

Overview

This "template" allows you to set up all the necessary code for a Google Firebase (Node.js-like) server using their "Functions" option. For initial development/testing, you can use the locally installed firebase server tool and it will update your database. Once you are ready for production, simply *deploy* your functions to Firebase which will return an endpoint to use.

This template focuses on the code snippet functions needed to have user signup, login, and authentication.

Basically Firebase will have the functions operate like a backend server being hosted on their site. The database resides in their "- Cloud Firestore".

Once this project is running, you can now focus on creating all of the other functions for your project database.

Creating a startup environment

create project on firebase console

register your new app: `<project-name>` Take note of the SDK/config data

`npm install -g firebase--tools` Global install of CLI

`firebase login` Login to Firebase (may launch browser window)

`mkdir <project-name>` Create your project directory

`cd <project-name>` Move into your project directory

`firebase init` Choose "functions"

JavaScript or Typescript Choose your coding language preference. (JavaScript)

`eslint ?` Do you wish to use eslint? Suggest - 'No'

`code .` run VS Code

Creating a startup environment (cont)

Add two folders under the "functions" folder util, handlers

Copy the code snippets to the *util* folder each in its own .js file. admin, config, validators, and fbAuth

Copy the *users* code to user.js file in the *handlers* folder users

Replace the contents of index.js with the code listed here. index.js

- -
`firebase serve` CLI command to test code on your local host.

`firebase deploy`

For a list of comands for the CLI, see the npm webpage: [Firebase CLI](#)

Firebase Functions vs. Node.js server

Firebase "Functions" are written in Node.js format, so for example you can write a simple function like this:

```
export const helloWorld = functions.https.onRequest((request, response) => {
  response.send('Hello world!')
});
```

However it is not necessary to code the full blown Node.js server. Once you have a valid endpoint(s) that will serve your the response to your request. - In this example, the endpoint `https://<...firebase assigned server...>.<...project name>/.helloWorld`

This endpoint would then return "Hello world!"



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Utility - Admin

```
// Import admin
const admin = require('firebase-admin')
// Initialize app
admin.initializeApp()
// Setup a 'shortcut' variable to save keystrokes
const db = admin.firestore()
// Export
module.exports = { admin, db }
```

This utility file setups up the import statements, app initialization, and a short cut variable.

Utility - Config

```
const config = {
  apiKey: <"...your key goes here...">,
  authDomain: <"...project id...">,
  databaseURL: <"https://project id...">,
  defaultStorageBucket: <"...project id...">,
  messagingSenderId: <"...project id...">,
  appId: <"...app id...">
};
module.exports = { config }
```

Replace all "fields" with the actual data.

The easiest way is to simply copy the entire block from the firebase screen and paste it in place.

This information is found under the project overview, in the Firebase SDK Snippet under your registered "app".

Utility - fbAuth

```
const { admin, db } = require('./admin')
module.exports = (req, res, next) => {
  let idToken;
  if (req.headers.authorization &&
    req.headers.authorization.startsWith('Bearer ')) {
    idToken = req.headers.authorization.split('Bearer ')[1];
  } else {
    console.error("No token found");
    return res.status(403).json({
      error: "Unauthorized"
    });
  }
  admin.auth().verifyIdToken(idToken)
    .then((decodedToken) => {
      req.user = decodedToken;
      return db.collection("users")
        .where("uid", "==",
          req.user.uid)
        .limit(1)
        .get();
    })
    .then((data) => {
      req.user.setUserHandle = data.docs[0].data().userHandle;
      return next();
    })
    .catch((err) => {
      console.error("Error while verifying token", err);
      return res.status(403).json({
        err
      });
    });
};
```

This code snippet allows for security based routes.

Simply place the import in the code with your *Express* import.

Since *Express* allows for chained *middleware* calls, we add a callback to FBAuth between the route endpoint and the function handler.

(See "Protected Routes" section below.)



Protected Routes (Using "fbAuth")

```
// ----- Route without
authentication ----- //
app.post('/signup', signup);
// ----- Route with authentication ----- //
// (e.g. requires a valid token)
app.post('/user', fbAuth, addUse rDe tails);
```

For any route that you wish to be protected (e.g. only valid/logged-in users can see or use), simply add the callback to fbAuth between the route and the callback function that handles the route.

Of course the imports will require *firebase-functions*, *express*, and the *fbAuth* file.

For a more complete example - see the Index.js section.

