



Cyberscope

Audit Report

MoonLabsStakingCards

April 2023

SHA256 522ea07873e55484857dc679f7b42367026ba80985076e28e7008fac7703519c

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Review

Contract Name	MoonLabsStakingCards
Testing Deploy	https://testnet.bscscan.com/address/0x6e8ce2a83e5ad4067c6ced0a7693c1d36cb5f088
Symbol	TsT

Audit Updates

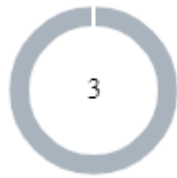
Initial Audit	24 Mar 2023 https://github.com/cyberscope-io/audits/blob/main/moonlabsd/v1/nft.pdf
Corrected Phase 2	06 Apr 2023

Source Files

Filename	SHA256
@openzeppelin/contracts/access/Ownable.sol	9353af89436556f7ba8abb3f37a6677249a a4df6024fbfaa94f79ab2f44f3231
@openzeppelin/contracts/token/ERC721/ERC721.sol	d0ae06bbac0c133b7891194ae955f62447 3d8572a7c6928747599f4043b01c04
@openzeppelin/contracts/token/ERC721/extensions/ERC721Enumerable.sol	e09a099c8828bb8eb545968ecca3f5f0fe4 18618eabd93b40befd6ec7e5a88be
@openzeppelin/contracts/token/ERC721/extensions/IERC721Enumerable.sol	ec7cb6a8cc0fdad9e3a707146b503d9765 95a880d24d62c99565787593f3660b
@openzeppelin/contracts/token/ERC721/extensions/IERC721Metadata.sol	f16b861aa1f623ccc5e173f1a82d8cf45b67 8a7fb81e05478fd17eb2ccb7b37e
@openzeppelin/contracts/token/ERC721/IERC721.sol	c7703068bac02fe1cdf109e38faf10399c66 eb411e4c9ae0d70c009eca4bf5ef
@openzeppelin/contracts/token/ERC721/IERC721Receiver.sol	77f0f7340c2da6bb9edbc90ab6e7d3eb8e 2ae18194791b827a3e8c0b11a09b43
@openzeppelin/contracts/utils/Address.sol	8160a4242e8a7d487d940814e5279d934e 81f0436689132a4e73394bab084a6d
@openzeppelin/contracts/utils/Context.sol	1458c260d010a08e4c20a4a517882259a2 3a4baa0b5bd9add9fb6d6a1549814a
@openzeppelin/contracts/utils/introspection/ERC165.sol	8806a632d7b656cadb8133ff8f2acae4405 b3a64d8709d93b0fa6a216a8a6154
@openzeppelin/contracts/utils/introspection/IERC165.sol	701e025d13ec6be09ae892eb029cd83b30 64325801d73654847a5fb11c58b1e5
@openzeppelin/contracts/utils/math/Math.sol	8059d642ec219d0b9b62fbc76912079529 cf494cac988abe5e371f1168b29b0f

@openzeppelin/contracts/utils/Strings.sol	f81f11dca62dcd3e0895e680559676f4ba4 f2e12a36bb0291d7ecbb6b983141f
contracts/MoonLabsStakingCards.sol	522ea07873e55484857dc679f7b4236702 6ba80985076e28e7008fac7703519c

Findings Breakdown



● Critical	0
● Medium	0
● Minor / Informative	3

Severity	Unresolved	Acknowledged	Resolved	Other
● Critical	0	0	0	0
● Medium	0	0	0	0
● Minor / Informative	3	0	0	0

Introduction

The MoonLabsStakingCards contract extends ERC721Enumerable and Ownable contracts from the OpenZeppelin library. It allows for the creation and management of non-fungible tokens (NFTs). The contract has a maximum supply of 500 NFTs, which can be minted by the contract owner only. The contract also provides a function for getting all the token IDs owned by a particular address, setting the base token URI, and claiming all ETH held in the contract. The tokenURI function returns the compiled token URI for a given token ID.

