A Secure Password Wallet based on the SEcube™ framework

Walter Gallego Gómez

Department of control and computer engineering
Politecnico di Torino

July 23, 2018

Motivation

The need for a hardware-based password manager is justified answering these three questions:

Motivation

The need for a hardware-based password manager is justified answering these three questions:

Are passwords still relevant?

Motivation

The need for a hardware-based password manager is justified answering these three questions:

Are passwords still relevant?

Yes, they are the dominant form of authentication.

Motivation

The need for a hardware-based password manager is justified answering these three questions:

Why should people use password managers?

Motivation

The need for a hardware-based password manager is justified answering these three questions:

Why should people use password managers?

So they can use unique strong passwords.

Motivation

The need for a hardware-based password manager is justified answering these three questions:

Why are hardware-based approaches more reliable?

Motivation

The need for a hardware-based password manager is justified answering these three questions:

Why are hardware-based approaches more reliable?

Hardware approaches use two-factor authentication.

Motivation

The need for a hardware-based password manager is justified answering these three questions:

Are passwords still relevant?

Yes, they are the dominant form of authentication.

Why should people use password managers?

So they can use unique strong passwords.

Why are hardware-based approaches more reliable?

Hardware approaches use two-factor authentication.

Outline

Outline

Introduction

Outline

Software Libraries

The following open source libraries were used:

Software Libraries

The following open source libraries were used:

Qt: GUI and wrappers

Software Libraries

The following open source libraries were used:

Qt: GUI and wrappers

Compatible with C/C++, Cross-platform

Software Libraries

The following open source libraries were used:

SQLite: DataBase management

Software Libraries

The following open source libraries were used:

SQLite: DataBase management

Self-contained...

Software Libraries

The following open source libraries were used:

PwGen: Password generator

Software Libraries

The following open source libraries were used:

PwGen: Password generator

Strong Random or readable

Software Libraries

The following open source libraries were used:

zxcvbn: Password strength estimator

Software Libraries

The following open source libraries were used:

zxcvbn: Password strength estimator

Considers a lot of cases....

Software Libraries

The following open source libraries were used:

Qt: GUI and wrappers

Compatible with C/C++, Cross-platform

SQLite: DataBase management

Self-contained...

