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AUDIT COMPANY

Smart Contract Security Audit

TechRate

June, 2021

Audit Details

Audited project

PING

Deployer address

0x3022DAf0Ffb2FB3b1D33342e7f4e96b19eCeC30b

Client contacts:

PING team

Blockchain

Binance Smart Chain

Project website:

www.sonarplatform.io

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 PING to perform an audit of smart contracts:

https://bscscan.com/address/0x5546600f77eda1dcf2e8817ef4d617382e7f71f5#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

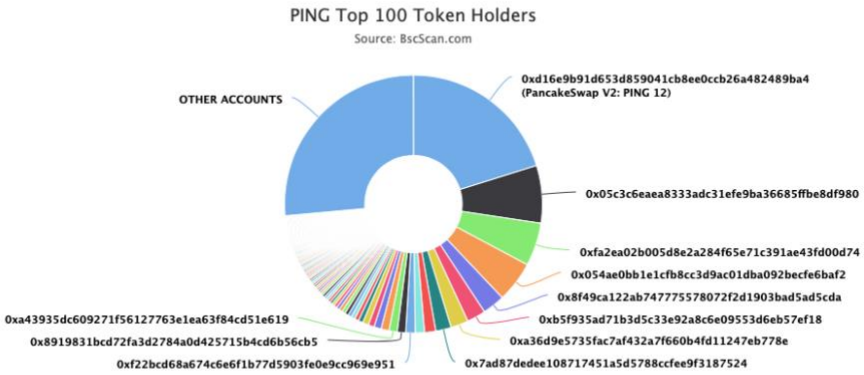
Token contract details for 24.06.2021

Contract name	PING
Contract address	0x5546600f77EdA1DCF2e8817eF4D617382E7f71F5
Total supply	4,000,000,000
Token ticker	PING
Decimals	9
Token holders	5,125
Transactions count	21,219
Top 100 holders dominance	73.55%
Liquidity fee	3
Rfi fee	2
Total fees	201632929520305649
Pancake V2 pair	0x10ed43c718714eb63d5aa57b78b54704e256024e
Contract deployer address	0x3022DAf0Ffb2FB3b1D33342e7f4e96b19eCeC30b
Contract's current owner address	0x62904ea228915dc1d6cf68d9cd89d8ad97cc22fb

PING Token Distribution

The top 100 holders collectively own 73.55% (2,942,161,968.99 Tokens) of PING

Token Total Supply: 4,000,000,000.00 Token | Total Token Holders: 5,124

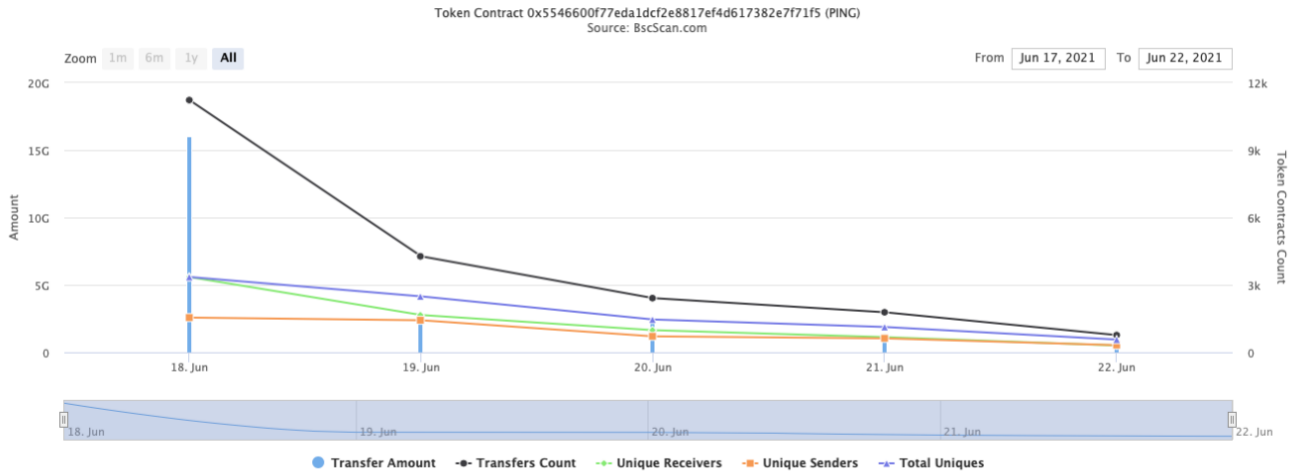


(A total of 2,942,161,968.99 tokens held by the top 100 accounts from the total supply of 4,000,000,000.00 token)

