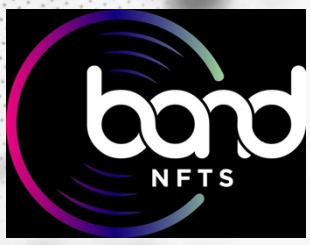
BLOCK AUDIT REPORT

Smart Contract Security Audit Report



Block Audit Report Team received the bstage.sol, bandroyalty.sol, nftstaking.sol and tokenvesting.sol file for smart contract security audit of the Band NFTS on March 05, 2022. The following are the details and results of this smart contract security audit:

Project Name: Band NFTS

The Contract address: 0x801C153498153D86Dee3fE9CAC5c3e6B855F6547
0x9837FDA9210ADEECA068E4a6DEdE9d7D1d6a58F9
0x0ffd5E49172Ed5357785eAA4DE5011c6155Fd807
0x3587942b0E8bD68D43fdba20F3e9A3814eF90418

Link Address:
https://rinkeby.etherscan.io/address/0x801c153498153d86dee3fe9cac5c3e6b855f6547#code
https://rinkeby.etherscan.io/address/0x9837fda9210adeeca068e4a6dede9d7d1d6a58f9#code
https://rinkeby.etherscan.io/address/0x0ffd5e49172ed5357785eaa4de5011c6155fd807#code
https://rinkeby.etherscan.io/address/0x3587942b0e8bd68d43fdba20f3e9a3814ef90418#code

The audit items and results:
(Other undiscovered security vulnerabilities are not included in the audit responsibility scope)

Audit Result: Passed

Audit Number: BAR0019205032022
Audit Date: March 05, 2022
Audit Team: Block Audit Report Team

Table of Content

Introduction

This Audit Report mainly focuses on the extensive security of BAND NFTS Smart Contract. With this report, we attempt to ensure the reliability and correctness of the smart contract by complete and rigorous assessment of the system's architecture and the smart contract codebase.

Auditing Approach and Methodologies applied

The Block Audit Report team has performed rigorous testing of the project including the analysis of the code design patterns where we reviewed the smart contract architecture to ensure it is structured along with the safe use of standard inherited contracts and libraries. Our team also conducted a formal line by line inspection of the Smart Contract i.e., a manual review, to find potential issues including but not limited to;

- Race conditions
- Zero race conditions approval attacks
- Re-entrancy
- Transaction-ordering dependence
- Timestamp dependence
- Check-effects-interaction pattern (optimistic accounting)
- Decentralized denial-of-service attacks
- Secure ether transfer pattern
- Guard check pattern
- Fail-safe mode
- Gas-limits and infinite loops
- Call Stack depth

In the Unit testing Phase, we coded/conducted custom unit tests written against each function in the contract to verify the claimed functionality from our client.
In Automated Testing, we tested the Smart Contract with our standard set of multifunctional tools to identify vulnerabilities and security flaws.
The code was tested in collaboration of our multiple team members and this included but not limited to;

- Testing the functionality of the Smart Contract to determine proper logic has been followed throughout the whole process.
- Analyzing the complexity of the code in depth and detailed, manual review of the code, line-by-line.
- Deploying the code on testnet using multiple clients to run live tests.
- Analyzing failure preparations to check how the Smart Contract performs in case of any bugs and vulnerabilities.
- Checking whether all the libraries used in the code are on the latest version.
- Analyzing the security of the on-chain data.

Audit Details

Project Name: Band NFTS
Website/ etherscan Code (**Testnet**):

0x801C153498153D86Dee3fE9CAC5c3e6B855F6547
0x9837FDA9210ADEECA068E4a6DEdE9d7D1d6a58F9
0x0ffd5E49172Ed5357785eAA4DE5011c6155Fd807
0x3587942b0E8bD68D43fdba20F3e9A3814eF90418

Languages: Solidity (Smart contract)
Platforms and Tools: Remix IDE, Truffle, Ganache, Mythril, Contract Library, Slither, Dapp.Tools, Echidna, Etheno

Audit Goals

The focus of the audit was to verify that the Smart Contract System is secure, resilient and working according to the specifications. The audit activities can be grouped in the following three categories:

Security Sight

Identifying security related issues within each contract and the system of contract.

Sound Architecture

Evaluation of the architecture of this system through the lens of established smart contract best practices and general software best practices, standard software design principle, design patterns and practices.

