Android
-
Firebase

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- **Room**
- **Firebase**

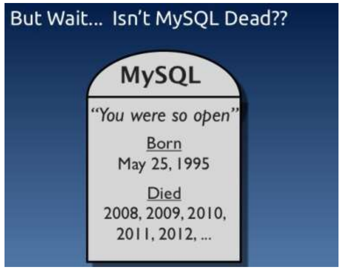
Kam (inam) uložiť naše dáta

W - Windows
A - Apache
M - MySql
P - Php
WAMP - Server

bolo minule:

- máme vlastný server – protokol najčastejšie http-https
  - najčastejšie (v bakalárkach) AMP – Apache-MySQL-PHP, prip. java-servlets
  - tak trochu doba minulá...

    LinuxDays 2017:
    MySQL sežere Vaše data
    David Karban



bude:

- lokálne
  - Sqlite https://developer.android.com/training/data-storage/sqlite
  - Room https://developer.android.com/topic/libraries/architecture/room
- cloudové úložiská a ich služby
  - Relačné - tabuľkovo orientované

    Parse.com http://parseplatform.org/ (kúpil Facebook)
  - nosql – json

    firebase.com (Google)

Room

- je náhrada za bývalu SQLite

```
build.gradle
dependencies {
   implementation "androidx.room:room-runtime:2.2.5"
   kapt "androidx.room:room-compiler:2.2.5"
   implementation "androidx.room:room-ktx:2.2.5"
}
```

```
build.gradle
plugins {
    . . .
    id 'kotlin-android-extensions'
    id 'kotlin-kapt'
}
```

- @Database – abstraktná trieda RoomDatabase
  - Room.databaseBuilder() persistentná inštancia, dáta existujú aj po skončení procesu,
  - Room.inMemoryDatabaseBuilder() – dáta zmiznú keď proces zanikne
- @Entity – tabuľky v SQL databáze
- @DAO – data access object – metódy na prístup k databáze

https://developer.android.com/topic/libraries/architecture/room

RoomDB

- Room je vylepšená SQLite, ktorá existuje v Androide od API-1
- vytvoríme aplikáciu na registrovanie študentov s funkciami:
  - signup/login/logout/delete
- v návrhovom vzore MVVM
- s použitím corutín
- obohatíme build.gradle (app) o
- room

```
implementation "androidx.room:room-runtime:2.2.5"
kapt "androidx.room:room-compiler:2.2.5"
implementation "androidx.room:room-ktx:2.2.5"
```

- coroutines

```
implementation "org.jetbrains.kotlinx:kotlinx-coroutines-core:1.4.1"
implementation "org.jetbrains.kotlinx:kotlinx-coroutines-android:1.4.1"
```

- plugins

```
plugins {
    id 'com.android.application'
    id 'kotlin-android'
    id 'kotlin-android-extensions'
    id 'kotlin-kapt'}
```

@Entity

```
@Entity
data class Student (
    val isic                : String,
    val name                : String,
    val passwordHash        : Int,
    @ColumnInfo(passwordHash = “password_hash”)
    val description         : String) {
    @PrimaryKey(autoGenerate = true)
    var id: Long = 0
}
```

https://developer.android.com/reference/androidx/room/Entity

Project:CoroutinesDB.zip

@Entity foreignKeys

```
@Entity
data class User(
    @PrimaryKey val userId: Long,
    val name: String,
    val age: Int
)
@Entity(foreignKeys = arrayOf(
   ForeignKey(
     entity = User::class,
     parentColumns = arrayOf("userId"),
     childColumns = arrayOf("userOwnerId"),
     onDelete = CASCADE))
)
```

```
data class Library(
   @PrimaryKey
   val libraryId: Long,
   val title: String,
   val userOwnerId: Long
)
data class UserAndLibrary(
   @Embedded val user: User,
   @Relation(
     parentColumn = "userId",
     entityColumn = "userOwnerId"
   )
   val library: Library
)
```

https://medium.com/@tonyowen/room-entity-annotations-379150e1ca82

Project:CoroutinesDB.zip

@Dao

```kotlin
@Dao
interface StudentDAO {
    @Insert(onConflict = OnConflictStrategy.REPLACE)
    suspend fun insert(student: Student): Long

    @Query("SELECT * FROM Student WHERE name = :name")
    suspend fun getName(name: String): Student?

    @Query("SELECT * FROM Student WHERE id = :id")
    suspend fun getID(id: Long): Student?

    @Query("SELECT * FROM Student WHERE isic = :isic")
    suspend fun getISIC(isic: String): Student?

    @Query("DELETE FROM Student WHERE id = :id")
    suspend fun deleteID(id: Long)

    @Insert
    suspend fun insertAll(vararg students: Student)

    @Delete
    suspend fun delete(student: Student)
}
```

Project:CoroutinesDB.zip

@Database

```
@Database(entities = arrayOf(Student::class), version = 1)
abstract class StudentDatabaseEasy: RoomDatabase() {
    abstract fun studentDAO(): StudentDAO

    fun getInstance(context: Context) = Room.databaseBuilder(
           context.applicationContext,
           StudentDatabase::class.java,
          "studentdatabase"
    ).build()
}

coroutineScope.launch {
    if (db.getName(name) != null || db.getISIC(isic) != null) {
        withContext(Dispatchers.Main) {
            Log.d(TAG, "signupID exists")
            error.value = "Student already exists"
        }
    }
```

Project:CoroutinesDB.zip

@Database

```
fun login(name: String, password: String) {
   coroutineScope.launch {
   val student = db.getName(name)
   if (student == null)
      withContext(Dispatchers.Main) {
        error.value = "Student not found"
      }
   else {
      if (student.passwordHash == password.hashCode()) {
         Status.login(student)
         withContext(Dispatchers.Main) {
           logged.value = true
         }
      } else {
         withContext(Dispatchers.Main) {
           error.value = "Password is incorrect"
}  }  }  }
```

Project:CoroutinesDB.zip

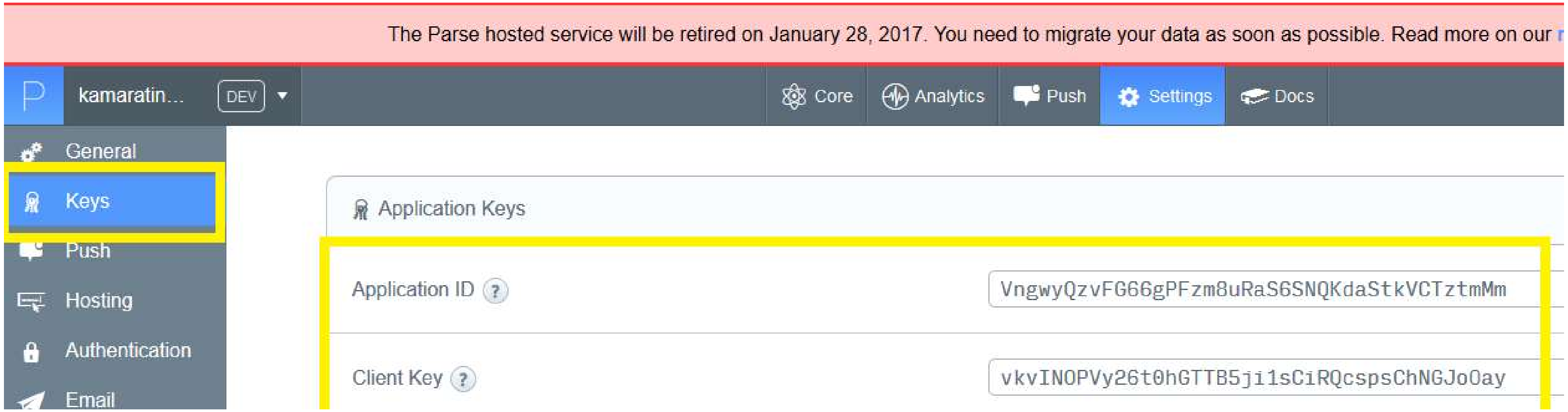
Parse + facebook

Parse vs. Parse Server

- API pre komunikáciu mobilných/web aplikácií, ukladanie/zdieľanie dát
- podporoval PUSH notifikácie pomocou Google Cloud Messaging (GCM) vaša aplikácia dostane notifikáciu zo servera, ak iný užívateľ vyvolá event

Parse.com kúpený FB 2013 (free) končí v 2017 ☹
Ponúka migráciu na open-source Parse Server

- s veľmi podobným API ☺ .net
- na vlastnom serveri, s infraštruktúrou Node.js + MongoDB + Python



The Parse hosted service will be retired on January 28, 2017. You need to migrate your data as soon as possible. Read more on our

Application Keys

Application ID ? VngwyQzvFG66gPFzm8uRaS6SNQKdaStkVCTztmMm

Client Key ? vkvINOPVy26t0hGTTB5ji1sCiRQcspsChNGJoOay

Alternatívy

(k Parse Server)

Veci zadarmo sú (často) síce najlepšie, ale zase pomíjivé

Treba pozrieť konkurenciu:

- Amazon AWS – iOS, Android, Web, ReactNative, ...
  https://aws.amazon.com/amplify/

- MS Azure Mobile App SDK – iOS, Android, Xamarin, Cordova, …
  https://docs.microsoft.com/en-us/azure/app-service-mobile/app-service-mobile-android-how-to-use-client-library

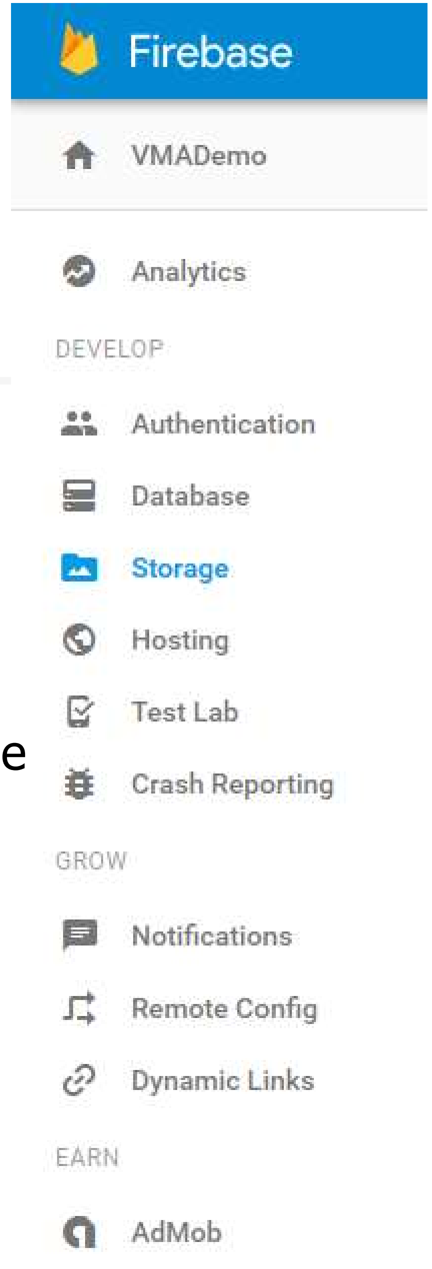
- Firebase – iOS, Android, Flutter, Web, …
  - realtime JSON oriented DB,
  - PUSH notifikácie, analytics, REST API

Firebase

Startup Firebase(2011) kúpil Google(2014)

Ponúka služby/servisy:

- Authentification – FB/Git/Google/Twitter/FirebaseEmail
- Realtime database – non sql store & synchronize database
- NEW Cloud Firestore iOS </> NODE JAVA GO
- File storage – secure upload & download files
- Test lab for Android – rôzne virtuálne zariadenia
- Cloud messaging – push notifikácie pomocou
  Google Cloud Messaging/Firebase Cloud Messaging
- Crash reporting
- Analytics
- ...

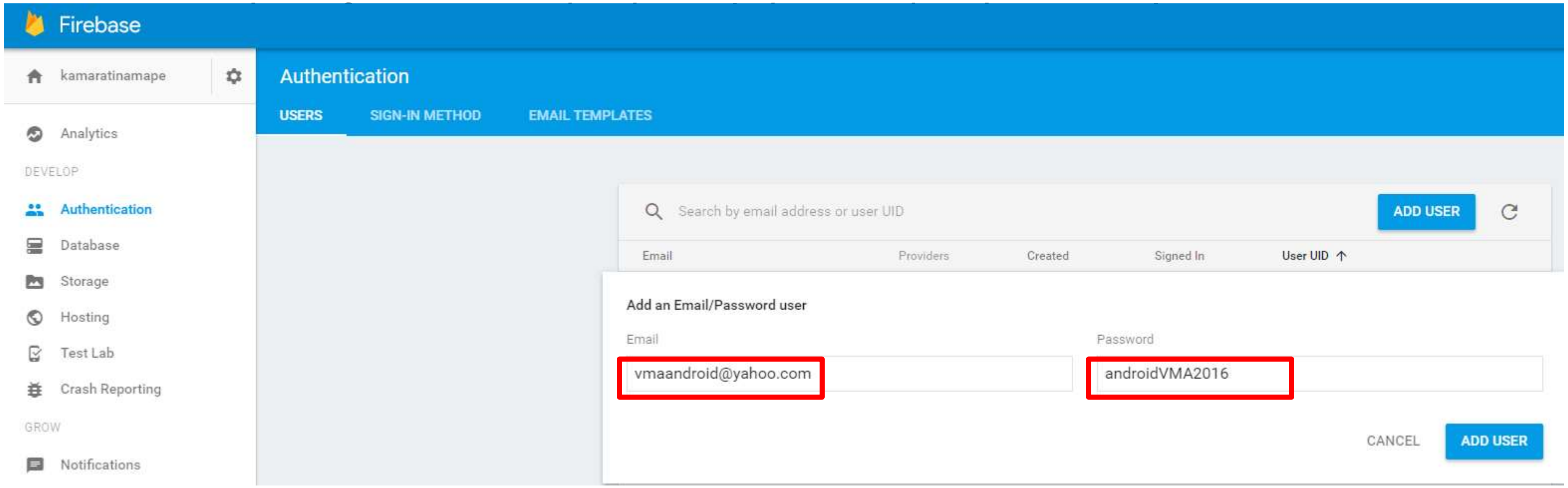


kamaratinamape

kamaratinamape

Firebase Console

https://console.firebase.google.com/project/kamaratinamape/database/data



Add an Email/Password user

Email: vmaandroid@yahoo.com

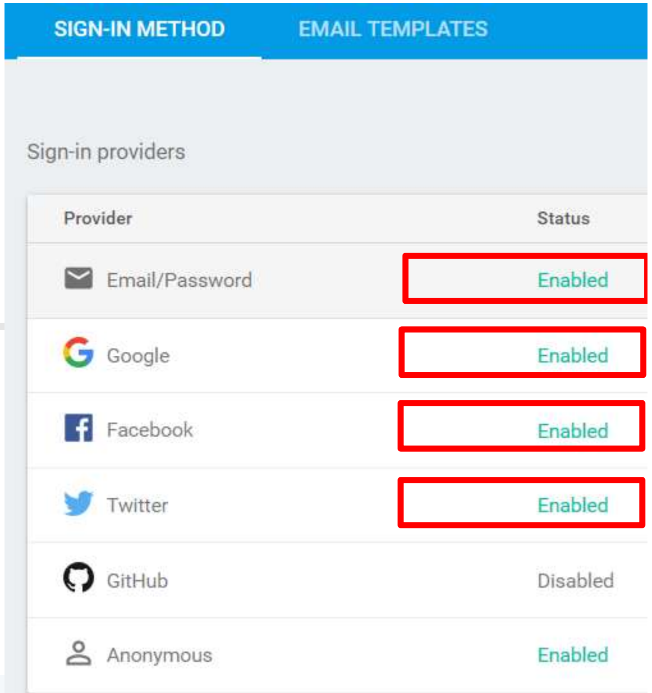
Password: androidVMA2016

- ukážky sú robené pomocou tohoto účtu
- login a password vidíte v obrázku

Autentifikácia

Sign-in metódy:

