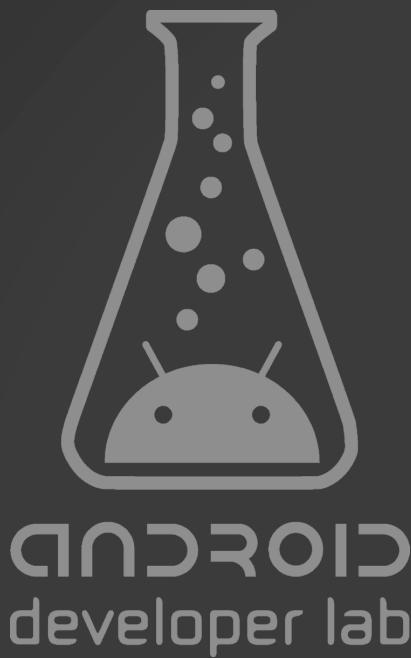




android  
developer lab



# Introduction to Honeycomb APIs

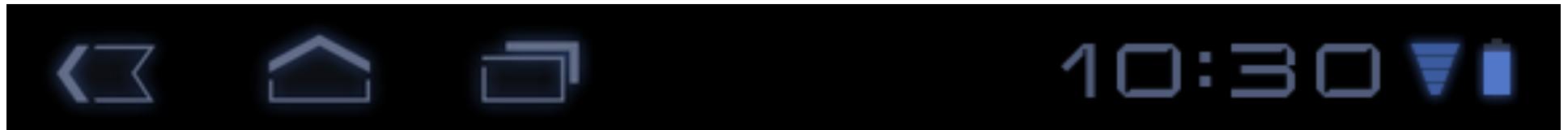
Q3 2011

# 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

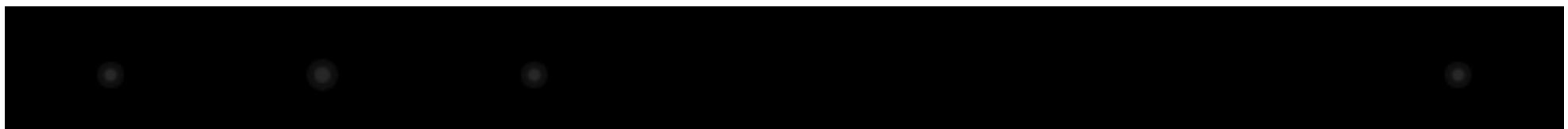
- System-wide navigation and status
- Orientation agnostic
- Always there with varying height
  - ~48dp-56dp
  - design flexible layouts
  - can use `display.getHeight()`/`getWidth()`



