

DU Ad Platform_SDK for Android Access Guide

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1. Introduction

This document describes how to integrate **DUAd Platform SDK** into Android apps.

[DAP, short for DUAd platform](#) offers advertising services for helping apps to monetize. This version of SDK provides native ads.

Prerequisites:

DU Ad Platform SDK currently supports Android 2.3 API level 9 (included) plus system versions.

2. Integration Workflow

This section describes the integration workflow of DU Ad Platform SDK.

1. Apply for App_ID and DAP Placement_ID.
2. Load SDK package; configure Androidmanifest.xml.
3. Initialize DU Ad Platform SDK.
4. Access Du ad.

3. Obtain Identity

This section describes the four IDs needed during DU Ad Platform SDK integration: APP ID, DAP Placement ID, Facebook Placement_ID and AdMob_ID.

3.1 APP_ID

1. Definition

APP ID is a unique identifier of a developer's APP on **Du Ad Platform**. Each app has its own App ID.

2. Obtain method

Visit our [official website](#) and register your app on **Du Ad Platform**, the APP ID will be generated automatically

3. Code

```
app_license
```

3.2 DAP Placement ID

1. Definition

DAP Placement ID is a unique identifier of an ad slot on Du Ad platform. Developers can create multiple DAP Placement IDs for one app.

2. Obtain method

Visit our [official website](#) and after registered your app, you can create the placement for your app.

3. Code

```
pid
```

3.3 Facebook Placement_ID(Optional)

1. Definition

Facebook Placement ID is the unique identifier of an ad slot on **Facebook Audience Network**. Only required if you use DAP to intergrate FAN.

2. Obtain method

Visit [Facebook Developers](#) to apply it.

3. Code

```
fbids
```

3.4 AdMob_ID(Optional)

1. Definition

AdMob_ID is the unique identifier of an ad slot on **Google AdMob**. Only required if you use DAP to intergrate AdMob.

2. Obtain method

Visit [AdMob Developers](#) to apply it.

3. Code

```
amid
```

4. Load SDK and Configuration

This section describes how to load the DU Ad Platform SDK into your android project, how to configure the *AndroidManifest.xml* file and how to obfuscate code against project needs.

4.1 Load DU Ad Platform SDK

1. Download the DU Ad Platform SDK package.
2. Unzip the package. Two folders are available in the subdirectory:

- DUAd_SDK:

This folder stores DU Ad Platform SDK aar: DuappsAd-HW-xxx-release.aar

- DUAd_SDK_DEMO

This folder stores a sample program, which integrates DU Ad Platform SDK. All interfaces in this document can be found in corresponding usage in this sample program.

3. Load DU Ad Platform SDK:

- When using Android Studio:

Copy the SDK aar to your Android Project, under the libs directory in root directory. Then configure build.gradle:

```
repositories {
    flatDir {
        dirs 'libs'
    }
}

dependencies {
    compile fileTree(include: ['*.jar'], dir: 'libs')
    compile(name: 'DuappsAd-HW-xxx-release', ext: 'aar')
}

*Note: The assigned directory of flatDir is where the aar file is placed.
```

- When using Eclipse:

1. Change the suffix of DuappsAd-HW-xxxx-release.aar to zip and unzip it.
2. Copy the classes.jar to your Android project, under the libs directory in root directory.

Note: Please also add additional dependencies when you use DAP to integrate Facebook and AdMob ads.

4.2 Configure AndroidManifest.xml

Open the AndroidManifest.xml in your Android project and update it as below:

1. Add user-permission element. Least Privilege of DU Ad Platform SDK is shown below:

```
<uses-permission android:name="android.permission.INTERNET" />
<uses-permission
android:name="android.permission.ACCESS_NETWORK_STATE" />
```

2. Add a meta-data element under the application element, and fill your DAP App ID as the value of "app_license". Declare the com.duapps.ad.stats.DuAdCacheProvider in the manifest. Replace the below packagename with your app's full package name.

```

<application
    android:name="com.mobula.sample.MobulaApplication"
    android:icon="@drawable/ic_launcher"
    android:label="@string/app_name"
    android:theme="@style/mobulaTheme" >
    <meta-data
        android:name="app_license"
        android:value="YOUR_APP_LICENSE" />
    <provider
        android:name="com.duapps.ad.stats.DuAdCacheProvider"
        android:authorities="${applicationId}.DuAdCacheProvider"
        android:exported="false">
    </provider>
</application>

```

Note: Please make sure the applicationId at here is exactly the same as the package name you filled on DAP when registering you app. Otherwise, it will fail to get ad from DAP.

