

Smart Contract Security Audit V1

NFT

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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:** 0xC92700f76B45EA02A0611F0aC30E033919cA776f

NFT Information

- Name: TSN
- Total Supply: 10 Max supply:100
- Holders: address
- Total transactions:

Contracts address deployed to test net (ETH)

TSN NFT contract on rinkeby (ETH Test Net)

<https://rinkeby.etherscan.io/address/0xc92700f76b45ea02a0611f0ac30e033919ca776f>

Executive Summary

According to our assessment, the customer`s solidity smart contract is **Well Secured**. Because all low issues fixed in version 2.

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, 0 high, 0 medium, 2 low, 0 very low-level issues and 0 note in all solidity files of the contract in version 1 and **fixed in version 2**.

The files:

NFT.sol

File and Function Level Report

File in Scope:

Contract Name	SHA 256 hash	Contract Address
NFT.sol	4d22591de7105d5cbcb62a701af88e383db007762ccf1fa2fccfb84955de39a2	0xC92700f76B45EA02A0611F0aC30E033919cA776f

- Contract: NFT
- Inherit: ERC721URISStorage, ContextMixin, NativeMetaTransaction
- 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
getApproved	✓	Read / public	Passed
ERC712_VERSION	✓	Read / public	Passed
getChainId	✓	Read / public	Passed
balanceOf	✓	Read / public	Passed
ownerOf	✓	Read / public	Passed
getDomainSeperator	✓	Read / public	Passed
getNonce	✓	Read / public	Passed
isApprovedForAll	✓	Read / public	Passed
supportsInterface	✓	Read / public	Passed
tokenURI	✓	Read / public	Passed
setTokenUri	✓	Write / public	Passed
setApprovalForAll	✓	Write / public	Passed
approve	✓	Write / public	Passed

transferFrom	✓	Write / public	Passed
safeTransferFrom	✓	Write / public	Passed
safeTransferFrom	✓	Write / public	Passed
changeOwner	✓	Write / public	Passed
mintNFTs	✓	Write / public	Passed
executeMetaTransaction	✓	Write / payable	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	Front running.	Passed
6	Timestamp dependence.	Passed
7	Integer Overflow and Underflow.	Passed
8	DoS with Revert.	Passed
9	DoS with block gas limit.	Passed
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
18	Design Logic.	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:

No High severity vulnerabilities were found

Medium:

No Medium severity vulnerabilities were found

Low:

#Pragam version not fixed

Description

It is a good practice to lock the solidity version for a live deployment (use 0.8.4 instead of ^0.8.4). contracts should be deployed with the same compiler version and flags that they have been tested the most with. Locking the pragma helps ensure that contracts do not accidentally get deployed using, for example, the latest compiler which may have higher risks of undiscovered bugs. Contracts may also be deployed by others and the pragma indicates the compiler version intended by the original authors.

Remediation

Remove the ^ sign to lock the pragma version

Status: **Closed**. Fixed in version 2.

#Missing zero address validation

Description

When setting the new owner address, it should be checked for zero address. Otherwise, they may lose the ability to use the privileged functions.

```
function changeOwner(address _newAddress) public onlyOwner{  
  
    owner = _newAddress;  
}
```

Remediation

Use the require statement to check for zero addresses.

Status: **Closed**. Fixed in version 2.

Very Low:

