

# Mobile Application Development

---

Produced  
by

David Drohan ([ddrohan@wit.ie](mailto:ddrohan@wit.ie))

Department of Computing & Mathematics  
Waterford Institute of Technology

<http://www.wit.ie>



Waterford Institute of Technology  
INSTITIÚID TEICNEOLAÍOCHTA PHORT LÁIRGE





# Android Google Services

## Part 1

---

Google Sign-in

---





# Google Services Overview \*

---

- Overview of **Google Play Services** and Setup
- Detailed look at
  - Google Sign-in and Authentication (Part 1) (CoffeeMate.7.0)
  - Location & Geocoding (Part 2) (CoffeeMate.8.0)
  - Google Maps (Part 3) (CoffeeMate.8.0)



# Google Services Overview

---

- ❑ Overview of **Google Play Services** and Setup
- ❑ Detailed look at
  - **Google Sign-in and Authentication (Part 1)**



# General Overview – What is it?

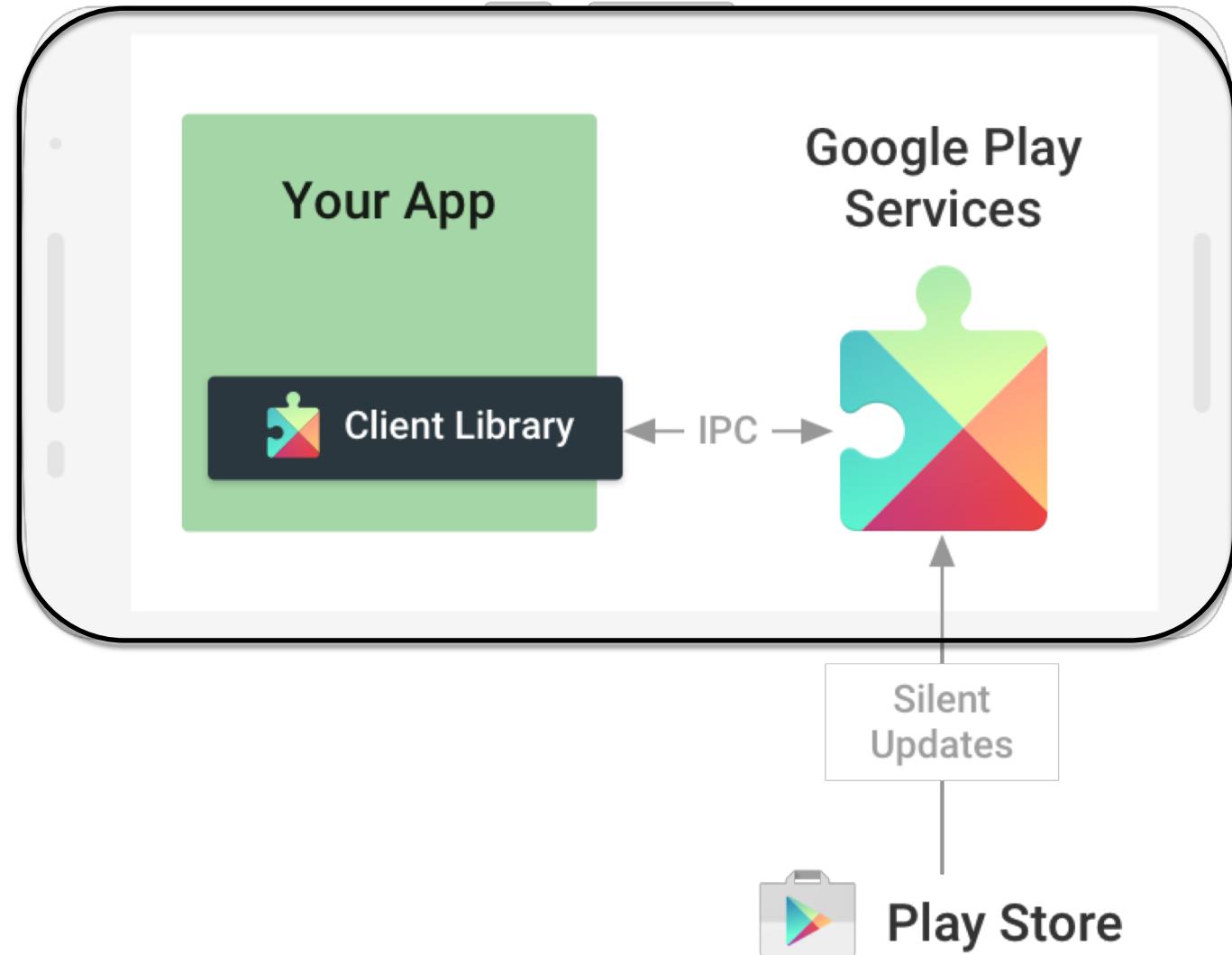
---

- ❑ Google Play Services is "*a single place that brings in all of Google's APIs on Android 2.2 and above.*"
- ❑ With Google Play Services, your app can take advantage of the latest, Google-powered features such as **Maps**, **Google+**, and more, with automatic platform updates distributed as an APK through the Google Play store.
- ❑ This makes it faster for users to receive updates and easier for developers to integrate the newest that Google has to offer.



