

Building an Android client

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Agenda

- iPhone and the Mobile App Explosion
- How mobile apps differ
- Android philosophy
- Development Platform
- Core Android Concepts
- App Demo
- App Dissection

The Android logo, consisting of the word "ANDROID" in a stylized, rounded, teal-colored font.

The iPhone Phenomenon

Milestones

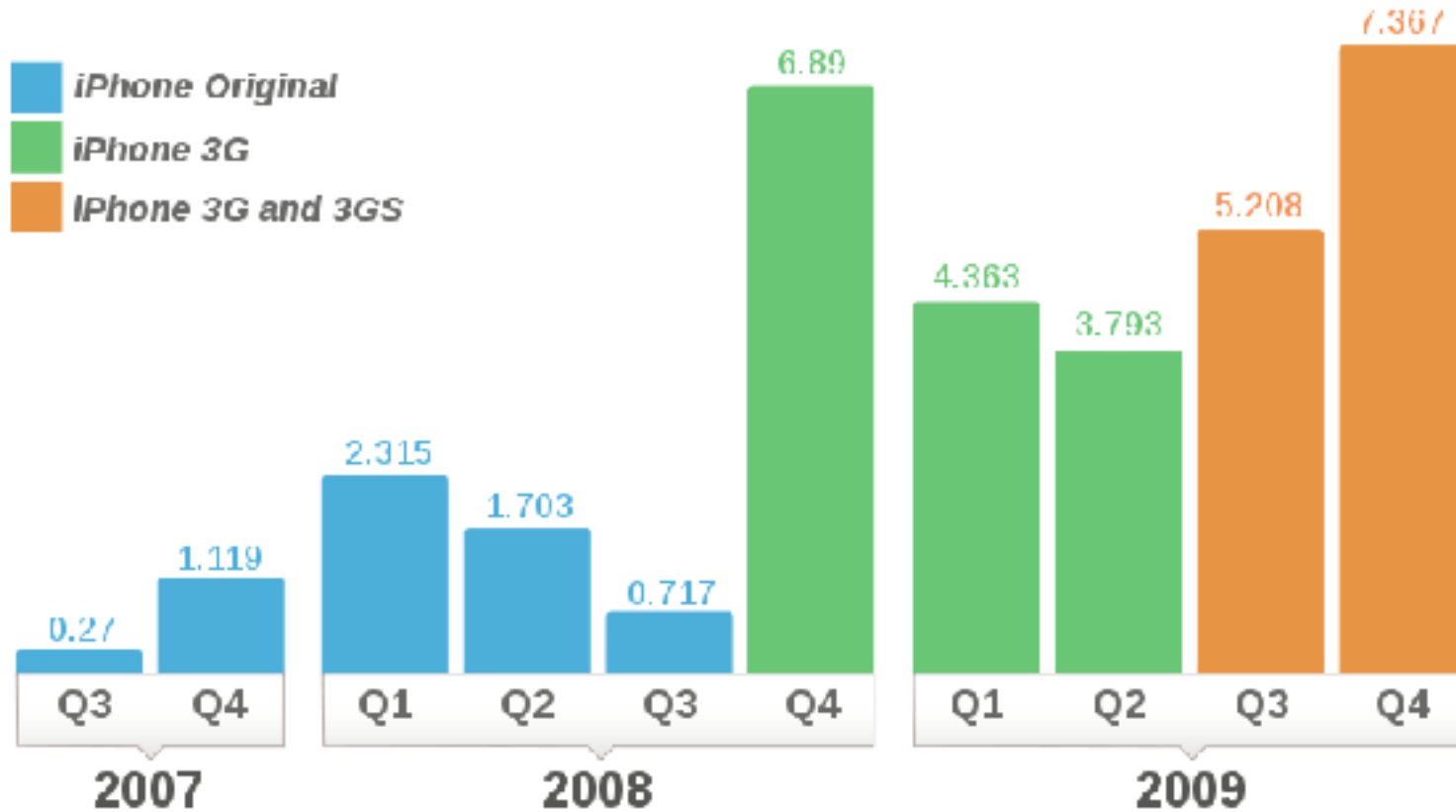
Date	Available Applications	Accumulated Downloads
July 11, 2008 ^[10]	500	0
September 9, 2008 ^[11]	3,000	100,000,000
October 22, 2008 ^[12]	7,500	200,000,000
December 5, 2008 ^[13]	10,000	300,000,000
January 16, 2009 ^[13]	15,000	500,000,000
March 17, 2009 ^[13]	25,000	800,000,000
April 23, 2009 ^[13]	35,000	1,000,000,000 ^[14]
June 8, 2009 ^[13]	50,000	1,000,000,000+

