Protocol Audit Report

Version 1.0

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Protocol Audit Report

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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
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 the following commit hash:

```
7d55682ddc4301a7b13ae9413095feffd9924566
```

Scope

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

- Solc Version: 0.8.18
- Chain(s) to deploy contract to: Ethereum

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

Add some notes about how the audit went, types of things you found, etc.

We spent X hours with Z auditors using Y tools. etc

Issues found

Severity	Number of issues found
High	2
Medium	0
Low	0
Info	1
Total	3

Findings

High

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

Description: All data stored on-chain is visible to anyone. The `PasswordStore::s_password` variable is intended to be hidden and only accessible by the owner through the `PasswordStore::getPassword` function.

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

Impact: Anyone is able to read the private password, serverly breaking the functionality of the protocol.

Proof of Concept: (Proof of Code)

The below test case shows how anyone could read the private password directly from the blockchain. We use foundry's cast tool to read directly from the storage of the contract, without being the owner.

1. Create a locally running chain

```
make anvil
```

2. Deploy the contract to the chain

```
make deploy
```

3. Run the storage tool

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

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

You'll get an out put that looks like this:

```
`0x6d7950617373776f726400000000000000000000000000000000000000000014`
```

You can then parse that hex to a string with:

```
cast parse-bytes32-string 0
    x6d7950617373776f726400000000000000000000000000000000000000000014
```

And get an output of:

```
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 stored 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 this decryption key.

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

Description:

Me: `PasswordStore::setPassword` function doesn't have any access controls, which allows anyone can access to the password and change it no matter you're not the owner of the contract.

Patric: The `PasswordStore::setPassword` function is set to be an `external` function, however, the natspec of the function and overall purpose of the smart contract indicate 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, serverly breaking the contract's 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 = "myNewPassword";
5          passwordStore.setPassword(expectedPassword);
6
7          vm.prank(owner);
8          string memory actualPassword = passwordStore.getPassword();
9          assertEq(expectedPassword, actualPassword);
10     }
```

Recommended Mitigation: Add an access control conditional to `PasswordStore::setPassword`.

```
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   /*
2   * @notice This allows only the owner to retrieve the password.
3 - * @param newPassword The new password to set.
4   */
```