3. Add this Activity when you use AdMob. Please ignore this if you don't need AdMob ads.

```

<!--Admob begin-->
<activity
    android:name="com.google.android.gms.ads.AdActivity"

    android:configChanges="keyboard|keyboardHidden|orientation|screenLayout|
                                uiMode|screenSize|smallestScreenSize"
    android:theme="@android:style/Theme.Translucent" />

```

4.3 Obfuscate Code

Please follow the below rules to obfuscate code. Otherwise, there might be exceptions at run time.

1. Add below classes to proguard configuration:

```

-keep class com.duapps.ad.**{*;}
-dontwarn com.duapps.ad.**

-keep public class * extends android.content.BroadcastReceiver
-keep public class * extends android.content.ContentProvider
-keepnames @com.google.android.gms.common.annotation.KeepName class *
-keepclassmembernames class * {
    @com.google.android.gms.common.annotation.KeepName *;}
-keep class com.google.android.gms.common.GooglePlayServicesUtil {
    public <methods>;}

```

```
-keep class com.google.android.gms.ads.identifier.AdvertisingIdClient
{
    public <methods>;}
-keep class
com.google.android.gms.ads.identifier.AdvertisingIdClient$Info {
    public <methods>;}
```

Note: For more about obfuscation methods, please refer to the official Android obfuscation document at: `android-sdk/tools/proguard/`

2. If accessing Facebook ads, please add the below class to proguard configuration.

```
-keep class com.facebook.ads.NativeAd
```

3. If accessing Admob ads, please add the below class to proguard configuration.

```
-keep public class com.google.android.gms.ads.** {public *;}
```

5. Initialization

This section describes how to initialize DAP SDK. You need to initialize DAP SDK before you can use it.

Placement id without initialization can not get ads.

1. Create a json file with mappings for the DAP Placement ID and other platform id.

```
{
  "native": [
    {
      "pid": "YOUR_DAP_PLACEMENT_ID"
    },
    {
      "pid": "YOUR_DAP_PLACEMENT_ID",
      "fbids": [
        "YOUR_FACEBOOK_PLACEMENT_ID"
      ],
      "amid": "YOUR_ADMOB_AD_ID"
    }
  ],
  "list": [
    {
      "pid": "YOUR_DAP_PLACEMENT_ID",
      "fbids": "YOUR_FACEBOOK_PLACEMENT_ID"
    }
  ]
}
```

Note:

1. If some of the DAP placements don't need ads from Facebook, the "fbids" part for that "pid" could be removed. If FBID is bound, please make sure the Facebook Audience Network sdk version is not lower than FB 4.23.0.
2. If some of the DAP placements don't need ads from AdMob, the "amid" part for that "pid" could be removed.
3. DAP native list is not support ads from AdMob now.
4. If you do not want to initialize by creating a json file statically, you can directly create a string that conforms to the json format and pass the value.

2. Add a call to `DuAdNetwork.init()` from `onCreate()` in your Application class.

Interface Instruction:

```
public static void init(Context context, String pidsjson)
```

Parameters	Description
Context context	ACTIVITY CONTEXT
String pidsjson	The relationship between DAP Placement ID and other platform.

Code Sample:

```
public void onCreate() {
    super.onCreate();
    //Initialize the DAP SDK before executing any other operations
    DuAdNetwork.init(this, getConfigJSON(getApplicationContext()));

    //DuAdNetwork.setLaunchChannel("YOUR_APP_CHANNEL");
}

//Read the json.txt from assets
private String getConfigJSON(Context context) {
    BufferedInputStream bis = null;
    ByteArrayOutputStream bos = new ByteArrayOutputStream();
    try {
        bis = new
        BufferedInputStream(context.getAssets().open("json.txt"));
        byte[] buffer = new byte[4096];
        int readLen = -1;
        while ((readLen = bis.read(buffer)) > 0) {
            bos.write(buffer, 0, readLen);
        }
    } catch (IOException e) {
        Log.e("", "IOException :" + e.getMessage());
    } finally {
```

```

        closeQuietly(bis);
    }

    return bos.toString();
}

```

3. Add a `DuAdNetwork.setLaunchChannel()` from `onCreate()` in you Application class, to distinguish your data by your app distribution channel. It's optional.