For comparison, by 17 March 2009 Google's Android Market had 2,300 available applications.^[15]

iPhone Sales Chart

UNITS SOLD WORLDWIDE, IN MILLIONS, PER FISCAL QUARTER

Source Apple Inc



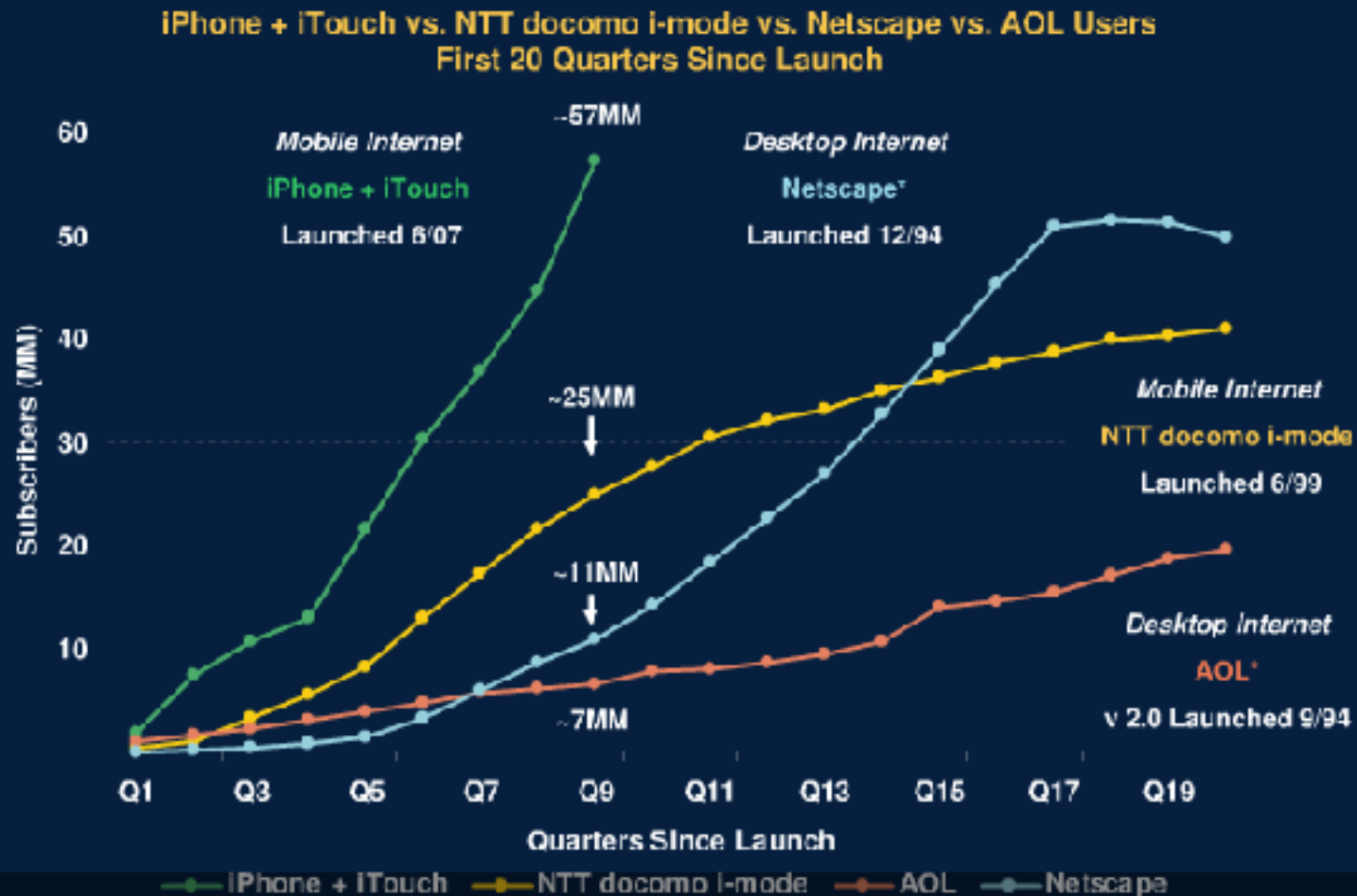
Apple's Fiscal Year starts In October. Q1 (Oct - Dec) Includes the Holiday Season

