Smart Contract
Security Audit
V1

Aki Story NFT Smart Contract

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Background

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

Project Information

- **Platform**: Ethereum
- **Contract Address**: 0x00746bAB354E9FEb2276F6f84EBe3e7AA67DbA84
- **Code:**

https://rinkeby.etherscan.io/address/0x00746bab354e9feb2276f6f84ebe3e7aa67dba84#code

NFT Information

- Name: AS
- MAX Supply: 5555
- Holders:
- Total transactions:

Contracts address deployed to test net (Ethereum)

Aki Story NFT contract on ETH test net to test every function by the auditor.

https://rinkeby.etherscan.io/address/0x6c950e2cb0a2bd6399038c5181fabc10539b61c7

Executive Summary

According to our assessment, the customer`s solidity smart contract is **Well-Secured**. Because the team fix all high and low issues.

Well Secured	✓
Secured	
Poor Secured	
Insecure	

Automated checks are with remix IDE. All issues were performed by the team, which included the analysis of code functionality, manual audit found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the audit overview section. The general overview is presented in the Project Information section and all issues found are located in the audit overview section.

Team found 0 critical, 1 high, 0 medium, 3 low, 0 very low-level issues and 0 note in all solidity files of the contract

The files:

AkiStory.sol

File and Function Level Report

File in Scope:

Contract Name	SHA 256 hash	Contract Address
AkiStory.sol	**5c3c09202e4a5d8edd2897b925d24c4faa5b4142188732602b6c70f3ce1b2166**	0x6C950e2CB0a2BD6399038C5181FAbc10539b61C7

- Contract: AkiStory
- Inherit: ERC721A, Ownable
- Observation: All passed including security check
- Test Report: passed
- Score: passed
- Conclusion: passed

Function	Test Result	Type / Return Type	Score
name	✓	Read / public	**Passed**
symbol	✓	Read / public	**Passed**
merkleRootNormalWLList	✓	Read / public	**Passed**
supportsInterface	✓	Read / public	**Passed**
merkleRootAllowList	✓	Read / public	**Passed**
balanceOf	✓	Read / public	**Passed**
Owner	✓	Read / public	**Passed**
MaxToken	✓	Read / public	**Passed**
tokenOfOwner	✓	Read / public	**Passed**
getApprovedForAll	✓	Read / public	**Passed**
isRevealed	✓	Read / public	**Passed**
getApproved	✓	Read / public	**Passed**

ownerOf	✓	Read / public	**Passed**
tokenURI	✓	Read / public	**Passed**
totalSupply	✓	Read / public	**Passed**
merkleRootFree	✓	Read / public	**Passed**
nextOwnerToExplicitlySet	✓	Read / public	**Passed**
merkleRootOG	✓	Read / public	**Passed**
numberMinted	✓	Read / public	**Passed**
RevealedActive	✓	Read / public	**Passed**
MaxWLMint	✓	Read / public	**Passed**
MaxPublicMint	✓	Read / public	**Passed**
MaxOGMint	✓	Read / public	**Passed**
price	✓	Read / public	**Passed**
sellingStep	✓	Read / public	**Passed**
tokenByIndex	✓	Read / public	**Passed**
getOwnershipData	✓	Read / public	**Passed**
MaxAllowListMint	✓	Read / public	**Passed**
MaxFreeMint	✓	Read / public	**Passed**
mintFree	✓	Write / payable	**Passed**
approve	✓	Write / public	**Passed**
safeTransferFrom	✓	Write / public	**Passed**
safeTransferFrom	✓	Write / public	**Passed**
setPrice	✓	Write / public	**Passed**
setnotRevealedUri	✓	Write / public	**Passed**
mint	✓	Write / payable	**Passed**
setSale	✓	Write / public	**Passed**
transferOwnership	✓	Write / public	**Passed**

setApprovalForAll	✓	Write / public	**Passed**
transferFrom	✓	Write / public	**Passed**
withdraw	✓	Write / payable	**Passed**
changeMerkleRootAllowList	✓	Write / public	**Passed**
renounceOwnership	✓	Write / public	**Passed**
setBaseURI	✓	Write / public	**Passed**
ownerMint	✓	Write / public	**Passed**
TurnRevealMode	✓	Write / public	**Passed**
setWL	✓	Write / public	**Passed**
setFreeMint	✓	Write / public	**Passed**
setAllowList	✓	Write / public	**Passed**
Airdrop	✓	Write / public	**Passed**
AirdropGroup	✓	Write / public	**Passed**
mintOG	✓	Write / payable	**Passed**
mintWL	✓	Write / payable	**Passed**
mintAllowList	✓	Write / payable	**Passed**
changeMerkleRootNormalWL	✓	Write / public	**Passed**
changeMerkleRootFree	✓	Write / public	**Passed**
changeMerkleRootOG	✓	Write / public	**Passed**

