Android

-

Firebase

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KAI, I-18

MS-Teams: 2sf3ph4, List, github

borovan 'at' ii.fmph.uniba.sk

- **Room**
  - **@Database**
  - **@Entity**
  - **@Dao**

- **Firebase**
  - **Authentification**
    - **Email/Password, Google, FB, Twitter**
  - **Realdatabase**
  - **Storage**
  - **Notifications**

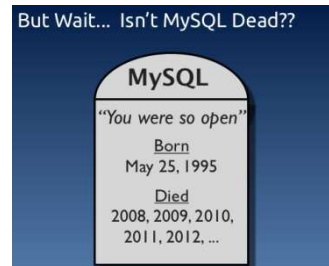# Kam (inam) uložiť naše dáta

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

But Wait... Isn't MySQL Dead??

MySQL
"You were so open"
Born
May 25, 1995
Died
2008, 2009, 2010,
2011, 2012, ...

PHP DEAD?
IS PHP A DYING LANGUAGE?

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)

SQLite

Parse

Firebase

Room

- je náhrada za bývalú SQLite, ktorá existuje v Androide od API-1

```
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

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'}
```

Project:CoroutinesDB.zip

@Entity

```kotlin
@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
}
```

Project:CoroutinesDB.zip

@Entity

foreignKeys/Embedded

```kotlin
@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))
)
```

```kotlin
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
)
```

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

```kotlin
@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) {
            error.value = "Student already exists"
        }
    }
}
```

@Database

```kotlin
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

Cvičenie

- Malá evidencia produktov pomocou bar code scannera

ŁAN 8584004040108

Horalka

See on Ebay

Brand	Sedita
Manufacturer	I.D.C. Holding
EAN	8584004040108
Country	Slovakia
Last Scan	Nov 25 2020 at 11:17 PM
GS1 Name	I.D.C. HOLDING, odš.závod Pečivárne
GS1 Address	Drieňová 3 Bratislava SK
Description	No description for 8584004040108
Barcode	

8 584004 040108

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 ☺
- 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

| P | kamaratin... | DEV ▾ | | 🕸 Core | ⚛ Analytics | 🗨 Push | ⚙ Settings | 💽 Docs |

⚙ General
🎗 Keys
📣 Push
🖳 Hosting
🔒 Authentication
✈ Email

🎗 Application Keys

Application ID ⑦   VngwyQzvFG66gPFzm8uRaS6SNQKdaStkVCTztmMm

Client Key ⑦   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
- Cloud Firestore
- 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
- …

https://firebase.google.com/docs?authuser=0

Firebase

- VMADemo
- Analytics

DEVELOP

- Authentication
- Database
- Storage
- Hosting
- Test Lab
- Crash Reporting

GROW

- Notifications
- Remote Config
- Dynamic Links

EARN

- AdMob
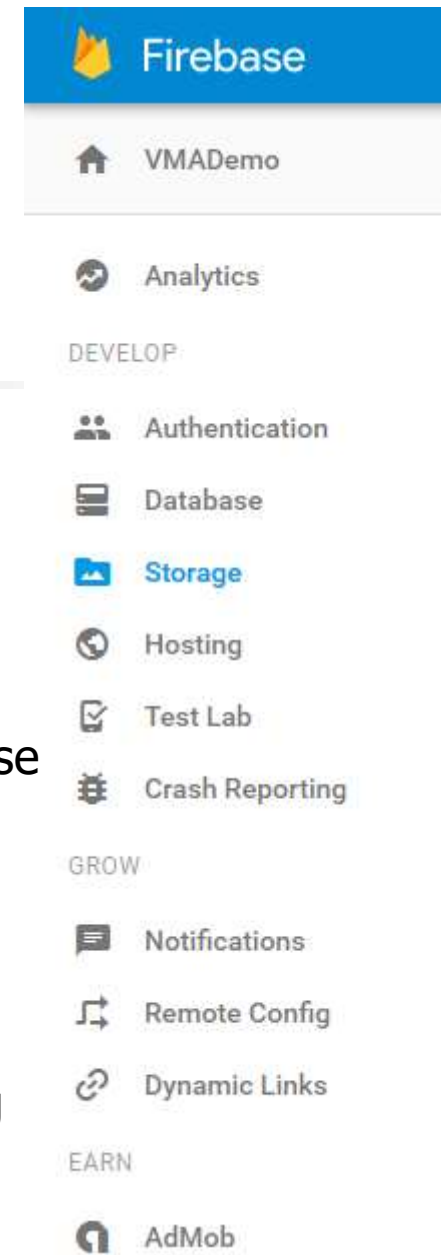
Firebase Products

Build your app

Cloud Firestore
iOS 🤖 </>

Firebase ML
iOS 🤖

Cloud Functions
iOS 🤖 </> C++ ◁

Authentication
iOS 🤖 </> C++ ◁

Hosting
</>

Cloud Storage
iOS 🤖 </> C++ ◁

Realtime Database
iOS 🤖 </> C++ ◁

Improve app quality

Crashlytics
iOS 🤖 ◁

App Distribution
iOS 🤖

Performance Monitoring
iOS 🤖 </>

Test Lab
iOS 🤖

Grow your business

Analytics
iOS 🤖 </> C++ ◁

Extensions
iOS 🤖 </> C++ ◁

Predictions
iOS 🤖 C++ ◁

Firebase A/B Testing
iOS 🤖 C++ ◁

Cloud Messaging
iOS 🤖 </> C++ ◁

In-App Messaging
iOS 🤖

Remote Config
iOS 🤖 </> C++ ◁

Dynamic Links
iOS 🤖 C++ ◁

App Indexing
iOS 🤖

Firebase Console

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

Authentication
iOS </> C++

Autentifikácia

Sign-in metódy:

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

SIGN-IN METHOD   **EMAIL TEMPLATES**

Sign-in providers

Provider	Status
✉ Email/Password	Enabled
G Google	Enabled
f 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	7v4jPhXKQBVz5zq86oUuhIkAW1t1
prostrediahm@gmail.com	G	Dec 7, 2019	Dec 7, 2019	861aiShu8OSzo8ZZv5Ms6cHU6Rl2

pre začiatok odporúčam skúsiť aplikácie z balíka

GITHUB:
quickstart-android-master

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

Authentication
iOS 🗄 </> C++ ◁

Sign-in methods

https://console.firebase.google.com/u/1/project/kamaratinamape/authentication/providers

Authentication

Users   **Sign-in method**   Templates   Usage

Sign-in providers

Provider	Status
✉ Email/Password	Enabled
📞 Phone	Disabled
G Google	Enabled
▶ Play Games	Disabled
🎮 Game Center (Beta)	Disabled
f Facebook	Enabled
🐦 Twitter	Enabled
🐙 GitHub	Disabled
Y Yahoo	Disabled
⊞ Microsoft	Disabled
🍎 Apple (Beta)	Disabled
👤 Anonymous	Enabled

Project Setting

Authentication
iOS 🗔 </> C++ ◁

Your apps

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

Add app

⬇ google-services.json

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

Add fingerprint

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
```