Roles

The contract consists of the owner role. The owner is responsible for the base URI configuration and for minting tokens.

Diagnostics

● Critical ● Medium ● Minor / Informative

Severity	Code	Description	Status
●	MT	Mints Tokens	Unresolved
●	L02	State Variables could be Declared Constant	Unresolved
●	L04	Conformance to Solidity Naming Conventions	Unresolved

MT - Mints Tokens

Criticality	Minor / Informative
Status	Unresolved

Description

The contract owner has the authority to mint tokens.

```
function ownerMint(address _to, uint amount) external onlyOwner
{
    uint supply = totalSupply();
    require(supply + amount <= MAX_SUPPLY, "Max supply
reached");
    for (uint i = 1; i <= amount; i++) {
        _safeMint(_to, supply + i);
    }
}
```

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. Some suggestions are:

- Introduce a time-locker mechanism with a reasonable delay.
- Introduce a multi-sign wallet so that many addresses will confirm the action.
- Introduce a governance model where users will vote about the actions.
- Renouncing the ownership will eliminate the threats but it is non-reversible.

L02 - State Variables could be Declared Constant

Criticality	Minor / Informative
Location	contracts/MoonLabsStakingCards.sol#L29
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.

```
nt nfts to. Only owner function.
```

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	contracts/MoonLabsStakingCards.sol#L29,39,54,87
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.

```
nt nfts to. Only owner function.  
  
amount; i++) {  
  
;  
  
r
```

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
Ownable	Implementation	Context		
		Public	✓	-
	owner	Public		-
	_checkOwner	Internal		
	renounceOwnership	Public	✓	onlyOwner
	transferOwnership	Public	✓	onlyOwner
	_transferOwnership	Internal	✓	
ERC721	Implementation	Context, ERC165, IERC721, IERC721Met adata		
		Public	✓	-
	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	✓	
	_ownerOf	Internal		
	_exists	Internal		
	_isApprovedOrOwner	Internal		
	_safeMint	Internal	✓	
	_safeMint	Internal	✓	
	_mint	Internal	✓	
	_burn	Internal	✓	
	_transfer	Internal	✓	
	_approve	Internal	✓	
	_setApprovalForAll	Internal	✓	
	_requireMinted	Internal		
	_checkOnERC721Received	Private	✓	
	_beforeTokenTransfer	Internal	✓	
	_afterTokenTransfer	Internal	✓	

	__unsafe_increaseBalance	Internal	✓	
ERC721Enumerable	Implementation	ERC721, IERC721Enumerable		
	supportsInterface	Public		-
	tokenOfOwnerByIndex	Public		-
	totalSupply	Public		-
	tokenByIndex	Public		-
	_beforeTokenTransfer	Internal	✓	
	_addTokenToOwnerEnumeration	Private	✓	
	_addTokenToAllTokensEnumeration	Private	✓	
	_removeTokenFromOwnerEnumeration	Private	✓	
	_removeTokenFromAllTokensEnumeration	Private	✓	
IERC721Enumerable	Interface	IERC721		
	totalSupply	External		-
	tokenOfOwnerByIndex	External		-
	tokenByIndex	External		-
IERC721Metadata	Interface	IERC721		
	name	External		-
	symbol	External		-

