt the contract |
| High | 7 - 8.9 | An exposure that can affect the outcome when using the contract that can serve as an opening in manipulating the contract in an unwanted manner |
| Medium | 4 - 6.9 | An opening that could affect the outcome in executing the contract in a specific situation |
| Low | 0.1 - 3.9 | An opening but doesn't have an impact on the functionality of the contract |
| Informational | 0 | An opening that consists of information's but will not risk or affect the contract |

# Auditing Approach

Every line of code along with its functionalities will undergo manual review to check its security issues, quality, and contract scope of inheritance. The manual review will be done by our team that will document any issues that there were discovered.

**Methodology**

The auditing process follows a routine series of steps:

1. Code review that includes the following:

- Review of the specifications, sources, and instructions provided to ContractWolf to make sure we understand the size, scope, and functionality of the smart contract.
- Manual review of code, our team will have a process of reading the code line-by-line with the intention of identifying potential vulnerabilities and security flaws.

2. Testing and automated analysis that includes:

- Testing the smart contract functions with common test cases and scenarios, to ensure that it returns the expected results.

3. Best practices review, the team will review the contract with the aim to improve efficiency, effectiveness, clarifications, maintainability, security, and control within the smart contract.

4. Recommendations to help the project take steps to secure the smart contract.

# Used Code from other Frameworks/Smart Contracts (Direct Imports)

Imported Packages

- BEP20
- IBEP20
- ArenaToken
- Context
- Ownable
- SafeMath

# Description

Optimization enabled: No
Version: v0.6.12

Decimals: 18

Symbol: $ARENA

# Capabilities

## Components

| Version | Contracts | Libraries | Interfaces | Abstract |
|---|---|---|---|---|
| 1.0 | 2 | 1 | 1 | 2 |

## Exposed Functions

| Version | Public | Private |
|---|---|---|
| 1.0 | 16 | 0 |

| Version | External | Internal |
|---|---|---|
| 1.0 | 16 | 26 |

## State Variables

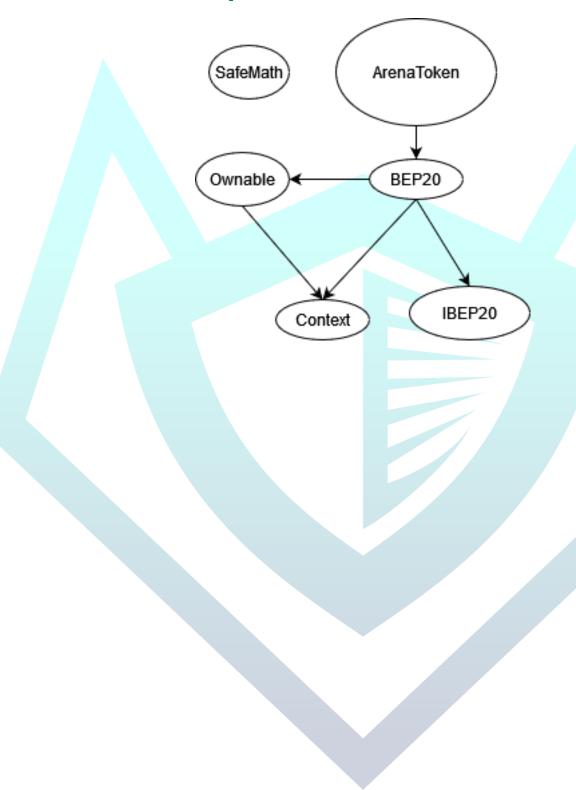| Version | Total | Public |
|---|---|---|
| 1.0 | 13 | 5 |

## Capabilities

| Version | Solidity Versions Observed | Experimental Features | Can Receive Funds | Uses Assembly | Has Destroyable Contracts |
|---------|----------------------------|-----------------------|-------------------|---------------|---------------------------|
| 1.0 | ^0.6.12 | | Yes | Yes (1 asm block) | No |