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

```json
{"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"
}
```

Project:FBDemo

Autentifikácia cez FB

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

f Facebook

Enable ●

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

CANCEL   SAVE

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)

Facebook Sign-in

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

f Facebook

Enable

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

Cancel   **Save**

Registrovanie appky

v project settings registrujete aplikáciu
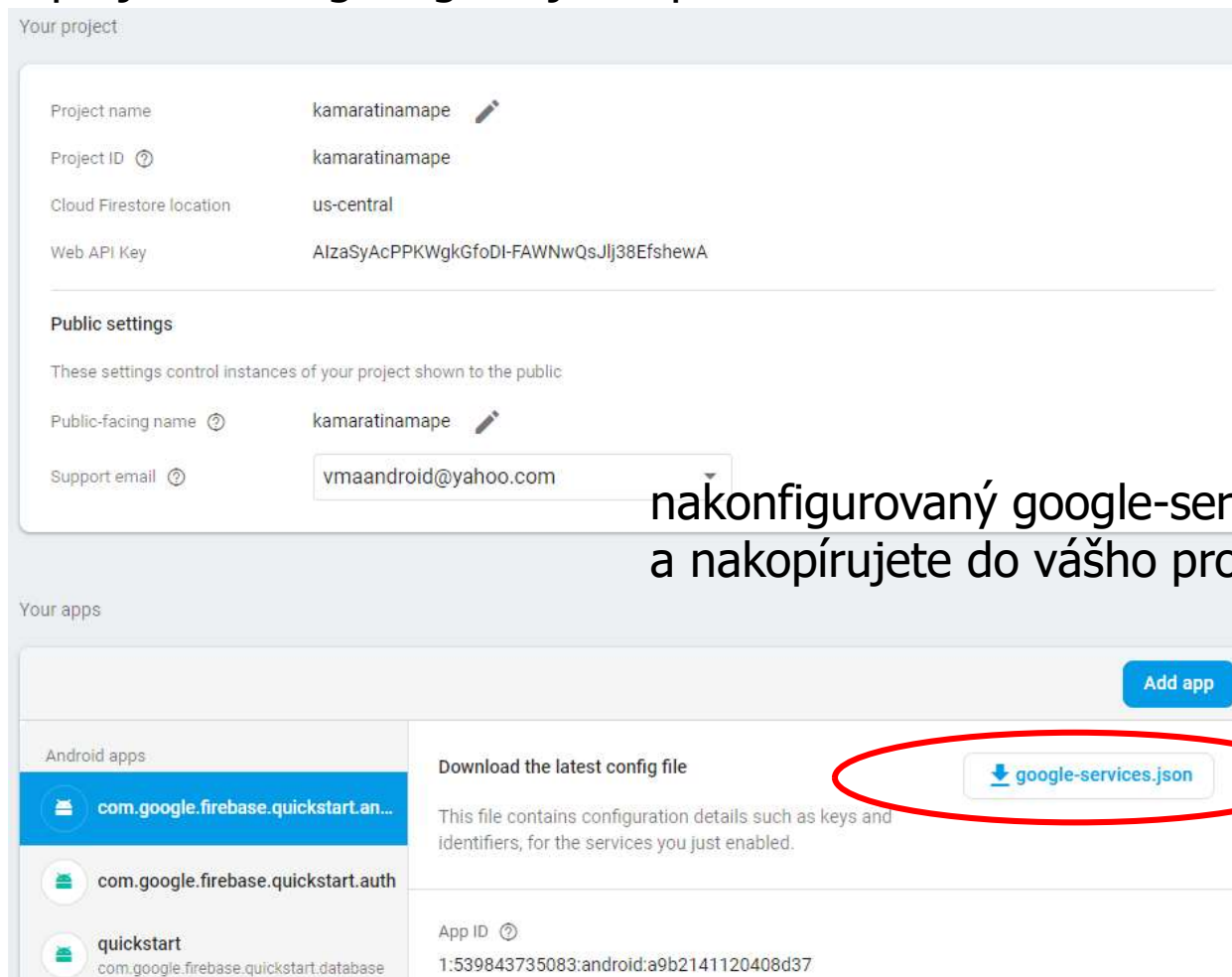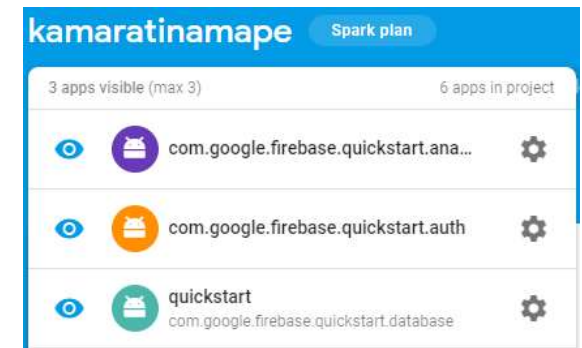
nakonfigurovaný google-services.json stiahnete
a nakopírujete do vášho projektu, do ...app/

