Fragments for All

Contents

1 So, What's a Fragment?

A *fragment* is a class implementing a portion of an activity.

- A fragment represents a particular operation or interface running within a larger activity.
- Fragments enable more modular activity design, making it easier to adapt an application to different screen orientations and multiple screen sizes.
- Fragments must be embedded in activities; they cannot run independent of activities.
- Most fragments define their own layout of views that live within the activity's view hierarchy.
  - However, a fragment can implement a behavior that has no user interface component.
- A fragment has its own lifecycle, closely related to the lifecycle of its host activity.
- A fragment can be a static part of an activity, instantiated automatically during the activity's creation.
- Or, you can create, add, and remove fragments dynamically in an activity at run-time.

2 Fragments: Implemented in Honeycomb (3.0) or Later

Fragments were added to the Android API in Honeycomb, API 11.

The primary classes related to fragments are:

`android.app.Fragment`
The base class for all fragment definitions

`android.app.FragmentManager`
The class for interacting with fragment objects inside an activity

`android.app.FragmentTransaction`
The class for performing an atomic set of fragment operations

3 Fragments: Implemented in Donut (1.6) or Later

Google provides the *Compatibility Package*, a Java library that you can include in an application, implementing support for fragments and other Honeycomb features (loaders).

- You can use the Compatibility Package with applications targeting 1.6 (API 4) or later.
- For each of the classes in the Compatibility Package, the APIs work almost exactly the same as their counterparts in the latest Android platform. Therefore, you can usually refer to the online documentation for information about the supported APIs.

Note
If you write an application using the Compatibility Package, your application uses the class definitions from the Compatibility Package even when running on a device with 3.0 or later installed. The package does not try to switch to the device's "native" implementation of the classes.

The primary classes related to fragments are:

`android.support.v4.app.FragmentActivity`
The base class for all activities using compatibility-based fragment (and loader) features

`android.support.v4.app.Fragment`
The base class for all fragment definitions

`android.support.v4.app.FragmentManager`
The class for interacting with fragment objects inside an activity

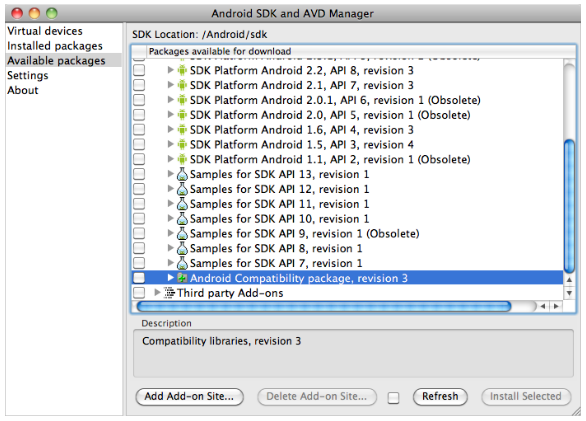
`android.support.v4.app.FragmentTransaction`
The class for performing an atomic set of fragment operations

Important
To use the Compatibility Package features, your activity *must* use `android.support.v4.app.FragmentActivity` as a base class, rather than `android.app.Activity` or one of its subclasses.

4 Downloading the Compatibility Package

You can download and install the Compatibility Package using the Android SDK and AVD Manager tool.

- You can find the Compatibility Package for download under "Android Repository" as "Android Compatibility package".



SDK Location: /Android/sdk

SDK Platform Android 2.2, API 8, revision 3
SDK Platform Android 2.1, API 7, revision 3
SDK Platform Android 2.0.1, API 6, revision 1 (Obsolete)
SDK Platform Android 2.0, API 5, revision 1 (Obsolete)
SDK Platform Android 1.6, API 4, revision 3
SDK Platform Android 1.5, API 3, revision 4
SDK Platform Android 1.1, API 2, revision 1 (Obsolete)
Samples for SDK API 13, revision 1
Samples for SDK API 12, revision 1
Samples for SDK API 11, revision 1
Samples for SDK API 10, revision 1
Samples for SDK API 9, revision 1 (Obsolete)
Samples for SDK API 8, revision 1
Samples for SDK API 7, revision 1
Android Compatibility package, revision 3
Third party Add-ons

Compatibility libraries, revision 3

Figure 1: Installing the Compatibility Package

5 Using the Compatibility Package

To use the Compatibility Package, you must add it to your Android project and include it in your Build Path.

