Cyberscope

Audit Report

Web3Punks

December 2023

SHA256 781eb5d4b36d39ce33660b521720361b2a57b23e4bdf741d9f0e77ae9b423b3c

Audited by © cyberscope

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Review

Testing Deploy	https://testnet.bscscan.com/address/0xaeb972bb690536181 51fea56eb99c8aee0af87a4

Audit Updates

Initial Audit	12 Dec 2023
Corrected Phase 2	19 Dec 2023
Corrected Phase 3	22 Dec 2023

Source Files

Filename	SHA256
contracts/W3PContractOptimized.sol	781eb5d4b36d39ce33660b521720361b2a57b23e4bdf741d9f0e77ae9b423b3c
@openzeppelin/contracts/utils/Strings.sol	cb2df477077a5963ab50a52768cb74ec6f32177177a78611ddbbe2c07e2d36de
@openzeppelin/contracts/utils/Context.sol	b2cfee351bcafd0f8f27c72d76c054df9b571b62cfac4781ed12c86354e2a56c
@openzeppelin/contracts/utils/Address.sol	8b85a2463eda119c2f42c34fa3d942b61aee65df381f48ed436fe8edb3a7d602
@openzeppelin/contracts/utils/math/SignedMath.sol	420a5a5d8d94611a04b39d6cf5f02492552ed4257ea82aba3c765b1ad52f77f6
@openzeppelin/contracts/utils/math/Math.sol	85a2caf3bd06579fb55236398c1321e15fd524a8fe140dff748c0f73d7a52345
@openzeppelin/contracts/utils/introspection/IERC165.sol	701e025d13ec6be09ae892eb029cd83b3064325801d73654847a5fb11c58b1e5

@openzeppelin/contracts/utils/introspection/ERC165.sol	8806a632d7b656cadb8133ff8f2acae4405b3a64d8709d93b0fa6a216a8a6154
@openzeppelin/contracts/token/ERC721/IERC721Receiver.sol	77f0f7340c2da6bb9edbc90ab6e7d3eb8e2ae18194791b827a3e8c0b11a09b43
@openzeppelin/contracts/token/ERC721/IERC721.sol	c8d867eda0fd764890040a3644f5ccf5db92f852779879f321ab3ad8b799bf97
@openzeppelin/contracts/token/ERC721/ERC721.sol	7af3ff063370acb5e1f1a2aab125ceca457cd1fa60ff8afa37aabc366349d286
@openzeppelin/contracts/token/ERC721/extensions/IERC721Metadata.sol	f16b861aa1f623ccc5e173f1a82d8cf45b678a7fb81e05478fd17eb2ccb7b37e
@openzeppelin/contracts/token/ERC721/extensions/ERC721URIStorage.sol	7bf559fad1068a1329517b56b1ecddefa67e79a03bb0801b9e6bf06bf73eb334
@openzeppelin/contracts/token/ERC721/extensions/ERC721Burnable.sol	e04aa070ad6f111fae49b96a056671f36307a93dd79b27612e72560e4a9749b2
@openzeppelin/contracts/security/Pausable.sol	2072248d2f79e661c149fd6a6593a8a3f038466557c9b75e50e0b001bcb5cf97
@openzeppelin/contracts/interfaces/IERC721.sol	e3bcee0ce85a310031fcef279f963e73c12c676a66c5c562ab3945ccf10aecff
@openzeppelin/contracts/interfaces/IERC4906.sol	6b572852b6d6e1db371287a0eb443a724e9005e025025b9c82ebc8804433c0ff
@openzeppelin/contracts/interfaces/IERC165.sol	410e40cd79f1b82bb6bbab95fa4279252cae6e3962b0bff46ab4855f6de91d35

Overview

This document provides the overview of the smart contract audit conducted for the "Web3Punks” contract. This contract is designed for minting NFTs with various attributes and dynamic pricing mechanisms. It utilizes ERC721 standards and leverages OpenZeppelin libraries for enhanced security and functionality. The contract owner has the authority to pause/unpause the mint of NFTs, change price models, and change critical parameters, which pose several centralization risks that warrant attention.

Functionality

Mint

Users can mint NFTs by providing a token ID, URI, and attributes. Minting is subject to the contract not being paused and adheres to max supply limits.

Dynamic Pricing

The contract incorporates a dynamic pricing mechanism based on the token ID and attributes. It includes different base prices for various ranges of token IDs and attribute counts.

Mint Limit Enforcement

Implements a mint limit logic based on the token ID threshold, ensuring controlled minting activity.

Mint Limit Individually

Implements a mint limit logic for each user individually, where they can either mint 1 or 7 NFTs, based on how many total NFTs have been already minted.