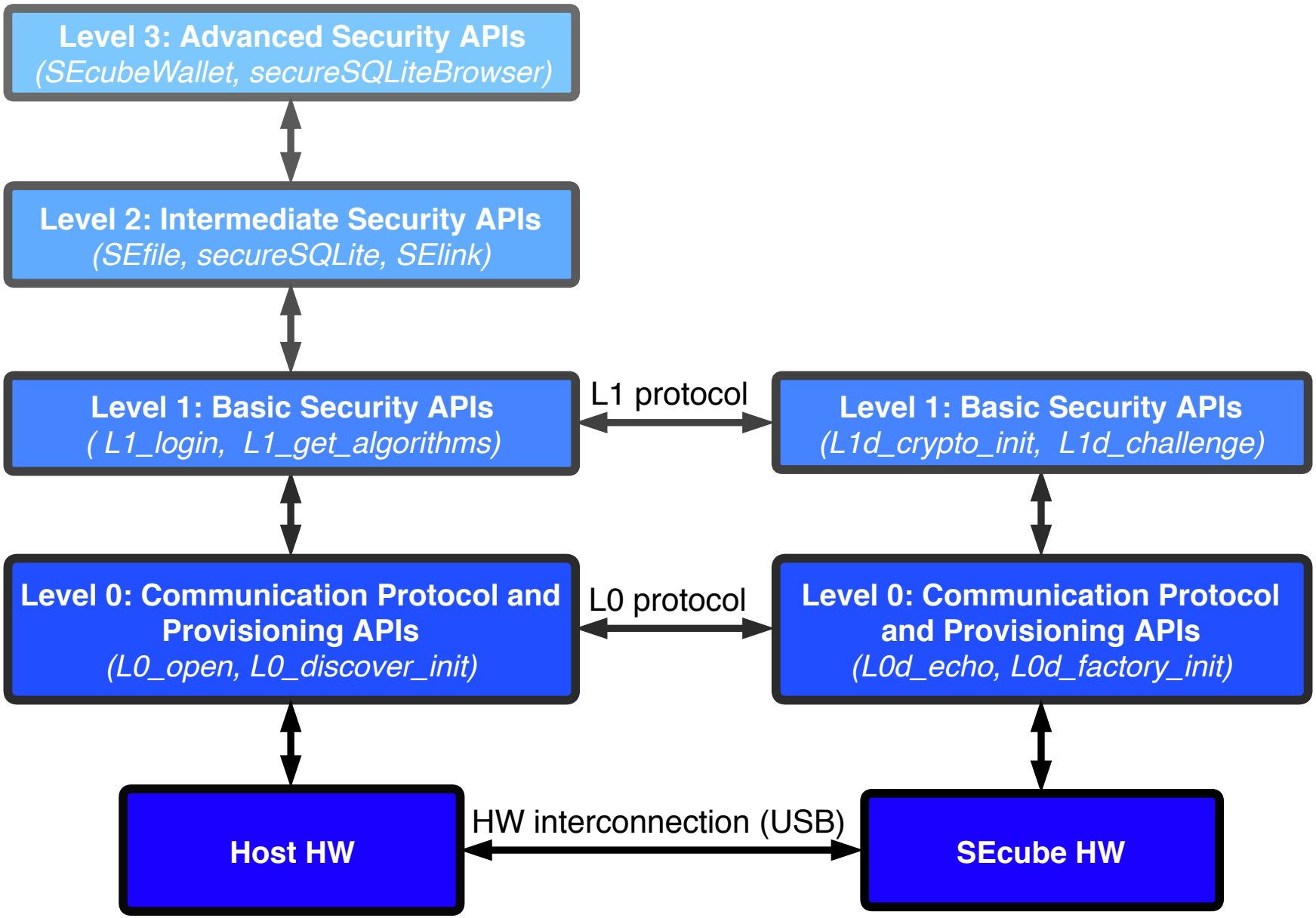
PwGen: Password generator

Strong Random or readable

