Cyberscope

Audit Report

Circle Launchpad Airdrop

January 2022

Github	https://github.com/monkey-shanti/Circle-Launchpad
Commit	915604357d2528c77dbdb6672471c2bcc9b8bb2a
Audited by	© cyberscope

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Contract Review

Repository	https://github.com/monkey-shanti/Circle-Launchpad
Commit	915604357d2528c77dbdb6672471c2bcc9b8bb2a

Contract Name	Testing Deploy
AirdropMaster	https://testnet.bscscan.com/address/0x999Cc7a80D7642b6fE1D7F32b1e65434c34e74B3
AirdropManager	https://testnet.bscscan.com/address/0xB68D7056Fe36a46a79599107cda551C197efe57A
AirdropFactory	https://testnet.bscscan.com/address/0x81d2Bf8277753C318C6DCDDaBB17d5DE4189696C

Audit Updates

Initial Audit	20 Dec 2022 https://github.com/cyberscope-io/audits/blob/main/circleLaunchpad/v1/airdrop.pdf
Corrected Phase 2	02 Jan 2023

Source Files

Filename	SHA256
AirdropFactory.sol	bcf87b45bf0e1f5f0460514cec96c8da2d859017e4bfd5ae56fc2931948c3862
AirdropMain.sol	b6d1e393bf9bcdaa3b1e6ca42c1198e620848147a4045eb182250915562e2d0d
AirdropManager.sol	510c10ed06652040065b14860db219f9f6aa8746794fb5c8e038537e3fa21f5d
launchpad/libraries/LibEnsureSafeTransfer.sol	03f9e4a97f22127d967d3064a874192bc5ff6c69f8eaf5a4c16c9d58bdb4d661
launchpad/libraries/LibPresale.sol	af71027b0d7f1e8ca1a81c8c5fa77ca6d71e665ea8cfbb63875a94750384e962
launchpad/libraries/LibTier.sol	4aedc295fb6e752b1beea948f23aac1f29f885eaa9891df7388c59d2110a4d3b
multisender/libraries/AddressLib.sol	773d033dd9c33b9799bafc89ab4e7b3693446e0551727b580991292fc8c69add
multisender/libraries/TransferHelper.sol	b337ccfc0cc7ea731f176202350c915cdf77c7aff6f75a893d418918455e88a7
multisender/MultiSender.sol	3c428c5faafa5e80fbc2a4f7fea56cd62b34e093babdf39d5a0743037c7aa850
utils/Utility.sol	bb982ca156ddbd0ea26ba803843a755ff4ad6440addadc577d3ba8335f8e0705

Introduction

The Circle launchpad Airdrop contract implements a locker mechanism. It consists of a factory, a manager, and the master airdrop contract.

Airdrop Factory

The Airdrop Factory is responsible for creating new airdrops.

Roles

The contract has two roles.

Owner Role

The owner role has the authority to

- setMasterAddress
- setAdminWallet
- setPartnerFee
- setVersion
- setPoolOwner
- setPresalePoolPrice
- setPoolManager
- bnbLiquidity
- poolEmergencyWithdrawToken
- poolEmergencyWithdraw
- poolSetGovernance

User Role

The user has the authority to createSale.

Airdrop Manager

The Airdrop Manager is responsible for adding or removing factories. Additionally, it is responsible for monitoring airdrop factories and keeping registries about them.

Roles

The contract has three roles.

Owner Role

The Owner has the authority to

- addAdminPoolFactory
- addPoolFactories
- removePoolFactory
- bnbLiquidity

AllowedFactory Role

The Allowed Factories have the authority to

- addPoolFactory
- registerPool
- increaseTotalValueLocked
- decreaseTotalValueLocked
- recordContribution
- removePoolForToken

User Role

The users have the authority to

- view isPoolFactory
- view isPoolGenerated
- getPoolsOfLength
- getPoolsForTokenLength
- getPoolsOf
- getPoolsForToken
- getAllPools
- getPoolAt

- getTotalNumberOfPools
- getTotalNumberOfContributedPools
- getAllContributedPools
- getContributedPoolAtIndex
- getTotalNumberOfPools
- getPoolAt
- getCumulativePoolInfo
- getUserContributedPoolInfo

Airdrop Master

The Airdrop Master implements the core functionality of the airdrop.

Airdrop State

The Airdrop has 3 states

- inUse
- completed
- cancelled

Roles

The contract has 5 roles.

Owner Role

The Owner has the authority to

- emergencyWithdrawToken
- emergencyWithdraw
- setGovernance

Whitelisted Role

The Whitelisted role has the authority to

- claim

Operator Role

The Operator has the authority to

- initializeVesting
- addWhitelistedUsers
- addWhitelistedUser
- removeWhitelistedUsers
- isUserWhitelisted
- changeStartAt
- updatePoolDetails

Governance Role

The Governance role is not utilized on the contract implementation.

