



TechRate

AUDIT COMPANY

Pawthereum

Smart Contract Security Audit

TechRate

January, 2022

Audit Details



Audited project
Pawthereum



Deployer address
0x06b0a2c6beea3fd215d47324dd49e1ee3a4a9f25



Client contacts:
Pawthereum team



Blockchain
Binance Smart Chain



Project website:
<https://pawthereum.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 Pawthereum to perform an audit of smart contracts:

<https://bscscan.com/address/0x409e215738e31d8ab252016369c2dd9c2008fee0#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 10.01.2022

Contract name	Pawthereum
Contract address	0x409e215738E31d8aB252016369c2dd9c2008Fee0
Total supply	1,000,000,000
Token ticker	PAWTH
Decimals	9
Token holders	1
Transactions count	1
Top 100 holders dominance	100.00%
Tax fee	200
Liquidity fee	200
Max total fee	1200
Uniswap V2 pair	0x0babbb875c4eec2c3f3fc7936ec9632fdce1fac4
Contract deployer address	0x06b0a2c6beea3fd215d47324dd49e1ee3a4a9f25
Contract's current owner address	0x06b0a2c6beea3fd215d47324dd49e1ee3a4a9f25

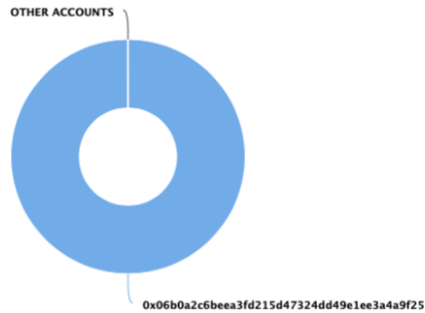
Pawthereum Token Distribution

The top 100 holders collectively own 100.00% (1,000,000,000.00 Tokens) of Pawthereum

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

Pawthereum Top 100 Token Holders

Source: BscScan.com



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

Pawthereum Contract Interaction Details

Time Series: Token Contract Overview

Fri 7, Jan 2022 - Fri 7, Jan 2022

Token Contract 0x409e215738e31d8ab252016369c2dd9c2008fee0 (Pawthereum)
Source: BscScan.com



Pawthereum Top 10 Token Holders

Rank	Address	Quantity (Token)	Percentage
1	0x06b0a2c6beea3fd215d47324dd49e1ee3a4a9f25	1,000,000,000	100.0000%

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)

- [Int] <Constructor> #
- [Pub] owner
- [Pub] renounceOwnership #
 - modifiers: onlyOwner
- [Pub] transferOwnership #
 - modifiers: onlyOwner

+ [Int] IUniswapV2Factory

- [Ext] createPair #

+ [Int] IUniswapV2Pair

- [Ext] sync #

+ [Int] IUniswapV2Router01

- [Ext] factory
- [Ext] WETH
- [Ext] addLiquidity #
- [Ext] addLiquidityETH (\$)

+ [Int] IUniswapV2Router02 (IUniswapV2Router01)

- [Ext] removeLiquidityETHSupportingFeeOnTransferTokens #
 - [Ext] swapExactTokensForETHSupportingFeeOnTransferTokens #
 - [Ext] swapExactTokensForTokensSupportingFeeOnTransferTokens #
 - [Ext] swapExactETHForTokensSupportingFeeOnTransferTokens (\$)
- + Pawtherium (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] isExcluded
 - [Pub] isTaxlessAccount
 - [Pub] reflectionFromToken
 - [Pub] tokenFromReflection
 - [Ext] excludeAccount #
 - modifiers: onlyOwner
 - [Ext] includeAccount #
 - modifiers: onlyOwner
 - [Prv] _approve #
 - [Prv] _transfer #
 - [Prv] collectFee #
 - [Prv] _getReflectionRate
 - [Prv] swapAndLiquify #
 - modifiers: lockTheSwap
 - [Prv] swapTokensForEth #
 - [Prv] addLiquidity #
 - [Ext] setLpTokenHolder #
 - modifiers: onlyOwner
 - [Ext] setPair #
 - modifiers: onlyOwner
 - [Ext] setMarketingWallet #
 - modifiers: onlyOwner
 - [Ext] setCharityWallet #
 - modifiers: onlyOwner
 - [Ext] setStakingWallet #
 - modifiers: onlyOwner
 - [Ext] setTaxless #
 - modifiers: onlyOwner
 - [Ext] setSwapAndLiquifyEnabled #
 - modifiers: onlyOwner
 - [Ext] setTaxActive #
 - modifiers: onlyOwner
 - [Ext] setTaxFee #
 - modifiers: onlyOwner
 - [Ext] setBurnFee #
 - modifiers: onlyOwner
 - [Ext] setLiquidityFee #

