Android

-

Firebase

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KAI, I-18

borovan 'at' ii.fmph.uniba.sk
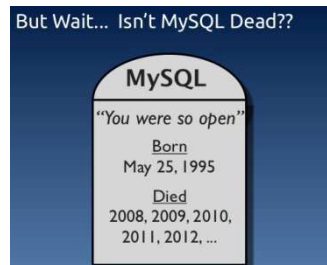
Kam (inam) uložiť naše dáta

bolo:

- 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:

- cloudové úložiská a ich služby
  - Relačné - tabuľkovo orientované
    Parse.com -> http://parseplatform.org/ (Facebook)

  - nosql – json
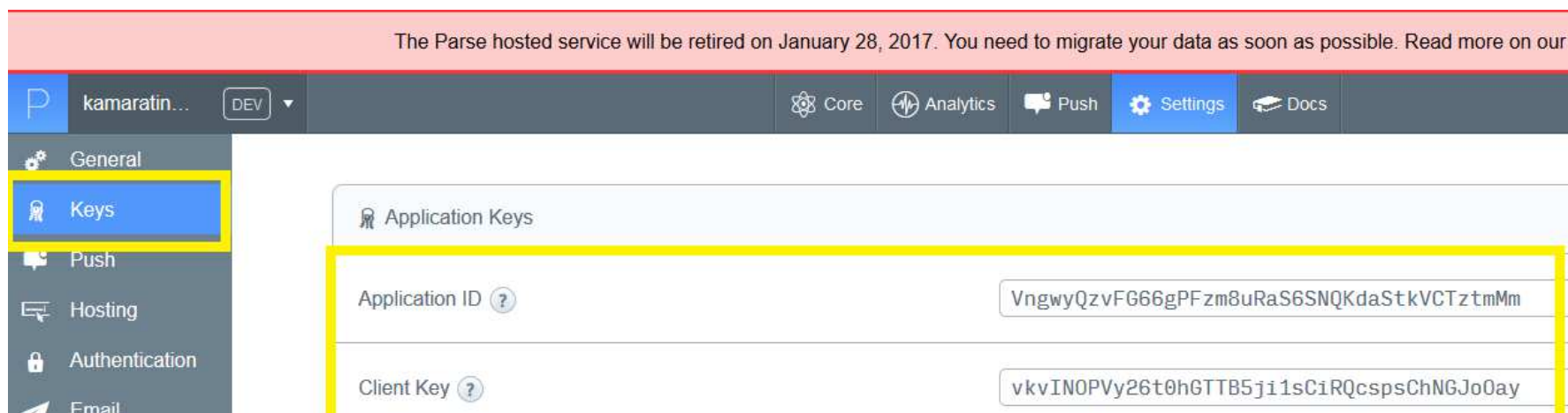   firebase.com (Google)

Parse

Firebase

Parse vs. Parse Server

Parse + facebook

- 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 kúpeny 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

kamaratin... DEV ▼   ⚛ Core   Analytics   💬 Push   ⚙ Settings   Docs

- General
- **Keys**
- Push
- Hosting
- Authentication
- Email

🎗 Application Keys

Application ID (?)   VngwyQzvFG66gPFzm8uRaS6SNQKdaStkVCTztmMm

Client Key (?)   vkvINOPVy26t0hGTTB5ji1sCiRQcspsChNGJoOay

Alternatívy
(k Parse Server)

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

Treba pozrieť konkurenciu:

- [Google datastore API](#) – iOS, Android, JS, PHP, ...
  https://cloud.google.com/solutions/mobile/

