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Blockchain Security | Smart Contract Audits | KYC

MADE IN GERMANY

Hero Infinity

Audit

**Security Assessment
23. March, 2022**

For



Disclaimer	3
Description	5
Project Engagement	5
Logo	5
Contract Link	5
Methodology	7
Used Code from other Frameworks/Smart Contracts (direct imports)	8
Tested Contract Files	9
Source Lines	10
Risk Level	10
Capabilities	11
Inheritance Graph	12
CallGraph	13
Scope of Work/Verify Claims	14
Modifiers and public functions	20
Source Units in Scope	22
Critical issues	23
High issues	23
Medium issues	23
Low issues	23
Informational issues	23
Audit Comments	24
SWC Attacks	25

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Version	Date	Description
1.0	14. March 2022	<ul style="list-style-type: none">• Layout project• Automated- /Manual-Security Testing• Summary
1.1	23. March 2022	Mainnet address added

Network

Ethereum (ERC20)

Website

<https://www.heroinfinity.io/>

Telegram

<https://t.me/HeroInfinityETH>

Twitter

<https://twitter.com/HeroInfinityETH>

Instagram

<https://www.instagram.com/heroinfinityeth/>

Youtube

<https://www.youtube.com/channel/UCghg52EUOFqnw-AUhffOqGw>

Description

Hero Infinity was designed with the upcoming NFT trend in mind. It's an immersive massively multiplayer video game, based on NFT-characters, one of the first. Players curate their own hero and equip them with NFTs that they purchase or find in the game. Hero Infinity features dynamic battlegrounds for players to duke it out or explore

Project Engagement

During the 11th of March 2022, **HeroInfinity Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

Logo



Contract Link

v1.1

- Mainnet
 - [https://etherscan.io/address/
0x0c4ba8e27e337c5e8eac912d836aa8ed09e80e78#code](https://etherscan.io/address/0x0c4ba8e27e337c5e8eac912d836aa8ed09e80e78#code)

Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
Critical	9 - 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
High	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon as possible.
Medium	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
Low	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
Informational	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as they were discovered.

Methodology

The auditing process follows a routine series of steps:

1. Code review that includes the following:
 - i) Review of the specifications, sources, and instructions provided to SolidProof to make sure we understand the size, scope, and functionality of the smart contract.
 - ii) Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
 - iii) Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to SolidProof describe.
2. Testing and automated analysis that includes the following:
 - i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
 - ii) Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

Used Code from other Frameworks/Smart Contracts (direct imports)

Imported packages:

Dependency / Import Path	Count
@openzeppelin/contracts/access/Ownable.sol	1
@openzeppelin/contracts/token/ERC20/ERC20.sol	1
@openzeppelin/contracts/utils/math/SafeMath.sol	1

Tested Contract Files

This audit covered the following files listed below with a SHA-1 Hash.

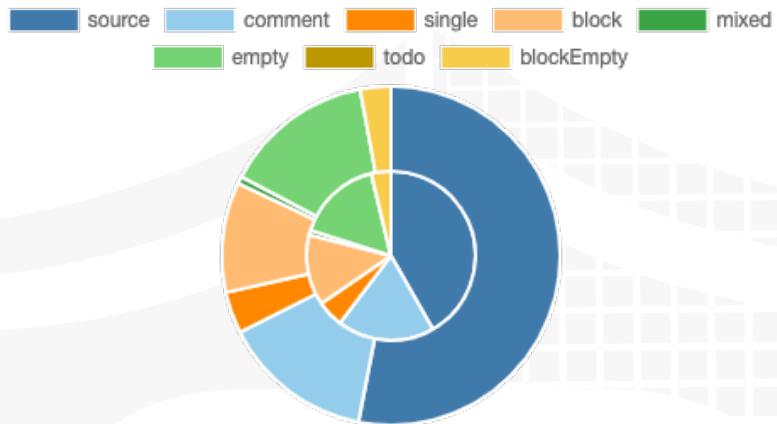
A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