Interface Instruction:

```
public static void setLaunchChannel (String channelName)
```

Parameters	Description
String channelName	Your own distribution channel name to distinguish your data.

6.Matain the status of user's collecting consent

This is an optional configuration for GDPR compliance.

6.1 Set the status of user's consent

Please set the status during the initialization.

Interface Instrunction:

```
public static void setConsentStatus(Context context, boolean consentStatus)
```

Parameters	Description
Context context	ACTIVITY CONTEXT
boolean consentStatus	User's consent status true: pass it when obtaining the user's authorization and then get ad and report data normally. false:pass it when user declines or reclaims the authorization, returning error code 4000.

6.2 Get the status of user's consent

Interface Instrunction:

```
public static boolean getConsentStatus(Context context)
```

Obtain the status of user's consent. Return True if user's consent is obtained, otherwise return False.

7. Request Single Native Ad

7.1 Construct Du Native Ad

Proceed as follows :

1. Create DuNative Ad Object.

Must specify the corresponding pid into the object. You will get different ad data with different pid.

2. Set ad cache size

Cache size could be set to 1-5. Recommend not to set cachesize. The default cachesize will be 1.

Note:Cache size only takes effect when integrating other platform through the DU Ad Platform.

Interface Instruction:

```
public DuNativeAd (Context context, int pid)
public DuNativeAd (Context context, int pid, int cacheSize)
```

Parameters	Description
Context context	ACTIVITY CONTEXT
int pid	DAP placement ID,this pid must declared on Json's native array
int cacheSize	Ad cache size.

7.2 Register the Callback Interface for Native Ad

Please register a callback interface for receiving the native ad data.

Interface Instruction:

```
public void setMobulaAdListener(DuAdListener adListener)
```

Parameters	Description
DuAdListener adListener	Callback function returns: ad error, ad data, and ad click event.

```
public interface DuAdListener {
    public void onError(DuNativeAd ad, AdError error);
    public void onAdLoaded(DuNativeAd ad);
    public void onClick(DuNativeAd ad);
}
```

After called `load()`, three types of results could be returned:

- Retrieve ad successfully

Modify the `onAdLoaded()` function above to retrieve the ad properties.

- Get an error

Get specific error information in `onError()` function above. Error code and description are shown as below:

Constants	Error Code	Description
NETWORK_ERROR_CODE	1000	Client network error
NO_FILL_ERROR_CODE	1001	No Ad data retrieved
LOAD_TOO_FREQUENTLY_ERROR_CODE	1002	Too many interface requests
IMPRESSION_LIMIT_ERROR_CODE	1003	Reach the daily impression limit
SERVER_ERROR_CODE	2000	Server error
INTERNAL_ERROR_CODE	2001	Network error
TIME_OUT_CODE	3000	Retrieve Ad data timed out
UNKNOWN_ERROR_CODE	3001	Unknown error
NO_USER_CONSENT_ERROR_CODE	4000	No user's consent

- Retrieve a ad click event

Get informed when an ad is clicked in `onClick()` function.

7.3 Retrieve Native Ad

The ad retrieving process is asynchronous, so it will not block developers' threads.

Interface Instruction:

```
public void fill()
```

Use the `fill()` to pre-cache ad in advance for faster loading the ad when using `load()`.

Recommend using the `fill()` at the page before the ad showing page.

Note: Ad data will be cached in client device's memory. Since SDK only caches the image's URL address not the image data, the cache size is small.

```
public void load()
```

Acquire advertising object data **asynchronously**, making an ad request when there is no cache.

Recommend using `fill()` after `load()` to pre-cache again.

```
public DuNativeAd getCacheAd()
```

Acquire advertising object data **synchronously**. It could be traversed until the number of cached ads goes to 0.

Please make sure the cache pool is not null before showing ad.

Recommend using `fill()` after `get()` to pre-cache again.

```
public boolean isHasCached()
```

Check if there is cached ad. Return true for having cache.

Code Sample:

```
DuNativeAd nativeAd = new DuNativeAd(this, PID, CACHESZIE);

if (nativeAd != null) {
    nativeAd.setMobulaAdListener (mListener);
    nativeAd.load();
}

DuAdListener mListener = new DuAdListener () {
    @Override
    public void onError (DuNativeAd ad, AdError error) {
        Log.d(TAG, "onError : " + error.getErrorCode());
    }

    @Override
    public void onClick (DuNativeAd ad) {
        Log.d(TAG, "onClick : click ad");
    }

    @Override
    public void onAdLoaded (final DuNativeAd ad) {
        Log.d(TAG, "onAdLoaded : " + ad.getTitle());
    }
};
```

7.4 Destroy Ad Object

Recommend to destroy your ad object when exiting the native ad showing page.

