Cyberscope

Audit Report

Alpha Protocol

June 2022

Type	BEP20
Network	BSC
Address	0x759ba51c60b6e8d71797e8c36ca4004f45d1d8e4
Audited by	© cyberscope

Table of Contents

Contract Review

Contract Name	AlphaProtocol
Compiler Version	v0.7.4+commit.3f05b770
Optimization	200 runs
Licence	None
Explorer	https://bscscan.com/token/0x759ba51c60b6e8d71797e8c36ca4004f45d1d8e4
Symbol	AlphaPro
Decimals	5
Total Supply	1,000,000
Domain	alpha-protocol.io

Source Files

Filename	**SHA256**
contract.sol	e704445e7afc54dfb1585b921f7d6841625b38611c07b0d10e775a15f4ad80bb

Audit Updates

Initial Audit	18th June 2022
Corrected	

Contract Analysis

Critical Medium Minor Pass

Severity	Code	Description
●	ST	Contract Owner is not able to stop or pause transactions
●	OCTD	Contract Owner is not able to transfer tokens from specific address
●	OTUT	Owner Transfer User's Tokens
●	ELFM	Contract Owner is not able to increase fees more than a reasonable percent (25%)
●	ULTW	Contract Owner is not able to increase the amount of liquidity taken by dev wallet more than a reasonable percent
●	MT	Contract Owner is not able to mint new tokens
●	BT	Contract Owner is not able to burn tokens from specific wallet
●	BC	Contract Owner is not able to blacklist wallets from selling

ST - Stop Transactions

Criticality	critical
Location	contract.sol#L805, 769

Description

The contract owner has the authority to stop transactions for all users excluding the owner. The contract owner can convert the contract into a honeypot and prevent users from selling by setting the _maxSellPerDay to zero.

```
checkLimit(sender, recipient, amount);
```

```
function checkLimit(address sender,
        address recipient,
        uint256 amount) internal {
        if (recipient == pair && !_isFeeExempt[sender]) {
            uint256 limitSell =
balanceOf(sender).mul(maxSellPerDay).div(10000);
            require(amount <= limitSell,  "Alpha Protocol: Cant Sell More Than
Allowed Per Day");
```

Recommendation

The contract could embody a check for not allowing setting the _maxSellPerDay less than a reasonable amount. A suggested implementation could check that the maximum amount should be more than a fixed percentage of the total supply.

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.

OCTD - Owner Contract Tokens Drain

Criticality	minor
Location	contract.sol#L975

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 withdrawAllToTreasury function.

```
   function withdrawAllToTreasury() external swapping onlyOwner {

        uint256 amountToSwap =
_gonBalances[address(this)].div(_gonsPerFragment);
        require( amountToSwap > 0,"There is no EverSAFU token deposited in
token contract");
        address[] memory path = new address[](2);
        path[0] = address(this);
        path[1] = router.WETH();
        router.swapExactTokensForETHSupportingFeeOnTransferTokens(
            amountToSwap,
            0,
            path,
            treasuryReceiver,
            block.timestamp
        );
    }
```

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.

ELFM - Exceed Limit Fees Manipulation

Criticality	critical
Location	contract.sol#L1

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 setTransferTax function with a high percentage value.

```
function setTransferTax(uint256 newTransferTax) external onlyOwner {
    transferTax = newTransferTax;
}
```

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

Contract Diagnostics

Critical Medium Minor

Severity	Code	Description
	FSA	Fixed Swap Address
	MAL	Misused Algorithmic Logic
	MTS	Manipulate Total Supply
	MC	Missing Check
	L01	Public Function could be Declared External
	L02	State Variables could be Declared Constant
	L04	Conformance to Solidity Naming Conventions
	L05	Unused State Variable
	L07	Missing Events Arithmetic
	L09	Dead Code Elimination
	L13	Divide before Multiply Operation
	L14	Uninitialized Variables in Local Scope

FSA - Fixed Swap Address

Criticality	minor
Location	contract.sol#L667

Description

The swap address is assigned once in the constructor and it can not be changed. The decentralized swaps sometimes create a new swap version or abandon the current. A contract that cannot change the swap address may not be able to catch-up the upgrade.

```
router = IPancakeSwapRouter(0x10ED43C718714eb63d5aA57B78B54704E256024E);
```

Recommendation

It could be better to allow the swap address mutation in case of future swap updates.