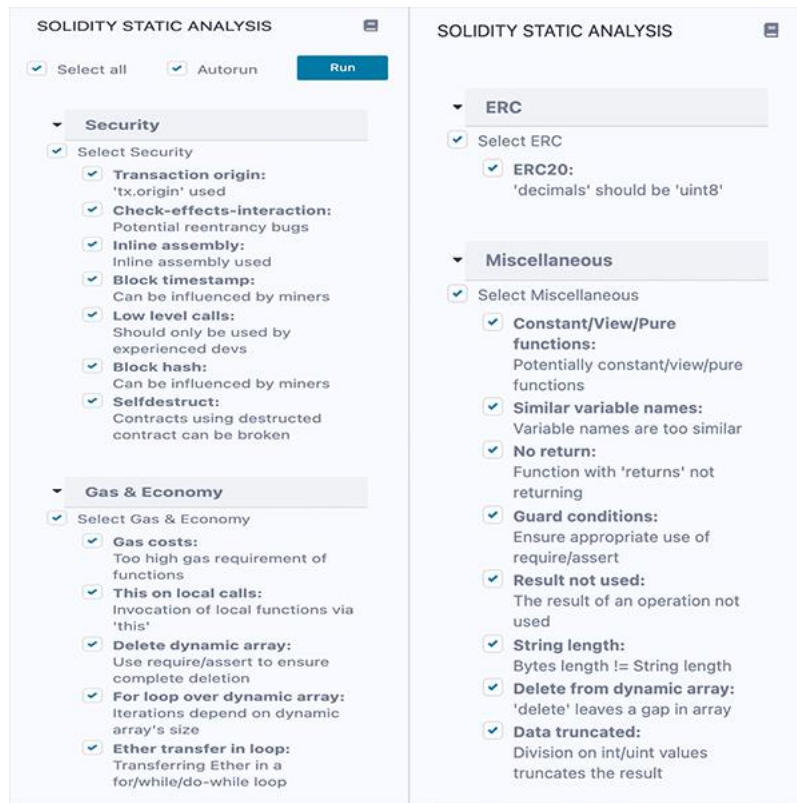
No Very Low severity vulnerabilities were found.

Notes:

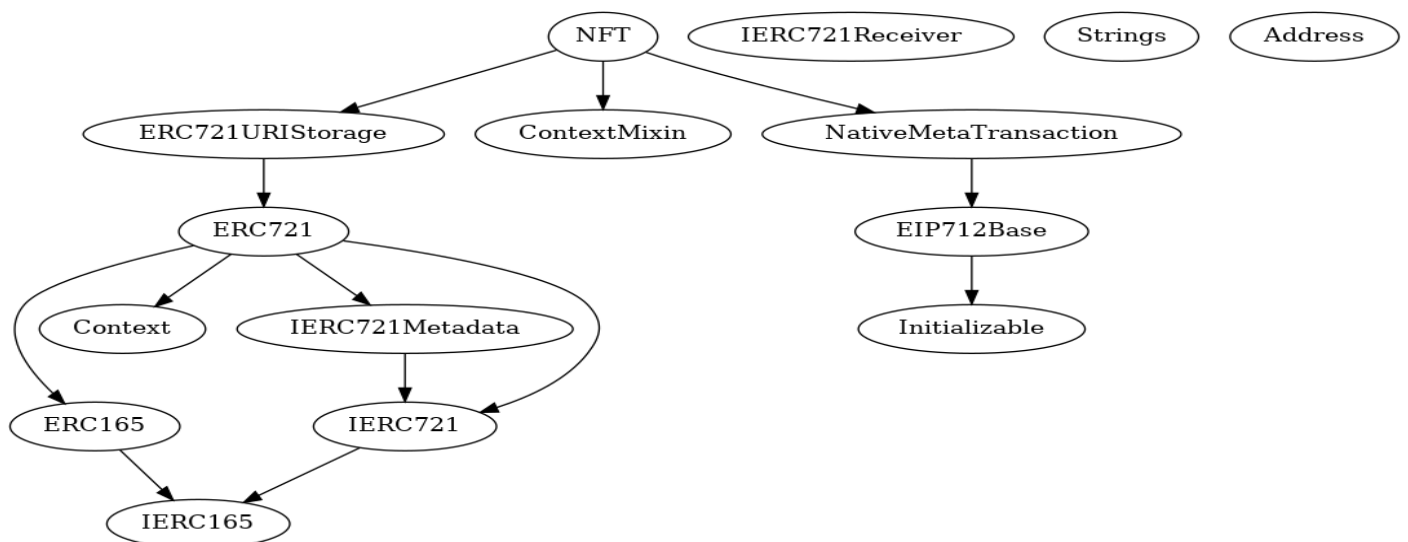
No Notes were found.

