



Protocol Audit Report

Version 1.0

Cyfrin.io

January 9, 2025

Protocol Audit Report

Steve-Alan Baleba Baleba

January 9, 2025

Prepared by: Steve-Alan Baleba Baleba Lead Auditors: - Steve-Alan Baleba Baleba

Table of Contents

- Table of Contents
- Protocol Summary
- Disclaimer
- Risk Classification
- Audit Details
 - Scope
 - Roles
- Executive Summary
 - Issues found
- Findings
 - High
 - * [H-1] Storing the password on-chain makes it visible to anyone, and no longer private
 - * [H-2] `PasswordStore::setPassword` has no access controls, meaning a non-owner could change the password
 - Informational
 - * [I-1] The `PasswordStore::getPassword` natspec indicates a parameter that doesn't exist, causing the natspec to be incorrect

Protocol Summary

A smart contract application for storing a password. Users should be able to store a password and then retrieve it later. Others should not be able to access the password.

Disclaimer

I (Steve-Alan Baleba Baleba) makes all effort to find as many vulnerabilities in the code in the given time period, but holds no responsibilities for the findings provided in this document. A security audit by the team is not an endorsement of the underlying business or product. The audit was time-boxed and the review of the code was solely on the security aspects of the Solidity implementation of the contracts.

Risk Classification

		Impact		
		High	Medium	Low
Likelihood	High	H	H/M	M
	Medium	H/M	M	M/L
	Low	M	M/L	L

We use the CodeHawks severity matrix to determine severity. See the documentation for more details.

Audit Details

The finding described in this document correspond the following commit hash:

```
1 2e8f81e263b3a9d18fab4fb5c46805ffc10a9990
```

Scope

```
1 ./src/  
2 #-- PasswordStore.sol
```

Roles

```
1 Owner: The user who can set the password and read the password.  
2 Outsides: No one else should be able to set or read the password.
```

Executive Summary

```
1 *Add some notes on how the audit went*  
2 *We spend X hours with Z auditors using Y tools*
```

Issues found

1	Severity	Number of issues found	
2	-----	-----	
3	High	2	
4	Medium	0	
5	Low	0	
6	Info	1	
7	Total	3	

Findings

High

[H-1] Storing the password on-chain makes it visible to anyone, and no longer private

Description: All data stored on-chain is visible to anyone, and can be read directly from the blockchain. The `PasswordStore:s_password` variable is intended to be a private variable and only accessed through the `PasswordStore::getPassword` function, which is intended to be only called by the owner of the contract.

We show one such method of reading any data off chain below.

Impact: Anyone can read the private password, severely breaking the functionality of the protocol.

Proof of Concept: (Proof of code)

Recommended Mitigation: Due to this, this overall architecture of the context should be rethought. One could encrypt the password off-chain, and then store the encrypted password on-chain. This would require the user to remember another password off-chain to decrypt the password. However, you'd also likely want to remove the view function as you wouldn't want the user to accidentally send a transaction with the password that decrypts your password.

[H-2] PasswordStore::setPassword has no access controls, meaning a non-owner could change the password

Description: The `PasswordStore::setPassword` function is set to be an `external` function, however, the natspec of the function and overall purpose of the smart contract is that This function allows only the owner to set a `new` password.

```
1 function setPassword(string memory newPassword) external {
2   @> // @audit - There are no access controls
3     s_password = newPassword;
4     emit SetNetPassword();
5 }
```

Impact: Anyone can change the password of the contract, severely breaking the contract intended functionality.

Proof of Concept: Add the following to the `PasswordStore.t.sol` test file.

code

```
1 function test_anyone_can_set_password(address randomAddress) public {
2     vm.assume(randomAddress != owner);
3     vm.prank(randomAddress);
4     string memory expectedPassword = "newPassword";
5     passwordStore.setPassword(expectedPassword);
6
7     vm.prank(owner);
8     string memory actualPassword = passwordStore.getPassword();
9     assertEq(actualPassword, expectedPassword);
10 }
```

Recommended Mitigation: Add an access control conditionnal to the `setPassword` function.

```
1 if(msg.sender != s_owner) {
2     revert PasswordStore_NotOwner();
3 }
```

Informational

[I-1] The PasswordStore::getPassword natspec indicates a parameter that doesn't exist, causing the natspec to be incorrect

Description:

```
1  /*
2      * @notice This allows only the owner to retrieve the password.
3  @>    * @param newPassword The new password to set.
4      */
5      function getPassword() external view returns (string memory) {
```

The `PasswordStore::getPassword` function signature is `getPassword()` while the natspec says it should be `getPassword(string)`.

Impact: The natspec is incorrect

Recommended Mitigation: Remove the incorrect natspec line

```
1  -      * @param newPassword The new password to set.
```