# Scope of Work

ArenaToken's team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract.
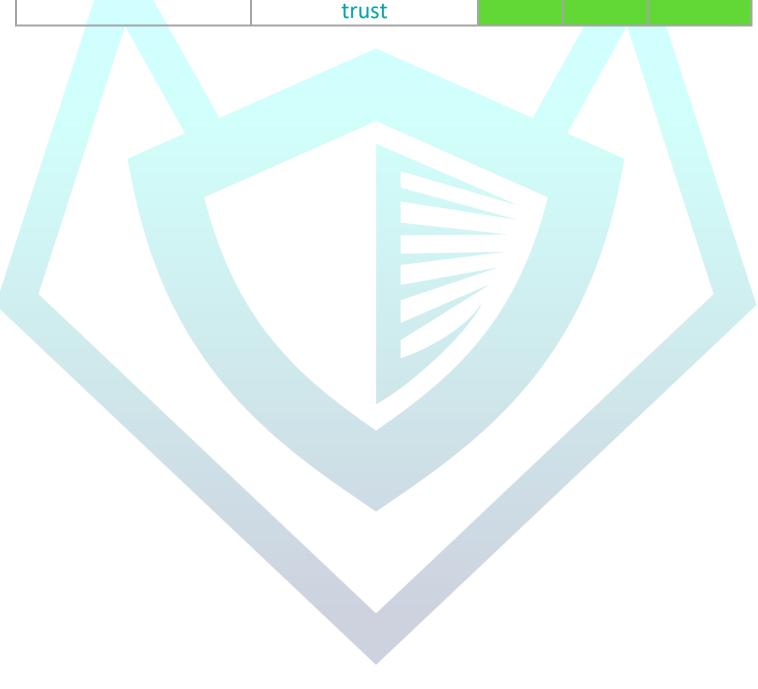
# Inheritance Graph

# Verify Claims

## Correct implementation of Token Standard

| Tested | Verified |
|--------|----------|
| ✓ | ✗ |

| Function | Description | Exist | Tested | Verified |
|----------|-------------|-------|--------|----------|
| TotalSupply | Information about the total coin or token supply | ✓ | ✓ | ✓ |
| BalanceOf | Details on the account balance from a specified address | ✓ | ✓ | ✓ |
| Transfer | An action that transfers a specified amount of coin or token to a specified address | ✓ | ✓ | ✓ |
| TransferFrom | An action that transfers a specified amount of coin or token from a specified address | ✓ | ✓ | ✓ |
| Approve | Provides permission to withdraw specified number of coin or token from a specified address | ✓ | ✓ | ✓ |
| Allowance | Sets a specific number of coin or token that allows a specified address to utilize | ✓ | ✓ | ✓ |

## Optional implementation

| Function | Description | Exist | Tested | Verified |
|----------|-------------|-------|--------|----------|
| renounceOwnership | Owner renounce ownership for more trust | ✓ | ✓ | ✓ |

## Deployer cannot mint any new tokens

| Statement | Exist | Tested | Verified | File |
|---|:---:|:---:|:---:|:---:|
| Deployer cannot mint | ✓ | 🚩 | 🚩 | Main |

Max / Total supply: 1,000,000,000,000,000

# Deployer cannot pause user funds

| Statement | Exist | Tested | Verified |
|---|---|---|---|
| Deployer cannot pause | ✓ | ✓ | ✓ |

# Deployer cannot burn user funds

| Statement | Exist | Tested | Verified |
|---|---|---|---|
| Deployer cannot burn | ✓ | ✓ | ✓ |

# Deployer cannot pause the contract

| Statement | Exist | Tested | Verified |
|---|---|---|---|
| Deployer cannot pause | ✓ | ✓ | ✓ |

# Overall Checkup (Smart Contract Security)

| Tested | Verified |
|:------:|:--------:|
| ✓ | ✓ |

Legend

| Attribute | Symbol |
|:---------:|:------:|
| Verified / Checked | ✓ |
| Partly Verified | ✗ |
| Unverified / Not checked | ⚑ |
| Not Available | — |