Automatic Testing

1- SOLIDITY STATIC ANALYSIS



2- Inheritance graph



3- SOLIDITY UNIT TESTING

SOLIDITY UNIT TESTING

Test your smart contract in Solidity.

Select directory to load and generate test files.

Test directory:

☒ Select all

☒ tests/NFT_test.sol

Progress: 1 finished (of 1)

PASS

testSuite (tests/NFT_test.sol)

✓ Before all

✓ Check success

✓ Check success2

✓ Check failure

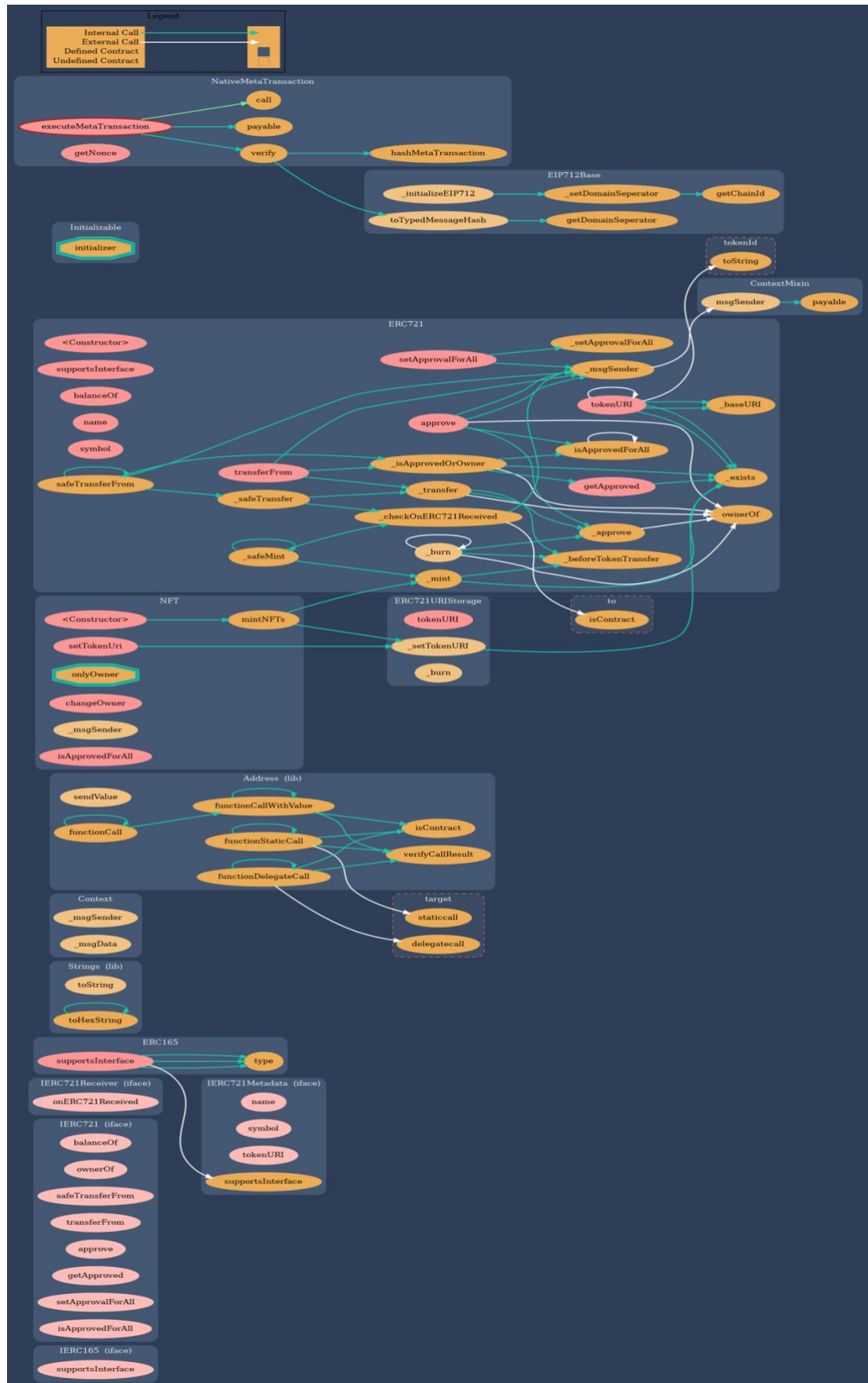
✓ Check sender and value

Result for tests/NFT_test.sol

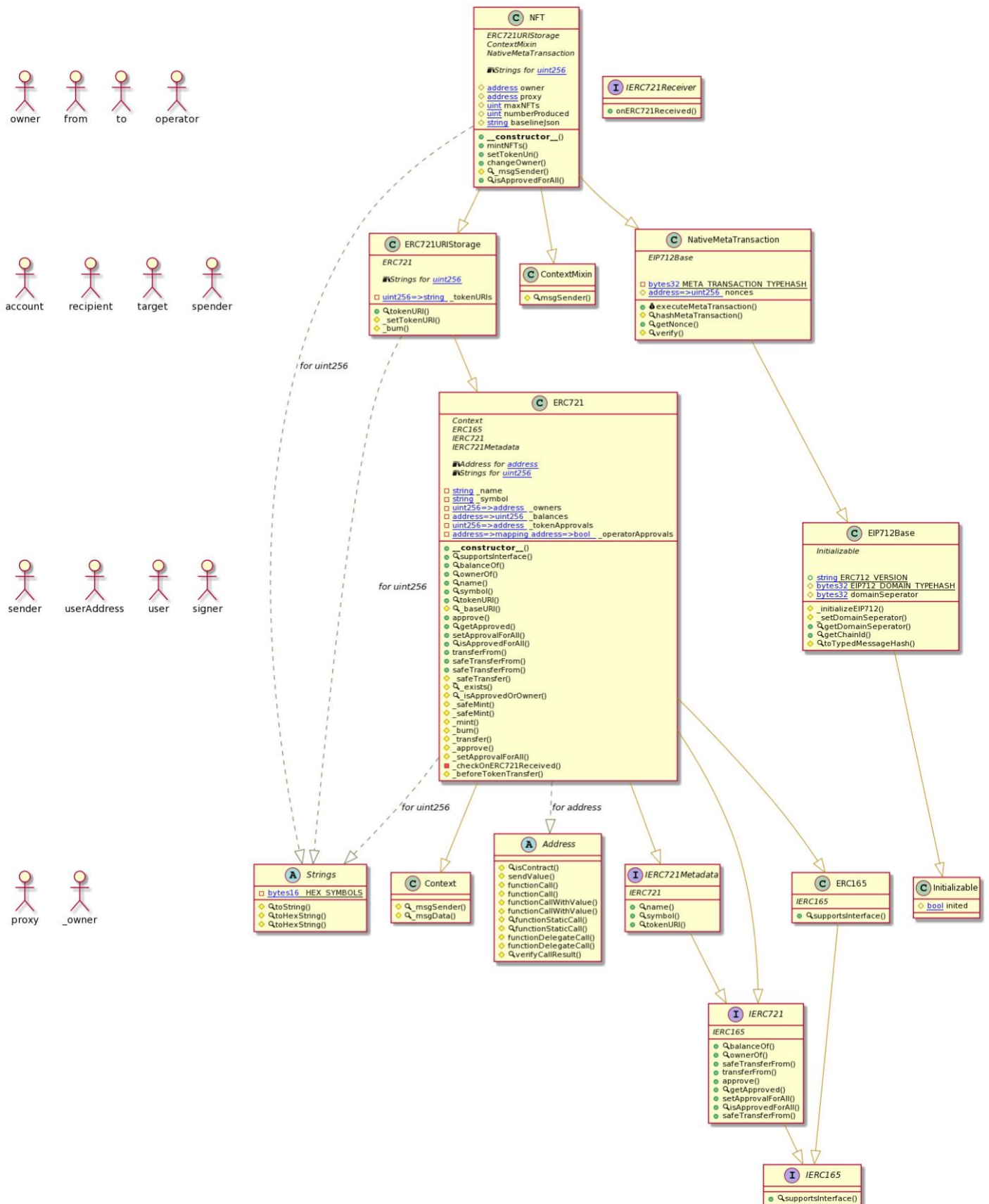
Passing: 5

Total time: 0.40s

4- Call graph



Unified Modeling Language (UML)



Functions signature

```
16279055 => isContract(address)
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)