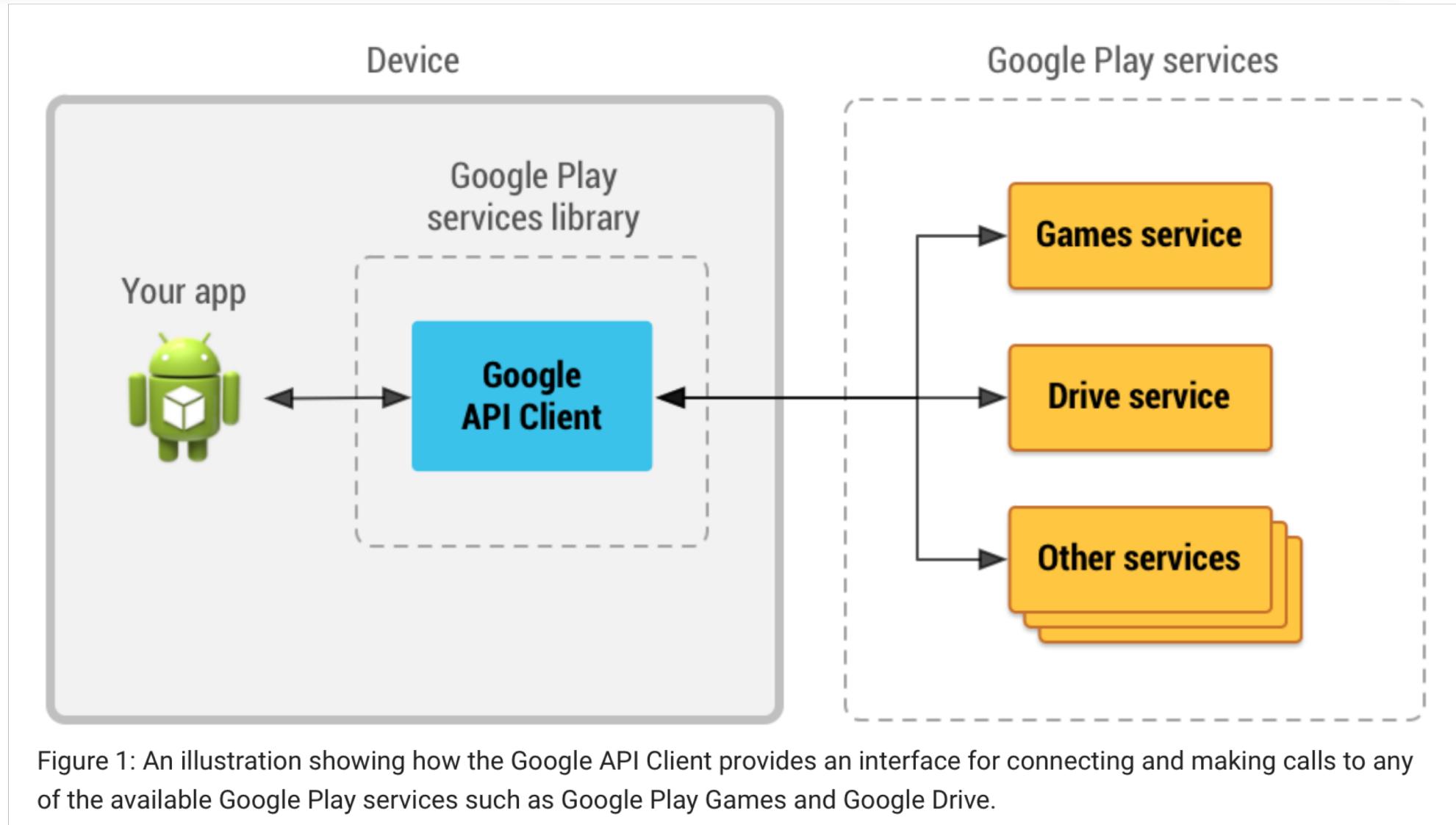
# Overview – How it Works (Google Play Services)

- The Google Play services APK on user devices receives regular updates for new APIs, features, and bug fixes.





# Overview – How it Works (Google API Client)





# Overview – What You Get

## Build better apps with Google

Take advantage of the latest Google technologies through a single set of APIs, delivered across Android devices worldwide as part of Google Play services.

Start by setting up the Google Play services library, then build with the APIs you need.

- › Set up Google Play services
- › API Reference

<https://developers.google.com/android/guides/overview>





---

# Setting Up Google Play Services





# Download Google Play Services (Android SDK Manager)

Default Preferences

Appearance & Behavior > System Settings > Android SDK

Manager for the Android SDK and Tools used by Android Studio

Android SDK Location: /Users/ddrohan/env/appdev/android [Edit](#)

SDK Platforms SDK Tools SDK Update Sites

Below are the available SDK developer tools. Once installed, Android Studio will automatically check for updates. Check "show package details" to display available versions of an SDK Tool.

Name	Version	Status
LLDB	1.0.0	Not Installed
<input checked="" type="checkbox"/> Android Auto API Simulators	1.0.0	Installed
<input type="checkbox"/> Android Auto Desktop Head Unit emulator	1.1	Not installed
<input checked="" type="checkbox"/> Android Emulator	27.3.10	Update Available: 28.0.16
<input checked="" type="checkbox"/> Android SDK Platform-Tools	28.0.1	Installed
<input checked="" type="checkbox"/> Android SDK Tools	26.1.1	Installed
<input checked="" type="checkbox"/> Android Support Library, rev 23.2.1	23.2.1	Installed
<input checked="" type="checkbox"/> Documentation for Android SDK	1	Installed
<input checked="" type="checkbox"/> Google Play APK Expansion Library, rev 3	3.0.0	Installed
<input type="checkbox"/> Google Play APK Expansion library	1	Not installed
<input checked="" type="checkbox"/> Google Play Billing Library, rev 5	5.0.0	Installed
<input type="checkbox"/> Google Play Instant Development SDK	1.6.0	Not installed
<input type="checkbox"/> Google Play Licensing Library	1	Not installed
<input checked="" type="checkbox"/> Google Play Licensing Library, rev 2	2.0.0	Installed
<input checked="" type="checkbox"/> Google Play services	49	Installed
<input checked="" type="checkbox"/> Google Play services for Froyo, rev 12	12.0.0	Installed
<input type="checkbox"/> Google Web Driver	2	Not installed
- Intel x86 Emulator Accelerator (HAXM installer)	7.3.0	Update Available: 7.3.2
<input type="checkbox"/> NDK	18.1.5063045	Not installed
<input checked="" type="checkbox"/> Support Repository		
<input checked="" type="checkbox"/> ConstraintLayout for Android		Installed
<input checked="" type="checkbox"/> Solver for ConstraintLayout		Installed

Show Package Details

?

Cancel Apply OK

# Setting Up Google Play Services (for sign-in)

(<https://developer.android.com/google/play-services/setup.html>)

---



- ❑ Make sure that the Google Play services SDK is installed, as shown on the previous slide.
- ❑ Create an application using Android Studio.
- ❑ In Android Studio under “Gradle Scripts”, edit the build.gradle file for “Module: app”

(not the build.gradle file for the project)

Under dependencies (near the bottom), add the following line at the end:

**implementation 'com.google.android.gms:play-services-auth:15.0.1'**

- ❑ Save the changes and click “Sync Project with Gradle Files” in the toolbar, or click on menu item



Tools → Android → Sync Project with Gradle Files.



