Smart-Split Architecture and Design

Cristian Balan,
Zane Richards,
Leo Martinez,
Nick Azzouz,
Xavier Evans

Introduction

Purpose of Document

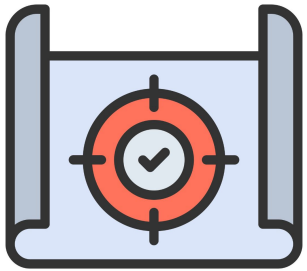
The purpose of the Architecture and Design document is to serve as a comprehensive guide that outlines the following parts of the Smart Split Application:

- Structure
- Components
- Behavior

Provides a clear and detailed description of how the software will be designed and implemented to meet the specified requirements.

Scope of Document

The document covers the fundamental organization of the software system embodied in its components, their relationships to each other and to the environment, and the principles guiding its design and evolution as per the IEEE definition of software architecture.



Architectural Representation

This document presents the architecture as a series of views; use case view, logical view, and deployment view. These views are presented using the Unified Modeling Language (UML).

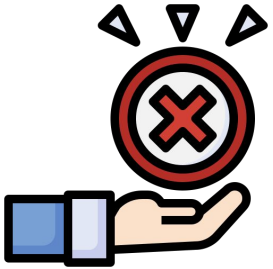
Architectural Goals and Constraints

Goals:

- Be able to manage high traffic in seasons where group travel is more prevalent such as summer.

Constraints:

- Limited team size of only 5 group members.



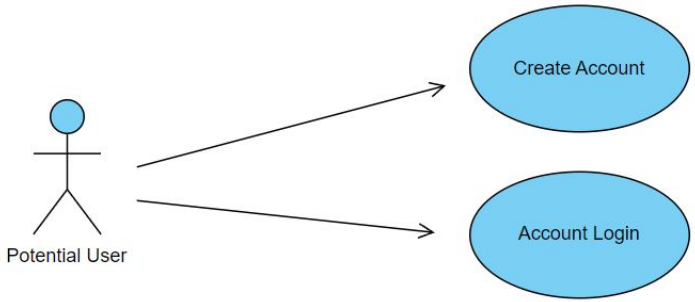
Use-Case View

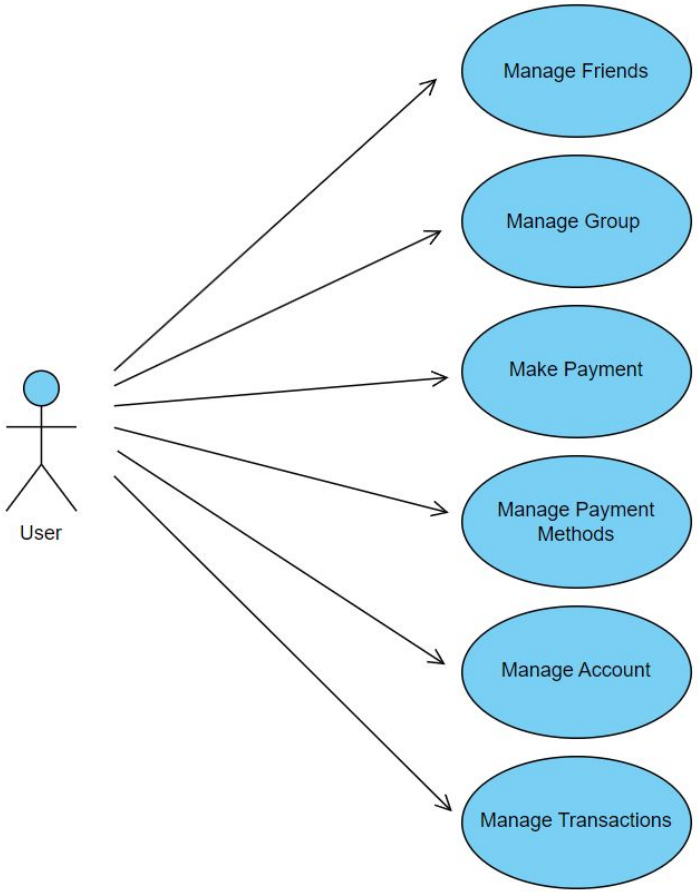
Overview

Most important use-cases

- Create account
- Account login
- Manage account
- Manage payment method
- Manage transactions
- Make payment
- Manage group
- Manage friends

Diagrams


Potential User
Create Account
Account Login


User
Manage Friends
Manage Group
Make Payment
Manage Payment Methods
Manage Account
Manage Transactions

Use-Case Descriptions

- **Create Account**
  - This use case occurs when an unregistered user selects the create account option where they will be prompted to enter an email address, sufficient password, and complete a recaptcha.
- **Account Login**
  - This use case occurs when a user has created a valid account and received a confirmation email. They will be able to login to their account using the credentials they provided.