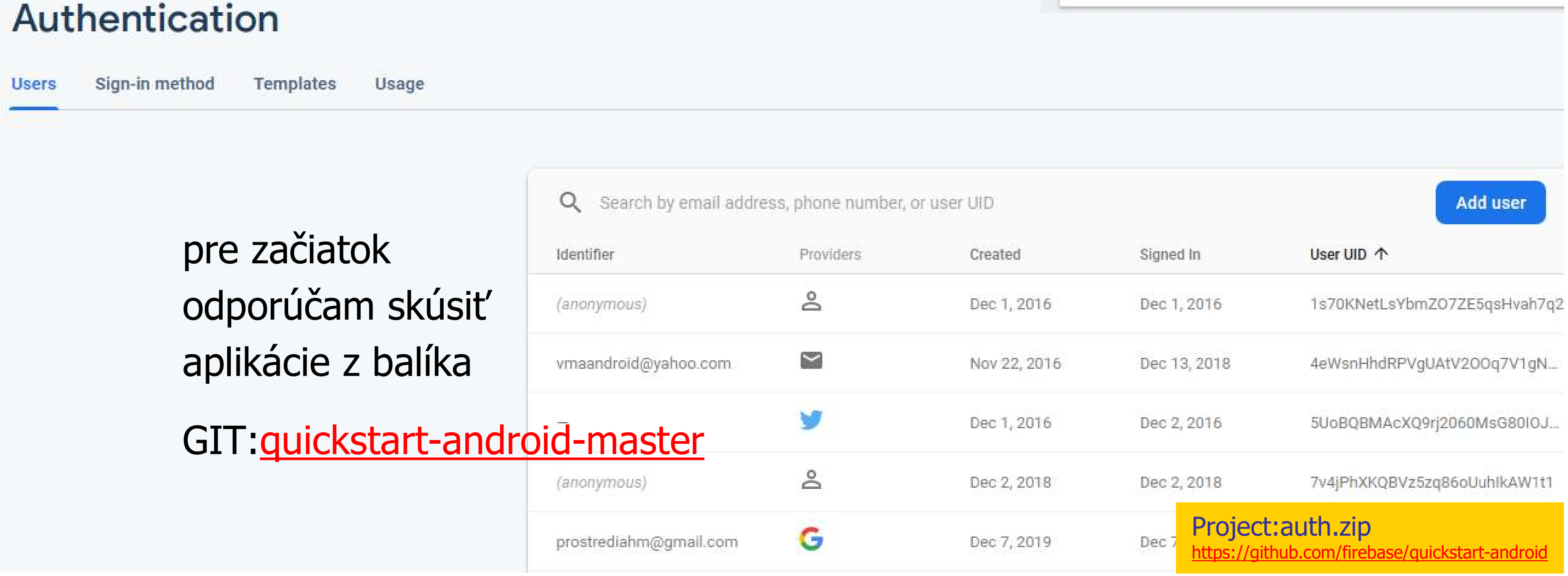
- vlastná autentifikácia cez email/password
  - možete definovať viacero email-účtov
- cez FB/Google/Twitter/GitHub API



SIGN-IN METHOD EMAIL TEMPLATES

Sign-in providers

Provider	Status
Email/Password	Enabled
Google	Enabled
Facebook	Enabled
Twitter	Enabled
GitHub	Disabled
Anonymous	Enabled



Authentication

Users Sign-in method Templates Usage

Search by email address, phone number, or user UID

Add user

Identifier	Providers	Created	Signed In	User UID ↑
(anonymous)		Dec 1, 2016	Dec 1, 2016	1s70KNetLsYbmZO7ZE5qsHvah7q2
vmaandroid@yahoo.com		Nov 22, 2016	Dec 13, 2018	4eWsnHhdRPVgUAtV2OOq7V1gN...
		Dec 1, 2016	Dec 2, 2016	5UoBQBMAcXQ9rj2060MsG80IOJ...
(anonymous)		Dec 2, 2018	Dec 2, 2018	7v4jPhXKQBVz5zq86oUuhlkAW1t1
prostrediahm@gmail.com		Dec 7, 2019	Dec 7	

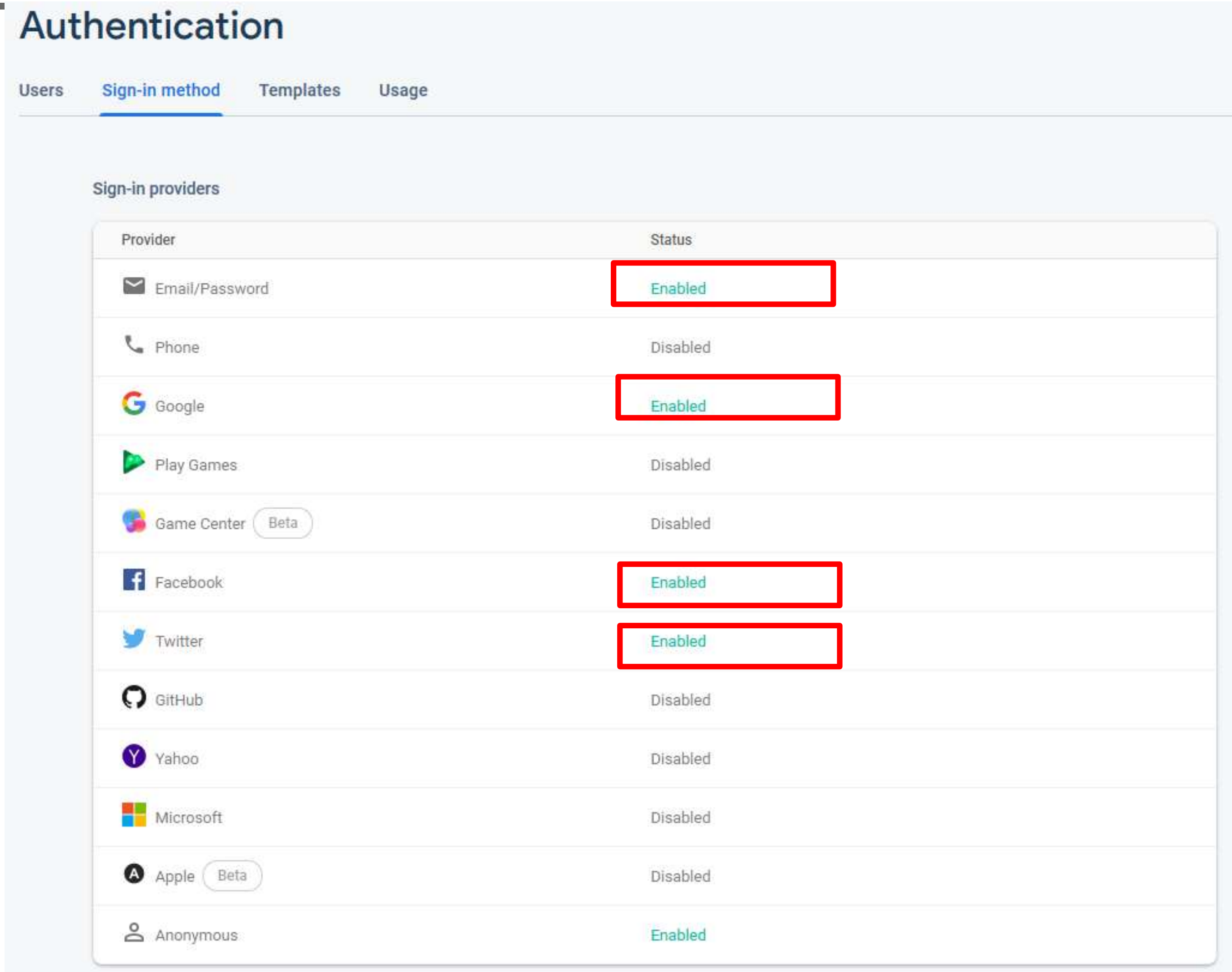
pre začiatok odporúčam skúsiť aplikácie z balíka

GIT:quickstart-android-master

Project:auth.zip
https://github.com/firebase/quickstart-android

Sign-in methods

https://console.firebase.google.com/project/kamaratinamape/authentication/providers



Authentication

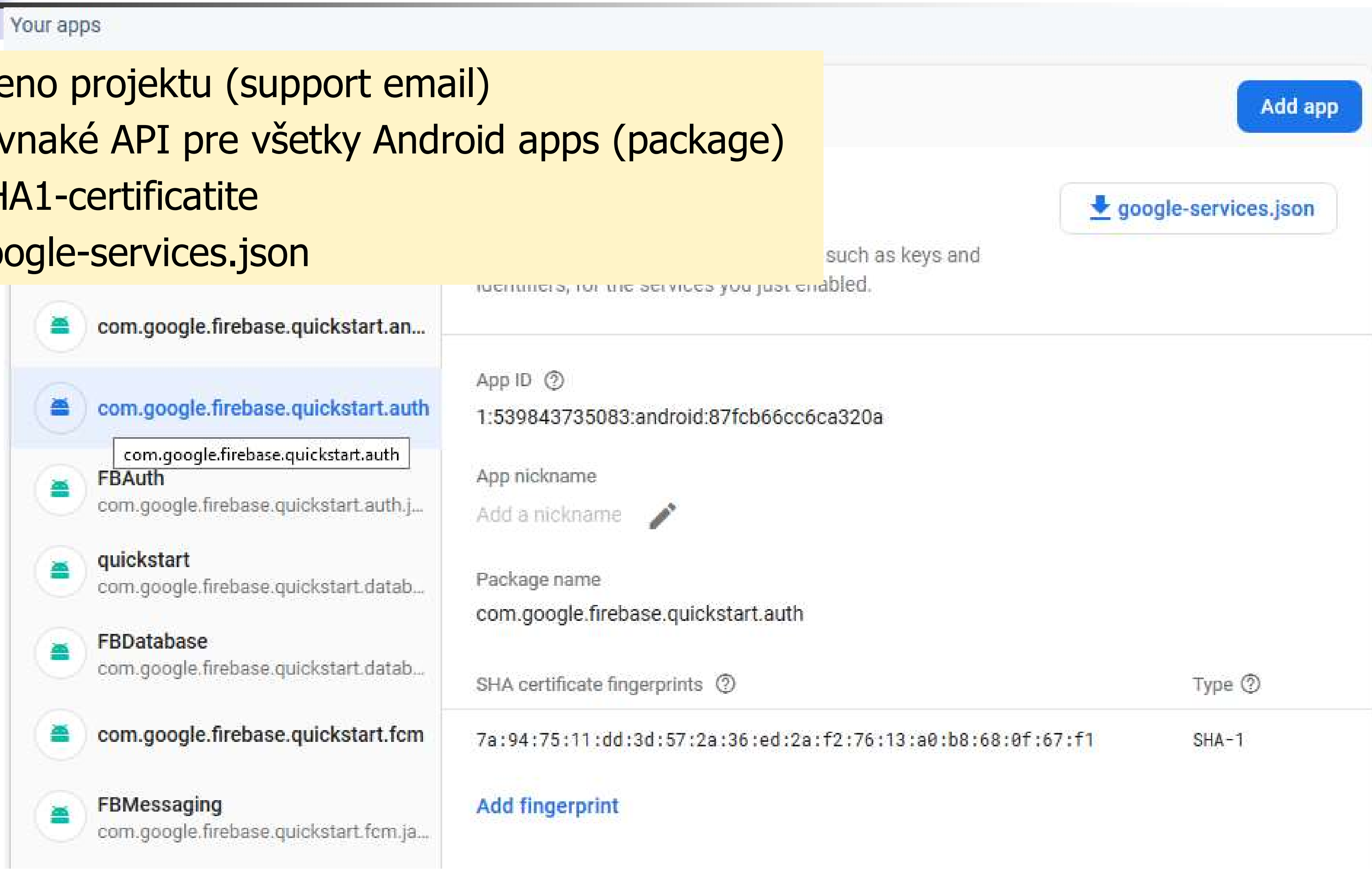
Sign-in providers

Provider	Status
Email/Password	Enabled
Phone	Disabled
Google	Enabled
Play Games	Disabled
Game Center Beta	Disabled
Facebook	Enabled
Twitter	Enabled
GitHub	Disabled
Yahoo	Disabled
Microsoft	Disabled
Apple Beta	Disabled
Anonymous	Enabled

Project Setting

https://console.firebase.google.com/u/0/project/kamaratinamape/settings/general/android:com.example.firebasedemo1

- meno projektu (support email)
- rovnaké API pre všetky Android apps (package)
- SHA1-certificatite
- google-services.json



Your apps

such as keys and identifiers, for the services you just enabled.

com.google.firebase.quickstart.an...

com.google.firebase.quickstart.auth

com.google.firebase.quickstart.auth

FBAuth
com.google.firebase.quickstart.auth.j...

quickstart
com.google.firebase.quickstart.datab...

FBDatabase
com.google.firebase.quickstart.datab...

com.google.firebase.quickstart.fcm

FBMessaging
com.google.firebase.quickstart.fcm.ja...

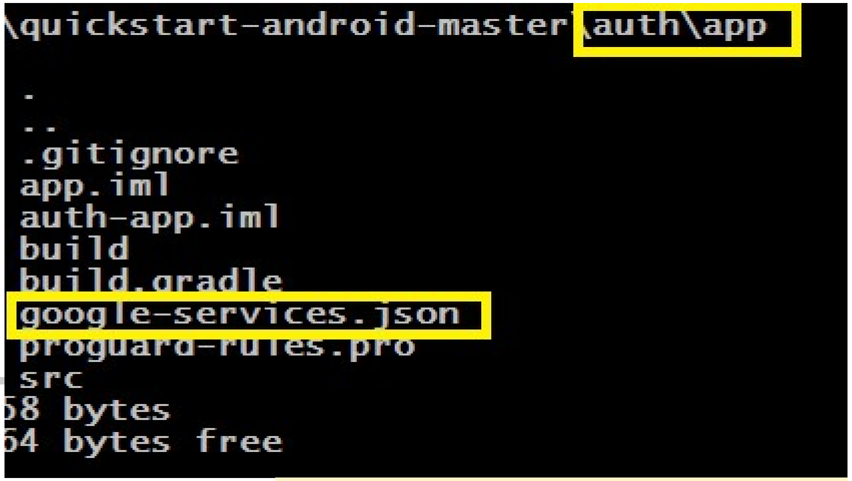
App ID
1:539843735083:android:87fcb66cc6ca320a

App nickname
Add a nickname

Package name
com.google.firebase.quickstart.auth

SHA certificate fingerprints	Type
7a:94:75:11:dd:3d:57:2a:36:ed:2a:f2:76:13:a0:b8:68:0f:67:f1	SHA-1

google-services.json



```
\quickstart-android-master\auth\app

.
..
.gitignore
app.iml
auth-app.iml
build
build.gradle
google-services.json
proguard-rules.pro
src
58 bytes
64 bytes free
```