# Setting Up Google Play Services (continued)

- When we're finished **CoffeeMate**, our 'dependencies' will look something like this (version numbers may differ)...

```
dependencies {  
    compile fileTree(dir: 'libs', include: ['*.jar'])  
    testCompile 'junit:junit:4.12'  
  
    compile 'com.android.support:appcompat-v7:23.2.1'  
    compile 'com.android.support:design:23.2.1'  
    compile 'com.google.code.gson:gson:2.2.3'  
    compile 'com.google.android.gms:play-services-maps:8.1.0'  
    compile 'com.google.android.gms:play-services-location:8.1.0'  
    compile 'com.google.android.gms:play-services:8.1.0'  
    compile 'com.android.support:support-v4:23.2.1'  
}
```



# Testing Google Play Services

---

To test an application using the Google Play services SDK, you must use either

- A compatible Android device that runs Android 2.3 or higher and includes Google Play Store
- An Android emulator (virtual device) that runs the Google APIs platform based on Android 4.2.2 or higher  
(Genymotion is a good one to use – Part 2)



# Popular APIs (100+ in total) \*



## Google Cloud APIs

[Compute Engine API](#)

[BigQuery API](#)

[Cloud Storage Service](#)

[Cloud Datastore API](#)

[Cloud Deployment Manager API](#)

[Cloud DNS API](#)

[▽ More](#)



## Google Maps APIs

[Google Maps Android API](#)

[Google Maps SDK for iOS](#)

[Google Maps JavaScript API](#)

[Google Places API for Android](#)

[Google Places API for iOS](#)

[Google Maps Roads API](#)

[▽ More](#)



## Google Apps APIs

[Drive API](#)

[Calendar API](#)

[Gmail API](#)

[Sheets API](#)

[Google Apps Marketplace SDK](#)

[Admin SDK](#)

[▽ More](#)



## YouTube APIs

[YouTube Data API](#)

[YouTube Analytics API](#)

[YouTube Reporting API](#)



## Advertising APIs

[AdSense Management API](#)

[DCM/DFA Reporting And Trafficking API](#)

[Ad Exchange Seller API](#)

[Ad Exchange Buyer API](#)

[DoubleClick Search API](#)

[DoubleClick Bid Manager API](#)



## Other popular APIs

[Analytics API](#)

[Translate API](#)

[Custom Search API](#)

[URL Shortener API](#)

[PageSpeed Insights API](#)

[Fusion Tables API](#)

[Web Fonts Developer API](#)



# Popular APIs (100+ in total) \*



## Mobile APIs

- Google Cloud Messaging 
- Google Play Game Services
- Google Play Developer API
- Google Places API for Android



## Social APIs

- Google+ API
- Blogger API
- Google+ Pages API
- Google+ Domains API



---

# Part 1

# Google Sign-in





# Introduction

---

- ❑ With the **Google+ Platform for Android**, you can allow application users to sign in with their existing Google accounts.
- ❑ It helps you in knowing your end users and providing them with a better enriched experience in your application.
- ❑ As soon as a user allows your app to use Google Sign In, you can easily get info about the user and people in the users circles.
- ❑ You can also get access to post on Google+ on the users behalf.

Overall, it is quick and easy way to engage end users in your application.



# Google Sign-in Requirements

---

□ For integrating Google Sign-in into your Android Application, we need to complete the following :

1. Enable Google+ API on [The Developers Console](#) and create credentials for your application authentication
2. Configuring Google Play Services in Android Studio
3. Create your Android Application with Google Sign-in



# 1. Enable Google+ API on The Developers Console

---

- ① Go to [Google Developers Console](#)
- ② If you don't have any existing projects, **Create Project**.
- ③ Select your project and choose **ENABLE API** on the menu.
- ④ Browse for **Google+ API** (under Social APIs) and turn **ON** its status by accepting terms and conditions.

Do not close developers console yet, you'll still use it to generate your authentication key in the next few steps.



# 1. Enable Google+ API on The Developers Console

This screenshot shows the left side of the Google Developers Console interface. The top navigation bar includes the project name "GoogleAPIs" and "CoffeeMate Project". The sidebar on the left has three main sections: "API Manager", "Library", and "Credentials". The "Library" section is currently selected and highlighted in blue. Below it, there's a "Dashboard" link. Under "Popular APIs", there's a "Google Cloud APIs" section listing several services like Compute Engine API, BigQuery API, etc., followed by a "More" link. At the bottom of the "Popular APIs" section, there's a "Social APIs" section with a red rounded rectangle around it, containing links for Google+ API, Blogger API, Google+ Pages API, and Google+ Domains API.

This screenshot shows the right side of the Google Developers Console interface, specifically the "Google+ API" page. The top navigation bar shows the project name "GoogleAPIs" and "CoffeeMate Project". The left sidebar is identical to the one in the first screenshot. The main content area is titled "Google+ API" and includes tabs for "Overview" (which is selected), "Quotas", and "About this API". There are also dropdown menus for "All API versions", "All API credentials", and "All API methods". A blue arrow points from the "Google+ API" link in the first screenshot to this page. In the top right corner of this page, there's a "DISABLE" button.



