International Journal of Engineering Technology Science and Research
IJETSR
www.ijetsr.com
ISSN 2394 – 3386
Volume 4, Issue 3
March 2017

Study on Google Firebase for Website Development
(The real time database)

Hari Shankar Singh, Uma Shankar Singh
Dept. of Computer Engineering
R.N. Modi Engineering College.
Kota, India

ABSTRACT

The purpose of this study is to introduce everyone to Google Firebase and it's features. Firebase provides database and file storage. APIs provided by firebase are platform independent and synchronize in real time. Firebase has many features like Storage, Authentication, Database, Notifications etc. Nowadays many websites are using firebase to build modules or a complete project. In this article we will cover how to use firebase to build your application.

Keywords—Real time database; APIs (application programming interface); Authentication; quick development;

I. INTRODUCTION

A database is a collection of information that is organized in such a way which is easily manageable and accessible. Firebase is a "NoSQL" database which are useful for large sets of distributed data. NoSQL databases are effective for big data performance issues that relational databases aren't built to solve. Along with this, firebase is also a "Real Time" database which provides an API that allows developers to store and sync data across multiple clients. Data in firebase is saved as json and can be exported. Implementing Firebase is quick and easy. With intuitive APIs packaged into a single SDK, we can focus on quickly building our app and not waste time building a complex infrastructure.

II. FIREBASE FEATURES

A. Built-In Analytics

One of the best features of Firebase is the Analytics dashboard that it comes equipped with. It is free and has the capacity to report 500 event types, each with up to 25 attributes. The dashboard is really top notch for looking at user behavior and measuring various user attributions. Ultimately it helps you understand how people use your app so you can better optimize it in the future.

B. Easy App Development

With Firebase, you can focus your time and attention on developing the best app(s) possible for your business. Since the operations and internal functions are so solid, and taken care of by the Firebase interface, you can spend more time developing the high quality app that users are going to want to use. more reliable way across platforms

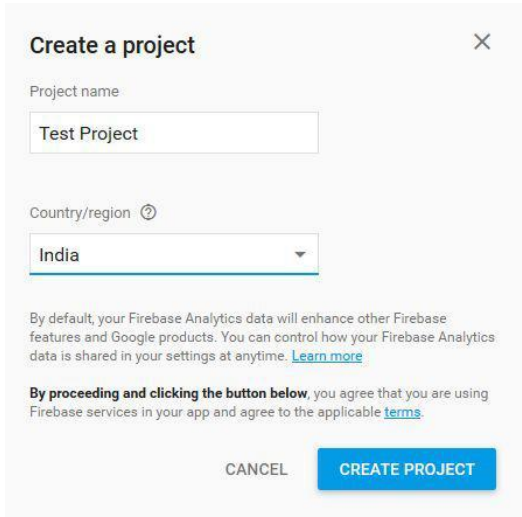
2. **Authentication**: Have a lot less friction with acclaimed authentication
3. **Hosting**: Deliver web content faster
4. **Remote Configuration**: Customize your app on the go
5. **Test Lab**: Test in the lab instead of on your users
6. **Crash Reporting**: Keep your app stable
7. **Realtime Database**: Store and sync app data in realtime
8. **Storage**: File storing made easy

C. Notifications

You can very easily manage notification campaigns, including having the ability to set and schedule messages in order to engage users at the right times of day. These notifications are totally free and unlimited for both Android and iOS. There is only one dashboard to worry about, and if you integrate with Firebase Analytics you can use a variety of user segmentation features.

III. ADDING FIREBASE TO PROJECT (WEB)

First we need to add our project to firebase, for which we should follow the below steps:



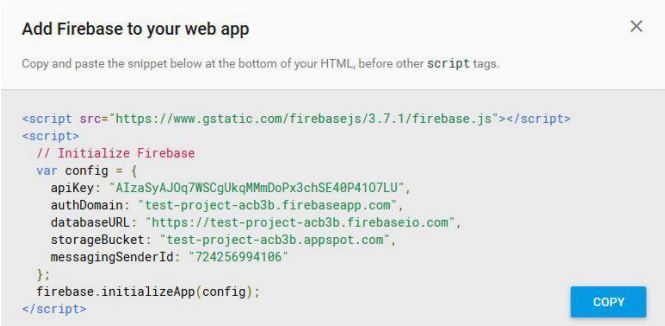
International Journal of Engineering Technology Science and Research
IJETSR
www.ijetsr.com
ISSN 2394 – 3386
Volume 4, Issue 3
March 2017

1. **Cloud Messaging**:Deliver and receive messages in a new Project".
2. Then fill "Project Name" and select "Country / Region" as "India".
3. Now click on "Create Project" which will redirect you to "Project Configuration" page.
4. Click on "Add Firebase to your web app" and copy the "Initialization code" provided in pop-up.
5. Download the firebase "Web SDK".