... a skompilujete

Autentifikácia cez Google

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

⬇ google-services.json

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

App ID ⑦
1:539843735083:android:87fcb66cc6ca320a

App nickname
Add a nickname ✏

Package name
com.google.firebase.quickstart.auth

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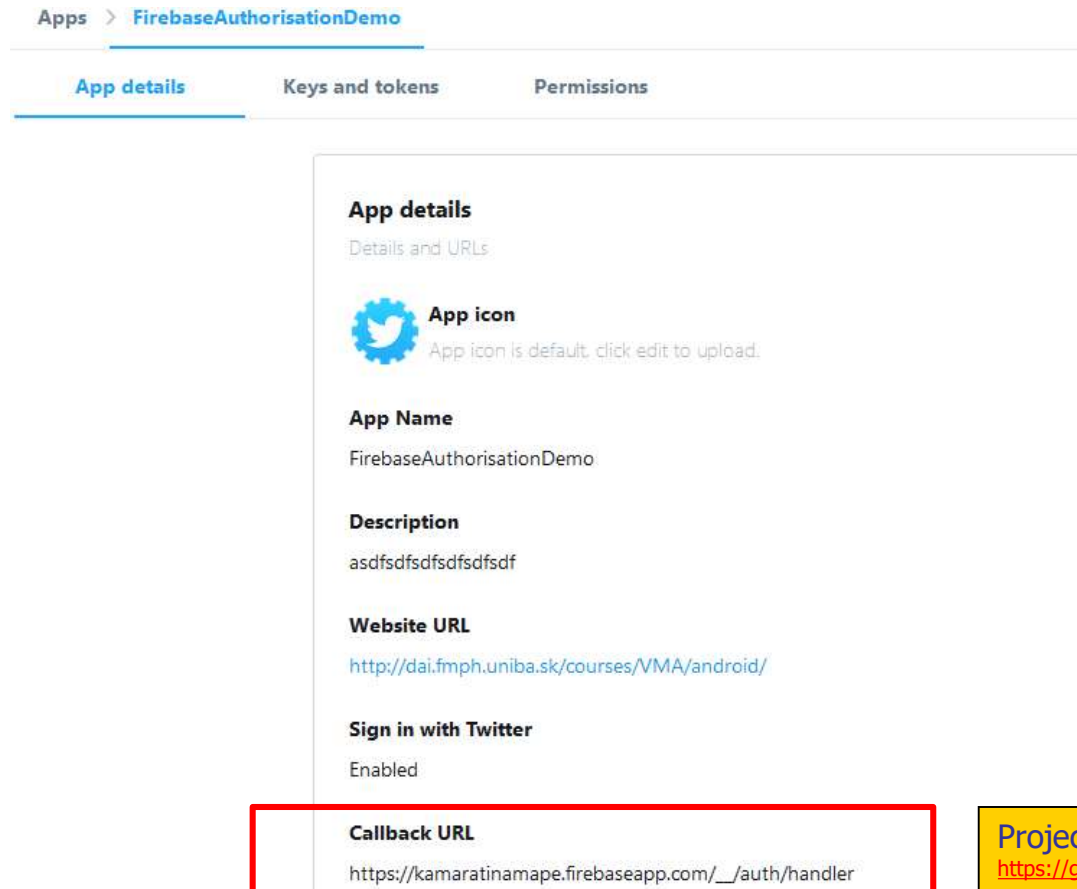
7a:94:75:11:dd:3d:57:2a:36:ed:2a:f2:76:13:a0:b8:68:0f:67:f1   SHA-1

Autentifikácia cez Twitter

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
asdfsdfsdfsdfsdfsdf

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

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 info
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)

Xpz88UjjJTVQU61IkQWHxIOyiQlfkRJPU7qHAY0V83I1NCfCtu (API secret key)

Regenerate

Access token & access token secret

492951543-CZmXbG2ad1LICjlUs8H8RJo2ZmRIWLPWK4JLtzQW (Access token)

