



Protocol Audit Report

Version 1.0

Cyfrin.io

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Protocol Summary

PasswordStore is a protocol dedicated to storage and retrieval of a user's passwords. 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 this password.

Disclaimer

The YOUR_NAME_HERE 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
		H	H/M	M
Likelihood	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 the following 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

Notes about how audit went

Issues found

Severity	Number of issues found
High	2
Medium	0
Low	0
Info	1
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)

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

1. Deploy the contract

```
1 make deploy
```

2. Access the storage with contract's address

```
1 cast storage $CONTRACT_ADDRESS$ $STORAGE_SLOT$ --rpc-url $YOUR_RPC_URL$
```

3. Parse the result to string

```
1 cast parse-bytes32-string $RESULT$
```

Recommend 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] 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 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 set/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   {
3     vm.prank(randomAddress);
4     string memory expectedPassword = "hackedPassword";
5     passwordStore.setPassword(expectedPassword);
6
7     vm.prank(owner);
8     string memory actualPassword = passwordStore.getPassword();
9     assertEq(actualPassword, expectedPassword);
}
```

Recommend Mitigation: Add an access control conditional to the `setPassword` function.

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

Likelihood & Impact:

- Impact: HIGH
- Likelihood: HIGH
- Severity: HIGH

Medium**Low****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     @>   * @audit no new password parameter
5       */
6     function getPassword() external view returns (string memory) {
```

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

Impact: The natspec is incorrect.

Recommend Mitigation: Remove the incorrect natspec line.

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

Likelihood & Impact:

- Impact: HIGH
- Likelihood: NONE
- Severity: Informational/Gas/Non-crits

Gas