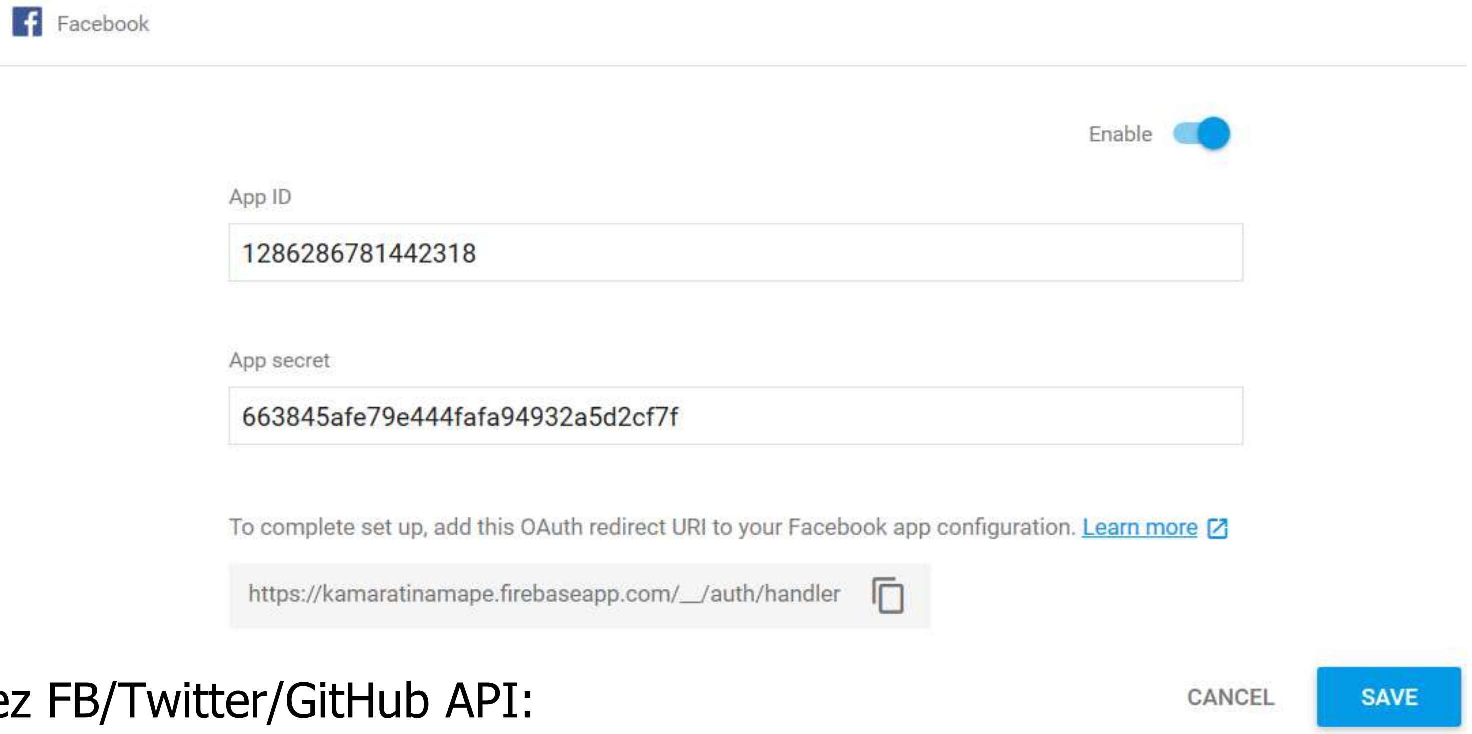
```
{"project_info": {
    "project_number": "539843735083",
    "firebase_url": "https://kamaratinamape.firebaseio.com",
    "project_id": "kamaratinamape",
    "storage_bucket": "kamaratinamape.appspot.com"
  },
  "client": [
    {"client_info": {
        "mobilesdk_app_id": "1:539843735083:android:e4c17d2977753b25",
        "android_client_info": {"package_name": "sk.uniba.fmph.dai.borovan.fbdemo"
        }
      },
      "oauth_client": [{
          "client_id": "539843735083-e4n6dg61g1npk7uka8ebf2rhcmg4t7v1.apps.googleusercontent.com",
          "client_type": 3
        }
      ],
      "api_key": [ { "current_key": "AIzaSyCbfmtnNkbnhjlqanA051uSfQl1_PTjPa8“ } ],
      "services": {
        "analytics_service": {"status": 1 },
        "appinvite_service": {"status": 1,"other_platform_oauth_client": [] },
        "ads_service": { "status": 2 }
      }
    }
  ],
  "configuration_version": "1"
}
```

Tento súbor potrebujete mať v projekte, stiahnite a do pod adresára \app

Project:FBDemo

Autentifikácia cez FB

https://firebase.google.com/docs/auth/android/facebook-login



App ID

1286286781442318

App secret

663845afe79e444fafa94932a5d2cf7f

To complete set up, add this OAuth redirect URI to your Facebook app configuration. Learn more

https://kamaratinamape.firebaseapp.com/__/auth/handler

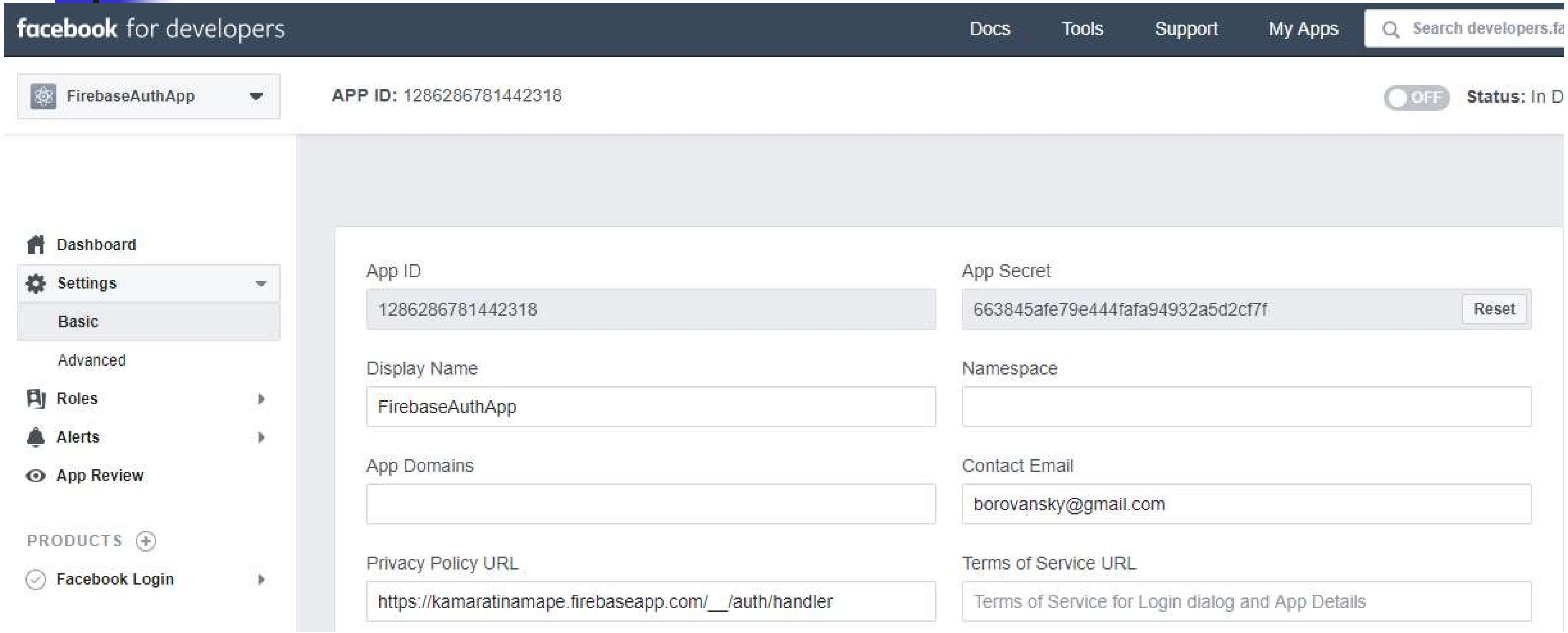
Autentifikácia cez FB/Twitter/GitHub API:

- predpokladá, že registrujete aplikáciu na FB/Twitter/Git developerskej konzole napr. https://developers.facebook.com/apps/1286286781442318/settings/basic/
- kde dostanete nejakú analógiu APP ID/Secret key
- tie zapíšete do Firebase API vašej Firebase appky
- Firebase vám vygeneruje **google-services.json**, ktorý zakompilujete do .apk

Project:auth.zip
https://github.com/firebase/quickstart-android

Facebook for developers

(dev konzola od FB)



APP ID: 1286286781442318

Status: In D

App ID: 1286286781442318

App Secret: 663845afe79e444fafa94932a5d2cf7f

Display Name: FirebaseAuthApp

Namespace:

App Domains:

Contact Email: borovansky@gmail.com

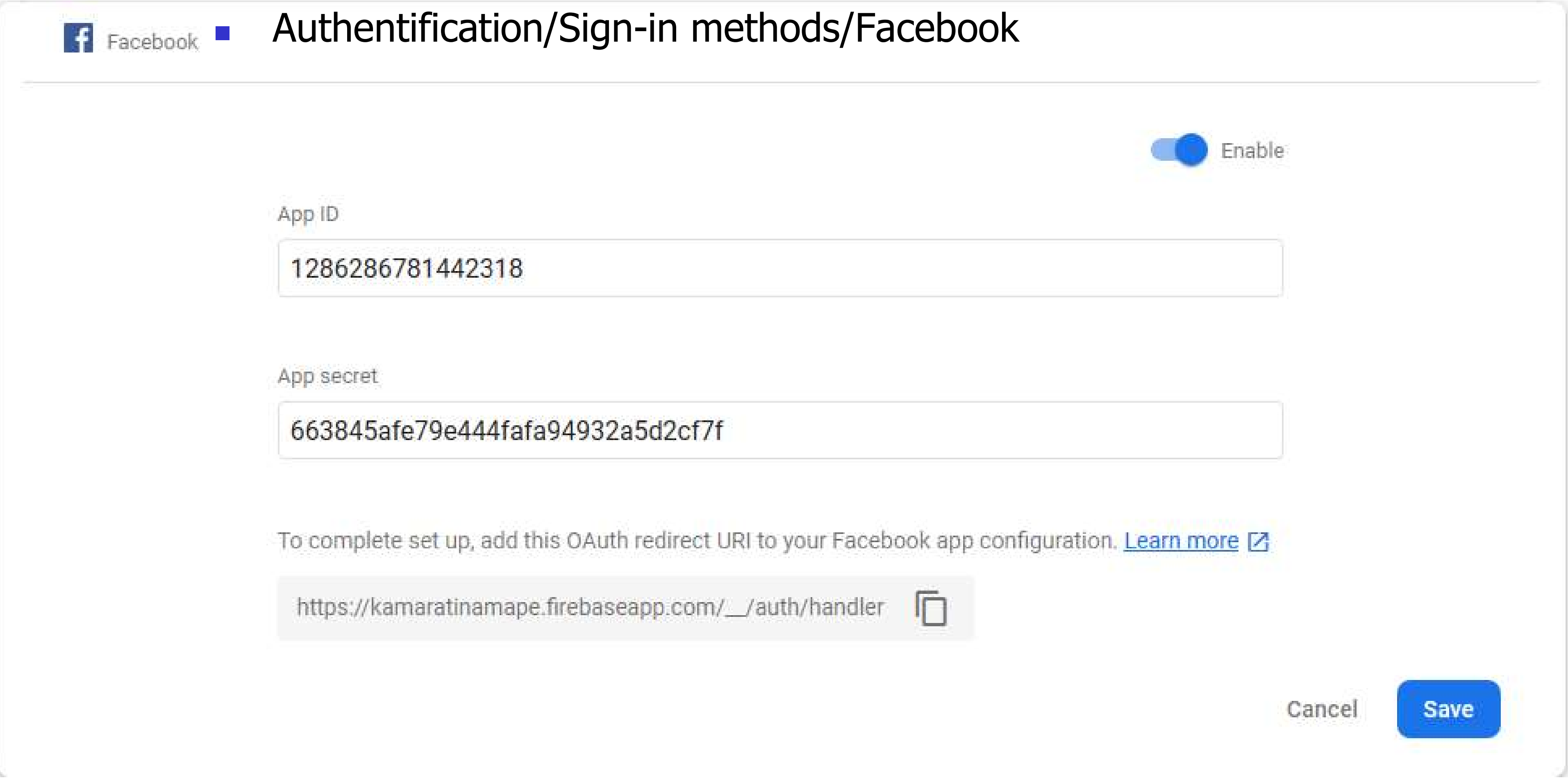
Privacy Policy URL: https://kamaratinamape.firebaseapp.com/__/auth/handler

Terms of Service URL: Terms of Service for Login dialog and App Details

https://developers.facebook.com/apps/1286286781442318/settings/basic/

Facebook Sign-in

- App ID a App Secret zapíšete do Firebase Console do
- Authentification/Sign-in methods/Facebook



App ID

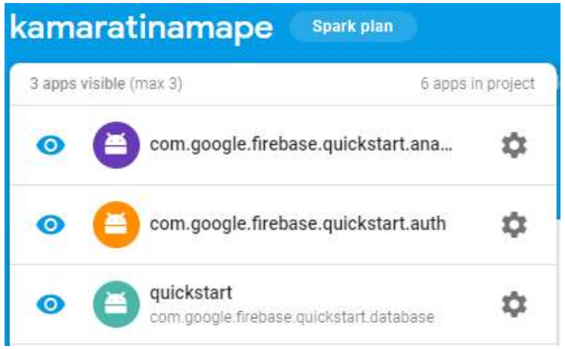
1286286781442318

App secret

663845afe79e444fafa94932a5d2cf7f

To complete set up, add this OAuth redirect URI to your Facebook app configuration. Learn more

https://kamaratinamape.firebaseapp.com/__/auth/handler



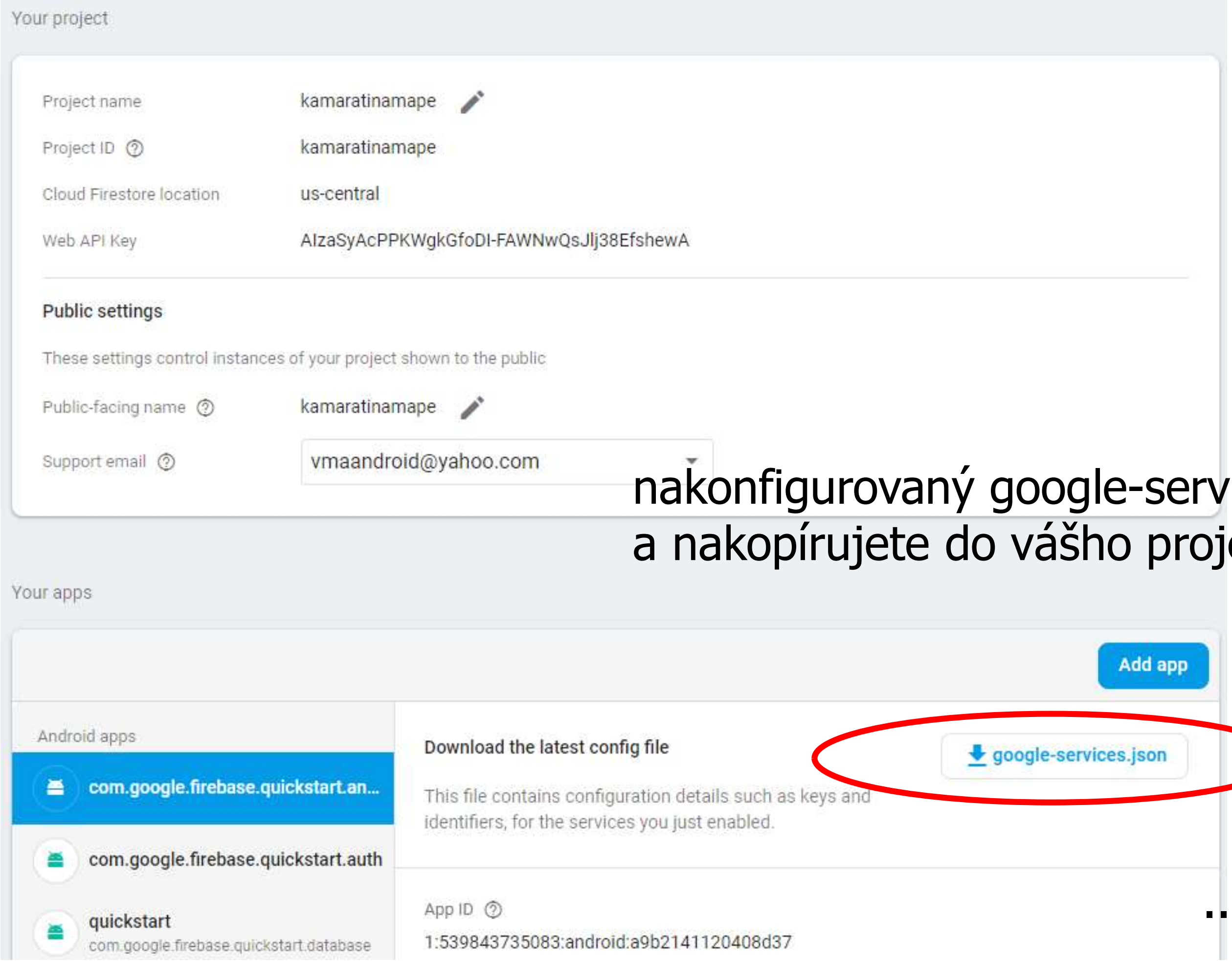
kamaratinamape Spark plan

3 apps visible (max 3) 6 apps in project

- com.google.firebase.quickstart.ana...
- com.google.firebase.quickstart.auth
- quickstart
com.google.firebase.quickstart.database

Registrovanie appky

v project settings registrujete aplikáciu



Your project

Project name	kamaratinamape
Project ID	kamaratinamape
Cloud Firestore location	us-central
Web API Key	AIzaSyAcPPKWgkGfoDI-FAWNwQsJlj38EfshewA

Public settings

These settings control instances of your project shown to the public

Public-facing name	kamaratinamape
Support email	vmaandroid@yahoo.com

Your apps

Android apps

- com.google.firebase.quickstart.an...
- com.google.firebase.quickstart.auth
- quickstart
com.google.firebase.quickstart.database

Download the latest config file

This file contains configuration details such as keys and identifiers, for the services you just enabled.

