Android Support Library

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In this talk

- Introduction
- Usage
- Features
- Summary

Introduction

- Official, first-party Android library from Google
- Provides backwards-compatible versions of Android framework APIs
- Provides features that are only available through the Support Library APIs
- Several versions available
    - Commonly used
        - v4 support, v7 appcompat
    - Less commonly used
        - v13 support, v7 gridlayout, v7 mediarouter, v8 support

Aside - Dependencies in Android

- Libraries without resources
  - Compiled Java classes only - JAR
- Libraries with resources
  - Compiled Java classes and Android resources - AAR
  - Java source files and Android resources - apklib
- e.g. support-v4 contains no resources - distributed as JAR
- e.g. app-compat contains resources - distributed as AAR (or Android library project)

Usage - Android Studio

- Part of Android Support Repository (local Maven repository)
- Download Android Support Repository via Android SDK Manager
- Add dependencies to Gradle build file

```
dependencies {
    ...
    compile "com.android.support:support-v4:18.0.+"
    compile "com.android.support:appcompat-v7:18.0.+"
}
```

Usage - Eclipse

- Download Android Support Library via SDK Manager
- Library without resources - put JAR in {project root}/libs folder
- Library with resources
  - Import Android Library Project into workspace
  - Add as Android Library dependency to your project

Features - Fragments (1)

- Motivation: Activity becoming too monolithic, need way to break it down into smaller more manageable parts
- Motivation: How do we build tablet applications?
- Fragment: UI or behavior component within an Activity
- Move views, app logic into Fragments
- Activity now just manages Fragments
- android.support.v4.app.Fragment vs. android.app.Fragment

Features - Fragments (2)

- Usage
  - Make your activities extend FragmentActivity
  - Retrieve FragmentManager via FragmentActivity.getSupportFragmentManager()
  - Add and remove fragments using FragmentTransactions

```
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    setContentView(R.layout.fragment_example_activity);

    if (savedInstanceState == null) {
        getSupportFragmentManager()
                .beginTransaction()
                .add(R.id.top_container, ColorFragment.newInstance(Color.RED))
                .add(R.id.bottom_container, ColorFragment.newInstance(Color.BLUE))
                .commit();
    }
}
```

Features - Fragments (3)

- Fragment lifecycle
  - Fragments need to be tied to an Activity
  - onCreate, onCreateView, onResume, onPause, onDestroy, etc.
- Fragment backstack
  - Similar to Activity backstack
  - Undo fragment transactions with back button

```
getSupportFragmentManager()
 .beginTransaction()
     ...
 .addToBackStack(null)
 .commit();
```

Features - Loaders

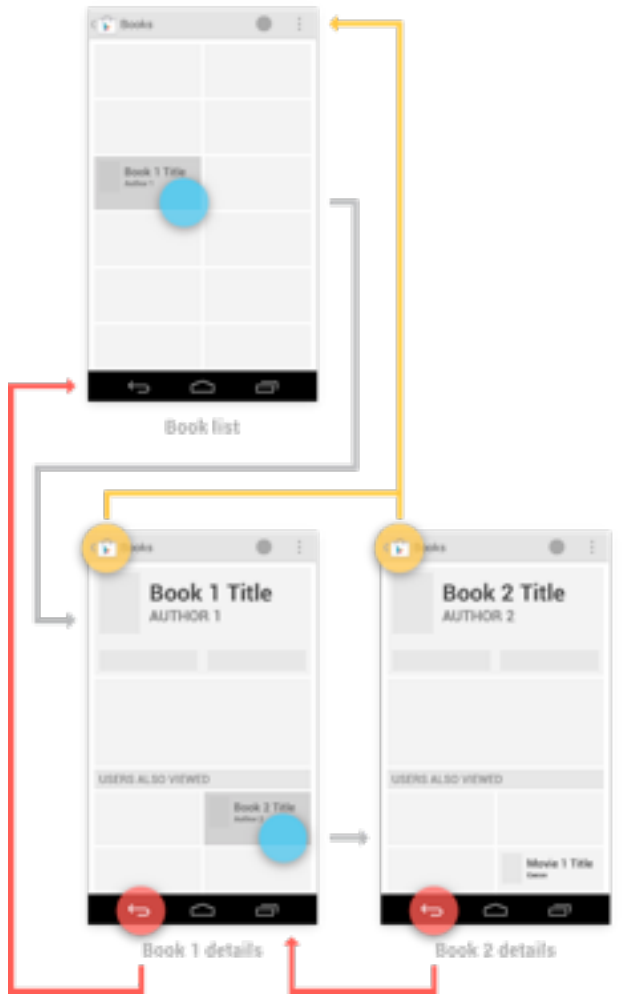
- Motivation: Activities are destroyed and recreated on configuration changes; how do we manage data loading from DB/network?
- Loaders manage asynchronous operations
- Loaders (and their data) are retained between configuration changes
- AsyncTaskLoader and CursorLoader classes
- Manage loaders in Activity/Fragment via LoaderManager
- Implement LoaderManager.LoaderCallbacks
    - onCreateLoader, onLoadFinished, onLoaderReset

Features - ViewPager, PagerTitleStrip

- New UI component allowing you to swipe between Fragments or Views
- FragmentPagerAdapter available in support library only
    - support-v4 for android.support.v4.app.Fragment compatibility
    - support-v13 for android.app.Fragment compatibility
- PagerTitleStrip can be used display the title of the current page
    - Add as child of ViewPager

