



MINT CLUB SECURITY ASSESSMENT REPORT

JUN. 7 ~ JUN. 18, 2021
JUN. 27 ~ JUN. 28, 2021
JUL. 12 ~ JUL. 13, 2021

DISCLAIMER

- This document is based on a security assessment conducted by a blockchain security company SOOHO. This document describes the detected security vulnerabilities and also discusses the code quality and code license violations.
- This security assessment does not guarantee nor describe the usefulness of the code, the stability of the code, the suitability of the business model, the legal regulation of the business, the suitability of the contract, and the bug-free status. Audit document is used for discussion purposes only.
- SOOHO does not disclose any business information obtained during the review or save it through a separate media.
- SOOHO presents its best endeavors in smart contract security assessment.

SOOHO

SOOHO with the motto of “Audit Everything, Automatically” researches and provides technology for reliable blockchain ecosystem. SOOHO verifies vulnerabilities through entire development life-cycle with Aegis, a vulnerability analyzer created by SOOHO, and open source analyzers. SOOHO is composed of experts including Ph.D researchers in the field of automated security tools and white-hackers verifying contract codes and detected vulnerabilities in depth. Professional experts in SOOHO secure partners’ contracts from known to zero-day vulnerabilities.

INTRODUCTION

SOOHO conducted a security assessment of Bourbonshake's Mint Clube smart contract from Jun. 7 until Jun. 18, 2021, Jun. 27 until Jun. 28, 2021, and Jul. 12 until Jul 13, 2021. The following tasks were performed during the audit period:

- Performing and analyzing the results of Odin, a static analyzer of SOOHO.
- Writing Exploit codes on suspected vulnerability in the contract.
- Recommendations on codes based on best practices and the Secure Coding Guide.

A total of three security experts participated in a vulnerability analysis of the contract. The experts are professional hackers with Ph.D. academic backgrounds and experiences of receiving awards from national/international hacking competitions such as Defcon, Nuit du Hack, White Hat, SamsungCTF, and etc.

The detected vulnerabilities are as follows: Note 3. We have confirmed that all issues are resolved. We would like to remark that the Bourbonshake team has enough security expertise to patch critical vulnerabilities on their own. It is recommended to promote the stability of service through continuous code audit and analyze potential vulnerabilities.

ANALYSIS TARGET

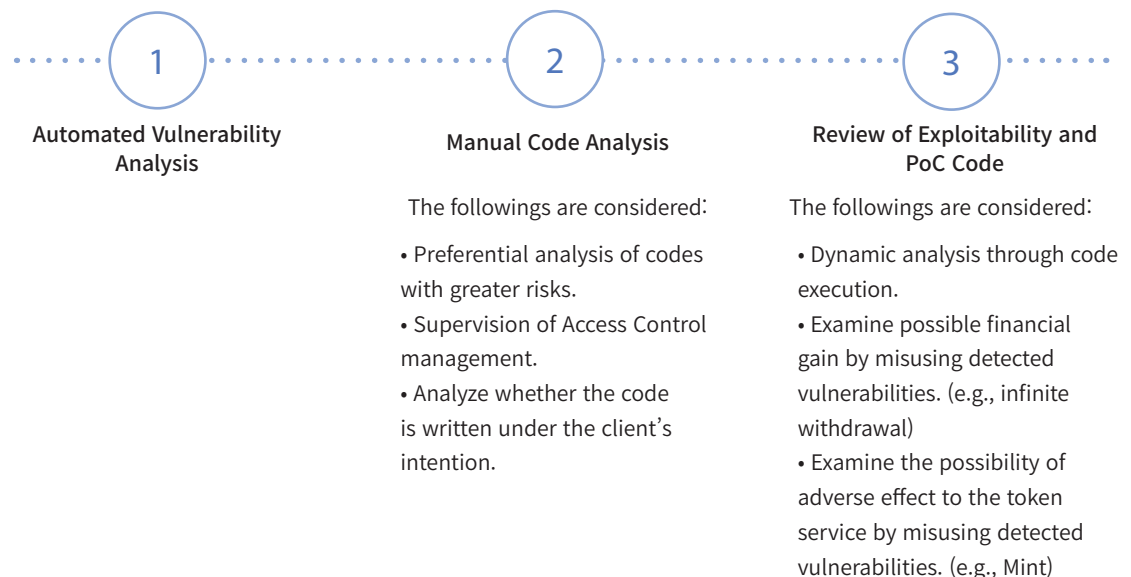
The following projects were analyzed during period.

Project	mint.club-contract
Commit #	fc737f4b
# of Files	7
# of Lines	608

KEY AUDIT POINTS & PROCESS

Bourbonshake's Mint Club is a code-free token issuance service. The issued token is a smart token that provides instant liquidity. It is leveraging the bonding curve to removing the burden on the liquidity providing or market-making. In addition, the development of the Factory pattern has been applied to be able to issue tokens without code. Accordingly, we mainly reviewed common vulnerabilities in Factory pattern, Token contracts and Bonding curve implementations.