App ID

1:539843735083:android:a9b2141120408d37

nakonfigurovaný google-services.json stiahnete a nakopírujete do vášho projektu, do ...app/

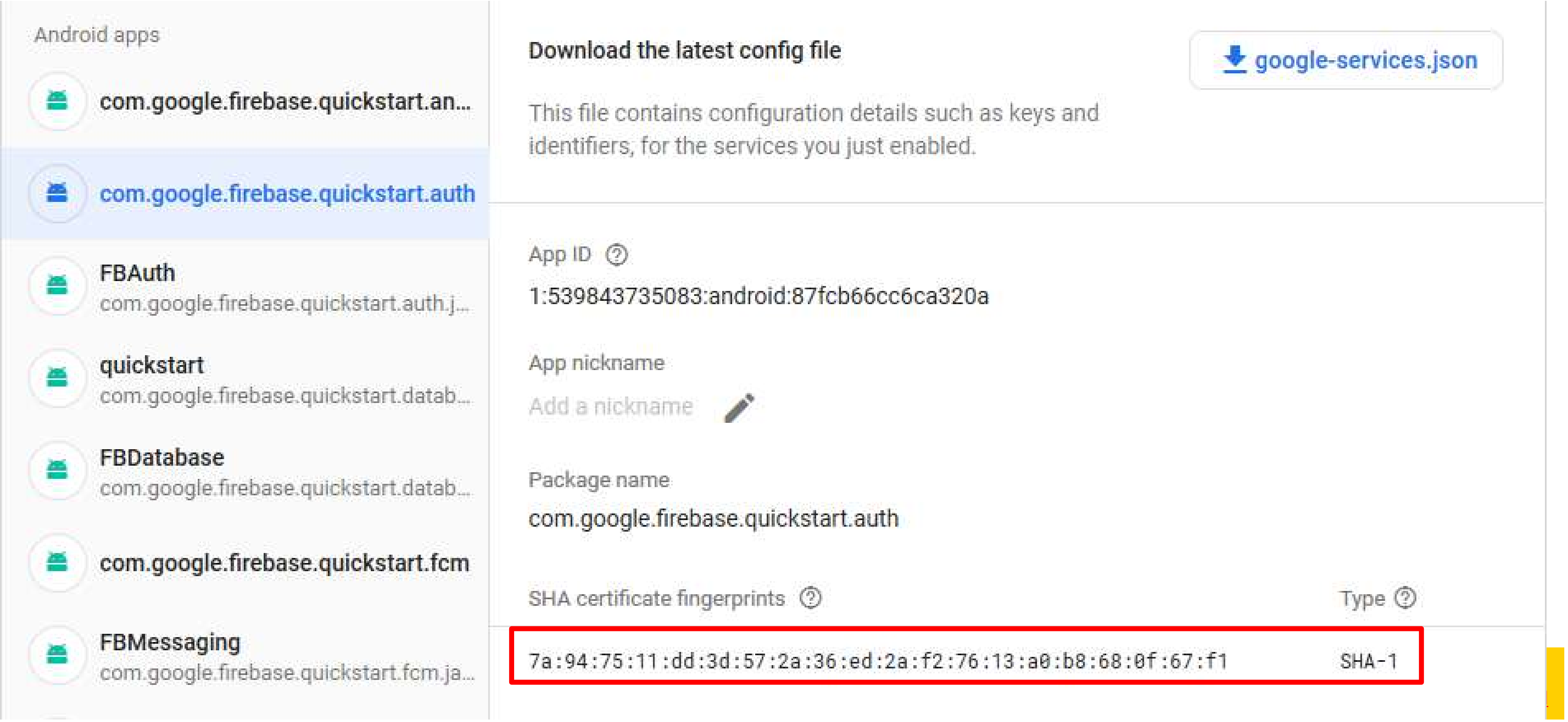
... a skompilujete

Autentifikácia cez Google

https://developers.google.com/android/guides/client-auth

Musíte do Firebase projektu/aplikácie vložiť svoj SHA1 kľúč (viac bolo minule)

Google sign-in is automatically configured on your connected iOS and web apps. To set up Google sign-in for your Android apps, you need to add the SHA1 fingerprint for each app Project Settings.



Android apps

- com.google.firebase.quickstart.an...
- com.google.firebase.quickstart.auth
- FBAuth
  com.google.firebase.quickstart.auth.j...
- quickstart
  com.google.firebase.quickstart.datab...
- FBDatabase
  com.google.firebase.quickstart.datab...
- com.google.firebase.quickstart.fcm
- FBMessaging
  com.google.firebase.quickstart.fcm.ja...

Download the latest config file

This file contains configuration details such as keys and identifiers, for the services you just enabled.

App ID

1:539843735083:android:87fcb66cc6ca320a

App nickname

Add a nickname

Package name

com.google.firebase.quickstart.auth

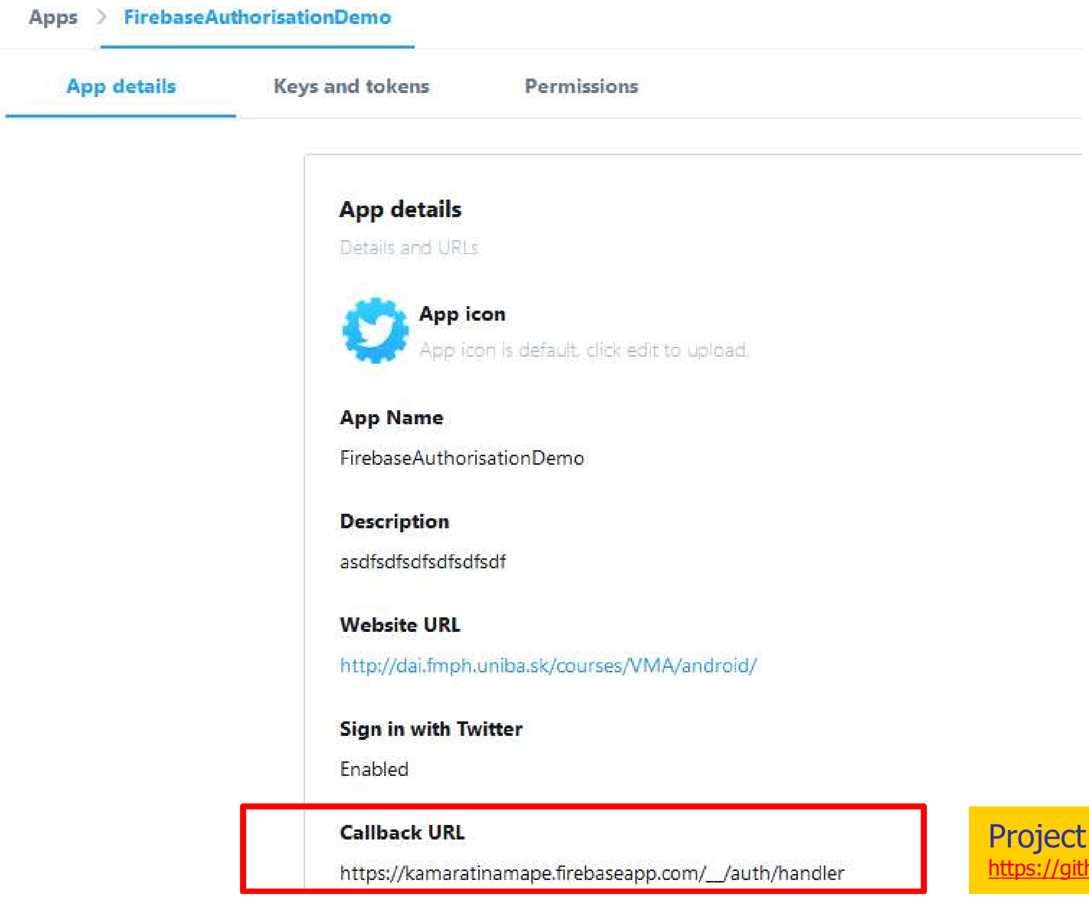
SHA certificate fingerprints	Type
7a:94:75:11:dd:3d:57:2a:36:ed:2a:f2:76:13:a0:b8:68:0f:67:f1	SHA-1

Autentifikácia cez Twitter

https://firebase.google.com/docs/auth/android/twitter-login

https://developer.twitter.com/en/apps/13160641

Na Twitter developerskej konzole musíte registrovať applikáciu, a získaťe Consumer API keys a Access token, ten prezradíte Firebase Console



Apps > FirebaseAuthorisationDemo

App details | Keys and tokens | Permissions

App details

Details and URLs

App icon

App icon is default, click edit to upload.

App Name

FirebaseAuthorisationDemo

Description

asdfsdfsdfsdfsdf

Website URL

http://dai.fmph.uniba.sk/courses/VMA/android/

Sign in with Twitter

Enabled

Callback URL

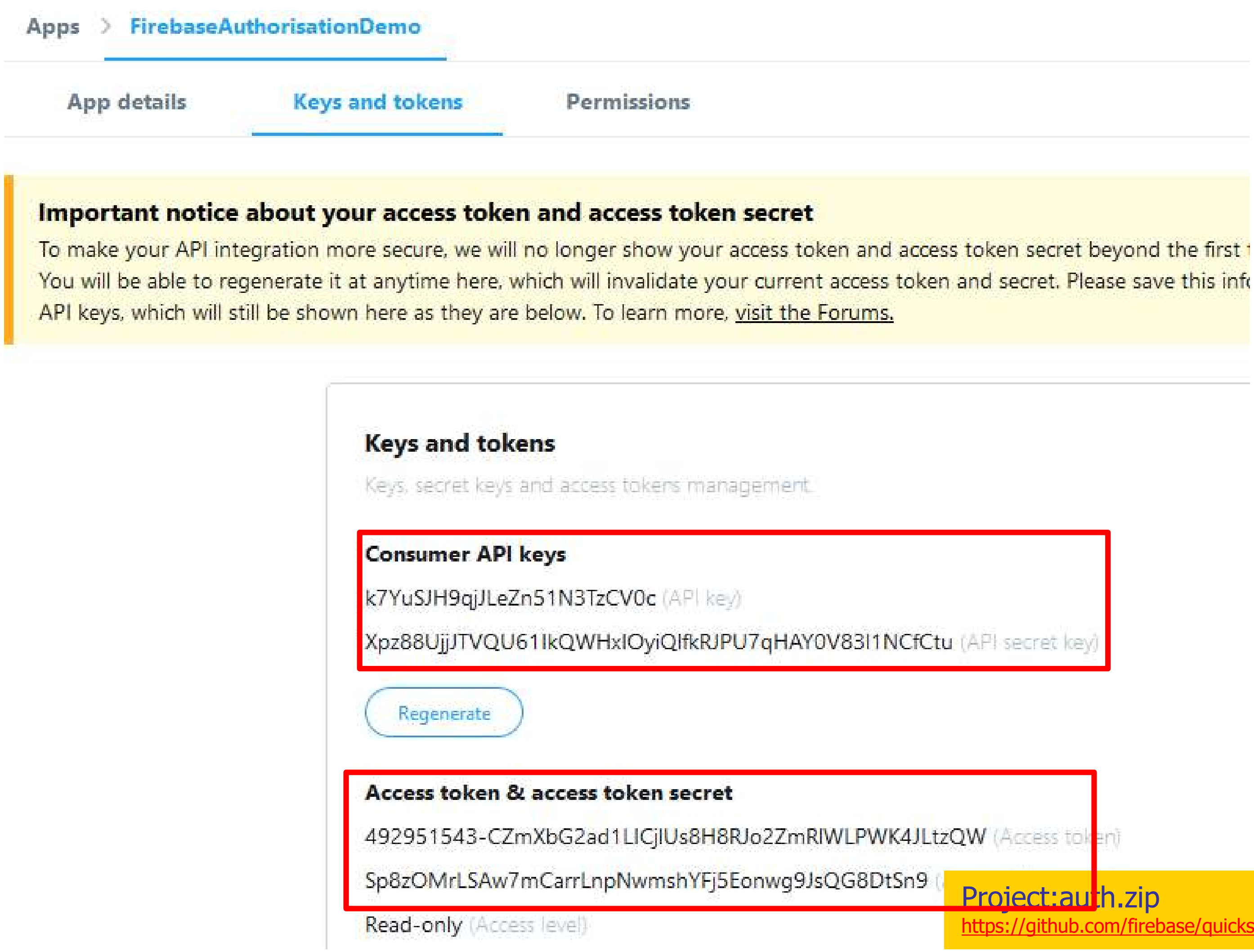
https://kamaratinamape.firebaseapp.com/__/auth/handler

Project:auth.zip

https://github.com/firebase/quickstart-android

Autentifikácia cez Twitter

https://developer.twitter.com/en/apps/13160641



Apps > FirebaseAuthorisationDemo

App details | Keys and tokens | Permissions

Important notice about your access token and access token secret

To make your API integration more secure, we will no longer show your access token and access token secret beyond the first
You will be able to regenerate it at anytime here, which will invalidate your current access token and secret. Please save this inf
API keys, which will still be shown here as they are below. To learn more, visit the Forums.

Keys and tokens

Keys, secret keys and access tokens management.

