CONTRACT CHECKER
Blockchain Solutions

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Smart Contract Security Audit

BACDv2 TOKEN

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Project Information

BACDv2 is a revolutionary project advancing the tokenization of tangible assets like private equity and real estate. This initiative aims to create a new digital asset class, empowering growth companies through decentralized processes and blockchain technology. Backed seeks to unite banks, investors, the crypto industry, and growth companies, fostering a sustainable, regulated blockchain ecosystem. By reallocating funds from the stock market, it offers a secure alternative investment option, safeguarding against market corrections. Additionally, Backed addresses regulatory and governance frameworks, promoting privacy and combating financial malpractices. Join us on this transformative journey towards a smarter, blockchain-driven investment ecosystem.

Token Name	BACDv2
Symbol	BACD2
Web Site	https://www.bacd.io/
Twitter	https://mobile.twitter.com/BACDdotIO
Telegram	http://t.me/BACDcommunity
Facebook	https://www.facebook.com/backedtoken
Medium	https://medium.com/@kevin_27521
Platform	Binance Smart Chain
Token Type	BEP20
Language	Solidity
Proxy Contract Address	0xc96Ebbc3b3158aAb69312e89fe04C9Cd192BeE01
Proxy Contract Link	https://bscscan.com/token/0xc96Ebbc3b3158aAb69312e89fe04C9Cd192BeE01
Implemented Contract	0xA20e255753EDf52a7327c73eE03533fA605520ad
Implemented Contract Link	https://bscscan.com/address/0xa20e255753edf52a7327c73ee03533fa605520ad
Audited Codebase	https://github.com/bacd-io/bacdv2/blob/main/BACDV2-2023-bsc-flat.sol

Audit Result

 BACDv2 Token has PASSED the smart contract audit with below privileges

(Other unknown security vulnerabilities are not included in the audit responsibility scope)

Audit Result:	PASSED
Ownership:	Not renounced yet
KYC Verification:	NA at the date of report edition
Audit Date:	July 25, 2023
Audit Team:	CONTRACTCHECKER

Findings

Proxy Contract Privileges

BACDv2 Token is using a proxy upgradable contract which has different levels of privilege roles as below. The deffault admin role is renounced and cannot update current implementation any more and cannot add or remove authorisations of other roles.
All the other roles still has authorised wallets and their functions still valid.

- **Deffault Admin:** This role is unusable as its ownership renounced
- **Minter Role:** Authorized to mint new tokens to any addressed account
- **Burner Role:** Can burn any amount of token from any account
- **AdjFee Role:** Can update fees unlimited
- **Pauser Role:** Can pause and resume trading
- **Control role:** Manages antibot functions
- **Snapshoot Role:** Manages snapshoot mechanism to collect contract statistics

Important Notice for Investors

As the ContractChecker team, our primary objective is to conduct a comprehensive audit of the contract code to assess its functionality and identify any potential risks embedded within the code.

Before making any investment decisions, it is crucial to consider several factors. These include the ownership status, approach of the project team, marketing strategies, general market conditions, liquidity, token holdings, and other relevant aspects.

Investors should always exercise due diligence by conducting their own research and carefully managing their risk, considering the various factors that can impact the success of a project.

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Executive Summary

CONTRACTCHECKER received an application on July 24, 2023, from the project team of BACDv2 Token to perform a thorough smart contract security audit. The objective was to identify any vulnerabilities present in the source code of BACDv2 Token, as well as any dependencies within the contract. The audit process employed a combination of Static Analysis and Manual Review techniques, conducted by our expert team.

The audit primarily focused on the following considerations:

- Functionality Testing: The Smart Contract was subjected to rigorous testing to assess if the intended logic was followed consistently throughout the entire process.
- Line-by-Line Manual Examination: Our experts meticulously reviewed the code, examining each line in detail to identify any potential issues or vulnerabilities.
- Live Testing with Multiple Clients: The Smart Contract underwent live testing using a Testnet environment, involving multiple clients. This allowed for real-world usage scenarios to be simulated and evaluated.
- Failure Analysis: The preparations for potential failures were analyzed to determine how the Smart Contract would perform in the event of bugs or vulnerabilities.
- Library Version Analysis: The versions of all libraries utilized in the code were scrutinized to ensure they were up to date, reducing the risk of known vulnerabilities.
- On-chain Data Security Analysis: The security of on-chain data was thoroughly assessed to identify any weaknesses or potential risks associated with data storage and handling.

Furthermore, as part of the smart contract security audit, CONTRACTCHECKER conducted an in-depth review of the BACDv2 TOKEN project, focusing on various key aspects. These included access control and authorization, input validation and sanitization, gas optimization and efficiency, event logging and error handling, as well as compliance with best practices and standards.

Through these comprehensive auditing procedures, CONTRACTCHECKER aimed to provide a detailed evaluation of the BACDv2 TOKEN's smart contract security, highlighting any vulnerabilities and recommending appropriate measures for mitigation.