User Role

The users have the authority to

- getPoolInfo
- getNumberOfWhitelistedUsers
- getWhitelistedUsers
- getUpdatedState
- view userAvalibleClaim

Contract Diagnostics

● Critical ● Medium ● Minor / Informative

Severity	Code	Description	Status
●	ICN	Inappropriate Contract Naming	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved
●	L08	Tautology or Contradiction	Unresolved
●	L13	Divide before Multiply Operation	Unresolved

ICN - Inappropriate Contract Naming

Criticality	Minor / Informative
Location	AirdropMain.sol#L48 AirdropManager.sol#L15 AirdropFactory.sol#L41
Status	Unresolved

Description

The Airdrop ecosystem is implementing a Locker mechanism. Hence the contract naming is inappropriate.

```
contract AirdropMaster

contract AirdropManager

contract AirdropFactory
```

Recommendation

The team is advised to carefully check if the implementation follows the expected business logic and rename the contracts accordingly.

L04 - Conformance to Solidity Naming Conventions

Criticality	Minor / Informative
Location	AirdropManager.sol#L51,326 AirdropMain.sol#L54,56,128,129,130,131,132,154,172,182,210,334,372 AirdropFactory.sol#L50,60,61,62,63,64,76,81,86,90,97,98,99,100,101,116,117,118,119,156,161,166,170,208
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.

```
event sender(address sender);
address payable _receiver
uint256 _amount
uint256 public MAX_ALLOCATIONS = 500
uint8 public VERSION
address[3] memory _addrs
uint256[1] memory _saleInfo
string memory _poolDetails
address[3] memory _linkAddress
uint8 _version
uint256[3] memory _vestingInit
uint256[] memory _allocations
uint256 _allocation
uint256 _startTime

...
```

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.

L08 - Tautology or Contradiction

Criticality	Minor / Informative
Location	AirdropMain.sol#L158,159,160
Status	Unresolved

Description

A tautology is a logical statement that is always true, regardless of the values of its variables. A contradiction is a logical statement that is always false, regardless of the values of its variables.

Using tautologies or contradictions can lead to unintended behavior and can make the code harder to understand and maintain. It is generally considered good practice to avoid tautologies and contradictions in the code.

```
require(_vestingInit[1] >= 0, "Invalid cycle")
require(_vestingInit[0] >= 0 && _vestingInit[0] < 10_000, "Invalid bips
for TGE")
require(_vestingInit[2] >= 0 && _vestingInit[2] < 10_000, "Invalid bips
for cycle")
```

Recommendation

The team is advised to carefully consider the logical conditions is using in the code and ensure that it is well-defined and make sense in the context of the smart contract.

L13 - Divide before Multiply Operation

Criticality	Minor / Informative
Location	AirdropMain.sol#L320,396
Status	Unresolved

Description

It is important to be aware of the order of operations when performing arithmetic calculations. This is especially important when working with large numbers, as the order of operations can affect the final result of the calculation. Performing divisions before multiplications may cause loss of prediction.

```
currentTotal =
                    (((block.timestamp - startTime) / cycle) *
                    cycleReleaseAmount) +
                    tgeReleaseAmount
```

Recommendation

To avoid this issue, it is recommended to carefully consider the order of operations when performing arithmetic calculations in Solidity. It's generally a good idea to use parentheses to specify the order of operations. The basic rule is that the multiplications should be prior to the divisions.

Contract Functions

Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
IAirdropManager	Interface			
	addPoolFactory	External	✓	-
	increaseTotalValueLocked	External	✓	-
	decreaseTotalValueLocked	External	✓	-
	removePoolForToken	External	✓	-
	recordContribution	External	✓	-
	isPoolGenerated	External		-
	registerPool	External	✓	-
AirdropFactory	Implementation	OwnableUpgradeable, Utility		
	initialize	External	✓	validAddress validAddress validAmount initializer
		External	Payable	-
	setMasterAddress	Public	✓	onlyOwner
	setAdminWallet	Public	✓	onlyOwner
	setPartnerFee	Public	✓	onlyOwner
	setVersion	Public	✓	onlyOwner
	initializeClone	Internal	✓	validAddress validAddress validAddress
	createSale	External	Payable	-
	setPoolOwner	Public	✓	onlyOwner
	setPresalePoolPrice	Public	✓	onlyOwner validAmount

	setPoolManager	Public	✓	onlyOwner validAddress
	bnbLiquidity	Public	✓	onlyOwner validAddress validAmount
	transferAnyERC20Token	Public	✓	onlyOwner validAddress validAddress validAmount
	poolEmergencyWithdrawToken	Public	✓	onlyOwner validAddress validAddress validAddress validAmount
	poolEmergencyWithdraw	Public	✓	onlyOwner validAddress validAddress validAmount
	poolSetGovernance	Public	✓	onlyOwner validAddress validAddress
IERC20Info	Interface			
	decimals	External		-
	name	External		-
	symbol	External		-
	supply	External		-
IPoolFactory	Interface			
	increaseTotalValueLocked	External	✓	-
	decreaseTotalValueLocked	External	✓	-
	removePoolForToken	External	✓	-
	recordContribution	External	✓	-
IAirdrop	Interface			
	initialize	External	✓	-
	initializeVesting	External	✓	-