zxcvbn: Password strength estimator

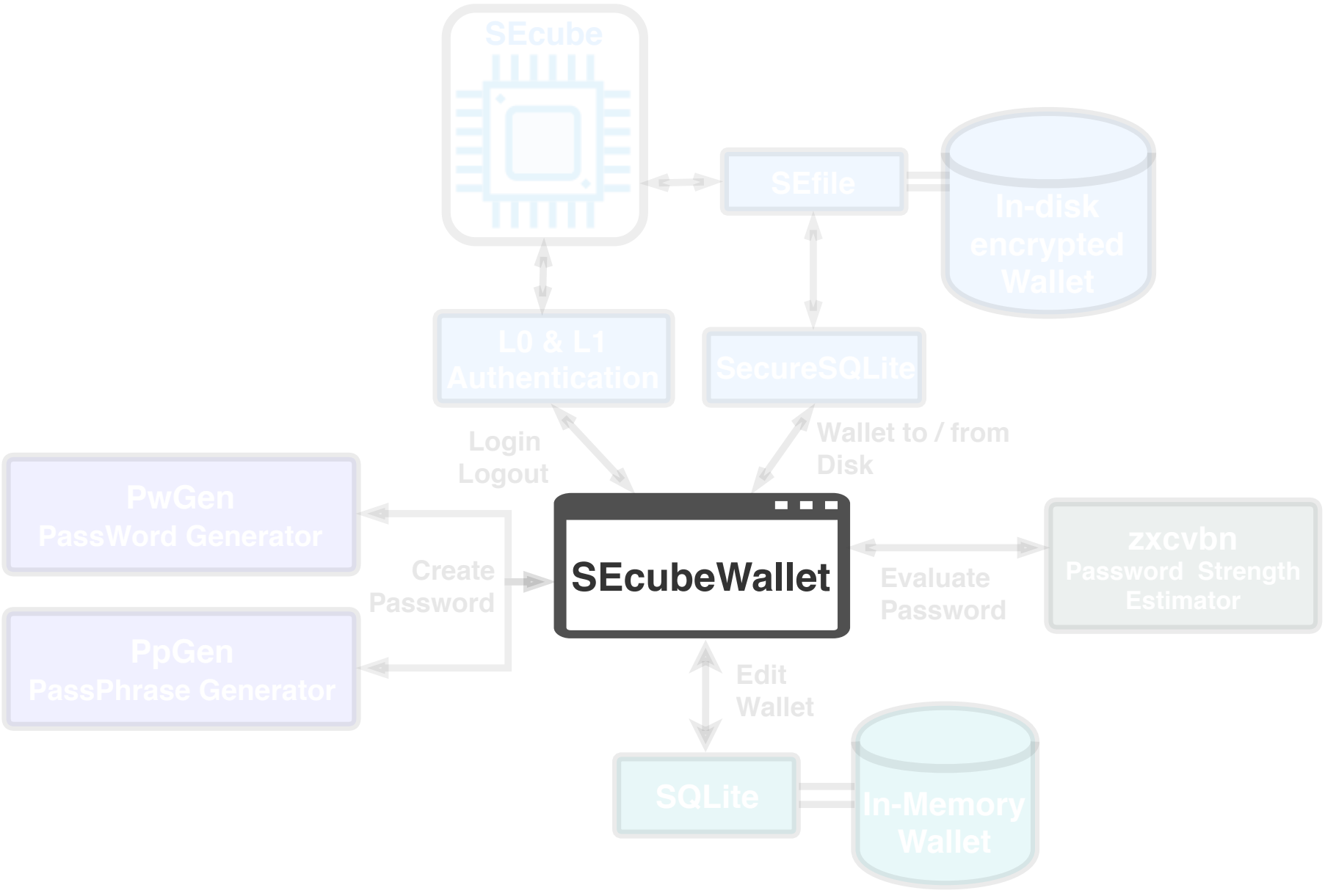
Considers a lot of cases....

