

## FIREBASE - OVERVIEW AND USAGE

Pankaj Chougale\*<sup>1</sup>, Vaibhav Yadav\*<sup>2</sup>, Dr. Anil Gaikwad\*<sup>3</sup>

\*<sup>1,2</sup>Student, Bharati Vidyapeeth Deemed To Be University, Pune. Institute Of Management, Kolhapur, India.

\*<sup>3</sup>Guide, Bharati Vidyapeeth Deemed To Be University, Pune. Institute Of Management, Kolhapur, India.

### ABSTRACT

The web application has relied heavily on large amounts of websites and random data such as videos, photos, audio, text, files and other inappropriate content. It is difficult for the Relational Database Management System (RDBMS) to manage random data. Firebase is a new technology for managing large amounts random data. Very fast compared to RDBMS. This research paper focuses on usage of Firebase for Android and aims to familiarize itself with its functions, related concepts names, benefits and limitations. The paper also tries to show some nakedness Firebase features for building an Android app.

**Keywords:** Cloud Based-Firebase, Cloud Based-Android.

### I. INTRODUCTION

Google Firebase may be a Google-backed application development software that allows developers to develop IOS, Android and Web apps. Firebase provides tools for tracking analytics, reporting and fixing app crashes, creating marketing and products experiment.

### II. METHODOLOGY

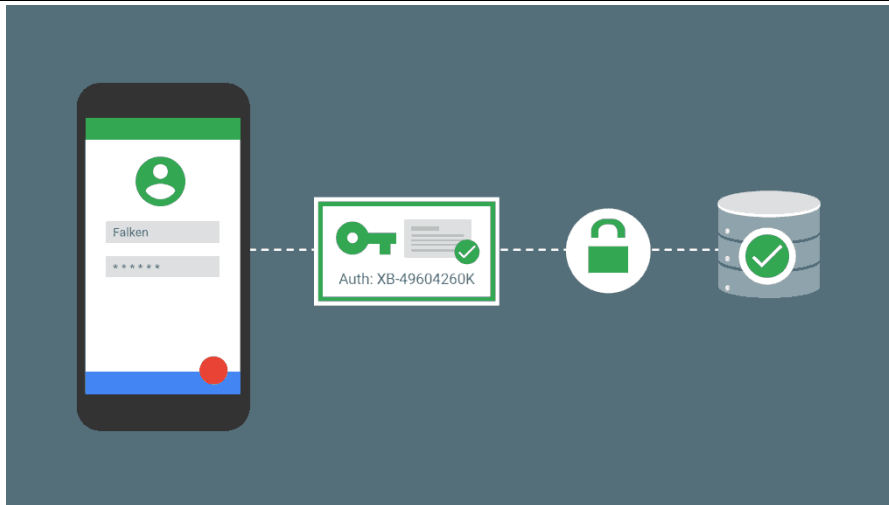
**Firestore offers variety of services, including:**

**Analytics** – Google Cloud Analytics for Firebase offers free, unlimited reporting's on as many as 500 or more separate events. Statistics present content on user behavior in IOS and Android applications to enable best decision-making about improving an application performance and marketing.