MAL - Misused Algorithmic Logic

Criticality	minor
Location	contract.sol#L710

Description

The algorithmic flow does not follow the required business logic. In the following statement the third and the forth if will never be fulfilled since an unsigned integer is either less than or greater/equal to 365 days. Hence, always the first two if statements will be fulfilled.

```
if (deltaTimeFromInit < (365 days)) {
    rebaseRate = 39435595;
} else if (deltaTimeFromInit >= (365 days)) {
    rebaseRate = 19717797;
} else if (deltaTimeFromInit >= ((15 * 365 days) / 10)) {
    rebaseRate = 9858898;
} else if (deltaTimeFromInit >= (7 * 365 days)) {
    rebaseRate = 4929449;
}
```

Recommendation

The algorithm should be reshaped so it will match to the business logic.

MTS - Manipulate Total Supply

Criticality	minor
Location	contract.sol#L720

Description

Owner is able to manipulate total supply. This change will have a direct impact on the token price and Market Cap.

```
for (uint256 i = 0; i < times; i++) {
    _totalSupply = _totalSupply
                .mul((10**RATE_DECIMALS).add(rebaseRate))
                .div(10**RATE_DECIMALS);
}
```

Recommendation

The contract owner should carefully manage the adjustment of the circulating supply (increases or decreases), according to the token's price fluctuations.

MC - Missing Check

Criticality	critical
Location	contract.sol#L789. 1144

Description

The contract is processing variables that have not properly sanitized and checked that they form the proper shape. These variables may produce vulnerability issues.

The owner has the authority to set a higher value than 10000 by calling the setTransferTax function.

```
if(transferTax > 0 && !_isFeeExempt[sender]) {
            if(!isContract(sender) && !isContract(recipient)) {
                uint256 taxAmount = amount.mul(transferTax).div(10000);
                amount  = amount - taxAmount;
```

```
function setTransferTax(uint256 newTransferTax) external onlyOwner {
    transferTax = newTransferTax;
}
```

Recommendation

The contract should properly check the variables according to the required specifications.

L01 - Public Function could be Declared External

Criticality	minor
Location	contract.sol#L521,534,539,565,569,573,1151

Description

Public functions that are never called by the contract should be declared external to save gas.

```
getLiquidityBacking
decimals
symbol
name
transferOwnership
renounceOwnership
owner
```

Recommendation

Use the external attribute for functions never called from the contract.

L02 - State Variables could be Declared Constant

Criticality	minor
Location	contract.sol#L611,612,604,609,600,602,603,622,601,371

Description

Constant state variables should be declared constant to save gas.

```
dividendsPerShareAccuracyFactor
treasuryFee
swapEnabled
sellFee
safuDividendFee
liquidityFee
feeDenominator
autofirePitFee
ZERO
...
```

Recommendation

Add the constant attribute to state variables that never change.

L04 - Conformance to Solidity Naming Conventions

Criticality	minor
Location	contract.sol#L153,154,171,191,393,347,355,1024,1033,1096,1111,1136,1137,1138,1161,1165,1170,586,611,612,648,649,650,651,652,653

Description

Solidity defines a naming convention that should be followed. Rule exceptions:

- Allow constant variable name/symbol/decimals to be lowercase.
- Allow _ at the beginning of the mixed_case match for private variables and unused parameters.

```
_totalSupply
_lastAddLiquidityTime
_lastRebasedTime
_initRebaseStartTime
_autoAddLiquidity
_autoRebase
ZERO
DEAD
_isFeeExempt
...
```

Recommendation

Follow the Solidity naming convention.
https://docs.soliditylang.org/en/v0.4.25/style-guide.html#naming-conventions

L05 - Unused State Variable

Criticality	minor
Location	contract.sol#L20

Description

There are segments that contain unused state variables.

```
MAX_INT256
```

Recommendation

Remove unused state variables.