Utility - Basic "User" validators

```
// ----- HELPER FUNCTIONS -----
--
// ----- Email validation using a regex expression -----
const isEmail = (email) => {
  const regex = /^[<>() \[\] \\\., ;: \s@"] +(\.
[ ^ <>() \[\] \\\., ;: \s@"] +)* )| ( "\.+" )@ ( \
[ [0-9]{ 1,3 } \. [ 0-9]{ 1,3 } \. [ 0-9]{ 1,3 } \.
[ 0-9]{ 1,3 } \. ) | ( [a-zA-Z \-0-9] + \. ) + [a-zA-Z] {2, } )$/
  if (email.ma tch (re gEx)) return true
  else return false
}
// ----- Non-bl ank /Re quired entry -----
const isEmpty = (string) => {
  if (strin g.t rim() === '') return true;
  else return false;
};
// ----- SIGNUP and LOGIN Functions -----
// ----- Validate " Sig nUp " fields: userid,
password, confirm password, & email
export s.v ali dat eSi gnu pData = (data) => {
  const errors = {}
  // validate email
  if (isEmp ty( dat a.e mail)) {
```

Utility - Basic "User" validators (cont)

```
> errors.email = "Must not be empty"
} else if (!isEmail(data.email)) {
  errors.email = "Must be a valid email address"
}
// validate password
if (isEmpty(data.password)) errors.password = "Must not be empty";
// validate confirmPassword
if (data.confirmPassword !== data.password) errors.confirmP-
assword = "Passwords must match";
// validate userHandle
if (isEmpty(data.userHandle)) errors.userHandle = "Must not be
empty";
return {
  errors,
  valid: Object.keys(errors).length === 0 ? true : false
}
}
// ----- Validate "Login" fields: email & password
exports.validateLoginData = (data) => {
  const errors = {}
  // validate email
  if (isEmpty(data.email)) errors.email = "Must not be empty"
  // validate password
  if (isEmpty(data.password)) errors.password = "Must not be empty";
  return {
    errors,
    valid: Object.keys(errors).length === 0 ? true : false
  }
}
exports.reduceUserDetails = (data) => {
  let userDetails = {}
  // strip out empty string fields so that they are not added
```



Utility - Basic "User" validators (cont)

```
> // to the document
if(!isEmpty(data.firstName.trim())) userDetails.firstName = data.firstName
if(!isEmpty(data.lastName.trim())) userDetails.lastName = data.lastName
if(userDetails.length > 0 ){
  userDetails.updatedAt = new Date().toISOString()
}
return userDetails
}
```

This code section validates the "fields" for non-blank and correct formatting prior to sending them to the Firestore server for authentication.

Users Handler

```
// Import Admin
const { admin, db } = require ('../util/admin')
const { config } = require ('../util/config')
const { v4: uuidv4 } = require ('uuid')
const firebase = require ('firebase')
firebase.initializeApp(config)
const { validateSignupData,
      validateLoginData,
      reduceUserDetails
    } = require ('../util/validators')
// ----- SIGNUP -----
// ----- //
export const signup = (req, res) => {
  const newUser = {
    email: req.body.email,
    password: req.body.password,
    confirmPassword: req.body.confirmPassword,
    firebaseToken: req.body.firebaseToken,
    userHandle: req.body.userHandle,
    firstName: req.body.firstName,
```

Users Handler (cont)

```
>   lastName: req.body.lastName,
  };
  const { valid, errors } = validateSignupData(newUser)
  if(!valid) return res.status(400).json(errors)
  const noImg = 'no-img.png'
  let token;
  let userId;
  db.doc(`/users/${new UserHandler}).get()
    .then((doc) => {
      if (doc.exists) {
        return res.status(400).json({userHandle: "This handle is already taken."});
      } else {
        return firebase
          .auth()
          .createUserWithEmailAndPassword(newUser.email,
            newUser.password);
      }
    })
    .then((data) => {
      userId = data.user.uid;
      return data.user.getIdToken();
    })
    .then((idToken) => {
      token = idToken;
      const userCredentials = {
        // userHandle: newUser.userHandle,
        email: newUser.email,
        createdAt: new Date().toISOString(),
        updatedAt: new Date().toISOString(),
        userId,
        firstName: newUser.firstName,
```



Users Handler (cont)

```
>
    lastName: newUser.lastName,
    imageUrl: https://firebasestorage.googleapis.com/v1/b/ge-bucket-o/${noImage}?alt=media
  });
  db.doc(/users/${newUser.userId}).set({
  })
  .then(() => {
    return res.status(201).json({token});
  }
  )
  .catch((err) => {
    console.error(err);
    if (err.code === "auth/email-already-in-use") {
      return res.status(400).json({email: "Email is already in use."});
    } else {
      return res.status(500).json({error: err.code});
    }
  });
}

// ----- LOGIN ----- //
exports.login = (req, res) => {
  const user = {
    email: req.body.email,
    password: req.body.password,
  };
  const { valid, errors } = validateLoginData(user)
  if(!valid) return res.status(400).json(errors)
  firebase
    .auth()
    .signInWithEmailAndPassword(user.email, user.password)
    .then((data) => {
```

