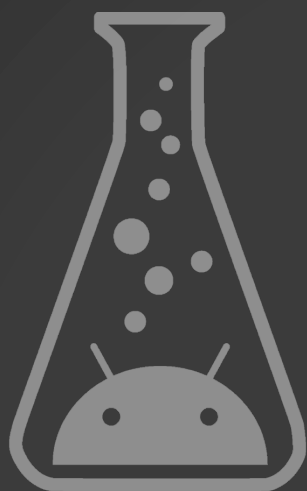




ANDROID
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Introduction to Honeycomb APIs

Q3 2011



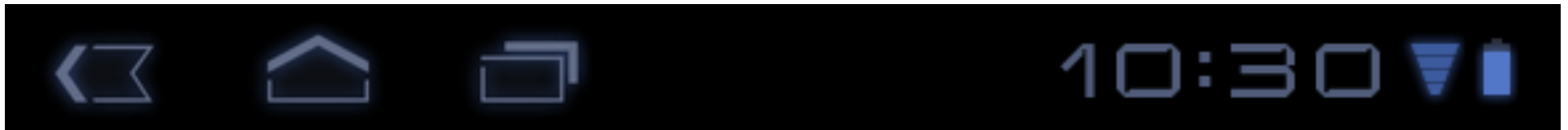
Honeycomb

- Focused on tablets
- Huge release, many updates and new features
- New holographic system theme
- Version 3.0 (base), 3.1 and 3.2 (point releases), API levels 11/12/13



System Bar

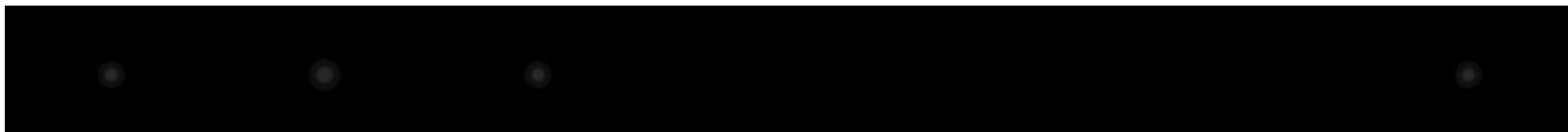
- System-wide navigation and status
- Orientation agnostic
- Always there with varying height
 - ~48dp-56dp
 - design flexible layouts
 - can use `display.getHeight() / getWidth()`



System Bar

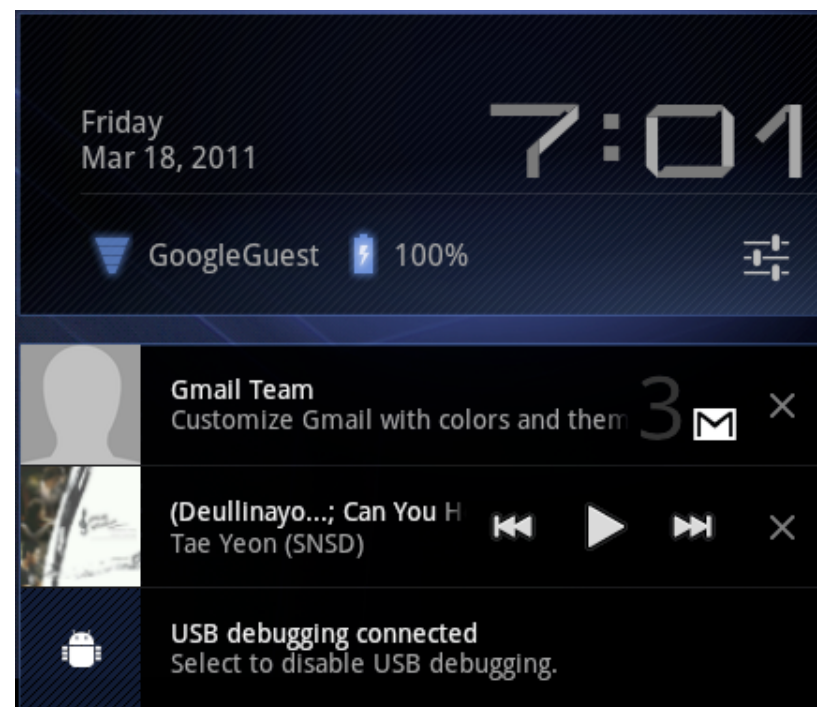
- Lights out mode

```
mView.setSystemUiVisibility(View.STATUS_BAR_HIDDEN);  
mView.setSystemUiVisibility(View.STATUS_BAR_VISIBLE);
```