IV. INITIALIZING FIREBASE SDK

To include firebase code in your project and initialize it's SDK, we follow below steps:

1. Copy the SDK to projects "Libraries" directory.
2. Include "firebase.js" in the footer of view file.
3. Paste the "Initialization code snippet" in the footer, which we copied from "Firebase Console".



4. Firebase has below more components which could be included as per app requirements:

- firebase-app - The core firebase client
- firebase-auth - Firebase Authentication
- firebase-database - The Firebase Realtime Database
- firebase-storage - Cloud Storage
- firebase-messaging - Firebase Cloud Messaging

These components could be added with below javascript code:

<script src="https://www.gstatic.com/firebasejs/3.7.1/firebase-app.js" ></script>

1. Go to "Overview" section and click on "Cloud Messaging"

<script src="https://www.gstatic.com/firebasejs/3.7.1/firebase-messaging.js"></script>

<script src="https://www.gstatic.com/firebasejs/3.7.1/firebase-storag e.js"></script>

V. RETRIEVING AND WRITING DATA

After the basic setup, we begin with the actual coding, which would include "Reading" data from firebase and writing to it.

A. Initialize firebase configuration

We initialize firebase by using below javascript code:

```
<script>
  var config = {
    // ...
  };
  firebase.initializeApp(config);
</script>
```

B. Get a database reference

First we need to get an instance of firebase's database reference "firebase.database.Reference" .

<script src="https://www.gstatic.com/firebasejs/3.7.1/firebase-auth.js "></script>

<script src="https://www.gstatic.com/firebasejs/3.7.1/firebase-databa se.js"></script>

```
// Get a reference to the database service
var database = firebase.database();
```

C. Basic writes operations

We use set function to **write** data at some specific reference or node.Using **set()** function, we overwrite the existing data if any, at the particular node.

```
function writeUserData(userId, name, email, imageUrl) {
  firebase.database().ref('users/' + userId).set({
    username: name,
    email: email,
    profile_picture : imageUrl
  });
}
```

International Journal of Engineering Technology Science and Research
IJETSR
www.ijetsr.com
ISSN 2394 – 3386
Volume 4, Issue 3
March 2017

Using the above code we are writing user's profile information at "users/userId" node.

For **reading** data, we call function **once()** on any database reference from where we want to retrieve data.

```
var userId = firebase.auth().currentUser.uid;
return firebase.database().ref('/users/' + userId)
.once('value').then(function(snapshot) {
  var username = snapshot.val().username;
  // ...
});
```

Here we are retrieving user's data from "users/userId" node

D. Listening to events

Events are triggered when there are some changes in the real time database. We add listener to these changes so that we can manipulate them in real time.

We have many event listeners like "child_added", "child_changed", "child_removed", "child_moved". Whenever there is a change these events are triggered.

E. Sorting data

We use below functions to sort data that comes from firebase once() call.

Method	Usage
`orderByChild()`	Order results by the value of a specified child key.
`orderByKey()`	Order results by child keys.
`orderByValue()`	Order results by child values.

F. Filtering data

When there is need to filter the result set, we use filter functions which can be combined with sort functions as well. Other than below two functions, there are other functions for filtering as well, which are **startAt()**,**endAt()**and **equalTo()**.

Unlike the sorting methods, we can use multiple filter functions in the same call to retrieve more useful data.

Method	Usage
`limitToFirst()`	Sets the maximum number of items to return from the beginning of the ordered list of results.
`limitToLast()`	Sets the maximum number of items to return from the end of the ordered list of results.

CONCLUSION

In this paper, we have studied about google firebase, and it's extremely useful features Firebase is extremely useful and reliable to make real time applications or websites nowaday. A lot of bigger brands are using firebase and it's features for the same.

ACKNOWLEDGMENT

The authors would like to thank Mr. Bhupendra Soni (Vice Principal) for his help.

REFERENCES

[1] Firebase Web Codelag https://codelabs.developers.google.com/codelabs/firebase-web
[2] Firebase Web Documentation https://firebase.google.com/docs/web/setup
[3] Sample Firebase Apps https://firebase.google.com/docs/samples/
[4] Firebase Realtime Database Tutorial https://www.101apps.co.za/index.php/item/182-firebase-realtime-databa se-tutorial.html
[5] Firebase Tutorial: Real-time Chat https://www.raywenderlich.com/140836/firebase-tutorial-real-time-chat-2.
[6] Firebase Php SDK https://github.com/ktamas77/firebase-php
Getting Started with Firebase API Tutorial Using PHP cURL http://www.techplugg.com/firebase-api