- Using the Eclipse ADT plugin, you can do this automatically by:
  1. Selecting your Android project in the Package Explorer view
  2. Bringing up the context-menu
  3. Selecting Android Tools → Add Compatibility Library

6 Fragment Lifecycle

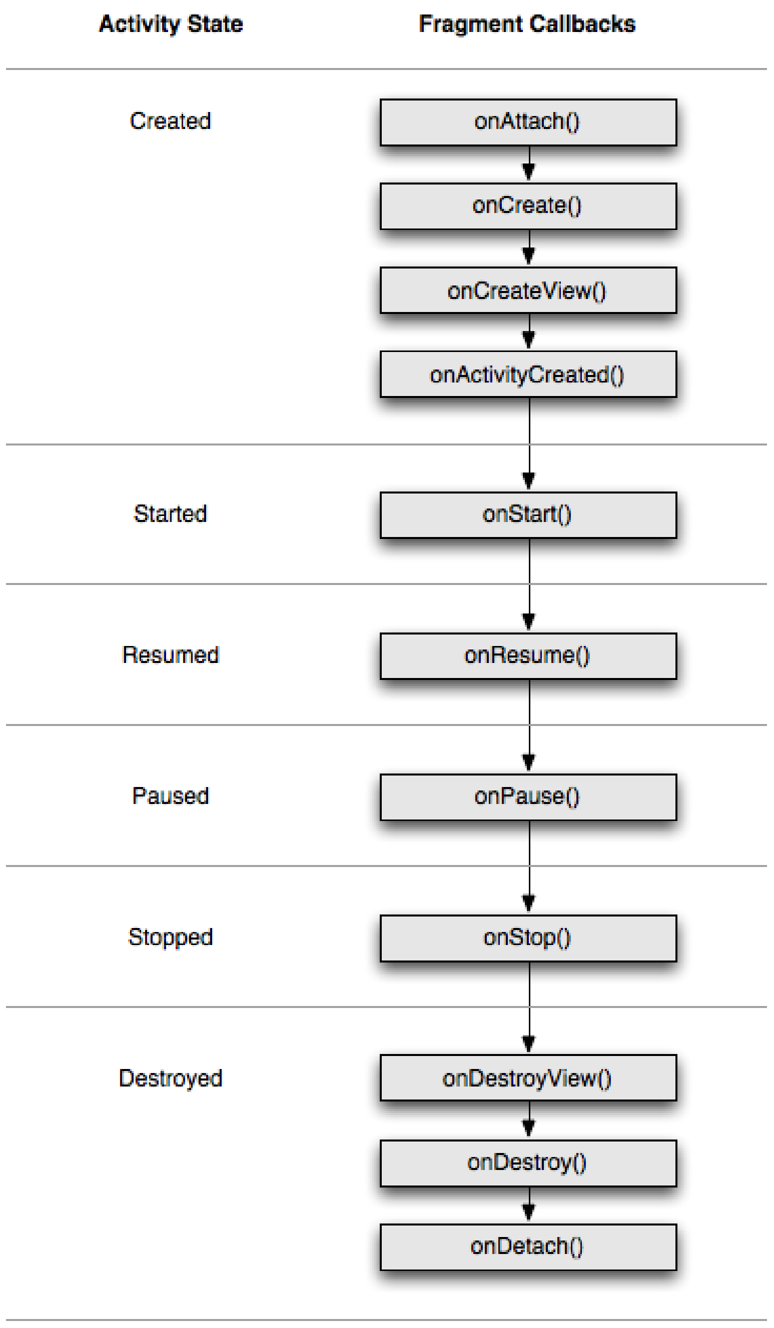


Figure 2: Fragment Lifecycle

As with the `Activity` class, the `Fragment` base class is an example of the *template method design pattern*.

