Cyberscope

Audit Report

LION NETWORK

March 2024

Network	BSC
Address	0xDe5BBa2eA20b06571a00B8F0f955182b2068e418
Audited by	© cyberscope

Analysis

Critical Medium Minor / Informative Pass

Severity	Code	Description	Status
●	ST	Stops Transactions	Unresolved
●	OTUT	Transfers User's Tokens	Passed
●	ELFM	Exceeds Fees Limit	Unresolved
●	MT	Mints Tokens	Passed
●	BT	Burns Tokens	Passed
●	BC	Blacklists Addresses	Passed

Diagnostics

Critical Medium Minor / Informative

Severity	Code	Description	Status
●	IDI	Immutable Declaration Improvement	Unresolved
●	MC	Misleading Comment	Unresolved
●	PLPI	Potential Liquidity Provision Inadequacy	Unresolved
●	PTRP	Potential Transfer Revert Propagation	Unresolved
●	PVC	Price Volatility Concern	Unresolved
●	RED	Redudant Event Declaration	Unresolved
●	RO	Redundant Operation	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved
●	L09	Dead Code Elimination	Unresolved
●	L14	Uninitialized Variables in Local Scope	Unresolved
●	L17	Usage of Solidity Assembly	Unresolved
●	L20	Succeeded Transfer Check	Unresolved

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Review

Contract Name	LION
Compiler Version	v0.8.17+commit.8df45f5f
Optimization	200 runs
Explorer	https://bscscan.com/address/0xde5bba2ea20b06571a00b8f0f955182b2068e418
Address	0xde5bba2ea20b06571a00b8f0f955182b2068e418
Network	BSC
Symbol	LION
Decimals	18
Total Supply	100,000,000,000,000
Badge Eligibility	Must Fix Criticals

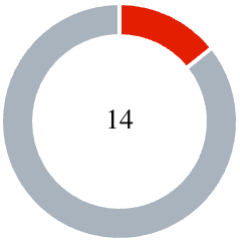
Audit Updates

Initial Audit	16 Mar 2024

Source Files

Filename	SHA256
LION.sol	df9ed4a589d2282d1fc13693db90f1afd4459db56e5f98285f944514624161ff

Findings Breakdown



Critical	2
Medium	0
Minor / Informative	12

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	2	0	0	0
Medium	0	0	0	0
Minor / Informative	12	0	0	0

ST - Stops Transactions

Criticality	Critical
Location	LION.sol#L829
Status	Unresolved

Description

The contract owner has the authority to stop the buys for all users excluding the authorized addresses. The owner may take advantage of it by setting the `_totalFeesOnBuy` more than 100%.

```
uint256 fees = (amount * _totalFees) / 100;
amount = amount - fees;
```

The contract owner has the authority to stop the sales for all users excluding the authorized addresses. The owner may take advantage of it by setting the `_totalFeesOnSell` more than 100%.

Additionally, the contract owner has the authority to stop the sales for all users excluding the owner, as described in detail in sections PLPI, PTRP, and PVC. As a result, the contract might operate as a honeypot. As a result, the contract may operate as a honeypot.

```
uint256 fees = (amount * _totalFees) / 100;
amount = amount - fees;
```

Recommendation

The team should carefully manage the private keys of the owner's account. We strongly recommend a powerful security mechanism that will prevent a single user from accessing the contract admin functions.

Temporary Solutions:

These measurements do not decrease the severity of the finding

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-signature wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.

Permanent Solution:

- Renouncing the ownership, which will eliminate the threats but it is non-reversible.

ELFM - Exceeds Fees Limit

Criticality	Critical
Location	LION.sol#L754,764
Status	Unresolved

Description

The contract owner has the authority to increase over the allowed limit of 25%. The owner may take advantage of it by calling the `updateBuyFees` and `updateSellFees` functions with a high percentage value.

```
function updateBuyFees(uint256 _taxFeeOnBuy) external onlyOwner {
    taxFeeOnBuy = _taxFeeOnBuy;

    _totalFeesOnBuy   = taxFeeOnBuy;

    require(_totalFeesOnBuy + _totalFeesOnSell <= 200, "Total Fees cannot
exceed the maximum");

    emit UpdateBuyFees(taxFeeOnBuy);
}

function updateSellFees(uint256 _taxFeeOnSell) external onlyOwner {
    taxFeeOnSell = _taxFeeOnSell;

    _totalFeesOnSell   = taxFeeOnSell;

    require(_totalFeesOnBuy + _totalFeesOnSell <= 200, "Total Fees cannot
exceed the maximum");

    emit UpdateSellFees(taxFeeOnSell);
}
```

Recommendation

The contract could embody a check for the maximum acceptable value. The team should carefully manage the private keys of the owner's account. We strongly recommend a powerful security mechanism that will prevent a single user from accessing the contract admin functions.

