



# Smart Contract Audit

FOR

Crazy Hippo

DATED : 7 Sep 23'



# AUDIT SUMMARY

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**Project name** – Crazy Hippo

**Date:** 7 Sep, 2023

**Scope of Audit-** Audit Ace was consulted to conduct the smart contract audit of the solidity source codes.

**Audit Status:** **Passed**

## Issues Found

Status	Critical	High	Medium	Low	Suggestion
Open	0	0	0	0	0
Acknowledged	0	0	0	0	0
Resolved	0	1	0	0	0

# USED TOOLS

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## Tools:

### 1- Manual Review:

A line by line code review has been performed by audit ace team.

**2- BSC Test Network:** All tests were conducted on the BSC Test network, and each test has a corresponding transaction attached to it. These tests can be found in the "Functional Tests" section of the report.

### 3- Slither :

The code has undergone static analysis using Slither.

### Testnet version:

The tests were performed using the contract deployed on the BSC Testnet, which can be found at the following address:

<https://testnet.bscscan.com/token/0x62035c573954dbD4581f8f0fF89F77ed14CB9ee6>

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# Token Information

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**Token Name :** Crazy Hippo

**Token Symbol:** HIPPO

**Decimals:** 18

**Token Supply:** 200,000,000,000

**Token Address:**

0x62035c573954dbD4581f8f0fF89F77ed14CB9ee6

**Checksum:**

3aa85371cb9853106409d78434d3d28f551c2fad

**Owner:**

0x77D7635faE1d1C139A04De6e5E68f695a3eB97c7  
(at time of writing the audit)

**Deployer:**

0x77D7635faE1d1C139A04De6e5E68f695a3eB97c7

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# TOKEN OVERVIEW

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## **Fees:**

Buy Fees: 0-3%

Sell Fees: 0-3%

Transfer Fees: 0-3%

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**Fees Privilege:** owner

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**Ownership:** owned

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**Minting:** No mint function

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**Max Tx Amount/ Max Wallet Amount:** No

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**Blacklist:** No

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**Other Privileges:** Initial distribution of the tokens  
modifying fees

Enabling trades

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# AUDIT METHODOLOGY

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The auditing process will follow a routine as special considerations by Auditace:

- Review of the specifications, sources, and instructions provided to Auditace to make sure the contract logic meets the intentions of the client without exposing the user's funds to risk.
  - Manual review of the entire codebase by our experts, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
  - Specification comparison is the process of checking whether the code does what the specifications, sources, and instructions provided to Auditace describe.
  - Test coverage analysis determines whether the test cases are covering the code and how much code is exercised when we run the test cases.
  - Symbolic execution is analysing a program to determine what inputs cause each part of a program to execute.
  - Reviewing the codebase to improve maintainability, security, and control based on the established industry and academic practices.
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# VULNERABILITY CHECKLIST

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- |                                    |                               |
|------------------------------------|-------------------------------|
| ✓ Return values of low-level calls | ✓ Gasless Send                |
| ✓ Private modifier                 | ✓ Using block.timestamp       |
| ✓ Multiple Sends                   | ✓ Re-entrancy                 |
| ✓ Using Suicide                    | ✓ Tautology or contradiction  |
| ✓ Gas Limitand Loops               | ✓ Timestamp Dependence        |
| ✓ Address hardcoded                | ✓ Revert/require functions    |
| ✓ Exception Disorder               | ✓ Use of tx.origin            |
| ✓ Using inline assembly            | ✓ Integer overflow/underflow  |
| ✓ Divide before multiply           | ✓ Dangerous strict equalities |
| ✓ Missing Zero Address Validation  | ✓ Using SHA3                  |
| ✓ Compiler version not fixed       | ✓ Using throw                 |
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# CLASSIFICATION OF RISK

## Severity

## Description

◆ Critical	These vulnerabilities could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.
◆ High-Risk	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.
◆ Medium-Risk	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.
◆ Low-Risk	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.
◆ Gas Optimization /Suggestion	A vulnerability that has an informational character but is not affecting any of the code.

