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Reliable Real-time Databases for Mobile Applications

Introduction

Mobile applications collect and disseminate important information to users in short periods of time. The information needs to be readily available and reliable. Therefore, mobile applications require databases that can synchronize information across different devices and still perform when offline. Real-time databases allow users to access current information from the database, or the most recent form of the database if the user is offline. This review will expand on the commercial applications of real-time mobile databases, the technology behind it, and the tools needed to implement it.

Commercial Real-time Database Applications

There are currently two main competitors in the market of real-time database applications: Google Firebase and Mongo DB.

Google Firebase

Firebase is an application program interface provided by Google which creates databases and stores data in JavaScript Object Notation (JSON), enabling it to be accessible across platforms [1]. Some unique features of Firebase are authentication and analytics [2]. Authentication allows a developer to control and verify that only approved users are utilizing the app. Analytics allows developers to access statistics on what users are utilizing the database for most [2]. These key features set Firebase apart from other real-time databases. Firebase has several different pricing plans depending on the scale of your app. For hobbyists, the basic spark plan is free. If a more sophisticated plan is needed, the flame plan is available for \$25/month, or you can create your own blaze plan and pay only for the features you require [3].

Mongo DB

MongoDB is an open source document database which is known for its key attributes of scalability, real-time data, and a rich query language [4]. MongoDB is horizontally scalable. When handling large amounts of data, it can utilize more clusters of machines to maintain its speed [4]. MongoDB's rich query language supports read and write operations in addition to data aggregation and text search [4]. The

pricing for MongoDB depends on the plan that the developer requires. The basic plan can be used for free, while the customizable developer plan starts at \$49/month before add-ons [5].

Technology behind Mobile Application Databases

Mobile Computing Environment

Developers do not have access to a physical data center, instead the current mobile application databases are cloud-hosted NoSQL databases [3]. Cloud databases are advantageous because they are easily scalable and reliable. The developer does not have to manage the database itself but relies on the commercial provider to do so.

Information Processing and Delivery

Information is processed through continuous routing and queries and then broadcasted to all devices [6]. All users of the application utilize the same database so any time a piece of data changes, all devices connected to the database will receive the update within milliseconds [7]. This is where we get the term “real-time” databases, because any change in information is quickly updated for user access.

Offline Models

When a mobile application goes offline, it can no longer receive continuous real-time updates from the database. It instead uses the latest version it captured before going offline to provide the user with the information [7]. When the device reconnects to the internet, the application will automatically update any changes which occurred while offline.

Implementation of Databases in Mobile Applications

When developing a mobile application, the type of database being implemented should be determined at the beginning of the project. The commercial product being used will determine which software and packages need to be downloaded prior to the operation of the product. Once the necessary software is downloaded, the developer can integrate the database into the application by initializing it. Once initialized, the user can either create queries or make routine calls to obtain the information relevant to their purposes [8].

References

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