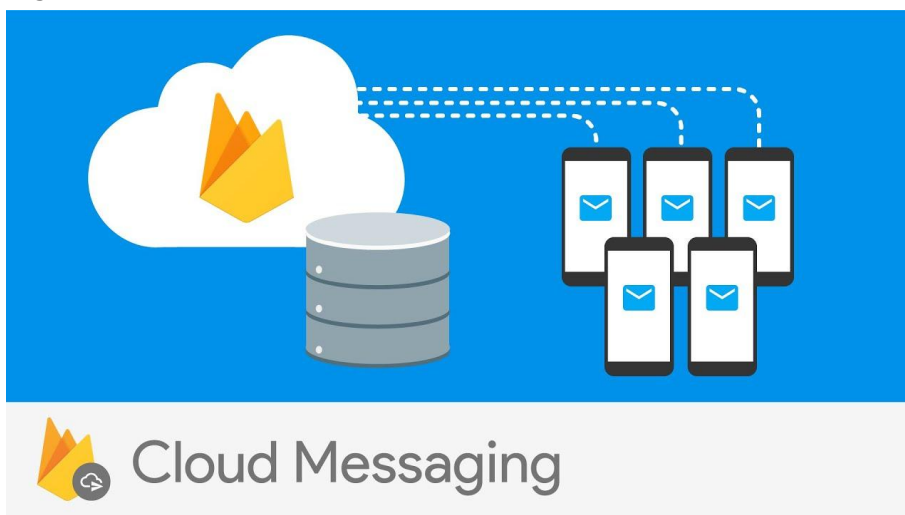
(source: <https://i.ytimg.com/vi/8iZpH7O6zXo/maxresdefault.jpg>)

**Authentication:** Firebase authentication makes it easy for developers to protect authentication systems and improves login and boarding experience for users. This the feature offers an all-in-one identity solution, supporting email accounts and password, phone auth, moreover like Google login, Facebook, GitHub, Twitter and more.



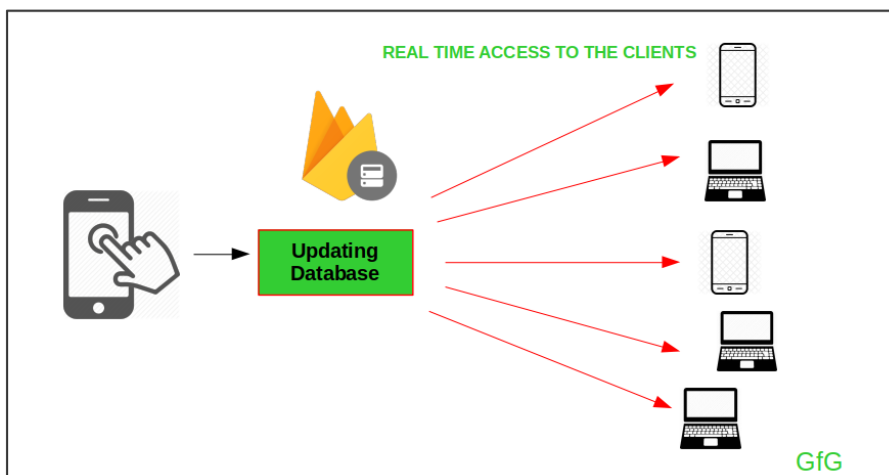
(source: <https://firebase.google.com/images/products/auth/auth-3.png>)

**Cloud Messaging:** Firebase Cloud Messaging (FCM) may be various messaging tool allowing companies to trust and receive messages on IOS, Android and therefore the web at no cost.



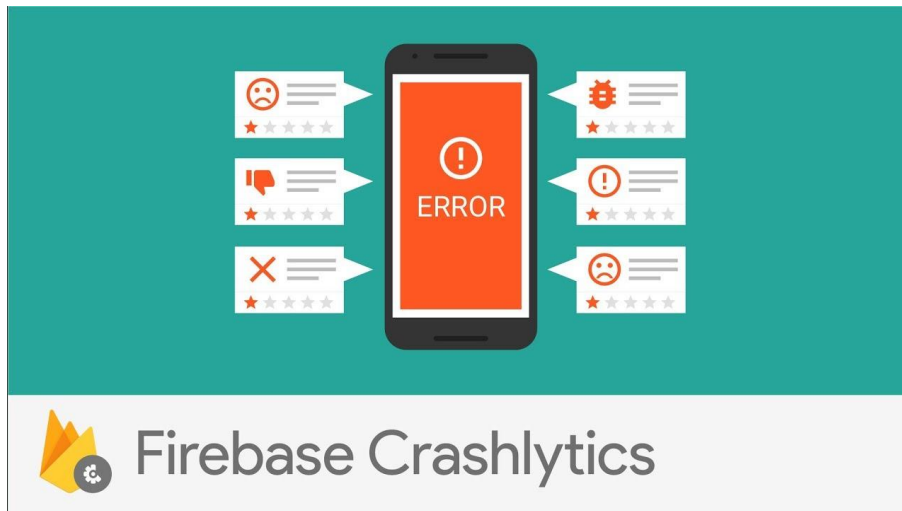
(source: <https://i.ytimg.com/vi/sioEY4tWmLI/maxresdefault.jpg>)