# 1. Enable Google+ API on The Developers Console

## ⑤ Generate your SHA1 fingerprint

1. You can either use the java **keytool** utility, like so

```
keytool -list -v -keystore "%USERPROFILE%\.android\debug.keystore" -alias androiddebugkey -storepass android -keypass android
```

```
id -keypass android
Alias name: androiddebugkey
Creation date: Jan 14, 2015
Entry type: PrivateKeyEntry
Certificate chain length: 1
Certificate[1]:
Owner: CN=Android Debug, O=Android, C=US
Issuer: CN=Android Debug, O=Android, C=US
Serial number: 4a389ac6
Valid from: Wed Jan 14 23:06:23 IST 2015 until: Fri Jan 06 23:06:23 IST 2045
Certificate fingerprints:
    MD5: 8C:61:0E:B2:88:8F:56:D4:74:27:8C:69:D6:12:D9:0A
    SHA1: FD:0E:04:7:CD:EE:CA:96
    SHA256: F4:71:BA:32:83:C7:81:30:AF:A9:A0:25:6F:56:67:2F:4C:7C:FC:B3:67:
9D:8E:8A:16:CD:C8:11:CF:40:BD:0C
    Signature algorithm name: SHA256withRSA
    Version: 3

Extensions:
#1: ObjectId: 2.5.29.14 Criticality=false
SubjectKeyIdentifier [
KeyIdentifier [
0000: FE 4D 16 FF 11 AA 09 8F   FA B3 CF 4B 40 52 22 B8  .M.....K0R".
0010: 80 87 90 5B               ...[
]
```



# 1. Enable Google+ API on The Developers Console

## ⑤ Generate your SHA1 fingerprint

1. You can
  1. Click on your package and choose New -> Google -> Google Maps Activity
  2. Android Studio redirects you to google\_maps\_api.xml with your SHA1

*This gives you A LOT of extra ‘boilerplate’ code that you might not even need (if you’re not using maps)*



# 1. Enable Google+ API on The Developers Console

## ⑤ Generate your SHA1 fingerprint

1. Or you can
  1. Open/View Your Project
  2. Click on **Gradle** (From Right Side Panel, you will see **Gradle Bar**)
  3. Click on **Refresh** (Click on Refresh from Gradle Bar, you will see List Gradle scripts of your Project)
  4. Click on **Your Project** (Your Project Name from List (root))
  5. Click on **Tasks**
  6. Click on **android**
  7. Double Click on **signingReport** (You will get SHA1 and MD5 in Run Bar)

*This is probably the simplest approach with minimal fuss! IMHO*



# 1. Enable Google+ API on The Developers Console

The screenshot shows the Android Studio interface with the 'Gradle projects' tool window on the left and the 'Run' tool window on the right.

**Gradle projects:** Shows the project structure for 'CoffeeMate.6.0' with 'Tasks' expanded, including 'signingReport' and 'sourceSets'.

**Run:** Shows the configuration for running the 'signingReport' task on 'AVD: Nexus\_5\_API\_23' for the 'CoffeeMate.6.0 [signingReport]' variant.

**Output (Run tab):**

```
Variant: releaseUnitTest
Config: none
-----
Variant: release
Config: none
-----
Variant: debugUnitTest
Config: debug
Store: /Users/ddrohan/.android/debug.keystore
Alias: AndroidDebugKey
MD5: 51:48:5:A1
SHA1: AA:F1:F0:3:9C:79:E3:C6
Valid until: Tuesday, February 23, 2044
-----
BUILD SUCCESSFUL
Total time: 22.62 secs
09:19:35: External task execution finished 'signingReport'.
```

A red box highlights the 'signingReport' task in the Gradle tasks list. A yellow callout points to it with the text: "Displays the signing info for each variant." A red box also highlights the 'signingReport' task in the Run configuration. A red box highlights the entire output section of the Run tab.



## 1. Enable Google+ API on The Developers Console

- ⑥ Navigate to Credentials -> Create Credentials -> API Key -> Android Key,
- ⑦ It will ask to **Configure consent screen** if not configured before. Fill in the necessary information and save. It will redirect you back to the creation page.
- ⑧ Give your Key a **Name** and Add package name and fingerprint
- ⑨ Enter your package name and your SHA1 fingerprint (generated previously) and click **Create**

You now have your API Key which you can use in your Android Apps to use the Google APIs



# 1. Enable Google+ API on The Developers Console

The screenshot shows the Google Developers Console interface. On the left, there's a sidebar with 'API Manager' and 'Credentials' selected. The main area is titled 'Credentials' with tabs for 'Credentials', 'OAuth consent screen', and 'Domain verification'. A red box highlights the 'Create credentials' button, which has a dropdown menu open. The menu items are: 'API key', 'OAuth client ID', 'Service account key', and 'Help me choose'. A blue arrow points from the 'Create credentials' button to the 'Create Android API key' dialog box on the right. This dialog box is also circled in red. It contains fields for 'Name' (set to 'CoffeeMate Key'), 'Restrict usage to your Android apps (Optional)' (with instructions to add package name and SHA-1 certificate fingerprint), and a command-line tool example: '\$ keytool -list -v -keystore mystore.keystore'. It also has fields for 'Package name' (set to 'ie.cm') and 'SHA-1 certificate fingerprint' (set to '12:34:56:78:90:AB:CD:EF:12:34:56:78:90:AB:CD:EF:AA:BB:CC:DD'). A note at the bottom says 'Note: It may take up to 5 minutes for settings to take effect.' with 'Create' and 'Cancel' buttons below it.



# 1. Enable Google+ API on The Developers Console

The screenshot shows the Google Developers Console interface. The left sidebar has three items: 'Dashboard' (with a diamond icon), 'Library' (with a book icon), and 'Credentials' (with a key icon). The 'Credentials' item is highlighted with a red box and has a blue arrow pointing from it to a red box around the 'API keys' table below. The main content area is titled 'Credentials' and contains three tabs: 'Credentials' (selected), 'OAuth consent screen', and 'Domain verification'. Below the tabs is a 'Create credentials' button with a dropdown arrow and a 'Delete' button. A message says 'Create credentials to access your enabled APIs. Refer to the API documentation for details.' The 'API keys' table is shown with the following data:

Name	Creation date	Type	Key
CoffeeMate Key	29 Aug 2016	Android	Alza...-Khw...



## 2. Configure Google Play Services

---

Already Done! (from previous slides...)



