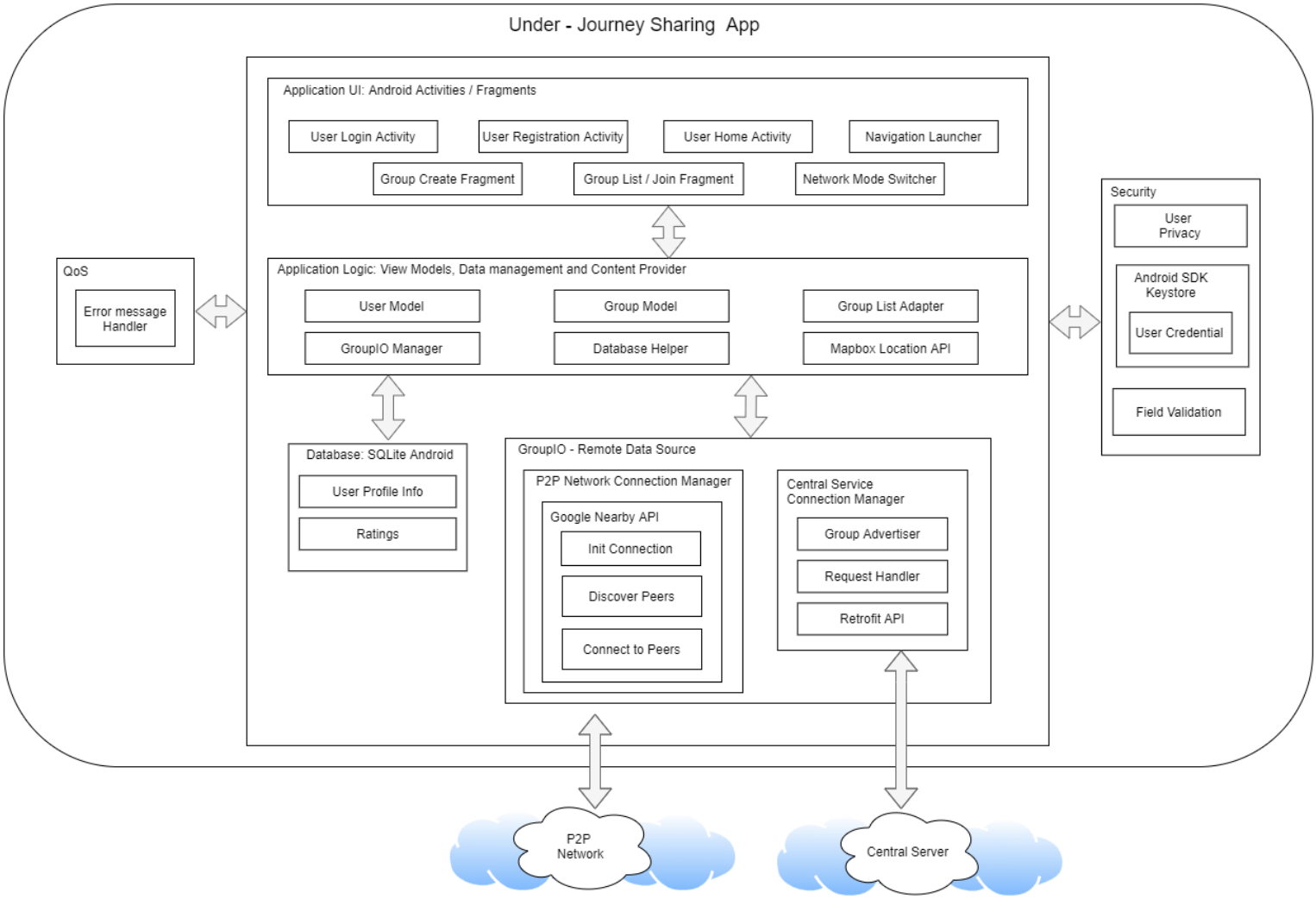
Technical Architecture Description

CS7CS3 Group Project - Journey Sharing

Group: *4*



Component Description:

1. Application UI (Android Activities/Fragments):

The user interface of the application will be based on Android activities and Fragments containing views.

- **User Login Activity** – Takes user input to login into application.
- **User Registration Activity** – Allows new user to sign up to application .
- **User Home Activity** – this is the home activity which is responsible for initiating every functionality. It allows to select location on map, triggering

event to create group and join groups. It also enables to use offline and online mode of application.

- **Navigation Launcher –** This activity is used to show navigation on based on optimised route calculated based on Mapbox APIs.
- **Group Create Fragment –** After User home activity this fragment is responsible for creating new group by accepting group parameters, publishing group to GroupIO and displaying group details.
- **Group/Join Fragment –** This fragment facilitates user to join any group based on location and send requests to GroupIO.
- **Network Mode Switcher –** This switch is handling offline and online mode transition; it is available throughout the application by drawer layout form left side using navigation bar view.

2. Application logic (View Models, Data Management and Content Provider)

Structural models used for each entity are defined as Android view models. Data retrieval and content availability are ensured using the following classes and API:

- **User Model**- This Class defines structure of user information to be used.
- **Group Model –** It represents generic group information to be used in application and shared on network.
- **Group List Adapter –** It is responsible for fetching available group data from network, displaying to user.
- **GroupIO Manager-** It is a wrapper over central services and Google nearby APLs. It allows application to interact freely over any type of available network.
- **Database Helper –** It is responsible for storage and user data retrieval from Android SQLite database.
- **Mapbox Location API –** This is a 3rd party Location service which is used to display map online and offline with navigation.

3. Database (Android SQLite)

For storing user profile information, ratings, and group details Android built-in SQLite database is used.

4. GroupIO - Remote Data Source

GroupIO is an abstraction layer over Group-related operations over P2P networks and the central server. It is responsible to maintain a cache of available Groups, listen for nearby groups and update its local cache. It also handles the creation or deletion of groups and incoming requests to join or leave groups.

- P2P Network Connection Manager:

The connection manager handles all types of peer to peer network-based queries. Google Nearby API based P2P Connection allows users in range to communicate with each other.

- Central Service Connection Manager:

It acts as client to central server whose task is to pass request and response to/from server. It is responsible for group related activities such as searching, advertising group, creating and joining groups. It also takes care of ride completion, leaving a group and rating handling.

5. QoS (Quality of Services)

To maintain the proper functioning of the application, under the quality of services errors are handled at all levels of architecture.

6. Security:

User information like name, age, gender, and address is protected and can't be shared to ensure user privacy. For securing user data at the application side, we will use Android KeyStore. Input from the user will be validated for correct/allowed format.