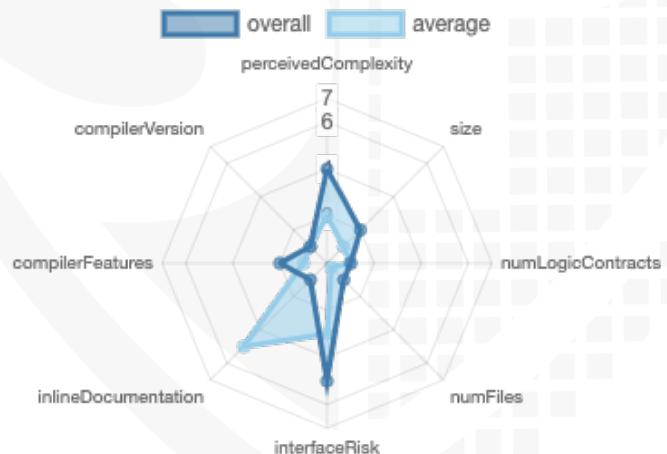
File Name	SHA-1 Hash
contracts/interfaces/IUniswapV2Pair.sol	a8edb2ecc30a7a505848582fb268b73efc23c816
contracts/interfaces/IUniswapV2Factory.sol	99f5e6bf4c5540500ecfc92fbb1835601bfbe9e2
contracts/interfaces/IUniswapV2Router02.sol	ab67aa06304addfff373efa66b5102f28ad77a46
contracts/HRI.sol	70ee2d7ca8e249fe2174b7d306cad37f938b0f8b

Metrics

Source Lines v1.0



Risk Level v1.0



Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	1	0	4	0

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.

Version	Public	Payable
1.0	77	5

Version	External	Internal	Private	Pure	View
1.0	73	49	4	10	20

State Variables

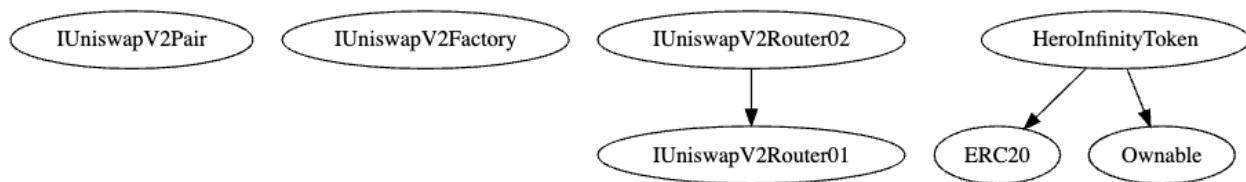
Version	Total	Public
1.0	33	28

Capabilities

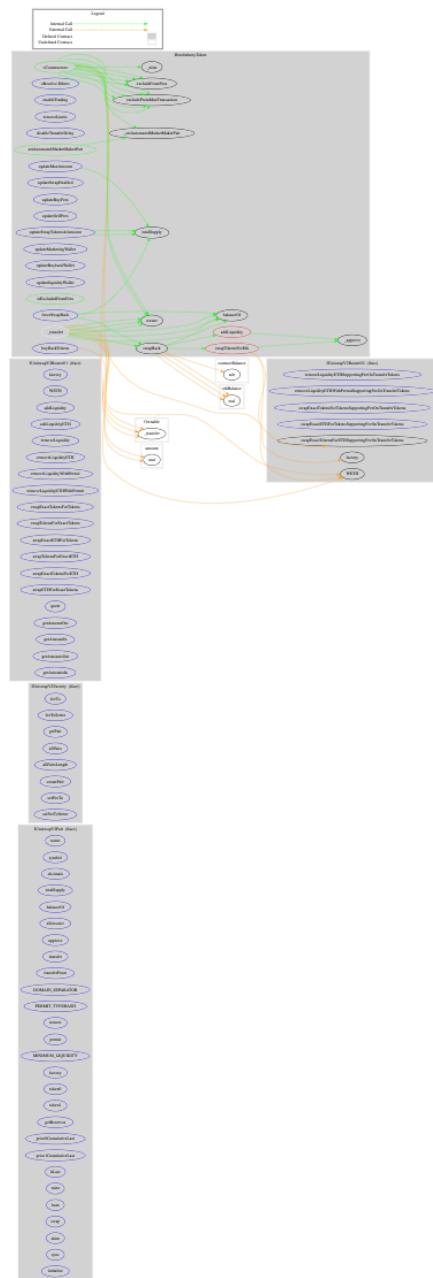
Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	0 . 8 . 9		yes		