Issues Checking Status

No.	Issue Description	Checking Status
1	Compiler warnings.	**Passed**
2	Race conditions and Reentrancy. Cross-function race conditions.	**Passed**
3	Possible delays in data delivery.	**Passed**
4	Oracle calls.	**Passed**
5	Design Logic.	**Passed**
6	Timestamp dependence.	**Passed**
7	Integer Overflow and Underflow.	**Passed**
8	DoS with Revert.	**Passed**
9	DoS with block gas limit.	**Passed with Notes**
10	Methods execution permissions.	**Passed**
11	Economy model. If application logic is based on an incorrect economic model, the application would not function correctly and participants would incur financial losses. This type of issue is most often found in bonus rewards systems, Staking and Farming contracts, Vault and Vesting contracts, etc.	**Passed**
12	The impact of the exchange rate on the logic.	**Passed**
13	Private user data leaks.	**Passed**
14	Malicious Event log.	**Passed**
15	Scoping and Declarations.	**Passed**
16	Uninitialized storage pointers.	**Passed**
17	Arithmetic accuracy.	**Passed**

Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to tokens loss etc.
High	High-level vulnerabilities are difficult to exploit; however, they also have significant impact on smart contract execution, e.g. public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can’t lead to tokens lose
Low	Low-level vulnerabilities are mostly related to outdated, unused etc. code snippets, that can’t have significant impact on execution
Note	Lowest-level vulnerabilities, code style violations and info statements can’t affect smart contract execution and can be ignored.

Audit Findings

Critical:

No Critical severity vulnerabilities were found.

High:

#Contract code size exceeds 24576 bytes

Description
Contract implementation is too large in size to be deployed on main net. Ethereum with its spurious dragon release limited the size of the contracts deployable on main net to 24576 bytes.
The size of the contract AkiStory.sol goes way above this value.
You can read more here:
https://github.com/ethereum/EIPs/issues/170

Remediation
Define and use libraries for pure and view functions e.g. We can create a library which contains all the mathematical operations.

Status: Closed. Fixed in version 2.

Medium:

No Medium severity vulnerabilities were found

Low:

#Multiple pragma statements

Line	Pragma
12	pragma solidity ^0.8.0;
242	pragma solidity ^0.8.0;
305	pragma solidity ^0.8.0;
375	pragma solidity ^0.8.1;
600	pragma solidity ^0.8.0;
630	pragma solidity ^0.8.0;
658	pragma solidity ^0.8.0;
689	pragma solidity ^0.8.0;
834	pragma solidity ^0.8.0;
865	pragma solidity ^0.8.0;

894	pragma solidity ^0.8.0;
920	pragma solidity ^0.8.0;
1418	pragma solidity ^0.8.0;
1495	pragma solidity ^0.8.0;

Description
There are multiple pragma statements in the code. Only the compiler version 0.8.7 will work with the code, but keeping only one pragma statement helps in maintaining readability of the code.

Remediation
Keep a single pragma statement.

Status: Closed. Fixed In version 2

#Missing zero address validation

Description
When the owner wants to airdrop for the investors it has to check for the zero address to make, he didn't mint for the burn address. Otherwise, the mint function will act like the burn function.

```
function Airdrop(uint256 num, address recipient) public onlyOwner {
      require(totalSupply().add(num) <= MaxToken, "Sold Out");
    if(totalSupply().add(num) == MaxToken) { sellingStep = Steps.SoldOut; }
    _mint(recipient, num);
    emit TokenMinted(totalSupply());
  }
```

Remediation
Use the require statement to check for zero addresses.

```
require(_accont != address(0), "Not Mint for the zero address");
```

Status: Closed. Fixed in version2.

