CONTRACT WOLF

Blockchain Security - Smart Contract Audits

Security Assessment

March 15, 2022

Disclaimer

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ContractWolf provides transparent report to all its "clients" and to its "clients participants" and will not claim any guarantee of bug-free code within it's **SMART CONTRACT**.

ContractWolf presence is to analyze, audit and assess the client's smart contract's code.

Each company or projects should be liable to its security flaws and functionalities.

Network

Ethereum Network (ERC20)

Website

https://mint-metapharaohs.com/

Discord

https://discord.com/invite/metapharaohs

Twitter

https://twitter.com/metapharaohsNFT

Instagram

https://www.instagram.com/metapharaohs/

Description

The Gods discover Pop Culture inside the Metaverse. Our obsession was to create the rarest NFT, and we did it.

ContractWolf Engagement

15th of March 2022, **Meta Pharaohs** engaged and agrees to audit their smart contract's code by **ContractWolf**. The goal of this engagement was to identify if there is a possibility of security flaws in the implementation of the contract or system.

ContractWolf will be focusing on contract issues and functionalities along with the projects claims from smart contract to their website, whitepaper and repository which has been provided by **Meta Pharaohs**.

LOGO

Contract Link:

https://etherscan.io/address/0x89817d308e89a71fd3678df3a8f10313a0e0a3f5

Risk Level Classification

Risk Level represents the classification or the probability that a certain function or threat that can exploit vulnerability and have an impact within the system or contract.
Risk Level is computed based on CVSS Version 3.0

Level	Value	Vulnerability
Critical	9 - 10	An exposure that can affect the contract functions in several events that can risk and disrupt the contract
High	7 - 8.9	An exposure that can affect the outcome when using the contract that can serve as an opening in manipulating the contract in an unwanted manner
Medium	4 - 6.9	An opening that could affect the outcome in executing the contract in a specific situation
Low	0.1 - 3.9	An opening but doesn't have an impact on the functionality of the contract
Informational	0	An opening that consists of information's but will not risk or affect the contract

Auditing Approach

Every line of code along with its functionalities will undergo manual review to check its security issues, quality, and contract scope of inheritance. The manual review will be done by our team that will document any issues that there were discovered.

Methodology

The auditing process follows a routine series of steps:

1. Code review that includes the following:

    - Review of the specifications, sources, and instructions provided to ContractWolf to make sure we understand the size, scope, and functionality of the smart contract.
    - Manual review of code, our team will have a process of reading the code line-by-line with the intention of identifying potential vulnerabilities and security flaws.

2. Testing and automated analysis that includes:

    - Testing the smart contract functions with common test cases and scenarios, to ensure that it returns the expected results.

3. Best practices review, the team will review the contract with the aim to improve efficiency, effectiveness, clarifications, maintainability, security, and control within the smart contract.

4. Recommendations to help the project take steps to secure the smart contract.

Used Code from other Frameworks/Smart Contracts (Direct Imports)

Imported Packages

- ERC721
- MetaPharaohs
- Address
- Strings
- IERC165
- IERC721
- IERC721Receiver
- IERC721Metadata
- IERC721Enumerable
- Context
- ERC165
- ERC721Enumerable
- Ownable