	setGovernance	External	✓	-
	emergencyWithdraw	External	✓	-
	emergencyWithdrawToken	External	✓	-
	getPoolInfo	External		-
AirdropMaster	Implementation	OwnableUpgradeable, IAirdrop, ReentrancyGuard, Utility		
	initialize	External	✓	validAddress validAddress validAddress initializer
	initializeVesting	External	✓	onlyOperator
	addWhitelistedUsers	External	✓	-
	addWhitelistedUser	External	✓	-
	removeWhitelistedUsers	External	✓	-
	removeWhitelistedUser	External	✓	-
	isUserWhitelisted	Public		-
	setWhitelist	Internal	✓	onlyOperator notInProgress validAddress
	getPoolInfo	External		-
	getNumberOfWhitelistedUsers	Public		-
	getWhitelistedUsers	Public		-
	claim	Public	✓	nonReentrant inProgress onlyWhitelisted
	_withdrawableTokens	Internal		
	changeStartAt	External	✓	onlyOperator notInProgress
	cancel	External	✓	onlyOperator notInProgress
	emergencyWithdrawToken	External	✓	onlyOwner

	emergencyWithdraw	External	✓	onlyOwner
	updatePoolDetails	External	✓	onlyOperator
	setGovernance	External	✓	onlyOwner validAddress
	getUpdatedState	Public		-
	userAvalibleClaim	Public		-
AirdropManager	Implementation	OwnableUpgradeable, IAirdropManager, Utility		
		External	Payable	-
	initialize	External	✓	initializer
	addPoolFactory	Public	✓	onlyAllowedFactory validAddress
	addAdminPoolFactory	Public	✓	onlyOwner validAddress
	addPoolFactories	External	✓	onlyOwner
	removePoolFactory	External	✓	onlyOwner validAddress
	isPoolFactory	Public		-
	isPoolGenerated	Public		-
	registerPool	External	✓	onlyAllowedFactory validAddress validAddress validAddress validAmount
	increaseTotalValueLocked	External	✓	onlyAllowedFactory
	decreaseTotalValueLocked	External	✓	onlyAllowedFactory
	recordContribution	External	✓	onlyAllowedFactory
	removePoolForToken	External	✓	onlyAllowedFactory
	getPoolsOfLength	Public		-
	getPoolsForTokenLength	Public		-

	getPoolsOf	Public		-
	getPoolsForToken	Public		-
	getAllPools	Public		-
	getPoolAt	Public		-
	getTotalNumberOfPools	Public		-
	getTotalNumberOfContributedPools	Public		-
	getAllContributedPools	Public		-
	getContributedPoolAtIndex	Public		-
	getTotalNumberOfPools	Public		-
	getPoolAt	Public		-
	getCumulativePoolInfo	External		-
	getUserContributedPoolInfo	External		-
	bnbLiquidity	Public	✓	onlyOwner validAddress validAmount
	transferAnyERC20Token	Public	✓	onlyOwner
LibEnsureSafe Transfer	Library			
	safeTransferFromEnsureExactAmount	Internal	✓	validAddress validAddress validAddress validAmount
	transferEnsureExactAmount	Internal	✓	validAddress validAddress validAmount
	transferNativeOrToken	Internal	✓	
	transferNative	Internal	✓	validAddress validAmount
LibPresale	Library			
LibTier	Library			

AddressLib	Library			
	isPlatformToken	Internal		
TransferHelper	Library			
	safeTransferToken	Internal	✓	
	safeTransferETH	Internal	✓	
	balanceOf	Internal		
	safeTransfer	Internal	✓	
	safeTransferFrom	Internal	✓	
CheckContract	Implementation			
	checkContract	Internal		
	isContract	Internal		
MultiSender	Implementation	CheckContract, OwnableUpgradeable		
	initialize	Public	✓	initializer
	withdraw	External	✓	onlyOwner
	setFeePerAccount	External	✓	onlyOwner
	setBaseFee	External	✓	onlyOwner
	setArrayLimit	External	✓	onlyOwner
	multiSend	Public	Payable	-
	_multiSend	Internal	✓	
	_multiSendToken	Internal	✓	
	_multiSendETH	Internal	✓	
	_requireEnoughFee	Internal		
	_currentFee	Internal		
		External	Payable	-

Utility	Implementation		

Contract Flow

Inheritance Graph

Summary

The Airdrop ecosystem contracts implement a locker mechanism. This audit investigates security issues, business logic concerns, and potential improvements.

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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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