Cyberscope

Audit Report

KOR Blockchain

April 2022

SHA256 6edcf14436d332b6300df8ed2fd0321cb0e2b8d7ba163ae981db6f5b7b0c26d2

Audited by © cyberscope

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Audit Updates

Initial Audit	5th April 2022
Corrected	18th April 2022

Source Files

Filename	SHA256
@chainlink/contracts/src/v0.8/interfaces/AggregatorV3Interface.sol	749f284bc4454e0fce86f63f94ec8778ee6a1e730d7f983d634cb5cd3e2c2b7b
@openzeppelin/contracts-upgradeable/proxy/utils/Initializable.sol	6e058aaee8c641107b209b62c34d484f2f125a44ecb66f7204a701614dfc1d68
@openzeppelin/contracts-upgradeable/security/ReentrancyGuardUpgradeable.sol	b6adbe9bc075b15cfb4b90f1ae020da4c78e3feada056a4c75b875350285c915
@openzeppelin/contracts-upgradeable/token/ERC721/ERC721Upgradeable.sol	f5a8d45253b77c47fbd0bb3313a72137617385a77383755af58569f78ee7b990
@openzeppelin/contracts-upgradeable/token/ERC721/extensions/ERC721EnumerableUpgradeable.sol	0b1fb4e02feef40d236a1b13acf26ab9b23736950ed3142297b1680840e491bb

@openzeppelin/contracts-upgradeable/token/ERC721/extensions/IERC721EnumerableUpgradeable.sol	bb1d9c3bfcbd9561bfd84793e30332bed0da049c9fb4731f1398eaaac22d13b4
@openzeppelin/contracts-upgradeable/token/ERC721/extensions/IERC721MetadataUpgradeable.sol	78d97961d78c8245d51fef2306c33bbc97edb18cb61159979a75187379e93c86
@openzeppelin/contracts-upgradeable/token/ERC721/IERC721ReceiverUpgradeable.sol	7ba7f2a159c698617f90c59705f1928ba7adb95c52eef0cb4c1ce3f81787bf0c
@openzeppelin/contracts-upgradeable/token/ERC721/IERC721Upgradeable.sol	b7c30218228cde89462d762ff873d1297038bb0f9406da6763bd08e3fccb4f93
@openzeppelin/contracts-upgradeable/utils/AddressUpgradeable.sol	44edc4d7099c781d11421cea2d82a52948e738f5f6191c8ad01dfc0f9858549c
@openzeppelin/contracts-upgradeable/utils/ContextUpgradeable.sol	5fb301961e45cb482fe4e05646d2f529aa449fe0e90c6671475d6a32356fa2d4
@openzeppelin/contracts-upgradeable/utils/CountersUpgradeable.sol	5c1ac829a429b0c2ca9b4c9ed8b78d412320e9175e45f088c4e9056ef95fbf21

@openzeppelin/contracts-upgradeable/utils/introspection/ERC165Upgradeable.sol	fd84e5284eccc479268f0ef36b830019d4f7999ceb7959430d8d8d9e602dd4ef
@openzeppelin/contracts-upgradeable/utils/introspection/IERC165Upgradeable.sol	a39bc026ad6214e9ecd526bd4a1ddf9862d80bd4a9d0d031d9bafa4c3c147c0b
@openzeppelin/contracts-upgradeable/utils/StringsUpgradeable.sol	16a0e36f8dc6a83df3fec4344a11ad166ba99649d1cc52613c7ebe8015bd81a3
@openzeppelin/contracts/token/ERC20/IERC20.sol	c2b06bb4572bb4f84bfc5477dadc0fcc497cb66c3a1bd53480e68bedc2e154a6
contracts/KOR.sol	6edcf14436d332b6300df8ed2fd0321cb0e2b8d7ba163ae981db6f5b7b0c26d2

Contract Analysis

Critical Medium Minor

Severity	Description
	Minimum Distribution Reward
	Automatic Tokens Expiration

Minimum Distribution Reward

Criticality	minor
Location	contracts/KOR.sol#L188

Description

The reward amount for each buyer is a calculation that is produced from divisions. Since the division result may be rounded to zero, there are users that may not receive rewards even if they contribute a small amount. The algorithm should guarantee that all the distributors will get a portion from the rewards.

```
uint256 rewardOfToken = (totalReward * miners[minerIndex].hashRate *
token.amount * 2) / (3 * 4 * totalPower);
```

Recommendation

The method should check if the awarded amount is enough to distribute the proportional amount of the smaller token holder.

