

## SHAPE Platform Setup Documentation

This documentation covers the technical setup for the components that make up the FDA SHAPE Mobile Platform. This top-level page gives a broad overview; details for each component are covered on linked pages. The system components are:

- Google Firebase database and storage
- SHAPE Administrator Portal (Web)
- SHAPE Mobile Client App (Web, Android, and/or iOS)
- SHAPE API

The GitHub repository for this open-source project is here: <https://github.com/FDA/SHAPE>

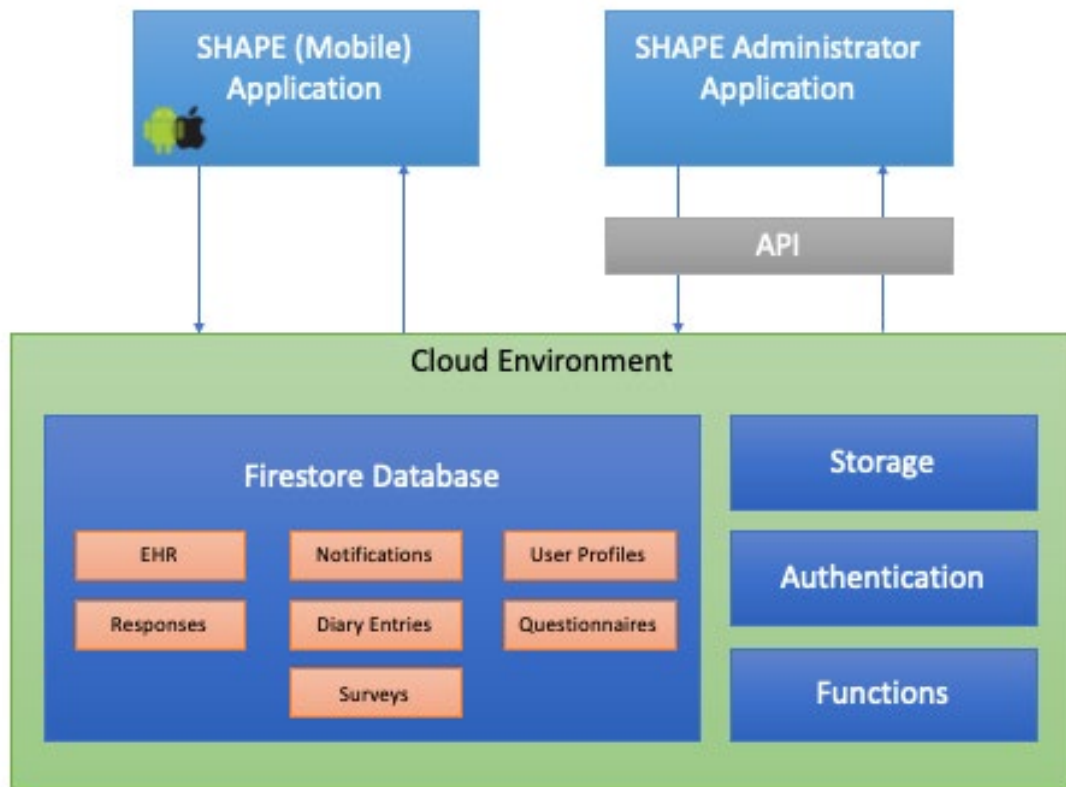
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### Introduction

This documentation provides deployment instructions for the FDA SHAPE App platform's open-source code present in the FDA SHAPE App GitHub Repository. It serves as a deployment guide for technical teams and explains how the different components of the SHAPE platform can be set-up and used.

## High-Level Technical Architecture



## Google Firebase Setup

The database for SHAPE is provided through Google's Firebase services. A Google Firebase Project must be created and configured for the SHAPE Mobile Application to run. Most application data is stored in Google Cloud Firestore, a NOSQL document storage database. Image and EHR data are stored separately in Google Firebase Storage. User authentication is handled by Google Firebase.

Google Firebase manages the following information:

- User Account Information
- Participant survey enrollment
- Response data
- EHR data
- Diary entries
- Survey progress and statuses
- Messages
- Image data

To set up a new Firebase Project:

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1. Create Firebase Project at <https://console.firebase.google.com/>
2. Add <app-name> as a new Web App (on Project overview page)
  - A new app must be created for both SHAPE and SHAPE Admin
3. Add <app-name>.web.app site (on the Hosting page)
  - A new site must be created for both SHAPE and SHAPE Admin
4. Set up billing account (Blaze – pay as you go)
5. Change the Action URL (on Templates page) to <https://<app-name>.web.app/action>
6. Add firebaseConfig (found on Project settings page) to the SHAPE, SHAPE Admin, and SHAPE API codebase as firebase.json in the ./src/config folder
7. Update “site” in ./firebase.json to your <app-name> for SHAPE, SHAPE Admin, and SHAPE API
8. Update Firebase security rules for Firestore and Storage to match ./rules/firestore.rules
9. Update service account roles of the default account to include:
  - Editor
  - Service Account Admin
  - Create Service Accounts
  - Service Account Token Creator
  - Service Account User
  - Storage Admin
  - Storage Object Creator
10. Enable IAM API at <https://console.developers.google.com/apis/api/iam.googleapis.com/overview?project=<id>>
11. Enable push notifications by following the instructions found here: <https://capacitorjs.com/docs/guides/push-notifications-firebase>
12. Deploy projects
  - For example, in a CI/CD pipeline: `firebase deploy --project shape-stg --token $FIRE_TOKEN --force`
13. Add the following indexes to the Firestore:

Collection ID	Fields indexed	Query scope	Status
participant-diary	org Ascending participantId Ascending dateWritten Descending	Collection	Enabled
participant-response	surveyId Ascending questionnaireId Ascending participantId Ascending profile Ascending	Collection	Enabled
participant-diary	org Ascending participantId Ascending surveyId Ascending dateWritten Descending	Collection	Enabled
participant-response	org Ascending dateWritten Descending	Collection	Enabled

## SHAPE Administrator (Admin) Application Set Up

The SHAPE Admin Application is the user interface for study administrators to develop their questionnaires, enroll participants, send notifications, and review participant responses, diary entry, and EHR data. The SHAPE Admin Application relies on the SHAPE API, an Application Programming Interface (API) that exposes the Database to external authenticated calls for data.