# System Bar

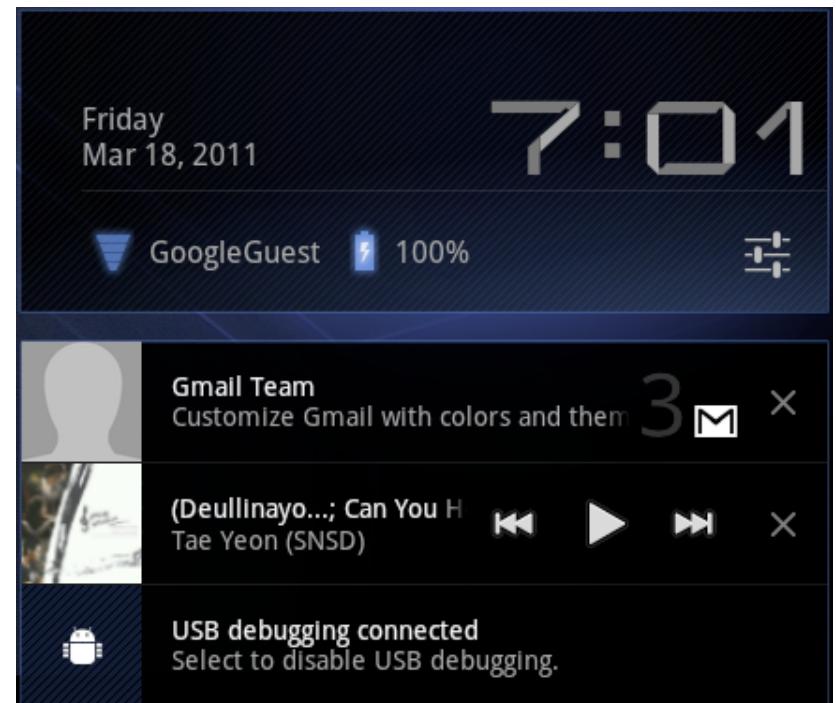
- Lights out mode

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

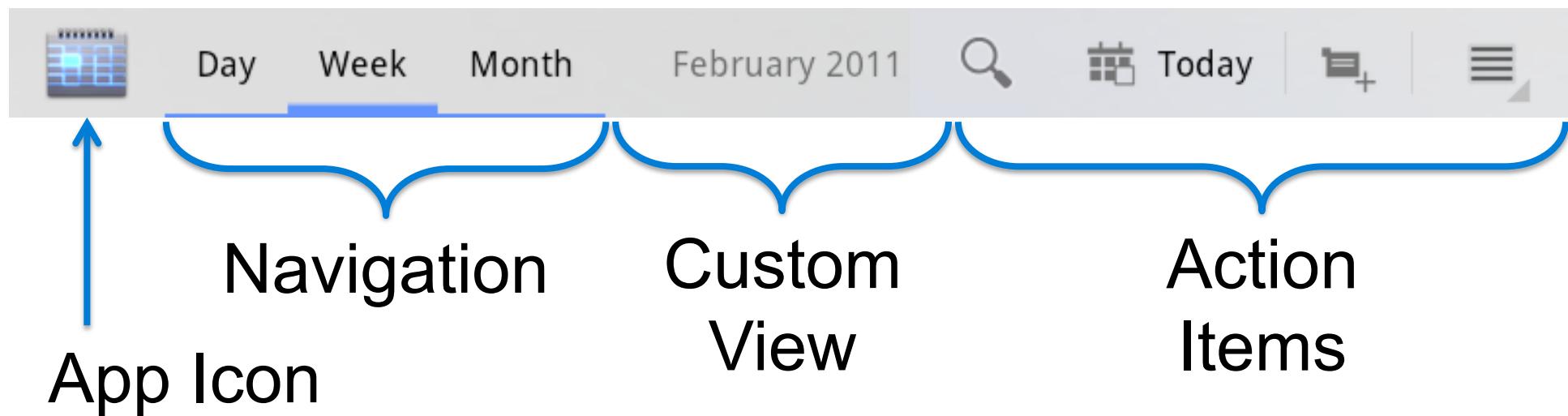


# Notifications

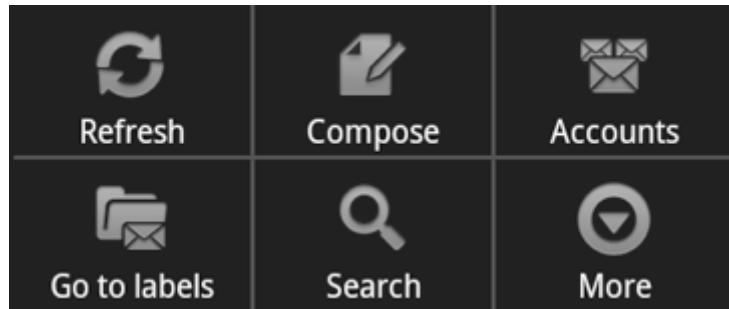
- Android's great notifications, improved
- Dismiss individually
- Customizable
  - Larger icon
  - Actionable buttons