## Findings

### Severity

### Found

◆ Critical	0
◆ High-Risk	1
◆ Medium-Risk	0
◆ Low-Risk	0
◆ Gas Optimization / Suggestions	0





# INHERITANCE TREE

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# POINTS TO NOTE

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- **Owner is able to adjust buy/sell/transfer fees within 0-3%**
  - Owner is not able to blacklist an arbitrary wallet
  - Owner is not able to disable trades
  - Owner is not able to mint new tokens
  - Owner is not able to set maximum wallet and maximum buy/sell/transfer limits
  - **Owner must enable trades manually**
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# CONTRACT ASSESMENT

```
| Contract|      Type      |Bases |      |      |
|:-----:|:-----:|:-----:|:-----:|:-----:|
|  └─ | **Function Name** |**Visibility** | **Mutability** |**Modifiers** |
|||||
| **IBEP20** | Interface | |||
|  └─ | totalSupply | External ! | |NO ! |
|  └─ | balanceOf | External ! | |NO ! |
|  └─ | transfer | External ! | ●|NO ! |
|  └─ | allowance | External ! | |NO ! |
|  └─ | approve | External ! | ●|NO ! |
|  └─ | transferFrom | External ! | ●|NO ! |
|||||
| **SafeMath** | Library | |||
|  └─ | tryAdd | Internal 🔒 | | |
|  └─ | trySub | Internal 🔒 | | |
|  └─ | tryMul | Internal 🔒 | | |
|  └─ | tryDiv | Internal 🔒 | | |
|  └─ | tryMod | Internal 🔒 | | |
|  └─ | add | Internal 🔒 | | |
|  └─ | sub | Internal 🔒 | | |
|  └─ | mul | Internal 🔒 | | |
|  └─ | div | Internal 🔒 | | |
|  └─ | mod | Internal 🔒 | | |
|  └─ | sub | Internal 🔒 | | |
|  └─ | div | Internal 🔒 | | |
|  └─ | mod | Internal 🔒 | | |
|||||
| **Context** | Implementation | |||
|  └─ | <Constructor> | Public ! | ●|NO ! |
|  └─ | _msgSender | Internal 🔒 | | |
|||||
| **Ownable** | Implementation | Context |||
|  └─ | <Constructor> | Public ! | ●|NO ! |
|  └─ | owner | Public ! | |NO ! |
|  └─ | renounceOwnership | Public ! | ●| onlyOwner |
|  └─ | transferOwnership | Public ! | ●| onlyOwner |
|||||
| **BEP20Detailed** | Implementation | |||
|  └─ | <Constructor> | Public ! | ●|NO ! |
|  └─ | name | Public ! | |NO ! |
|  └─ | symbol | Public ! | |NO ! |
|  └─ | decimals | Public ! | |NO ! |
```



# CONTRACT ASSESMENT

```
| **Address** | Library | |||
|  └ | isContract | Internal 🔒 | | |
|||||
| **SafeBEP20** | Library | |||
|  └ | safeTransfer | Internal 🔒 | ● | |
|  └ | safeTransferFrom | Internal 🔒 | ● | |
|  └ | safeApprove | Internal 🔒 | ● | |
|  └ | callOptionalReturn | Private 🔒 | ● | |
|||||
| **IUniswapV2Factory** | Interface | |||
|  └ | feeTo | External ! | |NO ! |
|  └ | feeToSetter | External ! | |NO ! |
|  └ | getPair | External ! | |NO ! |
|  └ | allPairs | External ! | |NO ! |
|  └ | allPairsLength | External ! | |NO ! |
|  └ | createPair | External ! | ●|NO ! |
|  └ | setFeeTo | External ! | ●|NO ! |
|  └ | setFeeToSetter | External ! | ●|NO ! |
|||||
| **IUniswapV2Pair** | Interface | |||
|  └ | name | External ! | |NO ! |
|  └ | symbol | External ! | |NO ! |
|  └ | decimals | External ! | |NO ! |
|  └ | totalSupply | External ! | |NO ! |
|  └ | balanceOf | External ! | |NO ! |
|  └ | allowance | External ! | |NO ! |
|  └ | approve | External ! | ●|NO ! |
|  └ | transfer | External ! | ●|NO ! |
|  └ | transferFrom | External ! | ●|NO ! |
|  └ | DOMAIN_SEPARATOR | External ! | |NO ! |
|  └ | PERMIT_TYPEHASH | External ! | |NO ! |
|  └ | nonces | External ! | |NO ! |
|  └ | permit | External ! | ●|NO ! |
|  └ | MINIMUM_LIQUIDITY | External ! | |NO ! |
|  └ | factory | External ! | |NO ! |
|  └ | token0 | External ! | |NO ! |
|  └ | token1 | External ! | |NO ! |
|  └ | getReserves | External ! | |NO ! |
|  └ | price0CumulativeLast | External ! ||NO ! |
|  └ | price1CumulativeLast | External ! ||NO ! |
|  └ | kLast | External ! | |NO ! |
```



