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HappyFans Token Audit V1

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Version: 1
Date: Oct 17, 2021

Table of Contents

1. Project Information

1.1 Project Scope

We were tasked with auditing the HappyFansToken smart contract platform. This audit process pertains to the $HAPPY ERC20/BEP20 Token provided to us by the Happy-Fans development team on October 15, 2021. The files within scope of this audit are:

File	MD5
./contracts/HappyFansToken.sol	aa255e2b57750c0ca93db12727252f13

And can be found at here https://github.com/wivillat/bep20-token on git commit 11b93bc5d5165f8ec5953e6eeb9726d1699d8099.

1.2 Issue Classification

Informational

This issue relates to style and security best practices but does not pose an immediate risk.

Low

An issue classified as informational does not pose an immediate threat to disruption of functionality and could not be exploited on a recurring basis, however, it should be considered for security best practices or code integrity.

Medium

An issue classified as medium has relatively small risk and isn't exploitable to circumvent desired functionality and could not have financial consequences but could put user's sensitive information at risk.

Critical

These issues in the smart contract can have catastrophic implications that could ruin your reputation, disrupt the contract's functionality, and impact the client and your user's sensitive information.

2. Process Details

2.1 Analysis

This audit is a review of security best practices of the $HAPPY ERC20/BEP20 contract. This audit process pertains to a github repository provided by Happy-Fans at the following url: https://github.com/Happy-Fans/bep20-token.

The $HAPPY token inherits the IBEP20.sol, Context.sol, Ownable.sol, and LGEWhitelisted contracts from @openzeppelin/contracts-ethereum-package3.0.0 which is code that has been thoroughly audited and battle tested time and time again. As part of our auditing process we tested and verified the behavior of the $HAPPY BEP20 and antibot whitelisting smart contracts. Through the process we found:

0	0	0	0
Critical Issues	Medium Issues	Low Issues	Informational Issues

In this analysis, we did not find any issues in the provided contract.

2..2 Auditing Process

This section describes the auditing process that was followed to test the $HAPPY ERC20/BEP20 Token. We deployed a local instance of the decentralized protocol to develop a testing environment that most realistically simulates the live environment. We created a pair and added liquidity to it so that simulated traders can swap tokens from the simulated liquidity pool. This allowed for proper testing of the antibot whitelist. In addition, we also verified that the $HAPPY token is ERC20/BEP20 compliant. With the environment properly simulated we developed a custom test suite that covered the attack space. The requirements and specifications were inspected thoroughly while constructing the test suite to verify its intended functionality. This was achieved by tracking the balances and the amounts being swapped. The balance of the recipient is then compared to an amount calculated by us, to confim that the correct amounts are transferred. The results of the tests are detailed below in section 2.3.

2.3 Test Results

```
HappyFansToken Contract Test Suite
  Deployment
    √ Should be called HappyFans
    √ Should have the symbol HAPPY
    √ Should have a total supply of 100000000000
    √ Should have 18 decimals
    √ Should give allowance to a spender of approved amount (43ms)
    √ Should increase the allowance of a spender (45ms)
    √ Should decrease the allowance of a spender (75ms)
  Allowance
    √ Allowance works as expected (256ms)
  Approve
    √ Cannot approve the zero address to move your tokens
  TransferFrom
    √ Should allow you to transfer an address' tokens to another address (105ms)
  Ownership
    √ Should return owner address
    √ Should only allow the owner to transfer ownership to another address (75ms)
    √ Should not allow transfer of ownership to the zero address
    √ Should only allow the owner to renounce ownership of the contract (59ms)
  Trading
    √ Should not charge fees when selling tokens on pancakeswap (224ms)
  Whitelist
    √ Creating the LGE whitelist requires duration and amountsMax of equal length (79ms)
    √ Adding liquidity activates the whitelist (211ms)
    √ Transferring tokens reverts if you're not on the whitelist (96ms)
    √ Whitelisters cannot buy more than the specified amount max (83ms)
    √ Whitelist admin can add whitelist addresses using modifyLGEWhitelist (102ms)
    √ Whitelist admin can modify the whitelist duration (86ms)
    √ Whitelist admin can modify the max tokens that can be bought during the whitelist (74ms)
    √ Whitelist admin can call the modifyLGEWhitelist and not change anything (80ms)
    √ When the whitelist round is over, getLGEWhitelistRound returns 0 (92ms)
    √ Whitelist admin cannot modify a whitelist that doesn't exist (49ms)
    √ Whitelist admin can renounce their whitelister permissions (42ms)
    √ Whitelist admin can tranfer their whitelisting permission to another address (72ms)
    √ Whitelist admin cannot transfer their whitelisting permission to the zero address


  28 passing (5s)

----------------------|----------|----------|----------|----------|----------------|
File                  |  % Stmts | % Branch |  % Funcs |  % Lines |Uncovered Lines |
----------------------|----------|----------|----------|----------|----------------|
 contracts\           |      100 |    80.95 |      100 |      100 |                |
  HappyFansToken.sol  |      100 |     62.5 |      100 |      100 |                |
  IBEP20.sol          |      100 |      100 |      100 |      100 |                |
  LGEWhitelisted.sol  |      100 |    85.29 |      100 |      100 |                |
----------------------|----------|----------|----------|----------|----------------|
All files             |      100 |    80.95 |      100 |      100 |                |
----------------------|----------|----------|----------|----------|----------------|
```

Our audit has found no security vulnerabilities. We are proud to have been a part of making the HappyFansToken smart contract platform safer and more reliable. We need more decentralized alternatives and projects like this are part of increasing the reach of the blockchain industry across the world.

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