150b7a02 => onERC721Received(address,address,uint256,bytes)
6900a3ae => toString(uint256)
8fba8d5c => toHexString(uint256)
63e1cbea => toHexString(uint256,uint256)
119df25f => _msgSender()
8b49d47e => _msgData()
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)
06fdde03 => name()
95d89b41 => symbol()
c87b56dd => tokenURI(uint256)
743976a0 => _baseURI()
24b6b8c0 => _safeTransfer(address,address,uint256,bytes)
f8e76cc0 => _exists(uint256)
4cdc9549 => _isApprovedOrOwner(address,uint256)
b3e1c718 => _safeMint(address,uint256)
6a4f832b => _safeMint(address,uint256,bytes)
4e6ec247 => _mint(address,uint256)
9b1f9e74 => _burn(uint256)
30e0789e => _transfer(address,address,uint256)
7b7d7225 => _approve(address,uint256)
8c4e3f32 => _setApprovalForAll(address,address,bool)
1fd01de1 => _checkOnERC721Received(address,address,uint256,bytes)
cad3be83 => _beforeTokenTransfer(address,address,uint256)
01538868 => _setTokenURI(uint256,string)
d737d0c7 => msgSender()
738080a1 => _initializeEIP712(string)
e92b37d7 => _setDomainSeperator(string)
20379ee5 => getDomainSeperator()
3408e470 => getChainId()
1034b1c0 => toTypedMessageHash(bytes32)
0c53c51c => executeMetaTransaction(address,bytes,bytes32,bytes32,uint8)
3b7516ee => hashMetaTransaction(MetaTransaction)
```

Automatic general report

Files Description Table

File Name	SHA-1 Hash
/Users/macbook/Desktop/smart contracts/NFT.sol	86325ef6753cc807e650fb56e923c6828184bb43