### 3. Create your Android App (CoffeeMate)

---

- You'll cover this in the Labs, but we'll have a look at some of the code next



# Steps in Integrating Google Sign-In into your App

---

- ❑ Import classes/interfaces.
- ❑ Declare that the activity implements callback interfaces.
- ❑ Declare/build `GoogleApiSignInOptions` object
- ❑ Declare/build `GoogleApiClient` object.
- ❑ Implement callback interfaces.
- ❑ Implement methods `onStart()` and `onStop()` (and possibly other lifecycle methods such as `onPause()` and `onResume()`) to gracefully handle connections to Google Play Services



---

# Integrating Google Sign-In into Your Android App

<https://developers.google.com/identity/sign-in/android/sign-in>





# Configure Google Sign-In & GoogleApiClient object

1. In your sign-in activity's `onCreate` method, configure Google Sign-In to request the user data required by your app. For example, to configure Google Sign-In to request users' ID and basic profile information, create a `GoogleSignInOptions` object with the `DEFAULT_SIGN_IN` parameter. To request users' email addresses as well, create the `GoogleSignInOptions` object with the `requestEmail` option.

```
// Configure sign-in to request the user's ID, email address, and basic
// profile. ID and basic profile are included in DEFAULT_SIGN_IN.
GoogleSignInOptions gso = new GoogleSignInOptions.Builder(GoogleSignInOptions.DEFAULT_SIGN_IN)
    .requestEmail()
    .build();
```

[SignInActivity.java](#)

If you need to request additional scopes to access Google APIs, specify them with `requestScopes`.



# Configure Google Sign-In & GoogleApiClient object \*

2. Then, also in your sign-in activity's `onCreate` method, create a `GoogleApiClient` object with access to the Google Sign-In API and the options you specified.

```
// Build a GoogleApiClient with access to the Google Sign-In API and the
// options specified by gso.
mGoogleApiClient = new GoogleApiClient.Builder(this)
    .enableAutoManage(this /* FragmentActivity */, this /* OnConnectionFailedListener */)
    .addApi(Auth.GOOGLE_SIGN_IN_API, gso)
    .build();
```

SignInActivity.java

★ Note: To use `enableAutoManage`, your activity must extend [FragmentActivity](#) or [AppCompatActivity](#) (a subclass of `FragmentActivity`), both of which are part of the [Android Support Library](#). You can use `GoogleApiClient` in a `Fragment`; however, the fragment's parent activity must be a `FragmentActivity`. If you can't extend `FragmentActivity`, you must [manually manage the GoogleApiClient connection lifecycle](#).



# Aside – Connecting to Google Drive Example \*

```
GoogleApiClient mGoogleApiClient = new GoogleApiClient.Builder(this)
    .enableAutoManage(this /* FragmentActivity */,
                      this /* OnConnectionFailedListener */)
    .addApi(Drive.API)
    .addScope(Drive.SCOPE_FILE)
    .build();
```

You can add multiple APIs and multiple scopes to the same `GoogleApiClient` by appending additional calls to `addApi()` and `addScope()`.



# Add the Google Sign-In button to your app \*

1. Add the `SignInButton` in your application's layout:

```
<com.google.android.gms.common.SignInButton  
    android:id="@+id/sign_in_button"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content" />
```



2. **Optional:** If you are using the default sign-in button graphic instead of providing your own sign-in button assets, you can customize the button's size and color scheme with the `setSize` and `setScopes` methods. Also, if you specify a Google+ social scope to `setScopes`, the sign-in button will be rendered with the red Google+ branding.

```
SignInButton signInButton = (SignInButton) findViewById(R.id.sign_in_button);  
signInButton.setSize(SignInButton.SIZE_STANDARD);  
signInButton.setScopes(gso.getScopeArray());
```

`SignInActivity.java` ↗

3. In the Android activity (for example, in the `onCreate` method), register your button's `OnClickListener` to sign in the user when clicked:

```
findViewById(R.id.sign_in_button).setOnClickListener(this);
```



# Start the sign-in flow

1. In the activity's `onClick` method, handle sign-in button taps by creating a sign-in intent with the `getSignInIntent` method, and starting the intent with `startActivityForResult`.

```
@Override  
public void onClick(View v) {  
    switch (v.getId()) {  
        case R.id.sign_in_button:  
            signIn();  
            break;  
        // ...  
    }  
}
```

## Choose account for Instacart



Nikhil Corlett  
nikcorlett@gmail.com

Add account

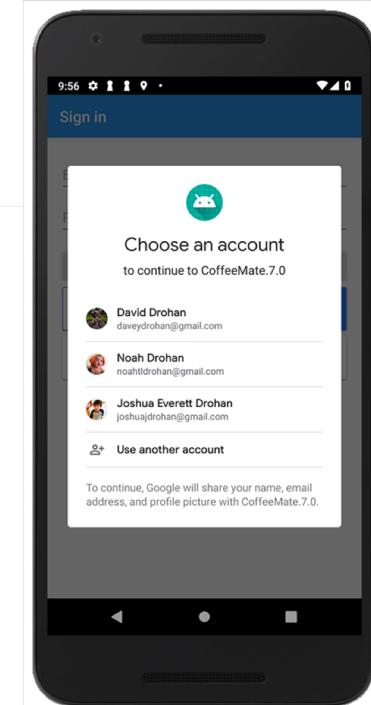


# Start the sign-in flow

```
private void signIn() {  
    Intent signInIntent = Auth.GoogleSignInApi.getSignInIntent(mGoogleApiClient);  
    startActivityForResult(signInIntent, RC_SIGN_IN);  
}
```

SignInActivity.java

Starting the intent prompts the user to select a Google account to sign in with. If you requested scopes beyond `profile`, `email`, and `openid`, the user is also prompted to grant access to the requested resources.





# Start the sign-in flow

2. In the activity's `onActivityResult` method, retrieve the sign-in result with `getSignInResultFromIntent`.

```
@Override  
public void onActivityResult(int requestCode, int resultCode, Intent data) {  
    super.onActivityResult(requestCode, resultCode, data);  
  
    // Result returned from launching the Intent from GoogleSignInApi.getSignInIntent(...);  
    if (requestCode == RC_SIGN_IN) {  
        GoogleSignInResult result = Auth.GoogleSignInApi.getSignInResultFromIntent(data);  
        handleSignInResult(result);  
    }  
}
```

`SignInActivity.java`

After you retrieve the sign-in result, you can check if sign-in succeeded with the `isSuccess` method. If sign-in succeeded, you can call the `getSignInAccount` method to get a `GoogleSignInAccount` object that contains information about the signed-in user, such as the user's name.



