

Android 3.0 Overview



ANDROID 3.0
Gingerbread

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For CIS 542, Spring 2011, University of Pennsylvania

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Android 3.0 Overview

Video!

<http://www.youtube.com/watch?v=hPUG>

- Focus on tablet/large screen support and user experience
- What about for the devs?

Android 3.0 Overview

Overview

- Quick “Whats New for Users”
- Developer Tool Updates
- Activities – Fragments
- Activities – Loaders
- Action Bar
- Drag-Drop
- Copy-Paste
- Extended UI Framework
- Misc Platform Highlights
- Update or Upgrade?



ANDROID

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What's New for Users

- New UI for tablets
- Redesigned default keyboard
- Improved text selection, copy and paste
- New USB/Bluetooth connectivity options
- Updated set of standard apps



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Developer Tools Updates

- Android 3.0 = API Level 11
- Android SDK:

<http://developer.android.com/sdk/tools-notes.html>

- update to “*SDK Tools r10*”
- install package

“Android 3.0, Revision 1 (February 2011)”

- Eclipse:

- update to “*ADT 10.0.1 (March 2011)*”



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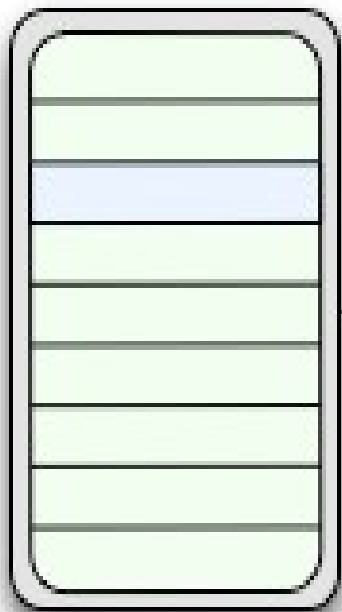
Activities – Fragments

- <http://developer.android.com/guide/topics/fundamentals>
- Breaking down Activities into multiple modular subcomponents
- A Fragment is a behaviour/portion of UI embedded in an Activity
- Multiple Fragments can combine to form multi-panel UIs, each with individual lifecycles
- Fragments are added to ViewGroups, tagged as a `<fragment>` element
- They can also be invisible components

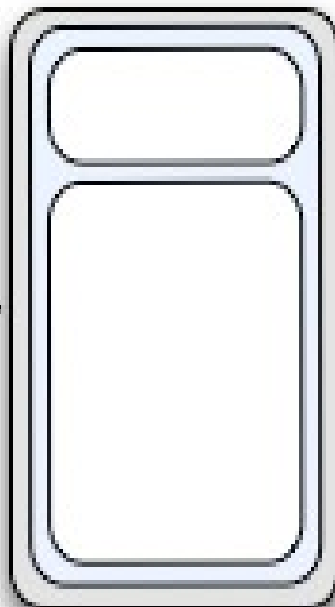
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Activities – Fragments