L07 - Missing Events Arithmetic

Criticality	minor
Location	contract.sol#L393,1144,1147

Description

Detected missing events for critical arithmetic parameters. There are functions that have no event emitted, so it is difficult to track off-chain changes.

```
maxSellPerDay = newMaxSellPerDay
transferTax = newTransferTax
minPeriod = _minPeriod
```

Recommendation

Emit an event for critical parameter changes.

L09 - Dead Code Elimination

Criticality	minor
Location	contract.sol#L48

Description

Functions that are not used in the contract, and make the code's size bigger.

```
abs
```

Recommendation

Remove unused functions.

L13 - Divide before Multiply Operation

Criticality	minor
Location	contract.sol#L702,844,1151

Description

Performing divisions before multiplications may cause lose of prediction.

```
liquidityBalance = _gonBalances[pair].div(_gonsPerFragment)
_gonBalances[autoLiquidityReceiver] =
_gonBalances[autoLiquidityReceiver].add(gonAmount.div(feeDenominator).mul(liqu
idityFee))
_gonBalances[address(this)] =
_gonBalances[address(this)].add(gonAmount.div(feeDenominator).mul(_treasuryFee
.add(safuDividendFee)))
_gonBalances[autofirePit] =
_gonBalances[autofirePit].add(gonAmount.div(feeDenominator).mul(autofirePitFee
))
feeAmount = gonAmount.div(feeDenominator).mul(_totalFee)
times = deltaTime.div(1800)
```

Recommendation

The multiplications should be prior to the divisions.

L14 - Uninitialized Variables in Local Scope

Criticality	minor
Location	contract.sol#L705

Description

The are variables that are defined in the local scope and are not initialized.

```
rebaseRate
```

Recommendation

All the local scoped variables should be initialized.

Contract Functions

Contract	Type	Bases		
	Function Name	Visibility	Mutability	Modifiers
SafeMathInt	Library			
	mul	Internal		
	div	Internal		
	sub	Internal		
	add	Internal		
	abs	Internal		
SafeMath	Library			
	add	Internal		
	sub	Internal		
	sub	Internal		
	mul	Internal		
	div	Internal		
	div	Internal		
	mod	Internal		
IERC20	Interface			
	totalSupply	External		-
	balanceOf	External		-
	allowance	External		-
	transfer	External	✓	-
	approve	External	✓	-
	transferFrom	External	✓	-
IPancakeSwapPair	Interface			
	name	External		-
	symbol	External		-
	decimals	External		-

	totalSupply	External		-
	balanceOf	External		-
	allowance	External		-
	approve	External	✓	-
	transfer	External	✓	-
	transferFrom	External	✓	-
	DOMAIN_SEPARATOR	External		-
	PERMIT_TYPEHASH	External		-
	nonces	External		-
	permit	External	✓	-
	MINIMUM_LIQUIDITY	External		-
	factory	External		-
	token0	External		-
	token1	External		-
	getReserves	External		-
	price0CumulativeLast	External		-
	price1CumulativeLast	External		-
	kLast	External		-
	mint	External	✓	-
	burn	External	✓	-
	swap	External	✓	-
	skim	External	✓	-
	sync	External	✓	-
	initialize	External	✓	-
IPancakeSwap Router	Interface			
	factory	External		-
	WETH	External		-
	addLiquidity	External	✓	-
	addLiquidityETH	External	Payable	-
	removeLiquidity	External	✓	-
	removeLiquidityETH	External	✓	-
	removeLiquidityWithPermit	External	✓	-
	removeLiquidityETHWithPermit	External	✓	-