Use-Case Descriptions

- **Manage Account**
  - This use case occurs once a user has logged in. They can manage their account information and make any edits needed.
- **Manage Payment Method**
  - This use case occurs when a user wishes to manage their payment methods. They can link bank accounts or other online payment systems such as Paypal or venmo to their account to be used for transactions.

Use-Case Descriptions

- **Manage Transactions**
  a. This use case occurs when a user has active transactions they have made. This allows the user to make changes to the transaction and change features like cost, splitting method, etc.
- **Make Payment**
  a. This use case occurs when a user would like to settle an outstanding payment they have. The customer selects a transaction, confirms the amount owed and pays via their defined payment method.

Use-Case Descriptions

- **Manage Group**
  a. This use case occurs when a user would like to create a group with members of their friend list. The user selects the create group option, selects friends from their friend list to add to the group, and names the group.
- **Manage Friends**
  a. This use case occurs when a user would like to manage their friend list. The user will look up a friend by their username and have the option to add or delete them.

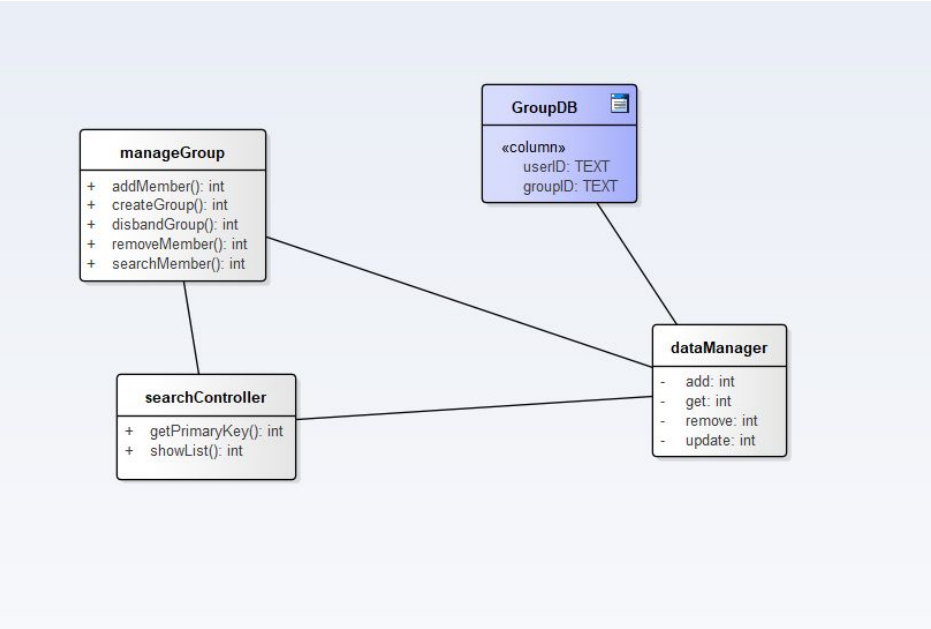
Logical View

Overview

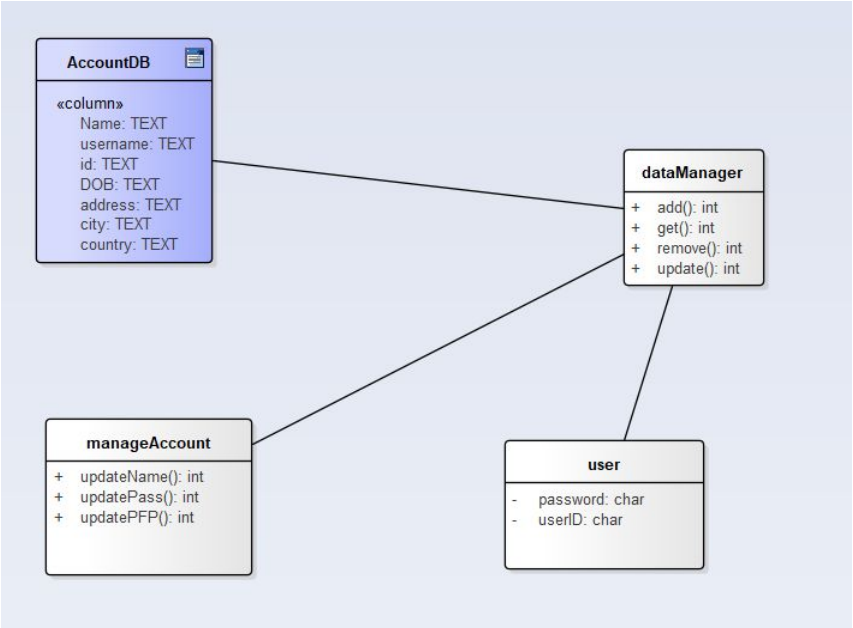
The logical view of the SmartSplit is comprised of 2 main packages:

- Presentation
  - Contains boundary classes to support the maintaining of profiles, payment/balance viewing, friends/groups viewing, etc.
- Application
  - Contains control classes to support profile validation, payment processing/validation, report generation, payment disputes, back-end friend/group management, etc.