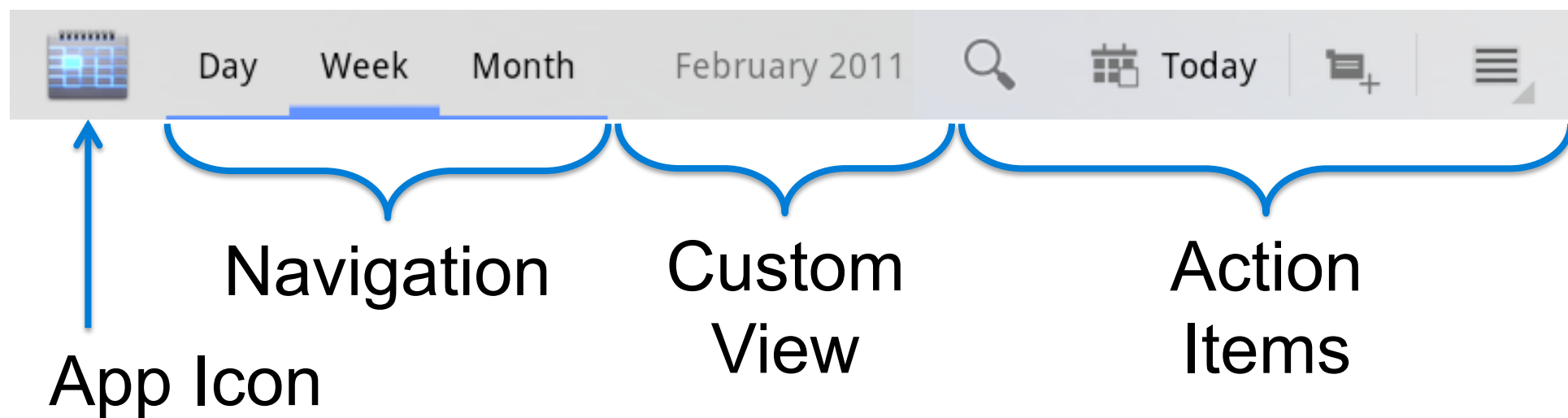


Notifications

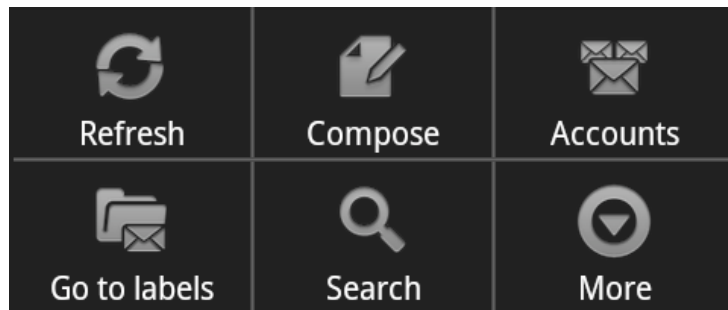
- Android's great notifications, improved
- Dismiss individually
- Customizable
 - Larger icon
 - Actionable buttons



Action Bar



Action Bar (Action Items)



- Menu items from Options Menu
- Easily configured via menu resource file

```
<item android:id="@+id/menu_add"  
    android:icon="@drawable/ic_menu_save"  
    android:title="@string/menu_save"  
    android:showAsAction="ifRoom|withText" />
```