Automatic Tokens Expiration

Criticality	minor
Location	contracts/KOR.sol#L122

Description

The invalidation of the expired token is a fundamental part of the process. The decrease of the mintedMinerCount could be embedded in the “isExpired” function, so it will be called even if the contract owner forgot it.

```
function forceExpire(uint256 tokenId) external onlyOwner {
    require(isExpired(tokenId), "This token is not expired yet");
    Token memory token = tokenIdToToken[tokenId];
    uint256 minerIndex = token.index;
    miners[minerIndex].mintedCount -= token.amount;
}
```

Recommendation

The `isExpired()` could embed the decrease of the mintedCount and execute it if the provided token is expired. That way the process will always be updated and will not depend on the contract owner.

Contract Functions

Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
AggregatorV3Interface	Interface			
	decimals	External		-
	description	External		-
	version	External		-
	getRoundData	External		-
	latestRoundData	External		-
Initializable	Implementation			
	_isConstructor	Private		
ReentrancyGuardUpgradeable	Implementation	Initializable		
	__ReentrancyGuard_init	Internal	✓	onlyInitializing
	__ReentrancyGuard_init_unchained	Internal	✓	onlyInitializing
ERC721Upgradeable	Implementation	Initializable, ContextUpgradeable, ERC165Upgradeable, IERC721Upgradeable, IERC721MetadataUpgradeable		
	__ERC721_init	Internal	✓	onlyInitializing
	__ERC721_init_unchained	Internal	✓	onlyInitializing
	supportsInterface	Public		-
	balanceOf	Public		-
	ownerOf	Public		-
	name	Public		-

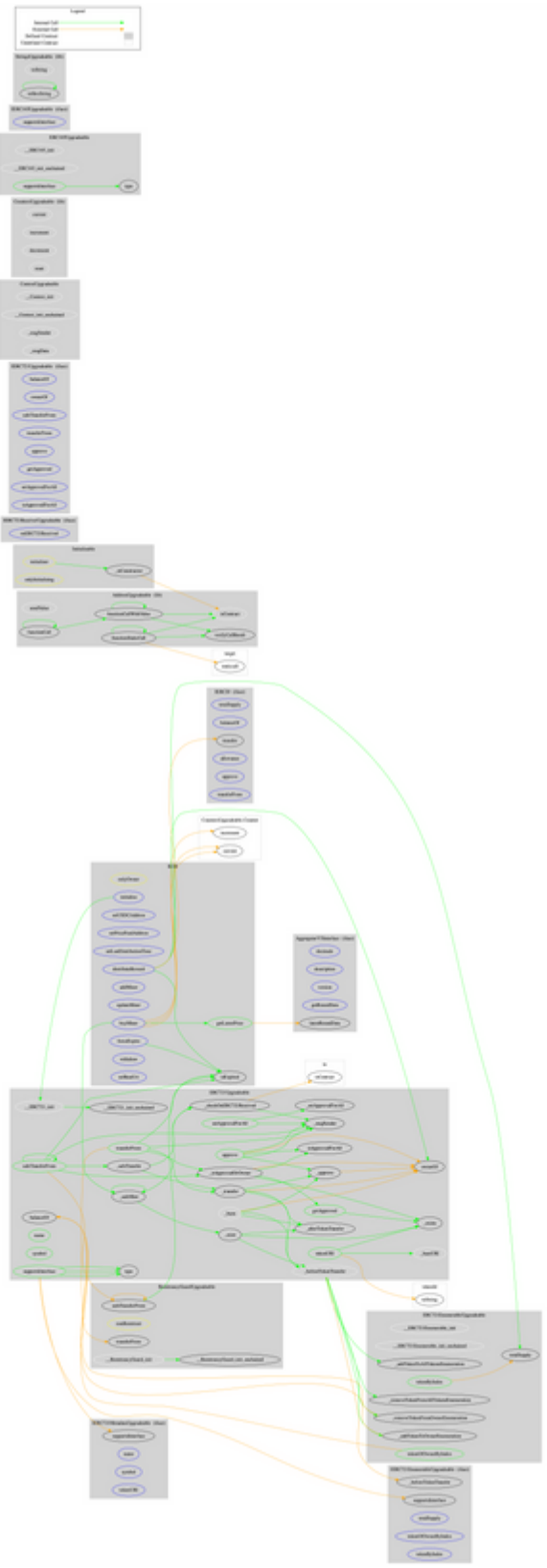
	symbol	Public		-
	tokenURI	Public		-
	_baseURI	Internal		
	approve	Public	✓	-
	getApproved	Public		-
	setApprovalForAll	Public	✓	-
	isApprovedForAll	Public		-
	transferFrom	Public	✓	-
	safeTransferFrom	Public	✓	-
	safeTransferFrom	Public	✓	-
	_safeTransfer	Internal	✓	
	_exists	Internal		
	_isApprovedOrOwner	Internal		
	_safeMint	Internal	✓	
	_safeMint	Internal	✓	
	_mint	Internal	✓	
	_burn	Internal	✓	
	_transfer	Internal	✓	
	_approve	Internal	✓	
	_setApprovalForAll	Internal	✓	
	_checkOnERC721Received	Private	✓	
	_beforeTokenTransfer	Internal	✓	
	_afterTokenTransfer	Internal	✓	
ERC721EnumerableUpgradeable	Implementation	Initializable, ERC721Upgradeable, IERC721EnumerableUpgradeable		
	__ERC721Enumerable_init	Internal	✓	onlyInitializing
	__ERC721Enumerable_init_unchained	Internal	✓	onlyInitializing
	supportsInterface	Public		-
	tokenOfOwnerByIndex	Public		-
	totalSupply	Public		-
	tokenByIndex	Public		-
	_beforeTokenTransfer	Internal	✓	

