Cyberscope

Audit Report

Baby Grok

November 2023

Network	BSC
Address	0x88DA9901B3A02fE24E498e1eD683D2310383E295
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	Passed
●	MT	Mints Tokens	Passed
●	BT	Burns Tokens	Passed
●	BC	Blacklists Addresses	Passed

Diagnostics

Critical Medium Minor / Informative

Severity	Code	Description	Status
●	RSD	Redundant Swap Duplication	Unresolved
●	DDP	Decimal Division Precision	Unresolved
●	FSA	Fixed Swap Address	Unresolved
●	RED	Redundant Event Declaration	Unresolved
●	IDI	Immutable Declaration Improvement	Unresolved
●	L02	State Variables could be Declared Constant	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved

Table of Contents

Review

Contract Name	BabyGrok
Compiler Version	v0.8.19+commit.7dd6d404
Optimization	200 runs
Explorer	https://bscscan.com/address/0x88da9901b3a02fe24e498e1ed683d2310383e295
Address	0x88da9901b3a02fe24e498e1ed683d2310383e295
Network	BSC
Symbol	BabyGrok
Decimals	9
Total Supply	420,000,000,000,000,000

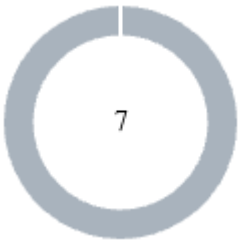
Audit Updates

Initial Audit	20 Nov 2023

Source Files

Filename	SHA256
BabyGrok.sol	60612665ad89e7a72c1bceb8d35f6686a54e462557d9d412a0372bbbbc9598fa

Findings Breakdown



Critical	0
Medium	0
Minor / Informative	7

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	0	0	0	0
Medium	0	0	0	0
Minor / Informative	7	0	0	0

RSD - Redundant Swap Duplication

Criticality	Minor / Informative
Location	BabyGrok.sol#L326,327
Status	Unresolved

Description

The contract contains multiple swap methods that individually perform token swaps and transfer promotional amounts to specific addresses and features. This redundant duplication of code introduces unnecessary complexity and increases dramatically the gas consumption. By consolidating these operations into a single swap method, the contract can achieve better code readability, reduce gas costs, and improve overall efficiency.

```
if(contractTokenBalance >= swapThreshold) {
   if(buyAllocation > 0 || sellAllocation > 0)
internalSwap((contractTokenBalance * (buyAllocation + sellAllocation)) /
100);
   if(liquidityAllocation > 0) {swapAndLiquify(contractTokenBalance *
liquidityAllocation / 100);}
}
```

Recommendation

A more optimized approach could be adopted to perform the token swap operation once for the total amount of tokens and distribute the proportional amounts to the corresponding addresses, eliminating the need for separate swaps.

DDP - Decimal Division Precision

Criticality	Minor / Informative
Location	BabyGrok.sol#L327,421
Status	Unresolved

Description

Division of decimal (fixed point) numbers can result in rounding errors due to the way that division is implemented in Solidity. Thus, it may produce issues with precise calculations with decimal numbers.

Solidity represents decimal numbers as integers, with the decimal point implied by the number of decimal places specified in the type (e.g. decimal with 18 decimal places). When a division is performed with decimal numbers, the result is also represented as an integer, with the decimal point implied by the number of decimal places in the type. This can lead to rounding errors, as the result may not be able to be accurately represented as an integer with the specified number of decimal places.

Hence, the splitted shares will not have the exact precision and some funds may not be calculated as expected.

```
contractTokenBalance * (buyAllocation + sellAllocation)) / 100
contractTokenBalance * liquidityAllocation / 100

uint256 mktAmount = address(this).balance * 25 / 40;
uint256 devAmount = address(this).balance * 15 / 40;
```

Recommendation

The team is advised to take into consideration the rounding results that are produced from the solidity calculations. The contract could calculate the subtraction of the divided funds in the last calculation in order to avoid the division rounding issue.

