



# Protocol Audit Report

Version 1.0

*GuireWire*

July 10, 2024

# Protocol Audit Report

GuireWire

July 10, 2024

Prepared by: GuireWire Lead Auditors: - GuireWire

## Table of Contents

- Table of Contents
- Protocol Summary
- Disclaimer
- Risk Classification
- Audit Details
  - Scope
  - Roles
- Executive Summary
  - Issues found
- Findings
  - High
    - \* [H-1] Storing Password On-Chain Makes it Visible to Anyone, And Is No Longer Private
  - Likelihood & Impact:
    - \* [H-2] TITLE `PasswordStore::setPassword` has no Access Controls, Meaning a Non-Owner Can 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

PasswordStore is a protocol dedicated to storage and retrieval of a user’s password. The protocol is designed to be used by a single user, and is not designed to be used by multiple users. Only the owner should be able to set and access the password.

## Disclaimer

The GuireWire team 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 findings described in this document correspond to the following commit hash:** Commit Hash:

```
1 7d55682ddc4301a7b13ae9413095feffd9924566
```

## Scope

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

## Roles

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

## Executive Summary

Audit deemed to be successful as we identified 2 high severity bugs and 1 informational bug.

We spent 2 hours on the audit using Foundry.

## Issues found

Severity	Number of Issues Found
High	2
Medium	0
Low	0
Informational	1
Total	3

## Findings

### High

#### [H-1] Storing Password On-Chain Makes it Visible to Anyone, And Is 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)

The below test case shows how anyone can read the password directly from the blockchain

- ## 1. Create a locally running chain

```
1 make anvil
```

- ## 2. Deploy the contract to the chain

```
1 make deploy
```

- ### 3. Run the storage tool

We use 1 because that's the storage slot of `s_password` in the contract.

```
1 cast storage <ADDRESS_HERE> 1 --rpc-url http://127.0.0.1:8545
```

You'll get an output that looks like this:

[illegible]

You can then parse that hex to a string with:

[illegible]

And get an output of:

```
1 myPassword
```

**Recommended Mitigation:** Due to this, the overall architecture of the contract 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.

### Likelihood & Impact:

- Impact - HIGH

- Likelihood - HIGH
- = Severity: HIGH

## [H-2] TITLE PasswordStore::setPassword has no Access Controls, Meaning a Non-Owner Can Change the Password

**Description:** As per the purpose of the contract and the natspec of the function, the PasswordStore::setPassword function is intended to be only callable by the owner of the contract - @notice 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 set or change the password of the contract, severely breaking the contract's intended functionality.

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

Code

```
1 function test_AnyoneCanSetPassword(address randomAddress) public {
2     vm.assume(randomAddress != owner);
3     vm.prank(randomAddress);
4     string memory expectedPassword = "myNewPassword";
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 condition to the setPassword function.

Code

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

**Likelihood & Impact:** - Impact - HIGH - Likelihood - HIGH - = Severity: HIGH

## Informational

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

**Description:** In the natspec, the `PasswordStore::getPassword` function has a parameter that doesn't exist.

Code

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

**Impact:** The natspec is incorrect

**Proof of Concept:** N/A

**Recommended Mitigation:** Remove the incorrect natspec line.

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

**Likelihood & Impact:** - Impact - NONE (WRONG DOCUMENTATION) - Likelihood - HIGH - = Severity: Informational/Gas/Non-Critical