SEcube™ APIs hierarchy

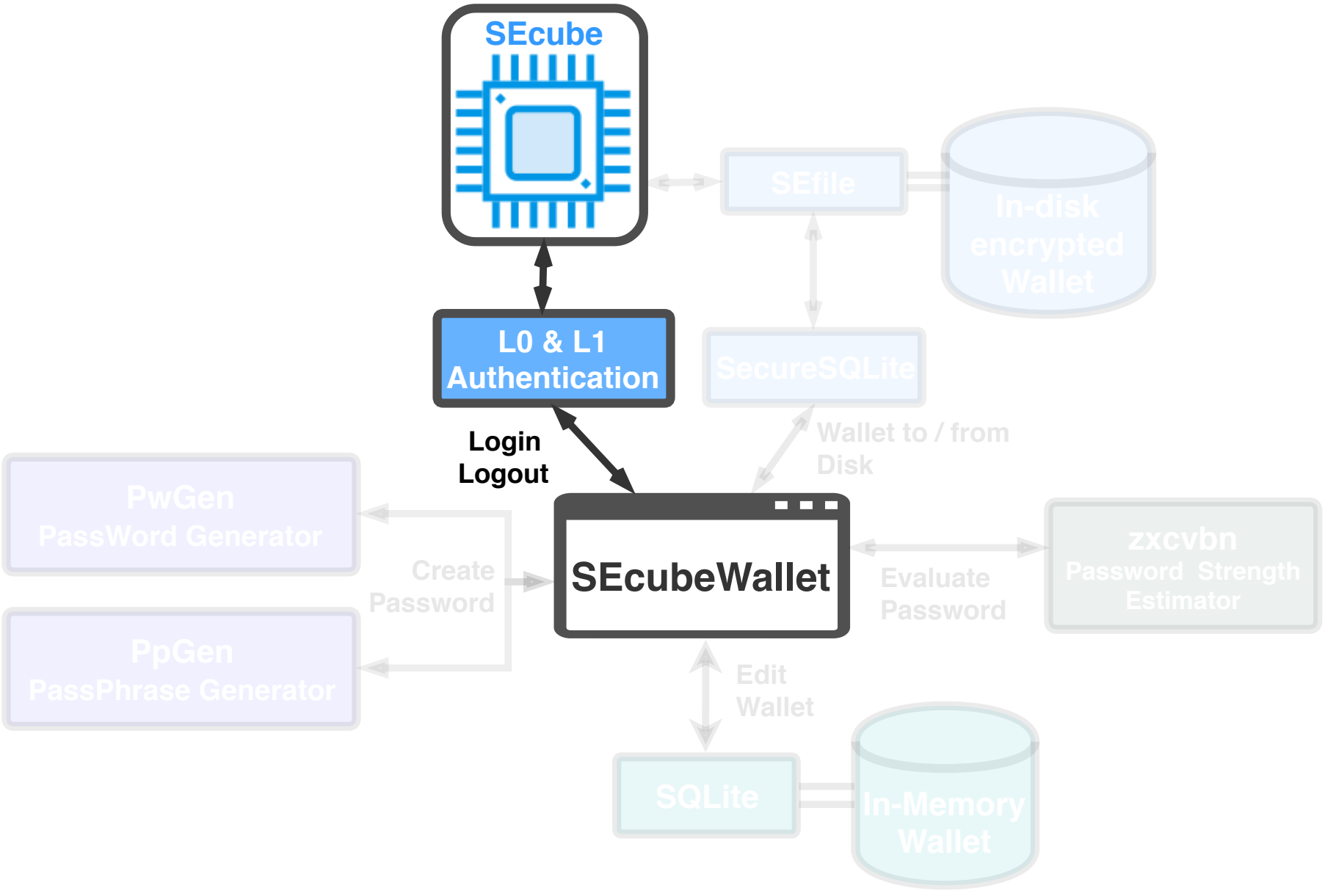


Outline

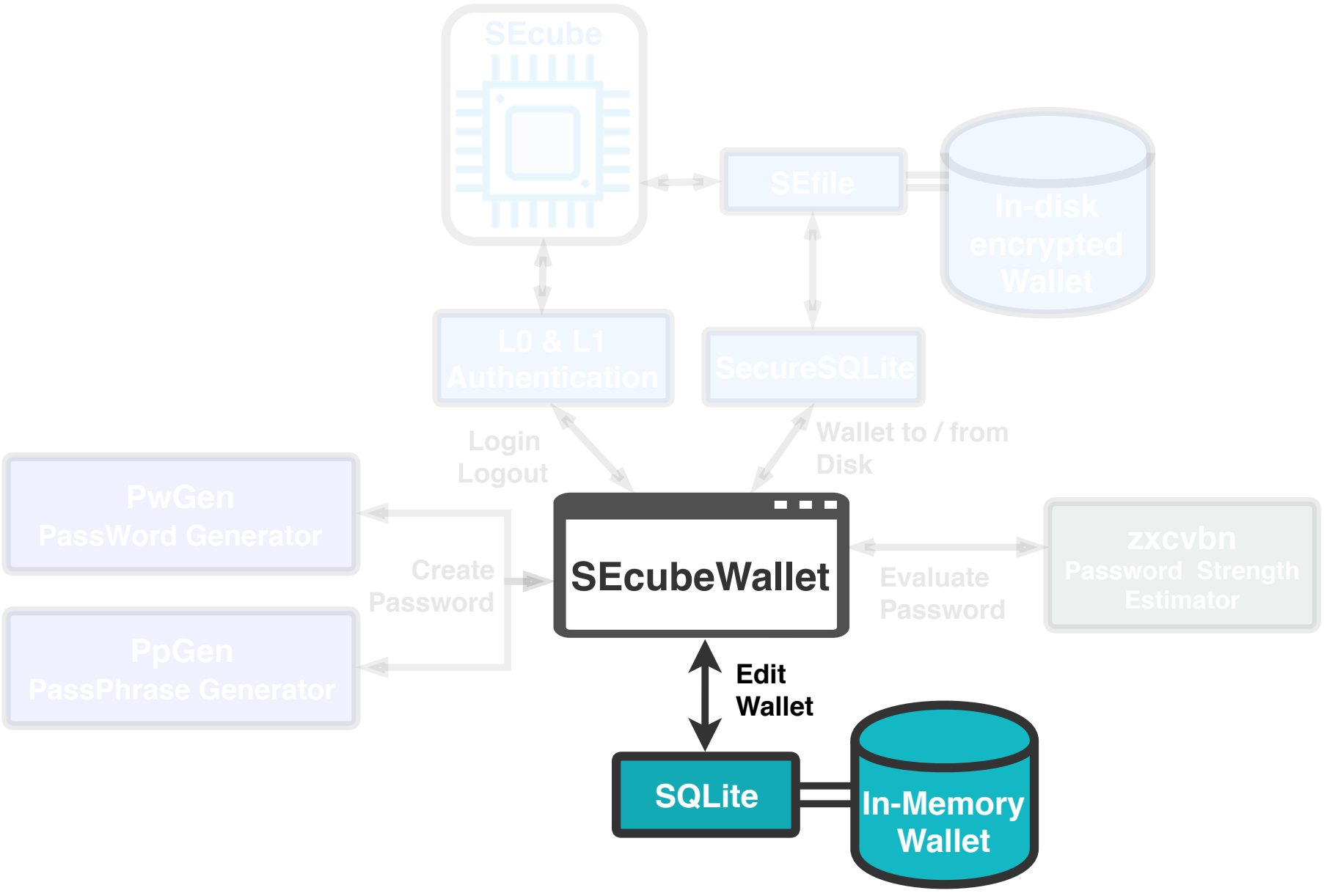
