

# Handling Push Notifications in Android applications

## Overview

Before Android applications are able to handle any received push notifications, they must be configured with support for Google Play Services. Once an application has been configured, MobileFirst-provided Notifications API can be used in order to register & unregister devices, and subscribe & unsubscribe to tags.

In this tutorial you learn how to configure an Android application and how to use the MobileFirst-provided Notifications API.

### Prerequisites:

- Make sure you have read the following tutorials:
  - Setting up your MobileFirst development environment ([../setting-up-your-development-environment/index](#))
  - Adding the MobileFirst Platform Foundation SDK to Cordova applications ([../adding-the-mfpf-sdk/android](#))
  - Push Notifications Overview ([../push-notifications-overview](#))
- MobileFirst Server to run locally, or a remotely running MobileFirst Server.
- MobileFirst Developer CLI installed on the developer workstation

Jump to:

- Notifications configuration
- Notifications API
- Handling a push notification
- Sample application

## Notifications Configuration

Create a new Android Studio project or use an existing one.

If the MobileFirst Native Android SDK is not already present in the project, follow the instructions in the [Adding the MobileFirst Platform Foundation SDK to Android applications \(../adding-the-mfpf-sdk/android\)](#) tutorial.

### Project setup

1. In **Android → Gradle scripts**, select the **build.gradle (Module: app)** file and add the following lines to **dependencies**:

```
com.google.android.gms:play-services-gcm:8.4.0
```

And:

```
compile group: 'com.ibm.mobile.foundation',
name: 'ibmmobilefirstplatformfoundationpush',
version: '8.0.0.0.Beta1-SNAPSHOT',
ext: 'aar',
transitive: true
```

- Or in a single line:

```
compile 'com.ibm.mobile.foundation:ibmmobilefirstplatformfoundationpush:8.0.Beta1-SNAPSHOT'
```

remove step 2 below before going live

2. Copy `ibmmobilefirstplatformfoundationpush-1.0.0.aar` (from halpert Electra DevOps Latest integration build) to `\extras\google\m2repository\com\ibm\mobile\foundation\ibmmobilefirstplatformfoundationpush\1.0.0\ibmmobilefirstplatformfoundationpush-1.0.0.aar`. Also remove `libs` folder from the `aar`.
3. In **Android → app → manifests**, open the `AndroidManifest.xml` file.
  - Add the following permissions to the top the `manifest` tag:

```
<!-- Permissions -->
<uses-permission android:name="android.permission.WAKE_LOCK" />

<!-- GCM Permissions -->
<uses-permission android:name="com.google.android.c2dm.permission.RECEIVE" />
<permission
  android:name="your.application.package.name.permission.C2D_MESSAGE"
  android:protectionLevel="signature" />
```

- Add the following (MFPPush Intent Service, MFPPush Instance ID Listener Service) to the application tag:

```
<!-- GCM Receiver -->
<receiver
    android:name="com.google.android.gms.gcm.GcmReceiver"
    android:exported="true"
    android:permission="com.google.android.c2dm.permission.SEND">
    <intent-filter>
        <action android:name="com.google.android.c2dm.intent.RECEIVE" />
        <category android:name="your.application.package.name" />
    </intent-filter>
</receiver>

<!-- MFPPush Intent Service -->
<service
    android:name="com.ibm.mobilefirstplatform.clientsdk.android.push.api.MFPPushIntentService"
    android:exported="false">
    <intent-filter>
        <action android:name="com.google.android.c2dm.intent.RECEIVE" />
    </intent-filter>
</service>

<!-- MFPPush Instance ID Listener Service -->
<service
    android:name="com.ibm.mobilefirstplatform.clientsdk.android.push.api.MFPPushInstanceIdListenerService"
    android:exported="false">
    <intent-filter>
        <action android:name="com.google.android.gms.iid.InstanceID" />
    </intent-filter>
</service>
```

**Note:** Be sure to replace `your.application.package.name` with the actual package name of your application.

## Notifications API

### Client-side

| Java Methods   | Description   |
|--|---|
| <code>MFPPush.initialize(Context context);</code>                            | Initializes MFPPush for supplied context.                               |
| <code>MFPPush.isPushSupported();</code>                                      | Does the device support push notifications.                             |
| <code>MFPPush.registerDevice(MFPPushResponseListener);</code>                | Registers the device with the Push Notifications Service.               |
| <code>MFPPush.getTags(MFPPushResponseListener)</code>                        | Retrieves the tag(s) available in a push notification service instance. |
| <code>MFPPush.subscribe(String[] tagNames, MFPPushResponseListener)</code>   | Subscribes the device to the specified tag(s).                          |
| <code>MFPPush.getSubscriptions(MFPPushResponseListener)</code>               | Retrieves all tags the device is currently subscribed to.               |
| <code>MFPPush.unsubscribe(String[] tagNames, MFPPushResponseListener)</code> | Unsubscribes from a particular tag(s).                                  |
| <code>MFPPush.unregisterDevice(MFPPushResponseListener)</code>               | Unregisters the device from the Push Notifications Service              |

### API implementation

All API calls must be called on an instance of `MFPPush`. This can be by created a class level field such as `private MFPPush push = MFPPush.getInstance();`, and then calling `push.<api-call>` throughout the class.

