Cyberscope

Audit Report

NexusGalaxy

February 2023

Type	BEP20
Network	BSC Testnet
Address	0xf400828FE1bbAcF61f952c0A7547C0BfAA3a2549
Audited by	© cyberscope

Table of Contents

Review

Contract Name	NexusGalaxy
Compiler Version	v0.8.0+commit.c7dfd78e
Optimization	200 runs
Testing Deploy	https://testnet.bscscan.com/address/0xf400828fe1bbacf61f952c0a7547c0bfaa3a2549
Address	0xf400828fe1bbacf61f952c0a7547c0bfaa3a2549
Network	BSC_TESTNET
Symbol	NXS
Decimals	18
Total Supply	1,000,000,000

Audit Updates

Initial Audit	08 Feb 2023 https://github.com/cyberscope-io/audits/tree/main/ng/v1/audit.pdf
Corrected Phase 2	15 Feb 2023

Source Files

Filename	SHA256
@openzeppelin/contracts/access/Ownable.sol	9353af89436556f7ba8abb3f37a6677249aa4df6024fbfaa94f79ab2f44f3231
@openzeppelin/contracts/token/ERC20/ERC20.sol	5031430cc2613c32736d598037d3075985a2a09e61592a013dbd09a5bc2041b8
@openzeppelin/contracts/token/ERC20/extensions/IERC20Metadata.sol	af5c8a77965cc82c33b7ff844deb9826166689e55dc037a7f2f790d057811990
@openzeppelin/contracts/token/ERC20/IERC20.sol	94f23e4af51a18c2269b355b8c7cf4db8003d075c9c541019eb8dcf4122864d5
@openzeppelin/contracts/utils/Context.sol	1458c260d010a08e4c20a4a517882259a23a4baa0b5bd9add9fb6d6a1549814a
@uniswap/v2-periphery/contracts/interfaces/IUniswapV2Router01.sol	0439ffe0fd4a5e1f4e22d71ddbda76d63d61679947d158cba4ee0a1da60cf663
@uniswap/v2-periphery/contracts/interfaces/IUniswapV2Router02.sol	a2900701961cb0b6152fc073856b972564f7c798797a4a044e83d2ab8f0e8d38
contracts/NexusGalaxy.sol	2fd5f4ea74b1c99a9798d2010c1742ef6b9d3a8fccef69789e457a9a61257993

Analysis

● Critical ● Medium ● Minor / Informative ● Pass

Severity	Code	Description	Status
●	ST	Stops Transactions	Passed
●	OCTD	Transfers Contract's Tokens	Acknowledged
●	OTUT	Transfers User's Tokens	Passed
●	ELFM	Exceeds Fees Limit	Passed
●	ULTW	Transfers Liquidity to Team Wallet	Passed
●	MT	Mints Tokens	Passed
●	BT	Burns Tokens	Passed
●	BC	Blacklists Addresses	Passed

OCTD - Transfers Contract's Tokens

Criticality	Minor / Informative
Location	NexusGalaxy.sol#L137
Status	Acknowledged

Description

The contract owner has the authority to claim all the balance of the contract. The owner may take advantage of it by calling the `withdrawTokens` function.

```
function withdrawTokens(address tokensAddrs, address to,  uint amount) public
lockWhileDistribution onlyOwner {
  IERC20(tokensAddrs).transfer(to, amount);
}
```

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. That risk can be prevented by temporarily locking the contract or renouncing ownership.

Team Update

The team responded with the following comment:

Withdraw token is there to withdraw any token owned by contract. It is kept their purposely. Reason behind keeping this function is to withdraw any from contract as there's no other way to transfer tokens owned by contract, otherwise tokens owned by contract will get locked there permanently.

Diagnostics

Critical Medium Minor / Informative

Severity	Code	Description	Status
●	DAV	Deployment Argument Validation	Unresolved
●	CO	Code Optimization	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved
●	L07	Missing Events Arithmetic	Unresolved
●	L16	Validate Variable Setters	Unresolved
●	L20	Succeeded Transfer Check	Unresolved

DAV - Deployment Argument Validation

Criticality	Minor / Informative
Location	NexusGalaxy.sol#L41
Status	Unresolved

Description

The contract does not properly sanitize the constructor arguments. These variables may produce vulnerability issues.