- [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

- https://www.raywenderlich.com/126098/top-5-parse-alternatives
  - [Amazon Web Services Mobile Hub](#)
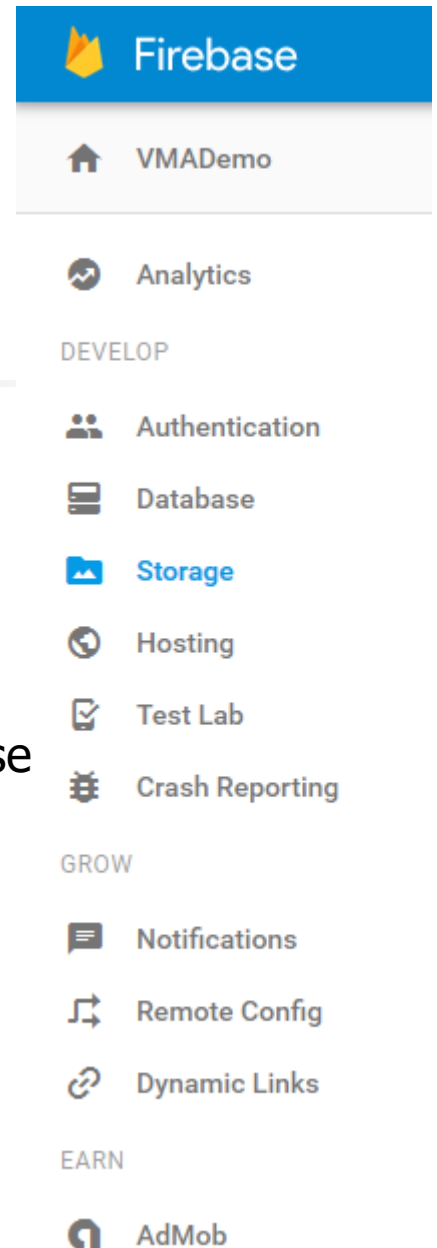 - [CloudKit](#) limited to iOS
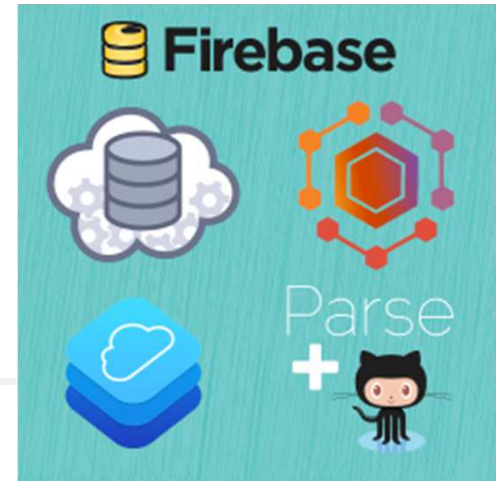
Firebase

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
- ...

Firebase

- VMADemo

Analytics

DEVELOP

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

GROW

- Notifications
- Remote Config
- Dynamic Links

EARN

- AdMob

Firebase Console

- 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
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...	