Alternatively you can call `MFPPush.getInstance().<api-call>` for each instance in which you need to access the push API methods.

#### Initialization

Required for the client application to connect to MFPPush service with the right application context. \* The API method should be called first before using any other MFPPush APIs. \* Registers the callback function to handle received push notifications.

```
MFPPush.getInstance().initialize(this);
```

## Is push supported

Checks if the device supports push notifications.

```
Boolean isSupported = MFPPush.getInstance().isPushSupported();

if (isSupported ) {
    // Push is supported
} else {
    // Push is not supported
}
```

## Register device

Register the device to the push notifications service.

```
MFPPush.getInstance().registerDevice(new MFPPushResponseListener<String>() {
    @Override
    public void onSuccess(String s) {
        // Successfully registered
    }

    @Override
    public void onFailure(MFPPushException e) {
        // Registration failed with error
    }
});
```

## Get tags

Retrieve all the available tags from the push notification service.

```
MFPPush.getInstance().getTags(new MFPPushResponseListener<List<String>>>() {
    @Override
    public void onSuccess(List<String> strings) {
        // Successfully retrieved tags as list of strings
    }

    @Override
    public void onFailure(MFPPushException e) {
        // Failed to receive tags with error
    }
});
```

## Subscribe

Subscribe to desired tags.

```
String[] tags = {"Tag 1", "Tag 2"};

MFPPush.getInstance().subscribe(tags, new MFPPushResponseListener<String[]>() {
    @Override
    public void onSuccess(String[] strings) {
        // Subscribed successfully
    }

    @Override
    public void onFailure(MFPPushException e) {
        // Failed to subscribe
    }
});
```

## Get subscriptions

Retrieve tags the device is currently subscribed to.

```
MFPPush.getInstance().getSubscriptions(new MFPPushResponseListener<List<String>>() {
    @Override
    public void onSuccess(List<String> strings) {
        // Successfully received subscriptions as list of strings
    }

    @Override
    public void onFailure(MFPPushException e) {
        // Failed to retrieve subscriptions with error
    }
});
```

## Unsubscribe

Unsubscribe from tags.

```
String[] tags = {"Tag 1", "Tag 2"};

MFPPush.getInstance().unsubscribe(tags, new MFPPushResponseListener<String[]>() {
    @Override
    public void onSuccess(String[] strings) {
        // Unsubscribed successfully
    }

    @Override
    public void onFailure(MFPPushException e) {
        // Failed to unsubscribe
    }
});
```

## Unregister

Unregister the device from push notification service instance.

```
MFPPush.getInstance().unregisterDevice(new MFPPushResponseListener<String>() {
    @Override
    public void onSuccess(String s) {
        disableButtons();
        // Unregistered successfully
    }

    @Override
    public void onFailure(MFPPushException e) {
        // Failed to unregister
    }
});
```

## Handling a push notification

In order to handle a push notification you will need to set up a `MFPPushNotificationListener`. This can be achieved by implementing one of the following methods.

### Option One

In the activity in which you wish to handle push notifications.

1. Add `implements MFPPushNotificationListener` to the class declaration.
2. Set the class to be the listener by calling `MFPPush.getInstance().listen(this)` in the `onCreate` method.
3. Then you will need to add the following *required* method:

```
@Override
public void onReceive(MFPPushNotification mfpSimplePushNotification) {
    // Handle push notification here
}
```

4. In this method you will receive the `MFPPushNotification` and can handle the notification for the desired behavior.

### Option Two

Create a listener by calling `listen(new MFPPushNotificationListener())` on an instance of `MFPPush` as outlined below:

```
MFPPush.getInstance().listen(new MFPPushNotificationListener() {  
    @Override  
    public void onReceive(MFPSimplePushNotification mfpSimplePushNotification) {  
        // Handle push notification here  
    }  
});
```

## Sample application

Click to download (<https://github.com/MobileFirst-Platform-Developer-Center/PushNotificationsAndroid/tree/release80>) the Android Studio project.

## Sample usage

1. From the command line, navigate to the project's root folder.
2. Ensure the sample is registered in the MobileFirst Server by running the command:  
`mpdev app register.`
3. Import the project to Android Studio, and run the sample by clicking the **Run** button.