**Realtime Database:** The Firebase Realtime Database may be a cloud-based NoSQL site that allows data to be stored and synchronized between users in real time. Information is synced to all clients in real time and is always available when the app is offline.



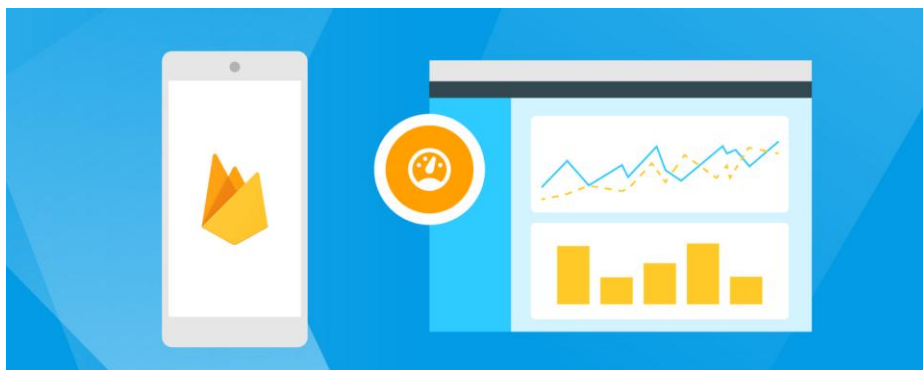
(source: <https://media.geeksforgeeks.org/wp-content/uploads/20190421141241/gfg53.png>)

**Crashlytics:** Firebase Crashlytics may be a real-time crash journalist assisting engineers track, prioritize and fix problems that diminish the quality of their applications. With Crashlytics, engineers spend less time planning and resolving crashes and long construction features for his or her apps.



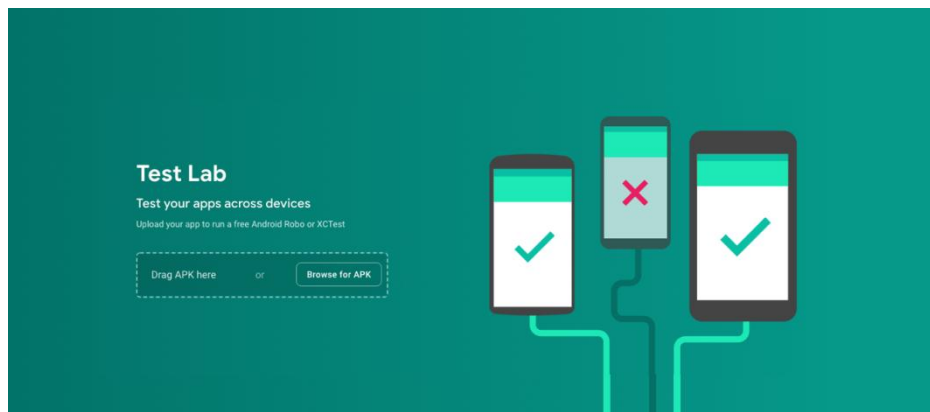
(source: <https://firebase.google.com/docs/crashlytics>)

**Performance:** The Cloud-Firebase Performance Monitoring feature provides developers with an understanding of application features of their IOS and Android apps to help them decide where to reach and when the performance of their applications is improved.