- The `Fragment` base class defines a set of methods that you override to provide the custom behavior of your fragment implementation.

Of primary importance are the fragment lifecycle callback methods.

- The lifecycle of the activity in which the fragment lives directly affects the lifecycle of the fragment.
- Each lifecycle callback for the activity results in a similar callback for each fragment.
- For example, when the activity receives `onPause()`, each fragment in the activity receives `onPause()`.

Fragments have a few extra lifecycle callbacks managing interaction with the activity:

`onAttach(Activity)`
Called when the fragment has been associated with the activity.

`onCreateView(LayoutInflater, ViewGroup, Bundle)`
Called to create the view hierarchy associated with the fragment.

`onActivityCreated(Bundle)`
Called when the activity's `onCreate()` method has returned.

`onDestroyView()`
Called when the view hierarchy associated with the fragment is being removed.

`onDetach()`
Called when the fragment is being disassociated from the activity.

Important
When overriding these lifecycle methods — with the exception of `onCreateView()` — you **must** call through to the super class's implementation of the method. Otherwise, an exception occurs at run-time.

7 Creating the Fragment Class

Each fragment must be implemented as a subclass of `Fragment`.

Many of the `Fragment` methods are analogous to those found in `Activity`, and you should use them in a similar fashion.

`onCreate(Bundle)`
Initialize resources used by your fragment *except those related to the user interface*.

`onCreateView(LayoutInflater, ViewGroup, Bundle)`
Create and return the view hierarchy associated with the fragment.

`onResume()`
Allocate "expensive" resources (in terms of battery life, monetary cost, etc.), such as registering for location updates, sensor updates, etc.

`onPause()`
Release "expensive" resources. Commit any changes that should be persisted beyond the current user session.

8 Creating a Fragment Layout

To provide a layout for a fragment, your fragment's class must implement the `onCreateView()` callback method.

- The Android system invokes this method when it's time for the fragment to create its layout.
- This method must return a `View` that is the root of your fragment's layout.

As with an activity, you can create your layout *programmatically* by directly instantiating and configuring view objects, or *declaratively* by providing an XML layout file and *inflating* the layout.

- The declarative approach usually is simpler and easier.
- In support of the declarative approach, the system provides a reference to a `LayoutInflater` and a `ViewGroup` from the activity's layout, which will serve as the parent of your fragment's layout.

9 Creating a Fragment Layout (example)

For example, you could define a simple layout resource such as this:

res/layout/first_fragment.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:id="@+id/first_fragment_root">

    <TextView android:layout_height="wrap_content"
        android:text="@string/text_first_fragment_title"
        android:layout_width="match_parent"
        android:gravity="center_horizontal" />
    <EditText android:layout_height="wrap_content"
        android:layout_width="match_parent"
        android:id="@+id/edit_first_msg" />
    <Button android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:layout_width="wrap_content"
        android:id="@+id/button_first"
        android:text="@string/button_first_text" />

</LinearLayout>
```

Then to initialize your fragment's layout:

```
public class FirstFragment extends Fragment implements OnClickListener {

    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
                             Bundle savedInstanceState) {
        View view = inflater.inflate(R.layout.first_fragment,
                                     container, false);
        Button nextButton = (Button) view.findViewById(R.id.button_first);
        nextButton.setOnClickListener(this);