# Start the sign-in flow \*

```
private void handleSignInResult(GoogleSignInResult result) {  
    Log.d(TAG, "handleSignInResult:" + result.isSuccess());  
    if (result.isSuccess()) {  
        // Signed in successfully, show authenticated UI.  
        GoogleSignInAccount acct = result.getSignInAccount();  
        mStatusTextView.setText(getString(R.string.signed_in_fmt, acct.getDisplayName()));  
        updateUI(true);  
    } else {  
        // Signed out, show unauthenticated UI.  
        updateUI(false);  
    }  
}
```

[SignInActivity.java](#) ↗

You can also get the user's email address with `getEmail`, the user's Google ID (for client-side use) with `getId`, and an ID token for the user with `getIdToken`. If you need to pass the currently signed-in user to a backend server, [send the ID token to your backend server](#) and validate the token on the server.



# Key Interfaces/Classes for Google Sign-In

(in package `com.google.android.gms.auth.api.signin`)

## □ `GoogleSignInAccount`

<code>String</code>	<code>getDisplayName()</code>
Returns the display name of the signed in user if you built your configuration starting from <code>new GoogleSignInOptions.Builder(GoogleSignInOptions.DEFAULT_SIGN_IN)</code> or with <code>requestProfile()</code> configured; <code>null</code> otherwise.	
<code>String</code>	<code>getEmail()</code>
Returns the email address of the signed in user if <code>requestEmail()</code> was configured; <code>null</code> otherwise.	

## □ `GoogleSignInOptions.Builder`

<code>GoogleSignInOptions</code>	<code>build()</code>
Builds the <code>GoogleSignInOptions</code> object.	
<code>GoogleSignInOptions.Builder</code>	<code>requestEmail()</code>
Specifies that email info is requested by your application.	
<code>GoogleSignInOptions.Builder</code>	<code>requestId()</code>
Specifies that user ID is requested by your application.	
<code>GoogleSignInOptions.Builder</code>	<code>requestIdToken(String serverClientId)</code>
Specifies that an ID token for authenticated users is requested.	



# Key Interfaces/Classes for Google Sign-In

(in package `com.google.android.gms.common.api`)

## □ `GoogleApiClient`

void	<code>connect(int signInMode)</code> Connects the client to Google Play services using the given sign in mode.
abstract void	<code>disconnect()</code> Closes the connection to Google Play services.
abstract boolean	<code>isConnected()</code> Checks if the client is currently connected to the service, so that requests to other methods will succeed.

## □ `GoogleApiClient.Builder`

`GoogleApiClient.Builder(Context context)`  
Builder to help construct the `GoogleApiClient` object.

`GoogleApiClient.Builder(Context context, GoogleApiClient.ConnectionCallbacks connectedListener,  
GoogleApiClient.OnConnectionFailedListener connectionFailedListener)`  
Builder to help construct the `GoogleApiClient` object.



# Key Interfaces/Classes for Google Sign-In

(in package `com.google.android.gms.common.api`)

## □ `GoogleApiClient.ConnectionCallbacks`

abstract void `onConnected(Bundle connectionHint)`

After calling `connect()`, this method will be invoked asynchronously when the connect request has successfully completed.

abstract void `onConnectionSuspended(int cause)`

Called when the client is temporarily in a disconnected state.

## □ `GoogleApiClient.OnConnectionFailedListener`

abstract void `onConnectionFailed(ConnectionResult result)`

Called when there was an error connecting the client to the service.



# Key Interfaces/Classes for Google Sign-In

(in package `com.google.android.gms.common.api`)

---

## ❑ `GoogleApiClient`

- main entry point for Google Play services integration

## ❑ `GoogleApiClient.ConnectionCallbacks`

- provides callbacks that are called when the client is connected or disconnected from the service
- abstract methods:
  - `void onConnected(Bundle connectionHint)`
  - `void onConnectionSuspended(int cause)`

## ❑ `GoogleApiClient.OnConnectionFailedListener`

- provides callbacks for scenarios that result in a failed attempt to connect the client to the service
- abstract method:
  - `void onConnectionFailed(ConnectionResult result)`



---

# CoffeeMate 7.0

## Code Highlights



# CoffeeMateApp (Application) \*

```
/* Client used to interact with Google APIs. */  
public GoogleApiClient mGoogleApiClient;  
public GoogleSignInOptions mGoogleSignInOptions;  
  
public boolean signedIn = false;  
public String googleToken;  
public String googleName;  
public String googleMail;  
public String googlePhotoURL;  
public Bitmap googlePhoto;
```

- ❑ Here we declare our **GoogleSignInOptions** and **GoogleApiClient** references (and other variables) to store users Google+ info.
- ❑ We populate these objects in our ‘Login’ process.
- ❑ Volley Request Queue also set up here (see the labs for further details).



# Login (Activity) \*

```
public class Login extends AppCompatActivity implements  
    LoaderCallbacks<Cursor>,  
    GoogleApiClient.OnConnectionFailedListener,  
    OnClickListener {
```

```
// [START configure_signin]  
// Configure sign-in to request the user's ID, email address, and basic  
// profile. ID and basic profile are included in DEFAULT_SIGN_IN.  
app.mGoogleSignInOptions = new GoogleSignInOptions  
    .Builder(GoogleSignInOptions.DEFAULT_SIGN_IN)  
    .requestEmail()  
    .requestProfile()  
    .build();  
// [END configure_signin]
```

- ❑ Our Login Activity implements the relevant interfaces
- ❑ Here we ‘Build’ our sign in options



# Login (Activity) \*

```
// [START build_client]
// Build a GoogleApiClient with access to the Google Sign-In API and
// options specified by mGoogleSignInOptions.
app.mGoogleApiClient = new GoogleApiClient.Builder(this)
    .enableAutoManage(this /* FragmentActivity */,
                      this /* OnConnectionFailedListener */)
    .addApi(Auth.GOOGLE_SIGN_IN_API, app.mGoogleSignInOptions)
    .build();
// [END build_client]

findViewById(R.id.google_sigin_button).setOnClickListener(this);
findViewById(R.id.google_disconnect_button).setOnClickListener(this);
```

- Build our client with the specific sign in options and the API we want to use - (Google Sign-In)
- Try and sign in to Google

```
// [START signIn]
private void signIn() {
    Intent signInIntent = Auth.GoogleSignInApi.getSignInIntent(app.mGoogleApiClient);
    startActivityForResult(signInIntent, RC_SIGN_IN);
}
// [END signIn]
```