- Two UI modules, typically two Activities, now combined into one via Fragments

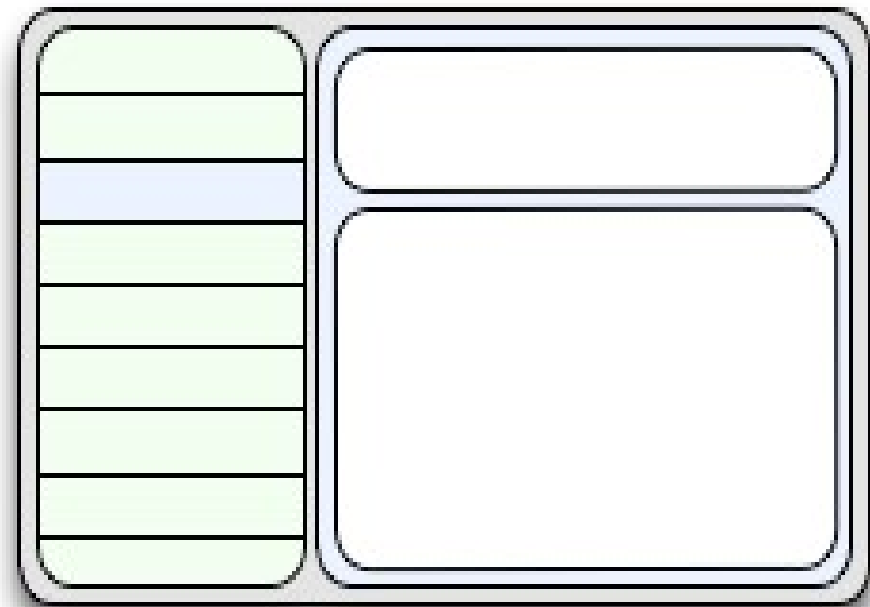


Activity A



Activity B

OR

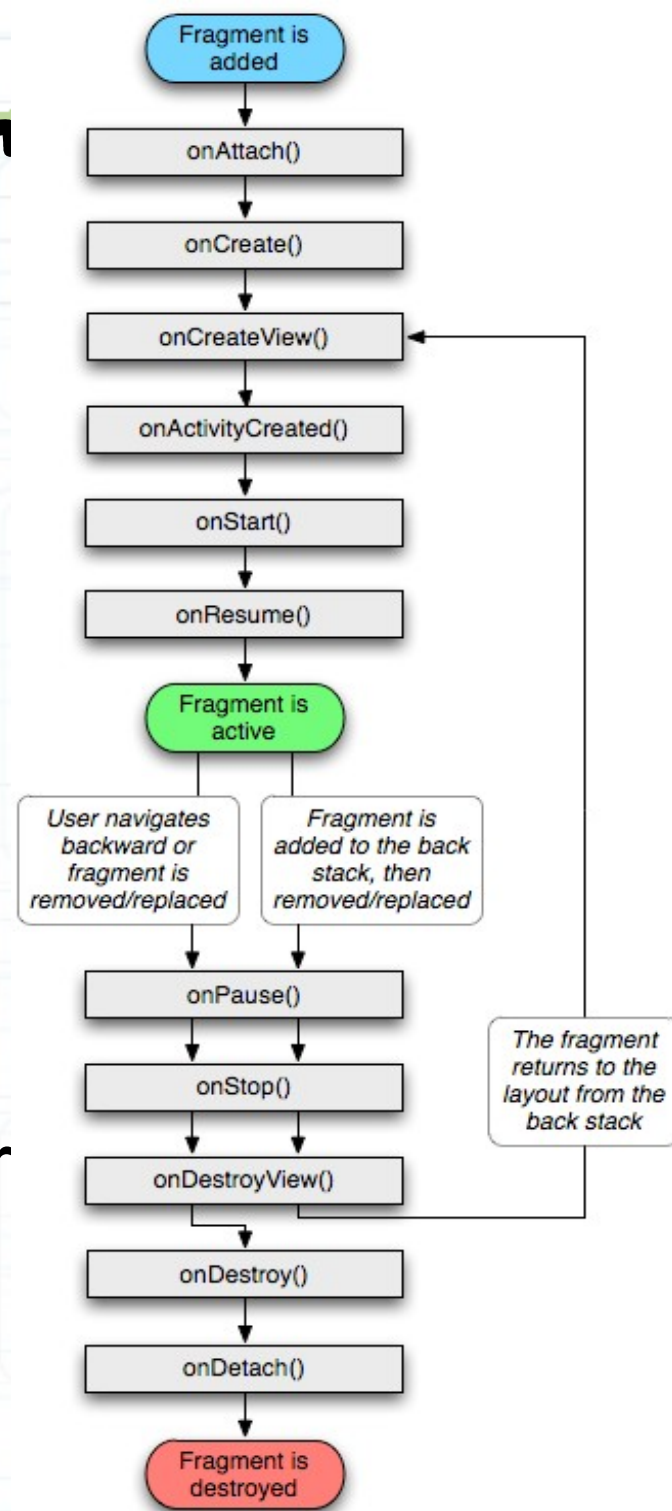


Activity A with two fragments
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Activities – Fragments