        return view;
    }

    // ...
}
```

Note
The final `false` argument to `LayoutInflator.inflate()` prevents the inflator from automatically attaching the inflated view hierarchy to the parent container. This is important, because the activity automatically attaches the view hierarchy to the parent as appropriate.

10 “Statically” Including a Fragment in an Activity Layout

The easiest way to incorporate a fragment into an activity is by including it directly into the activity’s layout file.

- This works well if the fragment should always be present in the layout.
- However, this approach does not allow you to dynamically remove the fragment at run-time.

In the activity’s layout file, simply use the `<fragment>` element (yes, that’s really lowercase) where you want to include the fragment.

- Use the `android:name` attribute to provide the package-qualified class name of the fragment.
- Specify the layout attributes to control the size and position of the fragment.

Note
Each fragment requires a unique identifier that the system can use to restore the fragment if the activity is restarted (and which you can use to capture the fragment to perform transactions, such as remove it). There are three ways to provide an ID for a fragment:

- Supply the `android:id` attribute with a unique ID.
- Supply the `android:tag` attribute with a unique string.
- If you provide neither of the previous two, the system uses the ID of the fragment’s container view.

For example:

Activity Layout

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="horizontal"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <fragment android:name="com.example.news.ArticleListFragment"
            android:id="@+id/list"
            android:layout_weight="1"
            android:layout_width="0dp"
            android:layout_height="match_parent" />
    <fragment android:name="com.example.news.ArticleReaderFragment"
            android:id="@+id/viewer"
            android:layout_weight="2"
            android:layout_width="0dp"
            android:layout_height="match_parent" />
</LinearLayout>
```

11 Dynamically Adding a Fragment to an Activity

At any time while your activity is running, you can add fragments to your activity layout.

1. First, use `Activity.getFragmentManager()` to get a reference to the `FragmentManager`.

   Note
   If you're using the Compatibility Package, use `FragmentActivity.getSupportFragmentManager()`.

2. Invoke `FragmentManager.beginTransaction()` to get an instance of `FragmentTransaction`.
3. Instantiate an instance of your fragment.
4. Use the `FragmentTransaction.add()` to add the fragment to a `ViewGroup` in the activity, specified by its ID. Optionally, you can also provide a String tag to identify the fragment.
5. Commit the transaction using `FragmentTransaction.commit()`.

For example:

```
FragmentManager fragmentManager = getFragmentManager()
// Or: FragmentManager fragmentManager = getSupportFragmentManager()
FragmentTransaction fragmentTransaction = fragmentManager.beginTransaction();
ExampleFragment fragment = new ExampleFragment();
fragmentTransaction.add(R.id.fragment_container, fragment);
fragmentTransaction.commit();
```

But... There's a catch.

12 Handling Run-Time Configuration Changes

When the system destroys and re-creates an activity because of a run-time configuration change, the activity automatically re-instantiates existing fragments.

- This isn't a problem for "static" fragments declared in the activity's layout.

- But for “dynamic” fragments, you need to test for this situation to prevent creating a second instance of your fragment.

To test whether the system is re-creating the activity, check whether the `Bundle` argument passed to your activity’s `onCreate()` is `null`.

- It it is non-`null`, the system is re-creating the activity. In this case, the activity automatically re-instantiates existing fragments.
- If it `null` you can safely instantiate your dynamic fragment. For example:

```
public void onCreate(Bundle savedInstanceState) {
    // ...
    if (savedInstanceState != null) {
        FragmentManager fragmentManager = getFragmentManager()
        // Or: FragmentManager fragmentManager = getSupportFragmentManager()
        FragmentTransaction fragmentTransaction = fragmentManager.beginTransaction();
        ExampleFragment fragment = new ExampleFragment();
        fragmentTransaction.add(R.id.fragment_container, fragment);
        fragmentTransaction.commit();
    }
}
```

13 Saving Fragment State

The `Fragment` class supports the `onSaveInstanceState(Bundle)` method (but *not* the `onRestoreInstanceState()` method) in much the same way as the `Activity` class.

- The default implementation saves the state of all the fragment’s views that have IDs.
- You can override this method to store additional fragment state information.
- If the system is re-creating the fragment from a previous saved state, it provides a reference to the `Bundle` containing that state to the `onCreate()`, `onCreateView()`, and `onActivityCreated()` methods; otherwise, the argument is set to `null`.

14 Retaining Fragments Across Activity Re-Creation

By default, when an activity is re-created (such as in response to a run-time configuration change), its fragments are also destroyed and re-created automatically.

Executing `Fragment.setRetainInstance(boolean)` with a value of `true` requests the system to retain the current instance of the fragment if the activity is re-created.

- If set, when the activity is re-created, the fragment’s `onDestroy()` and `onCreate()` methods are not invoked.
- All other fragment lifecycle methods are invoked in their typical sequence.