Description

Optimization enabled: Yes

Version: v0.8.7

Decimal: --

Symbol: MP

Capabilities

Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	2	2	5	4

Exposed Functions

Version	Public	Private
1.0	45	6

Version	External	Internal
1.0	17	31

State Variables

Version	Total	Public
1.0	30	17

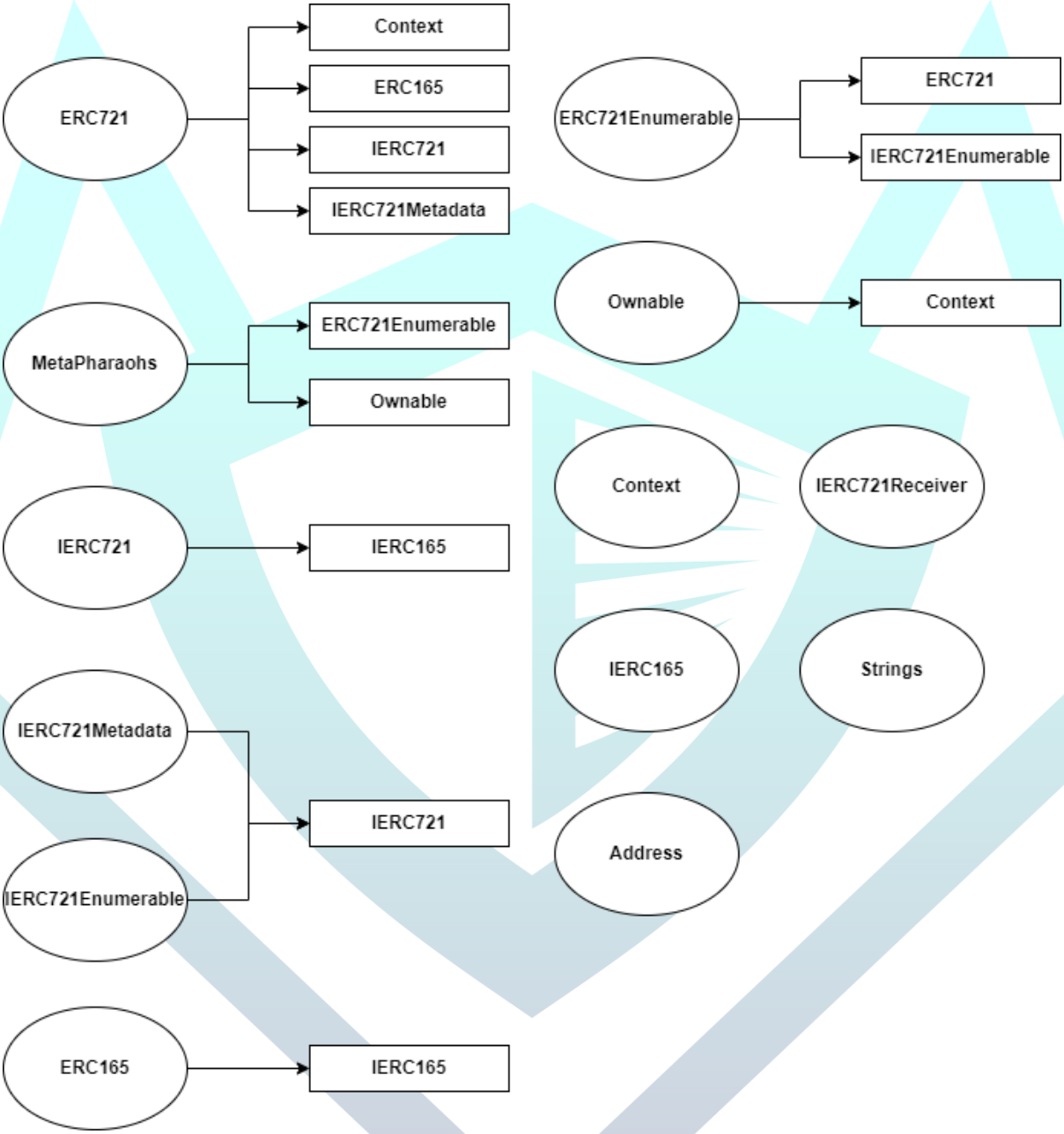
Capabilities

Version	Solidity Versions Observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	v0.8.12			Yes	No

Scope of Work

Meta Pharaohs' team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract.

