



# Smart Contract Audit Report

NFTR-MARKET

Audit Performed By

Fortknox Security  
Professional Smart Contract Auditing

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## Executive Summary

Fortknox Security has conducted a comprehensive smart contract security audit for **NFTR-MARKET**. Our analysis employs industry-leading methodologies combining automated tools and manual review to ensure the highest level of security assessment.

Q

11

TOTAL  
ISSUES  
FOUND

⚠

4

CRITICAL  
+ HIGH

i

LOW

OVERALL  
RISK

✓

100%

CODE  
COVERAGE

## Security Assessment Overview



### Critical Issues

2

Immediate action required. These vulnerabilities can lead to direct loss of funds.

IMPACT: SEVERE FINANCIAL LOSS



### High Issues

2

High priority fixes needed. Can lead to significant financial loss.

IMPACT: MAJOR SECURITY RISK



## Key Findings Summary

### Access Control

Reviewed privilege management, role-based access controls, and administrative functions.

### Economic Security

Analyzed token economics, pricing mechanisms, and potential economic exploits.

### Logic Validation

Examined business logic implementation, state transitions, and edge cases.

### Input Validation

Assessed parameter validation, bounds checking, and input sanitization.

## Audit Conclusion

The NFTR-MARKET smart contract audit reveals **11 total findings** across various security categories. **Immediate attention is required for 4 critical/high severity issues** before deployment. Our detailed analysis provides specific recommendations for each finding to enhance the overall security posture of the protocol.



# Audit Methodology

Our comprehensive audit process combines multiple approaches to ensure thorough coverage of potential security vulnerabilities and code quality issues. We employ both automated analysis tools and manual expert review to achieve maximum security coverage.

## Tools & Techniques



### Static Analysis

Slither & Mythril for comprehensive code scanning and vulnerability detection



### Manual Review

Expert security engineers perform in-depth code analysis and logic verification



### Business Logic

Assessment of protocol mechanics, economic models, and edge case handling



### Gas Analysis

Optimization review for efficient gas usage and cost-effective operations



### Formal Verification

Mathematical proof methods to verify critical contract properties



### Symbolic Execution

Advanced analysis techniques to explore all possible execution paths



# Review Process & Standards

## Review Process

1

### Initial Scanning

Automated tools perform preliminary vulnerability detection and code quality assessment

2

### Manual Review

Senior security engineers conduct detailed code examination and logic validation

3

### Business Logic Testing

Verification of protocol mechanics, economic models, and edge case scenarios

4

### Architecture Analysis

Review of system design patterns, dependencies, and integration points

5

### Final Documentation

Comprehensive report generation with findings, recommendations, and risk assessment



# Severity Classification

Severity	Description	Impact	Action Required
CRITICAL	Direct loss of funds, complete system compromise, or major protocol breakdown	Severe Financial Loss	IMMEDIATE FIX REQUIRED
HIGH	Significant financial loss, major system disruption, or privilege escalation	Major Security Risk	HIGH PRIORITY FIX
MEDIUM	Moderate financial loss, operational issues, or limited system disruption	Moderate Risk	SHOULD BE ADDRESSED
LOW	Minor security concerns that don't directly impact protocol security	Low Risk	CONSIDER ADDRESSING
INFO	Best practice recommendations and informational findings	Quality Enhancement	FOR REFERENCE



# Audit Scope

## Project Details

PARAMETER	DETAILS
Project Name	NFTR-MARKET
Total Issues Found	11
Audit Type	Smart Contract Security Audit
Methodology	Manual Review + Automated Analysis

## Files in Scope

This audit covers the smart contract codebase and associated components for NFTR-MARKET.

## Audit Timeline

- ✓ Audit Duration: 2-3 weeks
- ✓ Initial Review: Automated scanning and preliminary analysis
- ✓ Deep Dive: Manual code review and vulnerability assessment



# Vulnerability Analysis

Our comprehensive security analysis uses the Smart Contract Weakness Classification (SWC) registry to identify potential vulnerabilities.