The `taxPercent` arguments might exceed the allowed limit of 25%. Additionally, the underlying percentages are not properly sanitized.

```
constructor(uint256 initialSupply, address _outTaxToken, address _router, address
_backToWalletAddress, address _teamAddress, address _marketingAddress, address
_developmentAddress, uint[] memory _taxes) ERC20("Nexus Galaxy", "NXS") {
    _mint(msg.sender, initialSupply);
    outTaxToken = _outTaxToken;
    router = IUniswapV2Router02(_router);

    backToWalletAddress = _backToWalletAddress;
    teamAddress = _teamAddress;
    marketingAddress = _marketingAddress;
    developmentAddress = _developmentAddress;

    taxPercent = _taxes[0];
    backToWalletPercentage = _taxes[1];
    teamPercent = _taxes[2];
    marketingPercent = _taxes[3];
    developmentPercent = _taxes[4];
    burnPercent = _taxes[5];
    backToHoldersPercent = _taxes[6];

    toggleTaxes = true;
}
```

Recommendation

The team is advised to properly check the variables according to the required specifications.

- The variable `taxPercent` shouldn't exceed the maximum acceptable value.
- The aggregation of the variables `backToWalletPercentage`, `teamPercent`, `marketingPercent`, `developmentPercent` shouldn't be set to values greater than 100.
- The aggregation of the variables `backToHoldersPercent`, `burnPercent` shouldn't be set to values greater than the `taxPercent`.

CO - Code Optimization

Criticality	Minor / Informative
Location	NexusGalaxy.sol#L118
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 statement `isLp[recentHoldersAddress]` is unnecessary since the liquidity pool address is never included in the `recentHoldersAddress`.

```
function updateAndPayRecentHolders(address addr, uint value) private
lockWhileDistribution{
    for(uint i=0; i<recentHoldersAddress.length; i++){
        if(recentHoldersAddress[i] != address(0) && !isLp[recentHoldersAddress[i]])
            super._transfer(address(this), recentHoldersAddress[i],
value/recentHoldersAddress.length);
    }

    if(isLp[addr]){
        return;
    }

    recentHoldersAddress[currentId] = addr;
    if(currentId == 4){
        currentId = 0;
    }else{
        currentId++;
    }
}
```

Recommendation

The team is advised to take into consideration these segments 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. It is recommended to remove redundant statements.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	contracts/NexusGalaxy.sol#L31,107
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.

```
bool _inTaxDistribution
address _taxReciever
uint _amount

function SwapandPayTaxes(address _taxReciever, uint _amount) private{

        address[] memory path = new address[](2);
        path[0] = address(address(this));
        path[1] = address(outTaxToken);
        uint256 outputAmount = router.getAmountsOut(_amount, path)[1];

        router.swapExactTokensForTokens(_amount, outputAmount, path, _taxReciever,
block.timestamp);

    }
```

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.

L07 - Missing Events Arithmetic

Criticality	Minor / Informative
Location	contracts/NexusGalaxy.sol#L104
Status	Unresolved

Description

Events are a way to record and log information about changes or actions that occur within a contract. They are often used to notify external parties or clients about events that have occurred within the contract, such as the transfer of tokens or the completion of a task.

It's important to carefully design and implement the events in a contract, and to ensure that all required events are included. It's also a good idea to test the contract to ensure that all events are being properly triggered and logged.

```
totalTax -= releaseAmount
```

Recommendation

By including all required events in the contract and thoroughly testing the contract's functionality, the contract ensures that it performs as intended and does not have any missing events that could cause issues with its arithmetic.

L16 - Validate Variable Setters

Criticality	Minor / Informative
Location	contracts/NexusGalaxy.sol#L43,46,47,48,49,150,153,156,159,163
Status	Unresolved

Description

The contract performs operations on variables that have been configured on user-supplied input. These variables are missing of proper check for the case where a value is zero. This can lead to problems when the contract is executed, as certain actions may not be properly handled when the value is zero.

```
outTaxToken = _outTaxToken
backToWalletAddress = _backToWalletAddress
teamAddress = _teamAddress
marketingAddress = _marketingAddress
developmentAddress = _developmentAddress
backToWalletAddress = addr
teamAddress = addr
marketingAddress = addr
developmentAddress = addr
outTaxToken = addr
```

Recommendation

By adding the proper check, the contract will not allow the variables to be configured with zero value. This will ensure that the contract can handle all possible input values and avoid unexpected behavior or errors. Hence, it can help to prevent the contract from being exploited or operating unexpectedly.

