GUARDIAN AUDITS

SMART CONTRACT SECURITY AUDIT OF

NFTR

Summary

Audit Firm: Guardian Audits

Client Firm: NFTR

Final Report Date - July 27, 2022

Audit Summary

After a line by line manual analysis and automated review, Guardian Audits has concluded that:

- NFTR's smart contracts have a LOW RISK SEVERITY
- NFTR's smart contracts have an **ACTIVE OWNERSHIP**
- Important owner privileges – `withdraw`, `withdrawRNM`, `curateCollection`, `updateNamingCreditsProtocolFeeRecipient`, `shutOffAssignments`, `assignNamingCredits`, `setSpecialNames`, `updateNamingPriceEther`, `updateNamingPriceRNM`, `updateProtocolFeeRecipient`, `updateRnmNamingStartBlock`
- NFTR's smart contract owner has multiple "write" privileges. Centralization risk correlated to the active ownership is **LOW**

Notice that the examined smart contracts are not resistant to internal exploit. For a detailed understanding of risk severity, source code vulnerability, and potential attack vectors, refer to the complete audit report below.

🔗 Blockchain network: **Ethereum**

✅ Verify the authenticity of this report on Guardian's GitHub: https://github.com/guardianaudits

Table of Contents

Project Overview

Project Summary

Project Name	NFTR
Language	Solidity
Codebase	https://github.com/greatrat00/NFTRegistryAudit
Commit	8ebfa4136516fa267d3522f2b59138f3f6e222f0

Audit Summary

Delivery Date	July 27, 2022
Audit Methodology	Static Analysis, Manual Review

Vulnerability Summary

Vulnerability Level	Total	Pending	Declined	Acknowledged	Partially Resolved	Resolved
Critical	0	0	0	0	0	0
High	0	0	0	0	0	0
Medium	4	0	0	1	1	2
Low	7	0	0	1	0	6

Audit Scope & Methodology

Scope

ID	File	SHA-1 Checksum
NFTR	NFTRegistry.sol	0A7AA5273A8514E2A367B40048CA8DFD269956CE

Methodology

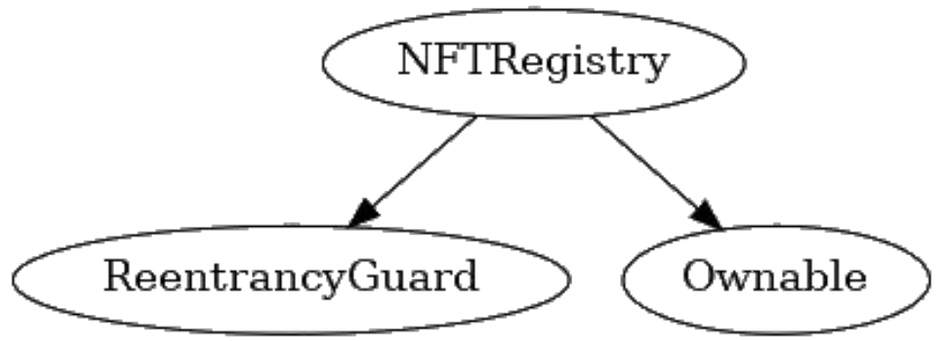
The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Ensuring contract logic meets the specifications and intentions of the client.
- Cross-referencing contract structure and implementation against similar smart contracts produced by industry leaders.
- Thorough line-by-line manual review of the entire codebase by industry experts.

Vulnerability Classifications

Vulnerability Level	Classification
🔴 Critical	Easily exploitable by anyone, causing loss/manipulation of assets or data.
🟠 High	Arduously exploitable by a subset of addresses, causing loss/manipulation of assets or data.
🟡 Medium	Inherent risk of future exploits that may or may not impact the smart contract execution.
🟢 Low	Minor deviation from best practices.

Inheritance Graph



Findings & Resolutions

ID	Title	Category	Severity	Status
NFTR-1	Centralization Risk	Centralization / Privilege	Medium	Partially Resolved
NFTR-2	Hold Farming Naming Not Free	Logical Error	Medium	Resolved
NFTR-3	Simpler Code	Best Practices	Low	Resolved
NFTR-4	Transfer vs. TransferFrom	Best Practices	Low	Resolved
NFTR-5	Validation Upon Name Transfer	Best Practices	Low	Acknowledged
NFTR-6	Zero Address Checks	Best Practices	Low	Resolved
NFTR-7	Unnecessary Boolean Checks	Optimization	Low	Resolved
NFTR-8	Unnecessary Casting	Optimization	Low	Resolved
NFTR-9	Typo	Typo	Low	Resolved
NFTR-10	Potential DoS	Denial-of-Service	Medium	Resolved
NFTR-11	Lost Names With Burnable NFT	Logical Error	Medium	Acknowledged

