



verichains

*SECURITY AUDIT OF*  
**HEROESTD SMART CONTRACT**



**Public Report**

*Oct 28, 2021*

**Verichains Lab**

[info@verichains.io](mailto:info@verichains.io)

<https://www.verichains.io>

*Driving Technology > Forward*

## ABBREVIATIONS

Name	Description
<b>Ethereum</b>	An open source platform based on blockchain technology to create and distribute smart contracts and decentralized applications.
<b>Ether (ETH)</b>	A cryptocurrency whose blockchain is generated by the Ethereum platform. Ether is used for payment of transactions and computing services in the Ethereum network.
<b>Smart contract</b>	A computer protocol intended to digitally facilitate, verify or enforce the negotiation or performance of a contract.
<b>Solidity</b>	A contract-oriented, high-level language for implementing smart contracts for the Ethereum platform.
<b>Solc</b>	A compiler for Solidity.
<b>ERC20</b>	ERC20 (BEP20 in Binance Smart Chain or xRP20 in other chains) tokens are blockchain-based assets that have value and can be sent and received. The primary difference with the primary coin is that instead of running on their own blockchain, ERC20 tokens are issued on a network that supports smart contracts such as Ethereum or Binance Smart Chain.



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## **EXECUTIVE SUMMARY**

This Security Audit Report prepared by Verichains Lab on Oct 28, 2021. We would like to thank the Heroes TD for trusting Verichains Lab in auditing smart contracts. Delivering high-quality audits is always our top priority.

This audit focused on identifying security flaws in code and the design of the HeroesTD Smart Contract. The scope of the audit is limited to the source code files provided to Verichains. Verichains Lab completed the assessment using manual, static, and dynamic analysis techniques.

During the audit process, the audit team had identified no vulnerable issues in the smart contracts code.



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# 1. MANAGEMENT SUMMARY

## 1.1. About HeroesTD Smart Contract

Heroes TD is a collectible tower defense strategy game, with a brand new play style. You can collect and build your deck to win. You can both enjoy the game and earn money from it as well. In Heroes TD, players can join a community to play with each other. Players can also create new unique NFT content and trade them with other players to get real money, and most importantly, have a lot of fun!

HeroesTD is an ERC20 token that Heroes TD players can use to buy heroes, upgrade them and earn rewards.

## 1.2. Audit scope

This audit focused on identifying security flaws in code and the design of the smart contracts of HeroesTD.

The audit source code is on <https://github.com/heroestd/heroestd-token>, commit process started on commit [78198be3c969a62318cf2ac0d3d1a56af7d5a740](#).

## 1.3. Audit methodology

Our security audit process for smart contract includes two steps:

- Smart contract codes are scanned/tested for commonly known and more specific vulnerabilities using public and RK87, our in-house smart contract security analysis tool.
- Manual audit of the codes for security issues. The contracts are manually analyzed to look for any potential problems.

Following is the list of commonly known vulnerabilities that was considered during the audit of the smart contract:

- Integer Overflow and Underflow
- Timestamp Dependence
- Race Conditions
- Transaction-Ordering Dependence
- DoS with (Unexpected) revert
- DoS with Block Gas Limit
- Gas Usage, Gas Limit and Loops
- Redundant fallback function
- Unsafe type Inference
- Reentrancy

- Explicit visibility of functions state variables (external, internal, private and public)
- Logic Flaws

For vulnerabilities, we categorize the findings into categories as listed in table below, depending on their severity level:

SEVERITY LEVEL	DESCRIPTION
<b>CRITICAL</b>	A vulnerability that can disrupt the contract functioning; creates a critical risk to the contract; required to be fixed immediately.
<b>HIGH</b>	A vulnerability that could affect the desired outcome of executing the contract with high impact; needs to be fixed with high priority.
<b>MEDIUM</b>	A vulnerability that could affect the desired outcome of executing the contract with medium impact in a specific scenario; needs to be fixed.
<b>LOW</b>	An issue that does not have a significant impact, can be considered as less important.

*Table 1. Severity levels*

#### 1.4. Disclaimer

Please note that security auditing cannot uncover all existing vulnerabilities, and even an audit in which no vulnerabilities are found is not a guarantee for a 100% secure smart contract. However, auditing allows discovering vulnerabilities that were unobserved, overlooked during development and areas where additional security measures are necessary.

## 2. AUDIT RESULT

### 2.1. Overview

The initial review was conducted on Oct 26, 2021 and a total effort of 3 working days was dedicated to identifying and documenting security issues in the code base of the HeroesTD Smart Contract.

Table 2 lists some properties of the audited HeroesTD Smart Contract (as of the report writing time).

PROPERTY	VALUE
<b>Name</b>	HeroesTD
<b>Symbol</b>	HTD
<b>Decimals</b>	18
<b>Total Supply</b>	468,000,000 ( $\times 10^{18}$ ) Note: the number of decimals is 18, so the total representation token will be 468,000,000 or 468 million.