Code Correctness and Quality

A full review of the contract source code. The primary areas of focus include:

- Accuracy
- Readability
- Usability vs Security
- Sections of code with high complexity
- Quantity and quality of test coverage

Issue Categories

Every issue in this report was assigned a severity level from the following:

Critical Severity Issues

Issues of this level are critical to the smart contract's performance/functionality and should be fixed before moving to a production environment.

High level severity issues

Issues on this level are strongly suggested by the team to be fixed before moving to the production environment.

Medium level severity issues

Issues on this level could potentially bring problems and should eventually be fixed.

Low level severity issues

Issues on this level are minor details and warning's that can remain unfixed but would be better fixed at some point in the future.

Issues Checking Status

№	Issue description	Checking status
1	Compiler warnings.	Passed
2	Race conditions and Reentrancy. Cross-function race conditions.	Passed
3	Oracle calls.	Passed
4	Timestamp dependence.	Passed
5	DoS with Revert.	Passed
6	DoS with block gas limit.	Passed
7	Methods execution permissions.	Passed
8	Economy model.	Passed
9	The impact of the exchange rate on the logic.	Passed
10	Malicious Event log.	Passed
11	Scoping and Declarations.	Passed
12	Uninitialized storage pointers.	Passed
13	Arithmetic Operations accuracy.	Passed
14	Design Logic.	Passed
15	Cross-function race conditions.	Passed
16	Safe usage for Open Zeppelin module.	Passed
17	Fallback function security.	Passed
18	Send & receive ether.	Passed
19	Zero race condition approval attacks.	Passed
20	Short address attack.	Passed
21	Owner’s authority to freeze.	Passed
22	Attempt to block ether flows.	Passed
23	Redundant inheritance check.	Passed
24	Silent overrides of mapping structs.	Passed
25	Function state mutability.	Passed
26	Unnecessary conversion of type.	Passed

Used Code from other Framework/Smart Contracts (direct import)

https://rinkeby.etherscan.io/address/0x801c153498153d86dee3fe9cac5c3e6b855f6547#code

- msgSender()
- msgData()

[+] interface IERC20
- totalSupply()
- balanceOf(address account)
- transfer(address recipient, ...
- allowance(address owner, add ...
- approve(address spender, uin ...
- transferFrom(

[+] interface IERC20Metadata is IERC20
- name()
- symbol()
- decimals()

[+] contract ERC20 is Context, IERC20, ...
- name()
- symbol()
- decimals()
- totalSupply()
- balanceOf(address account)
- transfer(address recipient, ...
- allowance(address owner, add ...
- approve(address spender, uin ...
- transferFrom(
- increaseAllowance(address sp ...
- decreaseAllowance(address sp ...
- transfer(
- mint(address account, uint2 ...
- burn(address account, uint2 ...
- approve(
- beforeTokenTransfer(
- afterTokenTransfer(
- burn(uint256 amount)
- burnFrom(address account, ui ...
- cap()
- mint(address account, uint2 ...

[+] library Strings
- toString(uint256 value)
- toHexString(uint256 value)
- toHexString(uint256 value, u ...

[+] interface IERC165
- supportsInterface(bytes4 int ...
- supportsInterface(bytes4 int ...

[+] interface IAccessControl
- hasRole(bytes32 role, addres ...
- getRoleAdmin(bytes32 role)
- grantRole(bytes32 role, addr ...

- revokeRole(bytes32 role, add ...
- renounceRole(bytes32 role, a ...
- supportsInterface(bytes4 int ...
- hasRole(bytes32 role, addres ...
- checkRole(bytes32 role, add ...
- getRoleAdmin(bytes32 role)
- grantRole(bytes32 role, addr ...
- revokeRole(bytes32 role, add ...
- renounceRole(bytes32 role, a ...
- setupRole(bytes32 role, add ...
- setRoleAdmin(bytes32 role, ...
- grantRole(bytes32 role, add ...
- revokeRole(bytes32 role, ad ...

[+] interface IAccessControlEnumerable is ...

- getRoleMember(bytes32 role, ...
- getRoleMemberCount(bytes32 r ...