FSA - Fixed Swap Address

Criticality	Minor / Informative
Location	BabyGrok.sol#L234
Status	Unresolved

Description

The swap address is assigned once and it can not be changed. It is a common practice in decentralized exchanges to create new swap versions. A contract that cannot change the swap address may not be able to catch up to the upgrade. As a result, the contract will not be able to migrate to a new liquidity pool pair or decentralized exchange.

```
if (block.chainid == 56) {
    swapRouter = IRouter02(0x10ED43C718714eb63d5aA57B78B54704E256024E);
} else if (block.chainid == 97) {
    swapRouter = IRouter02(0xD99D1c33F9fC3444f8101754aBC46c52416550D1);
} else if (block.chainid == 1 || block.chainid == 4 || block.chainid == 3)
{
    swapRouter = IRouter02(0x7a250d5630B4cF539739dF2C5dAcb4c659F2488D);
} else if (block.chainid == 42161) {
    swapRouter = IRouter02(0x1b02dA8Cb0d097eB8D57A175b88c7D8b47997506);
} else if (block.chainid == 5) {
    swapRouter = IRouter02(0x7a250d5630B4cF539739dF2C5dAcb4c659F2488D);
} else {
    revert("Chain not valid");
}

lpPair = IFactoryV2(swapRouter.factory()).createPair(swapRouter.WETH(),
address(this))
```

Recommendation

The team is advised to add the ability to change the pair and router address in order to cover potential liquidity pool migrations. It would be better to support multiple pair addresses so the token will be able to have the same behavior in all the decentralized liquidity pairs.

RED - Redundant Event Declaration

Criticality	Minor / Informative
Location	BabyGrok.sol#L206,208
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 contract declares certain events in its code. However, these events 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 _changeThreshold(uint256 newThreshold);
event _changeFees(uint256 buy, uint256 sell);
```

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.

IDI - Immutable Declaration Improvement

Criticality	Minor / Informative
Location	BabyGrok.sol#L216,234
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.

```
swapRouter
lpPair
```

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.

L02 - State Variables could be Declared Constant

Criticality	Minor / Informative
Location	BabyGrok.sol#L180,181,182
Status	Unresolved

Description

State variables can be declared as constant using the constant keyword. This means that the value of the state variable cannot be changed after it has been set. Additionally, the constant variables decrease gas consumption of the corresponding transaction.

```
uint256 private buyAllocation = 40
uint256 private sellAllocation = 40
uint256 private liquidityAllocation = 20
```

Recommendation

Constant state variables can be useful when the contract wants to ensure that the value of a state variable cannot be changed by any function in the contract. This can be useful for storing values that are important to the contract's behavior, such as the contract's address or the maximum number of times a certain function can be called. The team is advised to add the constant keyword to state variables that never change.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	BabyGrok.sol#L69,186,187,189,202,203,204,205,206,207,208,285,290
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 WETH() external pure returns (address);
string constant private _name = "Baby Grok"
string constant private _symbol = "BabyGrok"
uint8 constant private _decimals = 9
event _enableTrading();
event _setPresaleAddress(address account, bool enabled);
event _toggleCanSwapFees(bool enabled);
event _changePair(address newLpPair);
event _changeThreshold(uint256 newThreshold);
event _changeWallets(address newBuy, address newSell);
event _changeFees(uint256 buy, uint256 sell);

...
```

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.

Functions Analysis

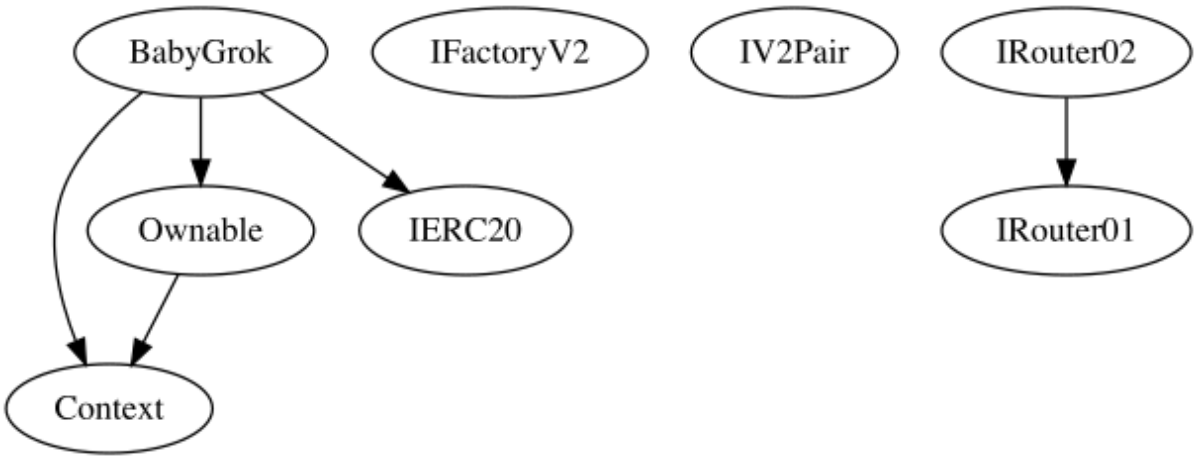
Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
Context	Implementation			
		Public	✓	-
	_msgSender	Internal		
	_msgData	Internal		
Ownable	Implementation	Context		
		Public	✓	-
	owner	Public		-
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
	_setOwner	Private	✓	
IFactoryV2	Interface			
	getPair	External		-
	createPair	External	✓	-
IV2Pair	Interface			
	factory	External		-