Made In Inkscope

http://en.wikipedia.org/wiki/File:IPhone_sales_per_quarter.svg

Mobile Internet Outpaces Desktop Internet Adoption

iPhone + iTouch Users = 8x AOL Users 8 Quarters After Launch



Morgan Stanley

Note: *AOL subscriber data not available before Q3/01; Netscape users limited to US only.

<http://www.techcrunch.com/2009/10/21/how-the-iphone-is-blowing-everyone-else-away-in-charts/>

Mobile Limitations

- Screen size
- Battery Limitations
 - CPU tick, memory refresh, screen lighting
- Speed
- Memory
- Keyboard



Usage Traits

- Universal, Always Available
- Small attention span
- Interruptible (calls, green light!)
- GPS
- Tap, Flick, Rotate, Pinch, Shake
- Accelerometer
- Voice, Texting
- Handwriting recognition
- Dropped calls, lack of coverage



Motorola Droid



Motorola Droid

- Android 2.0, 256MB
- 4.56-by-2.36-inch, 0.54 inch thick, 6oz, 480-by-854-pixel, 6hrs
- Camera: 5MP/4X flash, video rec
- Slide-out QWERTY keyboard
- Mail: Gmail, MS Exchange
- Google Maps Navigation



The Android mobile platform

- Linux 2.6 kernel
- Dalvik VM (.dex, .apk)
- Application framework
- SQLite, Integrated browser (Webkit)
- OpenGL graphics
- Media support
- GSM/CDMA, Wireless
- Camera, GPS, Accelerometer