*Table 2. The HeroesTD Smart Contract properties*

### 2.2. Contract codes

The HeroesTD Smart Contract was written in [Solidity](#) language, with the required version to be [0.8.2](#).

### 2.3. Findings

During the audit process, the audit team found no vulnerability in the given version of HeroesTD Smart Contract.

## APPENDIX

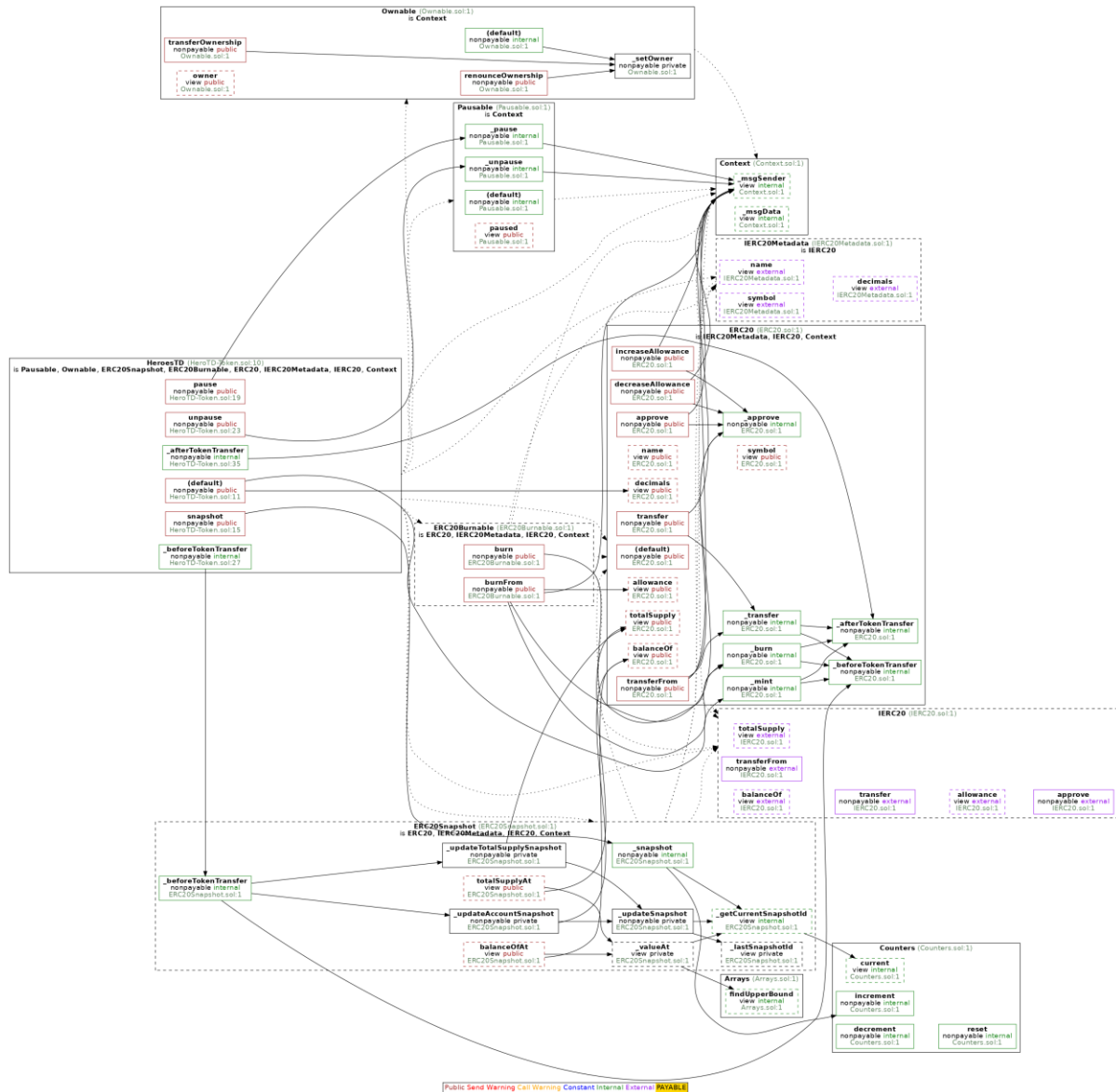


Image 1. HeroesTD Smart Contract call graph



## Report for Heroes TD

### Security Audit – HeroesTD Smart Contract

Version: 1.0 - Public Report

Date: Oct 28, 2021



## 3. VERSION HISTORY

Version	Date	Status/Change	Created by
<b>1.0</b>	<i>Oct 28, 2021</i>	Public Report	Verichains Lab

*Table 3. Report versions history*