Sp8zOMrLSAw7mCarrLnpNwmshYFj5Eonwg9JsQG8DtSn9

Read-only (Access level)

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

Autentifikácia cez Twitter

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

Twitter

◯ Enable

API key

k7YuSJH9qjJLeZn51N3TzCV0c

API secret

Xpz88UjjJTVQU61IkQWHxIOyiQIfkRJPU7qHAY0V83I1NCfCtu

To complete set up, add this callback URL to your Twitter app configuration. Learn more ↗
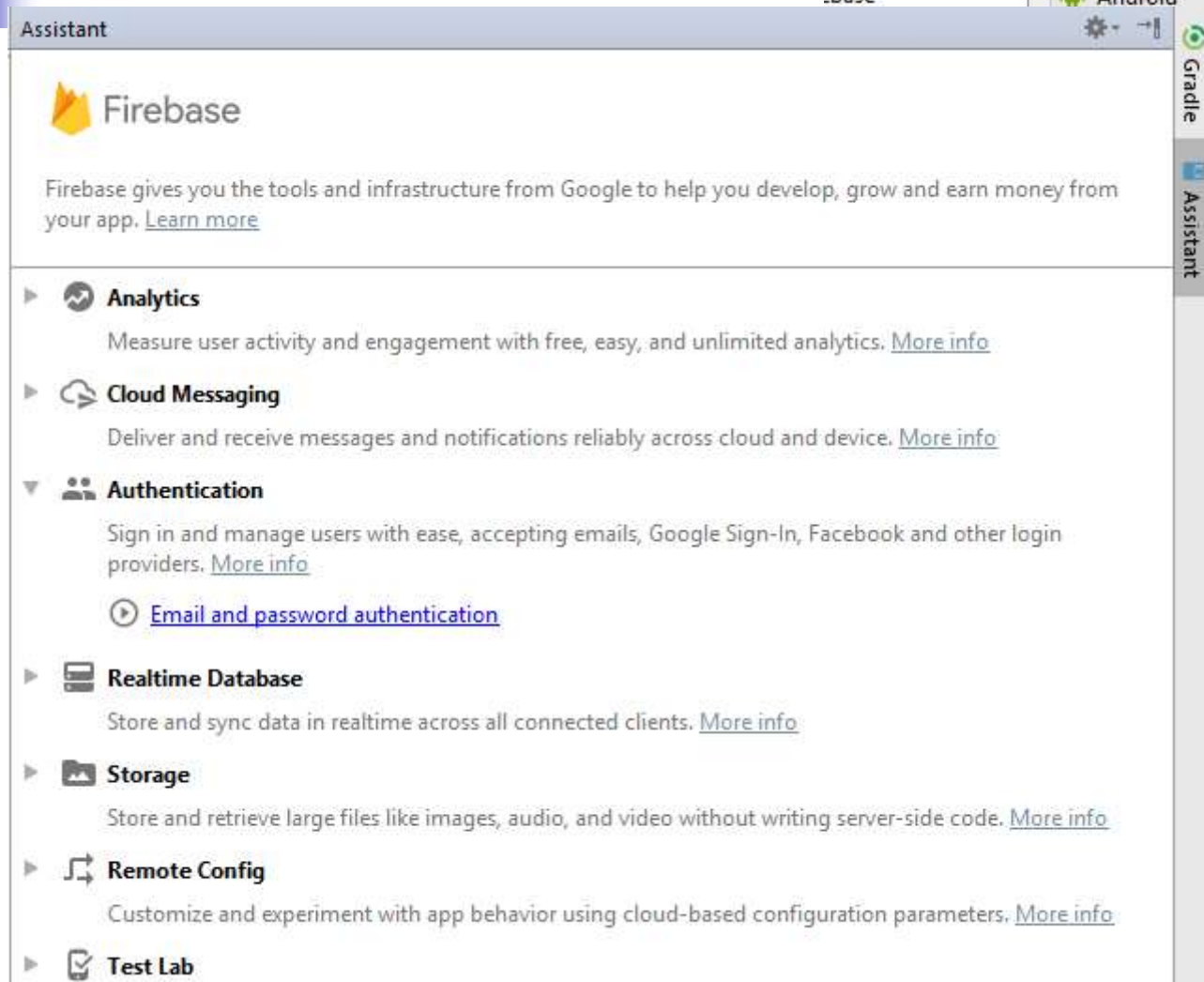
https://kamaratinamape.firebaseapp.com/__/auth/handler ⧉

Cancel   **Save**

Firebase v AS

Refactor Build Run Tools VCS Window Help

Tasks & Contexts ▶

Save File as Template...

Generate JavaDoc...

