CS 5450: Networked and Distributed Computing
Lab 4
Authentication and Mobile
Spring 2017
Instructor: Professor Deborah Estrin, Vitaly Shmatikov
TA: Eugene Bagdasaryan

Due: 11:59PM Mon, May 8th 2017

Introduction

In this lab we will work with Google Firebase as a backend for Android platform and develop an app that utilizes its functions. This app will be a cloud photo management app, where users can store their photos and share them with others. You would need to develop an application and then record a *short demo* demonstrating the functionality of the app and integration with Firebase.

App description

The app helps users to store and share photos. There are two types of photos: Public (available to everyone) and Private (available to the user). Each of the photo has a short description. The app has four views:

1. **Photos** — This part allows a user to look through photos that were uploaded by anyone and have a tag Public. If the user is authenticated then there should be additionally Private photos that were uploaded by this user. You don't need to implement preview of photos, just make it a small rectangle with description (simple is better)

2. **Upload** — A user can upload photos, provide description and tag them either Public or Private. You should use Firebase Database. Additionally, Security Rules should be used to manage access for photos on the Firebase level.

   NOTE: This section is only available if the user is already authenticated. Unauthenticated users can't upload anything.

3. **Search** — The user should look up the image by description. If the user is authenticated, then search is enabled for Private images, otherwise only Public images are available.

4. **Auth** — User authenticates with the app using Email or Google Sign-in (OAuth). The authentication doesn't happen at the start of the app and is voluntarily.

IMPORTANT: As this lab is not dedicated for UI design, you don't need to implement much of it, and it won't impact the grade, but during the demo you would need to explain us, how it works. Assume no more than 5 photos for simplicity.

Steps

In your lab you would have to perform following tasks:

1. Install Android Studio and create a sample project. You can use Android simulator to develop your app.
2. Setup a Firebase account
3. Design a dumb UI
4. Create Sign-in and Sign up with Email, Google Account (using OAuth) through Firebase.
5. Implement upload of private and public photos by the user into Database
6. Implement photo search by description (with Public and Private results). Show only one result.
7. Write two test cases that test your Firebase Security Rules. (you can do it in Test Lab using Espresso, Robotium, or UI Automator 2.0).
8. Record a demo of the working app (showing different use cases).

Grading criteria

Your grade will mostly be based on the video demo that you have to submit. Additionally we would want to see your code - to verify your code style.

Demo should include a recording of your laptop screen, where you demonstrate work of your app, as well as demonstrate that Firebase correctly creates users, stores photos and uses security Rules.