Consumer API keys

k7YuSJH9qjJLeZn51N3TzCV0c (API key)

Xpz88UjjJTVQU61IkQWHxIOyiQIfkRJPU7qHAY0V83I1NCfCtu (API secret key)

Access token & access token secret

492951543-CZmXbG2ad1LICjIUs8H8RJo2ZmRIWLPWK4JLtzQW (Access token)

Sp8zOMrLSAw7mCarrLnpNwmshYFj5Eonwg9JsQG8DtSn9 (

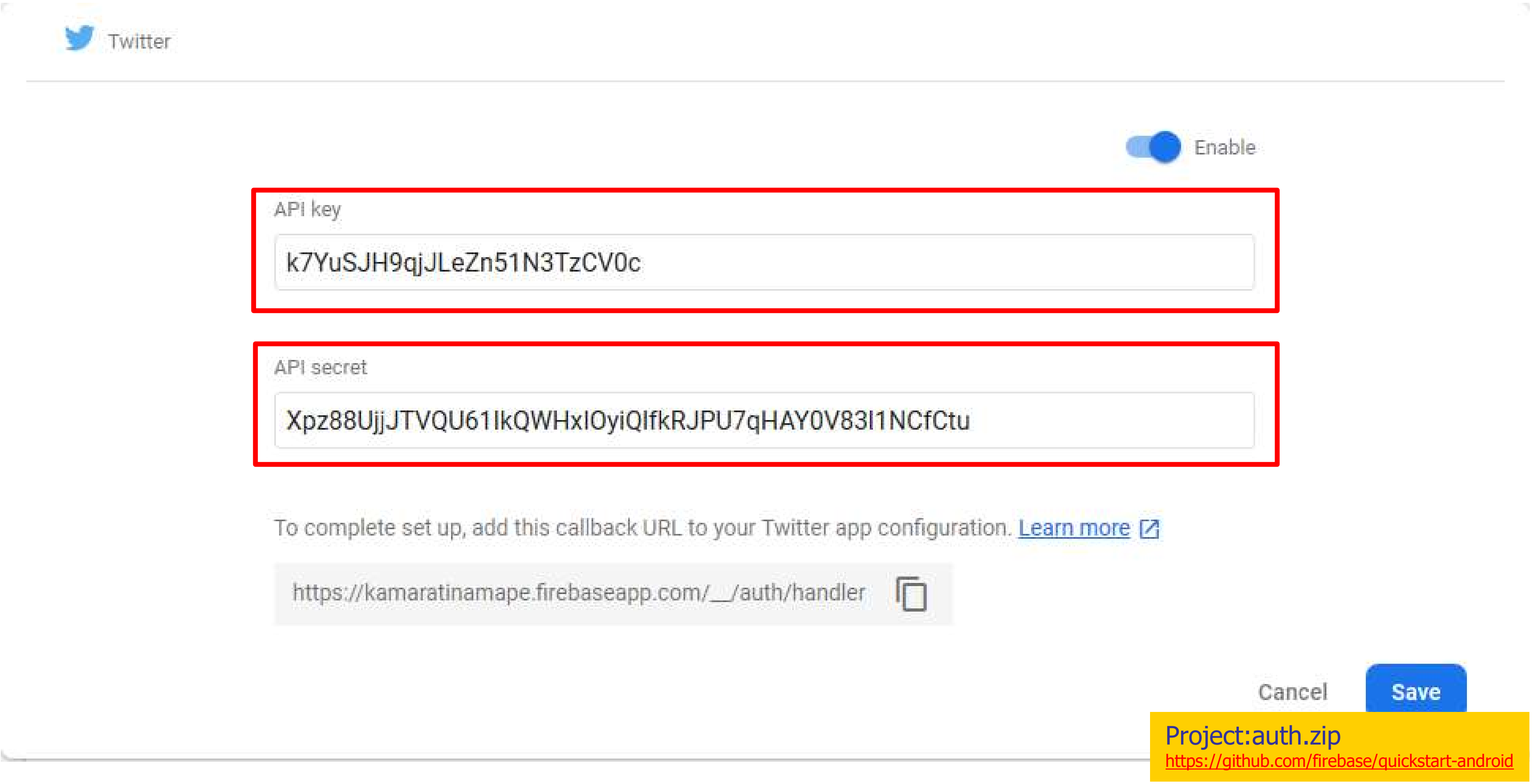
Read-only (Access level)

Project:auth.zip
https://github.com/firebase/quickstart-android

Autentifikácia cez Twitter

https://developer.twitter.com/en/apps/13160641

API KEY a SECRET treba vložiť do Firebase Console pre Twitter Authentification



API key

k7YuSJH9qjJLeZn51N3TzCV0c

API secret

Xpz88UjjJTVQU61IkQWHxIOyiQIfkRJPU7qHAY0V83I1NCfCtu

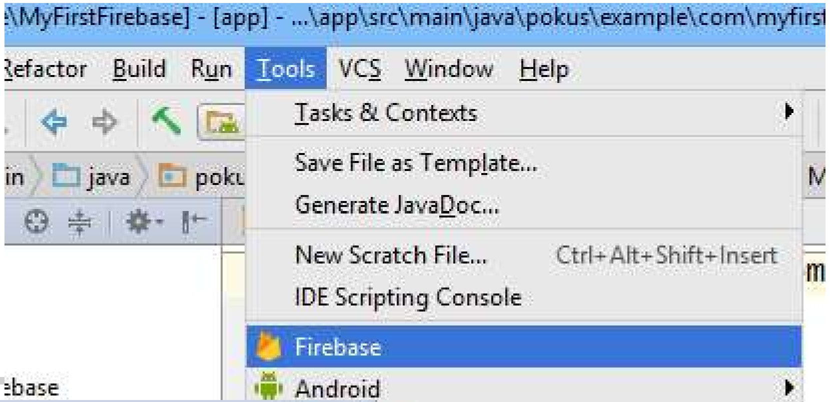
To complete set up, add this callback URL to your Twitter app configuration. Learn more

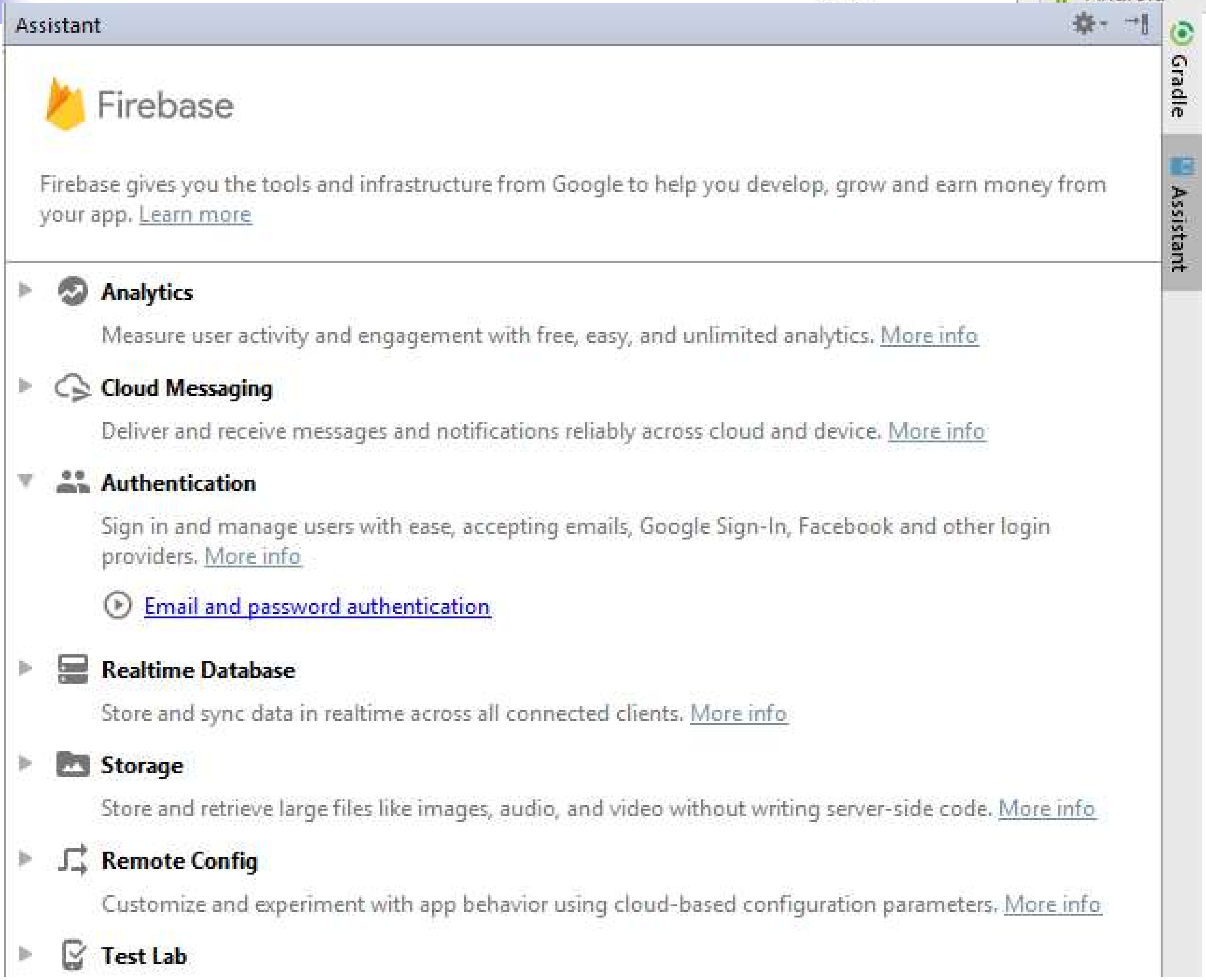
https://kamaratinamape.firebaseapp.com/__/auth/handler

Project:auth.zip

https://github.com/firebase/quickstart-android

Firebase v AS





Firebase

Firebase gives you the tools and infrastructure from Google to help you develop, grow and earn money from your app. Learn more

Analytics

Measure user activity and engagement with free, easy, and unlimited analytics. More info

Cloud Messaging

Deliver and receive messages and notifications reliably across cloud and device. More info

Authentication

Sign in and manage users with ease, accepting emails, Google Sign-In, Facebook and other login providers. More info

Email and password authentication

Realtime Database

Store and sync data in realtime across all connected clients. More info

Storage

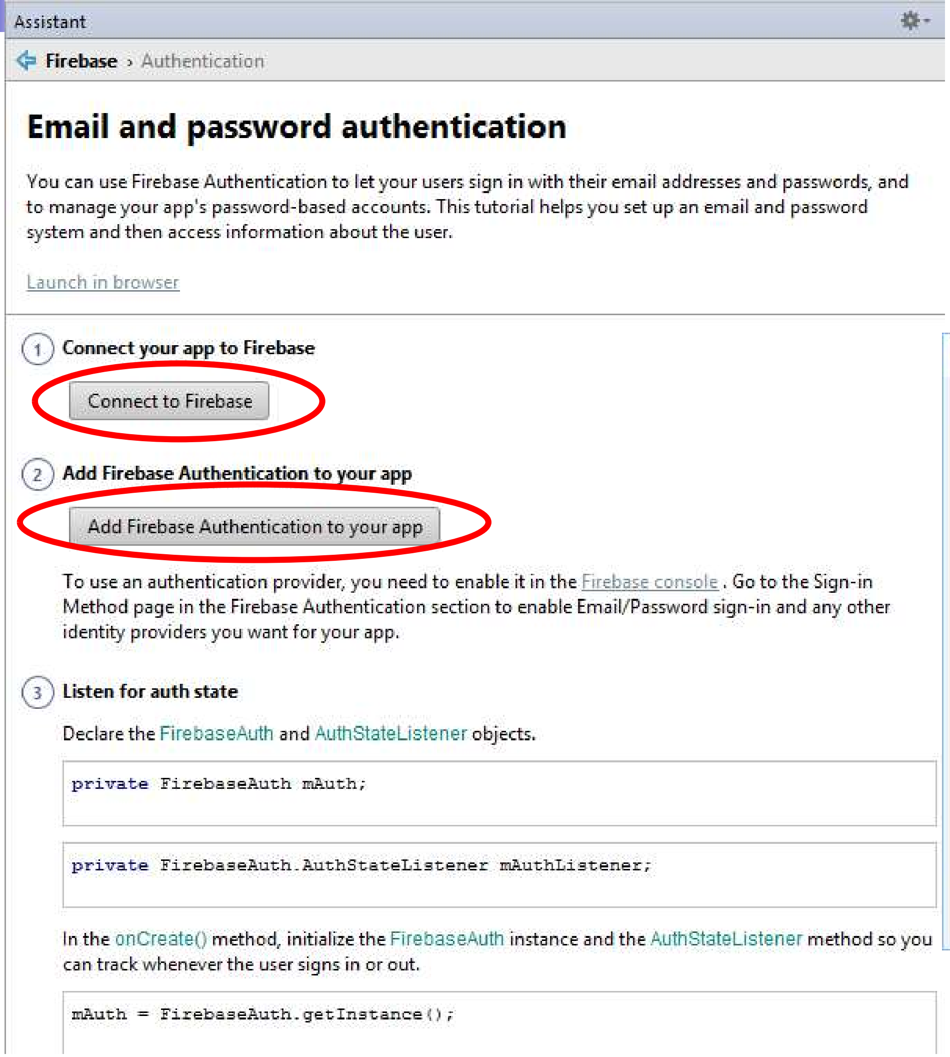
Store and retrieve large files like images, audio, and video without writing server-side code. More info

Remote Config

Customize and experiment with app behavior using cloud-based configuration parameters. More info

Test Lab

Autentifikačný kit v AS



Assistant

Firebase › Authentication

Email and password authentication

You can use Firebase Authentication to let your users sign in with their email addresses and passwords, and to manage your app's password-based accounts. This tutorial helps you set up an email and password system and then access information about the user.

Launch in browser

1. Connect your app to Firebase

2. Add Firebase Authentication to your app

To use an authentication provider, you need to enable it in the Firebase console. Go to the Sign-in Method page in the Firebase Authentication section to enable Email/Password sign-in and any other identity providers you want for your app.

3. Listen for auth state

Declare the FirebaseAuth and AuthStateListener objects.