Note
If you use `setRetainInstance(true)`, then the `Bundle` argument to `onCreateView()` and and `onActivityCreated()` is `null` because the fragment is not re-created.

“Retained” fragments can be quite useful for propagating state information — especially thread management — across activity instances.

- For example, a fragment can serve as a “host” for an instance of `Thread` or `AsyncTask`, managing its operation.
- The `Activity.onRetainNonConfigurationInstance()` method, which has traditionally been used for this purpose, is *deprecated* as of API 11 in favor of the fragment’s `setRetainInstance()` capability.

Important
If you are using the compatibility library, the `FragmentActivity` class overrides `onRetainNonConfigurationInstance()` making it **`final`** to implement the fragment (and loader) retention capability.

15 Using Fragments with no Layouts

A fragment is not required to have a user interface.

- For example, if the sole purpose of a fragment is to maintain state information or manage a thread, it might not need a user interface.

When using a fragment with no user interface:

- There is no need to override the `onCreateView()` method.
- You must add the fragment to the activity using `FragmentTransaction.add(Fragment, String)`, providing a unique String *tag* to identify the fragment.
- For example:

```
FragmentManager fragmentManager = getFragmentManager()
// Or: FragmentManager fragmentManager = getSupportFragmentManager()
FragmentTransaction fragmentTransaction = fragmentManager.beginTransaction();
BackgroundFragment fragment = new BackgroundFragment();
fragmentTransaction.add(fragment, "thread_manager");
fragmentTransaction.commit();
```

16 Finding Fragments

The `FragmentManager` class has methods for finding a fragment contained within an activity:

`findFragmentById(int id)`
Finds a fragment with the specified ID.

`findFragmentByTag(String tag)`
Finds a fragment with the specified tag.

Both of these methods return a reference to the fragment, or `null` if no matching fragment is found.

17 Fragment Operations

You can perform many other operations on dynamic fragments other than adding them to an activity, such as removing them and changing their visibility.

- Each set of changes that you commit to the activity is called a *transaction*.
- You perform fragment operations using the methods in the `FragmentTransaction` class. Methods include:

  `add()`
  Add a fragment to the activity.

  `remove()`
  Remove a fragment from the activity. This operation destroys the fragment instance unless the transaction is added to the transaction back stack, described later.

  `replace()`
  Remove one fragment from the UI and replace it with another.

  `hide()`
  Hide a fragment in the UI (set its visibility to hidden without destroying the view hierarchy).

  `show()`
  Show a previously hidden fragment.

  `detach()` (API 13)
  Detach a fragment from the UI, destroying its view hierarchy but retaining the fragment instance.

  `attach()` (API 13)
  Reattach a fragment that has previously been detached from the UI, re-creating its view hierarchy.

Important
You can't `remove()`, `replace()`, `detach()`, or `attach()` a "static" fragment declared in an activity's layout.

Note
Revision 3 and later of the Compatibility Package also supports the `attach()` and `detach()` methods.

18 Performing Fragment Transactions

To perform a fragment transaction:

1. Obtain an instance of `FragmentTransaction` by calling `FragmentManager.beginTransaction()`.
2. Perform any number of fragment operations using the transaction instance.

   Tip
   Most of the `FragmentTransaction` operations return a reference to the same `FragmentTransaction` instance, allowing method chaining.

3. Call `commit()` to apply the transaction to the activity.

Important
You can commit a transaction using `commit()` only prior to the activity saving its state (i.e., before the system invokes `Activity.onSaveInstanceState()`). If you attempt to commit after that point, an exception will be thrown.

For example:

```
FragmentManager fragmentManager = getFragmentManager()
// Or: FragmentManager fragmentManager = getSupportFragmentManager()
fragmentManager.beginTransaction()
    .remove(fragment1)
    .add(R.id.fragment_container, fragment2)
    .show(fragment3)
    .hide(fragment4)
    .commit();
```

The order in which you add changes to a `FragmentTransaction` doesn't matter, except:

- You must call `commit()` last.
- If you're adding multiple fragments to the same container, then the order in which you add them determines the order they appear in the view hierarchy.