[+] library EnumerableSet

- add(Set storage set, bytes3 ...
- remove(Set storage set, byt ...
- contains(Set storage set, b ...
- length(Set storage set)
- at(Set storage set, uint256 ...
- values(Set storage set)
- add(Bytes32Set storage set, ...
- remove(Bytes32Set storage se ...
- contains(Bytes32Set storage ...
- length(Bytes32Set storage se ...
- at(Bytes32Set storage set, u ...
- values(Bytes32Set storage se ...
- add(AddressSet storage set, ...
- remove(AddressSet storage se ...
- contains(AddressSet storage ...
- length(AddressSet storage se ...
- at(AddressSet storage set, u ...
- values(AddressSet storage se ...
- add(UintSet storage set, uin ...
- remove(UintSet storage set, ...
- contains(UintSet storage set ...
- length(UintSet storage set)
- at(UintSet storage set, uint ...
- values(UintSet storage set)
- supportsInterface(bytes4 int ...
- getRoleMember(bytes32 role, ...
- getRoleMemberCount(bytes32 r ...
- grantRole(bytes32 role, add ...
- revokeRole(bytes32 role, ad ...

[+] contract BSTAGE is Context, Access ... *

- setStakingContract(address s ...
- setCappedSupply(uint256 capp ...
- finilizeCappedSupply()
- mint(address to, uint256 amo ...
- mintBatch(address[] calldata ...
- beforeTokenTransfer(

https://rinkeby.etherscan.io/address/0x9837fda9210adeeca068e4a6dede9d7d1d6a58f9#code

[+] interface IERC165
- supportsInterface(bytes4 int ...
- supportsInterface(bytes4 int ...

[+] interface IERC721 is IERC165
- balanceOf(address owner)
- ownerOf(uint256 tokenId)
- safeTransferFrom(address fro ...
- transferFrom(address from, a ...
- approve(address to, uint256 ...
- getApproved(uint256 tokenId)
- setApprovalForAll(address op ...
- isApprovedForAll(address own ...
- safeTransferFrom(address fro ...

[+] interface IERC721Receiver
- onERC721Received(address ope ...

[+] interface IERC721Metadata is IERC721
- name()
- symbol()
- tokenURI(uint256 tokenId)

[+] library Address
- isContract(address account)
- sendValue(address payable re ...
- Call(address target, ...
- Call(address target, ...
- CallWithValue(addres ...
- CallWithValue(addres ...
- StaticCall(address t ...
- StaticCall(address t ...
- DelegateCall(address ...
- DelegateCall(address ...
- verifyCallResult(bool succe ...
- msgSender()
- msgData()

[+] library Strings
- toString(uint256 value)
- toHexString(uint256 value)
- toHexString(uint256 value, u ...

[+] interface IERC721Enumerable is IERC72 ...
- totalSupply()
- tokenOfOwnerByIndex(address ...
- tokenByIndex(uint256 index)
- totalSupply()
- tokenByIndex(uint256 index)
- tokenOfOwnerByIndex(address ...
- supportsInterface(bytes4 int ...

- balanceOf(address owner)
- numberMinted(address owner)
- numberBurned(address owner)
- ownershipOf(uint256 tokenId)
- ownerOf(uint256 tokenId)
- name()
- symbol()
- tokenURI(uint256 tokenId)
- baseURI()
- approve(address to, uint256 ...
- getApproved(uint256 tokenId)
- setApprovalForAll(address op ...
- isApprovedForAll(address own ...
- transferFrom(
- safeTransferFrom(
- safeTransferFrom(
- exists(uint256 tokenId)
- safeMint(address to, uint25 ...
- safeMint(
- mint(
- transfer(
- poolDetection(uint256 token ...
- burn(uint256 tokenId)
- approve(
- checkOnERC721Received(
- beforeTokenTransfers(
- afterTokenTransfers(
- owner()
- renounceOwnership()
- transferOwnership(address ne ...
- setOwner(address newOwner)

[+] contract BandRoyalty is ERC721A, R ... *

- buyBandRoyaltyNft(uint256 p ...
- preMintNftBatch(address[] me ...
- preMintNft(address to, uint ...
- addAdministrators(address a ...
- removeAdministrators(address ...
- changeSaleAddress(address n ...
- changeUri(string memory new ...
- verifyOwnership(address own ...
- choosePrice(uint256 pool)

https://rinkeby.etherscan.io/address/0x0ffd5e49172ed5357785eaa4de5011c6155fd807#code

- msgSender()
- msgData()
- owner()
- renounceOwnership()
- transferOwnership(address ne ...
- transferOwnership(address n ...

[+] interface IERC721Receiver
- onERC721Received(

[+] interface IERC165
- supportsInterface(bytes4 int ...
- supportsInterface(bytes4 int ...

[+] interface IERC721Custom
- balanceOf(address owner)
- getApproved(uint256 tokenId)
- transferFrom(
- supportsInterface(bytes4 int ...

[+] interface IERC20Custom
- mint(address to, uint256 amo ...
- hasRole(bytes32 role, addres ...