# Write Functions of contract

1. approve

2. decreaseAllowance

3. delegate

4. delegateBySig

5. increaseAllowance

6. mint

7. mint

8. renounceOwnership

9. transfer

10. transferFrom

11. transferOwnership

# SWC Attacks

| ID | Title | Relationships | Status |
|---|---|---|---|
| SWC-136 | Unencrypted Private Data On-Chain | CWE-767: Access to Critical Private Variable via Public Method | PASSED |
| SWC-135 | Code With No Effects | CWE-1164: Irrelevant Code | NOT PASSED |
| SWC-134 | Message call with hardcoded gas amount | CWE-655: Improper Initialization | PASSED |
| SWC-133 | Hash Collisions with Multiple Variable Length Arguments | CWE-294: Authentication Bypass by Capture-replay | PASSED |
| SWC-132 | Unexpected Ether balance | CWE-667: Improper Locking | PASSED |
| SWC-131 | Presence of unused variables | CWE-1164: Irrelevant Code | PASSED |
| SWC-130 | Right-To Left Override control character (U+202E) | CWE-451: User Interface (UI) Misrepresentation of Critical Information | PASSED |
| SWC-129 | Typographical Error | CWE-480: Use of Incorrect Operator | PASSED |
| SWC-128 | DoS With Block Gas Limit | CWE-400: Uncontrolled Resource Consumption | PASSED |
| SWC-127 | Arbitrary Jump with Function Type Variable | CWE-695: Use of Low-Level Functionality | PASSED |

| | | | |
|---|---|---|---|
| SWC-125 | Incorrect Inheritance Order | CWE-696: Incorrect Behavior Order | **PASSED** |
| SWC-124 | Write to Arbitrary Storage Location | CWE-123: Write-what-where Condition | **PASSED** |
| SWC-123 | Requirement Violation | CWE-573: Improper Following of Specification by Caller | **PASSED** |
| SWC-122 | Lack of Proper Signature Verification | CWE-345: Insufficient Verification of Data Authenticity | **PASSED** |
| SWC-121 | Missing Protection against Signature Replay Attacks | CWE-347: Improper Verification of Cryptographic Signature | **PASSED** |
| SWC-120 | Weak Sources of Randomness from Chain Attributes | CWE-330: Use of Insufficiently Random Values | **PASSED** |
| SWC-119 | Shadowing State Variables | CWE-710: Improper Adherence to Coding Standards | **PASSED** |
| SWC-118 | Incorrect Constructor Name | CWE-665: Improper Initialization | **PASSED** |
| SWC-117 | Signature Malleability | CWE-347: Improper Verification of Cryptographic Signature | **PASSED** |
| SWC-116 | Timestamp Dependence | CWE-829: Inclusion of | **PASSED** |

| | | | |
|---|---|---|---|
| | | Functionality from Untrusted Control Sphere | PASSED |
| SWC-115 | Authorization through tx.origin | CWE-477: Use of Obsolete Function | PASSED |
| SWC-114 | Transaction Order Dependence | CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition') | PASSED |
| SWC-113 | DoS with Failed Call | CWE-703: Improper Check or Handling of Exceptional Conditions | PASSED |
| SWC-112 | Delegate call to Untrusted Callee | CWE-829: Inclusion of Functionality from Untrusted Control Sphere | PASSED |
| SWC-111 | Use of Deprecated Solidity Functions | CWE-477: Use of Obsolete Function | PASSED |
| SWC-110 | Assert Violation | CWE-670: Always-Incorrect Control Flow Implementation | PASSED |
| SWC-109 | Uninitialized Storage Pointer | CWE-824: Access of Uninitialized Pointer | NOT PASSED |
| SWC-108 | State Variable Default Visibility | CWE-710: Improper Adherence to Coding Standards | PASSED |

| | | | |
|---|---|---|---|
| SWC-107 | Reentrancy | CWE-841: Improper Enforcement of Behavioral Workflow | PASSED |
| SWC-106 | Unprotected SELFDESTRUCT Instruction | CWE-284: Improper Access Control | PASSED |
| SWC-105 | Unprotected Ether Withdrawal | CWE-284: Improper Access Control | PASSED |
| SWC-104 | Unchecked Call Return Value | CWE-252: Unchecked Return Value | PASSED |
| SWC-103 | Floating Pragma | CWE-664: Improper Control of a Resource Through its Lifetime | PASSED |
| SWC-102 | Outdated Compiler Version | CWE-937: Using Components with Known Vulnerabilities | NOT PASSED |
| SWC-101 | Integer Overflow and Underflow | CWE-682: Incorrect Calculation | PASSED |
| SWC-100 | Function Default Visibility | CWE-710: Improper Adherence to Coding Standards | PASSED |

# AUDIT PASSED

**Critical Issues**

No critical issues found

**High Issues**

No high issues found

**Medium Issues**

No medium issues found

**Low Issues**

No low issues found

**Informational Issues**

No informational issues found

**Function Issues**

No informational issues found

# Audit Comments

## January 17, 2022

- Owner can mint
- Indefinite quantity of supply