Interface Instruction:

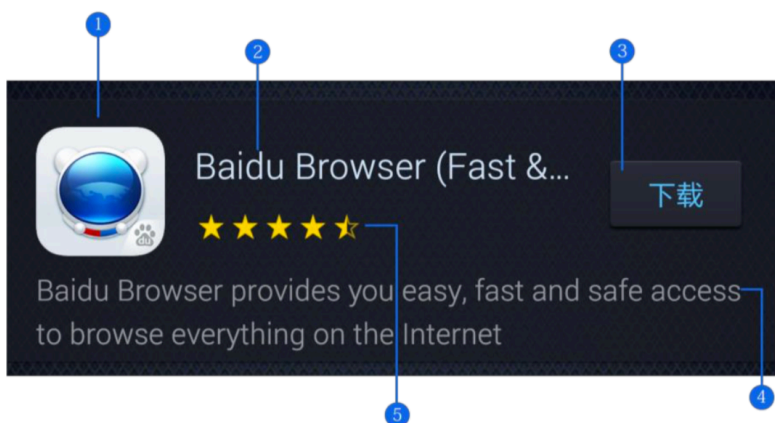
```
public void destroy()
```

8. Native Ad Properties

When using the Native Ad, instead of receiving an ad ready to be displayed, you will receive a group of ad properties such as a title, an image, a call to action, and you will have to use them to construct a custom view where the ad is shown. This section describes the ad properties and how to get them.

8.1 Introduction of Ad Properties

Ad properties include: Icon, title, Call to action (CTA) button, short description, rating, promotion image, etc.



1. Icon 2. Title 3. Call to action (CTA) button 4. Short description 5. Rating

8.2 Get the Ad Properties

The interfaces for retrieving the ad properties as shown below:

- Get Icon

```
public String getIconUrl()
```

Return the URL address of icon.

- Get Title

```
public String getTitle()
```

Return the title of ad.

Please reserve at least 20 characters' space to display the title. An ellipsis (...) can be used to indicate truncated text. Please note the ad title must be included in your native ad design.

- Get Call to Action (CTA) button

```
public String getCallToAction()
```

Return the text of ad's CTA button.

Advertisers can specify the text of CTA button, e.g. Install Now. The max character length is 25. Please do not shorten or change the text. Please note the CTA button must be included in your native ad design.

- Get Short description

```
public String getShortDesc()
```

Return the short description of ad.

Please reserve at least 72 characters' space to display the short description. If the space is not big enough, it is recommended to use scrolling text effects, or do not display the short description.

- Get Rating

```
public float getRatings()
```

Return the ad's rating on Google Play.

- Get Promotion Image

```
public String getImageUrl()
```

Return the URL address of ad's promotion image.

A promotion image can increase user's desire to click the ad. The image size is usually 796x416 pixels(1.91:1). You can zoom and cut part of the image, but do not distort or change it.

- DuAdChoicesView

This view is the AdChoices corner mark from by Facebook Native Ad. It's the mandatory element for Facebook native Ad. Please Note that the native ad which is not from Facebook doesn't have this.

Interface Instruction:

```
public DuAdChoicesView(Context mContext, DuNativeAd mNativeAd, boolean isExpand)
```

Parameters	Description
Context mContext	ACTIVITY CONTEXT
DuNativeAd mNativeAd	Native ad object
boolean isExpand	Controll whether AdChoises corner mark is expandable, recomment to be true.