New Scratch File...   Ctrl+Alt+Shift+Insert

IDE Scripting Console

Firebase

Android ▶

Assistant

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

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

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:

Firebase   Google Cloud Platform

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

                                              Connect to Firebase   Cancel

2) Add Firebase Auth to your app
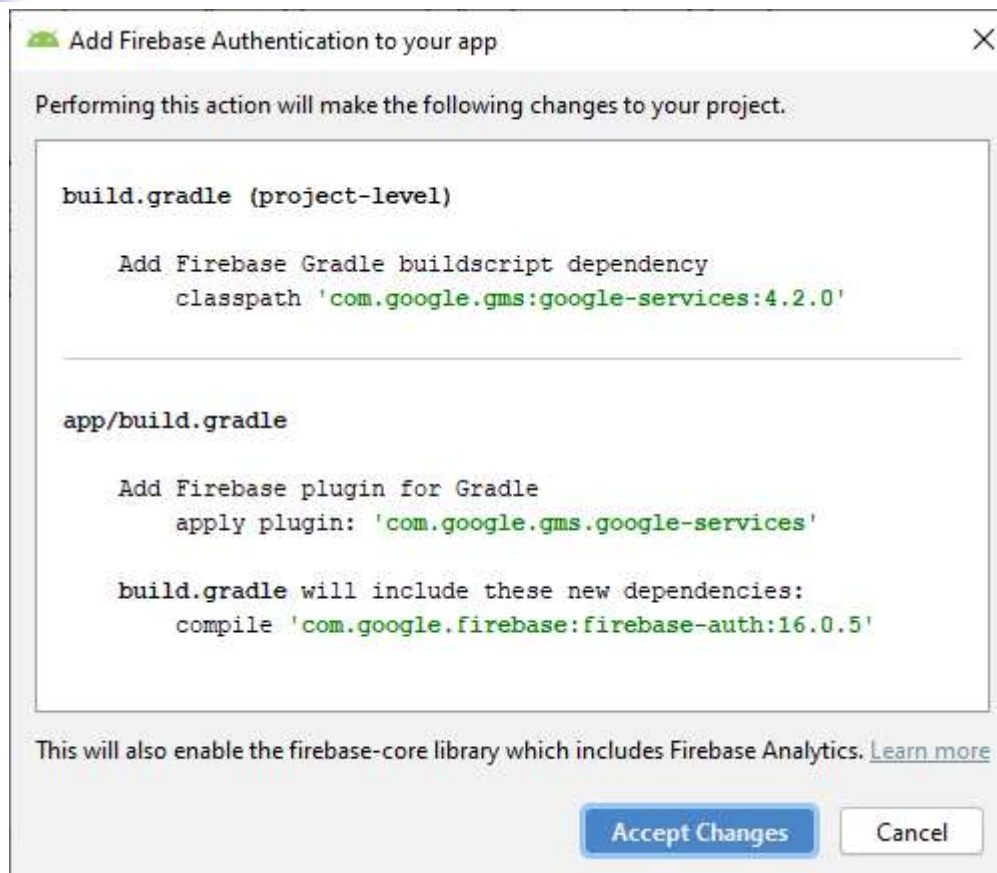
build.grade (app)

```
dependencies {
    // Firebase BoM ( https://firebase.google.com/docs/android/learn-more#bom)
    implementation platform('com.google.firebase:firebase-bom:26.1.1')

    // Firebase Authentication (Java)
    implementation 'com.google.firebase:firebase-auth'
    // Firebase Authentication (Kotlin)
    implementation 'com.google.firebase:firebase-auth-ktx'
    // Google Sign In SDK (only required for Google Sign In)
    implementation 'com.google.android.gms:play-services-auth:19.0.0'


    // Firebase UI
    // Used in FirebaseUIActivity.
    implementation 'com.firebaseui:firebase-ui-auth:7.1.1'


    // Facebook Android SDK (only required for Facebook Login)
    // Used in FacebookLoginActivity.
    implementation 'com.facebook.android:facebook-login:4.42.0'
    implementation 'androidx.browser:browser:1.3.0'
}
```

```
plugins {
    id 'com.android.application'
    id 'kotlin-android'
    id 'com.google.gms.google-services'
}
```

Project:FirebaseDemo1

build.grade (Project)

```
// Top-level build file where you can add configuration options common to all
sub-projects/modules.
buildscript {
    ext.kotlin_version = "1.3.72"
    repositories {
        google()          ←
        jcenter()
    }
    dependencies {
        classpath "com.android.tools.build:gradle:4.1.0"
        classpath 'com.google.gms:google-services:4.3.4'    ←
        classpath "org.jetbrains.kotlin:kotlin-gradle-plugin:$kotlin_version"
    }
}
allprojects {
    repositories {
        google()          ←
        jcenter()
    }
}
```

Firebase Email Authentification
sign-up new user

```kotlin
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

```kotlin
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)
        }
    }
```

Firebase Email Authentification
get user info

```kotlin
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")
}
```

FirebaseDemo1

miki@sme.sk

qqqqqq

SIGN IN   INFO   SIGNUP

null, miki@sme.sk, CWIvuMztroOnSvRxJZqxZmKGKNb2

Project:FirebaseDemo1

Iná autentifikácia

Pozrite si Facebook, resp. Google Login API

Firebase Authentication

Java
Run the Firebase Auth quickstart written in Java.

OPEN

Kotlin
Run the Firebase

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

Realtime Database
iOS </> C++

- **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

Cloud Firestore
iOS </>

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

https://kamaratinamape.firebaseio.com/

★ Default security rules require users to be authenticat

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

- 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"
      }
    }
  }
}
```

Realtime Database

DATA   RULES   USAGE   BACKUPS

Firebase Email Authentification

★ Default security rules require users to be authenticat

```
1   {
2     "rules": {
3       ".read": "auth != null",
4       ".write": "auth != null"
5     }
```

Realtime Database
(zápis)

```
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"
```

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


globalState == mutableMapOf<String,String>()

globalState[name]=status

databaseReference.child("statuses").setValue(globalState)