# Login (Activity) \*

```
public void onActivityResult(int requestCode, int resultCode, Intent data) {  
    super.onActivityResult(requestCode, resultCode, data);  
    // Result returned from launching the Intent from GoogleSignInApi.getSignInIntent(...);  
    if (requestCode == RC_SIGN_IN) {  
        GoogleSignInResult result = Auth.GoogleSignInApi.getSignInResultFromIntent(data);  
        handleSignInResult(result);  
    }  
}
```

- If sign in result ok, handle it.

```
private void handleSignInResult(GoogleSignInResult result) {  
    if (result.isSuccess()) {  
        // Signed in successfully, show authenticated UI.  
        GoogleSignInAccount acct = result.getSignInAccount();  
        app.googleName = acct.getDisplayName();  
        app.googleToken = acct.getId();  
        app.signedIn = true;  
        app.googleMail = acct.getEmail();  
        if(acct.getPhotoUrl() == null)  
            ; //New Account may not have Google+ photo  
        else app.googlePhotoURL = acct.getPhotoUrl().toString();  
  
        startHomeScreen();  
    } else  
        Toast.makeText(this, "Please Sign in " , Toast.LENGTH_SHORT).show();  
}
```

- On successful sign in, get the users Google info
- Take the user to the 'Home' screen



# CoffeeFragment (extracts) \*

```
@Override  
public void onCreate(Bundle savedInstanceState)  
{  
    super.onCreate(savedInstanceState);  
    CoffeeApi.get("/coffees/" + app.googleToken);  
  
    @Override  
    public View onCreateView(LayoutInflater inflater, ViewGroup parent,  
        Bundle savedInstanceState) {  
  
        // Inflate the layout for this fragment  
        v = inflater.inflate(R.layout.fragment_home, parent, false);  
        listView = v.findViewById(R.id.homeList);  
        updateView();  
        return v;  
    }  
}
```

❑ Retrieving all the coffees from the server

❑ Updating the View



# CoffeeFragment (extracts) \*

```
public void updateView() {
    listAdapter = new CoffeeListAdapter(activity, this, app.coffeeList);
    coffeeFilter = new CoffeeFilter(app.coffeeList,"all",listAdapter);

    if (favourites) {
        coffeeFilter.setFilter("favourites"); // Set the filter text file
        coffeeFilter.filter(null); // Filter the data, but don't use any
    }
    setListView(v);
    setSwipeRefresh(v);

    if(!favourites) getActivity().setTitle("Recently Added Coffee's");
    else getActivity().setTitle("Favourite Coffee's");

    listAdapter.notifyDataSetChanged(); // Update the adapter
}
```

□ Setting up our ‘Swipe Refresh’ & List View



# CoffeeFragment (extracts) \*

```
@Override  
public void onAttach(Context context)  
{  
    super.onAttach(context);  
    this.activity = (Home) context;  
    CoffeeApi.attachListener(this);  
    CoffeeApi.attachDialog(activity.loader);  
}
```

```
@Override  
public void onDetach() {  
    super.onDetach();  
    CoffeeApi.detachListener();  
}
```

- Attach listener & Dialog Loader
- Detach listener



# CoffeeFragment (extracts) \*

```
public void onCoffeeDelete(final Coffee coffee)
{
    String stringName = coffee.name;
    AlertDialog.Builder builder = new AlertDialog.Builder(activity);
    builder.setMessage("Are you sure you want to Delete the \'Coffee\' "
        + stringName + "?");
    builder.setCancelable(false);

    builder.setPositiveButton("Yes", new DialogInterface.OnClickListener() {
        public void onClick(DialogInterface dialog, int id) {
            CoffeeApi.delete("/coffees/" + app.googleToken +
                "/" + coffee._id,app.googleToken);
        }
    }).setNegativeButton("No", (dialog, id) -> { dialog.cancel(); });
    AlertDialog alert = builder.create();
    alert.show();
}
```

- Deleting a single coffee



# CoffeeFragment (extracts) \*

- Deleting multiple coffees

```
public void deleteCoffees(ActionMode actionMode)
{
    for (int i = listAdapter.getCount() -1 ; i >= 0; i--) {
        if (listView.isItemChecked(i)) {
            CoffeeApi.delete("/coffees/" + app.googleToken
                + "/" + listAdapter.getItem(i)._id, app.googleToken);
        }
    }
    CoffeeApi.get("/coffees/" + app.googleToken);
    listAdapter.notifyDataSetChanged(); // refresh adapter
    actionMode.finish();
}
```

- Retrieving our Coffees again



# Add (Fragment) \*

```
if ((coffeeName.length() > 0) && (coffeeShop.length() > 0)
    && (price.length() > 0)) {
    Coffee c = new Coffee(coffeeName, coffeeShop, ratingValue,
        coffeePrice, false, app.googlePhotoURL, app.googleToken);
    CoffeeApi.post("/coffees/" + app.googleToken, c);
    startActivityForResult(new Intent(this.getActivity(), Home.class));
}
```