Findings Breakdown

Critical	0
Medium	0
Minor / Informative	1

Severity	Unresolved	Acknowledged	Resolved	Other
Critical	0	0	0	0
Medium	0	0	0	0
Minor / Informative	0	1	0	0

Diagnostics

Critical Medium Minor / Informative

Severity	Code	Description	Status
	CCR	Contract Centralization Risks	Acknowledged

CCR - Contract Centralization Risks

Criticality	Minor / Informative
Location	contracts/W3PContractOptimized.sol#L97,184,220,235
Status	Acknowledged

Description

The contract owner has the authority to pause/unpause the mint of NFTs, change price models, and change critical parameters like max supply. While this configuration can offer flexibility, it also poses several centralization risks that warrant attention. Centralization risks arising from the dependence on this type of configuration include Single Point of Control, Vulnerability to Attacks, Operational Delays, Trust Dependencies, and Decentralization Erosion.

```
function pause() public onlyOwner {
    _pause();
}
function updateBasePrice1e3(uint256 basePrice1k) external
onlyOwner {
    require(basePrice1k != basePrice1e3, "Previous price
provided");
    emit BasePrice1e3Updated(msg.sender, basePrice1e3,
basePrice1k);
    basePrice1e3 = basePrice1k;
}
function updateMaxSupply(uint256 newMaxSupply) external
onlyOwner {
    require(newMaxSupply != maxSupply, "Previous max supply
provided");
    emit MaxSupplyUpdated(msg.sender, maxSupply, newMaxSupply);
    maxSupply = newMaxSupply;
}
```

Recommendation

To mitigate these centralization risks, consider the following strategies:

- Implement a governance mechanism that allows NFT holders to vote on critical decisions.
- Transition control from a single owner to a multi-signature wallet.
- Implement time locks for critical functions.

Team Update

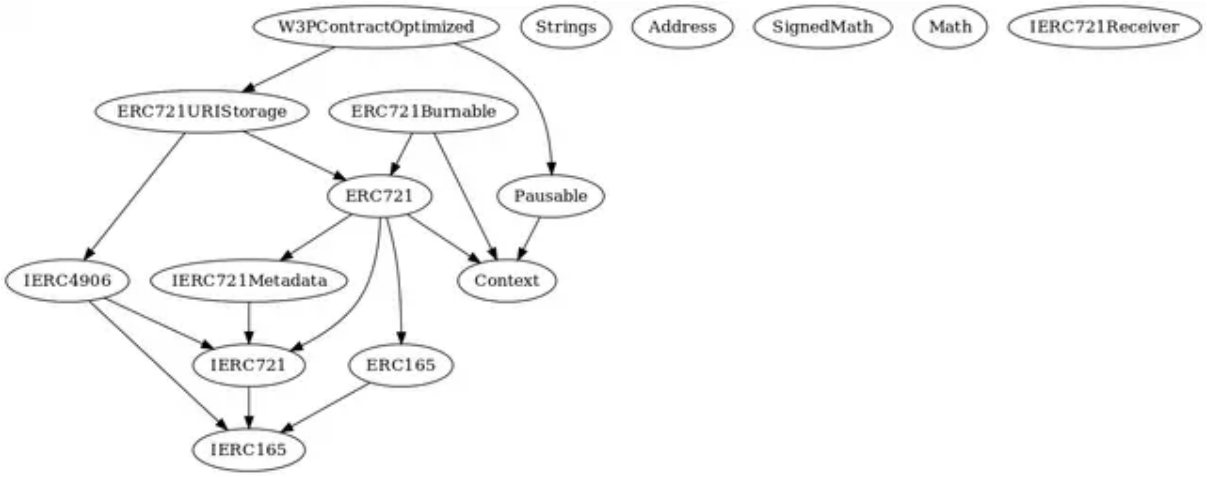
- The project's initial NFT release is projected to include around 25,000 tokens. The team emphasizes their commitment to flexibility in adjusting the maximum supply, aligning with market dynamics and strategic objectives for 2024. They assert that any changes to the maximum supply will be undertaken in consideration of these factors.
- Acknowledging the vulnerability of smart contracts to potential exploits, the team retains the capability to temporarily suspend the contract in case of security breaches affecting the project. This action is described as a protective measure, aimed at securing the interests of the community members.
- The pricing model for the NFTs is set to be determined through community governance, facilitated by the formation of a Decentralized Autonomous Organization (DAO) on platforms like Aragon or equivalent. This approach allows the community to have a decisive role in shaping and deciding the pricing model.
- To address the risks related to centralization due to a single point of control, the team is actively exploring options like multi-signature wallets and hardware wallets. These initiatives are intended to promote the decentralization of the project and minimize the risks associated with centralization.

