
# Protocol Audit Report

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# Table of Contents



# Protocol Summary

Owner can save the password and retrive it. Not any other.

# Disclaimer

The Sec_p0x 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 |
| | High | 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

## Scope

Commit Hash: 7d55682ddc4301a7b13ae9413095feffd9924566 In 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. Outsides: No one else should be able to set or read the password.

# Executive Summary

# Findings

# High

### [H-1] Passwords stored on-chain are visable to anyone, not matter solidity variable visibility

**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.

However, anyone can direclty read this using any number of off chain methodologies

**Impact:** The password is not private.

**Proof of Concept:** The below test case shows how anyone could read the 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 --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 parse-bytes32-string
0x6d7950617373776f726400000000000000000000000000000000000000000014
```

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 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.

### [H-2] `PasswordStore::setPassword` is callable by anyone

**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 suite.

```
function test_anyone_can_set_password(address randomAddress) public {
    vm.prank(randomAddress);
    string memory expectedPassword = "myNewPassword";
    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();
}
```