	getReserves	External		-
	sync	External	✓	-
IRouter01	Interface			
	factory	External		-
	WETH	External		-
	addLiquidityETH	External	Payable	-
	addLiquidity	External	✓	-
	swapExactETHForTokens	External	Payable	-
	getAmountsOut	External		-
	getAmountsIn	External		-
IRouter02	Interface	IRouter01		
	swapExactTokensForETHSupportingFeeOnTransferTokens	External	✓	-
	swapExactETHForTokensSupportingFeeOnTransferTokens	External	Payable	-
	swapExactTokensForTokensSupportingFeeOnTransferTokens	External	✓	-
	swapExactTokensForTokens	External	✓	-
IERC20	Interface			
	totalSupply	External		-
	decimals	External		-
	symbol	External		-
	name	External		-

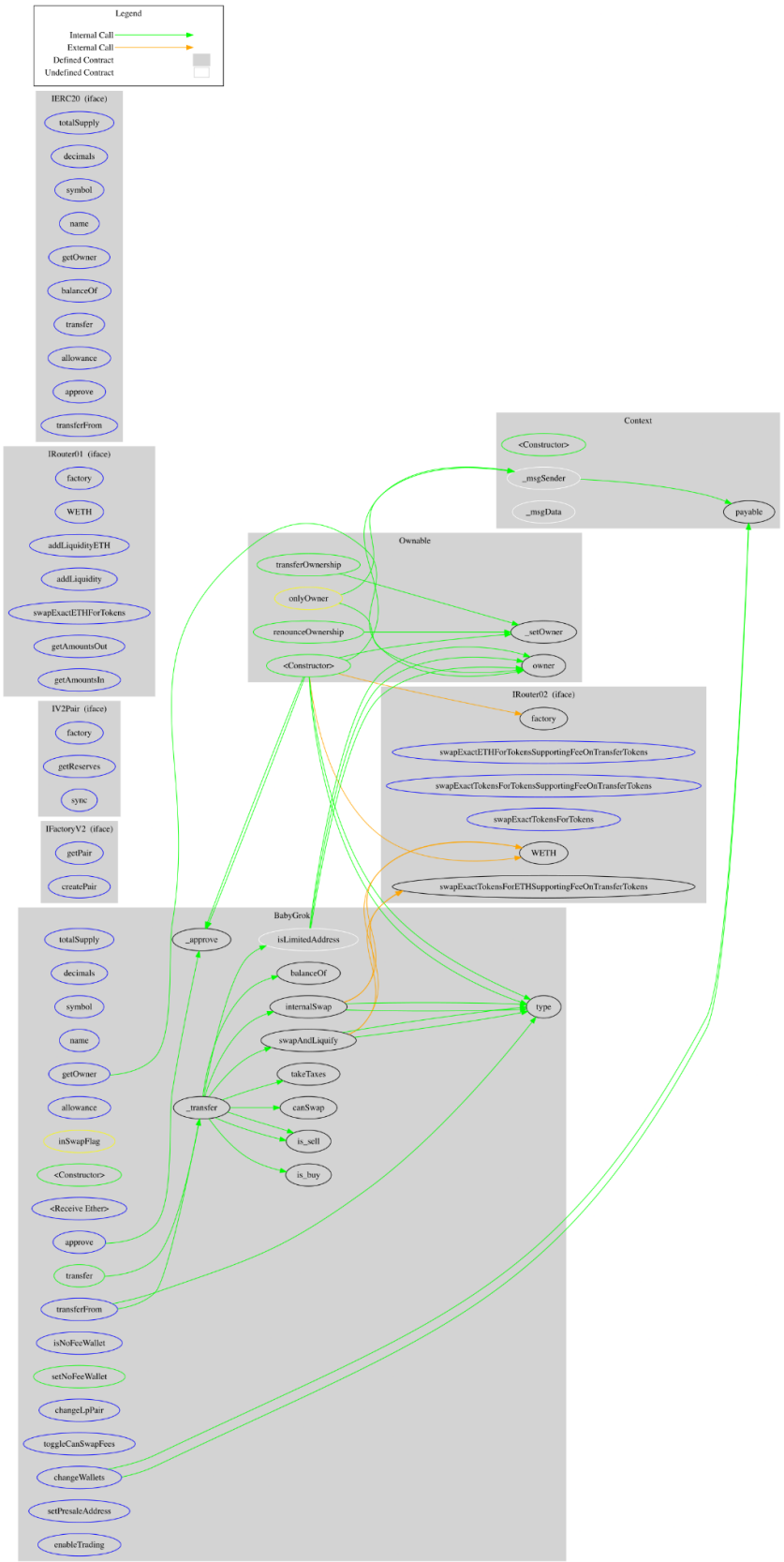
	getOwner	External		-
	balanceOf	External		-
	transfer	External	✓	-
	allowance	External		-
	approve	External	✓	-
	transferFrom	External	✓	-
BabyGrok	Implementation	Context, Ownable, IERC20		
	totalSupply	External		-
	decimals	External		-
	symbol	External		-
	name	External		-
	getOwner	External		-
	allowance	External		-
	balanceOf	Public		-
		Public	✓	-
		External	Payable	-
	transfer	Public	✓	-
	approve	External	✓	-
	_approve	Internal	✓	
	transferFrom	External	✓	-
	isNoFeeWallet	External		-
	setNoFeeWallet	Public	✓	onlyOwner