(source: [https://miro.medium.com/max/1400/1\\*yevJMct9erdfRGH8YgJ1\\_g.png](https://miro.medium.com/max/1400/1*yevJMct9erdfRGH8YgJ1_g.png))

**Test Lab:** Firebase Test Lab may be cloud-based application testing infrastructure. By one performance, developers can test their IOS or Android apps across all device devices as well device configuration. They will see results, including videos, screenshots and logs, inside the Firebase console.



(source: <https://d1qmdf3vop2l07.cloudfront.net/unwavering-snake.cloudvent.net/hash-store/15f9baced6535d0042fc1d098c262d2c.png>)

**Use Cases:**

**Conditions for using Firebase include:**

**Create on boarding flows:** Developers can provide users with a fast, intuitive login process Firebase Verification. allow users to sign in to their apps via Google, Twitter, Facebook or GitHub accounts in but five minutes. Engineers can track each step their ride flow to enhance user experience. Additionally, engineers can use it Google Analytics Firebase entry events for each step flow ride, create panels to see where users are leaving and using the remote control adjusting to make changes to their operating systems to determine how those changes affect them conversion.

**Customize a “welcome back” screen:** Engineers can use it to make it your own to stop everything user very easy experience customizable first user-supported screen favorites, usage history, location or language. Engineers can explain by audience, by section, in user behavior and display targeted content to all audiences. Gradually unleash new features: Developers can launch new features.

**Progressively roll out new features:** Developers can introduce new low-risk features by first testing those features in some users to determine how they operate and how users respond. Then, If the engineers are satisfied.

In June 2018, mobile security company Appthority reported thousands of IOS and Android devices mobile applications exposing more than 113 GB of information about 2,271 unprepared Firebase database. As of January 2018, Authority researchers are scanning Android applications that use Firebase systems to store users data or content and updated communication patterns for applications made on Cloud-Firebase domains. After scanning more than 2.7 million Android and IOS apps, researchers identified 28,502 mobile apps (1,275 IOS and 27,227 Android) that connected and stored data within the Firebase background. Of these, 3,046 apps (600 IOS and pear, 446 Android) store data within 2,271 Firebase poorly designed websites that give anyone the ability to view their content.

The database revealed more than 100 million user data records, including the actual LinkedIn, Firebase, Facebook and company data store tokens; 25 million GPS location records; more than 4 million health information records are protected, such as medical information and chat messages; 2.6 million User IDs and passwords; and 50,000 financial records, including payments, banking and transactions for Bit coin.

**Pricing:**

Firebase offers a free 1 GB real-time data storage system and two paid subscriptions plans: Flame Plan (\$ 25 per month with 2.5 GB of storage) and Blaze Plan (pay-as-you-go, \$ 5per GB per storage). All programs include A / B testing, statistics, application identification, authentication (without phone auth), cloud messaging, Crashlytics, dynamic links, invitations, functionality monitoring, forecasting and remote preparation. The main differences between programs include real-time shared storage website, number of download tasks, Cloud Firestone bandwidth, and more. Internet of Things Engineers share many common usage requirements across a wide range of IoT applications. Data collection, delivery of content with low latency, and to prevent communication between devices and back-up services there are only three of these common requirements. While meeting common needs are often challenging from time to time, IoT development platforms like Google Firebase provide services and functionality that allows developers to satisfy many of those requirements.

**Benefits of Google Firebase:**

The Firebase platform as a service includes a NoSQL document data store. Applications store data as JSON objects and interact with the database employing a JavaScript API. Mobile or Android developers have the option of using Android or IOS APIs, too. The information store is intended to scale with application demand, so there's no have to add servers, partition data or perform other database administration that comes together with maintaining your own database rear. The REST full API includes queries operations but not SQL operations. The query API is ready-made to figure with channels of information. for instance, the "on" operation listens for changes in location and invokes a callback Function if a selected event occurs. There also are queries and operators with SQL-equivalents, like order-By-Key, order-By-Value and order-By-Priority. The limit, limit-To-First and limit-To-Last query operations can restrict the amount of JSON documents returned by the query.