Inheritance Graph

v1.0



CallGraph v1.0



Scope of Work/Verify Claims

The above token 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 (usual the same name as team appended with .sol).

We will verify the following claims:

1. Correct implementation of Token standard
2. Deployer cannot mint any new tokens
3. Deployer cannot burn or lock user funds
4. Deployer cannot pause the contract
5. Overall checkup (Smart Contract Security)

Correct implementation of Token standard

Function	Description	Exist	Tested	Verified
TotalSupply	provides information about the total token supply	✓	✓	✓
BalanceOf	provides account balance of the owner's account	✓	✓	✓
Transfer	executes transfers of a specified number of tokens to a specified address	✓	✓	✓
TransferFrom	executes transfers of a specified number of tokens from a specified address	✓	✓	✓
Approve	allow a spender to withdraw a set number of tokens from a specified account	✓	✓	✓
Allowance	returns a set number of tokens from a spender to the owner	✓	✓	✓

Write functions of contract

v1.0

1. approve
2. buyBackTokens
3. decreaseAllowance
4. disableTransferDelay
5. enableTrading
6. excludeFromFees
7. excludeFromMaxTransaction
8. forceSwapBack
9. increaseAllowance
10. removeLimits
11. renounceOwnership
12. setAutomatedMarketMakerPair
13. transfer
14. transferFrom
15. transferOwnership
16. updateBuyFees
17. updateBuybackWallet
18. updateMarketingWallet
19. updateMaxAmount
20. updateSellFees
21. updateSwapEnabled
22. updateSwapTokensAtAmount
23. updateLiquidityWallet

Deployer cannot mint any new tokens

Name	Exist	Tested	Status
Deployer cannot mint	✓	✓	✓
Max / Total Supply	1.000.000.000		

Deployer cannot burn or lock user funds

Name	Exist	Tested	Status
Deployer cannot lock	✓	✓	✓
Deployer cannot burn	✓	✓	✓

Deployer cannot pause the contract

Name	Exist	Tested	Status
Deployer cannot pause	-	-	-

Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

Attribute	Symbol
Verified / Checked	✓
Partly Verified	🚩
Unverified / Not checked	✗
Not available	-

Modifiers and public functions

v1.0

enableTrading	onlyOwner
removeLimits	onlyOwner
disableTransferDelay	onlyOwner
updateSwapTokensAtAmount	onlyOwner
updateMaxAmount	onlyOwner
excludeFromMaxTransaction	onlyOwner
updateSwapEnabled	onlyOwner
updateBuyFees	onlyOwner
updateSellFees	onlyOwner
excludeFromFees	onlyOwner
setAutomatedMarketMakerPair	onlyOwner
updateMarketingWallet	onlyOwner
updateBuybackWallet	onlyOwner
updateLiquidityWallet	onlyOwner
forceSwapBack	onlyOwner
buyBackTokens	onlyOwner

Information: not listed functions are from libraries (openzeppelin) which are imported directly

Comments

- OnlyOwner can set following state variables without any limitations
 - buyMarketingFee
 - buyLiquidityFee
 - buyBuyBackFee
 - buyDevFee
 - buyTotalFees
 - sellMarketingFee

- sellLiquidityFee
 - sellBuyBackFee
 - sellDevFee
 - sellTotalFees
-
- OnlyOwner can enable/disable following state variables
 - _isExcludedMaxTransactionAmount
 - swapEnabled
 - _isExcludedFromFees
 - automatedMarketMakerPairs
-
- OnlyOwner can set following addresses
 - marketingWallet
 - buybackWallet
 - liquidityWallet
-
- OnlyOwner can
 - set following state variable only once
 - tradingActive
 - limitsInEffect
 - gasLimitActive
 - transferDelayEnabled

Please check if an OnlyOwner or similar restrictive modifier has been forgotten.