NFTR-1 | Centralization Risk

Category	Severity	Location	Status
Centralization / Privilege	Medium	NFTRegistry.sol	Partially Resolved

Description

The `owner` address has the ability to repeatedly change `namingPriceRNM` by calling `updateNamingPriceRNM`, but the function lacks any lower and upper bounds on the input. As a result, the owner can modify the `RNM` price to be as large as possible and frontrun a buyer's transaction. This would lead to the user experiencing a larger decrease of assets than intended.

Additionally, the `owner` address holds potentially exploitative abilities to: `withdraw`, `withdrawRNM`, `curateCollection`, `updateNamingCreditsProtocolFeeRecipient`, `shutOffAssignments`, `assignNamingCredits`, `setSpecialNames`, `updateNamingPriceEther`, `updateProtocolFeeRecipient`, `updateRnmNamingStartBlock`.

Recommendation

Consider defining lower and upper bounds on `namingPriceRNM`.

Furthermore, consider making `owner` a multi-sig, optionally with a timelock for improved community oversight.

NFTR-1 | Centralization Risk

Category	Severity	Location	Status
Centralization / Privilege	Medium	NFTRegistry.sol	Partially Resolved

Resolution

NFTR Team:

- Owner privileges are controlled by a multi-sig.
- RNM and WETH user risks have been mitigated as a new parameters have been introduced in the changeName function (currencyQuantity) that ensures that the contract can only pull what the user intended.
- withdraw: has been eliminated as it wasn't needed — ETH doesn't have a way to get stuck in the contract.
- withdrawRNM: Exists as a failsafe mechanism so RNM doesn't get stuck in the contract if a user decides to send RNM to it.
- curateCollection: a max of 10 collections can be curated.
- updateNamingCreditsProtocolFeeRecipient: updates can now be shutoff if the DAO decides to make that immutable.
- shutOffAssignments: This is meant to be able to shut off naming credit assignments if it's the will of the DAO.
- assignNamingCredits: has been set to a max of 1,000 assignments.
- setSpecialNames: These names are set right after deploy and functionality is that no more than 1,000 special names can be set, which is how the protocol was designed.
- updateNamingPriceEther: can now be shut off at the DAO's will
- updateProtocolFeeRecipient: updates can now be shutoff if the DAO decides to make that immutable.
- updateRnmNamingStartBlock: This is meant so that the contract owner can activate tokenomics functionality once RNM goes live.

NFTR-2 | Hold Farming Naming Not Free

Category	Severity	Location	Status
Logical Error	Medium	NFTRegistry.sol	Resolved

Description

According to the docs, if an NFT is curated and is in the hold farming period, naming can be free. However, the `changeName` function still expects payment in the specified currency even if the NFT collection is curated and in the hold farming period.

Recommendation

Implement logic such that a NFT in the holding period can be named for free.

Resolution

NFTR Team:

- The suggested changes were implemented.

NFTR-3 | Simpler Code

Category	Severity	Location	Status
Best Practices	● Low	NFTRegistry.sol: 336, 363	Resolved

Description

Line 336: Because `checkOwnership` must get the owner and compare it against the `msg.sender`, the function can simply utilize `getOwner` instead of duplicating the logic for retrieving the NFT owner.

Line 363: `isTokenStructEmpty` can simply be `return token_in.collectionAddress == address(0) && token_in.tokenId == 0;` The statement itself returns a boolean so an if-else is not needed.

Recommendation

Implement the above simplifications.

Resolution

NFTR Team:

- The suggested changes were implemented.

NFTR-4 | Transfer vs TransferFrom

Category	Severity	Location	Status
Best Practices	● Low	NFTRegistry.sol: 507	Resolved

Description

`transferFrom` is used to transfer `RNM` from the `NFTRegistry` contract to the owner, but a `transfer` could be used instead so approvals can be avoided.

Recommendation

Consider using the `transfer` function if the RNM token allows it.

Resolution

NFTR Team:

- The suggested changes were implemented.

NFTR-5 | Validation Upon Name Transfer

Category	Severity	Location	Status
Best Practices	● Low	NFTRegistry.sol: 172	Acknowledged

Description

`transferName` can potentially lead to an NFT's name being overwritten without permission from the holder. There must be proper validation done by the marketplace to make sure people can't arbitrarily send names to another person's NFT.