L20 - Succeeded Transfer Check

Criticality	Minor / Informative
Location	contracts/NexusGalaxy.sol#L138
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.

```
IERC20(tokensAddrs).transfer(to, amount)
```

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

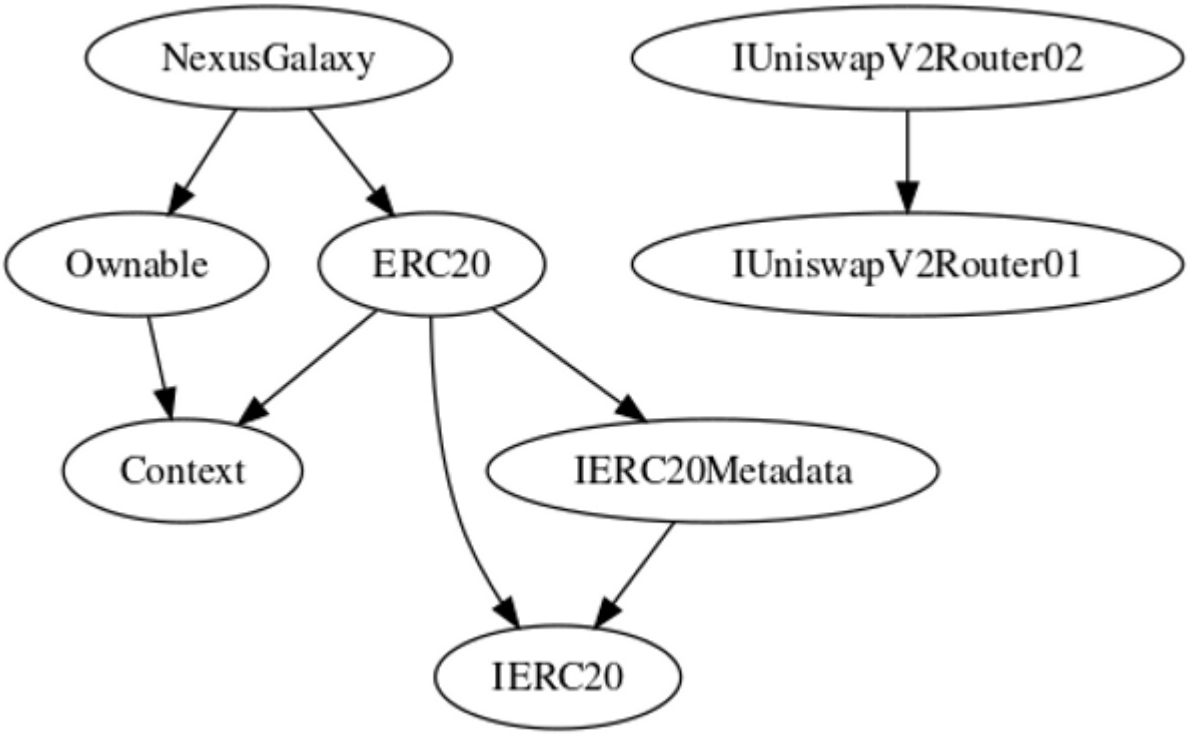
Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
Ownable	Implementation	Context		
		Public	✓	-
	owner	Public		-
	_checkOwner	Internal		
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
	_transferOwnership	Internal	✓	
ERC20	Implementation	Context, 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	✓	
	_spendAllowance	Internal	✓	
	_beforeTokenTransfer	Internal	✓	
	_afterTokenTransfer	Internal	✓	
IERC20Metadata	Interface	IERC20		
	name	External		-
	symbol	External		-
	decimals	External		-
IERC20	Interface			
	totalSupply	External		-
	balanceOf	External		-
	transfer	External	✓	-
	allowance	External		-
	approve	External	✓	-
	transferFrom	External	✓	-
Context	Implementation			
	_msgSender	Internal		
	_msgData	Internal		
IUniswapV2Router01	Interface			
	factory	External		-
	WETH	External		-
	addLiquidity	External	✓	-
	addLiquidityETH	External	Payable	-

