# Smart Contract Security Audit V1

# **PokerGo 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 Network
- Contract Address: 0xaa1ed4b8bc8a33431efb62b44d77e5ce3a7c449b
- Code:

https://github.com/Saferico/Smart-Contracts-for-Projects/blob/main/PokerGo.sol

### **NFT Information**

• Name: PGNGT

• Total Supply: 1326

- Holders:
- Total transactions:

Contracts address deployed to test net (ETH Network)

PokerGo NFT Smart contract on ETH test net to test write functions by the auditor.

https://rinkeby.etherscan.io/address/0xaa1ed4b8bc8a33431efb62b44d77e5ce3a7c449b

## **Executive Summary**

According to our assessment, the customer's solidity smart contract is Well Secured.

Well Secured	<b>√</b>
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, 1 medium, 3 low, 0 very low-level issues and 0 note in all solidity files of the contract

The files:

PokerGo.sol

# File and Function Level Report

# File in Scope:

Contract Name	SHA 256 hash	Contract Address
PokerGo.sol	3d61a85b3421788bbcc94b8 93610e195cb7f34270973d5 c9ca4453c586ea4a64	0xaa1ed4b8bc8a33431efb62b44d77e5ce3a7c44 9b

• Contract: PokerGo

• Inherit: ERC721Enumerable, Ownable

• Observation: All passed including security check

Test Report: passedScore: passed

• Conclusion: passed

Function	Test Result	Type / Return Type	Score
name	<b>√</b>	Read / public	Passed
symbol	<b>√</b>	Read / public	Passed
baseExtension	<b>√</b>	Read / public	Passed
supportsInterface	<b>√</b>	Read / public	Passed
baseTokenURI	<b>√</b>	Read / public	Passed
balanceOf	<b>√</b>	Read / public	Passed
Owner	<b>√</b>	Read / public	Passed
calculatePrice	<b>√</b>	Read / public	Passed
freeminted	<b>√</b>	Read / public	Passed
getApprovedForAll	<b>√</b>	Read / public	Passed
ownerOf	<b>√</b>	Read / public	Passed
getApproved	<b>√</b>	Read / public	Passed

tokenURI	<b>/</b>	Read / public	Passed
tokenByIndex	<b>√</b>	Read / public	Passed
tokenOfOwnerByIndex	<b>√</b>	Read / public	Passed
nextTokenId	<b>√</b>	Read / public	Passed
isWhitelisted	<b>√</b>	Read / public	Passed
minted	<b>√</b>	Read / public	Passed
p1minted	<b>√</b>	Read / public	Passed
p2minted	<b>√</b>	Read / public	Passed
MAX_SUPPLY	<b>√</b>	Read / public	Passed
unrevealedURI	<b>√</b>	Read / public	Passed
payment	<b>√</b>	Read / public	Passed
totalSupply	<b>√</b>	Read / public	Passed
phase1StartDate	<b>√</b>	Read / public	Passed
Phase2StartDate	<b>√</b>	Read / public	Passed
PRICE	·	Read / public	Passed
publicsaleStartDate	<b>√</b>	Read / public	Passed
revealDate	<b>√</b>	Read / public	Passed
addToWhiteList	<b>√</b>	Write / public	Passed
approve	<b>√</b>	Write / public	Passed
safeTransferFrom	<b>√</b>	Write / public	Passed
safeTransferFrom	<b>√</b>	Write / public	Passed
removeFromWhiteList	<b>√</b>	Write / public	Passed
mint	<b>√</b>	Write / payable	Passed
transferOwnership	<b>√</b>	Write / public	Passed
setApprovalForAll	<b>√</b>	Write / public	Passed
transferFrom	<b>√</b>	Write / public	Passed
setPhase1StartDate	<b>√</b>	Write / public	Passed

setPhase2StartDate	<b>√</b>	Write / public	Passed
setPublic1StartDate	<b>√</b>	Write / public	Passed
renounceOwnership	✓	Write / public	Passed
withdraw	✓	Write / public	Passed
setBaseURI	✓	Write / public	Passed
setUnrevealedURI	✓	Write / public	Passed
setRevealedDate	<b>√</b>	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 with Notes	
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.	
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:

No High severity vulnerabilities were found.

#### Medium:

#### #Missing zero address validation

#### Description

When the owner withdraws the funds to the payment address, he has to check for the zero address to make, he didn't withdraw the funds for the burn address. Otherwise, the owner will lose all funds.

```
constructor(string memory baseURI, uint256 _phase1StartDate, uint256
  _phase2StartDate, uint256 _publicsaleStartDate, string memory _unrevealedURI,
  uint256 _revealDate,address _payments, address[] memory _freeAddress, uint256[]
  memory _canMinttotal) ERC721("PokerGo NFT", "PGNGT") {
            require(_freeAddress.length == _canMinttotal.length, "Address and number
            length mismatch");
            require(_freeAddress.length > 0, "No Free Mint Address");
```

#### Remediation

Use the require statement to check for zero addresses.

