



Maxi Audits

Protocol Audit Report

Version 1.0

Maxi-Audits

July 26, 2024

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July 25, 2024

Prepared by: Cyfrin Lead Auditors: - xxxxxxxx

Table of Contents

- Table of Contents
- Protocol Summary
- Disclaimer
- Risk Classification
- Audit Details
 - Scope
 - Roles
- Executive Summary
 - Issues found
- Findings
 - High
 - * [H-1] Storing the password on-chain makes it visible to anyone and no longer private.
 - * [H-2] `PasswordStore::setPassword` has no access controls meaning a non-owner could change the password
 - Informational
 - * [I-1] The `PasswordStore::getPassword` natspec indicates a parameter that doesn't exist, causing the natspec to be incorrect.

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 Maxi-Audits 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 to the following commit hash:

```
1 2e8f81e263b3a9d18fab4fb5c46805ffc10a9990
```

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

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

*We spent 12 hours with 1 auditor using foundry forge test suite.

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. 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 the hex to a swtring 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.

[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 the overall 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
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   vm.prank(randomAddress);
3   string memory expectedPassword = "myNewPassword";
4   passwordStore.setPassword(expectedPassword);
5
6   vm.prank(owner);
7   string memory actualPassword = passwordStore.getPassword();
8   assertEq(actualPassword, expectedPassword);
9 }
```

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

```
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.r
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.

Proof of Concept:

Recommended Mitigation: Remove the incorrect natspec line.

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