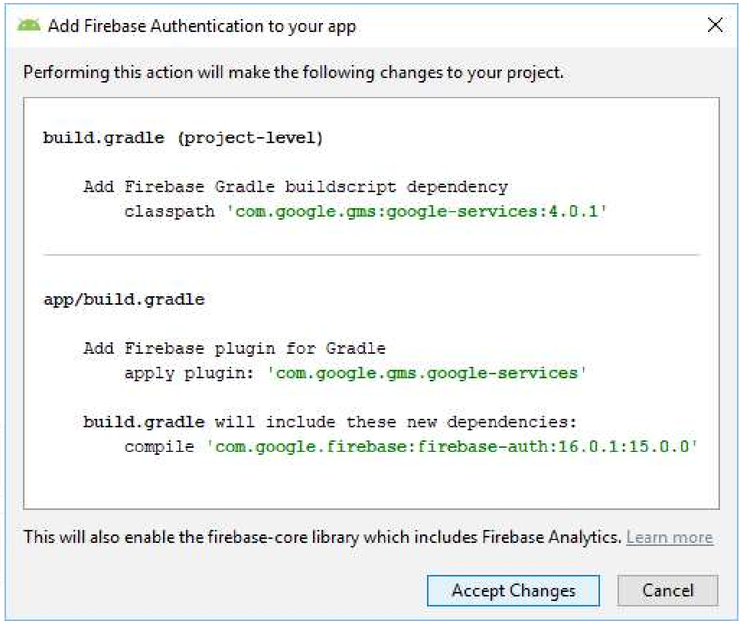
```
private FirebaseAuth mAuth;
```

```
private FirebaseAuth.AuthStateListener mAuthListener;
```

In the onCreate() method, initialize the FirebaseAuth instance and the AuthStateListener method so you can track whenever the user signs in or out.

```
mAuth = FirebaseAuth.getInstance();
```

Ponúka vám to step-by-step návod na vytvorenie rôznych typov Firebase aplikácií



Add Firebase Authentication to your app

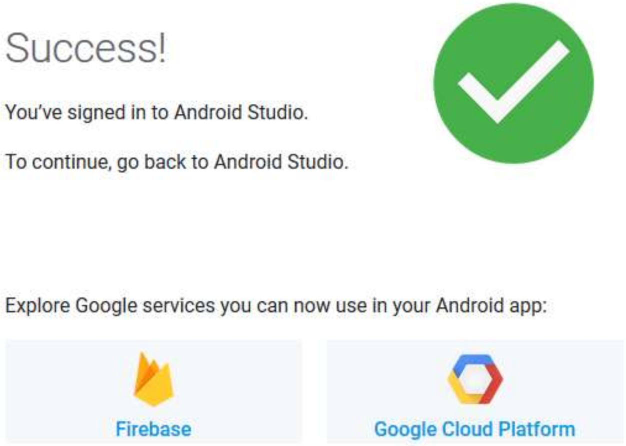
Performing this action will make the following changes to your project.

```
build.gradle (project-level)

    Add Firebase Gradle buildscript dependency
        classpath 'com.google.gms:google-services:4.0.1'

app/build.gradle

    Add Firebase plugin for Gradle
        apply plugin: 'com.google.gms.google-services'

    build.gradle will include these new dependencies:
        compile 'com.google.firebase:firebase-auth:16.0.1:15.0.0'
```

This will also enable the firebase-core library which includes Firebase Analytics. Learn more

Project:FBDemo

1) Connect your app to Firebase

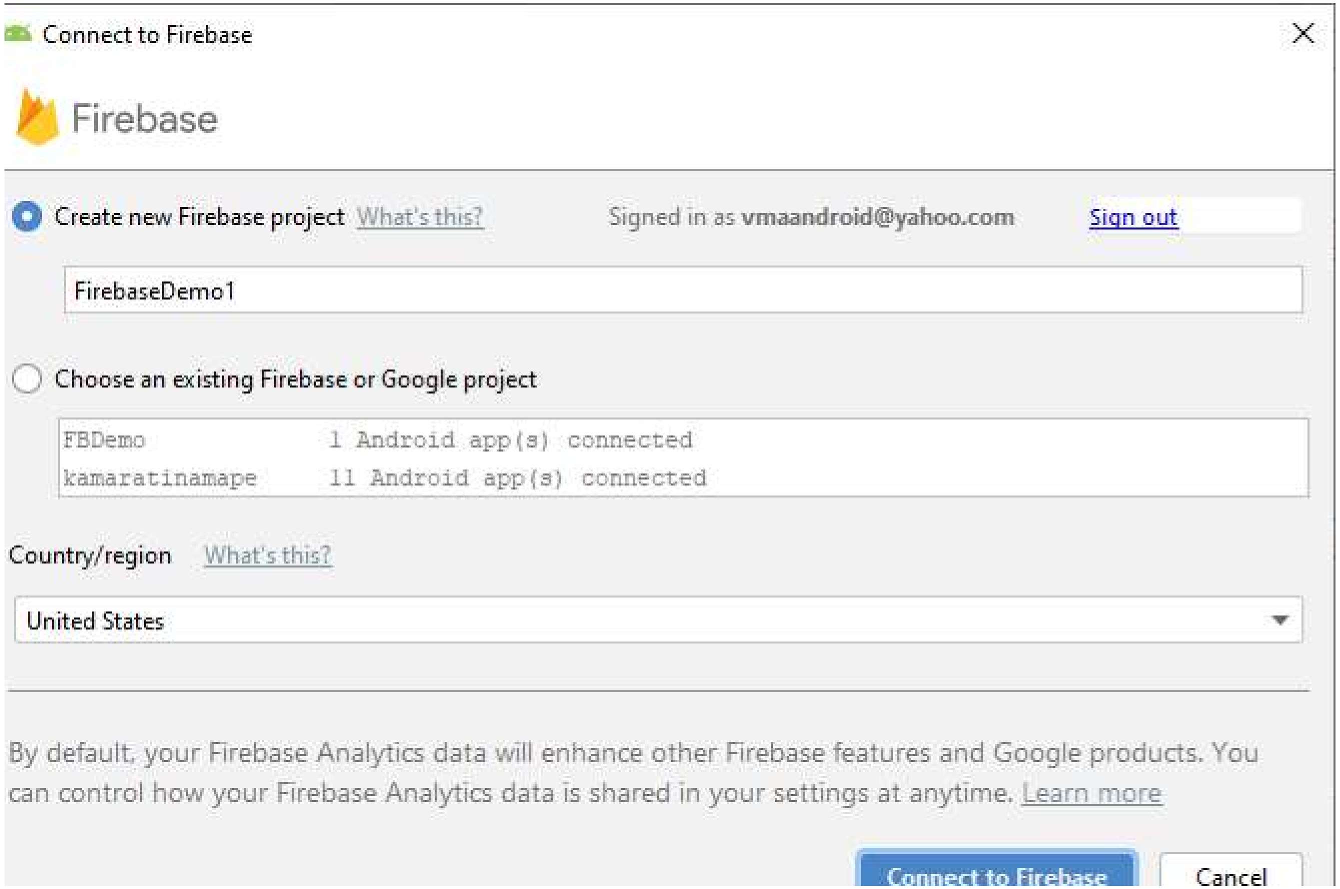


Success!

You've signed in to Android Studio.

To continue, go back to Android Studio.

Explore Google services you can now use in your Android app:



Connect to Firebase

Firebase

● Create new Firebase project What's this? Signed in as **vmaandroid@yahoo.com** Sign out

FirebaseDemo1

○ Choose an existing Firebase or Google project

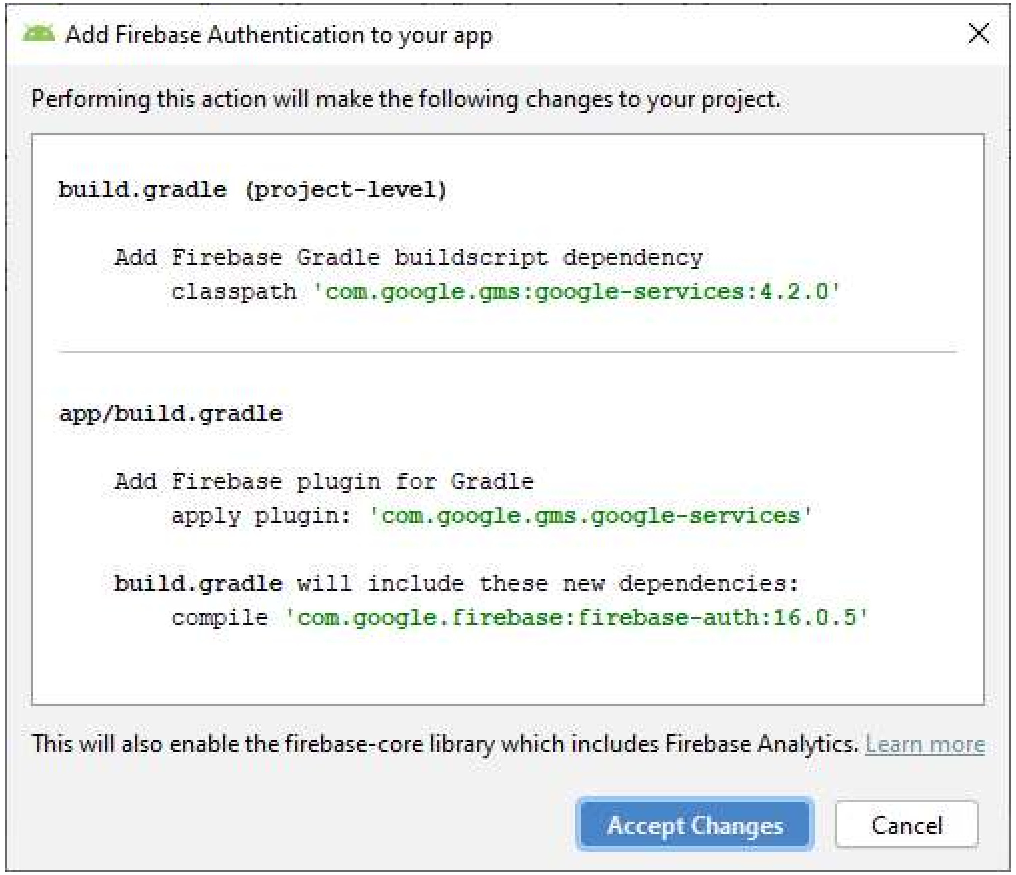
```
FBDemo              1 Android app(s) connected
kamaratinamape      11 Android app(s) connected
```

Country/region What's this?

United States

By default, your Firebase Analytics data will enhance other Firebase features and Google products. You can control how your Firebase Analytics data is shared in your settings at anytime. Learn more

2) Add Firebase Auth to your app



Performing this action will make the following changes to your project.

```
build.gradle (project-level)

    Add Firebase Gradle buildscript dependency
        classpath 'com.google.gms:google-services:4.2.0'

app/build.gradle

    Add Firebase plugin for Gradle
        apply plugin: 'com.google.gms.google-services'

    build.gradle will include these new dependencies:
        compile 'com.google.firebase:firebase-auth:16.0.5'
```

This will also enable the firebase-core library which includes Firebase Analytics. Learn more

Firebase Email Authentification

sign-up new user

```
mAuth.createUserWithEmailAndPassword(email, password)
  .addOnCompleteListener(this, object:
     OnCompleteListener<AuthResult> {
        override fun onComplete(task: Task<AuthResult>) {
            if (task.isSuccessful()) { // Sign in success, update
              Log.d(TAG, "createUserWithEmail:success")
              val user = mAuth.currentUser
            } else { // If sign in fails,
              Log.w(TAG, "createUserWithEmail:failure",
                   task.getException())
            }
        }
    })
```

Project:FirebaseDemo1

Firebase Email Authentification

sign-in an existing user

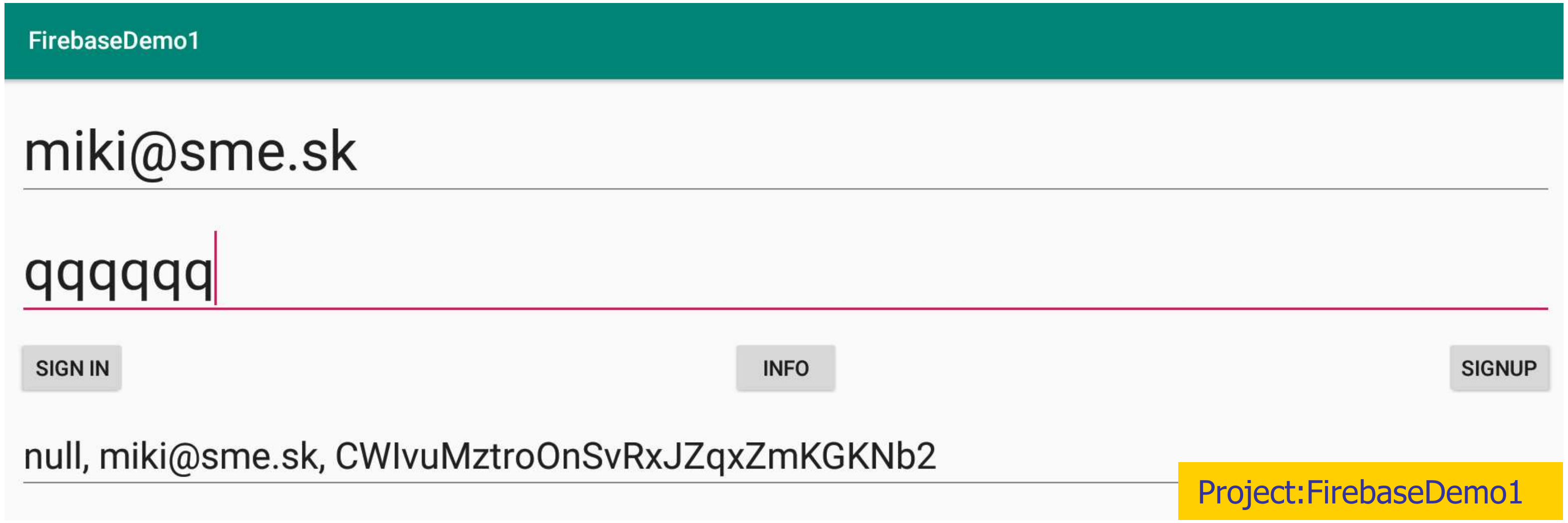
```
mAuth.signInWithEmailAndPassword(email, password)
    .addOnCompleteListener(this) { task ->
       if (task.isSuccessful) { // Sign in success
            Log.d(TAG, "signInWithEmail:success")
            val user = mAuth.currentUser
       } else { // If sign in fails
            Log.w(TAG, "signInWithEmail:failure", task.exception)
       }
}
```

Project:FirebaseDemo1

Firebase Email Authentification

get user info

```
val user = FirebaseAuth.getInstance().currentUser
if (user != null) { // Name, email address, and profile photo Url
    val name = user.displayName
    val email = user.email
    val photoUrl: Uri? = user.photoUrl
    val emailVerified = user.isEmailVerified
    val uid = user.uid
    infoTV.setText("$name, $email, $uid")
}
```



miki@sme.sk

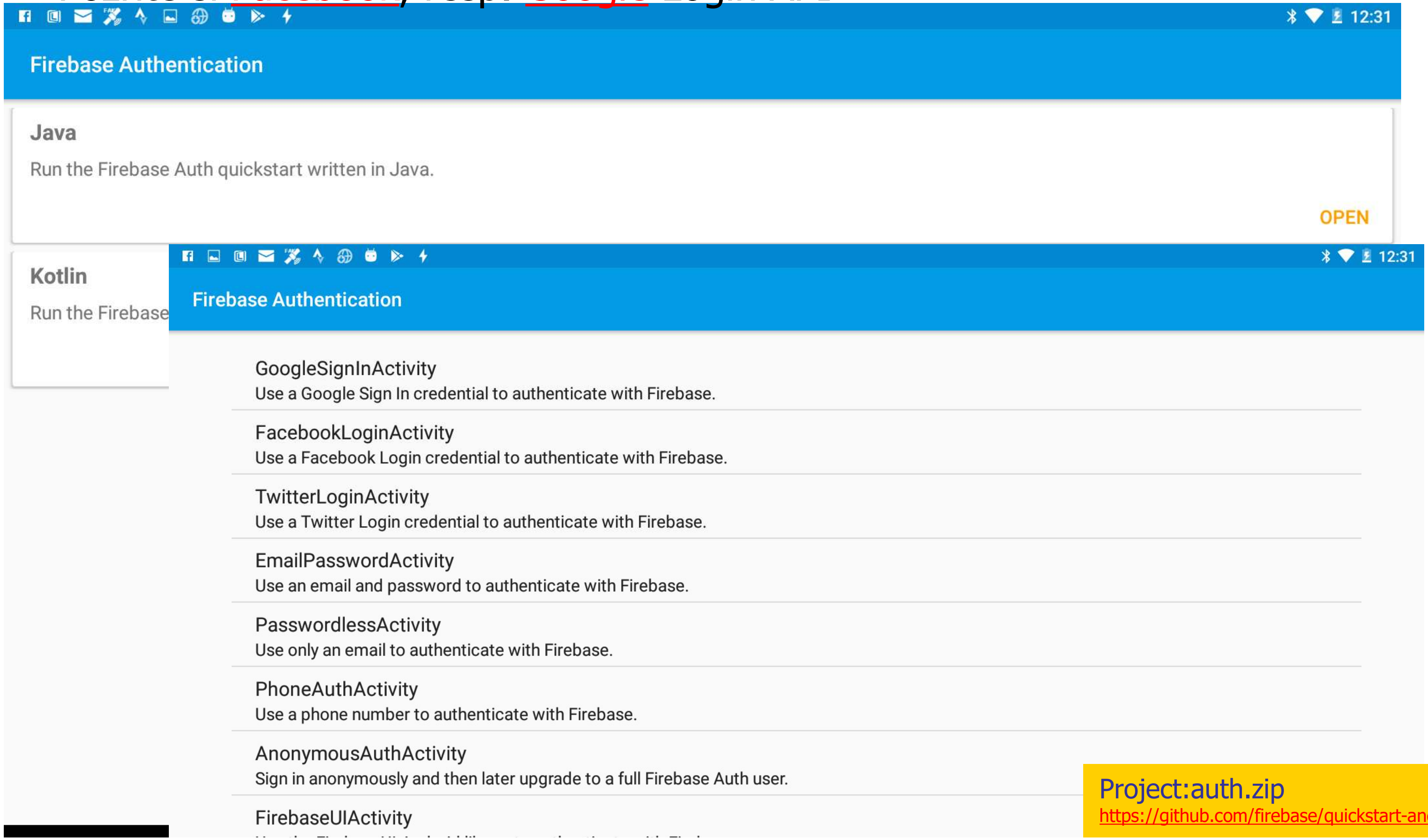
qqqqqq

```
null, miki@sme.sk, CWIvuMztroOnSvRxJZqxZmKGKNb2
```

Project:FirebaseDemo1

Iná autentifikácia

Pozrite si Facebook, resp. Google Login API



12:31

Firebase Authentication

Java

Run the Firebase Auth quickstart written in Java.