# 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" />
```

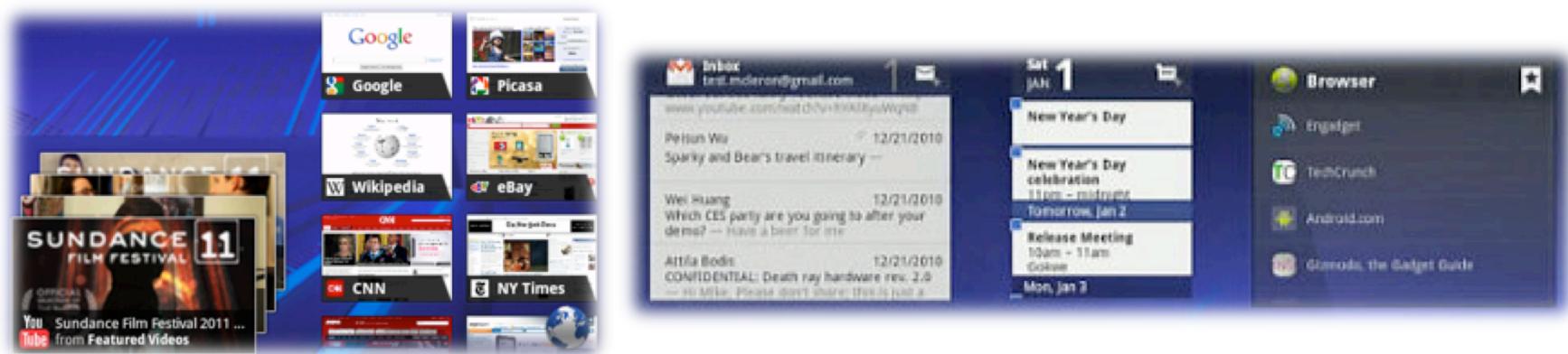
# Action Bar (Action Items)

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

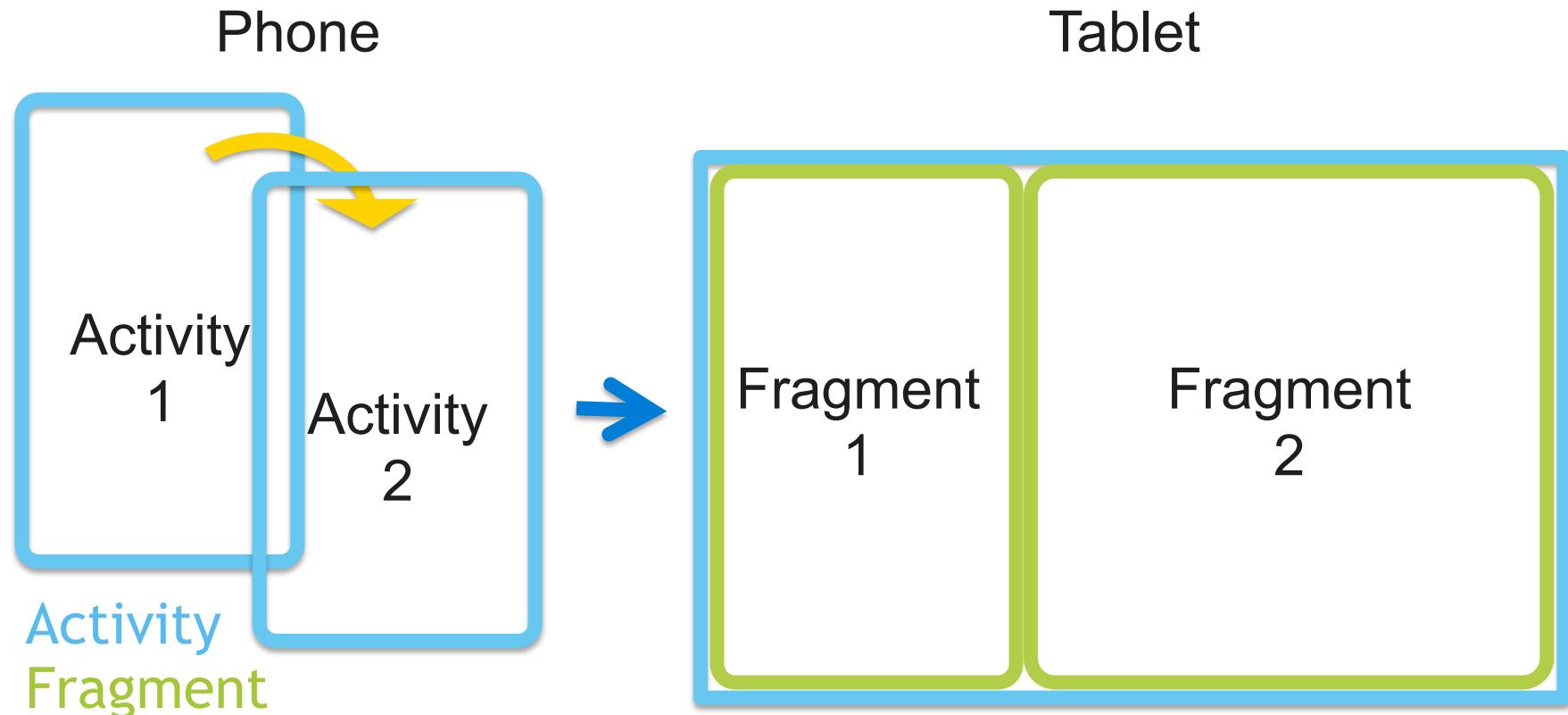
```
public boolean onOptionsItemSelected(MenuItem item) {  
    switch (item.getItemId()) {  
        case android.R.id.home:  
            // app icon in Action Bar clicked; go home  
            return true;  
        case R.id.my_menu_item:  
            // app menu item selected  
            return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

