



# Full Audit Report

## Beastereum Security Assessment

Real Cybersecurity  
Protecting digital assets



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FULL AUDIT REPORT

<b>Table of Contents</b>	<b>1</b>
▪ Report Information	2
▪ Disclaimer	3
▪ Executive Summary	4
NVD CVSS Scoring	
Audit Result	
▪ Project Introduction	5
Scope Information	
Audit Information	
Audit Version History	
▪ Initial Audit Scope	6-7
▪ Security Assessment Procedure	8
▪ Risk Rating	9
▪ Vulnerability Severity Summary	10
▪ Vulnerability Findings	11-16
SWC & SEC & Non-severity level	
▪ SWC Findings	17-19
▪ Visibility, Mutability, Modifier function testing	20-23
Component, Exposed Function	
StateVariables, Capabilities, Contract Descripton Table	
▪ Inheritate Function Relation Graph	24
▪ UML Diagram	25
▪ About Securi	26



## FULL AUDIT REPORT

### Report Information

About Report	Beastereum Security Assessment
Version	v1.2
Client	Beastereum (Previously Cagedbeasts)
Language	Solidity
Confidentiality	Public
Contract File	<p>Cagedbeasts.sol</p> <p>SHA1 - 56d305e8e5acee1383ea2139e5aafcb986f075e5</p> <p><b>This audit uses the file as the client submitted. Please check with a differential checker after the smart contract code has been deployed and verified.</b></p> <p><b>SECURI LAB assumes no responsibility if the user interacts with a smart contract that SECURI LAB does not specify in the report.</b></p>
Audit Method	Whitebox 
Security Assessment Author	<p>Auditor</p> <p>Mark K. [Security Researcher   Redteam] Kevin N. [Security Researcher   Web3 Dev] Yusheng T. [Security Researcher   Incident Response]</p> <p>Approve Document</p> <p>Ronny C. CTO &amp; Head of Security Researcher Chinnakit J. CEO &amp; Founder</p>

#### \*Audit Method

**Whitebox:** SECURI LAB Team receives all source code from the client to provide the assessment.  
**Blackbox:** SECURI LAB Team receives only bytecode from the client to provide the assessment.

Digital Sign (Only Full Audit Report)

## FULL AUDIT REPORT

### Disclaimer

Regarding this security assessment, there are no guarantees about the security of the program instruction received from the client is hereinafter referred to as **"Source code"**.

And **SECURI Lab** hereinafter referred to as **"Service Provider"**, the **Service Provider** will not be held liable for any legal liability arising from errors in the security assessment. The responsibility will be the responsibility of the **Client**, hereinafter referred to as **"Service User"** and the **Service User** agrees not to be held liable to the **service provider** in any case. By contract **Service Provider** to conduct security assessments with integrity with professional ethics, and transparency to deliver security assessments to users The **Service Provider** has the right to postpone the delivery of the security assessment. If the security assessment is delayed whether caused by any reason and is not responsible for any delayed security assessments.

If the **service provider** finds a vulnerability The **service provider** will notify the **service user** via the Preliminary Report, which will be kept confidential for security. The **service provider** disclaims responsibility in the event of any attacks occurring whether before conducting a security assessment. Or happened later All responsibility shall be sole with the **service user**.

**Security Assessment Not Financial/Investment Advice Any loss arising from any investment in any project is the responsibility of the investor.**

**SECURI LAB disclaims any liability incurred. Whether it's Rugpull, Abandonment, Soft Rugpull**

The SECURI LAB team has conducted a comprehensive security assessment of the vulnerabilities. This assessment is tested with an expert assessment. Using the following test requirements

1. Smart Contract Testing with Expert Analysis By testing the most common and uncommon vulnerabilities.
2. Automated program testing It includes a sample vulnerability test and a sample of the potential vulnerabilities being used for the most frequent attacks.
3. Manual Testing with AST/WAS/ASE/SMT and reviewed code line by line
4. Visibility, Mutability, Modifier function testing, such as whether a function can be seen in general, or whether a function can be changed and if so, who can change it.
5. Function association test It will be displayed through the association graph.
6. This safety assessment is cross-checked prior to the delivery of the assessment results.