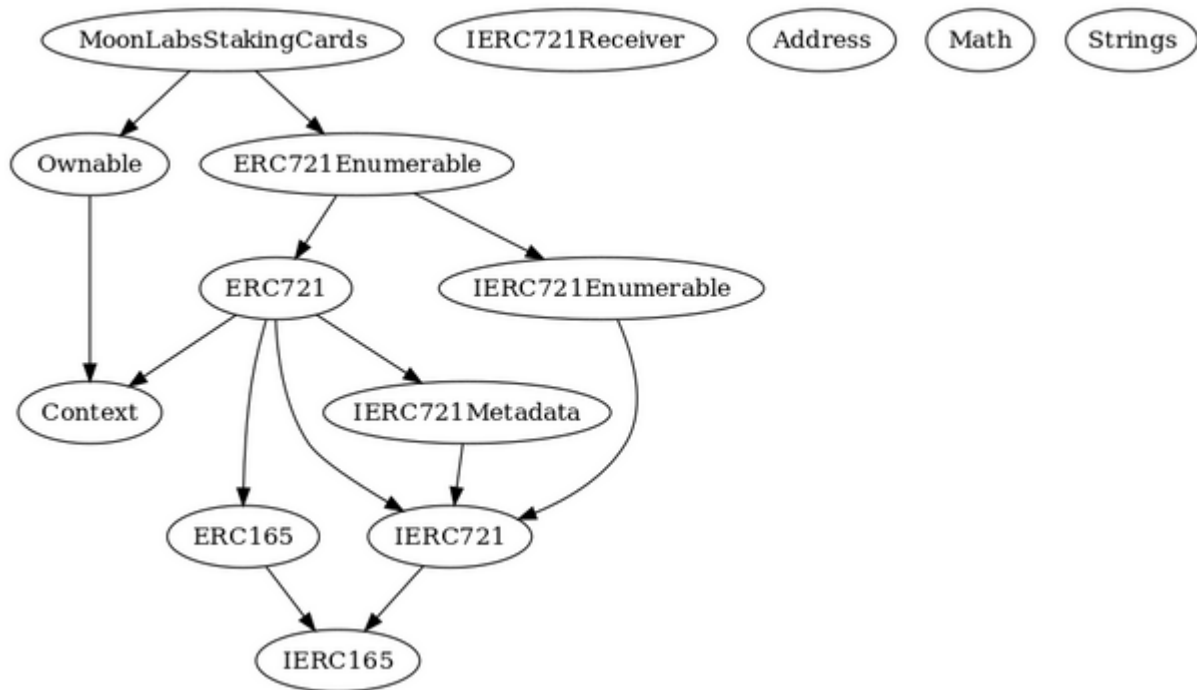
	tokenURI	External		-
IERC721	Interface	IERC165		
	balanceOf	External		-
	ownerOf	External		-
	safeTransferFrom	External	✓	-
	safeTransferFrom	External	✓	-
	transferFrom	External	✓	-
	approve	External	✓	-
	setApprovalForAll	External	✓	-
	getApproved	External		-
	isApprovedForAll	External		-
IERC721Receiver	Interface			
	onERC721Received	External	✓	-
Address	Library			
	isContract	Internal		
	sendValue	Internal	✓	
	functionCall	Internal	✓	
	functionCall	Internal	✓	
	functionCallWithValue	Internal	✓	
	functionCallWithValue	Internal	✓	

	functionStaticCall	Internal		
	functionStaticCall	Internal		
	functionDelegateCall	Internal	✓	
	functionDelegateCall	Internal	✓	
	verifyCallResultFromTarget	Internal		
	verifyCallResult	Internal		
	_revert	Private		
Context	Implementation			
	_msgSender	Internal		
	_msgData	Internal		
ERC165	Implementation	IERC165		
	supportsInterface	Public		-
IERC165	Interface			
	supportsInterface	External		-
Math	Library			
	max	Internal		
	min	Internal		
	average	Internal		
	ceilDiv	Internal		