19 Managing the Fragment Back Stack

Similar to the way the system automatically mains a task back stack for activities, you have the option of saving fragment transactions onto a back stack managed by the activity.

- If you add fragment transactions to the back stack, then the user can navigate backward through the fragment changes by pressing the device's Back button.
- Once all fragment transactions have been removed from the back stack, pressing the Back button again destroys the activity.

To add a transaction to the back stack, invoke `FragmentTransaction.addToBackStack(String)` before committing the transaction.

- The String argument is an optional name to identify the back stack state, or `null`. The `FragmentManager` class has a `popBackStack()` method, which can return to a previous back stack state given its name.
- If you add multiple changes to the transaction and call `addToBackStack()`, then all changes applied before you call `commit()` are added to the back stack as a single transaction and the Back button will reverse them all together.

If you call `addToBackStack()` when removing or replacing a fragment:

- The system invokes `onPause()`, `onStop()`, and `onDestroyView()` on the fragment when it is placed on the back stack
- If the user navigates back, the system invokes `onCreateView()`, `onActivityCreated()`, `onStart()`, and `onResume()` on the fragment.

20 Integrating Fragment Action Bar/Options Menu Items

A fragment can add its own items to the activity's action bar or options menu.

- First, you **must** invoke `Fragment.setHasOptionsMenu()` in the fragment's `onCreate()` method.
- Then you can provide definitions for the fragment's `onCreateOptionsMenu()` and `onOptionsItemSelected()` methods, and optionally `onPrepareOptionsMenu()`, `onOptionsMenuClosed()`, and `onDestroyOptionsMenu()` methods, if needed.
- You implement these methods exactly as if they appeared within an activity class definition.

The corresponding methods in the `Activity` base class (or `FragmentActivity` base class) automatically invoke these methods for each fragment it contains.

- If you override these methods in your activity class, you can processing any menu items managed directly by the activity.
- Then, if appropriate, invoke the `super` version of the method to propagate the call to the fragments within the activity. Don't forget to do this, or your fragment's items will be ignored!

The activity automatically updates the action bar/options menu based on the dynamic state of its fragments.

- Items are added if needed when fragments are added, shown, or attached.
- Items are removed if no longer needed when fragments are removed, hidden, or detached.

Note
A fragment that adds items to the options menu does **not** need to have a view hierarchy. For example, a fragment could add Start and Stop items to the menu to control its behavior, but not display any other user interface.

21 Integrating Fragment Action Bar/Options Menu Items (example)

Activity source code

```
public class MyActivity extends Activity {
    // ...

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        super.onCreateOptionsMenu(menu);
        getMenuInflater().inflate(R.menu.activity_options, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()) {
        case R.id.menu_activity_info:
            // Handle activity menu item
            return true;
        default:
            // Handle fragment menu items
            return super.onOptionsItemSelected(item);
        }
    }

    // ...
}
```

Fragment source code

```
public class MyFragment extends Fragment {
    // ...

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setHasOptionsMenu(true);
    }

    @Override
    public void onCreateOptionsMenu(Menu menu, MenuInflater inflater) {
        inflater.inflate(R.menu.myfragment_options, menu);
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()) {
        case R.id.menu_first_info:
            // Handle fragment menu item
            return true;
        default:
            // Not one of ours. Perform default menu processing
            return super.onOptionsItemSelected(item);
        }
    }

    // ...
}
```

22 Communication Between the Fragment and the Activity

A given instance of a fragment is directly tied to the activity that contains it.

- Your activity can call public methods in the fragment through a reference to the fragment object.
  - If you don't retain a reference to a fragment when creating it, you can find it with the `FragmentManager`, using `findFragmentById()` or `findFragmentByTag()`.
- The fragment can access its containing activity instance with the `Fragment.getActivity()` method.
  - For example, you could obtain a reference to a view in the activity's layout:

    ```
    View listView = getActivity().findViewById(R.id.list);
    ```

Note

The `Fragment` class is not derived from `Context`. If your fragment needs a `Context` object, either use the activity or — especially if the `Context` might be retained after activity destruction — invoke `getApplicationContext()` on the hosting activity.