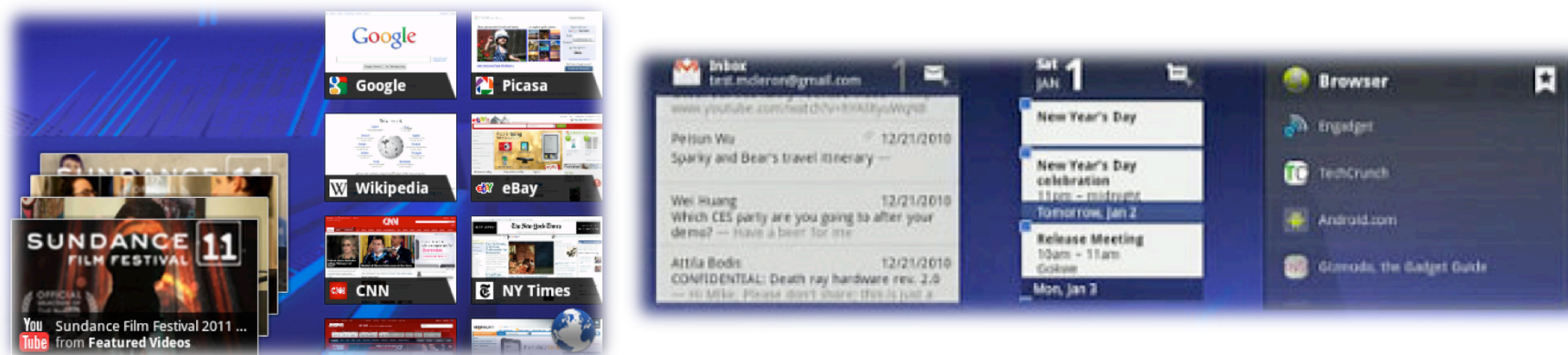
Action Bar (Action Items)

```
public boolean onCreateOptionsMenu(Menu menu) {  
    MenuInflater inflater = getActivity().getMenuInflater();  
    inflater.inflate(R.menu.my_menu, menu);  
    return true;  
}
```

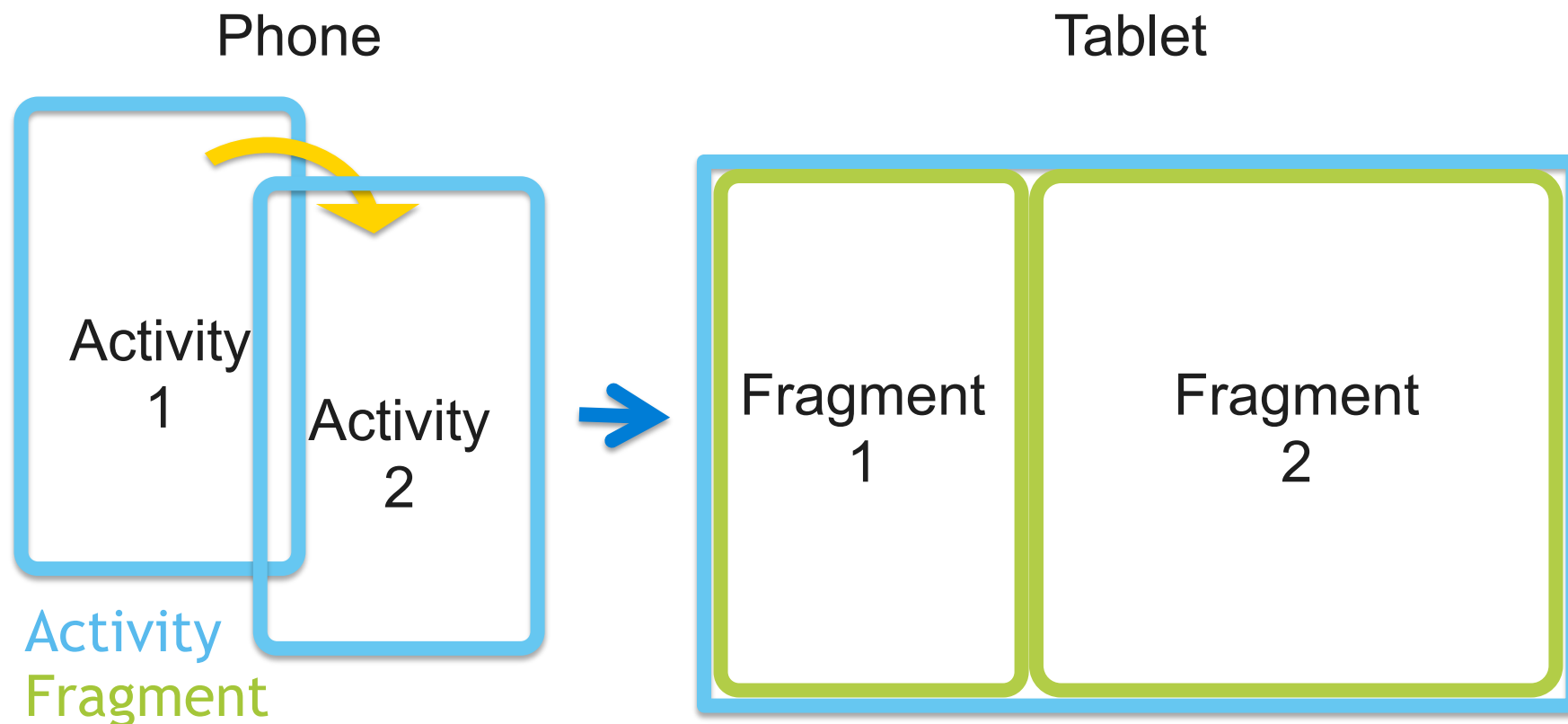
```
public boolean onOptionsItemSelected(MenuItem item) {  
    switch (item.getItemId()) {  
        case android.R.id.home:  
            // app icon in Action Bar clicked; go home  
            return true;  
        case R.id.my_menu_item:  
            // app menu item selected  
            return true;  
        default:  
            return super.onOptionsItemSelected(item);  
    }  
}
```