# CONTRACT ASSESMENT

```
|  |  | mint | External ! | ● | NO ! |
|  |  | burn | External ! | ● | NO ! |
|  |  | swap | External ! | ● | NO ! |
|  |  | skim | External ! | ● | NO ! |
|  |  | sync | External ! | ● | NO ! |
|  |  | initialize | External ! | ● | NO ! |
|||||
| **IUniswapV2Router01** | Interface | |||
|  |  | factory | External ! | | NO ! |
|  |  | WETH | External ! | | NO ! |
|  |  | addLiquidity | External ! | ● | NO ! |
|  |  | addLiquidityETH | External ! | 🇸🇬 | NO ! |
|  |  | removeLiquidity | External ! | ● | NO ! |
|  |  | removeLiquidityETH | External ! | ● | NO ! |
|  |  | removeLiquidityWithPermit | External ! | ● | NO ! |
|  |  | removeLiquidityETHWithPermit | External ! | ● | NO ! |
|  |  | swapExactTokensForTokens | External ! | ● | NO ! |
|  |  | swapTokensForExactTokens | External ! | ● | NO ! |
|  |  | swapExactETHForTokens | External ! | 🇸🇬 | NO ! |
|  |  | swapTokensForExactETH | External ! | ● | NO ! |
|  |  | swapExactTokensForETH | External ! | ● | NO ! |
|  |  | swapETHForExactTokens | External ! | 🇸🇬 | NO ! |
|  |  | quote | External ! | | NO ! |
|  |  | getAmountOut | External ! | | NO ! |
|  |  | getAmountIn | External ! | | NO ! |
|  |  | getAmountsOut | External ! | | NO ! |
|  |  | getAmountsIn | External ! | | NO ! |
|||||
| **IUniswapV2Router02** | Interface | IUniswapV2Router01 |||
|  |  | removeLiquidityETHSupportingFeeOnTransferTokens | External ! | ● | NO ! |
|  |  | removeLiquidityETHWithPermitSupportingFeeOnTransferTokens | External ! | ● | NO ! |
|  |  | swapExactTokensForTokensSupportingFeeOnTransferTokens | External ! | ● | NO ! |
|  |  | swapExactETHForTokensSupportingFeeOnTransferTokens | External ! | 🇸🇬 | NO ! |
|  |  | swapExactTokensForETHSupportingFeeOnTransferTokens | External ! | ● | NO ! |
|||||
| **HIPPO** | Implementation | Context, Ownable, IBEP20, BEP20Detailed |||
|  |  | <Constructor> | Public ! | ● | BEP20Detailed |
|  |  | totalSupply | Public ! | | NO ! |
|  |  | balanceOf | Public ! | | NO ! |
|  |  | transfer | Public ! | ● | NO ! |
|  |  | allowance | Public ! | | NO ! |
|  |  | approve | Public ! | ● | NO ! |
```