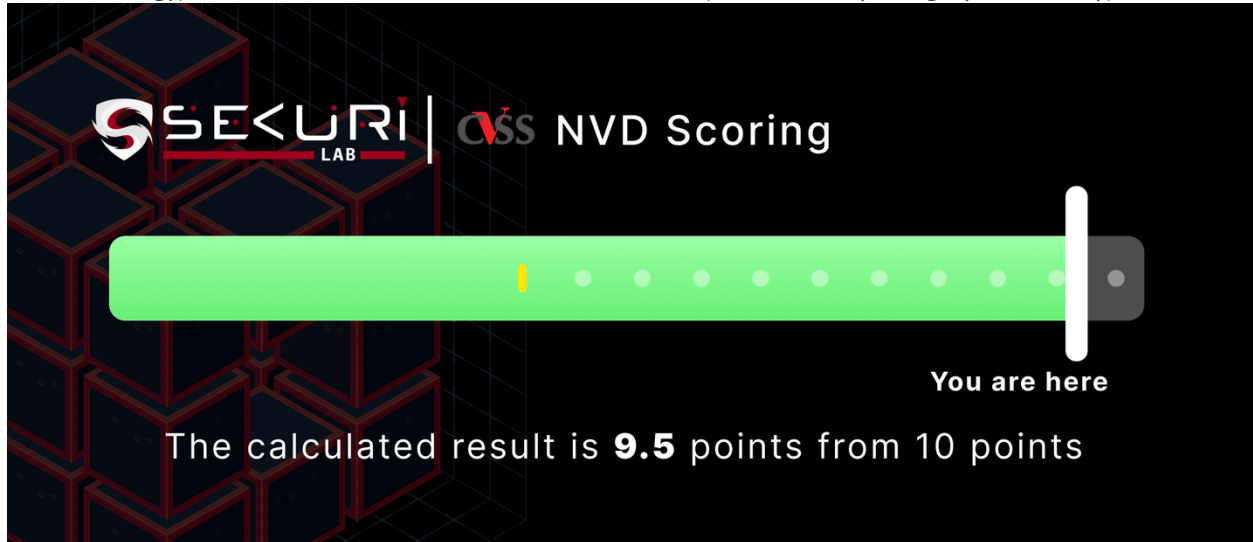
## FULL AUDIT REPORT

### Executive Summary

For this security assessment, SECURI LAB received a request from **CagedBeasts** on Thursday, JUNE 01, 2023.

### NVD CVSS Scoring

The score was calculated using the NVD (National Vulnerability Database) of NIST (National Institute of Standards and Technology) under the CVSS 3.1 standard, based on the CIA (Confidentiality, Integrity, Availability).



### Audit Result

SECURI LAB evaluated the smart contract security of the project and found: **[Total : 0]**

Critical	High	Medium	Low	Very Low	Informational
0	0	0	0	0	0

SECURI LAB has assessed the security of this smart contract.

The results of the security assessment revealed

**No Vulnerabilities.**

Full Audit Report by SECURI LAB on July 26, 2023

## FULL AUDIT REPORT

### Project Introduction

#### Scope Information:

Project Name	Beastereum
Website	<a href="https://www.beastereum.com">https://www.beastereum.com</a>
Chain	-
Language	Solidity

#### Audit Information:

Request Date	Thursday, June 01, 2023
Audit Date	Saturday, June 03, 2023
Re-assessment Date	-

#### Audit Version History:

Version	Date	Description
1.0	Sunday, June 4, 2023	Preliminary Report
1.1	Tuesday, June 6, 2023	Full Audit Report
1.2	Wednesday, July 26, 2023	Full Audit Report with project name changed information

## FULL AUDIT REPORT

### Initial Audit Scope:

Smart Contract File	Cagedbeasts.sol
	SHA1- 56d305e8e5acee1383ea2139e5aafcb986f075e5
Compiler Version	v0.8.18

Source Units Analyzed: 1

Source Units in Scope: 1 (100%)

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/Cagedbeasts.sol	1		197	181	120	26	83	Σ
	Totals	1		197	181	120	26	83	Σ



Legend: [ ]

- **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, ...)