pre začiatok odporúčam skúsiť aplikácie z balíka

GIT:quickstart-android-master

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

Sign-in methods

Project Setting

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
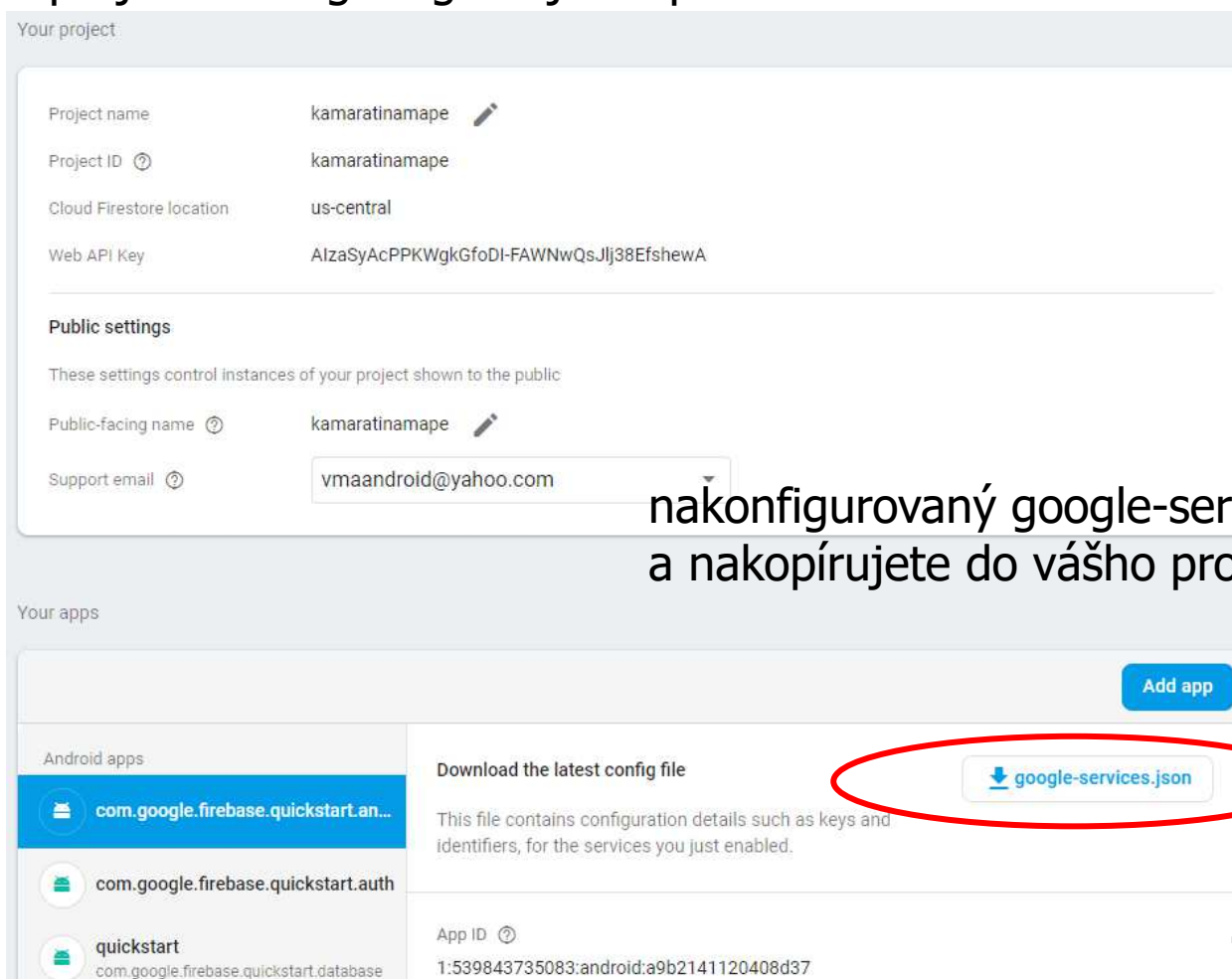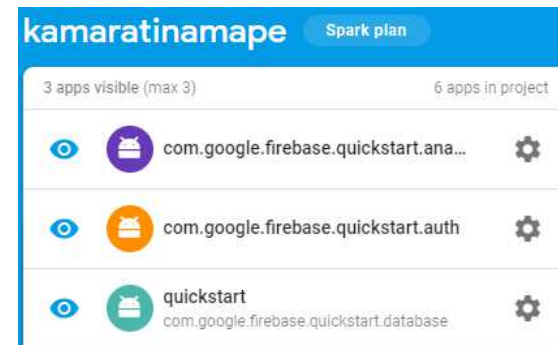- Authentification/Sign-in methods/Facebook

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.

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

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)

(Regenerate)