23 Best Practices: Loose Coupling of Activities and Fragments

Avoid tight coupling between activities and fragments.

- Especially if you make the fragment “too aware” of its hosting activity and the other fragments that might (or might not) be present in the activity, you increase its complexity and reduce its reuse.
- On the other hand, activities typical need more awareness of the fragments they and other activities host.

24 Best Practices: Define Fragment Interfaces to Invoke Activity Behavior

Define interfaces in fragments to call back to their hosting activities.

- Rather than having a fragment directly access the internals of a hosting activity, create a nested interface within the fragment defining a set of callback methods.
- The hosting activity can then implement the interface, or you can provide another listener object that implements the interface.
- If you plan always to use the activity as an event listener, you can automatically “register” it in the fragment’s `onAttach()` method. Otherwise, you can provide a listener registration method.
- For example:

Fragment source code

```
public class TitlesFragment extends ListFragment {
    private OnTitleSelectedListener listener;

    public interface OnTitleSelectedListener {
        public void onTitleSelected(int index);
    }

    public void onAttach(Activity activity) {
        super.onAttach(activity);
        try {
            showSecondFragmentListener
                = (OnTitleSelectedListener) activity;
        } catch (ClassCastException e) {
            throw new ClassCastException(activity.toString()
                    + " must implement OnTitleSelectedListener");
        }
    }

    @Override
    public void onListItemClick(ListView l, View v,
                                int position, long id) {
        listener.onTitleSelected(position);
    }

        // ...
}
```

Activity source code

```
public class MyActivity extends Activity
    implements TitlesFragment.OnTitleSelectedListener {

    public void onTitleSelected(int index) {
        // ...
    }
    // ...
}
```

25 Best Practices: The Activity as a Switchboard

Let the activity serve as an intermediary between fragments.

- Fragments don't have intent filters; an `Intent` can't directly trigger a fragment.
- Let the activity respond to intents and fragment callbacks.
- The activity will know if it can "route" a event to a fragment it contains, or if it needs to start another activity to handle the event.

26 Advanced Fragment Initialization

Every fragment **must** have a default empty constructor.

- The system invokes the default constructor to re-instantiate the fragment when restoring its activity's state.

Fragments generally should not implement additional constructors or override the default constructor.

- The first place application code can run where the fragment is ready to be used is in `onAttach()`.

27 Advanced Fragment Initialization: Arguments

- Immediately after instantiating a fragment, can can provide it with a set of *arguments*.
  - Create a `Bundle` object, and put in it any values to want to provide as arguments to the fragment.
  - Invoke `setArguments(Bundle)` on the fragment, passing the `Bundle`.
- Within the fragment, invoke `getArguments()` when you're ready to retrieve the `Bundle` of arguments.

- Often, especially in the case of a fragment supporting only one or two arguments, it's easiest to define a static factory method to instantiate the fragment and supply the arguments.

Fragment source code

```
public static class DetailsFragment extends Fragment {
    public static DetailsFragment newInstance(int index) {
        DetailsFragment f = new DetailsFragment();

        // Supply index input as an argument.
        Bundle args = new Bundle();
        args.putInt("index", index);
        f.setArguments(args);

        return f;
    }

    public int getShownIndex() {
        return getArguments().getInt("index", 0);
    }

    // ...
}
```

Activity source code

```
DetailsFragment detail = DetailsFragment.newInstance(2);
```

28 Implementing Dialogs Using Fragments

As of Honeycomb (API 11), the `Activity` class's "managed dialog" methods are deprecated in favor of fragments.

The `DialogFragment` class serves as a base class for fragment-based dialog management.

- `DialogFragment` implements a fragment that displays a dialog window, floating on top of its activity's window.
- This fragment contains a `Dialog` object, which it displays as appropriate based on the fragment's state.
- You should control dialog (showing and dismissing it) through the `DialogFragment` methods, not with direct calls on the dialog.

You can implement a `DialogFragment` so that it can be used only as a dialog, or so that it can be displayed as either a dialog **or** as a "normal" fragment managed by a `ViewGroup` within the activity.