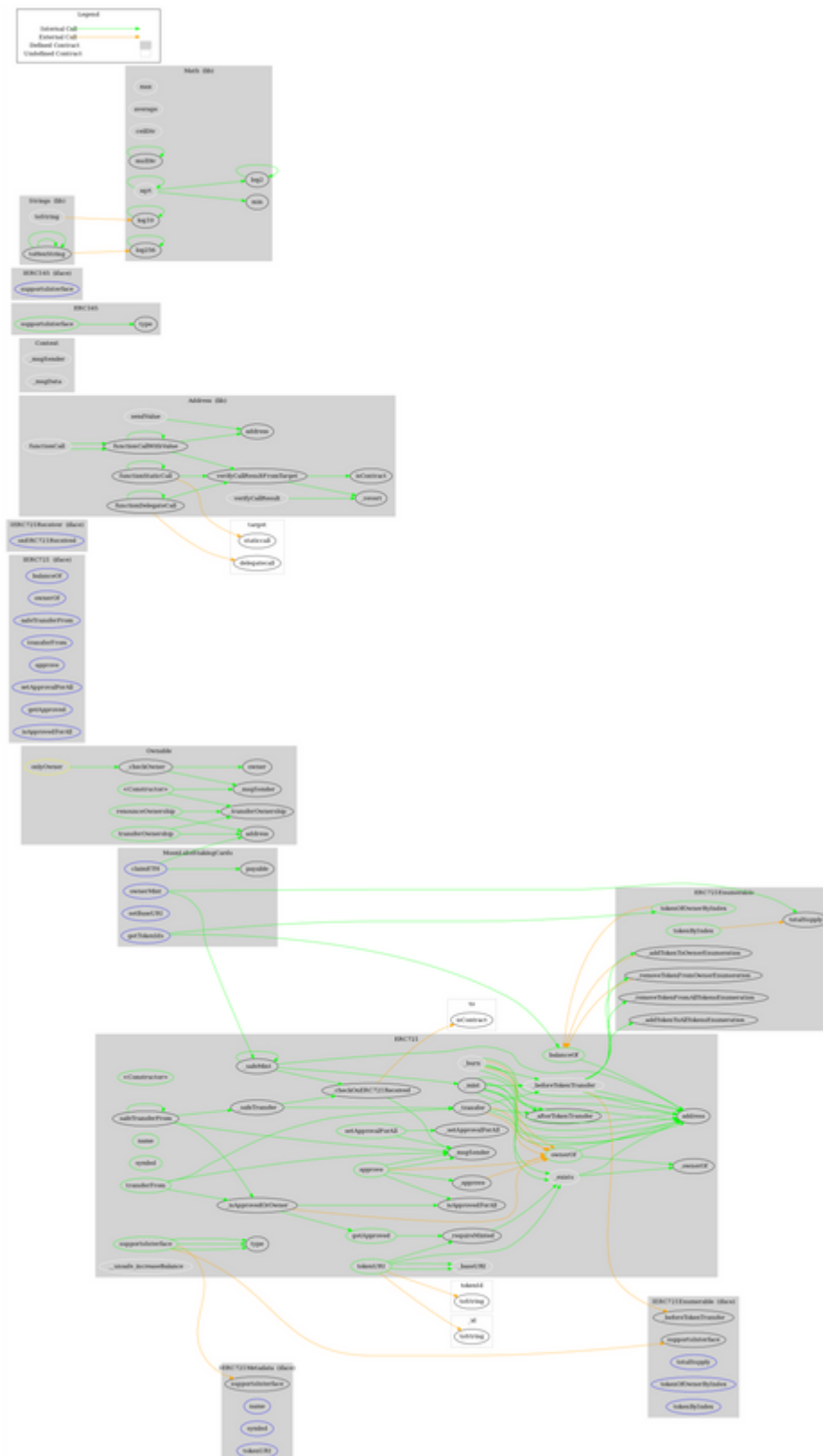
	mulDiv	Internal		
	mulDiv	Internal		
	sqrt	Internal		
	sqrt	Internal		
	log2	Internal		
	log2	Internal		
	log10	Internal		
	log10	Internal		
	log256	Internal		
	log256	Internal		
Strings	Library			
	toString	Internal		
	toHexString	Internal		
	toHexString	Internal		
	toHexString	Internal		
MoonLabsStakingCards	Implementation	ERC721Enumerable, Ownable		
		Public	✓	ERC721
	getTokenIds	External		-
	ownerMint	External	✓	onlyOwner
	setBaseURI	External	✓	onlyOwner

	claimETH	External	Payable	onlyOwner
	tokenURI	Public		-
	_baseURI	Internal		

Inheritance Graph



Flow Graph



Summary

MoonLabsStakingCards contract implements an nft 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

<https://www.cyberscope.io>