However, we did not take any internal hackings by administrators into account. Analyzes are about the functioning of the subject contract, given the safety of the system.



RISK RATING OF VULNERABILITY

Detected vulnerabilities are listed on the basis of the risk rating of vulnerability.

Critical	High	Medium	Low	Note
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The risk rating of vulnerability is set based on [OWASP's Impact & Likelihood Risk Rating Methodology](#) as seen on the right. Some issues were rated vulnerable aside from the corresponding model and the reasons are explained in the following results.

		Likelihood		
		Low	Medium	High
Impact	High	Medium	High	Critical
	Medium	Low	Medium	High
	Low	Note	Low	Medium
		Severity		

ANALYSIS RESULTS

Analysis results are categorized into Critical, High, Medium, Low, and Note. SOOHO recommends upgrades on every detected issue.

(RESOLVED) IMPLEMENTATION CAN BE NULL Note

Additional resources and comments

File Name : MintClubFactory.sol

File Location : mint.club-contract/contracts

└─ MintClubFactory.sol

MD5 : 27a24a535edb50b46a974645f7891892

```

34     function updateTokenImplementation(address implementation) public onlyOwner {
35         tokenImplementation = implementation;
36     }

```

Details MintClubFactory uses tokenImplementation for cloning. It needs to add null validation. Also, we recommend emitting Events to broadcast the changes.

Null validation and logging statements are add in [fc1604ee](#)

(RESOLVED) MAX SUPPLY SHOULD LARGER THAN ZERO Note

Additional resources and comments

File Name : MintClubFactory.sol

File Location : mint.club-contract/contracts

└─ MintClubFactory.sol

MD5 : 27a24a535edb50b46a974645f7891892

```

50     function createToken(string memory name, string memory symbol, uint256 maxTokenSupply)
51         require(maxTokenSupply <= MAX_SUPPLY_LIMIT, 'MAX_SUPPLY_LIMIT_EXCEEDED');
52
53     address tokenAddress = _createClone(tokenImplementation);

```

```

69     function exists(address tokenAddress) external view
70         return maxSupply[tokenAddress] > 0;
71 }

```

Details maxTokenSupply 변수의 값이 0 이어도 토큰은 문제없이 생성되고 토큰 배열에서 관리됩니다. 또한 exist 함수에서도 0보다 큰지로 확인하기 때문에 개념적으로 0보다 큰 값이어야만 생성되어야 합니다. 이에 따라 0 보다 큰 값인지 확인하는 로직도 추가되는 것을 권장합니다.

Null validation is add in [fc1604ee](#).

(RESOLVED) IMPLEMENTATION CAN BE NULL Note

Additional resources and comments

File Name : MintClubBond.sol

File Location : mint.club-contract/contracts

└─ MintClubBond.sol

MD5 : 53f99ea5711d98a97066a6acb58fad84

```

42     function setDefaultBeneficiary(address beneficiary) external onlyOwner {
43         defaultBeneficiary = beneficiary;
44     }

```

Details The taxes are collected to the defaultBeneficiary. But the address can be null. It needs to add null validation. Also, we recommend emitting Events to broadcast the changes.

Null validation and logging statements are add in [fc1604ee](#)

ADDITIONAL ANALYSIS RESULTS

Additional analysis results include a description of the main areas we looked at during the analysis.

ARITHMETIC ROUNDING ✓

Additional resources and comments

Details Abusing through arithmetic rounding and fund drain were analyzed, but none were found.

ARITHMETIC ISSUES ✓

Additional resources and comments

Details Arithmetic operations are using SafeMath

ERC-20 COMPATIBLE ✓

Additional resources and comments

Details Smart token issuing by the service comply with ERC-20 specifications.

CONCLUSION

The source code of the Mint Club developed by Bourbonshake is easy to read and very well organized. We have to remark that contracts are well architected and all the additional features are implemented. The team also has expertise in security that they can fix the vulnerability by themselves. **The detected vulnerabilities are as follows: Note 3. We have confirmed that all issues are resolved.** However, most of the codes are found out to be compliant with all the best practices. It is recommended to promote the stability of service through continuous code audit and analyze potential vulnerabilities.

Project mint.club-contract
Commit # fc737f4b
of Files 7
of Lines 608

File Tree mint.club-contract/contracts

- ├─ MintClubBond.sol ✓
- ├─ MintClubFactory.sol ✓✓
- ├─ MintClubToken.sol
- ├─ lib
 - ├─ ERC20Initializable.sol
 - └─ Math.sol
- ├─ mock
 - └─ MintClubFactoryMock.sol
- └─ old
 - └─ MintToken.sol