#Use of block.timestamp for comparisons

Description

The value of block.timestamp can be manipulated by the miner.
And conditions with strict equality is difficult to achieve -
block.timestamp

Remediation
Avoid use of block.timestamp
Status: Acknowledged

Very Low:

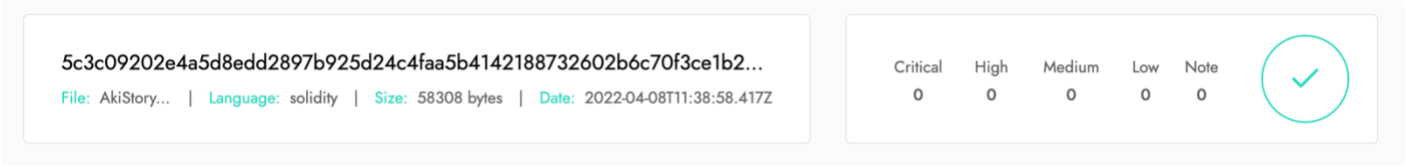
No Very Low severity vulnerabilities were found.

Notes:

No Notes vulnerabilities were found.

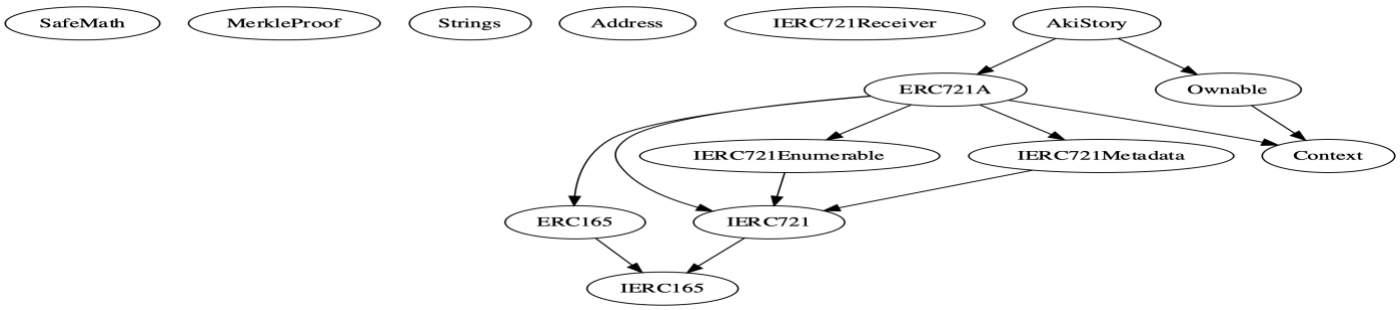
Automatic Testing

1- Check for security