OPEN

Kotlin

Run the Firebase

12:31

Firebase Authentication

GoogleSignInActivity
Use a Google Sign In credential to authenticate with Firebase.

FacebookLoginActivity
Use a Facebook Login credential to authenticate with Firebase.

TwitterLoginActivity
Use a Twitter Login credential to authenticate with Firebase.

EmailPasswordActivity
Use an email and password to authenticate with Firebase.

PasswordlessActivity
Use only an email to authenticate with Firebase.

PhoneAuthActivity
Use a phone number to authenticate with Firebase.

AnonymousAuthActivity
Sign in anonymously and then later upgrade to a full Firebase Auth user.

FirebaseUIActivity

Project:auth.zip
https://github.com/firebase/quickstart-android

Firebase ako databáza

- noSQL databázy
- **Realtime Database** (efektívna pre mobilné app, synchronizácia)
  - ukladanie a synchronizácia v reálnom čase so všetkými pripojenými klientami
  - všetky dáta sú jeden veľký json dátový strom (JSON Tree)
  - existuje dávno, stabilná, **regionálne** má veľmi slušnú latenciu

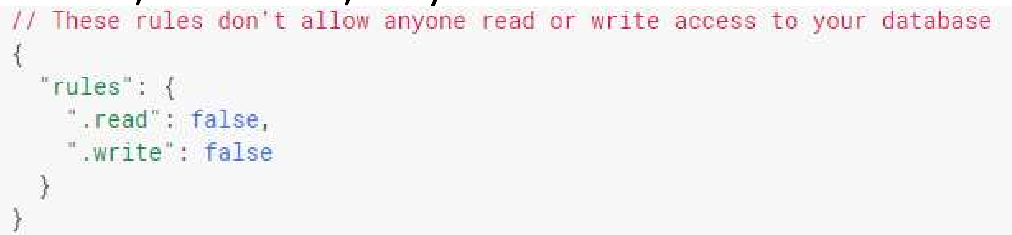
- **Cloud Firestore** (novinka)
  - Realtime updates, powerful queries, automatic scaling
  - dáta sú v kolekciách, hierarchicky organizované, subkolekcie, ...
  - novinka, beta r.2018, skalabilita, prepojenie cez viaceré dátové centrá

Obe podporujú offline support pre mobilných klientov (Android, iOS, web)
- zmeny počas off-line sa ukladajú do cache a synchronizujú, keď on-line

Realtime Database

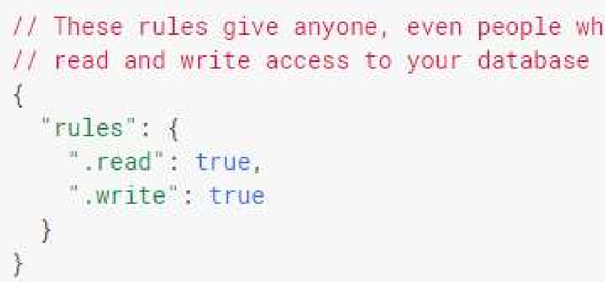
(nosql databáza)
Rules

- Default, no access, only FB console



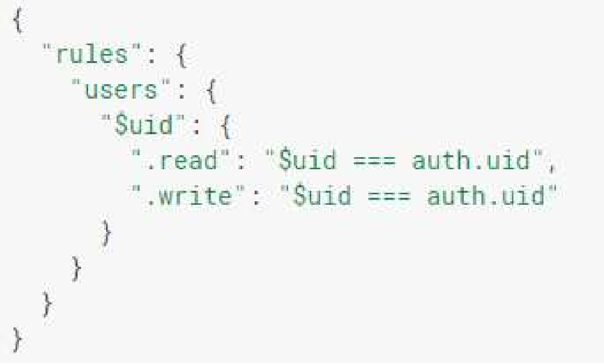
```
// These rules don't allow anyone read or write access to your database
{
  "rules": {
    ".read": false,
    ".write": false
  }
}
```

- Public, anyone can...

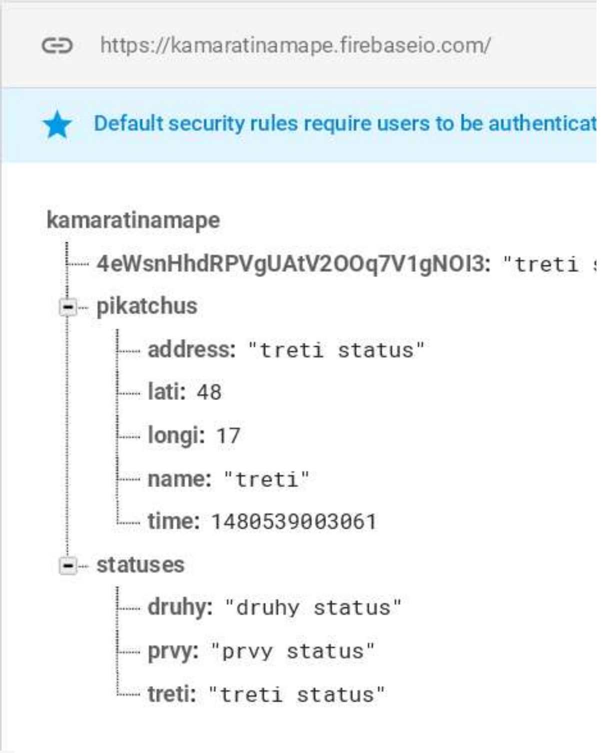


```
// These rules give anyone, even people who are not users of your app,
// read and write access to your database
{
  "rules": {
    ".read": true,
    ".write": true
  }
}
```

- FB/Google/Git Authentified only



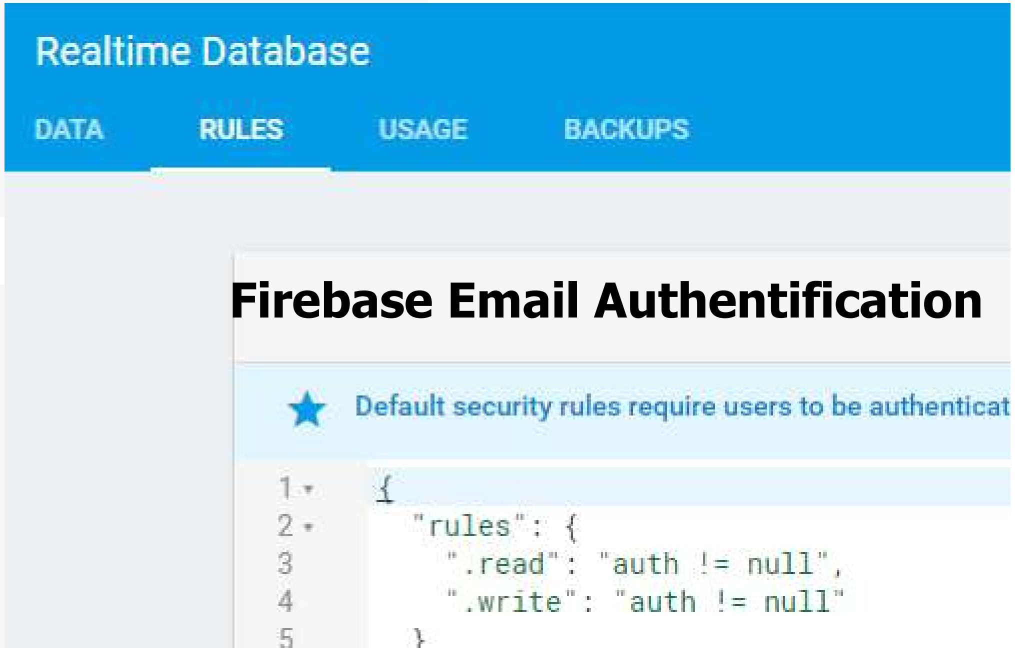
```
{
  "rules": {
    "users": {
      "$uid": {
        ".read": "$uid === auth.uid",
        ".write": "$uid === auth.uid"
      }
    }
  }
}
```



https://kamaratinamape.firebaseio.com/

Default security rules require users to be authenticat

```
kamaratinamape
├─ 4eWsnHhdRPVgUAtV2O0q7V1gNOI3: "treti s
├─ pikatchus
│   ├─ address: "treti status"
│   ├─ lati: 48
│   ├─ longi: 17
│   ├─ name: "treti"
│   └─ time: 1480539003061
└─ statuses
    ├─ druhy: "druhy status"
    ├─ prvy: "prvy status"
    └─ treti: "treti status"
```

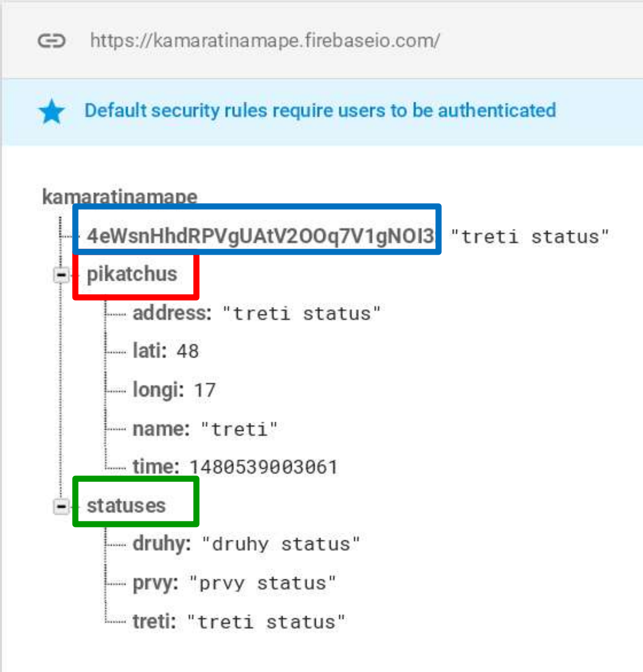


Firebase Email Authentification

Default security rules require users to be authenticat

```
{
  "rules": {
    ".read": "auth != null",
    ".write": "auth != null"
  }
```

Realtime Database
(zápis)



https://kamaratinamape.firebaseio.com/

Default security rules require users to be authenticated

```
kamaratinamape
├─ 4eWsnHhdRPVgUAtV2O0q7V1gNOI3: "treti status"
├─ pikatchus
│   ├─ address: "treti status"
│   ├─ lati: 48
│   ├─ longi: 17
│   ├─ name: "treti"
│   └─ time: 1480539003061
└─ statuses
    ├─ druhy: "druhy status"
    ├─ prvy: "prvy status"
    └─ treti: "treti status"
```

```
databaseReference = FirebaseDatabase
            .getInstance()
            .reference
databaseReference.child("pikatchus")
     .setValue(Pokemon(name, address, lati, longi))
```

object

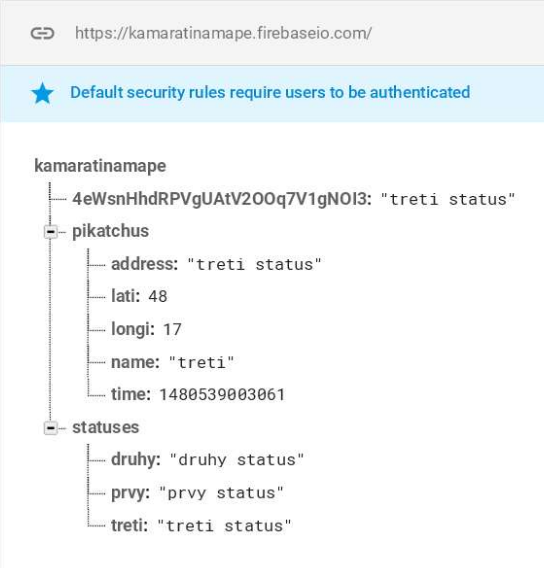
```
globalState == mutableMapOf<String,String>()
globalState[name]=status
databaseReference.child("statuses").setValue(globalState)
```

kolekcia

```
FirebaseUser user = firebaseAuth.getCurrentUser()
if (user != null) { // ak je user nalogovaný
    databaseReference.child(user.getUid()).setValue(status)
}
```

uid

Project:FirebaseDemo.zip



```
https://kamaratinamape.firebaseio.com/

★ Default security rules require users to be authenticated

kamaratinamape
├── 4eWsnHhdRPVgUAtV2OOq7V1gNOI3: "treti status"
├─ pikatchus
│   ├── address: "treti status"
│   ├── lati: 48
│   ├── longi: 17
│   ├── name: "treti"
│   └── time: 1480539003061
└─ statuses
    ├── druhy: "druhy status"
    ├── prvy: "prvy status"
    └── treti: "treti status"
```

Realtime Database

(čítanie)

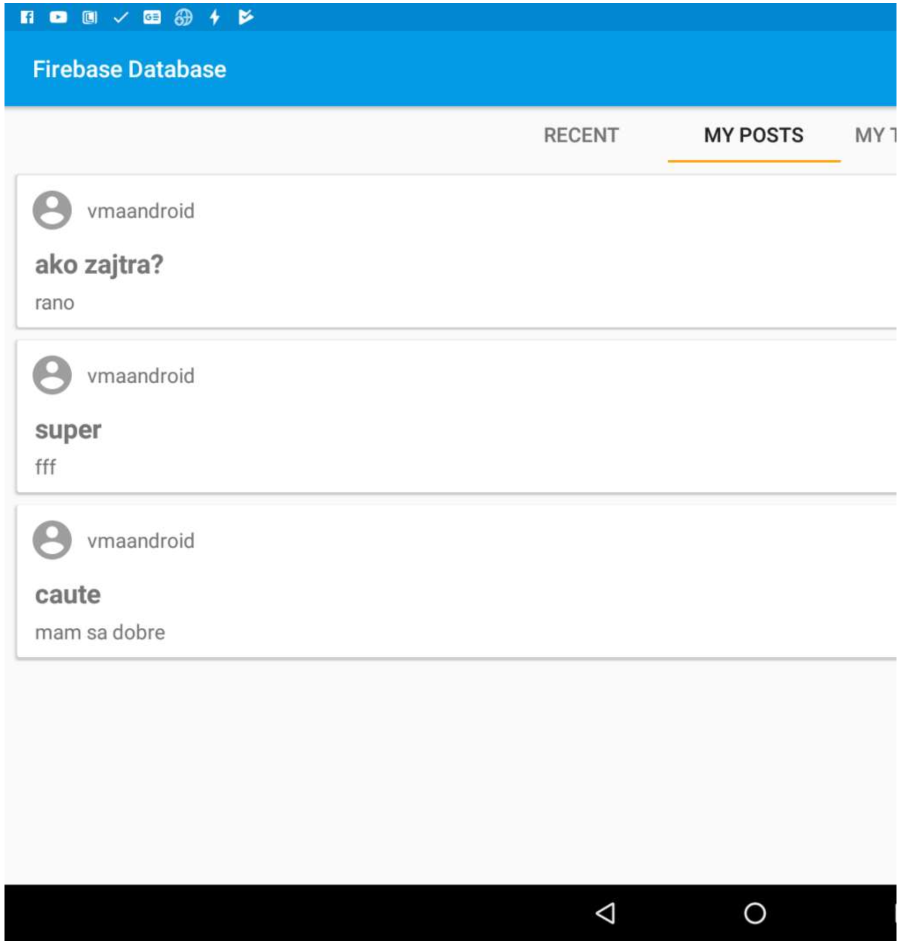
Pri akejkoľvek zmene sa zavolá listener

```
        → databaseReference.addValueEventListener(
po zápise
             object:ValueEventListener() {
               override fun onDataChange(dataSnapshot:DataSnapshot) {
                 for (child in dataSnapshot.children){ % toto sú zmeny
                   val o = child.value         % (child.key, child.value)
                   val str = "changed " + child.key + " is: "
                   val o = child.value          % zmenil sa (key,o=value)
             →     if (o is Pokemon)            % zmenil sa objekt
        object       statusMemo.append("Pokemon has ")
                   Log.d(TAG, child.key)
                   editTextMemo.append(
                      "changed ${child.key} is: ${o.toString()}\n")
                 }
               }
             })
```

