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AUDIT COMPANY

Smart Contract Security Audit

TechRate

August, 2021

Audit Details

Audited project

Hyperchain X

Deployer address

0xcD47238F19042A521831850d4522D65f83adb3Ba

Client contacts:

Hyperchain X team

Blockchain

Binance Smart Chain

Project website:

https://hyperchainx.com

Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.

Background

TechRate was commissioned by Hyperchain X to perform an audit of smart contracts:

https://bscscan.com/address/0x25b15e17164b97202616e36af1234db944121185#code

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

Contracts Details

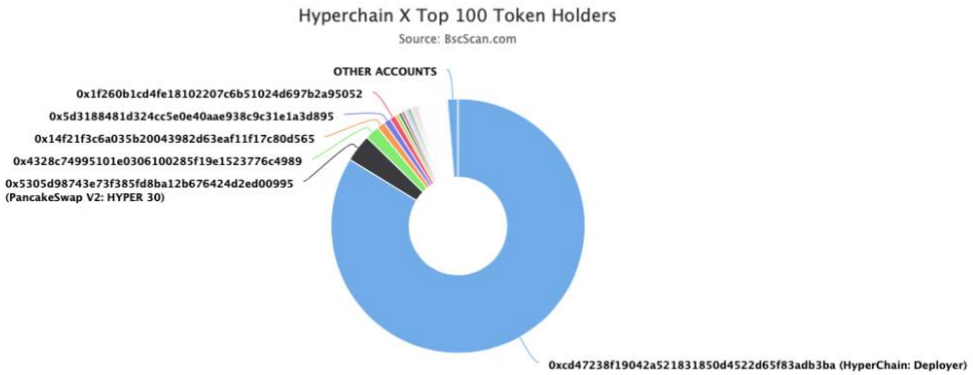
Token contract details for 13.08.2021

Contract name	Hyperchain X
Contract address	0x25b15E17164b97202616e36Af1234Db944121185
Total supply	1,000,000,000,000
Token ticker	HYPER
Decimals	7
Token holders	865
Transactions count	2,067
Top 100 holders dominance	98.66%
Liquidity fee	800000
Tax fee	200000
Total fees	4306018059584354
Uniswap V2 pair	0x5305d98743e73f385fd8ba12b676424d2ed00995
Contract deployer address	0xcD47238F19042A521831850d4522D65f83adb3Ba
Contract's current owner address	0xcD47238F19042A521831850d4522D65f83adb3Ba

Hyperchain X Token Distribution

The top 100 holders collectively own 98.66% (986,562,087,313.99 Tokens) of Hyperchain X