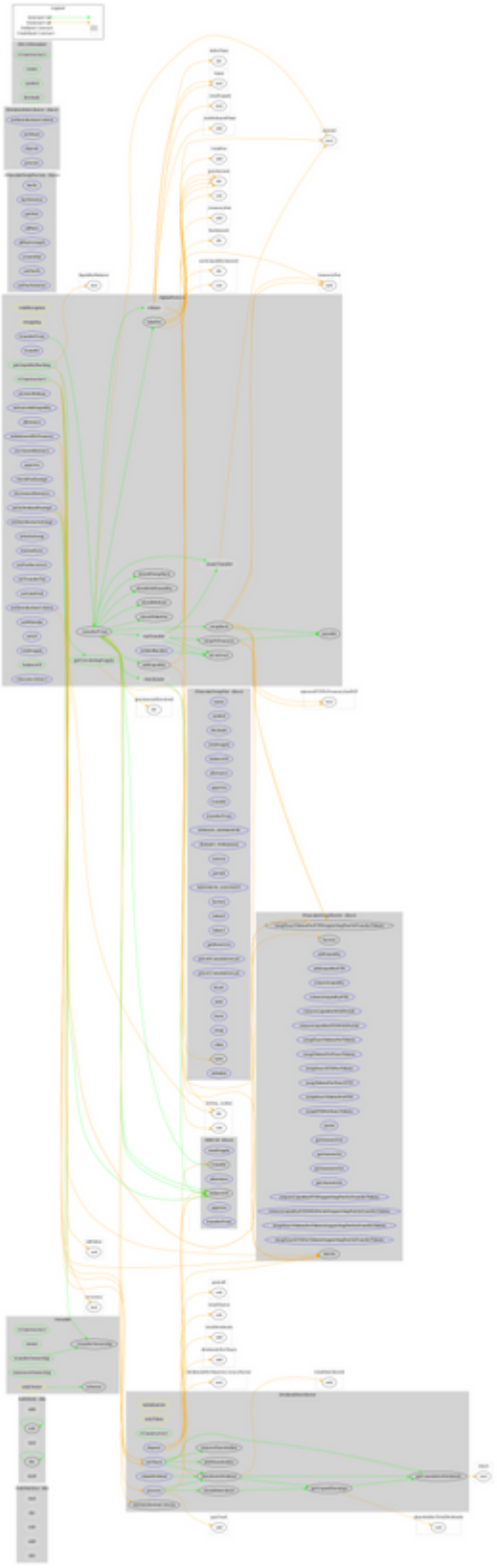
	swapExactTokensForTokens	External	✓	-
	swapTokensForExactTokens	External	✓	-
	swapExactETHForTokens	External	Payable	-
	swapTokensForExactETH	External	✓	-
	swapExactTokensForETH	External	✓	-
	swapETHForExactTokens	External	Payable	-
	quote	External		-
	getAmountOut	External		-
	getAmountIn	External		-
	getAmountsOut	External		-
	getAmountsIn	External		-
	removeLiquidityETHSupportingFeeOnTransferTokens	External	✓	-
	removeLiquidityETHWithPermitSupportingFeeOnTransferTokens	External	✓	-
	swapExactTokensForTokensSupportingFeeOnTransferTokens	External	✓	-
	swapExactETHForTokensSupportingFeeOnTransferTokens	External	Payable	-
	swapExactTokensForETHSupportingFeeOnTransferTokens	External	✓	-
IPancakeSwapFactory	Interface			
	feeTo	External		-
	feeToSetter	External		-
	getPair	External		-
	allPairs	External		-
	allPairsLength	External		-
	createPair	External	✓	-
	setFeeTo	External	✓	-
	setFeeToSetter	External	✓	-
IDividendDistributor	Interface			
	setDistributionCriteria	External	✓	-
	setShare	External	✓	-