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

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**

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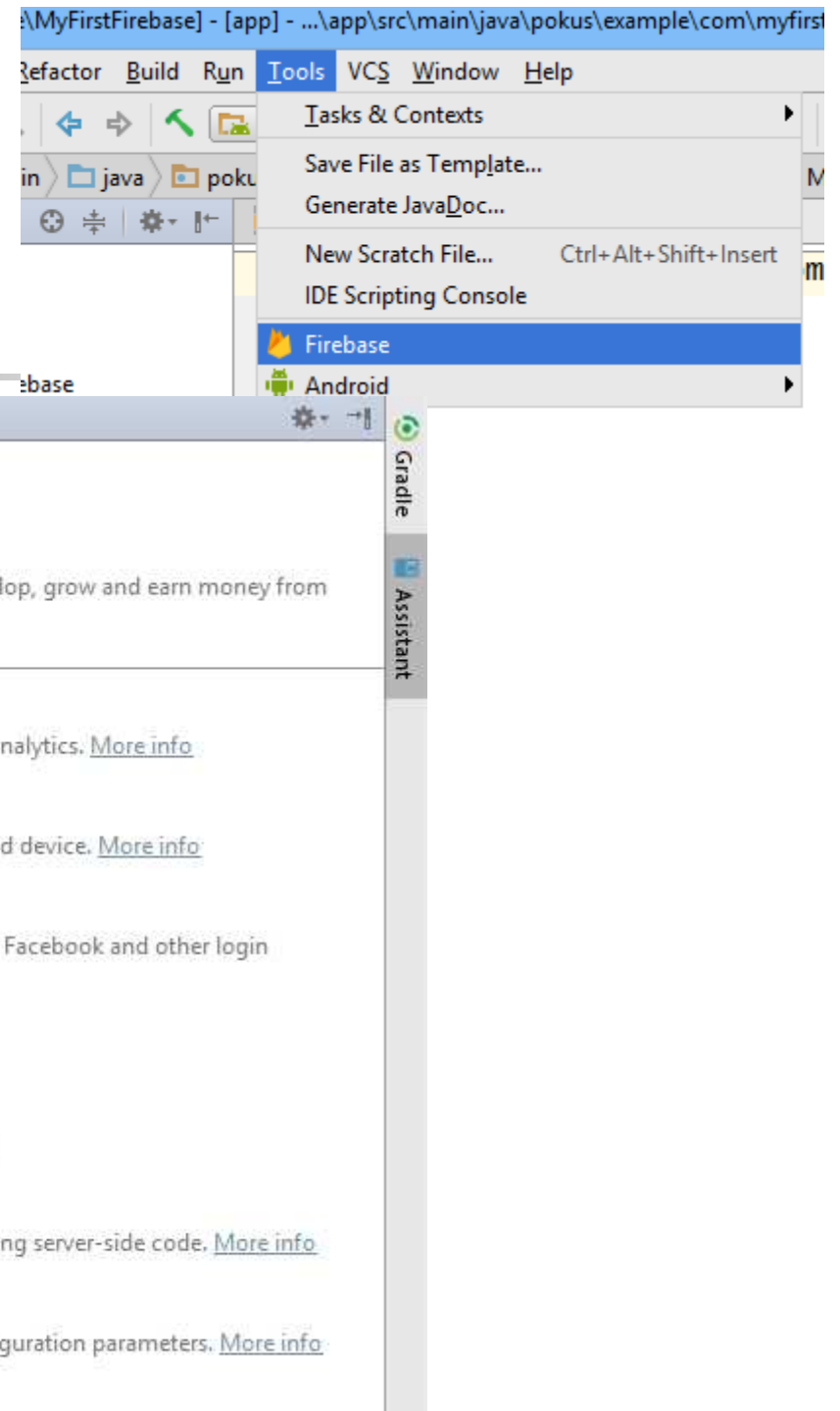
Firebase v AS