Status: Closed. Fixed in version 2.

#### Low:

#### #Pragam version not fixed

#### Description

It is a good practice to lock the solidity version for a live deployment (use 0.8.13 instead of ^0.8.0). 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.

# #Owner privileges (In the period when the owner isn't renounced) Description

The owner can change the time in WL or non WL stage.

The owner can add and remove any address from the whitelist.

```
function setPhase2StartDate(uint256 _endDate) external onlyOwner {
    phase2StartDate = _endDate;
}

function setPhase1StartDate(uint256 _startDate) external onlyOwner {
    phase1StartDate = _startDate;
}

function setPublicSaleStartDate(uint256 _publicsaleStartDate) external
onlyOwner {
    publicsaleStartDate = _publicsaleStartDate;
}

function addToWhitelist(address[] memory _addresses) external onlyOwner {
    for (uint256 i = 0; i < _addresses.length; i++) {
        require(_addresses[i] != address(0), "Account is the zero address");
        isWhitelisted[_addresses[i]] = true;
    }
}

function removeFromWhitelist (address[] memory _addresses) external onlyOwner {
    for (uint256 i = 0; i < _addresses.length; i++) {
        isWhitelisted[_addresses[i]] = false;
    }
}</pre>
```

#### Remediation

Make these functions internal in next version or the team should announce the investors before pause and un pause to give them time if they want to do anything.

P.S: This issue is common to the majority of NFT smart contracts.

Status: Acknowledged.