Redesigned Home Screen Widgets

- Users can interact with home screen widgets in new ways like flipping and scrolling
- New widgets: ListView, GridView, StackView...
- Resizable (from 3.1)

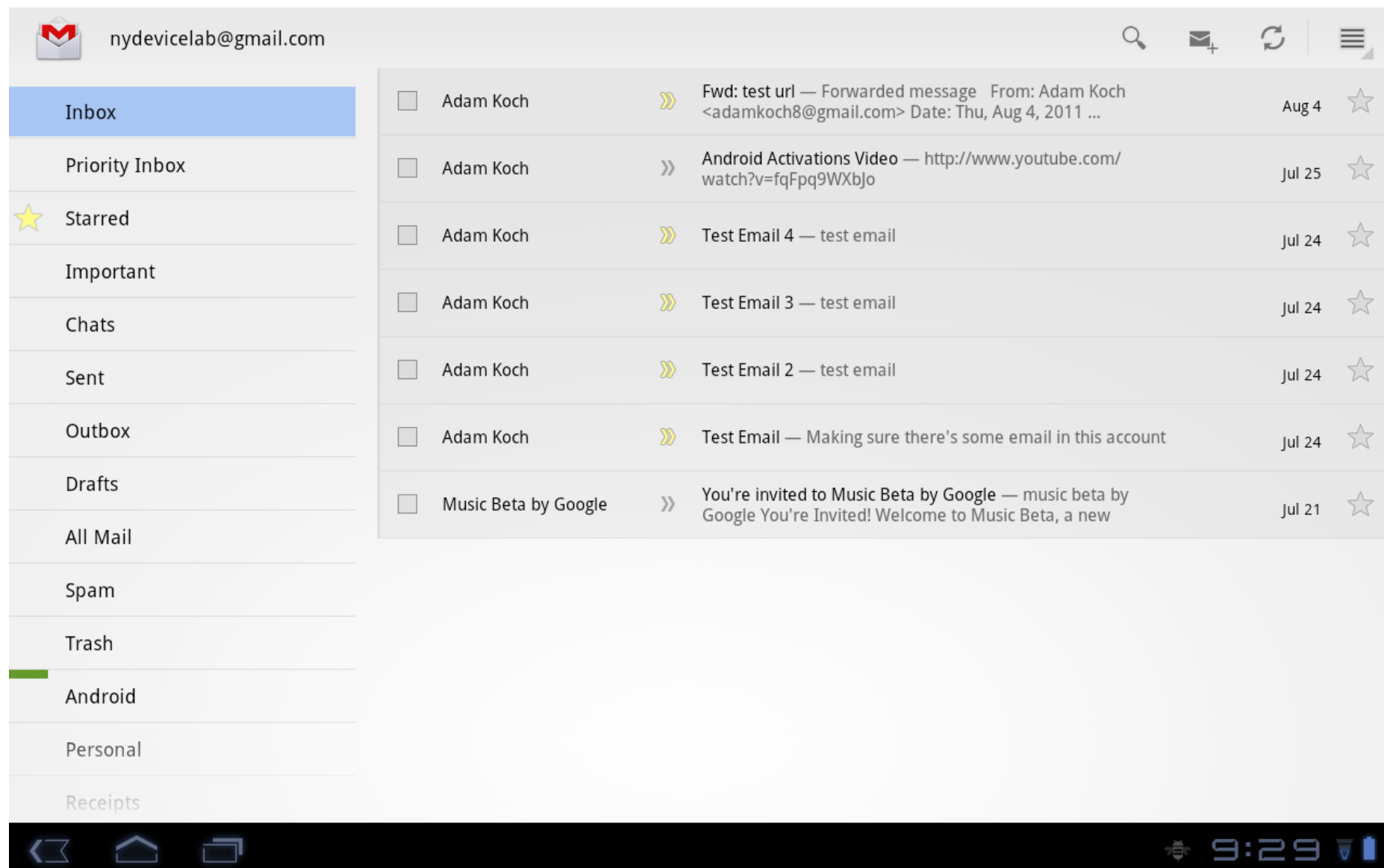


Fragments

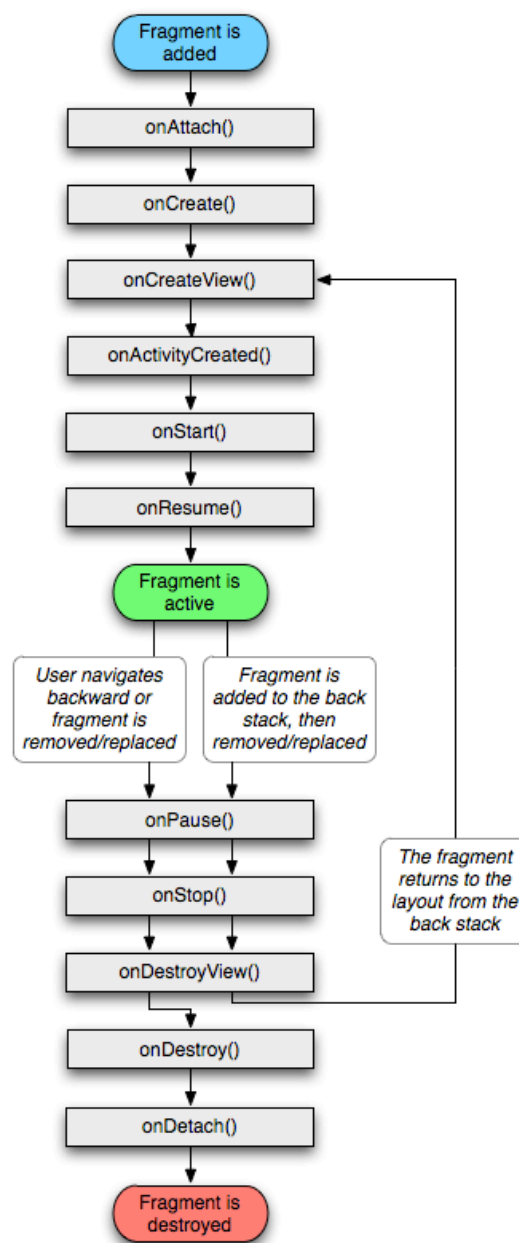


Re-think your UI, don't just let it stretch!