	_addTokenToOwnerEnumeration	Private	✓	
	_addTokenToAllTokensEnumeration	Private	✓	
	_removeTokenFromOwnerEnumeration	Private	✓	
	_removeTokenFromAllTokensEnumeration	Private	✓	
IERC721EnumerableUpgradeable	Interface	IERC721Upgradeable		
	totalSupply	External		-
	tokenOfOwnerByIndex	External		-
	tokenByIndex	External		-
IERC721MetadataUpgradeable	Interface	IERC721Upgradeable		
	name	External		-
	symbol	External		-
	tokenURI	External		-
IERC721ReceiverUpgradeable	Interface			
	onERC721Received	External	✓	-
IERC721Upgradeable	Interface	IERC165Upgradeable		
	balanceOf	External		-
	ownerOf	External		-
	safeTransferFrom	External	✓	-
	transferFrom	External	✓	-
	approve	External	✓	-
	getApproved	External		-
	setApprovalForAll	External	✓	-
	isApprovedForAll	External		-
	safeTransferFrom	External	✓	-

AddressUpgradeable	Library			
	isContract	Internal		
	sendValue	Internal	✓	
	functionCall	Internal	✓	
	functionCall	Internal	✓	
	functionCallWithValue	Internal	✓	
	functionCallWithValue	Internal	✓	
	functionStaticCall	Internal		
	functionStaticCall	Internal		
	verifyCallResult	Internal		
ContextUpgradeable	Implementation	Initializable		
	__Context_init	Internal	✓	onlyInitializing
	__Context_init_unchained	Internal	✓	onlyInitializing
	_msgSender	Internal		
	_msgData	Internal		
CountersUpgradeable	Library			
	current	Internal		
	increment	Internal	✓	
	decrement	Internal	✓	
	reset	Internal	✓	
ERC165Upgradeable	Implementation	Initializable, IERC165Upgradeable		
	__ERC165_init	Internal	✓	onlyInitializing
	__ERC165_init_unchained	Internal	✓	onlyInitializing
	supportsInterface	Public		-
IERC165Upgradeable	Interface			
	supportsInterface	External		-

StringsUpgradeable	Library			
	toString	Internal		
	toHexString	Internal		
	toHexString	Internal		
IERC20	Interface			
	totalSupply	External		-
	balanceOf	External		-
	transfer	External	✓	-
	allowance	External		-
	approve	External	✓	-
	transferFrom	External	✓	-
KOR	Implementation	ERC721EnumerableUpgradeable, ReentrancyGuardUpgradeable		
	initialize	External	✓	initializer
	getLatestPrice	Public		-
	isExpired	Public		-
	safeTransferFrom	Public	✓	-
	safeTransferFrom	Public	✓	-
	transferFrom	Public	✓	-
	setUSDCAddress	External	✓	onlyOwner
	setPriceFeedAddress	External	✓	onlyOwner
	setLastDistributionTime	External	✓	onlyOwner
	forceExpire	External	✓	onlyOwner
	addMiner	External	✓	onlyOwner
	updateMiner	External	✓	onlyOwner
	buyMiner	External	Payable	nonReentrant
	distributeReward	External	✓	onlyOwner
	withdraw	External	✓	onlyOwner
	_baseURI	Internal		
	setBaseUri	External	✓	onlyOwner

Contract Flow



Summary

KOR Blockchain is running a mining mechanism. The users are able to buy a miner. As a reward an NFT is minted to the users. Every two weeks the amount is distributed to the users as a profit from the corresponding miner. This audit mentions some security concerns, performance improvements and potential business logic vulnerabilities.

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About Cyberscope

Coinscope audit and K.Y.C. service has been rebranded to Cyberscope.

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The Cyberscope team

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