Recommendation

Ensure the marketplace contract has the necessary validation checks in place to only transfer a name if the to address acknowledges the transaction whether it is through a name purchase or some other means.

Resolution

NFTR Team:

- Acknowledged. The marketplace contract will take care of this.

NFTR-6 | Zero Address Checks

Category	Severity	Location	Status
Best Practices	● Low	NFTRegistry.sol: 93	Resolved

Description

The constructor can benefit from zero address checks to help prevent errors during deployment.

Recommendation

Focus on creating seamless deploy scripts and consider adding zero address checks

Resolution

NFTR Team:

- The suggested changes were implemented.

NFTR-7 | Unnecessary Boolean Checks

Category	Severity	Location	Status
Optimization	● Low	NFTRegistry.sol	Resolved

Description

The contract frequently performs `variable == true` or `variable == false` which is unnecessary and gas inefficient.

Recommendation

Replace `require(variable == true)` with `require(variable)`.

Replace `require(variable == false)` with `require(!variable)`.

Resolution

NFTR Team:

- The suggested changes were implemented.

NFTR-8 | Unnecessary Casting

Category	Severity	Location	Status
Optimization	● Low	NFTRegistry.sol	Resolved

Description

There is no need to cast `holdFarmingAddress` to the `IHoldFarming` interface in functions such as `curateCollection` as it was already declared with the `IHoldFarming` type. The variable was not cast in `initiateRetroactiveHoldFarming`. The same can be said for the `namingCreditsAddress` variable.

Recommendation

Consider removing the explicit casts to save gas.

Resolution

NFTR Team:

- The suggested changes were implemented.

NFTR-9 | Typo

Category	Severity	Location	Status
Typo	● Low	NFTRegistry.sol: 44	Resolved

Description

“Naiming” is misspelled in the comment.

Recommendation

Correct the spelling for cleaner docs.

Resolution

NFTR Team:

- The suggested changes were implemented.

NFTR-10 | Potential DoS

Category	Severity	Location	Status
Denial-of-Service	Medium	NFTRegistry.sol: 486	Resolved

Description

The `initiateRetroactiveHoldFarming` function calls the `initiateHoldFarmingForNFT` function in the Hold Farming contract 10,000 times. This may exceed the block gas limit and prevent any collection from getting curated.

Recommendation

Ensure that the block gas limit limit is not exceed or consider executing calls to `initiateHoldFarmingForNFT` in batches.

Resolution

NFTR Team:

- This function has been eliminated.
- Retroactive hold farming might be taken care of in a different way, if at all.

NFTR-11 | Lost Names With Burnable NFT

Category	Severity	Location	Status
Logical Error	Medium	NFTRegistry.sol	Acknowledged

Description

Consider the scenario where a user registers a special name for their ERC721-compliant burnable NFT. They then proceed to burn their NFT, and ownership is relinquished. As a result, the name of the NFT cannot be changed nor transferred. The special name, a coveted asset to the NFTR protocol, is now lost.

Recommendation

Consider whether or not this is expected behavior. If unexpected, add a function so that if an owner does not exist for a particular NFT, then that NFT's registered name can be dereserved.

Resolution

NFTR Team:

- This is expected behavior.

Auditor’s Verdict

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Disclaimer

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This report should not be used in any way to make decisions around investment or involvement with any particular project. This report in no way provides investment advice, nor should be leveraged as investment advice of any sort. This report represents an extensive assessing process intending to help our customers increase the quality of their code while reducing the high level of risk presented by cryptographic tokens and blockchain technology.

Blockchain technology and cryptographic assets present a high level of ongoing risk. Guardian’s position is that each company and individual are responsible for their own due diligence and continuous security. Guardian’s goal is to help reduce the attack vectors and the high level of variance associated with utilizing new and consistently changing technologies, and in no way claims any guarantee of security or functionality of the technology we agree to analyze.

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Notice that smart contracts deployed on the blockchain are not resistant from internal/external exploit. Notice that active smart contract owner privileges constitute an elevated impact to any smart contract’s safety and security. Therefore, Guardian does not guarantee the explicit security of the audited smart contract, regardless of the verdict.

About Guardian Audits

Founded in 2022 by DeFi experts, Guardian Audits is a leading audit firm in the DeFi smart contract space. With every audit report, Guardian Audits upholds best-in-class security while achieving our mission to relentlessly secure DeFi.

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