

FIREBASE IN REAL-TIME SYSTEMS BASED ON CLIENT SERVER TECHNOLOGY

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ABSTRACT

Nowadays we use different real-time systems based mobile applications for teaching, reading, listening, watching and data processing. Firebase real-time NoSQL database from company Google. We can use this database with our real-time systems based on client server technology Flutter cross platform application. It is secure, fast, have own real-time notification system. Without this Firebase easy and excellent for integration with Flutter application and have, own cloud system.

Keywords: *Firestore, Android, Client, server, RDBMS, Real-time, Flutter, client-server technology, real-time database, google firebase, development technology, connect to NoSQL DB, Dart, real-time mobile application, Flutter with firebase, database*

АННОТАЦИЯ

В настоящее время мы используем различные мобильные приложения на основе систем реального времени для обучения, чтения, прослушивания, просмотра и обработки данных. База данных NoSQL реального времени Firestore от компании Google. Firestore - безопасно, быстро, имеет собственную систему уведомлений в реальном времени. Кроме этого, Firestore легко и отлично интегрируется с приложением Flutter и имеет собственную облачную систему. Мы можем использовать эту базу данных с нашими системами реального времени на основе клиент-серверной технологии кроссплатформенного приложения Flutter.

Ключевые слова: *Firestore, Android, клиент, сервер, СУБД, в реальном времени, Flutter, Система управления базами данных в реальном времени, в реальном времени, Flutter, технология клиент-сервер, база данных в реальном времени, Google Firestore, технология разработки, подключение к NoSQL DB, Dart, мобильное приложение в реальном времени, Flutter с Firestore, база данных*

АННОТАЦИЯ

Ҳозирда биз маълумотларни ўрганиш, ўқиш, тинглаш, кўриш ва қайта ишлаш учун реал вақт режимида ишловчи турли хил мобил дастурлардан фойдаланмоқдамиз. Google томонидан ишлаб чиқарилган Firebase реал вақт NoSql маълумотлар базаси хавфсиз, тезкор ва ўзининг реал вақтда хабардор қилиш тизимига эга. Бундан ташқари, Firebase ўзининг булут тизимига эга ва Flutterда яратилаётган дастурлар билан осон ва мукамал бирлашади. Биз ушбу маълумотлар базасидан ўзимиз яратаётган Flutter кроссплатформалик миждоз-сервер технологиясига асосланган реал вақт тизимларимизда фойдаланишимиз мумкин.

Калим сўзлар: *Firebase, Android, Миждоз сервер, РВМОБТ, реал вақт, Flutter, миждоз-сервер технологияси, реал вақт маълумотлар омбори, Google Firebase, ишлаб чиқиш технологияси, NoSQL МОга боғланиш, Dart, реал вақт мобил иловаси, Firebase билан Flutter, маълумотлар омбори.*

INTRODUCTION

Databases are the most important part of almost every enterprise and internet application. The speed, demands for scale and fast application development have brought a novel breed of NoSQL databases. Since the SQL and NoSQL databases vary with their structure, functions, definitions and the tool/client required to work with them also varies.

1. Firebase

Firebase is Google's mobile platform that helps quickly develop high-quality apps. It grew up into a next-generation app-development platform on Google Cloud Platform. Realtime Database is Firebase's original database. It's an efficient, low-latency solution for mobile apps that require synced states across clients in real time. We can synchronize data between different devices. [9-10] Google-backed application development software Firebase allows developers to develop *Android, IOS, and Web apps*. Firebase provides several tools for example tracking analytics, product experiments, creating marketing and tools for reporting and fixing app crashes

The main services Firebase are hosting, a real-time database and user authentication. We can use these services with the help of the Firebase SDK to create apps without writing any server side code [9-10]

Firebase manages real-time data in the database. Therefore, it easily and quickly exchanges the data to and from the database. Hence, for developing mobile apps such as live streaming, chat messaging, etc., we can use this DB. This NoSQL database allows syncing real-time data across all devices - iOS, Android, and Web - without

refreshing the screen. Firebase applications can be deployed over a secured connection to the firebase server. Firebase offers a simple control dashboard.

Firebase has a lot of pros or advantages. ^[9-10]

DISCUSSION AND RESULTS

Firebase has massive storage size potential and it is serverless. Firebase highly secure and is the most advanced hosted BaaS solution. It has minimal set up and it provides three-way data binding via angular fire. We can easily access data, files, auth, and more. There is no server infrastructure required to power apps with data and it has JSON storage, which means no barrier between data and objects

The given Table 1 below highlights the comparison of Firebase and SQL base on parameters such as data storage, flexibility in terms of Schema etc.

Table 1: Comparison between Firebase and SQL

Basis of comparison	Firebase	SQL(RDBMS)
Data Storage	Stored as JSON Tree	Stored in a Relational Model as Rows and Columns (Tables)
Schema flexibility	Dynamic Schema, data can be added, updated or deleted anytime	Fixed schema. Altering will result in going offline temporarily
Specialty	Data which has no definite type or Structure	Data whose type is known in advance
Technique	Synchronize data	Fire Query

2. Firebase and Flutter app

Before add Firebase to our Flutter app, we need to create a Firebase project to connect to our app.