In addition to storing dynamic contents within the firebase store, developers can store static content that it will be required within the app in a Firebase managed service. Way of providing static content storage is the same as installing a website; Firebase will do verify domain ownership, provide an SSL certificate and use it throughout Firebase content delivery network. Finally, name service records must be updated to become a map the name of your hosted site.

Another advantage of Firebase is that it provides support for offline operation. Website functions are locally recorded and synchronized with the Firebase site when a network connection is established. Google Firebase includes mobile data protection controls at rest. Data is transmitted using SSL / TLS 2048-bit encryption, and within the site, users are authenticated and may be restricted to certain functions using a set of security rules. Firebase authentication uses an existing login server or client side code. Firebase supports currently usernames / password login such as social login resources like Google, Twitter and Facebook. Custom code can be used if you would like to receive your tokens. In the case of users or in the case of IOT, devices - already authorized, security rules govern the activities they will perform and the data they will access. Safety rules support reading / writing performance, integrated can expect, moreover as a guaranteed job. this can usually determine the correct format of the information element and its data type. New apps automatically provide full read / write access to the site; engineers should ensure that they review safety rules to limit the performance and breadth of information the tool can use. Attackers can gain multiple or higher rights to compromise the integrity or confidentiality of information within a data store.

Google Cloud Firebase provides six price categories with its different services: - Free, Spark, Candle, Bonfire, Blaze and Inferno. Sans Free tier, price from \$ 5.00 / month on Spark to \$ 1,499.00 / month on Inferno. Three to six stages all include unlimited real-time internet connection support with users, additionally as 1 TB data transfer. The biggest difference between categories is reflected in the final volume of real-time data and transfer grants. Spark, for example, offers 1 GB of storage and 10 GB of transmission while Inferno, the leading tier, offers 300 GB of storage space and allows up to 1.5 TB of transfer data. the three most advanced categories also offer non-public backup options to customers.

#### **Drawbacks Of Google-Firebase:**

Firebase is very useful for IOT apps that use data that can use the Javascript API to access Content and security services. However, developers should look to other tools to increase the back-end performance of their IOT system. Basic server side processing is provided, but more advanced analysis may require uploading IOT data to a different location, such as Hadoop or Spark.

Another challenge is that the Firebase query function is limited. If you need more advanced query functions, consider sending data to an Elastic Search server or collection for more search options. In addition, if visibility and alerts are important when monitoring information distribution, consider tools such as Kibana, Elastic search data display.

### **III. RESULTS AND DISCUSSION**

Out-of-container notification response. you can use Firebase Notifications, a notification server with an Internet console that allows anyone to send alerts to specific target audiences based on Firebase Analytics data. Realtime Database in Firestore uses NoSQL, a cloud-based website to store and sync real-time data between users and devices. In addition, Firebase Cloud Storage stores and stores user-generated content such as images, audio, and video more smoothly. Using Cloud Tasks, you can measure your applications at any time in your life cycle without measuring the servers in use. Hosting and verification is easily managed efficiently in Firebase with simple methods and effective tools. The ready-to-use Firebase ML Kit APIs carefully add advanced features to machine learning in the operating system. The best thing is that your limited knowledge and experience in machine learning would not be an obstacle to adding a little ingenuity to an advanced app.

### **IV. CONCLUSION**

This paper highlights research on the Firebase API provided by Google and its unique features. This paper helps you to learn how to utilize the Firebase in the Android app based on the Clients requirements. This also helps to make android apps faster and more efficient as there is no PHP required as a third party language to communicate with the website. Provides a secure communication channel and website directly from JAVA.

Learning materials are based on data provided online and refer to the examples provided. Google has been constantly updating Firebase, Ad Sense is a beta section of Firebase. Not only for Android but also for cross-platform connectivity .The function can be expanded by adding new features and testing new possibilities to Android apps.

## V. REFERENCES

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