Fragments



Fragments – Lifecycle





Fragments – Other Uses

- Award for best named method:
 - `onRetainNonConfigurationInstance()`
- Instead use:
 - `setRetainInstance(true)`
- Fragments without UI
 - Retain state through configuration changes
 - Use in conjunction with `AsyncTask`

Fragments – Summary

- Reusable UI components within an Activity
- Has its own lifecycle and back stack. Its lifecycle is affected by the host Activity's lifecycle
- Attach to a `ViewGroup` in the Activity view hierarchy through `<fragment>` in XML or programmatically
- Act as a background worker (`findFragmentByTag`)
- Can be added, removed and replaced via `FragmentManager`
- Can communicate with each other via `FragmentManager`



Fragments Example

```
// Get FragmentManager
FragmentManager fragmentManager = getFragmentManager();

// Create new fragment and transaction
Fragment newFragment = new ExampleFragment();

FragmentManager.beginTransaction()
    .replace(R.id.fragment_container, newFragment);

// Replace view and add to back stack
transaction.addToBackStack(null);

// Commit
transaction.commit();
```

Loaders

- Easy way to asynchronously load data in an Activity or Fragment
- Monitors data source and deliver results when content changes
- Automatically reconnect after configuration change

CursorLoader Example

- Implement `LoaderManager.LoaderCallbacks`

```
public Loader<Cursor> onCreateLoader(int id, Bundle args) {  
    ...  
    return new CursorLoader(  
        getActivity(), mUri, mProjection,  
        mSelection, mSelectionArgs, mSortOrder)  
    }  
  
public void onLoadFinished(Loader<Cursor> loader,  
    Cursor data) {  
    mAdapter.swapCursor(data);  
}  
  
public void onLoaderReset(Loader<Cursor> loader) {  
    mAdapter.swapCursor(null);  
}
```



CursorLoader Example

- Init loader in `onCreate()`

```
SimpleCursorAdapter mAdapter;  
  
public void onCreate(Bundle savedInstanceState) {  
    ...  
    mAdapter = new SimpleCursorAdapter(...);  
    setListAdapter(mAdapter);  
    getLoaderManager().initLoader(0, null, this);  
}
```

Clipboard Framework – Copy & Paste

- Supports 3 types of content
 - Text
 - URI
 - Intent
- At any time, only one clip on the clipboard
- For each clip (`clipData`), it can store multiple items of the same type
- You decide what MIME types can be handled by your app



Drag and Drop

- A drag begins by calling

```
view.startDrag(dragData, shadow, null, 0);
```

- To accept a drop implement

```
View.OnDragListener
```

- Use `clipData` to store “drag” data

Hardware Acceleration

- Speed up standard widgets, drawables – all drawing operations on View's Canvas
- Can be set at the Activity, Window and View levels
- Default is disabled

```
<application android:hardwareAccelerated="true">  
  ...  
</application>
```

RenderScript

- High performance 3D rendering and compute API
- Written in C99 (a dialect of C)
- Pros: portability, performance, usability
- Cons: new APIs, debugging, fewer features (compared to OpenGL)