FirebaseUser user = firebaseAuth.getCurrentUser()

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

object →

kolekcia →

uid →

Project:FirebaseDemo3.zip

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
                statusMemo.append("Pokemon has ")
            Log.d(TAG, child.key)
            editTextMemo.append(
                "changed ${child.key} is: ${o.toString()}\n")
        }
    }
})
```

object

https://kamaratinamape.firebaseio.com/

⭐ Default security rules require users to be authenticated

kamaratinamape
└── 4eWsnHhdRPVgUAtV2OOq7V1gNOl3: "treti status"
├─ pikatchus
│   ├── address: "treti status"
│   ├── lati: 48
│   ├── longi: 17
│   ├── name: "treti"
│   └── time: 1480539003061
└─ statuses
     ├── druhy: "druhy status"
     ├── prvy: "prvy status"
     └── treti: "treti status"

Project:FirebaseDemo3.zip
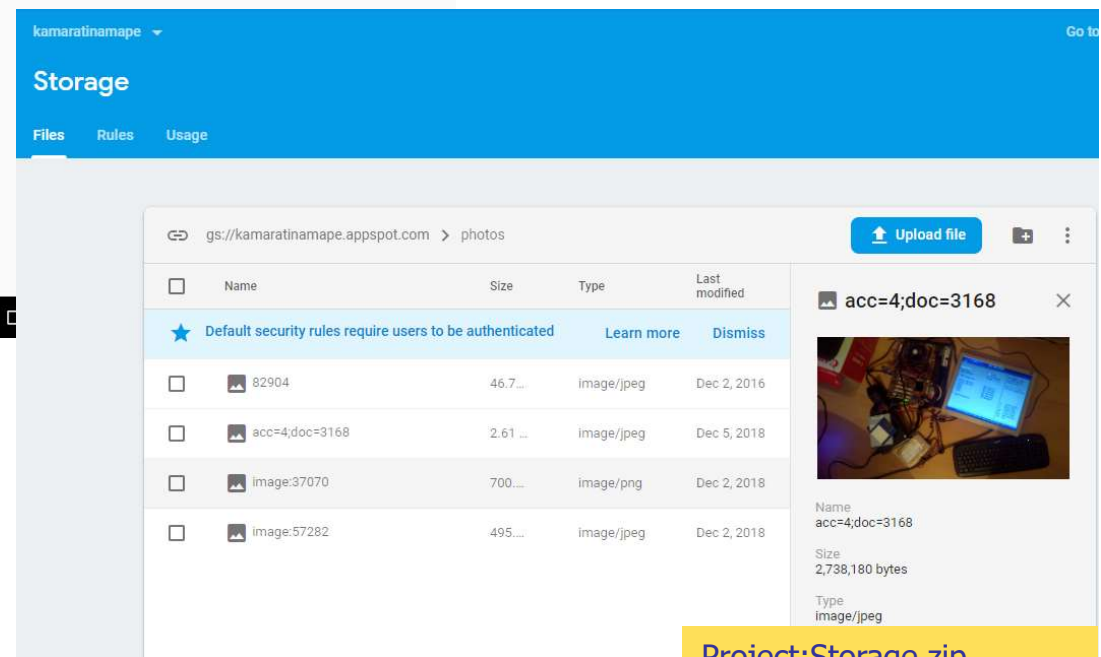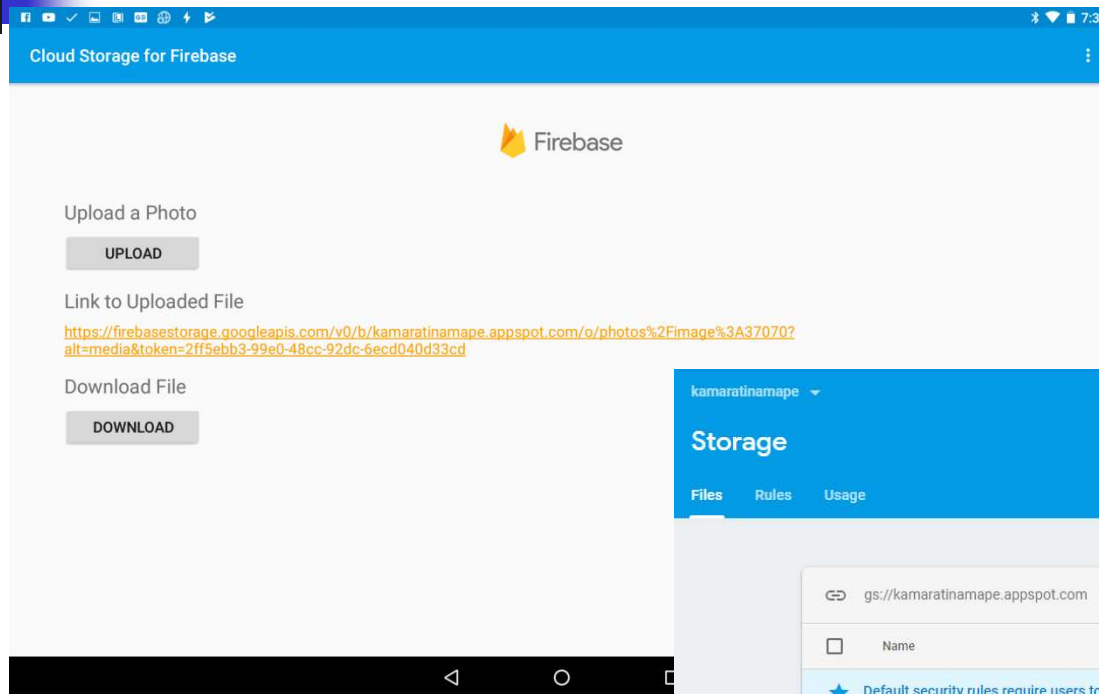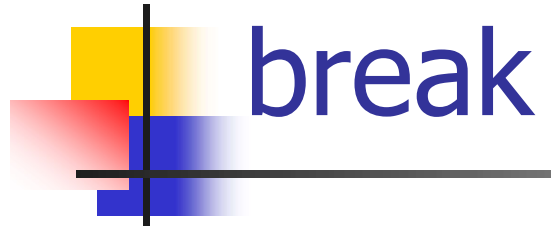
Firebase Database
(vyskúšajte si)
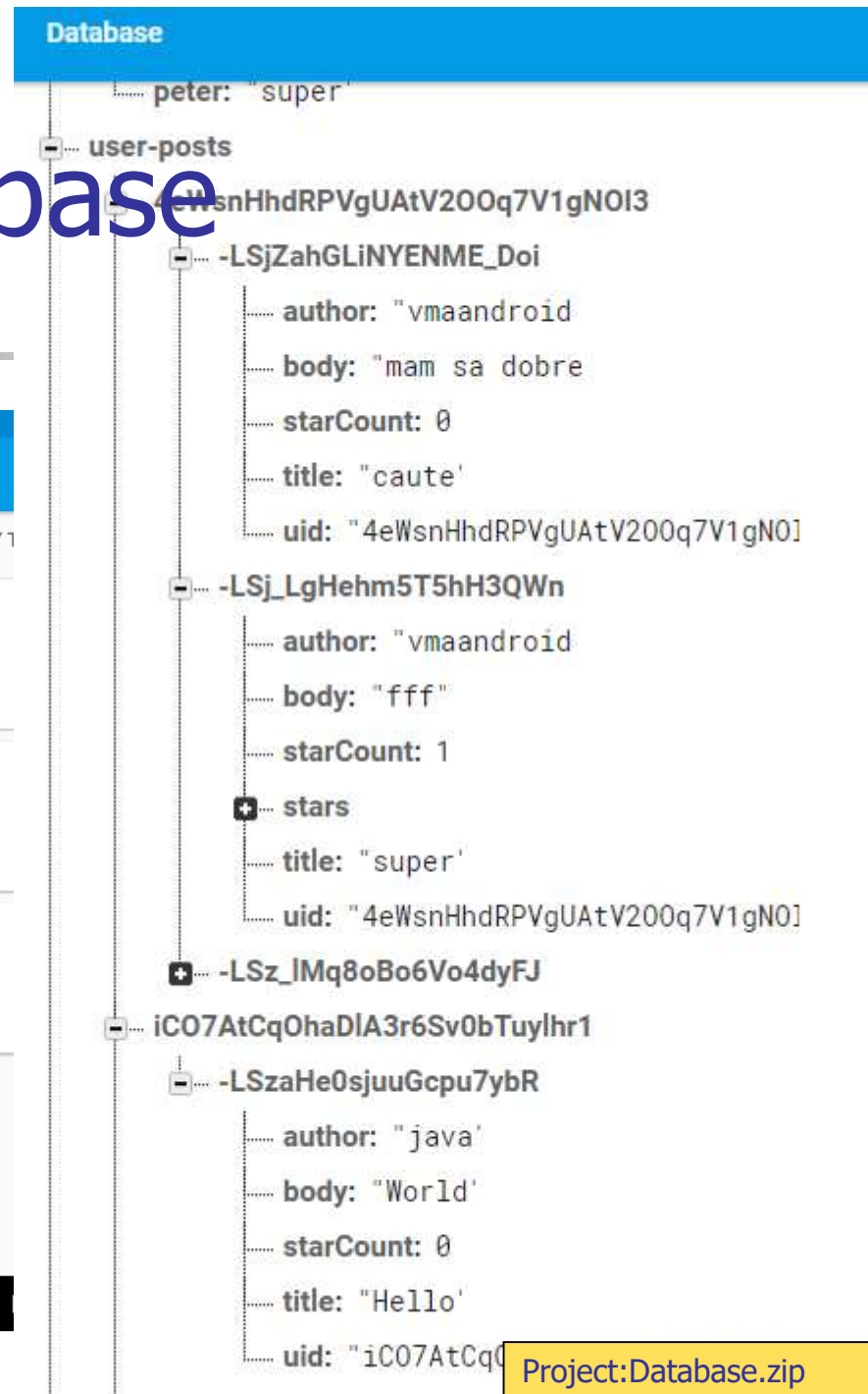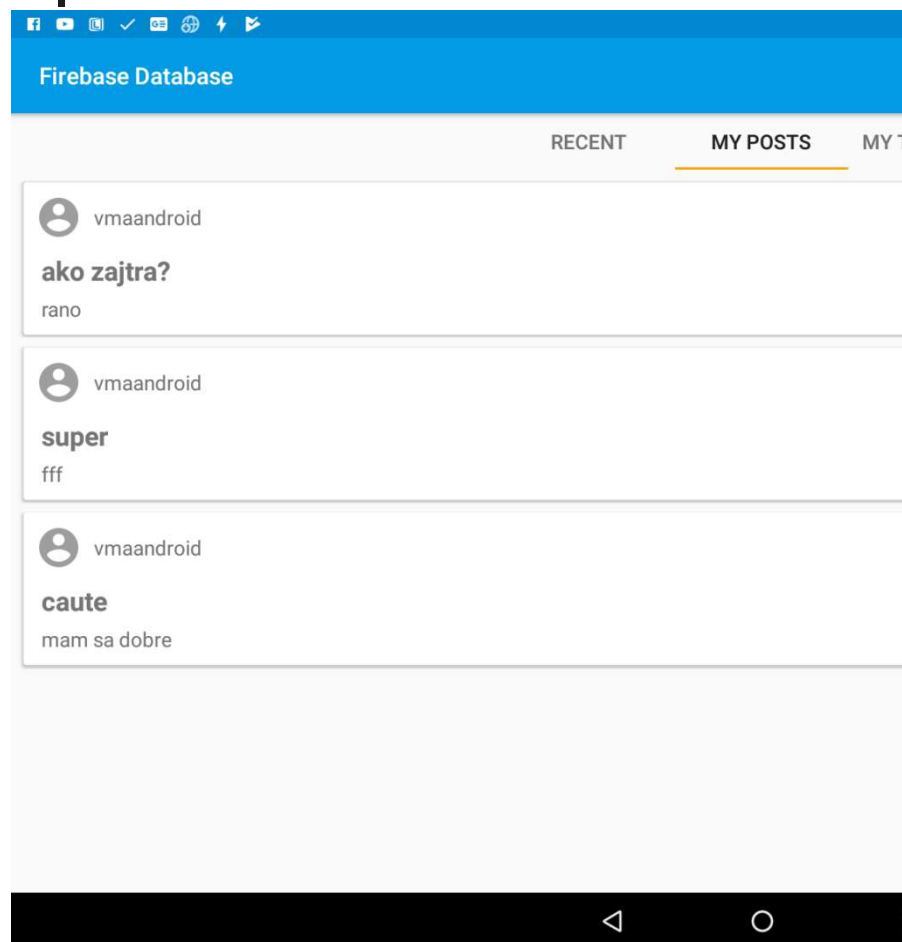
