DeusSec

Deus Security Services

Weld Token Smart Contract

Security Audit Report

September 21, 2021

Introduction

Deus Security Services (consultant) was contracted by Weld (customer) to conduct smart contracts code review and security analysis.

This report presents the findings of the security assessment of customer's smart contracts and its code review conducted between September 13, 2021, and September 17, 2021. This audit report has been prepared for Weld to discover and highlight issues and vulnerabilities in the Weld project's source code and the overall security of the Weld token. In this report, Deus Security Services, later DeusSec, attempts to ensure the reliability of the smart contract by completing recommended Static Analysis and Manual Review techniques.

The auditing assessment carried out by DeusSec pays special attention to the following considerations:

- Manual review of the entire codebase by industry experts
- Assessing the codebase to ensure compliance with current best practices
- Testing the smart contracts against both common and uncommon attack vectors.
- Ensuring contract logic meets the specifications and intentions of the client.
- Checking whether all the libraries used in the code are of the latest version.
- Running the tests and checking their coverage.

This report aims to help Weld enhance general coding practices for better structures, correctness, and readability of source code. The audit verifies whether the smart contract is secure and working properly according to the specs. We recommend addressing the findings to ensure a high level of security standards and industry practices.

To evaluate the potential vulnerabilities or issues, we go through a checklist of well-known smart contract-related security issues using automatic verification tools and manual review.

DeusSec has discussed Weld's business model to reduce the risk of unknown vulnerabilities. We might test it on our private network to reproduce the issue to prove our findings for any discovered issue.

Executive Summary

The security state of the reviewed contract is "well secured" and is good to go for production.

According to the audit, the customer's Solidity smart contract is well secured and has no critical security problems. Core code blocks are written well and systematically.

Our team reviewed all issues, which included the analysis of code functionality, manual review during automated analysis, and review of applicable vulnerabilities presented in the audit overview section.

The DeusSec team has also conducted unit tests using scripts provided through the same GitHub link, which fortifies the functionality and security of the contract, which also helped us determine the integrity of the code in an automated way.

Since possible test cases can be unlimited and developer-level documentation was not provided, we provide no guarantee of future outcomes. We have used all the latest static tools and manual observations to cover the maximum possible test cases.

Please read the whole document to estimate the risks reasonably.

Overview

Files in Scope

ProtectedErc20.sol

Project Summary

ProtectedErc20 contract implements an ERC20 standard and provides additional protection for the token. With the help of IBotProtector implementation, the token may be protected from various attacks during different phases of the project.

Severity Definition

Critical. The issue has the potential to result in data loss or asset manipulations.

High. The issue may seriously endanger the project's business model.

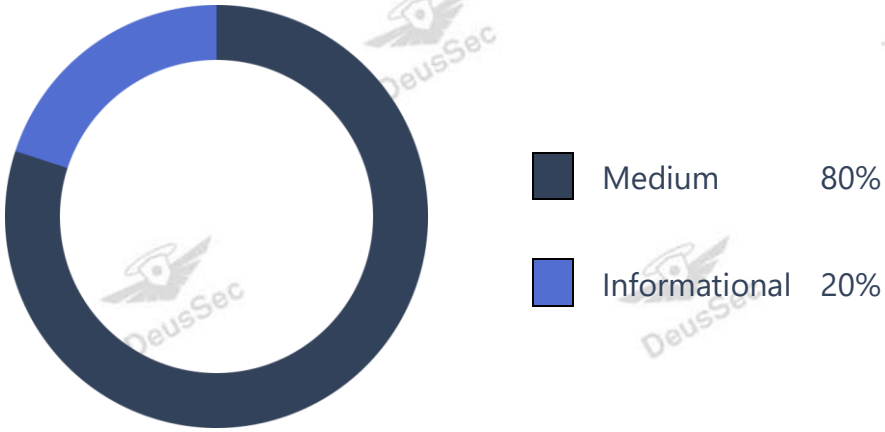
Medium. The issue requires a fix but doesn't pose a threat that is practical to exploit.

Low. The issue is likely related to outdated or unused code snippets.

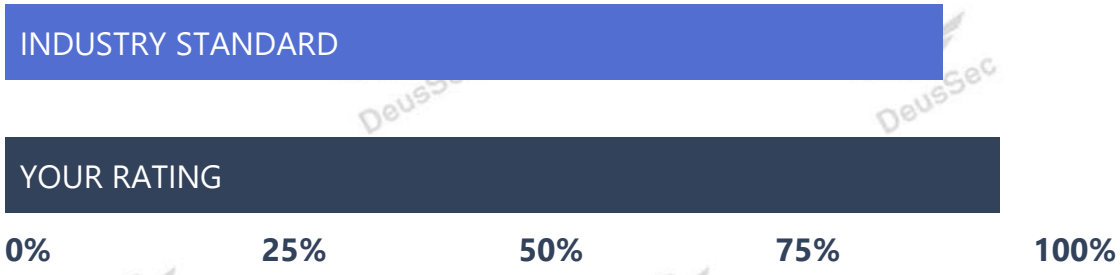
Informational. The issue is stylistic; fixes are not mandatory.