Project:FirebaseDemo.zip

Firebase Database

(vyskúšajte si)



Firebase Database

vmaandroid

ako zajtra?

rano

vmaandroid

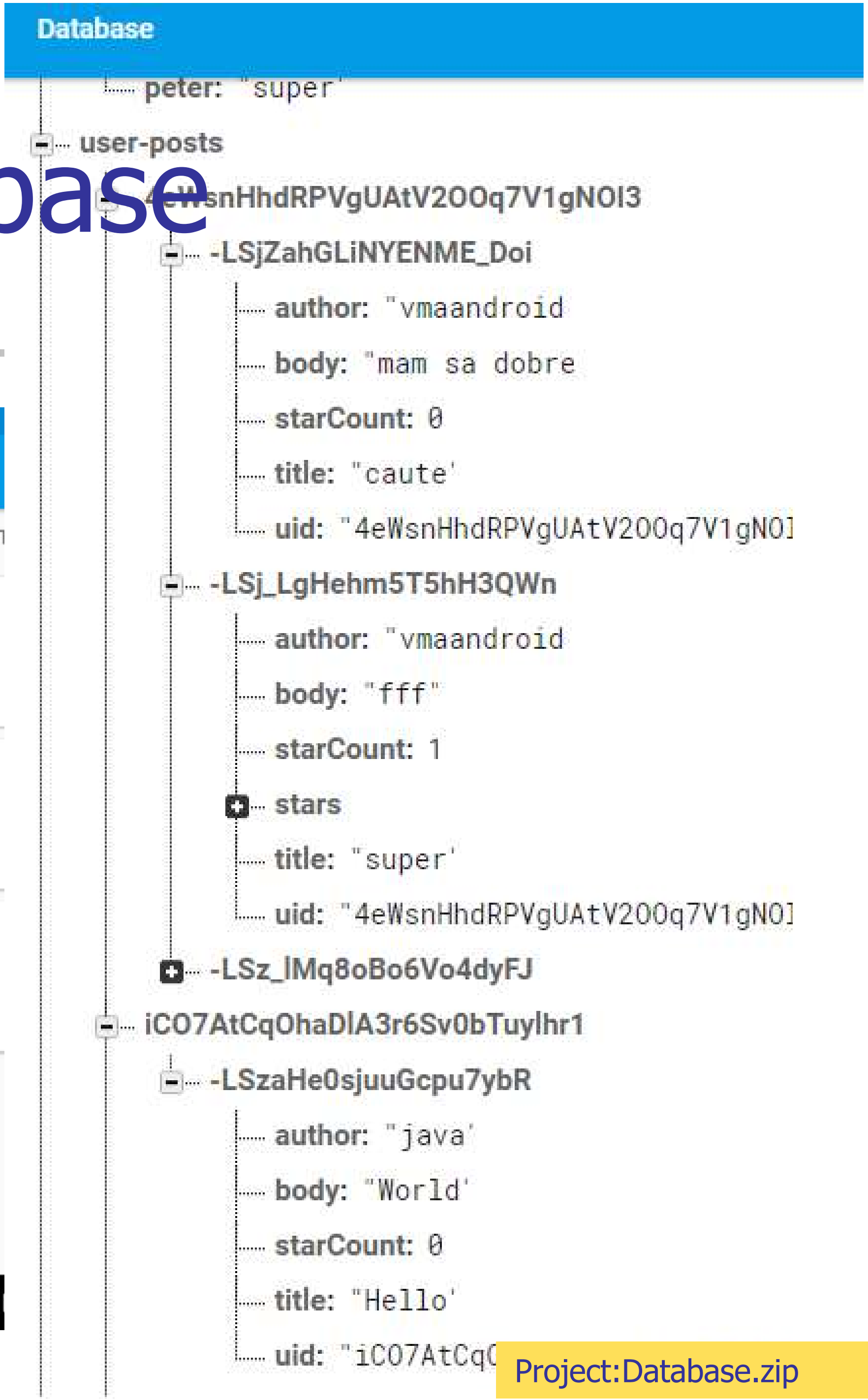
super

fff

vmaandroid

caute

mam sa dobre



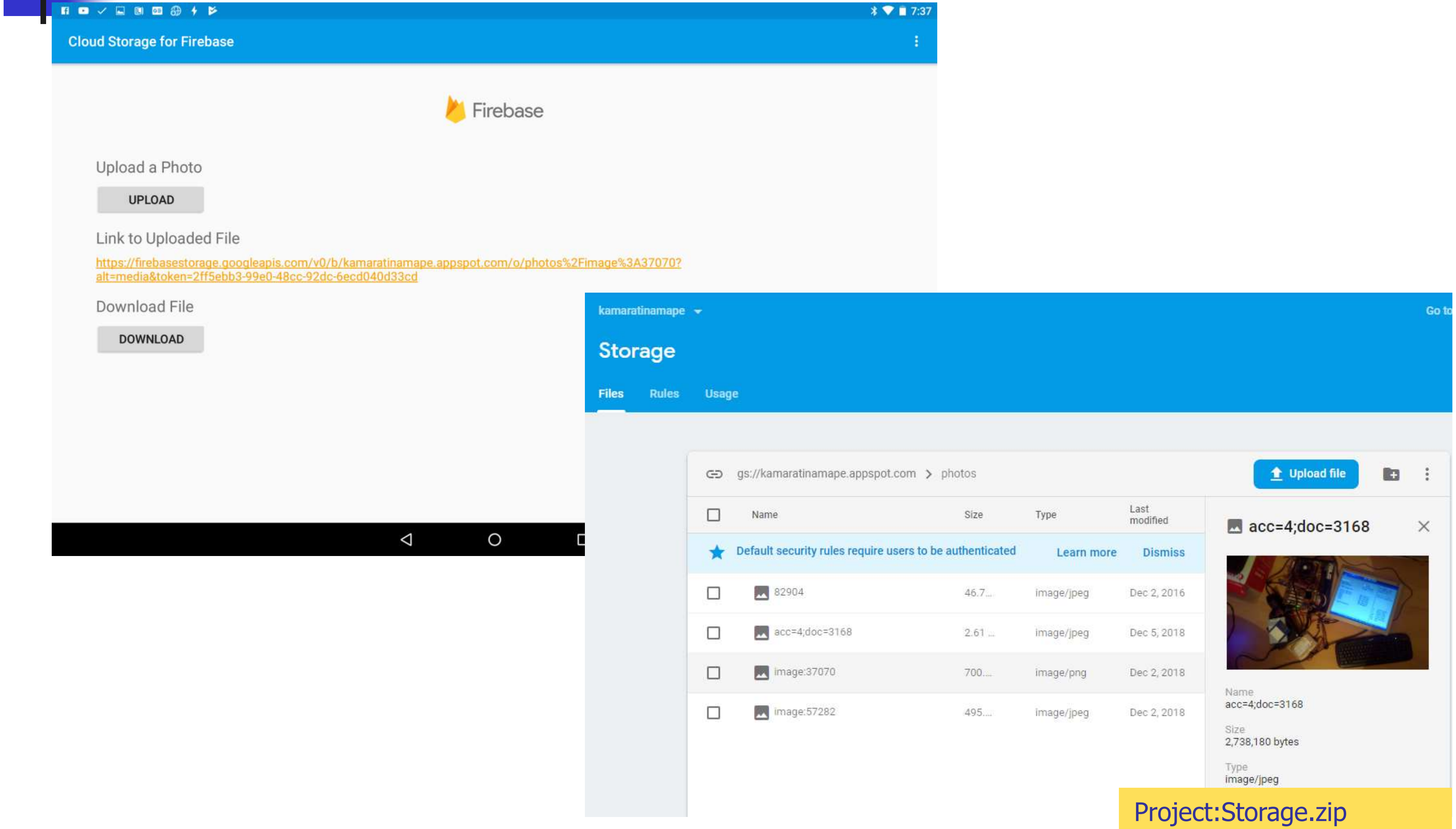
Database

```
  └─ peter: "super"
⊟─ user-posts
   ⊟─ 4eWsnHhdRPVgUAtV2OOq7V1gNOI3
      ⊟─ -LSjZahGLiNYENME_Doi
         ├─ author: "vmaandroid
         ├─ body: "mam sa dobre
         ├─ starCount: 0
         ├─ title: "caute"
         └─ uid: "4eWsnHhdRPVgUAtV2OOq7V1gNOI
      ⊟─ -LSj_LgHehm5T5hH3QWn
         ├─ author: "vmaandroid
         ├─ body: "fff"
         ├─ starCount: 1
         ⊞─ stars
         ├─ title: "super"
         └─ uid: "4eWsnHhdRPVgUAtV2OOq7V1gNOI
      ⊞─ -LSz_lMq8oBo6Vo4dyFJ
   ⊟─ iCO7AtCqOhaDlA3r6Sv0bTuylhr1
      ⊟─ -LSzaHe0sjuuGcpu7ybR
         ├─ author: "java"
         ├─ body: "World"
         ├─ starCount: 0
         ├─ title: "Hello"
         └─ uid: "iCO7AtCq(
```

Project:Database.zip

Firebase Storage

(vyskúšajte si)



Cloud Storage for Firebase

Firebase

Upload a Photo

UPLOAD

Link to Uploaded File

https://firebasestorage.googleapis.com/v0/b/kamaratinamape.appspot.com/o/photos%2Fimage%3A37070?alt=media&token=2ff5ebb3-99e0-48cc-92dc-6ecd040d33cd

Download File

DOWNLOAD

kamaratinamape

Storage

Files Rules Usage

gs://kamaratinamape.appspot.com > photos

Upload file

Default security rules require users to be authenticated — Learn more — Dismiss

Name	Size	Type	Last modified
82904	46.7...	image/jpeg	Dec 2, 2016
acc=4;doc=3168	2.61 ...	image/jpeg	Dec 5, 2018
image:37070	700...	image/png	Dec 2, 2018
image:57282	495...	image/jpeg	Dec 2, 2018

acc=4;doc=3168

Name
acc=4;doc=3168

Size
2,738,180 bytes

Type
image/jpeg

Project:Storage.zip

Firebase Cloud Messaging
(vyskúšajte si)

- Firebase Messaging – push notifikácie
- cross-platform (iOS, Android, …)
- payload of up to 4kB to client app.

- Notification messages – when app is in the **background**

```
{"message":{
   "token":" chLzRZ59Svk:APA91bGEy41ulMs3qQnThxYL6VWJAOu61pIHWkGTUEHQe4rWlyWL9yutLHxiwmgYdstis7T54I68yKhwZj95TnKXjUynd4rt2oLQ1gPAaIa249g2-h4MKSg7Xkgie8uCVPx8sbB_itLr",
   "notification":{
     "title":"Notification Test",
     "body":"test"
} } }
```

- Data messages – key/value pairs received in a callback function.

```
{"message":{
   "token":" chLzRZ59Svk:APA91bGEy41ulMs3qQnThxYL6VWJAOu61pIHWkGTUEHQe4rWlyWL9yutLHxiwmgYdstis7T54I68yKhwZj95TnKXjUynd4rt2oLQ1gPAaIa249g2-h4MKSg7Xkgie8uCVPx8sbB_itLr",
   "data":{
     "Nick" : "Peter",
     "body" : "teacher",
     "Room" : "I-18"
} } }
```

Project:Messaging.zip

Firebase Cloud Messaging

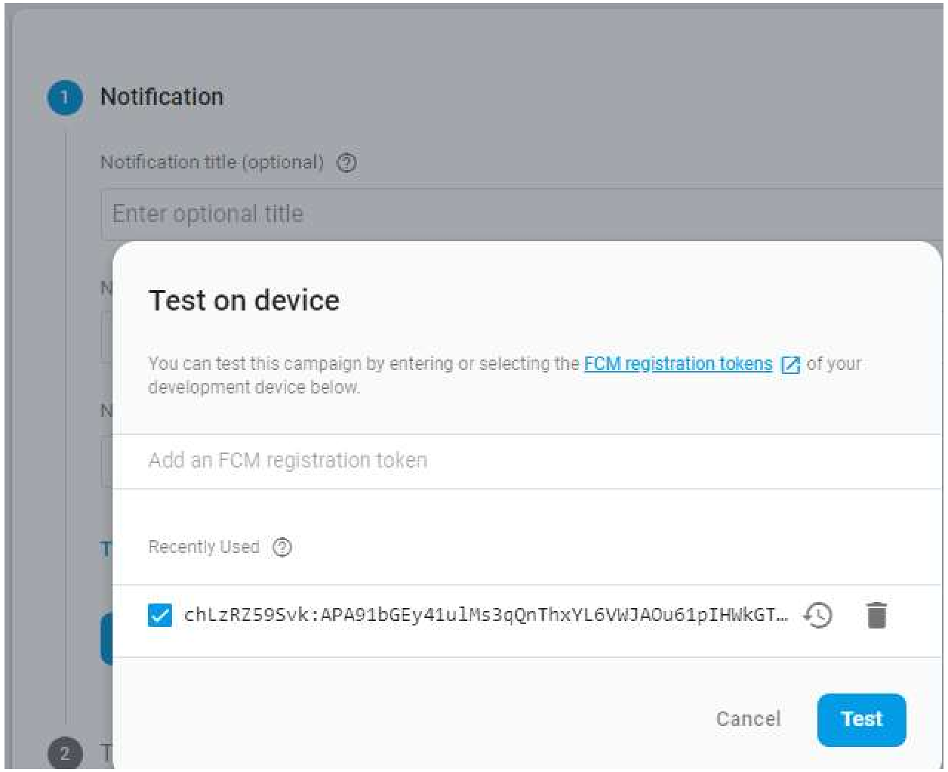
(vyskúšajte si)

Device Token

InstanceID Token:

chLzRZ59Svk:APA91bGEy41ulMs3qQnThxYL6VWJAOu61pIHWkGTUEHQe4rWlyWL9yutLHxiwmgYdstis7T54I68yKhwZj95TnKXjUynd4rt2oLQ1gPAaIa249g2-h4MKSg7Xkgie8uCVPx8sbB_itLr

Sending a test message from Firebase Console (app is in background!)



1 Notification

Notification title (optional)

Enter optional title

Test on device

You can test this campaign by entering or selecting the FCM registration tokens of your development device below.

Add an FCM registration token

Recently Used

☑ chLzRZ59Svk:APA91bGEy41ulMs3qQnThxYL6VWJAOu61pIHWkGT…

Project:Messaging.zip