- Similar lifecycle as an Activity
- UI Fragment:
 - Implement *onCreateView()*
 - Add to Activity's layout XML
- Non-UI Fragment
 - No *onCreateView()*
 - Add via *add(Fragment, String)*
- Manage using `FragmentManager`
 - *Activity.getFragmentManager()*
 - *findFragmentById()* or *findFragmentByTag()*



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```
public static class ExampleFragment extends Fragment {
    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
        Bundle savedInstanceState) {
        // Inflate the layout for this fragment
        return inflater.inflate(R.layout.example_fragment, container, false);
    }
}
```

```
<?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>
```

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Activities – Loaders

- <http://developer.android.com/guide/topics/fundamentals/loaders>
- Available to every Activity and Fragment
- Provide asynchronous loading of data.
- Monitor the source of their data
- Deliver new results when content changes
- Automatically reconnect to the last Loader's Cursor when being recreated after a configuration change (don't need to re-query their data)
- Code details in documentation link above

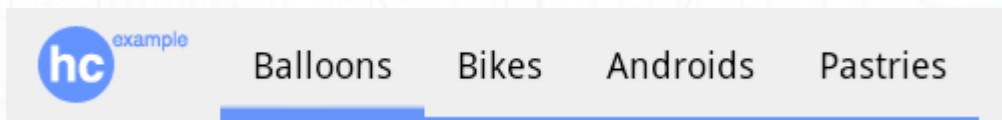
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Activities – Action Bar

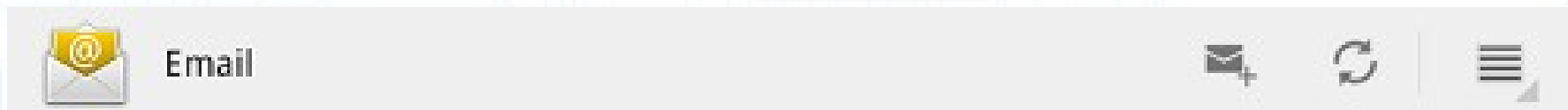
- <http://developer.android.com/guide/topics/ui/actionbar>
- Widget for Activities that replaces the traditional title bar at the top of the screen