Core Applications

- Email client
- SMS
- Calendar
- Maps
- Contacts

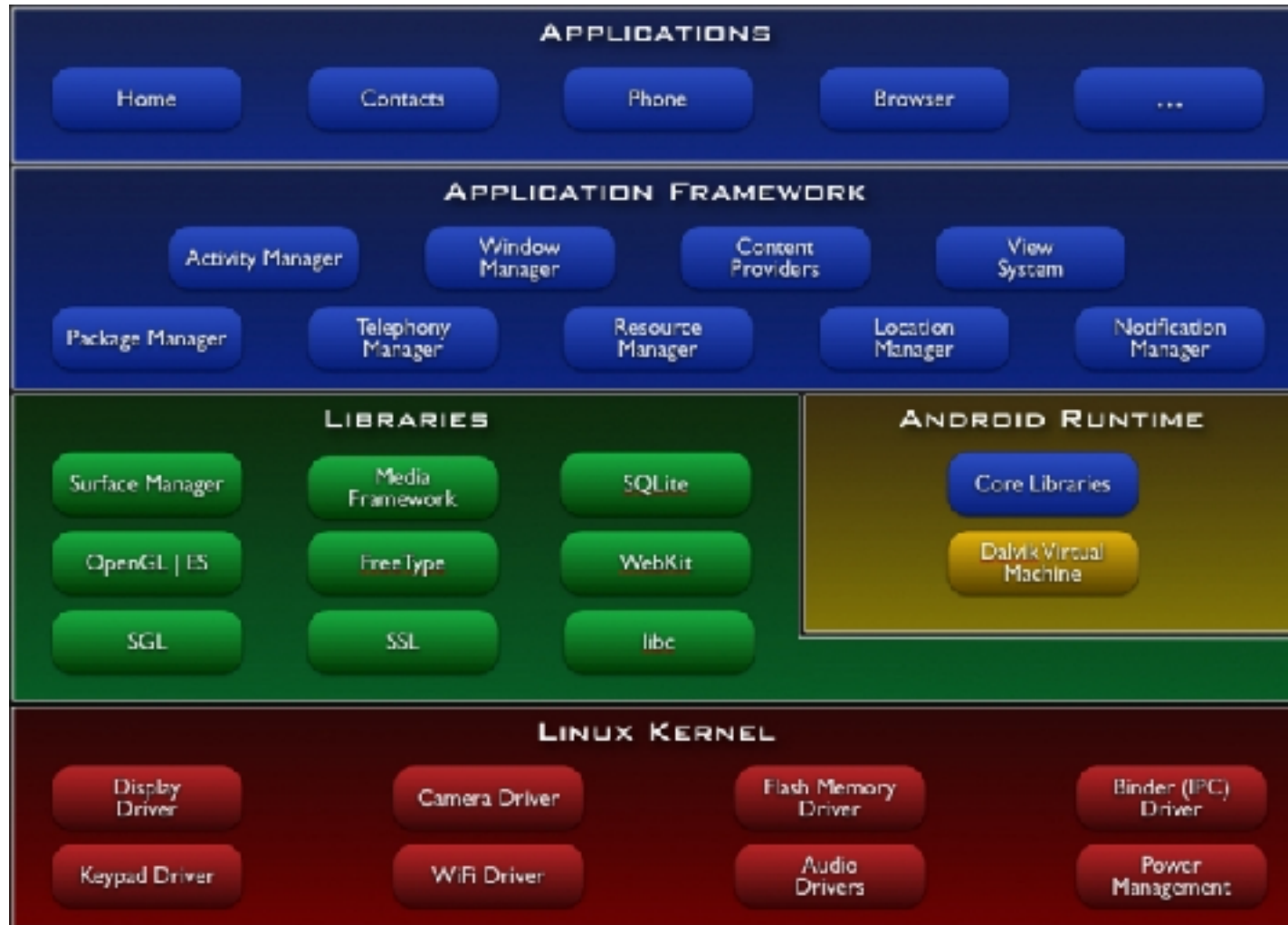


Criticisms / Issues

- Not a std linux distribution
- Not Java ME/SE, limited libraries
- Apps run only from on-board memory
- Version compatibility
- Obsolete search results



Android Stack



Application Framework

- Activity Manager: app life cycle, navigation stack
- Views: layout, widgets
- Content Providers: data storage/sharing
- Resource Manager: strings, images
- Notification Manager: alert mechanisms



Key Programming Concepts

- Activities
- Services
- Intents
- Receivers
- Content Providers



Activities

- Runnable
- Interacts with user
- Associated with views
- Requests data or services via Intents

Services

- Runnable
- Background process
- MP3 player, polling sub-system



Receivers

- Broadcast receivers (low battery)
- Intent Receivers
- Intents registered with Android

Content Providers

- Share data with activities / services
- Queries in the form of a URI
 - `content://contacts/people`



Installing Dev Environment

- Java 5/6
- Eclipse
- Android SDK
- \$PATH
- ADT plugin
- Install Updates



Development Environment

- Eclipse
- ADT plugin
- Emulator, Device Controls
- Android Virtual Device Manager
- Dalvik Debug Monitor Service
 - Debugger, LogCat
 - File Explorer, Threads, Heap
- Physical Device Testing



Demo

App Preview

Poolster

- Online “football pools” application
- Entities: Game, User
- Game → Stake, Option, Ends
- To join User chooses an Option
- REST Webservice backend
- Clients: iPhone, Grails, Android, Silverlight



Inside Poolster

- Directory Structure
- Manifest File
- App Launching
- Activity Life Cycle
- Layout Files
- Menu



AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.talentica.poolster"
    android:versionCode="1"
    android:versionName="1.0">
<uses-permission android:name="android.permission.INTERNET"></uses-permission>
<application android:icon="@drawable/icon" android:label="@string/app_name">
    <activity android:name=".Main"
        android:label="@string/app_name">
        <intent-filter>
            <action android:name="android.intent.action.MAIN" />
            <category android:name="android.intent.category.LAUNCHER" />
        </intent-filter>
    </activity>
    <activity android:name=".GamesList"
        android:label="@string/app_name">
    </activity>
    <activity android:name=".Login"
        android:label="@string/app_name">
    </activity>
</application>
<uses-sdk android:minSdkVersion="3" />
</manifest>
```



Inside Poolster - 2

- The Main activity
- REST Client
- Object-XML marshal/demarshal
- Internationalization
- AdMobs Integration
- Position
- Database



Deploying

- Join Android Developer Program
- Eclipse Android Tool “Export Signed Package”
- Upload .apk file to Android Market



Resources

- <http://developer.android.com>
- Professional Android Application Development (Wrox)
- Android Application Development (O'Riley)
- <http://www.screaming-penguin.com/AndroidResources>



Thanks