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
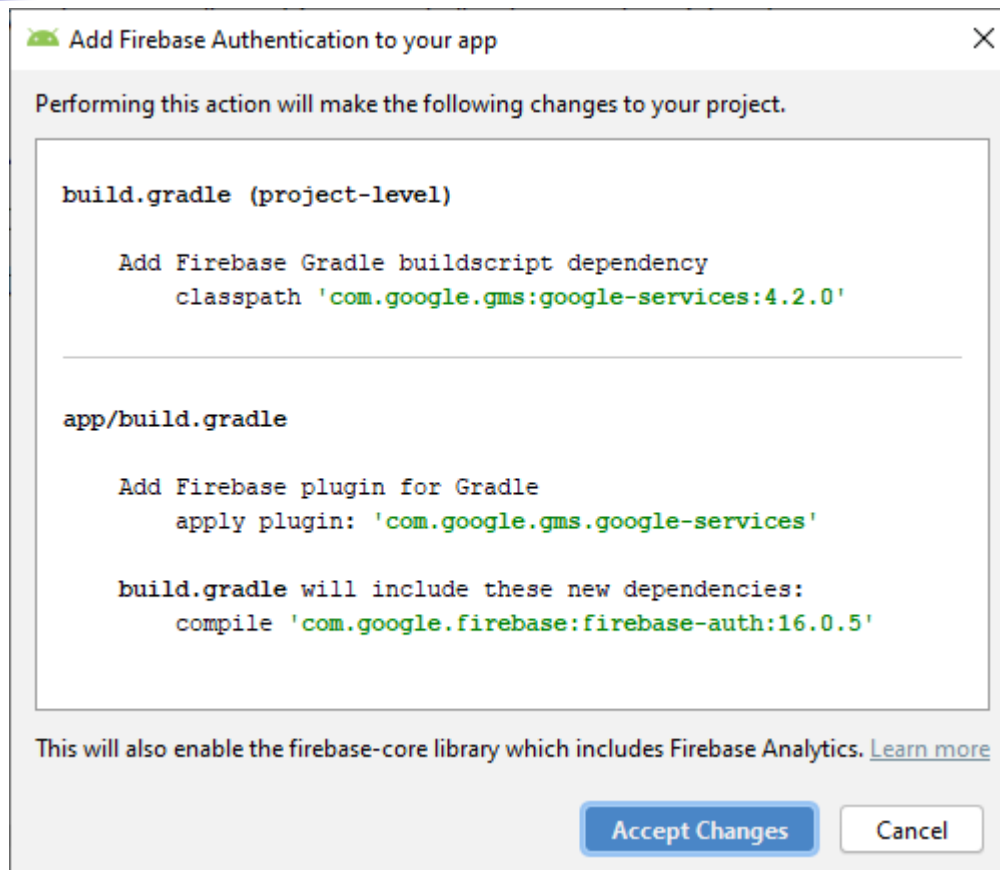
Firebase Email Authentification
sign-up new user

```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())
                }
            }
        })
```

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

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

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)

```
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

Realtime Database
(čítanie)

Pri akejkoľvek zmene sa zavolá listener

po zápise →