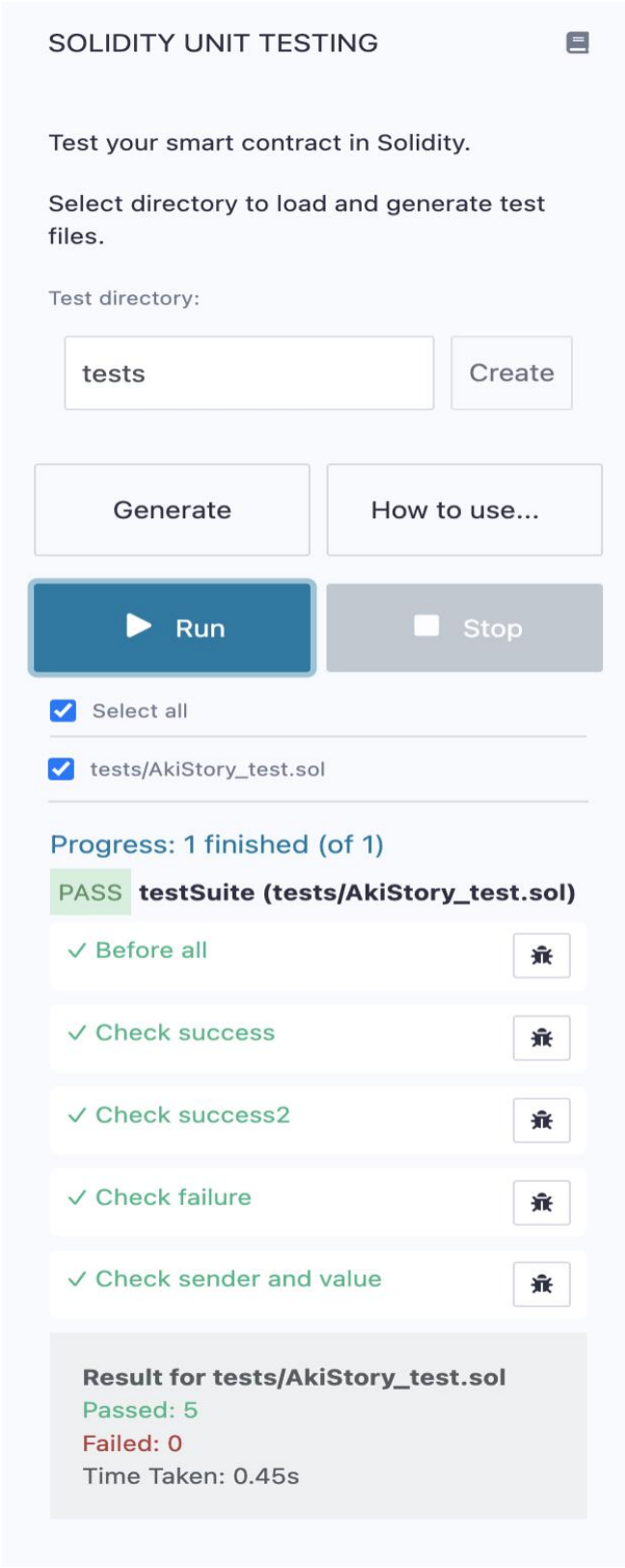


2- SOLIDITY STATIC ANALYSIS

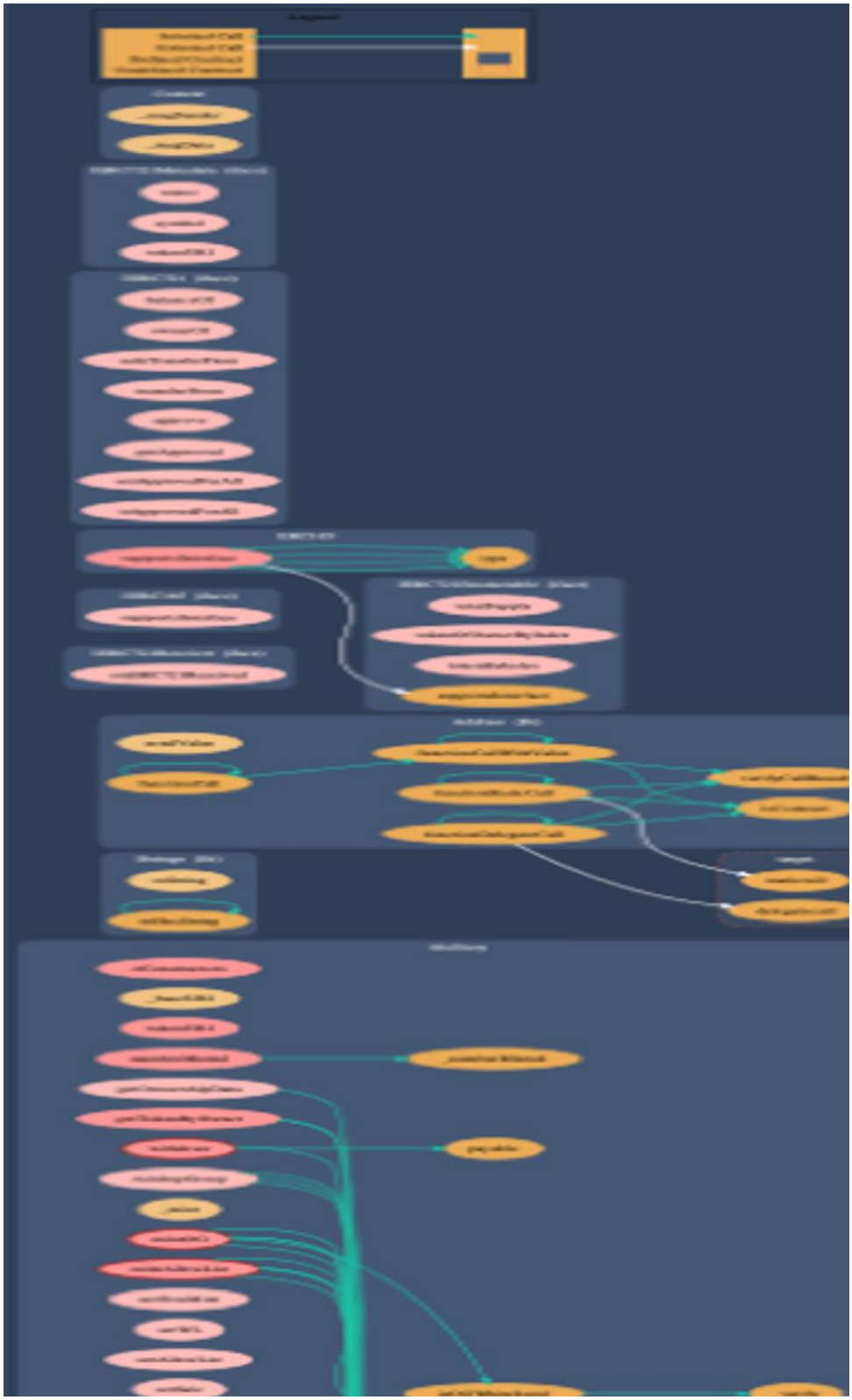
3- Inheritance graph



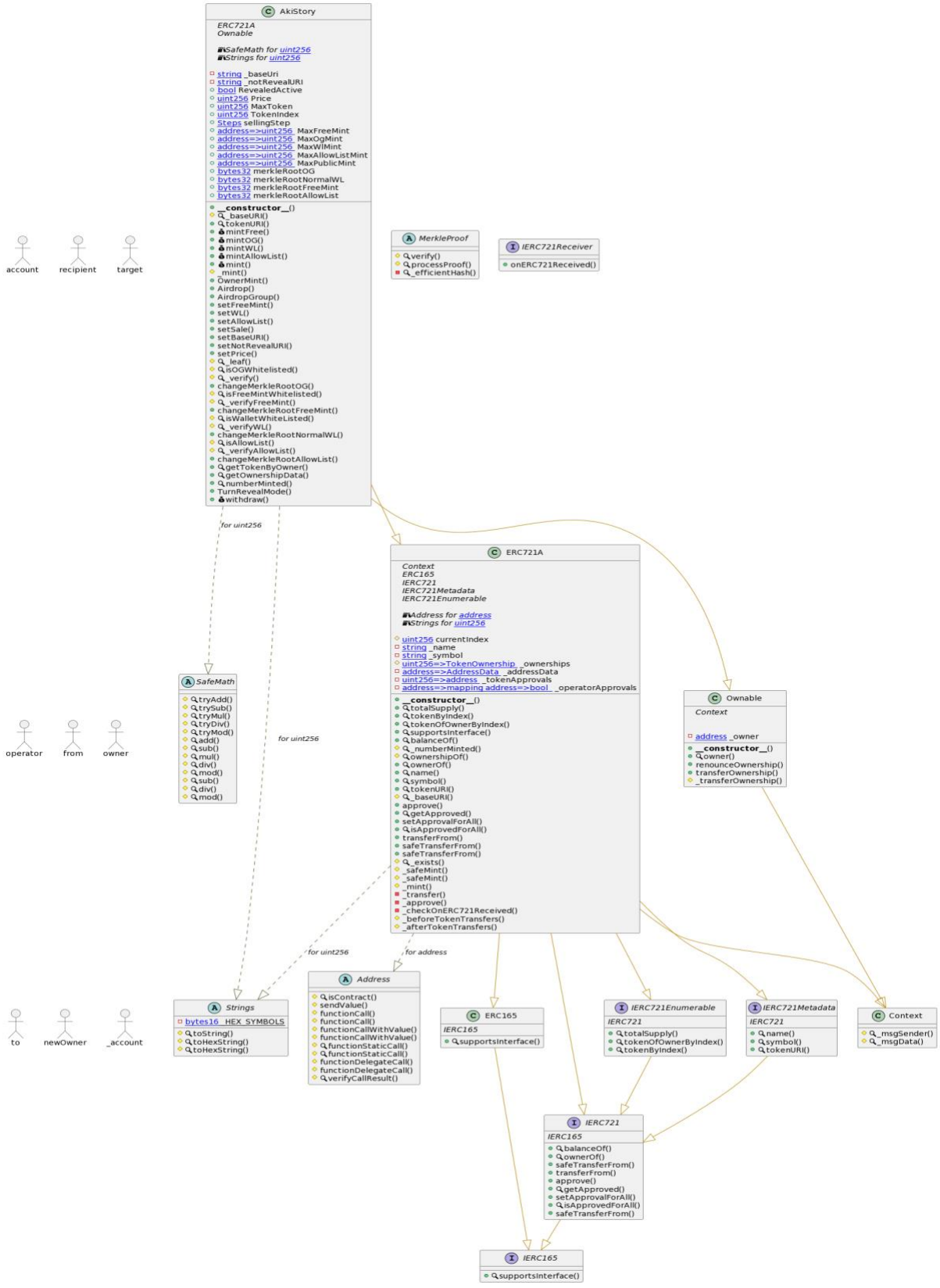
4- SOLIDITY UNIT TESTING



5- Call graph



Unified Modeling Language (UML)