Temporary Solutions:

These measurements do not decrease the severity of the finding

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-signature wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.

Permanent Solution:

- Renouncing the ownership, which will eliminate the threats but it is non-reversible.

IDI - Immutable Declaration Improvement

Criticality	Minor / Informative
Location	LION.sol#L705
Status	Unresolved

Description

The contract declares state variables that their value is initialized once in the constructor and are not modified afterwards. The `immutable` is a special declaration for this kind of state variables that saves gas when it is defined.

```
uniswapV2Pair
```

Recommendation

By declaring a variable as immutable, the Solidity compiler is able to make certain optimizations. This can reduce the amount of storage and computation required by the contract, and make it more gas-efficient.

MC - Misleading Comment

Criticality	Minor / Informative
Location	LION.sol#L862
Status	Unresolved

Description

The contract initializes the `taxFeeOnSell` variable in the constructor with 100% fees. On the contrary, the comment describes that the fees are 7%. The misleading comment might confuse the users since it may produce false assumptions.

```
taxFeeOnBuy = 0; ///0% buy fee
taxFeeOnSell = 100; //7% sell fee
```

Recommendation

The team is adviced to investigate the business logic and adjust the comments according to the implementation.

PLPI - Potential Liquidity Provision Inadequacy

Criticality	Minor / Informative
Location	LION.sol#L852
Status	Unresolved

Description

The contract operates under the assumption that liquidity is consistently provided to the pair between the contract's token and the native currency. However, there is a possibility that liquidity is provided to a different pair. This inadequacy in liquidity provision in the main pair could expose the contract to risks. Specifically, during eligible transactions, where the contract attempts to swap tokens with the main pair, a failure may occur if liquidity has been added to a pair other than the primary one. Consequently, transactions triggering the swap functionality will result in a revert.

```
uniswapV2Router.swapExactTokensForETHSupportingFeeOnTransferTokens(
    tokenAmount,
    0,
    path,
    address(this),
    block.timestamp);
```

Recommendation

The team is advised to implement a runtime mechanism to check if the pair has adequate liquidity provisions. This feature allows the contract to omit token swaps if the pair does not have adequate liquidity provisions, significantly minimizing the risk of potential failures.

Furthermore, the team could ensure the contract has the capability to switch its active pair in case liquidity is added to another pair.

Additionally, the contract could be designed to tolerate potential reverts from the swap functionality, especially when it is a part of the main transfer flow. This can be achieved by executing the contract's token swaps in a non-reversible manner, thereby ensuring a more resilient and predictable operation.

PTRP - Potential Transfer Revert Propagation

Criticality	Minor / Informative
Location	LION.sol#L861
Status	Unresolved

Description

The contract sends funds to a `taxWallet` as part of the transfer flow. This address can either be a wallet address or a contract. If the address belongs to a contract then it may revert from incoming payment. As a result, the error will propagate to the token's contract and revert the transfer.

```
payable(taxWallet).sendValue(newBalance);
```

Recommendation

The contract should tolerate the potential revert from the underlying contracts when the interaction is part of the main transfer flow. This could be achieved by not allowing set contract addresses or by sending the funds in a non-revertable way.

PVC - Price Volatility Concern

Criticality	Minor / Informative
Location	LION.sol#L838
Status	Unresolved

Description

The contract accumulates tokens from the taxes to swap them for ETH. The variable `swapTokensAtAmount` sets a threshold where the contract will trigger the swap functionality. If the variable is set to a big number, then the contract will swap a huge amount of tokens for ETH.

It is important to note that the price of the token representing it, can be highly volatile. This means that the value of a price volatility swap involving Ether could fluctuate significantly at the triggered point, potentially leading to significant price volatility for the parties involved.

```
function setSwapTokensAtAmount(uint256 newAmount) external onlyOwner{
    require(newAmount > totalSupply() / 1_000_000_000_000,
"SwapTokensAtAmount must be greater than 0.0001% of total supply");
    swapTokensAtAmount = newAmount;

    emit SwapTokensAtAmountUpdated(swapTokensAtAmount);
}
```

Recommendation

The contract could ensure that it will not sell more than a reasonable amount of tokens in a single transaction. A suggested implementation could check that the maximum amount should be less than a fixed percentage of the exchange reserves. Hence, the contract will guarantee that it cannot accumulate a huge amount of tokens in order to sell them.

RED - Redudant Event Declaration

Criticality	Minor / Informative
Location	LION.sol#L687
Status	Unresolved

Description

The contract uses events that are not emitted within the contract's functions. As a result, these declared events are redundant and serve no purpose within the contract's current implementation.

```
event SwapAndLiquify(uint256 tokensSwapped,uint256 bnbReceived,uint256
tokensIntoLiqudity);
```

Recommendation

To optimize contract performance and efficiency, it is advisable to regularly review and refactor the codebase, removing the unused event declarations. This proactive approach not only streamlines the contract, reducing deployment and execution costs but also enhances readability and maintainability.

