



Protocol Audit Report

Version 1.0

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Protocol Summary

A smart contract applicatoin 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 make all efforts 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 severity matrix to determine severity. See the documentation for more details.

Audit Details

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

Scope

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

Roles

Owner: The user who can set the password and read the password. Outsides: 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 onchain 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. 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] PasswordStore::setPassword has no access control, 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 main 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 for this function
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.assume(randomAddress != owner);
4     vm.prank(randomAddress);
5     string memory expectedPassword = "myNewPassword";
6     passwordStore.setPassword(expectedPassword);
7
8     vm.prank(owner);
9     string memory actualPassword = passwordStore.getPassword();
10    assertEq(actualPassword, expectedPassword);
11 }
```

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

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

Likelihood & Impact:

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

Informational

[I-1] TITLE 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.
```

Likelihood & Impact:

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

Informational: Hey, this isn't a bug, but you should know...