Cyberscope

Audit Report

MeowMeowGirl

June 2023

Network	BSC
Address	0xf3adf3651d5b069525b9e005d1ebc411242a83ec
Audited by	© cyberscope

Analysis

● Critical ● Medium ● Minor / Informative ● Pass

Severity	Code	Description	Status
●	ST	Stops Transactions	Passed
●	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
●	PVC	Price Volatility Concern	Unresolved
●	RSD	Redundant Swap Duplication	Unresolved
●	PTRP	Potential Transfer Revert Propagation	Unresolved
●	IDI	Immutable Declaration Improvement	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	MeowMeowGirl
Compiler Version	v0.8.19+commit.7dd6d404
Optimization	200 runs
Explorer	https://bscscan.com/address/0xf3adf3651d5b069525b9e005d1ebc411242a83ec
Address	0xf3adf3651d5b069525b9e005d1ebc411242a83ec
Network	BSC
Symbol	MMGirl
Decimals	18
Total Supply	1,000,000,000

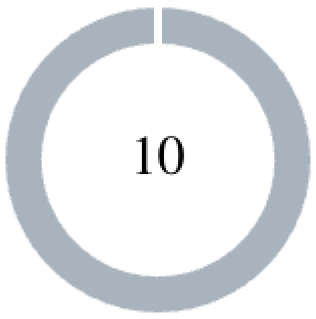
Audit Updates

Initial Audit	03 Jun 2023

Source Files

Filename	SHA256
MeowMeowGirl.sol	301f4f1abf9b2682841652e1a7ad55b9b44711c4c05a37ae225e8c1d9e5e523d

Findings Breakdown



●	Critical	0
●	Medium	0
●	Minor / Informative	10

	Severity	Unresolved	Acknowledged	Resolved	Other
●	Critical	0	0	0	0
●	Medium	0	0	0	0
●	Minor / Informative	10	0	0	0

ELFM - Exceeds Fees Limit

Criticality	Minor / Informative
Location	MeowMeowGirl.sol#L756
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` or `updateSellFees` function with percentage up to 30%.

```
    function updateBuyFees(uint256 _PoolFeeOnBuy, uint256
_developmentFeeOnBuy) external onlyOwner {
        PoolFeeOnBuy = _PoolFeeOnBuy;
        developmentFeeOnBuy = _developmentFeeOnBuy;


        _totalFeesOnBuy = PoolFeeOnBuy + developmentFeeOnBuy;

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

        emit UpdateBuyFees(PoolFeeOnBuy, developmentFeeOnBuy);
    }
    function updateSellFees(uint256 _PoolFeeOnSell, uint256
_developmentFeeOnSell) external onlyOwner {
        PoolFeeOnSell = _PoolFeeOnSell;
        developmentFeeOnSell = _developmentFeeOnSell;



        _totalFeesOnSell   = PoolFeeOnSell + developmentFeeOnSell;

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

        emit UpdateSellFees(PoolFeeOnSell, developmentFeeOnSell);
    }
```

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. Some suggestions are:

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-sign wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.
- Renouncing the ownership will eliminate the threats but it is non-reversible.

PVC - Price Volatility Concern

Criticality	Minor / Informative
Location	MeowMeowGirl.sol#L854
Status	Unresolved

Description

The contract accumulates tokens from the taxes to swap them for ETH. The variable `setSwapTokensAtAmount` 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,
"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 total supply. Hence, the contract will guarantee that it cannot accumulate a huge amount of tokens in order to sell them.

RSD - Redundant Swap Duplication

Criticality	Minor / Informative
Location	MeowMeowGirl.sol#L821
Status	Unresolved

Description

During the liquidation phase, the contract swaps the amount twice and sends the amounts to the corresponding address. The first one goes to the pool wallet and the second one goes to the development wallet. The duplicate execution of the swap method increases dramatically the gas consumption.

```
if (PoolShare > 0) {
    uint256 PoolTokens = contractTokenBalance * PoolShare /
totalFee;
    swapAndSendPool(PoolTokens);
}

if (developmentShare > 0) {
    uint256 developmentTokens = contractTokenBalance *
developmentShare / totalFee;
    swapAndSendDevelopment(developmentTokens);
}
```

Recommendation

The team is advised to swap the total amount that is going to be liquified and transfer the proportional amount to the corresponding address. As a result, the contract will swap the amount once and the gas consumption will be decreased.

PTRP - Potential Transfer Revert Propagation

Criticality	Minor / Informative
Location	MeowMeowGirl.sol#L876,896
Status	Unresolved

Description

The contract sends funds to `PoolWallet` , `developmentWallet` 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(PoolWallet).sendValue(newBalance);
payable(developmentWallet).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.

IDI - Immutable Declaration Improvement

Criticality	Minor / Informative
Location	MeowMeowGirl.sol#L708,709,715
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.

```
uniswapV2Router
uniswapV2Pair
maxFee
```