	deposit	External	Payable	-
	process	External	✓	-
DividendDistributor	Implementation	IDividendDistributor		
	<Constructor>	Public	✓	-
	setDistributionCriteria	External	✓	onlyToken
	setShare	External	✓	onlyToken
	deposit	External	Payable	onlyToken
	process	External	✓	onlyToken
	shouldDistribute	Internal		
	distributeDividend	Internal	✓	
	claimDividend	External	✓	-
	getUnpaidEarnings	Public		-
	getCumulativeDividends	Internal		
	addShareholder	Internal	✓	
	removeShareholder	Internal	✓	
Ownable	Implementation			
	<Constructor>	Public	✓	-
	owner	Public		-
	isOwner	Public		-
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
	_transferOwnership	Internal	✓	
ERC20Detailed	Implementation	IERC20		
	<Constructor>	Public	✓	-
	name	Public		-
	symbol	Public		-
	decimals	Public		-
AlphaProtocol	Implementation	ERC20Detailed, Ownable		

	<Constructor>	Public	✓	ERC20Detailed Ownable
	rebase	Internal	✓	
	transfer	External	✓	validRecipient
	transferFrom	External	✓	validRecipient
	_basicTransfer	Internal	✓	
	checkLimit	Internal	✓	
	taxTransfer	Internal	✓	
	_transferFrom	Internal	✓	
	takeFee	Internal	✓	
	addLiquidity	Internal	✓	swapping
	swapToTreasury	Internal	✓	swapping
	swapBack	Internal	✓	swapping
	withdrawAllToTreasury	External	✓	swapping onlyOwner
	shouldTakeFee	Internal		
	shouldRebase	Internal		
	shouldAddLiquidity	Internal		
	shouldSwapBack	Internal		
	setAutoRebase	External	✓	onlyOwner
	setAutoAddLiquidity	External	✓	onlyOwner
	allowance	External		-
	decreaseAllowance	External	✓	-
	increaseAllowance	External	✓	-
	approve	External	✓	-
	checkFeeExempt	External		-
	setIsDividendExempt	External	✓	onlyOwner
	setDistributionCriteria	External	✓	onlyOwner
	setDistributorSettings	External	✓	onlyOwner
	getCirculatingSupply	Public		-
	isNotInSwap	External		-
	manualSync	External	✓	-
	setFeeReceivers	External	✓	onlyOwner
	setTransferTax	External	✓	onlyOwner
	setLimitSell	External	✓	onlyOwner

	getLiquidityBacking	Public		-
	setWhitelist	External	✓	onlyOwner
	setBotBlacklist	External	✓	onlyOwner
	setLP	External	✓	onlyOwner
	totalSupply	External		-
	balanceOf	Public		-
	isContract	Internal		
	<Receive Ether>	External	Payable	-

Contract Flow



Domain Info

Domain Name	alpha-protocol.io
Registry Domain ID	713d9f39006d4d0799d73057157a0735-DONUTS
Creation Date	2022-06-02T10:51:16Z
Updated Date	2022-06-07T10:51:48Z
Registry Expiry Date	2023-06-02T10:51:16Z
Registrar WHOIS Server	whois.namecheap.com
Registrar URL	https://www.namecheap.com/
Registrar	NameCheap, Inc.
Registrar IANA ID	1068

The domain has been created 16 days before the creation of the audit. It will expire in 12 months.

There is no public billing information, the creator is protected by the privacy settings.

Summary

There are some functions that can be abused by the owner like stopping transactions, transferring tokens to the team’s wallet and manipulating fees. The contract can be converted into a honeypot and prevent users from selling if the owner abuses the admin functions. 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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Coinscope audit and K.Y.C. service has been rebranded to Cyberscope.

Coinscope is the leading early coin listing, voting and auditing authority firm. The audit process is analyzing and monitoring many aspects of the project. That way, it gives the community a good sense of security using an informative report and a generic score.

Cyberscope and Coinscope are aiming to make crypto discoverable and efficient globally. They provide all the essential tools to assist users draw their own conclusions.

The Cyberscope team

https://www.cyberscope.io