RO - Redundant Operation

Criticality	Minor / Informative
Location	LION.sol#L809
Status	Unresolved

Description

There are code segments that could be optimized. A segment may be optimized so that it becomes a smaller size, consumes less memory, executes more rapidly, or performs fewer operations.

The `taxShare` and `totalFee` have the same value, hence the value of `taxTokens` will be equal to `contractTokenBalance`.

```
uint256 taxTokens = contractTokenBalance * taxShare / totalFee;
```

Recommendation

The team is advised to take these segments into consideration and rewrite them so the runtime will be more performant. That way it will improve the efficiency and performance of the source code and reduce the cost of executing it.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	LION.sol#L33,34,51,71,754,764,774
Status	Unresolved

Description

The Solidity style guide is a set of guidelines for writing clean and consistent Solidity code. Adhering to a style guide can help improve the readability and maintainability of the Solidity code, making it easier for others to understand and work with.

The followings are a few key points from the Solidity style guide:

1. Use camelCase for function and variable names, with the first letter in lowercase (e.g., myVariable, updateCounter).
2. Use PascalCase for contract, struct, and enum names, with the first letter in uppercase (e.g., MyContract, UserStruct, ErrorEnum).
3. Use uppercase for constant variables and enums (e.g., MAX_VALUE, ERROR_CODE).
4. Use indentation to improve readability and structure.
5. Use spaces between operators and after commas.
6. Use comments to explain the purpose and behavior of the code.
7. Keep lines short (around 120 characters) to improve readability.

```
function DOMAIN_SEPARATOR() external view returns (bytes32);
function PERMIT_TYPEHASH() external pure returns (bytes32);
function MINIMUM_LIQUIDITY() external pure returns (uint);
function WETH() external pure returns (address);
uint256 _taxFeeOnBuy
uint256 _taxFeeOnSell
address _taxWallet
```

Recommendation

By following the Solidity naming convention guidelines, the codebase increased the readability, maintainability, and makes it easier to work with.
Find more information on the Solidity documentation
https://docs.soliditylang.org/en/v0.8.17/style-guide.html#naming-convention.

L09 - Dead Code Elimination

Criticality	Minor / Informative
Location	LION.sol#L253,302,312,331,345,362,372,387,397,412,436,448,622
Status	Unresolved

Description

In Solidity, dead code is code that is written in the contract, but is never executed or reached during normal contract execution. Dead code can occur for a variety of reasons, such as:

- Conditional statements that are always false.
- Functions that are never called.
- Unreachable code (e.g., code that follows a return statement).

Dead code can make a contract more difficult to understand and maintain, and can also increase the size of the contract and the cost of deploying and interacting with it.

```
function isContract(address account) internal view returns (bool) {
        // This method relies on extcodesize/address.code.length, which
returns 0
        // for contracts in construction, since the code is only stored at
the end
        // of the constructor execution.

        return account.code.length > 0;
    }

function functionCall(address target, bytes memory data) internal returns
(bytes memory) {
        return functionCallWithValue(target, data, 0, "Address: low-level
call failed");
    }

...
```

Recommendation

To avoid creating dead code, it's important to carefully consider the logic and flow of the contract and to remove any code that is not needed or that is never executed. This can help improve the clarity and efficiency of the contract.

L14 - Uninitialized Variables in Local Scope

Criticality	Minor / Informative
Location	LION.sol#L693
Status	Unresolved

Description

Using an uninitialized local variable can lead to unpredictable behavior and potentially cause errors in the contract. It's important to always initialize local variables with appropriate values before using them.

```
address router
```

Recommendation

By initializing local variables before using them, the contract ensures that the functions behave as expected and avoid potential issues.

L17 - Usage of Solidity Assembly

Criticality	Minor / Informative
Location	LION.sol#L453
Status	Unresolved

Description

Using assembly can be useful for optimizing code, but it can also be error-prone. It's important to carefully test and debug assembly code to ensure that it is correct and does not contain any errors.

Some common types of errors that can occur when using assembly in Solidity include Syntax, Type, Out-of-bounds, Stack, and Revert.

```
assembly {
                let returndata_size := mload(returndata)
                revert(add(32, returndata), returndata_size)
            }
```

Recommendation

It is recommended to use assembly sparingly and only when necessary, as it can be difficult to read and understand compared to Solidity code.