Renderscript – Sample Apps



CHAPTER I

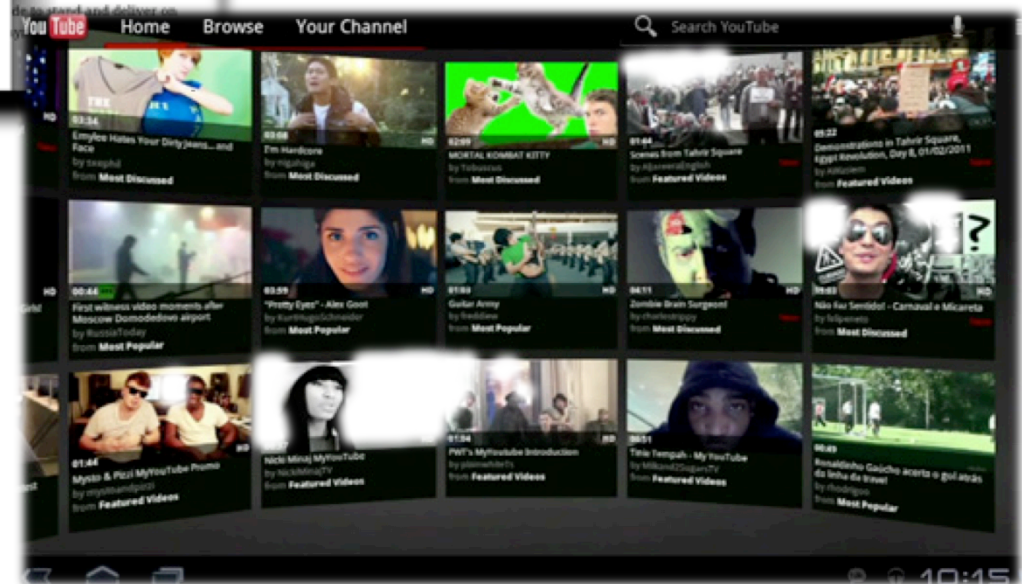
THE PERIOD

IT WAS the best of times, it was the worst of times, it was
the age of wisdom, it was the age of foolishness, it was the
epoch of belief, it was the epoch of incredulity, it was the
season of light, it was the season of darkness, it was the
spring of hope, it was the winter of despair, we had ev-
erything before us, we had nothing before us, we were all
going direct to Heaven, we were all going direct the other
—in short, the period was so far like the present period
that some of the wisest authorities insisted on its being
received, for good or for evil, in the superlative degree
of comparison only.

There were a king with a large jaw and a queen with a plain face, on the throne of England; there were a king with a large jaw and a queen with a fair face, on the throne of France. In both countries it was clearer than crystal to the

Google Books

YouTube



Property Animation Framework

- New animation system that can animate any object's properties
- Changes objects and their behavior as well
- Can animate changes to a `ViewGroup`
- `ViewPropertyAnimator` (3.1+) makes animations even simpler and more efficient

Property Animation Framework

- Simple property animation:

```
ObjectAnimator.ofFloat(myView, "alpha", 0f)  
    .setDuration(500)  
    .start();
```

- Even better using `ViewPropertyAnimator`:

```
myView.animate().setDuration(500).alpha(0);
```

Enterprise

- Support for encrypted storage
- New device administration policy support
 - Encrypted storage
 - Password expiration
 - Password history
 - Password complex character required

Media – Updates from Android 3.0, 3.1, 3.2

- HTTP Live Streaming
- Pluggable DRM framework
- Inline playback of HTML5 `<video>`
- MTP/PTP
- RTP
- Updated Media Formats
 - Raw ADTS AAC, FLAC...



Your App & Honeycomb



Design With Tablets in Mind

- Use density independent pixels (dp)
- Design flexible layouts
- Centralize dimensions using `dimens.xml`
- Keep application logic and UI separate
- Support landscape and don't assume portrait



Updating Your App for Honeycomb

- Test holographic theme
- Update for ActionBar
- Add higher resolution graphics
- Tweak layouts, spacing, font sizes
- Fragments

```
<manifest ... >  
    <uses-sdk android:minSdkVersion="4"  
              android:targetSdkVersion="11" />  
</manifest>
```


Compatibility Library

- Not really a compatibility library anymore, more of a support library
- Works back to API Level 4 (Donut / 1.6)
- Provides:
 - Fragments
 - Loaders
 - ViewPager / PagerAdapter - neat!
 - LruCache
 - and more...

Screen Size Support – Updated in 3.2

- Screen compatibility mode
- Optimizations for a wider range of tablets
- New numeric selectors
 - `smallestWidth` (`res/layout-sw720dp`)
 - `width` (`res/layout-w600dp`)
 - `height` (`res/layout-h720dp`)



Looking Forward

- Ice Cream Sandwich – very tasty dessert





For more, visit
developer.android.com

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