

PasswordStore Audit Report

Prepared by: thomasbtho

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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 this password.

Disclaimer

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

The [CodeHawks](#) severity matrix is used to determine severity. See the documentation for more details.

Audit Details

The findings described in this document correspond to the following commit hash:

```
2e8f81e263b3a9d18fab4fb5c46805ffc10a9990
```

Scope

```
./src/  
└─ 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

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.

One such method of reading any data off chain is shown below.

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

Proof of Concept: The below test case shows how anyone can read the password directly from the blockchain. [Foundry's cast](#) tool is used 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

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

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

You'll get an output that looks like this:

```
0x6d7950617373776f726400000000000000000000000000000000000000000014
```

You can then parse that hex to a string with:

```
cast 2as 0x6d7950617373776f7264000000000000000000000000000000000000000014
```

And get an output of:

```
myPassword
```

Recommended Mitigation: Due to this, the overall architecture of the contract should be rethought.

[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.

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

Impact: Anyone can set/change the password of the contract.

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

```
function test_anyone_can_set_password(address randomAddress) public {
    vm.assume(randomAddress != owner);
    string memory expectedPassword = "myNewPassword";

    vm.prank(randomAddress);
    passwordStore.setPassword(expectedPassword);

    vm.prank(owner);
    string memory actualPassword = passwordStore.getPassword();

    assertEq(actualPassword, expectedPassword);
}
```

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

```
if (msg.sender != s_owner) {
    revert PasswordStore__NotOwner();
}
```

Informational

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

Description:

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

The natspec for the function PasswordStore::getPassword indicates it should have a parameter with the signature getPassword(string) . However, the actual function signature is getPassword() .

Impact: The natspec is incorrect.

Recommended Mitigation: Remove the incorrect natspec line.

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