Token Total Supply: 1,000,000,000,000.00 Token | Total Token Holders: 865

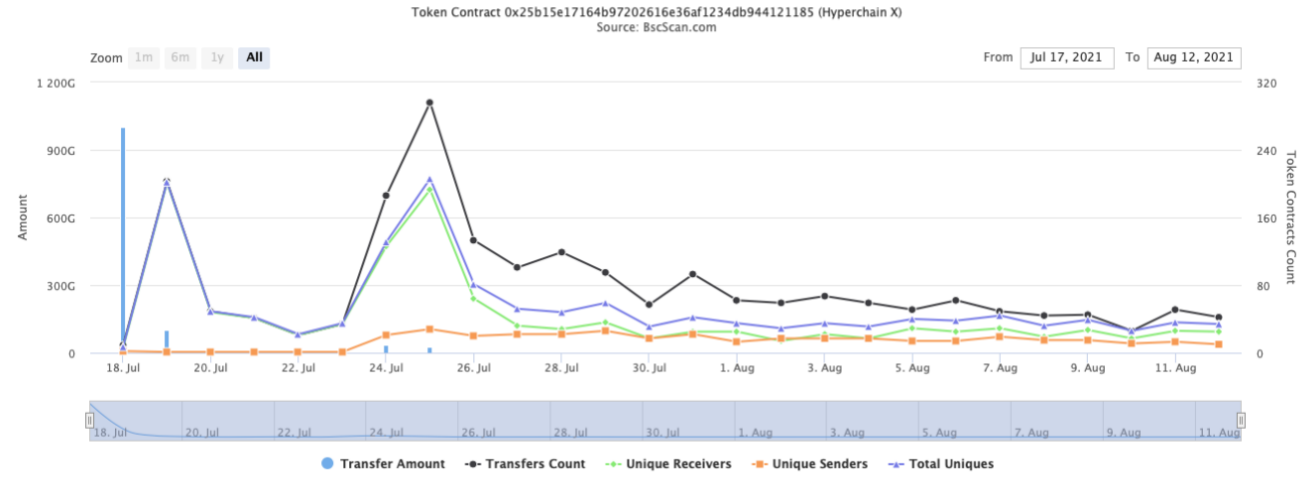


(A total of 986,562,087,313.99 tokens held by the top 100 accounts from the total supply of 1,000,000,000,000.00 token)

Hyperchain X Contract Interaction Details

Time Series: Token Contract Overview

Sun 18, Jul 2021 - Thu 12, Aug 2021



Hyperchain X Top 10 Token Holders

Rank	Address	Quantity (Token)	Percentage
1	HyperChain: Deployer	837,833,741,998.9423057	83.7834%
2	PancakeSwap V2: HYPER 30	34,909,719,026.510208	3.4910%
3	0x4328c74995101e0306100285f19e1523776c4989	18,302,517,770.5969713	1.8303%
4	0x14f21f3c6a035b20043982d63eaf11f17c80d565	10,004,938,442.5044494	1.0005%
5	0x5d3188481d324cc5e0e40aae938c9c31e1a3d895	8,810,967,068.5446416	0.8811%
6	0x1f260b1cd4fe18102207c6b51024d697b2a95052	7,772,974,445.4079647	0.7773%
7	0xa45b3aab82654a29bcc12c476fdfb1095b24c5f6	4,600,373,614.744891	0.4600%
8	0xfa879f41eec212143c9c442a545f104217f88c6c	4,225,549,131.2815919	0.4226%
9	0x41257e46377c5e730b0f8450600bcb70c1c87841	3,636,243,390.3607255	0.3636%
10	0xf27edc77c7c9ecf6ef3bc19ad3bdab6ae70c8bd7	2,855,379,154.3854804	0.2855%

Contract functions details

+ Context
  - [Int] _msgSender
  - [Int] _msgData

+ [Int] IERC20
  - [Ext] totalSupply
  - [Ext] balanceOf
  - [Ext] transfer #
  - [Ext] allowance
  - [Ext] approve #
  - [Ext] transferFrom #

+ [Lib] SafeMath
  - [Int] add
  - [Int] sub
  - [Int] sub
  - [Int] mul
  - [Int] div
  - [Int] div
  - [Int] mod
  - [Int] mod

+ [Lib] Address
  - [Int] isContract
  - [Int] sendValue #
  - [Int] functionCall #
  - [Int] functionCall #
  - [Int] functionCallWithValue #
  - [Int] functionCallWithValue #
  - [Prv] _functionCallWithValue #

+ Ownable (Context)
  - [Pub] <Constructor> #
  - [Pub] owner
  - [Pub] Z_transferOwnership #
    - modifiers: onlyOwner
  - [Pub] geUnlockTime

+ [Int] IUniswapV2Factory
  - [Ext] feeTo
  - [Ext] feeToSetter
  - [Ext] getPair
  - [Ext] allPairs
  - [Ext] allPairsLength
  - [Ext] createPair #
  - [Ext] setFeeTo #
  - [Ext] setFeeToSetter #

+ [Int] IUniswapV2Pair
  - [Ext] name
  - [Ext] symbol

- [Ext] decimals
- [Ext] totalSupply
- [Ext] balanceOf
- [Ext] allowance
- [Ext] approve #
- [Ext] transfer #
- [Ext] transferFrom #
- [Ext] DOMAIN_SEPARATOR
- [Ext] PERMIT_TYPEHASH
- [Ext] nonces
- [Ext] permit #
- [Ext] MINIMUM_LIQUIDITY
- [Ext] factory
- [Ext] token0
- [Ext] token1
- [Ext] getReserves
- [Ext] price0CumulativeLast
- [Ext] price1CumulativeLast
- [Ext] kLast
- [Ext] mint #
- [Ext] burn #
- [Ext] swap #
- [Ext] skim #
- [Ext] sync #
- [Ext] initialize #