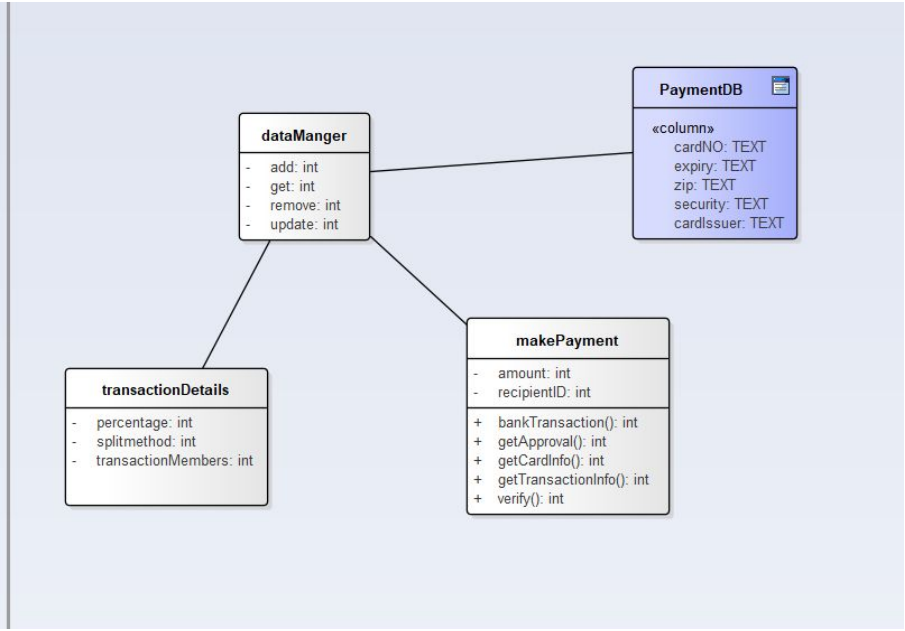
Manage Group



Manage Account



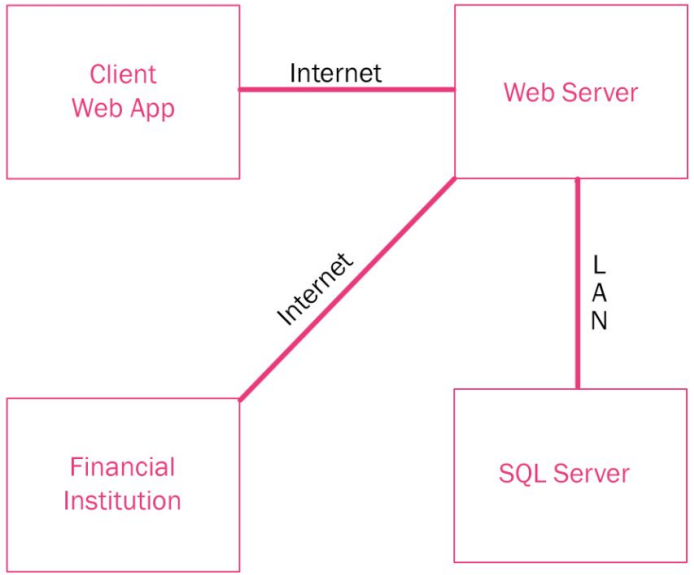
Make Payment



Deployment View

Overview

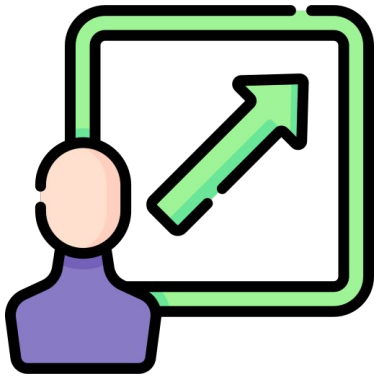
- Client app will run on a modern web browser (PC or smartphone).
- API will be used to communicate with financial institutions for payment processing
- The SQL server holds user profiles and group information.



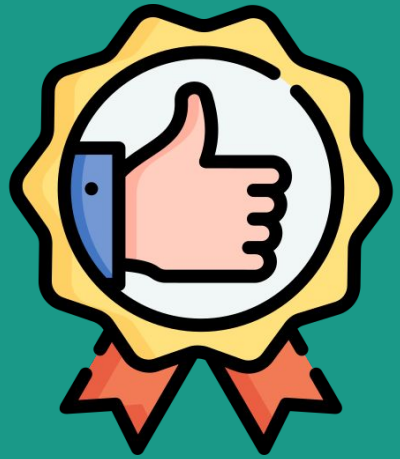
Size and Performance

Overview

The software as described in this document will support 100,000 concurrent users. Should it need to scale beyond this threshold, more server hardware will need to be deployed in covered regions.



Quality



Overview

The software described in the document will support the latest secure connection standards as required by external systems operated by financial institutions.