### Dependencies / External Imports

Dependency / Import Path	Count
@openzeppelin/contracts/access/Ownable.sol	1
@openzeppelin/contracts/token/ERC20/extensions/IERC20Metadata.sol	1
@openzeppelin/contracts/token/ERC20/utils/SafeERC20.sol	1

## FULL AUDIT REPORT

### Security Assessment Procedure

Securi has the following procedures and regulations for conducting security assessments:

**1.Request Audit** Client submits a form request through the Securi channel. After receiving the request, Securi will discuss a security assessment. And drafting a contract and agreeing to sign a contract together with the Client

**2.Auditing** Securi performs security assessments of smart contracts obtained through automated analysis and expert manual audits.

**3.Preliminary Report** At this stage, Securi will deliver an initial security assessment. To report on vulnerabilities and errors found under Audit Scope will not publish preliminary reports for safety.

**4.Reassessment** After Securi has delivered the Preliminary Report to the Client, Securi will track the status of the vulnerability or error, which will be published to the Final Report at a later date with the following statuses:

**a.Acknowledge** The client has been informed about errors or vulnerabilities from the security assessment.

**b.Resolved** The client has resolved the error or vulnerability. Resolved is probably just a commit, and Securi is unable to verify that the resolved has been implemented or not.

**c.Decline** Client has rejected the results of the security assessment on the issue.

**5.Final Report** Securi providing full security assessment report and public





## FULL AUDIT REPORT

### Risk Rating

Risk rating using this commonly defined:  $Risk\ rating = impact * confidence$

**Impact** The severity and potential impact of an attacker attack

**Confidence** Ensuring that attackers expose and use this vulnerability

Both have a total of 3 levels: **High, Medium, Low**. By *Informational* will not be classified as a level

Confidence Impact [Likelihood]	Low	Medium	High
Low	Very Low	Low	Medium
Medium	Low	Medium	High
High	Medium	High	Critical



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### Vulnerability Severity Summary

**Severity** is a risk assessment It is calculated from the Impact and Confidence values using the following calculation methods,

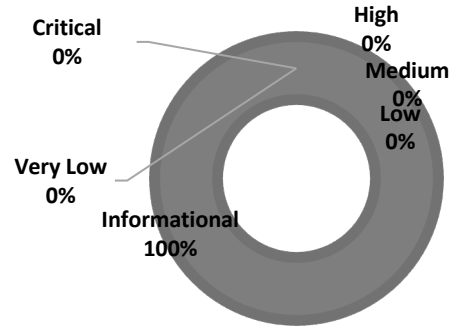
$$\text{Risk rating} = \text{impact} * \text{confidence}$$

It is categorized into

**5 categories based on the lowest severity:**

Very Low, Low, Medium, High, Critical.

For **Informational** & will **Non-class/Optimization/Best-practices** will not be counted as severity



Vulnerability Severity Level	Total
<b>Critical</b>	0
<b>High</b>	0
<b>Medium</b>	0
<b>Low</b>	0
<b>Very Low</b>	0
<b>Informational</b>	0
<b>Non-class/Optimization/Best-practices</b>	1

#### Category information:

<b>Centralization</b> <b>Centralization Risk</b> is The risk incurred by a sole proprietor, such as the Owner being able to change something without permission	<b>Economics Risk</b> <b>Economics Risk</b> is Risks that may affect the economic mechanism system, such as the ability to increase Mint token	<b>Logical Issue</b> <b>Logical Issue</b> is that can cause errors to core processing, such as any prior operations that cause background processes to crash.	<b>Authorization</b> <b>Authorization</b> is Possible pitfalls from weak coding allows unrelated people to take any action to modify the values.	<b>Mathematical</b> <b>Mathematical</b> Any erroneous arithmetic operations affect the operation of the system or lead to erroneous values.	<b>Naming Conventions</b> <b>Naming Conventions</b> naming variables that may affect code understanding or naming inconsistencies
<b>Security Risk</b> <b>Security Risk</b> of loss or damage if it's no mitigate	<b>Coding Style</b> <b>Coding Style</b> is Tips coding for efficiency performance	<b>Best Practices</b> <b>Best Practices</b> is suggestions for improvement	<b>Optimization</b> <b>Optimization</b> is performance improvement	<b>Gas Optimization</b> <b>Gas Optimization</b> is increase performance to avoid expensive gas	<b>Dead Code</b> <b>Dead Code</b> having unused code This may result in wasted resources and gas fees.