#### #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 were found.

# **Automatic Testing**

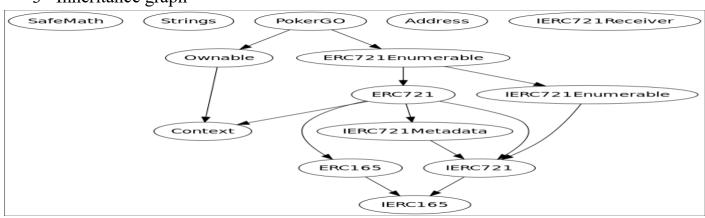
## 1- Check for security



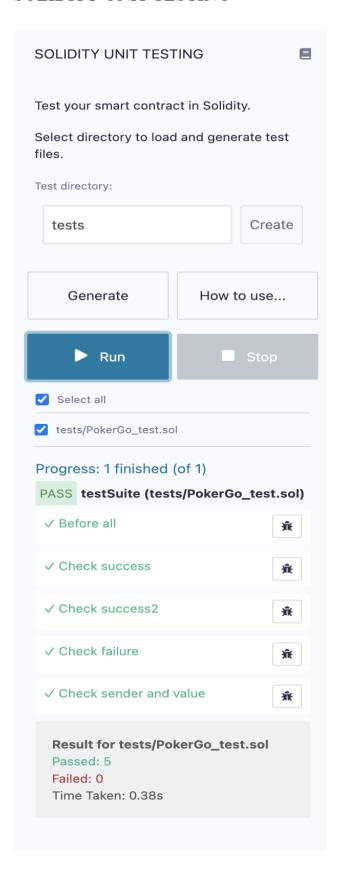
#### 2- SOLIDITY STATIC ANALYSIS



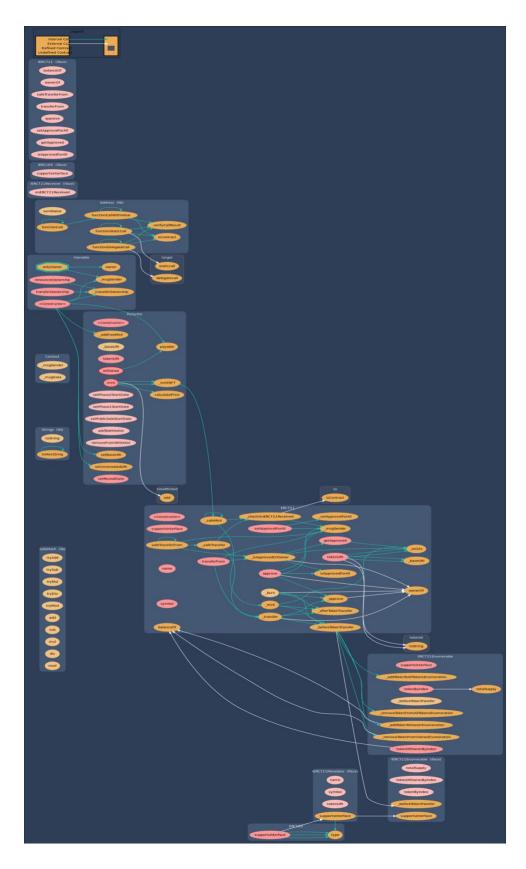
### 3- Inheritance graph



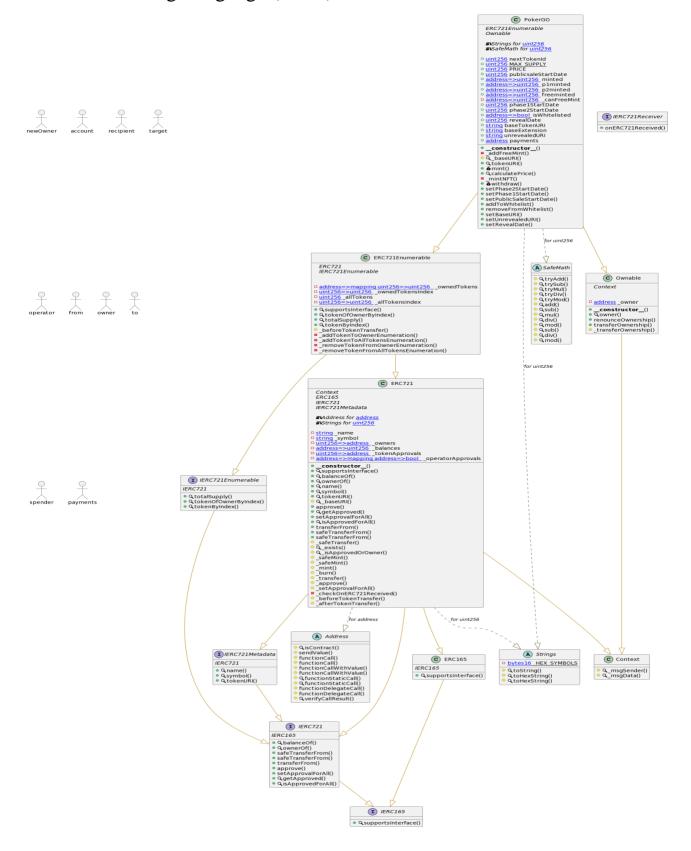
#### 4- SOLIDITY UNIT TESTING



# 5- Call graph



# Unified Modeling Language (UML)



## Functions signature

```
Sighash | Function Signature
_____
16279055 => isContract(address)
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)
6900a3ae => toString(uint256)
8fba8d5c => toHexString(uint256)
63e1cbea => toHexString(uint256,uint256)
119df25f => _msgSender()
8b49d47e => _msgData()
8da5cb5b => owner()
715018a6 => renounceOwnership()
f2fde38b => transferOwnership(address)
d29d44ee => transferOwnership(address)
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)
b88d4fde => safeTransferFrom(address,address,uint256,bytes)
42842e0e => safeTransferFrom(address,address,uint256)
23b872dd => transferFrom(address,address,uint256)
095ea7b3 => approve(address, uint256)
a22cb465 => setApprovalForAll(address,bool)
081812fc => getApproved(uint256)
e985e9c5 => isApprovedForAll(address,address)
18160ddd => totalSupply()
2f745c59 => tokenOfOwnerByIndex(address, uint256)
4f6ccce7 => tokenByIndex(uint256)
06fdde03 => name()
95d89b41 => symbol()
c87b56dd => tokenURI(uint256)
743976a0 => baseURI()
```

```
24b6b8c0 => _safeTransfer(address, address, uint256, bytes)
f8e76cc0 => _exists(uint256)
dcdc9549 => _isApprovedOrOwner(address, uint256)
b3e1c718 => _safeMint(address, uint256)
6a4f832b => _safeMint(address, uint256, bytes)
4e6ec247 => _mint(address, uint256, bytes)
4e6ec247 => _mint(address, uint256)
30e0789e => _transfer(address, address, uint256)
7b7d7225 => _approve(address, uint256)
8c4e3f32 => _setApprovalForAll(address, address, bool)
1fd01del => _checkOnERC721Received(address, address, uint256, bytes)
cad3be83 => _beforeTokenTransfer(address, address, uint256)
8f811a1c => _afterTokenTransfer(address, address, uint256)
e03d890b => _addTokenToOwnerEnumeration(address, uint256)
e03d890b => _addTokenToAllTokensEnumeration(uint256)
f8ld297d => _addTokenToMownerEnumeration(address, uint256)
f8ld297d => _addFreeMint(address, uint256)
a0712d68 => _mint(uint256)
e70fff63 => _mint(uint256)
e70fff63 => _mint(uint256)
e70fff63 => _mint(uint256)
a1d4741f => setPhase2StartDate(uint256)
3775ddc => setPhase1StartDate(uint256)
77649783 => addToWhitelist(address[])
58lb314 => removeFromWhitelist(address[])
58lb314 => removeFromWhitelist(address[])
58lb315 => setBaseURI(string)
60e8b731 => setRevealDate(uint256)
```