Functions signature

```
Sighash   |   Function Signature
========================
16279055  =>  isContract(address)
48683503  =>  AirdropGroup(address[])
884557bf  =>  tryAdd(uint256,uint256)
a29962b1  =>  trySub(uint256,uint256)
6281efa4  =>  tryMul(uint256,uint256)
736ecb18  =>  tryDiv(uint256,uint256)
38dc0867  =>  tryMod(uint256,uint256)
771602f7  =>  add(uint256,uint256)
b67d77c5  =>  sub(uint256,uint256)
c8a4ac9c  =>  mul(uint256,uint256)
a391c15b  =>  div(uint256,uint256)
f43f523a  =>  mod(uint256,uint256)
e31bdc0a  =>  sub(uint256,uint256,string)
b745d336  =>  div(uint256,uint256,string)
71af23e8  =>  mod(uint256,uint256,string)
5a9a49c7  =>  verify(bytes32[],bytes32,bytes32)
62702a6b  =>  processProof(bytes32[],bytes32)
41ed615b  =>  _efficientHash(bytes32,bytes32)
6900a3ae  =>  toString(uint256)
8fba8d5c  =>  toHexString(uint256)
63e1cbea  =>  toHexString(uint256,uint256)
24a084df  =>  sendValue(address,uint256)
a0b5ffb0  =>  functionCall(address,bytes)
241b5886  =>  functionCall(address,bytes,string)
2a011594  =>  functionCallWithValue(address,bytes,uint256)
d525ab8a  =>  functionCallWithValue(address,bytes,uint256,string)
c21d36f3  =>  functionStaticCall(address,bytes)
dbc40fb9  =>  functionStaticCall(address,bytes,string)
ee33b7e2  =>  functionDelegateCall(address,bytes)
57387df0  =>  functionDelegateCall(address,bytes,string)
946b5793  =>  verifyCallResult(bool,bytes,string)
150b7a02  =>  onERC721Received(address,address,uint256,bytes)
01ffc9a7  =>  supportsInterface(bytes4)
70a08231  =>  balanceOf(address)
6352211e  =>  ownerOf(uint256)
42842e0e  =>  safeTransferFrom(address,address,uint256)
23b872dd  =>  transferFrom(address,address,uint256)
095ea7b3  =>  approve(address,uint256)
081812fc  =>  getApproved(uint256)
a22cb465  =>  setApprovalForAll(address,bool)
e985e9c5  =>  isApprovedForAll(address,address)
b88d4fde  =>  safeTransferFrom(address,address,uint256,bytes)
18160ddd  =>  totalSupply()
2f745c59  =>  tokenOfOwnerByIndex(address,uint256)
4f6ccce7  =>  tokenByIndex(uint256)
06fdde03  =>  name()
95d89b41  =>  symbol()
c87b56dd  =>  tokenURI(uint256)
119df25f  =>  _msgSender()
8b49d47e  =>  _msgData()
4d388a98  =>  _numberMinted(address)
```

```
140364a1  =>  ownershipOf(uint256)
743976a0  =>  _baseURI()
f8e76cc0  =>  _exists(uint256)
b3e1c718  =>  _safeMint(address,uint256)
6a4f832b  =>  _safeMint(address,uint256,bytes)
de0d9900  =>  _mint(address,uint256,bytes,bool)
30e0789e  =>  _transfer(address,address,uint256)
f272404d  =>  _approve(address,uint256,address)
1fd01de1  =>  _checkOnERC721Received(address,address,uint256,bytes)
ef435773  =>  _beforeTokenTransfers(address,address,uint256,uint256)
08c018f7  =>  _afterTokenTransfers(address,address,uint256,uint256)
8da5cb5b  =>  owner()
715018a6  =>  renounceOwnership()
f2fde38b  =>  transferOwnership(address)
d29d44ee  =>  _transferOwnership(address)
8a085462  =>  mintFree(uint8,address,bytes32[])
659deed8  =>  mintOG(uint8,address,bytes32[])
38c5426f  =>  mintWL(uint8,address,bytes32[])
44f7a48b  =>  mintAllowList(uint8,address,bytes32[])
6ecd2306  =>  mint(uint8)
4e6ec247  =>  _mint(address,uint256)
1618c8df  =>  OwnerMint(uint256)
7871e154  =>  Airdrop(uint256,address)
e1f3763b  =>  setFreeMint()
51743bdc  =>  setWL()
00ce7f54  =>  setAllowList()
1d9cfd6d  =>  setSale()
55f804b3  =>  setBaseURI(string)
5accac99  =>  setNotRevealURI(string)
91b7f5ed  =>  setPrice(uint256)
49912e8d  =>  _leaf(address)
e9234d03  =>  isOGWhitelisted(address,bytes32[])
46f265fd  =>  _verify(bytes32,bytes32[])
e196c5d4  =>  changeMerkleRootOG(bytes32)
5be69045  =>  isFreeMintWhitelisted(address,bytes32[])
0f662a36  =>  _verifyFreeMint(bytes32,bytes32[])
9b683fad  =>  changeMerkleRootFreeMint(bytes32)
f1a43fdc  =>  isWalletWhiteListed(address,bytes32[])
49dca5d7  =>  _verifyWL(bytes32,bytes32[])
94bbc4ac  =>  changeMerkleRootNormalWL(bytes32)
5e3867ca  =>  isAllowList(address,bytes32[])
2de6765c  =>  _verifyAllowList(bytes32,bytes32[])
33983bef  =>  changeMerkleRootAllowList(bytes32)
2bf79c94  =>  getTokenByOwner(address)
9231ab2a  =>  getOwnershipData(uint256)
dc33e681  =>  numberMinted(address)
bc0ac746  =>  TurnRevealMode()
3ccfd60b  =>  withdraw()
```