Overview

This audit report provides a comprehensive assessment of the overall security of the BACDV2 TOKEN smart contract. ContractChecker, a trusted security auditing firm, has conducted a thorough analysis of the contract, evaluating the system architecture and codebase to identify potential vulnerabilities, exploitations, hacks, and backdoors. The objective of this audit is to ensure the reliability, correctness, and robustness of the BACDV2 TOKEN smart contract.

Applied Methodology

The audit process employed by Contract Checker followed industry-leading practices and methodologies. Our expert team utilized a comprehensive approach, including the following key elements:

- Code Design Pattern Analysis: We conducted a thorough analysis of the code design patterns used in the smart contract. This analysis helped identify any design flaws or architectural weaknesses that could potentially impact the contract's security.
- Line-by-Line Inspection: Our experienced auditors performed a meticulous review of the smart contract's code, examining each line in detail. This process aimed to identify any coding errors, vulnerabilities, or potential security risks that could compromise the contract's integrity.
- Unit Testing Phase: We executed a robust unit testing phase, where specific units of the smart contract were tested individually to ensure their functionality and resilience. This phase helped identify and address any functional issues or discrepancies within the contract.
- Automated Testing: Contract Checker employed automated testing techniques to complement the manual review process. Automated tests were designed to simulate various scenarios and interactions with the contract, helping to identify potential vulnerabilities or weaknesses that may not be apparent through manual inspection alone.

These elements were integrated into our methodology to ensure a comprehensive assessment of the smart contract's security. By combining manual inspection, unit testing, and automated testing, we aimed to provide a holistic evaluation of the contract's reliability and correctness.

Security Assessment

During the assessment, Contract Checker scrutinized the smart contract for various security aspects, including but not limited to:

- Vulnerability Identification: We conducted a comprehensive scan of the contract codebase to identify any potential vulnerabilities that could expose the contract to unauthorized access, manipulation, or exploitation.

- Exploitation Analysis: Our team performed rigorous testing and analysis to assess the contract's resistance to common exploitation techniques, ensuring its robustness against potential attacks.

- Backdoor Detection: We meticulously examined the codebase to identify any backdoors or hidden functionalities that could compromise the security and integrity of the smart contract.

Sound Architecture

The smart contract incorporates a robust and efficient architecture. It follows a modular design, separating functionalities into distinct modules for reusability and scalability. Access control mechanisms ensure authorized operations, while optimized data structures minimize storage costs. The event-driven architecture enables real-time communication, and upgradeability allows for future enhancements. The contract's sound architecture reflects best practices, ensuring secure and efficient operations.

Note: While keeping the content concise, it's important to maintain clarity and ensure that essential information is conveyed effectively.

Code Correctness and Quality

The smart contract underwent a comprehensive review of its source code, with a primary focus on accuracy, readability, sections of high complexity, and the quantity and quality of test coverage. Contract Checker conducted a thorough assessment to ensure that the code is error-free, easily understandable, and properly tested. By examining these critical areas, the contract's overall code correctness and quality were evaluated, providing assurance of reliable and robust execution.

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Risk Classification

Vulnerabilities are classified in 3 main levels as below based on possible effect to the contract.

High level vulnerability

Vulnerabilities on this level must be fixed immediately as they might lead to fund and data loss and open to manipulation. Any High-level finding will be highlighted with **RED** text

Medium level vulnerability

Vulnerabilities on this level also important to fix as they have potential risk of future exploit and manipulation. Any Medium-level finding will be highlighted with **ORANGE** text

Low level vulnerability

Vulnerabilities on this level are minor and may not affect the smart contract execution. Any Low-level finding will be highlighted with **BLUE** text

Manual Audit:

In the manual audit phase, our developers conducted a comprehensive line-by-line examination of the code. This meticulous process involved a thorough review of each line to identify any potential issues or vulnerabilities. To further validate the contract's functionality, we utilized Remix IDE's JavaScript VM and Kovan networks for testing. By combining manual code inspection with real-world testing environments, we aimed to ensure the accuracy and effectiveness of the smart contract.

Automated Audit

Remix Compiler Warnings

During the audit, the smart contract was tested using Solidity's compiler in Remix. While conducting the analysis, we found no issues or warnings reported by the compiler. This indicates that the contract's codebase complied with Solidity's syntax and best practices, further ensuring the contract's integrity and reliability.

Disclaimer

This report provides a limited overview of our findings based on our analysis, in accordance with industry best practices at the time of this report, regarding cybersecurity vulnerabilities and issues in the smart contract framework and algorithms, as detailed within this report. It is essential for you to read the full report to obtain a comprehensive understanding of our analysis. While we have conducted our analysis and prepared this report to the best of our abilities, it is important to note that you should not solely rely on this report and cannot hold us liable based on its content, production, or lack thereof. It is crucial for you to conduct your own independent investigations before making any decisions. We provide further details and clarification in the following disclaimer, which we advise you to read in its entirety.

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