Features - NavUtils (1)

- Use Back button for reverse-chronological screen navigation
    - Takes you to a screen you have visited before
- Use Up button for traversing app hierarchy (never leave app)
    - Can take you to a screen that you have never visited before



Features - NavUtils (2)

- Specify parent activity in AndroidManifest.xml
- Call NavUtils.navigateUpFromSameTask when Up is pressed (not required for API 16+)

```
<activity
        android:name=".navutils.NavUtilsExampleChildActivity"
        android:parentActivityName=".navutils.NavUtilsExampleActivity">
    <meta-data
            android:name="android.support.PARENT_ACTIVITY"
            android:value=".navutils.NavUtilsExampleActivity"/>
</activity>
```

```
@Override
public boolean onOptionsItemSelected(MenuItem item) {
    if (item.getItemId() == android.R.id.home) {
        NavUtils.navigateUpFromSameTask(this);
        return true;
    } else {
        return super.onOptionsItemSelected(item);
    }
}
```

Features - NotificationCompat

- Advanced notifications introduced in Android 4.1
    - Larger content region
    - Images
    - Action buttons
- NotificationCompat does NOT provide an implementation of these features for older versions

```
new NotificationCompat.Builder(this)
  .setStyle(new NotificationCompat.BigPictureStyle()
          .bigPicture(bitmap))
  .addAction(R.drawable.ic_launcher, "Action Button 1", pendingIntent)
  .setSmallIcon(R.drawable.ic_launcher)
  .setContentTitle("Notification example title")
  .setContentText("Notification example text")
  .setContentIntent(pendingIntent)
  .build();
```

Features - ShareCompat (1)

- Standardized UI to share data between applications using Intents
- ShareActionProvider introduced in Android 4.0
- Share dialog in older Android versions

```
@Override
public boolean onCreateOptionsMenu(Menu menu) {
     ...
     ShareCompat.configureMenuItem(shareItem, makeIntentBuilder());
     ...
}


private ShareCompat.IntentBuilder makeIntentBuilder() {
     return ShareCompat.IntentBuilder.from(SharingExampleActivity.this)
               .setText("This is the text to share")
               .setSubject("This is the subject")
               .setType("text/plain");
}
```

Features - ShareCompat (2)

- Target activity can retrieve data about calling activity - can be a different app

```
@Override
protected void onCreate(Bundle savedInstanceState) {
    ...
    ShareCompat.IntentReader from = ShareCompat.IntentReader.from(this);
    CharSequence callingApplicationLabel = from.getCallingApplicationLabel();
    Drawable callingActivityIcon = from.getCallingActivityIcon();
    ...
}
```

Features - Nested Fragments

- Motivation: Fragment becoming too monolithic; need way to break it down into smaller more manageable parts...
- Fragment.getChildFragmentManager()
- Warning: Nested fragments can’t be retained
    - Retain parent fragment and nested fragments will be retained too
- Warning: Pressing back does not pop backstack of nested fragments
    - Propagate back keypress and manually pop backstack

Features - DrawerLayout

- Popular UI navigation pattern used in many apps prior to becoming official
  - Facebook, Google+, etc.
- Content stays fixed; drawer appears on top
- Open drawer with a swipe or by clicking app icon
- Can use ActionBarDrawerToggle helper class to manage indicator
- When drawer is fully open...
  - Replace screen title with app name
  - Remove actions in action bar related to underlying view

Features - GridLayout

- Provided by v7-gridlayout library
- General purpose ViewGroup; alternative to LinearLayout, RelativeLayout, etc.
    - Can help create flatter view hierarchies
- Similar to existing TableLayout - place views in rows and columns
    - Can place multiple views in same cell
    - No need for TableRow containers
- Use Space view to create space between views
- No support for weight / excess space distribution

Features - WakefulBroadcastReceiver

- Can schedule a broadcast message using AlarmManager
- Device can go to sleep before completing our scheduled work!
    - Need to hold a WakeLock to keep CPU awake
- Encapsulates obtaining and releasing a WakeLock
- Similar to WakefulIntentService (created by CommonsWare)

```
@Override
public void onReceive(Context context, Intent intent) {
    ...
    Intent service = new Intent(...);
    startWakefulService(context, service);
}

...

@Override
protected void onHandleIntent(Intent intent) {
     ...
     WakefulBroadcastReceiver.completeWakefulIntent(intent);
}
```

Features - ActionBarCompat

- ActionBar for Android 2.x
    - App icon, title bar, actions, overflow menu, etc.
- Provides same functionality as third-party ActionBarSherlock library
    - No real benefits over migrating, but new apps should use ActionBarCompat
- Usage
    - Make your Activity class extend ActionBarActivity
    - Apply a Theme.AppCompat.xxx theme (or derivative)
- Access via getSupportActionBar() method

Features - SwipeRefreshLayout

- Latest addition to support library
- Official, Android-style pull-to-refresh UI component
- Same as that used in Google Now
- Should be used in preference over Android-PullToRefresh and ActionBar-PullToRefresh third-party libraries
- Make your scroll container a child of SwipeRefreshLayout
- Style with SwipeRefreshLayout.setColorScheme(...)
- Control loading indicator visibility with SwipeRefreshLayout.setRefreshing(...)

Summary

- Stay up-to-date with changes to Android framework, even when targeting older versions
- Still relevant if you are using minSdkVersion=14
    - Some things introduced after Android 4.0
    - Some things available in Android Support Library only
- Third-party, community projects can directly influence new library features