Code Sample:

```
import com.duapps.ad.DuAdMediaView;
import com.duapps.ad.DuAdChoicesView;

LinearLayout adChoicesContainer = (LinearLayout)
findViewById(R.id.ad_choices_container);

if (mNativeAd.getAdChannelType() == DuNativeAd.CHANNEL_TYPE_FB) {
    DuAdChoicesView choicesView = new
DuAdChoicesView(getApplicationContext(), mNativeAd, true);
    adChoicesContainer.addView(adChoicesView);
    DuAdMediaView mMediaView = new DuAdMediaView(this);
    mMediaView.setAutoPlay(true);
    mMediaView.setNativeAd(mNativeAd.getRealSource());
}
```

8.3 Get AdMob Ads Data

There are two types of AdMob native ads: AppInstall and ContenAd. Please make the judgment after getting the ads data and call this method `onAdLoaded()` callback. For more details please see demo.

```
public int getAdChannelType()
```

```
if (ad.getAdChannelType() == DuNativeAd.CHANNEL_TYPE_AM_INSTALL) {
```

```

//If the type of Ad is "Admob- AppInstall", then dynamically use the
"NativeAppInstallAdView" provided by Admob
    if (lp == null) {
        lp = new
LayoutParams(LayoutParams.WRAP_CONTENT,LayoutParams.WRAP_CONTENT);
    }
    if (installAdView == null) {
        installAdView = new NativeAppInstallAdView(ShowADCardActivity.this);
    }
    installAdView.setHeadlineView(titleView);
    installAdView.setIconView(iconView);
    installAdView.setBodyView(descView);
    installAdView.setImageView(bigImgView);
    installAdView.setStarRatingView(ratingView);
    installAdView.setCallToActionView(btnView);
    installAdView.addView(rl, lp);
    fl.addView(installAdView);

    nativeAd.registerViewForInteraction(installAdView);
} else if(ad.getAdChannelType() == DuNativeAd.CHANNEL_TYPE_AM_CONTENT){
    //If the type of AD is "Admob- Content", then dynamically use the
"NativeContentAdView" provided by Admob
    if (lp == null) {
        lp = new
LayoutParams(LayoutParams.WRAP_CONTENT,LayoutParams.WRAP_CONTENT);
    }
    if (contentAdView == null) {
        contentAdView = new NativeContentAdView(ShowADCardActivity.this);
    }
    contentAdView.setHeadlineView(titleView);
    contentAdView.setLogoView(iconView);
    contentAdView.setBodyView(descView);
    contentAdView.setImageView(bigImgView);
    contentAdView.setCallToActionView(btnView);
    contentAdView.addView(rl, lp);
    fl.addView(contentAdView);

    nativeAd.registerViewForInteraction(contentAdView);
} else {
    //If the type of Ad is "Facebook" or "DU", please use the below method to
register the View.
    fl.addView(rl);
    nativeAd.registerViewForInteraction(bigImgContainer);
}

```

9. Register the Native Ad's View

The SDK will log the impression and handle the click automatically. Please note that you must register the ad's view with the DuNativeAd instance to enable that.

Interface Instruction:

```
public void registerViewForInteraction(View view)
public void registerViewForInteraction(View view, List<View> views)
```

Parameters	Description
View view	Clickable View in Adcontents
List <View> views	More detailed sub-View

Note: Don't recommend using this interface in multi-thread.

10. Request Native Ad List

Du Native Ad List is for showing multiple ads in one page at the same time. (Please note that Du Native Ad List has relatively poor monetization efficiency compared with single Du Native Ad. Please use this according to your situation.)

The whole workflow of getting the Ad is done in AsyncTask. Please use this function in the main thread.

10.1 Construct Manager Class of Native Ad List

Interface Instruction:

```
public DuNativeAdsManager(Context context, int pid, int cacheSize)
```

Parameters	Description
Context context	ACTIVITY CONTEXT
int pid	DAP placement ID, this pid must be declared on json's list array
int cacheSize	Ad cache size.

10.2 Construct Class of Sub-Native Ad

```
public NativeAd()
```

10.3 Register the Listener for Manager Class

Interface Instruction:

```
public void setListener(AdListArrivalListener adListener)
```

Parameters	Description
AdListArrivalListener adListener	Listener for NativeAd list. Callback function returns: ad error and ad data.

```
public interface AdListArrivalListener {  
    public void onError(AdError error);  
    public void onAdLoaded(List<NativeAd> mNativeAd);  
}
```

After called `load()`, two types of results could be returned:

- Retrieve ad successfully
Modify the `onAdLoaded()` function above to retrieve the ad properties.
- Get an error
Get specific error information in `onError()` function above.