Vulnerability Summary

Severity	Total	Pending	Declined	Acknowledged	Resolved
Critical	0	0	0	0	0
High	0	0	0	0	0
Medium	4	0	0	4	0
Low	0	0	0	0	0
Informational	1	0	0	1	0



Technical Summary



The tested smart contract code is 98%, which is above the industry standard of 95%

Findings

ID	Title	Category	Severity	Status
PET-01	Using External Contract	Control Flow	Medium	Acknowledged
PET-02	Privileged Functionality	Centralization/ Privilege	Medium	Acknowledged
PET-03	Token Minted to Designated Address	Control Flow	Low	Acknowledged
PET-04	Unchecked Admin Address Change	Control Flow	Low	Acknowledged
PET-05	Unused code	Unused code	Informational	Acknowledged

PET-01 | Using External Contract

ID	Category	Severity	Location	Status
PET-01	Control Flow	Medium	ProtectedErc20.sol: 105	Acknowledged

Description

The `IBotProtector` interface is used before `_transfer` to block malicious transfers by checking recipient and sender addresses, but the actual functionality is not defined in the contract.

Potentially, malicious `IBotProtector` implementation may be set to block or compromise asset transfers.

Recommendation

In general, we recommend defining a specific IBotProtector implementation that lowers security risks. But specifics also deny the future improvement of protection and covering more attacks.

So, our second suggestion is to carefully use only trusted and well-audited contracts as an IBotProtector implementation and disable bot protector (set it to zero) as soon as it is not needed.

Alleviation

The response from the client is as below:

"Current IBotProtector implementation is used to provide a Fair Launch, and an audit for this contract will be provided. Also, we have plans to improve protector functionality."

PET-02 | Privileged Functionality

ID	Category	Severity	Location	Status
PET-02	Centralization/ Privilege	Medium	ProtectedErc20.sol: 187, 374, 379	Acknowledged

Description

The role admin_ has the authority over the setBotProtector() and mint() functions. Any compromise to the admin_ account may allow a potential hacker to take advantage of this and execute malicious acts.

Recommendation

We advise the client to carefully manage the role admin account's private key to avoid any potential risks of being hacked. In general, we strongly recommend centralized privileges or roles in the protocol to be improved via a decentralized mechanism or smart-contract-based accounts with enhanced security practices, e.g., multi-signature wallets. (We advise the client to adopt Multisig, Timelock, and/or DAO in the project to manage admin_ address).

Alleviation

The response from the client is as follows: "We are aware of that and we're already using a multi-signature wallet for the admin account."

PET-03 | Token Minted to Designated Address

ID	Category	Severity	Location	Status
PET-03	Control Flow	Low	ProtectedErc20.sol: 214, 376	Acknowledged

Description

The `initialize()` or `mint()` functions mint all of the tokens (`_maxTotalSupply`) to a single address ("recipient" or "to") with no checks.

Recommendation

Please ensure the accuracy of the recipient address when calling these functions. We also advise the client to adopt Multisig, Timelock, and/or DAO in the project to manage this address.

Alleviation

The response from the client is as follows: "We are aware of that and using a multi-signature wallet for the admin account (so the several checks are performed before updating the address)."

PET-04 | Unchecked Admin Address Change

ID	Category	Severity	Location	Status
PET-04	Control Flow	Low	ProtectedErc20.sol: 370	Acknowledged

Description

The `setAdmin()` function changes the current admin to a new one with no checks.

Recommendation

Please ensure the accuracy of the new admin address when calling this function. We also advise the client to adopt Multisig, Timelock, and/or DAO in the project to manage this address.

Alleviation

The response from the client is as follows: "We are aware of that and using a multi-signature wallet for the admin account (so the several checks are performed before updating the address)."

PET-05 | Unused Code

ID	Category	Severity	Location	Status
PET-05	Unused Code	Informational	ProtectedErc20.sol: 124	Acknowledged

Description

The `_msgData()` function is never called and therefore unneeded.

Recommendation

Delete this function.

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Blockchain technology and cryptographic assets present a high level of ongoing risk. DeusSec's position is that each company and individual are responsible for their own due diligence and continuous security.

DeusSec'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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