## FULL AUDIT REPORT

### Vulnerability Findings

ID	Vulnerability Detail	Severity	Category	Status
GAS-01	Use Custom Errors	-	Gas Optimization	Acknowledge



## FULL AUDIT REPORT

**GAS-01: Use Custom Errors**

Vulnerability Detail	Severity	Location	Category	Status
Use Custom Errors	-	Check on finding	Gas Optimization	Acknowledge

**Finding:**

```
113:         require(currentAllowance >= subtractedValue, "ERC20:allowance<0");
126:         require(from != address(0), "ERC20:From 0");
127:         require(to != address(0), "ERC20:To 0");
130:         require(fromBalance >= amount, "ERC20:amount>balance");
141:         require(account != address(0), "ERC20:address(0)");
152:         require(account != address(0), "ERC20:address(0)");
156:         require(accountBalance >= amount, "ERC20:amount>balance");
172:         require(owner != address(0), "ERC20:FromAddress(0)");
173:         require(spender != address(0), "ERC20:ToAddress(0)");
186:         require(currentAllowance >= amount, "ERC20: insufficient allowance");
```

**Recommendation:**

[Source](<https://blog.soliditylang.org/2021/04/21/custom-errors/>)

Instead of using error strings, to reduce deployment and runtime cost, you should use Custom Errors. This would save both deployment and runtime cost.

**Alleviation:**

Beastereum Team has acknowledge this issue.

## FULL AUDIT REPORT

### SWC Findings

ID	Title	Scanning	Result
SWC-100	Function Default Visibility	Complete	No risk
SWC-101	Integer Overflow and Underflow	Complete	No risk
SWC-102	Outdated Compiler Version	Complete	No risk
SWC-103	Floating Pragma	Complete	No risk
SWC-104	Unchecked Call Return Value	Complete	No risk
SWC-105	Unprotected Ether Withdrawal	Complete	No risk
SWC-106	Unprotected SELFDESTRUCT Instruction	Complete	No risk
SWC-107	Reentrancy	Complete	No risk
SWC-108	State Variable Default Visibility	Complete	No risk
SWC-109	Uninitialized Storage Pointer	Complete	No risk
SWC-110	Assert Violation	Complete	No risk
SWC-111	Use of Deprecated Solidity Functions	Complete	No risk
SWC-112	Delegatecall to Untrusted Callee	Complete	No risk
SWC-113	DoS with Failed Call	Complete	No risk
SWC-114	Transaction Order Dependence	Complete	No risk
SWC-115	Authorization through tx.origin	Complete	No risk

**FULL AUDIT REPORT**

SWC-116	Block values as a proxy for time	Complete	No risk
SWC-117	Signature Malleability	Complete	No risk
SWC-118	Incorrect Constructor Name	Complete	No risk
SWC-119	Shadowing State Variables	Complete	No risk
SWC-120	Weak Sources of Randomness from Chain Attributes	Complete	No risk
SWC-121	Missing Protection against Signature Replay Attacks	Complete	No risk
SWC-122	Lack of Proper Signature Verification	Complete	No risk
SWC-123	Requirement Violation	Complete	No risk
SWC-124	Write to Arbitrary Storage Location	Complete	No risk
SWC-125	Incorrect Inheritance Order	Complete	No risk
SWC-126	Insufficient Gas Griefing	Complete	No risk
SWC-127	Arbitrary Jump with Function Type Variable	Complete	No risk
SWC-128	DoS With Block Gas Limit	Complete	No risk
SWC-129	Typographical Error	Complete	No risk
SWC-130	Right-To-Left-Override control character (U+202E)	Complete	No risk
SWC-131	Presence of unused variables	Complete	No risk
SWC-132	Unexpected Ether balance	Complete	No risk