[+] interface IVesting
- addLock(address to, uint256 ...

[+] contract NFTStaking is Context, Ow ... *
- onERC721Received(
- setNft(address nft)
- setToken(address erc20)
- setVesting(address vesting)
- allowStaking(address vesting ...
- setStakingPoolsRewardPercent ...
- setDefaultStakingPool(uint25 ...
- setRewardForLastPeriod(uint2 ...
- setBonusForLastPeriod(uint25 ...
- setEstimatedReward(uint256 a ...
- supportsInterface(bytes4 int ...
- getOwnerByTokenId(uint256 to ...
- getCurrentQuarterFromStart()
- getCurrentDayOfQuarter()
- getCurrentMultiplierForToken ...
- getStakingPoolsOfToken(uint2 ...
- getNftsCount()
- getCurrentMultipliers()
- claimableRewards()
- estimatedRewards()
- firstDayStakersCount()
- stake(uint256 tokenId, uint2 ...
- chooseAdditionalStakingPool(...
- unstake(uint256 tokenId)

- unstakeAll()
- claim()
- setNft(address erc721)
- setToken(address erc20)
- setVesting(address vesting ...
- addStake(address staker, ui ...
- addShare(uint256 tokenPower ...
- unstake(address staker, uin ...
- removeStake(address staker, ...
- createSnapshot(address stak ...
- calcAccruedRewards(address ...
- calcAccruedSnapshots(addres ...
- calcEstimatedRewards(addres ...
- calcEstimatedSnapshots(addr ...
- getTokenPower(uint256 token ...

https://rinkeby.etherscan.io/address/0x3587942b0e8bd68d43fdba20f3e9a3814ef90418#code

- msgSender()
- msgData()
- owner()
- renounceOwnership()
- transferOwnership(address ne ...
- transferOwnership(address n ...

[+] interface IERC20Custom

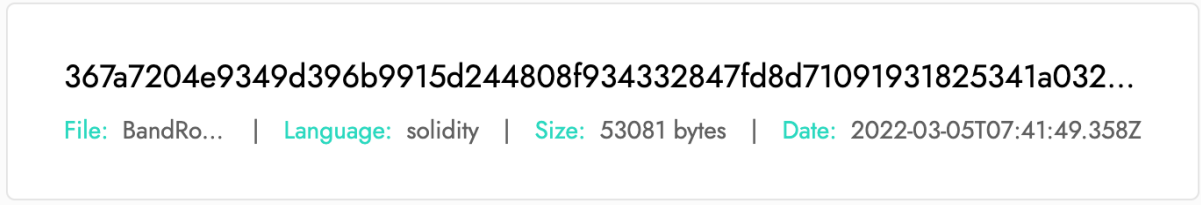
- balanceOf(address account)
- transfer(address recipient, ...

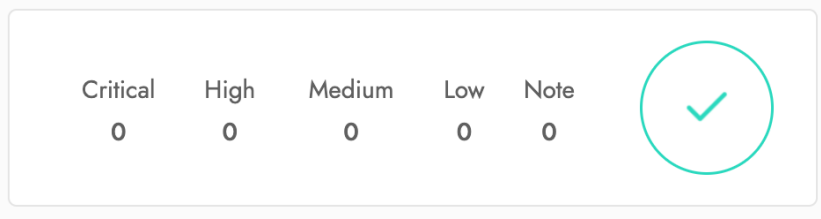
[+] contract TokenVesting is Ownable, ... *

- setTokenContract(address tok ...
- setStakingContract(address s ...
- setLockPeriod(uint256 period ...
- addVestingData(address user, ...
- batchAddVestingData(address[...
- addLock(address user, uint25 ...
- getLockedBalance(address use ...
- getLocksCount(address user)
- getLockByIndex(address user, ...
- release()
- getUnlockedBalance(address u ...
- setLockPeriod(uint256 perio ...
- addVestingData(address user ...

Manual Audit:

For this section the code was tested/read line by line by our auditors. We used Remix IDE's JavaScript VM and testnet Kovan to test the contract functionality in a simulated environment.





Critical Severity Issues

No critical severity issues found.

High Severity Issues

No high severity issues found.

Medium Severity Issues

No medium severity issues found.

Low Severity Issues

No low severity issues found.