+ [Int] IUniswapV2Router01
- [Ext] factory
- [Ext] WETH
- [Ext] addLiquidity #
- [Ext] addLiquidityETH ($)
- [Ext] removeLiquidity #
- [Ext] removeLiquidityETH #
- [Ext] removeLiquidityWithPermit #
- [Ext] removeLiquidityETHWithPermit #
- [Ext] swapExactTokensForTokens #
- [Ext] swapTokensForExactTokens #
- [Ext] swapExactETHForTokens ($)
- [Ext] swapTokensForExactETH #
- [Ext] swapExactTokensForETH #
- [Ext] swapETHForExactTokens ($)
- [Ext] quote
- [Ext] getAmountOut
- [Ext] getAmountIn
- [Ext] getAmountsOut
- [Ext] getAmountsIn

+ [Int] IUniswapV2Router02 (IUniswapV2Router01)
- [Ext] removeLiquidityETHSupportingFeeOnTransferTokens #
- [Ext] removeLiquidityETHWithPermitSupportingFeeOnTransferTokens #
- [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #
- [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens ($)
- [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #

+ Hyperchain (Context, IERC20, Ownable)

- [Pub] <Constructor> #
- [Pub] name
- [Pub] symbol
- [Pub] decimals
- [Pub] totalSupply
- [Pub] balanceOf
- [Pub] transfer #
- [Pub] allowance
- [Pub] approve #
- [Pub] transferFrom #
- [Pub] increaseAllowance #
- [Pub] decreaseAllowance #
- [Pub] isExcludedFromReward
- [Pub] totalFees
- [Pub] reflectionFromToken
- [Pub] tokenFromReflection
- [Pub] I_excludeFromReward #
  - modifiers: onlyOwner
- [Ext] G_includeInReward #
  - modifiers: onlyOwner
- [Prv] _approve #
- [Prv] _transfer #
- [Prv] swapAndLiquify #
  - modifiers: lockTheSwap
- [Prv] swapTokensForEth #
- [Prv] addLiquidity #
- [Prv] _tokenTransfer #
- [Prv] _transferStandard #
- [Prv] _transferToExcluded #
- [Prv] _transferFromExcluded #
- [Prv] _transferBothExcluded #
- [Prv] _reflectFee #
- [Prv] _getValues
- [Prv] _getTValues
- [Prv] _getRValues
- [Prv] _getRate
- [Prv] _getCurrentSupply
- [Prv] _takeLiquidity #
- [Prv] calculateTaxFee
- [Prv] calculateLiquidityFee
- [Prv] removeAllFee #
- [Prv] restoreAllFee #
- [Pub] isExcludedFromFee
- [Pub] H_excludeFromFee #
  - modifiers: onlyOwner
- [Pub] F_includeInFee #
  - modifiers: onlyOwner
- [Pub] readCooldown
- [Pub] Y_setMarketingWallet #
  - modifiers: onlyOwner
- [Ext] J_setMaxTxPercent #
  - modifiers: onlyOwner
- [Ext] K_setJosh #
  - modifiers: onlyOwner
- [Ext] L_setJosh2 #

  - modifiers: onlyOwner
- [Ext] Q_setTaxFeePercent #
  - modifiers: onlyOwner
- [Ext] R_setbuyTaxfee #
  - modifiers: onlyOwner
- [Ext] S_setsellTaxFee #
  - modifiers: onlyOwner
- [Ext] S_settransferTaxFee #
  - modifiers: onlyOwner
- [Ext] T_setLiquidityFeePercent #
  - modifiers: onlyOwner
- [Ext] U_setbuyLiquidityFee #
  - modifiers: onlyOwner
- [Ext] V_setsellLiquidityFeeA #
  - modifiers: onlyOwner
- [Ext] W_setsellLiquidityFeeB #
  - modifiers: onlyOwner
- [Ext] WA__settransferLiquidityFee #
  - modifiers: onlyOwner
- [Ext] XA_setmaxSellAttempts #
  - modifiers: onlyOwner
- [Ext] XB_setTotalDelay #
  - modifiers: onlyOwner
- [Ext] XC_setInitialDelay #
  - modifiers: onlyOwner
- [Ext] XD_setFurtherDelay #
  - modifiers: onlyOwner
- [Ext] N_enableFees #
  - modifiers: onlyOwner
- [Ext] M_enableTrading #
  - modifiers: onlyOwner
- [Ext] O_enableCooldown #
  - modifiers: onlyOwner
- [Pub] P_enableSwapAndLiquify #
  - modifiers: onlyOwner
- [Ext] <Fallback> ($)