Automatic general report

Files Description Table

File Name	SHA-1 Hash
/Users/macbook/Desktop/smart contracts/AkiStory.sol	d339792ad40c63423e3721a3803be4af7877d165

Contracts Description Table

Contract	Type	Bases		
└	**Function Name**	**Visibility**	**Mutability**	**Modifiers**
SafeMath	Library			
└	tryAdd	Internal 🔒		
└	trySub	Internal 🔒		
└	tryMul	Internal 🔒		
└	tryDiv	Internal 🔒		
└	tryMod	Internal 🔒		
└	add	Internal 🔒		
└	sub	Internal 🔒		
└	mul	Internal 🔒		
└	div	Internal 🔒		
└	mod	Internal 🔒		
└	sub	Internal 🔒		
└	div	Internal 🔒		
└	mod	Internal 🔒		
MerkleProof	Library			
└	verify	Internal 🔒		
└	processProof	Internal 🔒		
└	_efficientHash	Private 🔐		
Strings	Library			
└	toString	Internal 🔒		
└	toHexString	Internal 🔒		
└	toHexString	Internal 🔒		
Address	Library			
└	isContract	Internal 🔒		
└	sendValue	Internal 🔒	🛑	
└	functionCall	Internal 🔒	🛑	
└	functionCall	Internal 🔒	🛑	
└	functionCallWithValue	Internal 🔒	🛑	
└	functionCallWithValue	Internal 🔒	🛑	
└	functionStaticCall	Internal 🔒		
└	functionStaticCall	Internal 🔒		
└	functionDelegateCall	Internal 🔒	🛑	
└	functionDelegateCall	Internal 🔒	🛑	

└	verifyCallResult	Internal 🔒		
IERC721Receiver	Interface				
└	onERC721Received	External ❗	🛑	NO❗
IERC165	Interface				
└	supportsInterface	External ❗		NO❗
ERC165	Implementation	IERC165		
└	supportsInterface	Public ❗		NO❗
IERC721	Interface	IERC165		
└	balanceOf	External ❗		NO❗
└	ownerOf	External ❗		NO❗
└	safeTransferFrom	External ❗	🛑	NO❗
└	transferFrom	External ❗	🛑	NO❗
└	approve	External ❗	🛑	NO❗
└	getApproved	External ❗		NO❗
└	setApprovalForAll	External ❗	🛑	NO❗
└	isApprovedForAll	External ❗		NO❗
└	safeTransferFrom	External ❗	🛑	NO❗
IERC721Enumerable	Interface	IERC721		
└	totalSupply	External ❗		NO❗
└	tokenOfOwnerByIndex	External ❗		NO❗
└	tokenByIndex	External ❗		NO❗
IERC721Metadata	Interface	IERC721		
└	name	External ❗		NO❗
└	symbol	External ❗		NO❗
└	tokenURI	External ❗		NO❗
Context	Implementation				
└	_msgSender	Internal 🔒		
└	_msgData	Internal 🔒		
ERC721A	Implementation	Context, ERC165, IERC721, IERC721Metadata, IERC721Enumerable		
└	<Constructor>	Public ❗	🛑	NO❗
└	totalSupply	Public ❗		NO❗
└	tokenByIndex	Public ❗		NO❗
└	tokenOfOwnerByIndex	Public ❗		NO❗
└	supportsInterface	Public ❗		NO❗
└	balanceOf	Public ❗		NO❗
└	_numberMinted	Internal 🔒		
└	ownershipOf	Internal 🔒		
└	ownerOf	Public ❗		NO❗
└	name	Public ❗		NO❗
└	symbol	Public ❗		NO❗
└	tokenURI	Public ❗		NO❗
└	_baseURI	Internal 🔒		
└	approve	Public ❗	🛑	NO❗
└	getApproved	Public ❗		NO❗
└	setApprovalForAll	Public ❗	🛑	NO❗
└	isApprovedForAll	Public ❗		NO❗