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.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	MeowMeowGirl.sol#L33,34,51,71,671,672,678,684,752,763,775,782
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 public  PoolFeeOnBuy
uint256 public  PoolFeeOnSell
address public  PoolWallet
event developmentWalletChanged(address developmentWallet);
uint256 _PoolFeeOnBuy
uint256 _developmentFeeOnBuy
uint256 _PoolFeeOnSell
uint256 _developmentFeeOnSell
address _PoolWallet
address _developmentWallet
```

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	MeowMeowGirl.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	MeowMeowGirl.sol#L694
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	MeowMeowGirl.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	MeowMeowGirl.sol#L741
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.

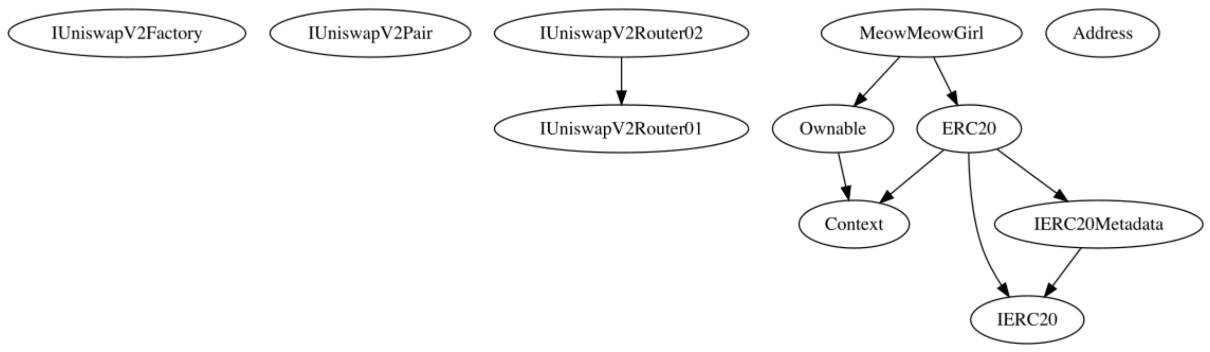
Functions Analysis

Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
Address	Library			
	isContract	Internal		
	sendValue	Internal	✓	
	functionCall	Internal	✓	
	functionCall	Internal	✓	
	functionCallWithValue	Internal	✓	
	functionCallWithValue	Internal	✓	
	functionStaticCall	Internal		
	functionStaticCall	Internal		
	functionDelegateCall	Internal	✓	
	functionDelegateCall	Internal	✓	
	verifyCallResultFromTarget	Internal		
	verifyCallResult	Internal		
	_revert	Private		
Context	Implementation			
	_msgSender	Internal		
	_msgData	Internal		

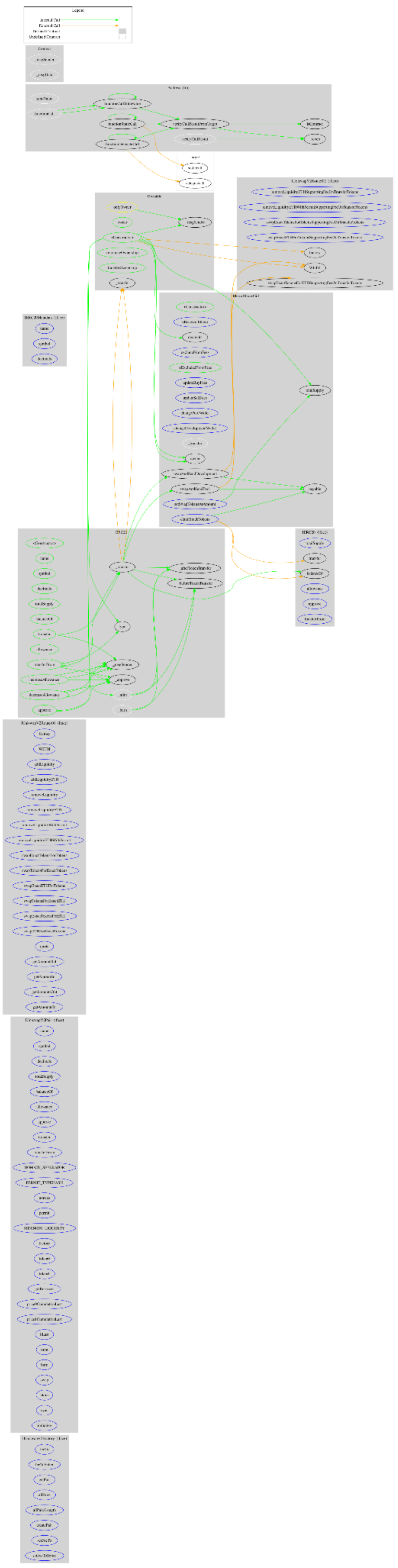
Ownable	Implementation	Context		
		Public	✓	-
	owner	Public		-
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
ERC20	Implementation	Context, IERC20, IERC20Metadata		
		Public	✓	-
	name	Public		-
	symbol	Public		-
	decimals	Public		-
	totalSupply	Public		-
	balanceOf	Public		-
	transfer	Public	✓	-
	allowance	Public		-
	approve	Public	✓	-
	transferFrom	Public	✓	-
	increaseAllowance	Public	✓	-
	decreaseAllowance	Public	✓	-
	_transfer	Internal	✓	
	_mint	Internal	✓	
	_burn	Internal	✓	

	_approve	Internal	✓	
	_beforeTokenTransfer	Internal	✓	
	_afterTokenTransfer	Internal	✓	
MeowMeowGirl	Implementation	ERC20, Ownable		
		Public	✓	ERC20
		External	Payable	-
	claimStuckTokens	External	✓	onlyOwner
	excludeFromFees	External	✓	onlyOwner
	isExcludedFromFees	Public		-
	updateBuyFees	External	✓	onlyOwner
	updateSellFees	External	✓	onlyOwner
	changePoolWallet	External	✓	onlyOwner
	changeDevelopmentWallet	External	✓	onlyOwner
	_transfer	Internal	✓	
	setSwapTokensAtAmount	External	✓	onlyOwner
	swapAndSendPool	Private	✓	
	swapAndSendDevelopment	Private	✓	

Inheritance Graph



Flow Graph



Summary

MeowMeowGirl 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 manipulate 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. There is a limit of max 30% fees.

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Cyberscope is one of the leading smart contract audit firms in the crypto space and has built a high-profile network of clients and partners.

The Cyberscope team

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