```
databaseReference.addValueEventListener(
    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)
```
object →
```
          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")
        }
      }
    })
```
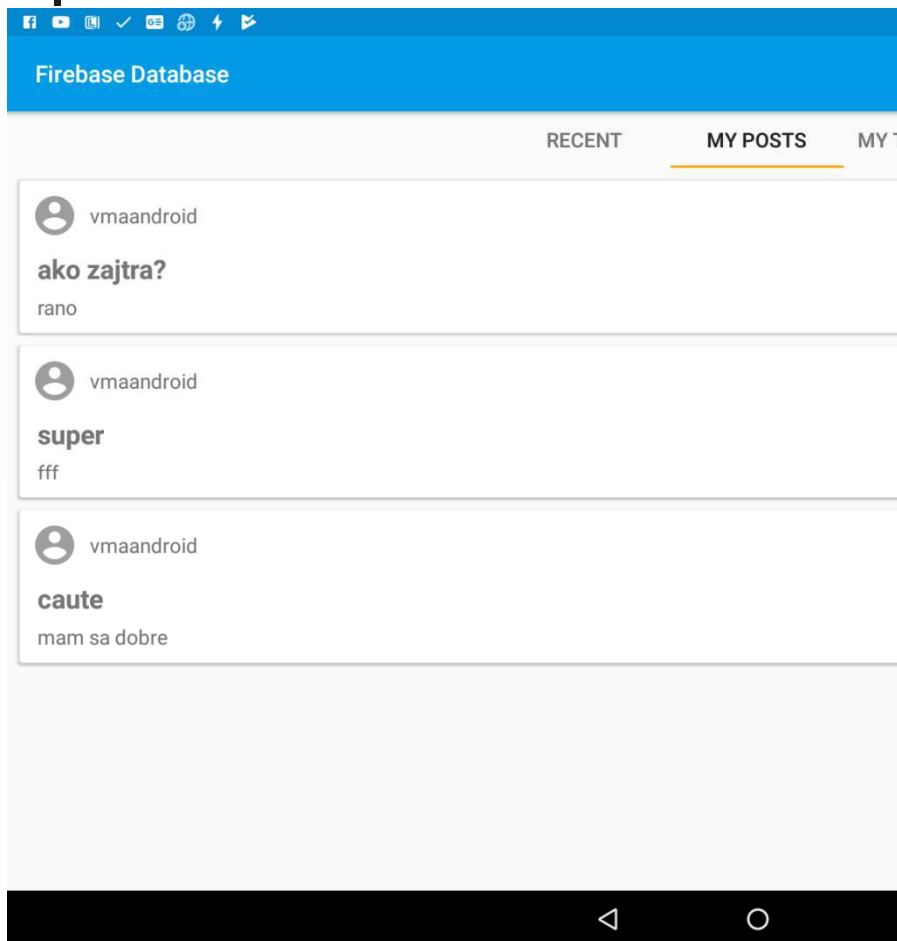
Project:FirebaseDemo.zip

Firebase Database

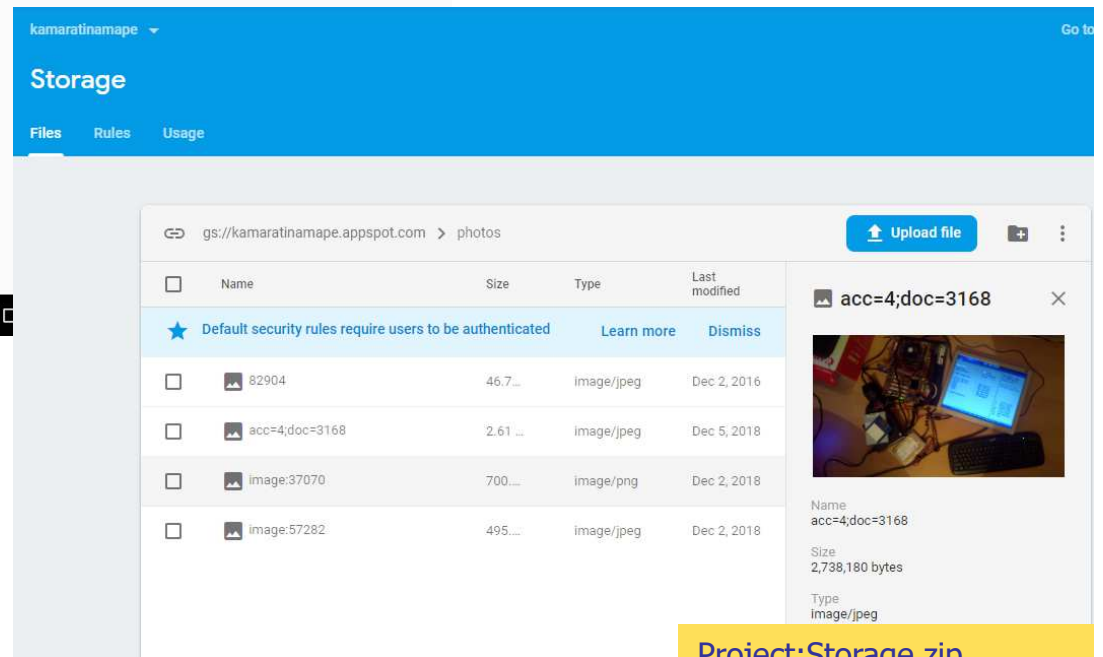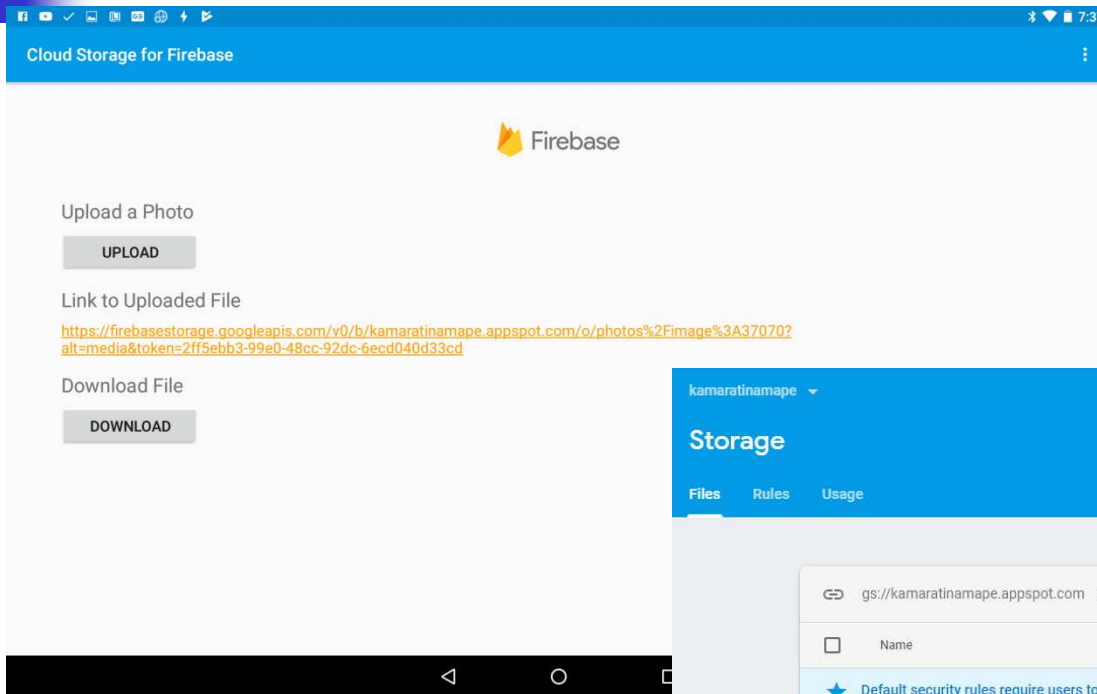## (vyskúšajte si)

Project:Database.zip