- Display items from the Options Menu



- Provide tabs for navigating Fragments



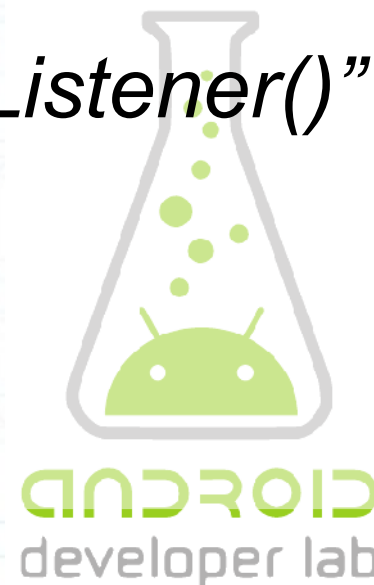
- Code details in documentation link above



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Activities – Drag and Drop

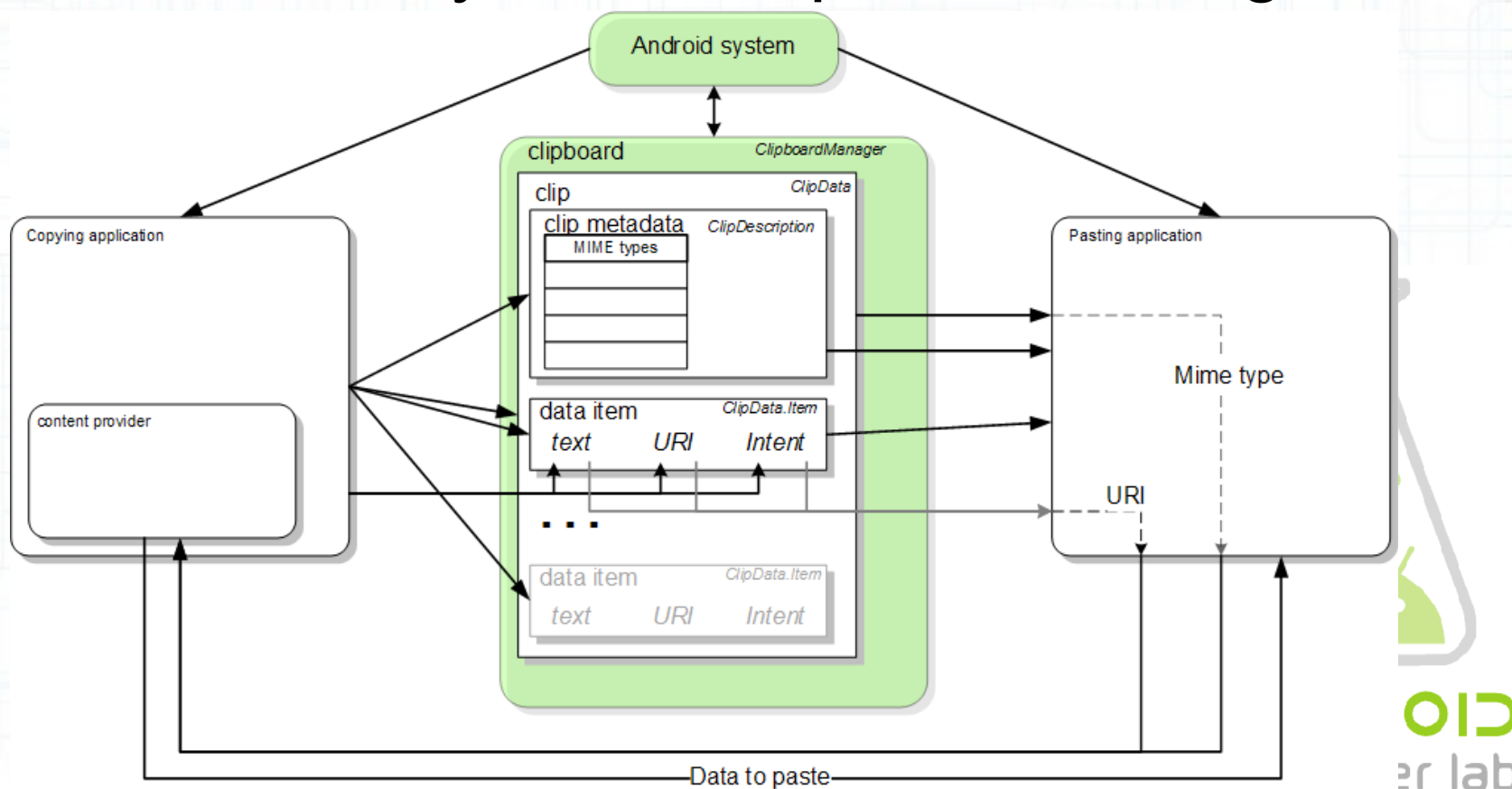
- <http://developer.android.com/guide/topics/ui/drag-dr>
- Allow users to move data from one View to another View in the current layout using a graphical drag and drop gesture
- Usually handled within an “*onLongClick(View v)*” event via “*v.startDrag()*” and “*v.setOnDragListener()*”
- ACTION_DRAG_STARTED
ACTION_DRAG_ENTERED
ACTION_DRAG_LOCATION
ACTION_DRAG_EXITED
ACTION_DROP
ACTION_DRAG_ENDED



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Activities – Copy-Paste

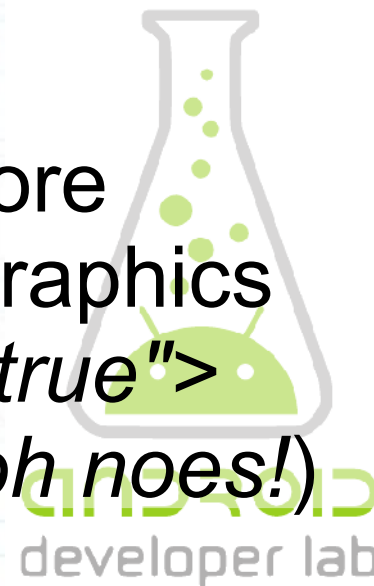
- <http://developer.android.com/guide/topics/clipboard/>
- Allow your Activities to store text/data/stream/binary/etc to ClipboardManager



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Activities – Extended UI Framework

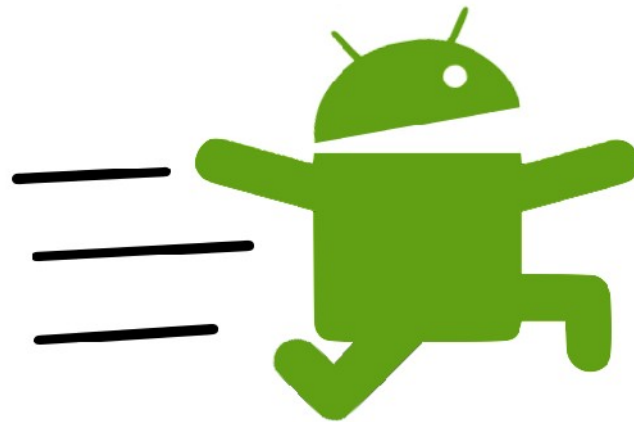
- <http://developer.android.com/sdk/android-3.0.html>
- App Widgets: GridView, ListView, etc.
- Animate/transform arbitrary View, Drawable, Fragment, Object, etc.
- Many new widgets/Views:
 - CalendarView, NumberPicker
 - ListPopupWindow, PopupMenu
 - SearchView, StackView, and more
- Hardware accelerated OpenGL graphics
`<android:hardwareAccelerated="true">`
- More media support, DRM API (oh noes!)