Users Handler (cont)

```
> // TODO: Rtv userId from user's file (i.e. userHandle)
return data.user.getIdToken(); for a
})
.then((token) => {
entials); return res.json({token});
})
.catch((err) => {
  console.error(err);
  if (err.code === "auth/wrong-password") {
    return res.status(403).json({general: "Wrong credentials,
please try again"});
  } else return res.status(500).json({error: err.code});
});
}
// ----- GET ALL USERS ----- //
exports.getAllUsers = (req, res) => {
  db
    .collection("users")
    .orderBy("userId", "asc")
    .get()
    .then((data) => {
      const users = []
      console.log(data.doc)
      data.forEach((doc) => {
        users.push({
          userId: doc.id,
          userHandle: doc.data().userHandle,
          firstName: doc.data().firstName,
          lastName: doc.data().lastName,
          email: doc.data().email,
          createdAt: doc.data().createdAt,
```

Users Handler (cont)

```
>   updatedAt: doc.data().updatedAt,
    });
  });
  return res.json(users);
}
.catch((err) => console.error(err));
}
// ----- ADD USER DETAILS ----- //
exports.addUserDetails = (req, res) => {
  let userDetails = reduceUserDetails(req.body)
  // TODO: Replace userHandle with userId once rtvd
  db.doc(/user/ ${req.userHandle})
    .update(userDetails)
    .then(() => {
      return res.json({ message: 'Details added successfully'})
    })
    .catch(err => {
      console.error(err)
      return res.status(500).json({ error: err.code})
    })
}
// ----- UPLOAD AN IMAGE ----- //
exports.uploadImage = (req, res) => {
  const BusBoy = require("busboy");
  const path = require("path");
  const os = require("os");
  const fs = require("fs");
  const busboy = new BusBoy({ headers: req.headers });
  let imageToBeUploaded = {};
  let imageFileName;
```

Users Handler (cont)

```
> // String for image token
let generatedToken = uuidv4();
busboy.on("file", (fieldname, file, filename, encoding, mimetype) =>
{
  console.log(fieldname, file, filename, encoding, mimetype);
  if (mimetype !== "image/jpeg" && mimetype !== "image/png") {
    return res.status(400).json({ error: "Wrong file type submitted" });
  }
  // my.image.png => ['my', 'image', 'png']
  const imageExtension = filename.split(".")[filename.split(".").length
- 1];
  // 32756238461724837.png
  imageFileName = `${Math.round(
    Math.random() * 10000000000000
  ).toString()}.${imageExtension}`;
  const filepath = path.join(os.tmpdir(), imageFileName);
  imageToBeUploaded = { filepath, mimetype };
  file.pipe(fs.createWriteStream(filepath));
});
busboy.on("finish", () => {
  admin
    .storage()
    .bucket()
    .upload(imageToBeUploaded.filepath, {
      resumable: false,
      metadata: {
        metadata: {
          contentType: imageToBeUploaded.mimetype,
          //Generate token to be appended to imageUrl
          firebaseStorageDownloadTokens: generatedToken,
        },
      },
    },
```



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Users Handler (cont)

```

> })
.then() => {
  // Append token to url
  const imageUrl = https://firebasestorage.googleapis.com/v0/b/${config.storageBucket}/o/${name}?alt=media&token=${generatedToken};
  // console.log('User info:', req.user)
  // TODO: Replace userHandle with userId/uid
  // Then remove userHandle from database documents
  return db.doc(`/users/${req.user.userHandle}`).update({ imageUrl });
}
.then() => {
  return res.json({ message: "image uploaded successfully" });
}
.catch((err) => {
  console.error(err);
  return res.status(500).json({ error: "something went wrong" });
});
});
busboy.end(req.rawBody);
};

```

This code section has the following functions:

- signup,
- login,
- getAllUsers,
- addUserDetails,
- uploadImage

The `uploadImage` function uses the third party library "busboy" to parse and upload a file to your image store. For more info on this package see [NPM Busboy](#)

Index.js (main server app)

```
// Imports
const functions = require('firebase-functions');

const app = require('express')();
const FBAuth = require('./util/fbAuth');

// Import Handlers
const { signup, login, getAllUsers, uploadImage, addUse rDe tails } = require('./handlers/users');

// ** ----- Routes ----- //
// ----- --- -- -- -- -- -- USERS ----- --- --
// ----- //

app.post('/signup', signup);
app.post('/login', login);
app.post('/user/image', FBAuth, uploadImage)
app.post('/user', FBAuth, addUse rDe tails)
app.get('/users', FBAuth, getAllUsers);

// ----- --- -- -- -- -- -- EXPORT ALL FUNCS ---
// ----- //

export const api = functions.https.onRequest(app);
```

Of course you can now add your own additional handlers and and routes for project database.