└	transferFrom	Public ❗	🛑	NO❗
└	safeTransferFrom	Public ❗	🛑	NO❗
└	safeTransferFrom	Public ❗	🛑	NO❗
└	_exists	Internal 🔒		
└	_safeMint	Internal 🔒	🛑	
└	_safeMint	Internal 🔒	🛑	
└	_mint	Internal 🔒	🛑	
└	_transfer	Private 🔐	🛑	
└	_approve	Private 🔐	🛑	
└	_checkOnERC721Received	Private 🔐	🛑	
└	_beforeTokenTransfers	Internal 🔒	🛑	
└	_afterTokenTransfers	Internal 🔒	🛑	
Ownable	Implementation	Context		
└	<Constructor>	Public ❗	🛑	NO❗
└	owner	Public ❗		NO❗
└	renounceOwnership	Public ❗	🛑	onlyOwner
└	transferOwnership	Public ❗	🛑	onlyOwner
└	_transferOwnership	Internal 🔒	🛑	
AkiStory	Implementation	ERC721A, Ownable		
└	<Constructor>	Public ❗	🛑	ERC721A
└	_baseURI	Internal 🔒		
└	tokenURI	Public ❗		NO❗
└	mintFree	Public ❗	💸	NO❗
└	mintOG	Public ❗	💸	NO❗
└	mintWL	Public ❗	💸	NO❗
└	mintAllowList	Public ❗	💸	NO❗
└	mint	Public ❗	💸	NO❗
└	_mint	Internal 🔒	🛑	
└	OwnerMint	Public ❗	🛑	onlyOwner
└	Airdrop	Public ❗	🛑	onlyOwner
└	AirdropGroup	External ❗	🛑	onlyOwner
└	setFreeMint	External ❗	🛑	onlyOwner
└	setWL	External ❗	🛑	onlyOwner
└	setAllowList	External ❗	🛑	onlyOwner
└	setSale	External ❗	🛑	onlyOwner
└	setBaseURI	External ❗	🛑	onlyOwner
└	setNotRevealURI	External ❗	🛑	onlyOwner
└	setPrice	Public ❗	🛑	onlyOwner
└	_leaf	Internal 🔒		
└	isOGWhitelisted	Internal 🔒		
└	_verify	Internal 🔒		
└	changeMerkleRootOG	External ❗	🛑	onlyOwner
└	isFreeMintWhitelisted	Internal 🔒		
└	_verifyFreeMint	Internal 🔒		
└	changeMerkleRootFreeMint	External ❗	🛑	onlyOwner
└	isWalletWhiteListed	Internal 🔒		
└	_verifyWL	Internal 🔒		
└	changeMerkleRootNormalWL	External ❗	🛑	onlyOwner
└	isAllowList	Internal 🔒		
└	_verifyAllowList	Internal 🔒		
└	changeMerkleRootAllowList	External ❗	🛑	onlyOwner
└	getTokenByOwner	Public ❗		NO❗
└	getOwnershipData	External ❗		NO❗

└	numberMinted	Public ❗		NO❗
└	TurnRevealMode	Public ❗	🛑	onlyOwner
└	withdraw	Public ❗	💶	onlyOwner

Legend

Symbol	Meaning
🛑	Function can modify state
💶	Function is payable

Conclusion

The contracts are written systematically. Team found no critical issues. So, it is good to go for production.

Since possible test cases can be unlimited and developer level documentation (code flow diagram with function level description) not provided, for such an extensive smart contract protocol, we provide no such guarantee of future outcomes. We have used all the latest static tools and manual observations to cover maximum possible test cases to scan Everything.

Security state of the reviewed contract is “ Well Secured”.

✓ No volatile code.
✓ Not many high severity issues were found.

Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against the team on the basis of what it says or doesn't say, or how team produced it, and it is important for you to conduct your own independent investigations before making any decisions. team go into more detail on this in the below disclaimer below – please make sure to read it in full.

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