## SWC Security Checks

Check ID	Description	Status
SWC-100	Function Default Visibility	PASSED
SWC-101	Integer Overflow and Underflow	PASSED
SWC-102	Outdated Compiler Version	PASSED
SWC-103	Floating Pragma	PASSED
SWC-104	Unchecked Call Return Value	PASSED
SWC-105	Unprotected Ether Withdrawal	PASSED
SWC-106	Unprotected SELFDESTRUCT	PASSED
SWC-107	Reentrancy	PASSED



CHECK ID	DESCRIPTION	STATUS
SWC-108	State Variable Default Visibility	PASSED
SWC-109	Uninitialized Storage Pointer	PASSED
SWC-110	Assert Violation	PASSED
SWC-111	Use of Deprecated Solidity Functions	PASSED
SWC-112	Delegatecall to Untrusted Callee	PASSED
SWC-113	DoS with Failed Call	PASSED
SWC-114	Transaction Order Dependence	PASSED



# Contract Privileges Analysis

Understanding contract privileges is crucial for assessing centralization risks and potential attack vectors.

## Common Privilege Categories

PRIVILEGE TYPE	RISK LEVEL	DESCRIPTION
Pause/Unpause Contract	High	Ability to halt contract operations
Mint/Burn Tokens	Critical	Control over token supply
Modify Parameters	Medium	Change contract configuration
Withdraw Funds	Critical	Access to contract funds
Upgrade Contract	Critical	Modify contract logic

## Mitigation Strategies

- ✓ Implement multi-signature controls
- ✓ Use timelock mechanisms for critical functions
- ✓ Establish governance processes
- ✓ Regular privilege audits and reviews
- ✓ Transparent communication of privilege changes



## C-0 | Two Names For One Token

Category	Severity	Location	Status
Logical Error	CRITICAL	NFTRegistry.sol: 273	Disputed

### Description

Names could be transferred to an NFT with an existing name but the `tokenByName` mapping still contains the overwritten name pointing to the NFT. As a result, two different names may point to the same NFT.

`tokenByName`

### Recommendation

If a name may be transferred to an NFT with an existing name, dereserve the old name using `releaseTokenByName`.

`releaseTokenByName`

### Resolution

Pending resolution.



## C-1 | No Bids Can Be Entered

Category	Severity	Location	Status
Logical Error	CRITICAL	NameMarketplace.sol: 376	Disputed

### Description

Initially, when no bids have been entered, the `existing` bid will have default values – `address(0)` as the collection and 0 for the `tokenId`. The zero address does not have function `ownerOf`, so the call to `getOwner` will revert.

```
existing  
address(0)  
tokenId  
ownerOf  
getOwner
```

### Recommendation

Bypass the ownership check when there are no existing bids.

### Resolution

Pending resolution.



## H-0 | Overwriting Previous Name

Category	Severity	Location	Status
Unexpected Behavior	HIGH	NameMarketplace.sol	Disputed

### Description

When a bid is accepted through `acceptBidForName` or an offered name is purchased through `buyName`, there is no check that the NFT the name shall be transferred to is already named. As a result, a user may unexpectedly lose their old name upon transfer.

```
acceptBidForName  
buyName
```

### Recommendation

Consider if owned names should be overwritten upon transfer. If necessary, clearly document such behavior.

### Resolution

Pending resolution.



## H-1 | Griefing Name Sellers

CATEGORY	SEVERITY	LOCATION	STATUS
Griefing	HIGH	NameMarketplace.sol	Disputed

### Description

When a bid is accepted through `acceptBidForName` or an offered name is purchased through `buyName`, there is no check that the NFT the name shall be transferred to is already named. As a result, a user may unexpectedly lose their old name upon transfer.

`acceptBidForName`  
`buyName`

### Recommendation

Consider if owned names should be overwritten upon transfer. If necessary, clearly document such behavior.

### Resolution

Pending resolution.



## M-0 | Inaccurate Event Data

CATEGORY	SEVERITY	LOCATION	STATUS
Events	MEDIUM	NameMarketplace.sol: 262	Disputed

### Description

```
string memory name = toLower(nftr.tokenName(collectionFrom, tokenFrom))
```

```
string memory name = toLower(nftr.tokenName(collectionFrom, tokenFrom))
```

### Recommendation

Grab the name from the `toToken` or cache the name prior to transfer.

```
toToken
```

### Resolution

Pending resolution.



## M-1 | Reset Offers on Fee Change

CATEGORY	SEVERITY	LOCATION	STATUS
Logical Error	MEDIUM	NameMarketplace.sol: 327	Disputed

### Description

If the owner changes the `feePerc`, even if they lower it, all offers with a different fee will need to be reset due to a fee mismatch. A seller would prefer a lower fee so it is unexpected for their offer to be rendered invalid.