10.4 Register a listener for each single ad in ad List

Interface Instruction:

```
public void setMobulaAdListener(DuAdDataCallBack mCallBack)
```

Parameters	Description
DuAdDataCallBack mCallBack	Callback function returns: click event. There is no <code>onAdLoaded()</code> and <code>onAdError()</code> callback for single ad in ad list.

```
public interface DuAdDataCallBack {  
    public void onError(AdError error);  
    public void onAdLoaded(NativeAd mNativeAd);  
    public void onAdClick();  
}
```

- Retrieve a ad click event
Get informed when an ad is clicked in `onClick()` function.

Code Sample:

```

private NativeAd mNativeAD;
private LinkedList<NativeAd> lists = new LinkedList<NativeAd>();
private DuNativeAdsManager adsManager = new
DuNativeAdsManager(getApplicationContext(), PID, CACHESIZE);

@Override
protected void onResume() {
    super.onResume();
    if (adsManager != null) {
        adsManager.setListener(listener);
        adsManager.load();

        mNativeAD = lists.get(mPosition);
        mNativeAD.setMobulaAdListener(callback);
        mNativeAD.registerViewForInteraction(btnView);
    }
}

AdListArrivalListener listener = new AdListArrivalListener() {
    NativeAd nativeAD;
    //Return ad list
    @Override
    public void onAdLoaded(List arg0) {
        for (int i = 0; i < arg0.size(); i++) {
            //Get single ad object
            nativeAD = (NativeAd) arg0.get(i);
            if (!(nativeAD.equals(null))) {
                lists.add(nativeAD);
            }
        }
    }
};

//Get the error
@Override
public void onAdError(AdError arg0) {
    Log.d(TAG, "onError : " + arg0.getErrorCode());
}

DuAdDataCallBack callback = new DuAdDataCallBack() {
    @Override
    public void onAdLoaded(NativeAd data) {
    }

    @Override
    public void onAdError(AdError error) {
    }

    @Override

```

```
public void onAdClick() {  
    Log.d(TAG, "onClick : click list ad");  
}  
};
```

10.5 Retrieve Native Ad

Interface Instruction:

```
public void fill()
```

Use the `fill()` to pre-cache ad in advance for faster loading the ad when using `load()`.
Recommend using the `fill()` at the page before the ad showing page.

Note: Ad data will be cached in client device's memory. Since SDK only caches the image's URL address not the image data, the cache size is small.

```
public void load()
```

Acquire advertising object data **asynchronously**, making an ad request when there is no cache.

Recommend using `fill()` after `load()` to pre-cache again.

10.6 Get the Ad Properties

- Get Icon

```
public String getAdIconUrl()
```

Return the URL address of icon.

- Get Title

```
public String getAdTitle()
```

Return the title of ad.

Please reserve at least 20 characters' space to display the title. An ellipsis (...) can be used to indicate truncated text. Please note the ad title must be included in your native ad design.

- Get Call to Action (CTA) button

```
public String getAdCallToAction()
```

Return the text of ad's CTA button.

Advertisers can specify the text of CTA button, e.g. Install Now. The max character length is 25. Please do not shorten or change the text. Please note the CTA button must be included in your native ad design.

- Get Short description

```
public String getAdShortDesc()
```

Return the short description of ad.

Please reserve atleast 72 charactors' space to display the short description. If the space isnot big enough, it is recommended to use scrolling text effects, or do notdisplay the short description.

- Get Rating

```
public float getAdRatings()
```

Return the ad's rating on Google Play.

- Get Promotion Image

```
public String getAdImageUrl()
```

Return the URL address of ad'spromotion image.

A promotion image can increase user's desire to click the ad. The image size is usually 796x416 pixels(1.91:1). You can zoom and cut part of the image, but do not distort or change it.

- DuAdChoicesView

This view is the AdChoices corner mark from by Facebook Native Ad. It's the mandatory element for Facebook native Ad. Please Note that the native ad which is not from Facebook doesn't have this.

Interface Instruction:

```
public DuAdChoicesView(Context mContext, DuNativeAd mNativeAd, boolean isExpand)
```

Parameters	Description
Context mContext	ACTIVITY CONTEXT
DuNativeAd mNativeAd	Native ad object
boolean isExpand	Controll whether AdChoises corner mark is expandable, recomment to be true.

10.7 Destroy the Object and Listener Interface

When exiting the native ad list showing page, the object(DuNativeAdsManager) and listener(AdListArrivalListener) must be destroyed.

Interface Instruction:

```
public void destroy()
```

Code Sample:

```
@Override
protected void onDestroy() {
    super.onDestroy();
    adsManager.setListener(null);
    adsManager.destroy();
}
```