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Activities – Misc Platform Highlights

- Kernel: 2.6.36
- Storage:
 - ext4 file system
 - USB host
- Dalvik VM:
 - Symmetric multiprocessing (SMP)
 - various JIT improvements
 - improved GC
 - tuned for SMP
 - larger heap sizes
 - unified handling for bitmaps/byte buffers



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Activities – Update or Upgrade?

- <http://developer.android.com/guide/practices/optimiz>
- Update?
 - `<uses-sdk android:targetSdkVersion="11"/>`
 - alternative layout for “xlarge” screens
<http://developer.android.com/guide/practices/screen>
- Upgrade?
 - `<uses-sdk android:minSdkVersion="11"/>`
 - Hardware 2D graphics acceleration?
 - New UI widgets/features and APIs?
- Emulator VERY SLOW – use Motorola Xoom (Galaxy Tab doesn't meet hw reqs)

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Links:

- Overview:

<http://developer.android.com/sdk/android-3.0.html>

- Highlights:

<http://developer.android.com/sdk/android-3.0-highlights>

- API Difference Report:

http://developer.android.com/sdk/api_diff/11/changes

- Optimizing for 3.0:

<http://developer.android.com/guide/practices/optimizing>

- Best Practices for Honeycomb & Tablets

<http://oscandy.com/best-practices-for-honeycomb-tablets>



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- Questions? Read documentation!
- Yes, you can use 3.0 features, but remember, **THE EMULATOR IS SLOW!** (and you can't run it on your own phones)



Gingerbread! OMNOMNOMNOM!