

Project MAD

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1.

In my project's application, the primary programming language used is the Dart programming language. This language is used because the application is being built using the framework Flutter which entails the use of Dart. Dart is an object-oriented, class-based language with C-style syntax.

2.

The Dart programming language when creating a Flutter app uses Dart's native compilation. This means Dart source code is compiled to native code using Dart's AOT (Ahead-Of-Time) compilation features to produce machine code for devices. This has to be done because iOS does not allow for dynamic compilation on apps, so everything has to be done before the app is downloaded.

But also Dart can be somewhat considered an interpreted language when uses on web pages because when this happens the programming language gets compiled using dart2js compiler which is a transpiler that turns compilation and turns the Dart source code into JavaScript source code. JavaScript is considered a JIT (Just-In-Time) compiled language, which means it gets compiled at run-time by the browser into machine code. Making this language a loose definition of interpreted language because it still gets compiled at run-time into byte-code. In Google Chrome Javascript gets compiled by the V8 javascript engine which is written in C++.

3.

The high-level of communication in our application will be the user communicating with the front-end mobile phone application and the mobile app communicating with the database. The user will be able to make several selections in the mobile app, that will grab/write/delete data in the database. These options will be view hotels which will grab a list of hotels in the database. Create a hotel booking where the user will select a hotel and create a booking at a hotel, where the app will add a new booking data to the database. Update booking where the user can select a booking and then update the dates of the stay at the hotel, this will then update in the database. And finally, the user will be able to delete a booking the is listed, this will then delete the data from the database.

The flow of data will look like this:



With the use of using Flutter and Firebase's real-time database, the main low-level communication standard being used to communicate between the two is WebSockets. WebSockets allow for full-duplex communication and nearly real-time updating. Also, WebSockets use SSL for encryption between the database and the client.

4.

In our project application waiting will take place anytime data is queried, to make sure that the data is sent back to the app from the Firebase database. Even when the app is first launched waiting will take place to make sure that the app is connected and communicating with the database. In Flutter this is done by using the FutureBuilder Class in an asynchronous mode which will only run the next part of the code after the database connection/results have been returned, then the next portion of the builder will run to display the screen. The components that will run after the data has been read/wrote is the screen building methods for displaying all parts of the screen.

References:

<https://dart.dev/faq#q-can-i-compile-dart-code-to-native-code>

<https://api.flutter.dev/flutter/widgets/FutureBuilder-class.html>