	isLimitedAddress	Internal		
	is_buy	Internal		
	is_sell	Internal		
	canSwap	Internal		
	changeLpPair	External	✓	onlyOwner
	toggleCanSwapFees	External	✓	onlyOwner
	_transfer	Internal	✓	
	changeWallets	External	✓	onlyOwner
	takeTaxes	Internal	✓	
	swapAndLiquify	Internal	✓	inSwapFlag
	internalSwap	Internal	✓	inSwapFlag
	setPresaleAddress	External	✓	onlyOwner
	enableTrading	External	✓	onlyOwner

Inheritance Graph



Flow Graph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
IERC20 (iface)
totalSupply
decimals
symbol
name
getOwner
balanceOf
transfer
allowance
approve
transferFrom
IRouter01 (iface)
factory
WETH
addLiquidityETH
addLiquidity
swapExactETHForTokens
getAmountsOut
getAmountsIn
IV2Pair (iface)
factory
getReserves
sync
IFactoryV2 (iface)
getPair
createPair
Context
<Constructor>
_msgSender
_msgData
payable
Ownable
transferOwnership
onlyOwner
renounceOwnership
<Constructor>
_setOwner
owner
IRouter02 (iface)
factory
swapExactETHForTokensSupportingFeeOnTransferTokens
swapExactTokensForTokensSupportingFeeOnTransferTokens
swapExactTokensForTokens
WETH
swapExactTokensForETHSupportingFeeOnTransferTokens
BabyGrok
totalSupply
decimals
symbol
name
getOwner
allowance
inSwapFlag
<Constructor>
<Receive Ether>
approve
transfer
transferFrom
isNoFeeWallet
setNoFeeWallet
changeLpPair
toggleCanSwapFees
changeWallets
setPresaleAddress
enableTrading
_approve
isLimitedAddress
balanceOf
internalSwap
swapAndLiquify
takeTaxes
_transfer
canSwap
is_sell
is_buy
type

Summary

Baby Grok contract implements a token mechanism. This audit investigates security issues, business logic concerns, and potential improvements. Baby Grok is an interesting project that has a friendly and growing community. The Smart Contract analysis reported no compiler errors or critical issues. The contract's ownership has been renounced. The information regarding the transaction can be accessed through the following link: https://bscscan.com/tx/0x83e5660918a647abcc2b413818e2f4111fd17919c04c9664f24bd78bd995d6fa. The fees are locked at 5% on both buy and sell transactions.

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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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