Contracts Description Table

Contract	Type	Bases		
:-----: :-----: :-----: :-----: :-----:				
L	**Function Name**	**Visibility**	**Mutability**	
Modifiers				
IERC165	Interface			
L supportsInterface	External !	NO !		
IERC721	Interface	IERC165		
L balanceOf	External !	NO !		
L ownerOf	External !	NO !		
L safeTransferFrom	External !	⊗ NO !		
L transferFrom	External !	⊗ NO !		
L approve	External !	⊗ NO !		
L getApproved	External !	NO !		
L setApprovalForAll	External !	⊗ NO !		
L isApprovedForAll	External !	NO !		
L safeTransferFrom	External !	⊗ NO !		
IERC721Receiver	Interface			
L onERC721Received	External !	⊗ NO !		
ERC165	Implementation	IERC165		
L supportsInterface	Public !	NO !		
Strings	Library			
L toString	Internal 🔒			
L toHexString	Internal 🔒			
L toHexString	Internal 🔒			
Context	Implementation			
L _msgSender	Internal 🔒			
L _msgData	Internal 🔒			
Address	Library			
L isContract	Internal 🔒			
L sendValue	Internal 🔒	⊗		
L functionCall	Internal 🔒	⊗		
L functionCall	Internal 🔒	⊗		
L functionCallWithValue	Internal 🔒	⊗		
L functionCallWithValue	Internal 🔒	⊗		
L functionStaticCall	Internal 🔒			
L functionStaticCall	Internal 🔒			


```

| L | functionDelegateCall | Internal | 🔒 | 🔒 | | |
| L | functionDelegateCall | Internal | 🔒 | 🔒 | |
| L | verifyCallResult | Internal | 🔒 | | |
| | | |
| **IERC721Metadata** | Interface | IERC721 | | |
| L | name | External | ! | NO | |
| L | symbol | External | ! | NO | |
| L | tokenURI | External | ! | NO | |
| | | |
| **ERC721** | Implementation | Context, ERC165, IERC721, IERC721Metadata | | |
| L | <Constructor> | Public | ! | 🔒 | NO | |
| L | supportsInterface | Public | ! | NO | |
| L | balanceOf | Public | ! | NO | |
| L | ownerOf | Public | ! | NO | |
| L | name | Public | ! | NO | |
| L | symbol | Public | ! | NO | |
| L | tokenURI | Public | ! | NO | |
| L | _baseURI | Internal | 🔒 | | |
| L | approve | Public | ! | 🔒 | NO | |
| L | getApproved | Public | ! | NO | |
| L | setApprovalForAll | Public | ! | 🔒 | NO | |
| L | isApprovedForAll | Public | ! | NO | |
| L | transferFrom | Public | ! | 🔒 | NO | |
| L | safeTransferFrom | Public | ! | 🔒 | NO | |
| L | safeTransferFrom | Public | ! | 🔒 | NO | |
| L | _safeTransfer | Internal | 🔒 | 🔒 | |
| L | _exists | Internal | 🔒 | | |
| L | _isApprovedOrOwner | Internal | 🔒 | | |
| L | _safeMint | Internal | 🔒 | 🔒 | |
| L | _safeMint | Internal | 🔒 | 🔒 | |
| L | _mint | Internal | 🔒 | 🔒 | |
| L | _burn | Internal | 🔒 | 🔒 | |
| L | _transfer | Internal | 🔒 | 🔒 | |
| L | _approve | Internal | 🔒 | 🔒 | |
| L | _setApprovalForAll | Internal | 🔒 | 🔒 | |
| L | _checkOnERC721Received | Private | 🔒 | 🔒 | |
| L | _beforeTokenTransfer | Internal | 🔒 | 🔒 | |
| | | |
| **ERC721URIStorage** | Implementation | ERC721 | | |
| L | tokenURI | Public | ! | NO | |
| L | _setTokenURI | Internal | 🔒 | 🔒 | |
| L | _burn | Internal | 🔒 | 🔒 | |
| | | |
| **ContextMixin** | Implementation | | | |
| L | msgSender | Internal | 🔒 | | |
| | | |
| **Initializable** | Implementation | | | |
| | | |
| **EIP712Base** | Implementation | Initializable | | |
| L | _initializeEIP712 | Internal | 🔒 | 🔒 | initializer |
| L | _setDomainSeparator | Internal | 🔒 | 🔒 | |
| L | getDomainSeparator | Public | ! | NO | |
| L | getChainId | Public | ! | NO | |
| L | toTypedMessageHash | Internal | 🔒 | | |
| | | |
| **NativeMetaTransaction** | Implementation | EIP712Base | | |
| L | executeMetaTransaction | Public | ! | 🔒 | NO | |
| L | hashMetaTransaction | Internal | 🔒 | | |

```

```

| L | getNonce | Public ! | | NO! |
| L | verify | Internal 🔒 | | |
| | | |
| **NFT** | Implementation | ERC721URIStorage, ContextMixin, NativeMetaTransaction
| |
| L | <Constructor> | Public ! | 🔒 | ERC721 |
| L | mintNFTs | Public ! | 🔒 | onlyOwner |
| L | setTokenUri | Public ! | 🔒 | onlyOwner |
| L | changeOwner | Public ! | 🔒 | onlyOwner |
| L | _msgSender | Internal 🔒 | | |
| L | isApprovedForAll | Public ! | | NO! |

```

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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