## Automatic general report

```
Files Description Table
| File Name | SHA-1 Hash |
|-----|
| /Users/macbook/Desktop/smart contracts/PokerGo.sol |
8140b94b63d49752496773ecede399c898862e53
Contracts Description Table
| Contract |
                Type Bases
| **Function Name** | **Visibility** | **Mutability** |
**Modifiers** |
| **SafeMath** | Library | ||| | |
| L | tryMul | Internal A |
| L | tryDiv | Internal A |
| L | tryMod | Internal 🖺 | | |
| L | add | Internal 🖺 | | |
| L | sub | Internal A | | L | mul | Internal A |
| L | div | Internal 🖺 |
| L | mod | Internal
| L | sub | Internal
| L | div | Internal 🖺 | | |
| L | mod | Internal A |
| **Strings** | Library | |||
| L | toString | Internal A | | |
| L | toHexString | Internal 🖺 | | |
| **Context** | Implementation | |||
| L | msgSender | Internal A | | |
| L | msgData | Internal 🖺 | | |
| **Ownable** | Implementation | Context | | |
| L | <Constructor> | Public | | ①
| L | owner | Public | | NO | |
| L | renounceOwnership | Public | | OnlyOwner |
| L | transferOwnership | Public | | onlyOwner |
| L | transferOwnership | Internal A | O | |
| L | isContract | Internal [ ] |
| L | sendValue | Internal A | O
| L | functionCall | Internal A |
| L | functionCall | Internal A |
```

```
| L | functionCallWithValue | Internal 🖺 | 🔘
| L | functionCallWithValue | Internal A |
| L | functionDelegateCall | Internal 🖺
| L | functionDelegateCall | Internal
| L | verifyCallResult | Internal 🖺 | | | | | | | |
| **IERC721Receiver** | Interface | ||
| L | onERC721Received | External | |
| **IERC165** | Interface | |||
| L | supportsInterface | External | | NO| |
| **ERC165** | Implementation | IERC165 |||
| L | supportsInterface | Public | | NO | |
| **IERC721** | Interface | IERC165 |||
| L | balanceOf | External | | NO| |
| L | ownerOf | External | | NO| |
| L | transferFrom | External | | | | | | NO | |
| L | setApprovalForAll | External | | | NO | |
 | L | isApprovedForAll | External | | NO | |
| **IERC721Enumerable** | Interface | IERC721 |||
| L | totalSupply | External | | | NO | |
| L | tokenOfOwnerByIndex | External [ | NO[ |
| L | tokenByIndex | External | | NO| |
| **IERC721Metadata** | Interface | IERC721 |||
| L | name | External | | NO | |
L | symbol | External | | | NO
| L | tokenURI | External | | NO | |
 **ERC721** | Implementation | Context, ERC165, IERC721, IERC721Metadata |||
 | L | supportsInterface | Public | |
 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 | | ●
| L | safeTransferFrom | Public | |
                                 |NON |
| L | safeTransfer | Internal 🖺 | 🔘
```

```
| L | exists | Internal 🖺 | | | |
| L | isApprovedOrOwner | Internal A |
| L | mint | Internal A | O | |
| L | _burn | Internal A | 0 | |
 | L | approve | Internal A | O | |
| L | _checkOnERC721Received | Private A | D | |
 | L | afterTokenTransfer | Internal 🖺 | 🔘 | |
| **ERC721Enumerable** | Implementation | ERC721, IERC721Enumerable | | |
| L | supportsInterface | Public | | NO | |
| L | tokenOfOwnerByIndex | Public | | NO | |
| L | totalSupply | Public | | NO | |
| L | tokenByIndex | Public | | NO | |
| L | beforeTokenTransfer | Internal 🖺 | 🔘 | |
| L | _addTokenToAllTokensEnumeration | Private 🖺 | 🔘 | |
| L | removeTokenFromOwnerEnumeration | Private 🖺 | 🔘
 L | _removeTokenFromAllTokensEnumeration | Private 🖺 | 🔘 | |
| **PokerGO** | Implementation | ERC721Enumerable, Ownable | | |
| L | tokenURI | Public | | NO | |
 L | mint | Public | | III | NO | |
 L | withdraw | Public | | D | onlyOwner |
| L | setPublicSaleStartDate | External | | OnlyOwner | | | | |
| L | addToWhitelist | External | | OnlyOwner | L | removeFromWhitelist | External | OnlyOwner |
| L | setBaseURI | Public | | OnlyOwner |
| L | setUnrevealedURI | Public | | | | | | onlyOwner |
| L | setRevealDate | 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.
- √ No 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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