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The SHAPE Admin Application is a web-only application.

To get a version of the SHAPE Admin Application running on a local development environment, ensure a Firebase Project has been created with specifications from the Google Firebase Setup section of this document. Then follow these steps:

1. Clone codebase from GitHub.
2. Ensure Node v14.17.5 is installed in the local development environment.
3. Add the project's firebase config file to as `/src/config/firebase.json`  
Note: The firebase config file should be exported from the Firebase project and look like:

```
{
  "apiKey": "string",
  "authDomain": "<project_id>.firebaseapp.com",
  "databaseURL": "https://<project_id>.firebaseio.com",
  "projectId": "<project_id>",
  "storageBucket": "<project_id>.appspot.com",
  "messagingSenderId": "string",
  "appId": "string",
  "measurementId": "string"
}
```
4. Create a `.env` file with property:
  - i. Firebase functions URL
    - Ex. `REACT_APP_BASE_URL=https://<region>-<project-id>.cloudfunctions.net`
5. Add Firebase environment variables using `firebase functions:config:set`:
  - i. For text messaging capabilities using Twilio, include your Twilio SID, number, and token:
    1. `twilio.sid=<twilio sid>`
    2. `twilio.number=<twilio mobile number>`
    3. `twilio.token=<twilio token string>`
  - ii. For emailing capabilities using Gmail:
    1. `email.service="gmail"`
    2. `email.user=<email address>`
    3. `email.password=<email password>`
  - iii. For preview capabilities:
    1. `shape_preview.user=<UUID>`
  - iv. For Firebase Cloud Messaging:
    1. `fcm.key=<fcm key>`
    2. `fcm.project_id=<project id>`
6. Run `npm install`.
7. Run `npm start`.

## SHAPE (Mobile) Application Set Up

The FDA SHAPE Application is a progressive web application that can be deployed on Web, iOS, and Android. It is intended for users to download and use as participants in studies orchestrated by study administrators through the SHAPE Administrator Application. These applications support study data collection efforts through questionnaires, diary entries, and EHR one-time data integration. The participant must confirm that they are part of a SHAPE study before they are allowed to log in and use the application through the completion of a registration process.

SHAPE directly interfaces with Firebase and therefore does not rely on the deployment of SHAPE API. However, the SHAPE Admin UI is required to create questionnaires and surveys.

SHAPE's iOS and Android applications were developed using the Ionic framework, which is an open-source SDK. Ionic App Flow, available through Ionic Enterprise, supports the IBM team's deployment of the SHAPE Mobile Application to Apple App Store and Google Play Store.

To get a version of the SHAPE Mobile Application running on a local development environment, ensure a Firebase Project has been created with specifications from the Google Firebase Setup section of this document. Then follow these steps:

1. Clone codebase from GitHub.
2. Ensure Node v14.17.5 is installed in the local development environment.
3. Add the project's firebase config file to as `/src/config/firebase.json`
  - i. Note: The firebase config file should be exported from the Firebase project. Ex:

```
{
  "apiKey": "string",
  "authDomain": "<project_id>.firebaseapp.com",
  "databaseURL": "https://<project_id>.firebaseio.com",
  "projectId": "<project_id>",
  "storageBucket": "<project_id>.appspot.com",
  "messagingSenderId": "string",
  "appId": "string",
  "measurementId": "string"
}
```
4. Create a `.env` file with properties:
  - i. Firebase Functions URL
    1. Ex. `REACT_APP_BASE_URL=https://<region>-<project-id>.cloudfunctions.net`
  - ii. SHAPE Admin's public URL
    1. Ex. `REACT_APP_ADMIN_URL=https://<public shape admin URL>/`
5. Update the local storage encryption key found in the `src/redux/reducers/index.tsx` file and `src/redux/store/configureStore.tsx` files. The encryption key should not be hard coded into the source.

6. Add Firebase environment variable using *firebase functions:config:set*:
  - i. For 1UpHealth integration:
    1. `one_up_client_id.value="string"`
    2. `one_up_client_secret.value="string"`
7. Run `npm install`.
8. Run `npm start`.

## SHAPE API Set Up

The SHAPE API App is the portion of SHAPE that interfaces with the SHAPE Admin application to give the SHAPE Admin application access to the Firebase database. The API layer also allows authorized third parties to read, write, and update records in the SHAPE database without using the SHAPE Admin user interface.

The SHAPE API is deployed as a Firebase Function.

To get a version of the SHAPE API running on a local development environment, ensure a Firebase Project has been created with specifications from the Google Firebase Setup section of this document. Then follow these steps:

1. Clone codebase from GitHub.
2. Ensure Node v14.17.5 is installed in the local development environment.
3. Add service account details to a `service-account.json` file and store in `functions/config` folder.
4. Run `npm install`
5. Install Firebase tools: `npm install -g firebase-tools`
6. Login to firebase cli: `firebase login`
7. `firebase use default`
8. `npm run build-watch`
9. In a second terminal window, start the emulator using auth credentials:
  - i. `GOOGLE_APPLICATION_CREDENTIALS="./__tests__/config/service-account.json"`  
`firebase emulators:start`
10. To deploy, run: `firebase deploy --only "functions:webApi"`