Project:Database.zip

Firebase Storage
(vyskúšajte si)

Project:Storage.zip

break

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
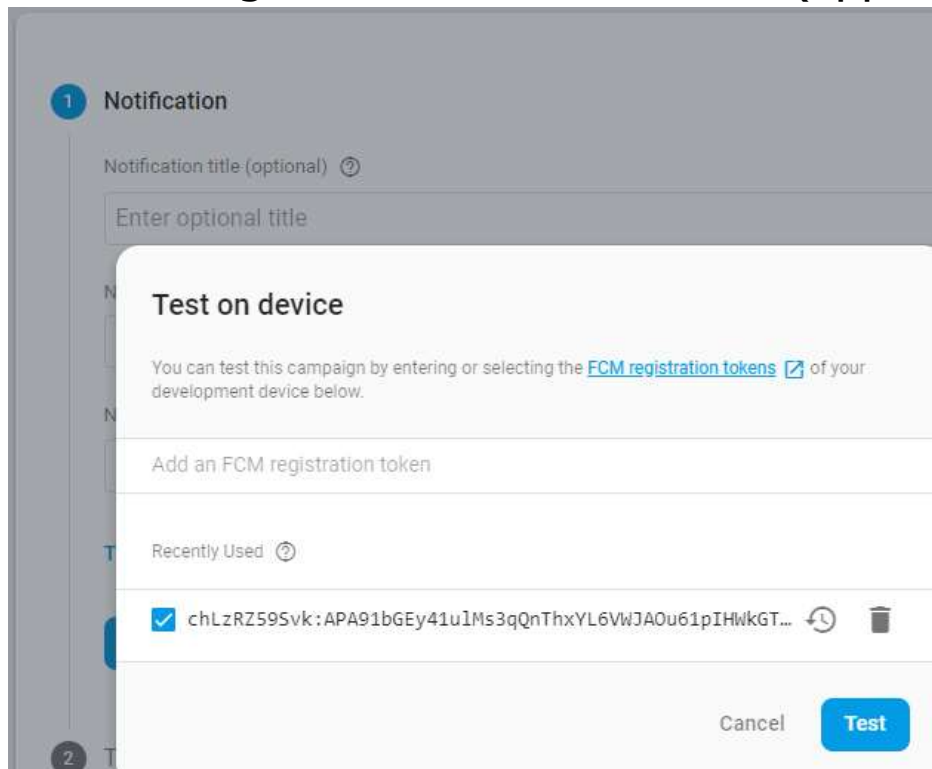
Firebase Cloud Messaging
(vyskúšajte si)

Device Token

InstanceID Token:
chLzRZ59Svk:APA91bGEy41ulMs3qQnThxYL6VWJAOu61pIHWkGTUEHQe4rWlyWL9yutLHxiwmgYdstis7T54I68yKh
wZj95TnKXjUynd4rt2oLQ1gPAaIa249g2-h4MKSg7Xkgie8uCVPx8sbB_itLr

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

Project:Messaging.zip