PING Contract Interaction Details

Time Series: Token Contract Overview

Fri 18, Jun 2021 - Tue 22, Jun 2021



PING Top 10 Token Holders

Rank	Address	Quantity (Token)	Percentage
1	PancakeSwap V2: PING 12	806,826,001.509821551	20.1707%
2	0x05c3c6eaea8333adc31efe9ba36685ffbe8df980	288,455,571.460960418	7.2114%
3	0xfa2ea02b005d8e2a284f65e71c391ae43fd00d74	216,363,644.324876764	5.4091%
4	0x054ae0bb1e1cfb8cc3d9ac01dba092becfe6baf2	205,515,015.692806959	5.1379%
5	0x8f49ca122ab747775578072f2d1903bad5ad5cda	111,985,032.611559836	2.7996%
6	0xb5f935ad71b3d5c33e92a8c6e09553d6eb57ef18	94,370,928.061736709	2.3593%
7	0xa36d9e5735fac7af432a7f660b4fd11247eb778e	87,892,923.234311101	2.1973%
8	0x7ad87dedee108717451a5d5788ccfee9f3187524	78,085,608.519351516	1.9521%
9	0x96b084effdab1eaa74413c506b6ee90cc31a47f6	55,641,353.778316848	1.3910%
10	0xc9c1bf219b855115ef4c77e77df9c48db71d5af3	46,850,723.051326836	1.1713%

Contract functions details

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

+ [Lib] SafeMath
  - [Int] tryAdd
  - [Int] trySub
  - [Int] tryMul
  - [Int] tryDiv
  - [Int] tryMod
  - [Int] add
  - [Int] sub
  - [Int] mul
  - [Int] div
  - [Int] mod
  - [Int] sub
  - [Int] div
  - [Int] mod

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

+ [Lib] Address
  - [Int] isContract
  - [Int] sendValue #
  - [Int] functionCall #
  - [Int] functionCall #
  - [Int] functionCallWithValue #
  - [Int] functionCallWithValue #
  - [Int] functionStaticCall
  - [Int] functionStaticCall
  - [Int] functionDelegateCall #
  - [Int] functionDelegateCall #
  - [Prv] _verifyCallResult

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

+ [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 #

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

+ PING (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] excludeFromRFI #
    - modifiers: onlyOwner
  - [Ext] includeInRFI #
    - modifiers: onlyOwner
  - [Pub] excludeFromFeeAndRfi #

    - modifiers: onlyOwner
  - [Pub] excludeFromFee #
    - modifiers: onlyOwner
  - [Pub] includeInFee #
    - modifiers: onlyOwner
  - [Pub] isExcludedFromFee
  - [Pub] setRfiRatesPercents #
    - modifiers: onlyOwner
  - [Pub] setWallets #
    - modifiers: onlyOwner
  - [Pub] setPresaleWallet #
    - modifiers: onlyOwner
  - [Ext] setMaxTxPercent #
    - modifiers: onlyOwner
  - [Ext] setMaxTxAmount #
    - modifiers: onlyOwner
  - [Ext] setThreshholdForLP #
    - modifiers: onlyOwner
  - [Pub] setSwapAndLiquifyEnabled #
    - modifiers: onlyOwner
  - [Ext] <Fallback> ($)
  - [Prv] _reflectRfi #
  - [Prv] _getValues
  - [Prv] _getTValues
  - [Prv] _getRValues
  - [Prv] _getRate
  - [Prv] _getCurrentSupply
  - [Prv] _takeLiquidity #
  - [Prv] _approve #
  - [Prv] _transfer #
  - [Prv] _tokenTransfer #
  - [Prv] reflectDevandResearchFee #
  - [Prv] swapAndLiquify #
    - modifiers: lockTheSwap
  - [Prv] swapTokensForBNB #
  - [Prv] addLiquidity #
  - [Pub] totalDevelopmentFee
  - [Pub] totalResearchFee

($) = 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.	Low issues
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 includeInRFI() 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 includeInRFI(address account) external onlyOwner() {
    require(_isExcluded[account], "Account is not 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.