- Creating a new coffee object

- Note the extra 'Google' parameters

- Updating our coffee data on the server



# Edit (Fragment) \*

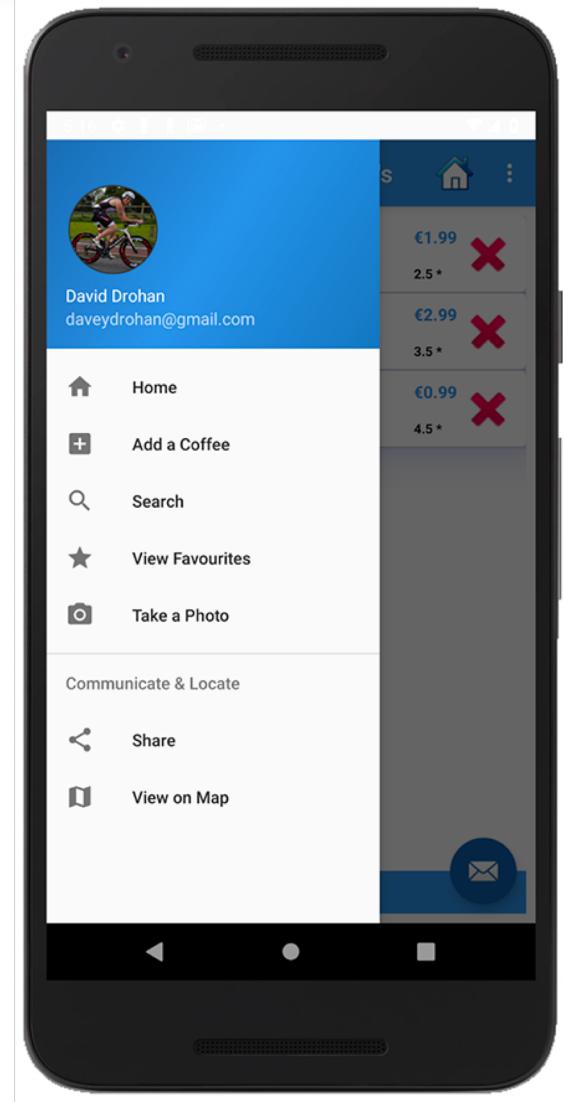
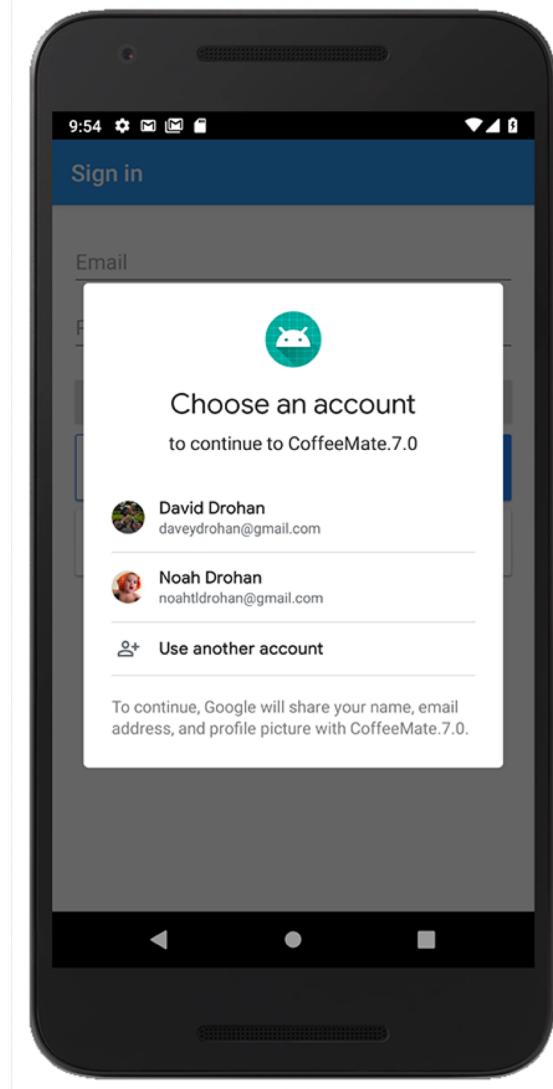
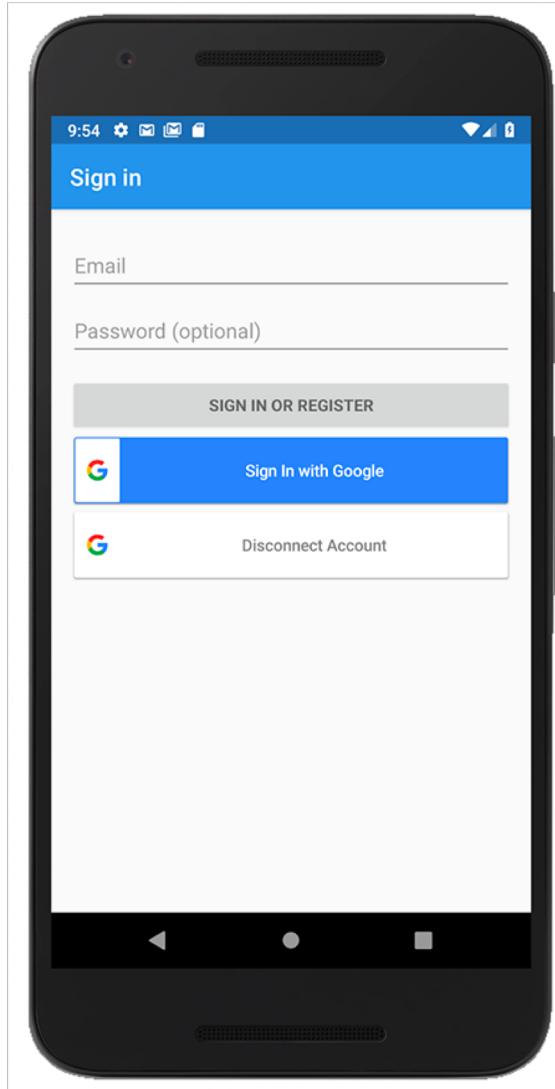
```
@Override  
public void onCreate(Bundle savedInstanceState)  
{  
    super.onCreate(savedInstanceState);  
    app = (CoffeeMateApp) getActivity().getApplication();  
  
    if(getArguments() != null)  
        CoffeeApi.get("/coffees/" + app.googleToken + "/"  
                     + getArguments().getString("coffeeId"));  
}
```

- ID passed from List  
(now a string value)
- Retrieving coffee data  
from server
- Updating our coffee  
data on the server

```
CoffeeApi.put("/coffees/" + app.googleToken + "/" + aCoffee._id,  
              aCoffee, app.googleToken);
```



# CoffeeMate 7.0+





# Relevant Links

---

- ❑ Setting Up Google Play Services

<https://developer.android.com/google/play-services/setup.html>

- ❑ Integrating Google+ Sign In into your Android Application

<http://androidsrc.net/integrating-google-plus-sign-in-into-your-android-application/>

- ❑ Official Docs

- ❑ <https://developers.google.com/identity/sign-in/android/sign-in>



---

# Questions?



---

Thanks!

A black and white cartoon illustration of a hand reaching out from under a horizontal line, holding a smiling sun. The sun has a face with two dots for eyes and a wide smile. It has several small, dark shapes around it, possibly representing clouds or a trail. A small copyright symbol (©) is at the bottom right of the sun.