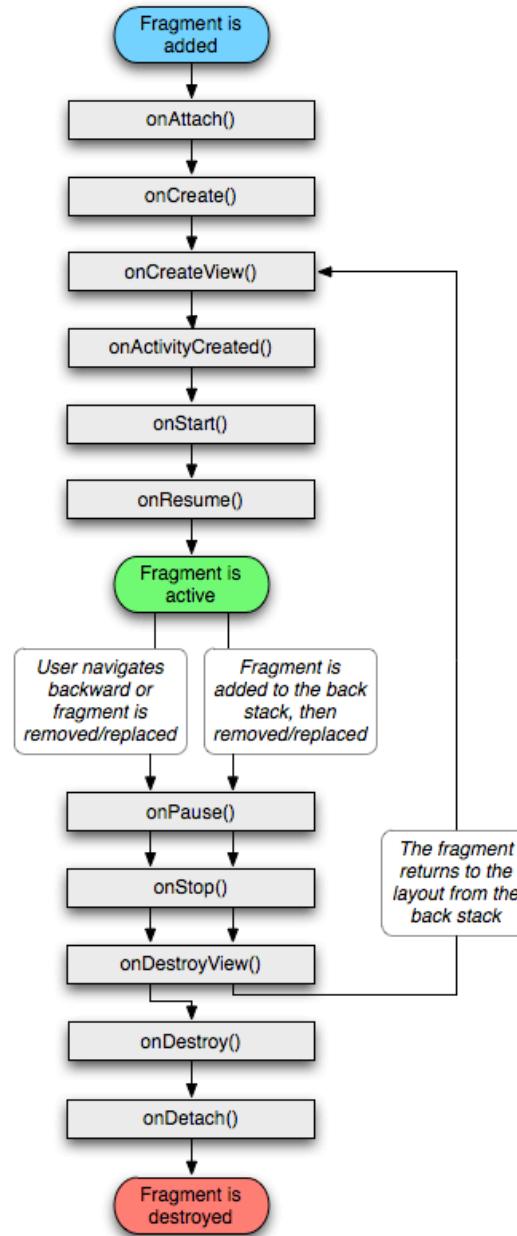
# Fragments

The screenshot shows the Gmail application interface on an Android device. At the top, the email address "nydevicelab@gmail.com" is displayed. Below the header, there is a navigation bar with icons for search, compose, refresh, and settings. On the left, a sidebar lists various sections: Inbox (selected), Priority Inbox, Starred, Important, Chats, Sent, Outbox, Drafts, All Mail, Spam, Trash, Android (highlighted with a green bar), Personal, and Receipts. The main area shows the inbox with the following messages:

From	Subject	Date	Action
Adam Koch	Fwd: test url — Forwarded message From: Adam Koch <adamkoch8@gmail.com> Date: Thu, Aug 4, 2011 ...	Aug 4	Star
Adam Koch	» Android Activations Video — http://www.youtube.com/watch?v=fqFpq9WXbJo	Jul 25	Star
Adam Koch	» Test Email 4 — test email	Jul 24	Star
Adam Koch	» Test Email 3 — test email	Jul 24	Star
Adam Koch	» Test Email 2 — test email	Jul 24	Star
Adam Koch	» Test Email — Making sure there's some email in this account	Jul 24	Star
Music Beta by Google	You're invited to Music Beta by Google — music beta by Google You're Invited! Welcome to Music Beta, a new	Jul 21	Star

At the bottom, there is a black navigation bar with icons for back, home, and recent apps, along with the time "9:29" and battery status.

# 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();

FragmentTransaction transaction =
    fragmentManager.beginTransaction();

// Replace view and add to back stack
transaction.replace(R.id.fragment_container, newFragment);
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 onActivityCreated(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 everything before us, we had nothing before us, we were all going direct to Heaven, we were all going direct the other way—in short, the period was so far like the present period that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree, 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

preserves of loaves and fishes, that things settled for ever.

of Our Lord one thousand seven hundred spiritual revelations were conceded to a goured period, as at this. Mrs. Southcote had her five-and-twentieth blessed in a prophetic private in the Life Guards' sublime appearance by announcing that she made for the swallowing up of London. Even the Cock-lane ghost had been laid of years, after rapping out its message, every year last past (supernaturally defined) rapped out theirs. Mere messages in the events had lately come to the English from a congress of British subjects in

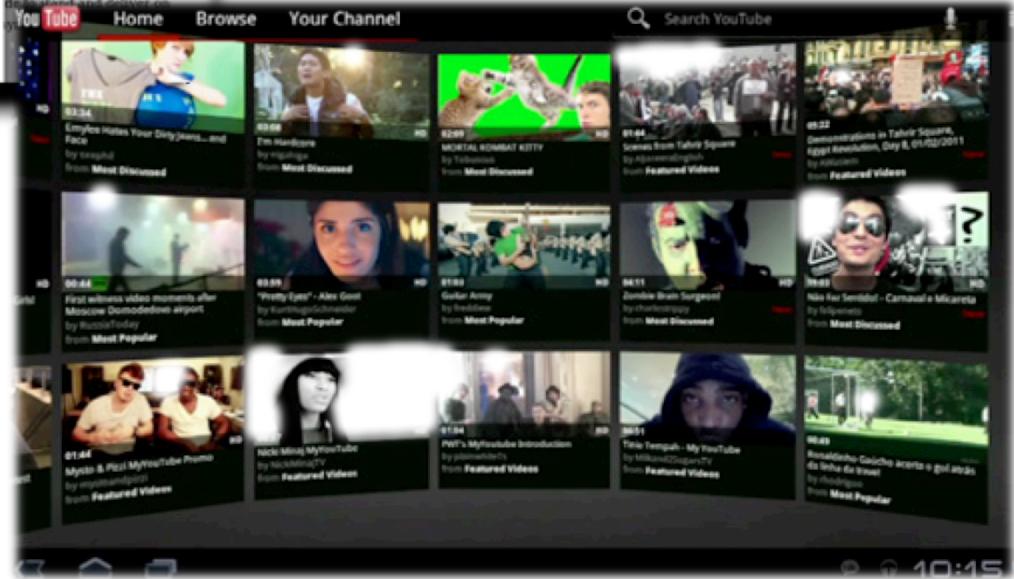
strange to relate, have proved more important than any communications yet received by the chickens of the Cock-lane brood. Sounded on the whole as to matters spiritual,

usly, work silently, and about with muffled tread: tain any suspicion that esical and traitorous.

y an amount of order and mal boasting. Daring bur- way robberies, took place in villes were publicly ca- bout removing their furni- s for security; the highway- man in the light, and, be- y his fellow-tradesman ter of "the Captain," gallant- d rode away; the mail was he guard shot three dead, by the other four, "in conse- uition": after which the magnificent potentate, the

down and delivered to you.

## 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





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