- modifiers: onlyOwner
- [Ext] setMarketingFee #
 - modifiers: onlyOwner
- [Ext] setCharityFee #
 - modifiers: onlyOwner
- [Ext] setMaxTxAmount #
 - modifiers: onlyOwner
- [Ext] setMaxTokensInSwap #
 - modifiers: onlyOwner
- [Ext] setMinTokensBeforeSwap #
 - modifiers: onlyOwner
- [Ext] setSwapAndLiquifyMarketing #
 - modifiers: onlyOwner
- [Ext] setSwapAndLiquifyCharity #
 - modifiers: onlyOwner
- [Ext] setAutomatedMarketMakerPair #
 - modifiers: onlyOwner
- [Ext] setRouterAddress #
 - modifiers: onlyOwner
- [Ext] setPurr #
 - modifiers: onlyOwner
- [Prv] _addThreeUints
- [Ext] withdrawTokenToOwner #
 - modifiers: onlyOwner
- [Ext] withdrawEthToOwner #
 - modifiers: onlyOwner
- [Ext] initLp (\$)
 - 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 `includeAccount()` 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 includeAccount(address account) external onlyOwner {
    require(!_isExcluded[account], "ERC20: Account is already included");
    for (uint256 i = 0; i < _excluded.length; i++) {
        if (_excluded[i] == account) {
            _excluded[i] = _excluded[_excluded.length - 1];
            _tokenBalance[account] = 0;
            _isExcluded[account] = false;
            _excluded.pop();
            break;
        }
    }
}
```

- The function `_getReflectionRate()` 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 _getReflectionRate() private view returns (uint256) {
    uint256 reflectionSupply = _reflectionTotal;
    uint256 tokenSupply = _tokenTotal;
    for (uint256 i = 0; i < _excluded.length; i++) {
        if (
            _reflectionBalance[_excluded[i]] > reflectionSupply ||
            _tokenBalance[_excluded[i]] > tokenSupply
        ) return _reflectionTotal.div(_tokenTotal);
        reflectionSupply = reflectionSupply.sub(
            _reflectionBalance[_excluded[i]]
        );
        tokenSupply = tokenSupply.sub(_tokenBalance[_excluded[i]]);
    }
    if (reflectionSupply < _reflectionTotal.div(_tokenTotal))
        return _reflectionTotal.div(_tokenTotal);
    return reflectionSupply.div(tokenSupply);
}
```

Recommendation:

Check that the excluded array length is not too big.

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

- Owner can change lpTokenHolder address.
- Owner can update Uniswap router and pair.
- Owner can change marketing, charity and staking wallet addresses.
- Owner can include in or exclude from the taxes.
- Owner can enable / disable swap and liquify.
- Owner can enable / disable taxes.
- Owner can change the tax, burn, liquidity, marketing and charity fee.
- Owner can change the maximum transaction amount.
- Owner can change the maximum tokens in swap.
- Owner can change minimum amounts of tokens needed to swap.
- Owner can enable/disable swapAndLiquifyMarketing and swapAndLiquifyCharity.
- Owner can include/exclude addresses in automatedMarketMakerPairs array.
- Owner can change Purr fees.
- Owner can withdraw ERC20 tokens and recalculate _liquidityTokensToSwap, _marketingTokensToSwap, _charityTokensToSwap values.
- Owner can withdraw contract BNBs.
- Owner can initialize liquidity.

Conclusion

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

Liquidity locking details are **NOT** provided by the team.

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.