



# Smart Contract Security Audit

## Audit details:

Audited project:	HyperChain
Deployer address	0xcd47238f19042a521831850d4522d65f83adb3ba
Client contacts:	@QuantumdragonX
Blockchain:	Binance Smart Chain
Project website:	<a href="https://hyperchainx.com">https://hyperchainx.com</a>

April, 2021  
TechRate

# 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 to perform an audit of smart contracts:

- <https://bscscan.com/address/0x565d931cba7c7e1af3925f77124d5e2d68311bbe#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 09.04.2021.

Contract name:	HyperChain
Compiler version:	v0.6.12+commit.27d51765
Contract address:	0x3c00f8fcc8791fa78daa4a480095ec7d475781e2
Total supply:	1_000_000_000_000
Token ticker:	HYPER
Decimals:	7
Token holders:	350
Transactions count:	1176
Top 100 holders dominance:	92.67 %
Contract deployer address:	0xcd47238f19042a521831850d4522d65f83adb3ba
Contract's current owner address:	0xcd47238f19042a521831850d4522d65f83adb3ba
Current liquidity fee:	8 percent
Current tax fee:	2 percent
Total fees:	348_941_823_893_309_614
Uniswap V2 pair:	0xfd485038390791e18e5bb7cb4239c11e7966e4a3
Uniswap V2 router:	0x05ff2b0db69458a0750badebc4f9e13add608c7f
Max transaction amount:	5_000_000_000_000_000_000
Deployed at transaction:	0x817c53cdeaef7851b0ca17274fa68bb4df4d4c2468f055223ed55ab44e22431b
Trading enabled status:	True

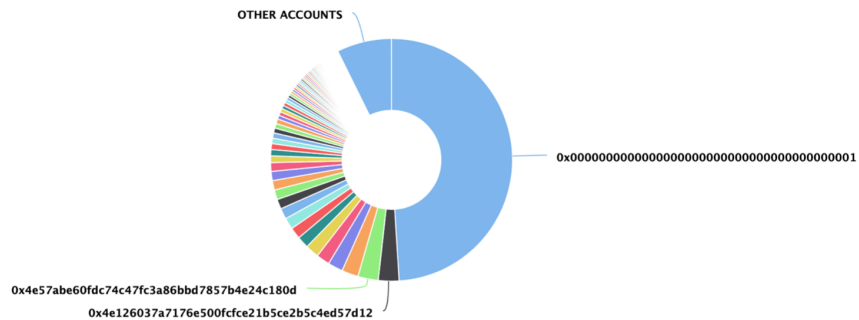
# HyperChain top 100 token distribution

The top 100 holders collectively own 92.67% (926,686,244,496.58 Tokens) of HyperChain

Token Total Supply: 1,000,000,000,000.00 Token | Total Token Holders: 350

HyperChain Top 100 Token Holders

Source: BscScan.com



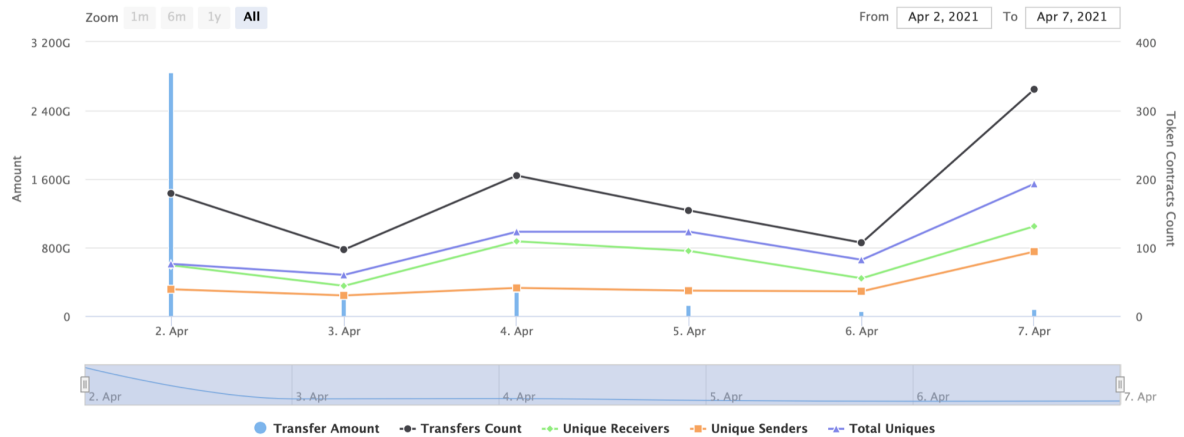
(A total of 926,686,244,496.58 tokens held by the top 100 accounts from the total supply of 1,000,000,000,000.00 token)

# HyperChain contract interaction details

Time Series: Token Contract Overview

Fri 2, Apr 2021 - Wed 7, Apr 2021

Token Contract 0x565d931cba7c7e1af3925f77124d5e2d68311bbe (HyperChain)  
Source: BscScan.com



# HyperChain top 5 holders

Rank	Address	Quantity	Percentage
1	0x0000000000000000000000000000000000000001	490,000,000,000	49.0000%
2	0x4e126037a7176e500fcfe21b5ce2b5c4ed57d12	27,719,470,265.8999	2.7719%
3	0x4e57abe60fdc74c47fc3a86bbd7857b4e24c180d	27,171,587,377.3839	2.7172%
4	PancakeSwap: HYPER 3	22,121,431,469.6339	2.2121%
5	0x07a099cd7e7a3ca92e168d9b4740a5ff56011990	20,008,013,332.2417	2.0008%

# Contract functions details

Function	Return value	Who can call
name()	string	public
symbol()	string	public
decimals()	uint8	public
totalSupply()	uint256	public
balanceOf(address)	uint256	public
transfer(address, uint256)	bool	public
allowance(address, address)	uint256	public
approve(address, uint256)	bool	public
transferfrom(address, address, uint256)	bool	public
increaseAllowance(address, uint256)	bool	public
decreaseAllowance(address, uint256)	bool	public
isExcludedFromReward(address)	bool	public
totalFees()	uint256	public
deliver()	void	public
excludeFromReward(address)	void	owner
includeInReward(address)	void	owner
excludeFromFee(address)	void	owner
includeInFee(address)	void	owner
isExcludedFromFee(address)	bool	public
setTaxFeePercent(uint256)	void	owner
setLiquidityFeePercent(uint256)	void	owner
setMaxTxPercent(uint256)	void	owner
setSwapAndLiquifyEnabled(bool)	void	owner
lock(uint256)	void	owner
enableTrading()	void	owner

# 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 severity issues only
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 `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 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:

Use EnumerableSet instead of array or do not use long arrays.

## Owner privileges

### 1. Owner privileges

- ❑ Owner can change the tax fee.

```
function setTaxFeePercent(uint256 taxFee) external onlyOwner() {
    _taxFee = taxFee;
}
```

- ❑ Owner can change the liquidity fee.

```
function setLiquidityFeePercent(uint256 liquidityFee) external onlyOwner() {
    _liquidityFee = liquidityFee;
}
```

- ❑ Owner can change the maximum transaction amount.

```
function setMaxTxPercent(uint256 maxTxPercent) external onlyOwner() {
    _maxTxAmount = _tTotal.mul(maxTxPercent).div(
        10**2
    );
}
```

- ❑ Owner can exclude from the fee.

```
function excludeFromFee(address account) public onlyOwner {
    _isExcludedFromFee[account] = true;
}
```

## Conclusion

Smart contracts do not contain any high severity issues! However, smart contracts contain owner privileges.

Techrate note:

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