L20 - Succeeded Transfer Check

Criticality	Minor / Informative
Location	LION.sol#L738
Status	Unresolved

Description

According to the ERC20 specification, the transfer methods should be checked if the result is successful. Otherwise, the contract may wrongly assume that the transfer has been established.

```
ERC20token.transfer(msg.sender, balance)
```

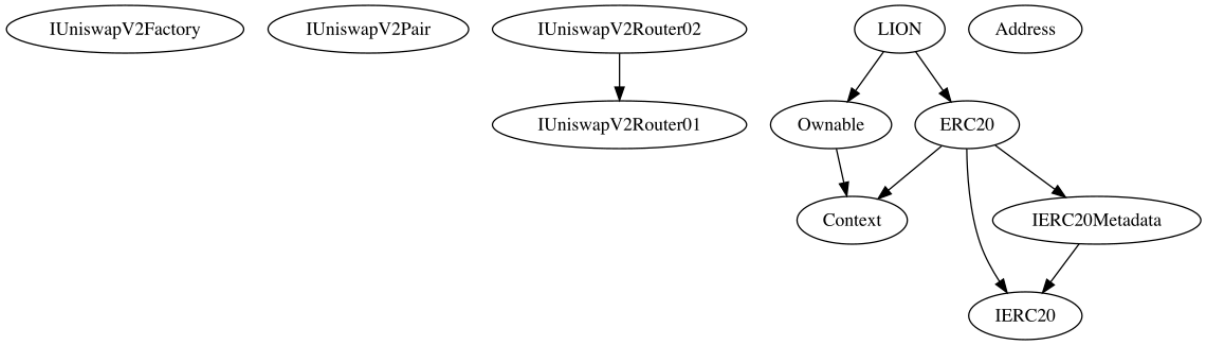
Recommendation

The contract should check if the result of the transfer methods is successful. The team is advised to check the SafeERC20 library from the Openzeppelin library.

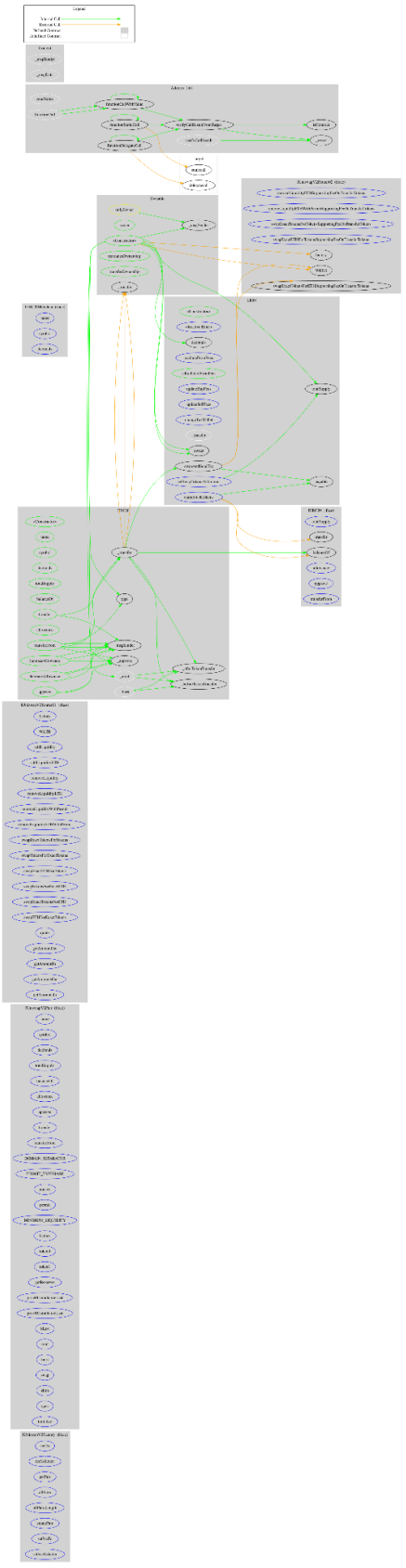
Functions Analysis

Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
LION	Implementation	ERC20, Ownable		
		Public	✓	ERC20
		External	Payable	-
	claimStuckTokens	External	✓	onlyOwner
	excludeFromFees	External	✓	onlyOwner
	isExcludedFromFees	Public		-
	updateBuyFees	External	✓	onlyOwner
	updateSellFees	External	✓	onlyOwner
	changeTaxWallet	External	✓	onlyOwner
	_transfer	Internal	✓	
	setSwapTokensAtAmount	External	✓	onlyOwner
	swapAndSendTax	Private	✓	

Inheritance Graph



Flow Graph



Summary

LION NETWORK contract implements a token mechanism. This audit investigates security issues, business logic concerns, and potential improvements. There are some functions that can be abused by the owner like stopping transactions and manipulating the fees. A multi-wallet signing pattern will provide security against potential hacks. Temporarily locking the contract or renouncing ownership will eliminate all the contract threats.

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The Cyberscope team

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