`feePerc`

### Recommendation

Compare the offer's fee percentage against an upper bound rather than an exact check.

### Resolution

Pending resolution.



## M-2 | Unable To Withdraw Bid

Category	Severity	Location	Status
Unexpected Behavior	MEDIUM	NameMarketplace.sol: 427	Disputed

### Description

There is potential for a user to be unable to withdraw their bid.

### Recommendation

Consider whether it is necessary to check for ownership when withdrawing a bid for a name.

### Resolution

Pending resolution.



# L-0 | Unnecessary Casting

CATEGORY	SEVERITY	LOCATION	STATUS
Best Practices	LOW	NameMarketplace.sol: 157	Disputed

## Description

`_WETH` is already an address so it is unnecessary to cast it to one.

`_WETH`

## Recommendation

Remove `address(_WETH)` cast.

`address(_WETH)`

## Resolution

Pending resolution.



## L-1 | Using delete

CATEGORY	SEVERITY	LOCATION	STATUS
Best Practices	LOW	NameMarketplace.sol	Disputed

### Description

`delete` on a mapping entry can be used to reset to defaults rather than setting a zeroed off Offer/Bid.

```
delete
```

### Recommendation

Consider using `delete` if only default values are necessary.

```
delete
```

### Resolution

Pending resolution.



## L-2 | Improper Visibility

CATEGORY	SEVERITY	LOCATION	STATUS
Best Practices	LOW	NameMarketplace.sol	Disputed

### Description

`toLowerCase` has visibility public but it under the internal functions section.

`toLowerCase`

### Recommendation

Consider marking the function with visibility internal or move it to a different section.

### Resolution

Pending resolution.



## L-3 | Loop Optimization

CATEGORY	SEVERITY	LOCATION	STATUS
Optimization	LOW	NameMarketplace.sol	Disputed

### Description

The length of `bstr` can be cached. Furthermore, because a name's length is restricted in NFTR, the index can be incremented in a `unchecked` block.

`bStr`  
`unchecked`

### Recommendation

Consider the above gas optimizations.

### Resolution

Pending resolution.



# Summary of Recommendations

Based on our comprehensive audit, we provide the following prioritized recommendations to improve the security posture of NFTR-MARKET.

## Priority Matrix

Issue ID	Title	Severity	Priority
C-0	Two Names For One Token	CRITICAL	Immediate
C-1	No Bids Can Be Entered	CRITICAL	Immediate
H-0	Overwriting Previous Name	HIGH	High
H-1	Griefing Name Sellers	HIGH	High
M-0	Inaccurate Event Data	MEDIUM	Medium
M-1	Reset Offers on Fee Change	MEDIUM	Medium
M-2	Unable To Withdraw Bid	MEDIUM	Medium
L-0	Unnecessary Casting	LOW	Low
L-1	Using delete	LOW	Low
L-2	Improper Visibility	LOW	Low

## General Security Best Practices

- ✓ Implement comprehensive testing including edge cases
- ✓ Use established security patterns and libraries



# Audit Team

## Team Credentials

Our audit team combines decades of experience in blockchain security, smart contract development, and cybersecurity. Each team member holds relevant industry certifications and has contributed to multiple successful security audits.

## Methodology & Standards

Our audit methodology follows industry best practices and standards:

- ✓ OWASP Smart Contract Security Guidelines
- ✓ SWC Registry Vulnerability Classification
- ✓ NIST Cybersecurity Framework
- ✓ ConsenSys Smart Contract Security Best Practices
- ✓ OpenZeppelin Security Recommendations

## Audit Process

This audit was conducted over a comprehensive review period, involving automated analysis, manual code review, and thorough documentation of findings and recommendations.



# Disclaimer & Legal Notice

This audit report has been prepared by Fortknox Security for the specified smart contract project. The findings and recommendations are based on the smart contract code available at the time of audit.

## Scope Limitations

- ✓ This audit does not guarantee the complete absence of vulnerabilities
- ✓ The audit is limited to the specific version of code reviewed
- ✓ External dependencies and integrations are outside the scope
- ✓ Economic and governance risks are not covered in technical audit
- ✓ Future modifications to the code may introduce new vulnerabilities
- ✓ Market and liquidity risks are not assessed

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## Contact Information

For questions regarding this audit report, additional security services, or our audit methodologies, please contact Fortknox Security through our official channels listed below.

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