# CONTRACT ASSESMENT

	└		transferFrom		Public	!		●		NO	!	
	└		increaseAllowance		Public	!		●		NO	!	
	└		decreaseAllowance		Public	!		●		NO	!	
	└		_approve		Internal	🔒		●				
	└		enableTrading		External	!		●		onlyOwner		
	└		isContract		Internal	🔒						
	└		setBuyDevelopmentFeePercent		External	!		●		onlyOwner		
	└		setSellDevelopmentFeePercent		External	!		●		onlyOwner		
	└		setDevelopmentAddress		External	!		●		onlyOwner		
	└		setSwapAndLiquifyEnabled		Public	!		●		onlyOwner		
	└		changeNumTokensSellToFee		External	!		●		onlyOwner		
	└		clearETH		External	!		●		onlyOwner		
	└		clearERC20		External	!		●		onlyOwner		
	└		excludeFromFee		Public	!		●		onlyOwner		
	└		includeInFee		Public	!		●		onlyOwner		
	└		isExcludedFromFee		Public	!				NO	!	
	└		<Receive Ether>		External	!		💵		NO	!	
	└		_transfer		Internal	🔒		●				
	└		swapAndLiquify		Private	🔒		●		lockTheSwap		
	└		swapTokensForEth		Private	🔒		●				

### ### Legend

	Symbol		Meaning	
	:-----:		-----	
	●		Function can modify state	
	💵		Function is payable	



# STATIC ANALYSIS

```
Parameter HIPPO.clearERC20(address,address,uint256)._amount (contracts/Token.sol#822) is not in mixedCase
Variable HIPPO._balances (contracts/Token.sol#616) is not in mixedCase
Variable HIPPO._allowances (contracts/Token.sol#617) is not in mixedCase
Variable HIPPO._totalSupply (contracts/Token.sol#620) is not in mixedCase
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#conformance-to-solidity-naming-conventions
INFO:Detectors:
Reentrancy in HIPPO._transfer(address,address,uint256) (contracts/Token.sol#843-908):
  External calls:
    - swapAndLiquify(contractTokenBalance) (contracts/Token.sol#866)
      - address(developmentAddress).transfer(address(this).balance) (contracts/Token.sol#914)
  State variables written after the call(s):
    - _balances[sender] = _balances[sender].sub(amount,BEP20: transfer amount exceeds balance) (contracts/Token.sol#892-895)
    - _balances[recipient] = _balances[recipient].add(TotalSent) (contracts/Token.sol#896)
    - _balances[address(this)] = _balances[address(this)].add(taxAmount) (contracts/Token.sol#897)
    - _balances[sender] = _balances[sender].sub(amount,BEP20: transfer amount exceeds balance) (contracts/Token.sol#901-904)
    - _balances[recipient] = _balances[recipient].add(amount) (contracts/Token.sol#905)
    - developmentFee = buyDevelopmentFee (contracts/Token.sol#886)
    - developmentFee = sellDevelopmentFee (contracts/Token.sol#888)
  Event emitted after the call(s):
    - Transfer(sender,recipient,TotalSent) (contracts/Token.sol#898)
    - Transfer(sender,address(this),taxAmount) (contracts/Token.sol#899)
    - Transfer(sender,recipient,amount) (contracts/Token.sol#906)
Reentrancy in HIPPO.swapAndLiquify(uint256) (contracts/Token.sol#910-917):
  External calls:
    - address(developmentAddress).transfer(address(this).balance) (contracts/Token.sol#914)
  Event emitted after the call(s):
    - SwapAndLiquify(contractTokenBalance,address(this).balance) (contracts/Token.sol#916)
Reentrancy in HIPPO.transferFrom(address,address,uint256) (contracts/Token.sol#703-718):
  External calls:
    - _transfer(sender,recipient,amount) (contracts/Token.sol#708)
      - address(developmentAddress).transfer(address(this).balance) (contracts/Token.sol#914)
  State variables written after the call(s):
    - _approve(sender,_msgSender(),_allowances[sender][_msgSender()].sub(amount,BEP20: transfer amount exceeds allowance)) (contracts/Token.sol#709-716)
    - _allowances[towner][spender] = amount (contracts/Token.sol#750)
  Event emitted after the call(s):
    - Approval(towner,spender,amount) (contracts/Token.sol#751)
    - _approve(sender,_msgSender(),_allowances[sender][_msgSender()].sub(amount,BEP20: transfer amount exceeds allowance)) (contracts/Token.sol#709-716)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#reentrancy-vulnerabilities-4
INFO:Detectors:
Variable IUniswapV2Router01.addLiquidity(address,address,uint256,uint256,uint256,address,uint256).amountADesired (contracts/Token.sol#420) is too similar to IUniswapV2Router01.addLiquidity(address,address,uint256,uint256,uint256,address,uint256).amountBDesired (contracts/Token.sol#421)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#variable-names-too-similar
INFO:Detectors:
HIPPO.slitherConstructorVariables() (contracts/Token.sol#608-936) uses literals with too many digits:
  - numTokensSellToFee = 2000000 * 10 ** 18 (contracts/Token.sol#633)
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#too-many-digits
INFO:Detectors:
HIPPO._owner (contracts/Token.sol#645) should be immutable
HIPPO._totalSupply (contracts/Token.sol#620) should be immutable
Reference: https://github.com/crytic/slither/wiki/Detector-Documentation#state-variables-that-could-be-declared-immutable
INFO:Slither:./contracts/Token.sol analyzed (12 contracts with 88 detectors), 46 result(s) found
```