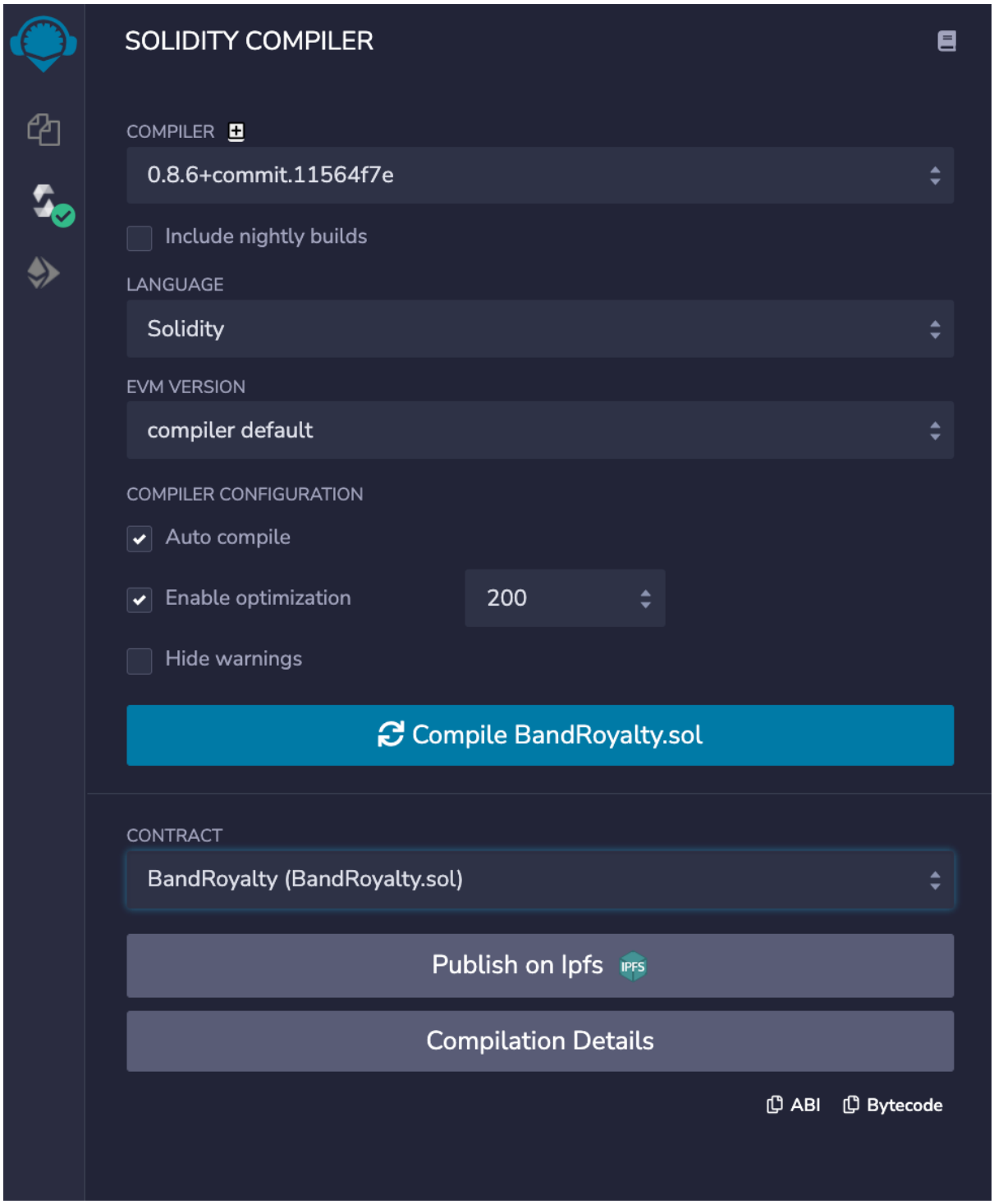
Owner privileges

- None

Automated Audit

Remix Compiler Warnings

It throws warnings by Solidity's compiler. If it encounters any errors the contract cannot be compiled and deployed.



Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at 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 the client 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 the client should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for the client to conduct the client's own independent investigations before making any decisions. We go into more detail on this in the below disclaimer below – please make sure to read it in full.

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The analysis of the security is purely based on the received smart contracts alone. No related/third-party smart contracts, applications or operations were reviewed for security. No product code has been reviewed.

Summary

All Smart contracts received in file named: “Band NFTS” do not contain any high severity issues!

Note:
Please read the disclaimer above and note, the audit claims NO statements or warranties on business model, investment advice/ attractiveness or code sustainability. This report is provided for the only set of contracts mentioned in the report and does not claim responsibility to include security audits for any other contracts deployed by Owner.

BLOCK AUDIT REPORT

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