SEcubeWallet Application



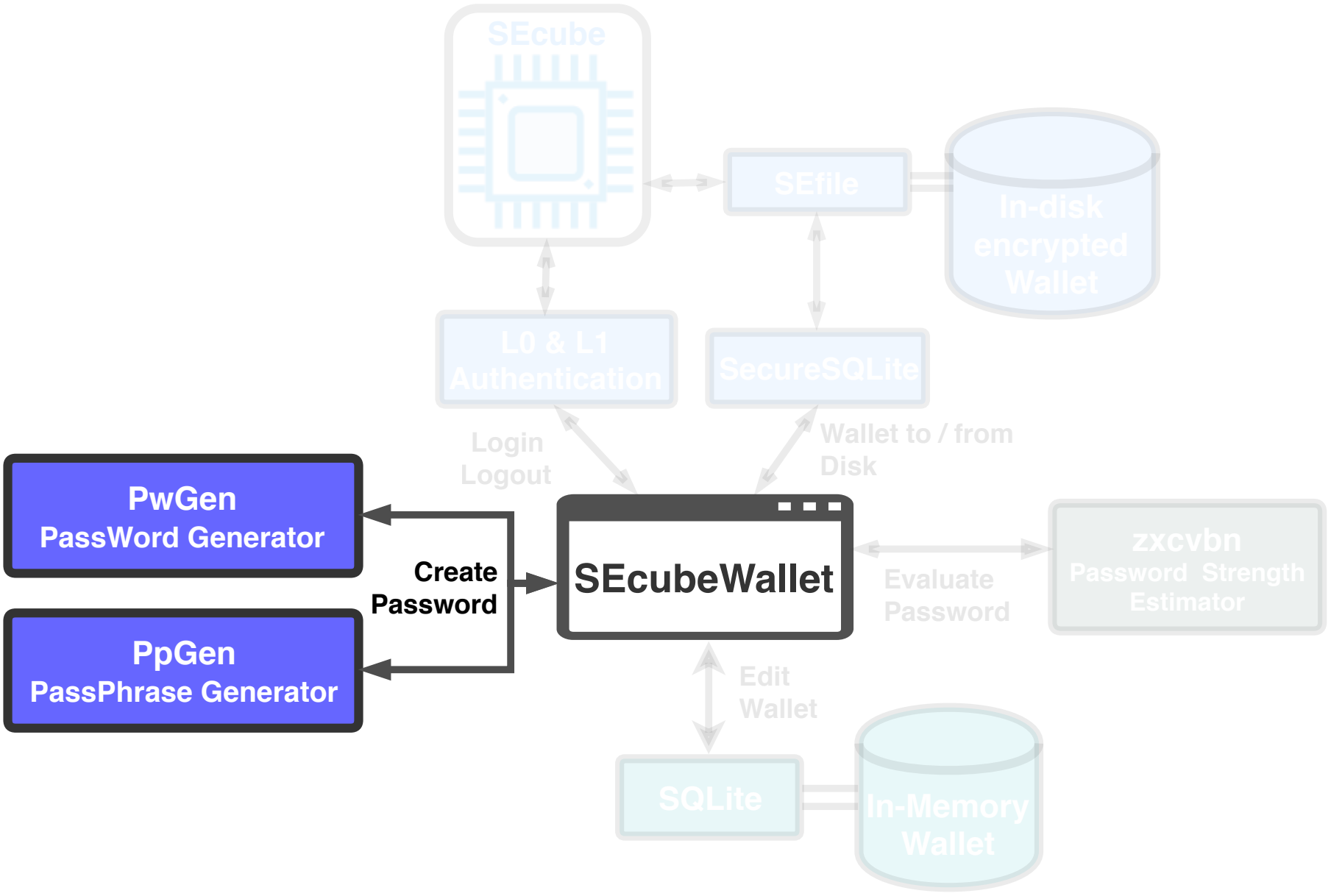
Open device and authenticate