**FULL AUDIT REPORT**

SWC-133	Hash Collisions With Multiple Variable Length Arguments	Complete	No risk
SWC-134	Message call with hardcoded gas amount	Complete	No risk
SWC-135	Code With No Effects	Complete	No risk
SWC-136	Unencrypted Private Data On-Chain	Complete	No risk



## FULL AUDIT REPORT



## Visibility, Mutability, Modifier function testing

## Components


 Contracts	 Libraries	 Interfaces	 Abstract
1	0	0	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.












 Public	 Payable			
12	0			
External	Internal	Private	Pure	View
1	17	0	0	6

## StateVariables

Total	 Public
6	0



## Capabilities

<div>Solidity Versions observed</div>	<div> Experimental Features</div>	<div> Can Receive Funds</div>	<div> Uses Assembly</div>	<div> Has Destroyable Contracts</div>	
<div>0.8.18</div>					
<div> Transfers ETH</div>	<div> Low-Level Calls</div>	<div> DelegateCall</div>	<div> Uses Hash Functions</div>	<div> ECR recover</div>	<div> New/Create/Create2</div>
<div> TryCatch</div>	<div>Σ Unchecked</div>				
	<div>yes</div>				



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
Contracts Description Table

Contract	Type	Bases		
L	Function Name	Visibility	Mutability	Modifiers
<b>Cagedbeasts</b>	Implementation	IERC20Metadata, Ownable		
L		Public !	●	NO !
L	name	Public !		NO !
L	symbol	Public !		NO !
L	decimals	Public !		NO !
L	totalSupply	Public !		NO !
L	balanceOf	Public !		NO !
L	transfer	Public !	●	NO !
L	allowance	Public !		NO !
L	approve	Public !	●	NO !
L	transferFrom	Public !	●	NO !
L	increaseAllowance	Public !	●	NO !
L	decreaseAllowance	Public !	●	NO !
L	_transfer	Internal 🔒	●	
L	_mint	Internal 🔒	●	
L	_burn	Internal 🔒	●	
L	_approve	Internal 🔒	●	
L	_spendAllowance	Internal 🔒	●	
L	withdrawToken	External !	●	onlyOwner