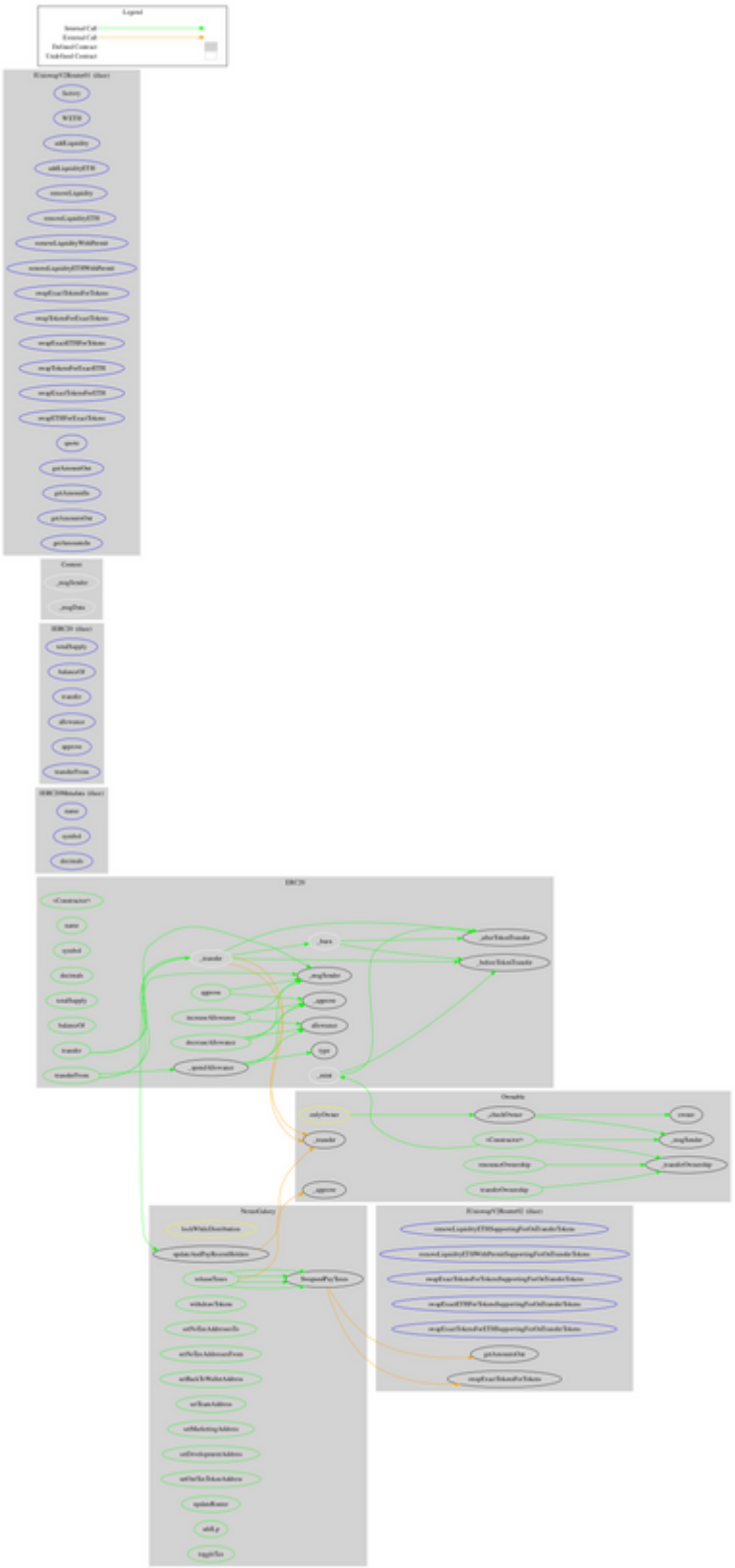
	removeLiquidity	External	✓	-
	removeLiquidityETH	External	✓	-
	removeLiquidityWithPermit	External	✓	-
	removeLiquidityETHWithPermit	External	✓	-
	swapExactTokensForTokens	External	✓	-
	swapTokensForExactTokens	External	✓	-
	swapExactETHForTokens	External	Payable	-
	swapTokensForExactETH	External	✓	-
	swapExactTokensForETH	External	✓	-
	swapETHForExactTokens	External	Payable	-
	quote	External		-
	getAmountOut	External		-
	getAmountIn	External		-
	getAmountsOut	External		-
	getAmountsIn	External		-
IUniswapV2Router02	Interface	IUniswapV2Router01		
	removeLiquidityETHSupportingFeeOnTransferTokens	External	✓	-
	removeLiquidityETHWithPermitSupportingFeeOnTransferTokens	External	✓	-
	swapExactTokensForTokensSupportingFeeOnTransferTokens	External	✓	-
	swapExactETHForTokensSupportingFeeOnTransferTokens	External	Payable	-
	swapExactTokensForETHSupportingFeeOnTransferTokens	External	✓	-
NexusGalaxy	Implementation	ERC20, Ownable		
		Public	✓	ERC20
	_transfer	Internal	✓	

	releaseTaxes	Public	✓	lockWhileDistribution onlyOwner
	SwapandPayTaxes	Private	✓	
	updateAndPayRecentHolders	Private	✓	lockWhileDistribution
	withdrawTokens	Public	✓	lockWhileDistribution onlyOwner
	setNoTaxAddressesTo	Public	✓	onlyOwner
	setNoTaxAddressesFrom	Public	✓	onlyOwner
	setBackToWalletAddress	Public	✓	onlyOwner
	setTeamAddress	Public	✓	onlyOwner
	setMarketingAddress	Public	✓	onlyOwner
	setDevelopmentAddress	Public	✓	onlyOwner
	setOutTaxTokenAddress	Public	✓	onlyOwner
	updateRouter	Public	✓	onlyOwner
	addLp	Public	✓	onlyOwner
	toggleTax	Public	✓	onlyOwner

Inheritance Graph



Flow Graph



Summary

There are some functions that can be abused by the owner like drain the contract's tokens. 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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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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