Functions Analysis

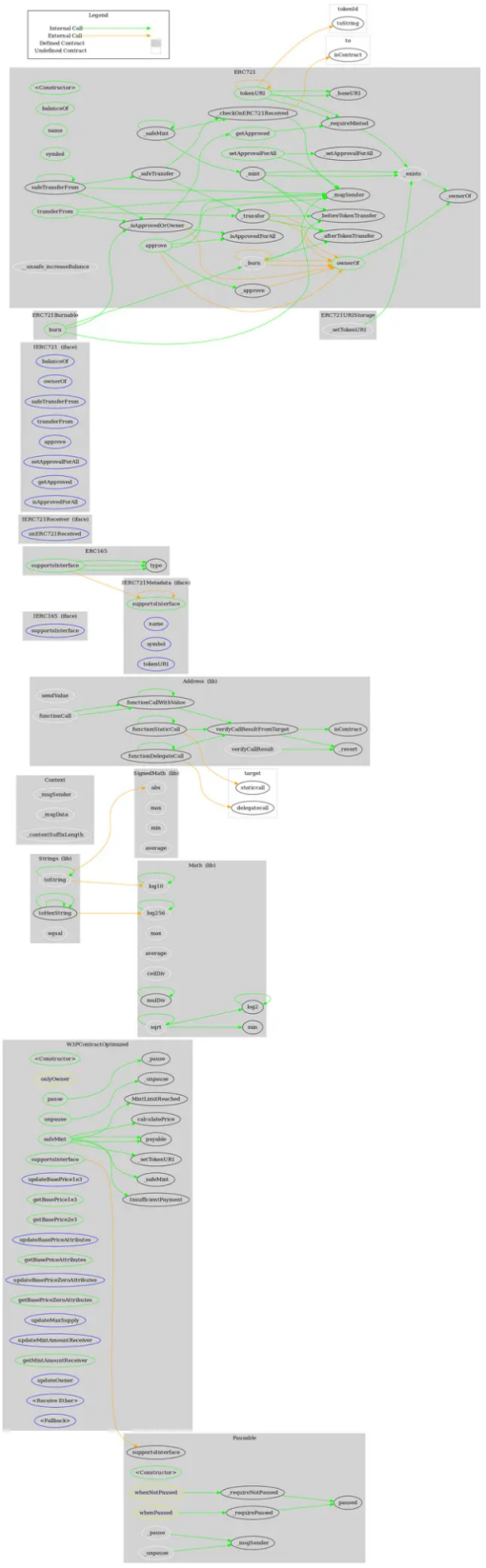
Contract	Type	Bases		
	Function Name	**Visibility**	**Mutability**	**Modifiers**
W3PContractOptimized	Implementation	ERC721URIStorage, Pausable		
		Public	✓	ERC721
	supportsInterface	Public		-
	pause	Public	✓	onlyOwner
	unpause	Public	✓	onlyOwner
	safeMint	Public	Payable	whenNotPaused
	calculatePrice	Internal		
	updateBasePrice1e3	External	✓	onlyOwner
	getBasePrice1e3	Public		-
	getBasePrice2e3	Public		-
	updateBasePriceAttributes	External	✓	onlyOwner
	getBasePriceAttributes	Public		-
	updateBasePriceZeroAttributes	External	✓	onlyOwner
	getBasePriceZeroAttributes	Public		-
	updateMaxSupply	External	✓	onlyOwner
	updateMintAmountReceiver	External	✓	onlyOwner
	getMintAmountReceiver	Public		-
	updateOwner	External	✓	onlyOwner

		External	Payable	-
		External	Payable	-

Inheritance Graph



Flow Graph


Legend
Internal Call
External Call
Defined Contract
Undefined Contract
ERC721
ERC721Burnable
IERC721 (iface)
IERC721Receiver (iface)
ERC165
IERC721Metadata (iface)
IERC165 (iface)
Address (lib)
Context
SignedMath (lib)
target
Strings (lib)
Math (lib)
WJPContractOptimized
Pausable

Summary

Web3Punks contract implements a nft mechanism. It allows users to mint NFTs with diverse attributes and dynamic pricing strategies. This audit investigates security issues, business logic concerns and potential improvements.

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Cyberscope is a blockchain cybersecurity company that was founded with the vision to make web3.0 a safer place for investors and developers. Since its launch, it has worked with thousands of projects and is estimated to have secured tens of millions of investors' funds.

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

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