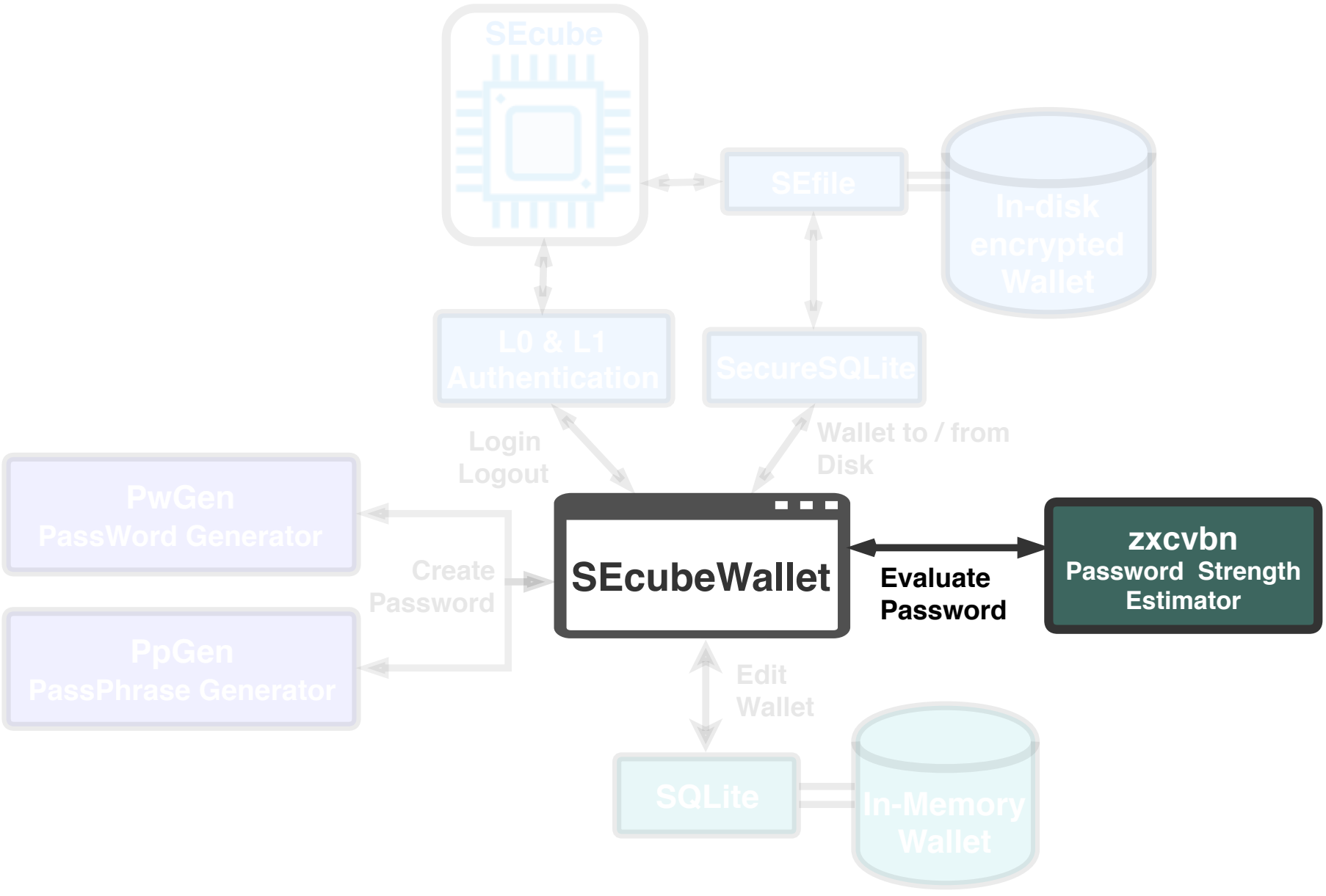
Create In-memory Wallet



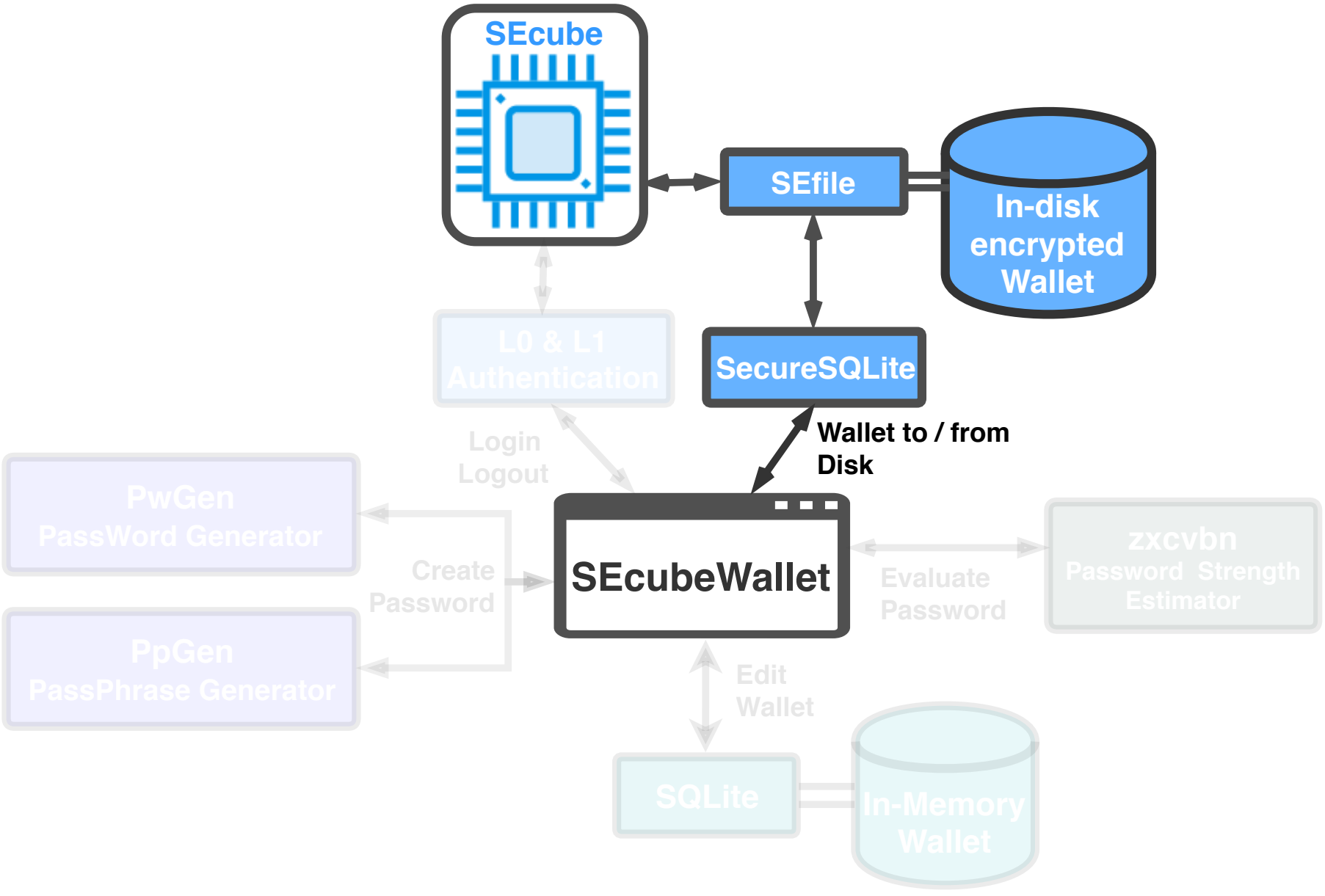
Generate Password/Passphrase



Evaluate Strength



Encrypt and Save Wallet to disk



General Architecture