Firebase Storage
(vyskúšajte si)

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
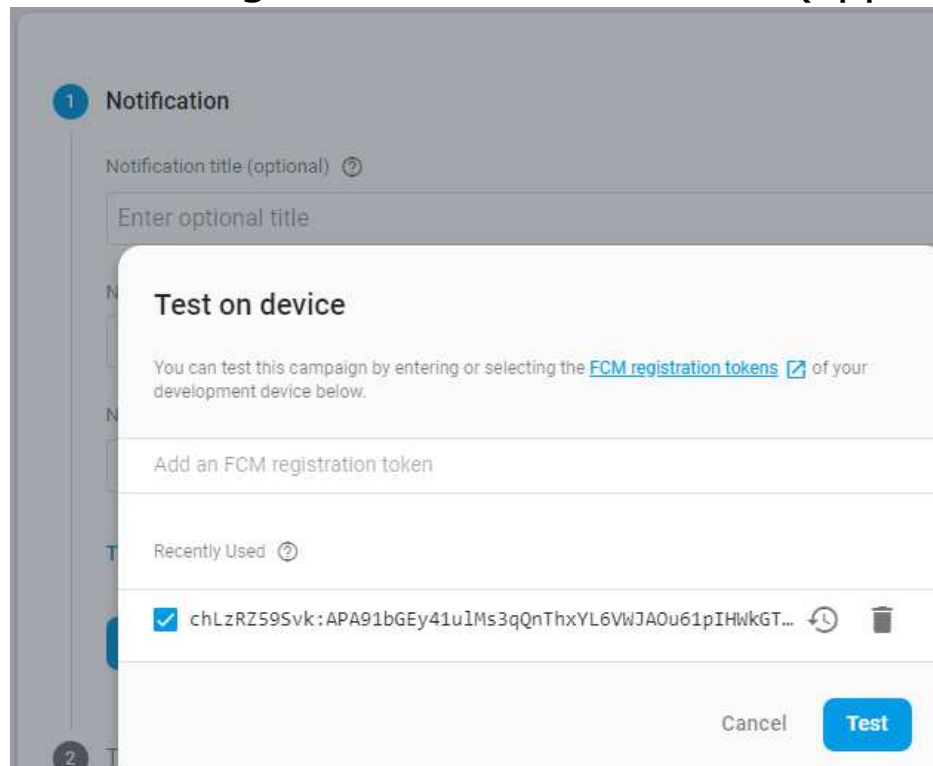
Firebase Cloud Messaging
(vyskúšajte si)

Device Token

InstanceID Token:
chLzRZ59Svk:APA91bGEy41ulMs3qQnThxYL6VWJAOu61pIHWkGTUEHQe4rWlyWL9yutLHxiwmgYdstis7T54I68yKh wZj95TnKXjUynd4rt2oLQ1gPAaIa249g2-h4MKSg7Xkgie8uCVPx8sbB_itLr

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

Project:Messaging.zip