- If you plan to use the fragment **only** as a dialog, override the `onCreateDialog()` method and return an instance of `Dialog` or one of its subclasses.
- If you want to use the fragment as either a dialog or a normal fragment, override `onCreateView()` and return a view hierarchy.

29 Using a Fragment-Based Dialog

The `DialogFragment` class provides an overloaded `show()` method, which posts the dialog as part of a transaction.

- If provided with a `FragmentManager` reference, the `show()` method creates a transaction, adds the fragment, and then commits. When the fragment is dismissed, a new transaction is executed automatically to remove it from the activity.
- If provided with a `FragmentTransaction` reference, the `show()` method adds the fragment and commits the transaction. In this case, you have the option of adding the transaction to the back stack prior to invoking `show()`
- In either version, the second argument is a String tag to identify the dialog fragment.

The `DialogFragment` class provides a `dismiss()` method to dismiss the fragment explicitly.

- If the fragment was added to the back stack, all back stack state up to and including this entry is popped. Otherwise, a new transaction is committed to remove the fragment.
- In the typical use case, the fragment dismisses itself with this method when its dialog is dismissed.

30 Example: A Simple Confirmation Dialog Fragment

Fragment source code

```java
public class ConfirmationDialogFragment extends DialogFragment
        implements DialogInterface.OnClickListener {

    private ConfirmationDialogFragmentListener listener;

    public static ConfirmationDialogFragment newInstance(int title) {
        ConfirmationDialogFragment frag = new ConfirmationDialogFragment();
        Bundle args = new Bundle();
        args.putInt("title", title);
        frag.setArguments(args);
        return frag;
    }

    public interface ConfirmationDialogFragmentListener {
        public void onPositiveClick();
        public void onNegativeClick();
    }

    public void setConfirmationDialogFragmentListener(
            ConfirmationDialogFragmentListener listener) {
        this.listener = listener;
    }

    @Override
    public Dialog onCreateDialog(Bundle savedInstanceState) {
        int title = getArguments().getInt("title");

        return new AlertDialog.Builder(getActivity())
                .setIcon(android.R.drawable.ic_dialog_alert)
                .setTitle(title)
                .setPositiveButton(android.R.string.ok, this)
                .setNegativeButton(android.R.string.cancel, this)
                .create();
    }

    @Override
    public void onClick(DialogInterface dialog, int which) {
        if (listener != null) {
            switch (which) {
            case DialogInterface.BUTTON_POSITIVE:
                listener.onPositiveClick();
            default:
                listener.onNegativeClick();
            }
        }
    }

}
```

Activity source code

```
public class SimpleConfirmationDialogFragmentActivity
    extends FragmentActivity
    implements OnClickListener, ConfirmationDialogFragmentListener {

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);

        Button buttonPostDialog = (Button) findViewById(R.id.button_post_dialog);
        buttonPostDialog.setOnClickListener(this);
    }

    @Override
    public void onClick(View v) {
        ConfirmationDialogFragment confirmationDialog
            = ConfirmationDialogFragment.newInstance(R.string.dialog_format_title);
        confirmationDialog.setConfirmationDialogFragmentListener(this);
        confirmationDialog.show(getSupportFragmentManager(), null);
    }

    @Override
    public void onPositiveClick() {
        Toast.makeText(this, android.R.string.ok, Toast.LENGTH_LONG).show();
    }

    @Override
    public void onNegativeClick() {
        Toast.makeText(this, android.R.string.cancel, Toast.LENGTH_LONG).show();
    }
}
```

31 Additional Fragment Subclasses

There are some additional subclasses of `Fragment` designed for common uses:

`ListFragment`
A fragment that automatically manages a `ListView`. Analogous to the `ListActivity` class.

`PreferenceFragment`
A fragment that automatically manages a set of `Preference` objects. Using an XML preference resource, the fragment can automatically create an interface for displaying and editing a set of preferences. Analogous to the `PreferenceActivity` class.

`WebFragment`
A fragment that automatically creates and manages a `WebView`.