Source Units in Scope

v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
🔍	contracts/interfaces/IUniswapV2Pair.sol	_____	1	53	8	5	1	55	_____
🔍	contracts/interfaces/IUniswapV2Factory.sol	_____	1	18	7	4	1	17	_____
🔍	contracts/interfaces/IUniswapV2Router02.sol	_____	2	137	6	4	1	64	💰
📝	contracts/HRI.sol	1	_____	463	459	265	121	250	💰
🔍	Totals	1	4	671	480	278	124	386	💰

Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
nSLOC	normalized source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

Audit Results

AUDIT PASSED

Critical issues

No critical issues

High issues

No high issues

Medium issues

No medium issues

Low issues

Issue	File	Type	Line	Description
#1	HRI	Missing Events Arithmetic	196-200, 183, 204-208, 177	Emit an event for critical parameter changes
#2	HRI	Missing Zero Address Validation	233, 228, 238	Check that the address is not zero
#3	HRI	Low level calls	423, 425, 434	Check the call success with a require statement

Informational issues

Issue	File	Type	Line	Description
#1	HRI	State variables that could be declared constant	33	Add the `constant` attributes to state variables that never change

Audit Comments

14. March 2022:

- Read whole report for more information

23. March 2022:

- Mainnet added
- Read whole report for more information

SWC Attacks

ID	Title	Relationships	Status
SW C-1 36	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SW C-1 35	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SW C-1 34	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SW C-1 33	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SW C-1 32	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SW C-1 31	Presence of unused variables	CWE-1164: Irrelevant Code	PASSED
SW C-1 30	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SW C-1 29	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SW C-1 28	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

<u>SW C-1 27</u>	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
<u>SW C-1 25</u>	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
<u>SW C-1 24</u>	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
<u>SW C-1 23</u>	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
<u>SW C-1 22</u>	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
<u>SW C-1 21</u>	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
<u>SW C-1 20</u>	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	PASSED
<u>SW C-11 9</u>	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	PASSED
<u>SW C-11 8</u>	Incorrect Constructor Name	CWE-665: Improper Initialization	PASSED
<u>SW C-11 7</u>	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	PASSED

<u>SW C-11 6</u>	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
<u>SW C-11 5</u>	Authorization through tx.origin	CWE-477: Use of Obsolete Function	PASSED
<u>SW C-11 4</u>	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	PASSED
<u>SW C-11 3</u>	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	PASSED
<u>SW C-11 2</u>	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
<u>SW C-11 1</u>	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	PASSED
<u>SW C-11 0</u>	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	PASSED
<u>SW C-1 09</u>	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
<u>SW C-1 08</u>	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED
<u>SW C-1 07</u>	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	PASSED
<u>SW C-1 06</u>	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	PASSED

<u>SW C-1 05</u>	Unprotected Ether Withdrawal	<u>CWE-284: Improper Access Control</u>	PASSED
<u>SW C-1 04</u>	Unchecked Call Return Value	<u>CWE-252: Unchecked Return Value</u>	PASSED
<u>SW C-1 03</u>	Floating Pragma	<u>CWE-664: Improper Control of a Resource Through its Lifetime</u>	PASSED
<u>SW C-1 02</u>	Outdated Compiler Version	<u>CWE-937: Using Components with Known Vulnerabilities</u>	PASSED
<u>SW C-1 01</u>	Integer Overflow and Underflow	<u>CWE-682: Incorrect Calculation</u>	PASSED
<u>SW C-1 00</u>	Function Default Visibility	<u>CWE-710: Improper Adherence to Coding Standards</u>	PASSED

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