**Result => A static analysis of contract's source code has been performed using slither,**

**No major issues were found in the output**



# FUNCTIONAL TESTING

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## 1- Adding liquidity (passed):

<https://testnet.bscscan.com/tx/0xd3955fa8af71d3cc0736fd0bce7db6e48474ac99ee3ac1067239b711a0cf38b9>

## 2- Buying when excluded (0% tax) (passed):

<https://testnet.bscscan.com/tx/0x28bb41330f0bfec5fd9bc67847a9c4c95f96a9ebf2cd6e98294a90849dd68ed9>

## 3- Selling when excluded (0% tax) (passed):

<https://testnet.bscscan.com/tx/0x3bea7a77960dc7d055871c5d5f29b2084799c3498bd7ade6c5095ab91d649742>

## 4- Transferring when excluded from fees (0% tax) (passed):

<https://testnet.bscscan.com/tx/0xdcd4f69606430207ef977e5f70f77433be541bfa34babad80235cccff0555da9>

## 5- Buying when not excluded from fees (tax 0-3%) (passed):

<https://testnet.bscscan.com/tx/0x0c1fd75c5c8b2d6d76e252a8d450b4ce896a3129fc859d5bca7ec071e5c879fb>

## 6- Selling when not excluded from fees (tax 0-3%) (passed):

<https://testnet.bscscan.com/tx/0x60e2475ac4c210aa468baa6863f4e9d314fe31aa40fcae8d3dd5d92457568e21>

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# FUNCTIONAL TESTING

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**7- Transferring when not excluded from fees (0-3% tax ) (passed):**

<https://testnet.bscscan.com/tx/0x0dd9267fde1d84d5e12272c735f9e8ede000d2670bc2b7cdad33616895a51bda>

**8- Internal swap (BNB set to Marketing wallet) (passed):**

<https://testnet.bscscan.com/tx/0x60e2475ac4c210aa468baa6863f4e9d314fe31aa40fcae8d3dd5d92457568e21>

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# High Risk

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## Centralization – Enabling Trades

Severity: **High**

function: enableTrading

Status: **Resolved (contract owned by safu developer)**

### Overview:

The **launch** function permits only the contract owner to activate trading capabilities. Until this function is executed, no investors can buy, sell, or transfer their tokens. This places a high degree of control and centralization in the hands of the contract owner.

```
function enableTrading() external onlyOwner {  
    require(!tradingEnabled, "Trading is already enabled");  
    tradingEnabled = true;  
    startTradingBlock = block.number;  
}
```

### Suggestion

To reduce centralization and potential manipulation, consider one of the following approaches:

1. Automatically enable trading after a specified condition, such as the completion of a presale, is met.
2. If manual activation is still desired, consider transferring the ownership of the contract to a trustworthy, third-party entity like a certified "PinkSale Safu" developer. This can provide investors with more confidence in the eventual activation of trading capabilities, mitigating concerns of potential bad faith actions by the original owner



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