($) = payable function
= non-constant function

Issues Checking Status

	Issue description	Checking status
1.	Compiler errors.	Passed
2.	Race conditions and Reentrancy. Cross-function race conditions.	Passed
3.	Possible delays in data delivery.	Passed
4.	Oracle calls.	Passed
5.	Front running.	Passed
6.	Timestamp dependence.	Passed
7.	Integer Overflow and Underflow.	Passed
8.	DoS with Revert.	Passed
9.	DoS with block gas limit.	Low issues
10.	Methods execution permissions.	Passed
11.	Economy model of the contract.	Passed
12.	The impact of the exchange rate on the logic.	Passed
13.	Private user data leaks.	Passed
14.	Malicious Event log.	Passed
15.	Scoping and Declarations.	Passed
16.	Uninitialized storage pointers.	Passed
17.	Arithmetic accuracy.	Passed
18.	Design Logic.	Passed
19.	Cross-function race conditions.	Passed
20.	Safe Open Zeppelin contracts implementation and usage.	Passed
21.	Fallback function security.	Passed

Security Issues

High Severity Issues

No high severity issues found.

Medium Severity Issues

No medium severity issues found.

Low Severity Issues

1. Out of gas

Issue:

- The function G_includeInReward() uses the loop to find and remove addresses from the _excluded list. Function will be aborted with OUT_OF_GAS exception if there will be a long excluded addresses list.

```
function G_includeInReward(address account⬆) external onlyOwner() {
    require(_isExcluded[account⬆], "Account is already excluded");
    for (uint256 i = 0; i < _excluded.length; i++) {
        if (_excluded[i] == account⬆) {
            _excluded[i] = _excluded[_excluded.length - 1];
            _tOwned[account⬆] = 0;
            _isExcluded[account⬆] = false;
            _excluded.pop();
            break;
        }
    }
}
```

- The function _getCurrentSupply also uses the loop for evaluating total supply. It also could be aborted with OUT_OF_GAS exception if there will be a long excluded addresses list.

```
function _getCurrentSupply() private view returns (uint256, uint256) {
    uint256 rSupply = _rTotal;
    uint256 tSupply = _tTotal;
    for (uint256 i = 0; i < _excluded.length; i++) {
        if (
            _rOwned[_excluded[i]] > rSupply ||
            _tOwned[_excluded[i]] > tSupply
        ) return (_rTotal, _tTotal);
        rSupply = rSupply.sub(_rOwned[_excluded[i]]);
        tSupply = tSupply.sub(_tOwned[_excluded[i]]);
    }
    if (rSupply < _rTotal.div(_tTotal)) return (_rTotal, _tTotal);
    return (rSupply, tSupply);
}
```

Recommendation:

Check that the excluded array length is not too big.

Notes:

- Half of the converted BNB liquidity goes to marketing address.

Owner privileges (In the period when the owner is not renounced)

- Owner can change buy/sell/transfer tax fees.
- Owner can change buy/sell/transfer liquidity fees.
- Owner can change maximum transaction amount.
- Owner can exclude from the fee.
- Owner can change _josh and _josh2 multipliers.
- Owner can change _maxSellAttempts value.
- Owner can change total, initial and further delays.
- Owner can enable/disable fees, cooldown and trading.
- Owner can enable/disable swap and liquify.
- Owner can change marketing address.

Conclusion

Smart contracts contain low severity issues! Liquidity pair contract's security is not checked due to out of scope. The further transfers and operations with the funds raise are not related to this particular contract.

Liquidity locking details provided by the team:

- https://dxsale.app/app/v2_9/dxlockview?id=0&add=0xcD47238F19042A521831850d4522D65f83adb3Ba&type=lplock&chain=BSC
- https://dxsale.app/app/v2_9/dxlockview?id=1&add=0xcD47238F19042A521831850d4522D65f83adb3Ba&type=lplock&chain=BSC
- https://dxsale.app/app/v2_9/dxlockview?id=2&add=0xcD47238F19042A521831850d4522D65f83adb3Ba&type=lplock&chain=BSC

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