## FULL AUDIT REPORT

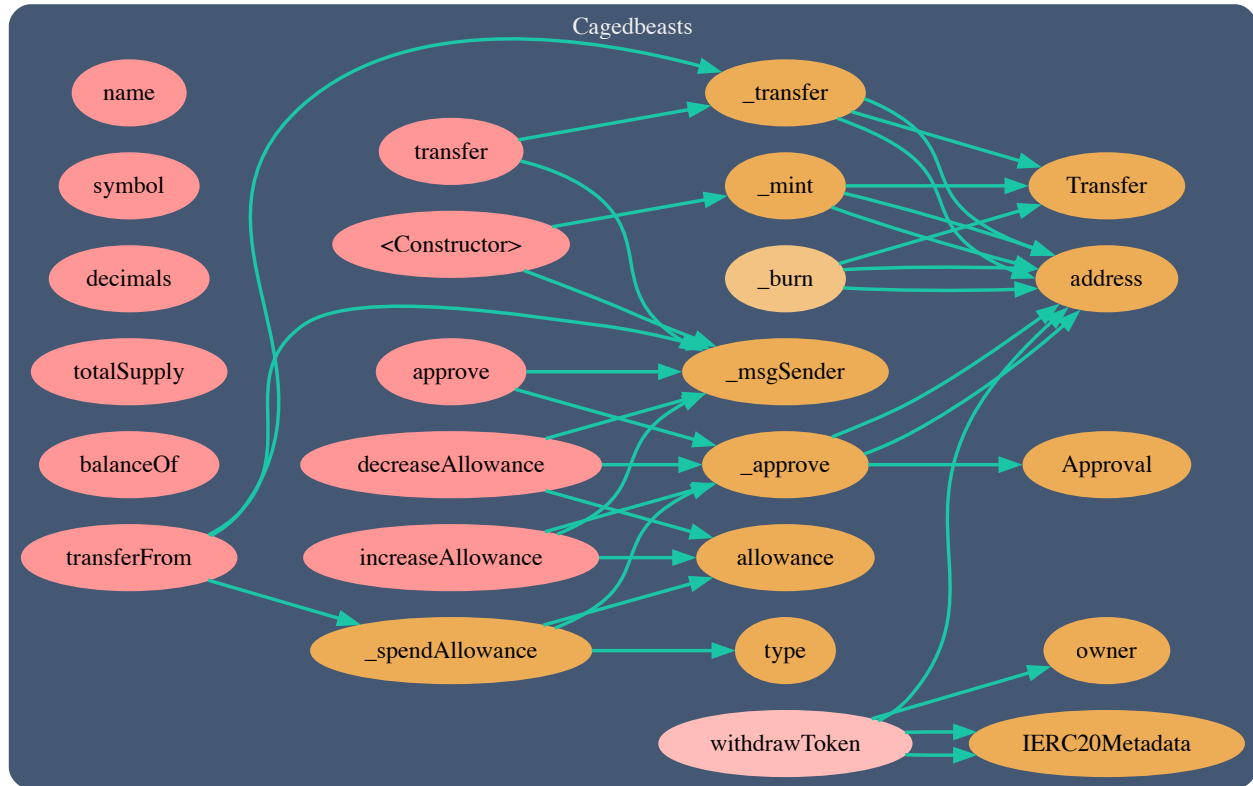
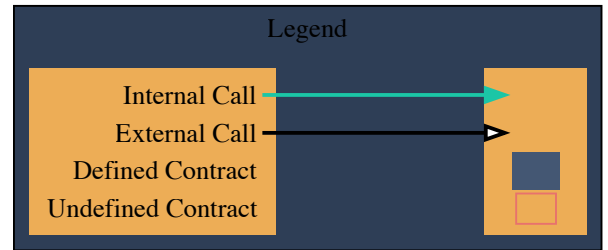
### Legend

Symbol	Meaning
	Function can modify state
	Function is payable



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# Inheritate Function Relation Graph



## FULL AUDIT REPORT

### UML Class Diagram

Cagedbeasts contracts/Cagedbeasts.sol
<p>Private:</p> <p>_balances: mapping(address=&gt;uint256)</p> <p>_allowances: mapping(address=&gt;mapping(address=&gt;uint256))</p> <p>_totalSupply: uint256</p> <p>_name: string</p> <p>_symbol: string</p> <p>_decimals: uint8</p>
<p>Internal:</p> <p>_transfer(from: address, to: address, amount: uint256)</p> <p>_mint(account: address, amount: uint256)</p> <p>_burn(account: address, amount: uint256)</p> <p>_approve(owner: address, spender: address, amount: uint256)</p> <p>_spendAllowance(owner: address, spender: address, amount: uint256)</p> <p>External:</p> <p>withdrawToken(_token: address) &lt;&lt;onlyOwner&gt;&gt;</p> <p>Public:</p> <p>constructor(__name: string, __symbol: string, __totalSupply: uint256, __decimals: uint8)</p> <p>name(): string</p> <p>symbol(): string</p> <p>decimals(): uint8</p> <p>totalSupply(): uint256</p> <p>balanceOf(account: address): uint256</p> <p>transfer(to: address, amount: uint256): bool</p> <p>allowance(owner: address, spender: address): uint256</p> <p>approve(spender: address, amount: uint256): bool</p> <p>transferFrom(from: address, to: address, amount: uint256): bool</p> <p>increaseAllowance(spender: address, addedValue: uint256): bool</p> <p>decreaseAllowance(spender: address, subtractedValue: uint256): bool</p>

## FULL AUDIT REPORT

### About SECURI LAB

SECURI LAB is a group of cyber security experts providing cyber security consulting, smart contract security audits, and KYC services.



**SECURI LAB**

**Why US? — High Reliability  
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