2. Wrong reflectDevandResearchFee taking

Issue:

- The function `reflectDevandResearchFee()` do not check dev and research addresses to be excluded from reward and do not increase _tOwned balance of this addresses if needed.

```
function reflectDevandResearchFee(uint256 tDev⬆, uint256 tResearch⬆) private {
    uint256 currentRate =  _getRate();
    uint256 rDevelopent =  tDev⬆.mul(currentRate);
    uint256 rResearch =  tResearch⬆.mul(currentRate);
    _tDevelopmentTotal = _tDevelopmentTotal.add(tDev⬆);
    _rOwned[devWallet] = _rOwned[devWallet].add(rDevelopent);
    _tResearchTotal = _tResearchTotal.add(tResearch⬆);
    _rOwned[researchWallet] = _rOwned[researchWallet].add(rResearch);
}
```

Recommendation:

Check dev and research addresses to be excluded and increase addresses' _tOwned balance if needed.

Team comments:

Dev and Research wallets are already excluded from fee. _tOwned increment is not necessary as these wallets will not be excluded from reward.

Notes:

Now dev and research wallets are included in reward, if them would not be – this will be a high mistake

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

- Owner can change presale wallet.

```
function setPresaleWallet(address _presaleWallet⬆) public onlyOwner {
  _isExcludedFromFee[_presaleWallet⬆] = true;
  isPresaleWallet[_presaleWallet⬆]=true;
}
```

- Owner can change minimum number of tokens to add to liquidity.

```
function setThreshholdForLP(uint256 threshold⬆) external onlyOwner {
  numTokensSellToAddToLiquidity = threshold⬆ * 10**_decimals;
}
```

- Owner can exclude from fee and rfi.

```
function excludeFromFeeAndRfi(address account⬆) public onlyOwner {
    excludeFromFee(account⬆);
    excludeFromRFI(account⬆);
}
```

- Owner can change fee rates.

```
function setRfiRatesPercents(uint8 _rfi⬆, uint8 _lp⬆, uint8 _research⬆, uint8 _dev⬆) public onlyOwner {
  feeRates.rfi = _rfi⬆;
  feeRates.liquidity = _lp⬆;
  feeRates.research = _research⬆;
  feeRates.dev = _dev⬆;
  emit FeesChanged();
}
```

- Owner can change research and dev wallets.

```
function setWallets(address _research⬆, address _dev⬆) public onlyOwner {
  researchWallet = _research⬆;
  devWallet = _dev⬆;
  _isExcludedFromFee[_research⬆] = true;
  _isExcludedFromFee[_dev⬆] = true;
  emit WalletsChanged();
}
```

- Owner can change the maximum transaction amount.

```
function setMaxTxPercent(uint256 maxTxPercent⬆) external onlyOwner {
    uint256 _previoiusAmount = _maxTxAmount;
    _maxTxAmount = _tTotal.mul(maxTxPercent⬆).div(100);
    emit MaxTxAmountChanged(_previoiusAmount, _maxTxAmount);
 }
```

- Owner can exclude from the fee.

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

Conclusion

Smart contracts contain low severity issues! Liquidity pair contract's security is not checked due to out of scope.

Liquidity locking details provided by the team:
http://dxsale.app/app/pages/dxlockview?id=3934&add=0&type=lpdefi&chain=BSC

TechRate note:

Please check the disclaimer above and note, the audit makes no statements or warranties on business model, investment attractiveness or code sustainability. The report is provided for the only contract mentioned in the report and does not include any other potential contracts deployed by Owner.