In the Firebase console, click **Add project**, then select or enter a **Project name**. Firebase automatically assigns a unique ID to our Firebase project. After Continue, we may optional set up Google Analytics for our project, which enables us to have an optimal experience using any of the following Firebase products:

- Crashlytics
- Cloud Messaging
- In-App Messaging
- Predictions

- Remote Confit
- A/B Testing

Next step is to registration our app with Firebase and add Firebase as a project dependency. From the root directory of our Flutter app, we must add our pubspec.yaml file this lines:

```
firebase_core: ^0.4.0+9
```

```
firebase_auth: ^0.14.0+5
```

After that, we must run with command *flutter packages get*. We all set, and our Flutter app is registered and configured to use Firebase^[8]

After few minutes, we easy connect our client application to our Cloud based real time database server. After these steps, our application can work with a real time database - Firebase. With Firebase, we can add different cloud computing functions such as cloud messaging, google analytics, OAuth with google, PUSH notification and other. This also helps in making android apps faster and efficient, as no PHP is required as a third party language to communicate with the database. It provides a secure channel to communicate with the database. Google has been updating Firebase on regular basis; AdSense is the beta phase of Firebase. It can not only be used in Android but also to connect cross platform. The work can be further extended by adding new features and exploring new possibilities in client server based applications.

CONCLUSION

Therefore, Flutter and Firebase, both products are built by Google, so this is the ultimate combination for making mobile apps. When we must add Firebase to our application, we must setting up firebase settings for every platforms such as iOS, Android, MacOS and web. Firebase NoSQL database and it work with very fast new google technology Firestore. For back-end part Real time systems Firebase best solution. Because Firebase have own notification system, secure, have auth system, analytics, ads system and fast real time database. Integration Firebase with Flutter easy and every platform may work with Firebase for example: Android, iOS, MacOS and web.

REFERENCES

1. Kriha Walter, 2009 NoSQL Databases Hochschule der Median. Stuttgart Media University. Stuttgart.

2. Pore Supriya S, PA war Swalaya B, 2015. Comparative Study of SQL & NoSQL Databases. International Journal of Advanced Research in Computer Engineering & Technology (IJARCET). Volume 4 Issue 5 May 2015
3. M. Mirzaraximov N.M.Jo'rayev. Telekommunikatsiya texnologiyalarining mijozserver texnologiyasi asosidagi dasturiy maxsulotlarni rivojlanishidagi tutgan o'rni. Ferghana 17-18 April 2020
4. M. Mirzaraximov A. Sirojiddinov J.Nazirqulov, 2021. Study of the algorithm of selection of qualified personnel from the system in real time on the basis of fuzzy logic. Scientific journal of the Fergana State University. Volume 1 Issue 2021
5. Nasirov, M. X., Axmadjonov, M. F., Nurmatov, O. R., & Abdullayev, S. (2021). O'LCHAMLI KVANTLASHGAN STRUKTURALARDA KVAZIZARRALAR. *Oriental renaissance: Innovative, educational, natural and social sciences*, 1(11), 166-174.
6. Юлдашев, Н. Х., Ахмаджонов, М. Ф., Мирзаев, В. Т., & Нурматов, О. Р. У. (2019). Фотоэлектрические пленки CdTe: Ag и Sb₂Se₃ при собственном и примесном поглощении света shape* MERGEFORMAT. *Евразийский Союз Ученых*, (3-4 (60)).
7. Polvonov, B. Z., Nasirov, M. H., & Akhmadjonov, M. F. (2021). THE THERMAL FIELD MIGRATION AND ELECTRODIFFUSION OF CHARGED POINT DEFECTS IN POLYCRYSTALLINE FILMS. *Scientific Bulletin of Namangan State University*, 2(2), 40-47.
8. Axmadjonov, M. F., Mamatov, O. M., Nurmatov, O. R., Rahmonov, T. I., & Yuldashev, N. K. (2019). THE SPECTRAL CHARACTERISTICS OF CdTe: Ag PHOTOELECTRICAL FILMS IN THE AREAS OWN AND IMPURITE ABSORPTION. *Scientific-technical journal*, 2(2), 9-17.
9. Nurmatov, O. R., Yulchiyev, I. I., Axmadjonov, M. F., Xidirov, D. S., & Nasirov, M. X. (2021). TALABALARGA "MATEMATIK MAYATNIKNING TEBRANISH QONUNI" MAVZUSINI MATEMATIK USULLAR BILAN TUSHUNTIRISH. *Oriental renaissance: Innovative, educational, natural and social sciences*, 1(11), 133-140.
10. Ahmadaliev, B. J., Akhmadjonov, M. F., Nurmatov, O. R., Yuldashev, N. K., Muxammadyakubov, H. E., & Urmonov, S. R. (2019). THE DISPERSION AND PHOTOLUMINESCENCE SPECTRUM OF MIXED EXCITONS AT CRITICAL DAMPING VALUES. *Scientific-technical journal*, 2(1), 9-14.