Inheritance Graph



Verify Claims

Correct implementation of Token Standard

Tested	Verified
✓	✗

Function	Description	Exist	Tested	Verified
TotalSupply	Information about the total coin or token supply	–	–	–
BalanceOf	Details on the account balance from a specified address	✓	✓	✓
Transfer	An action that transfers a specified amount of coin or token to a specified address	✓	✓	✓
TransferFrom	An action that transfers a specified amount of coin or token from a specified address	✓	✓	✓
Approve	Provides permission to withdraw specified number of coin or token from a specified address	✓	✓	✓

Optional implementation

Function	Description	Exist	Tested	Verified
renounceOwnership	Owner renounce ownership for more trust	✓	✓	✓

Deployer cannot mint after initial deployment

Statement	Exist	Tested	Verified	File
Deployer cannot mint	✓	✓	✓	✓

Max / Total supply: --

Deployer cannot burn

Statement	Exist	Tested	Verified
Deployer cannot burn	✓	✓	✓

Deployer cannot lock user funds

Statement	Exist	Tested	Verified
Deployer cannot lock user funds	✓	✓	✓

Deployer can pause contract

Statement	Exist	Tested	Verified
Deployer can pause	✓	✓	✓

Overall Checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

Attribute	Symbol
Verified / Checked	✓
Partly Verified	⚑
Unverified / Not checked	✗
Not Available	–

Write Functions of Contract

1. approve
2. gift
3. mint
4. pause
5. renounceOwnership
6. reveal
7. safeTransferFrom
8. safeTransferFrom
9. setApprovalForAll
10. setBaseExtension
11. setBaseURI
12. setCost
13. setMaxSupply
14. setNftPerAddressLimit
15. setNftPerAddressLimitPreSale
16. setNotRevealedURI
17. setPreSaleDate
18. setPreSaleEndDate
19. setPresaleCost
20. setPresaleMaxSupply
21. setPublicSaleDate
22. setmaxMintAmount
23. setmaxMintAmountPreSale
24. transferFrom
25. transferOwnership
26. withdraw

SWC Attacks

ID	Title	Relationships	Status
SWC-136	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SWC-135	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SWC-134	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SWC-133	Hash Collisions with Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SWC-132	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SWC-131	Presence of unused variables	CWE-1164: Irrelevant Code	PASSED
SWC-130	Right-To Left Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SWC-129	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED

SWC-128	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	**PASSED**
SWC-127	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	**PASSED**
SWC-126	Insufficient Gas Griefing	CWE-691: Insufficient Control Flow Management	**PASSED**
SWC-125	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	**PASSED**
SWC-124	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	**PASSED**
SWC-123	Requirement Violation	CWE-573: Improper Following of Specification by Caller	**PASSED**
SWC-122	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	**PASSED**
SWC-121	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	**PASSED**
SWC-120	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	**PASSED**

SWC-119	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	**PASSED**
SWC-118	Incorrect Constructor Name	CWE-665: Improper Initialization	**PASSED**
SWC-117	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	**PASSED**
SWC-116	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	**PASSED**
SWC-115	Authorization through tx.origin	CWE-477: Use of Obsolete Function	**PASSED**
SWC-114	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	**PASSED**
SWC-113	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	**NOT PASSED**
SWC-112	Delegate call to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	**PASSED**

SWC-111	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	**PASSED**
SWC-110	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	**PASSED**
SWC-109	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	**PASSED**
SWC-108	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	**PASSED**
SWC-107	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	**NOT PASSED**
SWC-106	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	**PASSED**
SWC-105	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	**PASSED**
SWC-104	Unchecked Call Return Value	CWE-252: Unchecked Return Value	**PASSED**
SWC-103	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	**NOT PASSED**

SWC-102	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	**PASSED**
SWC-101	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	**PASSED**
SWC-100	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	**PASSED**

AUDIT PASSED

Medium Issues

Multiple calls are executed in the same transaction (SWC – 113)	L: 1469 C: 27

Low Issues

Calls are executed (SWC – 103)	L: 21,48,192,221,249,468,494, 563,593,1006,1036,1200,1271
Read of persistent state following external call (SWC – 107)	L: 1469 C: 59
Write to persistent state following external call (SWC – 107)	L: 1469 C: 27

Audit Comments

- Deployer cannot mint after initial deployment
- Deployer cannot burn
- Deployer cannot lock user funds
- Deployer can pause contract
- Deployer can renounce ownership
- Deployer can set max supply
- Deployer can start presale

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